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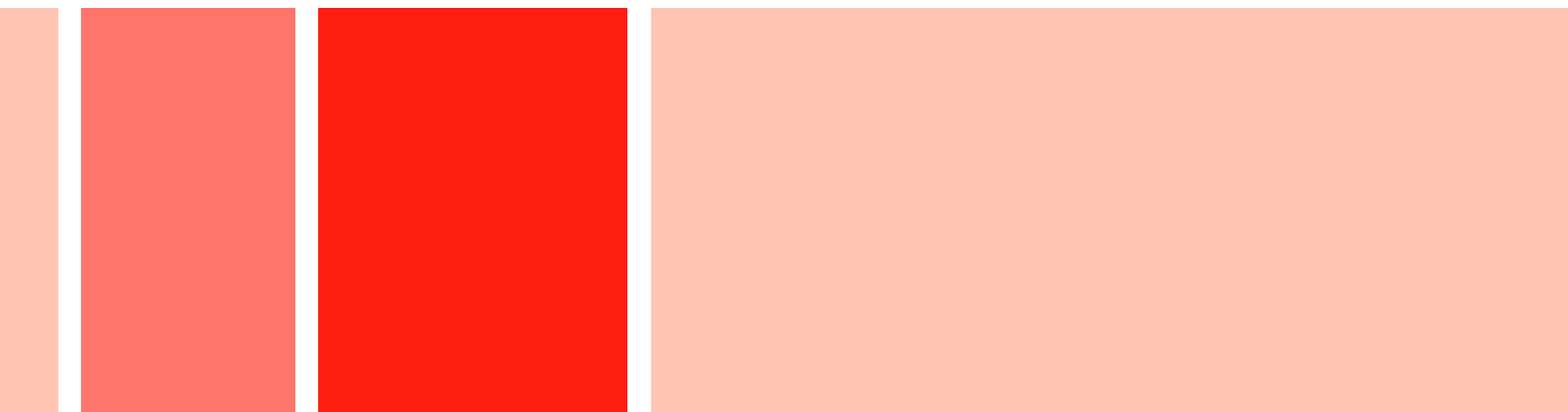
Using social media to promote environmentally sustainable transport in Wales

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Views expressed in this report are those of the researcher and not necessarily those of the Welsh Government

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A note on this report

This report is the result of a three-month study commissioned by the Transport Policy, Planning & Partnerships branch of the Welsh Government. The author is a PhD student researching British transport planning at the University of Leicester's Centre for Urban History. The research was carried out as part of an internship funded by the Economic and Social Research Council.

1 Introduction

1.1 This report is the product of a three-month research project, which involved interviews with members of interested bodies and the location and assessment of existing primary research. The purpose of this research has been to assess the general use of social media channels in effecting behaviour change and to establish if this could be translated to changes in travel behaviour. In particular, it has been to assess existing ways of using social media to increase the use of environmentally sustainable transport and to report on their applicability to Wales. In addition to the results of this research, this report contains some recommendations of next steps in this area of transport policy for the Welsh Government to consider. The Welsh Government's Transport Policy, Planning & Partnerships branch, in commissioning this project, had the expectation that it might be a prelude to the development of a pilot social media application in Wales.

1.2 Behaviour change is a term used in public policy to refer to the outcome of 'soft' or persuasive political measures. Such measures are employed with the aim of inducing voluntary changes in behaviour on the part of citizens. They stand in contrast to traditional methods of achieving desirable changes in behaviour, such as legal sanctions and financial rewards and penalties. This report is concerned solely with investigating the use of social media to support this type of intervention. It is worth noting, however, that the potential uses of social media in transport policy go beyond this. There is, for example, growing interest in using social media to provide open public access to government-held data on sustainable travel services and infrastructure.

1.3 Environmentally sustainable travel is defined in this report as the use of modes other than motor vehicles with a single occupant, namely: walking, cycling, using public transport, and car sharing. It is not to be inferred from this definition that car-use by single occupants is unsustainable, but rather that it is desirable to reduce it.

1.4   The promotion of sustainable transport has become a major preoccupation of local and national governments around the world, not least in Wales. This trend has been driven by increasing concern over the negative impact of car-use. Heavy reliance on the private car for transport purposes has been linked to traffic congestion, to poor health, and to environmental damage locally and globally. Most notably, it has been identified as being a significant contributor to global warming.

1.5   As a result, the Welsh Government has taken steps to encourage its citizens to use alternatives to the car, such as the preparation of the Active Travel Bill, which is designed to promote walking and cycling. It is also offering Personalised Travel Planning (PTP) to 100,000 households in Wales, which constitutes the largest programme of PTP in Britain.[1] Travel planning allows people to make informed choices of transport mode by making information available to them about sustainable transport in their area that is relevant to their needs. The use of PTP is part of a growing trend in transport policy towards the use of behaviour change measures. Increasing interest has also been shown in using social media to support these approaches.

Structure of the report

1.6   The remainder of this report is composed of five main sections, beginning with a brief discussion of the place of behaviour change in public policy. The second section offers a definition of social media and explores their suitability as vehicles for behaviour change campaigns from the standpoint of behaviour change theory. The third part identifies particular examples of social media being used to effect behaviour change. As well as providing some empirical evidence of their effectiveness, the section sets out how behaviour change theory has been applied in the examples described. Drawing on data concerned

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[1] http://cymru.gov.uk/newsroom/transport/2011/110907travelplanning/?lang=en (visited 30.8.13)

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with internet use and propensity to change travel mode in Wales, the next section assesses the applicability of such initiatives to Wales. The final section contains both an overall assessment of the advisability of undertaking a pilot project and a number of recommendations on its shape and scope.

2   Public policy and voluntary behaviour change

2.1   Interest has grown in the British Government and elsewhere in the use of persuasive or 'soft' political measures to achieve political goals. In the realm of sustainable transport policy, soft policy options include PTP, other forms of travel planning, and general promotional campaigns. They might be contrasted with 'hard' policies, such as infrastructure improvements, and changes in the rates of taxes on fuel and motor vehicles.

2.2   Various theories of behaviour change have been applied to political situations and often grouped under the title 'behavioural insights'. The Cabinet Office, which is responsible for co-ordinating policy across Whitehall, has a Behavioural Insights Team.[2] Several Departments of the British Government also have similar units, including the Department of Energy and Climate Change (DECC) and the Department for Transport (DfT).[3] Voluntary behaviour change techniques used in transport policy are often grouped together under the term Travel Demand Management (TDM).

2.3   Measures to induce voluntary changes in transport behaviour have been applied in several countries. PTP, for example, has been applied in three continents in over 250 projects up to 2009. The technique, which was pioneered in Germany, was introduced to Britain by Socialdata in partnership with Sustrans under the brand-name *TravelSmart*®. Between 2001 and 2009, 24 *TravelSmart*® projects, involving 600,000 people, achieved an average reduction of car-use of 12 per cent (measured in car trips per person per year).[4] PTP has also been used as part of wider transport initiatives in Britain under the term *Smarter*

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[2] For information on the role of the Team see:
https://www.gov.uk/government/organisations/behavioural-insights-team (visited 16.9.13)
[3] For a discussion of this trend see Rhys Jones, Jessica Pykett and Mark Whitehead, *Changing Behaviours: On the Rise of the Psychological State* (Cheltenham, 2013)
[4] Werner Brög, Erhard Erl, Ian Ker, James Ryle and Rob Wall, 'Evaluation of voluntary travel behaviour change: Experiences from three continents' in *Transport Policy*, Volume 16, Issue 6, November 2009, pp.1-10

Choices, which included other soft measures and improvements to infrastructure. The other measures included workplace and school travel planning as well as general publicity.[5]

2.4   Meanwhile, behaviour change theory has continued to develop. For example, the social context of decision-making has drawn the interest of researchers in various disciplines, including social and cognitive psychology, behavioural economics, and social marketing. Such research has contributed to a growing realisation that decision-making is not purely rational (as classical economics tends to assume) and is profoundly influenced by social factors. Recent studies have included examinations of how behaviour change theory can be applied in transport policy, both in general terms and via social media.

