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Ideas in Transit WP 33 'Case Study of Already Established Innovations'
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Technology, innovation and travel; understanding the user

Report on interviews with the innovators and their users

1. Introduction

'Ideas in Transit' (IiT) is one of three projects funded as part of the Future Intelligent Transport Systems initiative. The initiative is sponsored by the Engineering and Physical Sciences Research Council, the Department for Transport and the Technology Strategy Board. IiT is a 5-year project running from October 2007 and the research team is comprised of the University of the West of England, Bristol (UWE), Loughborough University, Ito World Ltd and Ordnance Survey.

IiT originated from a growing Government and private sector interest in the ways in which people use information communication technologies (ICTs) to organize travel, during travel, and to solve particular transport challenges - particularly where they do so creatively, or 'innovatively'. Here, creative use of ICTs is considered to be 'the production of new ideas or combining old ideas in a new way' (Heye, 2006; 253) and such creativity becomes an innovation when it 'has a socioeconomic effect' – something that 'changes the way people live' (Chayutsahakij and Poggenpohl 2002; first page).

The project focuses on 'user' innovation in particular, defined here as,

> "*The creation and application of an invention initiated by affected individuals that stems from user need or curiosity to address a problem or challenge within social practice*" (Lyons et al., 2011)

Such innovation is often niche, but highly focused on user needs – e.g. a school website for parents to organize sharing the school run. It differs from top down Government or large company led innovation which is usually driven by the desire to 'please everyone' through incremental improvements to large top-down systems – such as web-based UK wide travel planning. As highlighted by Lyons et al. (2011), such systems are likely to be well-resourced, but struggle to meet the needs of all individuals. In comparison, user innovation may, very specifically, meet individual needs, but be limited by resources.

Previous exploratory, depth IiT research carried out by the Centre for Transport and Society (CTS) began by investigating the public's relationship with ICTs in the context of travel and the prevalence of user innovation (see Line et al., 2010, Jain et al., 2011). This research illustrated that ICTs are now embedded in people's everyday lives and travel behaviour – particularly via the use of mobile (or more recently 'smart') phones. For example, such phones are used to arrange travel, to book tickets, to check timetables and real time traffic information, as well as make last minute arrangements – e.g. ringing child minders if parents are stuck in traffic. However, despite the prevalence of ICTs and their use, it has proved difficult to discover new, creative ways in which users of the transport system are utilizing the technologies available to them. Further, even where the

participants did display creative use of ICTs when mitigating the transport challenges they face on an individual basis, they are often unaware that their practices can be viewed in this way and hence showed little motivation to take their ideas forward into innovations that may be used by other people.

As such, in building on this research, the CTS team took the decision to focus on gaining a deeper understanding of user innovation through an investigation of the experiences and motivations of a sample of already established user innovations and their users[1]. Hence, the study 'Technology, innovation and travel; understanding the user' aimed to:

a) identify a sample of user innovators and establish what they understood about their users – before and after investigating the motivations and experiences of people using these innovations; and

b) draw conclusions about how user innovation's success is likely to be affected by the motivations and experiences of those people using them, as well as the innovators' understanding of this.

The overall aim of this piece of research was to better understand the problems, or challenges, established innovations may (or be perceived/intended to) solve, as well as the barriers and enablers to their use. Such an understanding could be used to further establish the circumstances in which a user innovation may be successful. Exploratory, qualitative research was thus carried out with four user innovations with established user bases – Bristolstreets, CycleStreets, Liftshare and Walkit, as detailed in the following section. Following this, the report presents a summary of the methodology used, a discussion of the main findings, and finally the discussion and conclusions.

2. The innovations

At the outset it is essential to note that the descriptions and experiences provided by the innovators and users are relevant to the innovations in the form they were found during the period of empirical data collection – March to July 2011.

www.bristolstreets.co.uk is an online interactive map that allows users to explore transport options in the city of Bristol, UK, viewed over a Google Maps base. It was launched in 2007 and provides information about bus timetables and bus stops; cycle routes, cycle parking and cycle shops; train stop routes and national rail information; ferry timetables and routes; walking route; taxi ranks; and car club parking. It also includes a 'quiet map' which displays a contour map of environmental noise and user identified 'quiet' locations and a link to Bristolmix which is a separate website providing local information about arts and cultural events taking place in Bristol. According to the innovator, Toby Lewis, the site has approximately 150 visitors per day (as of April, 2011). The site does not generate revenue and thus Toby runs the site as a form of unpaid employment.

www.cyclestreets.net is a UK-based cycle journey planner system, launched in 2006 by Simon Nuttall and Martin Lucas-Smith. Users of CycleStreets can plan routes from A to B by bike and in doing so choose the fastest, quietest or shortest route in a number of cities including Cambridge, Bristol, London and Edinburgh. The routes are displayed using an OpenStreetMap.org (OSM) map base and the distance, time taken and route directions are also calculated. A separate cross-sectional map is also available, providing information on the altitude of a given route and therefore information on the climbing required. In addition, CycleStreets allows users to upload cycling-related photos and

[1] As identified by IiT partners and as found on the IiT portal (see http://www.ideasintransit.org/wiki/Ideas_in_Transit)

videos and these can be used to visualise a route or to point out problems or obstacles (such as bollards in the middle of cycle paths) and/or examples of good practice. By June 2011, over 825,000 journeys have been planned, covering more than 10 million kilometres, and over 28,000 photos and videos have been uploaded. The site is not for profit, supported by requests for donations.

www.liftshare.com was launched in 1998 by Ali Clabburn and the company currently employs 17 people. It is an online service that facilitates journey sharing between individual users, as well as providing separate services for businesses, organisations and events. Consequently, there is a public Liftshare scheme which, as of June 10th, 2011, has 439,571 registered users, and separately there are 1,327 privately run Liftshare schemes. Users of the site sign up to the public and/or a private scheme, enter details for the journey they want to share and then wait to be contacted by other Liftshare users or notified of potential matches, or they can search for matches or other journeys that they could share.

www.walkit.com was launched in 2006 by Jamie Wallace and it now employs a total of three people. The site aims to encourage people to walk as a form of transport and provide point-to-point walking routes in a number of UK cities using a drawlive map base (www.drawlive.co.uk). Initially the maps available to Walkit users only covered central London, but the site has since expanded to over 25 cities and towns and continues to add new locations. In addition to walking routes, the site provides directions, journey times, the option of a direct or indirect route, routes that avoid busy roads, as well as calories burned and CO_2 emissions avoided on the journey. In some areas, including Cambridge and inner London, routes can be chosen that avoid areas of higher pollution. Walkit also hosts a blog page, an events page highlighting walking related events in its featured cities, and information pages on walking for health, walking to work, walking to school and information about 'going green'. Users can sign up to have a personalised account, either for free (myWalkit) or for a subscription of £1.50 a month or £15 a year (myWalkit+). Mywalkit account holders can personalise their walking speed and in doing so obtain more accurate walking statistics. Mywalkit+ users can use additional facilities including logging previous walking routes, and recording their carbon savings. 100,000 people currently use the site.

3. Methodology

The research took an exploratory, qualitative approach. Data was collected in three stages as illustrated in Table 1. An initial semi-structured interview was carried out with each of the four innovations (lasting 30-40 minutes), based on the key aims/themes the research wished to explore in order to establish what their 'product' is, how it works, what the challenges were in developing it, their relationship with users, and what they understand/assume about the users' motivations for and experiences of using the innovation. Following this, the innovators advised and/or assisted in contacting five of their users, by emailing or using Twitter to notify users of the research. Individuals then contacted the CTS research team directly and the first five were then invited to be interviewed (once the interviews were completed, the remaining volunteers were notified that the study had filled its quota for participants). Again, a semi-structured approach (lasting 35 to 60 minutes) was used and here the questioning related to the participants' motivations and experiences of the innovation, as well as the transport challenges/problems such innovations may (or be perceived/intended to) solve and the ease or difficulties of using them. Each participant was given a £20 voucher as a thank you for taking part.

Table 1: Timetable of data collection

	Period of data collection		
	Initial interviews with innovators Feb – Mar 2011	**Interviews with users of innovations Mar – June 2011**	**Follow up interview with innovators July 2011**
Liftshare	18/02/2011	30/03/2011 (x2) 31/03/2011 05/05/2011 06/05/2011	22/07/2011
Walkit	22/02/2011	15/03/2011 01/02/2011 07/04/2011 15/04/2011 (x2)	19/07/2011
Bristolstreets	03/03/2011	11/04/2011 12/04/2011 19/04/2011 20/04/2011 03/05/2011	13/07/2011
CycleStreets	11/03/2011	13/04/2011 14/04/2011 21/04/2011 20/05/2011 (x2)	15/07/2011

Both sets of interviews were transcribed and thematically analysed[2]. The interview data were broken down into specific sentences or paragraphs and each one labelled according to the aims of the research (e.g. 'motivation to develop innovation', 'purpose of innovation', 'initial encounter of innovation by user', 'positive experience of innovation' etc), while also allowing new themes to emerge. Essentially, each line, sentence, or paragraph is read in search of the answer to the repeated question "what is this about? What is being referenced here?". The themes arising were compared across each innovation and then across all of the innovations.

