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Systemic Barriers to Upscaling Car Sharing in the UK.

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Introduction

Several studies suggest that increasing the quality of cars and their durability through design enables important reductions in their environmental impact (Fuhrmann 1979, Nieuwenhuis 1994, Kagawa, Tasaki et al. 2006, Allwood, Cullen 2012, Kagawa, Hubacek et al. 2013). However, significant variations in the lifetime of cars around the world suggest that design may not be the root cause (Oguchi, Fuse 2014) and consumer attitudes towards product lifetimes may also be relevant (Cooper 2004, 2005, Evans and Cooper 2010).

Moreover, some studies suggest that products with a high energy impact during the user stage should be instead designed as use-intensive products (van Nes, Cramer 2006). An investigation by Rodrigues, Cooper et al. (2015b) found that many automotive designers argued that potential environmental benefits from longer lasting cars could be undermined by increased weight, which would increase CO₂ emissions in use. A subsequent study on the design of cars for use-intensity concluded that a systemic approach would be required to develop a favourable market (Rodrigues, Cooper et al. 2015a). Such a market already exists in the form of car sharing, but it is marginal in size when compared to conventional car ownership.

An increase in car sharing offers the potential to reduce the number of cars on the road and decrease congestion, resource consumption and pollution (Steininger, Vogl et al. 1996, Meijkamp 1998, Williams 2007, Ceschin, Vezzoli 2010, Firmkorn, Müller 2011). In theory, it may significantly reduce the number of cars needed for current levels of mobility. Furthermore, there may be economic advantages for users of car sharing schemes (Fellows, Pitfield 2000, Katzev 2003), especially those driving

relatively few miles each year. According to Carplus (2016), drivers traveling less than 6,000 miles per year - who account for 38% of all UK drivers (RAC 2011) - may save up to £3,500 per year and the economic benefit of joining a car sharing scheme (such as a car club in an urban area) ranges from £2.80 to £5.70 for every pound spent. Compared with a strategy of longer lasting cars, the rate of replacement may be faster, enabling fuel-saving benefits from technological improvements to be gained more quickly (Vezzoli, Manzini 2008). The upscaling of car sharing in the UK may need to be systemic and gradual, however, and may require collaboration between different stakeholders to capture public interest and generate growth.

Scope of Research

The aim of this paper, based upon a larger research study covering car longevity and use-intensive cars, is to explore systemic approaches to intensive product usage. Focusing on the UK's car sharing sector, it seeks to understand the barriers to a sustainable approach to car use. This form of travel is still marginal at best: according to Carplus, the UK umbrella organisation for car sharing, there are just 207,000 registered car club members and 3,600 cars (Carplus 2015a, 2015b, 2015c), compared to roughly 30 million cars registered in the UK (Department for Transport 2016).

Car sharing is assumed in the paper to include car clubs, car hire and lift share (where car pools can be included). The service can be user-oriented (e.g. car clubs) or result oriented (e.g. lift sharing) (Williams 2007), and can be enhanced by integration with public transport, leading to improvements in transport system capacity (Steininger, Vogl et al. 1996). However, for car sharing to become more widespread, a policy framework that stimulates its introduction and diffusion needs to be in place so that companies are encouraged to adapt their business model as necessary (Ceschin, Vezzoli 2010).

This research focuses on three modes of car sharing;

- Car clubs, which operate along similar lines to traditional car hire firms, but with a more limited choice of cars. Users pay a membership fee, usually annual, plus 'as-you-drive' rates, counted in minutes or hours. Alternatively, cars supplied by a club or private owners are rented out to consumers for a set period (hours or days). Car clubs are usually open to the public and organisations who wish to use their service either occasionally or as a car pooling system, and typically provided by registered companies or local community organisations.
- Car hire, which allows people to use vehicles from a pool of available cars, normally with different price brackets and for a set number of days. On a daily basis, hire rates are paid and the car normally is returned to a pick-up station. No membership is required.
- Lift share, which is a formal scheme requiring a membership. Private owners provide the cars and advertise a journey between two cities and its price. Members sign up for that journey and share the car for a lift. The owner drives the car. Lift share somewhat blurs the boundaries between informal and formal car sharing because it only requires an online platform for advertising journeys. Lift share, like car clubs, is open to the wider public and to organisations wishing to sign up.