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[5] Erel Avineri and Phil Goodwin, *Individual behaviour change: Evidence in transport and public health* (London, 2010), pp.19-20

3   Social media as persuasive and promotional tools

3.1   Andreas Kaplan and Michael Haenlein have offered the following
definition of social media: 'a group of Internet-based applications….that
allow the creation and exchange of User Generated Content' [capitals
theirs].[6] This definition encompasses a wider group of platforms than is
often appreciated. Kaplan and Haenlein grouped them into the following
categories:

- Collaborative projects, such as Wikipedia and Wordpress
- Blogs and micro-blogs, such as Twitter, Wordpress and Blogger
- Content communities, which include Pinterest and YouTube
- Social networking sites, such as Facebook, MySpace and LinkedIn
- Virtual game worlds, like World of Warcraft
- Virtual social worlds, such as Second Life

3.2   This list hints at the wide range of uses to which social media may be
(and indeed are) put by private and public bodies. They fulfil a range of
functions, allowing corporate users to broadcast information, monitor
and respond to other users' comments, present a humanised and less
formal face to other users, and to build and maintain an on-line
community.[7]

3.3   Social media are used by a large and growing audience worldwide, not
least in the United Kingdom, where it is estimated that visits to social
networking sites (alone) account for a quarter of the time spent on-line.[8]
It is no surprise, therefore, that social media are attractive to various
organisations as broadcasting platforms. Not only is the audience
potentially huge, but it also possesses the capacity to pass on ideas and

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[6] Andreas M Kaplan and Michael Haenlein, 'Users of the world, unite! The challenges and
opportunities of Social Media' in *Business Horizons* Volume 53, Issue 1, January – February
2010, p.61
[7] For a fuller discussion of these themes, see Ryan Thomas, *Exploring social media within the
Welsh Government* (Cardiff, 2012)
[8] UKOM/Nielson, *UK top 50 web brands reach 13 month trend to December 2011* (2011),
cited in Anne Binsted and Rebecca Hutchins, *The role of social networking sites in changing
travel behaviours* (Wokingham, 2012), p.6

information immediately. The social media campaign supporting Barak Obama's successful bid for the presidency of the United States in 2008 is often cited as a demonstration of this power and reach. The campaign was also contrasted with more traditional methods of garnering political support (polling and canvassing via phone and mail) in terms of its cost-effectiveness.[9]

3.4 Social media also allow information to be transmitted across multiple platforms in a variety of formats, including text, sound, video, games and interactive sequences. This has encouraged organisations to attempt to heighten the impact of messages through the use of social media to deliver material intended to (by turns) shock, enthuse and entertain. The Home Office is one example. It has used various social media in support of its educative campaigns, such as *Talk to Frank* (informing young people about the dangers of illegal drugs) and *It Doesn't Have to Happen* (discouraging the carrying of knives) which combined commentary and personal testimonies from visitors to its websites with video clips and interactive features. The campaigns used social networking sites (Habbo and Bebo) to publicise or host their on-line platforms. The sites were selected, because they were particularly popular with the target audience.[10]

3.5 The ability of social media to inform the public in this way is particularly encouraging for their use in transport policy. As recent research has shown, the provision of information about travel times and costs has allowed people to make informed choices about their transport mode. Although it is acknowledged that information provision does not normally lead *on its own* to a change in behaviour, it is thought that it can be an

[9] David Carr, 'How Obama Tapped Into Social Networks' Power', *New York Times*, 9th November 2008: http://www.nytimes.com/2008/11/10/business/media/10carr.html?_r=0 (visited 16.7.13)
[10] John Rooksby and Ian Sommerville, 'The Management and Use of Social Network Sites in a Government Department' in *Computer Supported Cooperative Work*, Volume 21, Issue 4-5, October 2012, pp.14-5

important stimulus towards it.[11] Indeed, information provision is central to successful approaches like PTP. One of the key assumptions lying behind it is that many people are uninformed about the quality of public transport, believing it to be worse than it is in reality.[12]

Social media and behaviour change theory

3.6   The potential for public participation and social interaction in social media opens up further possibilities. Behaviour change theory holds that the social context of decision-making is important in understanding travel behaviour. Researchers have suggested a number of ways in which behaviour change programmes can make use of the social interactions of target groups, either on-line or off-line. The most relevant concepts are discussed below.

Normative relationships

3.7   A paper by Erel Avineri and Phil Goodwin has pointed to the success of grass-roots approaches to behaviour change in various fields of public policy.[13] Such approaches take advantage of 'normative relationships', which are the shared values and trust found within social groups, to promote certain types of behaviour that appeal to the values of those groups. In the case of the *Cycology* experiment (which is discussed in more detail Section 4) a social medium was used to encourage cycling to work amongst members of a small number of workplaces. The researchers found that the website built on the implicit sense of trust and spirit of co-operation felt within the group to reinforce positive views of

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[11] The effects of information provision are discussed in Anne Binsted, Owen Waygood, Anna Clark, and Erel Avineri, 'Communicating the impacts of transport choices to encourage low carbon travel behaviours', Proceedings of the 8th SoNorA University Think Tank Conference (Szczecin), June 2011, pp.10-14 and in Alice Moseley and Gerry Stoker, 'Nudging citizens? Prospects and pitfalls confronting a new heuristic' in *Resources, Conservation and Recycling* (Issue in press)

[12] Michael A P Taylor and Elizabeth S Ampt, 'Travelling smarter down under: policies for voluntary travel behaviour change in Australia' in *Transport Policy*, Volume 10, Issue 3, July 2003, p.169

[13] Avineri and Goodwin, *Individual behaviour change.* See also Binsted and Hutchins, *The role of social networking sites*, p.42

cycling. A central plank of the site's success was the exchange of useful information on cycle routes and cycling generally by participants. Alice Moseley and Gerry Stoker called this process of building reciprocity and establishing patterns of behaviour amongst existing groups as 'norm creation' and noted that participants were motivated to conform by the attainment of reputational rewards.[14]

Public acceptability

3.8 Moseley and Stoker felt that the potential for social groups to co-operate and establish values was so strong that they advocated the development of 'community websites' to support environmental policies.[15] In this way, such policies are thought to gain acceptability faster, because they would not appear simply to come from a remote governmental authority and could be discussed freely.

The behaviour of others

3.9 Avineri noted that a key principle of behavioural economics was that the behaviour of other people mattered in determining that of the individual. People do many things by observing and replicating the behaviour of others; and they are motivated to maintain their current behaviour when they perceive that other people approve. Research also indicates that individuals tend to behave altruistically if they expect others to do likewise.[16] Social networks can be used to exploit this phenomenon by allowing people to report their behaviour and to receive feedback on it. The *CarbonCulture* pilot at the DECC provides an example of this and is discussed in more detail in Section 4.

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[14] Moseley and Stoker, 'Nudging citizens?'
[15] See also Avineri and Goodwin, *Individual behaviour change*
[16] Erel Avineri, 'On the use and potential of behavioural economics from the perspective of transport and climate change' in *Journal of Transport Geography*, Volume 24, September 2012, pp.512–521
See also Rita Seethaler and Geoff Rose, 'Using the six principles of persuasion to promote travel behaviour change: Findings of a TravelSmart pilot test' in *Road & Transport Research Journal*, Volume 15, Number 2, June 2006, pp.67-84 and Binsted *et al*, 'Communicating the impacts of transport choices'

Cognitive consistency

3.10 Psychologists claim that people try to behave in a way that is consistent with their beliefs. This desire to maintain what is known as 'cognitive consistency' is reinforced when people are invited to make public commitments to perform certain actions. In doing so, individuals often experience a change in their self-image and are motivated to continue acting in a way that is consistent with their public statements.[17] As public forums, social networking sites can serve as platforms for such statements. Indeed, they are already a feature of the sites supporting the *Challenge for Change* programme (to take an example) which promotes cycling for transport purposes. The initiative is discussed in more detail in Section 4.

Gamification

3.11 'Gamification' is an informal term applied to the inclusion of elements of video game design in computer systems to increase their appeal and use. The idea comes from computer science, rather than behaviour change theory. Its basic thrust is to make simple activities enjoyable by turning them into games, which typically involve an element of challenge, targets to reach, and real or virtual rewards.[18] The technique lends itself to social media, because such platforms can act as virtual arenas within which visitors can compete with and motivate each other. It has been used in the *Challenge for Change* sites and by *CarbonCulture*.