The findings from this process were then presented to the innovators in the form of an individually-tailored report (focusing on the findings from their users, but drawing on finding across the four innovations where relevant) and discussed in a follow-up interview. These interviews lasted 60 to 90 minutes and allowed the innovators to pick up on any particular points raised by the users and discuss any influence these may have on future development of their sites. The innovators were also asked whether they could share any additional data with the research team and Jamie was able to provide the findings from a survey of Walkit users conducted across May 2010. These are referred to where appropriate in Section 5 below[3].

The sample of both innovators and users was purposive. As stated above, the innovations were chosen on the basis that they were initiated by 'user' innovators and that they had an established user base. The users were chosen on the basis that they had used the innovations in some capacity and were able to reflect on their motivations and experiences of using them. The sample did not intend to be representative of user innovations, nor users – this is instead the purpose of future research by CTS for IiT. However, Table 2 provides information about the gender and residential

[2] However, at this point it should be noted that due to technical (and human) error, the initial interview with CycleStreets was lost. However, a report on the key findings from the interview was written immediately after the interview took place and then agreed with the innovators.

[3] This survey was completed by 932 people, 70% female, 30% male; 9% of whom were under 25 years of age, 30.5% aged 26-35 years, 21.5% aged 26-45, 21% aged 46-55, 15% 56-65, with the remaining respondents over the age of 66 or of unknown age.

location of the users. Overall, 10 female and 10 male participants were interviewed. Although there was some bias towards one gender in each of the groups, the findings did not illustrate any particular variation on this basis. Unsurprisingly, the users of Bristolstreets were based in Bristol due to the local relevance of this site. The users of Liftshare were recruited through UWE and were thus employed by the university but resided in a number of different locations, as far away as Somerset and Wales. Despite being available in other cities, all of the Walkit users were from London, whereas the CycleStreets users volunteered from four different cities. Unlike gender, some of the participant responses did relate to the facilities available in their different residential locations and these are illustrated, where useful, in the discussion of findings presented below.

Table 2: Gender and residential location of the users:

	Gender	Residential location
Bristolstreets	Female	Bristol
	Female	Bristol
	Male	Bristol
	Male	Bristol
	Male	Bristol
CycleStreets	Female	Bath
	Male	Bristol
	Male	Cambridge
	Male	Cambridge
	Male	London
Liftshare	Female	Chippenham
	Female	Chippenham
	Female	Brockweir
	Male	Bridgewater
	Male	Burnham on Sea
Walkit	Female	London
	Female	London
	Female	London
	Female	London
	Male	London

4. Findings

This section presents the findings from all three sets of interviews. The initial interviews with innovators are considered first, outlining their understanding of users. Following this, the findings from the interviews with users are outlined together with the responses of the innovators. An interpretation and conclusion of the key findings is then presented in Section 5.

4.1. Innovators motivations

Although not established specifically in a transport context, research has revealed that key motivations for a user to innovate are (after Leadbeater, 2006; and Luthje, 2000):

- a need not being met (adequately) by the market;
- 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 (and knowledge/expertise) and work co-operatively with others.

Largely, these were mirrored in the motivations expressed by the four innovators involved in this research. Firstly, each of the innovations were conceived in response to a particular transport problem, challenge, or 'need' for which the innovator believed the market was not providing a solution. For Bristolstreets, Walkit and Liftshare, the innovators had all experienced the problem themselves and assumed it must be a problem for other people (although they had also conducted a limited study of the potential markets).

Toby had experienced a lack of easily understandable bus information. In particular, he referred to Bristolstreets' aim to provide a solution to people's need to have pre-knowledge of a journey when using other sources of transport information,

> *"So the idea with Bristolstreets was that it was almost coming from the other end, you're getting the general information, you're getting the big picture and from that you then have the weaponry to go and ask specific questions either on this site or you know to acquire schedules or route planners elsewhere."* (Toby Lewis, Bristolstreets)

Ali was motivated to develop Liftshare through personal experience of car sharing in Germany when he was a student, together with his discovery that such a scheme was not already available at his University when he returned home. Jamie was interested in sustainable transport and had experienced a need for walking information amongst friends and colleagues,

> *"I couldn't persuade even colleagues who are pro-environmental behaviour motivated to walk places in London, and they always knocked back at me saying 'it's going to take me too long, and I don't know where to go above ground'. ...Yes, so I thought there was a gap in the market."* (Jamie Wallace, Walkit)

Like Bristolstreets, both Liftshare and Walkit were developed in response to the innovator's perceived lack of relevant information. Ali pointed to Liftshare's aim to provide people with all the information they need to find car share[4] partners. Similarly, Jamie stated that the provision of this information about where to walk and how long it would take to provided Walkit users with the confidence to walk and as a consequence he "*might be able to shift some behaviours to walking*."

In comparison, CycleStreets was initially proposed as an idea for Simon to develop a Cambridge Journey planner for the city council, a project that in the end did not happen. However, after Simon left that job, he and Martin developed CycleStreets as part of a voluntary organisation, and the site stemmed from their belief that information about cycle routes could be more effectively presented on the internet and, in doing so, they could make it easier for people to cycle.

[4] To clarify, by car sharing we refer to the sharing of car journeys so that more than one person travels in the car. Car sharing can also be referred to as carpooling, ride sharing or lift sharing.

Thus overall it is information, and the effective presentation of this information that each of the innovations aimed to provide their users - either information that is an end in itself (as in the case for CycleStreets, Bristolstreets and Walkit in relation to route information about different transport modes) or information that allows users to then seek out further information (as in the case for Liftshare where users are introduced to each other and can then make arrangements away from the site). They have not sold a particular device or 'gadget', although users could pay to use myWalkit+ and after the initial interviews took place, it became possible for Walkit users to pay to download a mobile phone application (or 'app') version of the site (which allow the device to perform tasks that are typically restricted to PCs).

Beyond user needs, Simon was also strongly motivated by CycleStreets being 'an interesting technical challenge'. Martin was also motivated by this, as well as citing the computer programmer's "*rite of passage*" in writing the code for a (more basic) routing engine. As such, it can be said that they were motivated by their technological 'expertise and capabilities'. Similarly, Toby referred to his expertise with ICTs, as well as the 'enjoyment' of running a website, "*rather than building websites for other people*".

Further to this, Martin was interested in promoting the collection and use of user-generated information in relation to cycling, and the general movement to encourage Government to release transport data which can be used by innovators to create new products quickly (rather than Government paying for the creation of a closed system). In this sense, he was also motivated by the opportunity to share the ideas behind CycleStreets with other people and 'gain social capital' through the sharing of user generated data.

However, in addition to these motivations (which can be attributed to user innovations in general), across the four innovators their most prevalent motivations were a desire to improve people's quality of life and encourage people to reduce their dependency on (single occupancy) use of the car (as illustrated in Table 3[5]) – although it should be noted that there was no one specific reason why the innovators wanted to reduce car dependency.

Table 3: Most prevalent innovator motivations for developing initial idea

	Improve quality of life	**Encourage behaviour change away from a reliance on (single occupancy) use of the car**
Bristolstreets	"*I see transport as a quality if life issue… commute time is one of the three largest factors in people's quality of life and their happiness so getting that right is very important"*	*"…part of the idea was that by offering information about say driving…you'd get car visitors who would then be exposed to bus information and hopefully …they would start using those and then cycling was obvious and the ferries"*
CycleStreets	Martin was motivated by providing people with something that would make it easier for them to cycle – i.e. a social good	Martin and Simon see CycleStreet's photomap as something that adds to their campaigning for behavior change from cars to bikes.

[5] Due to the loss of the original recording of the initial interview with CycleStreets, Table 2 (as well as Tables 3 and 4) uses short description of findings rather than quotes for CycleStreets.

Liftshare	*"…the more I did, the more it became about socially helping people"*	*"…probably a year into it before the environmental thing really occurred to me and then you start to realise that people are saying 'oh it helps…' …you realise that it is crazy that people are [driving] on their own …and you kind of think I can help this."*
Walkit		*"I don't really care why people are walking as long as they are, and I don't care what motivates them to walk. I just think if there's a site and more people are walking its good for them individually, and it's good for society."*

Finally, as explained by Lyons et al. (2011), often direct financial benefit is not a motivation for the user innovator, but this could be an indirect consequence of generating innovations in response to true user needs in that there may be a market for such solutions amongst the population that leads to a business opportunity. Both Walkit and Liftshare are run as businesses, but only Ali was interested in running a business prior to investigating the potential for Liftshare (*"I had four or five things I wanted to do, businesses I wanted to do and I thought that car sharing would be the easiest and quickest one to get going.");* thus suggesting that this he was perhaps more motivated to develop a commercial innovation (i.e. looking for a profit) than the others. In fact, through selling private schemes to businesses and organizations, Liftshare was perhaps the most successful of the four in terms of raising revenue and number of employees. In comparison, Walkit raised revenue through advertising and selling myWalkit+ and the Walkit iPhone app. CycleStreets is run as a not-for-profit business, relying on donations and any funding/grant opportunities that are available to them. Bristolstreets currently (August, 2011) does not have a revenue stream.

4.2. Assumptions about users

The innovators differed in the extent to which they sought feedback from their users. Both Bristolstreets and CycleStreets invited users to submit feedback via a feedback or 'contact us' form available via a link available on the websites. Jamie also requested feedback via a link on the Walkit website, but in addition he conducts an annual survey of users; the findings from the 2011 version are drawn on here in the discussion of findings[6]. Ali also referred to conducting 'member surveys' and his staff have regularly gone to workplaces to consult with their clients and gain feedback from individual users via focus groups. Interestingly, only Ali feels that he has received all the feedback that his users have been willing or able to give. Although Jamie illustrated that he has received a significant amount of feedback, he appeared more open to the possibility of needing to know more about his users. In contrast, Toby talked of his concern about 'hassling' users for more feedback, and Martin and Simon referred to their lack of time and resources to deal with the feedback they have received (although they did say that they would like to carry out their own survey when they have the resources to do so).

