The Future of Rural Mobility: Opportunities to address rural needs

Gary Bosworth, Liz Price, Charles Fox, Martin Collison
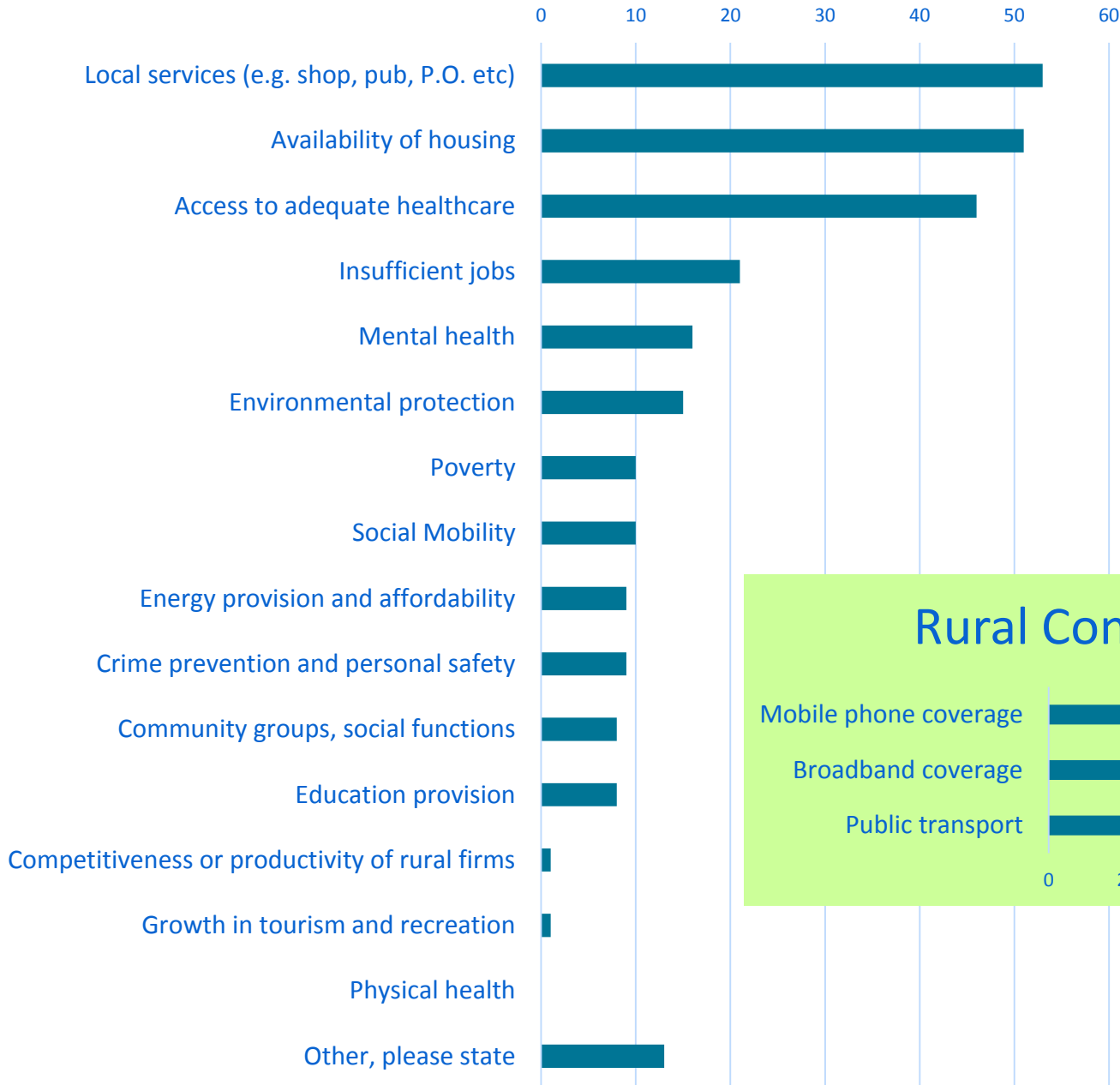
UNIVERSITY OF LINCOLN

Aims & Rationale

- Shortcoming in national policy assuming that transport and mobility innovations start in urban regions and then trickling down.

