

Is there a public appetite for user innovation in transport?

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## Is there a public appetite for user innovation in transport?

**The theme of this paper is user innovation in the context of ICTs and transport, which focuses on the bottom up activities of individual members of the public. Specifically we explore public appetite for finding innovative solutions to transport problems and for using already established innovations to solve such problems. New research indicates that people perceive themselves to be affected by transport problems, but they do not see their actions as solving them. However they do ‘mitigate’ the effects of wider problems on an individual level, both with and without the use of ICTs. In some cases they use ICTs creatively, but did not recognize this themselves or display a motivation to take such practices forward into innovations that could be used by other people. They also showed a distinct tendency to find reasons against using already established innovations.**

## 1. Introduction

The impacts of society's reliance on the car (in the UK) are many, but one important focus of Government transport policy has highlighted those effects negatively effecting people and the environment - such as safety (see Sonkin et al, 2006; Gray, 2001; DfT, 2007a), health (see Wen et al., 2006; Frumkin, 2002; DfT, 2007b) social exclusion (see SEU, 2003; Transport2000, 2007; DfT, 2007c), and climate change (Defra, 2006). Following a change of Government in the UK in May 2010, there has been a refocusing of transport objectives, with more stated emphasis on economic and climate change impacts, but a focus on reducing society's reliance on the car and increasing use of alternative modes remains. Policies focus on both physical changes to transport infrastructure or operations, as well as management and marketing activities that address psychological motivations for travel choice. In both approaches there is interest in the role of technical innovation, especially the potential for information and communication technologies (ICTs) to play a role in people voluntarily moving towards more sustainable transport behaviours, and in making transport systems work more efficiently. This is part of a wider influx and embedding of ICTs into the transport system and travel behaviours - much of which has been top-down, led by Governments and large companies, which have the resources to develop huge highly technical new systems such as in-car satellite navigation systems, as well as the provision of transport information via online public transport timetables and ticket allocation, cycle and walking routes/maps (all of which can be accessed at home or on the move through smart phones or other mobile devices).

The project reported here concentrates on the opposite end of the spectrum, namely the idea of ‘user innovation’ associated with such technologies. The working definition in the project was informed by Von Hippel’s (2005) concept, namely that user innovators are firms or individuals that expect to benefit from using a product or service themselves as distinct from producers who expect to benefit from selling a product or service. The idea of ‘user innovation’ is usually both bottom-up (starting from the experience and needs of the user rather than the capabilities and products of the supplier) and small-scale (individuals or sparsely organised collaborations rather than big companies). User innovation is itself not always clearly defined or unambiguous, since it exists in several different forms. Specifically, this paper considers user innovation which might arise from members of the general travelling public, who do not have either the technical expertise to devise new technologies themselves, or the motivation to convert themselves into entrepreneurs and companies. In this sense, they are not necessarily innovating in terms of developing new software or applications, but instead in relation to the social practices that occur around already established ICTs.

The development of text messaging (or SMS) is perhaps the best illustration of such a change in social practice. SMS was originally added to mobile phone technology to compete with that provided by pagers. But whereas early pagers simply displayed the number of call back, and later versions provided around 80 characters of text, messaging on mobile phones allowed a *two-way* version of paging with (initially) 160 characters. This transformed the way in which the technology was used, and in turn the technology itself. Specifically relevant to this research Haddon (2005) notes emergent practices with the mobile phone such as parental monitoring of children and impacts on their spatial

independence, and adaptations to changing conditions of travel in real time. It is this innovation in use that was unanticipated by the providers. But what motivates people to use ICTs in such creative, or innovative ways? Here we refer to ‘creative’ use of ICTs as ‘the production of new ideas or combining old ideas in a new way’ (Heye, 2006; 253). It is this creative use that may, or may not, be taken forward into an innovation that is used by other people - innovation is defined as ‘an invention that has a socioeconomic effect’ – something that ‘changes the way people live’ (Chayutsahakij and Poggenpohl 2002; first page). However, here we focus on innovation by *users* of ICTs and transport in particular.

