Contents

Glossary

Below are the meanings of some words used throughout this report that you may be unfamiliar with, or which may have a specific meaning in the report context:

85th Percentile Speed - The 85th percentile is used in transport monitoring to gauge changes in speeds and speeding behaviour. It is the speed at which 85% of traffic will be travelling at, or below, along a street (15% of traffic will be travelling faster than this speed). For example, if the 85th percentile speed is 20mph, then 85% of vehicles will be travelling at 20mph or less.

AM Peak – In this report, "AM peak" refers to the hours between 07h00 and 10h00.

Automatic Number Plate Recognition (ANPR) cameras – Automatic Number Plate Recognition (ANPR) cameras – ANPR cameras are used to read vehicle registration plates and the information used to inform a traffic management and for enforcement. In the context of this report, ANPR cameras are used to enforce some traffic filters within the LTN's in Haringey so that only those with exemptions or the emergency services can pass through them. It is important to note that some filters have a 'no entry' sign on one side which means they are not accessible from that direction for any vehicles, regardless of status.

Automatic Traffic Counters – "Automatic Traffic Counters" (ATCs) measure traffic volumes and speeds using two thin tubes that run across the street and are connected to a sensor. When wheels pass over the tubes, the pressure impact is interpreted by the sensor to identify the type of vehicle passing over, and the speed at which it passed. ATCs are considered to be extremely accurate. (See Appendix 1 for more details).

Boundary roads – For the purpose of this report, the "boundary roads" of the Bounds Green trial area are, in a clockwise direction, **A109 Bounds Green** to the north of Area C but intersecting the trial areas and finishing to the south of Area B, the **A105 High Road** to the east of Area B and the **B106 Durnsford Road** along the southeastern border of Area C.

Cell or 'sub cell' – A neighbourhood within a Low Traffic Neighbourhood (LTN) is often referred to as a cell or sub cell. Cells are a group of residential streets bordered by a boundary road as defined above.

Experimental Traffic Management Order (ETO) – An "Experimental Traffic Management Order" (ETO) is similar to a permanent Traffic Management Order in that it is a legal document that imposes traffic and parking restrictions. However, unlike a Traffic Regulation Order, an Experimental Traffic Order can only stay in force for a maximum of 18 months while the effects are monitored and assessed, the first six months being a statutory consultation period during which time formal objections can be raised. An ETO also allows for changes to be made to the relevant scheme during the first twelve months of the trial period, this may trigger another six-month statutory consultation period. An Experimental Traffic Order is made under Sections 9 and 10 of the Road Traffic Regulation Act 1984.

Internal Roads – These are roads which fall in between two or more boundary roads in low traffic neighbourhoods. For the purposes of this report, "internal roads" are local roads in the Bounds Green LTN trial area on which the project aims to reduce the amount of traffic through the introduction of traffic filters, although some will still lie on through routes within the scheme area. These roads are generally narrower than boundary roads. Traffic data has been collected on some, but not all, of the internal roads in the Bounds Green scheme area.

Low Traffic Neighbourhood – A "low traffic neighbourhood" (LTN) is an area where a number of traffic filters are strategically placed to make it impossible or very difficult to cut through the area by motor vehicle. This stops drivers using local streets as shortcuts and makes it safer and easier to walk and cycle. In this report, the Bounds Green Phase 1 LTN (Phase 1 LTN) trial refers to a low traffic neighbourhood implemented in Haringey under an Experimental Traffic Management Order (ETO). The position of the traffic filters means that drivers (including residents, delivery workers and businesses) are still able to reach any part of the neighbourhood whilst using a vehicle, but the route they need to take to reach their destination may change.

Modal Filters - "Modal filters" are restrictions on streets to prevent motor vehicles passing through, either by presenting a physical barrier, such as bollards or planters, or by camera enforcement. Camera enforcement is used to enable buses and emergency vehicles to access the area. People are legally able to walk, cycle and wheel though filters (and use non-motorised scooters).

Normalising – In this report, "normalising" means to adjust traffic count figures to consider the impact of COVID-19 and other macro-scale factors on traffic patterns. This methodology is explained below in more detail, but in simple terms it means that the traffic count figures have been increased to project what traffic counts may have looked like if traffic levels were at pre-Covid levels.

Observed – In this report, "observed" means the data that was collected, which has not been adjusted to consider the impact of COVID-19 on traffic patterns. This is the actual data that was supplied by the data collection company used.

Patched sites /data – As it is not uncommon for there to be problems with data surveys (broken equipment, cars parked on ATC bands etc.) as well as anomalous readings from surveys resulting from one-off events (waterworks, gas leaks, accidents etc.), all data has been thoroughly checked by hand and cleaned or "patched" (i.e. blank data or significantly anomalous data has been substituted by more representative data from the site/wave in question), which is a necessary task in order to maintain comparable data.

PM Peak – In this report, "PM peak" refers to the hours between 16h00 and 19h00.

Traffic Filters - "Traffic filters" are restrictions in the street to prevent motor vehicles passing through, either by presenting a physical barrier, such as bollards or planters, or by camera enforcement. Camera enforcement is used to enable buses and emergency vehicles to access the area. People are legally able to walk, cycle and wheel though filters (and use non-motorised scooters).

Video Surveys – Video surveys utilise cameras mounted onto telescopic masts to enable capture of traffic movements, including vehicle classes. Analysts count the traffic from the video surveys to a very high level of >98-100% accuracy.

Introduction – Bounds Green LTN Post-implementation Report

Haringey Council's 'Streets for People' initiative aims to reclaim local streets for the people living on them, making them safe, welcoming and liveable places. The introduction of measures under the ambitious 'Streets for People' project is aimed at cutting road traffic and pollution, as well as to improve the walkability and cyclability of local areas, all whilst developing active travel corridors between local amenities.

Following an extensive listening and engagement exercise, Haringey Council has introduced three people-friendly Low-Traffic Neighbourhoods (LTNs) across the borough. These schemes use filters, such as bollards or ANPR cameras, to stop traffic taking shortcuts along local roads, creating a safer, cleaner and quieter neighbourhood for the people living there.

The borough's Phase 1 Low Traffic Neighbourhoods comprise the following, which can be seen on Map 1 on the following page:

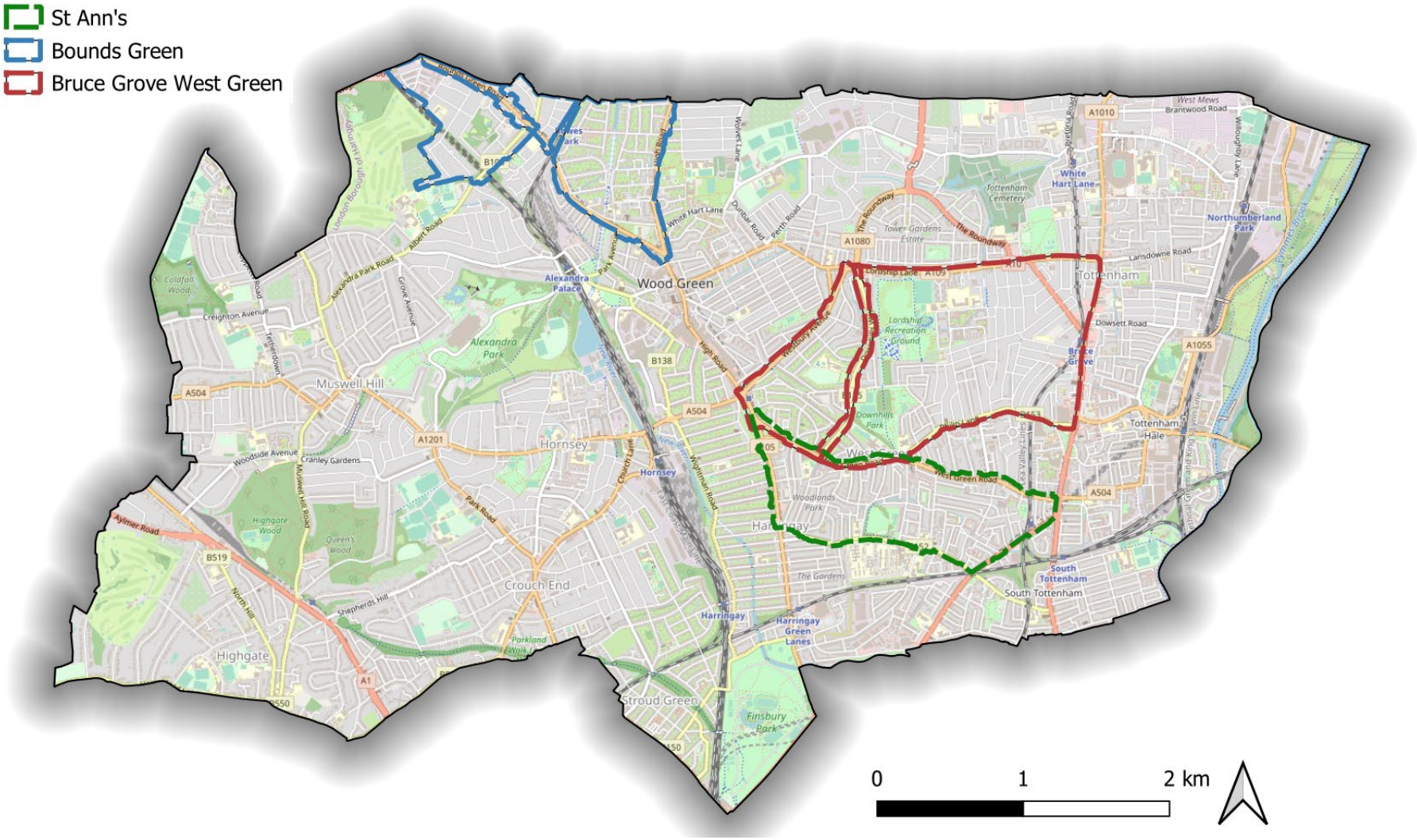
- Bounds Green LTN (introduced 15 August 2022)
- St Ann's LTN (introduced 22 August 2022)
- Bruce Grove West Green LTN (introduced 1 November 2022)

Scheme Context

For the Bounds Green LTN, the council has installed 10 new traffic filters in the trial area to prevent motor vehicles from using local streets as through routes. Camera enforcement is used in some locations so that emergency vehicles, refuse vehicles and where relevant buses can still pass through some of the traffic filters. Others are enforced with a physical measure such as a bollard.

Camera filters also enable those that are eligible for exemptions to pass through the traffic filters without incurring a Penalty Charge Notice (PCN). More details on the range of exemptions available for LTN's in Haringey can be found via this link.

Map 1 : Location of Haringey Stage 1 LTNs Within the Borough



Introduction – Monitoring Report

This monitoring report provides data and insights relating to the Bounds Green LTN trial. The trial went live in August 2022 following a two week 'discretionary' period during which warning letters were issued instead of Penalty Charge Notices (PCN'S), so the analysis compares data from before and after that date. The pre-implementation ("before") traffic counts were collected in November 2021, before the LTN was put in place. The post-implementation monitoring traffic counts were collected in January and February 2023, five months after it was installed.

Traffic Counts Approach

The count data presented in this report is not traffic modelling, but actual observed traffic, comparing traffic flows in November 2021 to those collected in January / February 2023.

Dates of Traffic Counts

Pre-implementation counts: 1st November 2021 – 7th November 2021

Bounds Green scheme went live: 15th August 2022

Post-implementation counts: 10th January 2023 – 2nd February 2023 (start dates varied across sites during this period to account for roadworks and other disruptions)

The council uses various traffic counting methods to understand traffic volumes and speeds within and around the LTN to assess if the scheme is having the desired impact and to respond (if required) with mitigating actions. Automatic Traffic Counts (ATCs) were used for all sites for the Bounds Green LTN area. ATCs measure motorised and cycle traffic volumes and motorised traffic speeds and classify the traffic by type, and are able to collect data for all vehicles regardless of their speed of travel (including those travelling at <10mph). More information about the different types of counts and which type was used at each site is detailed in Appendix 1.

A map of the count sites is presented on the following page. It is noted that some locations presented in the map have been slightly shifted from their on-street locations to assist with legibility.

Independent Production of the Report by SYSTRA Ltd.

SYSTRA has been commissioned to prepare this report in partnership with the London Borough of Haringey.

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. Their 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. They 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.

Neither SYSTRA nor LB Haringey can be held accountable for errors in the data provided by third parties, where these errors have not been identified through normal checking processes.

Map 2: Bounds Green LTN and monitoring sites

Analysis and Normalisation Methodology Overview

All of the counts in this analysis were undertaken in full awareness of COVID implications and post-COVID working patterns, as well as ongoing national trends such as the cost-of-living crisis – and were therefore processed with results interpreted in a way that accounts for these (and other) background changes to how people travel in London.

Daily volumes of motorised traffic have been drawn from a range of 11 permanent traffic counters managed by Transport for London across Haringey and used to establish monthly averages in 2019 and 2020. The percentage difference between the same month across the two different years has been used to adjust the counts to normalise for COVID-19 disruption between the months in which counts have been taken. The methodology is set out in greater detail in Appendix 2. Using normalisation methodologies using TfL count locations across selected typologies (only within 2km of scheme, only on trunk routes etc.) has been considered in studies for other Boroughs and has not been shown to make a notable difference in results, particularly following the lifting of COVID-related regulations.

For context, the difference based on this dataset was greatest in April 2020, where motorised traffic was approximately 58% of what it had been in April 2019.

Using the months of the Bounds Green counts, in November 2021 motorised traffic was approximately 1% lower than in November 2019 and in January 2023 motorised traffic was approximately 5% lower than in January 2019.

