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Stories of the future: Personal mobility innovation in the United Kingdom



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ABSTRACT

This paper looks at personal transport futures in the context of greenhouse gas emissions reduction, as portrayed in documents from various stakeholders in the transport sector. It analyses the role of frames and narratives in constructing stories of the future, through the lens of two innovations: electric vehicles (EVs) and car clubs. Most of the documents draw on technological progress to tell stories of a future similar to the present but with EVs or other low-carbon vehicles, while car club focused documents stress broader notions of sustainability. A number of economic, technological and political-related frames are identified, which are used in constructing and justifying these stories. Some frames, such as ‘economic growth’, are nearly ubiquitous. Narratives support and are sometimes actively supported by the stories, such as ‘technology neutrality’. Frames and narratives play a key role in creating stories of the future, and help create and maintain expectations and legitimacy of innovations. Frame analysis helps unpick and challenge unrealistic expectations that might leave us unprepared for the future.

1. Introduction

The future of surface transport is a much debated topic. Specifically, the current modes and volume of personal mobility are considered environmentally unsustainable, primarily because of greenhouse gas emissions of cars. In the UK, as elsewhere, there have been growing concerns about transport implications for climate change, but also for energy security, social exclusion, and public health and wellbeing [1]. Personal surface transport in the UK has for decades been dominated by a system of *automobility* where privately owned cars are seen as a right and a necessity; car-based mobility is linked to economic development; and norms, practices and institutions reinforce the role of cars in society [2,3]. This makes the system resilient and resistant to change, as path dependencies and lock-in make shifting the transport system towards sustainability difficult. However, there are many innovations which could potentially make personal mobility more sustainable, from technical improvements to engines and new fuels, to new models of transport behaviour and car ownership. Creating future visions is considered part of the innovation process: it can raise expectation and lend legitimacy to an innovation, generate support from stakeholders.

This paper reports from a project on future visions of personal mobility in the UK, in the context of sustainability and emissions reduction, and the dominance of the private vehicle. Roughly 25% of UK CO₂ emissions come from transport, nearly 2/3 of which comes from cars and vans [4]. Two relevant innovations were considered in the study: electric vehicles (EVs), which offer technological reduction in

emissions, but potentially keep other parts of automobility in place, and car clubs, which offer cultural and behavioural shifts, including severing the link between car use and ownership. There are other innovations of interest, with autonomous vehicles (driverless cars) receiving attention recently. However, this study focuses on two innovations which are already well-established in the transport system and therefore in policy-relevant literature. A collection of 20 documents looking at the future was analysed; these include forecasts, roadmaps, pathways, and more. We consider each document to be a *future exploration*. The explorations were created by various stakeholders in the UK transport sector, including government, industry, consultancies and transport coalitions. The research focused mostly on EVs, as they feature more prominently in most documents, with car clubs offering a counterpoint useful for examining underlying assumptions in the narratives. Another paper from this study [5] focuses on how aspects of the future were imagined and how the visions served the agendas of their authors. This paper considers how the framing of the innovations plays an important role, with frames acting as building blocks in constructing stories told about the future, and how narratives, which weave together different frames, reflect and strengthen dominant worldviews and agendas. It concludes that analysing the frames underlying the stories helps unpick and challenge unrealistic expectations that might leave us unprepared for the future.

Section 2 offers a theoretical background on the importance of visions in innovation (2.1), and describes the concepts of frames and narratives and their use in this paper (2.2). Section 3 outlines the

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methodology, including selection of documents and coding procedure. Section 4 reviews some of the common frames in the explorations, while Section 5 covers some demonstrative narratives found implicitly or explicitly in the visions. Section 6 offers some conclusions and observations.

1.1. Terminology

Internal combustion engine vehicles (ICEVs) are ‘regular’ vehicles powered by combustion of petrol or diesel. In contrast, *electric vehicles* (EVs) are powered using electrical energy, most commonly stored in plug-in rechargeable batteries. The term EV sometimes also includes *plug-in hybrids*, which have both an electric motor and an internal combustion engine. *Ultra-low-emission vehicles* (ULEVs) refer to any motor vehicle with very low emissions, including EVs (when powered by low carbon electricity), biofuel and hydrogen powered vehicles, and other technologies. Finally, *car clubs* are a form of shared mobility where members pre-book cars for short periods, often paying by the hour. Cars are typically picked up and dropped off at the same on-street location.

2. Background – stories of the future

2.1. Visions and expectations

Stories about the future are often articulated as *visions*. Visions can be powerful tools in public discourse and policymaking, because those that become widely accepted can shape expectations about the future, and therefore motivate actions in the present towards such a future [6,7]. Such visions can be considered ‘shared imaginaries’, which have been defined as “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology” ([8], p. 6). In the innovation context, successful vision creation can generate more support from a greater range of stakeholders (e.g., [9–11]), for example when rapid technological change is required, “technology promoters have much to gain by having ‘the public’ on-side rather than resistant to innovation” ([12], p. 931). More broadly, in order to be successful and effective, visions must attract credibility through realistic strategies and tactics, achieving the right balance between utopia and realism, and also have the potential to be open to new entrants [7].

