

Intelligent Transport Solutions for Social Inclusion (ITSSI): Project Report

Dr Frauke Behrendt
Principal Lecturer in Media Studies, University of Brighton

Dr Lesley Murray
Associate Professor in Social Science, University of Brighton

Andrew Hancox
Freelance Chief Technical Officer, Southern Sky Technologies, Brighton

Dr Maria Sourbati
Senior Lecturer in Media Studies, University of Brighton

Prof Jörg Huber
Professor of Health Sciences, University of Brighton

With Contributions by
Angela Hughes, Martina Gregory, Becky Farmer



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Executive Summary

The project “Intelligent Transport Solutions for Social Inclusion” (ITSSI) explored the opportunities of intelligent technologies, Information and Communication Technologies (ICT) and data for community transport services in Brighton and Hove, focussing on older, socially isolated users and social inclusion.

Key Findings

- Community transport provision in Brighton and Hove is diverse and fragmented; centralisation is not currently favoured by commissioners
- Providers of community transport (often one of several services they offer and not necessarily their core business) would benefit from coordination with each other
- New technologies (Information Communication Technologies (ICT), smart, intelligent, and data solutions) could support this coordination and synergies could be achieved
- The community transport data models helps understand complexity and opportunities
- The case study analysis (UK, EU and global) shows best practice, challenges and opportunities
- In terms of end-user communication, an inclusive approach to community transport needs to cover both ‘traditional’ (print, phone) and digital media (web, mobile), plus follow accessibility guidelines
- The sharing of data between health services and community transport services would require strict protocols and ethical standards but could lead to benefits for end users and commissioning bodies, and might also create opportunities for business innovation
- The digital and data industry (especially start ups and SMEs) are very interested in this area and see the potential for innovation and business development
- Business-facing funding opportunities (e.g. Innovate UK) for supporting intelligent/data approaches to community transport are available

Recommendations

- Hold Knowledge Exchange and Training events for Community transport providers as this would benefit IT skills, peer learning, cooperation and synergies
- Build an extension for an existing open-source ride/car sharing platform that serves community-transport needs (e.g. accessibility of vehicles, training and checks of drivers) as this would be a way of facilitating coordination and synergies

- Develop the community transport data models into a more formal model
- Develop detailed guidelines and ethical protocols for data collection, sharing and analysis around community transport (and health and social care) as this would benefit commissioning processes and could aid business innovation at the intersection of public health and intelligent transport
- Develop a model for quantifying the benefits of community transport in Brighton and Hove as this would be important for end users, commissioning bodies and community transport providers
- Involve end users in all stages of planning and designing software and data solutions
- Ensure accessibility guidelines as followed for both 'traditional' (print, phone) and digital media (web, mobile) for inclusive end-user engagement
- Consider a method for collecting data about people that would benefit from community transport to reduce isolation and/or loneliness, e.g. drawing on existing services and activities (e.g. door knocking, befriending services, health data), as this data is not currently readily available
- Hold further events for knowledge exchange and consortium building for community transport providers and digital/data industries (as requested by those attending the first event) to ensure business-facing funding opportunities (e.g. Innovate UK) can be leveraged
- Use Total Transport Board funding or other relevant funding to work on one or several of these recommendations



ITSSI event 'Intelligent technologies for community-based transport solutions' with the Digital/Data industry, community transport providers, Brighton & Hove City Council, Clinical Commissioning Group and University Researchers, March 2017. Source: Patricia Prieto-Blanco

Introduction

The “Intelligent Transport Solutions for Social Inclusion” (ITSSI) project explored the opportunities of intelligent transport for social inclusion in Brighton and Hove, specifically how the combination of Information and Communication Technologies (ICT) and community transport solutions could improve the lives of socially isolated groups and individuals, with a focus on older adults.

Considerations around the use of data are becoming increasingly important for local authorities. For example, the report ‘Wise council: Insights from the cutting edge of data-driven local government’ analyses examples of “the specific ways in which data can benefit people and communities, and how councils can make this happen” (Symons 2016).

A newly published academic review of community transport (CT) in Scotland “clearly demonstrated that CT offers a wide range of economic, social and health benefits”, including “promoting accessibility and social inclusion, social interaction, [and] independence” and therefore has “the potential to contribute to a cross-section of different policy goals” (Nelson et al. 2017, p12). The findings analysed in the review also “support the view that CT offers substantial cost savings for local authorities” (Nelson et al. 2017, p12). A report published by the charity ECT also argues that “an investment in community transport means savings elsewhere” as its support of wellbeing and independent living would reduce health costs (ECT Charity 2016, p6).

The ECT report provides an alternative argument with regards to the cost of community transport, drawing on “the costs of loneliness and isolation to services in the UK and at a more local level, as well as the reduction in loneliness and isolation that community transport can achieve” to “estimate the benefits to the state achievable through community transport to be between £0.4bn and £1.1bn per year” (ECT Charity 2016, p30). While these figure need to be regarded with caution, the ECT’s framework for quantifying the benefits of community transport is an example of considering how much community transport saves, rather than focussing on how much it costs.

Data collection, analysis and sharing around the multiple aspects of community transport are therefore of key importance for evidencing its benefits to commissioners, providers and end users. Against the backdrop of the growing importance of data in most aspects of our societies, including local authorities and community transport, many end users of community transport do not have digital/online skills and/or access – making this an especially interesting and challenging area for digital transformation.

The “Intelligent Transport Solutions for Social Inclusion” (ITSSI) project’s understanding of community transport includes a wide range of transport services. This includes very locally arranged volunteer car schemes and informal minibus use, section 19 providers (not for profit passenger transport that is not available to the general public), public transport services, voluntary sector providers and Brighton and Hove City Council. Accessible transport, social deprivation, geographical isolation, and community cohesion are identified as four key characteristics of community transport in a recent report (ECT Charity 2016, p8).

ITSSI was interdisciplinary in terms of the academic team, but also in terms of the areas/departments involved from the local authority/CCG, while engaging with a very diverse and fragmented landscape of providers of community transport services in Brighton and Hove – combined with the fast pace of change in the digital/data sector. Moving from these levels of complexity and interdisciplinary to very specific recommendations has been a key challenge of the project.

The ITSSI project operated in a fast changing environment, in terms of changes to project aims and stakeholders, as well as funding and organisational context. The project initiated a dialogue where very little communication had taken place in the past, hopefully providing a starting point for more conversations and collaboration in the future.

The project was explored through five work packages: WP1 focussed on existing community transport services and resources, WP2 engaged with community transport data, WP3 reviewed and analysed intelligent transport for social inclusion from around the globe, WP4 explored case studies of social isolation and WP5 delivered the event ‘Intelligent technologies for community-based transport solutions’.

The “Intelligent Transport Solutions for Social Inclusion” project ran from June 2016 to March 2017 and was commissioned by Brighton and Hove City Council as one of the projects funded by the regional board “South East Area Transport Solutions” (S.E.A.T.S.) that in turn is funded through the Department for Transport’s UK wide “Total Transport Pilot Fund”.

For Brighton and Hove City Council, the key stakeholder was Alistair Hill (Public Health Consultant) with Annie Alexander (Public Health Programme Manager) and Judith Cooper (Commissioning Manager Adult Social Care) as further stakeholders. Jane Lodge (Head of Engagement) was the key Stakeholder for the Brighton and Hove Clinical Commissioning Group (CCG).

The research team at the University of Brighton was lead by Dr Frauke Behrendt (Principal Lecturer in Media Studies) and further comprised Professor Lesley Murray (Associate Professor in Social Science), Andrew Hancox (Freelance Chief Technical Officer, Southern Sky Technologies), Dr Maria Sourbati (Senior Lecturer in Media Studies), Professor Jörg Huber (Professor of Health Sciences), plus student Research Assistants Becky Farmer, Angela Hughes and Martina Gregory.

The reports from the five work packages form the heart of this ITTSI report, followed by a conclusion. Key findings and recommendations are provided in the executive summary.

WP 1: Existing Transport Services and Resources

Dr Lesley Murray
Associate Professor in Social Science, University of Brighton

With Contributions by
Becky Farmer

Introduction

The aim of this workpackage was to carry out work in Brighton and Hove to understand the existing informal community transport initiatives that exist in the city- e.g. very locally arranged volunteer care schemes and informal minibuses, section 19 providers (not for profit passenger transport that is not available to the general public), public transport services, voluntary car schemes, taxi operators, voluntary sector providers and Brighton and Hove City Council.

This mapping stage of the research is limited in that it predominantly covers services under the broad umbrella of adult social care and does not provide a full picture of community transport as not all organisations responded to our questionnaire.

Method

A questionnaire survey was designed using Bristol Online Surveys (BOS). Following ethical approval from the University of Brighton Tier 1 Ethics Committee (School of Applied Social Science), the questionnaire link was sent by email to twenty-two organisations identified as potential providers of Community transport in Brighton and Hove (See figure 1).

<i>Age UK Brighton & Hove</i>	<i>Countryliner 40x hospital bus</i>
<i>Alzheimers Society</i>	<i>Crossroads Care</i>
<i>Bike Train</i>	<i>Federation of Disabled People/Possability People</i>
<i>Blind Veterans Brighton</i>	<i>Grace Eyre Foundation</i>
<i>Bluebird Society for the Disabled</i>	<i>Grow</i>
<i>Brighton and Hove Bus Services</i>	<i>Helping Hands</i>
<i>Brighton Lions Club</i>	<i>Lifelines</i>
<i>British Red Cross</i>	<i>Shopmobility</i>
<i>Carers Centre</i>	<i>St John's Ambulance</i>
<i>City Synergy</i>	<i>The Bevy</i>
<i>Community Transport (Brighton, Hove & Area) Ltd.</i>	<i>The Big Lemon</i>

Figure 1: List of potential community transport providers that were contacted to fill in the survey

All responses were saved securely via the BOS web page before the data was exported into an Excel spreadsheet. Seven responses (30 per cent response rate) have been received from the following organisations: *Brighton Lions Club*; *Grace Eyre: Active Lives*; *Brighton and Hove Shopmobility* (part of Possability People); *Community Transport (Brighton, Hove and Area) Ltd*; *The Grow Project*; *Bluebird Society for the Disabled*; *The Big Lemon CIC*.

Those organisations that did not respond to the questionnaire were telephoned and asked to provide a short summary of the organisation's activities – a further seven organisations responded in this way as follows: *British Red Cross*; *St John's Ambulance*; *Alzheimer's Society*; *The Hop 50+*; *Age UK Brighton & Hove*; *Blind Veterans*; and *The Carers Centre*.

The following organisations did not respond: *Bike Train*, *Helping Hands*, *Lifelines*, *City Synergy*, *Crossroads Care*.

Community transport in Brighton and Hove

Community transport in the city is provided by a range of organisations of varying scales. *Community Transport Ltd (Brighton, Hove and Area) Ltd*, a not-for-profit organisation, is the largest provider of services specifically aimed at community provision, although *The Big Lemon CIC* provides a significant level of community-based services, which they were unable to quantify (see figure 2). In year ending 31 March 2016, *Community Transport (Brighton, Hove and Area) Ltd* have had 2,444 individual vehicle hirings as well as over 20,000 Easylink¹ passenger journeys per year. In addition, they carry out contracted journeys for home-to-school transport and to Adult Social Care day centres. The organisation provided transport for 93 local not-for-profit organisations during 2015/16 and they are about to start a new service to GP surgeries. At the other end of the scale, *The Grow Project* have one minibus that is available for private hire at a reduced rate for community organisations. Having experienced difficulty in hiring a minibus at a reasonable cost on an ad hoc basis, they 'hoped that lending [theirs] out would help other small organisations'.

There is some level of co-ordination between the providers and other organisations in Brighton and Hove. In particular, *Grace Eyre* have partnerships with *Amaze*, *Autism Sussex*, *Sports4All*, *Brighton and Hove Buses*. *Community Transport (Brighton, Hove and Area) Ltd* are 'active members of the *Community Transport Association* and the *East Sussex Community Transport Operators Forum*. They also have a 'co-operative working arrangement with the main public

¹ Easylink is a door to door minibus service available to those unable to access regular bus services. There are special services available for shopping, cinema trips and eating-out trips.

transport and taxi providers in the area.’ *The Big Lemon* CIC ‘communicate and occasionally cover and seek cover from other local coach operators’.

Aims and focus of organisations

Some services are aimed at particular gaps in provision, mainly in relation to social need. *Community Transport (Brighton, Hove and Area) Ltd* aim to:

‘provide safe, affordable and accessible transport that would not otherwise be available to vulnerable and isolated groups and individuals. We meet many of the identified needs, but there are still needs that remain unmet.’

On the other hand, *The Big Lemon’s* primary focus is on sustainability. The organisation:

‘put[s] sustainability and reducing our carbon footprint at the heart of our values. We won an award for our recycling efforts from Brighton Paper Round. Whenever we can reduce our impact we do including using second hand furniture in our office and using eco-friendly stationery and cleaning products’

They aim to ‘provide a sustainable service using locally sourced biofuel and soon [they] will run [their] vehicles on solar energy produced on-site’. *Grace Eyre* and *Community Transport (Brighton, Hove and Area) Ltd* also seek to be sustainable through measures such as lighter vehicles, and alternative fuel; and vehicle acquisition policy and compliance with good practice respectively.

Four of the seven organisations: *Brighton and Hove Shopmobility*, *Community Transport (Brighton, Hove and Area) Ltd.*, *The Big Lemon CIC* and the *Bluebird Society for the Disabled*, have mission statements that are focused on the provision of transport. The other organisations: *Grace Eyre: Active Lives*, *British Lions Club* and *The Grow Project* have broader aims in: ‘helping people achieve their dreams and wishes’; ‘to apply its income for any purpose that is charitable’; and ‘provid[ing] nature connection courses and days out to improve wellbeing’ respectively.

Service	Aims and Focus
<i>Age UK Brighton & Hove</i>	Older people (defined at 50+)
<i>Alzheimers Society</i>	People with Alzheimers
<i>Blind Veterans</i>	Blind and visually impaired veterans. Transport for weekend respite care and take clients to activities
<i>Bluebird Society for the Disabled</i>	Older People, People with mobility impairment, blind and partially sighted people.
<i>Brighton and Hove Shopmobility</i>	Older People and People with mobility impairment

<i>Brighton Lions Club</i>	People with mobility impairment, blind and partially sighted people
<i>British Red Cross</i> •	People with medical needs, People with mobility impairment. Personalised support for adults of all ages, but primarily focuses on older people and those living with disability
<i>Carers Centre</i>	Young and adult carers
<i>Community Transport (Brighton, Hove and Area) Ltd.</i>	Children (Aged 5-16), Older People, People with mobility impairment, Blind and partially sighted people, Deaf and hearing impaired people, People with learning disabilities, People with experiences of poor mental health, People with hidden disabilities, Families with children, Families without children
<i>Grace Eyre: Active Lives</i>	People (Aged 18+) with learning disabilities
<i>St John's Ambulance</i> •	Non-emergency patient transport service – range of services from planned hospital appointments to a move into a new property. One service (one vehicle) specifically for homeless people
<i>The Bevy</i>	Various groups affiliated to the community pub
<i>The Big Lemon CIC</i>	Children, Older People, People with learning disabilities, People with experiences of poor mental health, People with hidden disabilities, Families with children, Families without children ('We run services for all types of people which have in the past included community groups focused on older people and young people with learning difficulties. We don't currently have vehicles equipped for people with mobility issues. We regularly run private hires for a few different nurseries and schools in the local area'.)
<i>The Grow Project</i>	All client groups as long as they are being driven by a community group that does not charge them for the service
<i>The Hop 50+</i>	People aged 50+

Figure 2: Overview of the aims and focus of services

Two of the organisations provide services to specific activities and destinations. *Brighton Lions Club* provide transport for people who had strokes and their carers to a monthly social/therapy meeting, and also provide transport for locally based people with visual impairment to their monthly meetings of the *East Sussex Association for the Blind and Partially Sighted*. *Grace Eyre* provide transport for adults with learning disabilities from home to service and also to community activities during the day. In contrast, *Shopmobility* facilitates transport (providing equipment rather than transport) to mainly non-regular activities – the hire of scooters or wheelchairs on an ad hoc basis to local customers for appointments or shopping. Most hirers come from out of the area and are day-trippers or holiday makers. *Community Transport (Brighton, Hove and Area) Ltd.*, *Bluebird Society for the Disabled* and *The Big Lemon CIC* provide transport for both regular and non-regular activities. *St Johns Ambulance* run a local client transport service for homeless people – just one vehicle that operates from the seafront – *Brighton*

Homeless Service Project. The Bevy has a minibus, which is contracted to Community Transport (Brighton, Hove and Area) Ltd and is used ‘amongst other things for our Friday Friends Seniors Club, to go to Brighton home matches and to pick up our student sponsored rugby team’.

There are also a number of buddy schemes up and running Brighton and Hove (see figure 3) including: HealthLink, Impetus Neighbourhood Care Scheme, Grace Eyre. Other relevant schemes include: Citywide Connect (run by Possability People) and Connect and Share.

Schemes	Brief Description
Grace Eyre	About people helping each other to travel safely. Individuals with learning disabilities who use the Grace Eyre services can be matched with Travel Buddies who provide them with the skills and confidence to travel safely across the City and even beyond (whether it be to meet friends, visit Grace Eyre, or learn a new journey) http://www.grace-eyre.org/what_we_do/promoting_independence/travel_buddy/
HealthLink	HealthLink scheme to accompany older people to GP surgeries, hospital appointments, dentists, health screenings and other important routine health appointments. HealthLink isn't a transport scheme but can make getting to appointments much less stressful. http://lifelinesbrightonhove.org.uk/home/healthlink/
Impetus Neighbourhood Care Scheme	Accept referrals from individuals who meet the following eligibility criteria <ul style="list-style-type: none"> • people aged over 60 • adults with a physical or sensory disability or chronic condition • carers who live in our neighbourhoods Referrals are also accepted from their families, their friends, voluntary organisations, and social and health care agencies. The NCS is a befriending scheme. It is committed to providing long-term practical and social support to people and helps individuals by finding local volunteers to accompany them out (to the shops, to the doctors, for pleasure). http://www.bh-impetus.org/projects/neighbourhood-care-scheme
Connect and Share	The site is a space where organisations can advertise resources they can share, share resources such as spare meeting rooms or transport, or offers of speakers at others' team meetings or work shadowing. So the Possability People team has started the following scheme. https://connectandshare.sharetribe.com
Citywide Connect	The scheme is co-ordinated by Possability People. The work is overseen by a Partnership Board which meets quarterly. Brings together health and social care providers, voluntary and community sector activity providers (including faith groups) and private and independent providers, such as care homes and care agencies. -Gives the groups an opportunity to develop new and innovative ways of working together A key part of Citywide Connects' work is to improve partnership and working via locality hubs. There are hubs in the east, north central and west of the city. They organise hub meetings twice a year where local organisations exchange knowledge, share good practice and identify gaps and solutions. http://www.possabilitypeople.org.uk/how-we-can-help/business-services/citywide-connect/

Figure 3: Overview of Travel Buddy Schemes and Other Relevant Schemes

Scale of Provision

The following figure gives an overview of the scale of provision of community transport services based on the size of the organization, the number of services offered and the number of trips. The method for obtaining this information is described earlier in this chapter.

Service	Transport modes/fleet	Number of drivers	Area covered	Frequency of service	No. Journeys per year approx.	No. of clients
Age UK Brighton	One	Not known	Brighton and Hove	Ad hoc	Not known	Not known
Alzheimer's Society	None	None	NA	NA	Not known	Not known
Blind Veterans	Two buses, nine cars	Not known	Brighton and Hove	Ad hoc	Not known	Not known
Bluebird Society for the Disabled	Two minibuses and two 4-seat plus one wheelchair cars	5	Mainly Hove and Portslade	Ad hoc	225	85
Brighton and Hove Shopmobility	Mobility scooters	N/A	Brighton and Hove	Daily		1181
Brighton Lions Club	One car	5	Brighton and Hove	Monthly	24	4
British Red Cross	Not known	Not known*	UK	Daily	Many	Many
Carers Centre	None	None		NA	Not known	Not known
Community Transport (Brighton, Hove & Area) Ltd	20 minibuses	19	None specified	Daily	10,000	75000
Grace Eyre: Active Lives	One 11-17 seater minibus, Six seater taxi cab		Shoreham to Peacehaven	Daily Mon-Fri	2600	156
St John's Ambulance	900 nationwide**	Many	UK	Daily	Not known	Many
The Bevy	One minibus	None	Brighton and Hove	NA	Not known	Not known
The Big Lemon CIC	One 16-seater minibus, two 25-seater minibuses and seven 51-seater buses	12	UK	Daily, weekly, Ad hoc	Many	Many
The Grow Project	One 16-seater minibus	1	None specified	Ad hoc		10
The Hop 50+	None	None	NA	NA	Not known	Not known

*As well as drivers, the British Red Cross also have escorts that can stay with clients throughout their journey

**In Brighton and Hove one vehicle specifically for homeless people and one specially adapted minibus for wheelchairs. In Brighton and Hove provision of a fully accessible minibus and two staff members to assist clients and a volunteer car driver.

*** Having lost funding for their minivan, they are currently on the list for Aviva Community Fund

Figure 4: A summary of the scale of provision

Sources of funding

Grace Eyre, Brighton and Hove Shopmobility and Community Transport (Brighton, Hove and Area) Ltd receive funding from local authority contracts. *The Big Lemon CIC* is funded through private and public sector contracts and fares. *Grace Eyre*, along with Brighton Lions Club and *Bluebird Society for the disabled* carry out fund-raising activities; in addition, *Grace Eyre* also receives funding through donations. *The Grow Project* and *The Big Lemon CIC* have received one-off donations from *South Downs National Park* authority funds (lease on the minibus) and recent funding from Marks & Spencer Ltd to install solar panels on the depot roof, respectively. *St John's Ambulance* are contracted by *South East Coast Ambulance Service*.

Communication and use of new technologies

Organisations use a range of methods of communications including telephone, email, website, letter, and face to face. Most use a website to publicise their activities. Only two of the organisations use new technologies to help run their service: *Grace Eyre* use customised software, smart phones, and tablets; and *Community Transport (Brighton, Hove and Area) Ltd* use a specialist community transport database software; vehicle tracking; in-vehicle text messaging between office and vehicles; mobile phone communication; and CCTV.

