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# Interrogating transition imaginaries: mapping present futures of urban (auto)mobilities

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## Abstract

Given the contested nature of urban futures, we approach the term “transition” as a floating signifier to investigate imaginaries of transformation. Focusing on urban mobility transitions, we demonstrate the plurality of associations with a post-transition future. This perspective allows the identification of underlying tensions and incommensurabilities between competing visions of the future. Q method is applied to explore imagined mobility futures among professionals working on mobility and urban development in Hamburg. The results show that even among those directly engaged in mobility transitions in their day-to-day work, there are plural and often conflicting views on what such transitions can and should achieve. The research offers insights into the coordinating role of floating signifiers in processes of socio-technical change. While these signifiers perform an important coordinating function in the governance of socio-technical change, they are inherently susceptible to capture.

## Policy and practice recommendations

Possible manifestations of urban mobility transitions vary greatly, with significant implications for justice and sustainability.

Techno-optimistic mobility futures risk perpetuating the assumptions and logics that underpin car-based automobility.

Reflexivity regarding the trade-offs between different mobility futures-in-the-making is important to avoid solutions that may inadvertently deepen the entrenchment of automobility.

## Science highlights

- Investigations into imaginaries can overlook contestation and conflict.
- Treating transformation-oriented terms as floating signifiers helps draw out tensions between imagined futures.
- Investigates the differences in imagined mobility futures among professionals engaged in mobility and urban development in the city of Hamburg.
- Three distinct imagined urban mobility futures are identified.
- There are notable differences among individuals across organisations in how they understand what urban mobility transitions can and should deliver.



## Introduction

Terms such as *transition* or *transformation* have become so commonplace in political and scientific discourse that others have claimed they may have become “buzzwords” (Hölscher, Wittmayer and Loorbach 2018). Common reference is made to such terms at a range of governance levels from the neighbourhood to the supra-national and by a range of actors from public and civil society organisations to multinational firms. For those interested in urban transformations (Wolfram, Frantzeskaki and Maschmeyer 2016) or transformations towards sustainability more broadly (Scoones et al. 2020), the prolific reference to terms connected with ideas that connote fundamental departures from the status quo could be understood as a positive development. However, there are always questions about what constitutes a transition according to whom (Feola 2015). When one talks about *transition*, it is highly contested what is meant in terms of what changes and what remains the same once this transition has taken place. Taking the variety of images and ideas evoked under the banner of *mobility transition* (see 3.1)—as one example and the focus of this paper—makes clear that there is no consensus around what is envisioned under a given *transition*. Rather, those who proclaim to be working towards a transition are in many cases working towards very different and often contradictory political projects.

We argue that because the term gives coherence to a plurality of meanings, providing a veneer of unity among very different and often incommensurable political demands, *transition* can be understood as a *floating signifier* (Laclau 2005). This is not to suggest that *transition* is meaningless or that the work performed in its name in a given context does not matter. On the contrary, we argue contestation around the attempts to fix its meaning is a crucial dimension of the politics of transformation. These issues also have relevance for *urban* transitions (Egermann et al. 2024; Hölscher and Frantzeskaki 2021; Torrens et al. 2021; Wolfram, Frantzeskaki and Maschmeyer 2016). Others have observed that urban areas present unique conditions for enabling or constraining transformation, making them particularly promising spaces for contributing to local and global sustainability (Bulkeley, Castan Broto and Edwards 2014; Hölscher and Frantzeskaki 2021). This is reflected in the abundance of visions and imaginaries for the future of urban areas in circulation (de Jong et al. 2015). However, as Torrens et al. (2021, 104) argue, the prevailing “visions and imaginaries informing governance deserve further scrutiny. Dominant imaginaries of smart, healthy, circular cities are not bridging the sustainability gap”.

To provide such further scrutiny, the paper has two main objectives. Firstly, it aims to demonstrate the utility of looking at prevailing (urban) imaginaries of transformation through the lens of the floating signifier. There is increasing academic attention paid towards understanding the co-production of socio-technical imaginaries (STI) shaping—and being shaped by—action in the present (Jasanoff and Kim 2015; Kuchler and Stigson 2024). This perspective emphasises the role of desired imagined future states of affair that prevail and influence action in the present. Yet, as we argue below, the application of STI can gloss over differences, tensions, and conflicts. The floating signifier as a concept can help bring these tensions to the fore. Secondly, it investigates the plurality of associations with *transition* by focusing on imagined mobility futures in one urban context. We use Q method (Brown 1993; Sneegas et al. 2021) to investigate inter-subjective

associations regarding the future of urban mobility among professionals working on urban and transportation development in the city of Hamburg, Germany.

In the following sections, we first demonstrate the plurality of imagined mobility futures currently in circulation. These futures, while more or less compatible with one another, all align with an imagined post-mobility-transition scenario. They also vary in their compatibility with the prevailing regime of automobility, which continues to shape the material, institutional, and cultural realities inherited from the past (Böhm et al. 2006; Sheller and Urry 2000). While imagined mobility futures can coexist in abstract form, not all can be materialised within the same urban space. Given these inherent trade-offs, we argue that examining imagined futures through the lens of the floating signifier helps to surface underlying antagonisms.

We then introduce Q method, which we used to investigate imagined mobility futures in the city of Hamburg. This application enabled us to identify three imagined urban mobility futures, which are outlined and contrasted in the section that follows. Finally, the discussion reflects on our findings in terms of the role of imagined futures and floating signifiers in urban governance. We argue that floating signifiers perform an important coordinating function in governance but remain inherently susceptible to capture. Therefore, rather than assuming their benevolence (or malevolence), it can be productive to examine what associations prevail with the signifier amongst particular groups, the activities carried out in their name and the chains of associated meaning that are built and broken over time instead of treating the signifier as essentially fixed.

## **Background**

### **Mobility transition imaginaries: plural and contested**

Recent years have seen a growth in academic interest in socio-technical and broader forms of imaginary in terms of their role in transformative change (Kuchler and Stigson 2024; Rudek 2022). The notion of socio-technical imaginaries (STIs) accounts for how these “collectively held and performed visions of desirable futures” influence socio-technical developments by informing decision-making, coordinating action, and allocating funding, etc (Jasanoff 2015, 4). STIs are not merely normative abstractions; they also encompass the materialities through which desirable futures are performed and enacted (Jasanoff 2015). Considering socio-technical change through the lens of STIs highlights that values, understandings, and interests are in a constant process of co-production with prevailing institutions, technologies, and materialities (Jasanoff 2015; Stirling et al. 2023).