- Instead, rural regions will need different solutions to tackle rural need, **designed for rural places,** and integrated into urban systems

- The aims of the project were therefore to:

i. Review the various needs of people and business in rural areas

ii. Assess the new and future mobility tools available to rural areas

iii. Create a framework to align potential mobility and connectivity innovations with rural needs

iv. Create a "Toolkit" of technical and non-technical options available to support stakeholders developing new policies and initiatives for rural transport
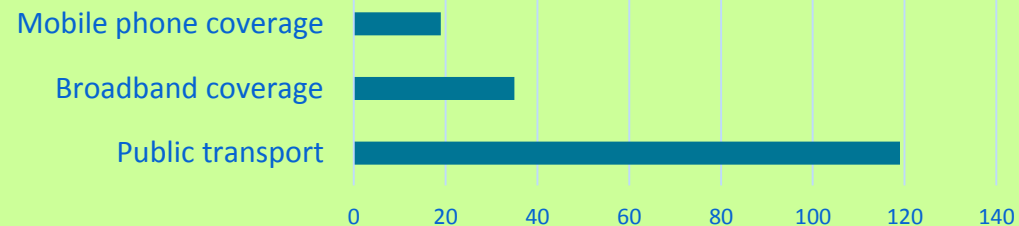
Rural Needs

- With thanks to the RSN members for completing our survey…

- 171 responses identified the key rural needs as: Access to health services; Availability & affordability of housing and local services

- "Insufficient Jobs" and comments about low pay jobs and lack of career progression opportunities also featured

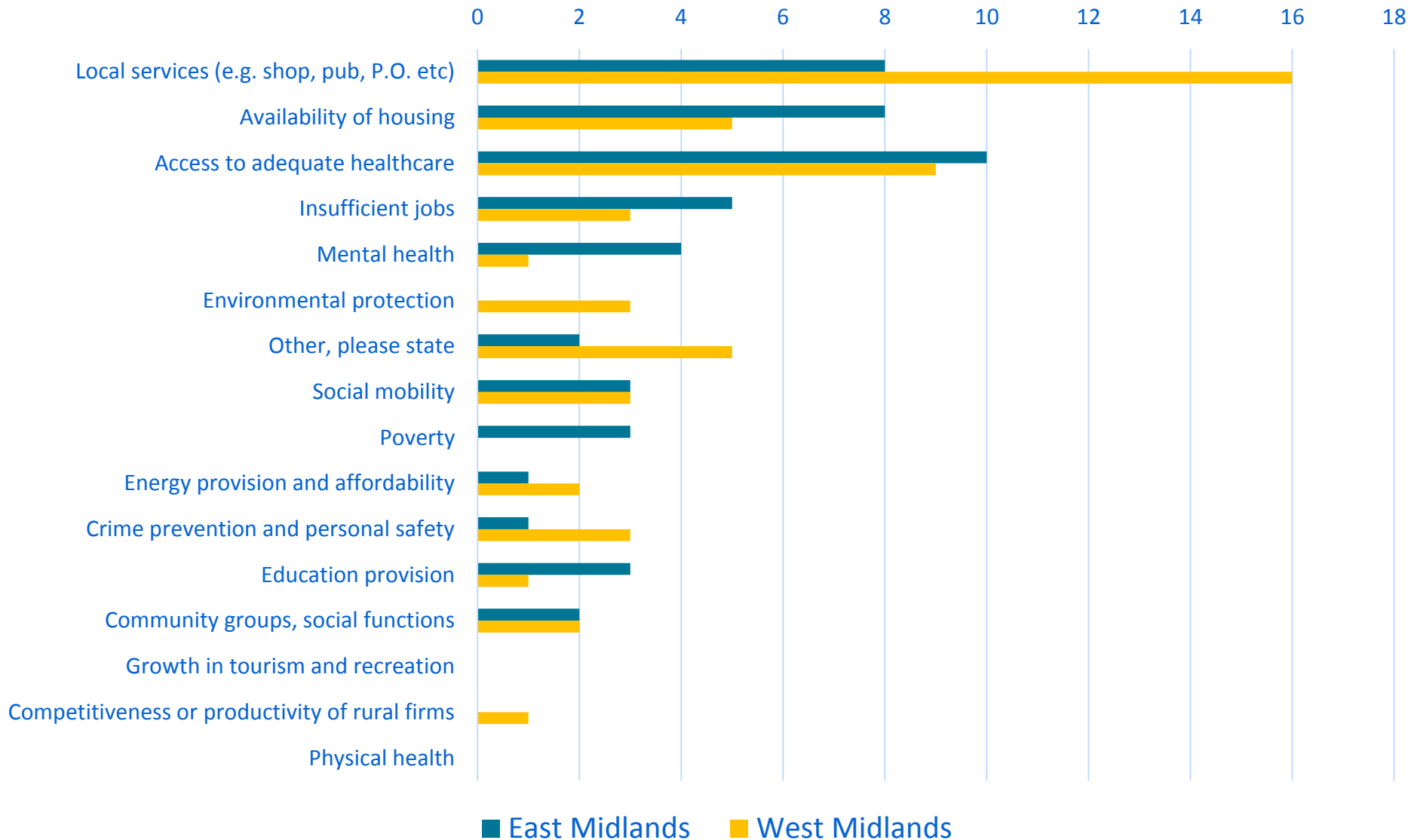- Broadband, mobile phone coverage and transport are means to address other rural needs.

