
Richmond Park

Movement Trial Analysis

March 2022



Stantec



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PARKS

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	Name	Position	Signature	Date
Prepared by:	Ben House	Apprentice Engineer	BH	March 2022
Reviewed by:	Milena Martinez	Transport Planner	MM	March 2022
Approved by:	Phil Brady	Director of Land Development	PB	March 2022
For and on behalf of Stantec UK Limited				

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1. Introduction

This document has been prepared by Stantec UK Ltd on behalf of The Royal Parks (TRP) to report the findings of the movement trial schemes implemented across five London Parks in August 2020. The study provides a summary of the results of various data collected pre and post implementation of the trial schemes, as well as conclusions drawn from the analysis.

The findings of each of the five parks have been analysed and reported separately across five documents. This report (ref: *RPMA-STN-RP-XX-R-TR-0001-P01*) focuses solely on Richmond Park.

1.1 TRP's Movement Strategy

TRP's Movement Strategy¹ was published in 2020 as a framework to help shape and inform the policies and decisions taken with regard to how park visitors can access, experience and move within the park. The Movement Principles in the Movement Strategy document set out TRP's Vision, as follows:

- *We will protect and conserve our parks' special qualities*
- *Our parks are for people*
- *We will encourage the use of more sustainable ways to access our parks*
- *Our park roads are not intended to be commuter through-routes for motor vehicles*
- *We will achieve more by delivering key projects through partnership and collaboration*
- *We will make evidence-based decisions*
- *We will be proactive in our approach to future transport challenges and opportunities*

In August 2020, TRP launched a series of traffic-related trials across five London parks to reduce the impact of cut-through traffic, improve the park visitor experience and open new spaces for park visitors to enjoy. The five parks included in the movement Trials are:

- Richmond Park;
- Bushy Park;
- St. James's Park;
- Hyde Park; and
- Greenwich Park.

The trials underwent consultation in November 2020. Particularly, Richmond Park received 10,765 responses to the consultation survey, showing:

- 73% of support to Scheme I (Removing all cut through traffic on the eastern side of the park);
- 69% support to Scheme II (Closing the vehicle link between Sheen Gate and Sheen Cross); and
- 73% support to Scheme III (Removing all unauthorised vehicle traffic between Richmond and Roehampton Gates on weekends.

¹ [TheRoyalParks_MovementStrategy.pdf](#)

The trials were initially planned to run until February 2021, however TRP decided to keep the measures in place for the remaining of 2021 with the aim to carry out monitoring and understand the impact of the schemes before determining whether they should be permanent.

The Richmond Park Trial involved restricting vehicle movements along key internal links to reduce cut-through traffic and make the enhance the park for visitors. Further restrictions were implemented on weekends to further improve the park for visitors.

1.2 Study Purpose

This study provides an analysis of a number of monitoring surveys carried out within Richmond Park and traffic data within the local road network. The purpose of this study is bifold:

- i. To understand any changes in the park's movement patterns since the trial was implemented; and
- ii. To understand the impacts of TRP's trial on traffic within the local and strategic road network outside Richmond Park since the trial was implemented.

Based on the above, the results of the study have been presented and discussed for TRP's consideration.

1.3 Assessment Methodology

Study Area

The extent of the study area has been based upon the Common Operational Road Network (CORN) map shown in **Figure 1.1**, which was prepared by TfL for an area within 500m and 1,000m of the park, and agreed between TRP with Local Authorities and TfL as part of the traffic study proposal. Key roads within the CORN map extent were subsequently identified as potential reassignment routes as a result of the trial scheme, these comprise the study area of the analysis presented in this report and are highlighted in **Appendix A**.

Data Sources

To understand the impact of the movement trial within Richmond Park, both on-park and off-park traffic data has been obtained from various sources including The London Borough of Richmond upon Thames (LBRuT), The Royal Borough of Kingston upon Thames (RBKuT) and Transport for London (TfL). The following data was obtained for the Richmond Park study:

