



Policy Brief Empowering People for Transitions to Unlock the 15-Minute City

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Executive Summary

Urban mobility systems are shaped by socio-technical arrangements in which infrastructure, regulations, planning traditions, funding mechanisms, institutional responsibilities, professional routines, and everyday travel practices reinforce one another over time. These reinforcing dynamics create path dependencies and **lock-ins** that stabilize car-centered mobility systems and constrain the range of policy options considered feasible. As a result, many transition efforts remain incremental, reversible, or limited to technological substitution.

This policy brief introduces an approach to unlocking the path towards mobility transitions elaborated within the UNLOCK15 project. To better understand future transitions, it employs socio-technical transition theory, reviews past mobility transitions and lock-in literature. The main result of the brief is based on an analysis of narratives on mobility transitions in scientific literature from the period 1967-2025.

Finally, the policy brief introduces the **Empowerment Framework for Sustainable Mobility Transitions**. The framework translates transition concepts into a five-step, process-oriented structure that supports the diagnosis of local constraints, the coordination of actors, and sustained action beyond isolated projects to achieve system-level change.

Introduction

Cities are increasingly expected to provide cleaner air, safer streets, healthier lifestyles, and reliable access to daily opportunities (Banister, 2008). At the same time, they face congestion, limited space, financial constraints, and climate risks (Geels et al., 2011). In response, many local authorities have adopted Sustainable Urban Mobility Plans and related strategies. Despite these efforts, progress often remains limited, particularly in small and medium-sized cities and in car-oriented contexts where strategies do not translate into changes in everyday mobility and responsibilities for action remain fragmented across sectors and levels of government (Hodson et al., 2017). Mobility transition remains an aspiration, but the needed changes do not reach the system level.

A system-level (radical) transition in urban mobility describes a change in how access to opportunities, transport modes, and urban space are understood, organized, and governed (Geels & Schot, 2007, 2010; Svensson & Nikoleris, 2018). The term radical refers to the scope of change involved: rather than adjusting individual measures, such transitions reconfigure the underlying structures and shared meanings that shape mobility systems. This includes the lock-ins embedded in infrastructure provision, regulatory frameworks, funding mechanisms, professional routines, and everyday travel practices.

From a socio-technical perspective, these elements are closely interlinked and co-evolve over time. Physical networks, rules and standards, institutional responsibilities, investment criteria, and social practices reinforce one another, creating path dependencies that stabilize existing

mobility regimes. Change in one part of the system often remains limited unless related elements are addressed in parallel. System-level transitions, therefore, tend to unfold through non-linear processes, in which established arrangements are questioned, contested, and gradually reworked rather than smoothly replaced.

These challenges cannot be addressed through technology or infrastructure investments alone (Geels et al., 2011).. Mobility transitions involve changes not only in vehicles and networks, but also in governance arrangements, institutional responsibilities, power relations, and how social groups experience mobility and access in everyday life (Schwanen, 2021).

How mobility problems and solutions are framed shapes transition outcomes (Simoens et al., 2022). Scientific studies, policy documents, planning tools, indicators, and public debate shape which challenges receive attention, which solutions are considered, what counts as evidence, and who is expected to act (Simoens et al., 2022). Narrative and knowledge infrastructures that circulate through plans and metrics can mobilise support and enable learning, but they can also reproduce car-oriented priorities and inequities when they rely on narrow performance measures or fail to reflect public concerns and lived experience (Karner et al., 2020).

Research on mobility transitions has expanded, but support for local decision-making remains uneven (Nikulina et al., 2019). Approaches such as socio-technical transition theory, the Multi-Level Perspective, and lock-in analysis explain why mobility systems resist change (Geels et al., 2011; Unruh, 2000). However, these approaches are only partly translated into diagnostics, tools, and working processes that help local actors coordinate across sectors, anticipate resistance, and sustain action over time,

including through attention to legitimacy and public acceptance (Nikulina et al., 2019; Simoens et al., 2022).

To fill this gap, the report introduces an Empowerment Framework for Sustainable Mobility Transitions, placing empowerment at the center of the process. Empowerment refers here to conditions that enable local actors to understand system dynamics, build coalitions, contest priorities, and sustain action across political cycles. To inform this framework, the UNLOCK15 project analyses how peer-reviewed research constructs and evaluates “mobility transition(s)”, treating academic discourse as empirical material to identify recurring framings, bottlenecks, and legitimacy risks. Developed within the UNLOCK15 project and informed by Learning Living Labs, the report shows how an empowerment-oriented approach can support cities in moving beyond isolated measures toward mobility transitions that are implementable in local contexts.



Lock-ins

Lock-ins are self-reinforcing processes through which technologies, infrastructures, institutions, and practices become entrenched over time (Unruh, 2000). In urban mobility, lock-ins arise from regulatory frameworks, planning standards, investment choices, market structures, and social norms that favor automobility. Once established, these arrangements raise the cost and political risk of changing the rules. Lock-ins operate across four dimensions that interact in planning practice.

Institutional lock-ins stem from laws, design standards, funding mechanisms, appraisal methods, and administrative procedures that prioritize traffic flow and car access.

Behavioral and cultural lock-ins stem from travel habits and social meanings associated with car use, e.g. status and autonomy. Governance structures can reinforce these lock-ins by continuing planning as they always have. For example, when proposals for low-emission zones or car-free areas face backlash due to the political risk they pose, especially in cities where car ownership is high. Or if a bike lane is added to a street without changes to design standards or spending priorities, the intervention can remain isolated and not contribute to a transition.