UNIVERSITY OF LINCOLN

Rural Needs in the Midlands

	0	2	4	6	8	10	12	14	16	18

- Local services (e.g. shop, pub, P.O. etc)
- Availability of housing
- Access to adequate healthcare
- Insufficient jobs
- Mental health
- Environmental protection
- Other, please state
- Social mobility
- Poverty
- Energy provision and affordability
- Crime prevention and personal safety
- Education provision
- Community groups, social functions
- Growth in tourism and recreation
- Competitiveness or productivity of rural firms
- Physical health

■ East Midlands ■ West Midlands

www.lincoln.ac.uk

UNIVERSITY OF
LINCOLN

Rural Needs

"Lack of affordable housing is stripping young, working people from our communities"

"lack of affordable housing and job opportunities for younger people"

"Rural areas are becoming increasing unaffordable… they also suffer from a lack of services such as GPs without travelling significant distances"

"There is no bus service at all in the evenings"

"Loneliness is a huge problem"

"a lot of widows and widowers… rely on non existent public buses, kindness of neighbours or increasingly community transport to get to the health centre, hospital and shops"

"the lack of affordable public transport can prevent people travelling even relatively short distances to access social and medical services etc"

"[having only one bus route]… I and the other residents are only too aware that we are often "cut-off" and depend on the few local facilities. With a higher than average ageing population, it is often difficult for the true residents to access healthcare and basic daily service"

UNIVERSITY OF LINCOLN

A Framework of Rural Needs

BUSINESS AND ECONOMY	SOCIAL AND COMMUNITY
Green energy; Ageing population; Access to health services	
Skilled workers	Social mobility & aspirations
Access to training and networking	Access to education and training
Accessible homes for employees	Affordable housing
Flexible working spaces	Home-working and flexible working arrangements
Broadband and phone coverage	Broadband and phone coverage and ICT skills
Quality of life to attract workers	Socio-cultural activities
Natural environment (esp. tourism)	Green space for healthy lifestyles
Meeting spaces	Combatting isolation. "Third places" for social interactions (e.g. pub, café, park)
Financial services (esp. for cash businesses)	Essential services (e.g. PO, bank, shop, pub)
Access to/for customers	Access to other places for retail & recreation
Premises for growth	