Problems encountered

A number of organisations identified capacity issues as a problem in the provision of community transport services. Providers experience a higher demand than they are capable of serving at present. High costs prevent providers from increasing the size of their fleet. *Brighton and Hove Shopmobility* are limited as they do not have a vehicle to deliver scooters to their clients and therefore they rely on volunteers to ride the scooters to the clients. They say that this 'puts a limit on how far out of the city centre we can deliver and how many we can deliver at a time'. There are also issues of affordability for clients and of difficulties in staff recruitment for providers. *The Alzheimers Society* and *The Hop 50+* do not have their own transport and identify this as problematic, although the *Alzheimers Society* have links with *Sussex Dementia Care and Support Service* who have their own transport and the *Hop 50+* have access to one *Impact Initiatives* vehicle but this is shared with Steyning and Henfield and therefore only available for organised trips. The *Carers Centre* have no vehicles and use taxis, which they say are expensive:

"Often parents of young carers find it difficult to transport their children and in most cases if we can't offer transport, the young carers wouldn't be able to come along to the clubs, groups and activities we run and could miss out on a well-earned respite and vital access to information and support"

Although *Community Transport (Brighton, Hove and Area) Ltd* have 20 buses, which are available to their 100 member organisations, the capacity is limited to 16 and so they cannot accommodate larger groups.

Visualisation of Services



Figure 5: Visualisation of Community Transport Services in Brighton & Hove (that responded to the project survey); the map is a backdrop. Source: Caitlin Bowbeer

Community Transport services for adult social care are visualised in Figure 5. This shows the scale of the organisations, the type of provision, the client group, details of the organisation's fleet use of new technologies, and linkages between organisations. This only includes those organisations that responded to the survey. No locational information is displayed in the visualisation; the map is a backdrop to the information. Although incorporated to some extent (*Community Transport Ltd (Brighton, Hove and Area) Ltd* provide services for home to school travel and for shopping for older people), community transport provision that extends beyond adult social care, particularly for children could be included in a future visualisation to provide a more comprehensive picture and identify further opportunities for linkages between organisations and services.

Conclusion

- There are at least fifteen organisations providing community transport services in Brighton and Hove, but potentially around 22
- Community transport provision varies in scale across the city from large providers such as *Community Transport (Brighton, Hove and Area) Ltd* to smaller providers such as *The Grow Project*.
- There is potential for further co-ordination between providers.
- Organisational aims range from a focus on a particular social group, to a combination of environmental and social.
- The organisations offer services to a range of client groups.
- Organisations are funded through local authority, university and private contracts, fund-raising, donations and fares.
- There is scope for the introduction of new technologies to assist in running services and for increasing co-ordination between providers.
- The main problem identified by providers of community transport services is unmet demand.

WP 2: Community Transport Data

Andrew Hancox
Southern Sky Technology Ltd., Brighton

Introduction

This work package aims to provide practical guidance on the use of Information and Communication Technologies (ICT) as well as data collection around community transport in Brighton & Hove.

WP2 focuses on three types of community transport that are happening in Brighton and Hove: (1) Commissioned Community Transport (a local company with a fleet of mini buses, commissioned by Brighton & Hove City Council and the Clinical Commissioning Group), (2) Non-commissioned community transport (a range of local community groups that run a small number of mini buses each to get end-users to activities) and (3) Buddy systems (a community group matches a 'buddy' with an end-user to take the end-user door-to-door on a trip – using various modes of transport).

After explaining the methods and material, the chapter explains the Community Transport Data Model it developed, followed by discussions around Reporting and Data, Carpooling and Lift sharing, Knowledge Exchange and Training events, as well as Centralisation. The conclusion outlines four practical steps around data and community transport in Brighton and Hove.

Methods and Material

This work package worked with semi-structured interviews, desk research and a data model. They were combined in an iterative approach. The community transport providers that had indicated use of ICT in their responses to the WP1 survey were interviewed, specifically representative from Community Transport (Brighton, Hove and Area) Ltd, The Big Lemon CIC and The Grace Eyre Foundation. In addition, project stakeholders from Brighton and Hove City Council (BHCC) and the Clinical Commissioning Group were interviewed, alongside further representatives from BHCC. For more detail on interviewees, see acknowledgements. The aim of these interviews was to explore the current understanding and reality of technology use in community transport in Brighton and Hove from a range of perspectives. The design of the interview schedule was based on existing ITSSI project findings from the other WPs, desk research of literature and

existing technical solutions, as well as best practice from business analysis. WP2 has successfully applied to the University of Brighton Tier 1 Ethics Committee – College of Arts & Humanities, for the ethical approval required before conducting interviews.

The desk research focused on reviewing current technology utilised and available to community transport, and also included reviewing related literature.

The development of a community transport data model was the third aspect of the method. This workpackage developed a novel high-level data model with the objective to understand and unpack the entities, components and relationships within the Brighton and Hove community transport system regarding technology use. This approach draws on other work that brings entity-relationship diagrams with qualitative and theoretical enquiry (Brady and Loonam 2010). Drafts of the data model facilitated discussion in the interviews. The data model was then refined based on the interview and desk research findings.

Result: Data Model

A high-level data model for community transport in Brighton and Hove (see figure 6) is the first key result of this WP. Working with data models helps to develop a data perspective on community transport. As far as we are aware, data models for community transport have not been produced elsewhere, whereas data models for other forms of transport exist (e.g. Pereira et al. 2016; Chalasani and Axhausen 2005). A data model approach to community transport is therefore a novel approach for Brighton & Hove, but also appears to be new for the UK context, and internationally.

A data model is a visual way of showing the results of analysing important processes of a business area. It is an abstract way of representing how different data elements relate to each other, and also how they relate to ‘things’ in the real world. More specifically, we lightly apply some principles of entity-relationship models/diagrams (Brady and Loonam 2010) to visualise how things and data are related for business processes relevant to community transport.

In the high-level data model, ‘entities’ are represented by boxes and the relationships (dependencies and associations) between entities are illustrated by lines (and diamond shapes) that connect the boxes to each other. Put simply, ‘entities’ are things in the real world that are distinct from other things. They operate similar to nouns and can be abstract entities (indicated by double lines around boxes) such as ‘a form of transport’, ‘a person’ - or real word entities (indicated by single lines around boxes) such

as 'provider-driven vehicle' or 'transport user'. The relationships between these entities operate similar to verbs, for example a transport user 'requests transport' from a transport facilitator. More specifically, a line with an arrow at the end means 'is a type of' (e.g. a Transport user is a type of person), a line with a crow's foot at the end means one to many (e.g. a transport facilitator has ownership of multiple forms of transport), and a simple line means 'is a property of' (e.g. overheads are a property of a transport facilitator). Entities can have attributes (represented by oval shapes), e.g. a form of transport might have 'fixed costs', 'marginal costs' and 'capacity'. Key areas of the diagram are highlighted in different background colours for ease of reading.

Our model (see figure 6) is a framework or domain model for understanding the relations between different elements that are relevant for a data perspective on community transport (rather than a database diagram). It could serve as basis for more formal work in the future, for example around specifying databases or building systems.

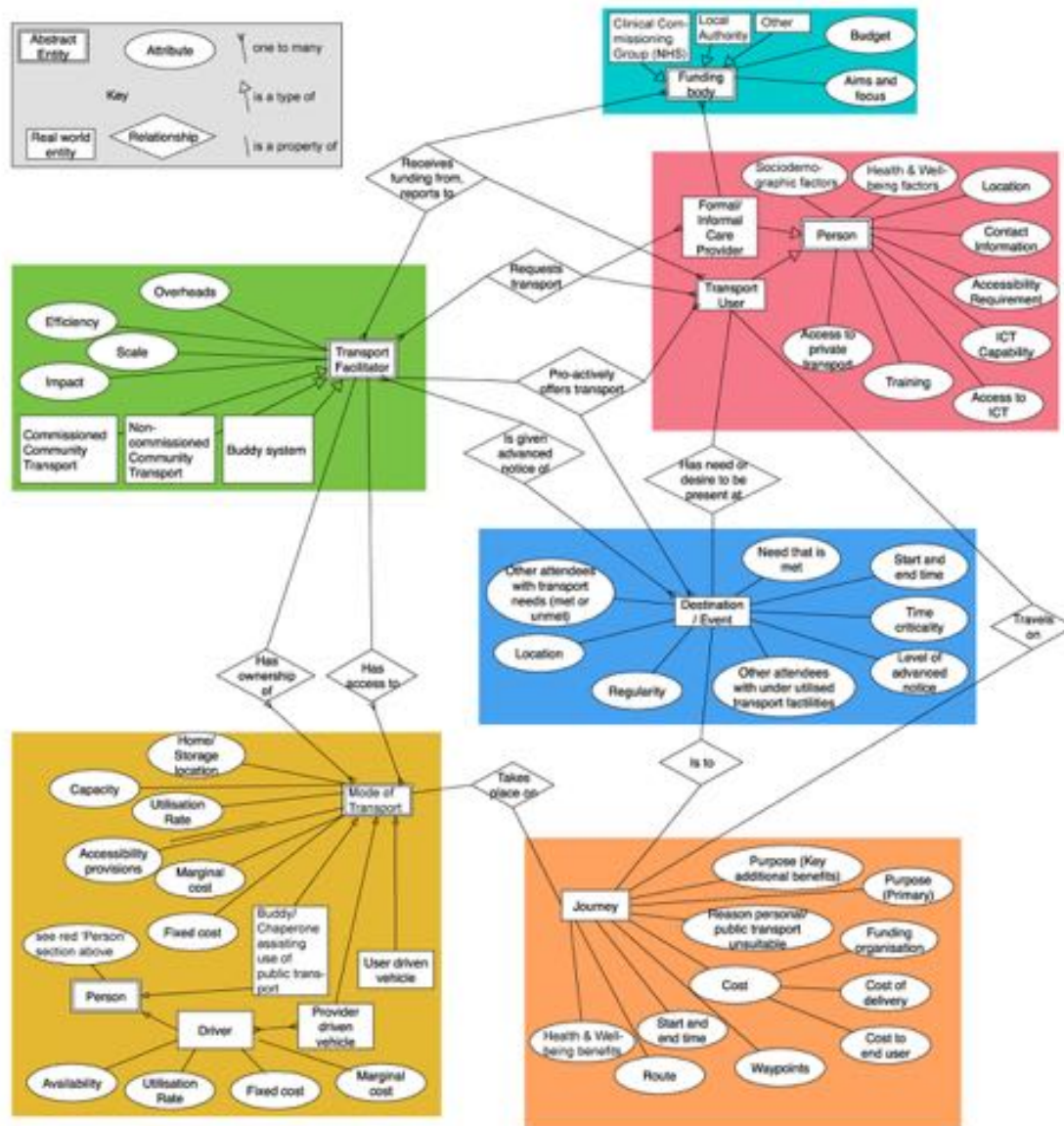


Figure 6: High-level data model for community transport in Brighton and Hove

When looking at the high-level data model (figure 6), the visual information can be turned into sentences by stringing together two entities and the relationship between them, plus optionally mentioning attributes of one or both entities. For example: A journey (entity) has a start and end time (attribute) and takes place on (relationship) a form of transport (entity) that has accessibility provision (attribute). If this were to be turned into a more formal data model in the future, this translate all these elements into something that can be captured in a database that can be queried (e.g. how many trips are made on Tuesdays between 9 and 11am by men over 85 in vehicles with wheelchair provision).

Result: Develop Reporting and Data

The second result of this WP is a more detailed understanding of the reporting and data needs and opportunities for community transport, and how this could be explored in the future in Brighton and Hove.

Currently, most community transport providers collect, use and report data in very limited ways, internally as well as externally, for example with the local authority or commissioners.

Improved data collection and reporting would have benefits (a) for community transport providers around the efficiency of providing their services and their ability to quantify their value, (b) for funders and commissioners in gaining more detailed knowledge about services and (c) for exploring the potential of working with other partners and/or data sets on new or improved services. The data model (see figure 6) suggests a wide range of opportunities for data collection.

A possible follow-on project could work with emerging best practice to develop detailed recommendations (and training/support) for the commissioning process and the community transport providers around data collection, sharing, analysis and use – in Brighton & Hove.

Community Transport Providers' reporting and data

Existing practices of data collection by community transport providers are covered in section 'Knowledge Exchange/Training' of this chapter. Based on that overview, it is clear that the majority of community transport providers would benefit from enhanced business intelligence to better manage their services and vehicles. Their reporting needs to be improved both internally and externally.

Also, there is a clear need for improved information regarding service users. Improved information about service users would build the ability to ensure the people are using the most appropriate service for their needs. Improved and more detailed data from service users would also help with the identification of potential gaps in the market, and could inform ways of addressing these.

Many current agreements that community transport providers have with their users do not allow providers to collect much data about their users. These agreements (Terms & Conditions) would need reviewing if any further data would be collected.

Client confidentiality, in which express consent is required from users to share data. Users who have care needs but do not fall within the care system do not wish to be assessed as having a care need and therefore will be reluctant to engage with this. Upcoming General Data Protection Regulation (GDPR) legislation will also need to be taken into account to deal with these reporting issues and restrictions.

Commissioning and reporting/data requirements

Although reporting has been part of the commissioning process for community transport, the data and reporting requirements have not always been fulfilled as best as they could be, while contracts might not have spelled out data collection requirements in the best ways. There has been little consideration of how the reported data could inform and integrate with other areas such as health.

Detailed guidance on best practice for reporting of community transport in Brighton and Hove should therefore be developed and then consistently be applied in commissioning.

Expected areas to be covered could include; 1) Cost per journey, 2) Number of journeys delivered 3) Number of journeys that would not have occurred without specialist transport service, 4) The need met by each journey and 5) Utilisation rates of vehicles. Additionally, (aggregated/annonymised) data about users could be covered, for example 1) age, 2) location, 3) frequency of service use, 4) length of service use, 5) self-declared reasons for use of service, 6) self-declared benefits of using the service, 7) way of interacting with/booking service. However, this would need further consideration, as detailed in the next section. Issues around commercial confidentiality that hinder reporting due to competition for funding and market share also need to be considered.

These changes in required data and reporting would need to be strongly supported through assistance given to the contracted organisations. This could include the knowledge exchange and training activities suggested in the next section of this chapter.

Quantifying the benefits of community transport use

There are distinct challenges when measuring and quantifying transport data. The issue lies in the question; How does one quantify the benefit of an individual having access to transport and the financial cost incurred? For example it is difficult to quantify the value of empowering someone to carry out shopping in an established social group versus delivering groceries to them. Best practise is emerging and being rolled out, for instance 'A Practical Method for Measuring Community Transport Social Value' (ECT

Charity 2016, see figure 7). This information and other currently on-going work in this area should be analysed and applied to the Brighton & Hove context. Proposed ways of quantifying these benefits and related data collecting and reporting could then inform community transport in Brighton and Hove. A successful example from a related domain is the WHO/Europe Health Economic Assessment Tool (HEAT) that “conduct an economic assessment of the health benefits of walking or cycling by estimating the value of reduced mortality that results from specified amounts of walking or cycling” (World Health Organisation, n.d.).

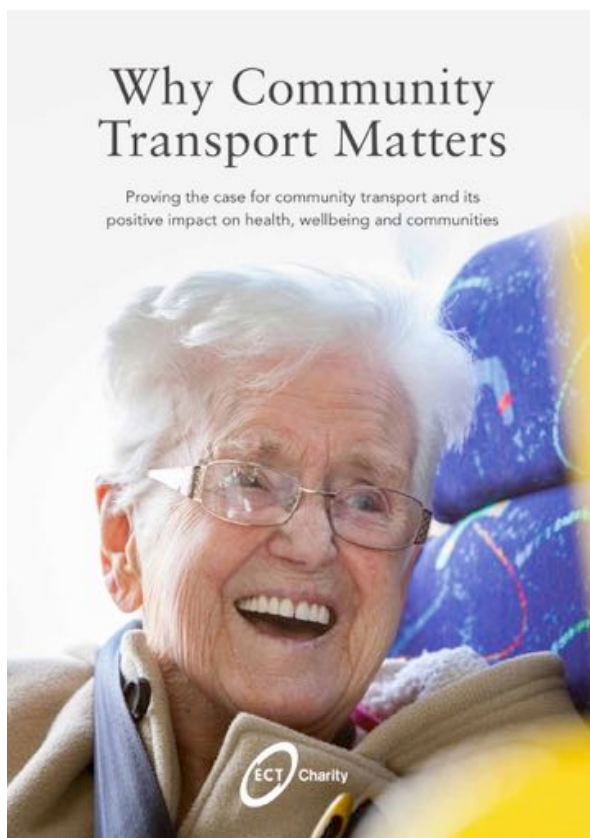


Figure 7: Cover of the ECT's 'A Practical Method for Measuring Community Transport Social Value' report

Further opportunities

When planning and implementing improved data collection and reporting around community transport in Brighton and Hove, it is also important to consider how new ways of using data or integration with other services could lead to added benefits or new services. For example, if a regular user of a community transport service misses a trip, this could automatically trigger a notification of a specified contact (e.g. carer, Next of Kin, health professional).

Another example could be around existing data sets of events or services relevant for users of community transport – and how these could be linked to community transport data for synergies and more inclusive services.

For example, councils and commissioning groups could provide guidance on best practice for arranging transport to funded activities and events to those organising them, perhaps even going so far as requiring transport provision or information when funding and facilitating events.

Results: Carpooling and Lift sharing

The third result is the opportunity to extend an existing open source platform for community transport use. This is relevant for non-commissioned community transport and buddy schemes for community transport, and also for others schemes that use car-pooling for community transport.

Non-commissioned community transport comprises a range of local community groups that run a small number of mini buses each to get end-users to activities. The other WPs identified that they could benefit from being able to share resources but do not currently have a satisfactory technical solution that would facilitate this.

For buddy-type approaches to community transport (incl. those flagged up by WPs 1 and 3), a community group matches a 'buddy' with an end-user to take the end-user door-to-door on a trip – and this could include a range of modes of transport (bus, community transport, buddy's car, etc).

Furthermore, car pooling is found to be evident on a small local scale. This has been evidenced by several General Practitioners (GP's) having ad-hoc volunteer car pooling systems as well as informal buddying schemes. The manner in which these carpooling activities are organised is typically phone or email and managed using paper or spreadsheets. These events are notably small scale and hence the system tends to work effectively.

All these types of community transport could benefit from a carpooling/lift sharing platform that is tailored to the needs of community transport. This would enable a more efficient use of resources and improved ways of connecting volunteers with service users and vehicles. Some actively developed open source platforms already exist to offer lift sharing but they do not currently offer the features that would be required for community transport. As an example, icare, "The Open Source Carpooling Platform" (<http://icare.diowa.com/>) could be extended to add functionality for transport facilitators and event managers, as well as extend data model to cover disabilities (see figure 7).



Figure 8: The icare Open Source Car Pooling website. Source: <http://icare.diowa.com/>

The human factors would need to be at the heart of developing such a tool, as evidenced by “Evaluation of volunteer led approaches to supporting older people get out and about” (Fed 2016). Any scheme would require funding and ownership by an organization and there are substantial safe guarding issues. A large number of service users are vulnerable in some way and therefore DBS checking of volunteers would be necessary. Most providers licensed under section 19 are restricted in who can use their vehicles. There are additionally commercial issues around providing a platform for people to share taxis, and insurance provision.

Grace Eyre experienced major issues with training and reliability of volunteers. Many service users have complex needs that may be difficult or expensive to train volunteers to meet. The most recent volunteer-based travel buddy system dropped from 90% volunteer participation to a mere 10% mainly due to drop outs.

A follow-on project could work with one of the existing open source lift share/car pooling tools (e.g. icare, “The Open Source Carpooling Platform”, <https://github.com/diowa/icare>, see figure 7), and add capabilities needed for the community transport context, and especially Brighton & Hove. This

could include issues around volunteers (e.g. checking and training), around end users (e.g. needs, mobility aids) and around the community group/organization (e.g. their mini buses and events). This could be developed, piloted and evaluated in partnership with non-commissioned community transport providers and buddy-type community transport providers in Brighton and Hove. Additional partners that already use car pooling (e.g. GP practices) could also be considered.

Result: Knowledge Exchange and Training Events

The fourth finding is that community transport providers would benefit from knowledge exchange and training opportunities around the use of ICT and smart/intelligent technologies. This would allow them to make better use of the tools they already use, and/or to engage with new tools.

Organisations without strong ICT provision require more professional services such as training, configuration and assistance embedding software into the organisation. The costs of this are often a challenge for these organisations. This could be mitigated by sharing these sessions between several organisations, and by obtaining external funding for these sessions. This is especially relevant for those providers where transport is an enabler rather than a core activity, and there is not sufficient time to investigate new features in existing resources and entirely new resources do not get noticed quickly.

This following section of the chapter discusses a range of software and technology already in use by some community transport providers, plus suggestions for further tools that could be used - structured by different areas relevant for community transport.

This information could be the basis for developing knowledge exchange and training events for community transport providers in Brighton and Hove, for example a series of workshops.

Real time vehicle tracking

This avenue is not perceived to be needed or utilised by most suppliers as there are only a small number of vehicles which use non-time critical schedules (i.e. nearest 20 minutes). There is little variation in core activities from week to week and there is minimal need to monitor driver compliance (i.e. speeding, petrol theft and idling to name a few), tachographs are used by most providers to meet regulatory requirements and therefore the expenditure cannot be justified.

For community transport companies, traditional fleet tracking solutions are thought to be prohibitively expensive to put in place. Often where real-time vehicle tracking is required, it is expected to be reliable, to accurately track mileage and reconcile with odometer or tachograph, specialist hardware is required that needs to be hardwired within the vehicle.

There are currently new solutions emerging for real-time vehicle tracking (e.g. <https://www.mycartracks.com> - see Figure 8), which rely on Global Positioning Systems (GPS) functionality of smart phones, which incur lower costs (i.e. require no installation and minimal monthly costs). These, while not as reliable and feature-rich as traditional solutions, deliver much value to the user. From this result decisions to not utilise real-time vehicle tracking requires revisiting by organisations with this new insight of mobile phone technology. This is already occurring within one organisation which stated that the catalyst was an upgrade of all mobile phones to more modern smart phones to support new ERP (enterprise resource planning) software which have these added capabilities.