Table 1: Normalisation factors since March 2020 for traffic in Haringey

Month	Impact
Mar-20	83.52%
Apr-20	58.28%
May-20	76.78%
Jun-20	90.56%
Jul-20	95.61%
Aug-20	98.61%
Sep-20	96.28%
Oct-20	99.45%
Nov-20	91.98%
Dec-20	89.47%
Jan-21	82.03%
Feb-21	84.69%
Mar-21	89.79%
Apr-21	92.65%
May-21	93.80%
Jun-21	96.76%
Jul-21	97.83%
Aug-21	96.95%
Sep-21	97.43%
Oct-21	101.60%
Nov-21	98.94%
Dec-21	94.96%
Jan-22	94.94%
Feb-22	95.95%
Mar-22	94.32%
Apr-22	93.70%
May-22	95.53%
Jun-22	94.88%
Jul-22	94.56%
Aug-22	93.44%
Sep-22	94.18%
Oct-22	99.69%
Nov-22	98.25%
Dec-22	92.49%
Jan-23	95.16%

Interpreting Count Results

Unless specified otherwise, the seven-day daily average has been used and discussed in traffic volumes analysis in this report. Full data and flow profiles for each site are provided in Appendix 5.

Raw data has been analysed and compared to give the observed results. The observed results have then undergone the normalisation process described in the previous section to give the normalised results. Both the normalised results and the observed results can be found in the results tables in this report and in the appendices. The figures given for changes in volumes of traffic in this report are normalised, and percentages have been drawn from the differences between normalised results.

A negative number or percentage indicates a decrease between the two counts, while a positive number or percentage indicates an increase.

Please note that traffic flows fluctuate daily (generally up to 10%), and background impacts on traffic flows cannot be consistently accounted for in the normalisation on a day-to-day and location-by-location basis. As such, changes within -10% to +10% are considered insignificant (i.e. no or negligible change).

In addition, it must be noted that as vehicles travelling through the LTN/on boundary roads may go through multiple counter sites, it is certain that the summed number of vehicles counted across all monitored roads is higher than the actual number of trips taken. As such, a drop/increase in total volumes of vehicles counted across multiple individual roads does not represent the same drop/increase in total unique vehicle journeys, although this figure can be useful in understanding the magnitude and direction of the scheme's impact. It is important to note, however, that this methodology of recording traffic volumes is consistent across both pre and post implementation periods. It is also important to note that this methodology is consistent with the analysis of LTN schemes in other London boroughs.

External Factors

It is important to consider all these results in the context of other external factors that could be impacting the data. Whilst broader trends occurring over longer timescales and larger geographies are likely addressed through normalisation, more local or short-term impacts may also be present. It is not possible to adjust for these in calculations. There are five main external factors which could be influencing results, as follows:

Nearby Low Traffic Neighbourhoods – As can be seen in Map 1, the Bruce Grove LTN is located approximately 1.7km to the southeast of the Bounds Green scheme. St Ann's LTN is directly south of the Bruce Grove LTN. It is considered that due to distance, any impacts from other Haringey Schemes on Bounds Green would have been minimal.

There are a range of schemes with similar objectives as LTNs in neighboring boroughs, including in Waltham Forest to the east, Islington and Hackney to the south and Enfield to the north. All of these schemes are relatively far away and were in place well before the Haringey schemes were introduced. These are therefore unlikely to have impacted on flows in the study area.

Weather – Weather can have a significant impact on travel choices, especially cycling, as well as on air pollution. During the month in which pre-implementation counts were conducted (November 2021), the average temperature in Greater London was 9°C, with average highs of 11°C and average lows of 7°C. Post-implementation counts, taken in January 2023, show an average temperature of 6°C, with average highs of 9°C and average lows of 4°C. This indicates that generally, temperatures in the post-implementation data collection period were similar or slightly cooler to those collected in the pre-implementation period.

COVID-19 Impacts – In the pre-implementation period (November 2021), most legally enforced COVID-19 restrictions had already been dropped across the UK. However, infection rates and hospitalisation rates were high throughout the autumn of 2021, peaking with the arrival of the Omicron variant in December of that year. Alongside the fact that masks were still required on Transport for London services until February 2022, it is likely that many individuals were still working entirely or mostly from home during the time this data was collected.

In contrast, post-implementation counts conducted in January 2023 were conducted long after all COVID-19 restrictions had been dropped and most London residents had settled into a consistent working pattern, whether at home, at workplaces or in hybrid setups.

However, given that these trends did not change on a day-to-day basis, is it considered that most of this background behaviour should

have been captured by the normalisation methodology.

Cost of Living Crisis – In January 2023, during the post-implementation counts, rising inflation had significantly increased the price of petrol and other critical items such as heating, with the cost of driving and taking public transportation increasing compared to previous years and the affordability of travel decreasing. This may have reduced the number of discretionary journeys taken by paid modes (both public and private), with some level of increase in walking and cycling likely despite the cold weather. Related to this is the high number of strikes (both on public transport and otherwise) that have disrupted patterns of behaviour – whilst care was taken not to collect data during strikes, it is possible that the uncertainty they generated has impacted more general travel behaviour as well. Again, it is considered that most of this background behaviour should have been captured by the normalisation methodology.

ULEZ Extension – In October 2021, directly before the pre-implementation counts were taken, the ULEZ (Ultra Low Emission Zone) was extended to the North and South Circular Roads, encompassing the entirety of the Borough of Haringey whereas previously none of the Borough was included. Given the pre-implementation counts occurred soon after this, it is possible that there was still some lag in driver behaviour as motorists became more familiar with this restriction.

In July 2022 Transport for London published the *Expanded Ultra Low Emission Zone – Six Month Report Including Low Emission Zone – One Year Report*. The report estimates that the new ULEZ reduced traffic by 21,000 vehicles in the zone on an average day, a reduction of 2 per cent of traffic flow compared to the weeks before the expanded ULEZ was implemented. Whilst it is expected that this broad change in cost of driving in the borough has been reflected in normalised data via TfL ATCs, it is possible that more localised effects exist. It is important to note that the ULEZ is expanding to the M25 boundary and covering all London Boroughs from August 2023.

Data Patching

For this report, data was processed using SYSTRA's proprietary automated data processing tools, which draw together raw data from all reporting periods and apply formulae-based calculations to produce the following charts, tables and appendices.

However, as it is not uncommon for there to be problems with data surveys (broken equipment, cars parked on ATC bands etc.) as well as anomalous readings from surveys resulting from one-off events (waterworks, gas leaks, accidents etc.), all data has been thoroughly checked by hand and "patched" (i.e. blank data or significantly anomalous data has been substituted by more representative data from the site/wave in question), which is a necessary task in order to maintain comparable data.

Analysis of Vehicle Volumes

All Motorised Vehicle Volumes (7-Day Daily Average)

This section outlines the changes in observed and normalised traffic volumes for all motorised vehicles, including cars (both private cars and taxis/company-owned cars) and goods vehicles ranging from delivery vans to large articulated lorries. The total number of such motorised vehicles counted in the monitored week has been summed and divided by seven to create a daily average. If roads are less heavily used on weekends, it is possible that seven-day averages are slightly lower than five-day (weekday) averages – however, as usage patterns are expected to be similar between data collection rounds, this factor is not likely to materially impact the net and percentage changes in flows between pre- and post-implementation.

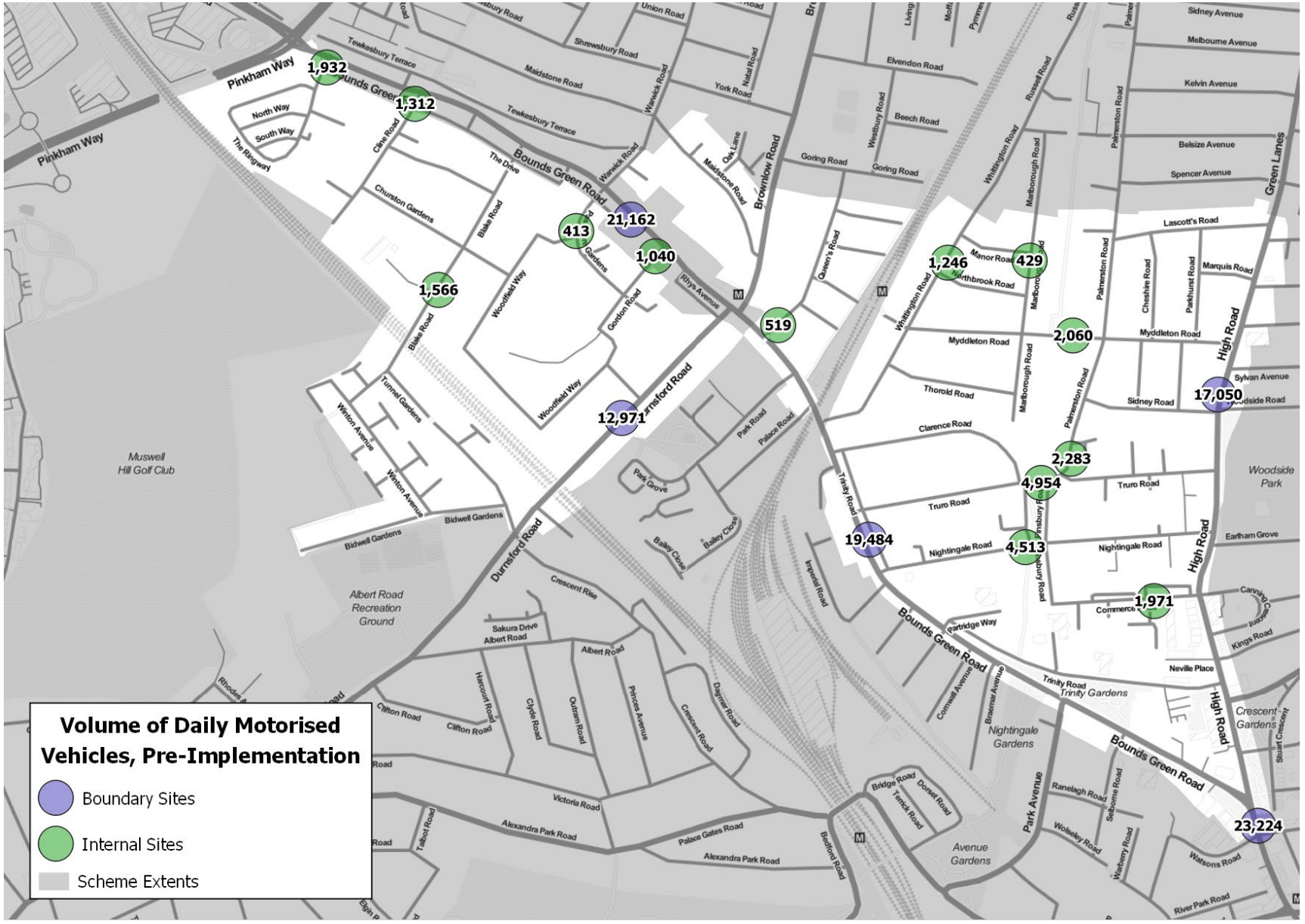
The numbers presented have been rounded to the nearest whole number and raw/percentage changes calculated accordingly. It is noted that the number of cycles counted is not included in this analysis.

Map 3 below shows the total volume of vehicles recorded during the pre-implementation period (November 2021) on both boundary and internal roads, whilst Map 4 on the following page shows the same data for the post-implementation period (January 2023).

Map 5 then percentage change in motorised vehicle volumes between the pre-implementation data (November 2021) and post-implementation data (January 2023). It is important that percentage change figures are considered in the context of raw changes, as presented in the tables, as a large percentage change could indicate a relatively minor change in actual vehicles counted on a particularly quiet road. Conversely, a busy road could see a small percentage change even if there the number of vehicles counted is quite different between the two monitored periods. In such cases, it is useful to compare data in Maps 3 & 4, or to refer to the tables for full context.

Further context for each site can be found in Appendix 5, which outlines the observed and normalised figures for all periods, as well as average flow profiles across the day.

Map 3: Pre-Implementation Motorised Vehicles Volumes



Map 4: Post-Implementation Motorised Vehicles Volumes

Map 5: Percentage Change in Motorised Vehicle Volumes

Table 2: Motorised Traffic Volumes on Internal Roads

	Pre-Observed: Nov-21	Pre-Normalised: Nov-21	Post-Observed: Jan-23	Post-Normalised: Jan-23	Difference Post- vs. Pre-(Observed)	Difference Post- vs. Pre-(Normalised)	% Difference Post- vs. Pre-(Observed)	% Difference Post- vs. Pre-(Normalised)
Blake Road	1,549	1,566	239	252	-1,310	-1,314	-85%	-84%
Cline Road	1,299	1,312	1,223	1,286	-76	-26	-6%	-2%
Commerce Road	1,949	1,971	1,230	1,294	-719	-677	-3 7%	-34%
Gordon Road	1,030	1,040	77	81	-953	-959	-93%	-92%
Marlborough Road	424	429	442	465	18	36	4%	8%
Myddleton Road	2,039	2,060	1,811	1,903	-228	-157	-11%	-8%
Nightingale Road	4,465	4,513	245	259	-4,220	-4,254	-95%	-94%
Palmerston Road	2,259	2,283	395	416	-1,864	-1,867	-83%	-82%
Passmore Gardens	409	413	125	132	-284	-281	-69%	-68%
Queen's Road	513	519	39	41	-474	-478	-92%	-92%
Ring Way	1,910	1,932	1,505	1,582	-405	-350	-21%	-18%
Truro Road	4,901	4,954	33	36	-4,868	-4,918	-99%	-99%
Whittington Road	1,232	1,246	548	576	-684	-670	-56%	-54%
Total Internal Road	**23,979**	**24,238**	**7,912**	**8,323**	**-16,067**	**-15,915**	**-67%**	**-66%**

*As detailed on page 18 it is important to note that vehicles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of vehicle journeys counted is certain to be higher than the actual number of trips taken.

Table 3: Motorised Traffic Volumes on Boundary Roads

	Pre-Observed: Nov-21	Pre-Normalised: Nov-21	Post-Observed: Jan-23	Post-Normalised: Jan-23	Difference Post- vs. Pre-(Observed)	Difference Post- vs. Pre-(Normalised)	% Difference Post- vs. Pre-(Observed)	% Difference Post- vs. Pre-(Normalised)
A105 High Road (@Cranbrook Park/Watsons Road)	22,977	23,224	26,250	27,587	3,273	4,363	14%	19%
A105 High Road (@Sidney Road/Woodside Road)	16,871	17,050	15,919	16,730	-952	-320	-6%	-2%
A109 Bounds Green Road (@Gordon Road/Passmore Gardens)	20,939	21,162	19,801	20,809	-1,138	-353	-5%	-2%
A109 Bounds Green Road (@Truro Road/Nightingale Road)	19,280	19,484	21,486	22,580	2,206	3,096	11%	16%
B106 Durnsford Road	12,834	12,971	12,389	13,019	-445	48	-3%	0%
Total Boundary Road	**92,901**	**93891**	**95,845**	**100,725**	**2,944**	**6,834**	**3%**	**7%**

*As detailed on page 18 it is important to note that vehicles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of vehicle journeys counted is certain to be higher than the actual number of trips taken.