Tool / rural need	Enhancing existing public transport (smart ticketing, dynamic scheduling etc)	Self-drive, car-pool and ride-share innovations	Independent transport (cycling, walking and electric micro-mobility)	Autonomous vehicles (people and goods)	Digital & online Innovations	Village Hubs
Community cohesion	Encourage public transport use; simplify payments and provide confidence to travellers	Potential to generate more social mixing & companionship; Social enterprises & volunteers to operate schemes. Scope for drivers to offset cost of travel by offering lifts.	Promote use of local services and community facilities; Community groups work together to develop cycle hire schemes, travel together for safety etc.	Enable less mobile individuals to get out of the house without feeling reliant on other people; Potential limitations for those with poorest physical mobility	Online hubs and digital raining centres can promote community cohesion; Village websites and social media spaces integrate with physical community activities.	A transport hub would provide the footfall to sustain more essential village services and activities.
Accessing key services (shops, banks, P.O etc)	Sustain market town high streets through increased footfall.	Highly realistic for journeys that are not time critical. Requires cultural change	More limited functionality for bulkier shopping trips.	Could fulfil "last mile" links to faster public transport; Reduce rapid increase in "white van" traffic to the home. Requires large scale network implementation with hubs, 5G, trackways, plus blockchain & microcontainerisation for freight	E-retail, e-banking is growing, but excludes those not online. E-retail increases freight journeys to rural homes.	Retail delivery lockers reduce intra-village freight travel. ATMs at the hub Access point to fast travel to town centres can strengthen high streets
Education, training & skills	Encourage public transport use and align school/college hours to transport timetables. Smart ticketing systems can allow easier implementation of subsidies for education-related transport.	Common destinations make car-shares realistic – potential to run from college or from rural community; Safeguarding and payments to drivers are possible; Car-share reliant on those with licences.	Desirable among young people if safe and mode-switch is possible; Data could be collected through wearable tech.	Could fulfil "last mile" links to faster public transport; Needs dedicated trackways & 5G	High potential for online courses, especially among work-based learners. Less desirable for full time learners	Learning lounges; More mixing of learners & professionals. Bridge time between transport to school or college and home.
Health and wellbeing	Potential to link different forms of transport through joined up information and ticketing, which could include non-emergency health travel.	Enable better coordination across existing voluntary patient transport schemes; Common destinations allow for more journey sharing, especially if outpatient appointments were coordinated by postcode	Could promote healthier lifestyles; Cycling for home care reduces requirement to drive; Less realistic for those who are already unwell or less physically mobile	First and last-mile links to hospitals; Improve mobility of health and social care professional Secure, autonomous delivery of prescriptions; Currently limited by challenges of rural environments to implement technology	Blended e-health and personal healthcare is realistic with new digital technologies; - Requires 5G and cultural acceptance - Over-reliance on e-health could worsens isolation.	Community space could be used by mobile healthcare services e.g. drawing on the Village Hall upgrade funding: http://acre.org.uk/our-work/village-hall-improvement-grant%20fund
Accessing employment	Allow more rural people to access diverse jobs; including shift work	Allow more rural people to access diverse jobs; including shift work	Integrate healthy lifestyles into working practices	Provide first and last-mile links to public transport networks.	Allow job-seekers better access to information; Make online interviews more realistic; Open up gig-economy opportunities to rural people	Enhance commuting experience; Enable workers to be based in co-working spaces;
Business growth	Simplify access for tourists/customers and workers Disproportionate costs to smaller rural travel firms	Improve access to workplace with potential for work-based schemes. Improve labour market options for employers.	Tourism options built around cycle hire, enhanced safety and signage on routes. Potential for rural commuting with safe routes and funding (e.g. wheels2work)	Entrepreneurial opportunities in the transport sector. Tourists, customers and employees access workplace/destination more easily.	5G opens up new business tools for efficiencies, collaboration & home manufacture	Rural businesses become more accessible and the hub provides outlets for sales and other activity; Co-locate with flexible co-working and networking spaces
Environmental protection	Encourage people away from the private car Requires government policies to promote behavioural change	Reduce private car miles; Increase use of e-vehicles in car-pools.	Reduces carbon footprint	Advances in logistics combined with automaton can reduce congestion and freight on rural roads	Reduces carbon footprint of travel	Hubs can support greener travel, reduce some journey needs & provide a focus for investment in charging points.

Tool / rural need	Enhancing existing public transport (smart ticketing, dynamic scheduling etc)	Car-pool and ride-share innovations	Independent transport (cycling, walking and electric micro-mobility)	Autonomous vehicles (For people and goods)	Digital & online Innovations	Village Hubs
Village services & community cohesion						
Education, training & skills						
Health and wellbeing						
Accessing employment						
Business growth						
Environmental protection						

Midlands Connect

https://mobihubs.eu/

UNIVERSITY OF LINCOLN

A rural hub model

- Partly inspired by Mobi-hubs, a lot of our thinking revolves around hubs to enable a range of other mobility innovations

- We are keen to run trials in 2 or 3 villages to assess the feasibility of rural hubs.

- These could provide a focus for car-sharing, e-vehicle charging, rural deliveries, "last-mile" transit technologies, business workspaces, learning lounges and other social functions.

