

‘Towards connected mobility: A Case Study and Delphi approach to a theoretical framework for delivering societal benefit’

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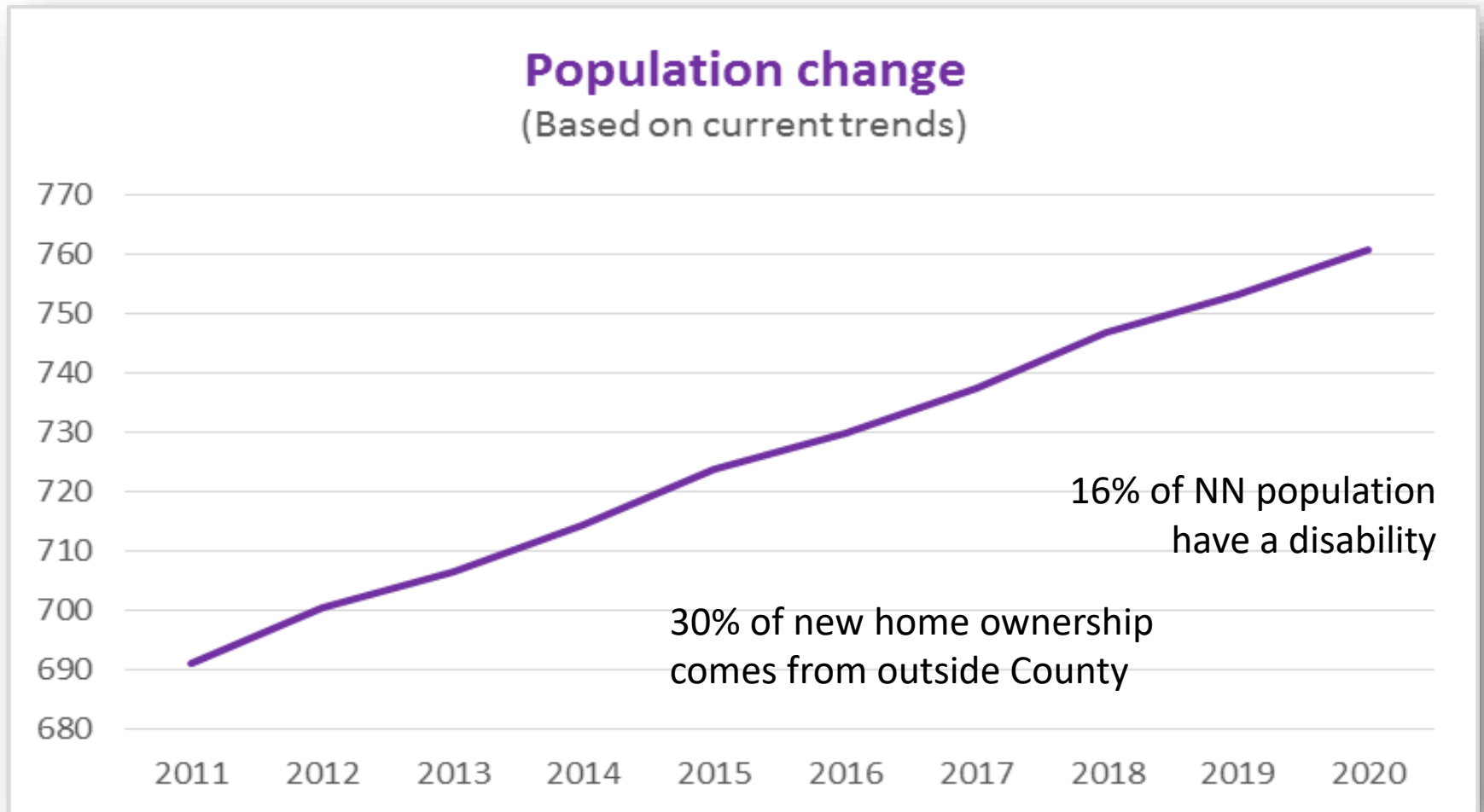
The Smart City