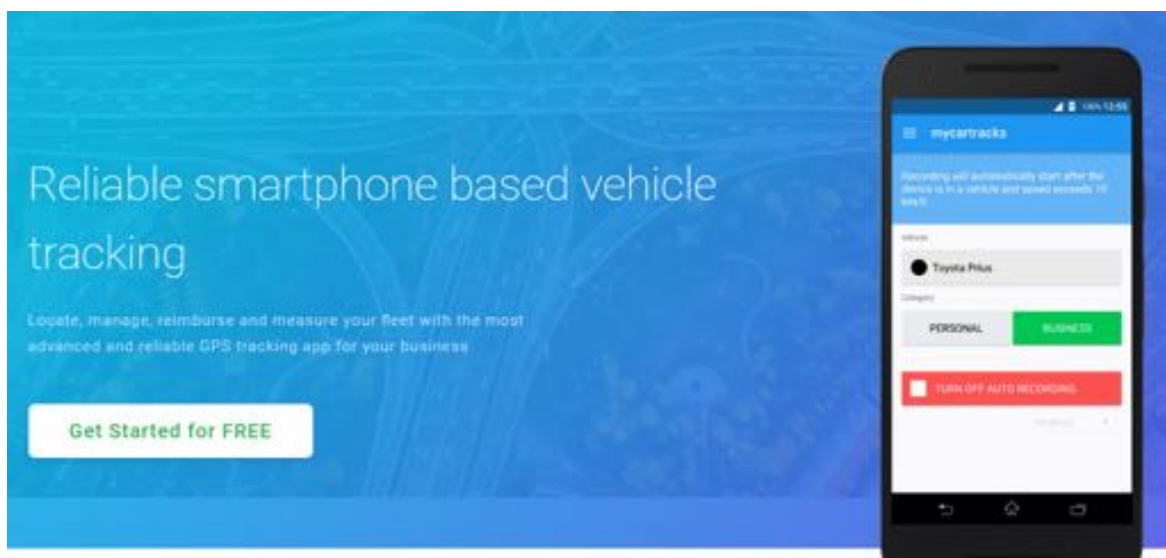


Figure 8: Mycartracks Home page interface. Source: <https://www.mycartracks.com>.

Smartphone based fleet management solutions such as My Car Tracks (<https://www.mycartracks.com>) have recently emerged and have potential to disrupt the fleet management market with low cost options that deliver a feature set which is likely to be sufficient for a smaller non-profit organisation.

Booking Management

It has been found that even specialist transport providers are managing bookings via phone or email. Many transport service users are digitally excluded, however of these many have carers (either formal or informal) who would be able to use a website to make and manage bookings. Most

transport providers deal primarily with regular bookings and therefore do not see this as a major administrative problem.

Bookings can be managed using software such as Checkfront (<https://www.checkfront.com>) which offers a full feature set for managing bookings of resources and Eventbrite (<https://www.eventbrite.co.uk>) which is focused on simpler, one off, event management. Checkfront is currently used successfully at Big Lemon.

Route planning & maintenance scheduling

Specialist route planning systems are expensive and there would need to be many scheduled services being run before the investment would be justified. Route planning is typically done in an ad-hoc manner either manually or using consumer technology (e.g. Google Maps). Due to most organisations having so few buses and services, maintenance schedules are easily co-ordinated through the use of spreadsheets or calendars.

Staff rostering

As specialist transport providers face pressure to more fully utilise assets and seek new markets to compensate for the loss of commissioned services, more staff will be required and vehicles may need to be available evenings and weekends. For this reason, the task of staff rostering may become more complex and current approaches which are often based around spreadsheets will become less viable. Most of the smaller transport operators simply use mobile phones as a tool to communicate bus to dispatcher information. Not all of these organisations have hands-free kits, which imposes a serious restriction on bus to dispatcher communication.

Rostering for services can be done through tools such as findmyshift (<https://www.findmyshift.co.uk> – see Figure 9) which is free for teams of 5 people and less.



Figure 9: 'Find My Shift' Website. Source: <https://www.findmyshift.com.uk>.

Dispatcher communication and locating

All organisations contacted use mobile phones as a tool to communicate between drivers and dispatchers as specialist systems are substantially more expensive and offer minimal extra value. Not all of these organisations have hands-free kits, which imposes a serious restriction on bus to dispatcher communication. One organiser used Whatsapp as an efficient means of communicating with multiple drivers simultaneously.

Instant messaging services such as the proprietary WhatsApp (already in use by Big Lemon) and tools like smsbroadcast (<https://www.smsbroadcast.co.uk> – see Figure 10) deliver an excellent and low cost tool for organisations to communicate with drivers as well as service users and carers. These tools can deliver many benefits such as saving office time spent phoning service users when transport is running late or is delayed.

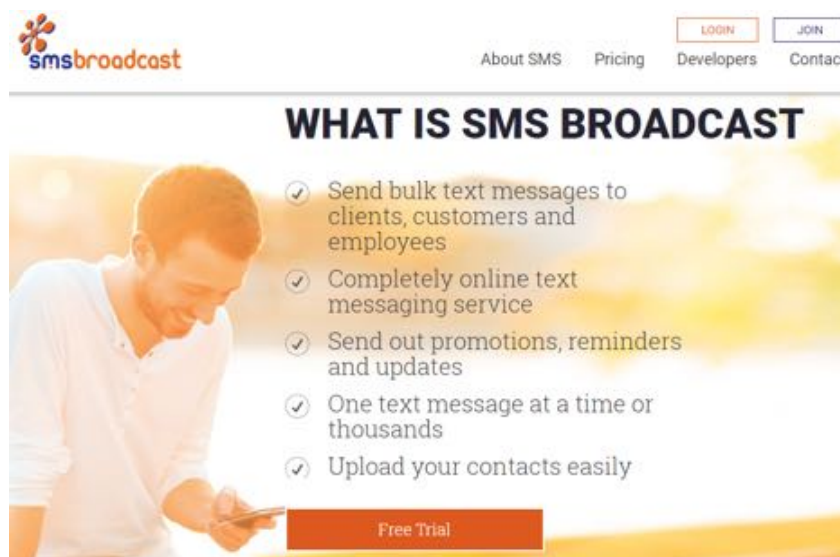


Figure 10: Illustration of SMS Broadcast interface. Source: <https://www.smsbroadcast.co.uk>

Tools such as Find My Phone and Android Device Manager are being used by Grace Eyre and other organisations to locate service users and drivers during emergencies when consent has been given. Currently use of these tools is informal and therefore lacking an audit trail as well as secure storage of credentials, tools such as TeamPassword (<https://www.teampassword.com>) would allow for this to be formally managed. There is also potential for an application which fully manages permissions, auditing and automates consent gathering for such a service which would provide a major boost for user independence, however a major limitation of this approach is that smartphones are not designed to be safety critical systems and can run out of charge, be turned off or get left behind.

Marketing and Communication

As funding is reduced and reallocated, specialist transport providers will need to develop new channels for marketing to reach new service users. There is a need to consider improved marketing tools and information and the how access to information can be best supported. support the council can provide.

Users are typically reached via print, which is rather costly, however the assumption of digital exclusion in this group requires revisiting and many carers are able technology users. There may be an opportunity to move from print to email in this aspect to decrease costs and printing.

Mailchimp was seen in use at Community Transport (Brighton, Hove and Area) Ltd and is an excellent and extremely low cost way to manage email communications and separate lists could be used to communicate with internal and external users, users of different services etc.

Instant messaging services such as the proprietary WhatsApp (already in use by Big Lemon) and tools like smsbroadcast (<https://www.smsbroadcast.co.uk> – see figure 10) deliver an excellent and low cost tool for organisations to communicate with service users and carers. These tools can deliver many benefits such as saving office time spent phoning service users when transport is running late or is delayed.

The marketing tool “My Life” (https://www.mylifebh.org.uk/transport/?fwp_transport=accessible-transport , see figure 11) has provided a useful directory platform helping link provider websites to users. However, some of the sites linked have not been updated recently or do not provide sufficient information about their services.

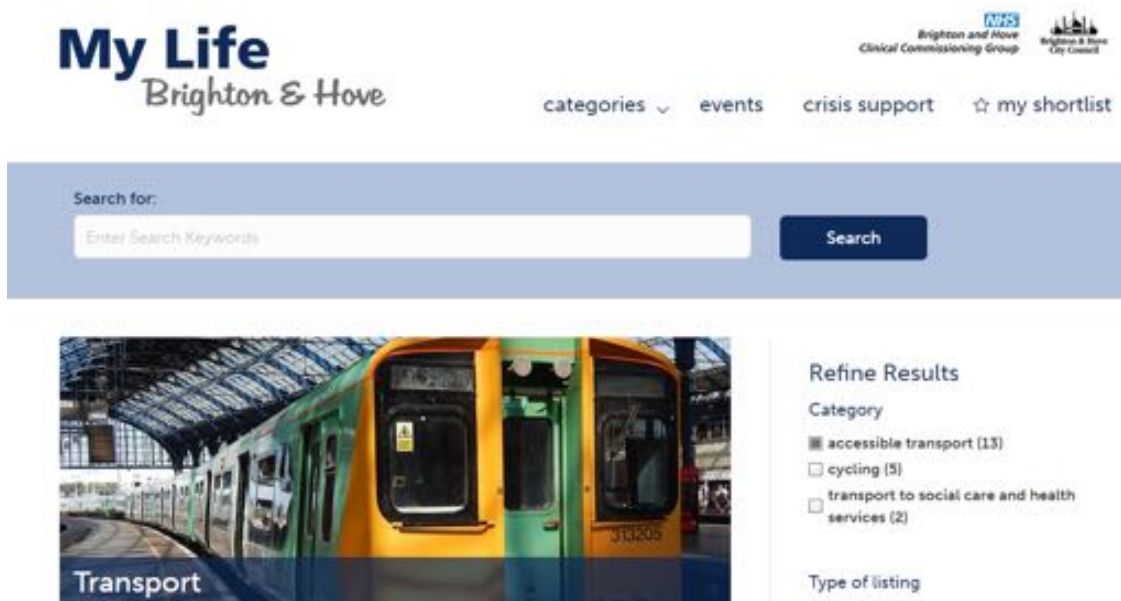


Figure 11: My Life Brighton and Hove interface. Source: https://www.mylifebh.org.uk/transport/?fwp_transport=accessible-transport.

There is opportunity in for communications and marketing via social media platforms such as Facebook which provides excellent event management and communications tools for simple membership groups.

JotForms and SurveyMonkey are two examples of tools which can be used to easily run surveys and gather data from service users and their carers.

Community transport providers could be provided with information to support their marketing activities such as lists of assisted living facilities, activity providers and event organisers. The Council is currently helping via sharing information regarding social housing managers with Community Transport (Brighton, Hove and Area) Ltd. There may be further potential around this issue.

Supplier and service user communication and engagement, accessibility

Not all users of community transport have access and skills for engaging with online communication. This presents a key challenge for how community transport providers communicate with their users. Direct communication is typically performed via telephone or writing. These traditional ways of communication remain vital and must be retained to retain social inclusion.

Over time, more community transport users will gain access and skills for engaging with online communication/the Internet. Community transport providers would therefore benefit from phasing in digital communication with their users. Workshop participants (see WP5) suggested that this could even serve as an encouragement for people to gain digital skills and

online access. Furthermore, carers can also be the ones providing the digital access to these services, rather than the end user.

Moving towards digital would also enable community transport providers to include functionality such as notifications of delays or confirmation of pickups. These features are highly demanded by users, particularly by carers who balance careers. In the past features like this have typically been the preserve of expensive specialist platforms. However new services such as WhatsApp (<https://www.whatsapp.com>) and smsbroadcast (<https://www.smsbroadcast.co.uk>) are changing this.

Accessibility of websites, apps, communication and online services is of key importance for community transport with its particular user group. Therefore, it needs to be ensured that transport applications meet guidelines and are accessible. Websites and apps should be fully accessible, something which could be encouraged or mandated by commissioning bodies.

There is currently strong provision in this area locally with Brighton and Hove Buses providing a highly accessible website and mobile app. The Community Transport (Brighton, Hove and Area) Ltd website however is very inaccessible with use of PDF's with no Aria tags.

Holistic solutions

CTX (<https://shaunsoft.com/>) is a specialist community transport management solution built by a small company founded by a former employee of a community transport operator. It allows management of vehicle allocations, passenger lists, maintenance schedules, rosters and routes as well as detailed and frequently bespoke reporting. CTX does not provide real time information (RTI) as the impression is the target market lacks budget to perform RTI properly and the service is tailored towards smaller organisations. It is required to be affordable due to low budgets and has a major focus on controlling costs and delivering efficiencies in the back office. The low price point it must maintain restricts what can be achieved. For example licensing quality mapping data and application programming interfaces (APIs) to route planning tools is too costly. Strong reporting functionality in CTX can provide tools for councils to query data held within operator's system through tools such as Power BI.

The largest problem evident is reporting tools being under-utilised, however some Community Transport providers are aware of this issue and are currently addressing it through data gathering and extensive reporting.

Some community transport providers have integrated CTX with Salesforce (<https://www.salesforce.com/>) as well as other platforms to further drive reporting and business intelligence. CTX is rapidly moving to a web based platform to allow online bookings and tools such as a widget for generating quotes within web sites, however uptake is slow in some areas. Mobile applications are soon to appear on the market. The major factor preventing this tool from having the most impact is a lack of budget for professional services to help organisations properly embed the tool within their operations and training to allow employees to gain the most benefit.

The increasing convergence of automated marketing, CRM (Customer Relationship Management) and ERP (Enterprise Resource Planning) provision in tools such as Salesforce (<https://www.salesforce.com/>), Zoho (<https://www.zoho.com/>) and Microsoft Dynamics (<https://www.microsoft.com/en-gb/dynamics365/home>) gives some excellent platforms for delivering community transport services but also, focusing on marketing, communicating with and developing an understanding of service users through the core functionality and wide variety of plugins that are available (e.g. mobile apps, SMS tools, marketing automation, surveys etc.). Costs of these platforms vary widely with Zoho providing a basic free service which goes up to £85 per user per month, Salesforce ranges from £20 to £240 per user per month. There are also highly variable costs around deployment; configuration and training, however, organisations can obtain some value from these platforms inexpensively. Grace Eyre has made a very large investment in Salesforce, which has provided a platform to centralise all operations including transport.

Centralisation and Trapeze

Community transport in Brighton and Hove is characterised by low centralisation and a huge diversity of organisations. Due to the high fixed costs of deploying technology (e.g. Trapeze £15,000 initial cost for a new supplier, Grace Eyre's substantial investment in Salesforce), major efficiencies and savings that may be delivered by technology are only realised where transport provision is delivered at scale. Centralisation allows improved services delivered at a scale that allows the investment in best in class technology, as well as a more holistic approach.

Trapeze (<http://www.trapezegroup.co.uk/>) is an example of such a transport technology that is relevant for community transport but is only feasible when working at scale. Trapeze is a platform created to solve public transport challenges. It has become a market leading application and is deployed within Brighton and Hove. Trapeze drives digital signage, provides RTI, rostering, fleet management, communication and route

planning tools to its users. It is centrally deployed therefore provides opportunities to ensure transport services, commissioning groups and the council join together. The contract between Brighton and Hove Council and Trapeze has been set up to allow access for all transport operators within the city, however not all community transport providers seem aware of this. There are high costs, for instance for a new provider it costs approximately £15,000 + £2,500 per vehicle to setup plus additional annual costs. This means that all but the largest transport providers are priced out of using the software.

Centralisation (including use of Trapeze) is a solution that has been pursued elsewhere in the UK and was one of the key drivers of initial ITSSI conversations. However, Brighton & Hove City Council does not currently consider centralisation the preferred solution for the context of Brighton and Hove. A successful example of centralisation in a different context is the “Community, health and social transport development in the west of Scotland - south west of Scotland transport partnership board meeting (11 March 2016)”, which shows community transport being centralised at a regional level allowing a dedicated control center with a full deployment of the Trapeze system delivering efficiencies through technology that would otherwise be impossible (for more detail on this, see WP3).

Conclusion

This chapter focussed on practical guidance on the use of Information and Communication Technologies (ICT) as well as data collection around community transport in Brighton & Hove.

The analysis found that the main hindrance to the use of technology is fragmented provision, which results in many organisations operating transport below the level that would facilitate proper investment in technology. Although a key driver in initial conversations around the ITSSI project, more centralised community transport is not currently a scenario favoured by Brighton & Hove City Council.

Within this context, this chapter identified four practical steps that could be taken in Brighton and Hove around data/technology and community transport:

- Create knowledge exchange and training events for community transport providers to improve their use of existing technologies/tools and/or to learn about new ones, as the most accessible gains from technology come from the use of low cost generalist software as a service (SAAS) tools.

- Work with emerging best practice to develop detailed recommendations (and training/support) for the commissioning process and the community transport providers around data collection, sharing, analysis and use – in Brighton & Hove.
- Add capabilities needed for the community transport context to an existing open source lift share/car pooling so this can be piloted and evaluated in partnership with non-commissioned community transport providers and buddy-type community transport providers in Brighton and Hove.
- Develop the high-level data model for community transport in Brighton and Hove into a more formal model, also considering emerging best practice around quantifying the benefits of community transport.

WP 3: Intelligent Transport Opportunities for Social Inclusion

Dr Maria Sourbati
Senior Lecturer in Media Studies, University of Brighton

Angela Hughes
Researcher

Introduction

WP3 examines how ICT can be used to best serve different agendas of public transport and social inclusion, including the integration of transport services (Department for Transport 2015) with a focus on older adults (linking with WP4). We interpreted technology and age broadly against the broader project context of an increasing population, especially of older people, and increasing demand for healthcare, education and transport services at a time of reductions in local authority funding. In light of findings highlighting demand responsiveness, the limited use of digital information and communication by transport providers and the potential for travel buddy schemes (WP1) and already launched initiatives that recognise the importance of relationships in digital skill learning schemes in the Brighton and Hove area² it was decided to further investigate a selection of good practice case studies in inclusive community transport solutions. Our findings support all age- inclusive solutions, that extend beyond adult health and social care (as also noted in WP1), being appropriate for but not exclusively aimed at older adults.

We defined ‘intelligent’ and ‘smart’ as synonyms referring to: The *use of digital technologies* to improve inclusiveness of public and community transport by improving access to information about any aspect of the journey, including destination and pickup points, booking and payment systems, timetable etc.; available for self-service use (by users of transport themselves) or for proxy use (used by a third person such as carer, on behalf of the public transport user). We took a rainbow approach to technology (Andrew Clement and Leslie R. Shade 2000) understanding digital technology as comprising: infrastructure/carriage, devices, software/tools, content service, service access provision, social facilitation/literacy and governance.

² Initiatives to promote learning of digital skills in B&H such as [HaKIT](https://www.brighton-hove.gov.uk/sites/brighton-hove.gov.uk/files/DofPH%20AR%202016%20Later%20Life%20FINAL.pdf) and [Lifelines](https://www.brighton-hove.gov.uk/sites/brighton-hove.gov.uk/files/DofPH%20AR%202016%20Later%20Life%20FINAL.pdf) (see section four in <https://www.brighton-hove.gov.uk/sites/brighton-hove.gov.uk/files/DofPH%20AR%202016%20Later%20Life%20FINAL.pdf>)

Following this perspective *access* to transport comprises infrastructure including the built environment (shelters, stops; signalling) and human capital-related (behaviours and skills including driver awareness of client needs & abilities; proxy users), as in our T3.2 findings.

This perspective recognises the relational character of ICT use and the need for physical and human contact ICT entails: To draw on the Foresight 2015 report *a visiting health worker can be seen as part of an assistive technology environment*. (Ormerod et al. 2015a:32) Relatedly, a social perspective takes account of the social uptake of technologies outside their original field: technologies of transport (e.g. tracking) have a social uptake outside the field of transport and vice versa – how everyday technologies (mobile phone apps) can be used to facilitate transport (Hubers and Lyons 2013).

Method & Material

Literature search combined desk based searches of databases such as Web of Knowledge with grey literature, information obtained in research events such as international conferences and through our team's research networks and local community contacts.

We focused our review on urban, city transport solutions. We also included schemes from rural areas. To sample international and national all age cities we used the WHO (2007) Global Network of 33 Age Friendly Cities.

Through UoB library databases we gained sense of a paucity of evidence-based articles. Grey literature search was expanded online to include the UK network of Age friendly cities

<http://www.micra.manchester.ac.uk/research/projects-and-groups/age-friendly-cities/> (*Brighton; Glasgow, Edinburgh; Cardiff, London Borough of Camden; Nottingham; Manchester; Newcastle; Stoke on Trent; Belfast; Leeds*)

We used the following keywords: *age friendly, smart city, intelligent transport, older people, elder people, mobility*, and *transport* using both internet and academic searches. Our multidisciplinary approach to analysis combined transport studies, health, geography and sociology, gerontology, and arts and humanities following the lead of major studies in age-friendly, inclusive cities (see Ormerod et al, 2015, Hubers and Lyons, 2013).

We obtained primary data through telephone and email interviews and research report data (Strathclyde; Newcastle; Siegen).

We also contextualised our analysis against the major WHO evaluation reports, national government reports and Transport Catapult reports, comprising the UK Urban Ageing consortium research evaluation and assessment framework reports (Handler 2014) The Kings College evaluation for the WHO (An age-friendly city: How far has London come?(Tinker and Ginn 2015)) and The Foresight 2014 Report (Ormerod et al. 2015) and referenced in the findings section.

To identify areas of good practice in the chosen case studies³ we have been drawing on the [WHO Age Friendly Cities assessment tools](#) and the European Innovation Partnership on Active and Healthy Ageing compilation of good practices in innovation for age-friendly buildings, cities and environments ([EIP on AHA, 2013](#)), (The European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) Action Group 4 2013a)

Findings – Inclusive and Age-friendly Intelligent Transport Solutions

Our research looked at everything we could find on transport in age friendly cities in the UK, Europe and beyond (WHO status). The measures to promote inclusive transport can be divided into seven main categories, four kinds of ‘Smart Technologies’ and three other categories:

1. Journey planning information ‘Smart Technologies’
2. Demand responsive information ‘Smart Technologies’
3. Hybrid ‘Smart Technologies’
4. Other ‘Smart Technologies’
5. Infrastructure/Built Environment
6. Adaptable/Flexible Services
7. Human Factors/Behaviours

The following sections provide an indication of the technical solutions for each of these seven categories, listed by city. In response to the project stakeholder’s feedback, selected case studies are explored in more detail, while others are mentioned more briefly.

³ Chosen in consultation with the steering group.

Journey planning information ‘Smart Technologies’

The first of the seven categories is Journey Planning Information ‘Smart Technologies’. Information is provided by the service provider (e.g. transport operator) to passengers to help plan all aspects of their pre-scheduled journey: book journey, buy ticket, signal the driver and navigation. This ranges from route/map information, live route and journey information provision (vehicle arrival times, distance/time from the stop,) to weather, services and amenities/city map as adapted to individual needs). For example: Strathclyde, [Traveline Scotland](#), [Stockholm journey planner](#), [London journey planning](#), NYC, US Interactive voice response system. Current initiatives include:

Stockholm, Sweden: Bus/Nav aids: All buses equipped with internal communication systems and automated announcements of the next bus stop through both speech and text as well as the external communication of the bus routes as it pulls up to the bus stop. There are 2000 digital signs displaying public transportation information in the city. Information for visually impaired travellers is also provided (Ceccato 2015, p.5)

New York, US: Response System: Interactive Voice Response System, alerts ‘access a ride’ clients of the impending arrival of their vehicle, via telephone, text message, or email. These alerts give clients approximately 15 minutes to prepare and reach their pickup location at their scheduled pickup time. (Nyc 2013, p.10)

London, UK: real-time information: Transport for London provides real time journey planning information for the entire city transport system (TFL.gov.uk).

