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Driving Equitable and Accessible 15 Minute Neighbourhood Transformations

WP4. New governance and business models and transition pathways

T4.1. Business models and subsidy levels

Deliverable D 4.1

Towards Resilient and Responsible Shared Mobility Business Models for Urban Outskirts

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Responsible partner: University of Applied Sciences Utrecht

Authors:

Stephanie Geertman, University of Applied Sciences Utrecht (HU)

Daniela Arias Molinares, University of Twente (UT)

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EXECUTIVE SUMMARY

Shared mobility services are increasingly recognized as important components of sustainable and accessible urban mobility systems. However, ensuring their long-term viability in urban outskirts remains challenging. Compared with dense urban centers, urban outskirts often experience lower population densities, dispersed travel patterns, higher levels of car dependency, and reduced commercial attractiveness for mobility providers. At the same time, these areas frequently accommodate population groups that are particularly vulnerable to mobility exclusion. Developing mobility services in urban outskirts therefore requires business models that are not only financially viable but also capable of delivering broader societal benefits.

This deliverable explores how resilient and responsible business models can support shared mobility services within the context of the [DREAMS project](#), and the concept of the 15-minute urban outskirts neighbourhood (15mN). The report aims to identify the conditions that support the long-term viability of shared mobility business models in urban outskirts. The findings demonstrate that business model viability depends not only on financial sustainability but also on governance arrangements, stakeholder collaboration, infrastructure provision and public value creation.

The research combines a systematic literature review, explorative stakeholder interviews, and empirical testing across the six DREAMS Living Labs in Brussels, Budapest, Munich, Paris, Utrecht, and Vienna. Findings from these activities were synthesized into the ResiMOB framework (Resilient and Responsible Mobility Business Models).

ResiMOB was developed as an analytical and participatory framework to support the assessment and co-creation of shared mobility business models. The framework is organized around three dimensions, Governance, Infrastructure, and Values, and nine associated components, providing a structured approach for analysing how responsibilities are distributed across stakeholder groups and how business models contribute to broader public objectives.

To test the framework, a stakeholder survey was conducted across the six DREAMS Living Labs. The results indicate that resilient shared mobility systems depend on hybrid governance arrangements that combine private-sector operational expertise with public-sector facilitation, regulation, infrastructure provision, and support for social and environmental objectives. Stakeholders also expressed a desire for greater involvement of users and civil society organizations in future governance arrangements.

The report further demonstrates how ResiMOB can function as a practical co-creation tool within Living Labs. By visualising stakeholder perspectives and highlighting areas of agreement and divergence, the framework supports communication, reflection, and collaborative business model development. Comparative analysis of stakeholder perspectives in Paris and Utrecht illustrates how the framework can help stakeholders explore alternative governance arrangements and pathways towards more resilient and responsible mobility systems.

To facilitate wider application beyond the DREAMS consortium, ResiMOB has been published through the DREAMS Interactive Knowledge Platform (IKP) as an open-access resource. The framework is also being translated into complementary engagement formats, including a board game developed by students, to support stakeholder participation and learning.

Overall, the findings demonstrate that resilient and responsible shared mobility business models require more than financial sustainability alone. They depend on effective governance arrangements, stakeholder collaboration, infrastructure provision, and the creation of public value. The ResiMOB framework contributes to these objectives by providing a transferable tool that supports the analysis, design, and co-creation of shared mobility business models in urban outskirts and beyond.

1. INTRODUCTION

1.1. About the DREAMS Project

The project “Driving Equitable and Accessible 15-Minute Neighbourhood Transformations” ([DREAMS](#)) is funded as part of the Driving Urban Transitions partnership (DUT). Its overall objective is to ***examine how co-created and user-centric mobility services, mobility hubs and flexible activity hubs can contribute to accessible, sustainable and inclusive 15-minute neighbourhoods in urban outskirts in European cities and regions***. DREAMS is organised around seven work packages: WP1) Project and data management and quality control, WP2) Review and comparative analysis, WP3) 15-minute city decision support tool, WP4) New governance and business models and transition pathways, WP5) 15mC living labs, WP6) Impact assessment and evaluation and WP7) policy integration and recommendations, transferability and knowledge dissemination. This report is the first deliverable for WP4.

1.2. About Deliverable 4.1: Exploring resilient and responsible business models for shared mobility

The 15-minute city (15mC) has emerged as an influential planning concept that aims to improve accessibility by ensuring that residents can reach essential daily destinations within a short distance of their homes. As the concept was originally developed for dense urban environments, its application in urban outskirts presents distinct challenges. Compared with urban centres, urban outskirts often experience lower population densities, higher levels of car dependency, and lower demand for alternative mobility services.

At the same time, many urban outskirts are home to population groups that may be particularly vulnerable to mobility exclusion, including lower-income households, older adults, young people, migrants, and residents without access to private vehicles. While these areas may have significant mobility needs, their lower densities and dispersed travel patterns make them less attractive for market-based mobility services. As a result, mobility solutions that may be economically viable in dense urban centres often struggle to operate successfully in suburban and peri-urban contexts. This creates a fundamental challenge for cities seeking to improve accessibility, social inclusion, and sustainability in urban outskirts.

Within DREAMS, this challenge is addressed through the concept of the 15-minute urban outskirts neighbourhood (15mN), which focuses on improving accessibility while reducing dependence on private cars. Shared mobility services, mobility hubs, flexible transport solutions, and other innovative mobility services are expected to play an important role in achieving this transition. However, ensuring that these services are available and accessible in urban outskirts requires business models that are not only financially viable but also capable of delivering broader public benefits, including accessibility, equity, social inclusion, and environmental sustainability.

The objective of this deliverable is to explore the conditions that support the long-term viability of shared mobility business models in urban outskirts. While economic viability remains an important objective, this study adopts a broader perspective by examining how governance arrangements, stakeholder collaboration, infrastructure provision and public value creation together contribute to resilient and responsible business models. To achieve this, the study combines evidence from a systematic literature review with practical insights from explorative stakeholder interviews. Together,

these provide the foundation for the development of the ResiMOB framework (Resilient and Responsible Mobility Business Models), which is subsequently operationalised and explored through a stakeholder survey across the six DREAMS Living Labs.

Resilient business models are able to adapt to changing circumstances and remain viable over time, while responsible business models contribute to broader societal objectives and create value for multiple stakeholders. While the original focus of Task 4.1 included the economic viability of shared mobility business models, the literature review and stakeholder interviews demonstrated that long-term viability depends on a broader set of interrelated conditions. Therefore, this report considers governance arrangements, stakeholder collaboration, infrastructure provision, public value creation, accessibility and environmental sustainability alongside financial viability.

To achieve this objective, the report combines three complementary approaches. First, a systematic literature review examines existing knowledge on business models for shared mobility services and related mobility innovations. Second, explorative stakeholder interviews provide practical insights into how business models are currently organised and experienced across the DREAMS Living Labs. Third, findings from the literature review and the explorative stakeholder interviews are synthesised to develop the ResiMOB framework, a framework designed to support the analysis and co-creation of viable, resilient and responsible shared mobility business models.

The framework was subsequently applied through a stakeholder survey conducted across the six DREAMS Living Labs. The survey explores how different stakeholder groups perceive the present and wished involvement of stakeholders across governance, infrastructure, and value dimensions of shared mobility systems. The resulting analyses provide insight into stakeholder perspectives on resilient mobility governance and illustrate how the framework can support stakeholder dialogue and business model development processes.

Beyond its analytical function, ResiMOB is presented as a practical co-creation tool that can support communication, learning, and decision-making among stakeholders. To facilitate wider application beyond the DREAMS project, the framework has been published through the DREAMS Interactive Knowledge Platform (IKP) and is being further developed through complementary engagement formats, including a board game developed by students.

ResiMOB: Developing resilient and responsible shared mobility business models for urban outskirts

From evidence gathering to practical application through the ResiMOB framework

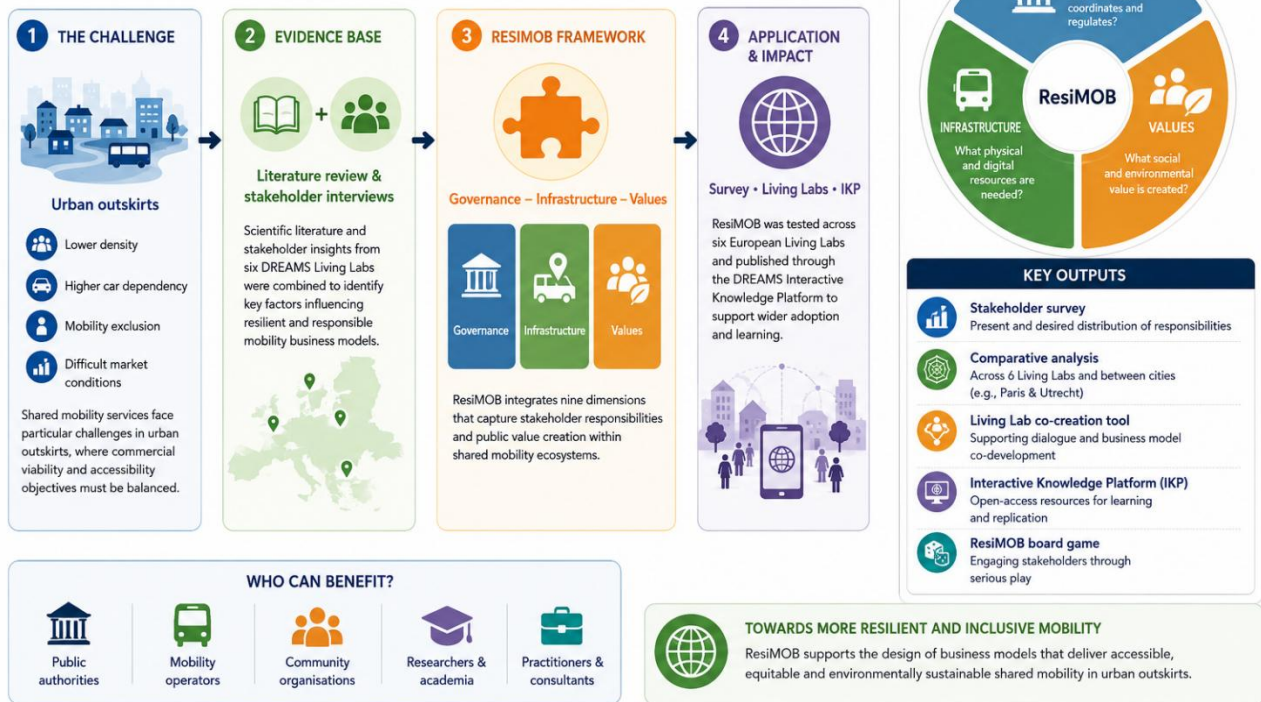


Figure 1. Development and application of the ResiMOB framework for resilient and responsible shared mobility business models in urban outskirts. Figure generated with OpenAI DALL·E (2026) based on a prompt describing the development of the ResiMOB framework

The remainder of this report is structured as follows. Section 2 describes the methodology used for the literature review, stakeholder interviews, and survey development. Section 3 presents the findings from the literature review. Section 4 summarises the key insights from the stakeholder interviews and discusses their implications for framework development. Section 5 presents the ResiMOB framework, survey results, comparative stakeholder analyses, Living Lab applications, and implications for resilient and responsible shared mobility business model development.

2. RESEARCH DESIGN AND METHODS

2.1. Overall research approach

University of Applied Sciences Utrecht (HU) was the responsible partner for Task 4.1 and led the research and development activities reported in this deliverable. The University of Twente (UT) contributed to the literature review.

This deliverable aims to explore the conditions that support the long-term viability of shared mobility business models in 15-minute urban outskirts neighbourhoods. To address this objective, a multi-stage research approach was adopted that combined literature review, stakeholder engagement, framework development, and empirical testing across the DREAMS Living Labs.

The research process consisted of five main stages. First, a systematic literature review was conducted to identify existing knowledge on business models for shared mobility services and related mobility innovations. Second, explorative stakeholder interviews were carried out across the DREAMS Living

Labs to gain practical insights into how shared mobility business models operate in different local contexts. Third, findings from the literature review and stakeholder interviews were synthesised into the ResiMOB framework. Fourth, the framework was operationalised through a stakeholder survey and applied across the six DREAMS Living Labs. Finally, the resulting data were analysed to identify patterns in stakeholder involvement, governance arrangements, and future business model configurations.

This approach enabled the development of a framework that is both theoretically informed and grounded in stakeholder experiences from real-world mobility systems. Importantly, the research showed that business model viability cannot be understood solely in terms of pricing or subsidy mechanisms, but also depends on governance arrangements, stakeholder collaboration and public value creation. This broader understanding informed the development of the ResiMOB framework.

2.2. Literature review

The literature review was conducted to identify existing knowledge on business models for shared mobility services and to explore how resilience and responsibility are addressed within mobility business model design. More specifically, the review addressed the following research questions:

1. Which characteristics contribute to the long-term viability of shared mobility business models in urban outskirts?

2. Beyond pricing and subsidy mechanisms, which governance, infrastructure and value-related elements are identified in the literature as supporting resilient and responsible shared mobility business models?

The review focused exclusively on academic scientific literature, as the objective was to capture current discussions within the scientific community regarding business models, shared mobility, and related mobility innovations. Only peer-reviewed journal articles published in English were included.

The review was conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Searches were performed in the Scopus database on 10 March 2025 using a search query that combined business model terminology with shared mobility and mobility service concepts.

The following search string was used:

“TITLE ((‘business model’ OR ‘value proposition’ OR ‘revenue’ OR ‘business strategy’ OR ‘economic model’ OR ‘business framework’ OR ‘subscription’ OR ‘pricing’ OR ‘price’ OR ‘subsidies’ OR ‘subsidy’ OR ‘subsidisation’ OR ‘subsidization’ OR ‘social business model’ OR ‘community-driven business’ OR ‘value creation’) AND (‘mobility’ OR ‘mobility hub’ OR ‘flexible activity hub’ OR ‘pop-up store’ OR ‘demand-responsive transport’ OR ‘on-demand transit’ OR ‘car-sharing’ OR ‘

carpooling’ OR ‘shared mobility’ OR ‘micromobility’ OR ‘micro-mobility’ OR ‘mobility solution’ OR ‘shared hub’ OR ‘bike-sharing’ OR ‘bikesharing’ OR ‘bikeshare’ OR ‘shared bike’ OR ‘cargo bike’))”

The search yielded 230 documents. Additional screening criteria were subsequently applied. Only journal articles and review papers written in English were retained. Full-text availability was required, resulting in a dataset of 215 documents.

A first screening was conducted through title and abstract review, excluding publications that only tangentially addressed shared mobility or business model development. Subsequently, full-text review was undertaken for 34 papers. Of these, nine papers were identified as highly relevant because they explicitly addressed both financial or business model components and shared mobility services.

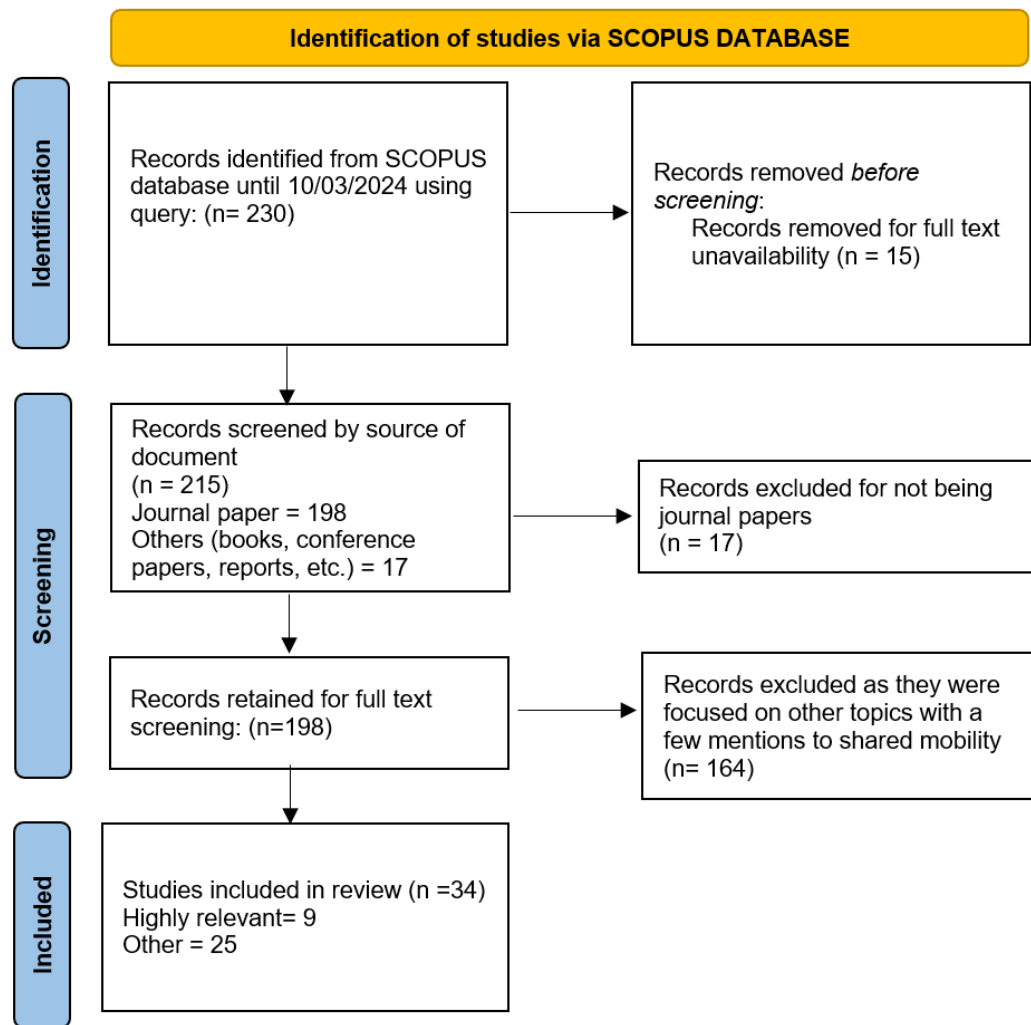


Figure 2. PRISMA flowchart of the literature review selection process. Source: own elaboration

The selected papers were analysed and synthesised using summary tables that documented key findings, business model characteristics, governance arrangements, financing structures, stakeholder roles, and public value considerations. These summaries formed the basis for the literature review findings presented in Section 3 and provided the initial conceptual foundation for the development of the ResiMOB framework.

With the 34 documents, we proceeded to read, analyse and synthesise the most relevant results in summary files which we then used to compile findings on a document table. With this main table we were then able to make summary tables and graphs showing the results and findings from the literature review.

2.3. Explorative stakeholder interviews

To complement the literature review, 10 explorative stakeholder interviews were conducted between June and September 2024 with representatives of public authorities, shared mobility providers, and other ecosystem actors across the DREAMS Living Labs in Paris, Munich, Budapest, Vienna, Brussels, and Utrecht.

The interviews were exploratory in nature and aimed to capture practical experiences with shared mobility business models. Discussions focused on governance arrangements, financing structures, stakeholder responsibilities, infrastructure provision, public-private collaboration, and broader societal objectives associated with shared mobility systems.

Rather than testing predefined hypotheses, the interviews were used to identify recurring themes, challenges, and opportunities that could inform framework development. They also provided insights into how business models are organised in practice and how responsibilities are distributed across stakeholder groups.

The findings from the interviews complemented the literature review and were thematically synthesised to support the identification of the key dimensions of the ResiMOB framework. A thematic summary of the exploratory stakeholder interview findings is provided in Appendix A.

2.4. Development of the ResiMOB framework

The ResiMOB framework was developed through an iterative process that combined insights from the literature review and stakeholder interviews.

Analysis of the literature highlighted recurring themes related to governance, infrastructure, financing, ownership, stakeholder collaboration, social inclusion, and environmental sustainability. These themes were subsequently compared with findings from the stakeholder interviews, which provided practical perspectives on how shared mobility systems are organised and governed in different local contexts.

The synthesis of these findings resulted in the identification of three overarching dimensions:

1. Governance;
2. Infrastructure;
3. Values.

Within these dimensions, nine specific components were defined:

1. Ownership;
2. Facilitation;
3. Finance;
4. Feedback systems;
5. Regulations;
6. Physical infrastructure;
7. Digital infrastructure;
8. Equity values;
9. Environmental values.

Together, these components form the analytical structure of the ResiMOB framework and provide a basis for assessing stakeholder involvement in shared mobility ecosystems.

2.5. Survey design and data collection

To operationalise the framework, a stakeholder involvement survey was developed. The complete ResiMOB Stakeholder Assessment Survey is provided in Appendix B. The survey assesses how different stakeholder groups are involved across the nine ResiMOB components.

For each component, respondents assessed stakeholder involvement using a five-point scale ranging from very low involvement (1) to very high involvement (5). Respondents completed two assessments:

1. the present involvement, representing current stakeholder involvement;
2. the wished involvement, representing preferred future governance arrangements.

The survey considers four stakeholder groups:

3. private shared mobility providers;
4. public authorities;
5. shared mobility users;

6. NGOs and third-sector organisations.

The survey was distributed across the six DREAMS Living Labs and resulted in eleven responses: six from urban authorities, four from private mobility providers, and one from a public mobility organisation. As the public mobility organisation was the only respondent in this category, its response was excluded from the comparative stakeholder analysis. The comparative stakeholder analysis was therefore based on ten responses.

The survey was designed to support both analytical assessment and stakeholder reflection by enabling respondents to compare present and wished involvement of stakeholders across mobility ecosystems.

2.6. Data analysis

The ten survey responses included in the comparative stakeholder analysis were analysed at three complementary levels. First, an aggregated stakeholder analysis was conducted to identify overall patterns in how stakeholder groups perceive present and wished involvement across the ResiMOB dimensions.

Second, Living Lab-specific analyses were undertaken to explore how governance arrangements differ between local contexts. These analyses provide insight into how institutional environments, stakeholder configurations, and policy priorities influence business model development.

Third, a comparative analysis was conducted for Paris and Utrecht, the only Living Labs in which responses were obtained from both public authorities and private mobility providers. This comparison enabled exploration of similarities and differences between public and private sector perspectives within the same local context.

Survey results were visualised using radar charts. Radar charts allow multiple dimensions to be displayed simultaneously and support the identification of governance gaps, differences in stakeholder expectations, and opportunities for collaboration. The visualisations also function as a communication tool that facilitates stakeholder dialogue and supports the co-creation of viable, resilient and responsible shared mobility business models.

Beyond the survey analysis, the framework was applied as a Living Lab co-creation tool and subsequently published through the DREAMS Interactive Knowledge Platform (IKP) to support wider dissemination and transferability beyond the project consortium.

3. LITERATURE REVIEW RESULTS

This section presents the results of the literature review and is structured into three complementary subsections. First, it clarifies how business models are defined in this review and identifies the mobility solutions that constitute the focus of the DREAMS project. Second, it provides an overview of the main business model propositions identified in the literature across different shared and integrated mobility contexts. Third, it examines more recent and emerging business model propositions related to Mobility as a Service (MaaS). Together, these subsections provide a structured synthesis of how business models are defined, operationalised, and adapted within contemporary mobility systems.

3.1. Business model definition and mobility solutions in focus

We begin by clarifying what is meant by the term “business model,” as this concept is used with varying meanings across the literature. In this review, we adopt the definition proposed by (Coenegrachts, 2023), who conceptualises a business model as a *formal representation that describes the key aspects and activities of an organisation, or a network of organisations, through which it moves towards achieving*

its goals and objectives. Under this interpretation, the business model serves as an analytical device to articulate and examine how value is created and captured, while reducing the complexity inherent in multi-actor systems. This definition is particularly relevant in the context of urban mobility and accessibility, where public and private actors operate within shared institutional and spatial environments and pursue both public and private forms of value creation.

Moreover, the author adapts a sustainability-oriented business model research, emphasising that sustainable business models extend beyond *purely economic value creation* to also *encompass public value, including social and environmental benefits*. In sectors such as urban mobility, where public and private actors operate within shared institutional environments, aligning public and private objectives through public-private business models is therefore considered essential for supporting sustainable outcomes.

Moreover, the scope of this review is limited to the list of solutions or shared mobility services to be analysed in the DREAMS project. Hence, based on the project's already published [Deliverable 2.2](#), a summary table of the DREAMS solutions can be compiled in *Table 1*, as they are the main focus of the project.

Solution	Description	Lessons
Car-sharing	Round-trip car-sharing in suburban areas (e.g. Cambio – Belgium, Paris Region). Station-based systems linked to PT accessibility. Peer-to-peer car-sharing platforms.	Round-trip car-sharing is best suited for low-density areas (more predictable demand) Works best when embedded in strong car-reduction policies (parking restrictions, limited ownership) One shared car can replace 5–10+ private cars, freeing public space Needs public support or regulatory incentives in outskirts to remain viable
Shared micromobility	Bike-sharing (docked, light-docked, virtual stations) E-bike and cargo-bike sharing Scooters (more limited relevance in outskirts)	Light infrastructure systems reduce costs and are better for suburbs Extending existing city systems to outskirts works better than starting from scratch Micromobility must be paired with safe cycling infrastructure In cycling-mature areas, investing in personal bike support (parking, subsidies) may be more effective than sharing systems
Carpooling	Dedicated carpool lanes (e.g. Barcelona C-31) Park-and-carpool facilities Digital matchmaking platforms Structured carpool routes	Most effective for longer suburban–urban trips, not local 15mC trips Needs strong incentives (time savings, lanes, parking benefits) Works best when combined with employer involvement and PT integration More an accompanying measure than a core 15mC solution
Flexible (pop-up) activity hubs	Mobile shops and services (markets, libraries, gyms, medical services)	Very effective for low-density areas where permanent services are not viable Part-time presence across locations improves economic viability

Solution	Description	Lessons
	Multi-service points in existing shops (post, banking, ticketing) Temporary hubs at stations or village centres	Strong social benefits: local vitality, social interaction, inclusion Works best when aligned with mobility hubs or PT nodes
Mobility hubs	Small local hubs (bike + car-sharing + PT stops) Regional hub networks (e.g. Hoppin – Flanders, NL hubs) Multimodal hubs with services (parcel lockers, seating, info)	Act as a keystone policy connecting all other levers Most successful when standardised but locally adapted Need strong institutional coordination (transport + spatial planning) Improve usability and visibility of sustainable modes in outskirts

Table 1 DREAMS project focus regarding mobility solutions

Source: own elaboration.

These mobility solutions are widely discussed in the literature in relation to accessibility and sustainable urban mobility. However, comparatively less research examines the value propositions and business model configurations required to make these solutions viable in urban outskirts.

3.2. Business model proposition in the literature

The business model propositions identified in the literature remain relatively limited. Moreover, when such propositions are put forward, they are often formulated at a high level of abstraction, lacking detailed specifications. In this section, we provide a summary of those few examples where we found relevant propositions for the shared mobility sector.

Beginning with Coenegrachts (2023), the author not only provides a business model definition as we mentioned previously but further operationalises the concept by proposing design components that need to be considered. According to his research, a business model is composed of five interrelated design domains. First, the service design specifies the value propositions offered by the network, the target user groups, and the channels through which services are delivered. Second, the infrastructure design captures the activities, expertise, and technological resources required to create and deliver this value. Third, the finance design outlines the revenue mechanisms and cost structures associated with the business model. Fourth, the feedback design addresses the systems through which user experiences and performance outcomes are monitored and evaluated. Finally, the organisation design defines the roles, dependencies, and governance arrangements among the stakeholders involved. Together, these design domains provide a comprehensive structure for analysing how shared mobility hubs, but also other solutions can create, deliver, and capture value within complex public–private settings (see Table 2) (Coenegrachts, 2023).