Table 4: Motorised Traffic Volumes on Internal Roads, By Direction

	Direction A	Nov-21 Daily Flow	Jan-23 Daily Flow	Absolute Difference	% Difference	Direction B	Nov-21 Daily Flow	Jan-23 Daily Flow	Absolute Difference	% Difference
Blake Road	Northbound	1,048	167	-881	-84%	Southbound	518	85	-434	-84%
Cline Road	Northbound	639	639	0	0%	Southbound	673	647	-26	-4%
Commerce Road	Eastbound	744	655	-89	-12%	Westbound	1,227	639	-588	-48%
Gordon Road	Northbound	551	50	-501	-91%	Southbound	489	31	-458	-94%
Marlborough Road	Northbound	236	251	15	6%	Southbound	193	214	21	11%
Myddleton Road	Eastbound	982	777	-205	-21%	Westbound	1,078	1,126	48	4%
Nightingale Road	Eastbound	2,070	123	-1,947	-94%	Westbound	2,443	136	-2,308	-94%
Palmerston Road	Northbound	955	211	-744	-78%	Southbound	1,328	205	-1,122	-85%
Passmore Gardens	Northbound	202	69	-133	-67%	Southbound	211	63	-148	-70%
Queen's Road	Northbound	10	11	1	10%	Southbound	509	30	-479	-94%
Ring Way	Northbound	899	785	-114	-13%	Southbound	1,033	797	-236	-23%
Truro Road	Eastbound	1,919	19	-1,900	-99%	Westbound	3,035	17	-3,017	-99%
Whittington Road	Northbound	874	383	-491	-56%	Southbound	372	193	-179	-48%

Table 5: Motorised Traffic Volumes on Boundary Roads, By Direction

	Direction A	Nov-21 Daily Flow	Jan-23 Daily Flow	Absolute Difference	% Difference	Direction B	Nov-21 Daily Flow	Jan-23 Daily Flow	Absolute Difference	% Difference
A105 High Road (@Cranbrook Park/Watsons Road)	Northbound	10,501	13,554	3,053	29%	Southbound	12,723	14,033	1,309	10%
A105 High Road (@Sidney Road/Woodside Road)	Northbound	7,369	7,625	256	3%	Southbound	9,681	9,105	-576	-6%
A109 Bounds Green Road (@Gordon Road/Passmore Gardens)	Northbound	10,345	10,538	193	2%	Southbound	10,817	10,271	-546	-5%
A109 Bounds Green Road (@Truro Road/Nightingale Road)	Northbound	10,055	12,532	2,477	25%	Southbound	9,429	10,048	619	7%
B106 Durnsford Road	Northbound	7,423	7,011	-412	-6%	Southbound	5,548	6,008	460	8%

*As detailed on page 18 it is important to note that vehicles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of vehicle journeys counted is certain to be higher than the actual number of trips taken.

Insights: All Motorised Vehicle Volumes

The comparison of normalised flows between the November 2021 pre-implementation and January 2023 post-implementation surveys, indicates that total motorised vehicles volumes have declined for almost all internal roads within the Bounds Green LTN area, whilst there has been a slight percentage increase on some scheme boundary roads.

Across all monitored internal roads, there were approximately 15,900 fewer vehicles counted post-implementation vs. pre-implementation, equating to an overall 66% drop in volume. On boundary roads, a marginal percentage increase of 7% was recorded, equating to around 6,800 additional vehicles as compared to the pre-implementation counts.

On internal roads, Truro Road and Nightingale Road experienced the largest reductions in traffic flows, which decreased by around 4,900 and 4,300 daily vehicles respectively, differences of -99% and -94% respectively when compared to pre implementation flows at the same sites. Both roads were filtered, thus resulting in the expected significant drop in traffic volumes. Other roads, including Queens Road, also experienced large percentage decreases in vehicle flows, but without large net changes in traffic volumes.

Overall, most internal roads within the Bounds Green LTN area experienced decreases of at least 50%, with seven roads observing drops of over 500 daily vehicles, in line with the objectives of the LTN to reduce traffic levels on quieter residential roads. However, it must be noted that as vehicles travelling through the LTN and boundary roads are likely to go through multiple counter sites, it is certain that the number of vehicles counted across all internal/boundary roads is higher than the actual number of trips taken. As such, a drop/increase in total volumes of vehicles counted across multiple individual roads does not represent the same drop/increase in total unique vehicle journeys, although can be useful in understanding the magnitude and direction of a change.

It is important to note however that this methodology of recording traffic volumes is consistent across both pre and post implementation periods. It is also important to note that this methodology is consistent with the analysis of LTN schemes in other London boroughs.

The picture on boundary roads was more varied, with an overall increase in flows. The most significant increase by both volume and percentage change was experienced on High Road (at Cranbook Park/ Watsons Road), where there were 4,400 more daily vehicles in January 2023 than in November 2021, an increase of 19%. There was also a noticeable increase in daily motorised vehicles on Bounds Green Road (at Truro Road/Nightingale Road), a 16% rise equating to around 3,100 additional vehicles – it is noted that much of this increase was for northbound vehicles.

In contrast to this, some boundary roads experienced a decrease in motorised traffic volumes when compared with the pre-

implementation period. The Bounds Green Road site at Gordon Road/Passmore Gardens saw a 2% decrease in motorised traffic, equating to around 350 fewer daily vehicles, with similar impacts seen at the High Road site at Sidney Road/Woodside Road.

Whilst these findings indicate that the total volume of traffic on internal roads has decreased considerably since the Bounds Green LTN trial, some boundary roads have seen increases since implementation and merit further monitoring by the council. Ultimately, though, there has been a net decrease in motorised vehicle volumes across the scheme area between the pre and post implementation periods, indicating that the scheme is delivering on this objective.

Goods Vehicles Volumes (5-Day Daily Average)

This section outlines the changes in normalised traffic volumes for Light Goods Vehicles and Heavy Goods Vehicles.

LGV stands for Light Goods Vehicle. This is defined, for the purposes of this report (which may differ from other traffic monitoring reports) as a rigid two-axle van, such as the type of van commonly used for deliveries. HGV stands for Heavy Goods Vehicle, which is a goods vehicle larger than the type of van described above.

The results shown are for 5-day average weekday volumes, excluding weekends. This is because goods vehicle traffic is generally lower at weekends, therefore the weekday data gives a better impression of actual impacts by not masking this. Similarly, the % numbers given are percentages of total motorised traffic, rather than all vehicles counted, so the comparison to cycles is not considered. Changes in the proportion of LGV/HGV compared to total motorised traffic (or ”prevalence” of such vehicles) is presented as a percentage point difference, although the actual percentage change for vehicles is also presented.

Table 6: Normalised Goods Vehicle Volumes on Internal Roads

	LGV Volume: Nov-21	LGV Prop: Nov-21	LGV Volume: Jan-23	LGV Prop: Jan-23	LGV Change in Prop.	LGV Change in Volume	HGV Volume: Nov-21	HGV Prop: Nov-21	HGV Volume: Jan-23	HGV Prop: Jan-23	HGV Change in Prop.	HGV Change in Volume
Blake Road	127	7%	40	15%	8%	-69%	9	1%	1	0%	-1%	-89%
Cline Road	27	2%	113	9%	7%	319%	62	5%	104	8%	3%	68%
Commerce Road	121	6%	82	6%	0%	-32%	46	2%	5	0%	-2%	-89%
Gordon Road	20	2%	7	8%	6%	-65%	52	5%	3	3%	-2%	-94%
Marlborough Road	48	11%	55	12%	1%	15%	3	1%	2	0%	-1%	-33%
Myddleton Road	163	8%	81	4%	-4%	-50%	41	2%	77	4%	2%	88%
Nightingale Road	328	7%	59	20%	13%	-82%	84	2%	7	2%	0%	-92%
Palmerston Road	240	10%	44	10%	0%	-82%	6	0%	8	2%	2%	33%
Passmore Gardens	30	8%	13	9%	1%	-57%	3	1%	6	4%	3%	100%
Queen's Road	38	7%	2	4%	-3%	-95%	2	0%	-	0%	0%	-100%
Ring Way	48	2%	293	16%	14%	510%	180	8%	43	2%	-6%	-76%
Truro Road	179	3%	-	0%	-3%	-100%	194	4%	-	0%	-4%	-100%
Whittington Road	134	11%	73	12%	1%	-46%	9	1%	3	1%	0%	-67%
Total/Average Internal Road	**1,503**	**6%**	**862**	**10%**	**4%**	**-43%**	**691**	**3%**	**259**	**3%**	**0%**	**-63%**

*As detailed on page 18 it is important to note that vehicles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of vehicle journeys counted is certain to be higher than the actual number of trips taken.

Table 7: Normalised Goods Vehicle Volumes on Boundary Roads

	LGV Volume: Nov-21	LGV Prop: Nov-21	LGV Volume: Jan-23	LGV Prop: Jan-23	LGV Change in Prop.	LGV Change in Volume	HGV Volume: Nov-21	HGV Prop: Nov-21	HGV Volume: Jan-23	HGV Prop: Jan-23	HGV Change in Prop.	HGV Change in Volume
A105 High Road (@Cranbrook Park/Watsons Road)	1,172	5%	664	2%	-3%	-43%	529	2%	1,579	6%	4%	198%
A105 High Road (@Sidney Road/Woodside Road)	1,854	11%	1,994	12%	1%	8%	240	1%	201	1%	0%	-16%
A109 Bounds Green Road (@Gordon Road/Passmore Gardens)	2,215	10%	2,202	11%	1%	-1%	357	2%	403	2%	0%	13%
A109 Bounds Green Road (@Truro Road/Nightingale Road)	1,895	10%	1,787	8%	-2%	-6%	214	1%	517	2%	1%	142%
B106 Durnsford Road	743	6%	1,405	11%	5%	89%	687	5%	79	1%	-4%	-89%
Total/Average Boundary Road	**7,879**	**8%**	**8,052**	**8%**	**0%**	**2%**	**2,027**	**2%**	**2,779**	**3%**	**1%**	**37%**

*As detailed on page 18 it is important to note that vehicles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of vehicle journeys counted is certain to be higher than the actual number of trips taken.

Insights: Goods Vehicles Volumes

The volume of goods vehicles during weekdays would generally be expected to decrease significantly on internal roads and increase slightly on boundary roads, in line with broader trends for motorised vehicles (although noting motorised vehicle trends above are for full, seven-day weeks).

For internal roads, the volumes of both LGVs and HGVs have decreased by 43% and 63% respectively. However, it is important to note that the proportion of LGVs compared to total motorised vehicles has increased by 4 percentage points, whilst remaining the same for HGVs. For LGVs, this indicates that routing choices may be less flexible than for general traffic, most likely because a higher percentage of LGVs need to drop off or pick up at specific households within the LTN area, whereby general traffic may be able to alter and amend their routes. However, it must be noted that as vehicles travelling through the LTN and boundary roads are likely to go through multiple counter sites, it is certain that the number of vehicles counted across all internal/boundary roads is higher than the actual number of trips taken. As such, a drop/increase in total volumes of vehicles counted across multiple individual roads does not represent the same drop/increase in total unique vehicle journeys, although can be useful in understanding the magnitude and direction of a change.

It is important to note however that this methodology of recording traffic volumes is consistent across both pre and post implementation periods. It is also important to note that this methodology is consistent with the analysis of LTN schemes in other London boroughs.

For individual internal roads, changes in vehicle flows often translate to large percentage changes (based on low initial volumes), so it is generally more useful to look at changes in actual vehicle numbers. Utilising this metric for LGVs, roads including Nightingale Road (-269 LGVs), Palmerston Road (-196 LGVs), Blake Road (-87 LGVs), and Myddleton Road (-82 LGVs) all saw notable decreases for daily vehicles. Of these, both Nightingale Road and Palmerston Road experienced 82% reductions in the number of LGVs. Furthermore, all LGVs stopped traveling via Truro Road due to the filter here.

In contrast, Ring Way in the northwest corner of the scheme area experienced a large increase in flows (+245 daily LGVs). This area is home to an industrial estate, so the continued prevalence of these vehicles is to be expected.

HGVs comprised a smaller starting proportion of all motorised traffic within the scheme area. As such, the only roads to experience a decrease in HGV volume of over 40 daily vehicles were Ring Way (-137 HGVs), Nightingale Road (-77 HGVs), Gordon Road (-49 HGVs), and Commerce Road (-41 HGVs). The largest increases in HGVs were seen on Cline Road (+42 HGVs) and Myddleton Road (+36 HGVs). As with LGVs, there was a 100% drop in HGVs on Truro Road.

Data for boundary roads has shown more variance, although it is noted following review of the data that survey outputs may have misclassed goods vehicle data in either the pre- or post-implementation collection periods – this can be seen for Durnsford Road, where an 89% increase in LGVs was seen alongside an 89% decrease in HGVs, yet together only calculates to an increase of 4%. A similar issue may exist on High Road at Cranbook Park/Watsons Road, where a 32% increase was seen when summing both LGVs and HGVs. Summing across all boundary sites, then, it appears that total goods vehicle numbers have increased by 9% - which is more or less in line with the trend for other motorised traffic.

Motorcycle Volumes (7-Day Daily Average)

Motorcycle volumes are considered separately from other vehicles as they are occasionally able to travel through neighbourhood blocks using filters and streets in manners that cars and lorries cannot (for example by illegally using cycle filters). Similarly, on average, they create more noise than general traffic and are therefore of particular concern during the overnight period, especially as a result of the significant increase in their prevalence following COVID-19 and the spike in deliveries made by motorcycle in London.

