

Steering Demand – A Wicked Problem in the Making: Insights from UK Transport Policy

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1. Introduction

There is an environmental imperative for tackling climate change. In the UK this imperative has been enshrined in law, with a ‘legally binding’ target of at least 80 per cent reduction in greenhouse gas emissions by 2050 (relative to 1990 levels). With emissions from transport representing one fifth of the UK total for domestic greenhouse gas emissions it plays a significant role in moves towards a low carbon economy (DfT, 2009). The scale of reduction means that decarbonisation of the vehicle fleet and energy system through electrification or hydrogen seems a requirement rather than a policy option.

Amidst doubts about the pace of technological adoption and the affordability of the transition there is a well-established critique of the reliance of policy thinking on supply side solutions without addressing more fundamental questions about how much demand is being supplied, and for what purposes. The scale of the decarbonisation challenge is bounded by the level of demand and how it is configured. In essence, the carbon reduction challenge has been largely simplified to a shift of fuel mix rather than a consideration of how much mobility there is, how much energy is required to service that mobility and, in turn how that energy is supplied.

This paper asks what role the state has in steering demand for mobility and why, despite its obvious relevance to policy imperatives such as climate change and congestion, the state seems to have an at best uneasy and inconsistent attachment to notions of demand and demand management. Through two UK based case studies (liberalisation of air transport and concessionary bus travel) we show, in different ways, the importance of government actions in shaping aspects of demand and, through examination of how these policies unfold over time, the recursive relationship between the promotion of demand and the increased challenge of managing it. We argue that the policies reviewed show the Department for Transport as developing demand inducing path-dependent practices that are proving hard to unpick. Moreover, we argue that demand-reduction, if and when recognised as a policy issue, is a wicked problem and one that will only get more wicked the longer it goes unrecognised as a systemic policy issue.

The paper will first start by outlining four processes of path dependency before going on to explain what is meant by a wicked problem, and the varying degrees of ‘wickedness’ highlighted in the literature. The paper will then go on to introduce the two case studies. In each case the governmental steering of demand, and its challenges,

will be discussed. Our analysis will reflect on the path dependencies evident in the cases and the wicked problems they are creating, before concluding.

2. Theoretical Tools

2.1 Path Dependency

The literature on path dependency aims to explain how policy interventions create incremental trajectories that over time become entrenched and hard to change. Lenvin et al (2012, 134-138) identify four causal processes that come out of the literature on path dependency, and which we think are useful here for thinking through issues relating to mobility demand. We briefly highlight these in turn, and reflect on these during exploration of the case studies;

- 1) *Lock-in*: this occurs when a policy intervention includes a logic that gives it immediate durability. This lock-in can be attributed to the large capital costs of building infrastructure relevant to the intervention, for example. In political systems it can be attributed to the rules of the game that render change difficult to initiate. For example the need for unanimous agreement amongst all member states of the EU in order to get a treaty change.
- 2) *Self-reinforcing*: this is where the costs of reversing the choice increase over time. The initial choice is sustained because it puts in place a set of forces and or institutions that encourage the choice to be sustained. For example, investing skills into being able to use a certain technology means that even if another is found that is more efficient, there will be a reluctance to move to the new technology because of the sunken investments in the acquired skills. Self-reinforcing ‘may also include the generation of “norms” of appropriateness that, sometimes sparked by routinization, can reinforce actions originally taken for self-interested reasons’.
- 3) *Increasing returns*: this is where the benefits of an intervention, once introduced, increase over time. For example, opening up a market for a service may increase the amount of providers who can enter the market and who will in turn benefit.
- 4) *Positive feedback*: this occurs when others who are not initially part of the target population make decisions to join, and by doing so reinforce the choices of the original target populations.

2.2 Wicked Problems

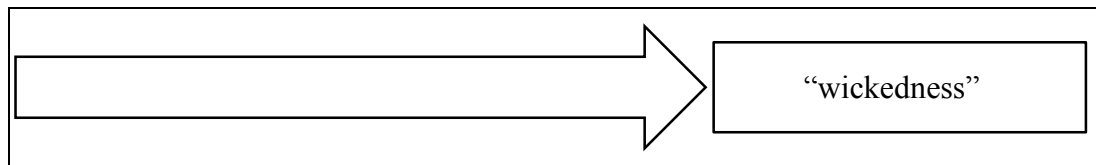
There is recognition in the literature that certain policies and technologies create path-dependencies which in turn create a reliance on fossil fuels. It is these dependencies which in turn exacerbate the problem of addressing climate change and which in turn contribute to the ‘wicked’ nature of the problem. Rittel and Webber (1973) were the first to elucidate the idea of ‘wicked’ problems; policy problems which are by their nature difficult to define and for which there are no definitive and objective answers. The contrast is made with ‘tame problems’, which science and its related practices are capable of dealing with. With tame problems there is a clear mission and it is also clear