Imaginaries are shaped by rival political forces. The definition above might lead to the presumption of a “consensus vision” among all within a given context. Indeed, the STI concept is often applied at the nation-state level and to compare multiple STIs across contexts to demonstrate their role in explaining differences (Rudek 2022). While such applications can give STIs a monothetic appearance, it is broadly understood that “multiple imaginaries can coexist within a society in tension or in a productive dialectical relationship” (Jasanoff 2015, 4). This is evidenced by the conceptualisation of “dominant” alongside “alternative” imaginaries (Delina 2018; Longhurst and Chilvers 2019; Rudek 2022). This contestation means “it often falls to legislatures, courts, the media, or other institutions of power to elevate some imagined futures above others, according them a dominant position for policy purposes” (Jasanoff 2015, 4). The conception of STIs as

plural and contested or monothetic is also a product of the techniques used to investigate them (Stirling et al. 2023).

The plural and contested nature of imaginaries can be demonstrated by examining diverse conceptualisations of imagined mobility futures. Manderscheid (2020) differentiates between three interrelated possible manifestations of transition in the transport sector. The first, drivetrain transition<sup>1</sup> (*Antriebswende*), would replace internal combustion engines with alternative propulsion technologies. The second, modal transition (*Verkehrswende*), envisions a broader shift in transport modes, encouraging the replacement of car trips with more sustainable options, such as cycling or public transport. The third, mobility transition (*Mobilitätswende*), involves transformative changes in mobility patterns, including the creation of conditions that allow people to be less mobile.

Imagined mobility futures are also intertwined with hype, hope, and fear about “promising” technological developments. Through the convergence of automation, electrification, and digitisation, a dominant high-tech imaginary referred to as connected and automated vehicles (CAV) has emerged (Dangschat and Stickler 2023). This imaginary is somewhat empty and susceptible to highly utopian and dystopian interpretations (Cugurullo et al. 2021). Images of clean, efficient, seamless, comfortable, accident-free, and socially inclusive car (or shuttle) travel are propagated through diverse media (Braun and Randell 2022). Mobility can be imagined as a service that is affordable and accessible to all. With “zero-emission” vehicles and intelligent traffic management, the air is clean and congestion is a relic of the past. On the more dystopian end of the CAV imaginary, automation is imagined to worsen urban sprawl and exacerbate transport justice issues (Dianin, Ravazzoli and Hauger 2021). Lower commuting costs are anticipated to encourage longer car commutes, increasing congestion and undermining AVs’ potential efficiency benefits and fostering a modal shift away from public and active transport (Milakis, van Arem and van Wee 2017).

Urban mobility futures must compete not only with each other but also with the material, institutional, and cultural realities inherited from the past which are highly spatially specific. Braun and Randell (2022) argue that automobility itself can be considered an imaginary: “The automobility imaginary is an imaginary that is oriented not toward the future but is a singular and enduring imaginary located in a continuous present composed of past, present, and future. It is an imaginary composed not only of discourses, representations, images and visions but also the ostensible materiality of automobility” (Braun and Randell 2022, 2). There is little doubt that this automobility imaginary is a central reason for the “closure of political non-car mobility imaginaries” (Cox 2023, 265). Also, why for some it “remains easier to imagine the end of the world than the end of the expressway” (Jones and T 2022, 19).

What these contributions make clear is that urban mobility transition imaginaries are plural and highly contested (also see Nikolaeva et al. 2019; Schwanen 2021). There are also clear mutual incompatibilities: a transition that is largely limited to substituting vehicle drivetrains is not compatible with the deep socio-technical reconfiguration

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<sup>1</sup> Others translate ‘-wende’ with ‘turn-around’ which may sometimes be more appropriate than ‘transition’. In reference to fundamental change in transportation systems, traffic or mobility ‘turnaround’ is not a term often referred to in the English academic or practice discourses. Therefore, we consider transport or mobility ‘transition’ to be a more suitable translation. Furthermore, we consider all three (*-wende*, *transition*, and *turn-around*) to have the same ‘floating’ function in both languages and being equally ambiguous as they all depict some sort of divergence from the status quo without defining precisely what that might entail.

imagined with a transition that allows less movement overall, as well as slower, softer, safer, and more sustainable forms of mobility. A “just” mobility transition is not compatible with the prevailing and inherent injustices of automobility (Sheller 2018).

While different imagined mobility futures can coexist in an abstracted form, they cannot all be materialised in the same space. The abstract imaginaries described above become more complex and contested when considered as enmeshed with local spatial realities. The prevailing socio-technical configurations that constitute urban mobility differ significantly across space (Prieto-Curiel and Ospina 2024). How global imaginaries are translated into local contexts and how they manifest will, therefore, vary between urban areas (Fratini, Georg and Jørgensen 2019). Likewise, manifestations of localised place-making can also be highly context-specific. Hoffman et al. (2021) demonstrate that effective transformative change is not only the product of the work of actors in re-imagining but also of the work that follows in re-coding institutions and reconfiguring materialities in a given context. Re-imagining is just one contested step along the journey towards reconfiguring urban space, with trade-offs becoming more apparent along the way.

#### **Transition as a floating signifier**

To appreciate these trade-offs and the contested nature of imagined transitions, we argue that it is helpful to consider transition as a floating signifier. According to this perspective, words have two dimensions: the *signifier* (their form, e.g., written or spoken) and the *signified* (their meaning), with the links between them contingent and shaped by social construction (de Saussure 2006). The spaces between signifier and signified can be understood as central sites of political contestation (Gunder and Hillier 2016; Laclau 1990, 2005).