Car clubs and lift share have, in some instances, been part of public transport schemes or trials, offering users end-to-end multimodal transport. Over the past decade, multinational car hire organisations have taken over several car clubs (Conway 2010). Car manufacturers have also entered the market (Shaheen, Cohen 2013), being on one hand suppliers to car clubs and car hire but also competing with the former, potentially creating complex relationships.

Methodology

This paper analyses ten in-depth semi-structured interviews with a broad range of car sharing experts. Interviewees ranged from car club and car hire organisation's senior managers to local transport authority experts in shared mobility and senior experts from Carplus. For confidentiality reasons they are identified as CS1, CS2, etc. (details in Annex 1). Interviews were predominantly conducted face to face, or by phone or video-call, and lasted between 40 minutes and one and a half hours. They were conducted by asking open questions (Robson 2002). Analysis was performed by clustering answers against codes chosen from car sharing literature (e.g. (Steininger, Vogl et al. 1996, Pretenthaler, Steininger 1999, Katzev 2003, Fellows, Pitfield 2000, Loose, Mohr et al. 2006, Williams 2007, Schot, Geels 2008, Firnkorn, Müller 2011, Bardhi, Eckhardt 2012, Shaheen, Cohen 2013, Ciari, Schuessler et al. 2013, Baptista, Melo et al. 2014, Steininger, Bachner 2014) and interviews (Rodrigues, Cooper et al. 2015 a, b).

The interviews explored the main barriers to the upscaling of car sharing in the UK. Data were subsequently compared with data on user-intensive cars from a previous set of interviews with car design and manufacturing experts (the focus of this paper being the systemic nature of car sharing rather than product design) (Rodrigues, Cooper et al. 2015a, b). The interviews also addressed the upscaling of user-intensive cars, largely based upon Schot and Geels' (2008) strategies of niche management and regime shift.

Findings

Social Barriers

Some interviewees suggested that car sharing might not be appropriate for everyone (CS1, CS9). This is consistent with the annual survey of Carplus (Carplus 2015a, 2015b, 2015c). The latter has used Mosaic social definitions to show that the majority of car sharing users are younger, urban, highly educated people (19%), older singles living in leafy inner suburbs (14%), wealthy households in accessible suburban areas (11%) and inhabitants of the university fringe (10%). According to one interviewee, people with higher levels of formal education seem more open to 'lifestyle services' such as car sharing. Some of them are already users of public transport, seeing car sharing as an option when other modes of transport are not available (CS1). Another argued that car sharing users have a more rational and open approach towards personal transport (CS9).

Transition management theory suggests that the development of 'niches' and 'experiments' are crucial to changing dominant practices in the prevailing system, or 'regime' (Schot and Geels (2008). However, car sharing schemes may not be financially viable, particularly in locations with sparse populations, and public sector intervention may be required (CS6). Several publicly funded car sharing schemes are trials that try to stimulate behaviour change. One interviewee suggested lifestyle marketing, rather than confronting car owners with the true costs of motoring, as an approach to car sharing engagement. This interviewee estimated the potential market for car sharing in the UK as roughly three million people and argued that social groups that have engaged in car sharing for many years should be the target (CS1).

Several interviewees considered that individuals do not fully understand the true cost of motoring, especially market depreciation, the biggest indirect cost of motoring (CS1, CS2, CS6 and CS9). The cost of depreciation is typically up to 50% after three years, the normal warranty duration, and is usually greater than the cost of fuel or insurance (Money Advice Service n/d, Rogers, Rodrigues 2015).