- Allied to Economic and sustainable development
- Designed to reduce carbon emissions & meet the needs of citizens
- Aligned to a conurbations high quality of life
- More easily achievable in high density populated areas
- A challenge to local government & partners: Requires central stakeholder and technology alignment



- Over 60 years demographic predicted to increase from 19% (2006) to 28% (2031) (ONS, 2016).
- Survival rates for elderly 50% greater if they are included in societal activities
- One in four elderly persons see another person less than once per week, and on average one million of the UK's elderly go a whole month without seeing someone.
- Western governments are seeing social enterprise partnerships as the way forward for mitigating social challenges associated with isolation (Mason, 2010)

Divergence between budget & society



Research problem

Independent communities, with access to jobs, health care & education - within cost

Thematic areas

Topic	Count
Transportation	28
Sustainable Development	28
Smart City	19
Article	17
Urban Planning	17
Cities	16
Land Use	15
Urban Areas	15
United States	
Economics	
Urban Development	
Intelligent transportation	
Smart Growth	
Smart	
	7
	7
	6
	5
	5
Cloud computing	2
Expert systems	1
Smart structures	1

Key themes in CABS journals

Topic	Count
Cities	41
Studies	3
Economics	
Issues in Sustainable	
Urban Areas	
	81
	73
	70
	65
	59
Things	56
Algorithms	47
Innovation	42
Air Pollution	37
Wireless Sensor Networks	24
Renewable Energy	23
Smart Grid	22
Cloud Computing	20

Topics in CABS journals

56% of journals were produced within past 4 years, indicating a developing interest

Data driven approach

- 8,198 School pupils (entitled)
- 107,901 School pupils (own way to school)
- 3,537 Special needs (SEN)

Total 119,636 (239,272 single movements per day)

- 1,683 Local authority
- 4,369 Health care
- 17,626 University
- 1,623 College
- 6,600 Hospital

Total 31,901 (63,802 single movements per day)

Data circa 25% of
Counties population
based on 2014 (714k)

*(38% when we include business
parks & health care movements)*

**The opportunity (current data) is
circa**

- 303,074 per day
- 1,515,370 per week
- **78,799,240** per year

Procurement & Social value

What is happening now?

Contracts
193 (1-3 day)
675 (5 day)

What is working well?

9,274	Capacity
8,198	Transported
88%	

Synergistic view!