Although established from the perspective of ‘specialist’ groups of user innovators (for example, those amongst mountain bikers (see Lüthje et al 2002, 2005), previous research suggests there are a number of factors that are important in the process of a user innovating, including (after Leadbeater, 2006; and Luthje, 2004) expertise and capabilities (skills, tools, facilities), fun and enjoyment of the development process (and other incentives such as gaining social capital); and an ability to share ideas. However, perhaps the key motivation lies in there being a need not being met (or ‘solved’) adequately by the market. The hypothesis is that without a problem or challenge, an individual has no need to develop a user innovation-based solution, so the prior condition for understanding user innovation is understanding the nature of transport problems as perceived by the public.

In the context of transport, a majority of people would now be seen as generally reliant on the car, yet at the same time, car drivers in the UK are faced with problems such as congested traffic, expensive or unreliable public transport, poor walking and

cycling facilities, and a lack of transport information or the environmental implications of using the car. It would therefore appear that there is a problem (or set of problems/challenges) to be solved. Consequently, the research reported here aimed to establish the extent to which people consider and respond to transport problems in relation to their motivation to develop innovative, ICT based, solutions and in relation to using already established user innovations. A deeper understanding in this context is considered useful for those aiming to, or already developing or investing in new user innovations in the context of transport and technology.

## **2. Methodology**

The research took an exploratory qualitative approach in order to allow definitions and opinions about transport problems, ICTs and innovation to emerge in the participants own words. As such, focus groups were used rather than a structured questionnaire. The aims of the focus groups were twofold:

- i. To explore what constitutes a transport ‘problem’;
  - Is it an emotional issue, a practical issue or both?
  - Is it something that affects society, or something that affects the individual?
- ii. To explore whether people want to/feel they can affect travel problems and why.
  - Do they feel they have the power to solve the transport problems they, or others, face?

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- Do they display any creative practices in relation to solving transport problems, particularly in relation to their use of ICTs?
- Could a full, or part solution be offered by an already established innovation?

Responses to these questions were explored through eight focus groups of six participants were undertaken, divided by gender, age group (18 – 40 years and 41 years and over) and residential location (urban/rural)<sup>i</sup>. These divisions were made as age, gender and residential location have been established as factors influencing the transport challenges facing individuals (see, for example, Alsnih and Hensher, 2003; Law, 1999; Nutley, 1998) and we aimed to establish whether the findings of the present study also varied in this way. However, the aim was not to establish ‘truths’ about particular societal groups, or to compare groups in order to find ‘significant differences’. A random sample of participants was thus recruited across social classes from the general public in Bristol and the surrounding rural areas.

Each focus group followed the same structure, led by two moderators. The groups began with a “warm-up task”, aimed at establishing the participants’ initial response to the idea of their daily travel being (un)problematic. As such, the participants were asked to place their name on a scale between ‘problematic’ and ‘problem free’ and to explain their choice. The following task was designed to explore the types, and depth, of feelings articulated by the participants when discussing transport in general. The participants were thus invited to consider the emotions they experience when travelling (over the previous two weeks) and to fill in three boxes on two cards labelled ‘emotion,’ ‘mode’, and ‘journey purpose’<sup>ii</sup> (examples included ‘anger, car, driving to work’;



'happiness, cycling, visiting a friend'). The participants were asked to reflect on their responses individually, then as a group.

The third task was devised in order to encourage the participants to reflect upon the degree to which, and why, they base their beliefs about transport on the problems faced by themselves or those (they assume are) faced by other people. Consequently, they were presented with a list of the 'top five transport problems facing the UK', as constructed by the research team using the Government's 2004 White Paper 'The Future of Transport' (DfT, 2004). These were: a congested road network; an unreliable, inefficient rail network; an unreliable bus service; poor walking and cycling facilities; and a lack of travel information. The participants were then asked to tick those they consider to be a problem for them individually and those which they consider to be a problem for other people. It was explained that they could tick either box, or both, or neither. We then discussed their responses as a group. Adding to the above chart, we then asked the participants to indicate which of the top five problems they feel they could do something to solve and which they feel they couldn't do anything to solve and were instead the responsibility of others (e.g. Government or private companies). It was here that we aimed to investigate issues of control, power and trust.