Strathclyde, UK: Traveline Scotland app: Includes a function to enable users to pick their NHS destination from a list of pre-defined locations, which will plan their journey right to the door of that facility. The hospitals section of the app is marked with clear ‘H’ branding currently used on bus timetables and provides public transport information to all the main hospitals across Scotland, not just the Greater Glasgow area. ‘Travel to Hospitals’ information is also available on the Traveline Scotland website. (Strathclyde Partnership for Transport 2016)

Specifically, this app features: A journey planner for public transport options between any two locations in Scotland, featuring all bus, coach, rail, Glasgow Subway and ferry routes; Departure boards showing next

scheduled buses at every stop in Great Britain; Live bus times are shown in Edinburgh, Glasgow, Aberdeen, Dundee, Angus, Ayrshire, Inverness area and Orkney where available; Live rail departures for all stations in Scotland; Transport times also shown for Scottish ferry terminals and Glasgow Subway stations, together with local taxi details relevant to your location; Full Scottish routes on the map, with all scheduled calling points and stop times displayed; News & Notices affecting public transport services; Contact details for all Scottish public transport operators.



Figure 12: The Traveline Scotland App

The 'H' feature of the app was developed in the anticipation of new hospitals opening and merging. Assistance labelled 'travel to hospitals' is also available on the Traveline Scotland website and a 24hours call centre <http://www.spt.co.uk/2015/04/download-the-traveline-scotland-app/> (Strathclyde Partnership for Transport 2016). Healthcare access information is already linked to the SPT website. <http://www.spt.co.uk/>. Traveline Scotland also offers a 'txt 2 traveline SMS service' – a text that can be sent to your phone for the next bus time, 'useful in areas where there may be no internet access' <http://www.travelinescotland.com/apps> (Traveline Scotland 2016).

Demand responsive information and 'Smart Technologies'

The second category is about Demand Responsive Information 'Smart Technologies', where service providers are responding to client travel requests, accommodate mobility needs through flexible routes, dial a ride etc., and provide information. For example: Leicestershire, [dial-a-ride](#) and Glasgow, [MyBus](#). Examples of such services include:

Helsinki, Finland: 'Callplus' service *Kutsuplus.fi* was running from 2012 to 2015 and is now discontinued due to lack of sustainable funding. The intelligent demand-responsive transport pilot - Kutsuplus - was the world's first fully automated, real-time demand-responsive public transport service, Kutsuplus was developed by Helsinki Regional Transport Authority (HSL) and Split Finland Ltd. (earlier Ajelo Ltd.). Pick-up-points and drop-off-points were general bus stops. Virtual bus stops could be defined; e.g. with a lower density of bus stops. The confirmation of the booked trip contains a code to identify oneself, the number of the vehicle and information about the route to the bus stop and arrival times. The trips were shared with other passengers that are travelling approximately the same route at the same time. Pick-up-times/drop-off-times of all passengers were displayed with a code inside the vehicle. This platform-based service was accessible to older users given the high level of internet use among older people in Finland on the one hand and, on the other, the availability of low-level booking option via SMS (Hilbert, et al. 2014, p.54)

Brisbane, Queensland Australia: Flexible Route Bus Service: The bus passes through zones and is dynamically redirected to go past users' residences. Users contact the bus company or booking system by telephone prior to the bus run in order to use the service (Broome et al. 2012)

Between 2005 and 2007 the Australian Department of Transport and Main Roads implemented flexible transport service initiative branded as KanGo in Toowoomba and Hervey Bay, Brisbane, Queensland. A fixed route bus service was replaced by a flexible route service 'KanGo'. KanGo was launched as a demand-responsive transport option designed to operate to a timetable on a partial fixed line of route connecting the respective areas to a predefined suburban service area with services operating hourly between 8am and 6pm with pick up points bookable over a fixed telephone line system. The service was launched in the context of changes in public transport provision.

Use by older people had doubled over eight months following its introduction. Dissatisfaction with the telephone operators pointed to the need of ICT systems (booking) being integral to the success of a flexible bus route; and accessibility and usability improvements including bus buddy programmes (Broome et al. 2012). Service evaluation accounts indicate a general decline in ease of use, accessibility and reliability of service. A self-evaluation by a sample of 100 users reported ease of use either remained

the same or decreased significantly and no significant change in frequency of bus use and in social outcomes (participants' social activity participation). Over a three year period (2007-2010) there had been an overall decline in ease of bus use and social activity participation among older users (Broome et al, 2010). Consistent with this trend local newspaper reporting in 2016 questioned the efficiency of this service that was reported as unreliable by local users (Antrobus 2016).

Manchester, UK: Ring & Ride: door-to-door accessible minibus service for people who have difficulty in using public transport. Local Link: low-cost, flexible, accessible transport service available to everyone, filling in the gaps where other public transport options are limited or unavailable (Manchester City Council 2016).



Figure 13: From the Manchester Ring & Ride Website

“A door to door service for people of all ages who find it difficult to use public transport” operated by GMATL (Greater Manchester Accessible Transport Limited) a charitable company formed to co-ordinate and manage Ring & Ride services in Greater Manchester. Provides short, local trips to eligible residents of Greater Manchester and may travel to any location within 6 miles of home address. Eligibility criteria: hold a Transport for Greater Manchester (TfGM) Concessionary Plus Pass; or hold TfGM Concessionary Disabled Person Pass; or are 70 years old or over, have mobility issues and hold a TfGM Over 60 Concessionary Pass; or are a TfGM Travel voucher user.

Examples of journeys include: travel to work, school or further education college; travel to health appointments, including visits to hospitals and medical centres; travel to supermarkets; travel to take part in social and leisure activities; travel to places of worship, Registered users may travel

more than 6 miles from their home address as long as the destination is within Greater Manchester for travel to the nearest local hospital and travel to the nearest town centre or accessible transport facility

<http://www.tfgm.com/ringandride/Pages/Areas-covered.aspx> (Transport for Greater Manchester 2016b)

Service performance: 668,596 journeys provided by year end March 2016; Over 26,000 passengers registered to use service; 56% had used the service in this financial year. Since 2016 regular bookings have been replaced by first come first served basis quota. (Transport for Greater Manchester 2016a, p.5)

Manchester, UK: Local Link Service: Local Link is a flexible (bookable) public transport service for local journeys, connecting to a range of transport providers. Local Link journeys can be made by shared minibuses from and to anywhere specified within each individual service area. Local link is available to registered users (Transport for Greater Manchester 2015, p3)

Leicestershire, UK – Demand Responsive Transport: Services needs to be pre-booked by phone between one week until one day before the journey takes place and fares are the same as in buses. Passengers are collected and dropped-off at agreed points. Timetables and destinations are determined (e.g. to a health or shopping centre) and based on the demand of the area in question. A more flexible mode of transport is the “Social Car Scheme” tailored towards the needs of individuals in comparison to the Community Bus as the journeys don’t follow a specific timetable but times and destinations are personally agreed (Hilbert et al. 2014, p.58)

The services advertised on the Choose How You Move website combine Community Transport, demand responsive transport and Social Car Schemes. The following demand responsive schemes are or have been in operation:

Central Leicestershire Dial-a-ride: Five dial-a-ride services are running once or twice a week in Leicester. The service is mostly provided by voluntary sector partners. It includes social car schemes and community bus services (accessible mini buses with passenger lifts, for wheelchair users) for users with mobility problems. Fares are comparable with bus fares for similar journey. Bus passes can be used (http://choosehowyoumove.co.uk/wp-content/uploads/2014/06/area_1-3.pdf)

Demand responsive transport across Leicestershire: Comprise over 30 pre-booked taxi or minibus services, which run once or twice weekly connecting villages and towns charging similar fare to a scheduled bus service. Journey planer app can be used on the website <http://www.choosehowyoumove.co.uk/everyday/public-transport/>

Rural demand responsive transport (DRT): (Ceased in May 2015)
Connected rural areas to local towns and villages; booked up to an hour before departure subject to availability; comprised over 30 DRT services across Leicestershire; cost similar fare to a scheduled service; Responded to demand (only run when needed; more runs in high demand days); was a service to local facilities, health centres, shopping centre and market in nearby towns and villages.

Travel information services are available through www.choosehowyoumove.co.uk. This is a partnership project between Leicester City Council and Leicestershire County Council, and funded by the Department for Transport. The website is a one-stop shop for travel information in Leicester & Leicestershire. It offers integrated system of travel information, including for public and community transport in Leicestershire (timetable; fares; journey maps), with links to booking information, and journey planning app for users to consider the different travel options available to them. Services are bookable via the phone.

Glasgow, UK – Buses and smart ticketing: MyBus is a bookable bus service offering door to door transport in local areas. There are five local service areas within Glasgow that cover the whole city. All vehicles are low-floor and wheelchair friendly and drivers are trained to assist passengers on and off the vehicle if required. Includes area specific phone lines or alternatively users can use an online booking facility (p.37). Will develop a smart and integrated ticketing product which will allow travel on subway, bus, rail and ferry. Easy to purchase and use, provides more affordable access to the entire public transport network and reduces the complexity currently associated with multi-operator journeys (p.9) (Glasgow City Council 2016)

Strathclyde, UK - MyBus: Strathclyde Partnership for Transport (SPT) operate [MyBus](#) as part of a number of demand responsive transport (DRT) services. MyBus is one of several community transport projects in the West of Scotland Community Transport Network partnership between SPT and Community Transport Operators throughout the west of Scotland. Mybus is

a bookable door to door service. It can be booked online or via the phone. It facilitates approximately 500,000 passenger journeys per annum for shopping, GP appointments, visiting friends, attending clubs and more. Mybus web allows bookings 24hours a day and functions on real time information. SPT contact centre is currently using *trapeze* software to optimise service operation.

<http://swestrans.org.uk/CHttpHandler.ashx?id=18375&p=0>



Figure 14: MyBus

Strathclyde, UK – integrated Transport Hub: Strathclyde Partnership for Transport is also leading an Integrated Transport Hub with key partners in the delivery of health and social care transport. This will move the situation from what is outlined in figure 15, to the future plan shown in figure 16.

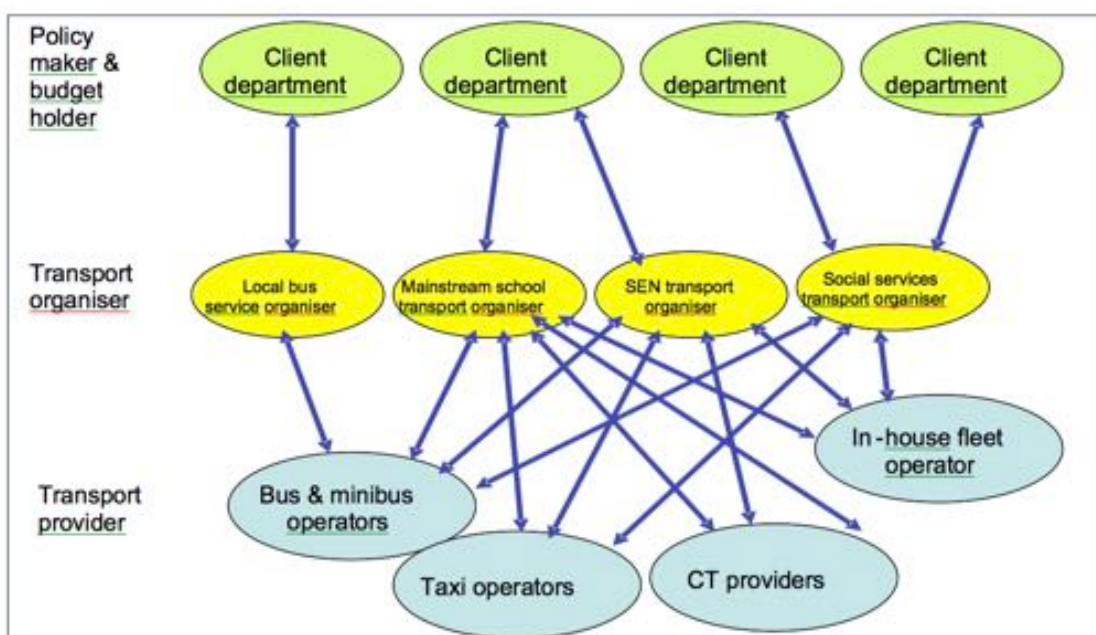


Figure 15: Transport coordination now

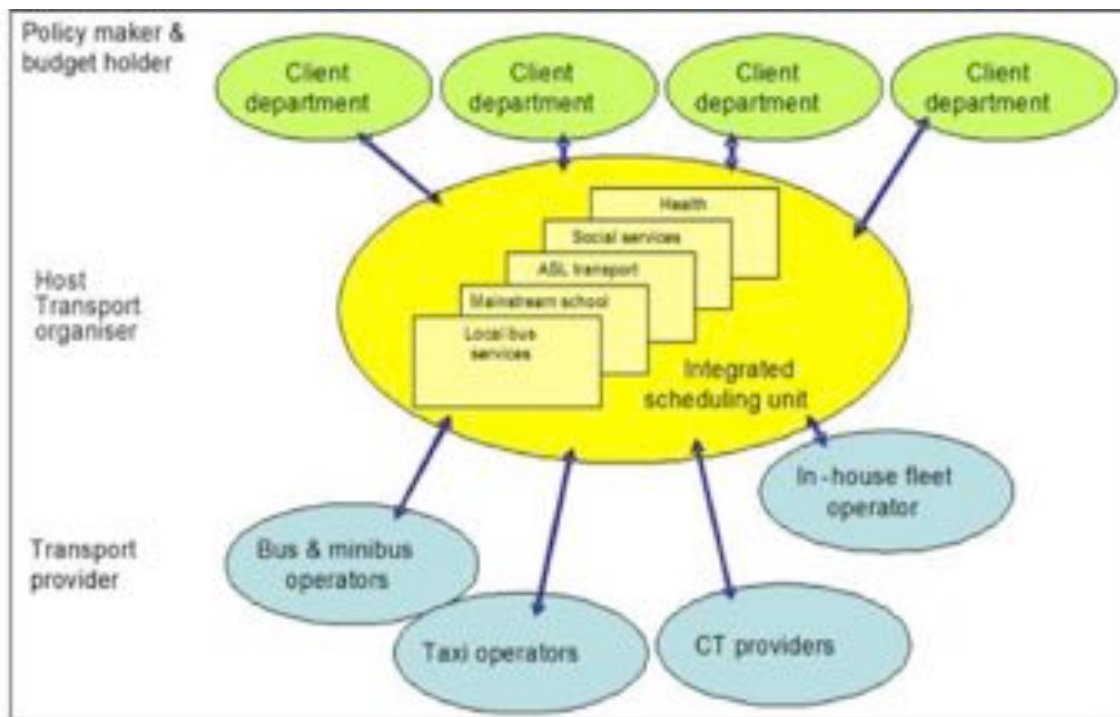


Figure 16: Hub vision

The aim of the hub is to ‘Develop a single point of contact for booking and scheduling health and social care transport for patient/service users, making use of SPT’s contact centre’ (Dunn 2016). The Integrated Transport Hub initiative can be used for a better co-ordination, scheduling and planning of all health and social care transport services through a single point of booking and scheduling facility.

Hybrid ‘Smart Technologies’

The third category is about Hybrid ‘Smart Technologies’. For example Bristol [open street map](#) and Sehr-mobil platform in Germany. Current initiatives include:

Siegen, Germany: [Sehr-mobil](#). Intergenerational platform: This application was designed as an age-friendly and intergenerational platform, using technological and organisational/social networked structures and instruments to improve the mobility options in old age. The platform combines: Travel information of different providers (public transport, patient transport ambulance and taxi) including walking, private carpooling and an event calendar with regional events. When using the function of travel information the passenger will be navigated from the current position to the pick-up-point and from the drop-off-point to the destination.

Older people were consulted in the design of the service. *Personalised* service option: Possible to set up a profile with personal information like residence or interests. The profiles help to know more about the person who offers a ride or that travels with the driver. By this means the social relationships of (older) people and the support of each other is promoted (Hilbert et al. 2014, p.69); <http://sehr-mobil.wineme.fb5.uni-siegen.de/>

SehrMobil platform offers a variety of age-friendly mobility options and also provides information about events and connects people. Its target group is older persons, disabled persons, persons that live in rural areas, persons that have no transportation alternatives. Its development was led by Universitätsstadt Siegen and funded by German Federal Ministry of Education and Research (BMBF)

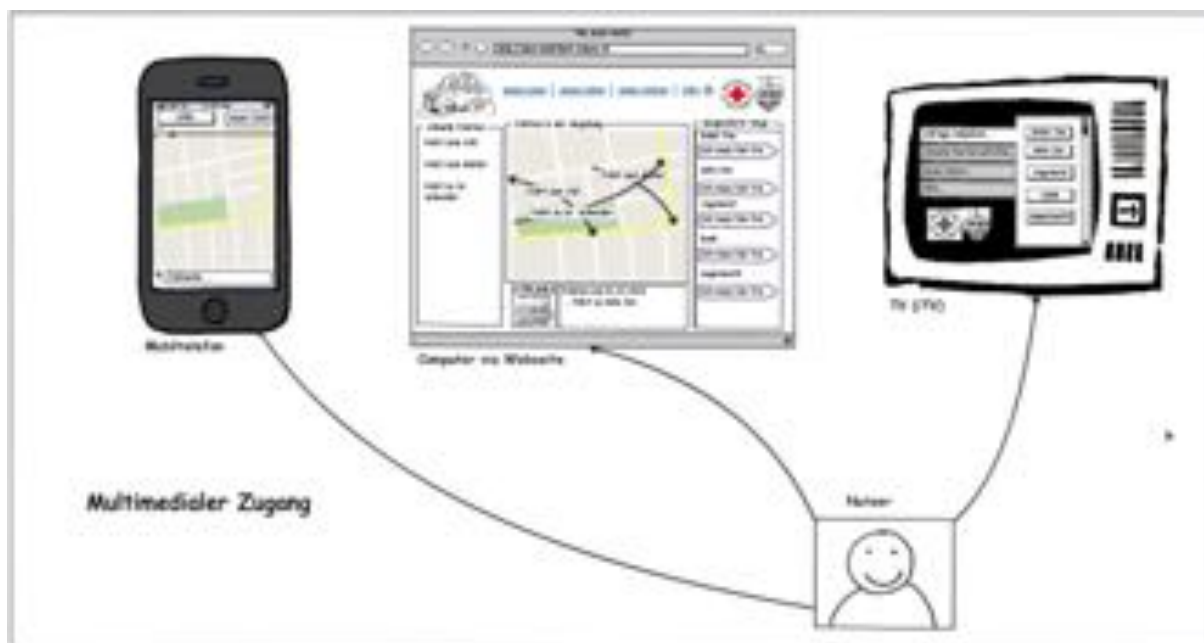


Figure 17: SehrMobil: access across different platforms

The platform integrates three services: *Travel information* of different providers (public transport, patient transport ambulance and taxi) including walking, *private carpooling* and an *event calendar* providing up to date information about local social activities – so that users know options available to them, time and distance and ways of getting there. The platform facilitates *social interaction* through user profiles: If registering with the platform users can set up a profile with personal information like residence or interests. The profiles help to know more about the person who offers a ride or that travels with the driver. By this means the social relationships of (older) people and the support of each other is promoted. It can be used on the web via PC or mobile and via digital interactive TV (DiTV)

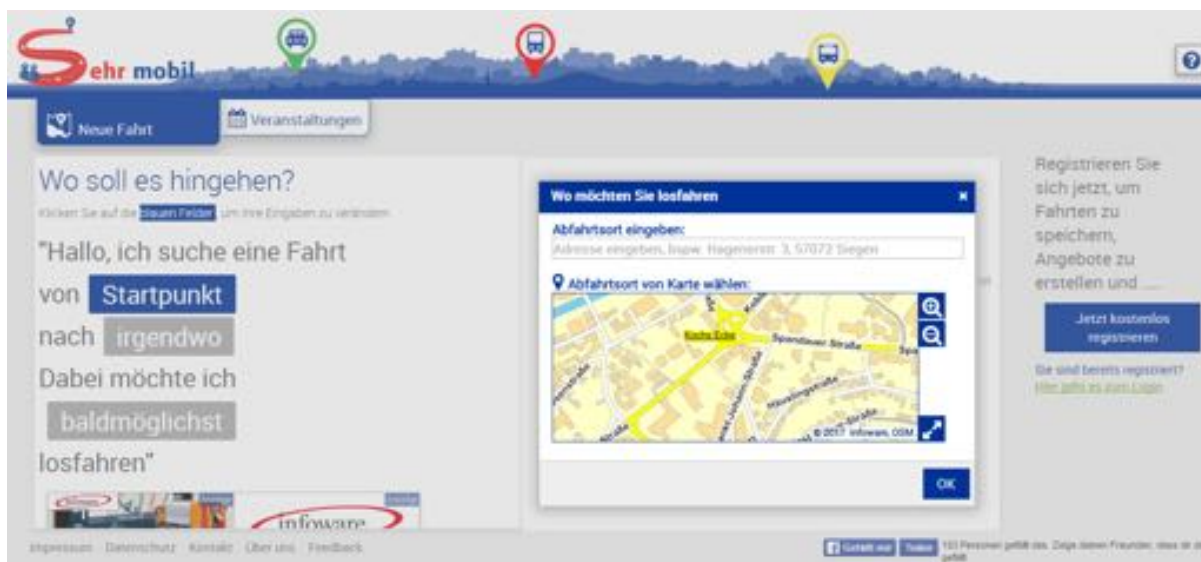


Figure 18: Sehr Mobil Platform

The platform combines a number of good practice areas ICT/intelligent, collaborative, participatory design, has been supported by public funding and is sustainable. Eight institutions were included in its development: German National Association of Senior Citizens, German Red Cross, Institute of Gerontology of Heidelberg University, International Institute for Socio-Information, Infoware GmbH, University of Siegen, City of Siegen and County Siegen-Wittgenstein. The platform was closely developed with 20 older future users (average age 70) inexperienced with modern technology (Hilbert, Heinze, Naegle, Howe, Enste, Merkel, Ruddat, Hoose, and Linnenschmidt 2014) <http://mopact.group.shef.ac.uk/wp-content/uploads/2013/10/D7.3-Built-tech-env-3-Case-study-Hand-outs.pdf> The system enables cross generational interaction by establishing a community of older and younger generations. The project is a free-of-charge and cost of maintenance is relatively low allowing for sustainability.