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[17] Moseley and Stoker, 'Nudging citizens?' and Seethaler and Rose, 'Using the six principles of persuasion'
[18] Sebastian Deterding, Kenton O'Hara, Miguel Sicart, Dan Dixon, and Lennart Nacke, *Gamification: Using Game Design Elements in Non-Gaming Contexts* (Vancouver, 2011)

4 Behaviour change promotion in social media

4.1   It is evident that social media can be used to get messages across to the general public in a variety of forms. The messages can (and do) include those that are designed to influence personal conduct and can be directed at a specific audience. Looking beyond this, behavioural research suggests that they can be used successfully in a more direct way to effect changes in behaviour. This section shows how some of those theories have been put into practice, as well as describing the uses to which social media are being put in the transport sector more generally. Where possible, it also gives an indication of social media's effectiveness in inducing behaviour change.

4.2   It is now a matter of routine for large public and private organisations to promote various products and services via the most popular social networking and micro-blogging sites. Many of these organisations have moved beyond using such sites simply to broadcast information towards the creation of a channel of interaction with their audiences. Complaints and queries from the public can elicit prompt personal responses, allowing organisations to enhance the service they provide and to present a human face to the outside world. Putting this useful humanising function aside, however, the overall effectiveness of social media as promotional tools is hard to measure. There is an old adage in advertising that half of the money spent on publicity is wasted, but nobody knows which half.

4.3   Organisations with an interest in effecting more profound changes in behaviour have also used social media in this way. Sustrans (which promotes sustainable travel in Britain) and Sustrans Cymru (its subsidiary in Wales) use Twitter and Facebook for general publicity and to invite comments from and discussions with the public. When questioned as part of this research, officers from Sustrans and Sustrans Cymru said that it was very difficult to attribute changes in travel behaviour directly to their social media activity. Nevertheless, they

reported a healthy level of attention and activity on their social media accounts, and were confident that they were useful in the achievement of long-term goals.

4.4   Research by Anne Binsted and Rebecca Hutchins on the impact of social networking sites supports this view.[19] They concluded that such sites were good tools for raising awareness of alternative transport in a broad range of demographic groups. They also found that the tendency for people to use social networks to find and relay useful information could be exploited to disseminate practical advice on sustainable transport. In a survey of internet-users, they found that 20 per cent used social media to find information on public transport; whilst 15 per cent used social media to arrange car sharing (44 per cent and 27 per cent respectively said that they might do so in the future).

4.5   The survey data also showed that social media could affect transport behaviour directly. When questioned about this possibility, 8 per cent of those surveyed said that social network activity had encouraged them to walk or cycle, whilst 6 per cent said that it had encouraged their use of public transport. The totals appear modest, but it should be noted that many participants indicated that they had answered the question negatively, because they already used sustainable transport whenever possible.

Behaviour change initiatives on social media

4.6   Binsted and Hutchins' research is encouraging and further encouragement can be found elsewhere. There are numerous examples of social media being employed to effect behaviour change directly. Some of these (drawn mainly from the transport sector) are discussed in detail below. They have been selected, because data on their effectiveness are readily available. The selection is not an exhaustive list

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[19] Binsted and Hutchins, *The role of social networking sites*

of relevant sites, although it does provide a representative sample of the various approaches to behaviour change through social media. Most of the platforms used are free-standing social media, rather than accounts on larger websites, although some initiatives make use of sites such as Facebook and Twitter to publicise their main site. Special features have been included in the descriptions if they are of particular interest. Other examples of platforms relevant to the study are discussed in Appendix 1.

Ride-matching websites

4.7   These sites help users wishing to car-share by matching them automatically with other users who make similar journeys. Users contribute typically by submitting basic details about themselves, their vehicle (if applicable) and the journey they are making or wish to make. The sites have proven to be effective agents of behavioural change by offering practical help towards the desired change (raising the occupancy rate of private cars). The service is often combined with information about the sociability and the environmental, social and financial benefits of car-sharing.

4.8   There are several sites operating around the world, including schemes covering the regions of Wales, which are supported by the Welsh Government. In these passages the following sites are discussed: *Liftshare*, which operates throughout Britain, and *BlaBlaCar*, which operates in Western Europe.[20] *BlaBlaCar* has three million members in ten countries and the shared trips it arranges have an average car occupancy rate of 2.8 (compared to an overall average of 1.7).[21] The *Liftshare* network has over 375,000 members and runs additional car-share schemes for workplaces, including the BBC, Tesco, Heathrow Airport and the Environment Agency.[22]

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[20] Links to the Welsh schemes can be found on: http://www.traveline-cymru.info/travel-by-car/ (visited 17.9.13)
[21] http://www.blablacar.com/blog/blablacar-about (visited 2.9.13)
[22] https://www.liftshare.com/uk/ (visited 2.9.13)

4.9   Each site makes use of a number of promotional tools, including personal testimonies from members, introductory videos, and accounts on other social media. The *Liftshare* site includes an application that allows visitors to calculate how much money that car-sharing could save them by entering journey distances, petrol price, size of vehicle, and parking charges.

4.10 In New Zealand, the Greater Wellington Regional Council launched the *Let's Carpool* website, which became the subject of an academic study.[23] Some of the participants were invited to complete an on-line survey, which revealed that the proportion of participants who shared car journeys to work increased from 12.4 per cent to 27.9 per cent. There was a corresponding decline in the proportion of those driving to work alone from 36.6 per cent to 29.9 per cent.

4.11 *Cycology*

4.12 *Cycology* was set-up specifically by researchers to determine the influence of the informal exchange of travel information amongst peers on travel behaviour and attitudes.[24] It was a secure layer of an existing map-based website that provides travel information in Bristol. It allowed visitors to mark cycle routes on a map of the city and to add comments and photographs. There was also a facility for people to discuss local cycling topics and to respond to each other's queries. Twenty-three people, who either commuted by bicycle or were considering doing so, participated in the study.

4.13 The researchers found by interviewing the participants and monitoring postings to the website that thirteen people tried a new cycle route which

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[23] Wokje Abrahamse and Michael Keall, 'Effectiveness of a web-based intervention to encourage carpooling to work: A case study of Wellington, New Zealand' in *Transport Policy*, Volume 21, May 2012, pp.45-51

[24] C Bartle, E Avineri, and K Chatterjee, 'Information-sharing and community-building: a case-study amongst commuter cyclists', The 43rd Annual Universities' Transport Study Group Conference (Milton Keynes), January 2011. There is a *Cycology* website in existence (https://cycolo.gy/about-cycology) but the experimental platform is unavailable to view on-line.

they had seen on the site, whilst three said that they intended to do so. Two had tried routes that they had not used for some time. Many participants also claimed that the experience had reinforced their positive attitude to cycling.

4.14 The researchers acknowledged that the sample size of the study was small and drawn from members of only five workplaces. It would be incautious, therefore, to draw very strong conclusions from the study, especially as the relatively close-knit nature of the participants meant that perceptions of trustworthiness amongst them was likely to have been higher than in loosely connected groups.

4.15 Nevertheless, the researchers concluded that the study demonstrated that information-sharing on-line promoted a community feeling whereby positive views of cycling to work were reinforced. This feeling, alongside the information that the site made available, was thought to be particularly encouraging to those who weren't regular cyclists.

Challenge for Change

4.16 *Challenge for Change* is an organisation that runs behaviour change programmes in Britain based on a scheme developed in New Zealand. The object of the programmes is to encourage more people to cycle, more often; particularly for transport purposes.

4.17 Events under the *Challenge for Change* banner have been run in various localities by local authorities and others. The essence of the events is to create competition between individuals and groups (particularly workplaces) to achieve the highest mileage of cycling trips. To encourage participation, the organisation offers ten-minute cycling experiences to interested individuals in order to break down negative perceptions of cycling.