Laclau (2005) differentiates between *empty* and *floating* signifiers: “The first [empty signifier] concerns the construction of a popular identity once the presence of a stable frontier is taken for granted; the second [floating signifier] tries conceptually to apprehend the logic of the displacements of that frontier” (2005, 133). Empty signifiers are characterised by being devoid of concrete meaning and can be understood as representational forms that encapsulate, “quilt” or fix a meaning around a plurality of different identities and political demands in *opposition* to a rival political project. Empty signifiers thus can obscure differences in specific political demands, establishing a unified identity (even though this is never complete). Floating signifiers are comparably unfixed and constitute central linguistic links *across* dichotomic frontiers (Laclau 2005). They are not empty but rather *overflowing* with meaning, with competing groups trying to fix their meaning. While a case could be made that (urban mobility) *transition* can also perform the function of an empty signifier, given the abundance of ongoing work to fix its meaning from opposing political projects, we treat transition as a floating signifier.

So, a floating signifier gives coherence to a range of different meanings, providing a veneer of agreement among (at times) contradictory perspectives. For those interested in transformation, floating signifiers provide an important coordination mechanism, unifying potentially divergent demands under a common banner. However, when the mutual incompatibility of multiple discourses becomes apparent, antagonism emerges: “when the presence of one prevents the other from constituting itself as an objective reality” (Brown 2016, 118). A central process through which opposing sides gain or lose

discursive ground is through signification: “The creation of a hegemonic discourse is the result of complex struggles in which opposed political forces (‘discourse coalitions’ or ‘hegemonic projects’) each seek to ‘universalize’ their particular storylines and interests. This is accomplished by articulating a common discourse that can win the support of affected parties while securing the compliance of others” (Griggs et al. 2017, 37).

We argue that these struggles play an important role in the shaping of imaginaries which—as argued above—is an important dimension of the politics of transformation. Considering *transition* through the lens of the floating signifier allows for closer examination of discursive frontiers between imaginaries: to bring the contestation to the fore. It is to appreciate that transitions are constantly shaped by opposing political projects, with some projects more successful in this shaping than others. Previous contributions have demonstrated the usefulness of considering socio-technical change through the lens of the floating (or empty) signifier in revealing under-appreciated political dynamics at play in the making around terms loaded with promise (e.g., Brown 2016; Sihlongonyane 2015; Ertelt and Hawxwell 2025), also specifically connected to the urban scale (e.g., Davidson 2010; Griggs et al. 2017; Gunder and Hillier 2016). We add *transition* to the list of such terms and make an attempt to interrogate its meaning in relation to mobility in one urban context.

### **Interrogating imagined futures through Q method**

Q method is an approach that combines qualitative interpretation with quantitative factor analysis to study subjectivity by identifying shared patterns in how people rank-order a set of statements about a topic. This approach has been used to map subjectivities around various topics, facilitating the exploration of diverse viewpoints (Brown 1993; Sneegas et al. 2021). It has specially been demonstrated as an effective means to inquire into transition imaginaries (Cairns et al. 2022). The process typically involves defining a concourse (a full range of ideas or opinions on a given topic), selecting a subset of statements (Q-set), and having participants (P-set) sort these statements according to structured instructions to reveal patterns in their perspectives (Brown 1993).

Applications of Q method can often have a strong *pragmatic* orientation. This view sees Q method as a tool to identify points of tension and overlaps in the opinions of individuals and groups as a step in reconciling conflicting goals and identifying optimal solutions. Beyond such pragmatic applications, Q method can also be deployed to *pluralise*: to open up complexity rather than seek an optimal solution. Examples include mapping different understandings around notions such as “sustainability” (Barry and Proops 1999; Griggs et al. 2017; Cairns et al. 2022) or bringing marginalised perspectives to the fore on a particular topic (Milakis, Kroesen and van Wee 2018). Compared with pragmatic counterparts, these pluralistic approaches are not typically deployed with the explicit purpose of overcoming conflicting viewpoints as much as they seek to reveal them. If deployed to open up the array of imagined futures in a particular context and pluralise, Q method can be a helpful tool to interrogate and pluralise often assumed monothetic notions such as *transition* (Stirling et al. 2023).

Whether a given application tends more towards the pragmatic or the pluralising is the product of the methodological design. A common approach to developing a credible concourse, P-set, and Q-set is to ensure that as many viewpoints as possible are considered. Therefore, the focus is on input legitimacy, which can be an effective strategy.

However, when considering that a typical Q-set to be sorted consists of 35–40 statements by an average of around 40 participants (P-set) (Sneegas et al. 2021), the limits regarding how much complexity can be built into such an approach become obvious. Furthermore, there is a tendency when engaging with (mobility) futures to draw disproportionately on the perspectives of actors already embedded in the incumbent system while perhaps integrating a few critical voices for good measure (Hawxwell, Hendriks and Späth 2024).

Hence, we apply a different strategy. To ensure a balanced spectrum of imagined urban futures, we draw on two interdependent archetypal imagined mobility futures, which can be understood as building a discursive frontier. The first represents the reproduction and extrapolation and/or mutation of the prevailing automobility regime (Böhm et al. 2006) into the future. The second is a future developed as a counterpoint to the dominant automobility imaginary: autonomobility (Cass and Manderscheid 2018; Manderscheid and Cass 2022). This mobility future was developed in response to an observed tendency among attempts to imagine (and make) alternative mobility futures to reproduce the underlying problems of automobility (also see Bergman, Schwanen and Sovacool 2017; Haarstad et al. 2022). There is a tendency to “ignore systemic issues, the increasing compulsions to travel, social injustices, and freedom constraints” (Cass and Manderscheid 2018, 102). Rather than address these underlying problems, it is often assumed that tinkering with the artefact can solve the problems of automobility with no significant changes to its cultural and economic foundations. Autonomobility questions these foundations. It does not simply negate automobility; rather, it offers a positive vision for an alternative mobility system that challenges the underlying logics and assumptions that power the reproduction of automobility. The negation is a pivot towards a utopian ideal.

