

Transport and Environmental Innovation

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Abstract

Transport gives rise to considerable CO₂ emissions, which are rising with little policy effect. Transport policy is a socio-technical regime ordered around the state funding large transport capital projects. This is supported by a professional skills and information structure that serves the logic of this regime. However, an innovative form of transport planning practice has tentatively emerged. Instead of the state implementing measures, it shifts to a supporting and enabling role with the devolution of responsibility to transport users. This is a very different rationale about what constitutes transport policy and its structures. This can be understood as a policy niche within the existing regime.

This paper reports research on two areas that seek to apply this niche approach: travel planning and the Milton Keynes electric vehicle project. These research suggest that rather than the 'new' transport policy niche leading to regime transformation, it appears to be migrating to other policy regime structures that are more compatible to its approach.

Key words: transport policy, socio-technical transition, strategic niche management, travel plans, electric vehicles

Transport and the environment

Transport can produce both direct and indirect social and environmental impacts (Potter and Bailey, 2008). These can be categorised as:

- **Direct impacts:** the result of transport operations such as pollutants emitted by vehicles, noise intrusion, the land take of roads, railways and airports and traffic accident casualties.
- **Indirect impacts:** how changes in travel behaviour lead to urban sprawl, changes in activity patterns and unhealthy lifestyles.

Attention is often focussed upon transport's direct impacts, but it is the more structural, indirect impacts that make transport a particularly difficult area to resolve in the context of sustainable development. The indirect impacts result in a 'lock in' to unsustainable patterns of behaviours and economic/social configurations that are difficult and slow to change. It is thus not surprising that transport has proved to be least amenable to policies seeking the reduction of CO₂ emissions.

This issue was highlighted in the 2006 Stern Report (Stern, 2006), where it was noted that, between the base measurement year of 1990 and 2002, transport was the fastest growing source of carbon emissions in OECD countries (growing by 25%) and the second fastest growing sector in non-OECD countries (a rise of 36%). Rather than declining, over the next 40 years the trend is for transport CO₂ emissions to grow, particularly in non-OECD countries, where its share of global emissions is anticipated to increase from one third to one half by 2030.

In the UK, while other sectors have cut CO₂ emissions, the proportion coming from transport has risen from 15.6% in 1990 to 21.7% in 2009 (with only the 2009 recession preventing transport emissions from rising compared to 1990). Over 90 per cent of the UK's transport CO₂ emissions come from road transport (Table 1). Passenger cars remain the biggest source of CO₂, but road freight emissions are significant and light van emissions have risen substantially (with the growth of the service economy). Rail produces only two per cent of transport's CO₂ emissions, despite recent substantial rises in passenger-kilometres and freight carried.

Table 1: UK CO₂ emissions by source (Mt CO₂) 1990 and 2009

	1990	2009
Domestic civil aviation	1.4	2.0
Passenger cars	73.1	70.9
Light duty vehicles (vans)	9.4	15.3
Buses	3.8	5.3
Lorries	24.0	21.0
Mopeds & motorcycles	0.6	0.6
LPG emissions (all vehicles)	0.0	0.3
Other (road vehicle engines)	0.3	0.1
Railways	2.1	2.1
Domestic shipping	1.8	1.5
Military Aircraft and naval shipping	5.3	2.5
Other Transport	0.3	0.5
Transport Total	122.1	122.2
Transport as % of total CO₂	15.6%	21.7%
Total UK CO₂ Emissions	781.6	563.6

Source: Department of Energy and Climate Change (2011)

The nature of transport policy

The way that the secondary impacts of transport are ingrained in our economic and social behaviour has led to some to conceive transport as a behavioural rather than a technical problem. This perspective is one that has been reflected in the changing nature of transport policy.

Until the early 1990s, the approach to transport planning in Britain, and most other nations, had been for the state to view its role as one that responds to growing transport demands from people and commerce. This predominantly involved increasing road capacity, together with the progressive trimming of rail and bus services, with some exceptions due to 'social need' (e.g. subsidising local bus, rail and ferry services, particularly in rural areas). The way in which these services have been provided, particularly whether by the state or the private sector, has been the subject of numerous reforms, including the 1980s and 1990s privatisation of bus and rail. However, these reforms have been within the context of a policy regime that took changes in travel demand for granted and sought to accommodate this growing demand by providing publically funded infrastructure.