4.18 Typically an event will have a dedicated website with interactive features. In the case of the Cardiff challenge, which took place in 2011, visitors who had signed-up to the challenge had the opportunity to post photographs and positive comments on the site. They were also able to log their journeys by bicycle, giving them and others information on their progress. Results were presented in terms of mileage covered, calories burnt and carbon dioxide saved. Prizes for competition winners were donated by local businesses.[25] The event attracted 63 organisations and 1,319 participants. Three months after the challenge, the organisation posted the following results:

•17 per cent of non-cyclists reported cycling at least once a week
•20 per cent of occasional cyclists reported cycling at least two days a week
•13 per cent of non-cyclists reported cycling to work at least once a week
•6 per cent of participants who reported travelling to work by car at baseline had switched to cycling to work as their main mode of transport

4.19 The results were by no means untypical of *Challenge for Change* events, which it is claimed have created 28,611 new cyclists overall at the time of writing.[26]

4.20 Like the *Cycology* experiment, the Cardiff site appeared to gather strength from a process of norm creation to help to achieve the results shown above. In addition, it attempted to make the site more enjoyable to use by introducing a competitive element. When looking at the results, it is important to note the contribution of 'off-line' activity. The local websites typically support other promotional activities that take place as part of these events. Meanwhile, the large number of participants belonging to various groups extends the possibilities for 'off-line' social interaction and, therefore, for reinforcement of campaign messages.

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[25] http://www.cardiffcyclechallenge.org.uk/home (visited 2.9.13)
[26] All the figures quoted above taken from: http://www.challengeforchange.com/home (visited 1.7.13)

CarbonCulture

4.21 *CarbonCulture* is a collaborative project designed to promote energy-saving and waste-reduction in workplaces. Participating organisations post their energy performance on the *CarbonCulture* website and share information on ways to reduce energy consumption and waste. A number of British Government Departments, the Tate Modern, and Cardiff Council are amongst those taking part.[27]

4.22 A smaller *CarbonCulture* pilot project at the DECC explored ways of using social media to encourage energy-saving behaviour in the workforce. A series of on-line applications were created on an interactive website, including *OK Commuter*, which allowed users to record and report the transport mode that they took to work.[28]

4.23 Participants were encouraged to interact on-line and to add short narratives to each journey. Prizes were offered to the commuters who made the most journeys by a sustainable mode. The object was to engender personal pride in making positive changes and to make participation fun, sociable and competitive.

4.24 The 240 staff members who used the application logged a total of 2229 journeys. The developers claimed that use of all the applications featured in the pilot could lead to a workplace reduction of around 10 per cent in carbon emissions. It was also reported that the 'user-facing' aspects of the project had demonstrated their worth in building participation and allowing users to see their energy consumption and appreciate ways to reduce it. The *OK Commuter* application was rated highly for 'future scalability'.[29]

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[27] http://www.carbonculture.net/ (visited 26.6.13)
[28] *OK Commuter* existed on an experimental platform, so the application is unavailable to view on-line.
[29] More Associates, *How can user engagement save energy and carbon at work?* (London, 2013): http://research.carbonculture.net/decc-report-2012/ (visited 26.6.13)

5 Applicability of a social media campaign to Wales

5.1 The evidence and examples of behavioural changes set out in the last section demonstrate that social media can be used to affect travel habits. They indicate that the creation of a social media pilot study in Wales is certainly worthy of consideration. To justify such a pilot, however, further data is required that demonstrates that conditions in the country are conducive to its success. This section presents the necessary data: a broad description of the size and composition of the target audience is provided and an indication of the degree of overlap between this group and the people that currently use social media is given.

5.2 In Travel Demand Management (TDM) initiatives, three basic groups are normally identified: those who use sustainable transport regularly, those who drive alone habitually and are not willing to change, and those who drive alone habitually and *are* willing to change their travel habits.[30] It is this third group where travel behaviour change is to be expected. In this study, therefore, it is assumed that this group will be the main target of any pilot scheme. Demographic data have been gathered on this group and is set out immediately below. Similar data are presented in subsequent passages on social media and internet use in Wales. The two sets of data are then compared.

Attitudes to environmentally sustainable travel in Wales

5.3 The results from the Welsh PTP programme suggest that a sizeable section of habitual car-users could be induced to change their behaviour towards more sustainable travel. The programme has produced encouraging results amongst the 63,000 households in Cardiff and

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[30] TDM initiatives reflect the fact that individuals do not normally fit neatly into such categories by seeking to encourage frequent use of sustainable travel modes amongst relatively infrequent users. This is briefly discussed in Victoria Transport Policy Institute, 'TDM Marketing Information and Encouragement Programs' in *TDM Encyclopedia*: http://www.vtpi.org/tdm/tdm23.htm (visited 28.6.13)

Penarth targeted so far, including an 8 per cent reduction in car journeys made by drivers and a 13 per cent reduction in car journeys made by passengers.[31]

5.4   A study of public attitudes to sustainable development, commissioned by the Welsh Government provides a broader indication of this propensity to change.[32] The overall results showed that a substantial proportion of the Welsh population is receptive to the notion of travelling more sustainably. Of those surveyed, 31 per cent said that they had switched from driving to using public transport for longer journeys, whilst 8 per cent said they were considering doing so. Meanwhile, 54 per cent claimed to have switched to walking or cycling for short journeys (and 8 per cent were considering doing so). Car-sharing for journeys to work or other regular trips had seen 24 per cent make the switch from driving alone (4 per cent were thinking about doing so).

5.5   The survey also showed that there was willingness to try sustainable travel amongst all age groups and social grades. Nevertheless, the data show some variation in attitudes and behaviour according to demographic group. For example, 35-54 year-olds were the most resistant to the idea of switching to public transport: 35 per cent said that they did not want to do so, compared to the overall figure of 29 per cent. Meanwhile, the ABC1 group were more willing to switch than C2DEs.[33]

5.6   People aged 16-54 were considerably more amenable to switching to walking or cycling than people over 54. Greater willingness to walk or cycle was also demonstrated amongst the ABC1s. The 35-54 age group were most resistant to the concept of car-sharing, whilst 16-34 year-olds were the most amenable; there was less variation in amenability between ABC1s and C2DEs.

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[31] http://www.sustrans.org.uk/wales/what-we-do/communities (visited 2.9.13)
[32] Welsh Government, *Sustainability survey 2011* (Cardiff, 2011). NB: Most of the figures quoted come from unpublished material from the survey.
[33] The terms ABC1 and C2DE are used in a social classification system based on occupation. ABC1s tend to have better paid jobs than C2DEs. Pensioners and the unemployed are usually included in the C2DE classification.

5.7   For each question, a sizeable proportion of those surveyed (to whom the questions were applicable) answered that they had not switched permanently to a sustainable travel mode, but did not reject doing so in the future. Looking at this group, there appeared to be generally more scope for change amongst younger and more affluent people. The same was true for people who had children living at home. Overall, each age group and social grade showed some scope for change.

Social media and internet use in Wales

5.8   The proportion of households with internet access in the first quarter of 2013 was lower in Wales than in the rest of the United Kingdom: 75 per cent compared to 80 per cent. Meanwhile, fixed broadband take-up has failed to increase from 2011 to 2013. More encouragingly, increasing numbers of Welsh adults are using mobile phones to gain access to the internet, rising from 25 per cent in 2011 to 47 per cent in 2013. The latest figure is closer to the average for the United Kingdom as a whole (49 per cent).[34] Furthermore, the use of social networks in Wales has continued to rise. By the first quarter of 2013, 61 per cent of adults in Wales used one of these (compared to 16 per cent in 2008) most of whom reporting that they had done so in the week prior to being questioned.[35]

5.9   The data for Britain as a whole suggest that younger people are more likely to use social networks. In 2013, 93 per cent of 16-24 year-olds had done so, in comparison to only 11 per cent of those aged 65 and over. However, use of social networks is quite common amongst all age groups: 84 per cent and 66 per cent of 25-34 and 35-44 year-olds respectively use them, whilst half of 45-54 year-olds do so.[36] There is

