Transport for London
Topic Project Brief (2023-24)
Activity centres for public transport network design

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Transport for London background:

Transport for London (TfL) is the body responsible for the majority of public transport within the Greater London Authority (GLA) area. Public Transport Service Planning (PTSP) within TfL plan London's public transport services to benefit our passengers and the city as a whole, aiming to achieve the optimal balance of journey time, capacity, reliability and value for money. It is responsible for the current and future planning of London Buses, London Underground, London Overground, Docklands Light Railway, Elizabeth line and London Trams.

Project title:
Draft - Project title:

Defining activity centres to support public transport network design

Project description:

Problems

Urban activity centres are where people travel to and from at different times of the day and week, with a sustained density of movements. People travel for a wide range of purposes, frequency and regularity, such as work, education, caring, leisure, socialising, personal businesses. TfL provides the majority public transport services in London, facilitating the inhabitants to carry out all these activities.

To help understanding urban mobility and to improve public transport connectivity and service quality, TfL would need to understand better these activity centres and how they are used by travellers.

There are existing spatial datasets available that give a lot of information about residents and workers. The Census data details where people live and work, the demography and how they travel to work. The land-use and retail data describe the coverage, floor space and potential employment of the commercial areas. London Plan has also a set of pre-defined town centres.

However, human mobility is a lot more complex than just to and from work. They travel to participate in many other activities that take outside of the major employment areas such as hospitals and out-of-town retail centres. Studying further into these activities and purposes is important for the planning of comprehensive PT services.

Many existing spatial zone boundaries (eg output areas, postcode areas) are bounded by roads and dissect activity centres. Nearby bus stops are thereby apportioned to different areas, making it difficult for spatial aggregation to analyse movements to and from these centres accurately.

Hence, there is a need for an alternative approach that considers the trip generations and attractions as well as the PT service access to study how inhabitants use PT to access these activity centres.

Objectives

In order to provide a comprehensive public transport service, TfL need to know where and how people go about their business for all activities, beyond just home and work, in large urban centre or in the local area.

TfL would like to develop a repeatable process that uses open data to identify these activity centres where trips begin and end within Greater London. The process is expected to be repeated every 3 years to refresh with the evolving nature of the city.

Each activity centre should have a "centre of gravity". The activity centres should then be expanded into non-overlapping polygons that divide up the city and contiguous areas into distinct units that facilitate PT mobility analysis and service planning.

The proposed methodology should ideally be generalisable for any city with similar datasets.

Other considerations:

- The number of centres, the distance between centres, polygon size of centres
- How to cover less developed areas
- How it handles new areas of development (eg Battersea Power Station, Barking Riverside)

Potential data sources

There are existing open datasets that can be considered for this framework:

- Census
- Employment data
- Retail centres
- Point of interests (especially for major employers outside of primary employment districts, eg hospitals)
- Existing PT access points (stops and stations)

Relevant literature areas

Spatial disaggregation, mobility analysis of movements between places, accessibility to opportunities, connectivity

Please note: we welcome students' interpretations of the topic and suggestions to further specify it.

Deliverables:

- The final dissertation
- A presentation to TfL stakeholders
- A code repository explaining the methodology