Technological lock-ins stem from road networks, parking facilities, traffic management systems, and vehicle fleets that shape travel choices and constrain spatial planning.

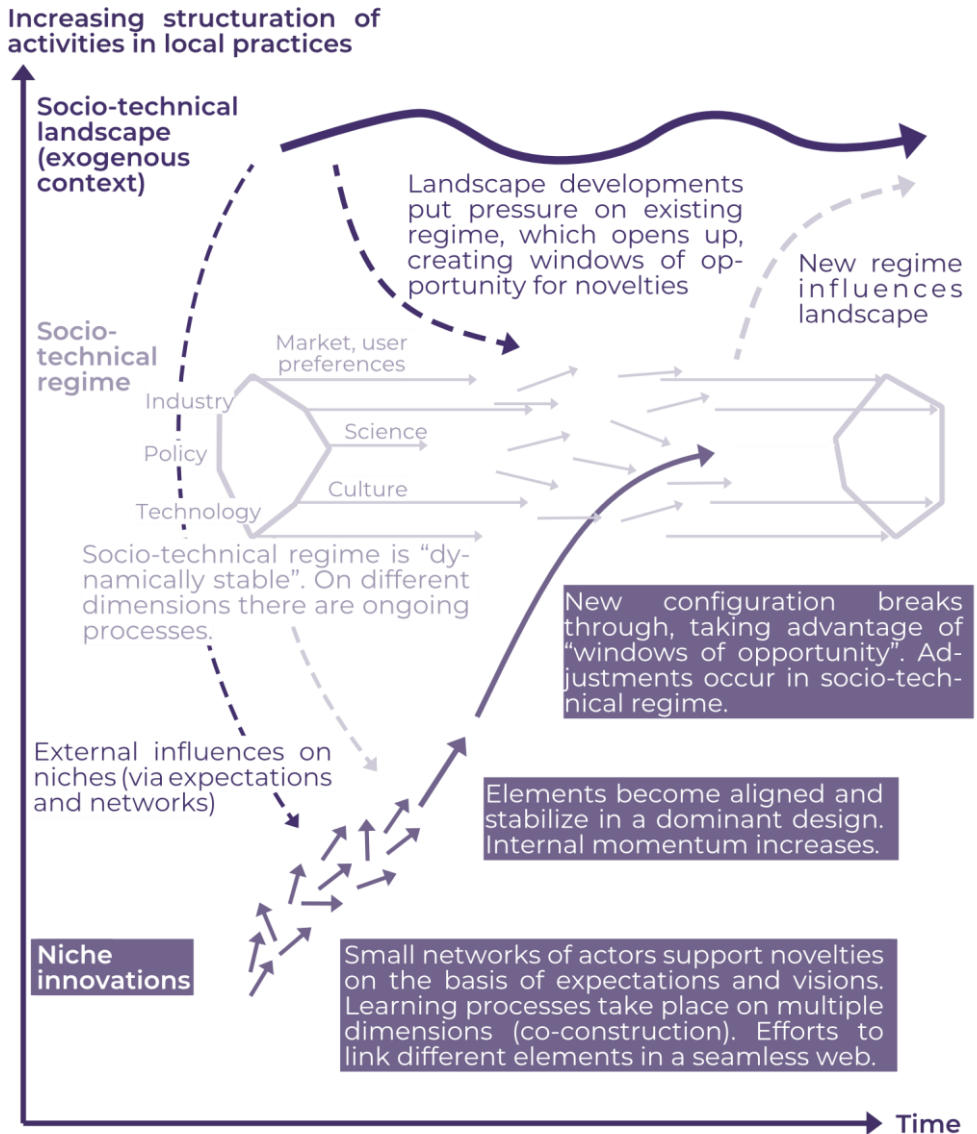
Economic lock-ins stem from sunk costs, revenue structures, and dependencies linked to car-oriented systems. They are closely related to fuel supply chains, automotive industries, and land development practices.

Mobility Transitions Theory

To analyze how mobility transitions unfold and why dominant regimes persist despite pressure for change, this policy brief draws on the Multi-Level Perspective (MLP) on socio-technical transitions (Geels, 2002; 2005). The MLP conceptualizes transitions as interactions between processes operating at three analytical levels: the socio-technical landscape, the socio-technical regime, and niche innovations (page X). In practice, these levels correspond to external pressures, the current mobility system, and spaces for experimentation.

Building on the MLP, Geels and Schot (2007) propose a typology of socio-technical transition pathways that show transitions do not follow a single, linear trajectory. Instead, they differ according to the timing and nature of interactions between landscape pressures, regime dynamics, and niche innovations. These pathways capture distinct patterns through which existing regimes respond to external pressures and emerging alternatives. They highlight variations in the radicality of change, i.e. the degree to which dominant structures are transformed, reconfigured, or replaced (page X+1).

Transitions after Geels (2002)



Transition pathways typologies

after Geels and Schot (2007)

Transformation

Gradual change within the existing regime through internal adjustment

e.g. switching from gas cars to electric cars (system stays the same)

Reconfiguration

Systemic change through cumulative integration of innovations

e.g. adding trams, subways to a walking city (system stretches and changes shape)

Substitution

Replacement of the dominant regime by mature niche innovations

e.g. cars destroying the tram network (one technology substitutes the other)

De-alignment, Re-alignment

The regime collapses under external pressures and new dominant configurations emerge

e.g. COVID-19 forced cities to abandon car-centrism for mixed-use/walking (total system collapse and rebuild)



What makes mobility transitions radical?