when the problem has been solved – the example of a mathematical equation is given. With wicked problems there is no such clarity and they cannot be solved in the same sense. For Rittel and Webber (1973, 160) wicked problems are by their nature ill-defined and ‘rely upon elusive political judgment for resolution’. Importantly, they suggest that wicked problems are never solved: at best they are only re-solved – over and over again. By contrast, tame problems can be solved because it is possible to formulate the information required for understanding the problem, assuming the problem-solver ‘knows his art’. Reflecting on the literature, the key characteristics of wicked problems can be described as follows (Bache et al 2015, Head and Alford 2015, Levin et al 2012, Rittel and Weber 1973);

- 1) The problem is ill defined
- 2) There is no definitive formulation of what factors are involved in creating the problem
- 3) There is no exhaustively describable solution set
- 4) The choice of explanation for the problem determines the solution to the problem; framing of the problem is therefore important
- 5) There is no ultimate ‘end’ to the problem; it must be re-solved over again rather than solved
- 6) Solutions to wicked problems are not true or false, but rather good or bad.
- 7) Every wicked problem can be considered to be a symptom of another problem; and in turn problems span multiple policy domains
- 8) Those who are the cause of the problem are also part of the solution

Many policy problems are seen as having degrees of wickedness which have to be understood by reference to multiple dimensions (Head and Alford 2013, 2). According to Head (2008, 103) tame and wicked problems should be understood by reference to three dimensions – complexity, uncertainty and divergence (see table below). In this schema, no dimension alone is sufficient to ensure wickedness; but it is ‘when serious disagreements are combined with complexity and uncertainty we have crossed a threshold’ (Head 2008, 103).

Complexity of elements, sub-systems and interdependencies	Low	Moderate	High
Uncertainty in relation to risks, consequences of action, and changing patterns	Low	Moderate	High
Divergence and fragmentation in viewpoints, views, strategic intentions	Low	Moderate	High



(Source: Head 2008, 103)

2.3 Relating the theories to demand

In this paper we explore the notion that as policies which steer mobility demand take effect, over time they not only become harder to change due to path dependency, but also become more 'wicked'; harder to (re)solve. Moreover, as yet there is no explicit recognition with the Department for Transport (DfT) about the extent of its involvement (intentioned or otherwise) in steering demand, and in turn locking-in that demand. The Department for Transport has long held a passive position in relation to its role in relation to controlling demand, dating back to 'predict and provide'; the notion that it is the state's role to try and build enough supply to meet forecast demand. While there has been a recognition that this approach is no longer technically feasible nor environmentally desirable there is not yet a clear narrative about what the role of demand is within Department for Transport policy. The National Road Traffic Forecasts which the Department produces for example, are explained as representing the underlying demand which will, to varying degrees, emerge depending on investment decisions, without a sense in which this demand encourages or discourages investment choice. Paradoxically, the lack of explicit demand policy is therefore having profound effects on demand and making the development of a demand policy more challenging. We illustrate this next through the two case studies.

3. Steering the demand for mobility

3.1 Liberalising Air Travel

There are clear indications that government policy has explicitly sought to stimulate demand for air travel and that, as one of a number of contributing factors, this has been successful. Since 1950 passenger numbers have increased 100 fold, with 210.6 million passengers travelling through UK airports in 2010 (Rutherford 2011). One of the stimulators of demand has been the UK's entrance into the EU single market. The single market has removed restrictive trade practices and operating barriers in the industry. This has led to an increase in market competition and subsequently to a long-term decline in the real costs of air fares. Long haul prices have fallen in real terms since 1996, while short haul fares fell in the mid-1980s, and, after little real change for most of the 1990s, continued this decline from the late 1990s onwards as 'no-frills' budget airlines entered the market (Rutherford 2011). In the recent review of EU competencies by the Department for Transport, Easyjet have claimed that they 'wouldn't exist' without the UK being in the EU. The review also notes how the free market has led to a huge growth in the number of passengers travelling to visit friends and relatives; between 2000 and 2007, while total passenger traffic grew by one third, the number of

passengers visiting friends and family grew by more than three quarters, and were mostly travelling to and from the EU.