Pax	Contracts
658	20
Synergistic procurement approach	
Pax	Contracts
658	13

Applying the approach

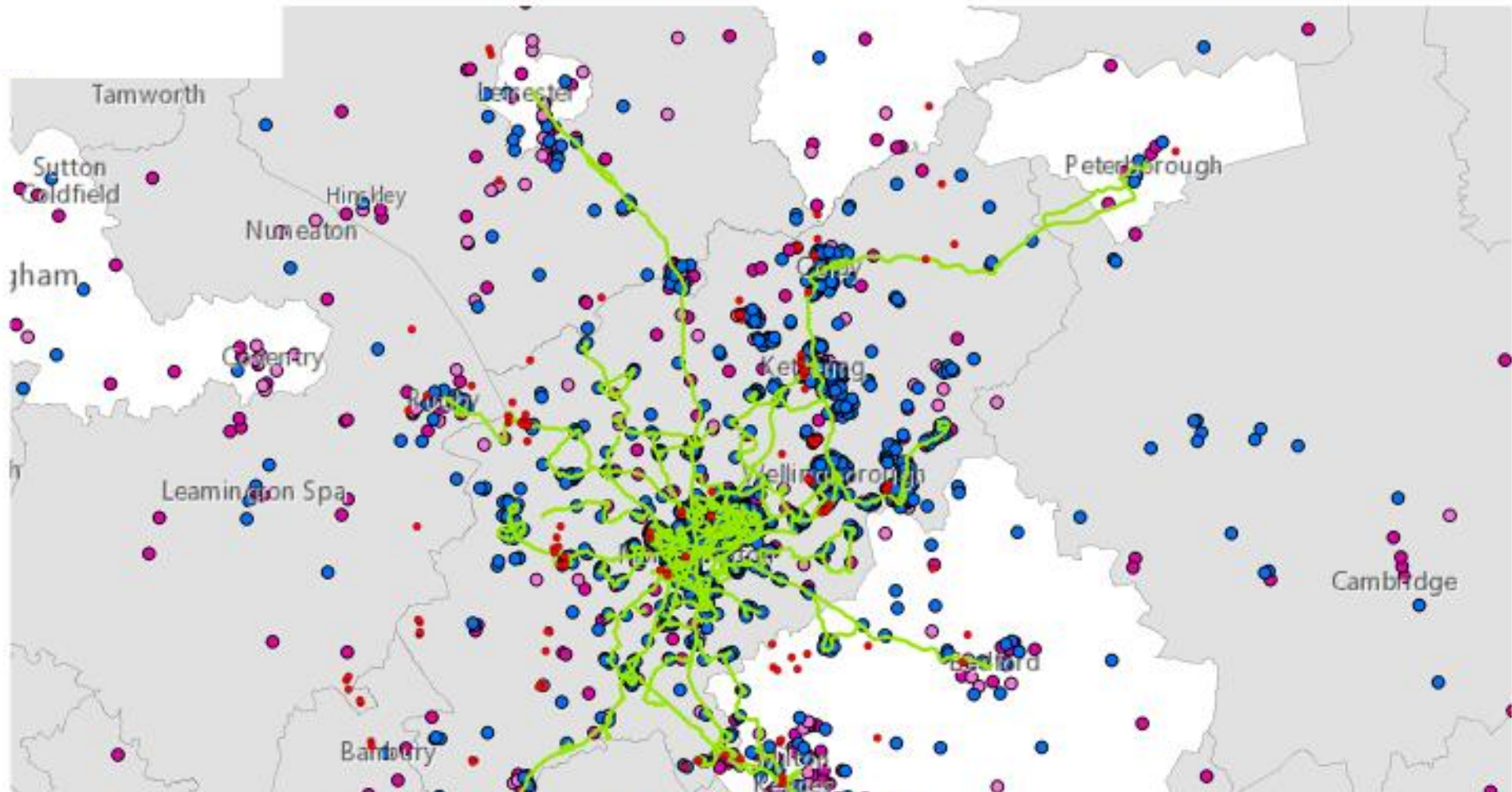
60% of above reside when embracing a synergistic approach, with very little impact to service provision

Health & wellbeing approach

Row Labels	Inward	Outward	Grand Total	
Ambulance 1 Crew	4,953	7,438	12,391	43%
Ambulance 2 Crew	4,880	15,049	19,929	
Bariatric	485	810	1,295	
Car Fully Mobile	6,457	6,358	12,815	27%
Car Minimal Assistance	5,892	5,983	11,875	
None patient movement	33	8	41	
Stretcher	1,740	7,633	9,373	
Wheelchair 1 crew	3,873	4,171	8,044	
Wheelchair 2 crew	5,047	5,600	10,647	
	33,360	53,050	86,410	

A synergistic approach to existing transportation infrastructure not only delivers significant cost savings, but further has a direct impact on health & wellbeing and social objects