Design domain	Key elements for shared mobility hubs
Service design	• Definition of the value proposition of the shared mobility hub (e.g. integrated access to public transport and shared modes) • Identification of target user groups (e.g. residents, commuters, visitors) • Composition of the service bundle (e.g. shared bikes, cars, cargo bikes, public transport connections) • Definition of access and usage logic (e.g. on-demand access, integrated ticketing, membership-based use)
Organisation design	• Local authority roles, including: – Owner of the shared mobility hub – Network facilitator assembling stakeholders – Regulator enforcing service levels – Enabler of a level playing field for providers – Allocator and repurposer of land for hubs – Subsidising authority • Public transport authorities acting as owner and/or operator and allocating land at PT nodes • Shared mobility providers operating services, performing rebalancing and recharging, and owning dedicated vehicle infrastructure • Private non-mobility actors (e.g. POI owners) acting as hub owners, land providers, or network facilitators
Infrastructure design	• Technologies to monitor availability and status of shared vehicles • Systems to enable access to multiple shared services (e.g. access control, interoperability) • Digital channels (e.g. apps, displays) to inform users about available services and hub functionality
Finance design	• Pricing schemes such as pay-per-use and subscription models • Coverage of investment costs (e.g. land repurposing, hub installation) through public subsidies, operating permits, or advertising revenues • Coverage of operating costs (e.g. hub maintenance, vehicle maintenance, rebalancing and recharging) through user fees and per-trip subsidies
Feedback design	• Feedback systems at community, neighbourhood, or organisational level (e.g. surveys, monitoring tools) • Identification and monitoring of key risks, including: – Over-reliance on shared electric vehicles affecting financial viability – Substitution of public transport trips by shared vehicles, reducing sustainability benefits – Low usage levels at hubs, undermining network performance and reliability

*Table 2 The five business models components of shared mobility hubs by Coenegrachts.
Source: own elaboration based on Coenegrachts (2023)*

Blueprint	Value proposition	Target users	Features	Challenges
First-and-Last-Mile Mobility Hub Network	Stimulating intermodal travel behaviour by implementing a first-/last-mile solution, that complements public transport and provides an alternative for car-only trips.	Commuters bridging first-and last-mile gaps. Location: highly dense neighbourhoods, city centres.	Dense hub network, MaaS integration, rebalancing operations, and storage for private vehicles. Finance: - Integrated fees and a demand-responsive pricing. - Integrate PT fee into subscription fee for SM services (MaaS) - Funding can come from PT operators, authorities, operating permits and advertisements.	High costs, potential overlap with public transport.
Clustered Mobility Hub Network	Clusters shared mobility services in suburban areas to raise awareness and reduce car reliance.	Residents in suburban neighbourhoods underserved areas with low public transit availability. Location: outskirts.	May include local shops, parcel lockers, or terraces for community use. Charging stations for shared and private electric vehicles. Finance: - Subscription fee, pay-per-use. - Integrate PT fee into subscription fee for SM services (MaaS) - Revenues from charging private vehicles - Funding can come from PT operators, authorities, operating permits and advertisements and from local service providers (parcel locker, bike repair shop, etc).	Financial risks due to low usage for low density areas. Shared mobility providers unwilling to operate unless the local authority bears the financial risks. Moreover, small local authorities could not have the sufficient bargaining power to require a minimum service level, leading to a low quality and non-reliable shared mobility system.
Point-of-Interest (POI) Mobility Hub Network	Establishes a network that connects different point-of-interests, so that these high demand areas can be more easily reached by alternative modes of transportation.	Visitors, commuters, and tourists. Location: concentration of POIs and high congestion.	Charging stations for shared and private electric vehicles. Finance: - Finance: Integrated fees and a demand-responsive pricing. - Integrate PT fee into subscription fee for SM services (MaaS) - Funding can come from PT operators, authorities, operating permits and advertisements and POI owner.	Requires strong stakeholder collaboration and infrastructure at POIs.

Blueprint	Value proposition	Target users	Features	Challenges
Hybrid Mobility Hub Network	Combines free-floating and station-based services to maximise flexibility and area coverage.	Daily commuters, shoppers, and leisure travellers. Location: highly dense neighbourhoods, city centres.	Centralised and combined fleet management (i.e., redistribution, maintenance, charging) for both station-based and free-floating modes. Finance: • Subscription fee, pay-per-use. • Integrate PT fee into subscription fee for SM services (MaaS) • Financial incentives offered to redistribute the shared fleet. • Funding can come from PT operators, authorities, operating permits and advertisements and operators using maintenance and charging infrastructure.	Users can mainly substitute their public transport trips by the shared mobility modes, thereby not reducing their car use and decreasing the revenues for public transport; free-floating devices are too numerous on certain locations (e.g., on the pavements), leading to frustrations of other public space users; low actual use of shared mobility services, leading to insufficient revenue for the providers and an unreliable shared system; free-floating providers capture market share of station-based providers in areas with shared mobility hub presence (or vice versa), thereby affecting the profitability of the competitor and thus the reliability of the shared system.
Closed Mobility Hub Network	Provides exclusive access to shared mobility for residents or private companies.	Real state developers, business park owners, employers, residents. Location: wherever the client is.	Exclusive use by subscribers: need for technology that allows access, parcel lockers and charging points for personal vehicles. • Finance: • Subscription fee, pay-per-use. • Funding from demand operators (real state and business park owners)	Low user base and profitability issues.

*Table 3 Business model blueprints proposed for mobility hubs
Source: own elaboration based on Coenegrachts (2023).*

For the specific case of mobility hubs, Coenegrachts (2023) conducted workshops with experts and proposed five business model “blueprints”, which may also provide relevant insights for other mobility solutions (see Table 3).

Taken together, these components provide the foundational conceptual structure for this study. His business model definition, components and blueprints are our baseline framework, which will subsequently be extended and enriched through insights derived from the broader literature review.

Services type	Business model	Policies
Round trip services	Return to its origin. Advanced reservation via the internet is typically required and payment includes an additional time-based parking charge for a planned trip. When the length of hire is longer, the fixed-base service often becomes relatively cheaper compared to the free-floating service.	Require assigned parking for shared vehicles, especially in the CBD or at public transit nodes.
One-way station-based services	Return to a different designated station. Users typically pay by the minute versus the hour and do not require a reservation. But a fine may be required if the vehicle does not return to the assigned station.	Require assigned parking spaces and additional labour for fleet rebalancing. Difficult to get parking in the CBD and at public transport nodes.
One-way free-floating services	Return to anywhere within a geographic area. Users typically pay by the minute versus the hour and do not require a reservation. But a fine may be required if the vehicle does not return to the defined geographic area.	Use public spaces for parking. Local government holds permission to allow business operation. Additional labour cost on fleet rebalancing. Issues (particularly for bicycles) are parking in the CBD and public shared zones.
Mode	Business model	Policies
B2C	Business-owned-and-operated transportation services to individual consumers, through memberships and subscriptions. User fees a combination of pricing models.	Services innovation to shared mobility; shared mobility services should be supplemented with public transport or local major land uses; forms a merit-based model.
B2G	Business-owned-and-operated transportation services to public agency. Fee-for-service contract, per-transaction basis.	Reduce public agency's car ownership; description on capital and operation cost; promoting shared mobility in public agencies.
B2B	Business-owned-and-operated transportation services to business consumers. Fee-for-service or usage fees.	Reduce business car ownership; description on capital and operation cost; promoting shared mobility services in the business.
P2P	Individual buyers and sellers sharing mobility equipment. Fee-for-service or exchange for a transaction fee.	Promotions on reducing household cost on car ownership and transportation cost; description on capital and operation cost. Requires social innovation.
G2P	Public-agency-operated transportation services to individual consumers. Fee-for-service or discounted fees or free.	Improve public transport service provision quality and reduce service operation cost. Forms a merit-based model.
B2E	Business-operated transportation services to employees. Fee-for-service or discounted fees or paid as a package of salary.	Increase environmental consciousness of business; improve workplace equity by providing shared transport; reduce business car parking spaces.

Table 4 Policies related to different business models

Source: own elaboration based on Meng, Somenahalli, and Berry (2020).

Abbreviations used in Table 4: B2C = business-to-consumer; B2G = business-to-government; B2B = business-to-business; P2P = peer-to-peer; G2P = government-to-person; B2E = business-to-employee.

Overall, the findings emphasize the need for collaborative partnerships between public authorities and service providers to establish merit-based business models, supported by adequate infrastructure provision and smart technologies, in order to advance more efficient, environmentally sustainable, and socially responsive multi-modal shared mobility systems.

Alessandrini, Cignini, and Ortenzi (2024) examine the different business models used for car-sharing services (see Table 5).

Dimension	Sub-dimension	Roundtrip	One-way	Roundtrip with option for one-way
Value proposition	Destination	Roundtrip	One-way	Roundtrip with option for one-way
	Minimum duration	At least 1 day or longer	Hourly	By the minute
	Vehicle types	Identical or very similar vehicles available	Very different vehicles available	Very different vehicles available
	Additional benefits	Free / discounted parking	Delivery by owner	No additional benefits
Interface	Vehicle booking	Reservation and fixed return time	Instant access and fixed return time	Instant access and open-ended
	Vehicle access	Manual key handover	Lock box for key	Automatic
Service platform	Booking platform	Proprietary	Open for other providers	Open for other providers
	Parking infrastructure	Dedicated carsharing stations	Only attached to other stations	Street parking / Private homes

Dimension	Sub-dimension	Roundtrip	One-way	Roundtrip with option for one-way
Organizing model	Vehicle ownership	Operator owned	Private customers	Private customers
	Vehicle maintenance	Maintained by operator	Maintained by private customer	Maintained by private customer
	Vehicle refuelling	Refuelled and paid by owner	Refuelled by driver and paid by owner	Refuelled and paid by driver
Revenue model	Price structure	By duration only	Combination of duration and distance	Combination of duration and distance
	Transaction-based revenues	Service fee (including insurance)	Commission and/or insurance	Commission and/or insurance
	Continuous revenues	Membership fee from drivers	Service fee from car owners	Combination of multiple sources / No continuous revenues
	Organizational ownership	Private company	Cooperative	Government owned

Table 5 Different business models for car-sharing
Source: own elaboration based on Alessandrini et al. (2024).

Dulskaia and Bellini (2023) provide a comprehensive conceptual and applied overview of emerging business models for shared and sustainable urban mobility. Rather than treating shared mobility as a homogeneous concept, the authors differentiate between multiple configurations of car sharing and other shared mobility services, including scooter and bike sharing, and show how variations in vehicle ownership, booking systems, pricing structures, and parking infrastructure result in distinct business models (see Table 6). They apply the Business Model Canvas, a structured template for describing key elements of a business model such as partners, activities, resources, value propositions, customer relationships, channels, costs, and revenue streams. This provides a consistent basis for comparing business model design choices, partnership arrangements, and institutional contexts, particularly in small and medium-sized cities.

Canvas Dimension	Electric kick scooter sharing	One-way free-floating scooter sharing	Free-floating car sharing	Station-based bike sharing
Key partners	Local authorities; PT operators; IT & scooter firms; energy providers	Local authorities; PT operators; IT & scooter firms; insurers	Local authorities; PT operators; IT firms; car manufacturers; insurers	Local authorities; bike operators; sponsors; IT firms
Key activities	Licensing; fleet management; software; charging; maintenance	Licensing; fleet & platform management; cleaning; refuelling	Licensing; fleet & software management; cleaning; refuelling	System setup; fleet supply; station management; redistribution
Value propositions	Easy access; short trips; pay-as-you-go; high availability	Maximum flexibility; no stations; pay-as-you-go	Flexible car access without ownership	Affordable, reliable urban cycling
Customer relationships	Fully automated	Fully automated	Fully automated	Automated with limited human support
Customer segments	Occasional users; tourists	Urban users; tourists	Urban users; tourists	Commuters; students; tourists
Channels	App; website; public advertising	App; website; public promotion	App; website; in-car promotion	Stations/kiosks; system interface
Key resources	Scooter fleet; software; IT; staff	Scooter fleet; charging; software	Car fleet; software; charging	Bikes; stations; IT system
System implementation cost	Fleet purchase; software; insurance	Fleet purchase; software; charging	Fleet purchase; software; insurance	Bikes; stations; system setup
Operational cost	Maintenance; staff; energy; marketing	Maintenance; cleaning; staff	Maintenance; cleaning; energy	Maintenance; redistribution; staff
Revenue streams	Registration; usage fees; ads	Usage fees; sponsorship	Registration; usage fees; ads	Usage fees; sponsorship

*Table 6 Comparison of business models canvases for different shared mobility services
Source: own elaboration based on Dulskaia and Bellini (2023).*

The main contribution lies in demonstrating that the viability and scalability of shared mobility services depend not only on technological innovation but also on well-aligned public–private partnerships and carefully designed revenue models.

van Waes, Farla, Frenken, de Jong, and Raven (2018) developed a prospective transition framework to analyse how business models can evolve and to assess the upscaling potential of bike-sharing business models. The framework links business model design to socio-technical context mechanisms, namely increasing returns, industry structure, and institutions (see Table 7).

Business model	Customer value proposition	Profit formula	Key processes	Key resources	Increasing returns	Industry structure	Institutions
Two-way station-based	Facilitate public transport commuters in last-mile transport	Pay-per-use	Distribution & intake; maintenance & repair	Bikes at stations; parking facilities; staff; permits; local subsidies	Embedded in public transport system; infrastructure-dependent; low switching costs	Dominant model; large public transport firms; bikes as complementary service	No friction with formal/informal institutions; embedded in intermodal transport
One-way station-based	Local city transport from one station to another	Pay-per-use; advertising	Maintenance & repair; redistribution	Bikes; automated docking; apps; local subsidies	Infrastructure-dependent; increasing returns; low switching costs	Small in NL; entrants; Dutch & German actors	No friction with institutions; supported by local/regional authorities
One-way free-floating	Take & drop a bike anywhere; flexible urban mobility	Pay-per-use; deposits; advertising; data	Redistribution; maintenance; float management	Network of bikes; smart locks; app; data; private/public investment	Independent from infrastructure; geo-fencing; strong increasing returns; network externalities	Emergent; new entrants; global actors backed by venture capital	Formal: friction with regulations; informal: legitimacy issues in public space
Two-way free-floating (P2P)	Enable private bike owners to rent out bikes	Transaction & rental fees	Platform development	Digital platform/website	Few users on both sides; infrastructure-independent; based on existing capacity	Digital platforms	Formal: no institutional friction; Informal: bike ownership norms may be a barrier

*Table 7 Business model propositions and how they could evolve in the future
Source: own elaboration based on van Waes et al. (2018).*

Their comparative analysis shows a key trade-off: station-based models are well institutionalised and widely legitimate but face scaling constraints due to their dependence on physical infrastructure, whereas one-way free-floating models exhibit stronger scaling potential through low switching costs and spatial network externalities, yet often trigger institutional friction related to public space and

parking regulation. Importantly, the study positions geo-fencing as a digital governance mechanism that can mitigate institutional conflict while preserving free-floating user convenience. Additionally, the authors also reviewed the Dutch cases (see Table 8), which further illustrates how ownership structures and financing patterns (incumbents and public support versus entrants backed by private capital) shape business model viability and diffusion pathways, underscoring that shared mobility business models evolve through co-alignment between operational design and regulatory–social acceptance.

Cohen and Kietzmann (2014) provide a structured overview of sustainability-oriented business models across shared mobility services (see Table 9). Building on their framework, four key dimensions are considered: value proposition, supply chain configuration, customer interface, and financial model. Their typology shows that sustainability-oriented value propositions are broadly consistent across segments, for example reduced emissions and congestion, while business model differentiation is primarily driven by ownership and supply configurations, customer interfaces, and revenue mechanisms such as fees, subscriptions, advertising, sponsorship, or subsidies. In Table 9, OEM refers to original equipment manufacturer, P2P to peer-to-peer, B2C to business-to-consumer, EV to electric vehicle, and TNC to transportation network company

System	Established	Intro in NL	Business model	Description	Ownership structure	Bike ownership	Bikes & users	Locations	Funding
OV-fiets	2004	2004	Two-way station-based	National rail-linked system; last-mile focus	Public (NS)	Company owned	~14,500 bikes; ~2.4M users/year	300+ stations (NL)	Public funding
KeoBike	2016	2016	Two-way station-based	Regional system; last-mile focus	Public transport operator	Company owned	~240 bikes	20 locations (Utrecht region)	Public transport budget
Donkey Republic	2016	2016	One-way station-based	Digital lock; GPS; city transport	Private company	Company owned / local partners	~450 bikes	Amsterdam, Rotterdam	Private & public funding
Hopperpoint	2015	2015	One-way station-based	Docking stations; business market	Private company	Company owned	~50 bikes; ~1,000 users	Eindhoven, Tilburg	Provincial funding
HelloBike	2016	2016	One-way station-based	Digital lock; city transport	Subsidiary (private)	Company owned	~500 bikes	Amsterdam (Zuid-As)	Municipal & national subsidy
Spinlister	2011	2016	Two-way free-floating (P2P)	Platform for private bike rental	Private company	User owned	N/A	Global	—

System	Established	Intro in NL	Business model	Description	Ownership structure	Bike ownership	Bikes & users	Locations	Funding
ListnRide	2017	2017	Two-way free-floating (P2P)	Platform for special-purpose bikes	Private company	User owned	N/A	Global	—
FlickBike	2017	2017	One-way free-floating	Geo-fencing; smartphone-based	Private company	Company owned	~1,000 bikes	Amsterdam	Private investors
Ofo	2014	2017	One-way free-floating	Dockless; global focus	Private company	Company owned	Planned	Global	Venture capital
Mobike	2016	2017	One-way free-floating	Dockless; city transport	Private company	Company owned	Started with ~150 bikes	Rotterdam	Venture capital

Table 8 Key business model characteristics of Dutch bike services
Source: own elaboration based on van Waes et al. (2018).

Mode	Segment	Value proposition	Supply chain	Customer interface	Financial model	Examples
Carsharing	B2C point-to-point	Reduce emissions & congestion; on-demand car; no return to same location	OEM vehicle fleets; some EVs/hybrids	Shift from ownership to shared use	Usage fees; potential profitability vs owning	Car2Go
	B2C roundtrip	Reduce emissions & congestion; on-demand car; return required	OEM vehicle fleets; some EVs/hybrids	Membership-based shared access	Usage fees; potential profitability vs owning	Zipcar
	Nonprofit / cooperative	Reduce emissions & congestion; shared access	OEM vehicles; some EVs/hybrids	Community-oriented shared use	Member fees; sponsorships; public subsidies	Modo
	P2P	Reduce emissions & congestion; vehicle variety; owners monetise idle assets	Platform intermediary; vehicles supplied by owners	Platform-mediated sharing between owners & renters	Transaction fees (%); cheaper access for renters	Relay Rides; FlightCar
Ridesharing	Carpooling	Reduce emissions & congestion; subsidise driver costs	Personal vehicles	Peer-to-peer matching (colleagues/neighbours)	Small user fees; often nonprofit intermediaries	Carpooling.com ; Liftshare
	Flexible carpooling	Reduce emissions & congestion; no prearranged pickup	Personal vehicles; meeting spots	On-demand matching at designated locations	Small user fees; often free to riders	Seattle

Mode	Segment	Value proposition	Supply chain	Customer interface	Financial model	Examples
	Vanpooling	Reduce emissions & congestion; supports larger groups	Vans via operators, employers, or government	B2C / employer-based access	Rider fees	WSDOT
	App-based ridesharing (TNC)	Cheaper/faster than taxis; driver income	Private vehicles & drivers	Smartphone apps; location-based service	Driver earnings + platform commission	Uber
Bikesharing	Street furniture contract	Affordable bike access; health & congestion benefits	Bike + docking suppliers; often PT-linked	Dock-based access; encourages bike use	Advertising revenues; membership fees	JCDecaux; Clear Channel
	Publicly owned	Affordable bike access; city branding; PT integration	Public or contracted operators	Dock-based access	Highly subsidised; low user fees	Capital Bikeshare; Providencia
	Sponsorship-based	Affordable bike access; health & congestion benefits	Private operators with sponsors	Dock-based access	Sponsor funding + member fees	Citi Bike; Barclays
	Nonprofit	Affordable bike access; strong public value focus	Nonprofit operators; dock-based systems	Dock-based access	Subsidies; donations; member fees	BCycle; Nice Ride; BIXI

*Table 9 Business models for sustainability across shared mobility services
Source: own elaboration based on Cohen and Kietzmann (2014).*

Additionally, the authors extend this descriptive typology with an agency-theory lens, proposing a “Shared Mobility Agency Matrix” to classify models as private, public, or merit-oriented depending on the alignment between a city’s system-wide goals and a provider’s customer/profit goals (see Figure 3).

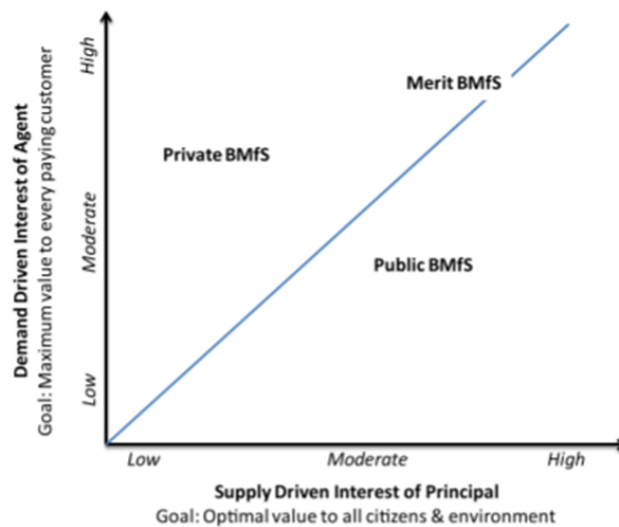


Figure 3. Shared mobility Agency Matrix. Source: (Cohen & Kietzmann, 2014)

Their central argument is that purely private or purely public approaches tend to generate conflicts or viability issues, whereas “merit” configurations - where private provision is complemented by targeted public support (e.g., parking privileges, subsidies, or integration incentives) - offer a more stable alignment for scaling shared mobility while pursuing sustainability outcomes.

In general, these studies primarily address business models within the context of traditional mobility systems, focusing on mode-specific services and relatively stable organizational arrangements. However, the recent disruption introduced by Mobility as a Service (MaaS) has shifted scholarly attention toward revisiting and rethinking mobility business models, emphasizing innovation, integration, and systemic change. This emerging body of work is the focus of the following section.

3.3. The role of Mobility as a Service (MaaS) disruption in re-thinking business models

The emergence of Mobility as a Service (MaaS) has renewed academic interest in the study of business models within the mobility sector. Mobility as a Service (MaaS) emerged in the mid-2000s, when the entrepreneur Sampo Hietanen first introduced the idea of “mobility packages” as a way of bundling transport services in a manner similar to mobile phone contracts (Hietanen & Sahala, 2014). He defined MaaS as a distribution model capable of delivering users’ transport needs through a single service interface, integrating multiple transport modes to offer tailored mobility packages (Hietanen & Sahala, 2014). Since then, MaaS has attracted increasing scholarly attention, resulting in a range of complementary definitions. By promoting integration, interoperability, and platform-based service delivery, MaaS challenges traditional, mode-specific, and asset-centred business models and calls for new approaches to value creation, capture, and delivery. As a result, a growing body of literature has explicitly focused on developing, adapting, and analysing business models that are compatible with MaaS ecosystems. These studies move beyond static representations of mobility services and instead examine how firms dynamically reconfigure their business models in response to MaaS-related technological, institutional, and organizational transformations. The following section reviews key contributions that explicitly address business model innovation in the context of MaaS.

Turoń (2022) identifies differences between business models designed for traditional shared mobility and those designed for open shared mobility systems oriented towards Mobility as a Service (MaaS) (see Table 10).

Dimension	Traditional shared mobility	Open shared mobility systems
Key partners	Vehicle suppliers; manufacturers; local businesses; service technicians	Universities & research centres; municipalities; investors; MaaS providers; other shared mobility operators; collectives
Key activities	Fleet maintenance; parking management; platform operation; customer service	Data provision; platform interoperability; ecosystem coordination; R&D; urban integration
Key resources	Vehicle fleet; IT platform; mobile app; staff	User-generated data; MaaS integration; geo-localized services; data-driven capabilities
Value propositions	Parking availability; vehicle access; flexible rental; convenience	Multimodal integration; MaaS compatibility; behaviour change; congestion reduction; public value creation
Customer relationships	Automated services; customer support; basic digital interaction	Co-creation; user feedback loops; personalization; community-building
Customer segments	Regular users; tourists; business users	MaaS users; first/last-mile users; platform users; system-level stakeholders
Channels	Website; mobile app; customer service	MaaS platforms; partner apps; data-driven communication; open APIs
Cost structure	Fleet maintenance; infrastructure; staff; marketing	R&D; data management; platform access fees; ecosystem coordination
Revenue streams	Subscription fees; usage fees; deposits	Multi-source revenues; platform-based income; data-enabled services

Table 10 Business models differences between traditional shared mobility vs open shared mobility systems (MaaS-oriented)
Source: own elaboration based on Turoń (2022).

Moreover, Carbonara, Messeni Petruzzelli, Panniello, and De Vita (2024) adopted a dynamic business model innovation perspective to analyse how MaaS affects firms operating within the shared mobility ecosystem. Using an inductive multiple case study approach, the authors examined both service providers (ride-hailing, public transport, and micromobility) and technology providers, and show that MaaS does not simply lead to the adoption of new business model archetypes, but rather triggers a progressive reconfiguration of existing models.

Value creation	Mode-specific transport services (PT, ride-hailing, sharing); limited integration	Integrated multimodal solutions; real-time information; ticket interoperability
Product differentiation	Variety of mobility options; flexibility and accessibility; sustainability incentives	R&D-driven innovation; AI, data analytics, EV/AV; smart mobility services
Innovation & efficiency	Technology and infrastructure upgrades; service digitalisation	Data-driven efficiency; process optimisation; real-time system management
Market development	Geographic expansion; entry into new cities and user segments	Ecosystem expansion through platforms and partners
Value capture	Fares, subscriptions, advertising, sponsorships, subsidies	New pricing strategies; memberships; revenue sharing
Partnership logic	Limited or bilateral cooperation	Network-based partnerships; strategic alliances
Customer retention	Price incentives; vouchers and discounts	Lock-in mechanisms; loyalty programmes; brand reputation
Value delivery	Standalone apps and websites; basic customer support	Integrated platforms; APIs; data sharing across services
Physical infrastructure	Stations, routes, and vehicle fleets	Enhanced and interconnected infrastructure; new stations and routes

Table 11 Business models differences after MaaS disruption
Source: own elaboration based on Carbonara et al. (2024).

Their analysis highlights a shift towards platformization, data-driven value creation, multimodal integration, and partnership-based revenue mechanisms. A key contribution of this work lies in demonstrating that MaaS-oriented business models are inherently ecosystem-dependent, with economic viability increasingly relying on interoperability, revenue sharing, and subscription-based schemes rather than on standalone service provision.