In the 1990s, this demand-led transport policy lost its credibility. This was partly due to the growing recognition that transport is a key environmental problem area, but also that Britain's road-building policy had failed to reduce traffic congestion. As documented by Goodwin (1991), road-building simply locked economic and social systems into a higher level of travel intensity and, at best, did no more than slow the rate at which congestion worsened.

Rather than simply responding to transport demand, the concept of transport demand management (TDM) gradually emerged into the policy arena. Initially TDM was conceived and formulated in the same way as the old demand-led transport policy; it was simply that, instead of building roads and car parks, the role of the state was to fund large public transport capital projects, such as trams, metros and busways, or to provide money to local authorities to build cycle lanes and install traffic calming measures around schools. The methods, institutional structures and practices were unaltered, merely the purpose to which they were applied (Potter and Subrahmanian, 2007).

The approach has been one of the state and transport industry actors using the same structures, practices and skills base of their regime. The only real amendment is that other state and industry players have gradually become involved, for example the Treasury in implementing ecotaxation reforms, and the development of new service configurations, such as for congestion charging. Transport users remain on the outside of the policy regime; transport is done for them by this top-down professional élite.

But, within this predominant approach, an innovative form of transport planning practice has tentatively emerged. This is about a different way of doing transport planning that is seen as a necessary consequence of a behavioural change approach. To do this, the actors need to change their practice and very different skills are required. The existing policy regime practice seeks to influence behaviour through top-down policies, such as building busways instead of roads, raising fuel tax and charging motorists to enter city centres. Such an approach is compatible with the existing transport policy regime's way of working. But TDM can be implemented in a different way. Instead of the state implementing measures, it shifts to a supporting and enabling role with the devolution of responsibility to transport users. This is a very different rationale about what constitutes transport policy and its structures. Although not articulated in this way, such transport policy approaches have come to be labelled 'Smarter Choices' (see Cairns et al 2004).

With 'Smarter Choices', the emphasis is not on centrally-provided and funded infrastructure provision, but is about sustaining initiatives with the organisations whose activities generate travel demands. For example, working with employers to manage the commuting behaviour of their staff, or with leisure and shopping centres to 'green' the travel of their customers, or travel education programmes in neighbourhoods. This approach involves very different skills and processes to that of 'mainstream' transport planning, with its structures and practices built around engineering skills and project approaches. This type of TDM is about a sustained programme of building partnerships, consulting, educating and empowering users.

Such transport policy developments can be conceived as 'policy niches' operating within an existing regime (Ieromonachou et al 2004). What are these niches and how are they interacting with the dominant regime? Are we moving towards regime transformation, or not?

Travel planning

For many years some employers have helped staff travel to work. Factories in remote locations might provide 'works buses' from nearby towns, and often special transport arrangements are made for late-night shift workers. Today it is more likely to be providing a company car or large free car parks. The travel plan concept is that employers, schools and other organisations take a responsibility to manage how staff, students, customers and visitors travel to their site in order to address wider public policy objectives.

The first environmental requirements for employers to manage the travel of their staff came as part of Californian air-quality legislation in the 1970s. The Dutch adopted travel plan type measures (called 'mobility management') in the 1980s and local authorities in the UK (notably Nottingham City Council) began promoting 'green commuter plans' in the early 1990s. The promotion of what in the UK became termed as 'travel plans' became UK Government policy from 1997, with workplace and school travel plans featuring in the 1998 and 2004 transport policy White Papers (DETR, 1998 and DfT, 2004). Government guidance defined a travel plan as being:

A general term for a package of measures tailored to [meet the] needs of individual sites and aimed at promoting greener, cleaner travel choices and reducing reliance on the car. It involves the development of a set of mechanisms, initiatives and targets that together can enable [an] organisation to reduce the impact of travel and transport on the environment, whilst also bringing a number of other benefits to [the] organisation as an employer and to staff.

