

LB Southwark: Dulwich Streetspace

Monitoring Study FAQs and Methodology
Step-by-Step

SYSTRA





About SYSTRA

Introducing SYSTRA

- SYSTRA is a **global leader in mass transportation and mobility**, employing over 7,000 global employees across 80 countries.
- SYSTRA has the unique advantage of being not only a Transport Consultancy, but also Social and Market Research Consultancy. Our team members have an in-depth understanding of both the transport sector and of social and market research techniques, providing expert support in monitoring and evaluation both direct to clients and also in a peer review capacity.
- We provide a wealth of experience in conducting both qualitative and quantitative transport research with stakeholders to help understand their priorities and to inform options for future investment and policy development.

The SYSTRA logo is displayed in a bold, red, sans-serif font. The letters are thick and blocky, with a slight shadow effect. The 'S' and 'Y' are particularly prominent.



Monitoring Study: Frequently Asked Questions (FAQs)

When Was Pre-Scheme Data Collected?

- The data used to understand traffic prior to the Streetspace scheme was mostly collected by the Council for studies prior to 2020 with some additional collection in June 2020. This data collection all took place outside school holidays.
- Where multiple data sets at a location were collected prior to scheme implementation, the most recent data collected prior to March 2021 was used to have a pre-scheme dataset unimpacted by COVID-19 where possible.

When Was Post-Scheme Data Collected?

- Data for after the implementation of the Streetspace schemes was collected in September 2020, and then either continuously or in tranches in 2021.
- On key external roads data has been collected continuously throughout 2021, on other roads data has been collected for all weeks in March, April, June and September 2021.
- The time periods during which the data in the report were collected are shown overleaf.

Data Collection Periods: ATCs

Collection period	April 2017	Sep 2018	January 2019	June 2019	Sep 2019	June 2020	Sep 2020	Mar 2021	Apr 2021	June 2021	September 2021
Level of Restrictions		Pre-Covid 19				Post-Covid 19 - Some restrictions		Essential travel only	Restriction easing	Further restriction easing	No restrictions
Champion Hill		Pre-Implementation			Post-implementation						
Champion Hill E					✓			✓	✓	✓	✓
Champion Hill N					✓			✓	✓	✓	✓
Grove Lane					✓			✓	✓	✓	✓
East Dulwich		Pre-Implementation Phase 1 and 2					Post-Implementation				
East Dulwich Grove E					✓		✓	✓	✓	✓	✓
Grove Vale W					✓		✓	✓	✓	✓	✓
East Dulwich Grove Central			✓								✓
Lordship Lane C				✓			✓			✓	✓
Melbourne Grove N					✓			✓	✓	✓	✓
Melbourne Grove S						✓	✓	✓	✓	✓	✓
Zenoria Street					✓			✓	✓	✓	✓
East of Lordship Lane		Pre-Implementation Phase 1 and 2					Post-Implementation				
Underhill Road	✓									✓	✓
Barry Road				✓						✓	✓

Data Collection Periods: ATCs

Collection period	Jan 2017	April 2017	Nov 2018	June 2019	Sep 2019	Oct 2019	June 2020	Sep 2020	March 2021	April 2021	June 2021	September 2021
	Pre-Covid 19						Post-Covid 19 - Some Restrictions		Essential travel only	Restriction easing	Further restriction easing	No restrictions
Dulwich Village	Pre Implementation							Phase 1 Implemented	Post Implementation - Phase 1 and 2			
Burbage Road N							✓	✓	✓	✓	✓	✓
Calton Avenue			✓					✓	✓	✓	✓	✓
Court Lane E							✓	✓	✓	✓	✓	✓
Croxted Road	✓								✓	✓	✓	✓
Dovercourt Road		✓						✓	✓	✓	✓	✓
Dulwich Village N					✓			✓	✓	✓	✓	✓
East Dulwich Grove S					✓			✓	✓	✓	✓	✓
Eynella Road		✓						✓	✓	✓	✓	✓
Half Moon Lane					✓				✓	✓	✓	✓
Lordship Lane S				✓				✓	✓	✓	✓	✓
Townley Road							✓	✓	✓	✓	✓	✓
Turney Road E			✓					✓	✓	✓	✓	✓
Turney Road W						✓		✓	✓	✓	✓	✓
Woodwarde Road		✓						✓	✓	✓	✓	✓

How has data been aggregated?