The UK's acceptance of the free market for air travel is an example of a hands-off steering of the conditions for demand to increase, yet there are more direct ways in which the demand for air-travel has been perpetuated by the UK. Since 1950 the UK has been signatory to the International Civil Aviation Organisation resolution that fuel for international air travel should be free from taxation. There has been no movement on this since its introduction and subsequently has neutralised one lever with which government could control demand for air-travel. The logics which apply to taxation of road fuels are not and cannot be applied to aviation which implies that the two types of demand are somehow thought of and treated differently.

The lack of fuel taxation has contributed to the generation of another interesting experiment in understanding the UK government's conceptualisation of air travel demand as it has become established. In 1994, Air Passenger Duty was introduced as a way of generating tax revenue (Seeley 2012, 2). Arguments surrounding its introduction were not driven by a desire to reduce demand, but rather the decision was made with confidence that the industry would be able to absorb the tax with only a minimal (2.5%) impact on demand (Seeley 2012, 3). In 2006 air passenger duty was frozen briefly, the government arguing this was to compensate for the volatile oil markets that were at risk of damaging the industry, implying some form of intolerance to market failure and a concern not just about demand but about a loss of demand which was price sensitive. However in 2007 the Air Passenger Duty was doubled (although only restoring its rate to what it had been five years previously when it had been halved), and there have been minimal tweaks up until 2014.

While the Air Passenger Duty does little to stifle demand, the way the duty has recently been altered reveals insights into how demand for flying has become normalised and how a lack of access to this demand could be problematic. For example, in 2014 the Chancellor of the Exchequer announced he wanted to reduce the costs of flying for families, and therefore from April 2016 children under the age of 16 will be exempt from the Air Passenger Duty if they travel on economy flights. At the same time the Government altered the fare banding system of Air Passenger Duty. George Osborne argued that;

‘We will ... reform air passenger duty to end the crazy system where you pay less tax travelling to Hawaii than you do travelling to China or India. It hits exports, puts off tourists and creates a great sense of injustice among our Caribbean and south Asian communities here in Britain. From next year, all long-haul flights will carry the same, lower, band B tax rate that you now pay to fly to the United States.’ (quoted in Seely 2016, 23)

Two points are important to make here. The first is that the government is effectively subsidising air travel for the under 16s and normalising the foreign holiday as a supported right. The second point to note is that the government could have increased rather than reduced tax on long-haul flights in order to make the contribution equal across all long-haul distances. By reducing the cost to fly to destinations such as China and India, the government has incentivised more long-haul flights.

3.2 Concessionary Bus Travel

Another example of explicit government steering revolves around national involvement in fares, fare regulation and discounting. Here we look at concessionary discount schemes for travel, although following through such thinking on regulation of rail season tickets would be equally instructive as any differential on prices says something about a different approach to demand for a particular user class or time of day.

Many different forms of concession are available to different age groups (typically the young and old) or groups (e.g. friends and family railcards). This section looks at the introduction of national concessionary bus fare schemes from 2001 onwards. These schemes meant that bus travel was available (post 9:30am) for women over 60, men over 65 and for all disabled people in England. In 2006 this was extended to be free travel on local services across the whole of England and the age lowered to 60 for men to resolve gender discrimination concerns (with other comparable schemes developed slightly earlier in the devolved administrations). The scheme was estimated by the government to reduce the cost of travel for 11 million people aged over 60, as well as help half of pensioner households who did not have a car to access local amenities more freely (Butcher 2009). The schemes have proved effective in stimulating demand. Since their introduction there has been an increase in bus patronage and the long-term steady decline in the number of bus journeys has been 'arrested' (Shaw and Docherty 2014, 133). Moreover, as of 2014 approximately four fifths of those eligible for the bus pass took it up and 'in London take up is essentially universal' (Butcher 2015, 8). Furthermore, across the English local bus network more than one in five journeys is made using a concessionary bus pass. There is also an argument that the bus pass has created mode shift with Passenger Focus (2009) reporting that 35% of trips that are made using a concessionary pass were previously made by car.

Shaw and Docherty (2014, 132) argue that concessionary schemes were put in place 'primarily as a means of tackling social exclusion', with the DfT (2006, non-paginated) seeking to ensure that 'bus travel... remains within the means of those on limited incomes and those who have mobility difficulties'. However, there is some underlying scepticism that the rationale for the scheme was more about securing the 'grey vote' than explicitly inducing demand for travel in these groups. Whatever the underlying rationale, the scheme privileges the travel of over 60s and actively supports demand growth. The benefit is not available to everyone as some people do not have access to a local bus service, particularly in rural areas. Whilst there are concerns about the affordability of the scheme (MCL Consultants 2009) it is interesting to note that the general decline in evening and weekend bus services which are resulting from reductions to local government funding are, through the back door, reducing the extent of coverage and use of the concession (Campaign for Better Transport, 2013). Demand stimulation for socially excluded people was a stated aim of the scheme although it operates as a universal right despite some very real fiscal concerns which are impacting the scale and coverage of the whole bus network for all users.