System-level (radical) mobility transitions are characterized by five interrelated features that distinguish them from incremental change. They are

Value-shifting



Reshape underlying societal values and redefine what is perceived as normal or desirable. Change the norms and evaluation criteria that guide planning.

Transformative



Reconfigure multiple components of the mobility system, including infrastructure, policies, governance, and mobility practices.

Synergic



Interact with transitions in other sectors, such as energy, housing, logistics, urban development.

Diverse



Involve multiple actors with different roles, resources, and interests

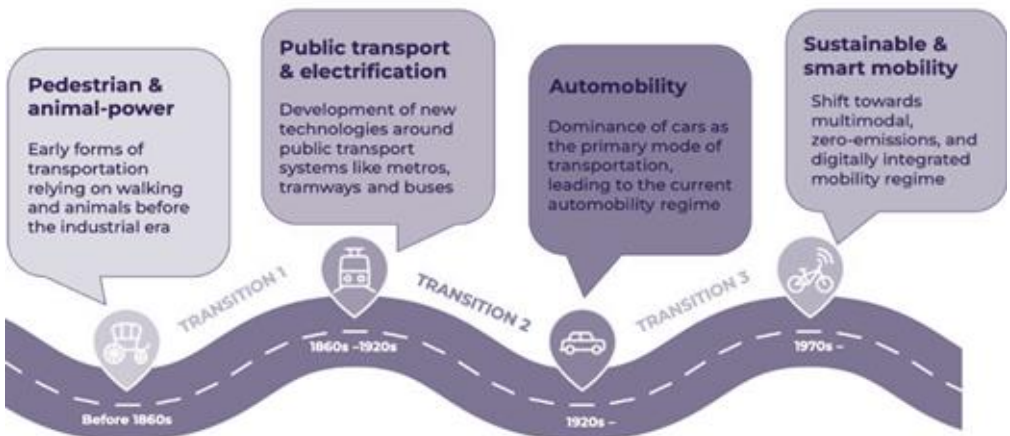
Disruptive



Involve breaks with established roles, standards, or practices rather than gradual changes of the status quo.

Historic Mobility Transitions

In the context of European cities, urban mobility has undergone successive transitions since the 19th century, driven by industrialization, rapid urban growth, and waves of technological innovation. Three major phases can be distinguished (Figure 1): (1) the transition from walking and animal-powered transport to electric public transport systems; (2) the rise and consolidation of automobility as the dominant regime; and (3) the ongoing transition toward more sustainable, low-carbon, and digitally integrated mobility systems. This historical perspective provides essential context for understanding current transition efforts and the structural challenges they face.



Features of Historic Transitions

after Hall (2002), Schipper et al. (2009), Banister (2008),
Schwanen (2015), Sheller & Urry (2000)

Transition 1



c. 1860 animal-powered
and pedestrian mobility
to...



c. 1920 consolidated
electric public transport

Value-shifting

Mobility framed
around collective
travel and net-
work-based acces-
sibility, normaliz-
ing public trans-
port as the back-
bone of urban
movement

Transition 2



Early 1920s tramway
dominance to...



Late 1920s rise of
automobility

Mobility framed
around speed, au-
tonomy, and pri-
vate vehicle use,
embedding auto-
mobility in every-
day aspirations and
identities

Transition 3



1960s automobility
dominance and gridlock
to...



2025 sustainable, fair and
inclusive mobility

Mobility increas-
ingly framed
around accessibil-
ity, safety, health,
equity, and the
quality and use of
public space

Transformative

Electric public transport replaced walking-based and animal-based systems as the main urban mobility form in many cities, disrupting existing travel patterns and street uses

Road expansion and rising car ownership displaced public transport from its central role, undermining established service regimes and institutions.

Street reallocation, parking reform, and new regulatory measures challenge existing standards and routines that have long prioritized automobility

Synergic

Mobility aligned with industrialization, electricity provision, and urban growth, creating synergies between transport networks and metropolitan development

Mobility aligned with fossil energy systems, suburban housing, logistics, and land markets, reinforcing car dependence and dispersed land-use patterns

Mobility is being linked to land-use planning, energy policy, logistics, digital services, and proximity-oriented planning to support more sustainable urban forms

Diverse

Municipalities, operators, utilities, engineers, and regulators coordinated system development around fixed-route electric public transport

Influence became concentrated among road authorities, automotive industries, fuel suppliers, developers, and planning institutions, consolidating a car-centred regime

Public authorities, operators, technology providers, civil society, researchers, and residents increasingly shape transition processes through participatory and experimental initiatives

Disruptive

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Mobility Transition Discourse in Scientific Writing

Scientific publications shape understandings of mobility transitions through the ways they define problems, select analytical concepts, describe causal mechanisms, and position actors, instruments, and outcomes within accounts of change. Through these framings, the literature influences which transition pathways are foregrounded, which constraints are treated as relevant, and which forms of action are presented as feasible or legitimate in planning and policy contexts (Karner et al., 2020; Simoens et al., 2022).

For this policy brief, a total of 300 peer-reviewed publications were selected from Scopus if they contained the lemma "mobility transition" OR "mobility transitions" and were identified to refer to urban mobility transitions through a manual review. The inquiry is how transition processes are described at the sentence level. Out of these, sentences that used the lemma "transition" or "transitions" were extracted. A total of 3488 sentences was analyzed quantitatively, and a random sample of 1126 sentences was qualitatively analyzed in a second step. The analysis focuses on patterns in thematic framing and evaluative language across the literature, rather than on individual policy recommendations or case studies.