Motorcycles are distinguished from pedal cycles in ATC counters by the weight and spacing of the vehicle tyres.

Table 8: Normalised Motorcycle Volumes on Internal Roads

	Motorcycle Volume: Nov-21	Motorcycle Prop: Nov-21	Motorcycle Volume: Jan-23	Motorcycle Prop: Jan-23	Motorcycle Change in Proportion	Motorcycle Change in Volume
Blake Road	64	4%	14	5%	1%	-78%
Cline Road	234	18%	272	21%	3%	16%
Commerce Road	99	5%	90	7%	2%	-9%
Gordon Road	22	2%	4	4%	2%	-84%
Marlborough Road	26	6%	40	9%	3%	53%
Myddleton Road	95	5%	121	6%	1%	27%
Nightingale Road	95	2%	8	3%	1%	-92%
Palmerston Road	33	1%	52	12%	11%	58%
Passmore Gardens	12	3%	5	4%	1%	-59%
Queen's Road	50	10%	12	29%	19%	-76%
Ring Way	59	3%	43	3%	0%	-28%
Truro Road	114	2%	34	95%	93%	-70%
Whittington Road	72	6%	57	10%	4%	-21%
Total/Average Internal	**975**	**4%**	**750**	**9%**	**5%**	**-23%**

*As detailed on page 18 it is important to note that vehicles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of vehicle journeys counted is certain to be higher than the actual number of trips taken.

Table 9: Normalised Motorcycle Volumes on Boundary Roads

	Motorcycle Volume: Nov-21	Motorcycle Prop: Nov-21	Motorcycle Volume: Jan-23	Motorcycle Prop: Jan-23	Motorcycle Change in Proportion	Motorcycle Change in Volume
A105 High Road (@Cranbrook Park/Watsons Road)	304	1%	1,090	4%	3%	259%
A105 High Road (@Sidney Road/Woodside Road)	675	4%	852	5%	1%	26%
A109 Bounds Green Road (@Gordon Road/Passmore Gardens)	437	2%	503	2%	0%	15%
A109 Bounds Green Road (@Truro Road/Nightingale Road)	676	3%	690	3%	0%	2%
B106 Durnsford Road	247	2%	309	2%	0%	25%
Total/Average Boundary	**2,338**	**2%**	**3,445**	**3%**	**1%**	**47%**

*As detailed on page 18 it is important to note that vehicles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of vehicle journeys counted is certain to be higher than the actual number of trips taken.

Insights: Motorcycle Volumes

As with goods vehicles, it would be expected that motorcycle flows broadly reflect the trends in overall motor vehicle traffic, for example large decreases on internal roads and slight increases on boundary roads.

For internal roads, motorcycle volumes have decreased in most locations, although not to the same extent as general traffic across the two surveyed periods. Despite a 23% drop in motorcycles, which equates to 225 per day when normalised, the proportional representation of motorcycles increased from 4% in November 2021 to 9% in January 2023. This perhaps indicates less flexibility for motorcycles (and motorcycle-based deliveries) than for general traffic in terms of routing options. It may also be a result of motorcycles passing illegally through filters with physical barriers such as bollards, which other motorised vehicles are unable to do. However, it must be noted that as vehicles travelling through the LTN and boundary roads are likely to go through multiple counter sites, it is certain that the number of vehicles counted across all internal/boundary roads is higher than the actual number of trips taken. As such, a drop/increase in total volumes of vehicles counted across multiple individual roads does not represent the same drop/increase in total unique vehicle journeys, although can be useful in understanding the magnitude and direction of a change.

It is important to note however that this methodology of recording traffic volumes is consistent across both pre and post implementation periods. It is also important to note that this methodology is consistent with the analysis of LTN schemes in other London boroughs.

The most significant decrease in daily motorcycles was on Nightingale Road where a drop of 87 motorcycles equates to a 92% change in volume post-implementation, other notable decreases included Blake Road (-50 motorcycles) and Truro Road (-80 motorcycles). Interestingly, whilst the Truro Road filter has stopped almost all general traffic, it has not stopped all motorcycles, which now account for 95% of all vehicles counted at this site – indicating a level of noncompliance for motorcyclists.

There were increases in motorcycle volume across all boundary roads that were assessed. Overall, this was equal to around 1,100 more motorcycles (+47%) in the post-implementation. This change was largely driven by increases at the High Road site at Cranbook Road/Watsons Road, which saw nearly 800 more motorcycles pass per day.

Ultimately, it appears that motorcycle volumes tend to follow the general trend of motorised vehicles (decrease for internal roads and increase for boundary roads) but in both cases show a higher degree of prevalence.

Cycle Volumes (7-Day Daily Average)

We have not normalised cycling figures for COVID-19 due to the lack of an available source that provides continuous month-to-month cycling levels encompassing all types of cycling trips (commute and leisure) and is at a sufficiently local geographic scale to form a meaningful and robust benchmark.

Unlike motorised traffic trends, cycling levels are significantly impacted by seasonal weather change including temperature and rainfall; for example, there is normally much more cycling participation in July than in January, and therefore there are significantly more cycle trips completed in July than January. There are several interlinked factors when it comes to the impact seasonal weather variation has on cycling levels, while weather can still vary within a season, a month or even a day. As an indication of the impact weather can have, one 2011 study found a doubling in temperature could lead up to a 50% increase in cycling levels, before having a negative impact if too high (Study by Miranda-Moreno and Nosal, 2011).

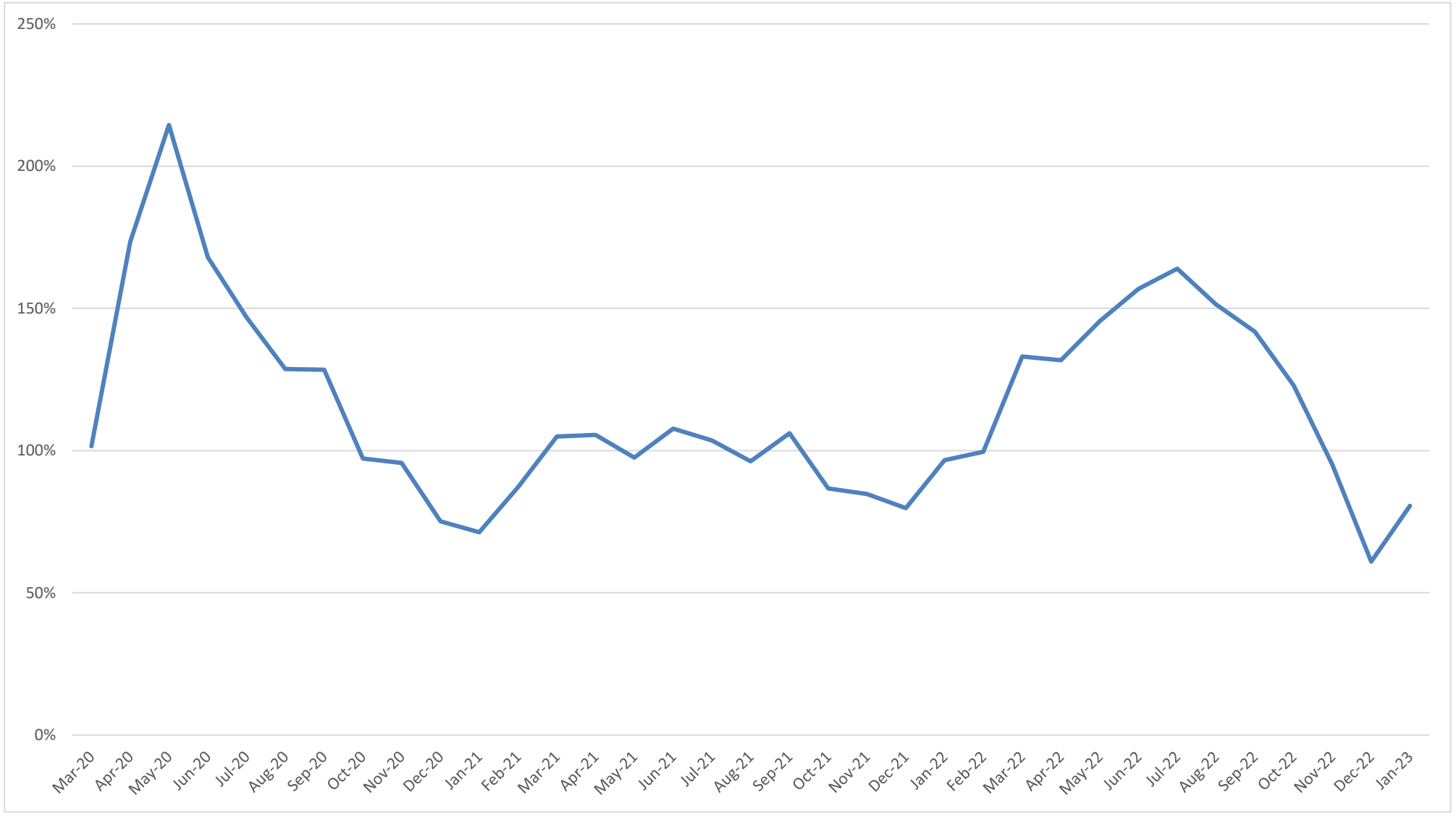
Between pre-implementation and post-implementation data collection periods (taken in November 2021 and January 2023 respectively), average climate data indicates that post-implementation weather was slightly colder, with an average temperature of 6°C vs. 9°C in November 2021 – although as was noted previously, post-implementation data was collected during the slightly warmer first half of January 2023.

Considering these caveats, it is also important to note that government regulations and guidance surrounding COVID-19, as well as the impact of the cost-of-living crisis in 2022/2023, have significantly impacted wider cycling trends since March 2020 (data from DfT's Official Statistics). Graph 1 on the next page shows, on a national basis, the number of cycle trips completed as compared to the same month pre-pandemic (i.e. June 2021 compared to June 2019), indicating that whilst the first few months of the pandemic (i.e. early summer 2020) saw very high levels of cycling, levels since then have been driven by a range of factors (for example, higher flows during the summer of 2022 and low flows over the winter spanning 2022/2023.

Route choices made by people cycling will also be impacted by the availability of nearby protected cycle infrastructure and less traffic dominated neighbourhoods, particularly in relation to any new infrastructure within or nearby the scheme that was installed between waves of data collection.

Graph 1 below outlines nationwide cycling trends, with the following maps and tables outlining the pre-implementation cycling levels and how these have changed between data collection phases.

Graph 1: National Cycling Levels - % of Comparison Month in Pre-Covid 2019/2020*



*For example, January 2023 cycling levels are 81% of the January 2020 average.

Map 6: Pre-Implementation Volume of Cycles

Map 7: Post-Implementation Volume of Cycles

Map 8: Percentage Change in Cycle Volumes

Table 10: Cycling Volumes on Internal Roads

	Pre-Implementation Observed: Nov-21	Post-Implementation Observed: Jan-23	Difference Post-Implementation vs. Pre-Implementation	% Difference Post-Implementation vs. Pre-Implementation
Blake Road	25	29	4	18%
Cline Road	52	43	-9	-18%
Commerce Road	65	48	-17	-25%
Gordon Road	51	21	-30	-58%
Marlborough Road	31	24	-7	-22%
Myddleton Road	110	115	5	5%
Nightingale Road	32	90	58	185%
Palmerston Road	36	178	142	393%
Passmore Gardens	16	18	2	12%
Queen's Road	53	49	-4	-7%
Ring Way	103	21	-82	-79%
Truro Road	45	27	-18	-40%
Whittington Road	62	56	-6	-9%
Total Internal	**679**	**720**	**41**	**6%**

*As detailed on page 18 it is important to note that cycles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of cycle journeys counted is certain to be higher than the actual number of trips taken.

Table 11: Cycling Volumes on Boundary Roads

	Pre-Implementation Observed: Nov-21	Post-Implementation Observed: Jan-23	Difference Post-Implementation vs. Pre-Implementation	% Difference Post-Implementation vs. Pre-Implementation
A105 High Road (@Cranbrook Park/Watsons Road)	1,112	839	-273	-25%
A105 High Road (@Sidney Road/Woodside Road)	418	194	-224	-54%
A109 Bounds Green Road (@Gordon Road/Passmore Gardens)	122	87	-35	-29%
A109 Bounds Green Road (@Truro Road/Nightingale Road)	197	157	-40	-20%
B106 Durnsford Road	206	150	-56	-27%
Total Boundary	**2,054**	**1,427**	**-627**	**-31%**

*As detailed on page 18 it is important to note that cycles travelling through the LTN may go through multiple counter sites (roads where traffic volumes have been counted), so the total number of cycle journeys counted is certain to be higher than the actual number of trips taken.

Insights: Cycling Volumes

Based on Graph 1, cycling levels on a national basis were around 85% during the pre-implementation monitoring period and closer to 80% during the post-implementation period, indicating that there was likely not a significant difference in baseline conditions for cycling between the two periods.

With consideration offered to the findings above, it appears that cycling levels have increased slightly across internal road within the Bounds Green LTN scheme area between the two monitoring periods, whilst levels have decreased significantly on boundary roads. The post-implementation situation has observed volumes rise by 6% overall on internal roads, an increase of around 40 daily cycles counted, whilst boundary road volumes dropped by 31%, equalling 627 fewer daily cycles post-implementation.

On internal roads, the most notable increase was on Palmerston Road, where daily cycle volumes increased by 142 (393%) – perhaps as this is now an especially attractive north-south route when combined with the North Circular Road crossing installed just before COVID. There was also a notable rise in cyclists along Nightingale Road of 58 (+185%), but all other increases were to a much smaller extent in both volume and proportion. There were significant decreases on some internal roads including Ring Way (-82) and Gordon Road (-30). However, it must be noted that as bicycles travelling through the LTN and boundary roads are likely to go through multiple counter sites, it is certain that the number of bicycles counted across all internal/boundary roads is higher than the actual number of trips taken. As such, a drop/increase in total volumes of bicycles counted across multiple individual roads does not represent the same drop/increase in total unique vehicle journeys, although can be useful in understanding the magnitude and direction of a change.