When faced with the dilemma of whether to purchase a car, consumers seem to think about exceptional uses, such as an occasional holiday (CS9). Nonetheless, a key driver of behaviour change is cost of motoring, including expenses such as parking permits and congestion charges, and this could encourage an uptake of car sharing (CS2, CS4). This was argued by Metz (2012), while Katzev (2003) found that consumer awareness of travel costs increases the chances of car sharing. By contrast, one interviewee suggested that in changing behaviour towards car sharing, financial benefit would not be the most important factor (CS1).

People are becoming more comfortable with sharing resources, including cars (CS7) and those with higher formal education are less assertive about the need to own a car and more open to the concept of car sharing. Even so, many people seem to be clinging onto car ownership, one of the key barriers towards car sharing (CS6).

The opportunities to upscale car sharing as part of multi-modal transport systems seem to lie with the generation born after 1980 (CS1, CS2, CS6, CS8), concurring with findings from previous interviews (Rodrigues, Cooper et al. 2015a). This generation does not seem to be so aspirational regarding private transport (Valentine, Powers 2013).

Awareness

All interviewees pointed out a general lack of awareness among consumers, businesses and public bodies as the main barrier to upscaling car sharing.

Consumer awareness of car sharing is considered very low and many either lack knowledge about or misunderstand the concept. Even those who have heard about it cannot describe it correctly (CS9). Information increases awareness (Ceschin and Vezolli 2010), but London's transport authority and boroughs try not to have too much signage in order to avoid street 'clutter' (CS3). Some car sharing organisations would like integration with public transport (CS3, CS6). One interviewee said that integration should be intuitive, through collaborative programmes where relevant (CS7). However,

some transport authorities argue that they are only responsible for franchising fixed routes in public transport, and that car sharing does not fit their remit (CS3). An important barrier is failure to see car sharing vehicles as public transport (CS10), which would blur the boundaries between private and public assets (Rodrigues, Cooper et al. 2015a).

Lack of business awareness can be divided into two forms. First, car sharing organisations acquired by larger multinationals feel that their new owners often fail to understand the business model and see it as disruptive. Second, businesses generally do not understand what car sharing entails and how a shift towards it can reduce costs of 'grey fleets' (i.e. vehicles that do not belong to a company but are used for business travel and uncontrolled travel allowances).

Some car sharing organisations see a role in raising awareness by embedding themselves within a parent multinational company's operating model and influencing it from inside; they work alongside a traditional car rental business model by filling the gap in 'short-term, by-the-hour' car rental (CS7). If integrated with public transport, this can become a seamless mobility offer. These car sharing organisations seem to be facing a dilemma; the capital invested in their operations by multinationals is welcome, leveraging access to credit and vehicles. However, they feel that the parent companies do not totally understand the business model and may see car clubs as a threat; this limits opportunities for upscaling (CS7). If so, after the consolidation period the use of policy to stimulate market development is vital if car clubs are to achieve further growth.

Variables such as the availability of parking spaces, convenience and value for money apply to smaller businesses and government bodies as much as to consumers. In addition, the former may benefit from a reduction in grey fleet costs. Salford Council's staff travel allowances allow multiple modes of transport, including car clubs, radically cutting the cost of staff transportation (CS4). Crown Commercial Services' vehicle hire tender process allows car sharing operators to apply (CS10), while Rideshare, one of the main UK operators of lift sharing, has a partnership with Stagecoach to provide better transport options in large industrial parks (CS8).

Policy

Interviewees argue that central government and local authorities should be promoting car sharing, and that this might stimulate a shift towards public transport (CS2, CS7), concurring with Ceschin and Vezzoli (2010). The absence of targets for car sharing, for example, was seen as a major barrier for expansion (CS2, CS8, CS9).

Council policies could raise barriers to driving in city centres (CS9), as in the case of central London. Politicians were considered unaware or confused about the concept of car sharing (CS2, CS7, CS8). In London, car share operators have to negotiate parking tariffs individually with the 33 London boroughs (CS7). Some boroughs do not offer them discounts or free parking, despite recognising their role in alleviating traffic congestion, reflecting boroughs' different political priorities or need to protect parking permit revenues.