[6] However, it should be noted that Jamie questioned these findings due to, in his view, the random sampling favouring those people who are prepared to fill in the online survey.

Despite these differences, all of the innovators referred to various assumptions they have been able to make about their users. Toby found that the majority of visitors to Bristolstreets have sought bus information and that the cycling layer was also very busy, but this was activity by a smaller number of people. In terms of a 'typical user' of Bristolstreets, Toby stated that, because the site was "*generally a positive thing it's sort of a magnet for more positive attitudes*", the users were "*better educated, more environmentally aware, more socially conscious*". He also found that although users have reported small problems relating to, for example, route changes and increases in car park fees, "*generally most of the feedback has been people saying thanks or just appreciation.*"

In relation to CycleStreets, Martin gave the impression that he was surprised at the number of users they have had and both he and Simon are unsure why people have used the site and what their motivations were. However, they have received feedback about the site from users, 50% of which they estimate was about routes and 50% relates to suggestions about the site or personal experiences/stories. Martin described the personal stories as 'heartening' as they are often positive. However, they have also been informed of small problems with route information, which they aimed to deal with as soon as they were able to.

From Liftshare's surveys with users, Ali explained that although their initial motivation may be financial, once users have organized a car share, the environmental impact also becomes important, or the fact that they've made a friend. However, when asked who he believed would be a 'typical user' of Liftshare, he explained that, contrary to his initial expectations (that they would be young males looking for lifts), users have been,

> "*50/50 male/female, average age 35, but that doesn't mean it's mostly 35 as there are a lot of young. Generally it's working age, but that's who we've been promoting it to. We do some elderly stuff, lifts to hospitals, but we don't do much promotion of that side of it. So it's generally working age, generally better off*". (Ali Clabburn, Liftshare)

He also suggested that people were likely to be attracted by the sense of community created by Liftshare,

> *"I think our success has been that it is all about the community, all about showing what you've got in common with someone."* (Ali Clabburn, Liftshare)

Jamie explained that Walkit received a high number of emails in response to their request for feedback on the website and he believed that half of these emails were positive feedback and half related to people highlighting problems with the mapping data. Also from this type of engagement, Jamie has gained the perception that Walkit is used by,

> *"…pretty normal people going about their daily lives in their city and we help them achieve that. They are not cutting edge techno geeks or bankers in the city ...I think we have provided something which you know normal people don't feel too intimidated by, or they don't need a fancy phone, they don't need a PhD in computing Physics or whatever"* (Jamie Wallace, Walkit)

Based on the annual surveys conducted by Walkit, Jamie assumed that his users have particularly liked the health and time saving benefits of using the site and "*love*" the facility for monitoring the number of calories burnt on a given journey. They have particularly liked the "*the security and knowledge that it's going to take you that amount of time*" to walk a given journey, but have been less interested in the amount of carbon they have saved. From Walkit's engagement with users through its Twitter feed and Facebook page, Jamie believed that a key motivation for users has been

the ability to monitor calorie burn, as well as time saved by walking, the convenience of walking, the ability to avoid public transport, as well as the opportunity to promote walking to friends.

4.3. Future development of the innovations

Each of the innovators recognized various issues in taking their innovations forward and all but Toby talked about ideas for future development (as summarized in Tables 4 and 5). At the time of the initial interview, Toby strongly indicated that the limited time he was able to give to the site meant that he was only able to maintain it, rather than develop it further. However, as highlighted throughout the discussion of findings, during the follow-up interview, Toby made it clear that he intended to invest more time in developing the site.

As can be seen in Tables 3 and 4, the majority of issues and plans for development noted by the innovators were specific to the context of each innovation. However, both Bristolstreets and Liftshare struggled to gain support from central or local Government; both Bristolstreets and CycleStreets had limited time to give to the maintenance and development of the innovations; and both Liftshare and Walkit were concerned with losing the simplicity and clarity of their sites if too many facilities were provided or added. The need to develop an app was mentioned by both CycleStreets and Walkit – an intention that was brought to fruition.

In addition, it is noted that Ali was the most vocally positive about the future of his innovation, stating that public awareness of Liftshare (in August, 2011) was less than five percent, yet they had already logged that "*one in every one hundred cars in the UK is a Liftshare member".* The remaining three innovators were somewhat unsure of the likely future success of their innovations, for the reasons highlighted above. For example, Martin and Simon explained that, although CycleStreets was run as a not-for-profit business, it needed an injection of cash to develop it further.

Overall Section 4.1 has illustrated that the innovators believed that the nature and provision of transport information was key to travel behaviour change, but differed in the extent to which they have, were able, or wanted, to engage with users and gain feedback about their sites. Correspondingly, they also differed in their assumptions about users – all of which are specific to the individual innovations, perhaps an obvious reflection of their differing aims and the typical niche nature of user innovations more generally. Similarly, the majority of the issues the innovators recognized in relation to the future development of the sites were specific to each innovation, with the exception of the struggles to gain Government support, the resources available to the innovators for development and their belief that simplicity was key to their sites and should be maintained. The implications of these findings are discussed in Section 5, but this report now turns to a presentation of the findings from the interviews with users and follow up interviews with the innovators.

Table 4: Issues taking the innovations forward

Issues	Bristolstreets	CycleStreets	Liftshare	Walkit
Sustaining use of the site – reducing participant drop off	*"…[people] don't have an on-going use or need for looking up [bus] information. (later) It's only the times like when they changing jobs, changing home and things that they actually really do a serious revaluation of transport."*			
People don't understand the site	*"I think a lot of people fall at the first hurdle which is they come to a blank map and they go 'there's no search, there's nothing there' and off they go because it's different"*			
Lack of trust by Government of local Council	*""…the council has concerns over data accuracy so they're reluctant to endorse something that might produce incorrect information but also they feel there's a lack of control because I'm not contracted to them"*		*"…we're the biggest in the world at what we do, we help far more people than anything else …[yet] trying to get Government support, or get the Government to say Liftsharing is good thing, or when we've shown them the benefit cost ratio of car sharing and it being 50:1 or 70:1 they say it seems too good, but it's not too good …The whole use your car wisely isn't really on the agenda."*	
Lack of interest by local transport providers	*"I went to talk to First and they quite liked it but they didn't want to get involved because I had other bus companies on so they didn't want to be sponsoring or promoting anything that promoted their competition as such."*			
Innovator has limited time	*"…it has to work as a self-sustaining project, if there was something else that was ticking over and making my life easy then I would be putting more time into this …I'm very torn because there's lots of things that I wanted to do with it."*	Martin and Simon explained that they currently do not have the resources (time and money) to deal with the feedback properly - if Simon did so he wouldn't have time to do anything else – it would be a full time job.		
Competitors who devalue the market			*"…there are competitors [who] undervalue the market and say they'll do it for free or have a free group and when it doesn't work people think that car sharing doesn't work, …we can't complain about it, competition is good because it drives the market forward,*	

			but bad competition hurts."	
Unsuccessful managers			*"…the other problem is [when] the car share managers are cyclists so they don't really understand car drivers. …have the wrong person promoting it and it doesn't really work."*	
Over-loading the site/losing simplicity			*"…lots of tenders say we want a [cycle/walk] budi scheme …It does work when it's done as a completely separate system. We have a client that has a Liftshare scheme and a bike budi scheme and it works brilliantly because they promote them as two separate things …but lots of people now have travel share sites and things which completely confuses the message, people don't quite know what it's all about"*	*"We have talked about [cycle routes] for years, and I am the most anti it. …I think for clarity and purpose I think we should stick with walking, and technically it's quite difficult to do cycle route planning well"*

Table 5: Ideas for future development

Ideas	CycleStreets	Liftshare	Walkit
Develop a feedback management system	Martin and Simon explained that a new feedback management system is to be written, which will make it much easier for other members of the OpenStreetMap community to help manage the feedback.		
Develop an app	Martin explained that they believe smart phone apps are a natural extension of the project, but it was continual user feedback requesting them that also led to their development.		*"iPhone is the big thing. We have had requests for this for years now …we are way behind the curve in terms of mobile because that's logically where a lot of people now want their help is on a mobile. They don't want to sit at a desk and look at a browser on a desktop and there's a logic in that you know, you are walking with your phone, that's where you need the info, but then we need to do an Android app and then we need to do a Blackberry app and then we need to do an iPad app and so it's going to be quite a challenge …and iPhone users in particular are very, I think they will be more demanding because people you know, there are all the design nuances on the iphone …but we have got to be there"*
Conduct a user survey	Martin wants to do a survey of your users, but Simon is not sure due to the time and money needed to do a survey properly (particularly considering the time needed for data entry and analysis). Simon is wary of hassling people, although Martin thinks users would be happy to fill in a survey.		
New version will improve key features of previous version		*"…now [developing Version] 4 has been about fully integrating all sorts of media, adding much better mapping, adding much better auditing, much better carbon management tools, improving visibility, a whole new business tool to help people plan for business trips, integrating public transport journeys, so people can use public transport to get to a car sharing route."*	
Enable contribution of user generated information			*"Open Street Map could be cheaper and we could get better tools for users to contribute data because that's the whole purpose of OSM is bottom up mapping. So we could hand over more of the, if someone's frustrated that there isn't something, a footpath on Walkit, we could say well add it into OSM."*

4.2. Users motivations

4.2.1. Solving transport challenges

This section begins by highlighting where users were motivated to use the innovations to solve particular transport challenges or problems, in order to assess the extent to which these mirror the transport problems the innovators were aiming to solve

For Bristolstreets users these challenges were:

- trying to live without a car (1 participant[7]),
- a limited and confusing local bus service (1), and
- a need for children to travel independently (1).

