↑ Data from transport flows around cities can be very useful to those who plan improvements to highway infrastructure and services MONGKOL FOTO – SHUTTERSTOCK

Building on big data to improve transport thinking

Useful data sets can be interrogated by academics to improve our understanding of how transport improves peoples' lives. Justin Ward reports on the UKRLG's work with the Urban Big Data Centre.

'Data is the new oil' is a phrase often heard at conferences and in news reports; and transportation is one area where the potential benefits of harvesting data are starting to be realised.

The UKRLG has identified the importance of data to transport: its business plan highlighted the need to enable innovation and development of digital solutions within the highways sector.

The Group recently decided to team up with the Urban Big Data Centre (UBDC), a UK wide data service that promotes innovative research methods and the use of big data to improve social, economic and environmental wellbeing in cities.

Funded by the UK Economic & Social Research Council, the UBDC brings together urban social scientists, data scientists and statisticians from the University of Glasgow and seven partner universities. Last month the UKRLG collaborated with the Centre on a workshop about transportation data.

"Research will help stakeholders better assess vulnerability and resilience."
Vonu Thakuriah

"The quality of the work they are doing is very high and all pertinent; this is not abstruse stuff," said UKRLG chair and the Department for Transport's director of local transport Graham Pendlebury.

The session took place on 6 February and featured an introduction from UBDC director Professor Vonu Thakuriah. Vonu provided a good summary of the wide range of projects and considerable data sets the centre has, or is acquiring.

The first session was led by Dr Jin Hong who gave a presentation about the impact of large cycling infrastructure investments in the Glasgow Clyde Valley before and after the 2014 Commonwealth Games.

He explained that a comprehensive understanding of cycling behaviour has been limited in the past due to a lack of information about cycling activities at a large, spatial scale. In recent years, however, big data research and 'citizen science' have paved the new way for the tracking of cycling activities.

The UBDC has been making use of crowdsourced data from Strava, a social network for athletes that records data from users who upload cycle rides and running activity via their smartphone or GPS device.

UK ROADS LIAISON GROUP
c/o CIHT, 119 Britannia Walk
London N1 7JE
web: *ukroadsliaisongroup.org*
email: info@ciht.org.uk
tel: 0207 336 1555
twitter: *@ukrlg*

UKRLG Chair: Graham Pendlebury

UKRLG Board Chairs:
Roads: James Bailey
Lighting: Lindsay McGregor
Bridges: Liz Kirkham
Network Management: Mark Kemp
Asset Management: Garry Sterritt

Senior Policy Officer:
Justin Ward
email: *justin.ward@ciht.org.uk*
tel: 0207 336 1584

Social media's potential for keeping cyclists safe

↑ **Strava is a tool for tracking routes taken by cyclists** ANTB – SHUTTERSTOCK

Presentations at the workshop were followed by a lively discussion around cycling, data and accidents, involving several participants.

Urban Big Data Centre data scientist Mirjam Allik pointed out that councils keep records of injuries and damage for insurance purposes and that this would be one way to get some data on cyclists' accidents.

Vonu Thakuriah from the UBDC noted the potential of using Twitter to get data on 'unreported' cycling accidents; another suggestion was that Strava could include a feature for reporting accidents.

Assessing the risk of injury for cyclists is clearly an area for development, but understanding risk more accurately will enable the transport profession to be able to more fully realise the health benefits of cycling, she noted.

Professor Thakuriah, originally from Chicago, has a good insight into how social media data can be useful for researchers. A UBDC project is using Twitter data to get sentiments from people on traffic accidents, crimes and other demographics to measure and map 'social hazards' at a small area scale in the American city.

This research would help stakeholders better assess vulnerability and resilience to (natural and social) hazards in urban areas, she says.

Commenting on the session, UKRLG representative John Irvine from Infrastructure Northern Ireland said: "Data gives insights, and interactions with data can be used for the public good."

Graham Pendelbury added that the UBDC does "great work, more people should know about what they do. The links made between policy experts and practitioners with data experts clearly have some way to go".

UBDC has acquired data from Strava that comprises anonymised data from users in Scotland, Tyne & Wear and Manchester. The aggregate information provides GIS compatible data that offers a minute by minute count of users at street level and wait times at intersections based on the Open Street Map roads network.

From research by Dr Hong, preliminary results showed that three new cycling facilities have led to positive and significant influences on monthly total cycling volumes across all modes (8-14%).

The next session was led by Dr David McArthur and considered the capturing and processing of multimodal travel data from smartphone apps. People with smartphones can, it was said, act as 'sensors' in urban areas; potentially very helpful for transport policy makers.

David has been involved with the 'Citizens at the City's Heart!' project (Catch!) which aims to improve the data gathering process by allowing people to collect their own data to improve transport and planning in their area.

Crowdsourced data is collected via an app that, with user consent, tracks the location of the user and what mode of transport they are using. It does this using GPS signals, as well as some clever machine learning algorithms that use the phone's sensors.

The UBDC then makes sense of the data by using a technique called 'map matching' to work out what transport infrastructure people were using. They work out the locations visited using 'stop detection' and 'semantic annotation' and data is anonymised using a variety of techniques including grid masking and blurring.

Next up, Dr Katarzyna Sila-Nowicka gave a presentation on an 'analysis of actual versus permitted driving speed' in Glasgow, which elicited such interest that the Department for Transport has held a follow up session to explore the implications of the research.

Dr Jim Uttley of the University of Sheffield – who is using data provided by UBDC – then presented on 'Using Strava data to identify the effects of light and lighting on cycling activity'. This session explored questions such as 'Can lighting encourage cycling after dark?', 'Can lighting make cycling safer?' and 'What lighting level is optimal?'

Jim said that UBDC has provided road lighting and Strava Metro data for Newcastle, so now his group is working out the effect street lighting has on cycling after dark.

The Cycling & Walking Investment Strategy does not mention street lighting, but the infrastructure to support cycling uptake might require a stronger focus on this element as a lack of sufficient lighting might affect people's willingness to cycle.

The UK Lighting Board is now working with Jim to explore other lighting related research projects to explore developments such as improvements in energy efficiency across the UK.

Road Safety Analysis director Richard Owen later gave a presentation on assessing risk of injury for cyclists and what datasets are being used. His research concluded that the theory of 'safety in numbers' is true and that the more cyclists you have in a city, the safer it is to cycle.

For more information visit *ubdc.ac.uk*

↓ **Impacts of cycle investments in Glasgow have been quantified using big data and 'citizen science'** CYCLING EMBASSY OF GREAT BRITAIN