Similarly, Bokolo (2023) proposes a business model for electric Mobility as a Service (eMaaS) (see Figure 4). In this context, the “e” refers to electric mobility. The eMaaS model integrates different business arrangements (e.g., B2C, B2B, P2P), parking configurations ranging from station-based to free-floating, and payment and pricing mechanisms such as pay-as-you-go and subscription models.

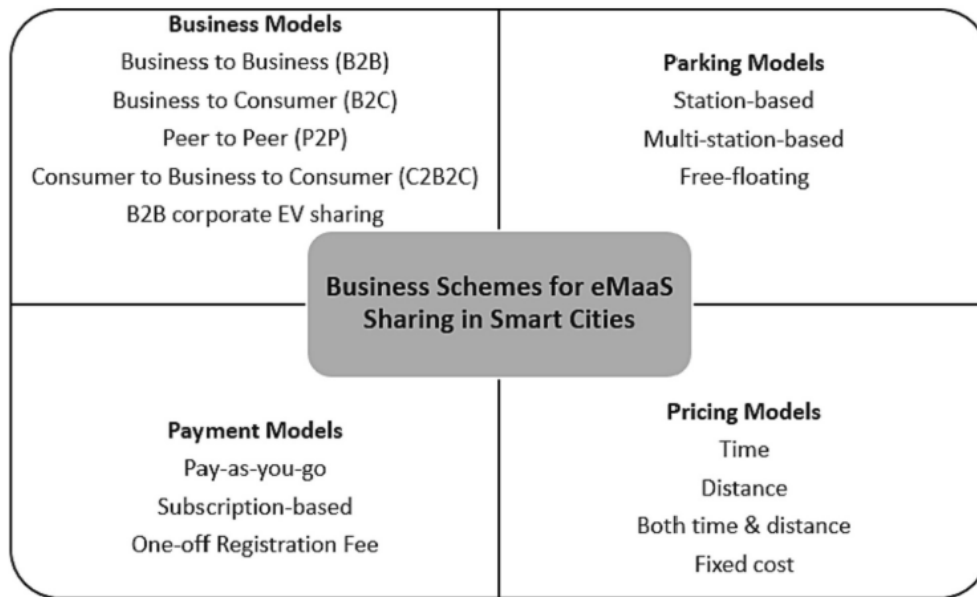


Figure 4. Business model for eMaaS proposed. Source: Bokolo (2023)

Building on this perspective, García-Reyes, Haveman, Westerhof, and Bonnema (2020) analysed shared electric mobility providers (SeMPs) and identified an effective business model for electric Mobility as a Service (eMaaS) based on a review of leading providers (see Figure 5).

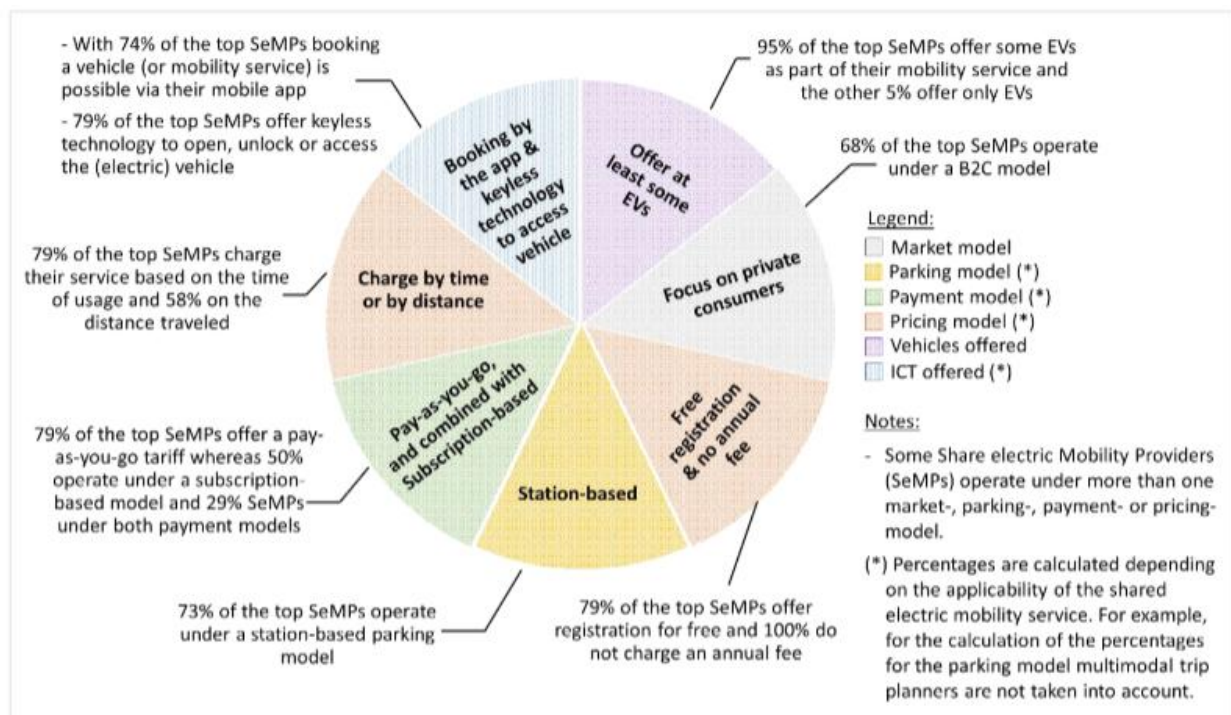


Figure 5. Effective business model for eMaaS based on current business models from top mobility providers. Source: García-Reyes et al. (2020).

Finally, a broader 15-minute-city perspective complements the shared-mobility-specific literature.

Based on a similar review of practices and solutions related to the 15-minute city, Büttner et al. (2024) provide a comprehensive overview of the global implementation of the concept. The study systematically maps 414 practices associated with the 15-minute city across 98 cities worldwide, covering a wide range of policy domains including transport, land use, urban governance, and planning

processes. By analysing this extensive set of cases, the report offers valuable insights into how cities operationalise proximity-based accessibility through different combinations of interventions, governance arrangements, and funding mechanisms. These findings provide a relevant point of comparison for understanding how incentives, financing structures, and business models are embedded within broader place-based strategies rather than functioning as stand-alone solutions.

Across the mapped 15-minute City practices, business models and financing arrangements are predominantly public-sector led and place-based, with municipalities acting as orchestrators that align policy objectives, funding streams, and local stakeholders. Rather than relying on stand-alone market-driven models, most initiatives are embedded within broader urban planning, mobility, and climate strategies, allowing cities to bundle investments across sectors such as transport, public space, housing, and social infrastructure. Financial incentives typically take the form of dedicated public funding streams, reallocation of municipal budgets to the neighbourhood scale, and targeted investment programmes (e.g. participatory budgets, place-based investment funds, or decentralised neighbourhood budgets). These mechanisms lower financial barriers for implementation while increasing local legitimacy and acceptance. In several cases, incentives are also non-monetary, including regulatory support (e.g. reduced car access, land-use flexibility), provision of public assets (such as buildings or public space), and long-term planning certainty, which together improve the viability of local services and shared mobility solutions.

From a business model perspective, the report highlights the growing relevance of hybrid and cooperative arrangements, particularly in areas such as local logistics and neighbourhood services. Examples include municipally supported cooperatives, public-utility-led platforms, and white-label infrastructures that enable multiple private or community actors to operate efficiently within a shared framework. These models distribute risks, reduce operational costs, and align economic viability with public value creation, especially in contexts where purely commercial models would struggle to scale or remain equitable.

Overall, the evidence suggests that successful 15-minute City implementation depends less on isolated revenue models and more on integrated financial ecosystems, where incentives, public investment, and governance structures jointly support long-term social, environmental, and economic objectives. This has direct implications for shared mobility and related services, which benefit most when embedded within stable, publicly anchored business models that explicitly balance private sustainability with public value creation. Overall, this literature review provides a consolidated understanding of how business models are defined, specifically for the mobility solutions of focus in the DREAMS project, and how these business model propositions have evolved from general shared mobility contexts towards more recent MaaS-oriented innovations. While the literature offers valuable conceptual and empirical insights, it also reflects a predominantly academic and often normative perspective. To complement and contextualise these findings, the next section turns to the analysis of stakeholder interviews, capturing insights from actors directly involved in the design, implementation, and operation of mobility solutions. By combining evidence from the literature with stakeholder perspectives, this study aims to develop the ResiMOB framework, integrating theoretical knowledge with practical experience to better reflect real-world business model dynamics in integrated mobility systems.

4. STAKEHOLDER INTERVIEW FINDINGS

4.1. Purpose and scope of the explorative interviews

To complement the systematic literature review, explorative interviews were conducted between June and September 2024 with representatives of public authorities, shared mobility providers, and other ecosystem actors across the DREAMS Living Labs in Paris, Munich, Budapest, Vienna, Brussels, and Utrecht. The interviews aimed to explore how shared mobility business models operate in practice and to identify key factors influencing their viability, governance, and long-term sustainability.

Rather than evaluating predefined business model components, the interviews were exploratory in nature and focused on understanding stakeholder experiences with financing structures, public-private collaboration, governance arrangements, infrastructure provision, and the role of shared mobility in achieving broader social and environmental objectives. A complete overview of interviewees is provided in the References: Interviews section.

The interviews served two purposes. First, they provided practical insights that complemented the findings from the literature review. Second, they helped identify recurring themes and governance challenges that informed the development of the ResiMOB framework presented in Section 4.

4.2. Key insights from stakeholder interviews

Hybrid financing and public support

Across the Living Labs, interviewees consistently described shared mobility business models as hybrid arrangements that combine user revenues with different forms of public support. Fully market-driven approaches were generally considered difficult to sustain, particularly in urban outskirts where demand is lower and service provision often serves broader public objectives.

Public investment was commonly associated with infrastructure provision, including mobility hubs, charging facilities, and the adaptation of public space. Private operators typically assumed responsibility for operational activities such as fleet management, maintenance, redistribution, and customer services. Stakeholders emphasised that financial viability often depends on balancing commercial revenues with public investments that support accessibility, sustainability, and territorial equity.

Public-private collaboration and governance

The interviews highlighted the central role of public authorities in facilitating and coordinating shared mobility systems. Even where services were privately operated, municipalities and transport authorities were frequently described as regulators, coordinators, and strategic partners that align mobility services with wider policy objectives.

Across the Living Labs, shared mobility was rarely viewed as a purely commercial activity. Instead, stakeholders described governance arrangements in which public and private actors jointly contribute to the development and operation of mobility services. Public-private partnerships, concession agreements, and collaborative governance structures emerged as recurring mechanisms for organising shared mobility systems.

Public value creation

A recurring theme across interviews was the importance of public value creation. Stakeholders frequently framed shared mobility not only as a transport service but also as a means of achieving broader societal goals. These objectives included improving accessibility, reducing car dependency, supporting climate ambitions, increasing social inclusion, and strengthening connections between urban centres and surrounding neighbourhoods.

Interviewees particularly emphasised the importance of serving groups and areas that are often underserved by conventional mobility systems. In several Living Labs, affordability measures, targeted incentives, and integration with public transport were identified as important mechanisms for achieving these objectives.

Infrastructure as an enabling condition

Stakeholders consistently identified infrastructure as a critical enabling factor for shared mobility business models. Physical infrastructure such as mobility hubs, parking facilities, charging stations, and dedicated public space was considered essential for service viability. Similarly, digital infrastructure, including data platforms, booking systems, and information services, was viewed as increasingly important for coordinating and integrating mobility services.

Several interviewees noted that infrastructure investments often function as an indirect form of subsidy, reducing operational risks and improving the feasibility of service provision in lower-density contexts.

4.3. Implications for ResiMOB development

Although the interviews were conducted across six different European Living Labs, the findings reveal a remarkable degree of convergence regarding how shared mobility systems are organised. Across all cities, stakeholders described governance arrangements in which public actors provide strategic direction, infrastructure, and regulatory frameworks, while private operators focus on service delivery and operational management.

At the same time, the exploratory nature of the interviews revealed that stakeholders often discussed business models through the lens of their own organisational responsibilities. As a result, individual interviews tended to focus on specific aspects such as financing, infrastructure, regulation, or service delivery rather than providing a comprehensive view of the mobility ecosystem.

This observation highlighted the need for a framework capable of systematically capturing the different dimensions of shared mobility business models and visualising how responsibilities are distributed across stakeholder groups. Building on the themes identified in both the literature review and the stakeholder interviews, the ResiMOB framework was therefore developed as a structured approach for analysing and co-creating resilient and responsible shared mobility business models. The framework is presented in the following section.

The thematic interview summaries underpinning these findings are presented in Appendix A.

5. RESIMOB: RESILIENT AND RESPONSIBLE BUSINESS MODELS FOR SHARED MOBILITY

5.1. Rationale and positioning of ResiMOB

This section integrates insights from the literature review and stakeholder interviews into the ResiMOB framework, an analytical and participatory framework designed to support the analysis and co-creation of viable, resilient and responsible shared mobility business models for urban outskirts. The framework was developed through an iterative process in which recurring themes identified in the literature were compared with practical insights from the exploratory stakeholder interviews. This synthesis resulted in three overarching dimensions—Governance, Infrastructure, and Values—and nine associated components, which are presented in Section 5.2.

Shared mobility systems involve multiple actors who experience and understand the system from different positions. The “blind men and the elephant” metaphor illustrates how each stakeholder may have valuable knowledge of one part of a complex system, while no single perspective captures the system as a whole (Figure 6). ResiMOB brings these different stakeholder perspectives together to support a more comprehensive understanding of the shared mobility system and to identify where responsibilities, expectations, and interests converge or diverge.

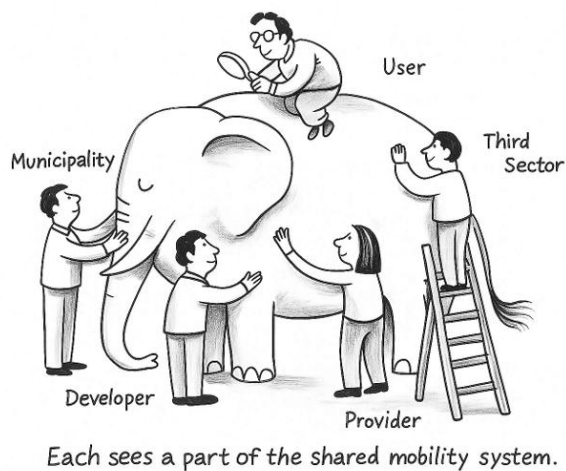


Figure 6. Different stakeholder perspectives on the shared mobility system, illustrated through the “blind men and the elephant” metaphor. Figure generated with OpenAI (2026) based on a prompt by the authors.

The ResiMOB framework provides the conceptual structure for this analysis, while the ResiMOB Stakeholder Assessment Survey operationalises that structure by asking respondents to assess stakeholder involvement across the nine components. This allows ResiMOB to function both as an analytical framework and as a practical instrument for stakeholder dialogue and business model development.

5.2. ResiMOB analytical dimensions

The ResiMOB framework consists of three analytical dimensions, Governance, Infrastructure, and Values, operationalised through nine components. The ResiMOB Stakeholder Assessment Survey is the instrument used to apply the framework empirically: respondents assess the involvement of four stakeholder groups across each of the nine components using a five-point scale. The survey therefore operationalises the framework; it is not the framework itself.

Governance	How shared mobility is organised and steered, including ownership, coordination, financing, feedback, and regulation.	Ownership, Facilitation, Finance, Feedback systems, Regulations
Infrastructure	Material and digital enablers that make shared mobility operable and integrated.	Physical infrastructure, Digital infrastructure
Values	Social and environmental commitments embedded in shared mobility practices.	Equity values, Environmental values

Table 12: Conceptual Framework ResiMOB

Governance	1. Ownership	Who holds or co-owns the assets that underpin shared mobility (vehicles, hubs, charging)?
	2. Facilitation	Who coordinates and manages shared mobility initiatives and cross-sectoral partnerships?
	3. Finance	Who funds, invests in, or contributes to operational and infrastructure costs of shared mobility?
	4. Feedback systems	Who gathers, shares, and uses data and user feedback to improve shared mobility?
	5. Regulations	Who defines and enforces the rules, permits, and policies that shape shared mobility systems?
Infrastructure	6. Physical infrastructure	Who develops, provides, or manages the spatial and physical enablers of shared mobility?
	7. Digital infrastructure	Who develops or manages the digital systems and data platforms that enable shared mobility?
Values	8. Equity values	Who promotes social inclusion, fairness, and accessibility in shared mobility?
	9. Environmental values	Who supports environmentally sustainable shared mobility practices?

Table 13. Component clusters & variables per component

Together, these nine components provide a comprehensive framework for assessing business model resilience beyond financial viability alone. The framework recognises that successful shared mobility systems depend on governance arrangements, infrastructure provision, and the creation of social and environmental value.

To assess how responsibilities are distributed across the mobility ecosystem, the ResiMOB framework evaluates stakeholder involvement across the nine components. Four stakeholder groups were identified based on the literature review and stakeholder interviews:

Stakeholder groups:

1. Private mobility providers (operators)

Companies or organizations that own, operate, or manage shared mobility services such as bike-, e-scooter-, or car-sharing. They may be commercial start-ups, established transport companies, or cooperatives providing shared mobility as a business or service. Examples: Cargoroo, Donkey Republic, Greenwheels, Moby, Bolt.

2. Public authorities

Governmental bodies at municipal, regional, or national level responsible for policy, planning, regulation, and infrastructure for mobility. They create enabling conditions for shared mobility through zoning, licensing, funding, and strategic coordination. Examples: Municipality of Utrecht, Brussels Mobility, Vienna City Council.

3. Shared mobility users

People or groups that use or represent the users of shared mobility services, including members of cooperatives, user councils, or advisory boards. They express user needs, share experiences, and may participate in co-design or co-ownership models. Examples: members of a bike-sharing cooperative, community car-sharing users, local advisory groups.

4. NGOs / Third sector organizations

Independent, non-profit organizations that work for social, environmental, or community goals related to mobility and accessibility, but are not direct users of the services. They advocate for inclusion, environmental impact, fairness, or neighborhood development. Examples: Cycling union, community associations, social inclusion NGOs.

The assessment procedure and five-point involvement scale are described in Section 5.3 and presented in full in Appendix B.

5.3. Development and operationalisation of ResiMOB

To operationalise the ResiMOB framework, the nine components were translated into the ResiMOB Stakeholder Assessment Survey. The survey was designed to examine how responsibilities are distributed among different stakeholder groups within shared mobility systems and how stakeholders perceive both the present involvement and a wished involvement.

For each of the nine components, respondents assessed the level of involvement of four stakeholder groups: private mobility providers, public authorities, shared mobility users, and NGOs and third-sector organisations. Involvement was assessed on a five-point scale ranging from very low involvement (1) to very high involvement (5). Respondents completed this assessment twice: first for the present involvement and subsequently for their wished involvement.

The survey was applied across the six DREAMS Living Labs in Brussels, Budapest, Munich, Paris, Utrecht, and Vienna. Eleven responses were collected: six from urban authorities, four from private mobility providers, and one from a public mobility organisation. As the public mobility organisation was the only respondent in this category, its response was excluded from the comparative stakeholder analysis. The comparative stakeholder analysis was therefore based on ten responses.

The resulting assessments were visualised using radar charts, enabling comparison of stakeholder involvement across the ResiMOB components and between present and wished involvements. The

visualisations provide a basis for identifying differences and similarities in stakeholder perspectives and for supporting dialogue about the future distribution of roles and responsibilities within shared mobility systems.

Survey participants

The ResiMOB survey was completed by 11 stakeholders involved in shared mobility systems across the DREAMS Living Labs.

Stakeholder category	Number of respondents
Urban authorities	6
Private mobility providers	4
Public mobility organisation	1
Total	11

Table 14. Respondent distribution by stakeholder category

Living Lab	Urban authorities	Private mobility providers
Brussels	0	1
Budapest	2	0
Munich	2	0
Paris	1	1
Utrecht	1	1
Vienna	0	1
Total	6	4

Table 15. Respondent distribution across DREAMS Living Labs

Responses were obtained from all six DREAMS Living Labs. However, *the distribution of respondents differed* between cities. Only Paris and Utrecht included responses from both urban authorities and private mobility providers, enabling direct stakeholder comparison within the same Living Lab. The remaining Living Labs were represented by a single stakeholder category.

One additional response was obtained from a public transport organisation in Vienna. As this was the only response in this respondent category, it was excluded from the comparative stakeholder analysis presented in Section 5.4. However, its contribution informed the broader Living Lab application of the ResiMOB framework.

Consequently, the comparative stakeholder analysis presented in Section 5.4 focuses on aggregated stakeholder perspectives across Living Labs, while Section 5.5 provides a more detailed comparison of the Paris and Utrecht cases, where perspectives from both stakeholder groups are available.

Although the ResiMOB framework conceptually includes four stakeholder groups, direct survey responses were obtained only from urban authorities, private mobility providers, and one public mobility organisation. The involvement scores assigned to shared mobility users and third-sector organisations therefore reflect the perceptions of participating stakeholders regarding the present and wished involvement of these actors within shared mobility ecosystems.

Assessment procedure

For each ResiMOB component, respondents assessed the level of involvement of each stakeholder group using a five-point Likert scale.

Score	Interpretation
1	Very low involvement
2	Low involvement
3	Moderate involvement
4	High involvement
5	Very high involvement

Table 16. Stakeholder involvement scale

Respondents completed two separate assessments. The first focused on the present involvement, reflecting how stakeholder involvement is currently perceived within existing shared mobility systems. The second focused on the wished involvement, reflecting how respondents believe responsibilities should ideally be distributed to support more resilient, equitable, and sustainable shared mobility systems.

This dual assessment approach enables comparison between existing governance arrangements and preferred future governance configurations.

Data analysis and visualisation

The ten survey responses included in the comparative stakeholder analysis were analysed at three complementary levels.

First, a comparative stakeholder analysis was conducted using the responses from urban authorities and private mobility providers. This analysis enables comparison between public and private perspectives regarding stakeholder involvement and responsibility distribution within shared mobility ecosystems.

Second, Living Lab-level analyses were conducted to explore governance patterns within individual DREAMS cities. These analyses provide insight into how local contexts, stakeholder configurations, and policy environments influence perceptions of business model responsibilities and governance arrangements.

Third, aggregated project-level analyses were undertaken to identify broader governance patterns across the DREAMS Living Labs.

Survey responses were visualised using radar charts. Radar charts allow multiple dimensions to be displayed simultaneously and provide a visual representation of stakeholder involvement patterns across governance, infrastructure, and value-related dimensions. The visualisations support the identification of governance gaps, opportunities for stronger collaboration, and potential pathways towards more resilient and responsible business model configurations.

Beyond its analytical function, the ResiMOB framework was used as a communication and reflection tool within the Living Labs. Visualising stakeholder involvement and responsibility distributions provided a structured basis for dialogue and future business model development. Its broader application as a co-creation tool, digital platform, and educational board game is discussed in Sections 5.6–5.8.

5.4. Comparative stakeholder perspectives on resilient mobility governance

This section presents the comparative results of applying the ResiMOB Stakeholder Assessment Survey across the DREAMS Living Labs, focusing on how respondents perceive the present and wished involvement of stakeholders within shared mobility ecosystems.

The comparative analysis presented in this section is based on ten survey responses from two stakeholder groups: six urban authorities and four private mobility providers. These stakeholder groups represent key actors involved in the planning, regulation, implementation, and operation of shared mobility services. By comparing their perspectives, the analysis provides insight into how responsibilities are currently distributed and how stakeholders believe they should evolve in the future.

The complete set of comparative radar chart visualisations is provided in Appendix C. This section focuses on aggregated findings across Living Labs, while Section 5.5 examines Paris and Utrecht in greater detail because both public-authority and private-provider responses were available in those Living Labs.

Across the Living Labs, respondents consistently identified private mobility providers as central actors within current shared mobility systems. Providers are primarily associated with financing operational activities, managing vehicle fleets, maintaining digital platforms, collecting user feedback, and delivering mobility services. Urban authorities are primarily associated with facilitation, regulation, infrastructure provision, and the pursuit of broader societal objectives such as accessibility, sustainability, and social inclusion.

These findings largely reflect the patterns identified in both the literature review and stakeholder interviews. The literature highlighted the growing importance of hybrid public-private business models, while interviewees consistently emphasised the critical role of public authorities in enabling shared mobility through infrastructure provision, regulatory frameworks, targeted subsidies, and coordination of stakeholder networks. At the same time, mobility operators remain responsible for service delivery, operational management, customer engagement, and technological innovation.

A comparison between current and wished involvements reveals a clear preference for more collaborative governance arrangements. While private mobility providers remain essential actors, respondents indicate a stronger future role for urban authorities in coordinating stakeholders, supporting infrastructure investments, promoting equitable access, facilitating integration with public transport systems, and enabling long-term system development.

The findings further suggest that resilient business models for shared mobility in urban outskirts neighbourhoods are unlikely to emerge from purely market-driven approaches. Instead, respondents favour hybrid governance arrangements in which responsibilities are shared between public and

private actors. Such arrangements combine operational expertise from mobility providers with the coordinating, regulatory, and public-value functions of urban authorities.

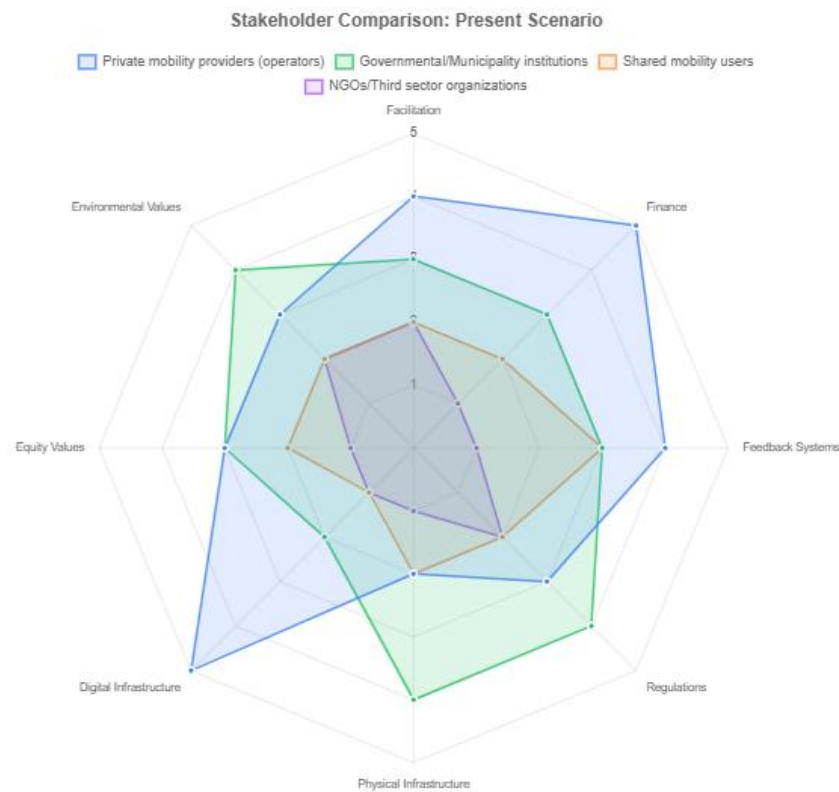


Figure 7. Aggregated stakeholder perspective – present involvement. Corresponds to visualisation 3E in Appendix C.

