Practice ecology of sustainable travel: The importance of institutional policy-making processes beyond the traveller

David G. Williams [a,*], Fiona Spotswood [b], Graham Parkhurst [a], Tim Chatterton [a]

[a] University of the West of England, Bristol, UK
[b] University of Bristol, Bristol, UK

ARTICLE INFO

ABSTRACT

Changing mobility behaviour towards activities and actions that have a less detrimental impact on the environment, public health and society is an objective of transport policy jurisdictions globally. In line with a burgeoning body of research examining behaviour and social change, this paper explores the governmental systems that influence mobility behaviours through a social practice lens. This paper blends two social practice theoretical models, the '3-Elements Model' and 'Systems of Provision', as a means of understanding the delivery of the Local Sustainable Transport Fund (LSTF), a central government grant scheme for English local authorities. We examine how the meanings, materials and competences within the practices of bid writing by local authorities and scheme selection by government influenced the distribution of funding to local authorities. The research starts from the principle that, where funding is provided by central government, in the case of this research that of the UK, an opportunity is created for mobility practices to change. The significance of funding is not easily theorised by the 3-Elements model but is more helpfully explained when that model is blended with the wider Systems of Provision model to create a model of practice ecology. Our theorisation allows for a rigorous exploration of the 'practice scaffolding' which shapes how people travel. Policymakers are recommended to consider a practice ecology approach when developing mobility management schemes to tackle air quality, climate change and obesity issues more effectively.

© 2019 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

1. Introduction

Across the world, transport policy has for many decades been designed to influence mobility practices. For example, changes to infrastructure, such as the development of freeways in the USA and the removal of the streetcar system in Los Angeles (Brodsly, 1983), combined with changing the meanings associated with private ownership of vehicles (Sheller, 2004) and property (Forrest & Hirayama, 2015), led to travel by private car becoming the dominant mode of travel. Indeed, new infrastructure aligned with the design of urban areas and buildings (Morrison & Minnis, 2012) helped to make car travel the dominant mode of transport across the higher-wealth economies of the world.

Internationally, policy interventions have been utilised to alter mobility behaviour towards more sustainable patterns of travel, although it has been difficult to prove whether these interventions have had any substantial and sustained effect (Bonsall, 2009). Globally, transport policies have struggled to reduce car dependence. This has been attributed by

---

Nettleton and Green (2014) to the limitations of the theoretical assumptions relating to how and why people travel and how to change behaviour, although support for funding regimes that are designed to maintain the status quo is another explanatory factor (Guiver, 2012). Hence, this paper draws on, and contributes to, the existing literature that advocates the use of practice theory for reframing the policy context of 'behaviour change' along more sociological lines (Cairns, Harmer, Hopkin, & Skippon, 2014; Mattioli, Anable, & Vrotsou, 2016; Shove, Pantzar, & Watson, 2012; Spurling, McMeekin, Shove, Southerton, & Welch, 2013; Watson, 2012). Our research illuminates the potential for a practice-theoretical approach for moving beyond understanding and influencing the behaviour of individuals as they travel, as it focuses on the governmental processes involved in the delivery of Voluntary Travel Behaviour Change (VTBC) schemes, and how the practices embedded in these processes create new opportunities for sustainable travel.

The present paper does not directly analyse the effectiveness of transport policy in altering mobility practices, but instead examines how top-down influence is exerted in a policy delivery hierarchy, taking as example the governance tiers in England. Central government influence is examined as affecting the nature of local transport interventions delivered, which, in turn, are assumed to have a potential influence on mobility practices.

Specifically, our research focused on the practices at three levels of government involved in delivering the Local Sustainable Transport Fund (LSTF) programme, which was designed to reduce Carbon Dioxide (CO_2) emissions from local road transport networks, whilst also improving the local economy where the schemes were implemented (DfT, 2011a). LSTF was a £500 m VTBC funding programme awarded to local authorities across England (excluding London) via a competitive bidding process, with selected intervention packages being delivered between 2011 and 2015. The grant funding needed to be matched by the local authorities in receipt of the awards, creating a total 'pot' of approximately £1bn (Williams, 2015). The LSTF was one of over 50 transport funding streams created by the UK Government between 2010 and 2017, and therefore represents one of many sources of transport funding in the UK (White, 2017).

As noted above, the present paper does not review the impact of the LSTF on travel behaviour, (see DfT, 2016 for a report on outcomes); instead our research examines the practices that underpin the provision of VTBC schemes which create the opportunity for sustainable travel to emerge. We do this through a practice theory lens applying, for the first time, a blended model that draws together the 3-Elements Model (Shove et al., 2012) and the Systems of Provision model (Fine & Leopold, 1993; Fine, 2002). This innovative approach seeks to make practice theory more accessible and useful to policy-makers.

The article is organised as follows: Section 2 reviews the UK Government's approaches to mobility management and VTBC delivery in the UK, and then considers how a sociological perspective can enhance our understanding of the effectiveness of policy, and within that the importance of the institutional processes which are the focus of the paper. Section 3 outlines the practice-theoretical approach which underpins our analysis of policy practices and how these shape mobility. The methodology for our empirical work is discussed in Section 4, with the findings from the research presented in Section 5 and discusses two practices: the practice of bid writing and the practice of scheme selection. Section 6 discusses the utility of a practice-theoretical framework in framing our understanding of how government funding creates the opportunity for sustainable travel to emerge. Section 7 concludes and outlines how this study has added to understanding of how theories of practice can be used to analyse mobility and shape travel behaviour.

2. Travel behaviour change

2.1. Voluntary travel behaviour change policy in the UK

Worldwide, governments are facing significant challenges to reduce Greenhouse Gas (GHG) emissions and improve local air quality. In the UK, the Coalition Government of 2010–2015 outlined its vision for reducing emissions by 80% of 1990 levels by 2050 (Department of Energy and Climate Change, 2011). The UK Government's approach has been largely based around technological fixes, such as supporting the development of both electric vehicles and their market (Millikin, 2015). Alongside technological substitution, changing behaviour, particularly travel behaviour, is seen by politicians and policymakers as an additional approach to tackling GHG emissions. To this end, 'behaviour change' is the broad term for a range of methods used by policymakers to influence the way citizens or organisations enact everyday activities, for social or individual benefit (McSmith, 2010). Internationally, behaviour change is dominated by understandings of how behaviour is motivated and enacted (Shove, 2010; Whitmarsh, O'Neill, & Lorenzoni, 2011). As such the focus tends to be on individuals as the root cause, and solution, of societal problems associated with health, environment or wellbeing. Two of the leading approaches to non-regulatory behaviour change in the UK are organised around understandings of decision-making through a behavioural economics lens, involving choice architecture, and a psycho-social lens, predominantly involving information about opportunity provision.

The popularity of behavioural economics in the UK led to the conception of the Behavioural Insights Team (BIT) within the UK Government's Cabinet Office in 2011 (Office, 2011). Many of the BIT's policy recommendations are based around the concept of 'nudge theory' (Thaler & Sunstein, 2008), where small changes, or nudges, are orchestrated to influence people's behaviour towards healthier or more environmentally sustainable choices. The UK DfT has embedded 'behavioural insights' within the projects it delivers (BIT, 2017), although, to date, no explicit behaviour change policies or programmes involving the public have been announced. 'Nudge theory' has been successful in altering behaviours such as plastic bag usage (Disney, Le Grand, Atkinson, & Oliver, 2013). However, tackling GHG emissions is far more complex, as the release of emissions is a

by-product of a wide range of everyday behaviours. These behaviours, such as travelling using fossil-fuel powered vehicles, are ingrained in peoples' lifestyles both though choice and necessity, and therefore require a different intervention approach. In many cases 'nudges' towards sustainable mobility-oriented behaviours will at best address the 'symptoms' of the problem, rather than the causes (Kenworthy, 2012).

Aside from behavioural economics approaches, the UK has traditionally deployed VTBC interventions. These, as the name suggests, are not designed to restrict travel behaviour, but provide options and support for the traveller to choose an alternative, more sustainable mode of travel. The DfT's 2011 White Paper (DfT, 2011a) introduced the LSTF, and did so with reference to the *Nuffield Council on Bioethics'* 'Ladder of Interventions', reproduced in Fig. 1, as the basis of the options to be provided through the available funding. Hence, the DfT stated that the VTBC schemes in LSTF proposals should seek to enhance information provision, enable choice and guide choice through incentives (DfT, 2011a).

The concept of VTBC schemes is based on the theoretical assumptions that: (i) citizens likely to choose the 'right' option, freely, given the right information and opportunity (Warde, 2005), and (ii) given that they are provided with an offer more appealing than the overall package of benefits associated with car driving (Andreasen, 2006). The assumption is that, if an individual has the information regarding the impact of his or her travel habits, he or she will consider altering behaviour to minimise or mitigate the impact. Conceptual approaches that promote behaviour change through individual choice with little incentive for action, illustrated in the Ladder of Interventions, have been robustly critiqued for not considering the wider societal, corporate and structural forces which shape, and are shaped by, behaviour (House of Lords, 2011); for relying on the capacity for individuals to make meaningful change (Gärling & Fuji, 2006); for failing to challenge social conventions, and by this omission therefore legitimising and reinforcing them (Shove, 2014); and for failing to account for the inseparability of material and socio-cultural context from the everyday performance of daily activities (Barr & Prillwitz, 2014; Ropke, 2009). It is an increasingly settled view that basing population-level behaviour change objectives on individual-level behaviour change initiatives alone will be unsustainable; that is, the latter approaches will fail to change the context of those decisions (Cairns et al., 2014), requiring expensive repetitions with each new generation (Chatterton, 2016).