The results inform the Empowerment Framework for Sustainable Mobility Transitions by identifying recurring ways in which transition dynamics are framed, how different forms of intervention are linked to specific problem definitions, and how local actors are positioned in relation to institutional constraints and coordination.

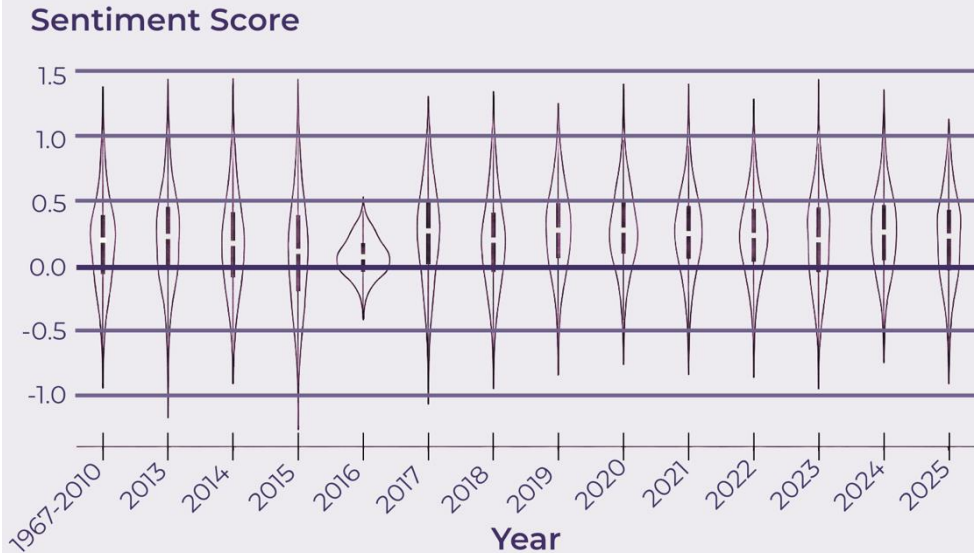
To examine polarization within academic discourse on mobility transitions, sentiment analysis was conducted at the sentence level using a two-stage approach that combined lexicon-based scoring with supervised classification. As an interpretable baseline, each sentence was analyzed using VADER (Valence Aware Dictionary and sEntiment Reasoner), a lexicon- and rule-based sentiment analysis method that estimates both polarity and intensity (Hutto & Gilbert, 2014).

To structure the corpus by semantic similarity prior to qualitative interpretation, unsupervised clustering was performed using the K-Means algorithm, selected for its computational efficiency and its suitability for identifying compact, semantically coherent groups in embedding spaces. Four thematic domains were identified – **Governance and social impact, Technology, Business, and Environment**. These domains capture how mobility transition is framed and debated in the dataset, rather than evaluating actual outcomes.

Finally, a qualitative content analysis was conducted to interpret how mobility transitions are framed within the academic discourse. A structured codebook was applied deductively based on the identified domains (Miles et. al, 2019). Sentences were further coded according to their narrative function within transition accounts when they identified drivers of transition processes, barriers to change, a risk or negative externality, criticised the existing mobility regime, or described a benefit or goal associated with transition pathways. Only sentences with non-neutral sentiment were coded. Coding decisions focused on what the sentence contributed to an explanation, justification, or critique of mobility transitions, rather than on topic frequency or lexical similarity.



VADER Sentiment Analysis



Two main patterns emerge from the sentiment analysis. First, the discourse becomes increasingly polarised after 2018, with a bimodal distribution in which many sentences cluster around neutral sentiment, reflecting descriptive or technical statements, while pronounced tails extend toward both positive and negative values. Second, the period from 2020 to 2024 shows a widening of negative sentiment compared to earlier literature, which more often contained optimistic or normative statements about transition potential. This shift indicates growing attention to implementation challenges, barriers, and sources of social friction within mobility transitions.

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- **Domains from quantitative analysis**

Governance and Social impact

Governance concentrates debates on responsibility, legitimacy, and implementation capacity. It is not a background for but instead actively shapes mobility transition trajectories. Social narratives foreground justice, rights, and the distribution of benefits and burdens as direct consequences of governance choices, inevitably tying the two into one domain of action. The social narrative does not reject transition, but insists that sustainability and justice must be co-produced through governance choices, design priorities, and the criteria used to define “successful” mobility transition. Some authors warn that transitions driven primarily by private-sector interests or consumer-oriented framings risk narrowing mobility to a market commodity (Davis, 2018).

Technology

The technological narrative is structured around a tension between innovation claims and critiques of technological determinism. Technologies are framed as instruments for integration, efficiency, and service coordination, while the literature cautions against treating technological change as transition in itself. This produces an evaluative split in which technology is presented as required for implementation but insufficient as a strategy when detached from governance arrangements, spatial reallocation, and behaviour change.

Business

Economy-related narratives focus on the tension between established automotive business models and service-oriented approaches that frame mobility as a bundled or platform-based offering. They also include an economic component, asking if transition pathways are investable and compatible with existing revenue structures, with profitability and incentive alignment framed as constraints on transition pace and direction.