Walkit users stated that they were motivated by challenges including:

- finding 'walker specific' information (such as the availability of pavements and areas with busy traffic) (1),
- maintaining motivation to cycle (1),
- the inconvenience experienced when using other modes of transport (1),
- a lack of knowledge related to journey times by bike (1),
- a need to save money (3), and
- a need to save time (1).

For CycleStreets users challenges included:

- not knowing how long cycle journeys would take (1),
- finding a website for uploading photos that focuses on cycling (and cycle campaigning) specifically (1), and
- paper cycle route maps being poor or difficult to use (1).

For Liftshare users, the following challenges were referred to:

- the cost of driving as a single passenger (1),
- sharing the drive to work (2), and
- the high cost in time and money, or impossibility of schedules, when using public transport as an alternative to driving (1).

In addition, two Liftshare users talked about the combined cost of petrol and parking charges at UWE and the threat of congestion charging and/or road charging putting pressure on their or others' ability to commute to work by car,

> *"…there's a price when people can't afford to work at UWE"*
>
> *"they're on about road charging aren't they: that would be a killer. ...if I've got to pay for parking, road charges, plus petrol, plus my [the Severn Bridge toll]"*
>
> (Liftshare users)

All of the users that sought a solution to their particular challenges were successful in doing so, apart from two Liftshare users who are yet to organize a car share. In all cases, it was information that the users required and retrieved from the sites – reflecting the main aim of each of the innovations as

[7] From this point, the number in brackets following each bullet point (and subsequent lists of bullet points) refers to the number of participants that referred to the comment/idea referred to.

highlighted above. However, as discussed in Section 4.3.3., not all of the users continued to use the innovations in the long term, even if they provided a solution in the past.

It was of particular interest to Simon and Martin that only one participant used the site as both a route planner and as a photomap. In the follow up interview, Martin was quick to pick up that, from this sample of CycleStreets users, there appeared to be little crossover between the two functions of the site – which he believed reflects the difficulty they had in making the photomap "*discoverable*" on the homepage of the website. In answering this problem, he previously added a 'photo of the day' to the homepage which they also 'Tweeted'[8] to users about, but he felt more needed to be done to encourage users to utilize both functions of the site; perhaps by including finding a way to notify users that when they use the planner, they could also use the photo resource to report/record any problems they have with a particular route.

With respect to Liftshare, Ali referred to his "*amazement*" at the number of insights revealed by only five participants, but also recognized the challenge Liftshare faced in utilizing these insights in their efforts to recruit more users,

> *"... just from five people there are so many different reasons why they use it …And those benefits would help so many more people but it's trying to work out how to get them to realise that Liftshare could help them too"* (Ali Clabburn, Liftshare)

4.2.2. Additional motivations for using the innovations

In addition to searching for and/or utilizing the innovations in order to solve particular challenges, users referred to other motivations; the majority of which related to the desire for specific forms of information about modes of transport. However, a small number of participants also referred to motivations relating to health, becoming part of a 'community' and enjoying nature. Firstly, for Liftshare, one participant was motivated to use the site to get to know the new area she had moved to.

Users of Bristolstreets were motivated to use the site in order to:

- better understand bus routes and bus stop locations in order to make more use of the bus (4),
- discover quiet spaces or new places of interest in Bristol, e.g. *"now being a kind of professional I am actually exploring Bristol more, I used to go to just student places so [Bristolstreet's] been really helpful for me"* (2),
- serve a professional interest, e.g. "*…because I work in technology, I've just tapped into some Bristol Technology groups and somebody said oh have you seen [Bristolstreets]"* (1), and
- improve health through cycling to work (via the obtainment of a suitable route) (1).

CycleStreets users were motivated to use the site:

- for finding out the timings of routes (1),
- in order to better understand the elevation of a cycle route (2),
- for detailed route planning beyond road routes (1),

[8] i.e. notify users via Twitter.

- to feel/become part of a cycling community (1),
- because it is a trustworthy source of information (2), and
- due to its facility for seeing a visualisation of cycle routes through photos (1).

Walkit users were motivated to use the site to:

- benefit mental and physical health (3),
- train for a long/marathon walk (3),
- explore/find new places, e.g., "*I've explored quite a lot of places that perhaps I wouldn't have considered walking before."* (2),
- better understand the geography of a location (1),
- find the most efficient or 'nicest' route to walk (1),
- enjoy the primacy of the pedestrian in the information provided (1),
- feed a competitive personality, e.g. *"I think I have a competitive element of like how fast can I do it? Like if it says on the website it's going to take twenty minutes, I'm damn well going to do it in like eighteen, so I have that bit of a competitive element that makes me do it as well."* (1), and
- walk more in order to enjoy nature (1).

Further to this, from the point of view of 'reducing negative environmental impacts of transport' (a key aim of the Ideas in Transit Project), it is of note that three participants (one user of Liftshare and two users of CycleStreets) stated that their concern for the environment is one of the main reasons they chose to share lifts to work or cycle instead of using the car. However, of the other participants who talked about having an environmental (or 'green'/'sustainability') concern (5), this had not been their primary motivation for using the innovations and was instead seen more as a bonus of using them:

> *"I kind of think as myself as quite green but I'd be kidding myself if I thought I was using it to be green. It is a consideration and I do think okay I am helping the planet in a little way but yes it is primarily financial"* (Bristolstreets user)

Similarly, when discussing these findings with Ali, he reiterated his belief that users of Liftshare "generally" joined Liftshare for financial reasons or because they are seeking an efficient form of transport, but the environmental benefits can be secondary. It is for this reason that he had not used 'the environment' as a selling point for joining the site in the first place. Similarly, Jamie felt that "there's a bit of a climate change weariness setting in amongst populations" and so he was unsurprised that this was not a motivating factor. According to other feedback Walkit has received, it was calorie burn that was of more interest to users.

Toby reiterated his belief that Bristolstreets is about quality of life, rather than the environment per se, and, like Jamie, pointed to the importance of health on people's behaviour in particular.

> *"I was just trying to remember some other research. I think the ranking of motivations, so the things like taking up cycling, is usually sort of 50% health reasons. …like organic produce, people buy it because they think it's going to make them healthier more than they think that that's a more sustainable means of farming."* (Toby Lewis, Bristolstreets)

Further, Martin and Simon explained that, since the initial interviews with users, they had added a calorie calculator to the site as they believed this was useful in providing an illustration of what impact cycling "actually has" on health. Comparatively, they suggested it would be more difficult to

illustrate what positive impact cycling has on the environment, but they were planning to provide a calculator for CO_2 savings, at some point in the future[9].

4.3. Users experiences

4.3.1. Initial experience - first contact with the site

Participants across the study displayed uncertainty about where they first heard about the innovations. Nonetheless, Table 6 illustrates the ways in which the innovations were first discovered by the users and it can be seen that internet searches were the most frequently mentioned - a finding mirrored by the Walkit survey where the internet was chosen by 38% of 930 respondents.

Table 6: Ways in which the innovations were first discovered (by number of individual users[10])

Mode of discovery	Bristolstreets	CycleStreets	Liftshare	Walkit
Internet search	2	3	1	2
University guide when student	1			
Printed source	1			1
Personal contact with innovators		2		
Through workplace			2	
Word of mouth promotion				2

Toby and Jamie picked up on these findings, both highlighting the important role of word of mouth promotion of their sites. Toby explained that he intended to develop a stronger social networking aspect to Bristolstreets (as detailed in Section 4.3.3.) which he assumed will *"encourage people to inform other people, so that there will be a lot more word of mouth replication.*" Interestingly, in comparison, Jamie explained that word of mouth "*is all Walkit is able to afford"* in relation to promotion and he felt that finances instead need to be focused on providing a good service.

4.3.2. Triggering actual travel behaviour change

Across Bristolstreets, CycleStreets and Walkit, the majority of participants stated or suggested that the schemes complement, or enhance, their already established travel behaviours. Four of the Bristolstreets users, four of the Walkit users and all of the CycleStreets users indicated that they were already intending to use the bus, walk and/or cycle, but that the sites provided them with the information necessary to do so.

> *"It informed the way I was probably going to travel anyway. I needed to find that information out so yes, so that way I suppose it helped me to do it because otherwise I wouldn't have been able to find it"* (Bristolstreets user)

[9] They added that they believed such information may stimulate debate amongst the users of CycleStreets and create more of a sense of trust in the site.

[10] Not all users provided an answer.