4. Analysis

Path dependency

Government steering of the demand for both air travel and bus travel have shown several characteristics of path dependency. With regards to air travel, the signing of international binding agreements on fuel taxation, and the single market for air travel within the EU are fundamental political constraints that render change hard to instigate. For example multiple reviews into reform of the air passenger duty have fallen by the wayside in the face of arguments that moving towards an airplane (rather than passenger) duty, or adding VAT to air travel, which may create more environmentally friendly practices, would be against EU law. Whilst with regards to bus travel the initial concessionary scheme had to be revised following a European Court ruling which found that allowing woman access to the concession at 60 and men 65 was discriminatory. As a result the concession was altered so men could access the scheme earlier.

Opening up the market for aviation has also brought increased economic benefits over time, which have also meant that tampering with taxes that may reduce demand has become seen as more risky, and made the arguments to reduce taxes more powerful. A recent parliamentary report noted the importance of the aviation industry to the economy arguing that the 'UK aviation sector had a turnover in 2011 of around £53 billion, generated around £18 billion of economic output and employed over 220,000 workers directly and supported many more indirectly' and went on to cite aviation industry commissioned research that suggests that the total number of jobs supported (directly and indirectly) by aviation could be as high as 921,000 (HoC 2013, 5). This means that the industry is no longer solely about travel, but has become increasingly important to the economic narrative and strategy of the country, further evidenced by the controversial beauty contest between Heathrow and Gatwick for the right to build the next runway for London to deal with the congestion, in part fostered by the liberalisation agenda.

Both air travel and bus travel patronage has increased, induced to some degree by policies in these areas. In figures published in the 2014 attitudes to air travel survey, just under half (48%) of adults said they had taken at least one flight in the previous 12 months, either within the United Kingdom or to go abroad. This was coupled with the expectation that more flights would be taken in the following year; 20% of respondents said they expected to fly more in the following year, compared to 10% who thought they would not. The most common reason for expectation of increased travel, cited by half of those that expected to make more flights, was because they wanted to go abroad more. Other reasons included changes in personal circumstances (20%) and having friends/relatives who had moved abroad (10%). Indeed, the steps to promote travel for families through removing the air passenger duty on children further normalises air travel as a right. This normalisation of air travel and indeed its 'democratisation' will make any changes to access hard to achieve politically without it being seen as unfair.

The challenge to altering demand is already being seen in bus travel. The difficult financial climate and pressure on government budgets given the climate of austerity has opened up discussions about the effectiveness of concessionary travel schemes, or rather drawn attention to what other ways the money for the schemes

(typically subsidised by around £1billion across the UK) could be used (Shaw and Docherty 2014, 132). For example, the money may be better spent on subsidising the travel of job seekers or getting young people to school. However, at the 2015 election all major political parties called to keep the free bus pass, although there have been calls among supporters of all parties to think about means-testing of the bus pass rather than keeping it a universal benefit. There is an argument to suggest that the bus pass, and indeed concessionary travel has become viewed as an entitlement from the state, and that taking it away would be seen as unfair and in turn politically unappetising. This political risk has been exemplified at the local level recently. In 2014 South Yorkshire Combined Authority removed the discretionary subsidy for members of the public in its area, which had allowed free bus travel half an hour earlier than the England wide statutory concession which starts at 9:30am. This proved an incredibly unpopular decision with ‘freedom riders’ conducting protests across the region. Again, this sense of entitlement, induced and normalised by the state, may create problems for it in the long-run should it look to reduce or change demand in the future.

Wicked Problems

The path dependency created by the steering of demand by government thus makes the underlying problem of demand management, and in particular a reduction in demand, ever more wicked a problem to be addressed. Firstly, while we have focused on the government’s inducement of demand, this is but part of the reason for demand increasing; population growth and income are two key reasons for growth in the demand for mobility. However, it is important to observe that the incentivising of mobility by the government only seeks to compound the challenges of reducing demand and makes a formulation for tackling the issue hard to come by. Also, norms around mobility are closely tied, and becoming increasingly integrated (especially in the case of air travel) with the challenge of economic growth, but also with ‘normal’ practices; flying at least once a year, being able to travel free on the bus even if maybe it could be afforded by some. This makes the normative challenges around the need to reduce the demand for energy associated with mobility even more pronounced; with notions of fairness and freedom of movement at the forefront of debates around steering demand.