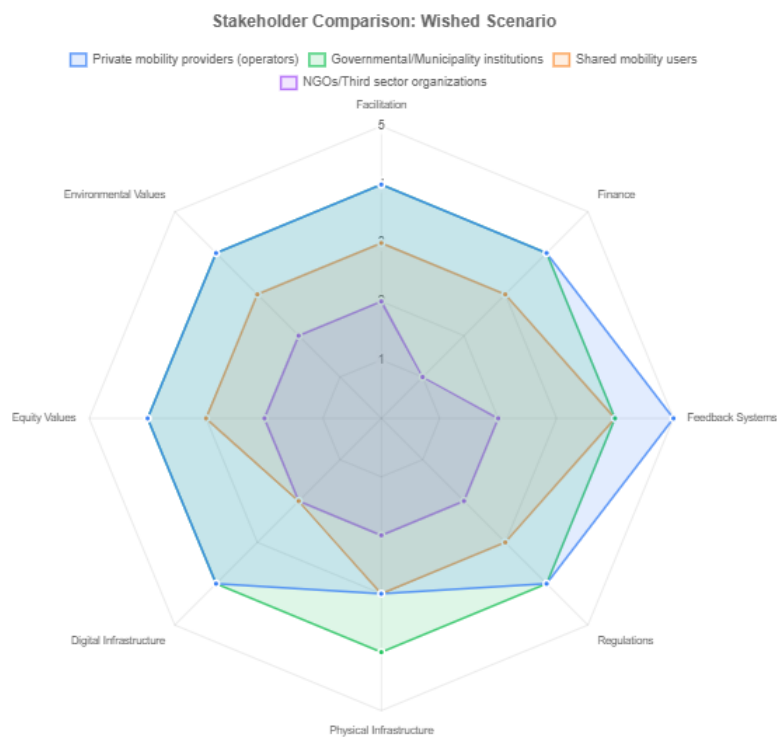


Figure 8. Aggregated stakeholder perspective – wished involvement. Corresponds to visualisation 3F in Appendix C.

The comparison between Figures 7 and 8 illustrates a gradual shift from predominantly operator-led service provision towards governance arrangements characterised by stronger public-private

collaboration and a broader distribution of responsibilities. Increased involvement is particularly visible in dimensions related to facilitation, equity, environmental sustainability, and infrastructure provision. These shifts suggest that stakeholders view resilient business models not only as financially sustainable arrangements, but also as governance structures capable of balancing economic viability with broader societal objectives.

The aggregated results further indicate that stakeholder expectations extend beyond traditional business model considerations such as revenues and operational costs. Respondents consistently highlighted the importance of accessibility, social inclusion, environmental performance, and long-term system resilience. This reinforces the notion that shared mobility services in urban outskirts neighbourhoods should be understood as public-private systems that create both economic and public value.

Governance finding	Evidence from stakeholder perspectives
Private mobility providers remain central actors	High current and future involvement, particularly in finance, digital infrastructure, and service operation
Urban authorities play a critical enabling role	Strong involvement in facilitation, regulation, and infrastructure provision, with increased importance in the wished-involvement assessment
More collaborative governance is desired	Respondents indicate stronger future involvement of multiple stakeholders across governance dimensions
Equity and environmental objectives require broader engagement	Wished involvements show increased attention to social inclusion, accessibility, and sustainability
Resilient business models require public-private collaboration	Stakeholders favour shared responsibility arrangements rather than purely market-driven approaches

Table 17. Key governance insights emerging from the ResiMOB assessment

Overall, the findings demonstrate that resilience is perceived not solely as a question of financial viability, but as a governance challenge requiring collaboration between multiple actors. The ResiMOB framework therefore provides a useful mechanism for making stakeholder roles explicit, identifying governance gaps, and supporting discussions on future business model development. In addition to its analytical value, the framework offers a practical basis for stakeholder dialogue and co-creation processes aimed at developing more resilient and responsible shared mobility business models.

Detailed ResiMOB profiles of all six Dreams Living Labs are provided in Appendix D.

The following section examines the Paris and Utrecht Living Labs in greater detail and explores how governance arrangements differ between stakeholder groups within the a similar local context.

5.5. Comparative stakeholder perspectives in Utrecht and Paris

Among the six DREAMS Living Labs, Paris and Utrecht were the only cases in which responses were obtained from both an urban authority and a private mobility provider. These cases therefore provide a unique opportunity to compare public and private sector perspectives within the same local context. While the findings should be interpreted with caution due to the limited number of respondents, they offer valuable insights into how different actors perceive responsibilities within shared mobility ecosystems.

Paris

The Paris Living Lab reveals a strong recognition of the importance of both public and private actors in the development of resilient and responsible shared mobility systems. The comparison between the private mobility provider and the urban authority perspectives highlights both common understandings and differences regarding stakeholder responsibilities across the ResiMOB dimensions.

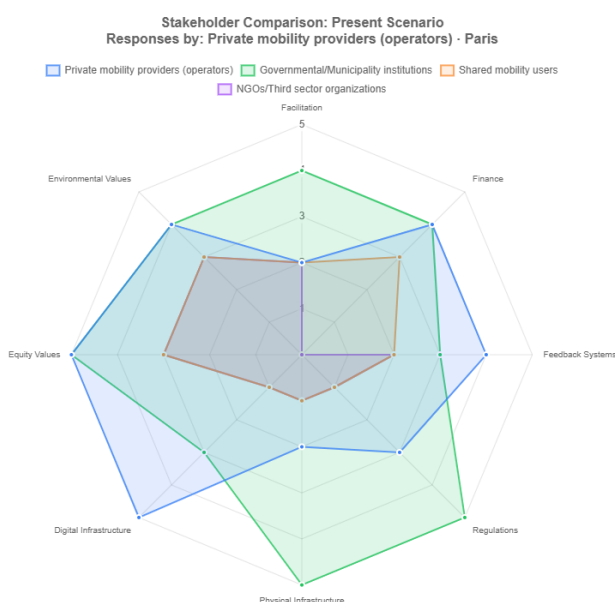


Figure 9. Paris Living Lab – Present involvement: comparison of private mobility operator and urban authority perspectives. Private mobility operator perspective.

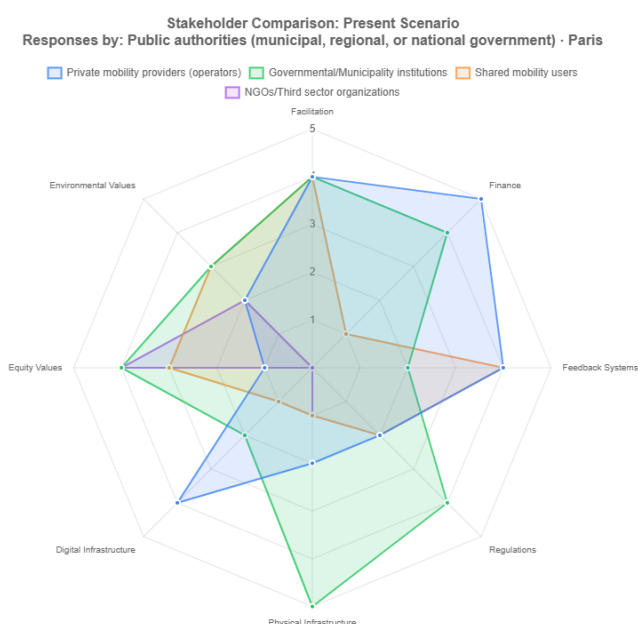


Figure 10. Paris Living Lab – Present involvement: comparison of private mobility operator and urban authority perspectives. Urban authority perspective

As shown in Figures 9 and 10, both stakeholders recognise the central role of private mobility providers in the current shared mobility ecosystem. Both respondents assign high levels of involvement to private mobility providers in dimensions such as finance and feedback systems. For example, both stakeholders assign private operators a score of 4–5 in finance and feedback systems, reflecting their central role in service delivery and operational management. At the same time, the urban authority assigns a stronger role to public actors in facilitation and physical infrastructure, both receiving scores of 5, whereas the operator assigns lower levels of public involvement in these dimensions. This reflects different perspectives on the extent to which public authorities should shape and support shared mobility systems.

The present involvement also reveals relatively limited involvement of third-sector organisations across most dimensions. Shared mobility users are recognised as important actors, but their role is primarily concentrated in feedback systems and equity-related dimensions rather than governance and infrastructure provision.

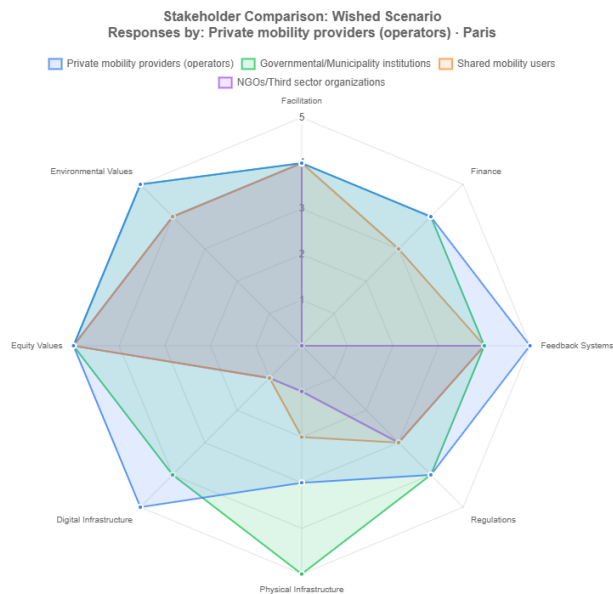


Figure 11. Paris Living Lab – Wished involvement: comparison of private mobility operator and urban authority perspectives. Private mobility operator perspective

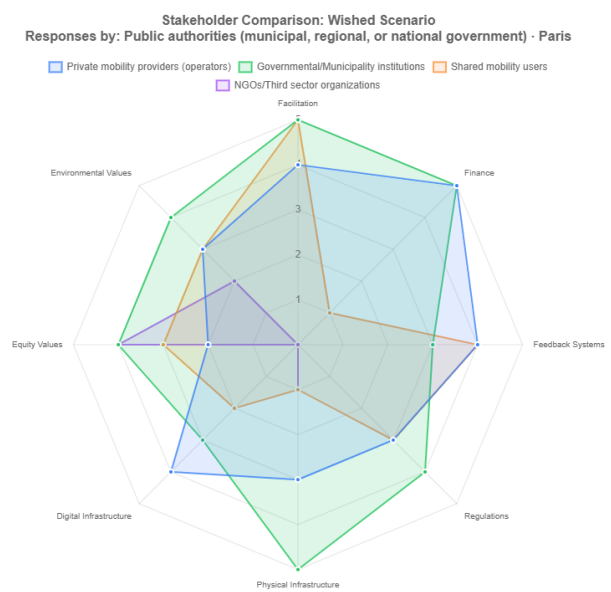


Figure 12. Paris Living Lab – Wished involvement: comparison of private mobility operator and urban authority perspectives. Urban authority perspective

Figures 11 and 12 illustrate the desired future governance configuration. Compared with the present involvement, both stakeholders envisage stronger collaboration across stakeholder groups. Increased involvement of public authorities, users, and third-sector organisations is visible across multiple dimensions. Notably, both respondents assign higher future scores to users and NGOs in equity and environmental value dimensions, indicating a desire for broader stakeholder participation in shaping shared mobility systems.

Despite these shifts, private mobility providers remain central actors across governance and infrastructure dimensions. The wished involvement therefore does not represent a transfer of responsibilities away from operators, but rather a more balanced and collaborative governance arrangement in which multiple actors contribute to system resilience and public value creation.

Overall, the Paris case points towards a hybrid governance model in which operational responsibilities remain largely with private providers, while public authorities play an increasingly important role in coordination, regulation, infrastructure provision, and the pursuit of social and environmental objectives.

Utrecht

The Utrecht Living Lab similarly demonstrates the complementary roles of public authorities and private mobility providers. As in Paris, both respondents recognise the importance of collaboration between public and private actors in achieving resilient and responsible shared mobility systems.

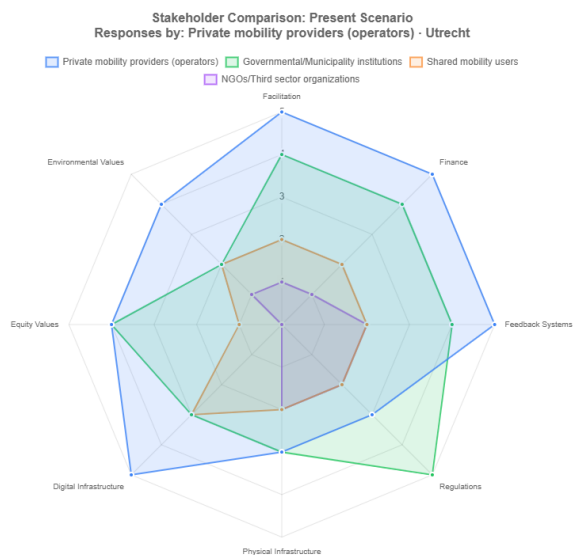


Figure 13. Utrecht Living Lab – Present involvement: comparison of private mobility operator and urban authority perspectives. Private mobility operator perspective

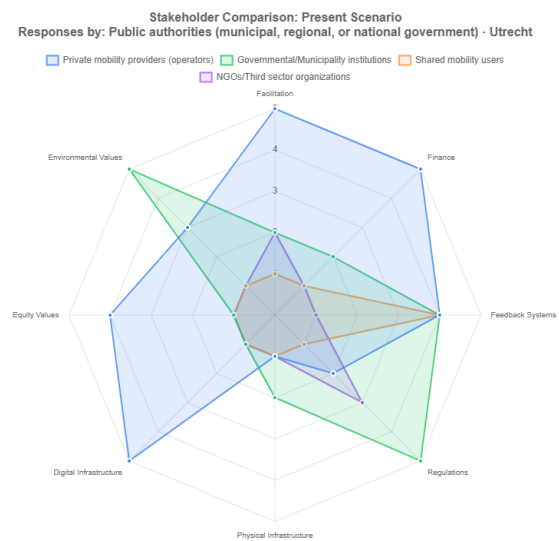


Figure 14. Utrecht Living Lab – Present involvement: comparison of private mobility operator and urban authority perspectives. Urban authority perspective

Figures 13 and 14 show that both stakeholders recognise the importance of operators in the current governance configuration. The private mobility provider assigns high levels of involvement to operators across most dimensions, particularly finance, feedback systems, and digital infrastructure, where scores consistently reach 4–5. The urban authority perspective similarly acknowledges the importance of operators but places considerably greater emphasis on public-value dimensions.

A particularly notable difference emerges in environmental values. The urban authority assigns public actors the highest possible score (5), whereas the operator assigns a substantially lower level of public involvement. Similar differences are visible in facilitation and infrastructure-related dimensions. These findings suggest that the authority views shared mobility as a strategic instrument for achieving broader policy objectives, while the operator primarily focuses on operational service provision.

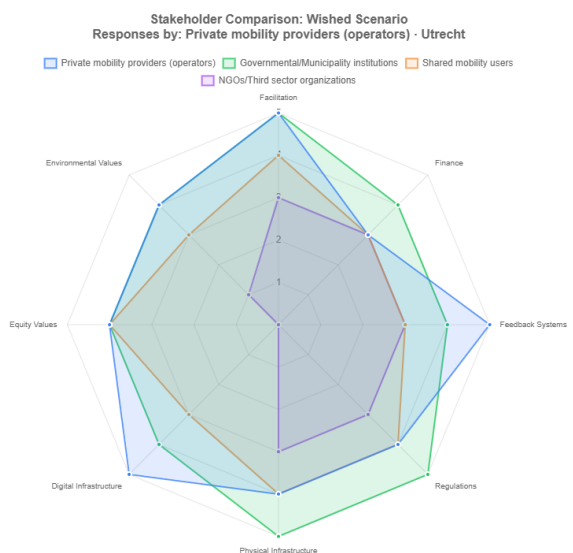


Figure 15. Utrecht Living Lab – Wished involvement: comparison of private mobility operator and urban authority perspectives. Private mobility operator perspective

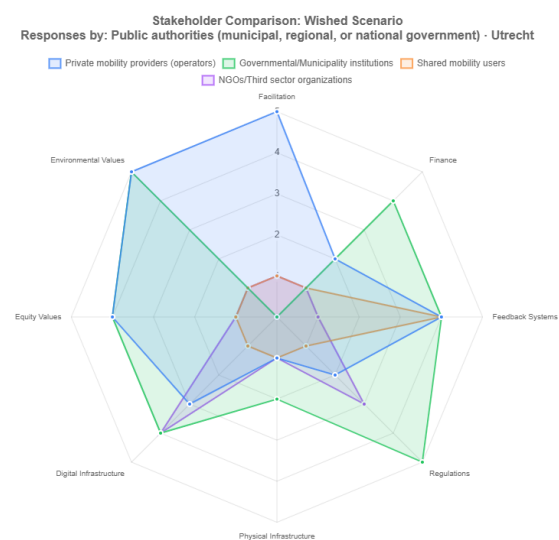


Figure 16. Utrecht Living Lab – Wished involvement: comparison of private mobility operator and urban authority perspectives. Urban authority perspective

As illustrated in Figures 15 and 16, both respondents envisage a future governance arrangement characterised by stronger collaboration among stakeholder groups. Increased involvement of users and community actors is visible across several dimensions, suggesting a move towards more participatory

governance arrangements. The urban authority perspective particularly emphasises stronger involvement of public actors in facilitation, regulation, environmental values, and equity-related dimensions.

At the same time, the operator perspective continues to assign a strong role to private providers in governance and infrastructure dimensions. Similar to Paris, the preferred future configuration is therefore characterised by shared responsibility rather than a redistribution of responsibilities from one actor to another.

The Utrecht case highlights the importance of balancing operational efficiency with wider societal objectives. Stakeholders perceive resilient business models as requiring not only financially sustainable service provision but also active public-sector involvement and stakeholder engagement.

Cross-case comparison

Despite differences in local context, several common patterns emerge across the Paris and Utrecht Living Labs.

First, both cases recognise private mobility providers as essential actors in the delivery and operation of shared mobility services. Second, both cases assign a significant enabling role to urban authorities, particularly in relation to regulation, facilitation, infrastructure provision, and long-term strategic coordination. Third, both Living Labs indicate a desire for greater involvement of users and third-sector organisations in future governance arrangements.

These similarities suggest that resilient and responsible shared mobility business models are unlikely to emerge through purely market-driven approaches. Instead, stakeholders in both cities favour governance arrangements that combine private-sector innovation and operational expertise with public-sector coordination and support.

At the same time, the comparison demonstrates the value of the ResiMOB framework as a dialogue and reflection tool. By visualising stakeholder perspectives and highlighting areas of agreement and divergence, the framework helps stakeholders identify governance gaps, discuss alternative responsibility allocations, and explore pathways towards more resilient business model configurations.

The Paris and Utrecht cases illustrate how ResiMOB can support both analytical assessment and stakeholder dialogue. They demonstrate that while governance arrangements remain context-dependent, the framework provides a common language through which stakeholders can collectively discuss and shape the future development of shared mobility systems.

5.6. ResiMOB as a Living Lab co-creation tool

Beyond its analytical function, ResiMOB was developed as a practical tool to support stakeholder dialogue, learning, and co-creation within the DREAMS Living Labs. While the framework enables the systematic assessment of stakeholder involvement across governance, infrastructure, and value dimensions, its primary contribution lies in its ability to facilitate discussions about responsibilities, collaboration, and business model development.

Across the six DREAMS Living Labs, the framework was used to visualise how different stakeholders perceive present and wished involvement. By making stakeholder roles explicit, the framework helped participants identify differences in expectations, uncover governance gaps, and explore opportunities for collaboration. In this way, ResiMOB functioned not only as an assessment tool but also as a communication instrument that supports collective reflection and decision-making.

The Living Lab applications demonstrated that stakeholders often hold different assumptions regarding who should be responsible for financing, regulation, infrastructure provision, user engagement, and the pursuit of social and environmental objectives. These differences are not always visible during conventional stakeholder meetings. The visualisations generated through ResiMOB provide a structured basis for discussing such differences and developing a shared understanding of future business model configurations.

The comparative analyses presented in Sections 4.4 and 4.5 illustrate this value. In both Paris and Utrecht, stakeholders recognised the importance of public-private collaboration while assigning different levels of responsibility to individual actors. The ResiMOB framework enabled these differences to be visualised and discussed, creating opportunities for stakeholders to jointly explore alternative governance arrangements and identify pathways towards more resilient and responsible mobility systems.

The framework also proved valuable because it combines governance, infrastructure, and public-value considerations within a single assessment tool. Traditional business model approaches often focus primarily on financial viability and operational performance. ResiMOB expands this perspective by explicitly incorporating dimensions such as equity, environmental sustainability, participation, and stakeholder coordination. As a result, the framework supports discussions not only about who delivers mobility services, but also about how shared mobility can contribute to broader societal objectives.

A further advantage of the framework is its adaptability to different local contexts. Although the six DREAMS Living Labs operate within distinct institutional, cultural, and mobility environments, the same framework could be applied across all cities. This enabled comparison between Living Labs while preserving sensitivity to local conditions and governance arrangements. The results suggest that ResiMOB can function as a transferable framework for supporting stakeholder dialogue and business model development beyond the DREAMS project.

The experiences from the Living Labs indicate that ResiMOB is particularly valuable during the early stages of business model development, when stakeholders are exploring roles, responsibilities, and potential governance structures. By providing a common language for discussing shared mobility ecosystems, the framework helps stakeholders move from individual perspectives towards collectively developed solutions.

5.7. ResiMOB within the DREAMS Interactive Knowledge Platform

To support wider application and transferability beyond the DREAMS project, the ResiMOB framework was integrated into the DREAMS Interactive Knowledge Platform (IKP). The IKP serves as an open-access environment through which project tools, methods, and knowledge products can be shared with researchers, practitioners, public authorities, mobility providers, and other stakeholders interested in sustainable mobility transitions.

The integration of ResiMOB into the IKP enables stakeholders to access and apply the framework independently. Through the platform, users can explore the ResiMOB dimensions, understand the underlying governance concepts, and apply the framework to assess stakeholder involvement in shared mobility ecosystems. In this way, the platform translates the conceptual and analytical components of ResiMOB into a practical resource that can support business model development and stakeholder dialogue.

ResiMOB within the DREAMS Interactive Knowledge Platform (IKP)

From framework development to open-access application and knowledge sharing

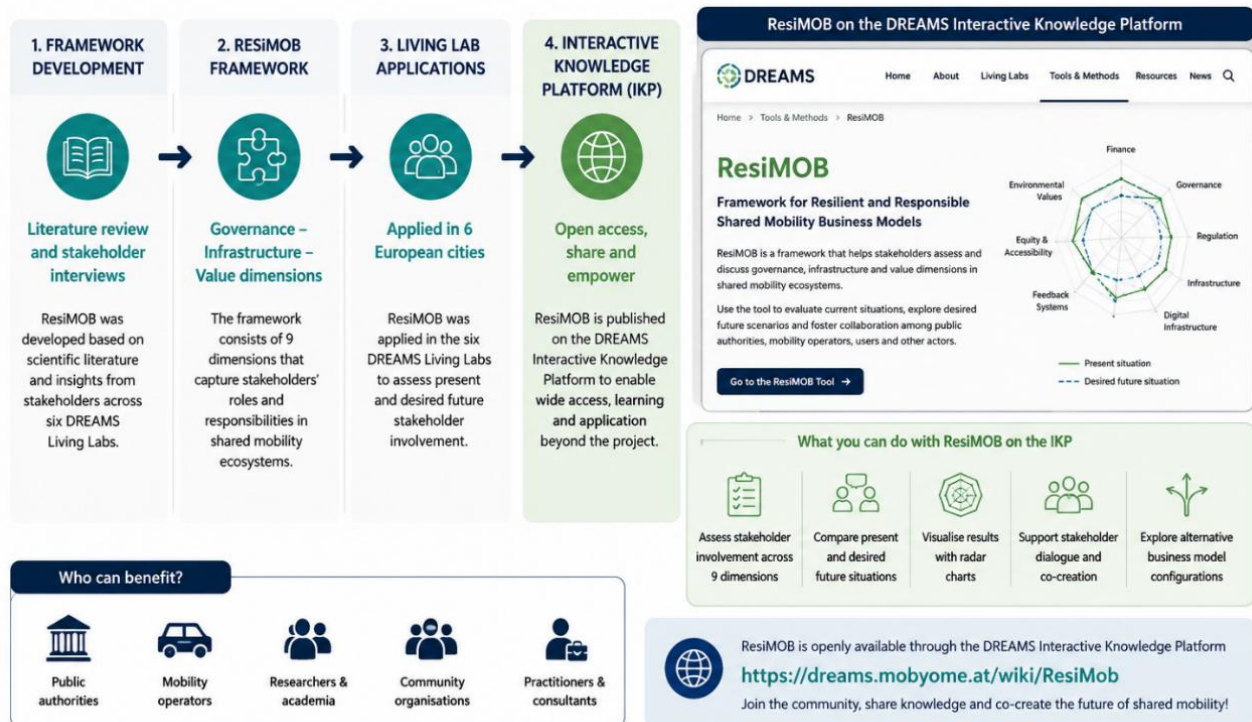


Figure 17. ResiMOB within the DREAMS Interactive Knowledge Platform (IKP): from framework development to open-access application and knowledge sharing. Figure generated with OpenAI (2026) based on a prompt by the authors.

As illustrated in Figure 17, the development of ResiMOB followed a pathway from literature review and stakeholder interviews, through framework development and Living Lab application, towards publication within the DREAMS Interactive Knowledge Platform. This process transformed ResiMOB from a research-based analytical framework into a practical tool that can be accessed and applied by stakeholders beyond the DREAMS consortium.

The ResiMOB tool is publicly accessible through the DREAMS Interactive Knowledge Platform:

<https://dreams.mobyome.at/wiki/ResiMob>

The platform enables users to:

- explore the ResiMOB framework and its conceptual foundations;
- assess stakeholder involvement across governance, infrastructure, and value dimensions;
- compare present and wished involvement;
- visualise results through radar chart representations;
- support stakeholder dialogue and co-creation processes;
- identify governance gaps and responsibility distributions;
- explore alternative business model configurations.

A key objective of publishing ResiMOB through the IKP is to facilitate learning and knowledge exchange beyond the DREAMS consortium. By making the framework openly available, the project contributes to the broader dissemination of approaches for developing resilient and responsible shared mobility business models. The platform also supports replication and adaptation in other cities and regions facing similar mobility challenges.

The IKP further strengthens the practical applicability of ResiMOB by making the framework accessible to a diverse range of users, including public authorities, mobility operators, researchers, community organisations, and consultants. Through the platform, stakeholders can explore how responsibilities are distributed across mobility ecosystems and use these insights to support planning, governance, and business model development processes.

The publication of ResiMOB within the IKP represents an important step in ensuring that the framework remains accessible beyond the duration of the DREAMS project. It transforms the framework from a project-specific research output into a transferable resource that can support future research, policy development, Living Lab activities, and stakeholder engagement processes.