> *It's definitely opened up a lot more possibilities... rather than sitting down with my Ordnance Survey map and just going 'right, let's try and map this out and see how long it's going to take'"* (CycleStreets user)

> *"I've always walked a lot. I used to live in Durham as well and I would walk all over there as well. ... so it hasn't necessarily changed it but it's probably made me a bit more adventurous. … I would still walk without it. But it's made it a lot easier."* (Walkit user)

However, one user stated that Bristolstreets had directly changed her travel behaviour towards using the bus, and one user illustrated that their use of Walkit had triggered a move away from use of public transport, towards walking,

> *"…before I found that site I wouldn't, I just wouldn't entertain getting on a bus because I don't know where it's going to stop."* (Bristolstreets user)

> *"I just put in the postcode and Walkit provides the way for me to do it, and because they do it I will walk it because they provide the information for me, rather than looking it up in some A–Z which I would never have thought of really, so before they came along I would have got a tube or bus."* (Walkit user)

In relation to Liftshare, three of the participants had successfully organized car shares to work and in this sense the site had directly triggered a change in their travel behaviour from driving a single occupancy car to driving (or sharing) a multi-occupancy car. However, none of the participants had used Liftshare for journeys beyond the commute – regular or one-off journeys and all stated that they had not thought of using it in this way.

When discussing these findings with Ali, he explained that people joined the scheme in order to organise car sharing to Festivals and other one-off journeys, and Liftshare then promoted the scheme to these users as a way to share lifts for regular journeys (such as the commute to work), but they have not done this the other way round. He explained that this is because the priority for Liftshare was to encourage lift sharing on regular journeys as this had the most potential value in relation to reducing congestion. In this sense, Ali did not consider this a 'worrying' finding.

In addition to the interview data, the Walkit survey reveals that, of 776 respondents, 75.9% said that Walkit has encouraged them to walk a route rather than using another mode of transport. Further, of 756 respondents, 8.2% said that they now always walk instead of taking the car; 10.3% walk instead of taking a taxi; 8.3% walk instead of taking the bus; 6.9% walk instead of taking the tube/metro/subway/train; and 4.6% walk instead of taking a train. As such, Jamie suggested that people's use of Walkit had changed travel behaviours, although he appreciated that it was difficult to accurately monitor this, as does this report.

When discussing the interview findings with Martin and Simon, they were initially surprised that there were not examples of people starting to cycle as a result of using CycleStreets, although on consulting some of their own feedback from their users, they noted that it is more often the case that users' cycling behaviour is enhanced by the site. Nonetheless, Martin said that he would like to find out more about this group of users in relation to future funding applications in order to prove that the site is not just about encouraging people to start cycling, but to continue cycling and/or to cycle more often. More widely, this raises wider questions within IiT, relating to how user innovations (both the four reported on here as well as others) can demonstrate the 'success' of their products in order to gain funding from Government or private industry. Unlike highlighting the selling power of a particular product, here the innovators need to illustrate that they are having an 'impact' on travel behaviour which brings its own difficulties; how do you assess the extent to which

a user's behaviour is as a direct result of using the innovation and how do you monitor whether this continues to be the case?

4.3.3. Continued use of the innovation

Looking across the four innovations, although a number of the users' travel behaviour has been changed or influenced by use of the innovation(s) as illustrated above, for the majority of Bristolstreets and Liftshare users, regular/routine use of the innovation itself was not.

Four of the Bristolstreets users explained that they no longer needed to use the site once they had established their bus routes or stops, or would no longer have needed it once they had established routes. Also, reflecting the importance of a change in circumstances on use of the innovation - as noted by Toby (Table 3) - one participant explained that she no longer used the cycle information layer when she moved too far from her work place to commute by bike and, in part consequence of this, she did not replace her bike when it was stolen.

Toby was unsurprised by these findings, but highlighted that cyclists (although fewer in number than bus users) have been the most active and vocal users and therefore more likely to maintain their use of the site[11]. It is for these reasons that Toby planned to provide this group with more information and the chance to share information by,

> *"making it possible to look at the open cycle map through the new version of Bristolstreets. … I'm going to move the sort of suggested topic categories to be more about helping other cyclists find their way, tips, recommendations, things to avoid" (Toby Lewis, Bristolstreets)*

Toby also pointed to plans for a new 'quality of life' layer on the map where people can comment on things that they think are good or things that they think people should avoid. When asked whether he would develop this idea in order to maintain the interest of users in the site (in that they could share information with others, rather than simply acquire information), he agreed that a new version of the site would provide *"a greater potential for social momentum … definitely the drive for me is to move out of the purely informational and give people a sort of social element to the site as a destination."*

Focusing on Liftshare, three of the participants – two who had yet to successfully share lifts and one whose Liftshare partner was about to leave his workplace (thus causing him to search for another partner) – were continuing to use the site on a regular basis as they attempted to find people with whom to share lifts. However, the two participants who successfully car shared rarely looked at the site as they had had no continued need for it, although they did say that they had used it 'occasionally' in order to make sure their profile was accurate, as they were happy to add another partner to their arrangements.

When discussing these findings with Ali, he explained that Liftshare "*has never tried to be a sticky site*", in that it never aimed for people to use the site on a regular basis, once they have successfully arranged a car-share. This links with Liftshare's desire to encourage car-sharing in relation to regular journeys (such as the commute to work) as noted in Section 4.3.3. However, reflecting the use of

[11] Cyclists were underrepresented by the five interviewed for this study; although one user had visited the site for cycling information and one explained that she no longer used the cycle information layer as she had moved too far from her work place to commute by bike.

the site noted above, Ali did note that they were aiming to encourage Liftshare users to share with more than one partner, and in this sense they would need to use the site more than once[12].

In contrast to these two innovations, both the use of the CycleStreets and Walkit websites, and the information gained from these sites, was being maintained by the users interviewed. Concerning CycleStreets specifically, one participant indicated that he had regularly uploaded photos to the site and had used this information in relation to cycle campaigning. The remaining four participants had all regularly used the cycle journey planner and one had also regularly uploaded photos. Martin and Simon were relatively surprised by this lack of reduction in use and Martin explained that he had always assumed that once people have looked up a few required routes, they would no longer need to use the site. However, on consulting his statistics relating to use of the Android and Iphone CycleStreets apps, Martin found that the number of installations was still rising and the level of use was not dropping off – suggesting that there must have been an overall continuation in use.

In relation to Walkit, all of the participants referred to their continued, regular use of the site, although this varied from once every couple of weeks, to every other day. Walkit's survey revealed that only 7.7% of 920 respondents said that they are using Walkit less than when they first used it and 28.8% are using it more than they used to and 42.9% are using it as much as they used to. Thus it would appear that there was very little drop off in use, which Jamie suggested was because people were likely to need to find, or discover new places, or better understand the locality in which they lived.

4.3.4. Usability of the site

Across all four innovations, the participants were generally positive about the usability and simplicity of the sites, although all had experienced 'niggly' problems with reliability of data, slowness to load, information that was out of date etc. They did not indicate that this had put them off using the sites however.

Bristolstreets users referred to their experiences of the site being slow to load when zooming into the map (1), the site having out of date information (3) and the difficulties experienced when trying to print off maps (1). Toby was unsurprised by the problem of missing or out of date routes as he had found it difficult to keep up with changes. However, he added that improved information available from Bristol City Council and Travelbristol.org would allow him to improve this. He was also unsurprised by the users' difficulty in printing off maps and he had already considered a solution in the form of a mechanism for printing off a series of 'mini maps' with directions for a given walking or cycling route that provide the same level of detail as the currently available larger maps.

CycleStreets users referred to:

- problems with geotagging and posting photos (2);
- a lack of local (possibly user generated) knowledge relating to, and therefore clarification of what is meant by, the three journey types (3);

[12] However, Liftshare recognized the potential difficulties this may create in terms of further complicating Liftshare arrangements was already noted by successful users in Section 5.8 (such as the dynamic between Liftshare partners within the car).

- difficulties when trying to save routes (2);
- no 'drag and drop' facility (1); and
- (perhaps ironically) irritation at the amount of information about how the innovators have dealt with technical issues relating to the site (1).

> *"It does have this tendency to be a bit too geeky. You know, sometimes they tell you about the changes they've made and I think 'well yes, bully for you', you know, you're having fun designing this stuff but I'm not quite sure how much use it actually has in the outside world."* (CycleStreets user)

Interestingly, during the follow-up interview with CycleStreets, Martin stated that he had enjoyed looking through the feedback from users of the site, but Simon said that he felt he already knew about the problems facing users and in contrast to Martin, he felt that such feedback simply "*weigh[ed] down*" on him as he knew he needed to fix various issues but had limited time to do so. Further, they were unsurprised by problem of geotagging as they considered this a well known problem when posting photos on the web in general. They also explained that there was a way to save routes, but was "*such a tiny little link on the webpage*" and therefore they intended to improve this facility – particularly as it was something that they had received similar feedback on from other users.

In response to the comment that there is too much technical information on the site, Martin explained that his initial reaction had been that individuals do not have to read this information and he had identified several audiences he believed would find it interesting or useful, including users who enjoy knowing about the technical progress of the site, funders of the site, and other organisations linked to CycleStreets. However, this finding had made him more aware of not alienating people who are less interested, and subsequently he had prefixed new information of this type with "'*tech', so people could immediately see this is technical and doesn't involve me*".

Walkit users referred to niggly issues with routes (8 comments), such as: a lack of variety, not including green spaces, a lack of safety information or limitations on the time-length of routes. They also referred to difficulties displaying or printing maps (2), slowness to load or save routes (2) and one participant felt "*nervous*'" of changes to the site as she is "*an old and creaky user*". Jamie picked up on this last issue in particular, noting that "*it's something that's easy to forget, that there's a whole generation who are much more wary about*" information being provided online, but that positive feedback he had received about the usability and simplicity of the site had led him to believe that older people were able to use the site. Interestingly, Martin and Simon also referred to people becoming 'nervous' of changes to CycleStreets and their resultant belief that any changes they make need to be gradual and "*not too big*" in order to satisfy the users' desire for something new, but also ease them into additions to the site.