The final discussion, in effect the core salient topic of the interviews, was about ways in which innovative information technologies could contribute to these solutions, specifically using as examples five existing web-based services, ie parkatmyhouse.com, walkit.com, schoolrun.org, Carbon Hero (carbondiem.com) and parcelpickup.com. As their web-names indicate, these are respectively facilities to organise parking in people's private residential parking space, walking routes, shared responsibility for parents to take

groups of children to school, a carbon-use calculator, and collection of parcels and packages at a pre-arranged location. In each case, the origin of the service was a ‘bottom-up’ initiative rather than by a pre-existing large company. It will be seen that this methodology specifically roots discussion of technical innovation in the prior discussions on what people feel about the transport services they have and the travel arrangements they make, with the intention of avoiding an unrooted discussion about the web-based facilities in the abstract.

Findings from the study are presented below and a number of key themes arise. Firstly, attention is given to the participants’ discussion of wider transport problems and the challenges they experience on an individual level, focusing on issues of control and trust. Following this we consider the ways in which the participants respond to transport problems, or in this case mitigate the effects of wider transport problems on an individual level; with and without the use of ICTs and the extent to which such use of technology is creative, or innovative. We then discuss their response to already established innovations as possible solutions to the problems they face, as well as those faced by other people.

### **3. Findings**

#### ***3.1. ‘It’s about mitigating the effects of problems, rather than solving them...’***

Although the participants referred to various positive aspects of using different modes of transport, several problems/challenges were also discussed (some of which may

be unique to, or at least exacerbated by, the local transport network in the city of Bristol which is dominated by the bus). For example, reconfirming transport problems reported elsewhere (see DfT, 2009a; DfT, 2009b; and Lyons et al., 2008), the participants discussed congestion, road works, late or cancelled train services, the high price of public transport (in some cases commenting critically on why it had not been included in the ‘top five’ government list), the dangers of crossing busy roads as a pedestrian and cycling on the road. The participants also displayed examples of quite strong emotions in relation to transport problems, both negative (primarily ‘frustration’) and positive (both ‘exhilaration’ and ‘calm’). These might be pictured as shown in figure 1. There are three poles, with a recurrent sense of frustration mostly associated with unreliable (or non-existent) transport services, a positive sense of achievement in overcoming difficulties (eg finding a route which avoids snow-bound pavements, a time which avoids crowds, a good deal which saves money) and a sense of calm or peace of mind when things were going well, or were ‘turned off’, and people could relax.

However, generally there was a feeling that wider transport problems, as listed in the ‘top five’ list, are beyond the capacity of ordinary people to solve, and maybe even those in a position to make changes:

“Travel information. All right, so say you’ve got easier access to the bus timetables – I know I can log on at home... but the fact is it still doesn’t go around... and it still costs £1.85, so...I’m still not going to take it... that sounds a very cheap easy thing to fix, just make travel information more easily accessible. It doesn’t solve the problems with the travel itself”

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(Urban woman aged 40+ years)

“The websites are useful and fair enough, I’m not against the idea, but... it’s so marginal for what the real problems are”

(Urban man aged 40+ years)

Although a small number of participants did reveal efforts to get involved in transport decision making on a wider level (through their involvement in the development of local plans for traffic calming measures or improved cycle facilities in their parish, or children’s school catchment area), ultimately they believe that real control lies with ‘others’, although there was some uncertainty as to who they believe these others are. A number of participants pointed to bus companies, or “big firms”, as well as central government and local authorities as being responsible for the bus and train, but there was a sense of confusion as to who is ultimately responsible for these modes, as well as providing cycling and walking facilities. However, problems were often seen as being due not only to inadequate investment or insufficient priority, but also to the privatisation of bus and rail services being carried out in such a way as to leave greedy, uncaring, inefficient and monopolistic suppliers in charge, a sensitive issue in the region. These views were quite strongly stated, though then not pursued in the interview context:

“I don’t think you can do much with First Bus really, you tell them what they think and then they don’t do anything with it.”

