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Fundamental challenges in designing a collaborative travel app

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ABSTRACT

The growing capabilities of smartphones have opened up new opportunities for travel coordination and transport is a fertile area for app development. One stream of development is apps that enable collaborative travel, either in the form of lift sharing or collaborative shopping, but despite growing interest from governmental agencies, there is little evidence of the efficacy of such apps. Based on trials of purpose built travel collaboration apps, deployed in tourism, urban and rural residential communities, and logistics, this paper analyses the fundamental challenges facing users adopting such travel apps. The findings suggest that transport practitioners, policy makers and app developers need to better understand the challenges associated with attracting users, the use of incentives and the types of communities most appropriate to implement collaborative travel concepts using such approaches. Also, how the users' sense of time pressure and the issues around reciprocal exchange can impact on their long-term success and wider adoption.

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1. Introduction

Following the Smarter Choices – Changing the way we travel report (Cairns et al., 2004), the UK Government's 2011 Transport White Paper (Department for Transport, 2011) focused on the potential for effecting travel behaviour through'nudging' individuals towards adopting more sustainable travel practices (Thaler and Sunstein, 2009). This encouraged local authorities to develop interventions, such as personalised travel planning and improved travel information, to encourage the adoption of more sustainable transport modes, currently being realised through initiatives such as the Local Sustainable Transport Fund (Department for Transport, 2011).

Car use, and vehicle use in logistics, is highly ingrained in society's travel practice. Yet, cars are an under-utilised resource with an average occupancy of 1.58 in the UK (Parliament UK, 2010). With higher vehicle occupancy, cars can achieve an environmental performance comparable to some modes of public transport in terms of greenhouse gas (GHG) emissions, especially as the emissions standards improve on modern cars (Atabani et al., 2011). Given cars are so ingrained in travel practice that is habitual and hard to change, there is a case for using them better, that is, working with the habits (Schwanen et al., 2012).

The growth of smartphones and the increasing Internet connectivity of many mobile devices, including vehicles (Speed and Shingleton, 2012), present an emerging opportunity to tackle car dependence. The ubiquity of the smartphone enables people to access information about travel problems, visualise where others might be in their social network, share information and ultimately intercept with others to share vehicle capacity. App developers have recognised this potential and there has been a growth in a variety of apps that wayfind, track users, share travel information and provide real-time public transport information. This enables access to data resources that were once previously the domain of highway managers and devolves power to make transport decisions to individuals at a grassroots level.

In a period of austerity and disinvestment by the public sector in the UK and elsewhere, this transfer of responsibility from governmental agencies to individuals is attractive to policy makers as a cost effective means of addressing the externalities of travel. This has prompted interest in a range of collaborative travel apps by organisations keen to facilitate car share as well as app developers who recognise this potential of ubiquitous media. There are some notable success stories such as Waze, a community-based traffic and navigation app where drivers share real-time traffic information (Waze Mobile, 2014), however, systems such as these

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largely enable people to manage their individual car use better. An evidence base on the effectiveness of collaborative travel apps where space vehicle capacity is shared either to carry people (lift share) or items (for example, shopping) has yet to emerge and preliminary studies show barriers in the UK to user acceptance (Cruickshank et al., 2013). The generalised exchange embedded in collaborative travel apps that requires off-line presence to fulfil tasks is undertheorised and has the potential to develop new forms of economic value (Harvey et al., 2013). This is especially significant in the transport field given that the largest collaboration gains may come from sharing vehicles (Fremstad, 2014).

This paper reports on a project which designed, built and tested a series of purpose built travel collaboration apps across a range of domains: tourism; urban and rural communities; and logistics. The trials identify a number of barriers to user adoption. The aim of the paper is therefore to analyse the fundamental challenges in user adoption of collaborative travel apps.

1.1. Vehicle use practice

Over a period of time the car has become embedded in day-to-day life to such an extent that alternatives to the car are not just unattractive but in many instances unpractical. The car has not only altered travel practice but has fundamentally altered how society operates. New technology has also led to new car based practices. For instance, our shopping practice has seen some interesting changes from the dedicated trip generating out-of-town shopping complexes of the 1980's and 90's to the 'click-and-collect' phenomenon of today, allowing retailers to avoid the potential headaches of failed home deliveries by having the customer come into-store via their own transport to collect purchases. In logistics, the growth in on-line sales has led to increased courier activity with smaller vehicles being used, carrying less-than-full loads and operating to fairly dynamic collection and delivery schedules. With the Consumer Contracts Regulations allowing 14 days for consumer's to change their mind on on-line purchases, reverse logistics in the retail sector has seen many 4th party logistics providers emerging, often contracted householders using their own vehicles, to return goods from consumers to suppliers. While logistics providers utilise optimisation techniques to maximise the efficiency of their vehicles under such circumstances, this is nearly always done in isolation and little collaboration and shared use of vehicles occurs between practitioners (McKinnon, 2009).