- The additional footfall at these sites can provide new business opportunities too – for transport providers and other rural services

UNIVERSITY OF LINCOLN

A rural hub model

Rural Mobility Toolkit

1) Co-ordination of transport budgets, infrastructure and existing transport provision: Maximise the value of what's already there

   - A place based approach needing local governance

Many providers of transport operate separate budgets with slightly different targets: inefficient and lacking strategic leadership?

2) Digital mechanisms to reward providers of lift-shares (UBER)

- digital payment infrastructure that tracks per mile travelled in a registered car share. Automated payments on a cost-share basis. Rates set by the scheme to avoid profiteering. Scheme provides safeguarding and vetting of participants.

UNIVERSITY OF LINCOLN

Midlands Connect
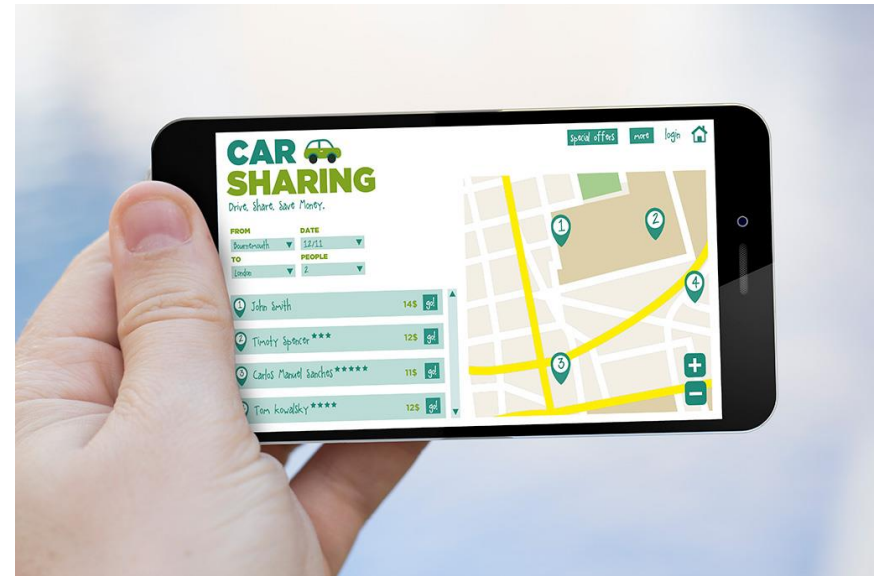
Data Science: Internet of Things (IoT)
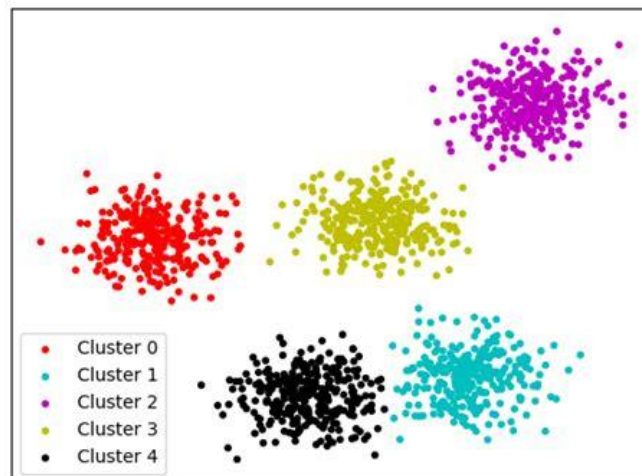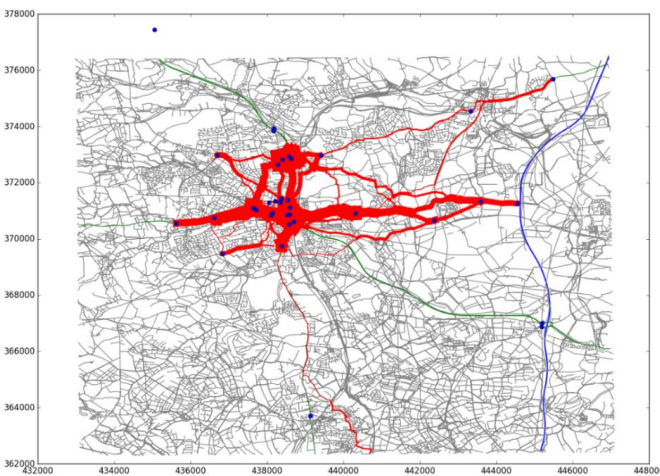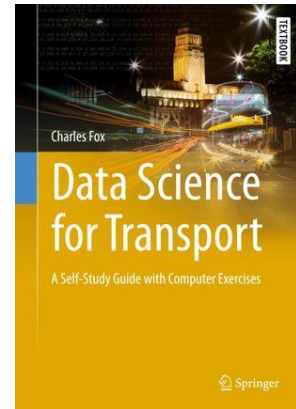
1) Collecting data about the state of transport networks