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“Unless everybody lobbied them or boycotted them or something but it’s not something you can organise is it?”

(Urban women 40+)

In contrast, the majority of participants referred to the ways in which they are able to, in their own word, ‘mitigate’ the effects of wider transport problems, both with and without the use of ICTs. However, in both cases, this mitigation is in the form of behaviour change – even when ICTs are used, they are not in the form of a new innovative product or application.

In terms of non-ICT based solutions, participants referred to avoiding congestion when driving by taking different routes (often aided by an in-car or phone satellite navigation system), travelling at different times, and using an automatic rather than manual car. One individual referred to congestion as “a big motivation” to move to the city centre where his job is based and cycle his commute instead of driving, and another participant referred to his decision to walk to work because he cannot afford to drive. Further, feelings of fear created by various wider transport problems were identified in particular as a prevalent reason for changing travel behaviour. For example, a number of urban women referred to their decision not to walk at night due to fear of being attacked when walking alone or in poorly lit areas and participants from all groups referred to their decisions not to cycle at all because of the dangers posed by cars, vandalism of bikes and poor cycling facilities (including large lorries on small rural roads, speeding cars, cycle paths that ‘just end’ and potholes). A number of the urban participants referred to their fear that their children may be at risk of physical attack if allowed to cycle alone on the

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Bristol to Bath cycle path<sup>iii</sup>. Rural participants who have experienced feelings of physical danger due to a lack of pavements, referred to their decision not to walk themselves (as it is not “a viable option”), or to allow their children to walk in the area local to their homes:

“When we moved to where we’re living, I think we were a bit short sighted. My eldest at the time was six. She’s now 13, going on 14. I want her to be a bit more independent and I want her to be able to just walk down the lane and catch a bus and it just isn’t possible ...we’re on rural lanes with no footpaths, so I don’t even really want her, even if the bus was a bit more frequent, I wouldn’t want her walking up these lanes that don’t have footpaths to get to the bus.”

(Rural woman, aged 40+ years)

In the context of creative use of ICTs, a small number of the participants referred to their use of the mobile phone to ring friends, family or colleagues to warn them of congested traffic:

“...if I am in a journey and I am stuck in traffic, I am travelling with someone else who is travelling by car, text them if they’re behind me to take a different route because we’ve just hit an accident, and I’ve done that several times”

(Rural man, aged 40+ years)

Similar practices were revealed in previous research by the authors (see Line et al., 2011 in press; Jain et al. 2011 in press) when exploring the role of ICTs in everyday mobile lives. For example, mobile phones are used for last minute schedule changes to rearrange child care or organise lift-sharing, and women use mobile phones when walking alone during the day, or at night, in order to deter attackers. Together these findings illustrate that people do use ICTs in creative ways to mitigate the effects of wider transport problems, yet the participants in the empirical study reported here and the research reported by Line et al. and Jain et al. did not appear to be motivated, or even aware of the potential to take such creative practices forward into a user innovation that may be used by other people. Similarly negative responses (with respect to the potential of user innovation in the context of transport problems and ICTs) were given when discussing already established user innovations, as highlighted below.

### ***3.2. Established innovations: “it’s a good idea, but...”***

As explained in Section 2, the participants were offered examples of innovations which might address some of their problems – specifically, finding parking spaces to rent, walking routes, sharing the school run, better understanding the CO<sub>2</sub> contribution of their transport choices and the opportunity to have parcel deliveries picked up by a local business. Overall, a typical response to these innovations was an initial brief enthusiasm followed by an escalating list of reasons why it would not work. Thus:

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“I think the Park at My House thing is a nice idea but I don’t see how it would, could really work”

“It works in the city doesn’t it, not in a rural environment?”

“But there are huge insurance liabilities, if you are parking at someone’s house, who takes responsibility for that vehicle? What if they drive into your wall, drive over your cat? I mean that’s fraught with problems”...

“You come back and they are still there and they are meant to be gone”

“I find them a bit gimmicky really”

“Well, you know they are not going to solve the major problem are they?...”