In relation to Liftshare, the only problem identified with the site itself was out of date profiles, as noted by one participant. In response to this, Ali explained that Liftshare was already aware of this and they were in the process of removing profiles that were more than three years old and once people had the chance to update their profiles, they would then remove those that are two years old and then over one year old.

4.3.5. Social/community engagement through site

Across all four innovations, participants believed the innovations lacked facilities for social networking and/or engagement and there was a desire for such a facility amongst a proportion of the Bristolstreets, CycleStreets and Walkit users. Bristolstreets did not provide a method of social/community engagement (beyond Liftshare providing a way for users to contact each in relation to car sharing only). Walkit, CycleStreets and Liftshare provided Twitter feeds and Facebook pages, and in addition Liftshare had a LinkedIn page.

In relation to Bristolstreets specifically, all of the users were aware that the site did not provide a facility for social/community engagement, but differed in their desire for one to exist in the future: one participant was not interested in there being a facility; one indicated that she would have been interested as a user rather than a contributor (i.e. using a forum to look up answers to questions, but not posting her own); and one suggested that he may have posted a comment if he felt it was of "*particular interest locally*". The remaining two users were more enthusiastic about the idea; one indicated that she would have posted comments because she had contributed to similar facilities on other sites (including Trip advisor, WhatsonBristol and her own Blue Yonder News Group) and believed that such user-provided information is particularly trustworthy, and one suggested that Bristolstreets could have provided information about community groups and a facility to share such information with others, believing that fostering a "*community aspect*" could be "*really positive.*"

Focusing on CycleStreets, two participants believed that there was a facility for engaging with other users, and/or that the site provided a sense of community. In contrast, the remaining three participants did not believe that a) there was a facility to engage with other users, and/or b) that there was a sense of community created by the site. However, they all expressed a desire for such a function,

> *"I think that would be brilliant, especially if you've got local people round and you could meet up."*
>
> *"I heard it had a forum but I looked for it and couldn't find where it was but I'd like to use a forum as a community thing"*
>
> *"I haven't noticed that there is a way to interact with other members or users of the site. If it was there and it was sharing information about particular routes and stuff I would use it."*
>
> (CycleStreets users)

Concerning Walkit, two users had not noticed any method for engaging with other users on the site, but suggested that it was something they should have, or would have liked to have got involved in. Another user stated that she had not considered Walkit a community, but by explaining that she had 'yet' to find a way to share routes with other users, she hinted that she would have been interested in using such a facility if it had existed,

> ***"So you wouldn't go to it to use other people's routes or ?***
>
> *Oh I have looked at doing that, but and that would be quite nice to do but …I guess I don't see it as being a community, yet, it's not that kind of sharing, mainly because I can't work out how to do that on the site."*
>
> (Walkit user, interviewer in bold

One other Walkit user stated that she would not have wanted to share walks with other users of the site due to fear for her personal safety, but suggested that she would have liked the site to have provided a way to engage with other users offline as this is something she had sought via a different site which focused on this in particular,

> *"...there is another niche that I have found out about …it's called meetup.com. Yes there's so many walking groups on there so they may take me away from Walkit. ...you just type in what you like do …I signed up for a coastal walk and then everybody meets up in London and gets the train down there and they do a walk for the day."* (Walkit user)

When discussing the findings with Toby, he emphasized the need for Bristolstreets to develop its 'social element' (as already noted in Section 4.3.3). He planned to add a mechanism for people to comment on particular locations, or transport modes on the map, using a similar format as Facebook's status update facility. For each comment there would be a marker and for each marker, a side bar would open to allow discussion in the style of a Facebook wall. In order to contribute, Toby would have required peoples email addresses, but they could remain anonymous. Toby felt that the style of Facebook would be familiar to people, therefore easy to use and *"remove the sort of fear of doing something wrong, because it builds on their past experience".*

In addition to this, Toby was planning to develop a mechanism for people to drag and drop walking routes (i.e. drag-routing) and when they did they would be asked why – e.g. because the original route was too hilly, or too busy? Toby believed this would, over time, build a database that would allow him to provide people with the option to say, for example, 'I want a less hilly/less busy route' and then generate a suitable route adjusted according to their previous choices.

During the follow-up interview with Martin and Simon, Martin highlighted additional feedback they had received from people asking for a way to comment on photos and they had recognised a need for such a function. They believed that this would have been provided through their intention to develop the campaigning side of CycleStreets which would have included encouraging more discussion from and between users.

When re-interviewing Jamie, he explained that they had thought about creating a forum for people to share information, but he had not felt that there was a demand for such a facility, especially when taking into account the lack of social interaction on the Walkit blog,

> *"Yes we have thought about it a lot [but]... it was a bit of an effort to do it and do it well and .. if you go to other sites you find empty forums and there's nothing more off-putting than seeing a forum where the last entry was four months ago. We have encouraged it a bit through the Blog, but the Blog comments have completed trailed off …we just haven't prioritised the forum. We don't want to have to be cajoling people into talking on a forum it would have to have its own life and people aren't asking for it."* (Jamie Wallace, Walkit)

Later in the interview Jamie stated that he had believed it was important for Walkit to be "*on top*" of both Facebook and Twitter and that they had "*put the odd message up on our Facebook wall and we do the odd tweet in Twitter*", but he was unsure whether Twitter would continue to be useful in the future,

> *"the more people you follow [on Twitter] the more massively you are bombarded with stuff, so how to pick the wheat from the chaff"* (Jamie Wallace, Walkit)

In contrast to the users of Bristolstreets, CycleStreets and Walkit, none of the Liftshare users had viewed this site as a community or expressed any desire for it to become one,

> ***"Did you see at as sort of joining a community at all?***
>
> *Not really …I just saw it as a useful resource"*

> *"…for me it was as I said, a very, just a very, it was a way of accessing someone to come and share my car rather than a community that I felt I was joining."*
>
> *"I don't get a sense of an identity as a, you know, I'm a lift sharer kind of 'go us aren't we good, kind of feeling (laughs). …I don't think there is a kind of massive community thing to it I don't think."*
>
> ***"Was there any element of sort of joining a community?***
>
> *No, no that wasn't relevant no."*
>
> (Liftshare users, interviewer in bold)

When discussing these findings with Ali, he clarified that by referring to Liftshare as a community in the initial interview (as noted in Section 4.3), he had been drawing on his experience that Liftshare became more successful when it was broken down into communities relating to workplaces or other organisations – rather than a platform for social and community engagement. He believed that in focusing on communities, individuals had already felt some level of security in the system by knowing the 'boundaries' of the group of people they were able to share with - which also increased the feeling of safety, or trust in using the site.

4.3.6. Communication

<u>*Users contacting the innovators and/or offering feedback*</u>

Across all four innovations, despite the problems noted by the participants, only a few had given feedback to the innovators (and these are mainly CycleStreets and Walkit users). With regards Bristolstreets, one participant had provided feedback to the innovator due to the cancellation of a particular bus service, but the remaining users were had not yet done so, or did had not felt the need to do so. One participant also explained that she had not given feedback as she had assumed it is something '*someone else would do*' and/or that the innovator would "*probably not take any notice of what you are going to tell them anyway*". When discussing this issue, Toby emphasised the importance of responding to feedback ("*I don't like giving out incorrect information")*, stating that users had always received a response, usually within half of hour of contacting him. If they had notified him of a problem that was easy to fix, he would have dealt with it immediately, or explained why it would take longer.

In comparison, three Walkit users had provided feedback. One user had met Jamie at a promotional event early on in the life of Walkit and had also sent feedback to the site in relation to imperfect route information, although she had not offered any further feedback about the site as she had not felt it was her place to do so having had a successful relationship with the site, to the extent that she had felt an emotional connection to it,

> *"I don't know if I have ever emailed, oh just that one time when I, initially when I found it was unhelpful where I lived, but other than that I haven't really, I have just been a user and you know, sort of exploiter of the benefit rather than giving anything back.*
>
> (Later)
>
> *…because I have used it a long time I am sort of loyal and I do feel it's like a friend and actually having met only briefly Jamie Wallace it makes me feel a real personal connection to that"* (Walkit user)

Two other participants had also contacted Walkit and both had received a response – one in relation to feedback about an imperfect direction and the other in relation to a 'Tweeted' question about route length. The remaining two Walkit users had experienced problems but had not felt that they had the time to provide feedback on these issues. Jamie responded to these finding by joking that he would *"like more people like that"*, in that the site got "*a bit overwhelmed by"* feedback and that they had not "*got very streamline systems to act on it all".* At the same time however, he stated that they had wanted the feedback in order to understand what problems and frustrations users experience.

Similar results were found with the Liftshare users, although here none of the users have given feedback to the site. Two had not felt that they needed to as the site was 'working for them' and one explained that he had not got the time and felt he had already done his bit for his community. Four of the participants indicated that they would have contacted the innovator if they had needed to – i.e. if they had experienced problems.

Lastly, three of the CycleStreets users interviewed had been in contact with the site – one suggested that he would have if he had needed to, one explaining that he did not want to hassle them and one was unsure of why she had not (although she had only been using CycleStreets for two months and was particularly enthusiastic about the site). In general Martin and Simon appeared pleased that users had not wanted to hassle them to give feedback, but they would continue to make sure it is possible for them to provide it if they wanted to.