- To provide a simple, easily comparable set of results, data has been averaged at a monthly level. All weeks commencing in a single month have been averaged to provide the average results for that month.
- ATC data has been summarised to provide a daily average total count of vehicles taking into account all days, often referred to as '7 day average' reflecting that it takes into account both weekday and weekend flows. Traffic in each direction has been added together.
- The data presented is therefore the average total number of vehicles that could be expected to pass by the recording site on any single day of the given month.

How are the changes calculated?

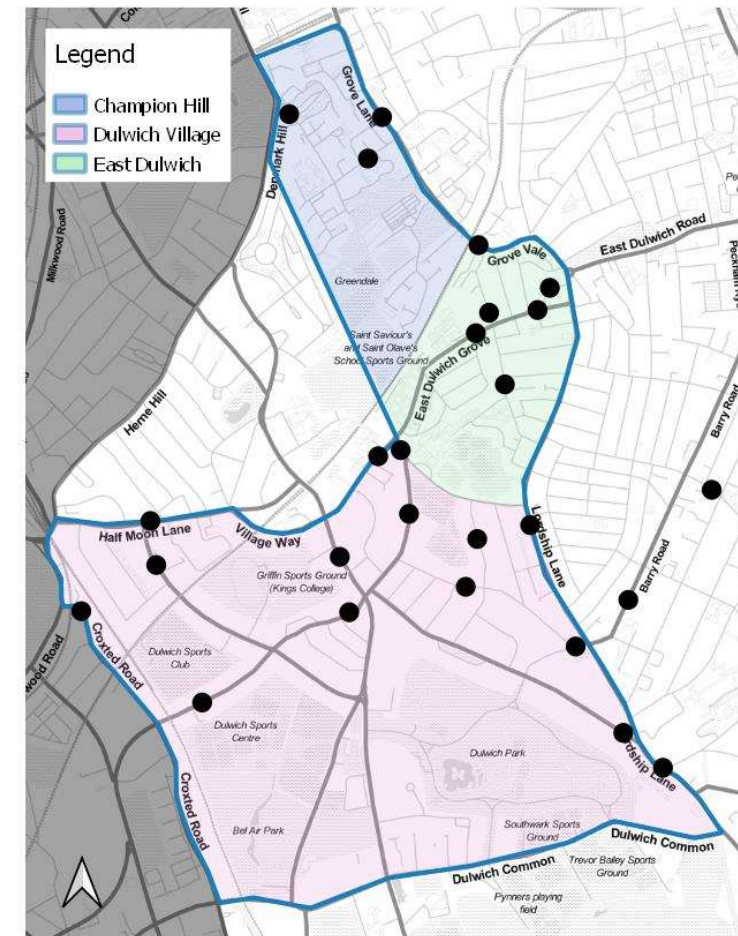
- The average daily total for each month post-implementation is compared to the pre-implementation average daily total for each of cycles, cars and LGVs, HGVs, and motorcycles. The absolute difference and percentage difference in these values has been calculated to understand the impact of the scheme.

Where has data been collected?

- The map to the right shows the location of the ATC sites used for the data analysis. There are 24 sites within or on the edge of the scheme and two further sites on Barry Road and Underhill Road. These two sites outside the scheme have not been included in overall totals quoted in the Executive Summary.

Why were these sites chosen?

- It is not cost efficient or practical to monitor every street, therefore the sites chosen reflect where changes in traffic volumes are most likely to change.
- To understand the impact of the scheme it was also necessary to have a count collected in the same location before the Streetspace measures were implemented. Additional data has been collected by the Council on some streets, but where no pre-implementation data is available for the same site, this has not been included in the report.