Behaviour change interventions, such as VTBC, focus on one part of the context of travelling e.g. commuting, ignoring the other factors that interconnect to shape how, why and when people travel. Initiatives that only provide information to travellers, including some VTBC initiatives, are unlikely to have a long-term impact on mobility choices in a context in which income, home location and attitudes influence levels of car ownership (Keyes & Crawford-Brown, 2018). Indeed, VTBC schemes have been trialled and delivered across the world since the 1990 s, but with limited success. Whilst Stopher, Moutou, and Liu (2013) found that VTBC schemes reduced distance travelled in Australia for a period of five to eight years, Arnott et al. (2014) conducted a meta-analysis of 13 worldwide VTBC schemes and found no evidence of a significant reduction in car use or any increase in use of alternative modes of travel. Melia (2013) found no evidence in the UK census of 2011
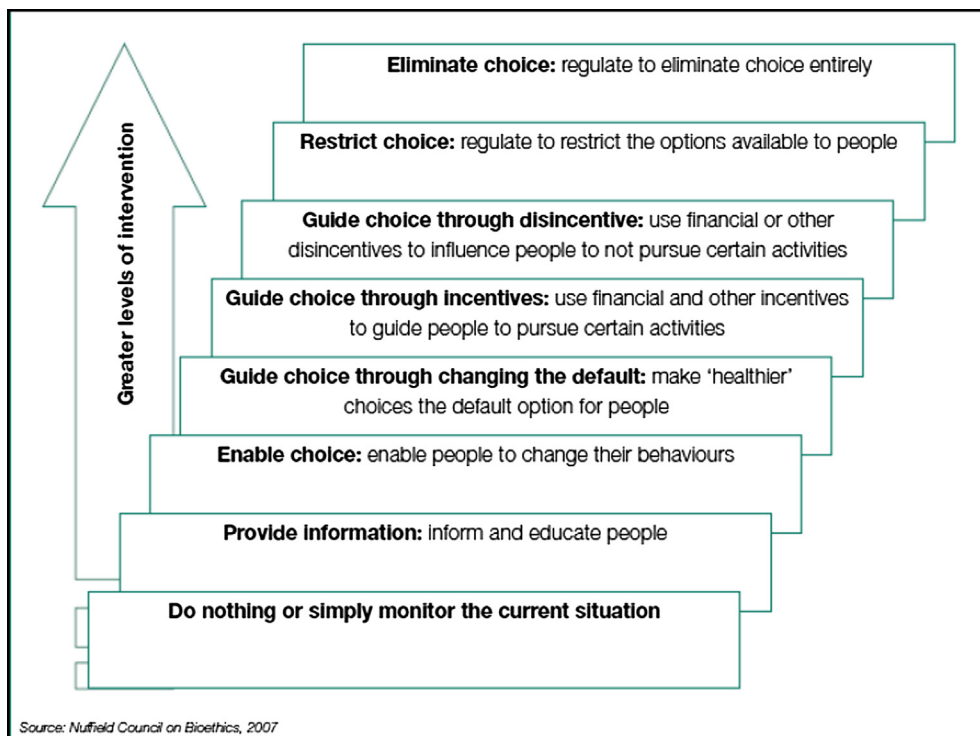

Fig. 1. Ladder of interventions (Nuffield Council on Bioethics, as reproduced in DfT, 2011a).

that the Sustainable Travel Towns programme (2004/5–2008/9) reduced the use of cars in the long-term. It is apparent that providing information or incentive to change travel behaviour is unlikely to result in long-term change if car use remains the simplest, most convenient and most socially normative option. In contrast, limiting choice, or making car-based options less attractive, such as through removing road space, has been found to reduce the total number of trips by car within many cities across the world (Cairns, Atkins, & Goodwin, 2002). The multiple examples highlighted by Cairns et al. (2002) demonstrate the significant power that transport planners and policymakers can wield in influencing mobility practices in relation to the system they manage.

It should also be noted that VTBC schemes are delivered in the context of significant investment, in both the maintenance and construction of new highways, which further promotes travel by car as the dominant mode of transport. Williams, Chatterton, and Parkhurst (2013) found that, in England during the four years of the LSTF (2011–2015), the UK Government planned to provide £9 for new highways schemes for every £1 spent on the LSTF. This difference in funding levels demonstrates how difficult it is for VTBC schemes to make a long-term change to how people travel, when a far greater level of funding is being spent enabling people to continue to drive.

2.2. Sociological approaches to behaviour change

In response to the limitations of the predominantly individualist approaches to behaviour change explored above, there has been growing interest in understanding the potential for sociological understandings of behaviour change, particularly theories of practice, and these have entered policy debates (Chatterton, 2011; Darnton & Evans, 2013). A practice-theoretical view of 'behaviour' is that everyday enactments, such as driving to work or showering, are organised according to practices, which are entities "made up of co-ordinated elements, as well as a performance, which needs to be done, redone and slightly differently done, in order to be recognised as a practice entity" (Keller & Halkier, 2014: 37–38). Elements include objects, which are used according to procedures and rules; doings, involving practical understandings and sets of routinised bodily activities; and meanings, including general understandings, rules and "teleoaffective" structures (Schatzki, 1996, 2000). Practices are entangled together (Gherardi & Nicolini, 2002) forming a nexus of interlocking practices that shape collective understandings about how activities should be undertaken, the monitoring of others' (and our own) behaviours, and practical understandings about the accomplishment of daily routines.

In the context of travel, driving a car to work would constitute a practice. Driving is undertaken according to a defined set of rules, inscribed in part in driving legislation and required skills, but also in social expectations. Driving also requires practical understandings, which is the embodied knowledge which drivers acquire through repeated actions. Driving is also governed by general understandings, such as a sense of freedom, which would overarch it and other practices in a capitalist society. Finally, it has a particular "teleoaffective" structure, in terms of the purpose, goals, ends and emotions which are inherent to the practice (Schatzki, 2000). Driving can be stressful, for example, and a means to an end (getting to work). Teleoaffective structures of one practice can be variable (driving is also convenient), and these are navigated and negotiated by practitioners during their performances (Molander & Hartman, 2018). Driving to work is also bound up within a nexus of other practices within society, including eating breakfast, shopping, childcare or the undertaking of leisure activities (Laakso, 2017), all of which integrate with 'driving' in various ways and help lock the dominance of the car in place (Shove et al., 2012). Within this view, much of the performance of practices is routinised through repeated performances. There are sets of implicitly understood rules about how, when and with what these various activities are undertaken. Thus, the practice-theoretical view significantly advances a perspective of 'sovereign' consumers (Warde, 2005), whose everyday activities are the result of goal-directed or symbolically-driven decisions.

From a 'behaviour change' perspective, theories of practice prompt a paradigm shift in the conceptualisation of both societal problems and policy interventions to address them. The practice, not the individual, is the unit of study and so behaviour change 'problems' are framed as contextualised practices, not individual behaviours (Cairns et al., 2014). Accordingly, the goals of intervention underpinned by practice theory are to shift collective conventions about the way different activities are done so they are no longer unsustainable or harmful (Shove, 2014). This can be achieved by disrupting existing practices, introducing new practices, recrafting practices or substituting practices (Vihalemm, Keller, & Kiisel, 2015).

Theories of practice have been widely used to frame an understanding of sustainability problems and associated behaviour-change approaches (Butler et al., 2014; Gram-Hanssen, 2010; Hargreaves, 2011; Moloney & Stengers, 2014), with an emerging body of work in a transport context (Shove, Watson, & Spurling, 2015). For example, practice-theoretical studies focus on ways of reducing automobility (Birtchnell, 2012; Watson, 2012); and ways of understanding and shaping leisure travelling (Hui, 2012), cycling (Spotswood, Chatterton, Tapp, & Williams, 2015), commuting (Barr & Prillwitz, 2014; Heisserer & Rau, 2017), food shopping (Mattioli & Anable, 2017), car sharing (Kent & Dowling, 2013), and electric car use (Ryghaug & Toftaker, 2014).

Within this body of practice-theoretical transport research, most of the studies focus on the practices of travelling, the performances of mobility practices and the performers who have been recruited to particular transport routines. As such, studies can inadequately analyse the full extent of the socio-political context which shapes the practical routines of travellers. Some papers, in considering how the social order of daily life requires motorised transportation, focus on practitioners who, in enacting practices such as escorting children or transporting heavy goods, often depend on car usage (Mattioli et al., 2016). Others consider how mundane and leisure practices are integrated with, and often impossible without, car travel (Hui, 2012).