[34] Ofcom, *Communications Market Report: Wales* (London, 2013), p.61 and Ofcom, *Communications Market Report 2013* (London, 2013), p.259
[35] Ofcom, *Communications Market Report: Wales* (London, 2013), p.64
[36] Office for National Statistics, *Internet Access - Households and Individuals, 2013* (Newport, 2013), p.8

less variation across social grades, although a considerably higher proportion of ABC1s use social networks at home than C2DEs.[37]

5.10 According to 2012 figures, broadband take-up in Wales varies significantly by demographic group.[38] It is significantly lower amongst those over 55 years of age, those with lower incomes, and in households without children. There is also a tendency for these groups to lag further behind the average for the United Kingdom. This is particularly the case for those over 55 years of age, where take-up stood at 44 per cent in Wales compared to 59 per cent in the United Kingdom as a whole. This can be contrasted with take-up in Wales of 77 per cent and 83 per cent amongst 16-34 and 35-54 year-olds respectively. Take-up in Wales amongst ABC1s was 80 per cent compared with 58 per cent amongst C2DEs.[39]

5.11 The pattern of broadband use is not, however, necessarily reflective of internet use overall and is becoming less relevant as an indicator. The proportion of households in Wales using mobile devices as the only means of internet access has increased from 4 per cent to 9 per cent in the twelve months prior to the first quarter of 2013.[40] The availability of internet connections outside the home is growing and people are increasingly making use of portable devices (laptops, tablets, e-readers, and mobile phones) to gain access to the internet. In 2013, 61 per cent of British adults had used a portable device to do so. This practice is particularly common amongst young people: 94 per cent of 16-24 year-olds had done so, compared to 17 per cent of those aged 65 or above.[41]

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[37] Ofcom, *Communications Market Report 2013*, p.296
[38] Broadband has almost completely supplanted dial-up as a means of internet connection in Britain.
[39] Ofcom, *Communications Market Report: Wales* (London, 2012), pp.39-40
[40] Ofcom, *Communications Market Report: Wales* (London, 2013), p.61
[41] Office for National Statistics, *Internet Access*, p.12

Concluding remarks on applicability

5.12 The lower-than-average broadband take-up experienced in Wales, which is particularly pronounced amongst certain demographic groups, is somewhat discouraging in the context of this report. However, broadband take-up and use of social media are highest amongst those groups that appear to be most amenable to changing their travel behaviour. It is also more consistent with levels for the United Kingdom as a whole. In addition, younger people are both more likely to be amenable to changing travel mode and to use means other than fixed broadband to gain access to the internet.

6 Conclusions and recommendations

6.1   Some aspects of behaviour change theory suggest that social media could provide an avenue to effect changes in people's travel behaviour. In particular, social media can be used to address the social context of decision-making. The evidence from the transport sector and elsewhere shows that the application of this theory has met with an encouraging degree of success. Although there have been only a small number of systematic studies of the effectiveness of social media in this area, there is certainly enough evidence to justify the creation of a pilot study in Wales - if the conditions are favourable.

6.2   The survey data show that there is a substantial portion of the Welsh population that wishes to travel more sustainably. Data on internet use suggest that there is a considerable overlap between those who might be persuaded to change their travel behaviour and those who use social media. There are, therefore, sufficient grounds to justify the running of a transport behaviour change pilot in Wales based on social media.

Recommendations on the design of a pilot scheme

6.3   The success of any social media pilot scheme in Wales will depend on careful research and design. On the most basic level, a clear identification of both the pilot's objectives and its audience is necessary. The former, should be relatively simple to determine in broad terms: it would be to gather data on the ability of social media to effect changes in travel behaviour. Meanwhile, the latter is likely to involve further research. With that in mind, it is far beyond the scope of this study to lay out the design of the pilot in detail, but it is appropriate to make some general recommendations and also to point out some of the design options.

Selection of the target audience

6.4 Behaviour change initiatives often involve the sub-division of the target group into segments whose members might share certain age, socio-economic and lifestyle characteristics. However, in the simplest terms, the main target of the pilot would be those who habitually drive cars alone and who are willing to change that habit. The pilot might be aimed at all of these people or a small section of them, such as a group of workforces or people living in particular locations.[42] If the pilot is restricted to a particular area, it should be one that has the infrastructure in place to allow participants to make the desired changes in their travel behaviour.

6.5 The targeting of established social groups should be considered, because people are more receptive to propositions put to them by their peers. Particular consideration should be given to workplaces, because they have the additional advantages of generating a lot of traffic and having workers that are likely to have similar experiences of commuting that can be shared and discussed.

Publicity and recruitment of participants

6.6 As implied by the remarks above, there are two possible approaches to publicity and recruitment: casting a wide net or fishing for a smaller yet promising catch. Whichever approach is adopted, the pilot needs to receive adequate publicity (both on- and off-line) to allow the pilot to be seen and heard above the mass of internet traffic.

6.7 The simplest approach is to target small and identifiable groups, such as workforces, residents of particular towns or neighbourhoods, or families and employees attached to particular schools. This has the advantage of allowing publicity to be more clearly targeted and more direct recruitment

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[42] Internet access and attitudes to transport vary between urban and rural areas. This difference is discussed in outline in Appendix 2.

methods to be used. Data on existing travel habits could also be gathered more effectively. A smaller project is, however, more open to failure if barriers (foreseen or unforeseen) to participation exist.

6.8 If the aim of the pilot is to reach a wide audience, a large part of the recruitment effort could remain concentrated on a smaller group. This would allow for the pilot to have a clearly identified group from which to draw meaningful data. Furthermore, if this group was primed with detailed knowledge of how the scheme operates, it could help to generate activity on the pilot's on-line platform. This activity could, in turn, make the site more attractive to prospective users. Group members could also be encouraged to recruit new participants directly.

Basic form and functions of the pilot platform

6.9 The pilot platform should have the basic functions of a social networking site: visitors should be able to identify themselves as followers and be able to post comments and to respond to the comments of the organisers and each other. This will give maximum play to the psychological effects discussed in Section 3.

6.10 The platform should promote all forms of sustainable travel. It should contain a clear statement (backed-up by appropriate information) on why a switch from habitual car-use is environmentally and socially desirable, personally beneficial, and achievable. It should also contain (or have links directing visitors to) practical information on walking, cycling, public transport, and car-sharing. Ideally, this information should demonstrate to individual users (where possible) that alternative transport modes can meet their transport needs and be a realistic option in their particular circumstances.

6.11 Visitors should be able to log the journeys that they undertake, track their progress, and to compare it with others. This will lend a competitive element to participation and will give participants a better sense of

progress. The option of presenting participants' activity in terms of reductions in carbon dioxide produced, money saved, and (if applicable) calories burnt, should be considered.[43]

Making the platform appealing and engaging

6.12 The platform should be visually appealing and a pleasure to visit. It should include material that is useful, engaging, entertaining and easy to use. Binsted and Hutchins found from their work with focus groups of site visitors that there were a number of things that would help to achieve this. Firstly, information should be provided primarily to interest and stimulate visitors, rather than to provide detailed knowledge. The volume of information should not be so high as to be off-putting, in other words, and should be delivered in authoritative, but accessible language. Secondly, navigating the platform should be made easy and its lay-out should be logical and straight-forward. Finally, the platform should be kept up-to-date and comments and questions should elicit timely responses.[44]

6.13 If the platform were to allow visitors to log journeys, as recommended, creative presentation of this information could add to the platform's appeal. Transport activity could be presented graphically, rather than simply textually or numerically, using bold and colourful symbols or as a position on a virtual journey.[45] The platform could also arrange participants' activity in overall league tables, or depict them as positions in a virtual race, to give participants the impression of being in a game.

6.14 Other material might include live-action videos, animated sequences, sound effects, free-standing games, and photo-galleries. Examples of which can be found on the websites discussed in Section 4 and also in Appendix 1. Every opportunity should be given to visitors to make

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[43] See Appendix 1 for examples of applications that provide data on individual trips.
[44] Further useful recommendations for presentation can be found in Binsted and Hutchins, *The role of social networking sites.*
[45] See below and Appendix 1 for examples.

comments, ask questions and hold discussions, or contribute in other ways. Sustrans Cymru found that a photography competition held on its site elicited an enthusiastic response.