The implementation of the full functions (including taxi and the additional services such as event calendar and private carpooling) in a bigger area is planned for the near future. The rollout on a national basis is supported by the German National Association of Senior Citizens' Organisations (BAGSO, DRK). By 2015 250 users were registered. A smart phone capable app was planned for release by March 2015. With budget cuts introduced in 2014 Siegen managed to implement the platform and find a provider (German Red Cross) to fund and coordinate the service also after the project ends. This allows a long-term perspective that is needed to fully implement the service for the whole region and beyond. We could not find data on the use of personal information in the social, intergeneration platform application

that was designed to capture use patterns and cost value while also promoting social inclusion.

Other 'Smart Technologies'

The fourth category is about Other 'Smart Technologies' in terms of mobility travel tools. For example smart card payment schemes to book transport, or to signal the bus driver (Edmonton Canada 'Bus Hailer Kit'; New York, US Taxi Smart Card Programme). Current initiatives include:

- Edmonton, Canada: Customer Communication Cards to help passengers communicate their trip needs to their bus driver. Customer Communication Cards designed for people who have difficulty verbally expressing their transit trip needs because of a cognitive or physical disability. There are a variety of different messages available, which help clarify the customer's travel request and communicate their disability in a discreet way to the ETS operator. The Helping Hands Scheme in Brighton & Hove is similar.
- Edmonton, Canada: 'Bus Hailer Kit' for customers with visual or cognitive disabilities. The plastic sleeve holds three numbers on each side. Showing the hailer kit at shoulder height as the bus pulls into the stop tells the Operator what route number you want. Each numerical card has the Braille equivalent of that number in the corner (City of Edmonton 2016)
- New York, US: Taxi Smart Card Programme (discontinued June 2015)
The Taxi Smart Card Program provides an alternative to Access-A-Ride for older and disabled residents of Canarsie/Flatlands or Astoria who were unable to use public transportation. The program provided a pre-loaded \$100 "debit card" to be used in taxi cabs and livery cabs. Out of pocket cost for enrollees is \$12.50 and the program contributes \$87.50, and the card can be reloaded four more times at a cost of \$12.50 for each reload, saving participants \$437.50 in travel expenses (Nyc 2013, p.27)

Infrastructure/Built Environment

The fifth of the seven categories is Infrastructure/Built Environment. This includes streets, pedestrian crossing timings, lighting and bus shelters.

Current initiatives include:

Sheffield, UK: Lights: Replacing the street lights with state of the art Light Emitting Diode (LED) technology. LEDs provide brighter 'white light' to

improve visibility and safety as well as being energy efficient (JGCE575T and Dell 2016). This is also happening in Brighton & Hove.

Newcastle, UK: Bench: A Bench design prototype with features that make it suitable for use by older people. The height of the seat, the angle of the seat back and the arm rests have been designed with older users in mind. In addition, there is a groove to hold a walking stick, hooks for shopping bags and space for cups (Ions 2014, p.9). This project was designed in collaboration with Voice North, Newcastle University Institute for Ageing, architects and estate planners. The seat was designed with older adults in mind and is all-age appropriate.

A prototype can be seen at Biomedical Research Building, Campus for Ageing and Vitality, Nuns Moor Road, Newcastle upon Tyne NE4 5PL



Figure 19: Bench project in Newcastle. Source (Ions 2014)

The bench has not yet been implemented. The prototype exists but is still in at the stage of pre-production. NUI are in current negotiations with manufacturers for potential partnerships to implement production. (G Armitage, Newcastle University Institute for Ageing, 28 January 2017).

New York, US: Safe Streets for Seniors: Typical improvements include extending pedestrian crossing times at crosswalks, adding countdown clocks, altering curbs and sidewalks, restricting vehicle turns, and narrowing roadways (Nyc 2013, p.4).

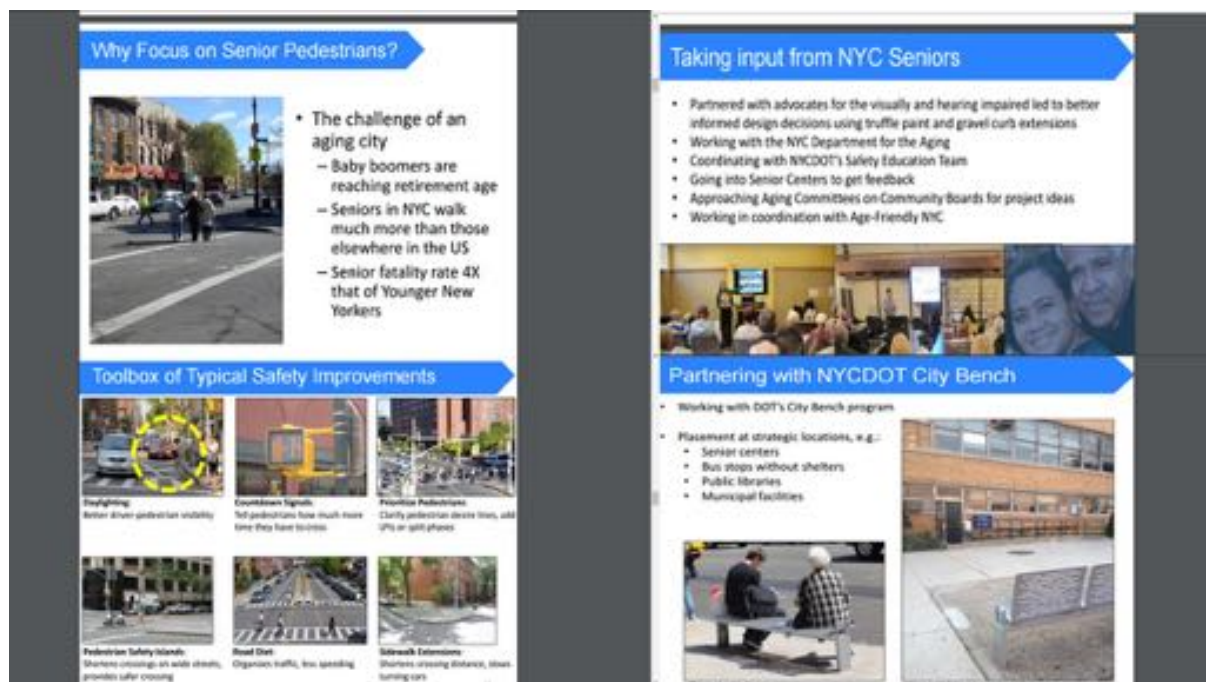


Figure 20: Safe Streets for Seniors. SOURCE: New York City department of transportation <http://www.nyc.gov/html/dot/downloads/pdf/safestreetsforseniors.pdf>

Traffic fatalities and injuries do not impact all people equally; certain demographic groups are threatened more by road safety problems than others, requiring solutions tailored to reach and protect specific populations. In 2008 older adults were 12% of NYC's population but accounted for 38% of fatalities. (New York City Department of Transportation 2010).

The areas covered in the programme have been identified using a combination of data based on the density of senior pedestrian (age 65+) crashes resulting in fatalities or severe injuries in a five-year period and variables such as senior trip generators, concentrations of senior centres, and senior housing locations. The department of transport evaluates pedestrian conditions in these neighbourhoods from a senior's perspective and implements safety improvements, such as extending pedestrian crossing times at crosswalks to accommodate slower walking speeds, constructing pedestrian safety islands, widening curbs and medians, narrowing roadways, and installing new stop controls and signals.

<http://www.nyc.gov/html/dot/html/pedestrians/safeseniors.shtml>

Since the program of implementing safety improvements for seniors began in 2008, senior pedestrian fatalities had decreased by 21% citywide (Nyc 2013)

Adaptable and Flexible Service

The sixth category is Adaptable and Flexible Service. This includes demand responsive routes with real-time booking and the sharing/reuse of bus fleet.

Schemes and initiatives include:

- Helsinki, Finland: 'Callplus' service [*Kutsuplus.fi*](#) (discontinued, see above)
- New York, US: [*Market Ride*](#) (now discontinued) used school buses during off hours to take seniors from senior centres to supermarkets and farmers' markets that have a greater array of fruits and vegetables than their smaller, neighbourhood stores. School buses are also used to take senior centre members to recreational facilities, museums, Broadway shows, and other venues (Nyc 2013, p.4)

Human Factors/Behaviours

The seventh and final category is Human Factors/Behaviours, relating to customer awareness e.g. bus driver training of the mobility needs of older adults or people with dementia Examples include:

- Belfast, Ireland: Translink (Metro/Buses/Trains) Over 2000 drivers are trained in dementia awareness as well as training to meet the needs of older people (Belfast Strategic Partnership 2016). Brighton & Hove Buses aim to increase the training of their drivers on this.
- Glasgow, Scotland: The Thistle Assistance Card indicates to the bus driver that extra help may be required during a journey. A number of public transport companies, including First, Stagecoach and SPT use journey assistance cards, specifically designed for customers who may need some extra help with their journey. This can include needing more time to reach your seat or the driver letting you know when you have reached your stop. These cards can be shown to the driver in a private and discrete way (Glasgow City Council 2016 p.36). The Helping Hand and the Carers Card are similar schemes in Brighton & Hove.

Design and roll out of the Thistle Assistance Card



Figure 21: Thistle Assistance Card.

The *Thistle* Assistance card was a nationally funded card that had been demised and redesigned in 2011 by Scotland's Regional, South East Transport Partnerships SEStran. SPT decided to roll out the design acknowledging that 26% of people in Strathclyde have some form of mobility issue. *Thistle* Card makes use of public transport easier for older people or those with disabilities or illness. The scheme is supported by a wide variety of voluntary organisations in and around Scotland and by most bus operators, comes with interactive editable stickers and free text fields, which advise the driver of your needs and the help you need in an easy-to-read format. The card is available through bus companies, libraries, health centres and on request. There are no eligibility requirements, which minimises the cost of administration. Since its launch in 2011 45,000 cards have been distributed.

SEStrans Equality Forum initiated the need and helped with the design along with bus companies. Other groups involved in the design stage were; Enable Scotland, Glasgow Disability Alliance, Scottish Accessible Transport, Mobility and Access Committee for Scotland. Other regional transport partnerships – Hitrans and Tactran have followed this success and now distribute the card (Source: email correspondence with L. Freeman, Project Officer, SEStran – South East Scotland Transport Partnership; G.Dunn Transport Development Officer, SPT Strathclyde Partnership for Transport) SEStran provide the design elements to those wanting to produce a similar card. The design standard means that it can be expected that public transport drivers will recognise the card and symbol at a glance <http://www.sestran.gov.uk/info/thistle-card/> (South East of Scotland Transport Partnership 2017)



Figure 22: Thistle Assistance card app

SEStran have developed an App version of the card to provide greater flexibility. Launched in 2017.

Findings – Evaluating Case Studies

To evaluate the transport solutions we report in this study we have been drawing on the WHO Age Friendly City assessment tools as combined in the European Innovation Partnership on Active & Healthy Ageing compilation of good practices in innovation for age-friendly buildings, cities and environments (EIP on AHA, 2013). Four main areas of good practice were found to best describe the reported studies:

Implement policies through collaborative and inclusive practice

- Starting from concrete local initiatives, and incorporating collaboration, respect and social inclusion, with older people regularly consulted by public, voluntary and commercial services on how to serve them better: Partners bring together their experiences in order to learn from each other and promote a better older people environment, multi stakeholders approach, new practices. (EIP on AHA, 2013)

Inclusive ICT and smart environment

- Promote ICT products and services adapted to older people's needs; promote better access to urban services, higher autonomy and home services (EIP on AHA, 2013)

Promote outdoor safety

- Pedestrian crossings are sufficient in number and safe for people with different levels and types of disability, with nonslip markings, visual and audio cues and adequate crossing times; sufficient, well maintained and safe outdoor seating. (WHO Age Friendly Cities Checklist)

Promote accessible transport

- Areas and services are accessible by public transport, with good connections and well-marked routes and vehicle; Drivers stop at designated stops and beside the curb to facilitate boarding and wait for passengers to be seated before driving off; Complete and accessible information is provided to users about routes, schedules and special needs facilities; Driver education and refresher courses are promoted for all drivers (WHO Age Friendly Cities Checklist)

The table below applies the good practice criteria on the selected case studies reported in this chapter.

	Leicestershire DRT & Dial-ride	MyBus	Manchester Ring Ride	Aus Flexible Route Bus	Siegen Sehr Mobil	NYC Safe Streets	Bench Design	Thistle Assist Card & App	Traveline Scot App
Collaborative, inclusive policy & practice		✓			✓	✓	✓	✓	✓
ICT / Smart Environment	✓	✓			✓			✓	✓
Outdoor Safety						✓	✓		
Accessibility	✓	✓	✓		✓			✓	✓

Figure 23: Good practice indicators in selected demand-responsive case studies

Conclusion

The reviewed case studies highlight how different aspects of built and technological environments (digital, ICT-based services) are closely linked to each other and work together, as do major programmes into innovation, active ageing and digital inclusion. The reviewed case studies also highlight the need to integrate peers (service users) into the design of innovative and sustainable solutions, the importance of cooperation of multiple stakeholders as well as the question of public funding and funding cuts.

Funding cuts and sustainability are a major area of challenge in inclusive transport and demand responsive transport (DRT). Spending allocations

since 2011 have posed significant challenges to the established ways of doing things.

New technologies and new business models are an area of opportunity. Introduction of new technologies to assist in running services and improving access to services and service information, allowing for better choice of travel options, were both identified as an area of good practice in our study and highlighted as an area with scope for provision by WP1.

Against the backdrop of an ageing population, increasing demand, and shrinking public funding redesign of both acute and primary care services our reviewed case studies point at opportunities in the combination of new technologies and innovative business models to promote inclusive demand responsive transport (DRT) with a social element (Siegen) and to improve access to health and social care transport services (Strathclyde).

The importance of information and communication to social inclusion was consistently mentioned in research on inclusive cities: “[T]he regular provision of information about local social activities is felt to be essential in order to reach out to isolated older people. Many of the voluntary and public sector service providers feel that relatively isolated older people may require greater incentives and encouragement to get involved.” (Briggs and Tinker, 2007:17). Transport, to services, for leisure, to meet others, is not an exception to this. A multi-method/multi-media approach to travel information provision, combining print (leaflet and posters and places/sites to display these e.g. community centres, local surgeries) and digital (visual/voice/audio) is therefore important.

Travel buddies can be ‘proxy’ users of digital technologies for those people who are unable to access transport and/or digital ICT capability at home or via a mobile device. Travel buddies can therefore be an example of combination of transportation and community development and/or engagement perspective (See WP4).

The schemes presented above address different aspects of inclusive public and community transport, addressing wider societal challenges such as loneliness and isolation, civic participation, connectivity and health and well-being in relation to mobility and the physical-environmental context (see also Briggs and Tinker, 2007 Tinker and Ginn, 2014, Ormerod et al 2015: 5) Our findings mirror a number of age-friendly, inclusive transport attributes as listed in WHO age-friendly cities programme (Briggs and

Tinker, 2007) and the EC Age Friendly environment programme (EIP on AHA). ICT-based transport solutions that are accessible, affordable and sustainable; collaborative working and the involvement of peers (/users) in service design; the centrality of behavioural factors and of information provision have been highlighted by research and user evaluation alike (e.g. Tinker and Ginn, 2007:17; 2015; Briggs and Tinker, 2007:15). Inclusive transport is key to having inclusive, all age friendly environments and cities because it enables people of all ages to get out, engage and socialise, and to access vital services (Facer, Horner and Manchester 2016).

Key Points

- Reflecting policy agendas (e.g. WHO Active Ageing; EC Silver Economy) transport has been a lesser focus compared to health-care related innovation. A number of smart transport pilots have been introduced over the past five years or so, many as part of EU-funded programmes on Active Ageing and Age Friendly cities (e.g. EIP on AHA, 2015).
- Age-inclusive transport solutions comprise a range of hybrid intelligent transport initiatives such as Siegen's Sehr-Mobil (Germany, ongoing), demand responsive pilots such as Kutsuplus (Helsinki, Finland, 2012-2015 a fully automated, real-time demand-responsive public transport service) and dial-a-ride services (UK, various cities).
- Financial sustainability of inclusive demand responsive schemes has been a problem due to shrinking public funding and a lack of a market-driven way to fund services. Changes in public spending allocations for transport infrastructure have led to discontinuation of schemes and reduction in service capacity.
- Partnership working, innovative business models and use of technology to coordinate service provision, including booking and scheduling improves sustainability of demand responsive transport (DRT) schemes.
- User evaluation as well as research into inclusive cities, transport, and digital inclusion have highlighted the importance of information provision and exchange – from capturing information about user needs through peer involvement in the design of transport solutions, to providing information about the running and use of a service, improving its reliability and helping users make informed choices about travel. Introduction of new, digital technologies to assist the running of services

and for increasing co-ordination between providers is therefore a significant area of opportunity.

- Intelligent city transport services such as journey planner websites, mobile apps and visual & audio displays on bus stops and in buses, improve the accessibility of transport to users who may access these services either directly on a self-service basis or through travel buddies.
- Our study identified seven categories of case studies: journey-planning smart technologies, demand-responsive smart technologies, hybrid smart technologies, other smart technologies, infrastructure/built environment, adaptable/flexible services, human factors/behaviours. Examples/case studies of these seven categories were reviewed.
- Our study used the following good practice indicators, combining instruments proposed by the WHO Age friendly cities and the European Innovation Partnership on Active & Healthy Ageing, to review and evaluate selected case studies: Design and implement policies through collaborative and inclusive practice; promote inclusive ICT and 'smart' environment; promote outdoor safety; promote accessible transport.
- 12 case studies (selected from a larger pool of example by the project stakeholders at BHCC and BHCCG) showcase good practice from around the world

WP 4: Case Studies of Social Isolation

Prof Jörg Huber
Professor of Health Sciences, University of Brighton

Researcher
Martina Gregory

Introduction

This work package aimed to (a) carry out a rapid review of literature on isolation and loneliness in relation to health and access to healthcare, (b) work with a local focus on Hangleton and Knoll as an illustration ('case study') of some of the issues identified in the review and (c) in order to achieve this, provide background information on Hangleton as the geographical area with the greater need, but also Knoll; issues of mobility, transport and access to health services will highlighted.

As part of reporting on WP4 we provide an introduction to issues around the needs of socially isolated individuals and groups. We shall then focus on Hangleton and Knoll as a locality of interest to BHCC which has received less attention compared to, for example, areas in the east of the City. Fuller details in relation to the choice of locality and the shift of focus of this WP as it progressed, will be provided below.

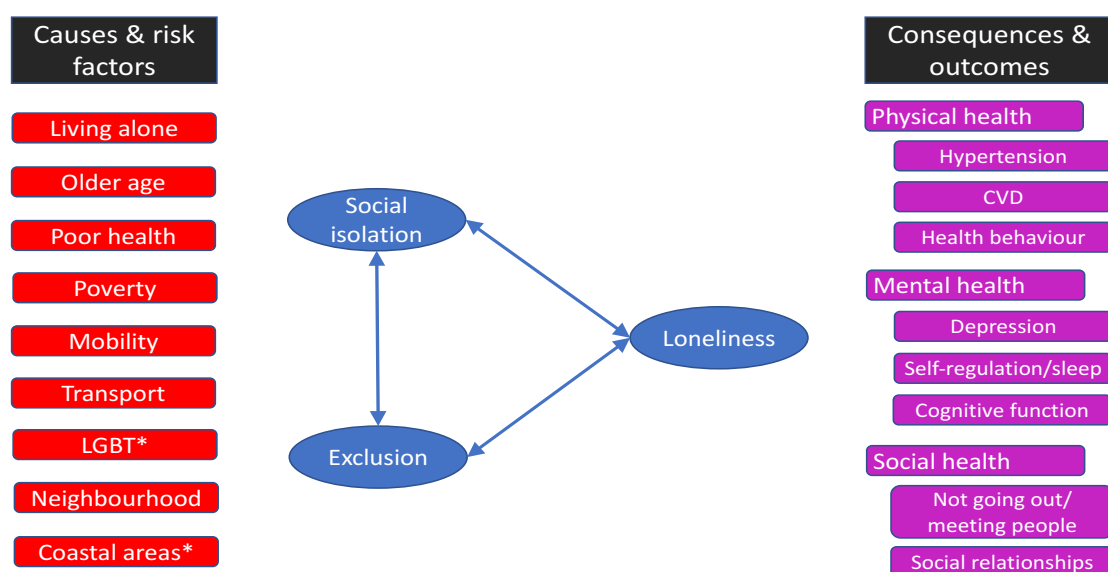
On social isolation

Social isolation, the lack of social contact or support, needs to be distinguished from loneliness, the feeling of being alone or isolated (e.g. York Centre for Reviews and Dissemination, 2014). A recent review by the Centre for Policy on Aging (CPA) further distinguished between social loneliness, ie limited and poor quality contacts, and emotional loneliness, ie lacking a confidante or best friend; living alone should not be equated with loneliness (CPA, 2014). Finally, social exclusion includes social isolation, but occurs for reasons beyond the control of the person (Barry, 1998). The following brief overview will focus on isolation and loneliness.

Assessment of social isolation and loneliness

While social isolation and loneliness are considered separate and distinct concepts, closer scrutiny of definitions and attempts at measuring isolation and loneliness shows that the concepts are likely to overlap and similarly, assessment tools are overlapping. An example of a UK study, successfully separating out the concepts and their measurements has been secondary analysis of the English Longitudinal Study of Aging (ELSA) (Steptoe et al, 2013) which assessed isolation through contacts and their frequency

(Shankar et al, 2011), while loneliness was assessed with a standardised questionnaire, the UCLA loneliness scale (Hughes et al, 2004). Currently research, more psychologically oriented than earlier more sociologically informed studies, tends to focus on loneliness, possibly because it is easier to assess using brief questionnaires. A provisional logic model on social exclusion, social isolation and loneliness can be found in figure 24; the model reflects the multitude of risk factors and causes, the complex relationships between exclusion, isolation and loneliness, and their large number of consequences and outcomes which can further increase exclusion, isolation and loneliness, possibly creating a ‘downward’ spiral.



Provisional logic model on exclusion, social isolation and loneliness. Note that (i) exclusion, isolation and loneliness are strongly associated, (ii) consequences and outcomes can also be risk factors for exclusion, isolation and loneliness, and (iii) the logic model highlights some of the factors and relationships, without claims (i) for completeness of all factors, and (ii) all aspects/links being fully supported by high quality research evidence.
*Factors with limited evidence, but of importance to Brighton & Hove.