Environment

Environmental narratives are anchored in climate mitigation, air quality, and resource constraints. Automobile-dominated systems are criticized not only for emissions and pollution but also for their spatial dominance and following impacts on urban liveability. In the dataset, they are mostly present as criticisms of the status quo.

Drivers, Barriers

	Drivers	Barriers
Governance and Social impact	Shared understanding of mobility transition	No unified concept of mobility transition
	Regulations that steer mobility systems	Weak systems understanding
	Systems thinking in planning	Awareness not translated into planning
	Ability to mobilize actors for regulatory change	Car dependence embedded in institutions and lifestyles
	User involvement in design and decisions	Poor understanding of user motivations
Technology		Viewing users only as consumers
		Private-sector dominance
		Technology-first approaches
Technology	Integration into everyday lifestyles	Profit-first evaluation of technologies
	High-quality mobility data	
Business		Competition between providers
		Transition perceived as less profitable than the status quo
Environment	Carsharing and EVs encouraging other green habits	

Opportunities, Challenges

Opportunities	Barriers
Multi-stakeholder collaboration	Many actors with competing agendas
Context-specific solutions	Overall complexity of transitions
Policy mixes (rules, incentives, investments)	Administrative boundaries leading to misaligned transition approaches
	Limited financing for transition measures
Citizen pressure on policymakers	Unequal impacts of mobility transitions
	Job losses linked to automation
	Profit-driven business models overriding social aims
	Strengthened inequality through exclusion of user groups
Local openings for niche experiments	EVs and AVs reinforcing car-centric lifestyles and regimes
IoT and accessible mobility data supporting system integration	Micromobility not substituting car trips
Can initiate a transition when governance is not yet ready	Competition with public services
	Data monopolies due to lack of IoT regulation

The analyzed sentences can be clearly divided into three time periods, each defined by a regime- or landscape-level change. Notably, technologies can enter the mainstream without shifting regime rules, and they can introduce distributional risks through unequal access. The core challenge is therefore not innovation supply. Instead, it is a governance problem of aligning policy mixes, infrastructure provision, evaluation criteria, and multi-level coordination. Ultimately, through successful governance, transition outcomes should be defined, contested trade-offs should be decided on, so that implementation can make a lasting change beyond pilots and political cycles. (Song et al., 2023)

Pre 2018

Narratives centre on change through niche innovation, micro-level initiatives, and context-specific planning. Governance is framed through person-centred approaches, learning from local initiatives, and the use of policy mixes plus auxiliary measures, alongside repeated calls for stable, long-term incentives. Barriers are framed as low readiness, one-size-fits-all policy failure, the entrenchment of automobility in lifestyle, and a lack of unified mobility transition concept. Technology is discussed through ICT and Web 2.0 integration in EVs, EV promotion in policy plans, BEVs as locally tested niche innovations, and car-sharing, demand-responsive mobility, and IoT/data. Critiques emerge that “good mobile subject” framings exclude parts of the population (Sheller, 2015), that auxiliary measures are missing, and that technological pathways are given advantage through profit logics and can generate monopoly risks and legitimacy loss (Davis, 2018). Regime persistence is treated as the baseline condition, with automobility described as ubiquitous and resistant to strategic action (Kent&Dowling, 2018).

2019–2021

Governance is framed through participatory policy, local solutions, socio-technical embedding, co-creation, and the need for multi-level, multi-stakeholder coordination, alongside accounts of austerity shifting responsibility to users and uncertainty about implementation “how” (Sørensen & Paulsson, 2020; Kinigadner et al., 2024; Whittle et al., 2019). Barriers are expressed as cultural dominance of car use, auto-oriented power structures, and regime rules that remain unchanged, with transition governance described as slow or fragmented. EVs are described as shifting culture while reinforcing automobility, with grid operators adapting and EVs strengthening rather than transforming the regime (Anfinssen, 2021). Political economy enters more directly through claims that mobility transition is less profitable than the automobility system and that capitalist dynamics resist transition, tightening the link between evaluation criteria, investment, and governance capacity (Freudental-Pedersen et al., 2020).

