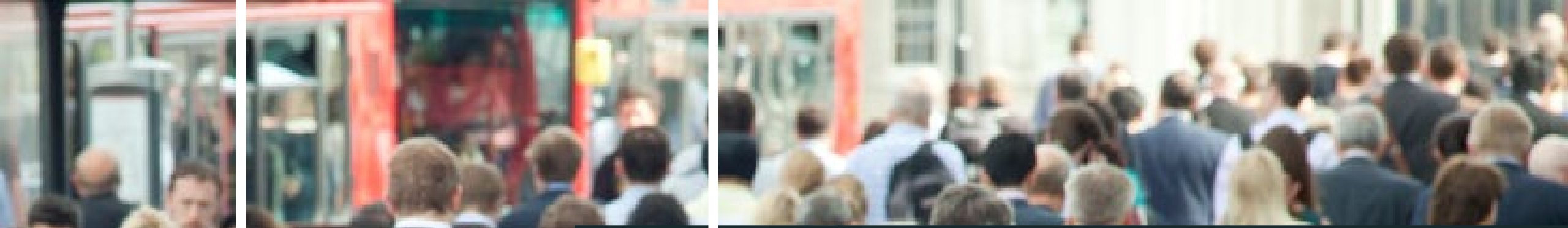


Project Flux: Journey Visualisation Mapping

Southwark Council Lane Rental Industry Publication

TRANSPORT FOR LONDON

Introduction

The bustling city of London is home to 9 million people. Accommodating millions of journeys every single day and some 400k road works taking place yearly, being able to understand how people move around the capital is essential.

Southwark Council has a variety of needs when analysing flows; impact to traffic and pedestrians in town centres/high streets during planned closures for activities such as street works, planned events (i.e. London Marathon), unplanned road closures, and major works. It's equally as important to understand the effect on busy footways, junctions, places of interest and transport hubs so that highway authorities can better design streets and spaces.

To improve decision making when planning and managing the disruption from road works and closures, Southwark Council set out to research and develop a new, innovative and visual spatial model, which could be used by multiple local authorities and by different teams, to analyse and benchmark journeys and traffic flows before, during and after different scenarios. Traffic flow data would consider pedestrians, cyclists, bus passengers, freight and other vehicle categories classified within standard DfT traffic datasets. Flows during a closure could then be monitored and diversions adjusted to minimise disruption, while engaging stakeholders, including residents, to understand the impact of closures.

This could be achieved by aggregating anonymised (GDPR compliant) population movement data from mobile operators and other roadwork data sources, to create a visual spatial model, combined with traditional counters and cameras. This would allow for movements to be tracked from origin to destination for comparison before, during and after works.

The Trial

Currently, local authorities rely on information from surveys and manual pedestrian counts. As a data collection method, this not only lacks accuracy but often does not allow for detailed historical analysis as data is only collected on specific days of interest.

After creating a set of requirements, and engaging with a variety of different suppliers, the project team sourced three months of anonymised people movement data from Vodafone mobile phones, supplied by Citi Logik and made available through RESTful API. Emu Analytics, a location software provider, were then engaged to create a platform that could visualise this data and provide the following ambitions:

Analyse traffic and pedestrian flows during different scenarios (planned road closures, large events, emergency repairs – with the ability to benchmark this flow before and after);

- Monitor traffic flow to inform decisions during a road closure (from origin to destination – to minimise disruption)
- Engage stakeholders and residents (with information on the impact)
- Create a London-wide solution – to help multiple local authorities make better transport decisions (including traffic planning and management)

A demonstration of the visualisation tool to transport decision makers enabled the project to scope further requirements for a ‘real world’ digital twin solution.

Counts via Hexagon

The current platform capabilities only allow for relatively high-level journey information. The platform and data used had significant limitations, and any future phase would require these limitations to be mitigated with the use of additional data sources.

Journey counts are represented in hexagons, with each representing an area of approximately 400 metres. Journeys were split into low-speed movements, likely representing pedestrians and cyclists, and high-speed movements for road and rail journeys. With the hexagons only providing accuracy down to 400 metres, the effect of road closures on specific streets could not be analysed.

It was not possible to analyse flow by individual hexagons. Empty hexagons shown on the platform, suggest that data has been attributed to nearby hexagons instead, underlining a lack of accuracy. Therefore, analysis can only be derived when a group of hexagons are considered.

The platform does enable some limited time-based analysis by showing journey counts on an hourly basis up to a whole month which allows journey flows before, during and after an intervention to be carried out or to compare weekdays to weekends. Currently, the ability to perform time-series analysis within the Emu Analytics platform is unavailable due to the limitations of the time period and contractual arrangements of the RESTful API.

Outcomes

The platform was limited to showing the ‘top 10’ most common journey postcodes for each hexagon. It is not able to pin-point the origin or destination of these journeys. The top 10 postcodes will inherently focus on local areas because every journey, including commuter journeys, will need to travel through local areas. This makes it difficult to determine a true representation.