The commuting conundrum



16 million journeys

80% single occupancy car use

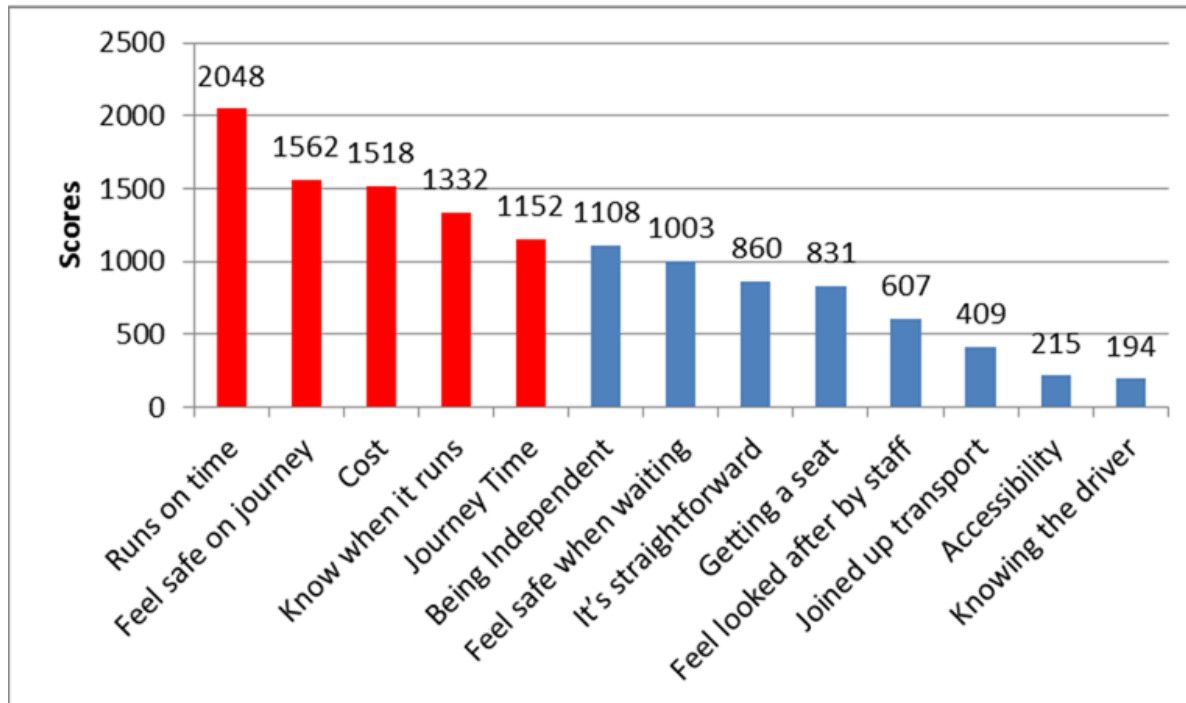
13 million opportunities to reduce cost, decrease carbon & increase customer service