Recording the performance of the project

6.15 For the pilot to have any purpose, it must produce measureable results. The number of participants can be counted fairly simply and information can be gleaned from on-line comments. However, this will only give the vaguest indication of the pilot's influence on travel behaviour. The most meaningful and efficient way of gathering data would be to allow visitors to log journeys on-line. In addition to this, of course, data on participants' travel behaviour prior to participation in the pilot would be required for comparative purposes. If the audience is pre-selected, a survey could be conducted at the beginning of the pilot. Alternatively, people could be asked to complete an on-line questionnaire upon registering as users of the platform.

Platform development

6.16 The needs of the pilot could be met either by a bespoke stand-alone website or by creating an account on an existing social networking site and adapting it to the pilot's needs. There is also a third option of having a suitable site act as a host for the platform, as in the case of the *Cycology* experiment discussed in Section 4. A decision about which route to take should be made only after careful consideration of the options.

6.17 The involvement of developers of existing sites or pilot schemes should be considered, because the state of knowledge in the field is already substantial and is growing. Technical pitfalls could be avoided and there is the potential to save time and resources if existing knowledge and applications are utilised. At the very least, existing sites should be visited to gather basic information on their design, lay-out and features. In

addition to those discussed in Section 4, some relevant sites are discussed in Appendix 1.

6.18 The project should try to avoid exact duplication of the functions of existing sites. There is no need to re-invent the wheel: if another site fulfils a function that could help the pilot platform to operate (ride-matching, for example) establishing a link to that site could be considered.

6.19 Finally, experience from the *CarbonCulture* project suggests that starting with a simple platform and adding extra functions as the pilot develops can yield benefits. It was found that visitors were attracted by different features, which allowed the developers to attract new participants and keep the interest of existing ones by the addition of new features over a period of time.[46] It also allows the design of the platform to be developed in the light of knowledge gained of the participants.

Links with other sites

6.20 Consideration should be given to the creation of links – in both directions – between the pilot platform and appropriate sites. This could be beneficial by increasing the on-line visibility of the platform and increasing its usefulness. Links with well-established and trusted sites also act as a form of endorsement.

6.21 The most obvious potential hosts for links are sites that offer sustainable travel and transport information. Firstly, such links could attract those who are thinking about their travel options to the platform. Secondly, having links to such sites would help users of the platform to assess their transport choices. In addition, since the pilot would be an initiative of the Welsh Government, it would be appropriate to have links with relevant sites that it runs or sponsors.

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[46] More Associates, *How can user engagement save energy?*

Use of multiple platforms

6.22 In a similar fashion, the pilot could have accounts on multiple social media in addition to a central platform. This could increase the visibility of the project and it allows the project to take advantage of the specialised functions of those sites.[47]

6.23 For example, social networking sites provide a simple way for visitors to discuss issues relating to the project and to promote the project amongst their friends. The sites can also act as a shop window for the main platform. Both Sustrans and the administrators of *BlablaCar* see their social network accounts as tools to reach a wider audience. Both reported that their pages on social networks generated extra traffic to their main websites.[48]

6.24 The use of video-sharing sites is another option. They provide a simple way to up-load video clips to the pilot platform and a video-sharing account can also create another way in to the main platform.

Use of incentives

6.25 Some of the sites described in Section 4 have offered prizes to the winners of competitions, which have been described as an effective way of encouraging competitiveness and participation. In some cases, commercial organisations have donated prizes. A further option is to offer incentives to participation, like *TravelWise* in Canada, which offers discounted public transport fares. Offering a gift 'up-front' and

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[47] The demographic profiles of social media audiences varies, which can be useful when attempting to target a particular social group. Data on audiences can be obtained from UKOM Ltd (http://www.ukom.uk.net/). Some sites have a minimum age requirement that some users attempt to circumvent, so it is necessary to avoid using such sites to reach audiences for which they weren't designed.
[48] Binsted and Hutchins, *The role of social networking sites*, pp.33-5

unconditionally also has the potential to build goodwill and could, according to one theory, encourage desirable changes in behaviour.[49]

Bilingualism

6.26 It is almost unnecessary to say that it is important to consider the needs and preferences of Welsh speakers when creating an on-line project in Wales. Moreover, the Welsh Government places certain obligations on its own social media channels in this respect.[50]

6.27 Encouraging people to post material to the site and hold discussions in Welsh, rather than simply adhering to minimum requirements, could drive up participation by helping to meet an unsatisfied demand. The recent *A Living Language: Have your say* and *Y Gynhadledd Fawr* consultations showed that many people wanted more opportunities to use Welsh in everyday life.[51]

Mobile internet access

6.28 The layout of the pilot platform's pages should reflect the rise of mobile internet access by being easy to use on any device. As mentioned in Section 5, an increasing proportion of people in Wales are using mobile phones and other mobile devices to gain access to the internet. 47 per cent of households in Wales use mobile phones for this purpose, whilst 21 per cent of households own tablets and 15 per cent of Welsh consumers own an e-reader. In a recent survey, 19 per cent of respondents in Wales identified their mobile phone as their most important device for internet access (a higher proportion than the average for the United Kingdom as a whole).[52]

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[49] This theory and a related study are discussed briefly in Seethaler and Rose, 'Using the six principles of persuasion'
[50] Welsh Government, *Welsh Language Scheme 2011-16* (Cardiff, 2011)
[51] http://intranet/English/NewsEvents/Pages/Alivinglanguagetheresultsarein.aspx (visited 3.9.13)
[52] Ofcom, *Communications Market Report: Wales* (London, 2013), pp.61-3

6.29 The infrastructure that supports this trend continues to expand. The 4G network, which supports faster mobile broadband, has recently been launched and is being expanded. Meanwhile, the numbers of wireless hotspots in public places are rapidly increasing.[53]

6.30 There are services and applications for mobile devices that aid sustainable travel, which could be tied to a web-based TDM initiative. Some are already popular, such as Twitter feeds that give real-time information on public transport, whilst some are in development, like the *i-Tour* application.[54]

Presenting data on individual carbon emissions

6.31 Giving people data on their carbon emissions is seen by some researchers as an important way to motivate changes in behaviour. Avineri is amongst those arguing for the effectiveness of providing people with direct feedback on the impact of their lifestyles, citing research suggesting that the installation of smart meters has had a positive impact on domestic energy use. He noted that carbon emissions are invisible to travellers, suggesting that their intangible nature could be overcome with imaginative visualisations. This approach is employed by the *Building Dashboard® Network™*, which uses 'interpretive gauges' to depict emissions as well as levels of water and energy use.[55]

6.32 It has been suggested elsewhere that people respond more readily to being given a recommended level of carbon emissions to which they can compare the emissions resulting from their own activity.[56]

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[53] Office for National Statistics, *Internet Access*, p.45
[54] See Appendix 1
[55] Still shots of the gauges can be viewed on http://www.luciddesigngroup.com/network/features.php (visited 2.7.13)
[56] Binsted *et al*, 'Communicating the impacts of transport choices', pp.11-2

6.33 The CATCH project (see Appendix 1) applied the principle that presenting the 'co-benefits' of reducing carbon emissions to members of the public and politicians was desirable. The underlying belief was that the provision of information on carbon emissions and their implications for the climate was less likely to motivate changes in behaviour on its own. It was asserted that people are motivated by different factors (or combinations of factors). For this reason, six 'co-benefit areas' were promoted in the project, which were associated variously with health, costs, time-savings, safety, town planning and communities.[57]

6.34 Meanwhile, Binsted and Hutchins suggested that sites should emphasise the positive impact of collective action in addition to the impact of individual action.[58] There are various ways that this can be achieved, but the following statement from the *CarbonCulture* website works well as an opening line: "It's fine to continue 'doing your bit' but 'doing your bit' works a lot better (and is more fun) when it's done with others".[59]

Final thoughts

6.35 As mentioned above, the aim of this section is to make some general recommendations and also to point out the design options available. It has been written with the desire to avoid being prescriptive in all areas of design and it is hoped that it successfully lays out the available options. The detailed design of the pilot cannot be made in advance of making some basic decisions on its general scope and nature. With that in mind, it is hoped that these recommendations will prove useful in the creation of a pilot scheme, should the decision to launch one be made.

