Exploring the Ambient Population: Leeds City Centre

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Project outline

This project involved collating data and undertaking preliminary analysis of data from the 8 footfall cameras located in Leeds city centre. The aim was primarily to investigate any patterns in the footfall data and to assess whether footfall patterns were impacted upon by location. Leeds City Council are interested in this project in order to provide them with a better understanding of how the number of people in Leeds City Centre fluctuates over time.
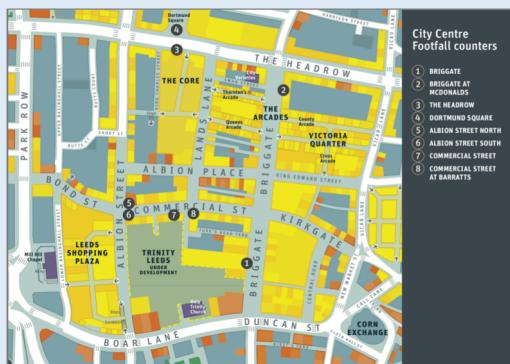
Figure 1: The locations of the 8 footfall cameras in Leeds city centre.

The ambient population

The ambient population is the number of people in a geographical area, at a given point in time; it will fluctuate on an hourly, daily, weekly and seasonal basis. Understanding the ambient population is beneficial for a range of applications, including:

• Public safety and emergency planning (including providing denominators for crime rates)
• Transport and infrastructure planning
• Assessment of visitor numbers in relation to retail spend and city centre attractiveness

Methodology

I. Identified datasets for use.. The data was cleaned and collated in a data warehouse.
II. The changes in hourly footfall by hour between 2012 and 2017 were calculated.
III. Data analysis by hour, week and by footfall camera location was conducted using Python.

Change in hourly footfall by hour: 2012-2017

Figure 2: The hours which experienced changes in footfall between 2012 and 2017.The main increases occurred in the evening; with an 85% increase at 19:00, a 70% increase at 20:00 and a 60% increase at 21:00.

## Fluctuations in mean daily footfall
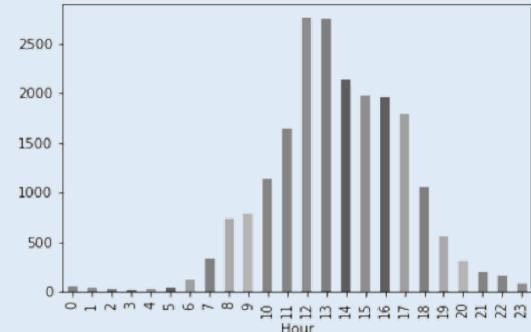
Figure 3: The average footfall for a Monday in 2017. Each bar on the x-axis represent a one-hour period from midnight to 23:00

• Footfall distribution over a 24-hour period on Saturdays and Sundays is similar
• Footfall peaks at 12:00 and 13:00 on weekdays and 14:00 on Saturdays and Sundays
• Footfall counts between the hours of 20:00-23:00 are highest on Fridays and Saturdays

Mean footfall by location
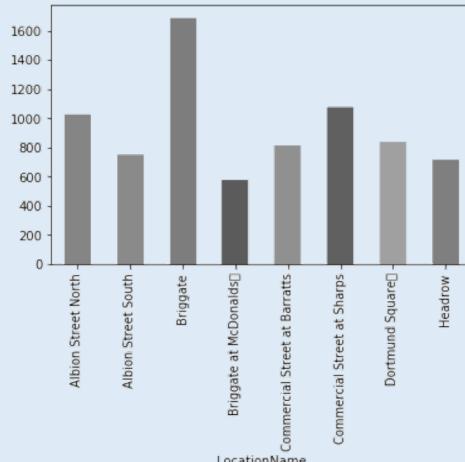
Figure 4: The average footfall for a 24-hour period in 2017 by location. Each bar on the x-axis represents one of the eight cameras. The y-axis depicts the average footfall.

• The two cameras which capture the lowest and highest footfall are located at opposite ends of the same street, Briggate,

Future developments

This work is now being utilized by Leeds City Council as evidence to support a financial bid to fund more footfall cameras. The project feeds into my PhD project which aims to quantify and model urban ambient population, in which the data from the footfall cameras will be analyzed in conjunction with data regarding shop density, workplace zone data and information regarding schools and hospitals.

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