These two rival imaginaries—automobility and autonomobility—present an opportunity to consider possible and desirable mobility futures from different vantage points. They are deliberately unclear, archetypal, and relational to invite contextualisation into different spatial and institutional arrangements. At each pole of a hypothetical spectrum is not a particular technology, but a set of assumptions, priorities, logics, and ways of understanding movement (see Table 1). These two concepts played a role in the development of the *concourse* and *Q set*. The goal was to compile the set of statements for

**Table 1** Underlying assumptions, priorities and values associated with automobility and autonomobility respectively (developed by the authors, inspired by Cass and Manderscheid (2018) and Sheller (2018))

	<b>Automobility</b>	<b>Autonomobility</b>
<i>Speed and safety</i>	Speed over safety	Safety over speed
<i>Transport induced death and injury</i>	Seen as collateral damage	Seen as unacceptable
<i>Commodification</i>	Profit over access	Access over profit
<i>Ownership</i>	Private over public/collective	Public/collective over private
<i>Freedom</i>	Freedom to over freedom from	Freedom from over freedom to
<i>Limits in focus</i>	Political expediency, user and incumbent actor acceptance	Ecological limits, human health and wellbeing, physical space
<i>Valued types of movement</i>	Automated movement over human movement	Human movement over automated movement
<i>Growth model</i>	Expansion over sufficiency	Sufficiency over expansion
<i>Urban space exclusively for moving goods and people</i>	Remains the same or grows	Declines
<i>Urban development paradigm</i>	Vehicle-centric	(more than) Human-centric
<i>Prevailing political-economic arrangements</i>	Unquestioned	Questioned

participants to sort, ensuring a balanced representation of perspectives that, in the authors' interpretation, reflect the sentiments underpinning both automobility and autonomobility in somewhat equal terms.

### **Case: mobility futures in Hamburg**

We investigate imagined futures among professionals involved in urban and mobility planning in Hamburg, Germany. As the country's second-largest city, Hamburg had nearly 1.9 million residents in 2023, expanding to 5.4 million with its metropolitan area (FHH 2023). The city's port has shaped its physical, economic, and cultural landscape (Lieber 2018), often creating conflicts with sustainability goals (Bauriedl and Wissen 2002). As both a city and a state, there is more direct influence over institutional changes, making locally imagined futures particularly important. The city council has committed to a "mobility transition", reflected in a renaming of the transportation department and a reframing of the urban mobility plan as a Strategy for the Mobility Transition (*Strategie Mobilitätswende* (FHH 2023)). In recent years, the city has seen significant increases in cycling and a growing number of initiatives to reclaim urban spaces from cars (Hawxwell 2025). Hamburg is also seen as a leader in smart mobility and ITS projects (Späth and Knieling 2020), hosting the ITS World Conference in 2021 and committing to be at the forefront of developments around autonomous mobility.

Statements for the concourse were sourced from various materials, including parliamentary debates, newspaper articles, strategic documents, city mobility council protocols, and stakeholder interviews, resulting in 333 initial quotes. These were refined to a final Q-set of 33 statements inductively, trying to achieve thematic balance (focal technologies, priorities, governance instruments, etc.) and equal representation of statements that seemed to reflect the sentiments of automobility and autonomobility, respectively. The participants<sup>2</sup>, 46 professionals (27 male, 18 female, and 1 undisclosed) involved in urban development and transportation planning in Hamburg, ranked the statements using an online Q-sorting tool based on a predefined distribution from "more in disagreement" to "more in agreement". The organisations involved in the city's Mobility Advisory Council (*Mobilitätsbeirat*) were the primary orientation for identifying participants. This institutionalised body is designed to facilitate exchange between politics, administration, business, science, and associations around the long-term planning of urban mobility in the city. All organisations represented in the council were contacted and invited to participate. Although not all participated, participants covered a broad spectrum of political factors and vested interests. Unlike a survey, the proportion of participants does not need to be representative of a broader context because the method is concerned with capturing the diversity of discourses and revealing patterns of subjectivity, rather than measuring the distribution of opinions. Instructions and a control survey ensured reliability and addressed any sorting issues. Factors were generated using Ken-Q software (CFA with varimax rotation), identifying three factors. Factors represent shared viewpoints or perspectives that emerge from the analysis of participants' Q-sorts (i.e., their ranked statements). Additional extraction methods and rotation techniques were tested for triangulation. The narratives below we term "imagined

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<sup>2</sup>Department for Transport and Mobility Transition (18), Other Public Administration Bodies (8), Political Parties (5), Environmental NGOs (4), Other NGOs (1), Business Associations (2), Research Organisations (2), Municipal Companies/Public Service Providers (2), Planning Offices/Consultancies (4).

futures” were developed inductively through comparing the statement scores across the factors, forming the basis for storylines (see Table 2 in annex).

### **Three imagined mobility futures for Hamburg**

Through the analysis, three distinct imagined futures were identified. We introduce these one by one and make reference to the respective statements from the Q method outputs when appropriate (see Table 2 in annex).

#### **Low-tech transform**

This imagined future foresees the need for fundamental changes to Hamburg’s transportation system. A mobility transition requires a significant reconfiguration of transport infrastructure and public spaces and deeper changes in residents’ daily mobility practices. Car ownership and use is significantly reduced to liberate space for alternative modes like cycling and public transport and to serve other important urban functions (16). According to this view, there are apparent conflicts between optimising car traffic and achieving the goals of a true mobility transition. Technological solutions like smart traffic management can be helpful. However, if they are not explicitly designed to reduce car use, could exacerbate the problem (2, 6). There is also a preference here for movement on foot, cycling and more conventional forms of public transportation (19). Specifically, the (re)introduction of the city’s light-rail system (24). To achieve this transformation, the city needs to introduce measures that liberate space currently dominated by cars. This includes significantly increasing parking fees (27), establishing low-car and car-free zones, and implementing appropriate speed limits (4).

#### **Incremental tinkering**

This imagined future foresees the preservation and gradual improvement of the existing transport system, rather than radical changes. The belief here is that all modes of transport—cars, public transport, cycling, and walking—can be improved simultaneously to meet the diverse needs of the population (12). Changes that have taken place recently under the banner of mobility transition are perceived as radical and polarising (15). Because people who own cars generally need them, interventions to reduce car traffic are an unnecessary and unjust burden on citizens (5, 7). There is therefore a general opposition to speed limits (4), higher parking fees (27), low-car and car free areas (17), and generally reducing the space devoted to transportation (16). Such interventions also threaten the economic foundations upon which the city maintains its high quality of life (31, 4). The focus should be on improving current infrastructure through smarter management and infrastructural upgrades. This includes measures like enhancing traffic flow with intelligent traffic control systems (2), expanding capacity on main roads to draw traffic away from residential areas (14), and improving parking management (6). The best chance to encourage modal shift is seen in the ambitious “Five-Minute Promise” (Hamburg-Takt), which is envisioned to significantly improve the accessibility, frequency and reliability of public transport (33).