It is important to note however that this methodology of recording traffic volumes is consistent across both pre and post implementation periods. It is also important to note that this methodology is consistent with the analysis of LTN schemes in other London boroughs.

All boundary roads contributed to the decrease in overall cycling levels, but the largest decreases were along the A105 High Road with the site at (@Cranbrook Park/ Watsons Road) counting 273 less cycles (-25%) than pre-implementation and (@Sidney Road/Woodside Road) recording 224 fewer (-54%). The A105 High Road at this location has seen a significant increase in overall traffic and especially HGV's which may have resulted in this section becoming less attractive to cyclists.

For the other boundary roads, decreases were observed but to a lesser extent than along the A105 High Road. It is unclear if there is a specific reason cycling decreases were seen on these roads, or if this is a larger area trend for boundary roads for the compared months.

Analysis of Vehicle Speeds

Speeding is a major contributing factor to road danger, so reducing speeding is vital to making roads safer for all.

Traffic counters measure motorised traffic speeds as well as volumes. Details about the dates and locations of the traffic volume and speed monitoring are in Appendix 5. The speed limit is 20mph on all roads in the Borough, with the exception of the following:

Table 12: Borough Speed Limit Exceptions

LB Haringey Road	Postcode	Speed Limit
Boreham Road	N22	30mph
Bounds Green Road (between Braemar Avenue & A406)	N22	30mph
Ferry Lane	N17	30mph
Fortis Green	N2	30mph
Great North Road	N2	30mph
Hale Road	N17	30mph
High Road (between Bounds Green Road and Borough boundary)	N22	30mph
Lordship Lane	N17 & N22	30mph
Muswell Hill	N10	30mph
Priory Road	N8	30mph
The Roundway (Western arm)	N17	30mph
Westbury Avenue (between Frome Road & Lordship Lane)	N22	30mph
Watermead Way	N17	40mph

Speed monitoring results have not been normalised as they are not considered to have been impacted by COVID-19 in the same way and to the same extent as traffic volumes, though speeds may settle into new patterns post-COVID-19. The results presented here are seven- day averages. The 85th percentile is used in transport monitoring to gauge changes in speeds and speeding behaviour. It is the speed at or below which 85% of traffic will be travelling along a street (and therefore 15% of traffic will be travelling faster than this speed).

Cycles and their speeds have been removed from calculations relating to vehicle speeds as including such counts would skew averages down.

Map 9: Average Vehicle Speed in mph pre-implementation (seven-day daily averages)

Map 10: Average Vehicle Speed in mph post-implementation (seven-day daily averages)

Map 11: Percentage Change in Motorised Vehicle Average Speed (seven-day daily averages)

Table 13: Speeds of Motorised Vehicles on Internal Roads

	Pre-Con Average Speed (mph)	Average Speed Diff. vs. Pre- (mph)	Average Speed Diff. vs. Pre- (%)	85th Pct. Speed Pre-Con (mph)	85th Pct. Diff. vs. Pre- (mph)	85th Pct. Diff. vs. Pre- (%)	% Speeding Pre-Con	% Speeding Diff vs. Pre- (% pt.)
Blake Road	16.3	-4.3	-21%	20.4	-5.0	-20%	23%	-31%
Cline Road	13.8	2.7	24%	17.4	3.3	23%	3%	3%
Commerce Road	13.6	0.0	0%	17.6	0.1	1%	7%	2%
Gordon Road	9.0	-2.3	-20%	13.0	-0.8	-6%	0%	0%
Marlborough Road	15.3	0.2	1%	20.4	0.1	0%	17%	-2%
Myddleton Road	18.3	1.4	8%	22.4	1.1	5%	34%	11%
Nightingale Road	11.2	-3.8	-25%	13.8	-4.6	-25%	1%	-4%
Palmerston Road	15.1	-3.1	-17%	19.0	-2.9	-13%	9%	-19%
Passmore Gardens	12.4	-2.9	-19%	15.1	-3.9	-21%	3%	-8%
Queen's Road	12.5	-2.8	-18%	16.6	-2.5	-13%	5%	-8%
Ring Way	14.5	2.7	23%	18.3	3.9	27%	6%	6%
Truro Road	12.9	0.2	2%	17.5	2.6	17%	4%	4%
Whittington Road	16.8	0.8	5%	20.8	1.0	5%	20%	6%
Weighted Average	**15.2**	**0.5**	**4%**	**19.1**	**1.1**	**6%**	**14%**	**3%**

Table 14: Speeds of Motorised Vehicles on Boundary Roads

	Pre-Con Average Speed (mph)	Average Speed Diff. vs. Pre- (mph)	Average Speed Diff. vs. Pre- (%)	85th Pct. Speed Pre-Con (mph)	85th Pct. Diff. vs. Pre- (mph)	85th Pct. Diff. vs. Pre- (%)	% Speeding Pre-Con	% Speeding Diff vs. Pre- (% pt.)
A105 High Road (@Cranbrook Park/Watsons Road)	15.5	2.1	16%	21.4	3.1	17%	25%	25%
A105 High Road (@Sidney Road/Woodside Road)	23.1	0.2	1%	27.5	0.2	1%	8%	0%
A109 Bounds Green Road (@Gordon Road/Passmore Gardens)	25.7	0.3	1%	30.0	0.1	0%	16%	0%
A109 Bounds Green Road (@Truro Road/Nightingale Road)	23.3	0.2	1%	28.1	-0.3	-1%	7%	-2%
B106 Durnsford Road	20.6	-0.1	0%	25.5	-0.2	-1%	4%	0%
Weighted Average	**21.3**	**0.4**	**2%**	**26.2**	**0.6**	**2%**	**14%**	**6%**

Insights: Vehicle Speeds

Overall, vehicle speeds have increased slightly on both internal and boundary roads across the key metrics analysed between the November 2021 pre-implementation and January 2023 post-implementation survey periods, the increases in most cases are negligible and all are less than 10% after the weighted averages are calculated.

On internal roads, there are a wide range of changes for vehicle speeds, although it is noted that the low volumes of traffic on many roads in the post-implementation stage means that values during this stage of data collection are quite easily skewed. Despite this, the data demonstrates that average speeds across internal roads increased by 0.5mph (4%) when compared to pre-implementation values. Increases were seen across a range of sites, although the largest increases in average speed remained fairly moderate at +2.7mph on both Cline Road and Ring Way.

On the other hand, several internal roads experienced significant decreases in average speed post-implementation, with the largest changes seen on Blake Road (-4.3mph), Nightingale Road (-3.8mph) and Palmerston Road (-3.1mph). Of the internal roads in the Bounds Green trial area, Blake Road saw the largest decrease in percentage of vehicles speeding (-31%) and Myddleton Road recorded the largest increase (11%) – despite Myddleton Road only seeing a 1.4mph increase in average speeds.

The situation on boundary roads did not change significantly between November 2021 and January 2023. Overall average speeds increased by 0.4mph (2%) and the percentage of speeding vehicles increased by 6% between the two periods, but for most roads the changes were minimal. The High Road site at Cranbrook Park/Watsons Road saw the most notable increases across this period, where speeds increased by 2.1mph (16%), 85th percentile speeds increased by 3.1mph and of motorised vehicles 25% more were recorded as speeding.

Overall, vehicle speed data indicates that vehicle speed metrics on both internal and boundary roads have slightly increased, but analysis tells us that for several internal roads speeds decreased and on most boundary roads there were no differences observed.

Bus Journey Times on Boundary Roads

TfL monitors bus journey times across its network, which can add an additional layer of understanding about the impacts of transport schemes, particularly levels of congestion along roads and at junctions.

Bus journey time monitoring focused on the four main boundary road corridors below, which are used by the bracketed main bus routes. A map of these corridors is presented on the following page.

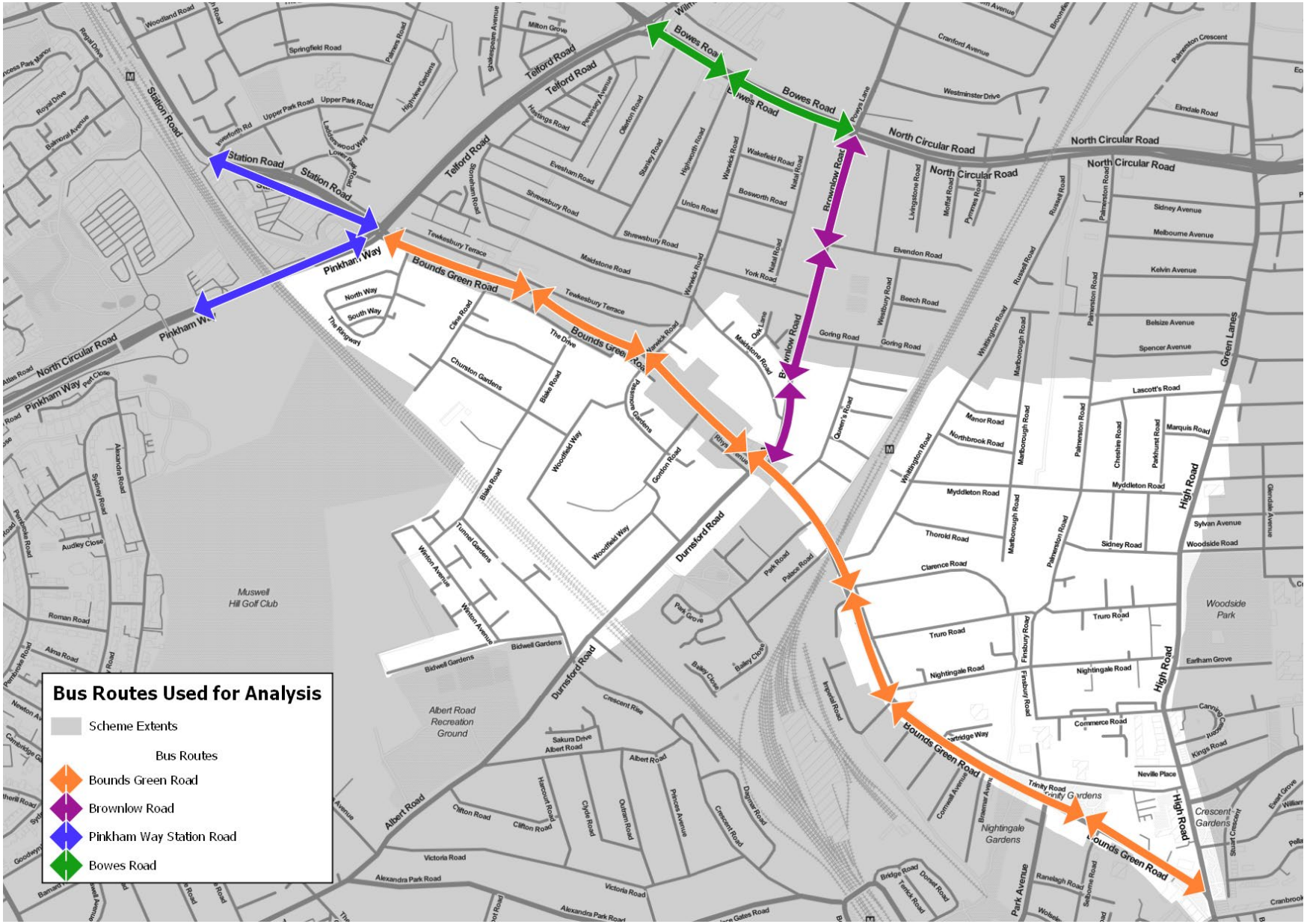
- **Bounds Green Road** (Routes 221, N91)
- **Brownlow Road** (Routes 102, 184, 299)
- **Pinkham Way Station Road** (Routes 221, 232, N91)
- **Bowes Road** (Routes 34, 184, 232)

Weekly iBus data provided by TfL has been used for analysis on these routes. This gives weekday (Monday to Friday, excluding bank holidays) average journey times by route, stop-to-stop link and peak periods. These journey times exclude dwell times at stops.

TfL's methodology has been used to analyse the results of the iBus data. Journey time results have first been summarised by route, by taking the total journey time across stop-to-stop links along the corridor and dividing by the length of these links, to give a minutes per kilometre figure. Corridor level figures have been found by taking a weighted average across the route level figures, weighted by the route frequency.