2) Devices have become very cheap

3) But rural networks are sparse

UNIVERSITY OF LINCOLN
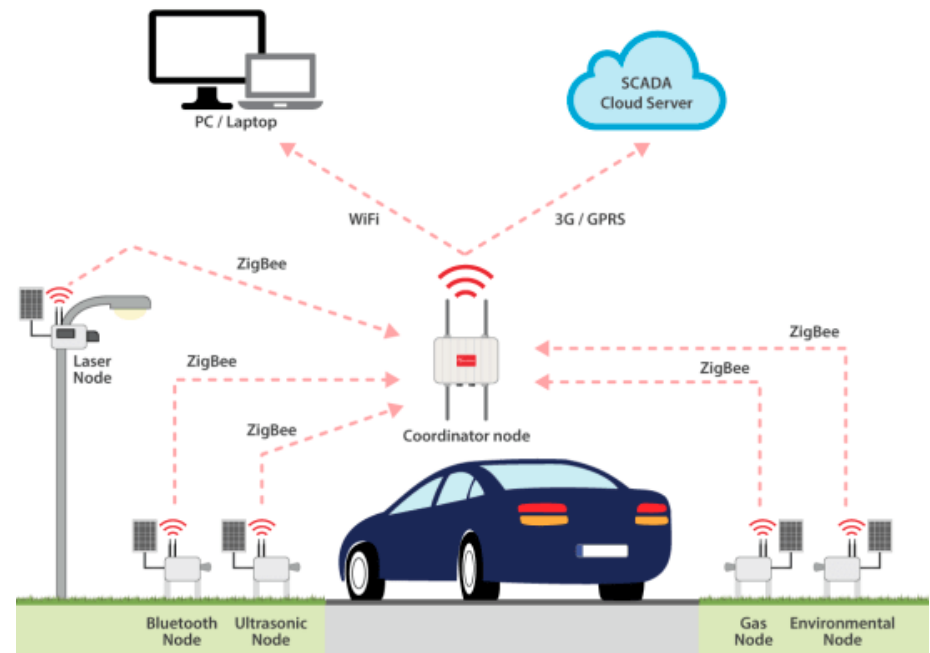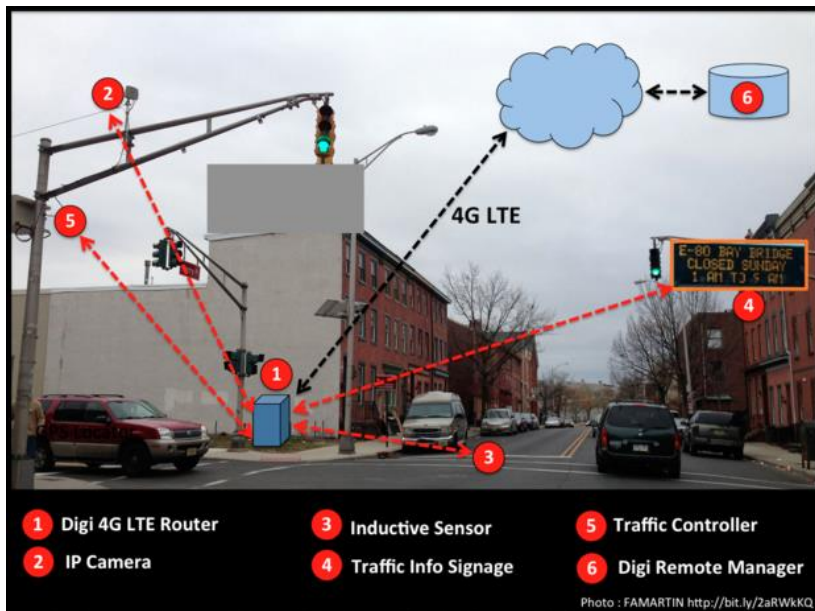
Data Science: Big data analytics