There are multiple examples of studies which seek to analyse personal transportation as practice, to reframe the societal problem and make recommendations for policy focus (Heisserer & Rau, 2017; Shove et al., 2015). For example, studies call for a policy focus on shopping-intensive travel patterns (Mattioli & Anable, 2017) or the adoption of electric car driving (Ryghaug & Toftaker, 2014). Furthermore, it is often noted that behaviour change policy must pay attention to reducing the necessity for unsustainable transport practices in order for citizens to live connected, meaningful lives (Cairns et al., 2014). For example, in an experiment in which participants gave up car ownership, Laakso (2017) found that, although bus travel could be a simple substitute for the accomplishment of some practices, participants were forced to dramatically reduced their socialising if friends did not live on bus routes, in which case they felt socially isolated. Cairns et al. (2014) review existing sociological analyses of mobility practices and offer a helpfully broad perspective about the context in which travel choices are made, arguing that achieving sustainable travel at a population level will require "fundamental discussions" at a policy level about the "role that travel plays, or should play, in people's lives and values" (p.115). However, the configuring relations between practices considered by existing mobility practice studies have tended not to consider or adequately theorise the full extent to which policymaking practices, including funding, power-relations, and strongly embedded socio-political trends, intersect and implicate the practices of travelling.

Specifically, the intersecting practices of interest in this study are those of transport planning which occur within local authorities, consulting firms and other service providers hired by local authorities to deliver transportation projects and services. At any one time the practices of local authorities are heavily influenced by the practices of a range of stakeholders, as shown in Fig. 2. These influences have an impact on what infrastructure and which services are provided downstream. In this context, this paper now focuses on the practices of transport planning that occur in local authorities and considers how these ultimately influence the way people travel.

It is helpful that the roots of practice theory can be linked back to structural and institutional influences, such as Giddens (1984) structuration theory which explored both the physical and social structures that influence how and why practices are performed. Institutions play an important role in defining how practitioners perform certain practices, such as travelling, as they can constrain practitioners' ability to participate in other projects and practices (Greene, 2018). Local authorities, through their provision of transport infrastructure in the UK, directly influence how the practice of travelling is performed due to the infrastructure and services they provide, which set meanings and societal conventions about travelling. This research seeks to explore the practices that occur at multiple levels of the governance structure (Hampton, 2018), and how these 'professional practices' ultimately shape everyday travelling (Hoolihan & Browne, 2018).

Concluding this section, we note that a sociological perspective naturally leads to an understanding of the contextualised nature of practical accomplishment. However, by focusing analysis primarily on mobility practices, even at the level of what travelling is 'for' (Shove et al., 2015), rather than conceptualising travel as a choice, current studies have not adequately examined the institutional practices which underpin the cultural and societal context in which travelling exists and evolves. In light of the gaps in current research, the theoretical underpinnings of our study are based on a practice ecology framework, discussed below, which draws on both the 3-Elements model of practice (Shove et al., 2012) and the Systems of Provision model (Fine & Leopold, 1993; Fine, 2002), to theorise how mobility practices are inherently interconnected with, and shaped by, the practices of policymaking.
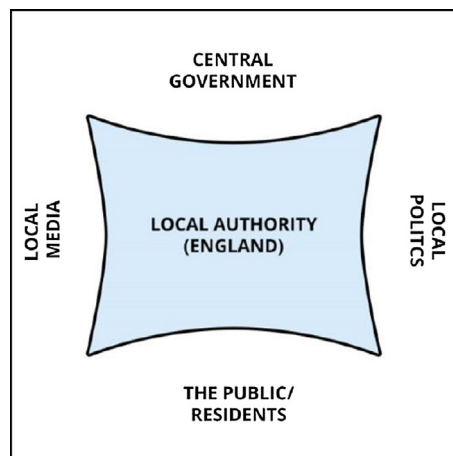

Fig. 2. Influences on Local Authorities (Williams, 2015).

3. Theoretical framework

3.1. Principles of practice ecology

Although there has been much focus on bundles of interrelated practices which co-implicate mobility practices at the level of the traveller (Laakso, 2017), these practices are also interconnected to systems of practices at institutional and political levels. The inherent interconnectedness of practices is helpfully termed 'practice ecology' (Kemmis, Wilkinson, Hardy, & Edwards-Groves, 2009), and we draw on this concept to advance a practice-theoretical analysis of sustainable transport.

The base principle of the practice ecology approach is that the practices all co-influence and are recursively entangled in their ongoing evolution, including those at some distance from the practices performed in the mundane routines of everyday life. For example, practices involving the consumption of technology influence the marketing and production practices of consumer technology goods as much as the other way around. Within the ecosystem of practices are meta-practices; practices at an institutional level that shape those at another level (Kemmis & Grootenboer, 2008). Kemmis et al. (2009: 9) give the example of educational policy and administration "which determine the resources, infrastructure and policies that influence the conditions for educational practice". Although interconnectedness is inherent in practice theoretical interpretations (Blue, 2017), the concepts of co-influence at multiple levels, and of meta-practices, strengthen an ecological practice approach, as they afford a way of foregrounding the ecological relationships that practices have in an ecosystem of interrelated practices (Kemmis et al., 2009).

Practice ecology provides a lens for us to consider the funding and policy-making practices of the transport planning system, which shape the mobility practices of everyday travellers. To operationalise our analysis, we blend the 3-Elements model of social practices with the Systems of Provision model. This combination allows our analysis of sustainable mobility to move beyond the everyday practices and performances of travellers and account for the system of policy and funding meta-practices behind them.

3.2. The 3-Elements model

Theories of practice have multiple roots and a diverse history (Hui, Schatzki, & Shove, 2017; Keller & Halkier, 2014) and can be deployed in numerous ways. There are various models which seek to consolidate the tenets of these theories (Magaudda, 2011; Reckwitz, 2002; Schatzki, 2000; Warde, 2005) but within the sustainability field, the simplified 3-Elements model of social practices is ubiquitous (Shove et al., 2012). The 3-Elements model, shown in Fig. 3, conflates the various elements suggested by earlier scholars, e.g. Schatzki (2000), Reckwitz (2002) and Warde (2005), into materials, competences and meanings. Materials include: things, technologies, tangible physical entities, and the stuff of which objects are made. Competences encompass: skill, know-how, and technique; and meanings include: symbolic meanings, ideas and aspirations (Shove et al., 2012).

The 3-Elements model attempts to merge physical and social elements and offers a lens for understanding how each of these elements informs and influences the others. As well as emphasising the importance of every element (Shove et al., 2012), the 3-Elements model emphasises the links between elements. Breaks to these links enable practices to be performed in different ways, new practices to emerge, or for practices to cease to exist. An example of the emergence of a new travel practice emerged from the construction of the railway network in the 19th century, which provided a range of new materials for travel, demanded new competences of people travelling long distances and shifted the meanings and expectations about who could travel, how and when. As illustrated in Fig. 4, the 3-Elements model extends beyond a granular analysis of any specific practice towards a way of theorising the connections between practices as they co-exist in bundles.
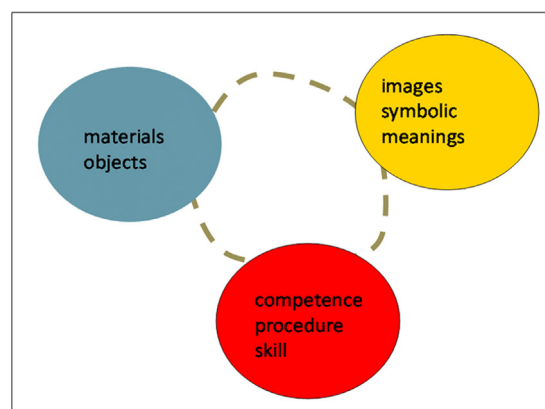

Fig. 3. The 3-Elements Model. Adapted from (Shove et al., 2012; Chatterton & Anderson, 2011).
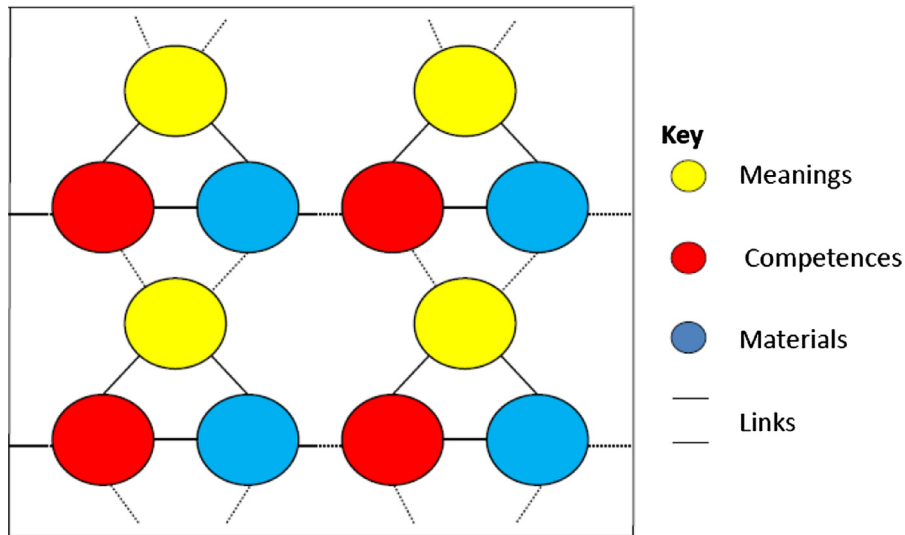
Fig. 4. The interconnectedness of practices. Adapted from (Shove et al., 2012, Williams, 2015).

However, the 3-Elements model has been critiqued for failing to adequately theorise connections between different types of practices in a large ecosystem; for example how the practices of governance implicate the practices of travelling (Cairns et al., 2014). To address this limitation, we draw on the Systems of Provision model to advance the usability of theories of practice.