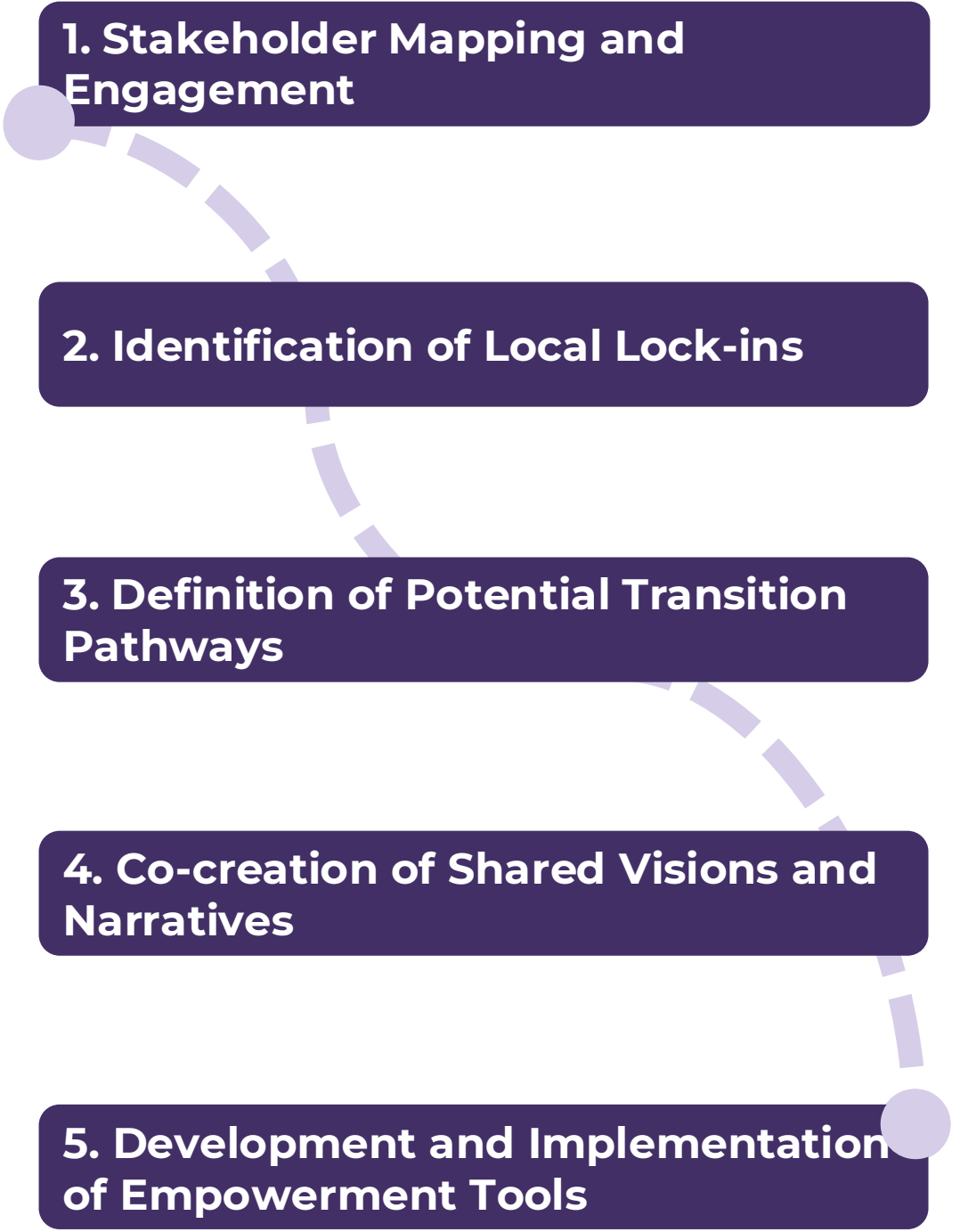
2022–2025

Governance is framed through concrete physical interventions plus regulation and early actor involvement, comprehensive policy mixes with clarified state roles, scale-aware governance, and street experiments with frontrunners using push–pull approaches (Mahzouni, 2022; Song et al., 2023). Critiques emphasise justice implications for e-mobility, including Global South neglect, risks of widening digital divides, cross-system coordination complexity, national funding gaps, inadequate infrastructure, resistance, and overlapping mandates (Prause & Dietz, 2022; Shammut & Imran, 2024). The discourse records persistent disagreement over scope (modal transition vs mobility transformation), with mobility transition described as elitist and fragmented, and the absence of a unified concept continuing to stall prioritisation. Technology narratives include on-demand mobility as expanding access and reducing car dependence, alongside micromobility conflict, poor integration of big data, and continued reliance on EVs framed as a driver while criticised for sustaining automobility (Shammut & Imran, 2024). Environmental narratives sharpen the critique that propulsion substitution is insufficient, reinforcing the systemic claim that transition depends on governance choices about coordination, funding, and space reallocation rather than technology deployment alone (Mahzouni, 2022).

Empowerment Framework for Sustainable Mobility Transitions

The empowerment-oriented framework translates findings on mobility transition dynamics into a set of governance tasks that support system change. It responds to evidence that transition efforts stall because decision authority is fragmented, lock-ins reinforce existing regimes, evaluation routines privilege continuity, legitimacy conflicts shape political feasibility, and institutional anchoring remains weak. The framework therefore starts from the conditions that determine what becomes actionable in a given city context, rather than from goal-setting. The framework is organized around mechanisms that shape which transition pathways become feasible and durable. Governance arrangements, appraisal routines, legitimacy, and institutionalization are treated as constraints that filter ambitions into specific pathways. When standards, budgeting rules, success metrics, and administrative responsibilities remain unchanged, transition agendas are absorbed into pathways that preserve regime structures.

The framework consists of five linked tasks. Each is informed by a problem identified in the analysis of scientific discourse in the previous section.



1. Stakeholder Mapping and Engagement

2. Identification of Local Lock-ins

3. Definition of Potential Transition Pathways

4. Co-creation of Shared Visions and Narratives

5. Development and Implementation of Empowerment Tools

1. Stakeholder Mapping and Engagement

Problem covered: Fragmented governance and unclear responsibility allocation. The absence of a shared operational definition of mobility transition leads to agreement on ambition while diffusing decision authority and accountability across department levels

This step aims to strengthen the capacity of local actors to recognize their roles within the mobility system, to understand existing power relations, and to initiate forms of collaboration that go beyond sectoral silos. Early and inclusive engagement is essential to avoid exclusive top-down approaches and to ensure that transition processes are socially legitimate, politically feasible, and context-sensitive. Participation and representation are made a feasibility condition for implementation rather than a communication activity after decisions are made.

Beyond identification of actors, this step explicitly integrates engagement as a core component of empowerment. It seeks to move from a static mapping of actors toward an understanding of how actors interact, influence one another, and can be mobilized to support transition processes while clarifying where decision authority sits, how mandates interact, and how responsibility for action can be coordinated across levels of government and administrative boundaries.