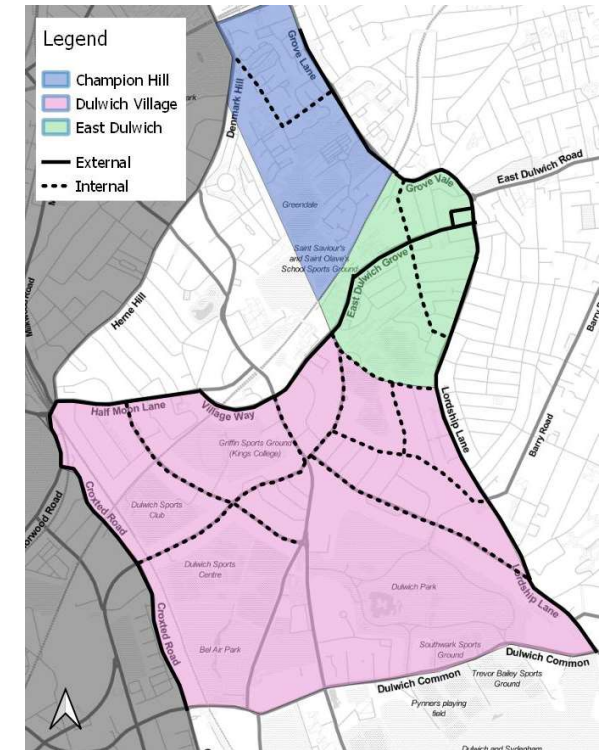


What about additional roads on which data has been collected?

- The Council has also collected data via ATCs on additional roads to those shown on the map above. However, these lack comparable pre-implementation data, and have not been included in the report. This data is being used by the Council to monitor the overall trend in traffic in 2021.

What is meant by internal and external roads?

- All roads in the report have been classified as either 'internal' or 'external'. Streets where the Streetspace measures have restricted or prevented through traffic are classified as internal. Streets where possible trips are unaffected as classified as 'external'. The classifications can be seen in the map to the right.



How has traffic changed on the South Circular / A205 / Dulwich Common?

- The South Circular is managed by TfL. No traffic count data has been collected on the section between Tulse Hill and Forest Hill. A direct comparison of the changes in traffic volumes is therefore not possible.
- Turning count data at the junction of Dulwich Common / Lordship Lane suggests a negligible (1%) change in traffic volumes on Dulwich Common compared to pre-scheme.
- There are no bus priority measures on the section of the A205 between Croxted Road and Lordship Lane, therefore bus journey times could be expected to be correlated to traffic volumes. Average journey times across the day were relatively stable, mostly showing no large change from pre-COVID journey times for much of 2021, and with exception of occasional weeks, have not risen above TfL's limit for acceptable variation.
- The Council is sourcing telematics data (based upon estimating volumes of traffic using GPS data from cars) from TfL to provide a more complete picture. The datasets involved are large and take time to process, results will be published on completion of this analysis.
- Currently, it is therefore hard to draw a firm conclusion about how traffic volumes on the South Circular have changed since the implementation of the Streetspace measures.

How is data collected?

- Data on traffic volumes has been collected via **Automatic Traffic Counters (ATCs)**, which consist of two pneumatic tubes spanning the width of roads. These record vehicle volumes and speeds in each direction, divided into 12 vehicle classes. Vehicle classification is based upon on the number of vehicle axles and the distance between axles, and are regularly used across the transport planning profession to capture traffic information.

How have vehicles been grouped?

- The 12 vehicle classes have been grouped to present in the report. The four groups are: cycles, motorcycles, cars and LGVs (delivery vans and similar), HGVs (lorries, buses).



Do the ATCs record all vehicle trips in the area?

- No, as not every road has an ATC. It is not feasible to record all vehicles that could be affected by the Streetspace Scheme.
- The report provides totals across all the ATC sites, but these reflect the totals of the places where vehicles have been counted only. These totals will include some vehicles multiple times where a trip means passing over more than one ATC. The totals should therefore be considered indicative, not a definitive summary of all vehicles in the study area and the change in this.

How are the changes calculated?

- The average daily total for each month post-implementation is compared to the pre-implementation average daily total for each of cycles, cars and LGVs and HGVs. The absolute difference and percentage difference in these values has been calculated to understand the impact of the scheme.

How accurate are ATCs for motor traffic?