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Figure 24: Provisional logic model on exclusion, social isolation and loneliness. Source: Jörg Huber.

Prevalence of isolation and loneliness

Older persons are particularly at risk of isolation and loneliness (Courtin and Knapp, 2015), but other disadvantaged or vulnerable persons are also at increased risk. For the purposes of this brief overview, the figures from the ELSA study are perhaps the best ones available: 7% reach the maximum isolation score, and 2% feel lonely all the time (Shankar et al, 2011).

Feelings of loneliness, ranging from more moderate to extreme levels, are however much more common in some groups which include the young and the old, and ethnic minorities. Figures of up to 50% have been reported

(Ubedo, 2014). A strong social gradient, with more disadvantaged and vulnerable groups experiencing more isolation and loneliness, has been observed (Shankar et al, 2011; Steptoe et al, 2013; Barnes et al, 2012). Finally, it is important to note that isolation and loneliness are frequently nuanced and not stable characteristics; persons may feel isolated or detached in some domains of life, but not others, and can move in and out of isolation and loneliness as ELSA has shown (Barnes et al, 2012). In England isolation and loneliness have been widely recognised over recent years. The Campaign to End Loneliness (CEL) was founded in 2011 and has a dedicated website; Age UK, the Department of Health and NICE all have produced documents and guidance on isolation and loneliness.

Social Change, Risk Factors, Causes and Consequences

The number of people, in particular older adults, living alone has increased substantially over the past decades, and is considered to be a contributory factor to social isolation and loneliness (Courtin and Knapp, 2015). Urban and rural living create different challenges, but the picture is complex. The main risk factors for isolation and loneliness are old age and living alone; the latter is more common in rural and coastal regions (Hart, 2016). Being poor, living in a poor neighbourhood and being in poor health increases the risks of loneliness (Davidson and Rossall, 2014).

Both social isolation and loneliness are linked to poorer physical health and mortality; an issue of particular interest is whether the experience of loneliness links social isolation to poor health outcomes or whether the effects are independent. For England, the ELSA study probably provides the highest quality data, coming from a representative sample of older Adults living in England (see <http://www.elsa-project.ac.uk>). Isolation and loneliness are independently associated with poorer health behaviour including low levels of physical activity and smoking. Isolation, additionally, is linked to a poorer biomedical health profile including higher blood pressure (Shankar et al, 2011). Similarly, isolation and loneliness increase mortality risk, but it is only isolation which after statistical adjustments remains an independent risk factor. For loneliness the effect on mortality may be mediated via health impairing behaviours (Steptoe et al, 2013). This implies that isolation and loneliness are closely linked to poorer health and mortality, but a full understanding of the links and mechanisms will require publication of findings related to very recent data collection waves of the ELSA panel study and confirmation by other studies.

Health, Age and Transport

Poor health is strongly associated with reduced participation in eg leisure and cultural activities, but is only weakly associated with the extent of social networks (Barnes et al, 2012). Older age is associated with less involvement in leisure and cultural activities, but has a lesser impact on engagement with social networks. Lacking access to private or public transport is closely associated with detachment from engagement with cultural and leisure activities. Barnes et al (2012) suggest that focusing on “poorer, less healthy older people with little access to transport” is likely to have a strong effect on reducing isolation. Reports on the ELSA study repeatedly emphasize the importance of transport, particularly for frail older people (Wave 6, Matthews et al, 2014). A very recent case study on loneliness and community transport, taking an end-user perspective and providing an econometric analysis, argues strongly for the need for community transport to reduce loneliness (ECT, 2016).

To conclude this overview: isolation and loneliness can be a consequence of vulnerabilities and poor health, but the reverse is also possible. Seminal studies carried out in England showed that the consequences of isolation and loneliness may be different. Central to the project is the finding that transport, private and public, plays an important role in participation in leisure and cultural activities (the reverse of isolation), but it is unclear whether this is as important in relation to health care (access to health services, selfcare).

Methods & Materials

A rapid document review was followed by an interlaced process of -

- tours on foot and by bike of Hangleton and to a lesser extent Knoll, accompanied by some GPS tracking, note and photo taking;
- conversations and enquiries with key informants; these included Claire Hopkins and Nick Goslett from the Hangleton & Knoll project, Jacqueline Reyher from a befriending group (*time to talk befriending* at <http://www.timetotalkbefriending.org.uk>) and a number of other people with local expertise including Kaye Duerdoth and Simon Hicknott;
- attendance of local meetings (e.g. 50+ event at St Richards Church and Community Centre at Knoll, Brighton, facilitated by the Hangleton &

Knoll Project; Hangleton and Knoll 50+ Steering Group), leading to informal conversations with local residents;

- A topic guide (see Appendix) was developed to cover relevant themes and issues: primary care services, issues for service users/residents, transport and technology solutions to improve access to health services and/or reduce isolation and loneliness.

It was hoped that the review and contacts would produce information at a fairly high level of granularity of information, particularly in relation to the number or percentage of vulnerable and frail older people, what their vulnerabilities and challenges are and where they reside.

In response to shifts in needs and interest of the project stakeholders, the aims and tasks of WP4 were revised.

Data were drawn from a range of reports and websites (all cited in footnotes). Most data came from the City Council's websites including Brighton & Hove CONNECTED (<http://www.bhconnected.org.uk/>). DataShine (developed by UCL on the basis of census data; <http://datashine.org.uk/>) provides higher resolution area data which was used to develop further insight e.g. in residency of very old people.

Findings

Hangleton and Knoll – the local focus

Extensive discussions with council staff, a Brighton & Hove City councillor and data available (Community Insights Team) helped to narrow down the areas for closer study by the project: Bevendean, Whitehawk and Hangleton and Knoll, and Portslade North. Bevendean and Whitehawk were excluded based on intelligence provided by our informants that these areas had seen considerable work to improve neighbourhoods; we received similar advice re Portslade South and North. The east side of Brighton around Lewes Road for example benefited from an improvement scheme in 2012 -2014.

Improvements included additional bus stops as well as pedestrian and cycle crossings. Further developments include the Coombe Road area (Brighton and Hove City Council, 2016) which is shaped by hills and known for its weak transport connection (Ward et al., 2012). Also the seafront area, where transport connection is inadequate is subject of future improvements (Brighton and Hove Seafront CCT, n.d.).

In contrast, Hangleton and Knoll (see Fig 1 and 2) has not received as much focus. The areas also include locations with steep hills and poor public transport access. Previous research conducted by the University of Brighton identified the 'physical landscape with its steep hills' as tricky for people to get around and as a contributing factor to social isolation (Ward et al. 2012). This, and the fact that Hangleton and Knoll is one of the more deprived neighbourhoods in Brighton & Hove was decisive in choosing Hangleton and Knoll as the areas of focus for this report. The changes to GP practices in these areas also contributed to this decision.

The primary concern of the work presented here, as already indicated, is with older and frail people who are frequently challenged by multiple issues (intersecting characteristics). However, information available on key websites including Community Insight Brighton & Hove and DataShine tends to provide data regarding one characteristic, but does not allow to explore intersecting characteristics such as age, gender and limitations of activities of daily living.

Hangleton and Knoll – Demographics and topography

The Hangleton and Knoll area has a population of 14,880 people, of which 2,745 or 18.5% are aged 65 or above (England 17.7%) (Estimates based on mid-year ONS 2015; OCSI, 2017⁴). In comparison, Brighton and Hove in total has 13% in this older age group. The Joint Strategic Needs Assessment (Brighton and Hove JSNA, 2016⁵) identified Hangleton and Knoll as one of the wards with the highest number of 65 plus year old adults (19%; joint 3rd position Patcham and after Rottingdean and Woodingdean.

⁴ Community Insight Brighton & Hove; Accessed 24/02/2017

⁵ Draft JSNA at <http://www.bhconnected.org.uk/content/jsna-update-page>; accessed 17/05/2017



Figure 25: Wards of Brighton and Hove, with Hangleton and Knoll highlighted

Source: https://en.wikipedia.org/wiki/Brighton_and_Hove_City_Council_election,_2015#/media/File:BHward16-Hangleton_and_Knoll.jpg

The DataShine mapping platform (<http://datashine.org.uk>)⁶ provides very detailed information in map form on the basis of the 2011 Census (Office of National Statistics). The database provides an estimated 2.7% of residents of 90 years or older at the top of Hangleton (indicated through red arrow, with Hangleton Valley Drive as one of the main streets) compared to an average of 0.7% across B&H (see figure 27). In addition, this area is also characterized by considerable limitations to day-to-day activities compared to the Brighton & Hove average and the UK as a whole (see figure 26). One of the questions is whether these figures are stable over a number of years; the underlying ONS data is now around 6 years old.

⁶ DataShine describes itself as “an output from an ESRC Future Research Leaders Project entitled “Big Open Data: Mining and Synthesis” (BODMAS). The overall project seeks promote and develop the use of large and open datasets amongst the social science community. A key part of this initiative is the visualisation of these data in new and informative ways to inspire new uses and generate insights.” (Source: <http://blog.datashine.org.uk/about/>; accessed 07/03/2017).



Figure 26: Hangleton and Knoll with darker colours indicative of higher levels of standardised Illness Ratios which implies an excess of activity limitations relative to the national average of 100. The average of B&H is 102, but the area of particular interest in Hangleton (see arrow) is has a very high score of 161. For technical details see: <https://www.ons.gov.uk/methodology/geography/geographicalproducts/areaclassifications>, accessed 07/03/2017.

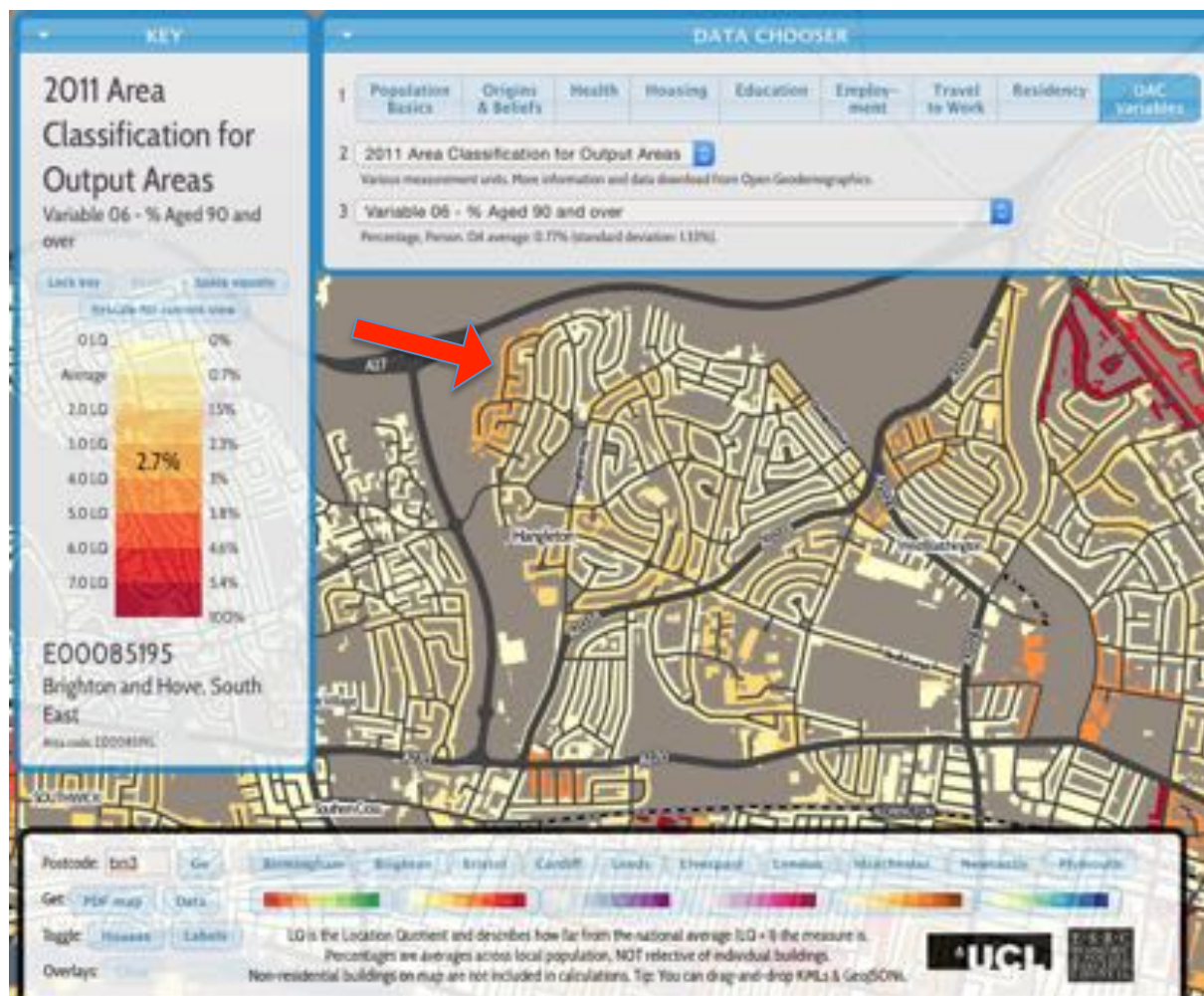


Figure 27: DataShine map Hangleton and Knoll with darker colours indicating larger percentages of very old adults (aged 90 or over).

More generally speaking, Hangleton and Knoll is mostly residential which mainly attracts families and retired couples. Owner occupied (with or without mortgage) residences number 63.4% (3,809; England: 64.1%), but the proportion of socially rented residences is higher – 25.3% (1,519) compared to England with an average of 17.7% (OSCI 2017). The area is characterised by a more stable population compared to England; 9.2% moved home during the last year compared to 12.3%. The number of pensioner households is 1,500 or 25% compared to an English average of 20.7%. Incapacity benefit is claimed by 725 individuals (8% compared to English average of 6%).

The area has an Index of Multiple Deprivation rank of 2,757 (18.6%) which is slightly below the average of England of 20.1%. Health deprivation (assessed through census questions about general health and limitations of

daily activities⁷⁾ affects 4,269 or 28.8% of residents compared to an English average of 19.8%.



Figure 28: Hangleton and Knoll Ward. Source:

<http://www.hangletonandknollcommunity.org.uk/images/map.jpg>, accessed 24/02/2017

The topography of Hangleton provides steep hills with long views to the downs and sea side (Urban Characterisation Study, 2009 (see figure 30). As visible on the map the residential area reaches up the hill to the boarder of the A27 (Worthing to Lewes) (see also figure 27).

Community Centres and Communities

Two community centres serve Hangleton and Knoll; the community centre in Hangleton (<http://hangletoncommunitycentre.org.uk>) provides activities for children and families, whereas St Richards Church & Community Centre in Knoll attracts more older adults and is seen as considerably more active, with more events taking place; the latter is easier to reach, due to its location at the bottom of hill on Egmont Road rather than at the very top of Hangleton for the former.

⁷ See Detailed Analysis of Health Deprivation Divide using the 2011 Census at http://webarchive.nationalarchives.gov.uk/http://www.ons.gov.uk/ons/dcp171776_352724.pdf; assessed 17/05/2017

Following conversations with Hangleton and Knoll project members we can identify a clear distinction between the areas of Hangleton and Knoll. Community activities in particular tend to take place in St. Richards Community centre in Knoll, whereas less activities take place in Hangleton. This is partly due to the geography of the area, with St. Richards being able to attract a wider population. Buses are not able to reach into areas served by long spur roads. The Hangleton community centre is difficult to reach, compared to St. Richards.

GP Practices and Access

Three GP practices served the area, but the GP practice 'Hangleton Manor' has recently permanently closed (July 2016); see map in figure 29 for practices and other facilities. The Burwash Medical Centre and Hove Medical Centre are the remaining practices. Both practices have issues with wheelchair access and car parking. In relation to the closure of Hangleton Manor, the local population was consulted by the Hangleton and Knoll Project⁸. While views of the service provided by the practice were mixed, although many views were positive, amongst respondents, there was concern about access to GP services (Community Works, 2016; Johnson, 2016). This was more pronounced for people without a car, ie those who had transport or mobility issues. Concerns were around affordability of buses and taxis, GPs willingness to do home visits at longer distances, and capacity of the remaining practices.

In response to the closure of the GP practice Hangleton Manor, an on-demand minibus service was set-up, with restrictive availability and limited promotion amongst local residents. Perhaps not surprisingly, take-up of the service was limited and terminated. Staff from Hangleton and Knoll project indicated that residents appear to help themselves by offering or organising shared trips, relying on those who own/drive a car. This suggests considerable community capacity to organise and improvise support. This is of interest given that car ownership in the area is slightly lower compared to the English average – 28.0% of households have no car compared to 25.8% in England (OSCI 2017).

⁸ http://www.hkproject.org.uk/docs/publications/2016_HangletonManorEngagementReport.pdf



Figure 29: Screenshot of Google map, with GP practices including the permanently closed Hangleton Manor Practice (accessed 03/03/2017). Note: Dr Devlin is still listed on google maps, even though this information is now out of date.

Transportation and Facilities, Health and Isolation

There are a few convenience shops spread out across the area. However, a big supermarket with a petrol station (Sainsbury) is situated in the south along the A293, but difficult to access by foot (Urban Characterisation Study, 2009). For further details see figure 30; the Sainsbury supermarket can be found in the bottom circle.



Figure 30: Residential area (Urban Characterisation Study, 2009)

The main bus routes are buses 5, 5A, 5B, and 16, 16A, 66 which serve the area every 20 – 30 minutes. Hangleton Valley, located uphill has the poorest access to public transport, despite a considerable ageing population (Brighton and Hove City Council 2009). Buses are serving only some of the major roads, but very long spurs are extending into the valleys and hillsides (compare also current bus routes, websites accessed 25/02/2017, see figure 31).

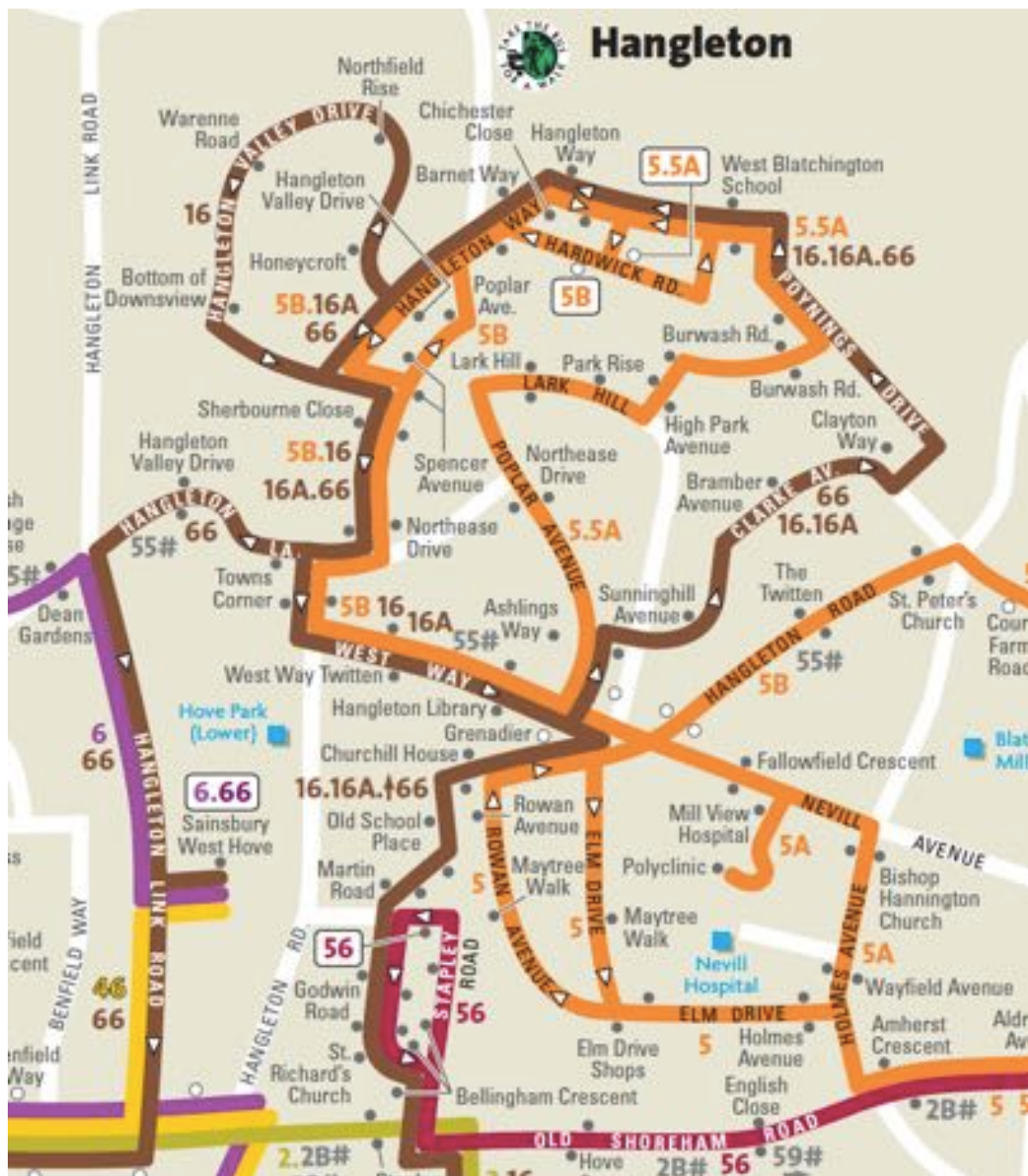


Figure 31: Bus routes in Hangleton and Knoll area, Source:

<http://bh.buscms.com/brightonbuses/uploadedfiles/areawide.pdf>; accessed 07/03/2017

Conversations with local residents, and a report covering the entire city and about to be published (Brighton and Hove Community Works 2017) strongly suggest that bus services are problematic for those who are older and with mobility problems: bus stops can be too far away and respondents mention the lack

of public toilets in the vicinity of bus stops. Figure 32 shows the range of bus shelters in Hangleton, ranging from simply a sign without a timetable (for an outsider it is not clear whether these are stops in operation) to very few sheltered bus stops.



Figure 32: Photos taken in Hangleton illustrating bus stops with shelter, with timetables, bench, no timetable (04/03/2017)

Older, frail and possibly isolated/lonely persons

Considerable efforts were undertaken, as part of WP4, to identify reports, gather intelligence and anecdotal reports on the primary target group of this work package, ie older or very old adults who may be frail, live with one or more long term conditions and who have difficulties accessing health services, possibly due to isolation or loneliness. While there appears to be a strong believe amongst various key informants and stakeholders that there is a significant number of persons fitting the above characterisation in the area of Hangleton and possibly also Knoll, it appears to be unclear

- who these persons are,
- where they live, and
- what needs these persons have.