Communication from the innovator

With the exception of two CycleStreets participants, all of the users interviewed indicated that they had received little or no direct communication from the innovators (beyond information posted on the websites, blogs, Facebook pages and Twitter feeds etc) and, with the exception of Walkit users (where three users had provided feedback and in doing so entered into more of a dialogue with the site, perhaps removing the need for direct communication *from* the innovator), the majority could see the benefit of having more, particularly if it had included requests for feedback. However, three Bristolstreets, three Liftshare, one Walkit, and two CycleStreets users indicated that they would not have wanted to receive information or requests for feedback *too often* (i.e. more than once a month).

In contrast, one Walkit user explained that they had been unaware of regular communication from the site and were glad of this as he "*probably would have unsubscribed by now*". Further, when discussing his annoyance at being 'bombarded' with information from websites he spoke positively of his belief that Walkit were "*not the kind of people who send [an email] every week*". Similarly, another participant suggested that Walkit had not needed to ask people for feedback as she had assumed it had a "*legion of loyal followers"* who were likely to have been "*willing to give feedback no matter what*". Comparatively, one Liftshare user participant explained that she simply had not expected to receive communication from Liftshare,

> *"I don't see it as being anything other than a service that I've sort of you know, I've used, which is absolutely fine."* (Liftshare user)

In response to this issue, Toby again pointed to his plan to develop and more strongly promote the social side of Bristolstreets as he believed it would provide a way for he and other users of the site to communicate with each other,

> *"I will start doing stuff on the Facebook page and hopefully I will participate in the on-map discussion and try and generate some involvement there and hope it will sort of gather its own momentum …I would like the feedback and I would like people to feel more engaged with the site and me. So that's definitely where it's going to go."* (Toby Lewis, Bristolstreets)

Martin suggested developing a monthly (or even weekly) CycleStreets newsletter, as he felt the site had not had enough of a "push mechanism" for engaging with their users. In contrast, Simon felt that a newsletter would be,

> *"…potentially very distracting, very time consuming and I think that a lot of it will be ignored, and I think people, really people who want real information will actually go to our blog."* (Simon Nuttall, CycleStreets)

Instead he believed that CycleStreets had needed to develop their "social networking style of interaction", which (it is assumed) related to their Facebook page, Twitter link and blog.

Ali was interested to hear that Liftshare users were happy to be "contacted a few more times" and saw this as an opportunity to promote Liftshare by sending "one extra email" to remind users to tell their friends or colleagues about the site, or to show them possible journeys they could share, or other users who they could travel with. He believed that promotion was key to the success of Liftshare, as did Jamie in relation to Walkit, although Jamie was conscious of not "bombarding" his users with too much information/news.

4.4. Promotion and fundraising

In terms of promotion of all four sites (with the exception of two CycleStreets users and one Walkit user) the majority of the participants did not recall seeing promotion of the innovations, beyond their initial encounter which was usually via Google searches, word of mouth promotion by friends, family or colleagues, UWE promotion (in the case of Liftshare) or written publication. This perhaps reflects the innovators' lack of a defined promotion strategy and/or resources to fund it, or in the case of Liftshare, the lack of control Ali had over the promotion employed by managers of private Liftshare schemes. However, four Bristolstreets, three CycleStreets, two Liftshare and four Walkit users stated that they had been active word-of mouth promoters of the innovations and the Walkit survey found 63.8% of 804 respondents stated they are extremely likely to recommend the site to friends or colleagues and 40.5% of users would be interested in promoting the site to other users.

In terms of raising revenue from the sites (in order to pay themselves to spend more time on the site in the case of Bristolstreets and CycleStreets or to pay staff in the case of Liftshare and Walkit), there were a number of key insights relating the participants' response to the sites. Overall, with the exception of Liftshare, where advertising was not raised or discussed by the users, the majority suggested that targeted advertising (for example, pointing to local cycle shops, nice cafes along a walking route, or walking holidays) would have been acceptable on the sites. Interestingly, despite Walkit already being part-funded through advertising, four participants indicated that they were unaware of advertising previously displayed on the site and two participants suggested they would have been happy if it had have been used. Similarly, the Walkit survey found that 46.5% of 792 respondents hardly noticed advertising on the site, 32.3% tolerate it, 13.8% think 'it brings some colour/variety to the site' and only 1.3% find it annoying. Further, one CycleStreets user suggested that advertising was "*invaluable*" to such schemes and he had been able to "*filter out"* advertising anyway.

However, a proportion of the users were less enthusiastic. For example, one Bristolstreets participant suggested that advertising would have been 'annoying' and one CycleStreets user suggested that advertising would have spoilt the simplicity of the site (by *"throwing a load of crappy products at you"*) – although this participant also stated that this would not have stopped him using the site. Three Walkit users also stated that they would have preferred not to have advertising on the site, even though they had not been aware of previous advertising.

In response, Martin and Simon described advertising as a "lazy" idea and both innovators worried that it would have changed the tone of the site and raised issues of trust, not just in relation to advertising large corporations such as Tesco, but local companies as well,

> *"I would be concerned that to have cafes on route people will say well has the route planner deliberately taken me that way in order to promote this café that they're getting 50 quid from, or is it just that it happens to be on that route. I think there's a trust issue there"* (Martin Lucas Smith, CycleStreets)

Martin also referred to feedback they had received from users who had described CycleStreets as 'human' and his and Simon's belief that their request for donations had made it clear that it was not being running by a big profit making company and instead,

> *"…it's run by people trying to do their best, and therefore I guess they are already realising it's going to be tatty edges, and it's not going to be perfect"* (Martin Lucas-Smith, CycleStreets)

Not only does this suggest that they hoped the users would not mind an imperfect site, but that they felt a sense of trust in the site. However, both innovators would have liked to have a method for providing users with information about local points of interest or cafes if they had chosen it, but not in a way that generated revenue – purely as shared information between users in the form of an extra 'layer'.

When discussing these findings with Jamie, he explained that Walkit had wanted the advertising to be better targeted and to have *"lots of sort of ethical companies"*, but that such companies did not want to use such advertising. Consequently, on occasion, they had "*ended up*" advertising cars, which drew a few complaints from users, but he had also been aware (from his survey data as well) that a lot of users simply had not seen the advertising. Toby remained unconvinced that small scale advertising was likely to be successful, and like Jamie he believed that local small businesses "*don't want to be bothered by yet another person trying to sell them advertising*", although he felt that sponsorship of the site by one company would have been far more successful. Jamie also discussed setting up a shop on the site to sell Walkit branded goods, such as t-shirts which would have both made money and promoted the site.

4.5. Use of mobile technology/smart phones

In the relatively recent past, and certainly since the Ideas in Transit Project began (in September 2007), there has been an explosion in the development and use of smart phones (all-in-one devices providing mobile access to voice, video, data, and image communications (Mutchler et al., 2011)) and smart phone apps. As described by Mutchler et al. (2011), smart phones have become the "all-in-one" device as they provide mobile access to voice, video, data, and image communications. According to Ofcom (2011), over a quarter of adults (27 % per cent) and almost half of teenagers

(47%) now own a smart phone. In this research, half of the users owned smart phones, more than the average, but only a few had accessed the site on their device – instead relying on their PCs.

Across the four innovations, half of the sample owned smart phones and half did not, but only a handful had accessed the innovations on these devices – instead the innovations were seen very much as something they had accessed on their PC. Table 7 provides an illustration of the reasons given by Bristolstreets, CycleStreets and Walkit users as to why they had not accessed the innovations on their smart phones, or why they had not owned a smart phone in the first place.

In relation to Liftshare, two users said that they owned a smart phone and that they had not accessed the innovation on it, but no reason was given. However, two of the participants had organised their car-sharing on their phones via text – but they were not smart phones. The only explanation offered by one participant for not using a smart phone was that he had used his work email for Liftshare but had not wanted to be swamped with other work emails on his phone.

Table 7: Reasons why users do not access the innovations on their smart phone and/or do not own a smart phone

		Bristolstreets	**CycleStreets**	**Walkit**
Reasons for not using the innovations on smart phones	**Prefer to discover/explore**	*"[I'm] more of a discoverer ...But I guess if I was lost in Bristol then it would be very helpful, but no not so much for me just yet"*	*"I would say, yes, that is what I was thinking about actually, about trying not to use[my smart phone] too much, ...at the moment I think we are probably over relying on the technological aspect of being told what to do and where to go."*	
	The website is better than the app		*"the App's*[13] *okay – it's not particularly brilliant – but then looked it up on online and just found this wonderful resource"*	
	Cost		*"When I go abroad then data-roaming is prohibitively expensive."*[14]	
Reasons for not owning a smart phone	**Small screen size**	*"I think partly I'm put off by sort of the size of the screen I have seen people trying to use the internet on their phones and it just looks rubbish."*		*"the thing that put me off was the screen is too small … you know as my eyesight sort of gets worse"*
	Cost	*"It's probably going to cost me more than I would actually use it so I don't bother."*		
	Don't want to be permanently connected	*"I've got internet at home, I've got internet at work, I don't need an internet phone, it's nice not to be on the internet sometimes."*	*"my main means of communication is email and generally by WiFi when I'm travelling or just at home. Yes, I've got no need to be that connected"*	

[13] When discussing this finding with Martin and Simon they explained that due to the timing of the interview with this user, she could not have used the CycleStreets app as it had not been launched at this time – thus when referring to the CycleStreets App, she must have been using a third-party App which uses CycleStreets routing.
[14] This was the only time this user felt he would need to use CycleStreets on his mobile phone.