This paper takes the position that imagined futures are always normative, as they inevitably make assumptions about behaviour, economics, technological development, and more. Assumptions about innovations could include imagining the nature and behaviour of adopters and users, which could significantly shape innovation trajectories in envisioned futures. The visions literature can therefore be useful even for future explorations which do not intentionally pursue a political or other agenda.

A variety of research points to the importance of creating *expectations* about the future of innovations, partly through the use of visions. Expectations can motivate and stimulate action on technological innovation among engineers, designers and managers, as well as among sponsors, investors and politicians [13,14]. It has been further argued that expectations and visions are not separate from the technological innovation process, but a formative element of it (e.g., [14,15]).

Ruef and Markard [16] argue that actors sometimes strategically inflate expectations of new technologies to attract resources and attention. Once expectations are shared, they effectively act as requirements that cannot be ignored by other innovating actors, which can lead to a period of *hype*, during which media attention and expectations peak. A ‘herd effect’ is also possible as technological ‘solutions’ become more and less fashionable [17]. Periods of hype are inevitably followed by a decline in expectations and attention, potentially leading to disappointment. While details of this ‘hype cycle’ model have been

criticised, the concept of hype and disappointment is well established (e.g., [18]).

For any innovation to be widely taken up, it must gain *legitimacy*, that is, it must be accepted by a (perceived) consensus of a social group as matching their norms, values, practices and procedures [19]. Sources of legitimacy are varied, and can include narratives, discourses, verbal accounts, and traditional and social media [20]. Legitimacy can be crucial early in an ‘innovation journey’ for securing investments, ventures and policy support for new technologies, while later in the journey, legitimacy can maintain public and political support [21]. Maintaining positive expectations after a hype and disillusionment cycle can be crucial to keep legitimacy intact [16]. The next section turns to frames and narratives, which underpin the stories that help create and maintain expectations and legitimacy.

2.2. Frames and narratives

This paper focuses on some of the building blocks of stories of the future – frames and narratives – and how they make these stories influential. Frames can be described as conceptual models that help us make sense of the world, or “basic cognitive structures which guide the perception and representation of reality” [22]. This approach follows the cognitive sciences, which suggest we think in terms of unconscious structures – *frames* (or *schemata*), with even our everyday thinking using metaphorical concepts that are deeply entrenched and culturally reinforced [23]. Our knowledge makes use of frames, and our neural circuits mean repetition of frames makes them more ‘hardwired’ in our brains, connected to emotions and ideologies more than reason [24].

Frames can structure “which parts of reality become noticed” [22]. Lakoff [24] suggests that facts must make sense in terms of the system of frames of the person hearing them, or they will likely be ignored. In this way frames might limit our understanding, e.g., we might have the ‘wrong’ environmental frame to understand the ‘real crisis’ [24]. Public discourse can be thought of as which frames are being activated, and therefore strengthened. In sum, frames “are principles of selection, emphasis and presentation composed of little tacit theories about what exists, what happens, and what matters” ([25], p. 6).

A more constructionist approach suggests that people such as journalists cannot tell stories effectively without preconceived notions [26]. Van Gorp reviews how journalists need myths, archetypes and narratives to cover news events; culturally constructed and embedded frames are part of the journalist’s toolkit, as their symbolic meaning evokes other stories the audience is familiar with [27,26]. Culturally embedded frames are ‘universally understood codes’ [26]. In this approach, the storyteller *chooses* their frames, and in fact, Van Gorp states that ‘individuals can mediate the persuasive power of frames by *using* them’ (2010, p. 89). The documents studied here are reports and reviews, but nonetheless the authors do have an audience in mind.

This paper draws on both approaches. Frames found in the documents studied could be Lakoff’s cognitive tools which shape how we see the world, often unconsciously. However, they could also be Van Gorp’s rhetorical devices, with authors choosing to tell a story whilst invoking certain culturally understood codes that match their agendas. These do not contradict each other, as the authors, in Lakoff’s terms, seek to activate, and thereby strengthen, their preferred frames.

Frames are not fixed, but can change over time, and be replaced in the long term as new frames are born and gain popularity. They can become ‘reified’ in various institutions and cultural practices; they will then not disappear until the institutions and practices change [24]. König [22] suggests two criteria for viability of frames, that is, how likely they are to become culturally resonant: *narrative fidelity*, i.e., how congruent the frame fits with the personal experiences of its audience; and *empirical credibility*, i.e., how well the frame fits with real world events (which might be derived from mainstream discourses). In the context of new vehicle technologies, Ruef and Markard [16] see frames as “overarching expectations which place the technology in the context

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