Energy Efficiency Best Practice Programme, 2002, Section 1.1

For school travel plans, according to the DfES:

An effective school travel plan puts forward a package of measures to improve safety and reduce car use, backed up by a partnership involving the school, education and transport officers from the local authority, the police and the health authority. It is based on consultation with teachers, parents, pupils and governors and other local people.'

(<http://www.teachernet.gov.uk>)

The key rationale of travel plans is that those organisations responsible for creating the need to travel, such as employers, schools, service providers and shopping centre owners, are involved in helping to solve transport problems. They are expected to enter into partnership with their local authority and with other actors. However, this whole approach is something they find difficult to comprehend. From their perspective, transport is something that is largely outside an individual organisation's control and is not their responsibility. They are used to operating within the existing rationale and practices of 'mainstream' transport planning and find it difficult to respond to such an alternative concept.

Equally, although travel planning is an essentially bottom-up, user led approach, local authorities have tended to implement them in the traditional 'top down' way of the transport policy regime. Travel plans tend to be treated as one-off activities linked to existing regulatory controls. Local authorities have developed legally binding agreements linked to planning consent to commit organisations to travel plan initiatives (Rye et al., 2008). This obligation or agreement is known in England as a 'Section 106 agreement', named after section 106 of the 1990 *Town and Country Planning Act*. Travel plans are required to be written as part of obtaining planning consent.

However, local authorities have also appointed travel plan co-ordinators with appropriate network developing skills who have established initiatives such as travel plan networks and clubs to share best practice, which reflects more the alternative approach of travel plans being an ongoing process to support, refine and manage. In our research on this subject, Roby (2008 and 2010), has conducted in-depth interviews with employers with travel that were in a state of transition or active development. This showed that the motivations sustaining the travel plan had significantly changed over time. Fulfilling planning requirements dropped from being the main motivation in 68% of cases to only 12%; Corporate Social Responsibility, parking, access strategies and business motivations all grew in

importance. The conclusion was that a traditional 'top down' approach by local authorities may get travel plans initiated, but this was unlikely to maintain a travel plan. The partnership/development support functions could sustain travel planning, but this alternative policy niche and the people with appropriate skills are vulnerable. As local authorities face funding cuts, it is not traditional transport planning that is being cut; this is defended by senior managers with their established professional bodies and intuitional embedding. The cuts are coming to the lower status travel planners who face redundancies and budget cuts. This is perhaps epitomised by the recent government decision to even axe data gathering that informs school travel plans (Forster, 2011).

But there have been other responses that suggest that travel plans could evolve into a somewhat different policy measure. A further project we have undertaken has been for Transport for London (TfL). This work has been to provide an insight into business travel, and how TfL might engage with the business sector to develop support programmes, firstly in managing business travel, and then considering the opportunities to manage the commute as well.

Rather than seeking to impose a transport planning concept (the travel plan) on organisations that do not see this as relating to their needs, the idea is to use the same philosophy of user engagement and support, delivered with the same sort of skills and methods as travel planning, but starting from a core business function – business travel (Roby 2011). One of the key findings from this project is the need to work with business in a flexible way that matches their organisational needs and culture, rather than prescribing policies and methods that conflict with these needs and culture.

The study covered a number of aspects (including an exploration of the issues around substituting travel with teleconferencing and other virtual technologies), but a major conclusion was that businesses in this study were looking for different ways to engage from those traditionally seen in travel planning, especially the way travel plans were developed through the planning process. The businesses were seeking to reduce their carbon emissions and costs and improve productivity, and looking for tools to support this process.

This study suggests that travel planning may need to be reinvented to fully take on board the implications of its innovative approach. If it really is about a different transport planning rationale, then travel planning needs to be refocused around that rationale and from there develop to the wider public policy agenda. As initially formulated, travel plans are an uncomfortable hybrid between old and new transport planning, which could help to explain why they are failing to realise their potential.