#### **High-tech reform**

This imagined future foresees a “High-Tech, Low-Car” future, where electric vehicles and autonomous on-demand shuttles are important dimensions of the future system

(11). These technologies could reduce the need for private cars while maintaining mobility and convenience (5). Despite the importance of such innovations, conventional soft modes like cycling remain important. Innovations that draw drivers of conventional into electric vehicles would be a significant improvement (1). Because people who own cars are dependent on them, real alternatives need to be created to induce behavioural shift, and technological innovation can help fill this gap (5). This will not happen automatically but will require a smart mix of both push and pull measures. Car ownership and driving does need to be made less attractive (19, 17). However, the alternatives to car ownership should be made significantly more attractive. This includes the holistic integration of alternative transport modes (public transport, cycling, sharing offers) into a more seamless system (8) and making electric vehicle charging stations widely available (1). Striking a balance between these approaches will not only mean that we can bring about a transition that is supported by the city's inhabitants (29) but also create opportunities for Hamburg to become a leader in urban mobility solutions (11).

#### **Alignments and misalignments between imagined futures**

There appears to be some alignment or at least some shared ambivalences between the imagined futures. Despite uncertainty about the potentials and pitfalls of emerging (autonomous) ride-hailing and on-demand services (23, 11), there is broad scepticism that these will emerge as sustainable and just alternatives if governed solely by market forces (20, 13). Furthermore, there is shared optimism regarding the potential of car-sharing, and the developments thus far are seen as largely positive (26). There also appears to be (largely) shared ambivalence around the question of traffic concentration (14). Should traffic be concentrated and optimised on a few selected major thoroughfares to ease pressure on more residential areas? Or are these major thoroughfares themselves residential enough to warrant their own traffic calming measures? Moreover, there is widespread recognition of the limitations inherent in simply creating off-street parking facilities, suggesting that a significant absolute reduction in parking will be necessary if space is to be liberated from cars in a growing city (9). Additionally, although not all agree that "vision zero" should be *the* main objective, there seems to be a shared understanding that the current mobility system induces too much death and injury (25).

There are also significant misalignments between the imagined futures. Obvious differences can be identified between *Incremental Tinkering* and the other two futures. Most notably, while the former does not envision a fundamental questioning of the status quo, the latter two see questioning the hegemonic position of the car in its current form as both possible and desirable. Yet there are also important differences between *Low-tech Transform* and *High-tech Reform*. Most significantly, there seem to be differing assumptions about technology's potential to address the comfort and convenience gap created when the personal car is removed from an imagined future arrangement. *High-tech Reform* appears more optimistic, albeit aware that this will not happen automatically. As with *Low-tech Transform*, creating powerful incentives to discourage car ownership and use is necessary to realise desirable outcomes.

## Discussion

In this section we reflect on the findings in terms of the role of imagined futures in shaping urban development and connect these insights back to the concept of the floating signifier. The results reveal marked divergences in opinion and belief about what a mobility transition in Hamburg can and should deliver. This is despite participants of the study already engaging with imagined mobility futures that are not purely abstract but deeply entangled with the spatial realities of their everyday professional work—work that inevitably includes regular confrontations with the “impossible”. Even in Hamburg, where an official strategy for the mobility transition has been published—a strategy one might expect to align imaginaries and translate particular elements of mobility futures into concrete expectations while excluding others—significant differences in perspective remain.

While vested interests undoubtedly play a role in these differences, the situation is more complex. There is significant variation not only between but also within organisations (see Table 3 in annex). Even within organisations that would not be expected to have a clear vested interest in one mobility future over another. This indicates that the coalitions forming around particular agendas can be less driven by rational interests and more by deeper ideological forces (see Hajer 1995). The imagined futures can also be understood as embedded in broader discourses that extend far beyond the topic of day-to-day movement of goods and people. Each of the introduced imagined futures are underpinned by their own value structures and assumptions around priorities, limitations, and (im)possibilities. This demonstrates that debates about the future of urban mobility transcend technocratic or managerial questions about how best to facilitate the movement of people and goods in the most environmentally efficient way. Rather, such debates can represent a microcosm of broader societal contestation about values and priorities around (urban) development.

Despite the significant misalignments between imagined futures, these futures seem to be able to maintain their performativity independently of each other, apparently shaping action in the present at different times, in different spaces, and to varying extents. A pure version of one or the other is unlikely to emerge as the unrivalled victor, manifested in the configurations determining movement. Rather, one might suspect traces of each imagined future captured in urban space, with one or the other “winning the day” in the negotiations over priorities constantly occurring in the messy day-to-day of urban development. One might also expect thicker layers of urban development where these traces are particularly reminiscent of one imagined future because of a ruling party forcing an artificial alignment of a particular imagined future through top-down pressures. However, the remarkable variation in plausible and desirable futures among the participants in this study suggests that these individuals are engaged in ideological contestations in their everyday work, the outcomes of which have significant implications for the types of urban areas inhabitants have to enjoy or tolerate in the future.

The outcomes also highlight the relational nature of such imagined futures: each is defined largely in relation to others. To give some examples, more techno-optimistic beliefs are likely fostered in response to the challenges associated with the interventions necessary according to the more low-tech future: reducing car-dominated space in urban areas is not typically an easy political endeavour. This might lead some to believe that it is more plausible to substitute the convenience of the car with technological

innovation than to negotiate such difficult political terrain. The *Low-tech Transform* imagined future likely prevails at least partly in response to years of unfulfilled techno-optimistic promises (Hawxwell 2025).