In addition, not all of the participants referred to their use of the information they had retrieved from the innovations, away from their primary use of the sites on their PCs[15]. However, Table 7 provides a summary of the differences and similarities between the ways the participants had made use of the information provided by Bristolstreets, CycleStreets and Walkit; and it is of particular interest that only one participant referred to their use of an innovation's smart phone app.

Table 7: Ways in which the participants make use of information from the innovations (away from their PCs), by number of individual participants

	Bristolstreets	CycleStreets	Walkit
Making notes on paper	1	1	
In conjunction with other paper-based information	1		2
Making notes on mobile phone	1		
Memory	1	2	3
Smartphone App		1	
Printing maps			4

However, in the follow-up interviews with the innovators, Martin and Simon confirmed that they had launched an Android app for CycleStreets and had received positive reviews from users. Martin believed there is a particular user need for information 'on the move' and it was for this reason that he believed they had needed to develop mobile app versions of CycleStreets. Despite recognising the resources (time and skills) needed to develop apps for each of the mobile phone platforms, when asked whether apps would become obsolete with the introduction of 4G[16] phones (and the increased download speed this would provide in relation to looking at websites on mobile devices), Martin remained convinced that it was the speed of using an app that was superior to a mobile website and therefore believed that they were a key part of the development of the site and worth investing in. Both Martin and Simon also believed that the cost of owning a smart phone would continue to decline and thus more people would own such devices.

Although he believed that not all people wanted a smart phone (and that even those that do, do not use them to their full capacity) Jamie was also enthusiastic about the need to develop the site with these devices in mind; drawing on the Walkit survey which found that 40.5% of 797 respondents said they would be very likely to use a version of walkit.com that was optimized for viewing on a handheld device. Consequently, after the initial interview and interviews with users, Walkit launched an iPhone app for Walkit and Jamie felt strongly that they needed to develop a generic mobile site or an Android specific app as well. It was iPhone users in particular who demanded an app and Jamie believed that it was this particular group who would always want a version of the site that was specific to their requirements,

> *"…you have a huge band of complete Apple loyalists who want anything they are viewing on their iPhones, beautiful and work just right for the iPhone and they have got huge high expectations"* (Jamie Wallace, Walkit)

[15] This issue was not discussed at all with the Liftshare users as (in crude terms) this group of users was provided with a facility for contacting other people, rather than a source of information (such as maps or public transport timetables) that has the potential to be printed off, or noted down for example (although the Liftshare users did talk about the different ways they continue to make arrangements with Liftshare partners via mobile phone, email or landline).

[16] i.e. fourth generation high speed mobile technologies.

In contrast, Toby was less enthusiastic. Like Jamie, he recognized that not all people would use smart phones to their full capacity, but he used this as a reason not to invest in the development of a Bristolstreets app (or multiple apps for different platforms). He also believed that the uptake of smart phones remained at around 10-15% of the population and even if there was an increase in uptake of smart phones, the soon to be introduced 4G mobile technologies meant that there was more value in developing a mobile site, rather than apps because mobile phones would be as 'capable' as PCs,

> *"Apps have this window and it's closing fast. It's going to... in three or four years' time, apps will, if they're not dead, will probably be, you know, well on the way out."* (Toby Lewis, Bristolstreets)

In addition to this, Toby questioned the suitability of accessing Bristolstreets on a mobile device in general – in that, he believed, that the map-based nature of the site meant that it was more suitable for using on a PC (and therefore a larger screen), although he could see that a mobile version would be suitable for cycle routes,

> *"you could have just a sort of list of the steps, but then if you wanted to see where this junction was, you could tap on that step and then it would give you a little mini map. So something that didn't have the full interactivity of the main site, but allowed you to dip into the information and that's the sort of route I think that's going to start or be most relevant on the phones. Because you're simply not going to use a phone to do the sort of browsing and exploration that you would on a big desktop map."* (Toby Lewis, Bristolstreets)

Ali also believed that the capability of smart phones would negate the purpose of, and market for, apps and it was for this reason that they "*skipped over"* developing app versions of the site and instead developed a mobile website. Overall he believed that,

> *"An app isn't necessarily the best route to go but people like paying for them so, so it's a crazy market but I think having seen what's happening I think that will settle down in the next two or three years and people will just start using their phones for things as they are on the internet now"* (Ali Clabburn, Liftshare)

The mixed response to the importance of developing app versions of the sites by the innovators, in many ways, reflects the extent to which this research took place during a period of transition in the evolution and adoption of mobile ICTs, although according to a Ofcom (2011), 47% of adult smart phone users have downloaded an app, suggesting that a considerable proportion of the population have already bought into it. However, although the CycleStreets app was free, the Walkit app was not and only 7% of 'paid-for apps' relate to maps/navigation, which could explain a wider reluctance to download/interest in the Walkit app (and CycleStreets and Bristolstreets apps if during the user interviews the participants assumed they would need to pay for them). However, this reluctance could also be explained by participants being influenced by rival smart phone app providers who have also developed free navigational and mapping tools, although this was not discussed to any great extent in the interviews. Ultimately, it may also justify both Jamie and Ali's unwillingness to develop this side of their innovation. However, it is yet to be seen whether the purpose of apps is superseded by mobile websites supported by 4G mobile technologies and whether the remaining proportion of the population will buy into the smart phone (and app) culture.

5. Conclusions

Reflecting the nature of user innovation, the research has determined that the innovators were first and foremost concerned with providing a good service to their users, rather than making a profit, and as part of this they were interested in gaining an in depth understanding of their users. However, (for Bristolstreets and CycleStreets in particular) their engagement with users was limited by available resources. Further, all of the innovators talked about their concern at 'hassling' users for feedback – Toby and Martin and Simon during the initial interview and Jamie and Ali in the follow up interview.

Despite this concern however, with the exception of two CycleStreets participants, all of the users interviewed indicated that they had received little or no direct communication from the innovators and, with the exception of Walkit users, the majority could see the benefit of more, particularly if it included requests for feedback – although usually they specified that it should not be 'too often' (i.e. more than once a month). Currently, only a few of the users had given feedback to the innovators - either because they did not feel it was their place to do so; they thought it would be ignored; or they were willing to, but simply forgot or 'never got round to it'. Those that had given feedback did so because they had experience of building websites and could give 'professional' feedback or saw the innovations as niche, community led ideas and therefore felt it was important to give feedback and that the innovators would appreciate it (particularly if it was positive).

In response, it would appear that the innovators were concerned with communicating with users, particularly in relation to gaining feedback about the sites, and they had responded to the users requests for more communication in a positive manner – i.e. they made reference to their plans to engage more effectively with users, or in additional ways. However, their fear of alienating the users by providing too much information or asking for feedback too regularly suggests that the innovators were basing development of the sites largely on user feedback, but also on a 'try it and see' approach. More widely it can be said that this is not unusual in the context of small scale business where there is a lack of resources to carry out the complex research necessary to fully understand user needs, and in the case of these innovations it would appear to have been so far successful. However, such an approach also risks getting it wrong and either leaving users dissatisfied, wasting what resources are available on facilities that no one utilizes, or missing out on developing resources that people want.

Nonetheless, very few of the findings raised by this research were surprising to the innovators, suggesting that their understanding of their users was good, and in addition their plans for the development of the innovations were with the needs of the user as the primary focus. There was some discussion of the difficulties of raising revenue, but largely the concern was with delivering a successful product for users and encouraging behaviour change - away from a reliance on (single occupancy of) the car and towards multi-occupancy of the car or other more sustainable modes of transport for reasons of quality of life including health, environmental impact and enjoyment.

In terms of lessons for other user innovators, the majority of issues and plans for development are specific to the context of each innovation, but it can be highlighted that both Bristolstreets and Liftshare have struggled to gain support from central or local Government due to a lack of trust in the innovations. It is therefore suggested here that they, and other user innovators, may benefit from finding (formally or informally) a way to share knowledge and expertise, as well as lobbying for more central and local Government support and funding. By combining efforts and experience/skills in improving their sites they could save on resources, as well as reduce the chance of mistakes.

Certainly in the interviews with innovators, comments were made to suggest that they are willing (or have already) sought advice from other user innovators and have enjoyed this process.

It could also be suggested that the innovators should be more concerned about their 'market share' as a top down/producer innovator would), yet it is clear that they are more driven by the desire to change transport behaviours and it is perhaps unsurprising that the innovators are not willing to compromise the image of their sites by using more aggressive methods of raising revenue through selling advertising for example. Further, each site is unique in the style in which it presents information and in comparison to large corporate sites such as Bing and Google, it can be argued that their unique selling point is in the independent nature of the sites, run by one person or a small staff focused on that one product which, as noted by Martin and Simon in Section 4.4., may create more of a sense of trust in the sites. In this sense, it can be argued that the innovations are secure in maintaining the market share they already have.

In terms of future research, the CTS team is aware that the findings discussed here, and established in other research for the Ideas in Transit project are useful in providing in depth insights into ICT use and the development and use of user innovation, but there remains a lack of understanding of the applicability of the findings at the population level. Thus, a number of key questions will be tested using a quantitative survey method.

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