- Automatic Traffic Counters (ATCs) are considered a reliable, tested method of data collection, and are utilised throughout the transport industry to understand traffic volumes on roads.
- ATCs are considered to be at least 95% accurate with respect to motor traffic volumes and speeds. Inaccuracies can occur due to cars being parked on the ATC, high traffic volumes obscuring cyclists or when traffic is very slow-moving. Occasional vehicle misclassification may also occur.
- Where vehicles park on ATCs, periods where no data is collected occur. To avoid this affecting overall averages, missing data has been “infilled”. This means using an appropriate approximation for the missing data (*for example, infilling blank data from 10-11am on a Wednesday with data from 10-11am the day before*).

How accurate are ATCs for pedal cycles?

- ATCs are designed to count motor traffic, analysis by LB Southwark suggests they consistently under-report volumes of pedal cycles.
- This under-reporting could relate to the weight of cycles being insufficient to be registered, misclassification as motorcycles, people cycling not passing over the ATC tubes (which do not usually extend across parking bays), or cycles passing over the tube simultaneously with heavier vehicles and therefore not being recorded.
- These issues will be consistent across all ATCs, therefore it is assumed that the changes indicated between different data collection periods are reliable. However, the overall volumes of people cycling may be significantly higher than suggested by the ATCs.
- On some streets for some months the ATCs have recorded implausibly few, or zero people cycling. These have been excluded from analysis.
- Cycle volumes are also highly dependent on the weather, this is likely to affect results, particularly for the pre-implementation data where only single week of data is available.

Why Has Pre-Implementation Data Been Adjusted?

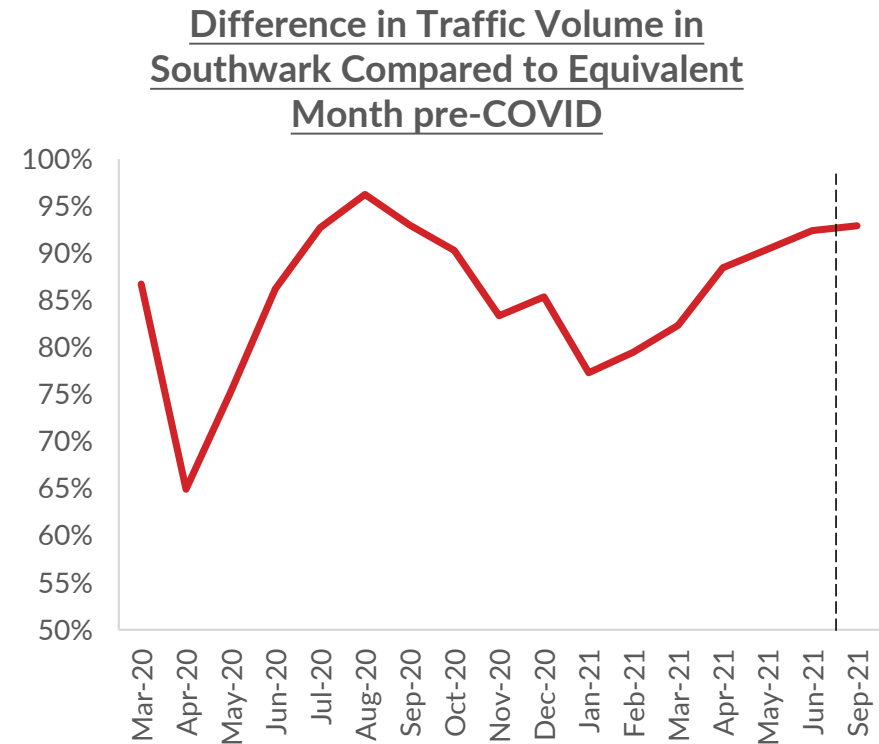
- Because pre-implementation ATC data was collected across a wide range of years and months, it has been necessary to adjust this data to account for the fact that traffic volumes are typically lower in some months of the year than others. This allows a fair comparison between pre- and post-scheme data, irrespective of the month of data collection.
- Pre-implementation data has been adjusted to the equivalent month it is being compared to. For example when considering April 2021 data, pre-implementation data is adjusted to April levels and for September 2021 it is adjusted to September levels.