However, DataShine (see p.67) indicates the area at the top of Hangleton (around Hangleton Valley Drive) being the home of people of very old age

(90 years or older) and an area with a high level of limitations to day-to-day activities. It would be interesting to have analytic evidence whether and to what degree old age and activity limitations coincide (Figure 27 and 26).

Repeat enquiries on these topics with various organisations and stakeholders could not clarify whether these persons were in addition isolated and lonely. Again there is a strong belief that this is the case, but the evidence is missing. Interestingly OCSI (2017) suggests that isolation, based on the estimated isolation index provided by Age UK, may be ever so slightly more severe than in England in general and B&H on average, the differences are very small and must not be overrated (it is unclear whether the differences have been assessed for statistical significance, but based on the extensive statistical expertise of the WP4 lead, this is unlikely).

Speaking to befriending organisations, they see the issue of ‘finding’ the isolated and lonely people as very challenging. The standard approach, ie knocking on doors, makes this an effort which can be daunting, frustrating and haphazard in equal measures. It is possible that the population of very old, frail and multi-morbid may be ‘transient’ and ‘mobile’ in its own way; the situation may lead to quick changes due to changing health conditions, moving in and out of hospital, or spending time in care facilities including hospices.

Interestingly views expressed by a key informant from Personal Transport Planning (<https://www.brighton-hove.gov.uk/content/parking-and-travel/travel-transport-and-road-safety/personalised-travel-planning>) differ in that a concerted effort can make a difference. Extensive experiences are based on door knocking in the East of the City (eg Whitehawk, Bevendean with many thousands of ‘knocks on doors’ and on average with one in three responses) suggest that personal solutions can make a difference; solutions range from providing waterproofs and other forms of practical assistance including walking with residents to eg the nearest bus stop to reduced return taxi fares (at a cost £3.50 to the end user). Routines and local customs (the *local* culture) may prevent people from using a range of transport opportunities; lack of awareness of what assistance, support or transport is available may be an issue, based on the experience in the East of the City. The Personal Transport Planning team aims to target Hangleton and Knoll in the financial year 2017/18 carrying out extensive door knocking; this plan has been approved and it may be interesting to see what difference this will make.

In general, topography is an important factor. The most challenging part according to community organisations is to reach the 85+ generation who barely leave their houses. Previous reports confirm that Hangleton is an area mainly inhabited by ‘families and retired couples’ (Brighton and Hove City Council 2009). As the study was published in 2009, the situation may have changed, but we do not seem to have adequate data. Nevertheless, some specific data are available from OCSI (2017): 63.3% of pensioners live in a single person household (compared to an English average of 59.6%). This suggests that there is a larger risk of loneliness in Hangleton and Knoll compared to England.

Very old people living in their own home, and frequently on their own, is a relatively new phenomenon which points to the need to consider the identification of relevant data and ways of gathering these data.

Final Comments and limitations

The analysis of the situation and Hangleton and Knoll (as part of WP4) should be seen as provisional; it is shaped by information provided and views expressed by key informants, and those who attended the meetings. Attendees tend to be different to those who do not attend (they are more engaged, most likely to be in better physical and mental health). It is also important to remember that key informants’ perspectives is likely to be informed by the nature of their own roles and interests. This should be kept in mind when developing strategies around transport solutions, community development and engagement, health including mental health and loneliness, and wellbeing.

Conclusion

- The Hangleton and Knoll ward has a larger older, population than Brighton & Hove in general (4th highest over 65s), and the ward is the 4th most deprived ward (HK – 25.79) and 3rd on IDOAPI score (but not the most deprived).
- The topography and layout of the area (e.g. hilly) is similar to other areas in B&H and creates challenges for people with mobility/access to transport issues. These issues are more pronounced for Hangleton than for Knoll due to the Hangleton’s location mostly uphill.
- The public and community transport infrastructure in Hangleton and Knoll is limited; areas with poor or no public transport exist. The road layout with long spur roads makes the operation of buses difficult.

- ‘Community spirit’ appears to have overcome some of the problems envisaged around the closure of Hangleton Manor GP practice. The reported lack of use of a community bus and informal reports of the extensive provision of transport by neighbours and friends helping those without transport (vulnerable persons?) to reach GP practices raises the question of whether the access to health services and care is above all a public and community transport problem or community and neighbourhood issue.
- Detailed information about older and frail persons (e.g. locations of households within wards, health issues, levels of exclusion, isolation and/or loneliness) is not readily available for analysis.

General Strategies for the Future

- Fundamentally, the issues around older, frail people (and other vulnerable groups) in relation to their healthcare and access to healthcare can be approached from a transportation or a community development/engagement perspective. Ideally, both should be integrated.
- Research on isolation and loneliness clearly suggests that community engagement efforts are likely to make the biggest difference
- Further development of neighbourly transport/mobility solutions may complement other community transport offers well (this could link with the lift sharing/carpooling software development suggestion of WP2)

Specific Strategies for the Future

- It would be beneficial to gather further and systematic information on vulnerable, older and frail persons who may have complex health needs and are (at risk of becoming) excluded, isolated and/or lonely, for example in cooperation with befriending organisations and possibly local health services.
- It would be beneficial to consider better information sharing between Health and other organisations including local authority services and charities in Brighton and Hove (with appropriate data sharing agreements)
- The planned door knocking by the Personalised Transport Planning team in this area should provide some initial information on this, also including physical activity and wellbeing, access to facilities including healthcare and social activities, isolation and loneliness. Some

coordination between this planned effort and community groups including Hangleton and Knoll community project may create synergies in making a difference.

WP 5: ‘Intelligent technologies for community-based transport solutions’ Event

Dr Frauke Behrendt

Principal Lecturer in Media Studies, University of Brighton

Introduction

This WP led the project, guided collaboration between the work packages and pulled together this report. WP5 also included all project management and the organisation of a final event. This chapter reports on this final event, titled ‘Intelligent technologies for community-based transport solutions’ that was organised in collaboration with the Digital Catapult Centre Brighton in March 2017. Before providing more detail on this, the chapter reports on two external events that were attended in preparation, ‘Improving Access to Healthcare through Intelligent Mobility’ in Coventry and ‘The Internet of Things, Technology and Positive Ageing’ event at the Digital Catapult Brighton.

Preparatory Event: ‘The Internet of Things, Technology and Positive Ageing’ event at the Digital Catapult Brighton

Dr Frauke Behrendt attended the event ‘Tech Beyond the Screen: the Internet of Things, Technology and Positive Ageing’ on behalf of the project on the 9th June 2016 at the Digital Catapult Brighton.



Figure 33: Phil Jones (Wired Sussex) opening the event ‘Tech Beyond the Screen: the Internet of Things’. Source: Frauke Behrendt

Eric Kihlstrom (KareInn, care innovation company) talked about “opportunities across the spectrum of care and what his company is doing

today in residential care homes to improve carer productivity and residents' quality of life" (Digital Catapult Brighton 2016). This representative from a care home provider reported on work with GPS tracking of residents for safety, security and for communication to family members. Integration of GPS trackers in mobility devices is a key part of this, e.g. walking sticks, shoes, wrist watch and mobility scooters. While this perspective focused on the context of care homes, some examples presented and issues raised are also relevant for those living in their own homes.

Examples from China were mentioned, for example set-top boxes that have customized content for an older market, working with face recognition and avatars. The use of networked technologies to combat loneliness is key, and co-design and social innovation are key for this area.



Figure 34: A visual record of the "Tech Beyond the Screen: the Internet of Things" event.
Source: Frauke Behrendt

The "Small grant" scheme is mentioned, and that this can also be used for connecting elderly people to the Internet. This could be relevant for WP 3.

The app 'Jointly' is mentioned, used by carers in care homes (www.jointlyapp.com).

Dave Cooper from the University of Chichester reported that most care homes have a policy for carers that they are not allowed to carry a mobile phone at work. For ITSSI, the question is if that is also true for carers that visit people at home as this influences if they can be used as 'digital proxies' for older people around transport.

Cooper also mentioned that measuring quality of life is a big issue. One potential solution would be to provide free equipment in return for the ethical use of the data – one example of an IoT Smart Home Business model.

Preparatory Event: 'Improving Access to Healthcare through Intelligent Mobility' in Coventry

Dr Frauke Behrendt attended the event 'Improving Access to Healthcare through Intelligent Mobility' on the 14-15 June 2016 in Coventry on behalf of the ITSSI project. This was a "workshop for everyone with an interest in transport, health care delivery and developing age friendly transport" (IMPART 2016).

The event was described as follows: "Co-design for service innovation is increasingly used to encourage user engagement in the human-centred design of complex systems and services. The biggest challenge in designing transport services with mobility in mind requires consideration of the public, the decision makers and the system itself. The challenge is in the match of these systems of user requirements and data that is often beyond transport related" (IMPART 2016).



Figure 36: Results of a user-led design activity at the 'Improving Access to Healthcare through Intelligent Mobility' event. Source: Frauke Behrendt

Key learning from this event:

- It is important to provide age-appropriate resources for all workshop participants (e.g. avoiding small print)
- Recruiting 'end users' for these events is challenging
- Having a mix of end users, carers, local council representatives, health care representatives and transport representatives is very productive
- It is important to not overload people with information, instead focus on short, interactive and engaging group work
- Most older participants report that paper letters and landline phone calls are their preferred mode of communication, and most refuse to text or use smart phones.
- 'Ring and ride' schemes are often mentioned as preferred solutions.
- Related events are happening with information at http://impart-upp.co.uk/improving_access_to_healthcare_im/?mc_cid=a8cc869285&mc_eid=6f3d5e6d0d
- Since developed an online platform for mobility data: <http://imdata.co.uk/>

ITSSI Event 'Intelligent technologies for community-based transport solutions' in Brighton

'Intelligent technologies for community-based transport solutions' was the title of the ITSSI event that was organised for the 21st March 2017.

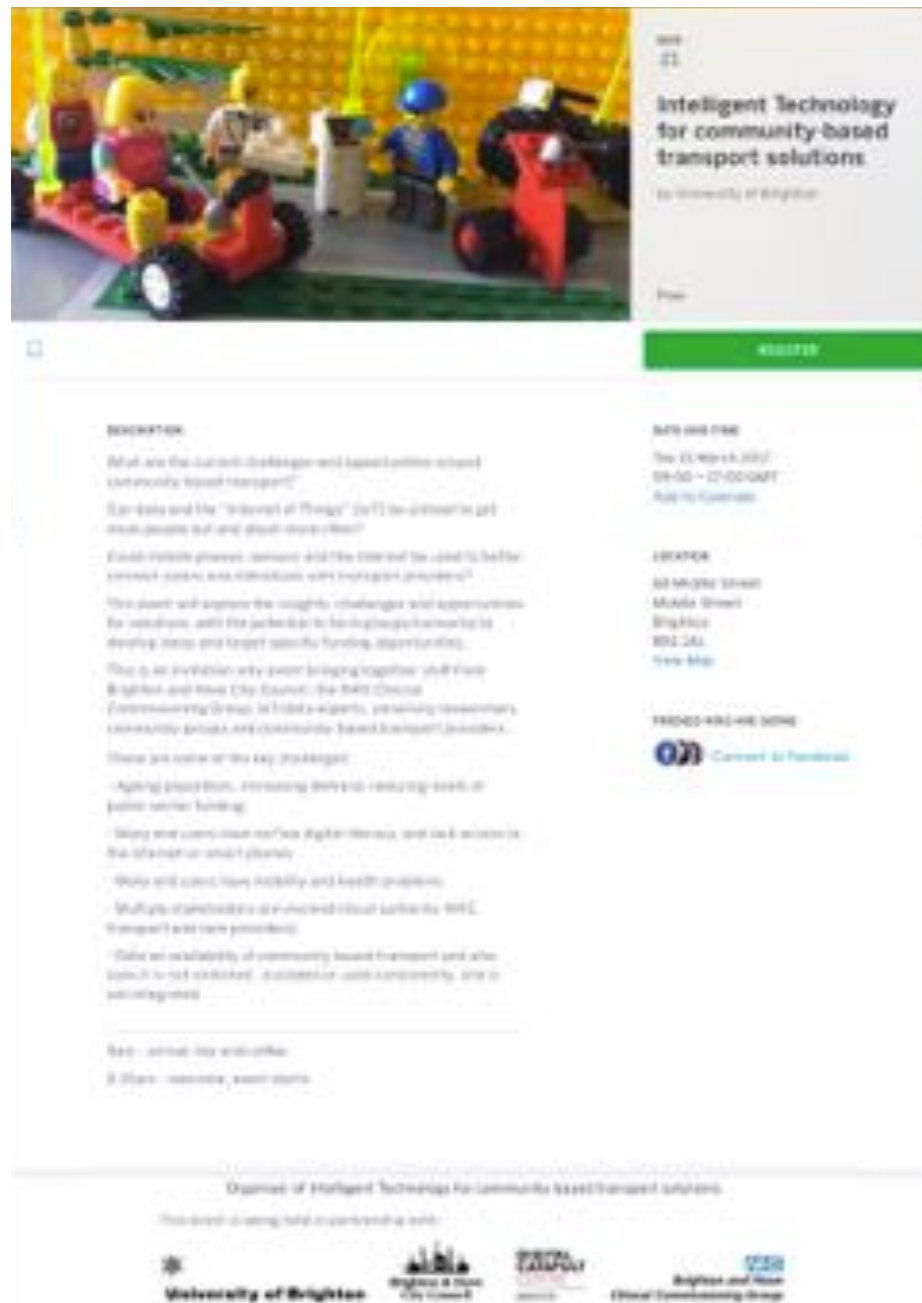


Figure 37: Eventbrite invite to the event. Source: Frauke Behrendt

The event was an invitation only to ensure a good mix of participants from the digital industries, community transport providers, and university researchers as well as stakeholders from Brighton and Hove council and CCG. The event was organised in partnership with the Brighton Digital Catapult at 68 Middle Street to maximise access to the participants from the

digital sector. The event was advertised through the Brighton Digital Catapult, Wired Sussex, the University of Brighton and Brighton and Hove City Council, and through the contacts identified through the project work. All of this enabled the event to draw on recent events organised by these partners that focus on the Internet of Things for Ageing and a future planned focus by these partners on intelligent transport. The event was facilitated by Ivanka Majic, Annie Heath and Frauke Behrendt, who also hosted.

An event page was created (see figure 37) to manage sign-ups and to obtain information from the participants about the following areas (they were also used to tailor the event activities): (a) their area of expertise, (b) based on their expertise, what challenges/opportunities do they see around the event's topic and (c) what they would like to get out of the event. An anonymised overview of the answers provided displayed as posters during the event (see figures 38 and 39) and participants engaged with them through a warm-up activity.



Figure 38: Poster at the ITSSI Event displaying challenges/opportunities identified by participants. Source: Patricia Prieto-Blanco



Figure 39: Posters at the ITSSI Event displaying what participants would like to get out of the event. Source: Patricia Prieto-Blanco

Interest in the event was very good and we therefore selected participants that were most suitable for the event, based on their responses. This interest indicates that an intelligent technology/data approach to community transport and inclusive mobility has potential for pilot projects that could apply for funding from Innovate UK and other business-type external funding opportunities. Figure 40 lists the event participants and their affiliation.

First Name	Surname	Company
Lynn	Poore	Age uk Brighton and Hove
Bill	Harpley	Astius Technology
John	Sandiford	Bayes Server
Simon	Hickmott	BHCC
Mike	Best	Brighton & Hove Buses
Judith	Cooper	Brighton & Hove City Council
Neil	Cholerton	Brighton & Hove City Council
Claire	Rowland	Brighton and Hove City Council
Charles	Phiri	CC Initiative Ltd
Tumpale	Phiri	CC Initiative Ltd
Robert	Bramwell	CDO Partners
Leigh	Hunt	Community Transport (Brighton, Hove & Area) Ltd
Kaye	Duerdoth	Community Works
Judith	Field	Digital Brighton & Hove
Kais	Al-Timimi	Datamation Ltd
Zabeda	Ali-Fogarty	ESP IT Consultancy Ltd
Lynn	Stevens	Grace Eyre
David	Matthews	Grace Eyre
Nick	Goslett	Hangleton & Knoll 50+ Steering Group
Darrel	Butlin	Hexology
Emma	Bailey	Horsham District Council
Anne	Brindley	Impact Initiatives
Carol	Hounsell	Independent
Simon	Champion-MacPherson	Makemedia
Ben	Dykes	Makemedia
Andrew	Hancox	Southern Sky Technology Ltd
Kimberley	Anscombe	Oxford Consultants for Social Inclusion (OCSI)
Kelly	Dibbert	The Big Lemon CIC
Tom	Druitt	The Big Lemon CIC
Norman	Baker	The Big Lemon CIC
Tim	Watt	TJW Media
Rebecca	Farmer	University of Brighton
Stuart	Hedley	University of Brighton
Elias	Stipidis	University of Brighton
Periklis	Charchalakakis	University of Brighton
Lesley	Murray	University of Brighton

Maria	Sourbati	University of Brighton
Jorg	Huber	University of Brighton
Pollie	Barden	University of Sussex
Jane	Lodge	B&H Clinical Commissioning Group (CCG)
Annie	Alexander	Brighton & Hove City Council

Figure 40: Event participants and their affiliations.

The objectives displayed to the participants of the event were to (see also figure 41):

- Use data, IoT & intelligent technologies to solve community-based transport challenges and improve social inclusion
- Generate ideas for a pilot in Brighton & Hove
- Develop ideas and consortia for bid applications



Figure 41: Poster displaying the event objectives and a participant. Source: Patricia Prieto-Blanco

Event Agenda and Activities

9:00 Arriving, Registration, Coffee

9:30 Introductions and Warm-up

- Welcome and thank you: Objectives + Intro about community transport landscape
- Agenda
- Funding Opportunities
- Getting to know each other exercise
- Public Health/Purse Perspective on Older People & Transport
- Technology Examples
- Working on Personas

10:50 Coffee Break

11:10 Team Building and Ideation

- Putting people in designed teams
- Creative activity: Lego Serious Play
- Ideation 1: come up with lots of ideas around one persona: Quantity not quality
- Ideation 2: Share ideas
- Decision: Vote on best ideas

12:30 Lunch Break

1:30 Facilitated Idea Development in Groups (with Coffee Break)

- Idea Development Activity 1
- Idea Development Activity 1

3:50 Break

4:00 Sharing, Next Steps and Closing

- Teams share: 5 minute presentations, audience feedback
- Next steps: Group sheet, flip-chart, funding ops. KTP support for funding applications, exchanging contact details
- Closing and Thank you
- Drinks, Networking

5pm: End

Figure 42: Event schedule and activities

Specific funding opportunities were presented in the morning session, so that event participants could have these in mind when working on their ideas. These funding opportunities were compiled by Knowledge Exchange staff at the University of Brighton, specifically by Jo Carpenter, [Business Researcher at](#) the University's Green Growth Platform. All participants received a handout with this information, so they could take it away, facilitating post-event work in consortia that might apply for funding (see figure 43). These are the funding opportunities that were identified:

Fund & who can apply*	Value	Details	Deadlines
Innovate UK – Innovation in infrastructure systems SME	Project size £25-100K	For SMEs to develop new digital solutions, under ‘urban living’ (health & wellbeing).	Currently closed, next deadline expected Sept ‘17 (10 week open call).
Innovate UK – Emerging & Enabling Technologies SME	Project size up to £100K	For SMEs to develop ‘smart technology that provides a richer and more informative output to the end user’.	Currently closed, next deadline expected June ‘17 (10 weeks open call).
Innovate UK – Open Programme SME	Eligible costs £25K plus	For projects demonstrating disruptive innovation leading to new products/services.	Currently closed, next deadline expected Aug ‘17 (10 weeks open call).
Knowledge Transfer Partnership (KTP) SME CB (may be possible)	Cost to the organisation approx. £22K/year	A graduate works on a strategic project within the business with supervision via a/two dedicated university academics.	10 deadlines that align with the main Innovate UK calls
Social Finance – Social Impact Bonds (SIBs) LA HA CB	Depends on project	SIB - financial mechanism in which investors pay for a set of interventions to improve a social outcome that is of social and/or financial interest to a government commissioner.	Ongoing. Finance raised on case by case basis.
Big Lottery Fund - Reaching Communities England LA CB CG	£10K – 500K	Under ‘Healthier and more active people and communities’.	No deadlines
Comic Relief CG	Depends on call	Under ‘health and wellbeing’ or ‘stronger communities’.	Individual grant deadlines
The Tudor Trust CG	Around £10K	Grants for core funding, unrestricted, capital, projects and short-term loans. Can fund external consultants.	No deadlines
Esmée Fairbairn CB CG C	Grant size £5K plus, average £100K.	Under ‘Social change: Participation – marginalised and excluded individuals and groups’. Also provides social investment loans.	No deadlines

Commercial sponsorship - E.g. Crediton & District CT Transport (several sponsors), Chelmsford CT & Dial a Ride (Caring Direct).

Funding links:

Innovation in infrastructure systems:

<https://www.gov.uk/government/publications/funding-competition-innovation-in-infrastructure-systems-round-2/competition-brief-innovation-in-infrastructure-systems-round-2>

Emerging & Enabling Technologies:

<https://www.gov.uk/government/publications/funding-competition-emerging-enabling-technologies/competition-brief-emerging-enabling-technologies>

Open Programme: <https://www.gov.uk/government/publications/funding-competition-open-programme-round-2-2016/competition-brief-open-programme-round-2>

Knowledge Transfer Partnership (KTP): <https://www.brighton.ac.uk/business-and-community-partnerships/research-and-development/knowledge-transfer-partnership/index.aspx>

Social Impact Bonds (SIBs): <http://www.socialfinance.org.uk/services/social-impact-bonds/>

<http://www.socialfinance.org.uk/wp-content/uploads/2015/05/Introduction-to-Social-Impact-Bonds.pdf>

E.g. Age UK, Worcestershire, £850K investment for 'Reconnections' service, to integrate isolated people back into their communities:

http://www.socialfinance.org.uk/database/?project_id=65

E.g. HCT Group, Lambeth, £420K investment for specialist travel training that gives young people the skills and confidence to travel independently on public transport:

http://www.socialfinance.org.uk/database/?project_id=23

Big Lottery Fund - Reaching Communities England:

https://www.biglotteryfund.org.uk/prog_reaching_communities

Comic Relief: <http://www.comicrelief.com/grants/health-and-wellbeing>

The Tudor Trust: <http://tudortrust.org.uk/what-we-do/about-our-grants/>

Esmée Fairbairn: <http://esmeefairbairn.org.uk/apply-for-funding/>

Credit and District Community Transport:

<http://www.creditoncommunitytransport.org.uk/sponsorship.htm>

Chelmsford Community Transport: <http://caringdirect.com/escort-services/community-transport-scheme/>

* Who can apply? Small/medium sized enterprise (**SME**), Local Authority (**LA**), Health Authority (**HA**), Community Business (**CB**), Community Group (**CG**), Charity (**C**)

Figure 43: External funding opportunities identified for the event. Source: Jo Carpenter

The event schedule (see figure 42) featured creative and design-led activities that enable diverse groups to generate and evaluate ideas, to form as a team and to work up ideas with a view to forming a consortium that could apply for specific funding. The activities included brainstorming, Lego Serious Play (facilitates creative thinking, communication, problem-solving and teambuilding) and Persona work (a user-centred design approach), see figures 44-46.