The social embeddedness of the car presents a problem to national and local government such that initiatives that successfully reduce car dependence are seen as something of a Holy Grail. While car use has reached a level of saturation in recent years in developed countries like the UK, with travel distances remaining stable since 2002 (Banister, 2011; Metz, 2010), congestion and GHG emissions remain a concern. While the emissions standards of vehicles are improving, these improvements alone will fail to meet governmental targets for reduction of GHG emissions under the Climate Change Act 2008 (Hickman et al., 2010). A surprisingly large share of GHG emissions are attributed to trips of less than 10 miles (40% of the UK domestic transport GHG emissions) (Department for Transport, 2011). Many of these are routine work or leisure trips where there is scope to increase vehicle occupancy through collaboration.

The relative cost and poor success rate at addressing transport problems has led public agencies to seek new strategies. Given the embeddedness of the car in contemporary lifestyles it makes sense to reappraise the way we use cars. To this end, rather than separate people from their cars, it is opportune to consider how spare vehicle capacity might be used more efficiently and collaboratively.

1.2. Smartphones, apps and collaborative travel initiatives

Given car occupancy remains well below vehicle capacity, lift share initiatives are seen as an attractive alternative by policy makers and organisations with sites highly dependant on cars for access. It is a strategy in which users are encouraged to control the context and their choices (Thaler and Sunstein, 2009) and fits the Government agenda of enabling choice (Department for Transport, 2011). There is no need for costly infrastructure, once established the responsibility for organisation is largely transferred to the user and the increasing costs of running a car can make lift sharing an attractive option. Software has been developed to help find lift share partners (for example, carsharedorset.com (Dorset County Council, 2014)) and lift share is seen as a cost effective solution to on-site parking problems, localised congestion and reducing GHG emissions. Travel collaboration is also established in leisure and tourism contexts, particularly lift share to UK music festivals (see, for example, Greener Festival, 2012) where acute traffic management problems arise. These schemes have had some success, but remain one-off activities for most participants. While leisure and tourism is considered less routine than the daily commute, there are distinct spatial and temporal travel patterns at tourism destinations and leisure facilities (Dickinson et al., 2013). Since car occupancy is 1.7 for leisure (visiting friends and relatives and local leisure trips) and 2 for holiday and daytrips (Department for Transport, 2014) there is scope for more lift share in this domain.

There are, however, several reasons why car share has failed to play a more prominent role. People's routines are not as predictable as they might seem and current car share initiatives lack tools to deal with flexibility (Chen et al., 2011). For example, the need to divert off route to collect a child from an out-of-school activity or flexible working practices can pose organisational problems. Also, with an increasingly dispersed workforce, finding a suitable car share partner can be more difficult than anticipated. Car share initiatives have also proved difficult to operationalise in the UK due to the safety concerns of travelling with strangers (Cruikshank et al., 2013).

Collaborative logistics, on the other hand, are led by an organisational imperative to increase efficiency and range from agreements between two small companies to collaborative logistics networks (Lin et al., 2012). The savings in transport costs can be substantial (Lewis et al., 2010; IGD, 2009), reducing empty running vehicle kilometres and vehicle emissions (Lamb, 2012). The challenge lies in coordination and overcoming inherent competition.

The ubiquitous nature of smartphones makes them an ideal travel tool since they can be used on the move to access and share timely and spatially relevant information (Dickinson et al., 2014). The first wave of apps focused on travel information and route planning, however, more recently organisations have developed apps to facilitate more collaborative use of cars through lift share (for example, Avego Driver) or collaborative shopping (for example, Bringbee). These apps enable users to join a social network and make better use of their collective travel resources, thus potentially removing some car trips.

An overview of collaborative travel apps currently available indicates they operate according to different forms of exchange. Commercial economic exchange underpins many travel apps, even though some purport to have a'community of users', for example, Uber. These lie outside the interest of this paper. Others operate according to negotiated exchange, which embeds an element of economic reward (Lampinen et al., 2013), such as Bringbee where users pay a small fee for delivery of items. Belk (2014) refers to this as 'pseudo-sharing'. In comparison, reciprocal exchange involves an often 'continuous act of reciprocity' (Harvey et al., 2013) and typically operates in dyads where there are existing social ties,

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