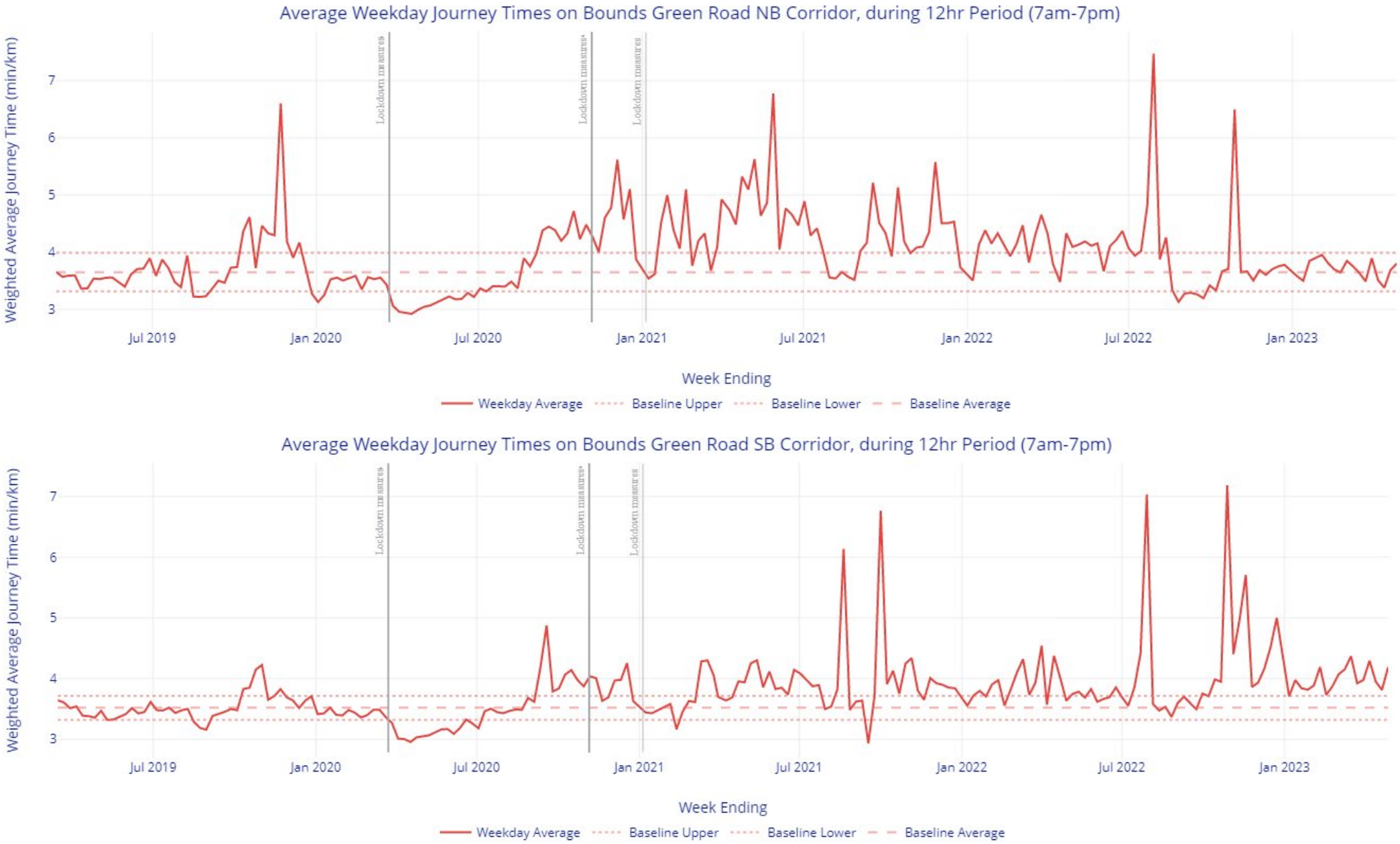
The data shows the corridor averages each week but also shows thresholds ('Baseline Upper' & 'Baseline Lower'). These thresholds have been found by taking the mean journey time plus or minus one standard deviation during the pre-COVID-19 baseline period (11 March 2019 – 13 March 2020). This allows for a reasonable amount of week-to-week variation but gives a threshold above which minutes per km figures would be deemed above "normal".

Map 12: Corridors Analysed Using iBus Data

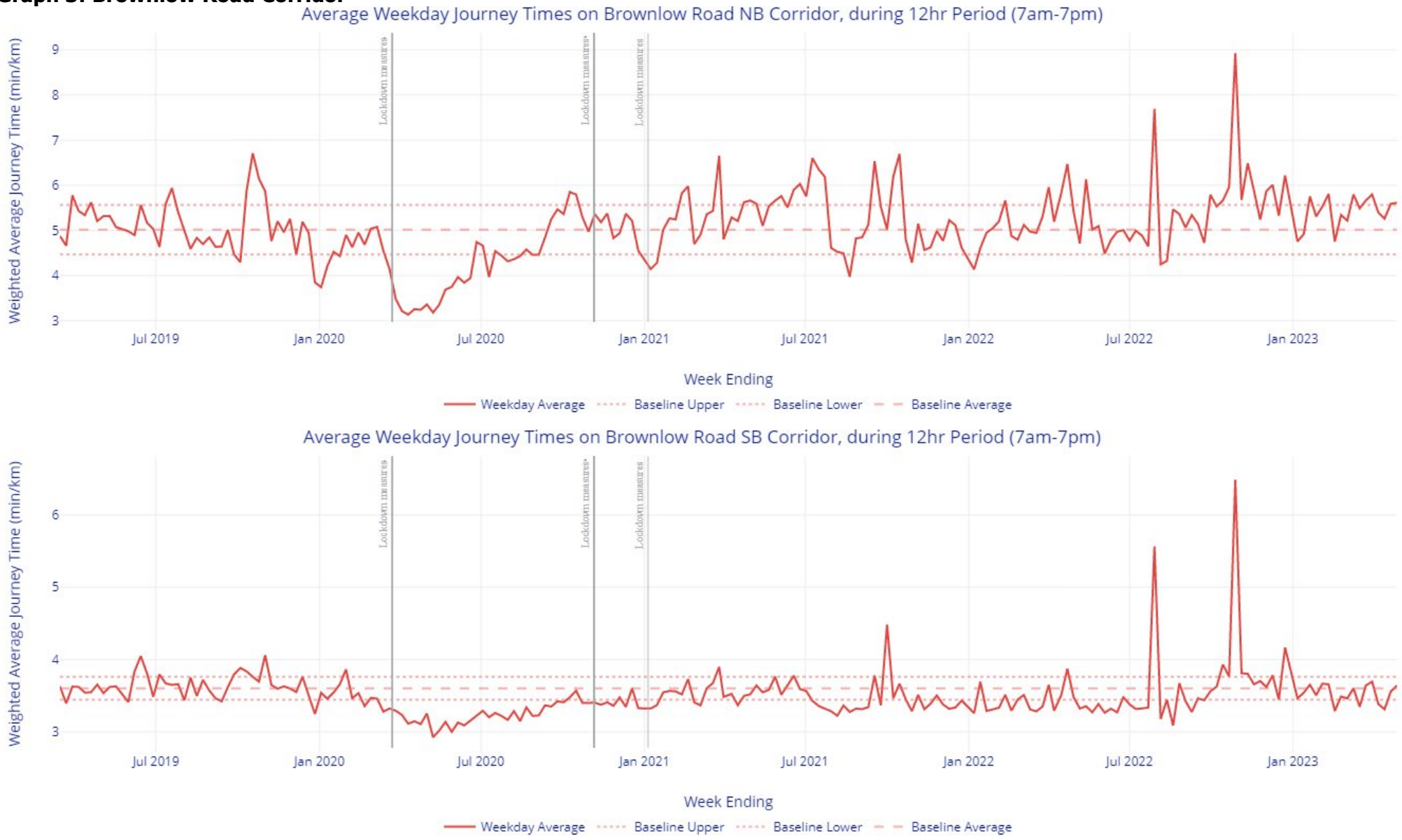


The results are shown in Graph 2 to Graph 5 on the following pages. The dashed red lines indicate the baseline threshold and the red line indicates the average journey times, on a three-week basis.

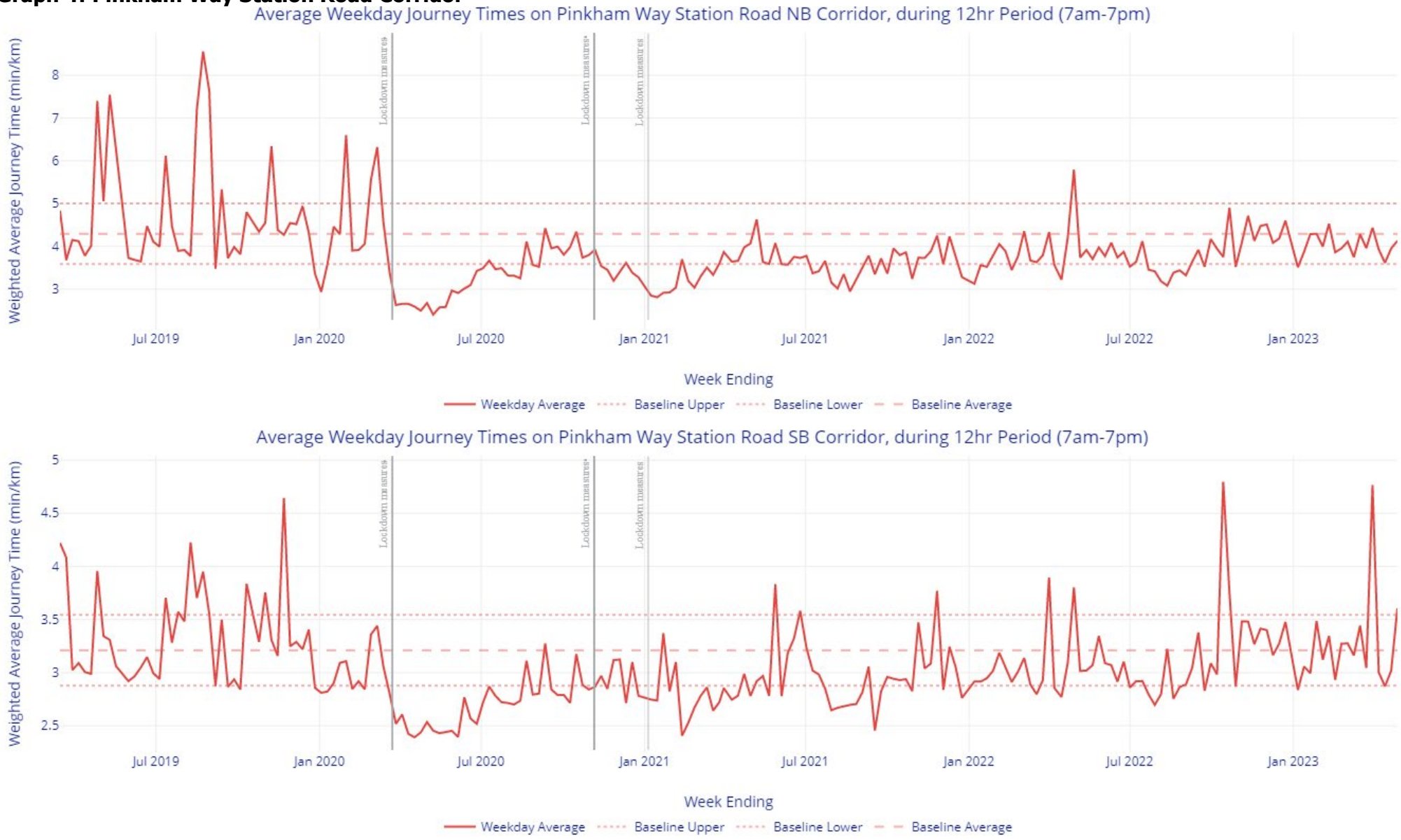
Graph 2: Bounds Green Road Corridor



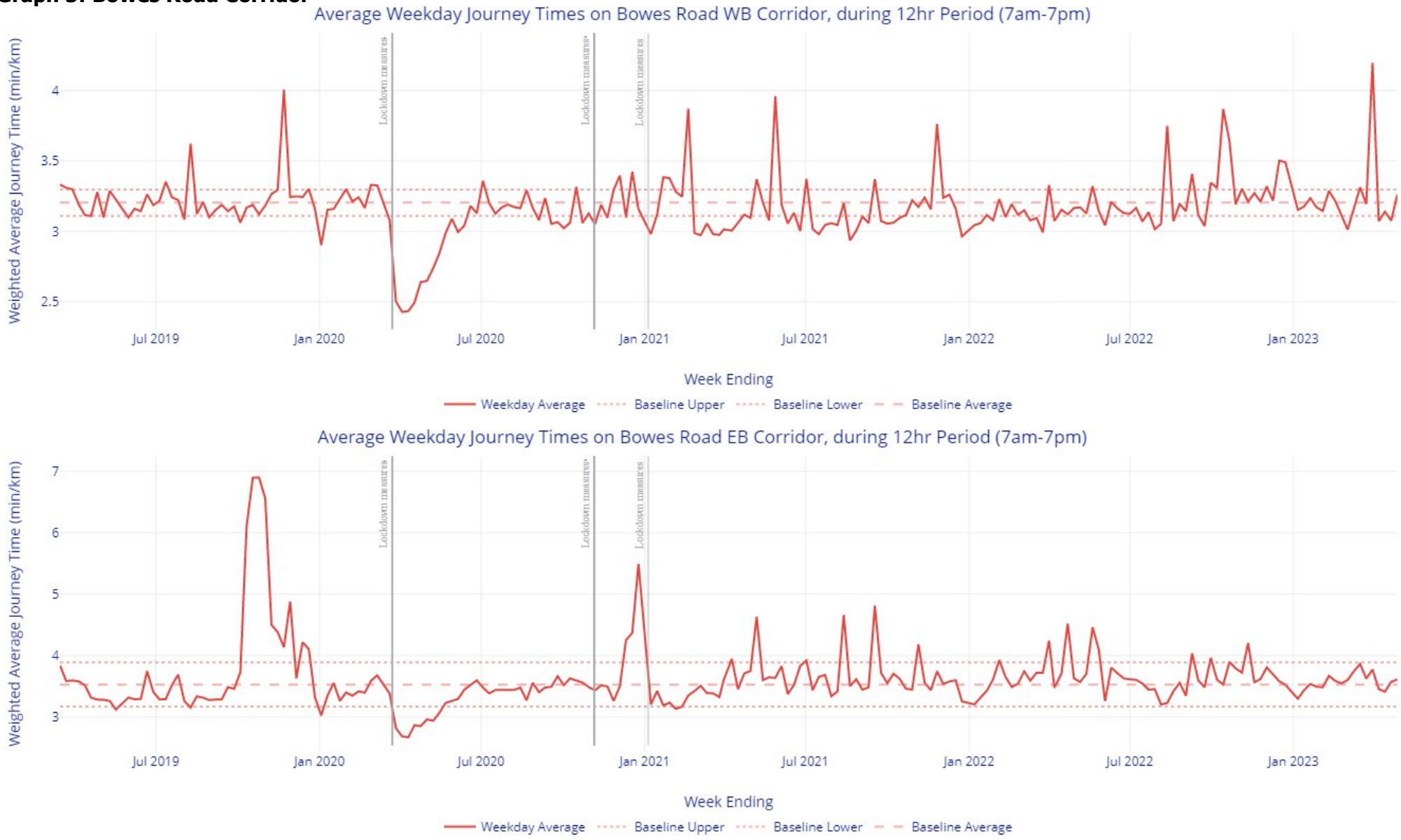
Graph 3: Brownlow Road Corridor



Graph 4: Pinkham Way Station Road Corridor



Graph 5: Bowes Road Corridor



Insights: Bus Journey Times on Boundary Roads

Bounds Green Road Bus Journey Times

Across the assessed period, bus speeds and times along the Bounds Green Road corridor in both directions have varied considerably, with several notable spikes in journey times. Journey times, particularly for northbound vehicles, tended to be above the pre-COVID range – in 2021 averaging around 4.5min/km, about a minute slower than before the pandemic. Journey times improved slightly up to August 2022, when the scheme was implemented and journey times saw a spike – however, northbound journey times on Bounds Green Road have since returned to pre-COVID averages, whilst southbound journey times are only slightly elevated.