How Has Pre-Implementation Data Been Adjusted?

- Pre-implementation ATC data was adjusted by using traffic data continuously collected by TfL. This comprised total vehicles counted at over 20 permanent traffic data collection sites operated by Transport for London (TfL) in the Boroughs of Southwark, Lambeth, Wandsworth, Lewisham and Greenwich (excluding Central London).
- The volume of traffic recorded by TfL in each month in 2019 was compared to complete the adjustment, with the difference between the months being applied to the pre-implementation data.
- It should be noted that these adjustments are small, the difference in traffic levels between September and June 2019 was 0.2% and September and April 2019 was 3.5%.
- The adjustment has been applied to cars, LGVs and HGVs only, as variations in cycle and motorcycles volumes follow different patterns to motor traffic, but an equivalently comparable dataset to the TfL traffic data is not available.

How Has The Impact of COVID-19 Been Considered?

- Post-implementation data has not been adjusted in relation to COVID-19, although context on how traffic levels have changed throughout the pandemic is provided in reporting.
- The chart to the right indicates the relative volume of all motor traffic compared to the equivalent month in 2019, showing the extent of reduction related to COVID-19.
- HGV traffic has not followed the same pattern as general motor traffic, often being at or above pre-COVID levels in 2021.
- There is no appropriate data source on cycle/motorcycle trends to accurately adjust data.
- The above information is provided in reporting for context, but numbers have not been adjusted.



What additional data collection methods have been used?

- In addition to ATC data, the report also contains Active Travel Monitor data (Vivacity Sensors), cycling demographics, turning count data, origin-destination data, and bus journey time data. Further details on all these methodologies follow.

What is cycling demographic data and how has it been used?

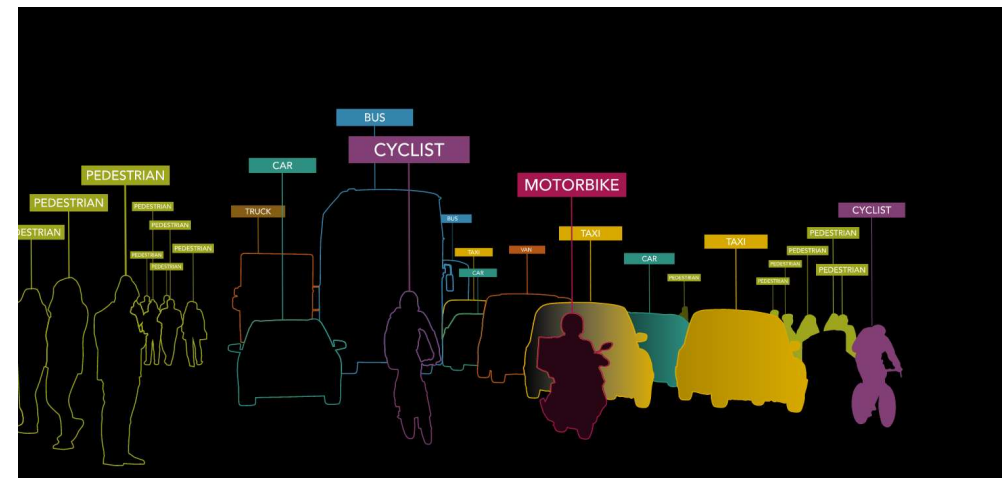
- Cycling demographic data has been collated via manual observation of video footage of people cycling through the junction of Calton Avenue / Dulwich Village, completed by an independent party.
- People were classified based upon whether they appeared to be adults, secondary school age children, or primary school age or younger. Children being carried on a cycle, either on a chair or in a cargo bike arrangement were also noted.
- Analysis was completed for a complete week during school term time.

What is turning count data and how has it been used?

- Turning counts record every vehicle that passes through a junction, noting the road on which the vehicle both entered and exited the junction, thus identifying the turning movement made. This process is recorded manually by watching footage from cameras set-up to record the junction for a defined period.
- At key junctions turning counts were completed in 2019 and again in June 2021 between 7AM – 7PM on two weekdays. The changes volumes of motor vehicles making each movement have been compared.
- Turning counts have also been used to establish the total number of people cycling through a junction for comparison with active travel monitor data. Turning counts are understood to provide a more accurate summary of cycle numbers than ATCs.