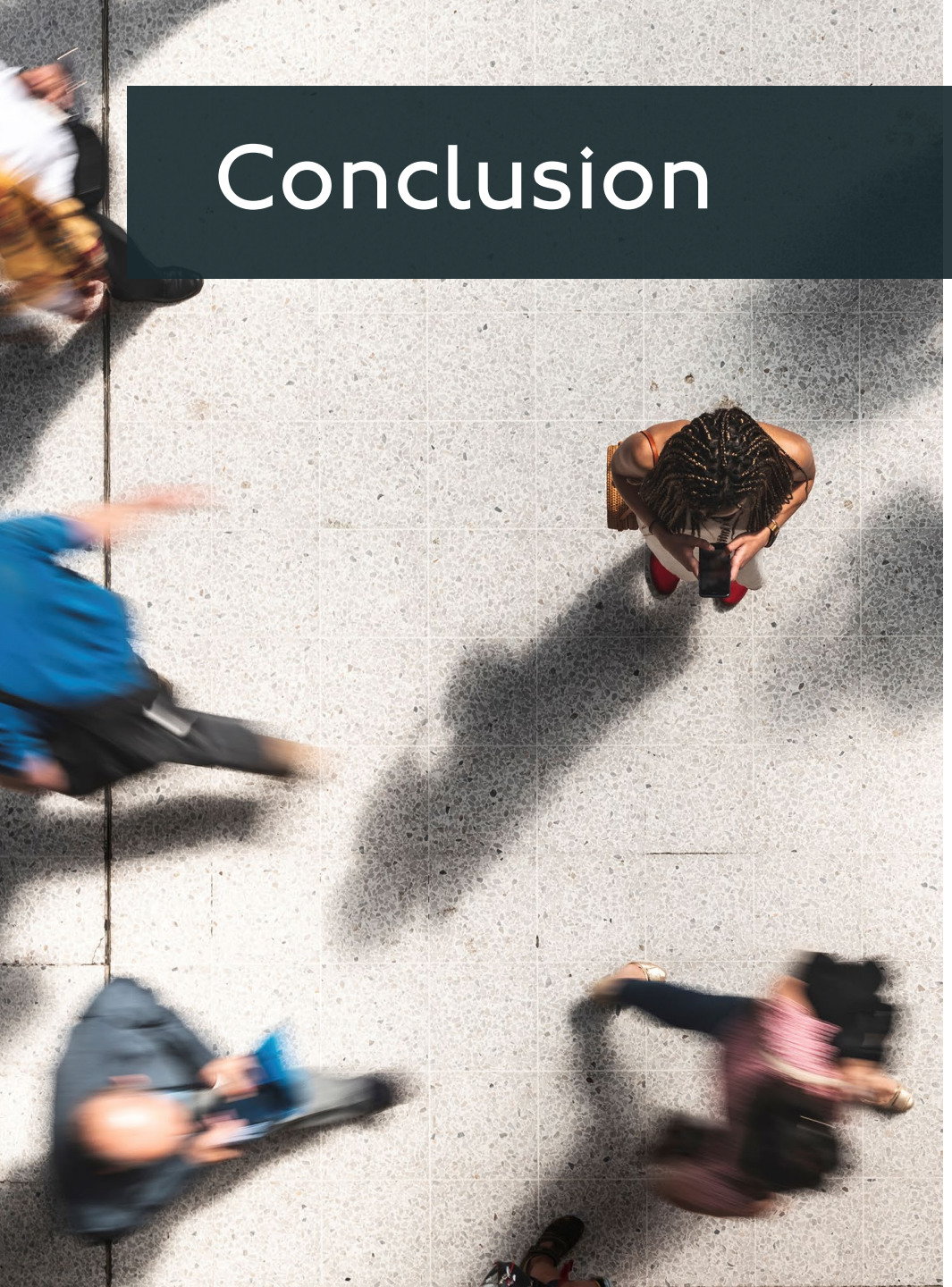
To effectively understand the impact of road works and closures on people and traffic flow, location data for the transport mode affected needs to be established, however this was not possible with mobile phone data. This was due to information being based on the tower the phone was connected to rather than the precise location of the device. The mobile phone provider tried to mitigate against some of this inaccuracy with algorithms, but unfortunately this was not sufficient.

Some hexagons, attributed key areas of Southwark, were shown to be empty and it’s likely the data was represented in a nearby hexagon instead. In addition, only the number of people journeys were presented rather than the number of vehicles, recording them as individual occupants.

Lessons Learnt

The project team worked with various council departments to understand how the platform could be adapted to suit user experiences, however the quality of data hindered project aspirations. Key learnings include:

- **Granularity of the data:** hexagons did not offer enough detail on some roads, with GDPR and assumptions distorting representation.
- **Data gaps:** the modified data produced empty hexagons in key locations, where high footfall and traffic flows occur, nullifying test sites.
- **Vehicle type data:** due to GDPR high quality data to provide this information could not be obtained, making mobile phone data unreliable for decisions.
- **Raw data is best:** GDPR prevented the purchase of raw data, so was purchased via an approved supplier, who developed algorithms and assumptions to produce an API.
- **Additional data sets:** a range of data sets (GPS, mobile data and cycle data) along with the development of an algorithm to support the project would be needed.
- **Ongoing cost:** the platform and bespoke API quote was commercially unviable and other avenues need to be explored.
- **Real-time data:** the aspirations of using mobile data for real time information was not possible and therefore, not an option for future platform development.
- **Visualisation is not enough:** due to the complexities of decisions made, a focus is needed on user experience in navigating the platform to aid services in using the data.



Conclusion

There are many traffic data platforms on the commercial market, however they do not provide the user experience needed for highways, transport planning and streetworks teams. A bespoke solution, using raw data and tailor-made algorithms, with a user-centred platform is required that can depict multiple data sets to establish flows. This project enabled a good insight and Southwark Council will continue to develop this proof of concept with new partners.

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