3.3. Systems of Provision with the 3-Elements: a blended framework

Fine and Leopold (1993) System of Provision conceptualises "chains of activity" that exist within a delivery network. Fine (2002: 79) defines a System of Provision as: "an inclusive chain of activity that attaches consumption to the production that makes it possible". Whilst the model was originally designed to explore the systems that provided goods, it has also been used to assess the delivery structures within public services (Bayliss, Fine, & Robertson, 2013). Fig. 5 illustrates the transport planning System of Provision that existed in the UK at the time the LSTF was delivered in terms of the sphere of influence for creating a change to the existing system.

In our blended theory, at each level of the System of Provision there are bundles of practices, including meta-practices such as those incorporated in the professional practices of transport planning. According to the model, these practices are influenced by the practices of travelling and above by practices within the civil service and ministerial level of national government, i.e. in a multi-level governance model (MLG) (Hampton, 2018), where different organisations are responsible for delivering the National Government's vision set out in the 2011 White Paper. Fig. 5 illustrates that the influence between levels of the system operates in both directions, although the top-down flow of meanings (from the 2011 White Paper) and funding is particularly strong. However, the practices of everyday travelling will also influence the practices that occur at the national government level, for example through the reproduction of societal meanings that influence the practices of government.

This blended framework (Fig. 6) affords a simplification of practice hierarchies (Warde, 2015) by helping identify flows of influence between the different practices in the system, as well as identify how change occurs within the system which might impact on the materials, meanings and competences available for the practice of travelling. Governmental meta-practices provide the infrastructure and in some cases funding for services to enable travel practices to be performed. Whilst private companies, such as bus providers, or local community groups offering services such as 'dial-a-ride', or transport-technology companies such as Uber can alter practices, they do not provide the basic material infrastructure for this change to occur. This is why this study focuses on the governmental system and its ability to create the conditions for sustainable travel practices to occur.

Unlike other sociological methods, such as Social Network Analysis, which place the individual, or group of individuals at the heart of analysis, our study uses the blended model to focus on practices within the system of provision as the central unit of enquiry. We explore how a change to this system of practices, through sustainable transport funding, implicates other parts of the practice ecosystem. The new or altered practices might provide new combinations of materials, meanings and competences that provide the opportunity for the practices of travelling to be performed in a sustainable way. The following section explains the methodology used to operationalise these theoretically-driven ideas.
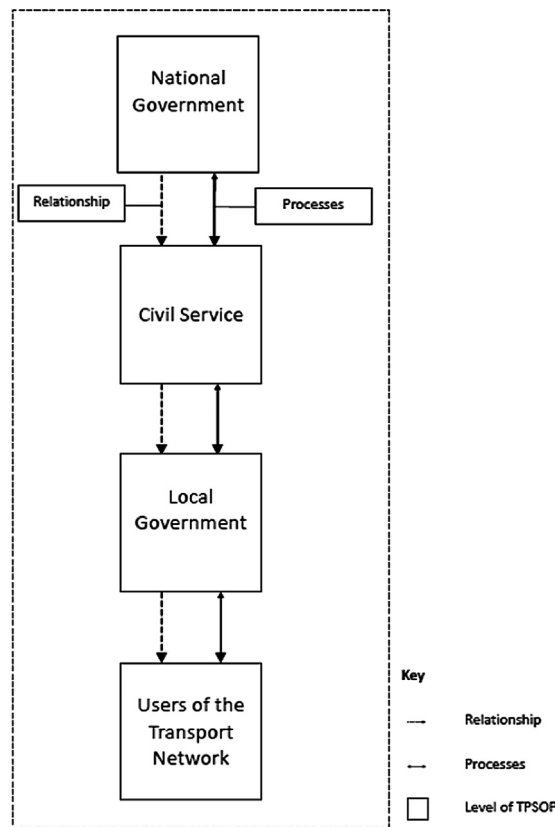
Fig. 5. Transport Planning System of Provision (Williams, 2015).

4. Methodology

4.1. Policy context

This study uses the LSTF as a case study. LSTF represented a step-change in funding for sustainable transport intervention in the UK, albeit in the context of continued funding for new highway infrastructure as discussed in Section 2. LSTF was a time-limited, standalone funding stream. The DfT's 2011 White Paper that introduced the LSTF was the mechanism used for setting the meanings for defining VTBC schemes within the System of Provision. These meanings came from the national government level of the system.

4.2. Content analysis methodology

The research employed two methodologies and drew upon two datasets. A content analysis was undertaken of all 145 LSTF bid documents submitted to the Department for Transport (DfT) by local authorities in England in 2011. The content analysis was designed to identify the meanings embedded in the wording of funding applications submitted by both successful and unsuccessful applicants.

Whilst the meanings within the text were important, the research was also designed to capture the competences that transport planning practitioners utilised to win funding. Therefore, the success or failure of the bids, discussed in the context of the relationships and power that exists within the transport planning system discussed in Section 5, relate to the competences of the practitioners to interpret and incorporate the right meanings into their bidding practice.

The application process involved a pro-forma template, provided by the DfT, consisting of five sections, shown in Table 1. Section B was of primary interest as it included the objectives of the bid and it was possible to review how these aligned with the DfT's objectives for the LSTF. Section C was also analysed, as it included a list of schemes to be delivered, from which it was possible to identify the purpose of each proposed intervention that would be delivered through receipt of the LSTF funding. Section A provided an overview of the area, Section D included a summary of how the money would be spent, and Section E gave an overview of the delivery process. Whilst Sections A, D and E are of contextual interest, and would be important
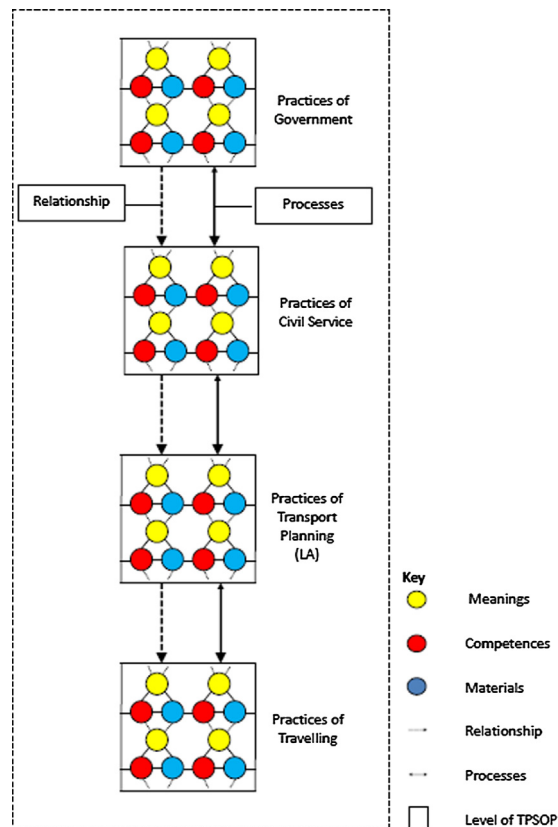
Fig. 6. Theoretical Framework incorporating the 3-Elements nexus within the System of Provision (Williams, 2015).

to the decision-making process, they did not provide any details on the objectives or types of schemes that were being delivered.

All 145 LSTF bid documents submitted to the DfT for funding in 2011 and 2012 were included in the content analysis. In total 96 bids were funded (including 2 merged bids), 16 invited to resubmit and 32 were not funded. The 2011 White Paper identified supporting the local economy and reducing carbon emissions as the two primary objectives of any VTBC scheme that would be funded through the LSTF programme. Two chi-square tests of independence were performed to test (i) the working hypothesis was that the inclusion of the DfT's objectives influenced whether bids received funding; and (ii) that the success of the proposal was related to the way the bid articulated the purpose of the intervention. The chi-square test was chosen to demonstrate whether the inclusion of DfT objectives observed was due to chance, as it measures how well the observed distribution of data fits to what was expected. The schemes were coded in the following categories based on the stated intention of the application about what it was designed to achieve: enabling travel; enabling journeys by car; incentivising (financial); incentivising (non-financial); disrupting car use; and reducing the need to travel. These codes were used during the analysis to explore how meanings situated across the practice ecology, at the 'top' levels of the system of provision, had influenced what type of schemes were successful in being funded, and therefore as a result became accepted as 'sustainable transport'. At each stage of the coding process, the codes and outputs were rigorously examined by the other members of the research team.

Table 1
Sections of LSTF Bid Submission Proforma (DfT, 2011b).

Section	Overview
A	Project name; headline description; a summary of the geographical area; the type bid; the cost of the package and DfT contribution sought; a spend profile for the project and what the local contribution will be; how it would be funded; and which bodies would be working in partnership with the authority
B	The local context; evidence for the need for the funding and the objectives the scheme was designed to meet
C	Package description; a more detailed breakdown of the package costs, the rationale and strategic fit of the bid and community support
D	The value for money assessment; financial sustainability
E	Implementation; output milestones, a summary of key risks, and project evaluation

4.3. In-depth interview methodology

The second dataset was derived from 20 in-depth interviews undertaken with individuals involved in the LSTF funding process. These included:

- A government minister (1 interviewee);
- A sustainable transport campaigner on the LSTF independent advisory panel (1 interviewee);
- Civil servants (2 interviewees); and
- Local authority transport planning practitioners (16 interviewees).