1) Processing big data about transport networks

2) Computation has become very cheap

3) Methods:

origin-destination;   clustering;   network theory
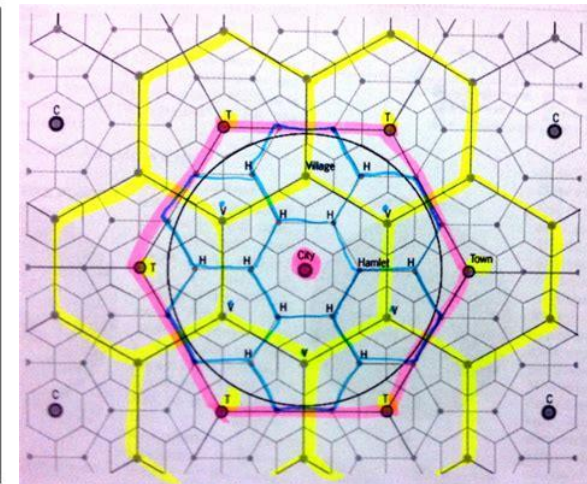
3) E-learning; E-health and Tele-working

- Advances in virtual reality technology will make video-conferencing more realistic; Cloud-based and virtual project collaboration tools are increasing the flexibility of workplaces

- A hub model would allow a check-in system for homeworkers and "help points" to empower tech adopters

Last mile vehicles

SCHEEMDA ELECTRIC DRIVERLESS SHUTTLE

Scheemda Ommelander Hospital electric driverless shuttle (Arriva)

Jan Emmelkamp

Starting Monday, August 6 2018, an autonomous little Navya electric bus connects the entrance of the Ommelander Hospital with the closest regular bus stop at the Molenstraat in Scheemda, around 1.5 km away. The bus, with registration 10-00-ZZ (the ZZ series is used for special vehicles), is "operated" by Arriva. Though there is no driver,

Self-driving vehicles

Midlands Connect

UNIVERSITY OF LINCOLN

Midlands Connect

5) Freight (cont'd): rural areas are produce a disproportionate amount of goods – especially bulky items like minerals, food etc.

- Innovations in containerisation

- Autonomous lorries   Implications for rural mobility

- Banning lorries from city centre

- Already in some ports

- Location of warehousing may change

- Disruption of food and drink supply chain

UNIVERSITY OF LINCOLN

Midlands Connect

4) Freight and home delivery

- Legal challenges relating to drone flight and challenges for security and safe landing sites

- Identify opportunities for village retailers to provide distinctive offers: align rural services with delivery hubs.
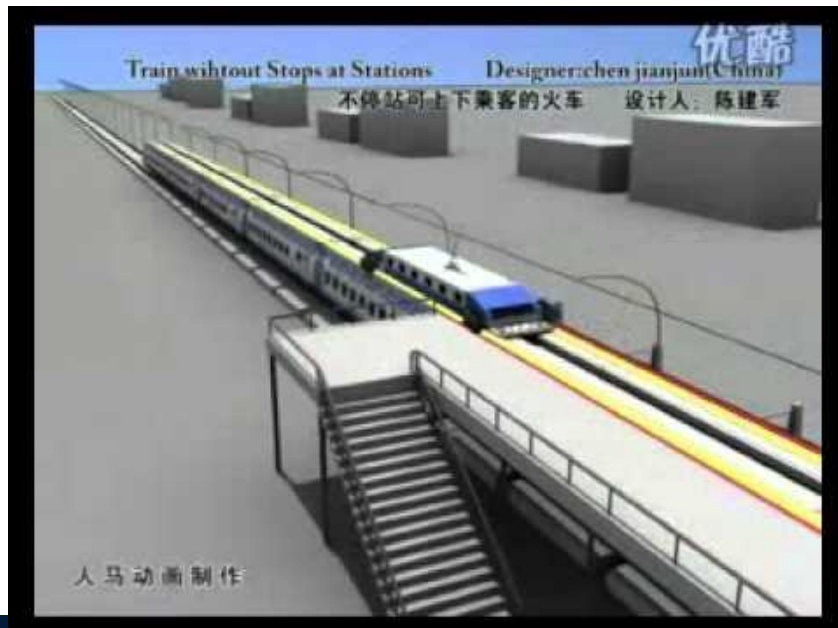
UNIVERSITY OF LINCOLN
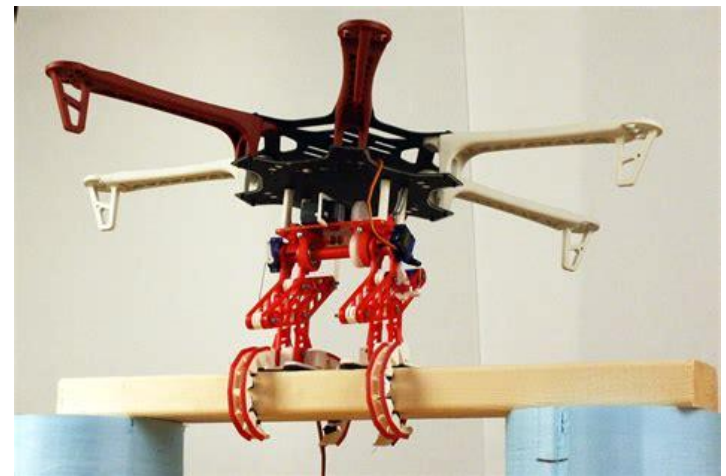
6) Autonomous drones