5.8. The Mobility Match: translating ResiMOB into an accessible co-creation tool

Development of Mobility Match

The development and application of ResiMOB followed an iterative process in which experiences with different formats informed subsequent adaptations of the tool. Before development of the digital ResiMOB tool, the framework was first tested as an analogue canvas during a DREAMS stakeholder meeting in Paris. Based on this initial application, ResiMOB was further developed into the digital tool described in Section 5.7. Stakeholders across the six DREAMS Living Labs subsequently used the digital tool to assess present and wished stakeholder involvement, providing the empirical basis for the comparative analyses presented in Sections 5.4 and 5.5. During this application, some stakeholders experienced the digital tool and underlying framework as relatively complex. This indicated a need for a complementary and more accessible format for situations in which stakeholders can meet and work together in person.

To address this need, a group of co-design students at Utrecht University of Applied Sciences was invited to translate the ResiMOB framework into an analogue co-creation game, The Mobility Match. The first version of the game was tested with stakeholders in the Utrecht Living Lab as part of the co-creation of a cooperative cargo-bike intervention in the neighbourhood (Figure 18). This intervention forms part of Task 5.5 and is documented in DREAMS Deliverable D5.5, which is under development at the time of writing. The application provided an opportunity to explore how the game could structure stakeholder dialogue around a concrete mobility intervention and make potential roles, contributions and opportunities for collaboration visible.



Figure 18. Testing the first version of Mobility Match with stakeholders in the Utrecht Living Lab during the co-creation of the cooperative cargo-bike intervention (Task 5.5).

Based on the experience gained during this first application, the game was further developed by graduate student Lizanne de Bie of the Utrecht Academy of the Arts in collaboration with the researcher. The resulting version was subsequently tested internally with colleagues and refined into the current Mobility Match format. A further application is planned during a workshop at the DREAMS final conference in Munich, providing an additional opportunity to collect user feedback before final publication of the game materials.

How the game works

Mobility Match starts from a shared vision and a concrete sustainable mobility intervention, which is placed at the centre of the game board. Participants then move through three consecutive rounds:

Round 1 - Ideas: participants indicate the elements of the intervention on which they want to share ideas and have a voice.

Round 2 - Contribute: participants identify the elements to which they are willing to contribute.

Round 3: for the elements selected in Round 2, participants make these potential contributions more concrete by indicating what they could contribute using four types of cards: Money, People, Knowledge, or Other.

Each participant uses a unique symbol throughout the game, making it possible to relate the choices and proposed contributions on the completed board to individual stakeholders.

From individual input to co-creation

An important principle of the game is that participants initially make their choices independently and in silence. After each round, each participant briefly explains their choices while the others listen without immediately responding or discussing them.

After the three rounds, participants individually reflect on the completed board and on what the emerging pattern means for the intervention and potential collaboration. Only after these reflections have been shared is the discussion opened. The resulting dialogue can be used to identify:

- areas of convergence and divergence;
- gaps in responsibility;
- potential partnerships; and
- possible next steps.

The board, individual reflections and discussion outcomes can together provide a first shared co-design basis for further development of the intervention.

Relationship with the digital ResiMOB tool

Mobility Match therefore complements rather than replaces the digital ResiMOB tool. Whereas the digital application supports systematic assessment and comparison of present and wished stakeholder involvement, the game translates the underlying ResiMOB logic into an in-person co-creation process around a concrete intervention. It moves the dialogue from sharing Ideas, to willingness to Contribute, and finally to identifying the concrete resources that stakeholders may bring to the collaboration. In this way, Mobility Match extends ResiMOB from the assessment and visualisation of stakeholder perspectives towards facilitated collaborative action.

The Preparation Guide, Participant Guide and Facilitator Guide for Mobility Match are provided in Appendix E. The complete printable game toolkit, including the game board and cards, is being further refined and will be published alongside the ResiMOB tool on the DREAMS Interactive Knowledge Platform introduced in Section 5.7, following the final user-feedback phase.

5.9. Implications for resilient and responsible mobility business model development

The findings presented in this deliverable demonstrate that the long-term viability of shared mobility business models requires more than financially viable service provision. Across the literature review, stakeholder interviews, survey responses, and Living Lab applications, stakeholders consistently emphasised the importance of governance arrangements, stakeholder collaboration, and public value creation alongside operational and financial considerations.

The ResiMOB framework was developed in response to this challenge. By integrating governance, infrastructure, and value dimensions within a single framework, ResiMOB expands conventional business model approaches that often focus primarily on economic performance. The framework highlights that shared mobility systems are embedded within broader socio-technical and institutional environments in which multiple actors contribute to the creation and maintenance of mobility services.

The comparative stakeholder analysis revealed broad agreement regarding the central role of private mobility providers in operating shared mobility services. At the same time, stakeholders consistently assigned important responsibilities to urban authorities, particularly in relation to facilitation,

regulation, infrastructure provision, and the pursuit of broader societal objectives. The findings therefore support the view that resilient business models are most likely to emerge through hybrid governance arrangements that combine private-sector innovation with public-sector coordination and support.

The comparison between Paris and Utrecht further demonstrated that stakeholders may hold different assumptions regarding the distribution of responsibilities within shared mobility ecosystems. While such differences can create challenges for collaboration, they also highlight the importance of tools that make stakeholder perspectives visible and discussable. The ResiMOB framework contributes to this process by providing a common language through which stakeholders can explore alternative governance arrangements and jointly develop future business model configurations.

A further implication concerns the role of users and third-sector organisations. Although these stakeholder groups were not directly represented in the survey sample, respondents consistently expressed a desire for greater involvement of these actors in future governance arrangements. This finding suggests that resilient and responsible shared mobility systems may benefit from more participatory approaches that extend beyond traditional public-private partnerships. Greater involvement of users and civil society organisations may contribute to improved accessibility, stronger social inclusion, and increased legitimacy of shared mobility initiatives.

The Living Lab applications demonstrated that governance arrangements remain highly context-dependent. Differences in institutional structures, mobility systems, stakeholder networks, and policy priorities influence how responsibilities are distributed across actors. At the same time, the application of ResiMOB across six European Living Labs showed that the framework is sufficiently flexible to support analysis and stakeholder dialogue across diverse local contexts. This suggests that ResiMOB has potential as a transferable framework for supporting business model development in cities beyond the DREAMS consortium.

The publication of ResiMOB through the DREAMS Interactive Knowledge Platform further extends the potential impact of the framework. By making the tool openly accessible, the project contributes to knowledge sharing, capacity building, and the wider dissemination of approaches for developing resilient and responsible shared mobility business models. The platform enables researchers, practitioners, public authorities, and mobility operators to apply the framework within their own contexts and explore alternative governance configurations.

Overall, the results indicate that resilience in shared mobility should be understood not only as the ability of business models to remain financially sustainable, but also as their capacity to adapt, collaborate, and generate public value over time. Responsible business models similarly require attention to social inclusion, accessibility, environmental sustainability, and stakeholder participation. The ResiMOB framework contributes to these objectives by supporting reflection, dialogue, and co-creation among stakeholders involved in shared mobility ecosystems.

Several limitations should be considered when interpreting the ResiMOB survey findings. The survey included eleven responses across six Living Labs, and the distribution of respondents differed between cities and stakeholder categories. Consequently, the aggregated results are exploratory and should not be interpreted as representative of all stakeholders within the Living Labs. Aggregation can also mask differences between individual respondents and local contexts, particularly where only one response represents a stakeholder category or Living Lab. In addition, direct survey responses were not obtained from shared mobility users or third-sector organisations; scores concerning these groups therefore reflect the perceptions of the participating public and private stakeholders. The findings are best used to identify patterns, stimulate stakeholder dialogue, and inform further testing of the framework with broader and more balanced samples.

This deliverable broadens the original perspective of Task 4.1 from economic viability alone towards a more comprehensive understanding of business model viability. While pricing structures and subsidy mechanisms remain important, the findings demonstrate that their effectiveness depends on wider governance arrangements, stakeholder collaboration, infrastructure provision and the creation of public value. The ResiMOB framework therefore supports the assessment and co-creation of viable shared mobility business models by integrating these interrelated dimensions into a single analytical framework.

6. CONCLUSION

This deliverable set out to explore the conditions that support the long-term viability of shared mobility business models in urban outskirts and within the context of 15-minute neighbourhood transformations. Combining evidence from a systematic literature review, exploratory stakeholder interviews, and empirical testing across the six DREAMS Living Labs, the study demonstrates that the viability of shared mobility services cannot be understood solely through financial performance. Instead, successful and enduring mobility systems depend on the interaction between governance arrangements, infrastructure provision, stakeholder collaboration, and the creation of public value.

The literature review showed that contemporary shared mobility business models increasingly move beyond conventional operator-centred approaches towards hybrid arrangements involving public authorities, private operators, users, and civil society actors. Stakeholder interviews confirmed that public-private collaboration, supportive infrastructure, and shared responsibility for societal goals such as accessibility, inclusion, and sustainability are essential conditions for long-term success, particularly in lower-density urban outskirts where purely market-driven models often struggle to remain viable.

To address these challenges, this deliverable developed the ResiMOB (Resilient and Responsible Mobility Business Models) framework. Organised around the three dimensions of Governance, Infrastructure, and Values, and operationalised through nine assessment components, ResiMOB provides a structured approach for understanding how responsibilities are distributed across shared mobility ecosystems. The survey results across the DREAMS Living Labs revealed a clear preference for hybrid governance models in which private mobility operators continue to play a central operational role, while public authorities assume strong facilitating, regulatory, and infrastructure-related responsibilities. Respondents also expressed a desire for greater future involvement of users and third-sector organisations, particularly regarding equity and sustainability objectives.

Beyond its analytical value, ResiMOB proved to be a valuable co-creation and dialogue tool. By visualising stakeholder perspectives and identifying areas of convergence and divergence, the framework supports reflection, learning, and collaborative business model development. The comparative analyses of Paris and Utrecht illustrated how ResiMOB can facilitate discussions about future governance configurations and help stakeholders jointly explore pathways towards more resilient and responsible mobility systems.

Future research avenues

While this study provides an important first step in developing and testing the ResiMOB framework, several opportunities for future research remain. First, the framework should be applied and validated in a larger variety of cities, regions, and mobility contexts to assess its transferability beyond the DREAMS Living Labs. Second, future studies could investigate the relationship between ResiMOB outcomes and actual mobility system performance, examining whether more collaborative governance configurations contribute to improved service uptake, resilience, accessibility, and sustainability

outcomes. Third, research could explore the direct involvement of users and civil society organisations in the assessment process, as these stakeholder groups were represented primarily through the perceptions of other actors in the current study. Finally, the framework could be further developed to support the design and evaluation of subsidy schemes, public procurement strategies, and policy interventions aimed at strengthening equitable and sustainable shared mobility systems.

Application possibilities of the ResiMOB tool

The results of this deliverable demonstrate that ResiMOB has significant potential beyond its initial application within DREAMS. As an open-access resource available through the DREAMS Interactive Knowledge Platform, the framework can support a wide range of stakeholders, including public authorities, mobility operators, researchers, consultants, and community organisations.

Potential applications include:

- Business model development and assessment, enabling stakeholders to analyse existing shared mobility systems and explore alternative governance configurations.
- Living Lab and co-creation processes, where the framework can facilitate dialogue, stakeholder engagement, and collaborative decision-making.
- Policy development and strategic planning, supporting municipalities and regional authorities in identifying governance gaps and designing supportive policy measures.
- Evaluation of mobility hubs and Mobility-as-a-Service initiatives, helping stakeholders understand the distribution of responsibilities and value creation mechanisms within complex mobility ecosystems.
- Education and capacity building, including the use of the digital platform and the emerging ResiMOB board game to support learning, training, and stakeholder awareness.
- Comparative and longitudinal research, allowing cities and regions to monitor how governance arrangements evolve over time and compare experiences across different contexts.

In conclusion, ResiMOB advances the discussion on shared mobility business models by shifting attention from economic viability alone towards a broader understanding of resilience and responsibility. The framework recognises that successful shared mobility systems are not simply transport services, but collaborative socio-technical systems that create economic, social, and environmental value. By providing a common language for analysing, visualising, and co-creating shared mobility governance arrangements, ResiMOB offers a practical and transferable contribution to the development of accessible, equitable, and sustainable mobility futures in urban outskirts and beyond.

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APPENDIX A. THEMATIC SUMMARY OF THE EXPLORATORY STAKEHOLDER INTERVIEWS

Purpose

The exploratory stakeholder interviews were conducted across the six DREAMS Living Labs to complement the literature review with practice-based insights. The summaries presented in this appendix are derived from the original interview material and represent the outcome of the thematic interview analysis. The interviews were not intended as a formal comparative study between Living Labs, but as an exploratory source of evidence to identify recurring themes relevant to shared mobility business models.

The recurring themes identified through the exploratory stakeholder interviews were subsequently synthesised with the findings from the literature review and together informed the development of the ResiMOB framework.

Methodological note

The interviews were exploratory and were not originally structured according to the ResiMOB framework. Interview findings were first summarised and analysed thematically across the Living Labs. These themes were then considered alongside the literature review during the development of the ResiMOB framework. To keep this appendix focused and concise, the desk research column and longer supporting notes from the original working document have been removed. The tables below retain the interview-based thematic summaries.

Table A. Overview of thematic interview categories

Overview of thematic interview categories

Living Lab	Interview summary
Finance	Funding mechanisms, investments, operational costs and financial arrangements.
Facilitation	Governance, partnerships and stakeholder collaboration.
Ownership	Ownership of infrastructure, services and vehicles.
Regulation	Policies, concessions and institutional responsibilities.
Equity and public value	Accessibility, affordability, inclusion and societal benefits.
Environmental value	Sustainability and environmental impacts.
Feedback and evaluation	Monitoring, learning and stakeholder feedback.
Infrastructure	Physical and digital infrastructure supporting shared mobility.

Finance

Living Lab	Interview summary
Paris	Subscription fee or per-use charging; investment comes from both public and private actors. Depending on the mobility type, maintenance costs may be covered publicly for infrastructure or privately for vehicle upkeep.
Munich	Subscription fee or pay-per-use charging; investment comes from private companies and public actors, including mobility hub development and subsidised electric bike-sharing. Upkeep requires coordination between public and private stakeholders.
Budapest	Shared mobility is financed either publicly, through heavily subsidised services covered by municipality or government, or privately, where companies cover costs without subsidies. Public-private cooperation is planned for future micromobility.
Vienna	Public actors invest in intermodal infrastructure and sustainability subsidies, while private actors face high investment costs for technology such as tracking and vehicle systems. Collaboration includes subsidies, price reductions and location management; urban outskirts tend to rely on hybrid models.
Brussels	Shared mobility is funded through public sources, private companies, or collaborative arrangements, including public transport funding, EU funding, private car-sharing and models such as JCDecaux.
Utrecht	Hybrid models that combine hubs and free-floating systems require more monitoring and operational costs. The municipality invests in required infrastructure, while public-private collaboration supports data management and technology development.

Facilitation

Living Lab	Interview summary
Paris	Facilitation involves the City of Paris, Ile-de-France region, Ile-de-France Mobilites, private operators and academic or business institutions. Shared bicycles, shared cars and mobility hubs involve large networks of stakeholders.
Munich	The municipality regulates, subsidises and integrates shared mobility services for safety and accessibility. Public-private partnerships, such as MVG Rad and Nextbike, enhance bike-sharing, while Sixt Share collaborates with municipalities to expand car-sharing.
Budapest	The municipality controls public transport, including bus, metro and Mobi bike-sharing, while private operators such as Tier run independent services like scooters without subsidies. Future public-private partnerships aim to integrate shared micromobility, with the city providing infrastructure and private companies managing operations.
Vienna	The municipal government regulates and subsidises shared mobility, while private companies such as Mo.Point and Share Now operate under public-private partnerships. Property developers also integrate shared mobility into new projects. Wiener Linien dominates public transport, while private operators run car-sharing and e-scooter services under strict city regulations.

Living Lab	Interview summary
Brussels	STIB/MIVB operates public transport, while shared mobility services such as Cambio and Villo! integrate with public transport through public-private partnerships. The Green Deal on Inclusive Car Sharing brings together municipalities, NGOs and private operators to promote accessibility.
Utrecht	The municipality regulates and facilitates shared mobility by working with providers to manage infrastructure, parking and service efficiency. Data sharing and negotiations between the city and providers help optimise parking zones, improve accessibility and shape regulations.

Ownership

Living Lab	Interview summary
Paris	Ownership of hubs typically lies with public authorities or private operators. Public spaces are used for parking and infrastructure, often in partnership with private companies, while vehicles are generally owned by private shared mobility operators.
Munich	The municipality owns and develops mobility hubs in partnership with shared mobility providers. Public spaces are municipally owned, while private companies operate within city-approved zones and own or maintain their fleets.
Budapest	Public ownership is prominent for transport infrastructure in central Budapest, while private operators own vehicles and infrastructure for micromobility services such as electric scooters. Future public-private collaborations may lead to shared ownership models, particularly in suburban districts.
Vienna	Vehicles are mainly owned by private companies, while hubs are often managed by municipal authorities and private property developers. Locations for both station-based and free-floating services involve a combination of public spaces and private property.
Brussels	Ownership of mobility infrastructure is divided between public and private sectors. Public authorities own land and stations used by public transport and car-sharing services, while private companies generally own vehicles and operational infrastructure.
Utrecht	The municipality owns physical infrastructure, including parking zones and hubs, while shared mobility providers own and maintain vehicles. This creates a hybrid ownership model balancing public oversight with private innovation and operational efficiency.

Regulation

Living Lab	Interview summary
Paris	Local and regional authorities enforce regulations on service quality and safety. Concessions are awarded through tenders, often with performance-based

Living Lab	Interview summary
	contracts, while public consultations and regulatory bodies monitor compliance and adjust policies.
Munich	Shared mobility services are governed by municipal regulations that ensure safety, operational efficiency and accessibility. Local authorities enforce compliance through licensing and safety standards, while providing subsidies and concessions to support eco-friendly transport options.
Budapest	Regulation and enforcement by local and national authorities ensure that public and private mobility services meet safety, accessibility and operational standards. Concessions enable public-private collaborations under government oversight.
Vienna	Local authorities regulate and enforce mobility services, including public space use and safety. Concessions are often granted to private operators in collaboration with property developers or public authorities to align services with planning and sustainability goals.
Brussels	Mobility services are regulated by local, regional and national authorities. Shared mobility services are subject to licensing and local regulation controlling operational areas, vehicle density and parking, with enforcement by regional and municipal authorities.
Utrecht	Shared mobility is governed by municipal regulations covering parking, distribution and operational conditions. The municipality monitors providers, uses data-sharing systems and adjusts rules based on feedback; providers operate under concession conditions.

Equity and public value

Living Lab	Interview summary
Paris	Shared mobility aims to be accessible to diverse populations across regions. Efforts focus on democratising public space, improving transport equity and prioritising affordable and inclusive options.
Munich	Shared mobility promotes equity by ensuring accessibility for all, including expanded electric bike options and suburban service coverage. Public-private partnerships and subsidies support affordability, while mobility hubs help democratise public space.
Budapest	Equity focuses on making transport affordable and accessible, especially for lower-income and suburban residents. Shared mobility solutions are integrated into public areas, with subsidised public transport and public-private collaborations aimed at expanding services beyond central districts.
Vienna	Mobility models aim to improve accessibility through affordable and flexible transport options. Shared mobility and public transport support the democratisation of public space and equitable access to transportation resources.
Brussels	Equity is central to mobility initiatives, with attention to accessibility regardless of income, age or physical ability. Public transport and shared mobility services include affordable options for vulnerable groups.

Living Lab	Interview summary
Utrecht	Shared mobility is designed to promote equity by making services accessible to a wide range of people. Parking zones and flexible systems make access easier, while collaboration between the municipality and providers supports more efficient and equitable use of public space.

Environmental value

Living Lab	Interview summary
Paris	Shared mobility aims to reduce CO2 emissions through electric vehicles and bikes. Noise pollution is reduced by promoting quieter modes such as electric cars and bikes, supported by charging stations and sustainable infrastructure.
Munich	Shared mobility contributes to environmental sustainability through electric bikes, e-scooters and car-sharing, reducing reliance on private cars, lowering emissions and encouraging eco-friendly transport options. Electric vehicles also help reduce noise pollution.
Budapest	Mobility focuses on reducing CO2 emissions and noise pollution through public transport, bike-sharing and electric scooters. Expanding micromobility infrastructure in suburban areas could further improve environmental quality.
Vienna	Mobility models reduce CO2 emissions by promoting shared electric mobility, reducing car ownership and encouraging sustainable transport. Electric vehicles also contribute to lower noise pollution and quieter urban environments.
Brussels	Public transport, car-sharing and micromobility contribute to reducing CO2 emissions and noise pollution. The transition to electric fleets and promotion of sustainable modes support cleaner and quieter urban environments.
Utrecht	Shared mobility contributes to environmental sustainability by reducing CO2 emissions through electric vehicles and decreased private car ownership. It also reduces noise pollution and supports the city's environmental goals by optimising the use of public space.

Feedback and evaluation

Living Lab	Interview summary
Paris	User feedback is collected through apps, websites and customer service hotlines. Providers gather insights via surveys, public consultations and performance monitoring, while governance bodies use municipal oversight committees to track and evaluate service quality.
Munich	Feedback systems include digital platforms where users rate experiences and make suggestions. Providers track performance and usage data, while local communities are consulted through surveys and meetings to assess impacts and inform improvements.

Living Lab	Interview summary
Budapest	Feedback and evaluation involve users, providers and communities. Users provide feedback on accessibility and satisfaction, providers collect operational data to optimise efficiency and financial viability, and communities contribute through surveys and consultations.
Vienna	Feedback and evaluation systems involving users, providers and communities support the improvement and optimisation of urban mobility services. Continuous feedback enables responsive decision-making and more efficient, user-friendly transport options.
Brussels	Feedback and evaluation systems improve user experience, provider performance and community impacts. Data-driven approaches, user surveys, public consultations and impact assessments help ensure that mobility systems remain inclusive and effective.
Utrecht	Feedback and evaluation operate at multiple levels. Users provide input through apps and municipal channels, providers share operational data, and the community participates through public consultations and long-term assessments, supporting continuous learning and adaptation.

Infrastructure

Living Lab	Interview summary
Paris	Infrastructure includes physical hubs such as bike stations, parking spaces and charging stations. Digital technologies such as GPS, IoT and real-time monitoring support efficient services, while platforms enable booking, payment and multimodal planning.
Munich	Infrastructure includes physical hubs for access to multiple transport modes, supported by digital technology for fleet management and real-time updates. Digital platforms enable seamless booking, payment and monitoring via mobile apps.
Budapest	Infrastructure includes physical hubs, such as bike-sharing docking stations and public transport terminals, digital technologies such as real-time data and mobile payment systems, and digital platforms such as bike-sharing and micromobility apps.
Vienna	Infrastructure spans physical hubs, such as mobility stations, car-sharing pick-up points and transit stations, and digital platforms such as mobile apps and real-time tracking systems that support integration and user convenience.
Brussels	Infrastructure relies on physical hubs, digital technology and digital platforms. Strategically placed hubs connect transport modes, while real-time tracking, smart parking and MaaS platforms improve efficiency and seamless multimodal access.
Utrecht	Shared mobility infrastructure combines physical hubs, advanced digital technology and integrated platforms. The hub network supports structured parking, while GPS tracking, geofencing and IoT improve service efficiency and support multimodal integration.

Concluding synthesis

Hybrid governance and public-private collaboration are recurring conditions for shared mobility in all Living Labs.

Municipalities play a critical role in coordination, regulation and infrastructure provision, even where private operators deliver services.

Integrated physical and digital infrastructure is a key enabling condition for viable shared mobility systems.

Accessibility, equity, environmental sustainability and continuous feedback broaden the understanding of business model viability beyond financial sustainability alone.

Together with the literature review, these findings informed the development of the ResiMOB framework and its three dimensions: Governance, Infrastructure and Values.

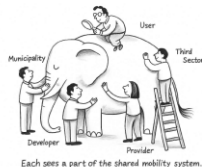
APPENDIX B. RESIMOB STAKEHOLDER ASSESSMENT SURVEY

The complete ResiMOB Stakeholder Assessment Survey is reproduced below. All survey content and response options are retained. To use each portrait page efficiently, eight original survey pages are presented in four rows of two pages.

ResiMOB: mapping the common and diverging perspectives

Welcome to the ResiMOB Tool!

When developing public-private collaborations for shared mobility, different stakeholders often see the system they operate in from different angles. This survey aims to bring those perspectives together and visualize them in a radar chart, comparing how stakeholders perceive their roles and responsibilities in shared mobility systems.



This survey will take you around 10-15 min and you will be asked to rate both the current and wished involvement of different stakeholders across nine components than form a resilient, inclusive, and responsible shared mobility ecosystem.

By wished involvement, we mean the level of stakeholder participation you think is ideal to make shared mobility more accessible in suburban and peripheral areas and achieve 15-minute neighbourhoods.

The radar chart generated from your responses will help identify areas of alignment and divergence, supporting dialogue for better collaboration.

Thank you for contributing to better mobility solutions!

Your responses will remain anonymous and used only for aggregated analysis. For question, contact stephanie.geertman@hu.nl or visit the DREAMS project website.



Note on the use of your data
Your responses will not include any identifying information about you, unless you were explicitly asked to provide it in a specific survey question.

There are 23 questions in this survey.

Your profile

In which of these cities - or nearby areas - do you work? *

Choose one of the following answers
If you choose "Other" please also specify your choice in the accompanying text field.
Please choose **only one** of the following:

☐ Utrecht
☐ Vienna
☐ Budapest
☐ Brussels
☐ Paris
☐ Munich
☐ Other

Introduction to stakeholder groups

This survey distinguishes **four main stakeholder groups** involved in shaping shared mobility systems. These categories help us understand how different perspectives contribute to shared mobility governance, operation, and use.

Hover over the stakeholder's name to see a brief description!

1. Private mobility providers (operators)
2. Public authorities
3. Shared mobility users
4. NGOs / Third sector organizations

Note: If your organization does not fit perfectly within one of these groups, in the following question you can just select the category that best reflects your main role or perspective when answering the questions. You can also indicate an additional role under "Other relevant actors" (for example if you are an urban authority who also provides the mobility service).

What type of stakeholder are you? *

Choose one of the following answers
If you choose "Other (please specify)" please also specify your choice in the accompanying text field.
Please choose **only one** of the following:

☐ Public authorities (municipal, regional, or national government)
☐ Private mobility providers (operators)
☐ Shared mobility users (or representatives)
☐ NGOs / Third sector organizations
☐ Other

Tip: If your organization plays multiple roles (e.g., a municipal company that also operates shared mobility services), please choose the role that best fits your current perspective when filling in this survey.

Your name and the organization:

Please write your answer here:

Component 1: ownership

Who owns or co-owns the fleet and related assets of shared mobility services, such as vehicles, parking spaces, charging stations, or docking areas?

To what extent are the following stakeholders (currently / ideally) involved in ownership or co-ownership of shared mobility assets? *

Please choose the appropriate response for each item:

	Current involvement					Wished involvement				
	Very high	High	Moderate	Low	I don't know	Very high	High	Moderate	Low	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other key actors (e.g., leasing companies, real-estate owners, housing associations, investors, or public-private partnerships) who play a role in the ownership or co-ownership of shared mobility assets in your city?

Choose one of the following answers
Please choose **only one** of the following:

☐ No
☐ Other

Component 2: facilitation

How stakeholders are involved in coordinating, managing, or steering shared mobility initiatives (e.g., working groups, coordination platforms, partnerships, or Living Labs).