The interviewees were identified though the LSTF bid submissions and the authors' contacts sourced through the transport planning sector. University ethical approval procedures have been followed and included measures to protect participant anonymity.

The interviewees were asked questions relating to their experience of the selection process, the LSTF funded schemes and delivery process, and the expected legacy of the funding intervention. The discussion guide included six sections and was used to steer the conversation towards key themes of interest for the research: (i) the interviewee's background and experience, (ii) the impact of the LSTF, (iii) evidence of government 'steer' in the system, (iv) theories of behaviour change, and (v) what the interviewee's idea of a notional 'perfect' funding stream would entail. Inductive thematic analysis guided by the theoretical framework was conducted on the resulting transcripts using the software package NVivo to code and group passages of text into themes and sub-themes (Braun & Clarke, 2006). This analysis was designed to further enhance understanding of how VTBC schemes were selected, funded and delivered. This process was used to build a picture of how the funding processes shape the materials, meanings and competences of practices up and down the System of Provision, including travelling practices.

The coding process followed the six steps recommended by Braun and Clarke (2006): (i) Familiarising yourself with the data, identifying the key themes that exist in the data; (ii) transcription of verbal data (all datasets were transcribed and reviewed three times as part of an iterative process), (iii) generation of initial codes (this formed the primary of codes, which are shown in Table 2) (iv) searching for themes within the set of codes, (v) reviewing themes (undertaken by the whole research team), and (vi) defining and naming themes to generate the secondary codes used in the analysis.

Practices are a theoretical construct, so cannot be 'seen' (Warde, 2005). This research instead focuses on a range of visible performances which are significant to the practice ecology of the VTBC delivery system, conceptualised through the blended model of 3-Elements and Systems of Provision. The focus was on 'professional practices', some of which are conceptualised as meta-practices, within the UK system of governance that enables and shapes the performance of mobility practices. These

Table 2
Sections of LSTF Bid Submission Proforma (DfT, 2011b).

Primary code	Secondary code
Changes to Department	Staff changes
	Cross-working between departments
	Working with stakeholders
Maintenance	General maintenance of infrastructure
Finance	Revenue funding
	Capital funding
	Whole life costs
	Consistency of funding
	Finance – post-2015
Behaviour Change	Nudge theory
	Individual choice
	Societal influences
	Meanings
	Changing meanings
Power and Influence	Central Government
	Local Enterprise Partnerships
	Local Authority influence
	External influences
LSTF	LSTF Delivery
Evaluation Process	Measuring transport benefits
	Forecasting
Disruption to Current Practices	Prohibiting private vehicle use
	Disincentivising private vehicle use
	Demand management

include funding, bidding, designing and implementing transport initiatives. These discrete practices form part of the ecology of practices that ultimately influences what VTBC schemes are delivered and how they influence people's travel.

5. Findings

The findings focus on two sets of practices that exist within the transport planning System of Provision: bid writing and selection of successful schemes. Both practices occur physically and conceptually removed from individuals' travel practices, yet both influence the materials, meanings and competences that do have a direct bearing on travel practices.

5.1. The practice of bid writing

The working hypothesis: "*the inclusion of the DfT's objectives influenced whether bids received funding*", was not supported by the analysis. The majority of both successful and unsuccessful bids included specific references to the two primary objectives: *supporting the local economy* and *reducing carbon emissions*. As Table 3 shows, there was not a statistically significant association between inclusion of either of these objectives, or any of the secondary objectives identified within the 2011 White Paper, and a proposal receiving funding.

The results shown in Table 3 are not a surprise, as the transport planning professionals undertaking the practice of bid writing were able to interpret meanings from government documents and incorporate this working into bid documents. Nonetheless, it is interesting to note that five successful bids did not explicitly mention supporting the local economy, and nine did not mention reducing carbon emissions, although every successful bid mentioned at least one of these objectives.

It can be postulated that the way in which individual transport planning practitioners interpreted the government's advice is likely to have varied according to a range of factors, including competences and meanings derived from their own understanding of the issues, the materials already *in situ* within each local authority area, and the skills, knowledge and ideas that existed within the specific local authority. However, it is possible to identify what the national government and civil service levels of the system of provision intended for the LSTF schemes to achieve by analysing the focus of each application, whether it was funded or not and the purpose of each proposed scheme as revealed by the presence of specific themes. Table 4 provides an overarching outcome that the national government expected if the LSTF scheme was delivered and supports the hypothesis of the second chi-square test: that the success of the proposal was related to the way the bid articulated the purpose of the intervention.

Hence, Table 4 demonstrates that there was a statistically significant association between a scheme being 'successful' (i.e. selected for DfT funding) and the application having made a specific reference to how the scheme would enable people to travel other than by car. There was also a significant association between acceptance and explicit reference in the application to non-financial incentives, such as cycle training. The LSTF funding was provided to enable people to travel by alternatives to private cars, so it is understandable that this would influence whether a scheme would be funded, but the association with non-financial incentives for behaviour change, and the lack of associations with other objectives could not be assumed, and are notable. The results show how the meanings pass through the System of Provision to different practices, as the materials and competences to travel in a certain way were defined by the DfT civil servants and national government. Only funding bids that met the criteria set and were explicit in the wording of how the promised outcomes would be achieved received funding.

Table 3
Success of bid, whether it contained DfT objectives and chi-square significance.

LSTF NVIVO Analysis Total Number of Bid Type	Successful Bids 96	Resubmit Bids 16	Refused Bids 32	Chi-square Significance
Supporting the Local Economy	91	16	30	p = 0.591
Reduce Carbon Emissions	87	14	30	p = 0.733
Reducing Congestion	76	11	24	p = 0.684
Improving Journey Time Reliability	50	9	11	p = 0.192
Improving Journey Time Predictability	27	6	8	p = 0.654
Enhancing Access to Employment	72	14	21	p = 0.263
Active Travel Walking	85	15	26	p = 0.449
Active Travel Cycling	93	16	29	p = 0.308
Deliver wider social and economic benefits	70	15	22	p = 0.146
Accessibility	86	13	24	p = 0.160
Improving Safety	80	16	27	p = 0.194
Improving Air Quality	53	7	13	p = 0.332
Promoting Healthy Living	84	13	26	p = 0.700

Table 4
Success of bid, in relation to scheme purpose and chi-square significance.

LSTF NVIVO Analysis Scheme Purpose	Successful Bids 96	Resubmit Bids 16	Refused Bids 32	Chi-square Significance
Enabling Travel (Non-Car)	96	16	29	**P = 0.034**
Enabling Journeys by Car	60	9	18	P = 0.810
Incentivising Financial	49	11	14	P = 0.259
Incentivising Non-Financial	92	14	25	**P = 0.019**
Disruption to Cars	32	9	7	P = 0.058
Reduce Need to Travel	15	3	4	P = 0.842

5.2. Practice of scheme selection for funding

Whilst Section 5.1 shows that almost all transport planning practitioners were able to incorporate the key words and appropriate schemes into their funding bids, the final decisions on which schemes were selected for funding were made through the practice of 'scheme selection'. This practice occurred at the civil service level of the System of Provision, although it was influenced by national government practitioners (government ministers), as demonstrated by the following quote by an interviewee, who was a civil servant:

> "We put recommendations to ministers. The Parliamentary Under-Secretary for Transport personally read just about every bid, at incredible high speed. We'd go up to his office with a pile of bids and say: 'we recommend you approve these'. He'd flick through them all and ask challenging questions and he really did influence the decisions; he was not rubber stamping what we recommended and made quite a few variations, as did the Secretary of State, to what we advised as officials should go forward for funding."

The quote demonstrates that meanings within the transport planning System of Provision were influenced by senior government ministers and adopted within the practice of scheme selection. The competences of the civil servant practitioners of administering complex funding schemes was altered by meanings delivered through relationships and processes that exist between the meta-practices of government. What is clear, however, is that the Parliamentary Under-Secretary for Transport read all the documents and made the final decision on several of the funding applications, in some cases going against expert advice, or competences of civil servant practitioners. This demonstrates the influence of the national government level in defining what a sustainable transport scheme was.

Other factors, outside the scheme selection process, also influenced this decision-making process:

> "The DfT told us they would not give us money [for the LSTF] *because we'd secured major scheme funding for a new road.*"

The quote demonstrates how meanings from outside the LSTF process could influence whether LSTF schemes would receive funding. Wider decisions within the DfT funding processes, concerning the other 50 funding streams highlighted by White (2017), influenced the LSTF scheme selection process. Whilst the LSTF's meanings associated with sustainability and the local economy were important within the decision-making process, it is likely that meanings associated with providing a 'fair share' of funding within the DfT were also influential in the practice of scheme selection.

5.3. Constructing materials, creating competences and changing meanings

The two practices of bid writing and scheme selection delivered through the LSTF funding stream created additional meanings in the meta-practices of transport planning. Although this paper does not review the outcomes of the LSTF schemes, it was possible to see the impact the successful schemes started to have on other elements of the transport planning System of Provision. Meanings associated with transport planning altered within local authorities due to positive feedback from the public:

> "We've seen local communities get behind cycle routes... So, people have just gone out and talked and engaged with the local community… It's coming through to local politicians who are saying to us, suddenly: 'How fast can we promote these cycle schemes?' We say: 'We've taken it to a certain point; we just need the funding to deliver it, which we don't have'."