#### **Floating signifiers in (urban) governance: between coordination and capture**

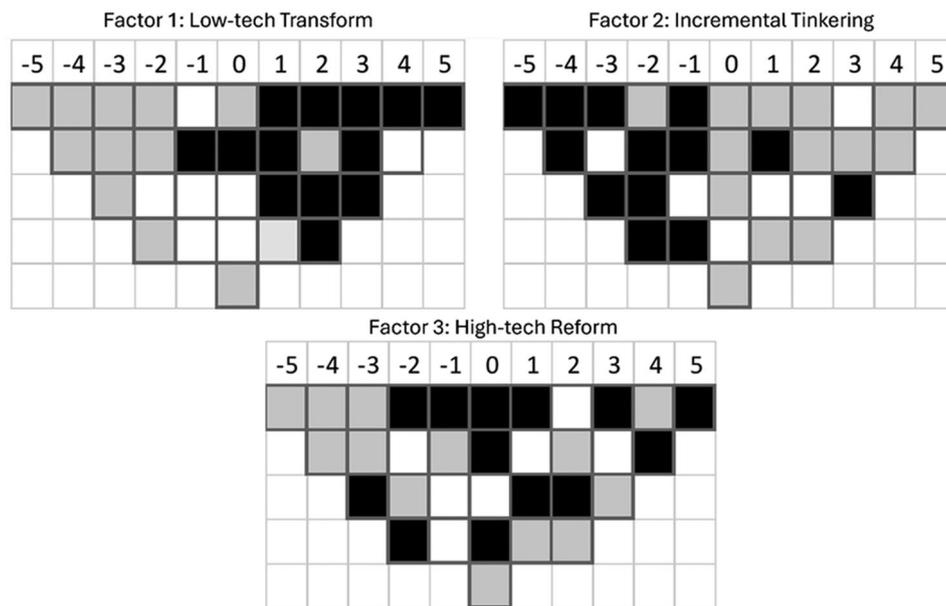
It is interesting to note that despite the fundamental differences between the imagined futures in terms of content, each could be plausibly argued as fundamental reorganisations of a system of provision: i.e. as a “transition”. A possible exception could be the imagined future titled *Incremental Tinkering*. For some, the term “incremental” might suggest the antonym of transition. Yet the drive-train transition imaginary (see 3.1) that underpins this imagined future would likely constitute a fundamental reorganisation of the supply side in the transport sector, which could be argued to constitute a “fundamental reorganisation”. Nevertheless, these very different imagined mobility futures can maintain association with the same transition signifier.

These findings demonstrate the important coordination function that floating signifiers play in processes of socio-technical change. The case demonstrates a broad spectrum of specific demands (safety, overcoming congestion, improved health, liveability, business opportunities, economic growth, freedom, environmental protection, etc.) connected through chains of equivalence and united under the banner of *mobility transition*. This makes it possible for actors with different agendas and underlying value preferences to (at least appear to) be working towards the same ends. However, through this process, individual demands can be weakened as they are distorted into a collective whole that appears to be a stable and closed identity but is actually fractured (Laclau 2014). The longer these chains of equivalence become, the more diluted the individual demands, and the more powerful the uniting whole must be to maintain coherence (Laclau 2014).

Rather than viewing this as a problem, it can be understood as a fundamental condition of the politics of socio-technical change. Floating signifiers have a productive coordination function, uniting divergent interests around a common vision without precisely determining its content (Brown 2016). That the term *transition* has become commonplace in Hamburg signals that the discussion is not just about whether to fundamentally change the transportation system but how these changes should manifest. This mainstreaming can be beneficial (and perhaps necessary) for the political project(s) through which the signifier originated (Pel 2016).

Yet, there is no reason to suggest that the post-transition arrangement will be any better (and not worse) than the present, regardless of the normative lens that may be used to judge this. The moment a signifier (such as *transition*) is adopted by the incumbent arrangements also marks the moment those incumbent arrangements begin to mould its meaning. This can lead to the co-optation of potentially transformative ideas, which is argued to be a central mechanism that undermines deeper forms of socio-technical change (Simoens, Fuenfschilling and Leipold 2022; Späth, Rohrachner and von Radecki 2016).

Insights from the Hamburg case demonstrate a kind of emergent co-optation of the pressures for transformation through techno-optimistic imaginaries. Others have observed that developments occurring under the banner of *smart mobility* tend to reinforce and reproduce automobility rather than fostering any real alternative (Freudental-Pedersen, Kesselring and Servou 2019). The *High-Tech Reform* imagined future appears



**Fig. 1** Factor structures according to statements reflecting automobility (grey) and autonomobility (black) sentiments. White boxes reflect statements that are deemed compatible with both automobility and autonomobility

to ride the wave of transformative spirit, foreseeing fundamental changes in the mobility system, but still reproduces certain automobility logics and impossibilities. This emergent co-optation is illustrated in Fig. 1, which depicts the different factor sort structures with statements marked according to whether they reflect automobility or autonomobility sentiments. While the distribution of sentiments is clearly divided between the other two imagined futures—with autonomobility aligning closely with the *Low-tech Transform* and automobility aligning closely with the *Incremental Tinkering* future—the *High-tech Reform* future presents a more mixed picture, still reinforcing particular assumptions associated with automobility. For example, there seems to be a comparative discounting of environmental and social costs embedded in the production and use of electric vehicles (28 – Table 2 in annex), loose interpretations of what it means to “need” a car, and the assumption that the convenience and comfort of the car can and should be replicated without questioning the desirability of this (5 – Table 2 in annex).

## Conclusions

This research aimed to interrogate the meanings attached to a notion loaded with promise for a better world. Like the many promising signifiers that have come before it, *transition* as a signifier is susceptible to being connected with a variety of different meanings from a variety of (at times contradictory and antagonistic) political projects. We demonstrated this by investigating imagined futures around urban mobility in an urban context where a *mobility transition* has begun to be broadly articulated as expectation rather than pure hope or aspiration.

We used Q method to investigate the inter-subjective associations between actors working on the future of urban mobility in their day-to-day work in Hamburg. In light of a tendency among those engaged in future-making practices to reproduce the very logics and assumptions of the systems they seek to transform (Hawxwell, Hendriks and Späth 2024), we built in a mechanism to systematically counter this tendency. Through

populating the array of statements to be sorted by participants with a balance of sentiments that reflect both automobility and autonomobility—two inherently antagonistic and incommensurable imaginaries—we could work against the tendency of reproducing assumptions embedded in the imaginaries inherited from the past when we engage with the future. The approach allowed the (albeit modest) questioning of the rarely questioned truths underpinning automobility while remaining accessible to actors embedded in the system rather than limiting such attempts at imagining fundamentally differently to more “vanguard” or “niche” future-making practices. Without downplaying the importance of creativity in conceiving different techniques for engaging with the future, we see potential in constantly tinkering with existing approaches to futuring to integrate a more critical orientation.