“It has the potential to add to congestion problems in highly desirable sites, like for example parking around Wembley on football days so you could actually exacerbate congestion problems”

(Rural Men, aged 40+ years)

More specifically, it became clear that one particular theme of resistance was a dislike of internet-based organisation, either because of mistrust (an issue already linked to the use of online social networking sites – see for example Dwyer et al., 2007; Fogel and Nehmad, 2008) or because the same solutions would be more friendly, reliable and sociable if arranged among parents or neighbours rather than in an anonymous website. This was particularly the case in relation to the parcel pick up and school run services:

“I am not very trusting and I don’t know, anything that is kind of new and not established on the internet it just puts panic signs up with me and I just think if it



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is quite important to me I don't think I would just get a random, putting my details on a random website and they were going to pick up a parcel of mine"

(Urban women, aged 18-40 years)

"I have the same objection [to parcelpickup] I think. I spend a lot of my time on the internet and the more I do it the less connected I feel [to] life, to community, to people. I don't like it"

"I agree"

"I am trying to move away from it"

"I remember what it was like in the 70s and 80s and well it was very different"

"You could just ask your neighbour, leave her a note, can I drop it round yours?"

(Urban women, aged 40+ years)

"[School run.org] is an anti-community thing... because we are just saying, people don't see each other face to face, they don't get to know each other, which happens at the school gate anyway. It's the organic natural way to do it"

(Urban women, aged 40+ years).

The participants' response to Liftshare also moved from initial interest to subsequent pessimism, highlighting issues documented elsewhere in relation to car-sharing. For example, as reported by Bonsall (2002), participants referred to their unwillingness to share their personal space with another (perhaps unknown) person and the difficulty of co-ordinating differing work schedules.

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“You know, just in terms of freedom, sort of, you can’t go out anywhere afterwards because you’ve got to give someone a lift home... if your plans change or anything...and as well it’s your personal space and you want to just go and shut up, don’t want to talk about work with someone else who you work with and you don’t really like”

(Urban man, aged 18-40 years)

The impression is given however that these responses are not necessarily a complete and accurate list of barriers to use – rather, they have the tone of thinking of reasons, almost excuses, on the spur of the moment. The dynamic of the interviews was such that when one person thought of a reason against, others would often chip in to add other reasons. However, it is also of note that park at my house drew particularly positive reviews when talked about in relation to parking difficulties in London – a response which policy agencies focused on sustainable transport may be concerned about, as encouraging more car commuting to London is not usually seen as a contribution to better transport:

“I lived in London for about 10 years and that was always a problem. Parking. And it’s expensive... yes that would be a fantastic solution, wouldn’t it... especially if you’re working...”

“For London, I can see the benefits of doing it. ..Absolutely. London. Absolutely ideal”

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(Rural men, aged 18-40 years).

### ***3.3. The embedding of ICT use in everyday life***

Reflecting the research findings of Line et al. (2010), the empirical research reported here also highlighted the extent to which use of ICTs has become embedded in everyday life. When current use of 'innovative' information systems were mentioned, it was often casually, in passing, in a matter-of-fact way and with no hint of the excitement that IT-enthusiasts often feel. One participant forgot she was a regular user of journey-planning sites, and did not tick the relevant box on the chart:

“I feel bad now, I feel I should have ticked that, only because I didn't think of it that way, because I think I am fine at planning my journeys and getting the information...it is all online so if you are not online you are not going to know. Am I allowed to go and tick it?”

(laughter)

(Urban woman 18-40)

Similarly other participants who referred to their use of texting, Facebook, online travel information and Walkit, suggested that such innovations were the obvious choice, established transport solutions, whether they use themselves or not:

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“I only ticked it because if I am in a journey and I am stuck in traffic, I am travelling with someone else who is travelling by car , text them if they’re behind me to take a different route because we’ve just hit an accident, and I’ve done that several times”

(Rural man 40+)

“I’ve seen a bit of car-sharing on things like Facebook... but I’ve never used it, I’ve just seen other people, when it pops up... I don’t pay attention but I did see it was there”

(Urban man, 18-40)

“...personally don’t find that [lack of information] much of a problem. I think that if I go on the internet I can find enough stuff for travel information most of the time”

(urban Man 18-40)

“I can’t even remember how I found [Walkit], but it was the first thing that came up to do with walking”

(Urban woman 18-40)

Again, although only a recent development, the iPhone and iPhone applications (i.e. ‘apps’) in particular were not spontaneously mentioned, but a prompt from the interviewer revealed that several people used the travel information facilities:

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“...you just get so lost unless you have a good little map that you can refer to, it is so difficult”

(Interviewer – but you use an iPhone don’t you, there are applications on that?)