Brownlow Road Bus Journey Times

Average weekday journey times for buses along Brownlow Road have remained quite low and consistent both pre-COVID and across the assessed period, not including two isolated but substantial spikes in August and October 2022 where journey times reached 6min/km. Along the northbound corridor there were more frequent fluctuations, the low in April 2020 was considerably below its standard deviation at 3min/km before then rising to above 5min/km regularly from 2021. Post-implementation journey times tend to be slightly higher than the pre-COVID average for northbound buses and about the same as this average for southbound buses.

Pinkham Way Station Road Bus Journey Times

Along Pinkham Way Station Road average weekday journey times have improved significantly along the northbound corridor when compared to pre-COVID averages. Bus times peaked at above 8min/km in September 2019 but now remain steadily around 4min/km. There were more regular variations in times for the southbound corridors between a low in March 2021 of 2.5min/km to spikes above 4.5min/km in October 2022 and most recently in April 2023, but journey times are still better than those in 2019 and early 2020.

Bowes Road Bus Journey Times

The situation on Bowes Road has also remained relatively consistent in both directions following the lifting of COVID lockdown restrictions, with average bus journey times remaining below 4min/km for most of the assessed periods. There does not appear to be any impact from the scheme's implementation.

Air Quality

Air quality refers to the air around us, how clean it is and how many pollutants (harmful chemicals or substances) it contains. The more pollutants the air contains the more air pollution there is and the worse the air quality is. Poor air quality is a concern as air pollution can impact health. The main pollutant of concern that we monitor is nitrogen dioxide (NO_2) – one of a group of gases called nitrogen oxides. NO_2 is toxic gas that can be very harmful on the human respiratory system.

The analysis conducted focuses on outputs from diffusion tubes, which provide monthly readings of NO_2. Whilst not as accurate as other types of monitors (i.e. automatic monitors), diffusion tubes can be more widely deployed to provide trends over a larger area and time period, and such tubes are a nationally approved monitoring technique. These tubes measure the air's concentration of nitrogen dioxide (NO_2). The tubes are replaced and analysed on a monthly basis. Research suggests that at urban roadside locations in the UK up to 80% of the nitrogen dioxide measured comes from road transport.

Haringey's air quality sites are classified based on their location using Defra guidance**,** but are referred to in these LTN monitoring reports using LTN terminology. According to Defra, "Roadside sites" are those within one to five metres of a busy road. In the LTN monitoring reports, roadside monitoring equates to boundary road sites for simplicity. According to Defra, "Urban background sites" are those in an urban location but more distanced from traffic sources, and in the reports these are the internal sites within the LTN.

The analysis has been conducted across two sets of monitors for purposes of comparison – those within LTN cells or on their boundary roads, or those that are elsewhere in the borough. The sites not in LTNs have been treated as a control group, as well as to show the longer trend of air quality in the borough. Continuous data from some wider-borough sites exists from 2018 onwards, whilst the LTN-focused monitors first started collecting data in June 2021. The wider-borough sites used for Haringey are those that are not within or on the direct boundary of LTN cells and consist of 12 roadside diffusion tubes and 16 background urban diffusion tubes.

The air quality monitoring sites for the Bounds Green LTN are listed in Appendix 3, with details about type and location. The wider-borough sites that are being used for comparison work in this report consist of eight boundary road diffusion tubes, six internal road diffusion tubes and four urban background tubes. For the Bounds Green scheme, there are three roadside/boundary road diffusion tubes and six urban background tubes.

Methodology

Air quality varies naturally over time due to a variety of factors, including seasonal variations, weather and other non-transport factors. It is therefore important to look at trends over a longer period of time, ideally for a year, to identify real changes in air quality that could be attributed to the scheme. The ultimate goal of Haringey's air quality strategy is to reduce air pollution as much as possible, and certainly to within legal limits.

In the case of this report, there has not been a full year's worth of data between scheme implementation and today (data is only available to January 2023 due to a lag in the review time for this). Only two months' data is available, meaning data for individual sites is easily skewed, particularly if further months are missing in the datasets – this is quite common, as when tubes are replaced each month they may be missing or presenting other clear issues (guidance set by the Mayor of London indicates how such situations are to be treated in the data). Ultimately, the above means that making comparisons between short periods of time before and after scheme implementation is unlikely to yield meaningful results, and that presenting air quality data on a site-by-site basis would be misleading.

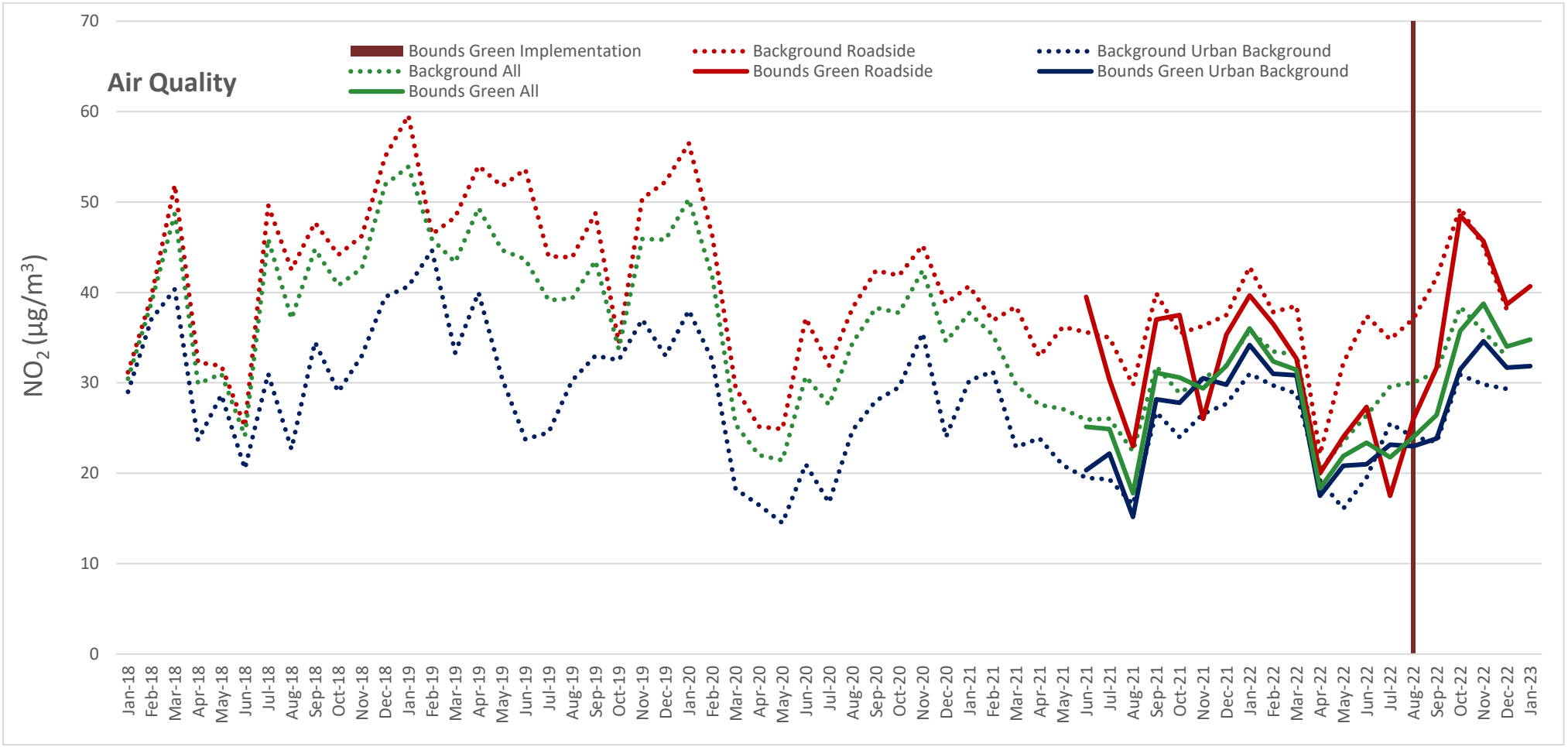
Instead, based on the above, the overall trend of NO_2 levels (as an average across all site types) has been considered to show how air quality has changed over time.

It is noted that to improve accuracy levels of diffusion tubes it is necessary to bias correct the results based upon local or national collocation studies with more accurate reference monitors. It is also necessary to calculate the data capture, and if this is less than 75%, the results should be annualised. More information on this process can be found in the council's annual air quality report. The results from 2022 have yet to be published, therefore the 2022 data presented here is in "raw" format and may be subject to change once the bias adjustment values are made available.

Results: Air Quality Diffusion Tubes

The results shown below show a longer-term picture of air quality, mostly for sites across the borough, but also for LTN sites since they were installed in June 2021. Data for each set of sites has been split by roadside sites (boundary/major roads), urban background sites (internal/residential roads), as well as an average of all sites reported on.

Graph 6: Average NO_2 Levels in Bounds Green LTN Compared to Long-Term Borough-Wide Sites from Diffusion Tubes



Insights: Air Quality

As can be seen in the chart, there are considerable seasonal impacts on NO_2 levels, with typically lower levels recorded in warmer months and higher levels in colder months. Still, the impact of COVID-19 on air quality was very clear during the most restrictive lockdowns in 2020 and 2021, with lower-than-average NO_2 levels recorded during this period. From around the time LTN-specific monitors were installed in June 2021, COVID-era improvements in air quality began to flatten and, as many returned to work and more active daily routines commenced in 2022, this began to increase slightly. Broadly the same trend can be seen for borough wide, non-LTN monitors as for monitors inside the LTN – both before and after the schemes were implemented.

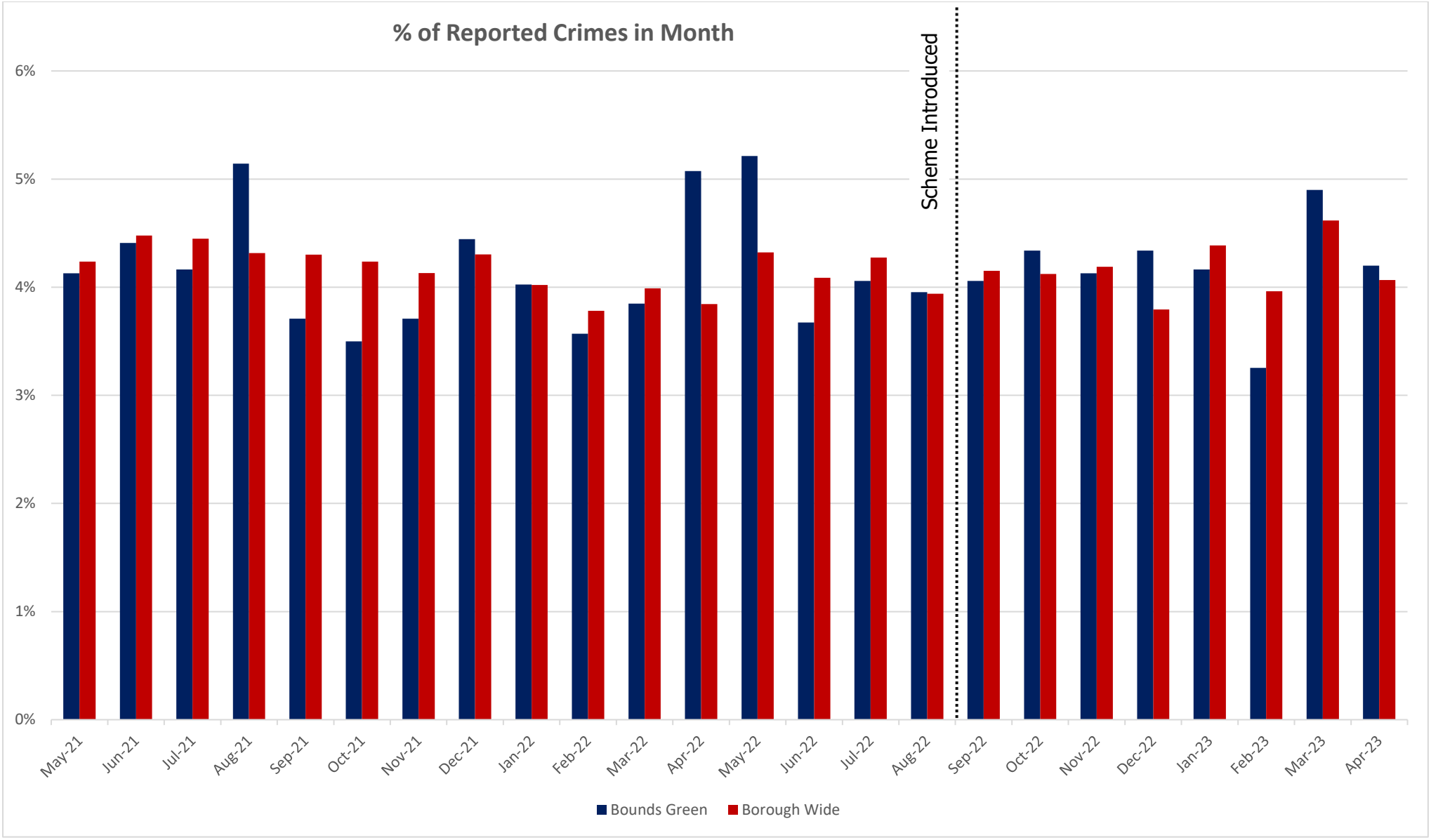
Based on the full calendar year data available at background sites, average NO_2 levels fell from an average 44 $\mu g/m^3$ in the 2019 peak to 30 $\mu g/m^3$ in 2021, before increasing slightly to 31 $\mu g/m^3$ for 2022, a total 30% reduction from peak levels. LTN sites, appreciating that 2021 data only began in June of that year, saw the same trend for 2021/2022 (i.e. a slight increase), so it is likely that air quality in these areas broadly followed the same borough wide trends.