The research demonstrates the plurality of imagined urban mobility futures and the relational, often antagonistic, relationship between them. The three imagined futures may not be surprising to some. We might expect similar outcomes in similar urban contexts, including those where the term transition has not been formally embraced. However, the approach has proved an effective means to investigate how these different imaginaries are articulated locally and the important lines of contestation between them. It provided insights into the extent to which and how these imagined futures are dispersed and embedded among organisations that are currently playing a central role in realising the mobility system of tomorrow in this context. These tensions arise not only from divergent views about what can or should happen in the future but also from an enduring automobility imaginary inherited from the past—manifested in different urban contexts in various ways and to different extents. Considering *transition* through the lens of the floating signifier helped to account for this contestation. Addressing latent incommensurabilities and trade-offs in place-specific debates about particular sustainability transitions—unpacking what a floating signifier is meant to disguise—can be a helpful way to account for the politics underpinning the processes of socio-technical change.

In terms of broader implications for research engaging with urban transformation, conceptual disambiguation remains an important academic exercise. The work of scholars pluralising associations with mobility transition offers an important starting point for thinking about difference and chains of equivalence (see e.g. Manderscheid 2020; Nikolaeva et al. 2019; Schwanen 2021; Temenos et al. 2017). Yet, the connections between signifier and signified are also forged outside academic settings. Beyond disambiguation, it can be productive to pay more critical attention to the types of imagined futures and the institutional and material changes made under the banner of such signifiers that promise positive change, rather than assuming their benevolence. Additionally, it is important to investigate how chains of equivalence are built and broken under the banner of other such terms, rather than assuming an essential meaning. Reflexivity requires acknowledgment that academic work is not just observing the battle over such floating signifiers but is also engaged in it. This means recognising that attempts at bringing about a “green transition” can tend to discount and outsource the social and environmental costs beyond the spaces for which the “sustainable” futures are being imagined (Deberdt and Le Billon 2024). Such reflexivity is a necessary prerequisite to give a promised transition the best chance of becoming part of an emancipatory project, rather than another mechanism of status-quo reproduction.

## Annex

**Table 2** Sorted Q-statements (own translation) with their factor scores for each extracted factor. Each factor (F1, F2 and F3) represents a shared way of ranking the statements. These were interpreted and developed into narratives that articulate distinct perspectives (see section “[Three imagined mobility futures for Hamburg](#)”). Factor scores indicate the normalised position of each statement within a factor array, showing how strongly it is ranked for that factor. Positive values signal stronger agreement or salience, negative values reflect stronger disagreement, and values near zero suggest relative neutrality. “The column ‘var.’ in reports the communalities (explained variance) for each statement across the three retained factors. These values indicate how much of the variability in participants’ rankings of a given statement is captured by the factor

Nm	Statement	F1	F2	F3	Var.
19	Getting around on foot, by bike or by public transport should be easy, safe and convenient. At the same time, driving should be less comfortable and slower, and owning a car less attractive.	3	-5	5	2,896
27	Resident parking fees in densely populated areas with good transport alternatives should be at least between 300 and 600 euros per year to adequately reflect the use of public space.	3	-4	2	2,242
4	The introduction of 30 km/h (instead of 50 km/h) as the standard speed in Hamburg poses a threat to maintaining and safeguarding commercial traffic.	-5	3	-5	1,652
17	Bicycle traffic should have absolute priority within Hamburg Ring 2. Parking within Ring 1 should only be permitted for people with restricted mobility and limited delivery traffic.	2	-4	4	1,481
5	As many people are dependent on their vehicles, we should first create real alternatives before measures are taken to reduce car use.	-3	4	2	1,46
21	The proportion of children who cycle to school is a better indicator of the success of the mobility transition than the proportion of electric vehicles on the roads.	5	-1	-2	1,329
12	The transport debate has often been conducted along the lines of “either or”. However, Hamburg needs both an improved public transport and cycling network and a targeted expansion of the road network.	-2	4	-1	1,17
28	E-cars are still cars. When you consider the space they take up and the emissions and resource consumption involved in their manufacture, they are not a truly sustainable alternative to combustion engines.	2	-2	-3	1,013
32	The construction of the A26 highway is a good and important project for improving mobility in Hamburg.	-3	2	-4	1
7	It is unfair to make private car ownership affordable only for the wealthy. Excessive parking fees are not a problem for the rich, but they are for the average user.	-1	3	-1	0,915
24	The phase out of the tram system in Hamburg was a mistake and it still makes sense to consider building a light rail system.	3	-2	-2	0,855
2	Although synchronised traffic lights (green waves) for public transport and cycling are important considerations, solving congestion problems in the city should be a priority.	-4	1	-4	0,753
6	A significant proportion of traffic congestion and the associated emissions are caused by the search for a parking space. Targeted optimisation of parking could improve the situation considerably.	-3	2	-2	0,66
15	The strategy currently being pursued in Hamburg clearly shows that politicians are still under the illusion that a mobility transition is possible without stepping on anyone’s toes.	1	-3	0	0,548
29	Change takes time. If we push too hard, we risk backlash. This could jeopardize the progress we have made so far. It is important to drive change at a pace that is supported by the population.	-1	1	3	0,548
31	The port and freight traffic are the economic basis of this city. If we take the risk of jeopardizing the port, we are jeopardizing the basis that makes the quality of life in this city possible.	-2	2	0	0,466
1	If we no longer want to have combustion engines in the city for climate protection reasons, we must promote electro mobility. This means the city-wide expansion of fast-charging stations without a price explosion.	0	0	4	0,447
18	Hamburg could achieve similar or even higher cycling rates than Amsterdam or Copenhagen if massive investment is made in safe and comfortable cycling infrastructure.	2	-1	3	0,413