To what extent are the following stakeholders [currently / ideally] involved in coordinating or facilitating shared mobility initiatives in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Medium	I don't know	Very high	High	Medium	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other key actors (e.g., coordination offices, research institutions, innovation labs, or business alliances) who play a role in facilitating or coordinating shared mobility initiatives in your city?

Choose one of the following answers
Please choose **only one** of the following:

☐ No

☐ Other

Component 3: finance

How stakeholders participate in decisions on pricing, investment, funding, or covering operational and infrastructure costs for shared mobility services.

To what extent are the following stakeholders [currently / ideally] involved in funding or investing in shared mobility services (e.g., operating costs, infrastructure, or subsidies) in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Medium	I don't know	Very high	High	Medium	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other key actors (e.g., developers, tech/data providers, investors, employers, real-estate owners) who play a role in this component in your city?

Choose one of the following answers
Please choose **only one** of the following:

☐ No

☐ Other

Component 4: feedback systems

How stakeholders contribute to gathering, sharing, and using feedback and data to improve shared mobility services (e.g., satisfaction surveys, community engagement, open data sharing).

To what extent are the following stakeholders [currently / ideally] involved in collecting or using feedback to improve shared mobility in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Medium	I don't know	Very high	High	Medium	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other actors (e.g., research institutes, data platforms, citizen science initiatives) who collect or use feedback in your city?

Choose one of the following answers
Please choose **only one** of the following:

☐ No

☐ Other

Component 5: regulations

How stakeholders influence or take part in creating and applying rules, permits, and policies that shape shared mobility services.

To what extent are the following stakeholders [currently / ideally] involved in defining or applying regulations and permits for shared mobility in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Medium	I don't know	Very high	High	Medium	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other actors (e.g., national ministries, transport agencies, real-estate developers) who play a regulatory or permitting role in your city?

Choose one of the following answers
Please choose **only one** of the following:

☐ No

☐ Other

Component 6: physical infrastructure

How stakeholders are involved in providing, designing, funding, or managing physical infrastructure for shared mobility (e.g., parking areas, hubs, charging or docking facilities, signage).

To what extent are the following stakeholders (currently / ideally) involved in developing or managing physical infrastructure for shared mobility in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Moderate	I don't know	Very high	High	Moderate	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national government)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other actors (e.g., real-estate developers, housing associations, energy companies, or parking operators) who play a role in providing or managing shared mobility infrastructure in your city?

Choose one of the following answers

Please choose **only one** of the following:

☐ No

☐ Other

Component 7: digital infrastructure

How stakeholders contribute to developing, maintaining, or supporting digital systems that enable shared mobility (e.g., apps, data platforms, payment systems, or digital integration with public transport).

To what extent are the following stakeholders (currently / ideally) involved in developing or managing digital infrastructure for shared mobility in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Moderate	I don't know	Very high	High	Moderate	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other actors (e.g., IT companies, data platforms, MaaS integrators, or universities) who play a role in developing or managing digital systems for shared mobility in your city?

Choose one of the following answers

Please choose **only one** of the following:

☐ No

☐ Other

Component 8: equity values

How stakeholders contribute to making shared mobility fair, inclusive, and accessible for different social and economic groups (e.g., affordable pricing, accessibility measures, service coverage in underserved areas).

To what extent are the following stakeholders (currently / ideally) involved in promoting equitable and inclusive shared mobility in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Moderate	I don't know	Very high	High	Moderate	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other actors (e.g., social housing associations, community centres, schools, foundations) who help promote equity in shared mobility in your city?

Choose one of the following answers

Please choose **only one** of the following:

☐ No

☐ Other

Component 9: environmental values

How stakeholders support environmentally sustainable shared mobility (e.g., clean energy use, emission reduction, eco-friendly operations).

To what extent are the following stakeholders (currently / ideally) involved in promoting environmentally sustainable shared mobility in your city?

*

Please choose the appropriate response for each item:

	Current involvement				Wished involvement			
	Very high	High	Moderate	I don't know	Very high	High	Moderate	I don't know
Private mobility providers (operators)	☐	☐	☐	☐	☐	☐	☐	☐
Public authorities (municipal, regional, or national)	☐	☐	☐	☐	☐	☐	☐	☐
Shared mobility users (e.g., cooperatives, advisory groups)	☐	☐	☐	☐	☐	☐	☐	☐
NGOs / Third sector organizations	☐	☐	☐	☐	☐	☐	☐	☐

Optional question:

Are there other actors (e.g., energy companies, environmental NGOs, climate initiatives, or transport agencies) who play a role in promoting sustainable shared mobility in your city?

Choose one of the following answers

Please choose **only one** of the following:

☐ No

☐ Other

Contact

Thank you very much for completing this survey!

Your contribution is highly appreciated. The visual results — radar charts based on the responses — will be added and made visible on the *DREAMS website* through its *Interactive Knowledge Platform* as soon as possible. At the Dreams website you will be able to compare your results with other stakeholders in your regions. This will provide you with information for step 2 of the Resimob analysis: discussing the results and making decisions together on PPP for inclusive shared mobility.

I am open to be contacted by email for the following:

Select all that apply

Please choose all that apply:

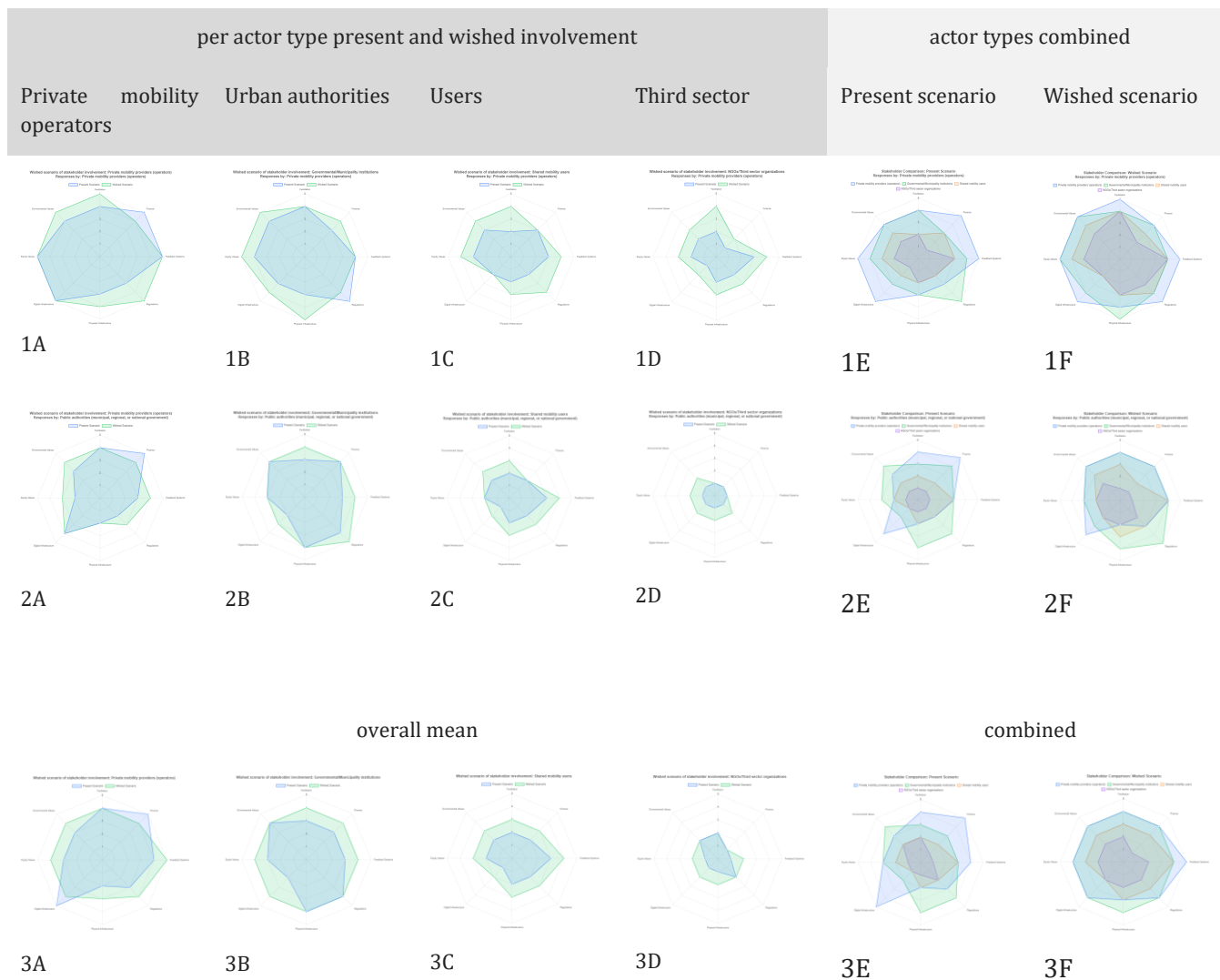
- ☐ To receive the visualization of my individual responses (radar chart).
- ☐ To be contacted for possible follow-up questions or further discussion.
- ☐ To give feedback about the Resimob survey
- ☐ I am not providing my email
- ☐ Other:

Submit your survey

Thank you for completing this survey.

APPENDIX C. COMPLETE COMPARATIVE STAKEHOLDER PERSPECTIVES ACROSS THE DREAMS LIVING LABS

This appendix presents the complete set of comparative stakeholder visualisations generated using the ResiMOB Stakeholder Assessment Survey. Whereas Chapter 4 presents the aggregated project results and selected comparisons, this appendix provides the full set of comparative radar charts across the six DREAMS Living Labs. These visualisations support a more detailed interpretation of stakeholder perspectives on the current and desired distribution of responsibilities across the ResiMOB dimensions. These results are also published through the [Living Labs - Dreams Knowledge Platform](#).



Next pages: all radarcharts enlarged. Also available at: [ResiMob - Dreams Knowledge Platform](#)

1A:

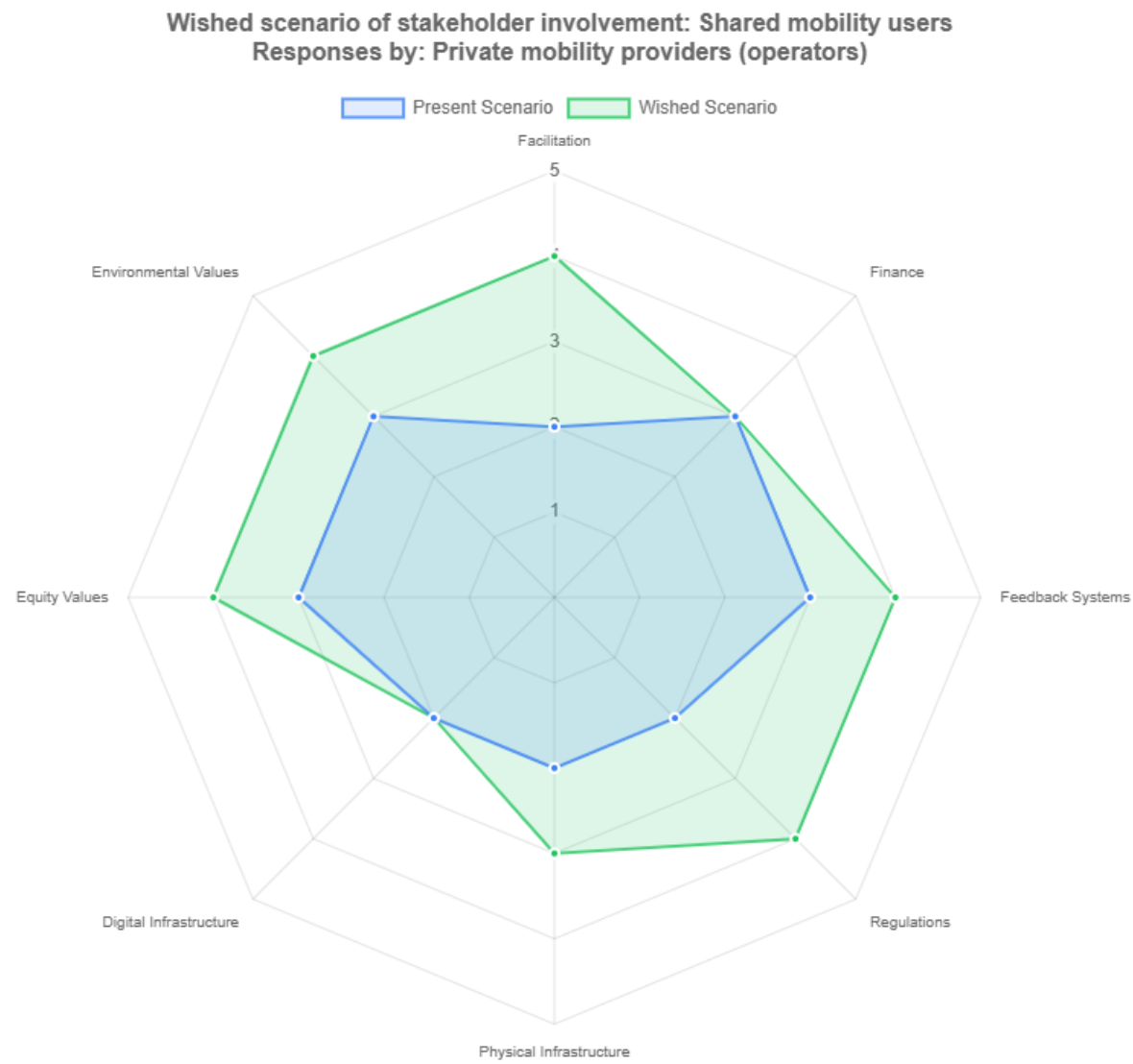
Wished scenario of stakeholder involvement: Private mobility providers (operators)
Responses by: Private mobility providers (operators)



1B:

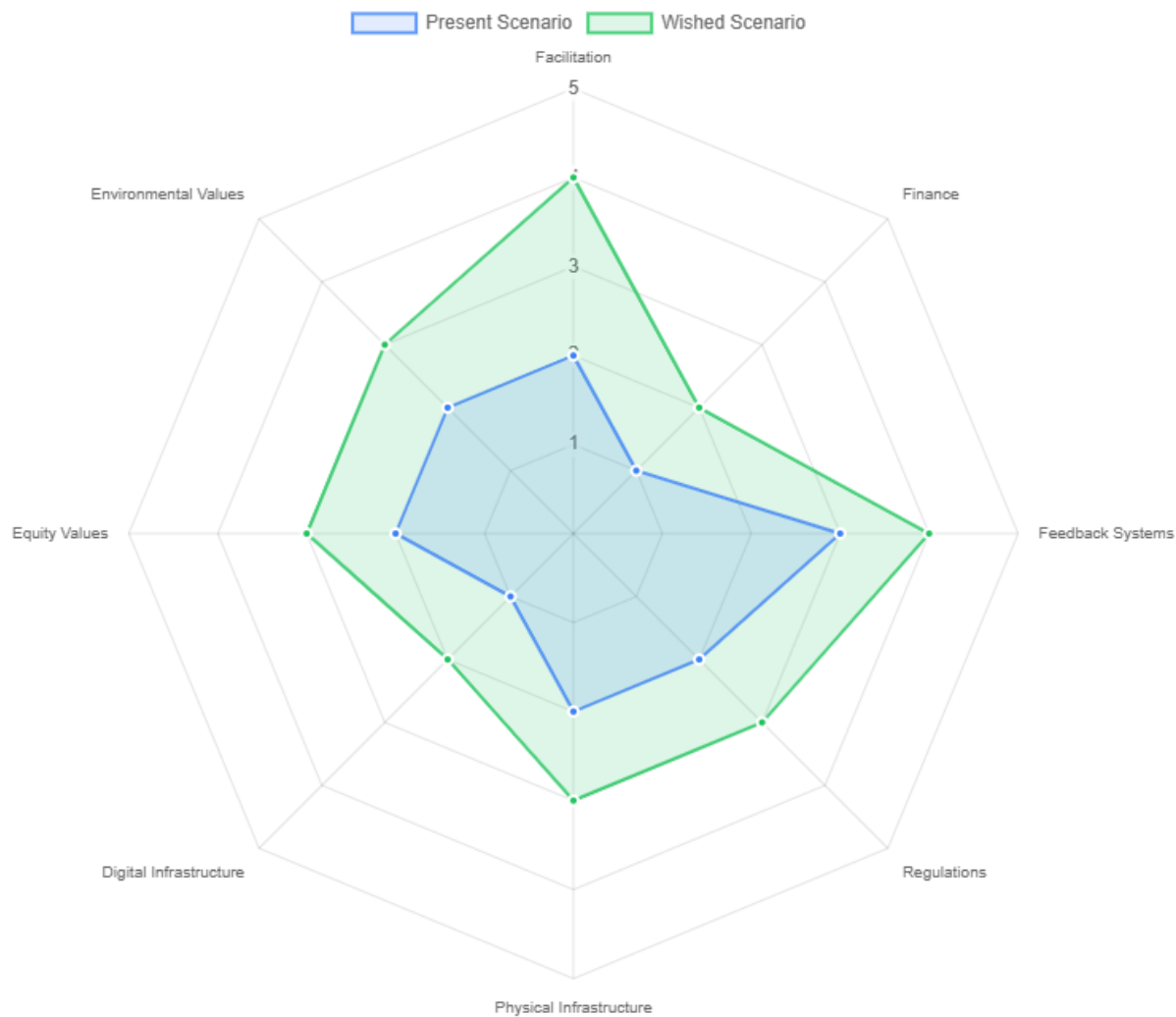


1C:

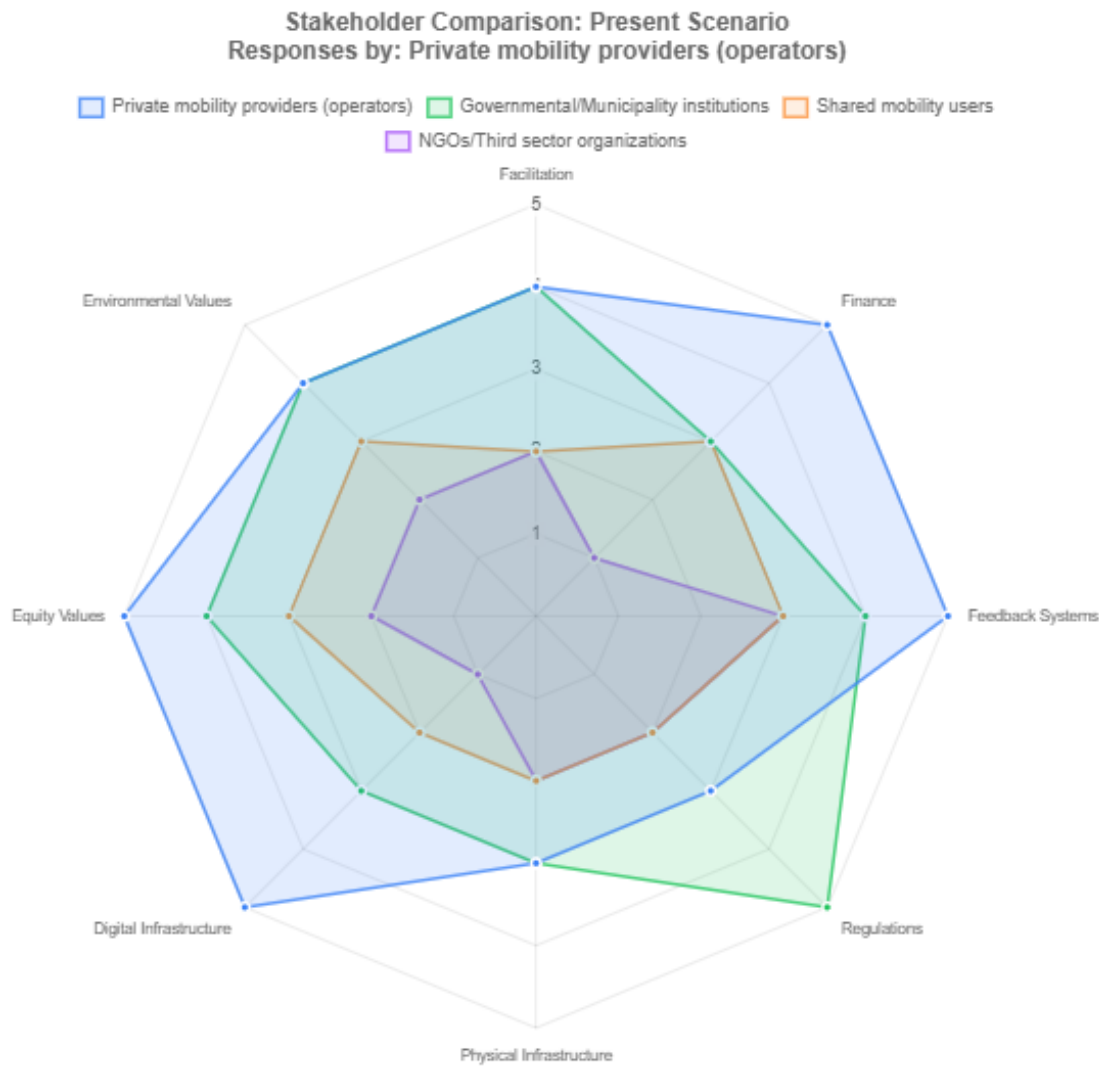


1D:

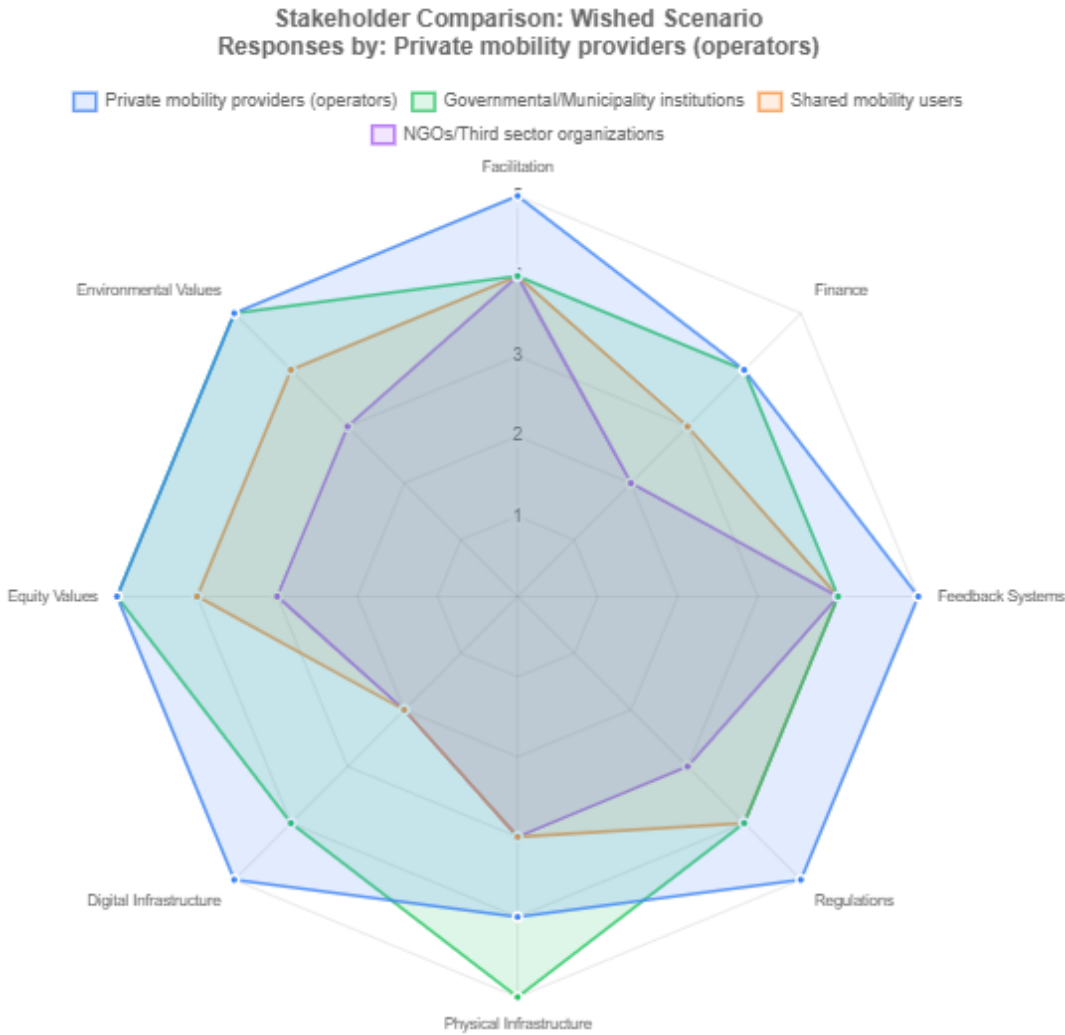
Wished scenario of stakeholder involvement: NGOs/Third sector organizations
Responses by: Private mobility providers (operators)

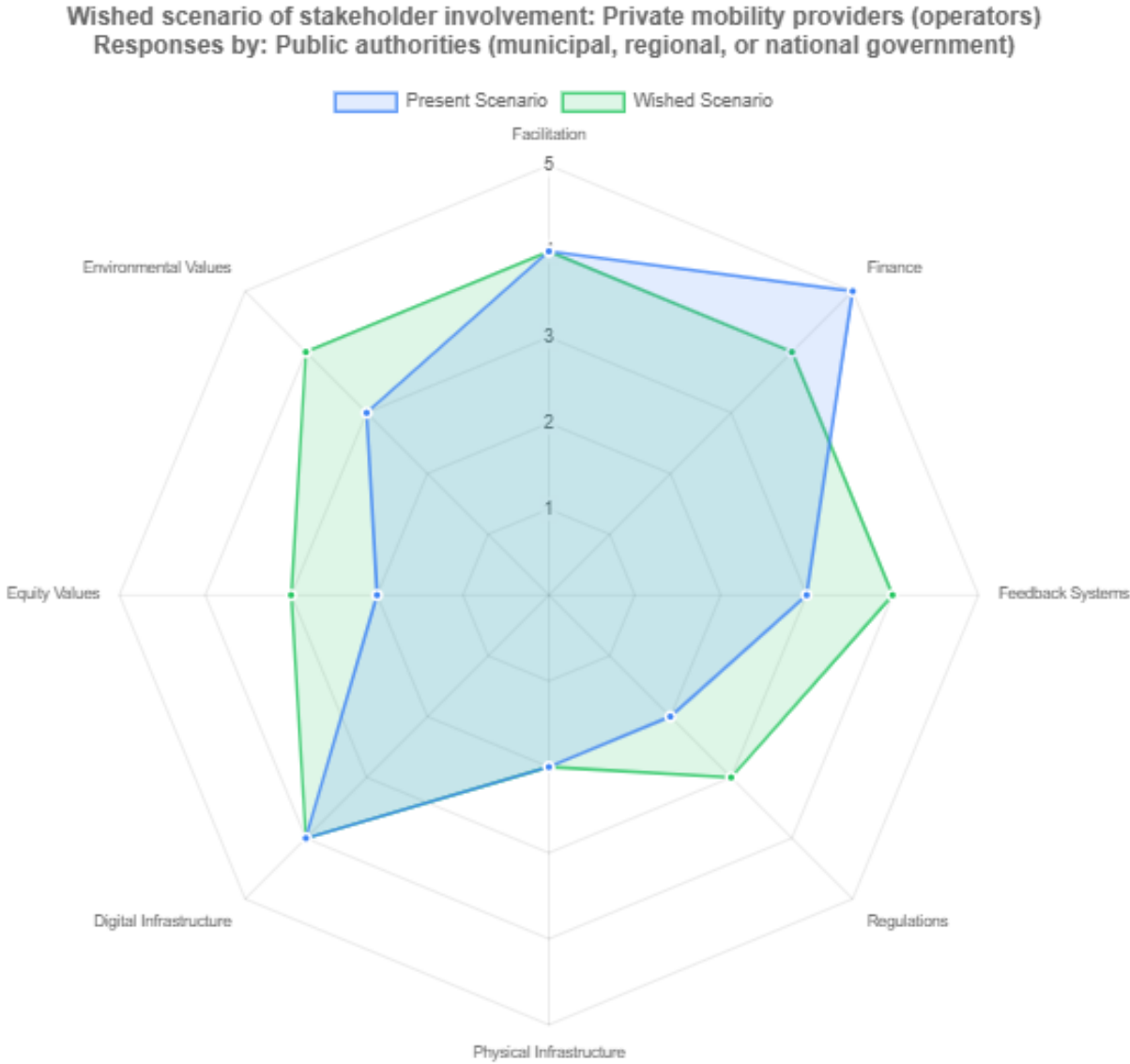


1E:



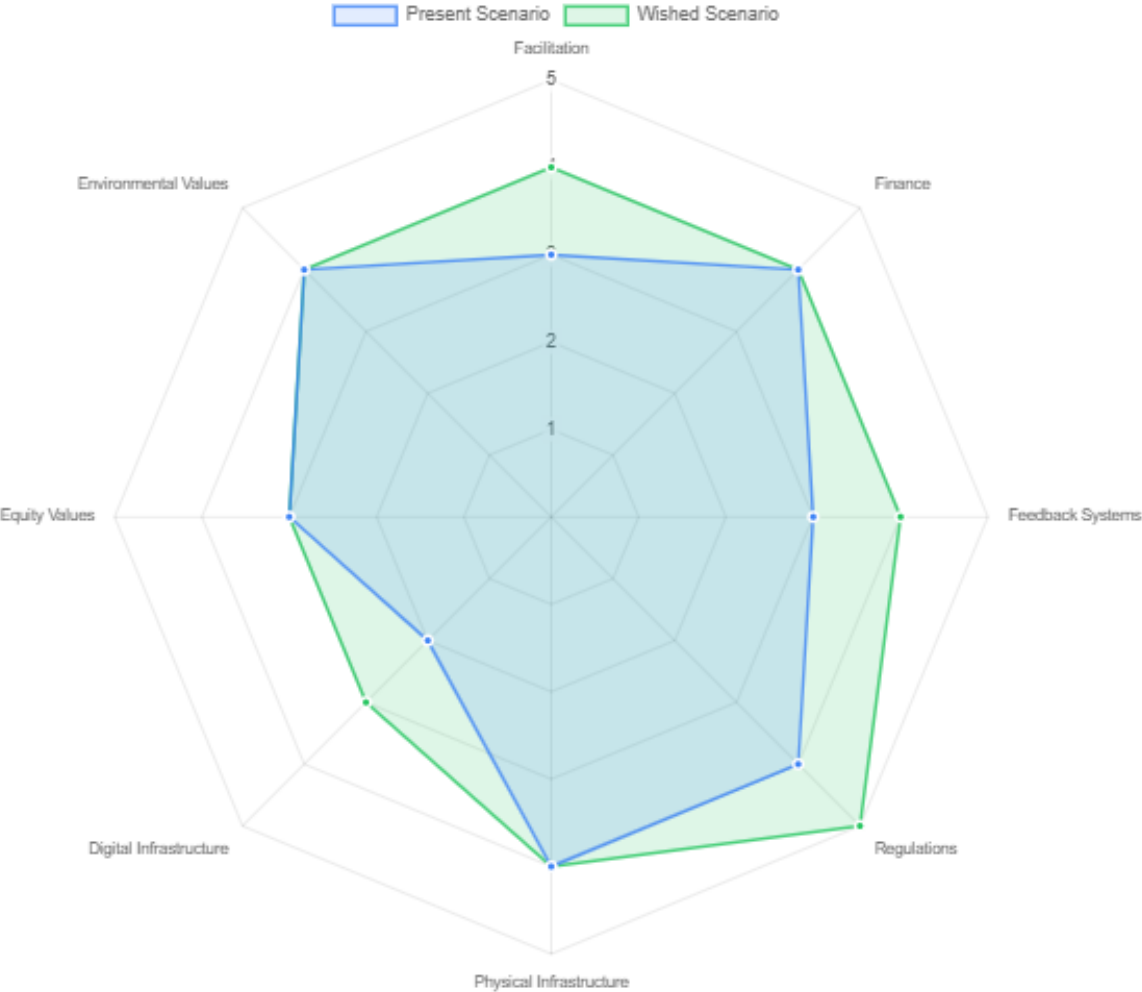
1F:





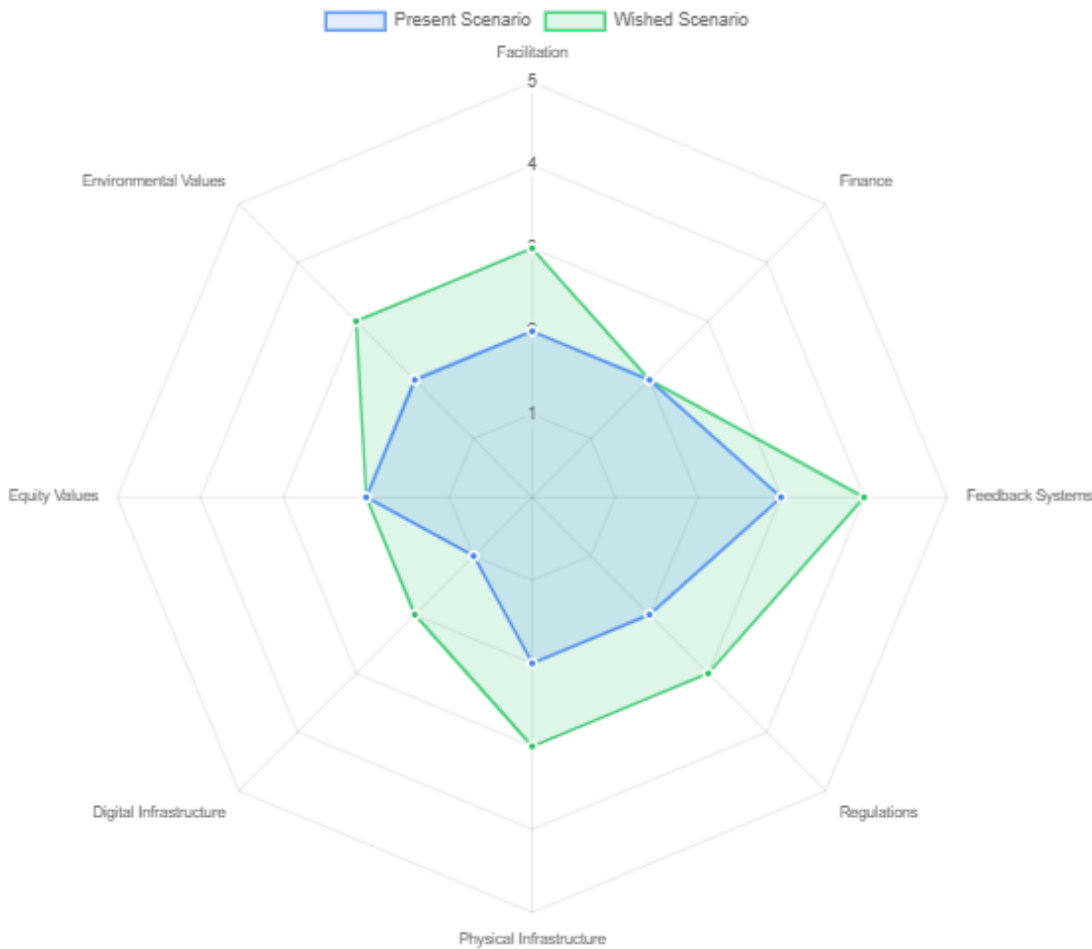
2B:

Wished scenario of stakeholder involvement: Governmental/Municipality institutions
Responses by: Public authorities (municipal, regional, or national government)



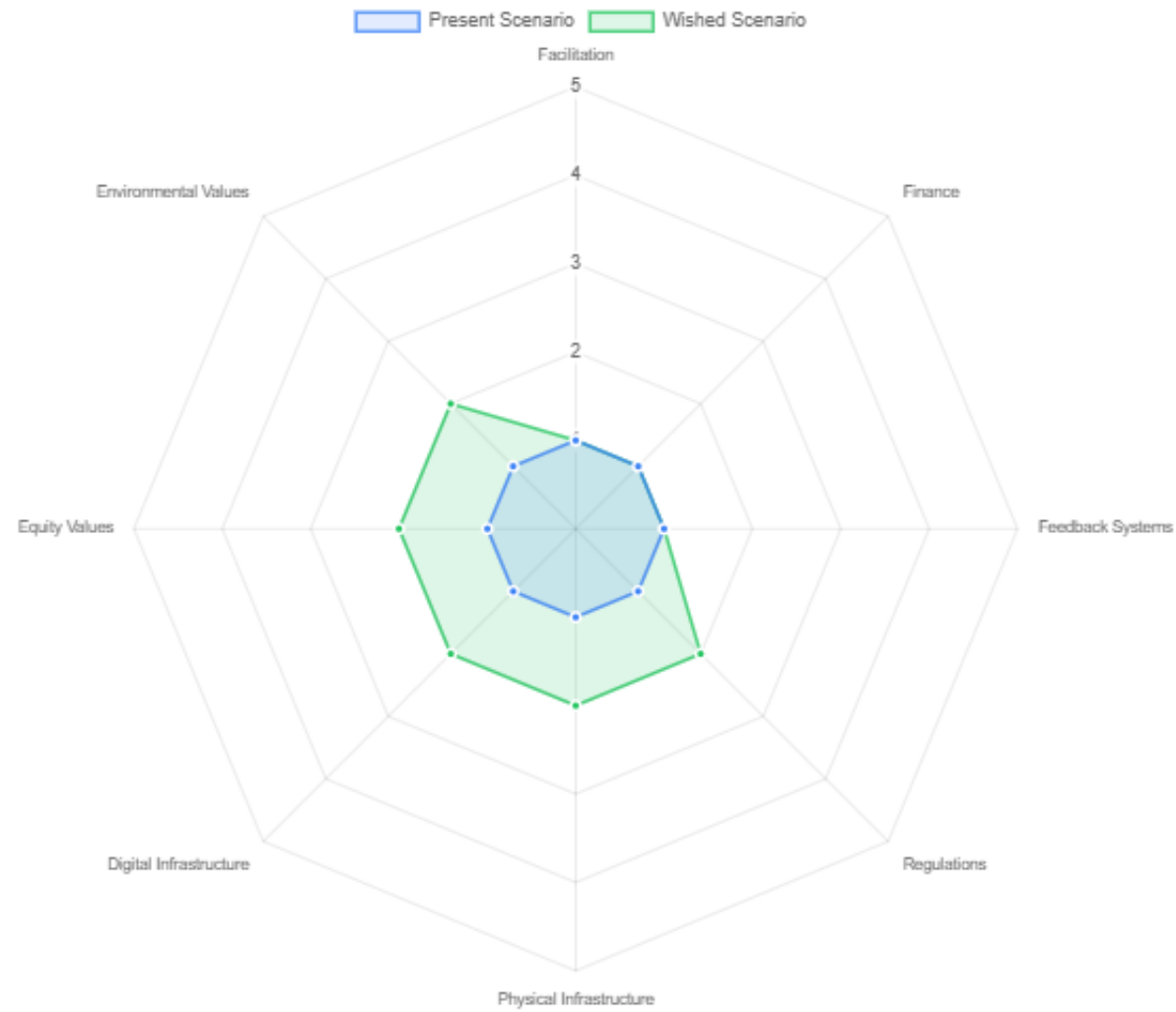
2C:

Wished scenario of stakeholder involvement: Shared mobility users
Responses by: Public authorities (municipal, regional, or national government)

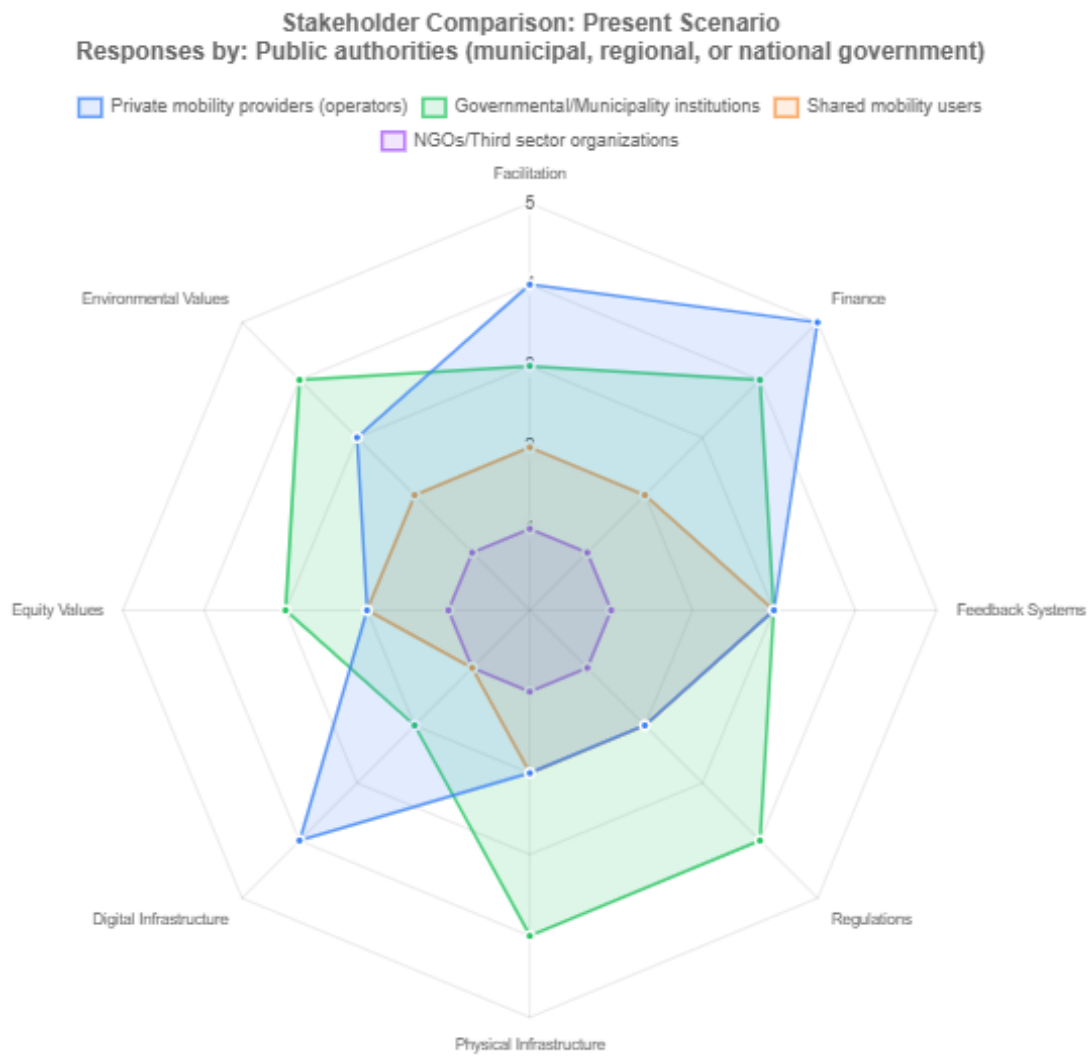


2D:

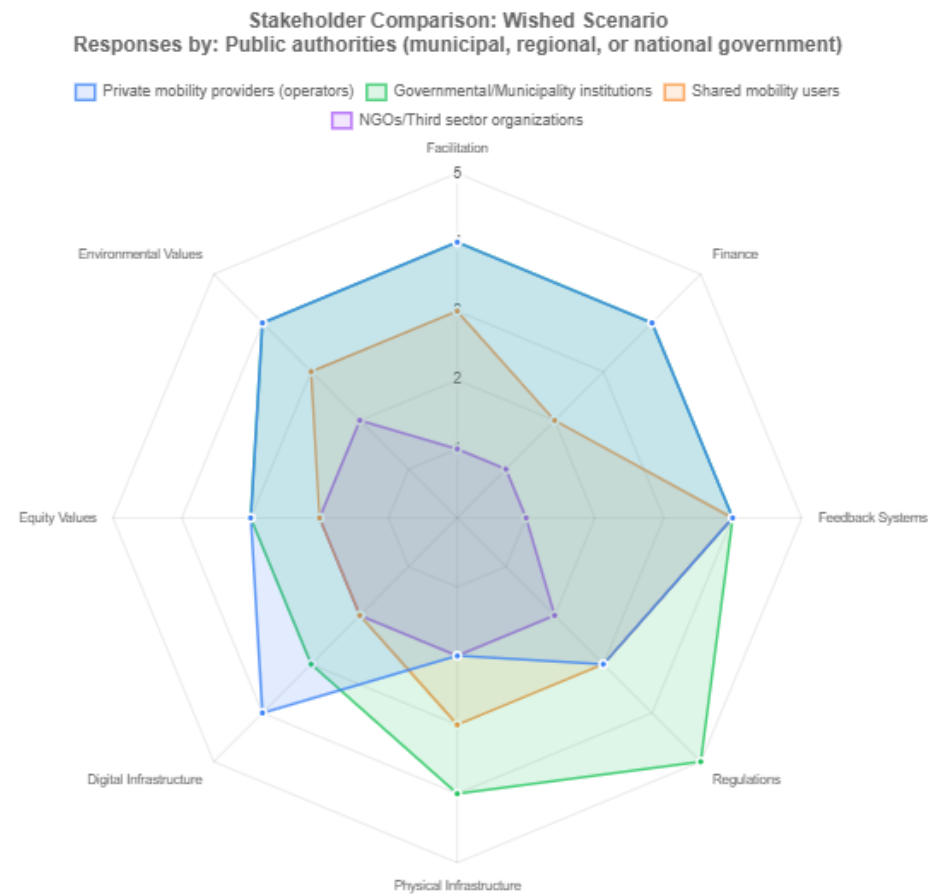
Wished scenario of stakeholder involvement: NGOs/Third sector organizations
Responses by: Public authorities (municipal, regional, or national government)



2E:



2F:



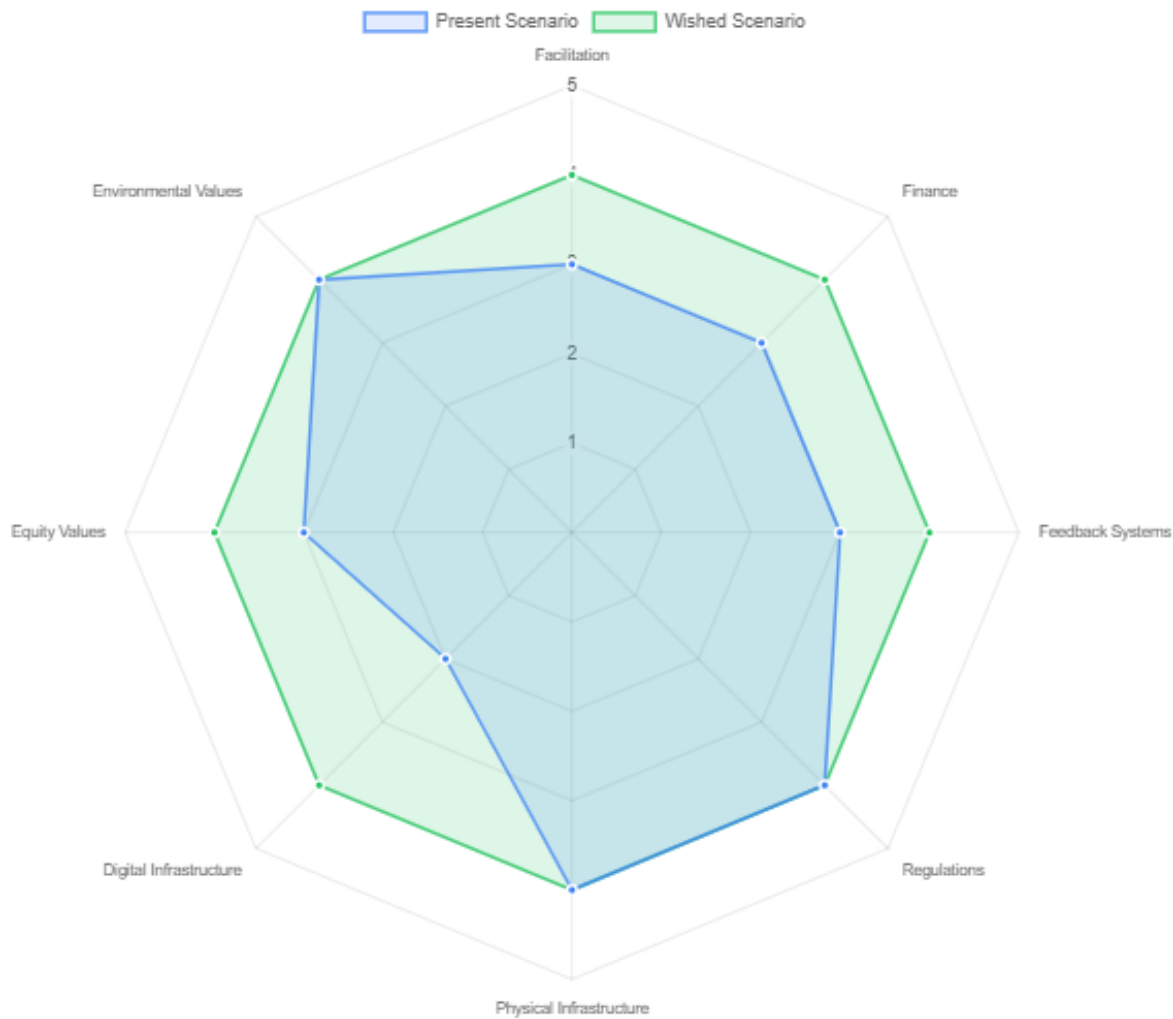
3A:

Wished scenario of stakeholder involvement: Private mobility providers (operators)



3B:

Wished scenario of stakeholder involvement: Governmental/Municipality institutions



3C:

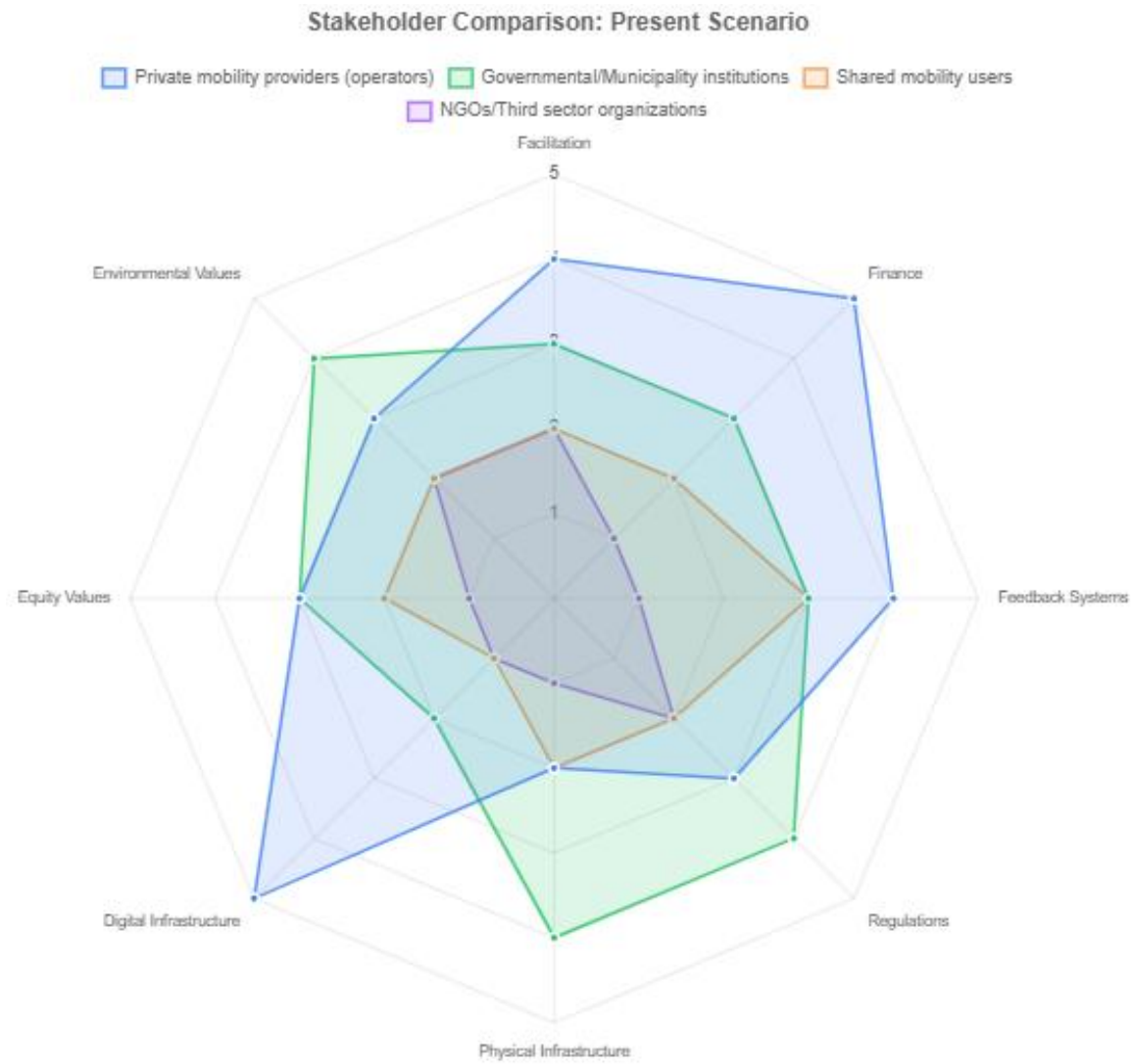


3D:

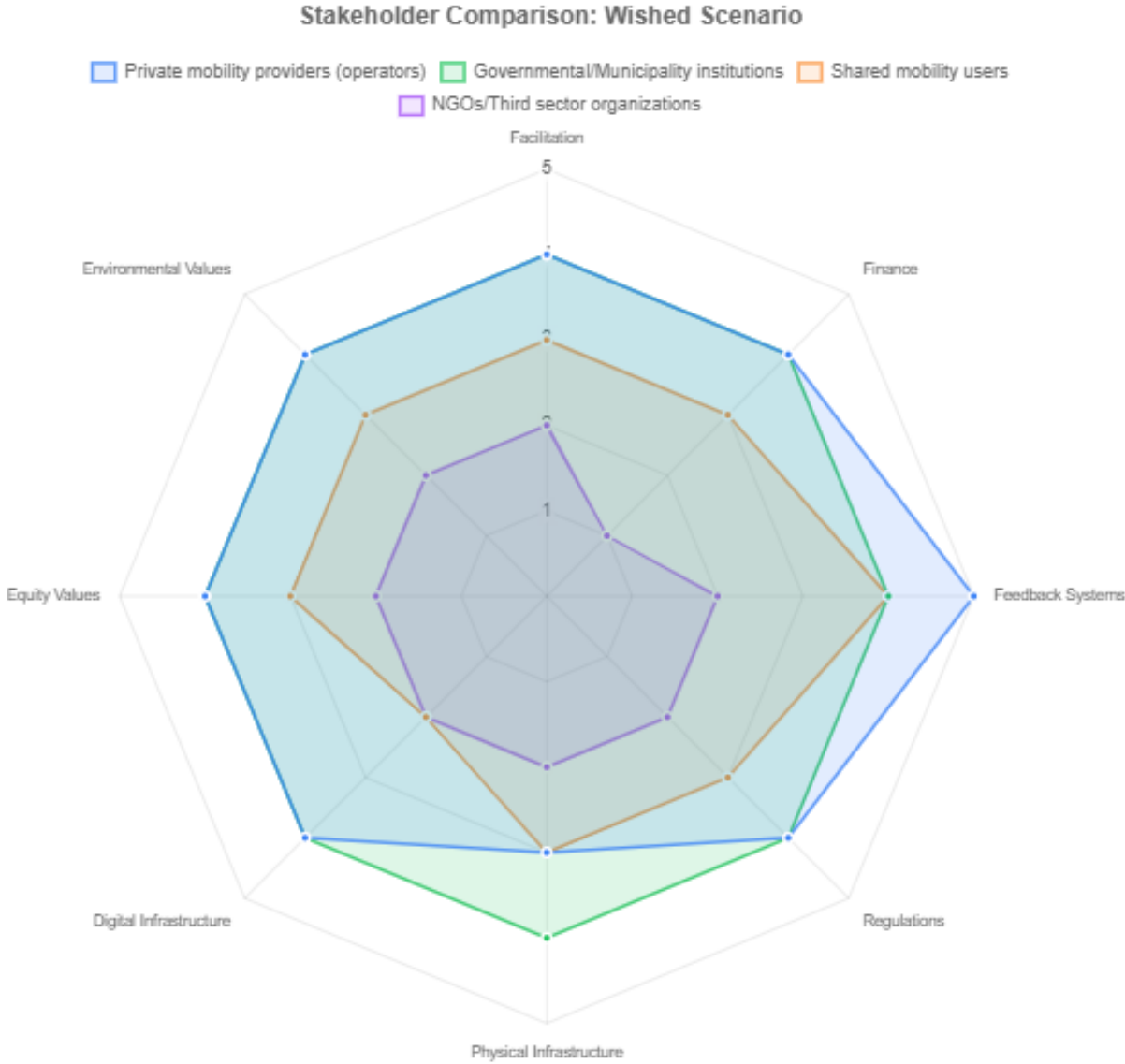
Wished scenario of stakeholder involvement: NGOs/Third sector organizations



3E:



3F:



APPENDIX D: DETAILED LIVING LAB PROFILES BASED ON THE RESIMOB ASSESSMENT

This appendix presents the detailed Living Lab ResiMOB profiles for each of the six DREAMS Living Labs. The profiles provide the complete city-specific radar chart visualisations underlying the comparative analyses presented in Chapter 4 and support interpretation at the individual Living Lab level. All Living Lab ResiMOB profiles are also published through the [Living Labs - Dreams Knowledge Platform](#) (IKP) and are available at the *Living Labs* section of the platform. The online profiles present the same results as those included in this appendix, while this appendix presents the visualisations in a format that facilitates direct comparison across Living Labs.