Off-Park Traffic Data

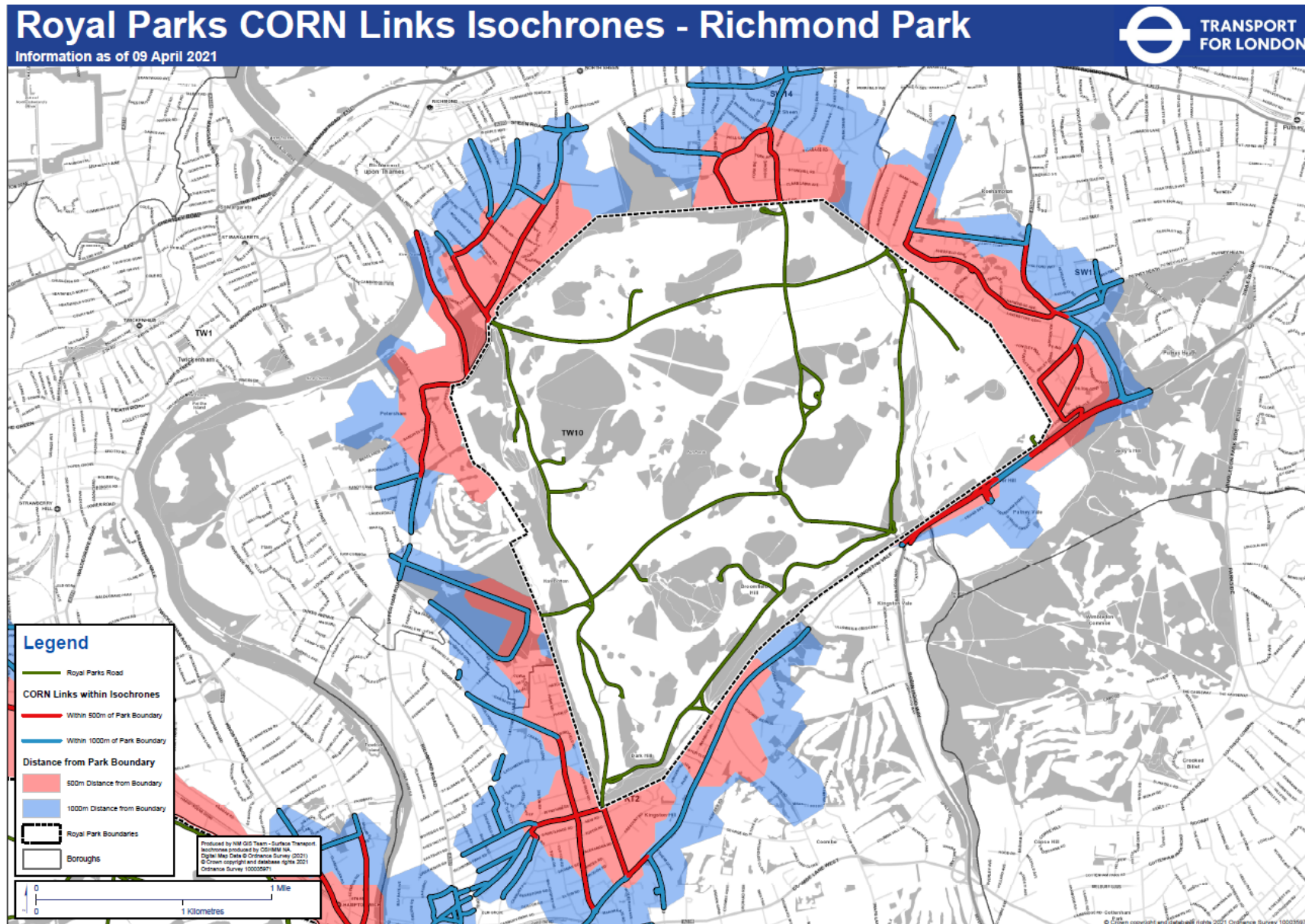
- Vehicle Journey Time data
- Bus Journey Time Data
- Vehicle Volume data

On-Park Traffic Data

- Automatic Traffic Counts (ATC) at Sawyers Hill and Queens Road
- Park Access Gate Manual Classified Turning Counts (MCTC)
- Automatic Number Plate Recognition (ANPR) Survey

From the available traffic data, the impact of the movement Trial within the park has been assessed to understand changes in traffic flows, general traffic journey times along strategic routes and along key bus routes surrounding Richmond Park. Furthermore, the on-park traffic data has been used to understand the movement of traffic between each entrance gate to the park pre and post-Trial.

Figure 1.1: Richmond Park CORN Map



1.4 COVID-19 Impact & General Traffic Trends

In response to COVID-19 pandemic national lockdown restrictions were introduced in late March 2020, which included closure of schools, non-essential shops, working-from-home regulation. As a result of this, traffic volumes dropped to levels not seen since the 1960s.

Passenger capacity on TfL London Buses was significantly reduced to promote social distancing. This significantly reduced capacity and may have encouraged more people to undertake single occupancy vehicle journeys.

After a period of relaxation and reintroduction of the above restrictions during the rest of 2020 and beginning of 2021, it wasn't until May 2021 when most restrictions associated with people's movement were lifted. Since then, TfL have reported that traffic in London is back to +/- 3% of pre-COVID levels, with the exception of central London where traffic is still significantly lower than it was before the pandemic.

On this basis the analysis undertaken in this report seeks to present the recorded traffic flows / journey times in 2020 but has not looked to use this assess the change pre and post-trial. All numerical and percentage change figures presented through this report are based upon change between 2018/2019 and 2021, with 2020 numbers just presented for context.