Green triangle

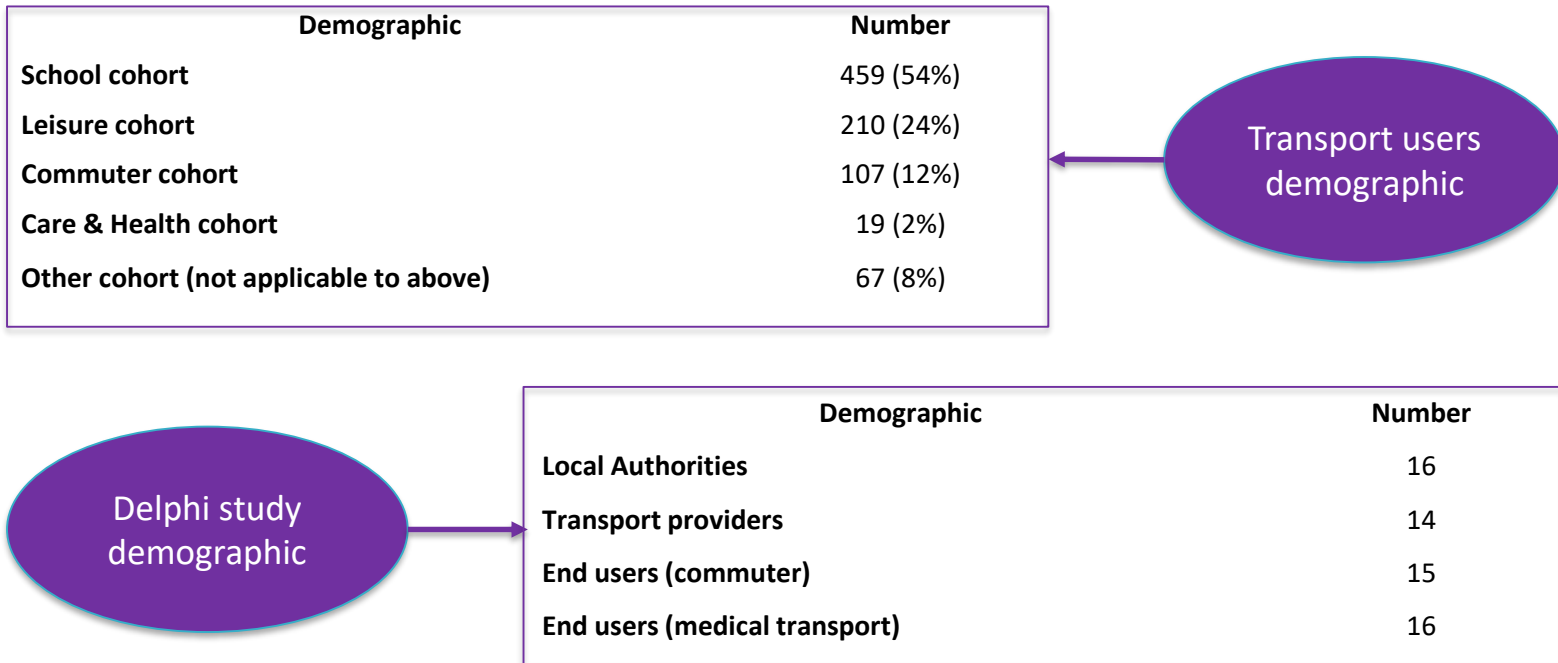
Circa 30,278 employees & students

NCC, NHS, St Andrews & UoN

Key needs of Transport Users



The Study



Delphi Final Round – Top 10

All responses collated	Ph I Mean	Ph I SD	Ph II Mean	Ph II SD	DIFF	Ph III	Ph III SD	Diff	1	2	3	4
Journey time	4.5	0.41	4.5	0.16	0	5	0.26	0.5	TP	U	LA	LG
On time performance	5	0.76	4.6	0.23	-0.4	5	0.26	0.4	TP	LA	LG	
Reliability of service	4.5	0.41	4.7	0.30	0.2	5	0.26	0.3	TP	LA	LG	GP
Visibility of operating times	4.6	0.48	4	0.20	-0.6	5	0.26	1	LA	GP		
Contactless payment	1	2.06	2.5	1.26	1.5	4.8	0.12	2.3	TP	GP	LA	
Connected transport	2	1.36	5	0.51	3	4.5	0.09	-0.5	LA	GP	LG	TP
Getting a seat	4	0.06	4	0.20	0	4.5	0.09	0.5	TP	LA	LG	
Real time data	4	0.06	4.7	0.30	0.7	4.5	0.09	-0.2	LA	GP	TP	
Accessibility	4.8	0.62	4.8	0.37	0	4	0.45	-0.8	TP	LA	GP	
Cost	4.8	0.62	4	0.20	-0.8	4	0.45	0	LA	GP	LG	TP
	3.92		4.28			4.63						

TP=Transport provider U=User LA=Local authority
 GP=Government Policy LG=Lobby group

Theoretical Framework

Users

Journey time
On time performance
Service reliability

Accessibility
Cost
Getting a seat
Visibility

Providers &
Procurers

Contactless payment
Connected transport
Real time data



Data
Social impact
Health & wellbeing
Community
Business attraction
Social isolation
All-inclusive networks

Social
impact
literature



From research to business plan...

The project offered a unique way of developing a business plan that proposed the creation of a social enterprise company whose objective would be to:

" ... carry on activities which benefit the community and in particular (without limitation) to improve access to education, skills development, health and wellbeing services, leisure pursuits and employment through commissioning and management of travel, transportation and allied services."

- A social enterprise
- Targets social benefit
- Delivers empowerment through mobility
- Improving access-generating employment opportunities
- Applying transformative innovative solutions to transportation challenges

Thank You