What is Active Travel Monitor data and how has it been used?

- Active Travel Monitors are sensors which have been installed at several key junctions in Dulwich by Vivacity. The monitors use artificial intelligence to count and classify all road users, including pedestrians.
- The Active Travel Monitors were installed in April 2021 and have therefore been used to provide post-implementation data on volumes of people walking and cycling. Comparison has been made to pre-COVID, pre-implementation data, as collected by turning counts or ATCs.
- Comparison with ATCs indicate that these sensors identify similar levels of motor traffic, but the Active Travel Monitors are more effective at recording people cycling than ATCs.



What is origin-destination data and how has it been used?

- Origin-destination data is collected via Automatic Number Plate Recognition cameras. These have been used to track vehicle movements on East Dulwich Grove.
- The cameras were placed at each major junction on the road. Cameras record each number plate passing by the camera, such that the movement of vehicles entering, passing along, and leaving East Dulwich Grove could be analysed.
- Data was collected for two days in June 2021 and used to identify the movement patterns of vehicles starting at each end of the road, as well as total volumes on key links on the road.

Why has SCOOT data not been used?

- SCOOT is live data collected by vehicle detectors to adjust traffic signals. However, it may differ from ATCs as it is often sensitive to over or under saturation, e.g. when vehicles are sat over the detector for long period of time such as in congestion queuing at the lights. It has therefore not been considered an appropriate tool to evaluate changes in traffic.

How Has Bus Journey Time Data Been Analysed?

- Transport for London has provided SYSTRA with bus speed data on key corridors within the Dulwich area. TfL's data provides the average speed by week. These have been averaged to calculate the average monthly speed included in the report. These speeds are the average for a 12 hour day, 7AM – 7PM, and the AM and PM peak (7-10AM and 4-7PM).
- Data from after scheme implementation has been compared to the average journey time of a whole year prior to COVID-19.
- Bus journey time data only includes the time buses spend moving; it does not include time waiting at stops, so the reduction in people using public transport during 2020/21 will not impact the bus journey time data used for comparison.



Methodology

Pre-Implementation Data

1. Pre-implementation data was collected for single weeks only, with the exception of June 2020.
2. For each site, the most recent week of available data prior to COVID-19 pandemic was chosen. If no such data was available, June 2020 was used, taking the average of only the weeks prior to scheme implementation.
3. Data was checked for gaps or anomalies, which were “infilled”. (See FAQ: ‘How accurate are ATCs for motor traffic?’)
4. The average daily total of cars/LGVs, HGVs, cycles and motorcycles was calculated, using both weekend and weekdays (i.e. a ‘7 day average’).
5. The daily total of cars/LGVs and HGVs was adjusted to September 2019 levels, to take into account seasonal differences in traffic levels. The adjustment was the % difference between the total volume of vehicles (as recorded by TfL counts in Southwark and neighbouring boroughs) in the month of collection and in September 2019. Adjustments are shown below. For example, if the total cars/LGVs recorded in November 2018 was 100, the adjustment = $100 \times (1 + 1\%)$.

Collection period:	Jan 2017	April 2017	Sep 2018	Nov 2018	June 2019	Sep 2019	Oct 2019	June 2020
Adjustment:	1%	2%	0%	1%	2%	0%	-2%	14%

Post-Implementation Data

1. Post-implementation data was collected for multiple weeks in 2021.
2. Data was checked for gaps or anomalies, which were “infilled”. (See FAQ: ‘*How accurate are ATCs for motor traffic?*’).
3. Data from all weeks commencing in a given month was averaged to calculate a monthly average for each time period (15 min segment of the day/day of the week) and vehicle type.
4. Monthly average data was used to calculate an average daily total of cars/LGVs, HGVs, cycles and motorcycles, using both weekend and weekdays (i.e. a ‘7 day average’).
5. Pre-implementation average daily totals were compared with post-implementation average daily totals.