Recovery of the Highway Network (Text from TfL)

Following discussions with TfL with regard to the scope and methodology of this study, the following text was drafted by TfL on 18th March 2022 for incorporation in this report, with regard to general trends in the strategic road network:

“Prior to understanding the full shape of the London traffic recovery from the pandemic the Royal Parks chose May 2021 as the month to compare traffic changes relative to a pre-pandemic baseline of May 2019. This follows industry practice where May is accepted to be a “neutral” month for the purposes of understanding year-on-year changes in traffic patterns, meaning it is not unduly influenced by seasonal influences such as holiday periods and adverse weather patterns.

*The chart below [see **Figure 1.2**] shows the profile of the traffic flows on the roads TfL manages (TLRN) during the pandemic relative to a baseline of 2019/20. It illustrates the impact of the first 3 lockdowns, 1) 23 March 2020, 2) 5 November 2020, and 3) 5 January 2021, on overall traffic volumes. There was a large recovery in volumes through April 2021 as lockdown restrictions eased enabling the reopening of non-essential business and there was also a notable increase in volumes in mid-May when indoor hospitality re-opened, and at*

this point traffic volumes were still down relative to their 2019 baseline by 5.6%

*However, although overall traffic volumes were still down the associated journey times were showing a slightly different trend due to changes in travel patterns by road users. At the point of return to the network in May 2021, traffic volumes were very much more concentrated in the inter-peak (10:00 to 16:00) and PM peak (16:00 to 19:00), therefore in the vicinity of the largest Royal Park Richmond, for the A205 within Richmond Borough, on weekdays, both directions, the data shows that journey times were 7% up relative to the pre-pandemic baseline [see **Figure 1.3**].*

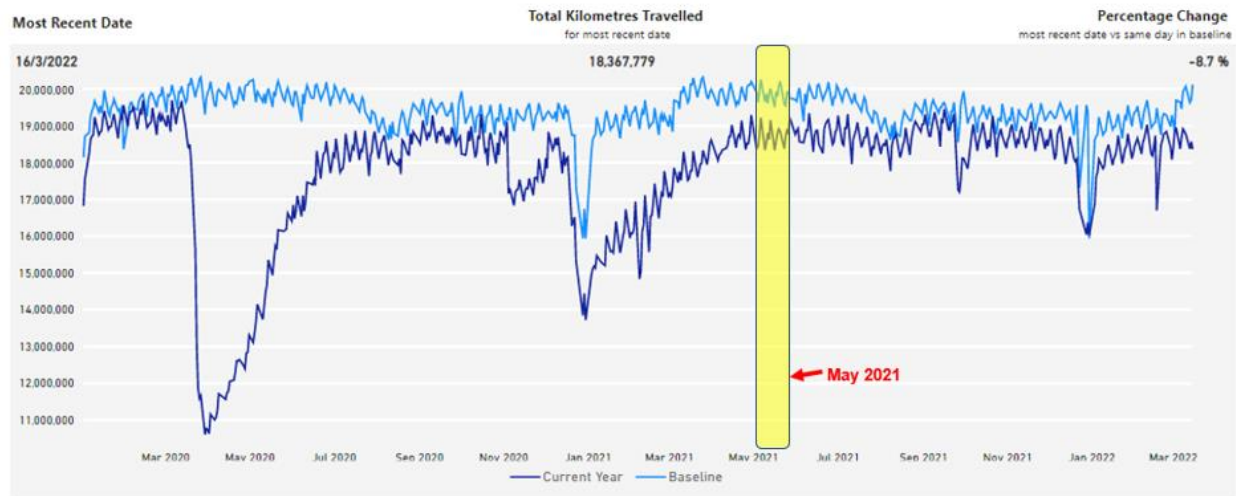
*For comparison, this is the trend for all of the TLRN, weekdays, in both directions, and here [see **Figure 1.4**] we also see in May 2021 an elevated journey time relative to the baseline of 2019.*

On the TLRN, outside of May 2021, through to recent weeks, journey times stayed below the baseline, and this was what we would have expected to see given the relative trends in traffic flow data. Given this insight of journey times in May 2021 showing elevation related the drop in traffic flows, as the network adjusted to the new reality of coming out of lockdown points to the choice of May 2021, not being as representative of movement outside of

pandemic, between lockdowns. This could not have been foreseen. It means that the results in the report should be treated as over-inflating the observed impact of policies, than would otherwise have been the case. If it is possible a good point of comparison to test this assumption would be to revisit the data for May 2022, if that is possible.