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[57] Ibid., pp.10-1
[58] Binsted and Hutchins, *The role of social networking sites*, pp.16 & 43-44
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Appendix 1: Internet platforms and technology relevant to the study

A selection of platforms that were visited as part of the research for this paper is shown below. They are either not mentioned in the main text or mentioned, but not described in detail. Some of the platforms are part of behaviour change initiatives, whilst others are of more general interest. The purpose of this section is to give a fuller picture of web-based TDM and other relevant platforms, and also to provide a description (in some cases) of possible partner or host websites. The platforms are arranged according to type and purpose.

In addition, some examples of technology and website features are listed at the end of this section to draw attention to some of the options available. They point to certain functions or qualities that might be considered desirable on a pilot platform.

Sustainable transport promotion

Do the right mix: http://dotherightmix.eu/campaign/about

Do the right mix video: https://www.youtube.com/watch?v=55yhNqMtdxA

Do the right mix is the website of the European Commission's Sustainable Urban Mobility campaign, which aims to promote the use of sustainable transport modes in the European Union. Its target audience is the general public and campaigners. The latter are invited to publicise their initiatives on a 'sustainable mobility map' on the site. Information on the benefits of sustainable travel and links to promotional videos are available to visitors.

Love to Ride: http://www.lovetoride.net/global

This website has been set-up by *Challenge for Change* as an 'on-line cycling community' to promote cycling. The initiative is British, but people living overseas can also sign-up.

Visitors can post comments, up-load photos, compete for prizes, and take part in virtual races from Land's End to John O' Groats. The site also features practical tips on cycling, a promotional video, and a mobile phone application for recording cycling trips.

The Big Pedal: http://bigpedal.org.uk/

This website supported an inter-school cycling competition organised by Sustrans. The competition ran for 15 days in early 2013. Staff, pupils and parents were encouraged to cycle to school each day in order to complete a set of stages, which corresponded to Sustrans cycle routes. The schools logged on to the site to record their daily total mileage.

It's Up To All Of Us (Harrow Borough Council):https://twitter.com/itsuptoallofus

The link above is to the Twitter account of the *It's Up To All Of Us* campaign, which promotes sustainable transport to 16-25 year-olds. The underlying campaigning strategy is to use various forms of social medium to reach young people who are not only heavy users of social media, but also in the process of forming life-time habits as they enter the workforce.

The social media are used to transmit useful information on sustainable travel and to interact with the target audience. The strategy has also included engaging with influential bloggers. The campaign has used multiple platforms, including YouTube, Blogger and Facebook.

TravelWise Merseyside: http://www.letstravelwise.org/index.html

This website contains information and advice on a range of sustainable transport modes in the Merseyside area. Much of the information is made available via links to other sites.

Keeping Cardiff Moving: http://www.keepingcardiffmoving.co.uk/

This website provides similar information to *TravelWise Merseyside*. In Cardiff's case, sustainable transport modes include river transport and a park and ride scheme.

Journey-planning

Traveline Cymru: http://www.traveline-cymru.info/

This website is funded by the Welsh Government and functions mainly as a journey planner. It offers detailed information on door-to-door trips by public transport, foot, and bicycle to and from any destination in Britain.

It also contains an array of features designed to promote the use of sustainable transport modes, including a page that gives information on forthcoming events in Wales and how to reach them sustainably.

It also makes a mobile phone application available for downloading, which gives information on public transport.

Traffic Wales: http://www.traffic-wales.com/Home.aspx?lang=en-GB

Traffic Wales is the Welsh Government's traffic information service. It is included here because it could be used to make regular drivers aware of the pilot scheme by hosting a link to the pilot platform.

Workplace travel-planning

TravelWise Commute (Canada):
http://www.regionofwaterloo.ca/en/gettingAround/travelwise.asp

TravelWise Commute is a TDM scheme running in the Waterloo region of Canada. It is one of a number of similar Canadian schemes that provide travel-planning for workplaces. The Region of Waterloo website provides a good example of how a local authority can promote such schemes in simple terms on-line.

It provides a link to the *TravelWise Commute* website in the transport section, 'Getting Around'. Information about the scheme is presented alongside the link, whilst an additional page hosts the personal testimonies of participants. Due to the link's location, other relevant information on traffic and travel, and other transport schemes are near at hand.

Smart Commute Toronto: http://www.smartcommutetoronto.ca/en/home

This site promotes the *Smart Commute* workplace travel-planning scheme. It contains information on the scheme and promotional material, including a video and testimony from participants.

It also contains a 'Commute Impact Calculator', which allows users to see the fuel costs and greenhouse gas emissions associated with their regular trips by car.

Travel alerts

TfL Travel Alerts: https://twitter.com/TfLTravelAlerts

National Rail Enquiries: https://twitter.com/mbta_alerts

MBTA Alerts! (USA): https://twitter.com/mbta_alerts

A number of public transport operators in Britain and overseas use Twitter accounts to convey real-time information on delays and service alterations to travellers. Twitter also allows interaction with passengers, who can get prompt personal responses to complaints and queries. Research suggests that such services can improve passengers' perceptions of the operators.[60]

Miscellaneous platforms

Building Dashboard® Network™: http://www.luciddesigngroup.com/

A similar programme to *CarbonCulture* has been running in the United States and Canada, called the *Building Dashboard® Network™*. The project's software, created by Lucid Design, allows users to view and share real-time

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[60] Transport for London, *Twitter Customer Satisfaction* (Undated), p.24

data on energy and water consumption on-line. The makers refer to it as 'a comprehensive and exciting social network for buildings'. Like *CarbonCulture*, it is designed for organisations and their premises, and employs a number of on-line applications that are designed to be visually pleasing, engaging and easy to use.

Features of the network include interpretive gauges on water use, electricity use and carbon output; instant comparisons of individuals or groups, geographical tagging, and competitions.

Lucid Design's customers include Princeton University, Yale, Harvard, the World Wildlife Fund, Google, and Yahoo.

CATCH (Carbon Aware Travel Choice): http://www.carbonaware.eu/

Introductory video: http://www.youtube.com/watch?v=i5eBppGwsOM

CATCH was an EU-funded project that aimed to provide an on-line 'knowledge platform' primarily for political decision-makers in cities. It came to an end in January 2012. The project's website can still be visited, but the knowledge platform is no longer accessible.

The site advised visitors on the best way to provide information on sustainable travel to local communities. It also allowed visitors to share their knowledge and experience in this area. The site was designed to act as a model of how to convey that information in a way that maximises the chances of achieving behavioural changes.

The project included the development and trial of an application that presented data on city-wide carbon emissions in imaginative ways. The key innovations were a facility for viewers to make comparisons between cities and to present 'co-benefits' of carbon reduction. The application can be viewed via the following link:
http://www.systematica.net/catch/cobentool/mobilitytech/

It was hoped that such applications would help overcome the abstract nature of carbon emissions figures, which are not conducive to motivating changes in behaviour. The study found that users responded most favourably to being given a recommended emissions level with which to compare their own performance.

Busnes Cymru: https://twitter.com/_busnescymru

Business Wales: https://twitter.com/_businesswales

Business Wales creatively manages the output of its English and Welsh Twitter accounts, so that neither represents a slavish copy of the other. Subscribers thus have the option to subscribe to either account and a reason to subscribe to both. The sites serve as a reminder of the advantages that can accrue from a creative exploration of the opportunities that bilingualism offers.

Ecotube: http://www.eco-tube.com/

As the name suggests, this is a video-sharing site for ecological material. On the platform it states that the object is to 'build a community of like-minded people'. It features videos on a variety of topics, including transport, which visitors can rate and comment upon.

Carbon Rally: http://www.carbonrally.com/

Carbon Rally is a social network where participants compete to make the largest reductions in carbon emissions via a number of lifestyle challenges. The challenges include transport-related activities, such as car-sharing and commuting via bicycle.

The website has a global 'rally map' that shows the reductions in carbon emissions achieved in each city via *Carbon Rally* challenges.

Strava (USA): http://www.strava.com/

This site was developed primarily for those who run and cycle for fitness. The developers saw a demand from solo trainers for a sense of competition, which would help them to get better results from their training.

