

2. Urban vitality: the value and provenance of new forms of data

The ability to collect and share locations within phone apps is one of a number of technological developments that have provided many new forms of data to capture population movement in a highly disaggregate way. The collection and storage of this in-app data is increasingly widespread and undertaken almost entirely by the private sector. It is an important data resource that remains under utilised in the contexts it is collected due to a limited understanding of how best to integrate it into data-driven decision making beyond location-based advertising (Ridge, Johnston and O'Donovan, 2015). From the perspective of academic research these kinds of data are attracting significant interest since they offer the promise of real-time population monitoring and could deliver important behavioural insights; however they remain unproven, are often of questionable provenance and not subject to the levels of rigor expected of traditional datasets such as the decennial census.

The proposed PhD will therefore build on the foundations of previously co-funded UBEL DTP studentships to establish the value and provenance of in-app data collection for understanding population flows into and within urban centres of the UK across the full range of temporal scales, from hourly to yearly. It will seek to demonstrate the intellectual and commercial value of such data and will offer fresh insights into the fortunes of high streets and retail centres across urban areas in the UK with findings of particular interest to policy makers.

Background

For a number of years, the ESRC Consumer Data Research Centre (CDRC) hosted at the UCL Department of Geography has monitored the footfall at 700 sites in retail dominated urban areas across the UK in order to study the volume and dynamics of pedestrian flows along UK high streets and within retail centres. However, it does not provide any information about the origins, destinations and routes taken by those who frequent them. The GPS technology that is now standard within phones can maintain a continuous list of locations visited by the device over long periods of time. With the consent of users many apps now collect these locations, which have proved invaluable in the study of individuals in home and work locations, regularly visited locations as well as places by for example counting the number of people present at a specific time at a specific location. In the context of retail location analysis, GPS trajectories of taxi flows have been used to compute trading areas around shopping centres and to calibrate spatial interaction models using home-based shopping trips. Furthermore, GPS trajectories offer the potential to link places together if they are commonly frequented by the same population groups.

The data required for this study is provided by Huq Industries through CDRC data services. It is collected by a large number of mobile apps, which, with user consent, store the mobile device's GPS location and time stamp in regular intervals. A sample of the data covering the area of Brighton has already been subject to a scoping study that included validation based on the CDRC footfall counts in addition to transaction data from a selection of retailers. In this case the dataset included 8,618 unique users, who have in total created 33 million data points in 2018 and its analysis has been integrated into an existing UBEL PhD. It has also

informed the conceptualisation of this study, which will benefit from access to the national dataset that comprises thousands of users and millions of points collected in 2018/19.

Research Questions

1. How can new sources of data be used to assess the vibrancy of urban areas in the UK?
2. How do such sources impact on existing methodological approaches to decision making for urban renewal and what are the key barriers to using new forms of data in future decisions?
3. How can such data be augmented with “gold-standard” sources such as the 2021 Census and with retail transaction data hosted by CDRC?

Approach

Footfall counts can help to understand the volume and temporal profile of pedestrian flows but they offer very little contextual information about the demographic composition and movement trajectories of the people counted. En masse such trajectories offer the potential to better understand the dynamics of consumption in urban areas, which may offer fresh insights into the decline of traditional retailing. For example, Lloyd and Cheshire (2017) established that there were clear differences in the composition of retail areas that consumers choose to visit with some frequenting only peripheral parts of London and avoiding the centre whilst others exhibited much more mono-centric retail behaviours. Using the data supplied by Huq it is possible to do a national study to link areas together based on trips by the same or similar consumers. It is expected that a hierarchy will emerge that could inform interventions such as the better distribution of key services (post offices, banks etc) between retail areas that share a common customer base. This could be achieved through establishing the presence or absence of Huq’s users within the boundaries of retail areas. In addition, the location of users facilitates linkage to a series of other spatially-referenced datasets such as the UK Census and classifications such as workplace zones in order to add important context to users and provide a benchmark against which to validate the insights. The Huq data will be interrogated to determine if it offers a fair reflection of commuter flows as compared to the census, an important indicator of the viability of whether new forms of data can ever replace the traditional census after 2021.

Outcomes & Impact

This is likely to be a high impact project since the research will investigate the factors affecting the vibrancy of retail areas in Britain. This is highly topical and hugely important. It benefits from the most comprehensive datasets available to academic research and can therefore produce significant insights that will be of interest to academics as well as retail practitioners. In addition, there is a growing market for the use in-app data for investment decisions as well as in academic research. Our existing expertise in this space in combination with a close relationship with Huq will put the PhD student in a strong position to offer a definitive view on the strengths and weaknesses of these kinds of data for establishing measures of urban vitality.

Applications (cover letter and CV) should be sent to [Professor James Cheshire](#)