Low carbon vehicles

Another area in which there has been a clash between transport planning rationale has been in public programmes to stimulate the uptake of innovative low carbon vehicles. This is illustrated well by our involvement in the network of actors promoting electric vehicles in Milton Keynes.

Ensuring the widespread take-up of electric vehicles is a key part of the government's policy to deliver greener transport, develop green growth and fulfil the UK's carbon reduction targets. The commercial launch in 2011 of a range of electric vehicle designs is part of a government/industry partnership approach that envisages a long term transition to a low carbon transport future, in which cleaner internal combustion technologies are joined by an initial widespread uptake of Battery Electric Vehicles then 'plug in' hybrids, followed later by hydrogen Fuel Cell Vehicles (NAIGT, 2009). Although not articulated as such, this is a network of actors that have agreed on expectations to plan a technology niche management exercise seeking to achieve an eventual regime transformation.

The car industry is bringing electric cars to market, and government support has centred upon *Plug-in Grants* to lower purchase costs coupled with the 'Plugged in Places' programme to fund public charging points in key local authority areas. Milton Keynes was one of three areas awarded a 'Plugged in Places' grant in 2009. The project involves inputs from Milton Keynes Council, three local universities, and the local economic partnership. A crucial part of the concept of the Milton Keynes programme was that, as well as preparing the physical infrastructure for electric vehicles, it sought to prepare users as the first vehicles go on sale. Despite intentions expressed in surveys, when it comes to spending £25,000 on an electric car, for most people and businesses it takes more than a one off grant and a charging point or two to part with that much cash.

So, to complement the capital investment side, a key part of the Milton Keynes project is a programme of public and business engagement, to develop user understanding, identify barriers and explore with local organisations how they might develop new electric vehicle based services (e.g. electric car rental). This is why our project includes contributions by the Open University's Institute of Social Marketing and the University's *OpenLearn* web design team. The programme also proposed developing an 'electric vehicle experience' centre where people can learn about and explore if an electric car is right for them, and run experience events at local shows.



Fig 1: A Nissan Leaf at the UK launch of this battery-electric car in Milton Keynes

Like in travel planning, this represents an approach of seeking to understand users and facilitate their participation in the practice of transport planning.

Significantly, the Milton Keynes consortium is not led by the transport planning department of Milton Keynes Council but by the economic development section, including employers through the local economic partnership. The transport planning section of the council is a peripheral actor in the network.

However, government has again taken a traditional policy approach, where funding has been conceived in terms of infrastructure and grants, not in terms of public engagement and developing networks of actors and users. Funds for public engagement activities have been retrospectively stripped out. User engagement is simply not accepted as an important and legitimate activity.

Implications

Research around the above cases is ongoing, but they indicate some crucial issues in transitions to a more sustainable socio-technical regime. The model of an innovation niche that is replicated, enlarged and then leads to a regime transformation does not seem to be playing out. Neither is this the case of a failed niche, which when protection is removed is outcompeted by a superior rival. Instead there is a more complex picture of the new 'niche' policy that conflicts with the practice of the regime compromising itself by seeking to conform. It thus fails to develop and get marginalised, making it vulnerable and, in the case of travel planning, is now under serious threat by powerful actors in the dominant regime.

It seems that only way forward is for this form of transport policy to be implemented in a different policy regime that has an appropriate culture of practice. Thus in TfL, travel planning and other smarter choices are migrating to become part of business and economic functions. With electric vehicles in Milton Keynes that is where this transport initiative is located, but has had problems in that public funding comes from a government department with a 'project' conception of how policy is done.

So rather than 'new' transport policy niches leading regime transformation, something different is happening. The new transport policy appears to be migrating to other policy regime structures that are more suited to its approach. Thus transport policy is now being done by business development. The old transport policy regime is not changing, but remaining for what it does well (infrastructure projects). The strategic level of transport policy may well now end up in the business and finance areas of government with the existing transport function contracting to a mere technical implementation role. The outcome is uncertain, but these case studies certainly indicate that this reconfiguration of function and power is playing out as a confusing and messy process.

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