It uses an application that allows runners and riders to log their journeys automatically via mobile devices with the aid of satellite navigation. Users are given a range of data on trips, including their heart rate, the length and topography of the routes, and the time taken to complete journeys. They then have the option of comparing their performance with that of others.

Website features and technology

Commute Impact Calculator

https://www.carpoolzone.smartcommute.ca/en/my/calc_impact.php?noheader=1

The 'Commute Impact Calculator' allows users to see the fuel cost and greenhouse gas emissions associated with their regular trips by car by entering some basic information on their commuting (car size, fuel cost, frequency of travel and mileage). It gives users information on the negative environmental and financial impact of commuting alone by car, which is directly relevant to them. Binsted and Hutchins found that their focus group members expressed a desire for individualised information like this.[61]

The expression of the results on the calculator as losses conforms to the view that highlighting the costs of *not* altering a particular practice has more impact than underlining gains accrued from following the alternatives. Presenting

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[61] Binsted and Hutchins, *The role of social networking sites*, pp.43-44 & 57

information in this way is known as 'loss-framing' and has some support amongst behaviour change theorists.[62]

Living Streets Ice Cream Calculator

http://www.livingstreets.org.uk/icecreamcalculator

Living Streets, which promotes the interests of pedestrians, has an application on its website that calculates the number of calories burnt on walking trips. As its name suggests, the calculator presents the data in a playful fashion.

i-Tour (intelligent Transport system for Optimised Urban trips)

The *i-Tour* application is designed to make trips by sustainable transport easier by laying out the options for specific door-to-door journeys in an easily understandable graphical format. The route options are presented as branches radiating from a central position (the user's location) with sub-branches representing the choices available at connections. It has been formulated specifically for mobile devices.

Further graphical displays allow the user to compare the alternatives by the cost and duration of the journey, the distance to be travelled, and the associated carbon dioxide emissions. A video demonstration can be viewed on the *i-Tour* website: http://www.itourproject.com/web/

Videos and interactive sequences

Some links to a few examples of videos on various websites in the transport sector and elsewhere are provided below. They are not necessarily highlighted for their quality, but rather to demonstrate the possibilities. The links provide examples of imaginative ways to convey information or (in the case of the *Smart Commute* video) show how a human face can be presented to visitors. A video can also introduce first-time visitors to a website in a way that is easy to understand.

Smart Commute Toronto: http://www.smartcommutetoronto.ca/en/home

CATCH: http://www.youtube.com/watch?v=i5eBppGwsOM

Liftshare: https://www.liftshare.com/content/info_youtube.asp

Do the right mix: https://www.youtube.com/watch?v=55yhNqMtdxA

Dumb Ways to Die: http://dumbwaystodie.com/

Talk to Frank: http://www.talktofrank.com/cocaine-basement

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[62] Loss-framing is discussed in Moseley and Stoker, 'Nudging citizens?, Seethaler and Rose, 'Using the six principles of persuasion', and Avineri, 'On the use and potential of behavioural economics', pp.515-7

Virtual journeys

Some sites allow visitors to see their sustainable mileage depicted as a position on a virtual journey. A popular choice is Land's End to John O' Groats.

Love to Ride:
http://www.lovetoride.net/leicester/virtual_ride_types/1?locale=en-GB

Cardiff Walking for Health:
http://www.cardiffwalkingforhealth.org/English/walkcardiff.html

Free-standing games

Some platforms include small games, which are unlikely to be a great draw, but can help to make a platform enjoyable to use. The best type of game would reinforce and relate to the platform's messages about sustainable travel.

Games on Liftshare: https://www.liftshare.com/content/fun.asp

QR code Treasure Hunt

http://vancouver.ca/news-calendar/viva---qr-code-treasure-hunt---july-20.aspx

Quick response (QR) codes work on the same basic principle of a barcode. They can be displayed on posters and other printed material and can be read by many mobile devices that also provide internet access. They can contain various types of data, including web addresses. Their origin is in manufacturing, but they are also used widely in advertising and elsewhere.

The Transport Policy, Planning & Partnerships branch raised the idea of posting them along pedestrian and cycle routes as part of an incentive scheme or a game. By providing links to the pilot platform, they could also provide publicity for the scheme. A brief search of the internet revealed that the City of Vancouver has run a QR code treasure hunt on a street that it periodically turns into a pedestrian plaza. Participants can win prizes by scanning the codes.

Appendix 2: Rural and urban areas

The Welsh Government might decide to run the pilot in selected locations to test the concept in different types of area. This section provides some basic information on the differences between rural and urban areas with regards to internet access and attitudes to sustainable transport.[63]

This year's *Communications Market Report* showed that take-up of broadband in rural households compares fairly well with urban households, as does the adoption of mobile devices with internet access amongst rural populations.[64] In 2013, a higher proportion of rural individuals have access to the internet overall than individuals in urban areas (81 per cent compared to 74 per cent). However, a slightly higher proportion of urban dwellers own a mobile phone with internet access than their rural counterparts (50 per cent compared to 48 per cent). This reflects a greater preference for using mobile phones to gain access to the internet amongst urban populations. 21 per cent of urban dwellers identified their mobile phones as the most important device for internet access, whilst only 14 per cent of rural dwellers did the same.

Overall, rural dwellers appear to be satisfied with the infrastructure that supports rural internet access. An equal proportion (81 per cent) of urban and rural dwellers expressed satisfaction with their ability to connect to the internet via 3G or 4G. Meanwhile, 82 per cent of rural dwellers were satisfied with the speed of their fixed broadband connection, in comparison to 74 per cent of urban dwellers.

The Welsh Government's *Sustainability Survey 2011* also revealed differences in attitudes to sustainable transport.[65] For example, whilst the survey revealed a similar scope amongst rural and urban populations for switching to using public transport, there was less scope amongst people living in remote areas. People living in remote areas were also least amenable to switching to walking or cycling. Urban dwellers were the most amenable. Remote areas revealed the least scope for car-sharing, whilst rural areas showed the most. Urban dwellers were slightly more amenable to car-sharing than people in remote and rural areas.

Overall, broadly similar levels of amenability to making changes towards more sustainable transport were displayed. This is with the exception of the substantially more negative attitude revealed in remote areas towards walking and cycling for transport purposes. Overall, significantly less scope for change towards sustainable transport was displayed in remote areas.

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[63] Geographical data on the level of internet use and transport modes used for commuting can be obtained from CACI Ltd via its ACORN service (see http://acorn.caci.co.uk/).
[64] Ofcom, *Communications Market Report: Wales* (London, 2013). The report defined respondents as urban if they lived in a settlement with a population of 2000 or more.
[65] Welsh Government, *Sustainability survey 2011.* Regional data on attitudes to sustainable transport was collected (but unpublished) in addition as part of the survey.

Appendix 3: Research project brief

The aims and objectives of the project

Personal Travel Planning (PTP) is an approach to delivering targeted information directly to travellers, to help them make sustainable travel choices. It seeks to overcome habitual use of the car, enabling more journeys to be made on foot, bike, bus, train or in shared cars. It can also seek to discourage unnecessary travel, through the provision of local or site-specific information.

The intervention involves teams of travel advisors, trained in the local transport, walking and cycling infrastructure, talking one-to-one with residents to gauge what their current primary modes of transport are, and then to educate and inform them of alternatives they may not have considered and supplying them with information and incentives to help them substitute regular car journeys with more sustainable and less congested transport methods.

This traditional method of delivering PTP is very resource intensive both in terms of people and materials and as a result can be seen by some as a relatively expensive intervention.

This project is to investigate the suitability of social media channels to deliver an alternative and more efficient form of PTP.

The work to be carried out by the postgraduate student

The work will look at the use of social media channels in effecting behaviour change more generally and establish if this could be translated to changes in travel behaviour. The study will also investigate and report on the suitability and success of any existing applications of social media campaigns related to travel change.

The output of the project will be a written report detailing the findings of the investigation and a recommendation of next steps

Depending on the outcomes the project may develop to pilot social media application to PTP in Wales.

Appendix 4: Acknowledgements