Crime Patterns within the LTN

Crime data has been drawn from the London datastore for the 16 Lower Super Output Areas included within the Bounds Green area, as well as for the entirety of Haringey, for a period covering May 2021 to April 2023. The dataset includes an indication of all criminal activity as reported to the police, including a wide range of offenses including public order offences, theft, drug offences and burglary, among others.

Data has been drawn from the Bounds Green LTN area and the whole of Haringey, with the number of crime reports summed by month and presented as a proportion out of the total number of such reports across the two years of data presented.

Table 15: Proportional Breakdown of Calls and Crimes in Bounds Green LTN area and Haringey



Insights: Anti-Social Behaviour and Crime Patterns

Whilst there is only six months of crime data following from the introduction of the scheme, there is so far no indication based on the data that crime patterns within the Bounds Green LTN area have changed following the scheme's introduction. The number of criminal activity reports in the scheme area and in the wider borough are broadly similar, both before and after the scheme's introduction.

The council will continue to monitor this metric to see if any changes are reflected over time as the scheme further beds-in.

Concluding Remarks

This interim monitoring report demonstrates that, in general, the Bounds Green LTN is delivering the intended impacts in terms of a reduction in motorised traffic volumes on internal roads without significant impact to boundary roads.

In numerical terms, internal roads have seen a 66% drop in such counts (-15,915 vehicles), compared to a 7% rise on boundary roads (+6,834). This overall reduction in vehicle numbers will help reclaim local streets for the people that live on them by making them safer and more welcoming for those choosing to walk wheel, scoot or cycle for their local journeys. As described in the introduction, these figures do include instances where vehicles journeys have been counted multiple times, but it considered that these totals are accurate in their magnitude and direction of change – indicating that the scheme is performing well against its strategic objectives, and will help reclaim local streets for the people that live on them by making them safer and more welcoming for those choosing to walk wheel, scoot or cycle for their local journeys.

More specifically, many internal roads such as Truro Road and Nightingale Road have seen reductions, of 99% and 94% respectively, since the introduction of local modal filters. Encouragingly, there have been no internal roads that have seen a significant increase in traffic volumes since the implementation of the scheme. Marlborough Road has seen a moderate 4% increase, but this represents an increase of 18 total vehicles daily so is not considered a concern.

Boundary roads present a more mixed picture between the two monitoring periods and will need to continue to be monitored as the LTN schemes continue to 'bed in' and people adapt their journeys accordingly. High Road (at Cranbrook Park / Watsons Road) has seen a 19% increase since implementation with a similar increase of 16% on the Bounds Green Road (at Truro Road / Nightingale Road). Other boundary road sites further north on High Road (at Sidney Road/Woodside Road) and Bounds Green Road (north of Durnsford Road) have seen small decreases in traffic volume, which is encouraging.

Cycling volumes within the scheme area show a mixed picture across both internal and boundary roads. Internal roads such as Palmerston Road and Nightingale Road have seen significant increases of +178 cycles and +142 cycles, respectively. However, several internal roads such as Ring Way have seen decreases.

Cycling on boundary roads has dropped on all such sites, particularly on High Road where 273 fewer cyclists were counted at the Cranbook Park/Watsons Road location and 224 fewer cyclists were counted at the Sidney Road/Woodside Road location. Overall, 627 fewer cyclists were counted on boundary roads, a drop of 31% One possible explanation for this is that cyclists have modified their routes to avoid the

busier boundary roads and utilise the quieter internal roads of the LTN. However, the council will continue to monitor cycling levels on boundary roads.

Goods vehicles and motorcycle trends mirror the overall picture for general traffic, with most internal roads seeing significant drops in numbers with a more mixed picture on boundary roads. There are, however, some specific outliers in relation to HGV traffic that will need to be monitored and require further investigation.

At this early stage, it is difficult to analyse the impact of the Bounds Green LTN on air quality due to a limited amount of data availability since the scheme was introduced. The identification of trends in air quality is recommended over longer periods of time due to the number of external factors that can influence air quality, such as seasonality. Haringey will continue to monitor the air quality across the borough and within all LTN scheme areas.

It is similarly difficult to draw conclusions on bus journey times and crime patterns given the short length of time the scheme has been in place, although data so far does not suggest that the scheme's implementation has had a material long-term impact on key indicators.

The Bounds Green LTN has been in place for approximately ten months at the time of writing this monitoring report but can be broadly seen to be achieving its main objectives of reducing traffic volumes on internal roads which in turn makes them safer, more pleasant, and more attractive for people to walk and cycle. There has been an overall reduction in traffic volumes across the entire scheme area, but it is noted that there have been some increase on boundary roads, namely High Road and Bounds Green Road. The council is continuing to monitor any potential issues at these locations and engaging with residents and businesses throughout the ETO period.

Appendices

Appendix 1: Bounds Green Traffic Count Locations and Type

Haringey-commissioned traffic count sites and type

Site	Latitude	Longitude	Site Type
A105 High Road (@Cranbrook Park/Watsons Road)	51.59859	-0.11076	ATC
A105 High Road (@Sidney Road/Woodside Road)	51.60547	-0.11179	ATC
A109 Bounds Green Road (@Gordon Road/Passmore Gardens)	51.60827	-0.1269	ATC
A109 Bounds Green Road (@Truro Road/Nightingale Road)	51.60316	-0.12077	ATC
Albert Road	51.60134	-0.1313	ATC
Alexandra Park Road	51.59874	-0.13122	ATC
B106 Brownlow Road	51.60983	-0.12283	ATC
B106 Durnsford Road	51.6051	-0.12714	ATC
Blake Road	51.60714	-0.13186	ATC
Cline Road	51.61011	-0.13246	ATC
Commerce Road	51.60218	-0.11344	ATC
Crescent Road	51.60141	-0.12635	ATC
Gordon Road	51.60768	-0.12627	ATC
Goring Road	51.60899	-0.12074	ATC
Maidstone Road	51.61043	-0.12897	ATC
Marlborough Road	51.60761	-0.11664	ATC
Maryland Road	51.60731	-0.10809	ATC
Myddleton Road	51.60642	-0.11552	ATC
Nightingale Road	51.60304	-0.11675	ATC
Palace Gates Road	51.5987	-0.12228	ATC
Palmerston Road	51.60445	-0.11557	ATC
Passmore Gardens	51.60808	-0.12831	ATC
Queen's Road	51.60658	-0.12311	ATC
Ring Way	51.6107	-0.13473	ATC

Tottenhall Road	51.61119	-0.10627	ATC
Truro Road	51.60406	-0.11634	ATC
Victoria Road	51.59907	-0.12793	ATC
Warwick Road	51.60961	-0.12629	ATC
White Hart Lane	51.6014	-0.10906	ATC
Whittington Road	51.60758	-0.11874	ATC
Wolves Lane	51.60753	-0.10367	ATC
Woodside Road	51.60532	-0.10816	ATC

TfL permanent traffic sites and coordinates (all ATCs)

Site	**Latitude**	**Longitude**	**Site Type**
A1055 Great Cambridge Road NB	51.609531	-0.085715	Permanent ATC
A1055 Great Cambridge Road SB	51.609111	-0.0854853	Permanent ATC
Bruce Grove	51.597282	-0.0735916	Permanent ATC
Great Cambridge Road NB	51.617411	-0.0864079	Permanent ATC
Great Cambridge Road SB	51.618248	-0.0855269	Permanent ATC
Green Lanes	51.572252	-0.0968812	Permanent ATC
High Road Tottenham	51.579888	-0.0728362	Permanent ATC
NCR Bowes Road	51.612497	-0.1189113	Permanent ATC
NCR Stirling Way EB	51.614228	-0.0778041	Permanent ATC
NCR Stirling Way WB	51.614483	-0.0778925	Permanent ATC
Seven Sisters Road	51.575750	-0.0849741	Permanent ATC
A1055 Great Cambridge Road NB	51.609531	-0.0857153	Permanent ATC

ATCs measure traffic volumes and speeds using two thin tubes that run across the street and are connected to a sensor. When wheels pass over the tubes, the pressure impact is interpreted by the sensor to identify the type of vehicle passing over, and the speed with which it passed. They are considered to be extremely accurate. Inaccuracies can arise when, for example, two vehicles pass at the same time they may be counted as one, or if a car and bicycle pass at the same time, it may be read as one car. However, the same method was used before and after and the method is considered a good industry standard. ATCs have been used as a standard in monitoring transport schemes.

Appendix 2: Traffic Count Normalisation Methodologies

To calculate the normalised percentage differences, the November 2021 traffic count volumes have been divided by 0.9894 and the January 2023 traffic counts by 0.9516 to give normalised volumes. In other words, in order to account for the fact that there was (generally) less traffic on Haringey streets from March 2020 onwards, we have provided adjusted figures that provide an estimate for what the traffic would have been if there had not been disruptions from broad events such as COVID-19 or the cost-of-living crisis. This allows us to analyse the impacts of the LTN scheme rather than the impacts of current events / central government policy.

To calculate the percentage change, the difference between the two has been taken and divided by the normalised baseline volume to arrive at a normalised percentage change.

The normalisation figure for each month is reached by calculating the daily average percentage difference between the 'baseline' month (pre-COVID-19 impact) and the corresponding 'impacted' month (i.e. November 2021 and January 2023) across all the permanent TfL counter sites around Haringey, and taking an average difference for the whole month.

Appendix 3: Air Quality Monitoring

The London Borough of Haringey's air quality strategy has been outlined in the borough's 2019-2024 Air Quality Action Plan. The document introduces a range of actions to improve air quality, such as reducing emissions from developments and buildings, incentivising cleaner transport and greening servicing and freight operations.

Part of the air quality strategy remains to improve the breadth of air quality monitoring in the borough. Haringey has been using diffusion tubes for air quality monitoring since before 2018, and now have 37 long-term monitoring sites, with more being added over time. A further set of diffusion tubes within or on the boundary of LTNs were added specifically to understand the impact of air quality of LTNs, 9 of which were within the bounds of the Bounds Green scheme.

The air quality monitoring sites in the Bounds Green LTN area are listed below, with details about type and if they have been added as part of the Phase 1 LTN programme or were pre-existing.

Bounds Green LTN air quality monitoring sites type and period of installation (all diffusion tubes)

Location	**Postcode**	**Defra Classification**
300a High Rd	N22 8JR	Roadside
5 Brownlow Rd	N11 2ET	Roadside
46, Myddleton Road	N22 8NW	Urban Background
66 Truro Rd	N22 8DN	Urban Background
6 Warwick Rd	N11 2TU	Urban Background
St Martin of Porres Primary School, Bounds Green	N11 2AF	Urban Background
21 Queen's Rd	N11 2QJ	Urban Background
162 Woodfield Way	N11 2NU	Urban Background
83 Durnsford Rd	N11 2EN	Roadside

Data quality control

To ensure data is as accurate as possible, national guidance for monitoring air quality (in terms of both deployment and results analysis), is followed – for example, such guidance requires the use of accredited monitors, personnel and laboratories or correction of diffusion

tube data based on annual comparisons to automatic monitors.

Air quality in Haringey is monitored using diffusion tubes. The existing monitoring stations currently measure the concentration of Nitrogen Oxides (NOx) in the atmosphere.

Overall monitoring for Particulate Matter (PM) across London shows that the current objective values are largely met, therefore, monitoring for PM10 (up to 10µm across) and PM2.5 (up to 2.5µm across) ceased in Haringey in 2014 and 2016 respectively. Monitoring for both started again in May 2021 at our Wood Green monitoring site, locally funded by the borough.

Under Part IV on the Environment Act 1995, local authorities are required to periodically review and assess air quality in their area and identify areas where the air quality objectives are not likely to be met. The air quality objectives are set out for the seven pollutants in the Air Quality (England) Regulations 2000. The objectives are based on the health effects of air pollution. For areas where the air quality objectives are not likely to be achieved, local authorities have to declare Air Quality Management Areas (AQMA) and produce Air Quality Action Plans (AQAP) detailing measures to work towards the achieving the air quality objectives. Following extensive review and assessment of all seven pollutants, Haringey Council declared the whole borough an AQMA for the pollutants of PM10 and NO2 in July 2001.

Haringey, like all authorities with AQMAs, has to produce annual reports for both Defra and the Greater London Authority (GLA) to show trends in air pollution and progress towards achievement of the air quality objectives for the pollutants concern. The most recent status report can be found on the Haringey website by following the link below.

https://www.haringey.gov.uk/sites/haringeygovuk/files/air_quality_annual_status_report_for_2021.pdf

Pollution levels are impacted by a range of local and wider sources, which can have national or even international origins. Therefore, it can be very hard to pick up on local changes caused by schemes such as the LTNs.

Pollution also varies significantly over time due to a range of external factors (such as weather) for which this study has not corrected. Therefore, ideally, a longer period of study would be required to analyse these results more fully. This would also allow further quality control of data that has not been possible with these results. There is also further uncertainty in recent results and whether these will represent longer term trends due to COVID-19. Studies of the first lockdown in March, for example by the Greater London Authority, show a decrease in overall motorised traffic and NO_2 levels but no consistent change in PM due to weather impacts.

Appendix 4: Individual Site Volumes & Speeds

Detail for each monitored site including a breakdown of flows and speeds by monitoring period and by vehicle class is appended as a PowerPoint slide pack.

As noted in the main report, data was processed using SYSTRA's proprietary automated data processing tools, which draw together raw data from all reporting periods and apply formulae-based calculations to produce the charts and tables shown in the following pages and appendices. However, as it is not uncommon for there to be problems with data surveys (broken equipment, cars parked on ATC bands etc.) as well as anomalous readings from surveys resulting from one-off events (waterworks, gas leaks, accidents etc.), all data has been thoroughly checked by hand and "patched" (i.e. blank data or significantly anomalous data has been substituted by more representative data from the site/wave in question), which is a necessary task in order to maintain comparable data.

It is also noted that data for goods vehicles is presented as seven-day averages in the appendix (vs. weekday averages in the report).