7) Rail Innovations

- Young adults in Great Britain and other countries are driving less now than young adults did in the early 1990s   (Chaterjee et al, 2018)

- Rail trips have increased for young adults but the increase is relatively small compared to the decrease in car driver trips

Left: non-stop trains;   Above: Pod trains

Rail Innovations (cont'd)

- Advances in e-ticketing and online timetables along with Wi-Fi on trains are all making it more convenient...

- But many rural lines lack Wi-Fi, have too few coaches and do not integrate effectively into main line connections

- Re-opening lines is costly, but can be transformative... e.g. the Borders Line

- Of those who had moved house, 29% stated that they would not have moved to their current address in the absence of the railway
- 52% of those who had moved employment stating that the re-opening of the line had been a factor in their decision
- For tourists, 71% said the re-opening of the line was a factor in choosing to make their trip; 25% stated they would not have made the trip had the line not been in place.

Behavioural shifts

- Incentivise public transport use – Wi-Fi on buses

- Incentivise green alternatives (e.g. e-taxis)

- Make mode-shifts easier, reliable and more habitual

- Disincentives for inefficient use of private transport

- Reduce private city-centre transport access

- Build familiarity with digital technology to replace mobility needs AND identify alternative behavioural changes to tackle isolation

UNIVERSITY OF LINCOLN

Infrastructure needs

- Comprehensive, reliable broadband underpins many of these developments

- Data science to predict and manage transport demands

- E-vehicles charging points, battery developments and reliable power

- For AVs, dedicates spaces and changes to highways laws

- Rail investments

- Airspace and landing spaces for drones

- Security measures to protect autonomous vehicles and to protect the public

UNIVERSITY OF LINCOLN

What role for the Public Sector?

- The Public sector needs to facilitate investments but is unlikely to have the resources to make the investments and run the services

- Community-led companies will drive some of the solutions, global giants will push other technology…but this is more likely to be urban-led

- The public sector has a key planning role

- The public sector as a regulator can drive behavioural changes among firms and individuals

UNIVERSITY OF LINCOLN

What role for the Private Sector?

- The private sector will innovate where they see the most profitability

- In many cases this will be cities, but entrepreneurial rural transport opportunities will emerge – many in partnerships

- How can we prompt action from the private sector and support third sector delivery of transport innovations?

? ? ?

UNIVERSITY OF LINCOLN

Summary

- Our Toolkit sets out a suite of options – some for the near future, others to "future proof" rural areas facing changing mobility needs

- Solutions MUST include a combination of technology-enabled innovations, organisational innovations & social/behavioural change

- Continuing <u>growth in our rural economies</u> needs investment in transport and digital infrastructure.

- An <u>ageing rural population</u> brings a different set of mobility challenges

- For <u>younger people</u>, the future of work, recreation, family and environmental lifestyles present even greater uncertainties.

UNIVERSITY OF LINCOLN

Looking ahead…

- We therefore call for a ring-fenced "Future of Rural Mobility Fund" to support initiatives including:

- Trials in different rural locations

- Digital and electrical infrastructure

- Private sector innovation challenges

- Support for smaller rural transport providers (incl. community sector) to adopt the latest technologies

- Promotion of sustainable transport alternatives, including "active transport"

UNIVERSITY OF
LINCOLN