The wicked problems literature identifies numerous ways in which governments might address these problems. In particular it recognises the importance of unpacking and discussing entrenched differences, perhaps through a process of mediated dialogue, to explore common ground about long term goals and more immediate steps for joint action (Head 2008). Durant and Legge (2006, 310) emphasise the importance of ‘reflexivity, learning, and meaningful stakeholder involvement in the deliberations of public agencies’ and suggest that deliberative models may be more attuned to dealing with wicked problems than more managerialist ones. On this theme, Head (2008, 102) emphasises that importance of deliberative processes recognising the perspectives and values that ‘frame’ the definition of the problem and in providing a quite different approach from the ‘top-down imposition of technical solutions, or from expertise-based solutions arising from the growth in empirical knowledge.’ However, importantly in the case of mobility demand, there is not yet recognition that this is a wicked problem.

Indeed, both cases here are about facilitating the growth in demand on the basis of different logics surrounding advancing societal benefits.

It may be due to the more pressing short-term political and economic benefits that inducing mobility brings, that demand is usually seen as a solution rather than a problem. It is in problematizing absolute levels of demand that more contentious issues arise and the problem becomes truly wicked. Simultaneously there are arguments for advancing mobility for social progress and for limiting mobility for environmental or congestion management. There are also real issues at play as to how much government actually influences demand relative to other on-going processes (e.g. the restructuring of retail or the facilitation of working at home through IT and communications advances) and questions about how much and how effectively or legitimately it could intervene to steer the reduction of demand. Our work here reveals however that government does intervene to the level of privileging some kinds of demand for mobility and for some types of travellers. By inference therefore it disadvantages or discourages (in a relative sense) other types of demand. Whilst government may not have a clear demand management policy it clearly has a role. The failure to articulate that role and acknowledge the impacts it is having on demand creates deeper and more entrenched problems to tackle.

Conclusion

This paper has sought to elucidate the ways in which government steers the demand for mobility, and in turn has highlighted how such demand gets reinforced through path dependent processes, which in turn only seek to make the problem of demand reduction more ‘wicked’. In concluding we are left with several questions regarding demand, related to the characteristics of wicked problems identified above:

- 1) *Is it possible to define the problem of demand?* There are multiple different aspects to the nature of the problem which remain unresolved; for example is it the level of demand, the rate of growth in demand, the type of demand, or the way in which demand is met, that is the problem or is it all of the above? The answer is also complicated by the framing of demand as a solution to other important issues such as economic growth and social progress. This is arguably why alternative logics to meeting demand such as ‘smarter choices’ and ‘alternatives to travel’ have failed to sustain policy attention because they are seen as deflecting attention from the priority of growth, and in the case of alternatives to travel, as potentially antithetical to it.
- 2) *Is it possible to formulate a comprehensive account of the factors involved in the problem of energy demand?* Demand is particularly complex in this regard because the factors involved derive from multiple levels and scales and are induced in multiple ways. For example, everything from where an individual lives (and the issues that facilitate or constrain this choice), through to the norms tied to travelling abroad once a year, the advances in technology that encourage home delivery of retail goods, and macro level changes in population growth are factors that steer energy demand in some way.

- 3) *Is there an exhaustively describable solution set to resolve the problem of demand?* Related to the above it is hard to identify what and where solutions would need to be targeted and where they would be effective given the multiple different causes and effects that seek to combine in complex processes around energy demand. This is compounded by the fact that the nature of energy demand is continually evolving, meaning the problem can only be re-solved over again, rather than solved indefinitely. Therefore solutions deemed appropriate or sufficient today, may not be deemed so in a decade's time.
- 4) *Can the issue of mobility be framed in a different way that is more accommodating to demand concerns?* Arguably one of the key challenges to encouraging demand management policies is that mobility is seen as a proxy for economic growth. In turn travel, and car ownership is tied to notions of success and therefore normalised and desired within society. However, the trends of declining mobility amongst millennials, for example, may provide a window of opportunity to frame mobility in a different way. Reframing is particularly important when we consider that solutions to 'wicked problems' are not true or false, but rather good or bad. Due to the nature of the problem, the solutions will be more normative than based on scientific truths (although these, we would hope, would be part of the solution set).

Thinking through the answers to these questions may provide us with a means through which we can outline a course to reducing the 'wickedness' of transport demand management and encourage policy to work towards more sustainable solutions.

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