“There are, it is on as standard, there is a map one”

“I use that to go home actually”

“I do as well”

(unclear, all talking at once)

(Urban women 18-40)

What emerges from this is the impression that some, perhaps many, people are more familiar with various travel information technologies than they initially say, but take them for granted without at least consciously considering them as a major influence in changing their lives. In that sense, while still ‘new’ in terms of social phenomena, they are no longer thought of as innovative by their users, and hence such changes in behaviour as they may have caused are now embedded and un-noticed.

#### **4. What does this mean for user innovation in the context of ICTs and travel?**

In Section 1 it was hypothesized that people are motivated to find solutions to the transport problems they face, yet here it would appear that this relationship is more complicated than expected. Within the limitations of qualitative research (a small

sample, confined to the city of Bristol and surrounding villages), the research has illustrated that a direct link between a willingness/motivation to find or use innovative, ICT based solutions to transport problems, is tempered both by the participants' (perceived and actual) lack of control over the wider problems they face, their lack of interest in ICTs and the embedding of ICT use in everyday life (as already reported in Line et al., in press and Jain et al., in press). Where they did illustrate innovative use of ICTs, such as texting or phoning friends, family or colleagues to warn them of congested traffic, they are in the form of new practices, rather than new products or applications. It is also key that the participants (in both this research and research reported by Line et al., 2010 and Jain et al., 2011) were unaware that their behaviours can be considered creative and did not express any motivation to take them forward as an innovation that could be used by other people.

Further, despite initial enthusiasm for a number of the established innovations presented to them, the participants also revealed a lack of trust in using them and suggested that such ideas would be more friendly, reliable and sociable if organized in person. In this sense the research methodology used has successfully revealed some cognitive dissonance in this area, without yet explaining it. An interesting hypothesis is that new technologies (in the context of transport) become embedded into everyday life without people appearing to notice much about the transitional process itself, or the changes in behaviour which may be occurring during it.

For those in a position of developing or investing in user innovations, these findings could be disheartening in the sense that expectations of large scale solutions to the wider transport problems affecting the public (both collectively and individually)

from new information technologies may be unrealistic. However, enthusiasm for parkatmyhouse suggests that some, perhaps more clearly defined, transport problems can be ‘sold’ a solution (although there are sustainability implications to support of this type of scheme, as noted above). It may be argued that parking problems are more universally felt, required and understood by the public than the need to calculate the carbon footprint of transport choices, plot walking routes or share the journey to school. Yet, these innovations do have a user base, however niche they may be. With this in mind, we suggest a need to better understand the motivations and experiences of those who have used, or are using, established innovations.

The practical implications of the research reported here are that there are problems in finding understanding from general groups of the population which will include a proportion of those resisting, and a proportion of those for whom change is now embedded, but few in the process of a recent or current transition in relation to their transport behaviour; such that they are searching for a ‘solution’. Consequently, the next phase of the research will focus on a selected group of people who have signed up to relatively new information services, and for whom any transitions will be a shared experience, and relatively recent.

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<sup>i</sup> Participants were each given an incentive of £40 and each group session lasted 1 hour and 20 minutes - although some over-ran (but by no more than 10 minutes).

<sup>ii</sup> Here it was explained that they needed to consider two different emotions, but the mode and journey purpose could be the same.

<sup>iii</sup> The Bristol & Bath Railway Path is a 13 mile off road route between the cities of Bristol and Bath, UK.

Figure 1: Three poles of participant emotion towards transport problems