Some city regions and most rural areas rely on public funding to stimulate demand because the market is still at its inception and there is not enough scale to run profitable operations (CS4, CS9). In some areas, environmental concern is used as an argument for the creation of schemes (Cumbria County Council, Lake District National Park 2011). One interviewee argued that the Department for Transport is not focusing on sustainable transport such as car share, allocating £100m to an autonomous vehicle project and only £1.5m to support 23 car share schemes (CS2). Such lack of investment is undermining the uptake of car sharing (CS6, CS9). By contrast, the *Autolib* scheme in Paris, like Hamburg's *Switchh*, is integrated with the local public transport system (CS3, CS6). In Greater Manchester, over 1,000 car club members and two car clubs, along with the local transport authority, Transport for Greater Manchester (TfGM), are currently working on a tender to build a car share electric vehicle network, at no cost to TfGM. It would aim to create a single car sharing supplier framework that any borough could access and adapt to their needs (CS4).

The different approaches of London and Manchester reflect diverse views on car sharing. Due to the size and density of its population, London is standing back from policies to incentivise car sharing, whereas Manchester is actively looking for a business model that will enable the sector to grow and fill the region's gaps in public transport.

One interviewee proposed that growth in car sharing could be aided by a car scrappage scheme, whereby for any returned car there would be an incentive to join a car sharing scheme (CS9).

The automotive industry is finding that the relationship of younger people with cars is changing, particularly in large cities, and has been setting up car sharing schemes. However, part of the manufacturers' strategy is to make users accustomed to their brands so that in later life, when people move from away from city centres and buy a private vehicle, they will choose their brand (CS1, CS9).

Sector Investment

As noted above, over the past decade multinational car hire companies have purchased some car club operators. The sector also includes car pool companies that have a peer-to-peer approach, where owners offer either their car without a driver (Easy Car Club) or seats in their car on a specific journey (Liftshare). Companies running such schemes do not own a fleet of cars; their role is to manage the members and bookings via a website or smartphone app. However, some car clubs, such as Zipcar, also offer car pooling schemes to businesses and public sector organisations in order to reduce grey fleet costs.

Acquisition by multinationals has had different outcomes for car clubs. City Car Club and Zipcar have been incorporated into the multinational's business structures, whilst others, such as E-Car Club, maintain some degree of independence. Car hire operations acquire car sharing organisations as a means to achieve portfolio expansion, enabling them to offer shorter by-the-hour rentals alongside traditional services such as car hire and long-term rental in the form of fleet service (CS9).

Some interviewees indicated that car sharing is not yet profitable. The multinationals are aware of the risk in terms of fleet costs, usage, depreciation, parking and congestion charges, and tracking equipment. Yet capital investment by large multinational firms could offset the need to use public funding to support car sharing (CS7). Such acquisitions could bring about the necessary funding to upscale operations in the UK. Already multinationals have brought scale to some car sharing organisations, providing leeway when negotiating car prices and insurance contracts (CS7, CS9). For example, one firm purchases over 60,000 cars per year in the UK alone (CS7).

Different levels of integration (i.e. fully owned or majority shareholding) may lead to different approaches being adopted in contract negotiations for new cars. The operational flexibility car sharing organisations used to have may be hampered by the rigidity of multinational organisation. Contract negotiations may be through the multinational's own procurement. Alternatively, car clubs may be allowed to operate more or less autonomously, and negotiate different rates compared to hire cars (CS7, CS9).

Multinationals that acquire car clubs have also found that when dealing with car damage, different types of insurance policies are required. In car hire, vehicles are only insured whilst being used by customers, whereas car club vehicles, which are either parked in bays or public car parks, have to be constantly insured (CS6). In car hire any damage is recovered when checking out, whereas in car clubs this process is harder because they rely on members' goodwill to inform them of any damage. Damage costs tend to be higher when compared with rental companies; users seem to drive car club vehicles slightly more aggressively than their own vehicles (CS7).