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Nm	Statement	F1	F2	F3	Var.
33	The key to the mobility transition is the five-minute promise (Hamburg-Takt: a reliable public transport connection within 5 minutes of any location in Hamburg).	2	5	1	0,4
16	“Smart” mobility solutions such as micromobility, charging infrastructure, delivery services and mobility hubs generally lead to a greater appropriation of public space. However, they should aim to systematically reduce the amount of space taken up exclusively by traffic.	1	−3	0	0,398
30	Many have clearly not yet recognised the seriousness of the situation. We need to change the city’s transportation system quickly and fundamentally. Paris shows that this can be implemented quickly with the necessary political will.	4	0	2	0,352
25	Vision Zero, the goal of having no deaths or serious injuries on the roads, should be the top priority in transport planning.	4	3	0	0,304
13	It is entirely possible to realize a fair and sustainable mobility system through networked autonomous vehicles, even if a large part of the services and infrastructure were not publicly owned.	−2	−1	0	0,214
11	As soon as autonomous on-demand shuttles reach a critical mass, things will get really exciting. If such mobility services can be operated economically, they could revolutionize urban mobility - not only in Hamburg, but also beyond.	0	0	2	0,202
23	We will never know exactly what impact autonomous on-demand shuttles will have on the mobility system until a critical mass of vehicles is on the road in the city. After this point, it will hardly be possible to abolish these systems.	−1	−2	1	0,194
9	I understand why the number of street parking spaces needs to be reduced. But the cars have to go somewhere. As a rule, the removal of an on-street parking space should be supplemented by the creation of a parking space in a neighbourhood garage.	−2	0	−3	0,188
10	A large part of the traffic problem can be solved by intelligent traffic control and autonomous driving. The majority of traffic jams, emissions and accidents are avoided by electric autonomous vehicles.	−4	−2	−3	0,123
14	If you want to protect residential areas, you have to concentrate traffic on the major arteries and bypasses and maximise efficiency there.	0	2	1	0,121
26	There is excessive optimism about car sharing. In particular, free-floating car sharing often leads to people cycling or taking the train less and using cars more instead, which is a counterproductive development.	−1	−3	−2	0,116
3	It would make sense to design the traffic space to be flexible and open, as developments over the next 20 to 30 years, particularly in the area of autonomous driving, are difficult to predict.	0	0	−1	0,095
8	Hamburg is neither Copenhagen nor Amsterdam. The Hamburg way should be to take a holistic view of the soft modes and public transportation and to network mobility intelligently.	1	1	3	0,095
22	When it comes to mobility, the focus should be less on movement and more on spending time in comfortable, green and attractive public spaces.	0	−1	−1	0,026
20	When you see how ride-hailing systems (e.g. Moia) have established themselves in the city, it becomes clear that the focus is more on business than on mobility. If mobility were the main goal, they would focus on the outlying areas where the need is greater, rather than the already well-served city center.	1	1	1	0,01

**Table 3** Factor loadings. The actor types in the table are coded as follows: municipal department for transport and mobility transition (BVM); other public administration (Verwalt); political party (Partei); NGO/Civil society organisation with environmental focus (ENGO); NGO/Civil society organisation with other focus (NGO); company or association of companies (Unterneh); research organisation (Forsch); municipal company or public Service (KomUnt); planning office or consultancy (Berat)

Nm	Q-sort	Factor Group	Factor 1	Factor 2	Factor 3
46	BVM18	F1-1	0.8671	-0.1611	0.0991
36	BVM10	F1-2	0.8096	0.0566	0.2098
2	BVM1	F1-3	0.726	-0.2262	0.0282
25	ENGO3	F1-4	0.7099	-0.2288	0.1896
34	BVM8	F1-5	0.6934	-0.186	0.1612
19	Partei4	F1-6	0.691	-0.029	0.0829
20	Forsch1	F1-7	0.6858	-0.1451	0.1636
24	Forsch2	F1-8	0.6517	-0.5994	0.1125
17	ENGO1	F1-9	0.6469	-0.3301	0.1505
11	Berat2	F1-10	0.6314	-0.3151	0.151
31	BVM5	F1-11	0.6243	0.1348	-0.0913
39	BVM13	F1-12	0.6238	-0.2064	0.1915
32	BVM6	F1-13	-0.612	0.4097	-0.1006
10	Berat1	F1-14	0.6088	-0.4594	0.245
35	BVM9	F1-15	0.6034	-0.0842	0.2486
27	ENGO4	F1-16	0.5991	-0.4258	0.1042
23	Berat4	F1-17	0.5902	-0.2879	0.2101
30	BVM4	F1-18	0.5536	0.1275	0.1674
5	BVM2	F1-19	0.5422	-0.1101	0.3189
9	Verwalt3	F1-20	0.5023	-0.1797	0.1065
3	Verwalt7	F1-21	0.4971	-0.3449	0.1066
45	Verwalt6	F1-22	0.4807	-0.3412	0.3376
1	Partei1	F1-23	0.48	0.014	0.05
14	Berat3	F1-24	0.4181	0.257	0.4118
21	NGO1	F2-1	-0.3563	0.7152	-0.2218
15	Partei3	F2-2	-0.1085	0.7116	0.2063
38	BVM12	F2-3	0.2319	-0.6837	-0.0046
40	BVM14	F2-4	0.3481	0.6213	-0.0984
29	BVM3	F2-5	-0.151	0.5611	-0.3688
16	Unterneh1	F2-6	-0.2034	0.4282	-0.0296
26	Unterneh2	F2-7	-0.3282	0.4231	0.3118
4	Verwalt8	F2-8	0.3217	0.4027	-0.0821
12	Verwalt4	F2-9	0.0287	-0.308	-0.1212
44	BVM17	F2-10	-0.0148	0.2447	0.2027
6	Verwalt2	F2-11	0.1127	-0.2301	0.0258
13	Verwalt5	F2-12	-0.1088	0.1671	-0.0453
22	KomUnt2	F3-1	-0.0063	0.0544	0.6993
28	Verwalt1	F3-2	0.2439	0.2197	0.6498
7	Partei2	F3-3	0.2882	-0.1415	0.6178
33	BVM7	F3-4	0.5116	-0.2664	0.5999
41	Partei5	F3-5	0.3965	-0.361	0.4699
42	BVM15	F3-6	0.1184	0.0188	0.4528
43	BVM16	F3-7	0.0337	0.3254	0.4246
8	KomUnt1	F3-8	0.2502	-0.023	0.3394
18	ENGO2	F3-9	0.1077	-0.2073	0.3108
37	BVM11	F3-10	-0.0028	0.1249	-0.1669

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### Authors contributions

T.H: Conceptualisation; Writing – review & editing, Writing – original draft, Project administration, Methodology, Data curation. P.S: Supervision, Writing – review & editing, Methodology, Conceptualisation.

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### Data availability

No datasets were generated or analysed during the current study.

### Declarations

#### Competing interests

The authors declare no competing interests.

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