In this case, the combination of both new physical assets (materials), consultation (competences) and marketing (meanings) increased interest in sustainable transport within the local authority area, leading local politicians to take an active interest in sustainable transport and the wider benefits this provided for their community. The decisions made both within the bidding process and scheme selection process had started to alter the transport planning System of Provision and the meanings that existed within it at the local authority level of the system.

Other changes also occurred within authorities that received LSTF funding, including the allocation of additional transport planning practitioners to deliver the schemes. Local authorities employed new staff, or existing staff were redeployed, as explained by one interviewee:

"The best way to use the funding to achieve transport behaviour change, economic growth and CO_2 reduction is to actually have people to deliver schemes on the ground. We have delivered PTP [Personalised Travel Planning] *and business travel planning"*.

This influx of new transport planning practitioners, (or as one interviewee described them, *"an army of sustainable transport officers"*), within the local authority level of the System of Provision generated a host of new meanings and competences, as well as helping to provide new materials that were designed to enable people to travel by sustainable modes. These created opportunities for citizens to gain the competences to travel that did not exist prior to the VTBC scheme being delivered, and in doing so providing a benefit to the local economy, as explained by an interviewee working for a local authority:

"Because we've been able to pick up the pieces where there's a slip through the system, 80 people have found themselves in full-time employment. And we are talking about all spectrums here as well: from people with learning disabilities to people who've been made redundant and just want to get back into employment. They've found our assistance has helped; it was very worthwhile".

The low-cost measure that had led to the positive outcomes reported in this excerpt, providing bus tickets to people looking for work, represented the very essence of the LSTF ethos, as it provided tickets (materials) combined with training to use the public transport system (competence) that together altered, if, how, and when people travelled. Ultimately, it benefited both the individual and the local economy, fulfilling the key objectives of the LSTF funding stream.

These findings demonstrate the importance that the practices which shape the flows of funding play within the System of Provision, as they enable citizen practitioners to travel in a sustainable manner.

5.4. Summary

Our study findings demonstrate the impact that the practices of bid writing and scheme selection can have on the ecosystem of practices which ultimately shape how the practices of travelling are performed. The findings show that funding and power are entangled with all the elements of practices across the transport planning system. For example, the meanings of what constitutes a VTBC scheme are embedded at the civil service level but are influenced by meanings generated by government ministers and other transport schemes that have been funded. The practices of distributing funding, the bidding process for this funding, the decisions about what this money should be spent on, and where it should be spent, all ultimately influence how 'travelling' is performed; mobility practices lying much lower down the system of provision. Section 6 discusses how the theoretical model presented and explored in this paper adds to our understanding of how change occurs in everyday practices of travelling.

6. Discussion

The findings presented in Section 5.1 demonstrate that practitioners at the local authority level of the sustainable transport System of Provision have the competences to enable them to interpret and incorporate the meanings associated with sustainable travel that have emerged from practices at both the civil service and national government levels of the system and manifested through their inclusion in the 2011 White Paper and LSTF application guidance. The findings suggest that most transport planning practitioners are adept at writing what the funder requires to be demonstrated as part of the application. This has been described as *'playing the game'* by one interviewee in terms of ensuring that the local authority received funding.

The results presented in Table 4 show that the meanings of what constitutes a VTBC within the System of Provision are defined within the practices that occur at the national government level of the system. That is, VTBC schemes are designed to ensure people continue to travel, albeit by more sustainable modes. At the local authority level, an alternative meaning existed (reducing the need for travel), as identified in some of the applications for LSTF funding, but the civil service level of the system dismissed these meanings by not accepting any applications citing these goals. This example demonstrates how the meanings from the national government and civil service flow through the System of Provision. The dominance of meanings stemming from national government is manifested and controlled through the level of funding provided to the local municipalities, and reconstituted through the performances of those bidding successfully.

The findings in Section 5.2 show that some of the funding decisions for the LSTF differed from the expertise and recommendations of the practitioners at the civil service level of the system, where the Senior Under-Secretary for Transport made the final decision. Here it was possible to identify the influence of the meanings and knowledge at the national government level on decisions about which bids would receive funding. The subsequent funding decisions had significant impacts on the local authorities in terms of both the number and type of staff they were able to employ, the schemes they were able to deliver, and provided the opportunity for travel practices to change within the areas that received funding.

6.1. Contributions to understanding how to change practices

One of the weaknesses of the 3-Elements model when used as a standalone mechanism for theorising practices is that it fails to adequately include the processes that systematically afford change within the practice elements from higher levels of an ecosystem of practices. In this case study, the process of change was prompted by the availability of funding to deliver

sustainable transport schemes. Funding does not fit neatly into any of the three elements: materials, meanings and competences. Funding is the manifestation of power within the System of Provision, but it is not a physical material, nor is it a competence, although the use of funding by transport planning practitioners to deliver schemes requires particular skills and know-how. However, funding has meanings associated with it that influence how and where it is used within the system, and can unlock materials, meanings and competences through its deployment. Funding and finance are both drivers of change for transport practices and the practice ecology theorization used in this research affords the mapping of these non-human agents of change. Through the financial stimuli added to the system by the government it is possible to see that the meanings associated with sustainable transport changed at both the local authority level and the traveller level of the sustainable transport System of Provision, as the schemes are delivered.

This research contributes to our knowledge of the practice theoretical interpretations of transport behaviour by exploring how the type of funding supplied by national government as part of the LSTF influenced the three elements of the practice of travelling. The aim of the DfT was for the LSTF to include over 50 percent of the funding to be revenue funding (DfT, 2011b). Funding provided to local municipalities in England is broken down into two types: capital and revenue. Capital revenue is the acquisition or creation of a tangible fixed asset. Revenue expenditure is the operating costs incurred providing a service (Hampshire County Council, 2010). Local authorities receive mainly capital funding for transport from central government through a grant allocation (UK Government, 2017), and this is used to build or maintain existing fixed assets. As such, most local authority transportation teams are perceived to be 'capital rich' and 'revenue poor', in contrast to the more revenue-intense social services budgets (Butler, 2013). As a result, prior to the LSTF, highway teams within local authorities rarely had the flexibility within budgets for the materials, or to develop the professional skills (competences), for marketing or promoting sustainable transport.

The introduction of revenue funding to the transport teams in local authorities created change as it altered the materials available for transport practitioners, e.g. funding for cycle maps, the competences, such as the delivery of marketing and PTP programmes, and the meanings of the practices performed by transport planning practitioners. The research shows that changes to the meanings associated with the type of funding provided for transportation can create changes to the types of transport solutions proposed, and therefore provided, potentially increasing the funding available for sustainable transport, and increasing the opportunities for people to travel in a sustainable way. In the case of the UK the hierarchical relationship of national government and local authorities was core to these processes. Elsewhere, perhaps with more devolved models of governance, or differences in the hierarchical tiers of governance, the dynamics of changing meanings can be expected to play out differently, reflecting the specifics and features of the locale.

6.2. Contribution of the practice ecology approach

The theoretical model defined in this paper advances the usability of the 3-Elements model by synthesising with it understandings of Systems of Provision, and thereby illustrating through the blended model the additional processes, such as bidding for funding and power relationships, that shape practices. The blended model theorises the way that the meanings, materials and competences associated with funding can create change right down to the level of the practice of travelling. When the 3-Elements Model is combined with the System of Provision, fuller visibility of the practice ecosystem is possible.

This new theoretical model has the potential of making theories of practice more accessible to policy-makers by making more visible the pathways and processes that a policy intervention will follow. In introducing the blended model to transport policymakers and researchers we are introducing a more flexible, practicable interpretation of abstract theoretical ideas that have failed so far to be used meaningfully by policymakers in policy design, particularly for transport. We are contributing to the burgeoning stream of research which attempts to reframe practice theoretical ideas for practical application in real world behaviour change problems (Chatterton & Wilson, 2013; Spurling et al., 2013; Wilson & Chatterton, 2011).

6.3. Implications for future research

The theoretical model provides a means of identifying how transport systems are designed, managed and funded. Shove et al. (2015) argue that:

"It is tempting to conclude that the professionals and policy-makers who influence infrastructural provision have some privileged status in steering what people do".

The present paper has demonstrated that in a hierarchical and centralised governmental system such as the UK, professionals and policy-makers influence what materials, and competences are available to enable people to travel, and the meanings associated with them. When the funding provided by the government to local authorities is spent on highway infrastructure and maintenance, then this is the way people will predominantly travel. The findings presented demonstrate how the meanings associated with transport move through the System of Provision and influence other practices in the adjoining nexus of practices. Future research using this model should focus on other systems, such as urban regeneration, healthcare or education, to identify how and where influence exists within these practice ecosystems and how this influence flows up and down the System of Provision.

7. Conclusion

The analysis in this paper has demonstrated the potential benefits the practice ecology approach provides for understanding how change occurs within a nexus of practices. Specifically, we blended the 3-Elements model with Systems of Provision to theorise the practice ecology of which sustainable or unsustainable transport is a part. Within policy-making, there are meta-practices such as bid writing for funding by local authority practitioners, which have a strong impact on population level personal mobility and transport practices. Our approach presents theories of practice as useful for understanding the impact of policy decisions and moving beyond an analysis of travelling practices. The model addresses the weakness of the 3-Elements model, as it incorporates non-human agents of change, such as funding, and identifies where in the ecosystem of practices this change occurs.