Figure 44: Posters at the ITSSI Event displaying prepared personas. Source: Patricia Prieto-Blanco



Figure 45: Participant working on a Persona activity Posters at the ITSSI Event displaying prepared personas. Source: Patricia Prieto-Blanco



Figure 46: Participants exploring the use of data and Internet of Things for community transport through Lego Serious Play. Source: Patricia Prieto-Blanco



Figure 47: Group work at the event. The WP1 visualisation of community transport is displayed on the wall. Source: Patricia Prieto-Blanco



Figure 48: Some of the ideas generated at the event. Source: Patricia Prieto-Blanco

A large number of ideas were generated in the 'Ideation' phase of the event (see figure 48). Out of those ideas, event participants and organisers thought the following ones were most interesting, in addition to those four that were selected and worked up with the groups during the event (see below):

- Rewarding community transport use: e.g. if you go on three trips a week, you get a free coffee – to increase the health and wellbeing benefits of community transport that could lead to overall savings on health budgets, and to counter the reluctance by some users to spend on transport
- Crowdsourcing nice/accessible routes for walking to places (to bus stops, venues, etc) in people's neighbourhoods
- Better event marketing, especially to those not using technology, linking accessible transport information to event information
- Wifi sharing with offline neighbours (who might have a handed-down tablet) – to get (potential) community transport users online, potentially even using access to events and transport information as incentive for gaining digital/online skills and access
- Certain buses at certain times could always have a buddy/facilitator on them: there would be IT support for information about this, it would strengthen the important social aspect of travelling together, and also build confidence
- Tracking people/when they are not doing trips to avoid entrenched isolation, to identify when things start slipping, possible links to other datasets (noting ethical concerns)
- Car/time/hosting sharing: one person hosts a tea party, another drives people there, they are connected by on online platform (could also include existing events)

The four teams that worked on specific ideas in the afternoon of the event were designed to have representation from community groups/community transport providers, digital/data industry, local authorities/Clinical Commissioning Groups, University researchers. The four ideas that were worked up in these groups were:

- Travel Guides: like gig buddies but for travel, connecting people to travel to a location/event together, trip-advisor style ranking of people, connecting to existing apps like meetups, shows people in your vicinity - 'everyone's a guide'.
- Platform for Coordination of Minibus Provision (in Brighton& Hove): solve fragmented situation of many groups with small number of mini buses, reach economies of scale, increase efficiency, charities give up own vehicles in return for centralised service.
- Personalised Journey Simulator to build confidence: a specific journey (e.g. home to event) is simulated for the user so they can familiarise themselves with the detail before actually setting out. Multiple platforms, from VR game simulation to paper list/visuals. Scrape data from existing sources (e.g. google street view).
- Based on the existing NextDoor (nextdoor.co.uk) social network - helping individuals locally (at neighbourhood level) to arrange transport, match up with buddies, and get to social events via on-line requests (posts). Local computer savvy volunteers help those in their neighbourhood that aren't, using the NextDoor system. Transport options could include lifts via private vehicles, info on public/community transport availability or offers to accompany individuals on journeys (buddy up). This could also include a central system/website that would be customer friendly so that a person could search for example, 'I would like to go to the hospital, on Tuesday at 10am, and I need assistance (a buddy to build my confidence)'. The system would then bring up a set of options and costs (e.g. public transport, community transport, taxi, neighbours/volunteers).

Conclusion

Drawing on the overall project work across all work packages, the final project event 'Intelligent technologies for community-based transport solutions' brought together people from the digital/data industry with those working in community transport and community groups, alongside representatives from the local authority and Clinical Commissioning group as well as university researchers. It was organised in collaboration with the Digital Catapult Centre Brighton. Interest and participation in the event was very good from across these sectors. The event suggests that an intelligent technology/data approach to community transport and inclusive mobility is currently perceived as a potential gap in the market, with potential for pilot

projects. The intelligent technology and data focus of the event shifted the focus of funding for developing these ideas into solutions and running pilots from local authorities or Clinical Commissioning Groups to business-type funding, for example from Innovate UK. Networking and knowledge exchange was another key aspect of the 'Intelligent technologies for community-based transport solutions' event. Expertise from the different sectors was shared to feed into the ideas that were generated and developed. Participants exchanged their contact details so they can stay in touch to work on their group ideas. They can also draw on the support of the University of Brighton Knowledge Exchange team to work up their ideas into funding applications. Post event, several participants expressed that they were keen for facilitated follow-up events that allowed for more networking, knowledge exchange, consortium building, idea development and support with funding applications.

Conclusion

The 'Intelligent Transport Solutions for Social Inclusion' (ITSSI) project explored this subject area through five work packages. This concluding chapter of the report provides highlights from each of them, followed by a brief overall project conclusion.

Work package 1 (WP1) researched the existing informal community transport initiatives that exist in Brighton and Hove. This mapping stage of the research predominantly covers services under the broad umbrella of adult social care and does not provide a full picture of community transport as not all 22 organisations that were identified and contacted responded to the questionnaire. From the organisations that responded, WP1 found that there are at least fifteen organisations providing community transport services in Brighton and Hove with a great variety of scale. Their organisational aims range from a focus on a particular social group, to a combination of environmental and social aims. Organisations offer services to a range of client groups and they are funded through local authority, university and private contracts, fund-raising, donations and fares. The providers of community transport services identified unmet demand as key issue. Within this diverse landscape of community transport in Brighton and Hove, WP1 identified that there is potential for further co-ordination between providers. Furthermore, there is scope for the introduction of new technologies to assist in running services and for increasing co-ordination between providers.

Work package 2 (WP2) focused on practical guidance on the use of Information and Communication Technologies (ICT) as well as data collection around community transport in Brighton & Hove. A data model for community transport was developed. The fragmented provision of community transport on Brighton and Hove (see also WP1) is a main hindrance to the use of technology, as many organisations operate transport below the level that would facilitate proper investment in technology. More centralised approaches to community transport taken elsewhere would be one way to address this, but this is not currently a scenario favoured by Brighton & Hove City Council.

In this context, WP2 identified four practical steps that could be taken in Brighton and Hove around data/technology and community transport. First, creating knowledge exchange and training events for community

transport providers to improve their use of existing technologies/tools and/or to learn about new ones, as the most accessible gains from technology come from the use of low cost generalist software as a service (SAAS) tools. Second, working with emerging best practice to develop detailed recommendations (and training/support) for the commissioning process and the community transport providers around data collection, sharing, analysis and use – in Brighton & Hove. Third, adding capabilities needed for the community transport context to an existing open source lift share/car pooling so this can be piloted and evaluated in partnership with non-commissioned community transport providers and buddy-type community transport providers in Brighton and Hove. And fourth developing the high-level data model for community transport in Brighton and Hove into a more formal model, also considering emerging best practice around quantifying the benefits of community transport.

Work package 3 (WP3) examined how ICT can be used to best serve different agendas of public transport and social inclusion, including the integration of transport services (Department for Transport 2015) with a focus on older adults.

WP3 identified seven categories of case studies: journey-planning smart technologies, demand-responsive smart technologies, hybrid smart technologies, other smart technologies, infrastructure/built environment, adaptable/flexible services, human factors/behaviours. Examples of these seven categories were reviewed, with particular attention to those 12 case studies that were deemed most relevant for the Brighton and Hove context by the project stakeholders. These case studies showcase good practice from around the world. The 12 selected case studies were reviewed and evaluated by following good practice indicators that combine instruments proposed by the WHO Age friendly cities and the European Innovation Partnership on Active & Healthy Ageing.

Several key issues emerge from the WP3 analysis of the case studies and the literature, as detailed in this and the following paragraphs. Research into inclusive cities, transport, and digital inclusion has highlighted the importance of information provision and exchange – from capturing information about user needs through peer involvement in the design of transport solutions, to providing information about the running and use of a service, improving its reliability and helping users make informed choices about travel. Introduction of new, digital technologies to assist the running

of services and for increasing co-ordination between providers is therefore a significant area of opportunity.

WP3 also shows how travel buddies can be ‘proxy’ users of digital technologies for those people who are unable to access transport and/or digital ICT capability at home or via a mobile device. Travel buddies can therefore be an example of combination of transportation and community development and/or engagement perspective (See WP4).

Financial sustainability of inclusive demand responsive schemes has been a problem due to shrinking public funding and a lack of a market-driven way to fund services, as shown by WP3. Changes in public spending allocations for transport infrastructure have led to discontinuation of schemes and reduction in service capacity.

WP3 highlighted the importance of information and communication to social inclusion, as this was consistently mentioned in research on inclusive cities. Transport, to services, for leisure, to meet others, is not an exception to this. A multi-method/multi-media approach to travel information provision, combining print (leaflet and posters and places/sites to display these e.g. community centres, local surgeries) and digital (visual/voice/audio) is therefore important. Intelligent city transport services such as journey planner websites, mobile apps and visual & audio displays on bus stops and in buses, improve the accessibility of transport to users who may access these services either directly on a self-service basis or through travel buddies.

The schemes presented in WP3 address different aspects of inclusive public and community transport, addressing wider societal challenges such as loneliness and isolation, civic participation, connectivity and health and well-being in relation to mobility and the physical-environmental context (see also Briggs and Tinker, 2007 Tinker and Ginn, 2014, Ormerod et al 2015: 5). Our findings mirror a number of age-friendly, inclusive transport attributes as listed in WHO age-friendly cities programme (Briggs and Tinker, 2007) and the EC Age Friendly environment programme (EIP on AHA). ICT-based transport solutions that are accessible, affordable and sustainable; collaborative working and the involvement of peers (/users) in service design; the centrality of behavioural factors and of information provision have been highlighted by research and user evaluation alike (e.g. Tinker and Ginn, 2007:17; 2015; Briggs and Tinker, 2007:15). Inclusive

transport is key to having inclusive, all age friendly environments and cities because it enables people of all ages to get out, engage and socialise, and to access vital services (Facer, Horner and Manchester 2016).

Against the backdrop of an ageing population, increasing demand, and shrinking public funding redesign of both acute and primary care services, the case studies reviewed by WP3 point at opportunities in the combination of new technologies and innovative business models to promote inclusive demand responsive transport with a social element (Siegen) and to improve access to health and social care transport services (Strathclyde).

Work package 4 (WP4) provided a rapid review of literature on isolation and loneliness in relation to health and access to healthcare, in addition to a local focus on Hangleton and Knoll as an illustration ('case study') of some of the issues identified in the literature review. Specifically, issues of mobility, transport and access to health services were considered.

WP4 engaged with the Hangleton and Knoll ward, which has a larger older, population than Brighton & Hove in general (4th highest over 65s), and the ward is the 4th most deprived ward (HK – 25.79) and 3rd on IDOAPI score (but not the most deprived). The topography and layout of the area (e.g. hilly) is similar to other areas in B&H and creates challenges for people with mobility/access to transport issues. These issues are more pronounced for Hangleton than for Knoll. The public and community transport infrastructure in Hangleton and Knoll is limited; areas with poor or no public transport exist. The road layout with long spur roads makes the operation of buses difficult. Detailed information about older and frail persons (e.g. locations of households within wards, health issues, levels of exclusion, isolation and/or loneliness) is not readily available for analysis.

Work package 4 recommends an integrated approach that draws on both transportation perspectives and community development/engagement perspectives for addressing the issues around older, frail people (and other vulnerable groups) in relation to their healthcare and access to healthcare. Further development of neighbourly transport/mobility solutions may complement other community transport offers well - this links with the lift sharing/carpooling software development suggestion of WP2.

WP4 found that it would be beneficial to gather further and systematic information on vulnerable, older and frail persons who may have complex health needs and are (at risk of becoming) excluded, isolated and/or lonely,

for example in cooperation with befriending organisations and possibly local health services. The planned door knocking by the Personalised Transport Planning team in Hangleton and Knoll should provide some initial information on this, also including physical activity and wellbeing, access to facilities including healthcare and social activities, isolation and loneliness. Some coordination between this planned effort and community groups including Hangleton and Knoll community project may create synergies in making a difference.

Furthermore, WP4 found that it would be beneficial to consider better information sharing between Health and other organisations in Brighton and Hove (with appropriate data sharing agreements), a topic also identified by WP2.

WP5 organised and delivered the final project event titled 'Intelligent technologies for community-based transport solutions'. It brought together people from the digital/data industry with those working in community transport and community groups, alongside representatives from the local authority and Clinical Commissioning group as well as university researchers. The event was organised in collaboration with the Brighton Digital Catapult Centre (BDCC). The Internet of Things in the Context of Ageing is one of the BDCC's focus areas, providing important context for potentially developing ITSSI follow-on projects, events and collaborations. The very good levels of interest and participation in the event suggests that an intelligent technology/data approach to community transport and inclusive mobility is currently perceived as a potential gap in the market. The event focussed on business-type funding such as Innovate UK for funding potential ideas and pilots that address this gap. During the event, four teams with representatives of all sectors targeted by the event worked on knowledge exchange, idea generation and development, including use of design-led and user-experience type activities. Knowledge exchange and networking were further key elements of the event. Four ideas were worked up by the teams, with a view to applying to one of the funding opportunities that had been identified for the event. Feedback by event participants indicates a need for further facilitated events that allow for more networking, knowledge exchange, consortium building, idea development and support with funding applications.

Overall, the five work packages of the 'Intelligent Transport Solutions for Social Inclusion' (ITSSI) project provided an interdisciplinary perspective

on an area of increasing importance. To our knowledge, this is the first project and report that approached inclusive mobility and community transport from a perspective of intelligent technologies, information and communication technologies (ICT), and data. The ITSSI project opened up conversations and facilitated potential collaborations. The report also pointed out practical next steps (see figure 49) that could be taken in Brighton and Hove. Potential future research in this area could draw on emerging discussions around quantifying the benefits of community transport and the current datafication of health and wellbeing - to further develop inclusive approaches to intelligent transport and smart mobility, for the context of Brighton and Hove and more widely.

Recommendations

Hold Knowledge Exchange and Training events for Community transport providers as this would benefit IT skills, peer learning, cooperation and synergies

Build an extension for an existing open-source ride/car sharing platform that serves community-transport needs (e.g. accessibility of vehicles, training and checks of drivers) as this would be a way of facilitating coordination and synergies

Develop the community transport data models into a more formal model

Develop detailed guidelines and ethical protocols for data collection, sharing and analysis around community transport (and health and social care) as this would benefit commissioning processes and could aid business innovation at the intersection of public health and intelligent transport

Develop a model for quantifying the benefits of community transport in Brighton and Hove as this would be important for end users, commissioning bodies and community transport providers

Involve end users in all stages of planning and designing software and data solutions

Ensure accessibility guidelines as followed for both 'traditional' (print, phone) and digital media (web, mobile) for inclusive end-user engagement

Consider a method for collecting data about people that would benefit from community transport to reduce isolation and/or loneliness, e.g. drawing on existing services and activities (e.g. door knocking, befriending services, health data), as this data is not currently readily available

Consider a method for collecting data about people that would benefit from community transport to reduce isolation and/or loneliness, e.g. drawing on existing services and activities (e.g. door knocking, befriending services, health data), as this data is not currently readily available

Hold further events for knowledge exchange and consortium building for community transport providers and digital/data industries (as requested by those attending the first event) to ensure business-facing funding opportunities (e.g. Innovate UK) can be leveraged

Use Total Transport Board funding or other relevant funding to work on one or several of these recommendations

Figure 49: Recommendations of the 'Intelligent Transport Solutions for Social Inclusion' (ITSSI) project

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Annexe

Annexe 1: WP1 Survey



University of Brighton

Community Transport Survey

Page 1: Introduction

We are researchers at the University of Brighton working on a project to map community transport provision in Brighton and Hove. The overall aim of the project, which was commissioned by Brighton and Hove City Council, is to identify ways of enhancing community transport provision in the city through the use of new technologies in order to improve the lives of socially isolated groups and individuals. The results of this questionnaire survey will help us begin to map out existing services so that we can identify: effective provision of community transport; gaps in service provision; areas where new technologies are used effectively; and also where new technologies could be introduced to improve services.

We invite you to complete all or part of the questionnaire, in order that we can get a full picture of community transport service provision. In completing the questionnaire you will be giving your consent for the data provided to be used in the research project. Due to the type of project we are working on, in gathering details of existing provision, we are unable to guarantee confidentiality. The raw data from this questionnaire will only be seen by the researchers and the University of Brighton and our contact officers at Brighton and Hove City Council, but the information you provide may be made available in the project report and other outputs from the project.

If you agree to complete the questionnaire, you do not need to answer all of the questions and you can decide to withdraw from the survey at any point - any details that you have already added to the survey form will not be saved.

The data will be collected in line with the requirements of the Data Protection Act

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1998. Any electronic data will be stored in a secure account for the duration of the research project. The survey is hosted by Bristol Online Survey and this ensures that all data collected remains within the EU.

We may wish to contact you after you complete the survey to discuss your answers further.

If you have any queries or concerns about any aspect of the survey please contact:

Lesley Murray, School of Applied Social Science, University of Brighton, Telephone 01273 644558 (L.Murray@brighton.ac.uk)

or

Rebecca Farmer, School of Applied Social Science, University of Brighton, Telephone 01273 643533 (R.C.Farmer@brighton.ac.uk).

Please contact us if you would like the survey to be made available in an alternative format or language.

Page 2: Your Service

Name of service provider:

Main location including postcode:

Telephone number:

Email address:

Office hours:

What are the aims or mission statement of your service?

Do you feel that these aims are being met?

- ☐ Yes
- ☐ No

If you have answered 'No', please specify below:

Please tell us about the structure of your service and, if applicable, provide an organisational chart

Please give details of the people involved in providing your service (for example drivers) including the number of people and whether or not they provide the service on a voluntary basis.

What is your annual budget?

What, if any, are your sources of funding?

Page 3: Service Provision

What type of service do you provide?

- ☐ Transport to a regular activity (for example an exercise class)
- ☐ Transport to a non regular activity (for example a hospital appointment)

Please specify:

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What is the frequency of your service?

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Ad-hoc
- ☐ Other

Please specify:

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Is your service limited to a specific geographical area?

- ☐ Yes
- ☐ No

Please specify:

Are you seeking to address a specific gap in service provision?

- ☐ Yes
- ☐ No

If so, do you think that this gap has been filled? Please specify below:

What barriers to the operation of your service, if any, do you encounter?

Are your services contracted by other organisations? Please specify:

Do you use new technologies to help run your service?

- ☐ Yes
- ☐ No

If yes, please give details below:

Page 4: Your Transport

What type of transport do you provide?

- ☐ Bus service
- ☐ Minibus service
- ☐ Taxi service
- ☐ Private car
- ☐ Mobility scooters
- ☐ Non motorised (e.g. bicycle or walking bus)
- ☐ Other

Please specify:

Please give details of your transport fleet if applicable

What type of operator permit do you have?

- ☐ Section 19
- ☐ Section 22
- ☐ Other

If you selected Other, please specify:

How many journeys do you make per year?

Do you seek to limit your environmental impact?

- ☐ Yes
- ☐ No

If 'Yes', please specify:

Page 5: Your Clients

What is your client group(s)?

- ☐ Children - please specify the age range below
- ☐ Older People - please specify the age range below
- ☐ People with mobility impairment
- ☐ Blind and partially sighted people
- ☐ Deaf and hearing impaired people
- ☐ People with learning disabilities
- ☐ People with experiences of poor mental health
- ☐ People with hidden disabilities
- ☐ Families with children
- ☐ Families without children
- ☐ Other - please specify below

Please specify:

How many clients do you have?

Do you operate services for more than one client group at a time?

- ☐ Yes
- ☐ No

If 'Yes', please specify:

Do you have links with other providers? Please specify:

Page 6: Communication

How do you communicate with your client group?

- ☐ Directly with the client
- ☐ Indirectly through an organisation
- ☐ Indirectly through a relative or friend
- ☐ Other

If you selected Other, please specify:

What method/methods of communication do you use?

- ☐ Telephone
- ☐ Email
- ☐ Website
- ☐ Face to face
- ☐ Letter
- ☐ Other

Please specify:

How do you publicise your service?

- ☐ Leaflets
- ☐ Website
- ☐ Emails
- ☐ Media
- ☐ We do not publicise

If you selected 'We do not publicise', please explain below:

Are your communications targeted towards a specific client group?

- ☐ Yes
- ☐ No

If 'Yes', please specify:

Is there anything else you would like to tell us about the service you provide?

Are you happy for us contact you by email or telephone for further information?

- ☐ No, I would prefer not to be contacted further
- ☐ Yes, by telephone or email
- ☐ Yes, by telephone only
- ☐ Yes, by email only

Page 7: Thank You

Thank you for taking part in this survey. If you have any questions or would like to convey further views or send additional documents (such as organisational charts), please feel free to get in touch with Rebecca Farmer using the following contact details:

Telephone: 01273 643533

Email: r.c.farmer@brighton.ac.uk

Annex 2: WP4 Topic Guide for Interviews and Conversations with Stakeholders and Key Informants, Hangleton & Knoll

Primary care services in Hangleton & Knoll:

- Service offer – what kind of service?
- Service users – who uses the services (most)?
- What aspects of work contributes to well being?
- Accessibility – How accessible is the service? by public transport?
- Uptake – how is the service uptake? What role does transport have in terms of service usage? What needs to be improved from your perspective?

→ aiming to get insight on the quality of relationships to service users.

Service users:

- What does the community in H&K look like? Is there a sense of community?
- What are the main issues/challenges for service users?
- How big is the issue around loneliness/ social isolation in the community?
- What do you feel is important to support this group?
- How can it be improved?

Transport:

- In how far does poor transport service effect health conditions (physical & mental) of service users
- What effect does transport have for wellbeing?
- Is there any landscape/geographical difficulties users report in terms of accessing the service?
- What opportunities are there? How can transport support the 'culture' within the community

Technologies:

- Would modern technologies improve service accessibility?
- In how far are modern technologies used by service users (e.g. smartphone, apps, trolleys)?
- What interest is there on modern technologies?
- If little, how can it be enhanced?