Table D.1 Perspectives of private mobility operators in the 6 Dreams LLs on the **desired level of involvement** of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.

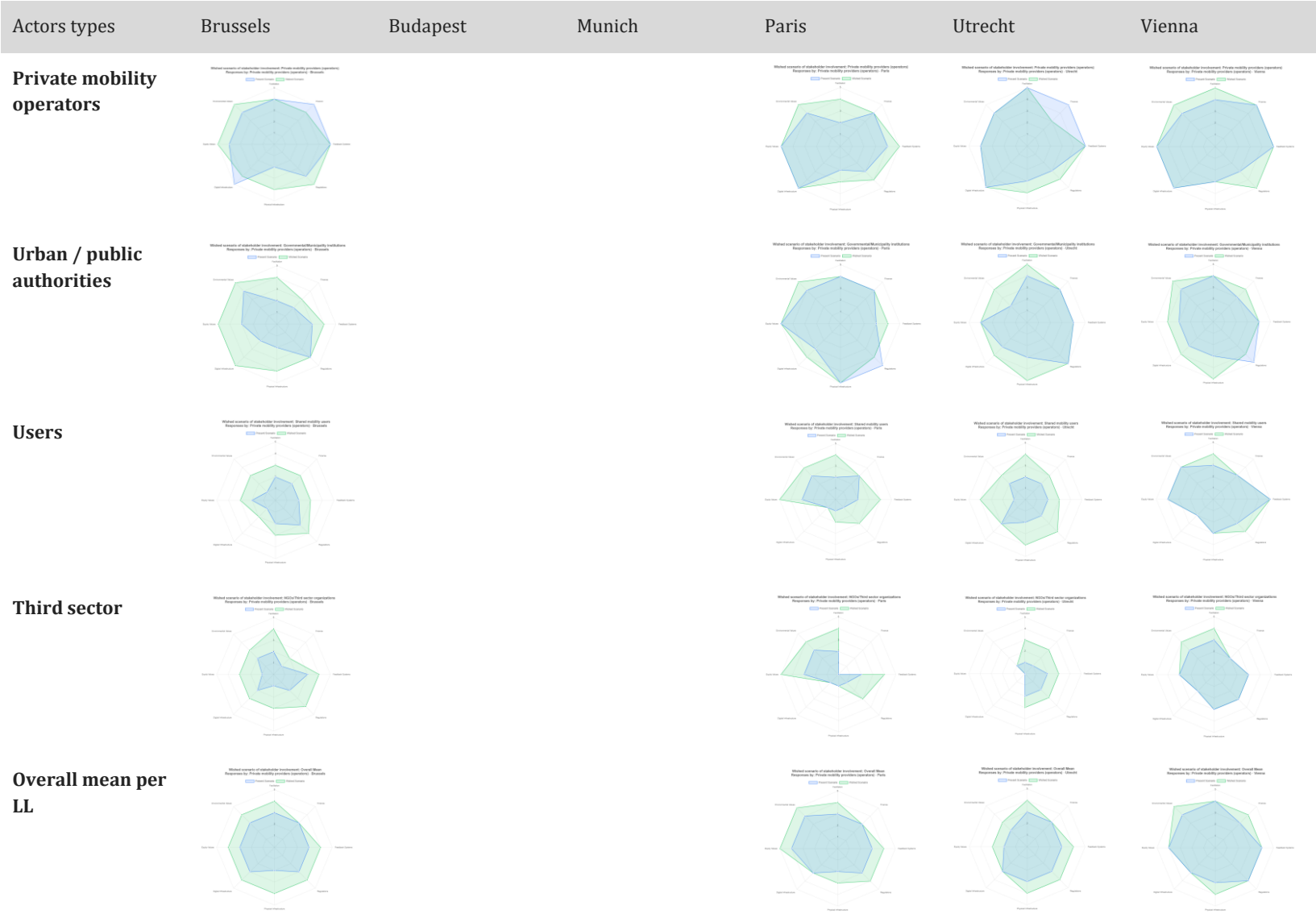


Table D.2 Perspectives of urban authorities in the 6 Dreams LLs on the **desired level of involvement** of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.

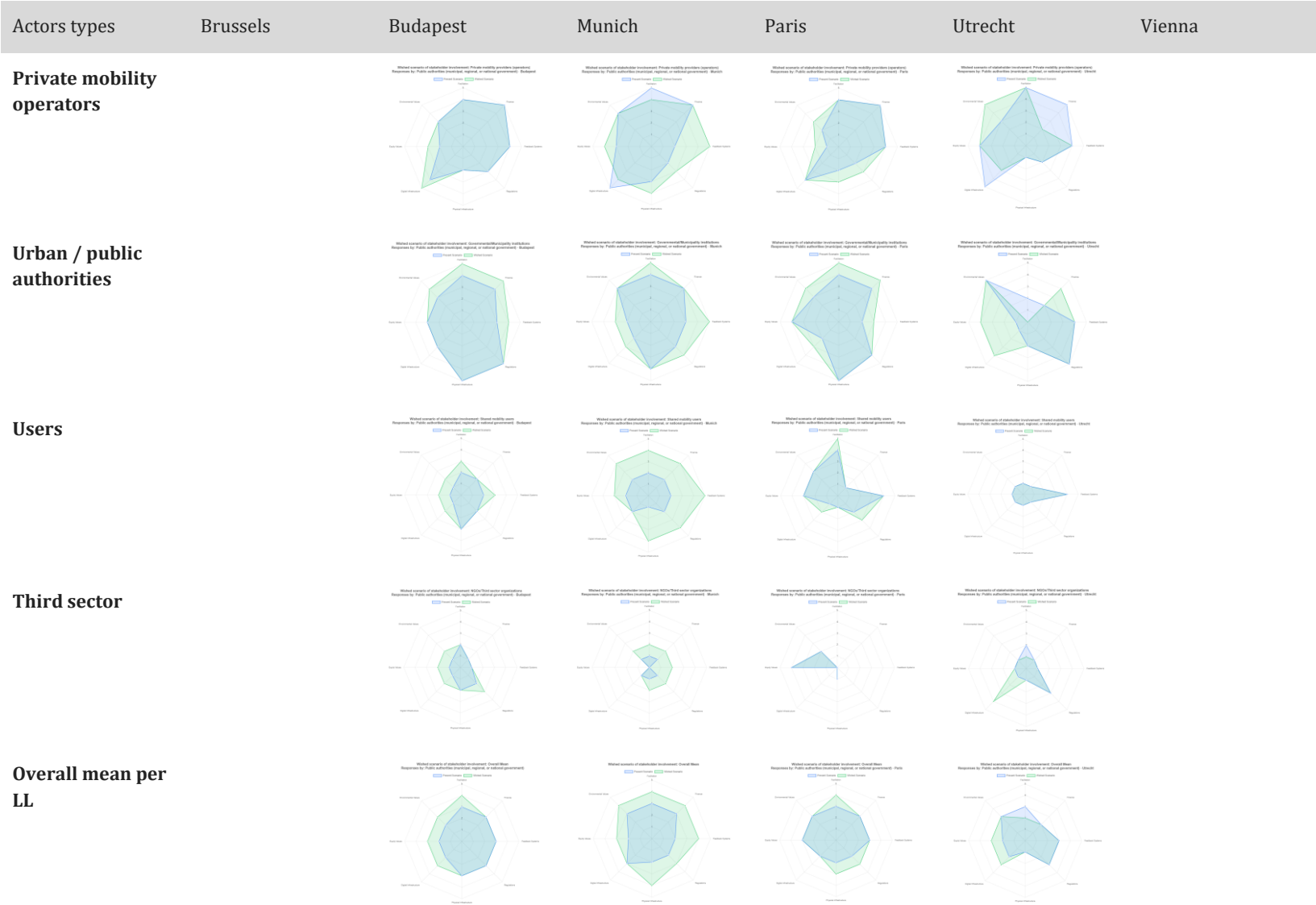


Table D.3 Perspectives of urban authorities and private mobility operators in Brussels on the present and desired level of involvement of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.

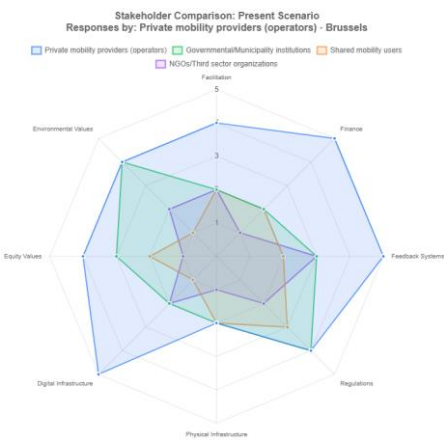
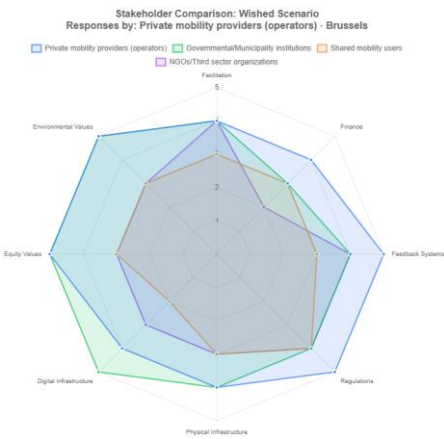
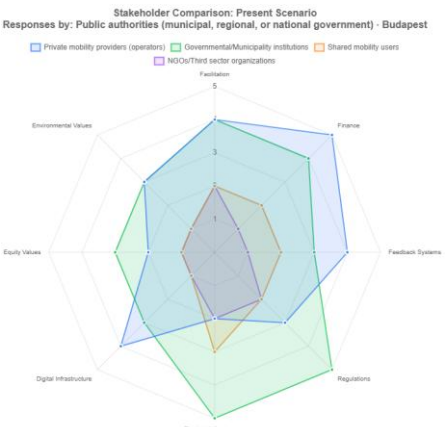
Brussels	Private mobility operators perspectives	Urban authorities perspectives
Present involvement of four different actor types 	Not available	
Wished involvement of four different actors types 	Not available	

Table D.4 Perspectives of urban authorities in Budapest on the present and desired level of involvement of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.

Budapest	Other	Urban authorities perspectives
Present involvement of four different actor types	Not available	

Wished involvement of four different actors types

Not available

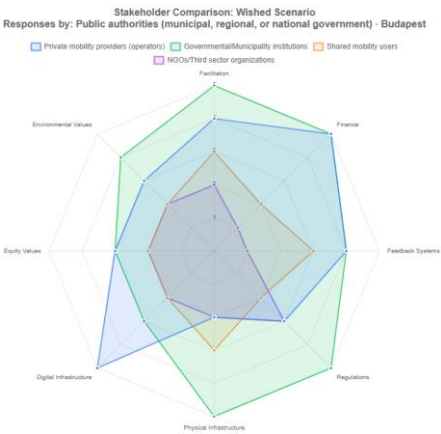


Table D.5 Perspectives of urban authorities in Munich on the present and desired level of involvement of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.

Munich	Private mobility operators perspectives	Urban authorities perspectives
Present involvement of four different actor types	Not available	
Wished involvement of four different actors types	Not available	

Table D.6 *Perspectives of urban authorities and private mobility operators in Paris on the present and desired level of involvement of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.*

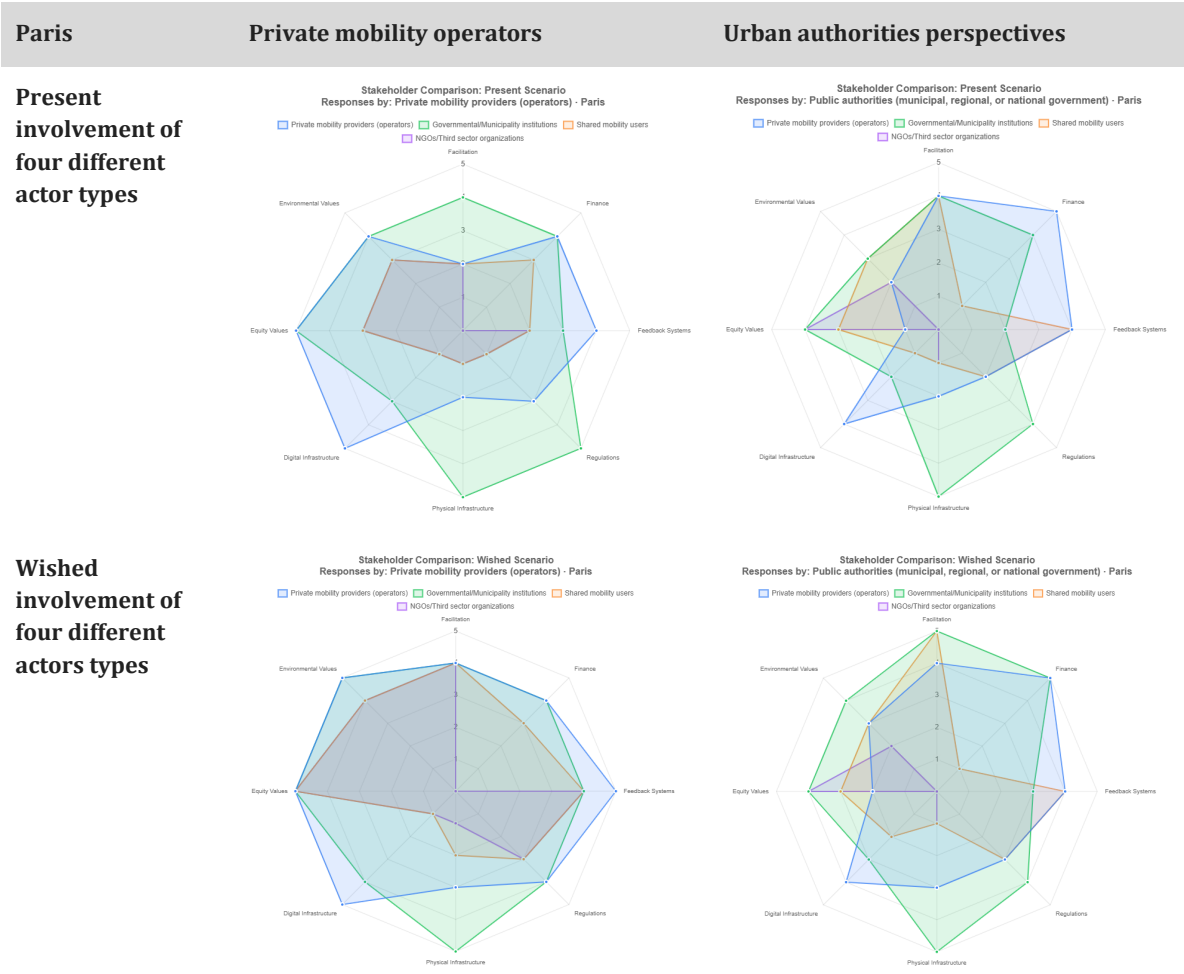
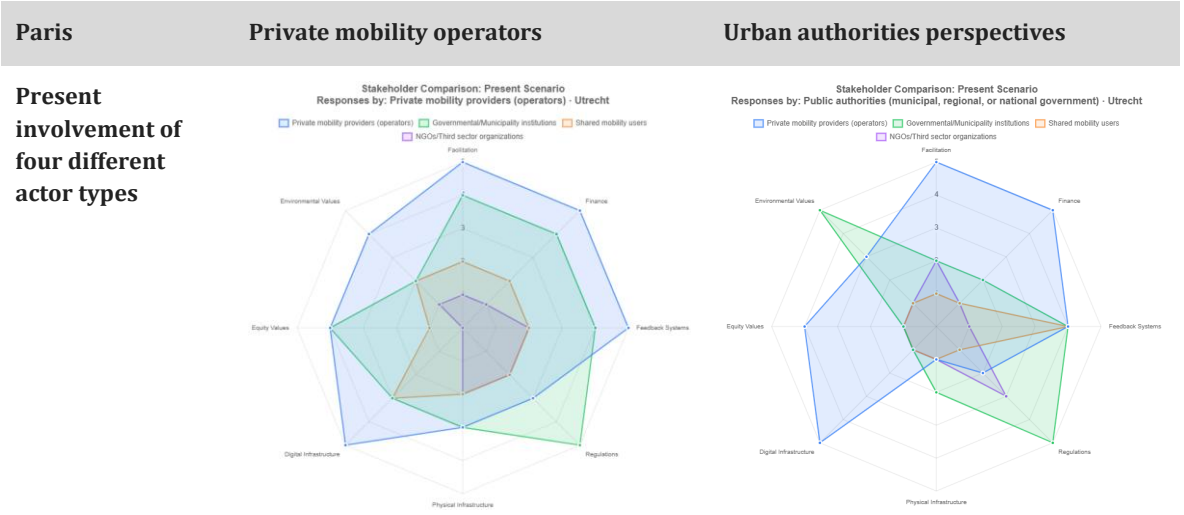


Table D.7 *Perspectives of urban authorities and private mobility operators in Utrecht on the present and desired level of involvement of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.*



Wished involvement of four different actors types

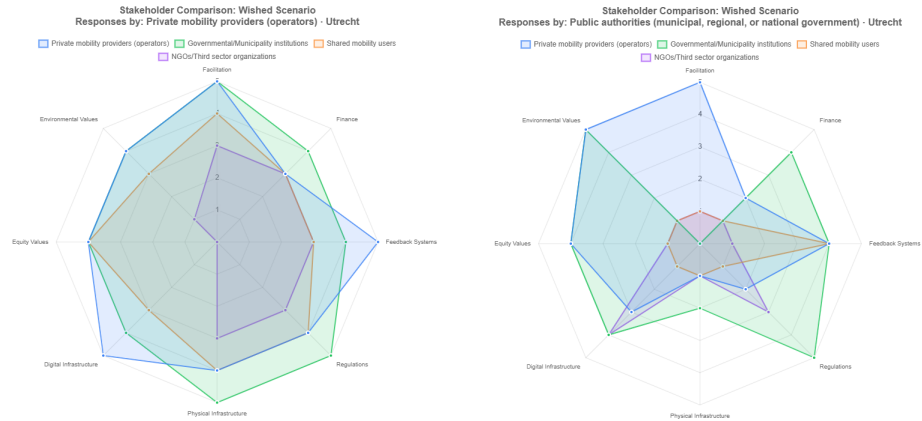


Table D.8 Perspectives of urban authorities and other (public mobility operators)–in Vienna on the present and desired level of involvement of four different actors types in the different components of ResiMob to co-create resilient and responsible shared mobility business model configurations.

Vienna	Private mobility operators	Public mobility operators
Present involvement of four different actor types		
Wished involvement of four different actors types		

APPENDIX E: THE MOBILITY MATCH: CO-CREATION GAME

This appendix provides the practical instructions for using The Mobility Match. The complete printable toolkit, including the game board and cards, will be published alongside the ResiMOB tool on the DREAMS Interactive Knowledge Platform after the final user-feedback phase.

E.1 Preparation Guide

Purpose

The Mobility Match is a co-creation game for jointly developing a sustainable mobility intervention. It makes visible where stakeholders want to share ideas, where they are willing to contribute, what they can bring, and where opportunities for collaboration emerge.

Who is it for?

The game can be played with different stakeholders, for example public authorities, residents, mobility providers, area developers, businesses, knowledge institutions and ICT developers.

Download and print

- the circular game board;
- the participant symbol cards;
- the participant-specific Ideas cards;
- the participant-specific Contribute cards;
- the small participant-specific cards: Money, People, Knowledge and Other;
- the reflection cards;
- the Participant Guide;
- the Facilitator Guide.

Cut out all game cards before the session.

Additional materials

- pens;
- a timer;
- a phone or camera to photograph the completed game board;
- a way to attach each participant symbol visibly to clothing, such as a paperclip or tape.

Preparing the game

1. Appoint one independent facilitator. The facilitator guides the process and does not participate in the game.

2. Ensure that participants start from a shared vision for a sustainable mobility intervention. If no shared vision has yet been developed, a backcasting exercise can be used beforehand.
3. Write the selected mobility intervention in the centre of the circular game board, for example cooperative cargo bikes.
4. Ask each participant to choose a different symbol and wear it visibly.
5. Give each participant all game cards carrying the same symbol. This keeps it visible during and after the game which choices and contributions belong to which participant.
6. Provide each participant with a reflection card and a pen.

Important game principle

During the three game rounds, participants first make their choices independently and in silence. After each round, everyone briefly explains their own choices. At this stage participants share and listen only; responses and discussion take place after the individual reflection at the end of the game.

E.2 Participant Guide

Together, we co-create a sustainable mobility intervention.

Start

Start from a shared vision. Write the selected sustainable mobility intervention in the centre of the board, for example cooperative cargo bikes. Choose a symbol and wear it visibly. All cards carrying this symbol belong to you.

Round 1 - Ideas

Where do you want to share ideas and have a voice? Make your own choices without consulting the other participants. Place your Ideas cards simultaneously and in silence on the elements on which you want to share ideas. Afterwards, everyone has one minute to explain their choices. Everyone shares and listens; responses and discussion come later.

Round 2 - Contribute

Where are you willing to contribute? Choose from your own perspective, your organisation, or the group you represent. Place your Contribute cards simultaneously and in silence on the elements to which you would be willing to contribute. Afterwards, everyone has one minute to explain their choices. Everyone shares and listens; responses and discussion come later.

Round 3

What will you bring? Look at the elements on which you placed a Contribute card in Round 2. Use the small cards to indicate what you could bring: Money, People, Knowledge, or Other. On an Other card, write the additional form of contribution yourself. Place the cards simultaneously and in silence next to the relevant elements. Afterwards, everyone has one minute to explain their choices. Everyone shares and listens; responses and discussion come later.

Reflection - 5 minutes

Look at the complete game board. In silence, write down:

- What stands out to you?
- What does this mean, in your view, for the intervention and potential collaboration?

Afterwards, everyone shares their own reflection. First share and listen; then move into discussion.

Open discussion

Discuss together what the overall picture means for the further co-creation of the intervention, potential collaboration and possible next steps.

E.3 Facilitator Guide

Your role

Guide the game, keep track of time and remain independent. Do not participate as a player.

Start

1. Ensure that participants start from a shared vision for a sustainable mobility intervention. The selected intervention contributes to achieving that vision; it is one intervention within a broader transition.
2. Ask participants to write the selected intervention in the centre of the board.
3. Ask each participant to choose a different symbol and wear it visibly.
4. Ensure that each participant has all cards carrying their own symbol.

Round 1 - Ideas

Ask: Where do you want to share ideas and have a voice? Have everyone place their Ideas cards simultaneously and in silence on the relevant elements. When everyone is finished, give each participant one minute to explain their choices. Everyone shares; the others listen. Do not allow responses or discussion yet.

Round 2 - Contribute

Ask: Where are you willing to contribute? Have everyone place their Contribute cards simultaneously and in silence on the relevant elements. When everyone is finished, give each participant one minute to explain their choices. Everyone shares; the others listen. Do not allow responses or discussion yet.

Round 3

Ask: What will you bring? Have participants look at the elements on which they placed a Contribute card in Round 2. Each participant uses the small participant-specific cards: Money, People, Knowledge, or Other. On an Other card, the participant can specify an additional form of contribution. Have everyone place the cards simultaneously and in silence next to the relevant elements. When everyone is finished,

give each participant one minute to explain their choices. Everyone shares; the others listen. Do not allow responses or discussion yet.

Reflection - 5 minutes

Ask everyone to look at the complete game board. Give each participant five minutes in silence to write down:

- What stands out to you?
- What does this mean, in your view, for the intervention and potential collaboration?

Afterwards, each participant shares their reflection. During sharing, everyone listens. Responses and discussion come afterwards.

Open discussion

Open the discussion. Invite participants to respond to what they see on the board and to what others have shared. Explore together what this means for the further development of the intervention, potential collaboration and possible next steps.

Documentation

- Take clear photographs of the complete game board.
- Collect the written reflections.
- Record relevant outcomes from the open discussion.

After the session, summarise the game board, explanations, contributions, reflections and open discussion as a first shared co-design basis for the further development of the intervention and potential collaboration.