Using the LSTF as a case study, it has been possible to identify how the practices that occur within the national government, the civil service and local authorities influence the materials, competences and meanings that exist around how practitioners perform the practice of travelling. The blended System of Provision modelled in this research is just one strand of the ecosystem that influences the performance of travelling, but nonetheless, studying it has provided an insight into what a national government can do, or indeed already does, to influence the practice.

Moving beyond the importance of national governments, future research should consider the role the private sector has on influencing travel practices, particularly in relation to the development of electric and autonomous vehicles (Parkhurst & Lyons, 2018). Our findings suggest that national government, through this System of Provision, are responsible for the infrastructure and services that exist to make the practices of travelling occur. These practices would not be possible without the provision and maintenance of infrastructure that enables people to travel.

The authors recommend that the blended model is trialled by national governments in the planning and delivery of funding streams as a way of identifying whether it is possible to map how and where changes are required to enable long-term, sustained travel practice.

The limitations of this research are that at the local authority level the research only interviewed transport officers involved in the LSTF, rather than those involved in other areas of delivery, such as other areas of transport, finance, legislation/regulation and the views of elected local authority members. All these people are likely to influence the type of scheme delivered, although they will rely on the transport expertise of their own officers.

Acknowledgements

References

Andreasen, A. R. (2006). *Social marketing in the 21st century*. London, UK: SAGE. ISBN: 9781412916349.

Arnott, B., Rehackova, L., Errington, L., Sniehotta, F., Roberts, J., & Araujo-Soares, V. (2014). Efficacy of behavioural interventions for transport behaviour change: Systematic review, meta-analysis and intervention coding. *International Journal of Behavioral Nutrition and Physical Activity, 11*, 133. https://doi.org/10.1186/s12966-014-0133-9.

Barr, S., & Prillwitz, J. (2014). A smarter choice? Exploring the behaviour change agenda for environmentally sustainable mobility. *Environment and Planning C: Government and Policy, 32*, 1–19. https://doi.org/10.1068/c1201.

Bayliss, K., Fine, B., & Robertson, M. (2013). From financialisation to consumption: The systems of provision approach to applied to housing and water. *London: FESSUD Working Paper Series, 2*, 1–43.

Birtchnell, T. (2012). Elites, elements and events: Practice theory and scale. *Journal of Transport Geography, 24*, 497–502. https://doi.org/10.1016/j.jtrangeo.2012.01.020.

Behavioural Insights Team [BIT]. (2017). An exploration of potential behavioural biases in project delivery in the department for transport. Available from: <http://38r8om2xjhhl25mw24492dir-wpengine.netdna-ssl.com/wp-content/uploads/2017/08/An-exploration-of-behavioural-biases-in-DfT.pdf>. Accessed 21/06/2018.

Blue, S. (2017). Maintaining physical exercise as a matter of synchronising practices: Experiences and observations from training in Mixed Martial Arts. *Health and Place, 46*, 344–350.

Bonsall, P. (2009). Do we know whether personal travel planning really works? *Transport Policy, 16*, 306–314.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–101. https://doi.org/10.1191/1478088706qp063oa.

Brodsly, D. (1983). *L.A. Freeway: An appreciative essay*. Berkley, USA: University of California Press. ISBN: 0-520-04546-7.

Butler, D., Farmani, R., Fu, G., Ward, S., Diao, K., & Astaraie-Imani, M. (2014). A new approach to urban water management: Safe and sure. *Procedia Engineering, 89*, 347–354. https://doi.org/10.1016/j.proeng.2014.11.198.

Butler, M. (2013) Funding for highways and transportation: A local government perspective, devolving major schemes seminar, Taunton, UK, 21 November 2013.

Cabinet Office (2011). Annual Update 2010–11. Available from: <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/60537/Behaviour-Change-Insight-Team-Annual-Update_acc.pdf>. Accessed 18/03/2014.

Cairns, S., Atkins, S., & Goodwin, P. (2002). Disappearing traffic? The story so far. *Proceedings of the Institution of Civil Engineers - Municipal Engineer, 151*(1), 13–22. https://doi.org/10.1680/muen.2002.151.1.13.

Cairns, S., Harmer, C., Hopkin, J., & Skippon, S. (2014). Sociological perspectives on travel and mobilities: A review. *Transportation Research Part A, 63*, 107–117. https://doi.org/10.1016/j.tra.2014.01.010.

Chatterton, T. (2011). *An introduction to thinking about 'energy behaviour': A multi-model approach* Available online. Department of Energy and Climate Change http://eprints.uwe.ac.uk/17873.

Chatterton, P. (2016). Building transitions to post-capitalist urban commons. *Transactions of the Institute of British Geographers, 41*, 403–415. https://doi.org/10.1111/tran.12139.

Chatterton, T., & Anderson, O. (2011). *An introduction to thinking about 'energy behaviour': A multi model approach*. London, UK: DECC.

Chatterton, T., & Wilson, C. (2013). The 'Four Dimensions of Behaviour' framework; a tool for characterising behaviours to help design better interventions. *Transportation Planning and Technology, 37*, 38–61. https://doi.org/10.1080/03081060.2013.850257.

Darnton, A., & Evans, D. (2013). *Influencing Behaviours: A technical guide to the ISM tool*. Scotland, UK: Scottish Government.

Department of Energy and Climate Change (2011) The Carbon Plan – reducing greenhouse gas emissions. Available from: <https://www.gov.uk/government/publications/the-carbon-plan-reducing-greenhouse-gas-emissions–2>. [Accessed 17/10/2018].

Department for Transport [DfT]. (2011a). Creating growth, cutting carbon: Making sustainable local transport happen. Available from: <https://www.gov.uk/government/publications/creatinggrowth-cutting-carbon-making-sustainable-local-transport-happen>. Accessed 11/10/2012.

Department for Transport [DfT]. (2011b). Local sustainable transport fund – guidance on the application process. Available from: <https://www.gov.uk/government/collections/localsustainable-transport-fund>. (Accessed 18/10/2012).

Department for Transport [DfT]. (2016). What works? learning from the local sustainable transport fund 2011–2015. Available online: <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/584463/lstf-what-works-report.pdf>. Accessed 24/03/2017.

Disney, K., Le Grand, J., Atkinson, G., & Oliver, A. (2013). From irresponsible knaves to responsible knights for just 5p: Behavioural public policy and the environment. In A. Oliver (Ed.), *Behavioural public policy* (pp. 69–93). Cambridge, UK: Cambridge University Press. https://doi.org/10.1017/CBO9781107337190.004. ISBN: 978-1-107-04263-6.

Fine, B. (2002). *The world of Consumption*. London, UK: Routledge.

Fine, B., & Leopold, E. (1993). *The world of consumption*. London, UK: Routledge.

Forrest, R., & Hirayama, Y. (2015). The financialisation of the social project: Embedded liberalism, neoliberalism and home ownership. *Urban Studies, 52*(2). https://doi.org/10.1177/0042098014528394.

Gärling, T., & Fuji, S. (2006). Travel behaviour modification: Theories, methods and programs. In R. Kitamura, T. Yoshii, & T. Yamamoto (Eds.), *The expanding sphere of travel behaviour research, 11th international conference on travel behaviour research, Kyoto University, Japan, 16–20 August 2006*. Bingley, UK: Emerald Group Publishing Ltd.

Gherardi, S., & Nicolini, D. (2002). Learning in a constellation of interconnected practices: Canon or dissonance? *Journal of Management Studies, 39*(4), 419–436.

Giddens, A. (1984). *The constitution of society*. Oxford: Polity Press.

Gram-Hanssen, K. (2010). Standby consumption in households analyzed with a practice theory approach. *Journal of Industrial Ecology, 14*, 150–165. https://doi.org/10.1111/j.1530-9290.2009.00194.x.

Greene, M. (2018). Paths, projects and careers of domestic practice: Exploring dynamics of demand over biographical time. In R. Day, A. Huiand, & G. Walker (Eds.), *Demanding energy: spaces, temporalities and change*. London: Palgrave Macmillan.

Guiver, J. (2012) Travel disruption: Three case studies. Report to disruption priqject. Available from: <http://clok.uclan.ac.uk/6475/2/__lha-011_pers-J_0004293D_My%20Documents_disrupt_Threecasesdraft.pdf>. (Accessed 15/01/2019).

Hampshire County Council (2010). Glossary of local government financial terms. Available from: <http://www3.hants.gov.uk/glossary-financialterms-updated2010-2.pdf>. (Accessed 07/11/2014).

Hampton, S. (2018). Policy implementation as practice? Using social practice theory to examine multi-level governance efforts to decarbonise transport in the United Kingdom. *Energy Research & Social Science, 38*, 41–52.

Hargreaves, T. (2011). Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of Consumer Culture, 11*, 79–99. https://doi.org/10.1177/1469540510390500.

Heisserer, B., & Rau, H. (2017). Capturing the consumption of distance? A practice-theoretical investigation of everyday travel. *Journal of Consumer Culture, 17*, 579–599. https://doi.org/10.1177/1469540515602304.

Hoolihan, C., & Browne, A. (2018). Reimagining spaces of innovation for water efficiency and demand management: An exploration of professional practices in the English water sector. *Water Practices, 11*(3), 957–978.