Role and place of public administrations

Stakeholder mapping and relationships

Stakeholder engagement

An inventory of roles and responsibilities across different public administrations involved in mobility and transport management at the municipal, metropolitan, regional and national levels.

Exhaustive mapping of the stakeholders, covering all the areas and themes of interests from a mobility perspective.

Analysis of public, private, NGOs, civil society, and other important stakeholders, including their responsibilities

Analysis of interactions between the stakeholders, in terms of power dynamics and individual interests in order to identify the positioning of actors toward mobility transitions (supportive, neutral, oppositional)

Ideation of strategies for enabling participation, learning, and co-creation, ensuring that underrepresented or affected groups can participate meaningfully

Expected outputs

- A comprehensive actor map identifying key stakeholders and their roles within the mobility system.
- A power-interest matrix highlighting actors' influence and positioning toward mobility transitions.
- Identification of missing or marginalised actors, particularly user groups affected by mobility inequalities.
- An initial engagement strategy, outlining how and when different actors should be involved in subsequent steps of the framework.

2. Identification of Local Lock-ins

Problem covered: Lock-ins in standards, funding mechanisms, appraisal routines, and professional practices are identified as the primary explanation for the persistence of car-dependent mobility systems.

This step aims to make lock-ins visible and intelligible to local actors. Rather than treating barriers as abstract or external constraints, the analysis focuses on how lock-ins are actively produced and maintained through governance arrangements, actor interests, infrastructures, and dominant narratives. This step is essential for enabling local stakeholders to identify leverage points for change and to distinguish between barriers that can be addressed through projects and barriers that require institutional reform, revised appraisal criteria, or changes to mandates and budget routines. Step 2 provides a direct input for Step 3 (Definition of transition pathways) by clarifying which structural barriers must be challenged, bypassed, or gradually dismantled. It also supports Step 4 by identifying legitimacy risks and distributional fault lines linked to lock ins (for example, where costs and benefits are unevenly allocated or where enforcement and pricing create exclusion).

Identification
of lock-in
types

Identification
of interactions
and reinforce-
ment
mechanisms

Prioritization
of critical lock-
ins

Identification and categorization of institutional, technological and behavioural lock-ins affecting the transition toward a sustainable and smart mobility system in the local context.

Mapping lock-ins to specific actors by analyzing which actors contribute to maintaining each lock-in and which are most affected by them.

Analysis of how different lock-ins reinforce each other across domains

Prioritization of lock-ins based on their relevance to the local transition process, considering their strength, the actors involved, their impacts on sustainability, equity, and accessibility, and the feasibility of addressing them over time.

Expected outputs

- A structured inventory of lock-ins affecting the local transition for a sustainable and smart mobility.
- A lock-in matrix linking lock-in types to actors, sectors, and governance levels.
- Identification of reinforcing mechanisms and feedback loops.
- A prioritised list of critical lock-ins to be addressed in subsequent steps.

3. Definition of Potential Transition Pathways

Problem covered: Transition strategies commonly consist of isolated or incremental measures that optimize existing practices without reconfiguring underlying system structures.

This step defines potential transition pathways that can guide the overcoming of the local lock-ins identified in Step 2. The step contributes to system/level change by supporting cities to define coherent pathways that reshape system configuration rather than optimize the status quo. Rather than prescribing a single optimal solution, it enables the identification of multiple context-sensitive pathways, adapted to local capacities, political conditions, and temporal horizons. It also encourages explicit consideration of sequencing and institutionalization, recognizing that pilots only contribute to transition when pathways for scaling, funding continuity, and administrative integration are defined. Step 3 provides a critical input for Step 4 (Co-creation of shared visions and narratives) by offering concrete strategic options around which collective imaginaries can be built. It also informs Step 5 (Development and implementation of empowerment tools) by highlighting key actions that are most likely to unlock systemic change and by clarifying which policy mixes and governance reforms are required for those actions to persist beyond project cycles.

Identification
of possible
transition
pathways

Actor roles
and
responsibilities

Temporal
sequencing
and scaling

Identify alternative transition pathways that differ in ambition, depth of change of the targeted lock-ins, proposing policy, infrastructural, regulatory, and behavioral changes.

Clarification of the roles, responsibilities, and coordination needs of key actors to ensure accountability and sustained collective engagement throughout the transition pathways.

Definition of the temporal logic of transition pathways by identifying short, medium, and long-term actions, experimentation phases, and conditions for scaling successful initiatives.

Expected outputs

- A selection of a potential transition pathway, adapted to the local context.
- Identification of priority actions and sequencing logic.
- A shared strategic orientation that can guide subsequent co-creation and innovation efforts.

4. Co-creation of Shared Visions and Narratives

Problem covered: Legitimacy conflicts linked to perceived elitism and distributional impacts. Sentiment and qualitative analyses reveal that negative evaluations cluster around governance and social equity, reflecting legitimacy challenges when distributional consequences are not openly negotiated.

The legitimacy and perceived fairness of policies condition political feasibility. This step treats narratives not only as top-down communication outputs but as a mechanism for negotiating distributional consequences, responsibilities, and contested priorities. It aims to align diverse actors around a common vision of change, while acknowledging differences in interests, values, and priorities. By co-producing narratives rather than imposing predefined messages, this step supports collective ownership, reduces resistance, and strengthens the social and political acceptance of transition processes. It also supports reframing transition away from purely technocentric substitution narratives toward system reconfiguration that links sustainability with accessibility, safety, equity, and the quality and use of public space. Step 4 builds directly on Step 3 by providing the narrative and symbolic dimension needed to legitimize strategic choices. As transitions evolve, visions and narratives may be revisited to reflect learning, changing conditions, or emerging societal priorities.

