Transport poverty meets the Digital Divide: accessibility and connectivity in rural communities

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Structure of Presentation

- Accessibility and connectivity issues in rural Scotland
- Transport technology issues in rural areas
- Transport and the Digital Economy
  - Informed Rural Passenger
- Conclusions
19% of the population live in rural areas

Most of the country is “remote rural” and there are only four large urban areas

Source: National Statistics, 2010
Road travel time

Source: modified from Halden et al., 2002
Limitations of public transport

Distance to Nearest Bus Stop by Geographic Area, 2009
(Source: National Statistics, 2010)

Percentage of Population within 15 Minute Drive Time by Public Transport of Service, by Geographic Area, 2009
(Source: National Statistics, 2010)
Views on the convenience of public transport in Scotland

Source: Scottish Executive, 2006
Transport technology issues

• To what extent could advanced technologies and telematics play a significant role in mitigating inconvenience associated with public transport use in rural areas?

• Degree of mitigation possible is influenced by transport technology coverage and infrastructure provision

• Digital technologies are increasingly used to make mainstream public services more effective and efficient

• “Digital Britain” (2010)
  Ambition: To make the UK a world leader in research, innovation, technology and creativity, by inspiring the next generation and creating the environment for digital talent to thrive. (Chapter 6, pg 165)
Technology issues (contd)

• Varying levels of access to digital infrastructure, technologies, knowledge and the skills required to use digital systems have led to notions of ‘digital divide’ with gender, age, income, race and location being identified as significant factors in identifying ‘haves’ and ‘have nots’ in the digital sphere.

• Scottish rural communities have been identified as being particularly vulnerable to digital exclusion.

• People who live in rural locations across the UK are less likely to have access to super-fast broadband, a 3G phone signal, or a choice of suppliers through their local fixed telephone exchange than urban residents.

• A recent consultation by the Scottish Government (2011) on rural Scotland identified broadband coverage as the key issue for rural communities and a vital measure to support economic growth in rural areas.
Broadband coverage in Scotland
(source: BT Scotland)
Transport poverty meets the digital divide

- The transport industry faces particular challenges in the deployment of transport telematics in rural areas
  - Service area
  - Service co-ordination
  - Infrastructure
  - Fleet size
- There has been a strong urban bias in the application of new technologies
- The role and potential of ICT remains poorly understood
The Informed Rural Passenger
Components of a Passenger Information System

- Location based tracking system (e.g. GPS)
- Real-time weather monitoring
- Road side cameras
- Other sensors etc.

Control station

- At-Stop Displays
- On-Board Displays
- In-Car Terminals
- VMS
- Web Sites
- Enquiry Office Terminals
- Personal digital assistant (PDA)
- Mobile phones etc.

Information ecosystem

Other data

Passengers
The Problem ...
Objectives of IRP

- Explore the use of linked open data to create transport information ecosystem
- Passenger-centric information system (not simply as consumer of information but also supplier)
- Explore the use of mobile devices to create and view information
- Explore methods for characterising provenance of information ecosystem
- Conduct reliability analysis of information obtained from passengers
- Assessment of information for passenger as well as operator point of view
The Informed Rural Passenger: Challenges

• How can data about rural transportation options/performance be collected?

• Is the data collected from the wider information eco-system trusted and reliable?

• What are the challenges associated with integration of knowledge and information sources with different provenance?

• What information visualisation techniques are appropriate for users in rural areas?

• How can we use this information to identify behaviour change?
System architecture

Information from operator (e.g., revised schedules), weather reports, traffic delay reports, etc.

UK government Open data (e.g., NaPTAN)

Passengers with Smart phones

Updates the real-time information about the delays and service conditions; and allow tracking the vehicle location through user mobile phones.

IRP backend server

Crowd-sourcing and Data integration

Data storage

Data processing

Passengers: Real-time information through mobiles

Transport agencies

Transport Operators
GetThere

- Mobile app
  - View real-time bus locations
  - Provide real-time bus location
  - Be alerted about bus arrival time

- Web site
  - View real-time bus locations
  - View previous journeys
  - Manage profile, notification settings
GetThere Mobile App
GetThere Mobile App
**GetThere: Pilot Study**

- To check technological issues with GetThere system
- In collaboration with First Aberdeen
- On Route number 17 (From Dyce to Faulds Gate)
- With 15 to 20 passengers
- Scheduled for Nov 2011.

**GetThere: Extended Pilot Study**

- First South East and Central Scotland Route 95/X95
- Similar format to Aberdeen pilot study
- Longer rural route
  - 3h 35m
  - ~93 miles
  - Up to 35 scheduled stops
Conclusions

• Providing accessibility and connectivity to rural communities presents significant challenges.

• Alongside social and economic aspects, these problems include a strong technological/technical component common to both the transport and digital spheres in terms of the quality and availability of infrastructure and services.

• Better gathering and communicating of information offers the prospect of enhanced quality of service, more closely aligned to user needs and expectations.
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Digital Economy

- Digital Economy
  - is the novel design or use of information and communication technologies to help transform the lives of individuals, society or business
  - Research programme (£120M) sponsored by EPSRC (lead Council), MRC, AHRC and ESRC
    - [http://www.rcukdigiteconomy.org.uk/](http://www.rcukdigiteconomy.org.uk/)
  - Understanding the needs of companies, people and organisations, with research into not just the technology, but also understanding how people use technology, what the impact is and where it fits.