House of Lords (2011). Behaviour change: Science and technology select committee 2nd report of session 2010–2012. Available from: <http://www.publications.parliament.uk/pa/ld201012/ldselect/ldsctech/179/179.pdf>. Accessed 18/03/2014.

Hui, A. (2012). Things in motion, things in practices: How mobile practice networks facilitate the travel and use of leisure objects. *Journal of Consumer Culture, 12*, 195–215. https://doi.org/10.1177/1469540512446873.

Hui, A., Schatzki, T., & Shove, E. (2017). Introduction. In A. Hui, T. Schatzki, & E. Shove (Eds.), *The nexus of practices: Connections constellations, practitioners* (pp. 8–23). Abingdon, UK: Routledge. ISBN: 9781138675155.

Keller, M., & Halkier, B. (2014). A practice theoretical approach to contested consumption and media discourse. *Marketing Theory, 14*, 35–51. https://doi.org/10.1177/1470593113506246.

Kemmis, S., & Grootenboer, P. (2008). Situating Praxis in Practice: Practice architectures and the cultural, social and material conditions for practice. In S. Kemmis & T. J. Smith (Eds.), *Enabling Praxis: Challenges for education* (pp. 37–64). Rotterdam, Netherlands: Sense. ISBN: 9789087902537.

Kemmis, S., Wilkinson, J., Hardy, I., & Edwards-Groves, C. (2009). Leading and learning: Developing ecologies of educational practice. *Symposium: Ecologies of practice*. Wagga Wagga, NSW: Charles Sturt University, School of Education. Paper Code: WIL091156.

Kent, J., & Dowling, R. (2013). Puncturing automobility? Carsharing practices. *Journal of Transport Geography, 32*, 86–92. https://doi.org/10.1016/j.jtrangeo.2013.08.014.

Kenworthy, J. (2012). Don't shoot me, I'm only the transport planner Retrieved from. *World Transport Policy and Practice, 18*, 6–26 http://www.eco-logica.co.uk/pdf/wtpp18.4.pdf.

Keyes, A., & Crawford-Brown, D. (2018). The changing influences on commuting mode choice in urban England under Peak Car: A discrete choice modelling approach. *Transportation Research Part F, 58*, 167–176. https://doi.org/10.1016/j.trf.2018.06.010.

Laakso, S. (2017). Giving up cars – The impact of a mobility experiment on carbon emissions and everyday routines. *Journal of Cleaner Production, 169*, 135–142. https://doi.org/10.1016/j.jclepro.2017.03.035.

Magaudda, P. (2011). When materiality 'bites back': Digital music consumption practices in the age of dematerialization. *Journal of Consumer Culture, 11*, 15–36. https://doi.org/10.1177/1469540510390499.

Mattioli, G., & Anable, J. (2017). Gross polluters for food shopping travel: An activity-based typology. *Travel Behaviour and Society, 6*, 19–31. https://doi.org/10.1016/j.tbs.2016.04.002.

Mattioli, G., Anable, J., & Vrotsou, K. (2016). Car dependent practices: findings from a sequence pattern mining study of UK time use data. *Transportation Research Part A, 89*, 56–72. https://doi.org/10.1016/j.tra.2016.04.010.

McSmith, A. (2010). First Obama, now Cameron embraces 'nudge theory. Available online: <http://www.independent.co.uk/news/uk/politics/first-obama-now-cameron-embraces-nudgetheory-2050127.html>. Accessed 07/04/2014.

Melia, S. (2013). No sign of smart travel towns in census. Available from: <https://www.transportxtra.com/magazines/local_transport_today/news/?id=34352>. Accessed 30/04/2013.

Millikin, M. (2015). UK extends current levels of the Plug-in Car Grant to at least February 2016. Available from: <http://www.greencarcongress.com/2015/08/20150826-uk.html>. [Accessed 22/10/2018].

Molander, S., & Hartman, B. J. (2018). Emotion and practice: Mothing, cooking and teleoaffective episodes. *Marketing Theory, 18*(3), 1–20.

Moloney, S., & Stengers, Y. (2014). 'Going green'? The limitations of behaviour change programmes as a policy response to escalating resource consumption. *Environmental Policy and Governance, 24*, 94–107. https://doi.org/10.1002/eet.1642.

Morrison, K., & Minnis, J. (2012). *Carscapes*. London, UK: Yale University Press.

Nettleton, S., & Green, J. (2014). Thinking about changing mobility practices: How a social practice approach can help. *Sociology of Health and Illness, 36*(2), 239–251.

Parkhurst, G., & Lyons, G. (2018). The many assumptions about self-driving cars – Where are we heading and who is in the driving seat? In Proc. of the 16th Annual Transport Practitioners Meeting, 5–6 July, Oxford. Available from: <http://eprints.uwe.ac.uk/36997> [Accessed 17/02/2019].

Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing. *European Journal of Social Theory, 5*, 243–263. https://doi.org/10.1177/13684310222225432.

Ropke, I. (2009). Theories of practice – New inspiration for ecological economic studies on consumption. *Ecological Economics, 68*, 2490–2497. https://doi.org/10.1016/j.ecolecon.2009.05.015.

Ryghaug, M., & Toftaker, M. (2014). A transformative practice? Meaning, competence, and material aspects of driving electric cars in Norway. *Nature and Culture, 9*, 146–163. https://doi.org/10.3167/nc.2014.090203.

Schatzki, T. R. (1996). *Social practices: A Wittgensteinian approach to human activity and the social*. Cambridge, UK: Cambridge University Press.

Schatzki, T. R. (2000). Practice mind-ed orders. In T. R. Schatzki, K. K. Cetina, & E. Savigny (Eds.), *The practice turn in contemporary theory* (pp. 50–63). London, UK: Routledge. ISBN: 0415228131.

Sheller, M. (2004). Automotive emotions – feeling the car. *Theory Culture and Society, 21*(4–5), 221–242.

Shove, E. (2010). Beyond the ABC: Climate change policy and theories of social change. *Environment and Planning A, 42*, 1273–1285. https://doi.org/10.1068/a42282.

Shove, E. (2014). Putting practice into policy: Reconfiguring questions of consumption and climate change. *Contemporary Social Science, 9*, 415–429. https://doi.org/10.1080/21582041.2012.692484.

Shove, E., Pantzar, M., & Watson, M. (2012). *The dynamics of social practice*. London, UK: SAGE.

Shove, E., Watson, M., & Spurling, N. (2015). Conceptualizing connections: Energy demand, infrastructures and social practices. *European Journal of Social Theory, 18*, 274–287. https://doi.org/10.1177/1368431015579964.

Spotswood, F., Chatterton, T., Tapp, A., & Williams, D. (2015). Analysing cycling as a social practice: An empirical grounding for behaviour change. *Transportation Research Part F, 29*, 22–33. https://doi.org/10.1016/j.trf.2014.12.001.

Spurling, N., McMeekin, A., Shove, E., Southerton, D. & Welch, D. (2013). Interventions in practice: Re-framing policy approaches to consumer behaviour. Available from: <http://www.sprg.ac.uk/uploads/sprg-report-sept-2013.pdf>. Accessed 04/04/2018.

Stopher, P. Moutou, C., & Liu, W. (2013) Sustainability of Voluntary Travel Behaviour Change Initiatives – a 5-Year Study. In Australasian transport research forum proceedings. 2–4 October 2013, Brisbane, Australia.

Thaler, R., & Sunstein, C. (2008). *Nudge: Improving decisions about health, wealth and happiness*. London, UK: Penguin.

UK Government (2017). Final local government finance settlement: England, 2017 to 2018. Available from: <https://www.gov.uk/government/collections/final-local-government-finance-settlement-england-2017-to-2018>. (Accessed 13/04/2018).

Vihalemm, T., Keller, M., & Kiisel, M. (2015). *From intervention to social change: A guide to reshaping everyday practices*. Surrey, UK: Ashgate.

Warde, A. (2005). Consumption and theories of practice. *Journal of Consumer Culture, 5*, 131–153. https://doi.org/10.1177/1469540505053090.

Warde, A. (2015). The sociology of consumption: Its recent development. *Annual Review of Sociology, 41*, 117–134. https://doi.org/10.1146/annurev-soc-071913-043208.

Watson, M. (2012). How theories of practice can inform transition to a decarbonised transport system. *Transport Geography, 24*, 488–496. https://doi.org/10.1016/j.jtrangeo.2012.04.002.

White, J. (2017). *We have a bright future: Transport planning in the West of England*. Bristol: University of the West of England. 8 March.

Whitmarsh, L., O'Neill, S., & Lorenzoni, I. (2011). Climate change or social change? Debate within, amongst and beyond disciplines. *Environment and Planning A, 43*, 258–261. https://doi.org/10.1068/a43359.

Williams, D. (2015). *Social practice theory and sustainable mobility: An analysis of the English local transport planning as a system of provision* PhD. Bristol: University of the West of England.

Williams, D., Chatterton, T., & Parkhurst, G. (2013). Assessing the local sustainable transport fund submissions in relation to disruption. In Universities' Transport Study Group (UTSG) 2013, Oxford University, 2–4 January 2013. Oxford, UK. Available from: <http://eprints.uwe.ac.uk/22195>.

Wilson, C., & Chatterton, T. (2011). Multiple models to inform climate change policy: A pragmatic response to the 'Beyond the ABC' debate. *Environment and Planning A, 43*, 2781–2787. https://doi.org/10.1068/a44404.