Articulation of shared visions

Analysis of existing narratives

Co-creation and reframing narratives

Definition of collectively agreed short and long-term visions for urban mobility that translate transition pathways into meaningful and desirable future states.

Identification and assessment of dominant narratives shaping local mobility debates in order to understand sources of support and resistance.

Reframing of narratives that align selected transition pathway with shared values, lived experiences, and collective aspirations.

Expected outputs

- A shared vision statement for sustainable urban mobility in the local context.
- A set of co-created narratives tailored to different audiences (policymakers, practitioners, citizens).
- Identification of conflicting narratives and strategies to address them.
- Communication elements that support mobilisation and collective engagement, including legitimacy-sensitive framing that clarifies who benefits, who bears costs, and how decisions are made and justified

5. Development and Implementation of Empowerment Tools

Problem covered: Weak translation of transition goals into administrative routines. Substitution transition pathways are shown to prevail because they align with existing mandates and funding logics, while redistributive measures require coordinated policy mixes that are rarely in place.

Empowerment tools are understood as practical instruments, methodological, institutional, regulatory, financial, or communicative, that enable actors to coordinate, and sustain change over time. This step translates visions into concrete capacities for action, ensuring that local actors are equipped with the tools required to operationalize and scale innovations and new practices around sustainable mobility. It emphasizes coordinated policy mixes (rules, incentives, investments, standards, enforcement, and monitoring) and the institutional anchoring needed to shift evaluation criteria away from regime-biased metrics toward accessibility and public value. This final step feeds back into Step 1 (Actor mapping and engagement) by strengthening actor capacities, and into Step 2 (Lock-ins diagnosis) by enabling targeted interventions that progressively dismantle structural barriers, and operationalize the framework outcomes. As such, this step closes the loop of the framework while supporting its iterative and adaptive application over time.

Identification
of
empowerment
tools

Validation of
empowerment
tools

Development
of
empowerment
tools

Identification and categorization of existing and potential tools that can support the implementation of transition pathways and key actions.

Alignment of empowerment tools with the needs, roles, and capacities of key actors to ensure usability, ownership and effective deployment of the tools.

Development and testing of new empowerment tools and adaptation of existing tools to meet local needs and unlock specific behavioral and infrastructural lock-ins.

Expected outputs

- An inventory of empowerment tools linked to facilitate participation and collective action, capacity building and education, and access to resources.
- Mapping of target groups in relation to specific empowerment tools.
- Guidelines for the deployment and monitoring of empowerment tools, including responsibilities, resourcing, and criteria for institutionalization and scaling.

Key Takeaways

A mobility transition is unlikely to be achieved through isolated measures or technological substitution alone. It requires an operational definition of transition that specifies system boundaries, the elements subject to change, and criteria for progress. Interventions that leave these elements unchanged may improve performance locally but adapt the regime rather than transform it. Transition policy effectiveness depends on interaction with governance structures, not solely on technical or environmental performance. A shared definition of mobility transition provides a reference for aligning policies, investments, and administrative decisions over time. Without this clarity, transition functions as an aspirational label rather than a basis for coordinated action, allowing responsibility to remain dispersed and accountability to remain weak.

Mobility systems are stabilised by interdependent regime conditions that shape decision-making. Lock-in mechanisms operate simultaneously within these regimes. Technological choices are reinforced by appraisal criteria and investment logics, while behavioural patterns are shaped by spatial and regulatory contexts and in their turn shape governance decisions. These mechanisms narrow the range of options considered feasible within public administration and help explain why incremental measures fail to accumulate into system change. Understanding how lock-ins reinforce one another is necessary to explain persistent gaps between transition goals and outcomes.

Although research on mobility transitions has expanded significantly in recent years, its translation into practical support for local decision-making remains uneven. Transition theories such as the Multi-Level Perspective and lock-in analysis offer powerful explanations for why mobility systems resist change, but they are only partially operationalised in the diagnostics, tools and working processes used by municipalities. They rarely provide guidance on how local actors can coordinate across sectors, anticipate resistance, manage distributional conflict and sustain action beyond political cycles.

This policy brief responds to this gap by placing **empowerment** at the centre of mobility transition processes and by introducing an Empowerment Framework for Sustainable Mobility Transitions. Empowerment is understood here as the set of conditions that enable local actors to understand system dynamics, build coalitions, contest dominant priorities, negotiate trade-offs and sustain coordinated action over time. The framework integrates socio-technical transition theory, lock-in analysis and narrative perspectives into a process-oriented structure. It supports the diagnosis of constraints and opportunities, the mobilisation of stakeholders and the co-creation of shared visions to guide transition pathways. Developed within the UNLOCK15 project and informed by Learning Living Labs, the framework supports cities in moving beyond isolated measures towards mobility transitions that are implementable and durable in local contexts.

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UNLOCK15 is an alliance between research institutions, private enterprises, and public administrations aimed at empowering citizens and local authorities to overcome barriers to sustainable urban mobility. Focused on transitioning towards the 15-Minute City, this project emphasises inclusivity, innovation, and collaborative action in mid-sized European cities.

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