Sector Asset and Usage

The intensive use of any form of car share has the potential to reduce new car demand. If a car share vehicle was used several times a day such that its mileage was 20,000 miles per year, it would reach 150,000 miles, a mileage that cars are typically designed to withstand (Rodrigues, Cooper et al. 2015b), after around 6.5 years. As cars have a 'service life' of around 13 years in the UK, on average, this would allow for quicker replacement by newer, more fuel efficient models (Vezzoli, Manzini 2008). However, if this level of use intensity is not reached or if car share vehicles are replaced prior to the end of their useful lives, the environmental benefits will not be fully realised. Car club vehicles are typically used for 15,000 miles per year and would have to be used for ten years to be utilised for 150,000 miles. Currently, though, they are normally only kept for the duration of the manufacturer's warranty period in order to keep maintenance costs relatively low and predictable, especially in the case of electric vehicles (CS7).

Car club vehicles owned by independent companies have a 'replacement life' of 3 years and those that are part of multinationals, around 2 years (CS5, CS7, CS9). By comparison, car hire vehicles typically run high annual mileages, around 17,500 miles (CS9, CS7), and have a replacement life of between 6 and 12 months (CS6, CS7). They are subject to relatively early replacement due to the potential for new models to attract customers and reduce maintenance costs. On the other hand, the cost of installing after-market telematics devices to track car club vehicles decreases the investment return and could prolong the time they are kept in service (CS7). No comparable data is available for community car club and lift share vehicles.

Acquisition of car clubs by multinationals may lead to a reduction in replacement lifetimes, although they have not fallen to the levels in car hire (CS7). However, because their annual mileage is lower than car hire, and the business risks for the multinationals are still high, car club vehicles are kept in use for longer. This situation may reverse once car clubs are fully consolidated into the multinational car hire companies and customers are offered a single service package.

Contrary to what might be expected, car club vehicles and hire cars are not being used intensively, with companies preferring early replacement to prolonged service lives. Once the purchase contract ends, cars are re-sold. By buying in such large quantities, car hire multinationals and their car clubs contribute to high volumes of car production (OICA 2015) while also flooding the second-hand car market, keeping prices relatively low and incentivising ownership. By promoting car sharing they could, in theory, contribute to environmental sustainability but at present the small amount of car sharing does not have a substantial environmental impact.

Conclusions

Car sharing remains a marginal activity in the UK, used by only a small proportion of the population, despite potential benefits from reduced congestion, pollution, and energy and material consumption. Low public awareness and disparate, often indifferent, attitudes towards car sharing by policy-makers seem to be hampering a large uptake.

In principle, car sharing is especially effective in large conurbations where a comprehensive public transport offer is available, and in remote areas can bridge gaps in public transport provision, although a lower population density creates a greater commercial challenge. The car sharing sector favours greater integration with a public transport offer, which could contribute to raising public awareness .

The potential of car sharing to reduce the negative impacts of excessive car production and usage is high. A lower level of production could lead to increased prices for new cars and, in theory, this could create demand for longer service lifetimes. This, in turn, may slow down the rate of supply of used vehicles, raise prices in the second hand market and thereby reduce the rate of car depreciation.

Finally, if levels of engagement in car sharing become sufficiently high to reduce car production significantly, production costs would have to be distributed among fewer vehicles. On the negative side, this would increase the cost of acquiring vehicles to car sharing organisations, who would have to keep them longer in service (in order to recuperate the cost of purchase), increase the annual mileage per vehicle (raising the ratio of users per car), or hope that fewer cars in the second hand market would increase used vehicle prices and deter people from ownership.

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Annexe

Appendix 1: List of Interviewees

CS1	Car sharing umbrella organisation	Senior Management
CS2	Car sharing umbrella organisation	Senior Management
CS3	Transport authority	Policy and Planning Analyst
CS4	Transport authority	Advanced Solutions Officer
CS5	Large Car club	Senior Locations Manager
CS6	Multinational car hire organisation	Business Development Manager
CS7	Small car club	Managing Director
CS8	Lift-sharing organisation	Chief Executive Officer
CS9	Large Car club	General Manager
CS10	Large Car club	Head of Locations