Network patterns have changed again outside of the 4th lockdown for Omicron and we are beginning to see elements of normality return to the network, although recent changes arising from increased fuel price rises in March 2022, suggest that traffic flows remain suppressed at about 5% less than baseline, and it may take several months before we can fully determine what the new normal on the road network will become. There is some evidence that traffic flows and their associated journey times will remain below their pre-pandemic level in a time frame of the next year or so.”

Figure 1.2 – Profile of traffic flows



Note: Prior to 7 March 2021 the baseline represented the equivalent date in the previous year. From 7 March 2021 onwards the baseline has been moved to represent the equivalent date in 2019. This will allow comparisons to be made to a pre COVID-19 period. Default view set to 7am - 7pm. To change use the 'Peak' filter.

Figure 1.3 – A205 Journey Time Trends (May 2021 – Baseline 2019)

Long Term Trend

Average **weekday** journey times (min/km) by peak & week, for last 12 months
Average Weekday Journey Times by Week

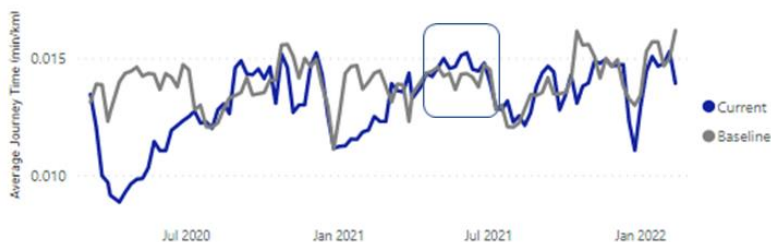
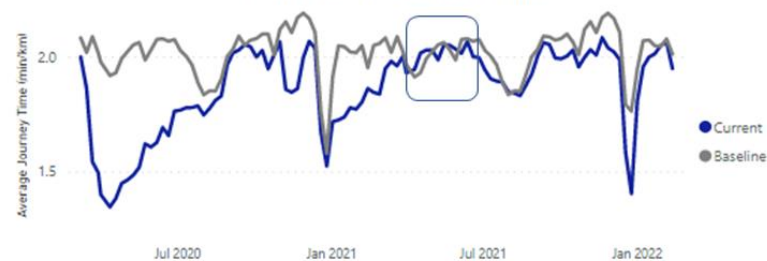


Figure 1.4 – TLRN Journey Time Trends (May 2021 – Baseline 2019)

Long Term Trend

Average **weekday** journey times (min/km) by peak & week, for last 12 months
Average Weekday Journey Times by Week



‘Travel in London’ Report Trends

The latest ‘Travel in London Report (Report 14)²’ which collates data for the period up to November 2021, summarises trends and development relating to travel and transport in London, including disruption caused by the COVID-19 pandemic from March 2020 and London’s early recovery during the latter part of 2021. This report shows the following key trends:

- By November 2021 the demand for public transport overall was around 70 per cent of pre-pandemic levels, while traffic on London’s major roads was typically 95 percent of pre-pandemic levels. This indicates there has been a car-based recovery in transport activity across London.
- Weekend travel has recovered more strongly than weekdays.
- Relative to average overall demand levels, the recovery of the weekday commuter peak is lagging. It is thought that this primarily reflects the persistence, as of late 2021, of flexible working arrangements put in place during the pandemic.

- Active travel mode shares were notably higher during the pandemic. However, this took place in the context of overall reductions to activity, meaning absolute trip making overall by these modes remained close to, or below, pre-pandemic levels through much of 2020.
- By spring of 2021 however, there have been signs that absolute volumes of cyclists have begun to increase in certain parts of London. **Table 1.1** shows that Outer London (of which Richmond is part) has seen a 19.9% increase in cycling volumes relative to pre-pandemic levels.

Table 1.1: Year-on-year change in cycling volume (TfL)

Year	Central London	Inner London	Outer London
2020	-24%	+7.5%	+24.4%
2021 (from 2019)	-16.4%	+4.6%	+19.9%

1.5 Summary of Stakeholder Engagement

Transport for London (TfL)

- Stantec contacted TfL on 15th November 2021 with regard to the scope and methodology of the study, requesting data and feedback.
 - An online meeting between Stantec and TfL was held on 15th November 2021 to agree on the format of data to be provided by TfL and methodology of the study.
 - Further correspondence was exchanged with regard to the data request, and the full set of ATC/ vehicle journey/ bus journey time data was provided on 20th December 2021.
- No concerns were raised by TfL with regard to this trial, however some refinement of data previously provided by TfL was required, and an additional set of updated ATC/ vehicle journey/ bus journey time data was provided on Tuesday 1st March 2022.
- A further meeting took place on Monday 28th February 2022 to discuss and reach an agreement with regard to the methodology

² [travel-in-london-report-14.pdf \(tfl.gov.uk\)](https://tfl.gov.uk/what-its-new/our-projects-and-services/our-projects/transport-trials/2021/11/14-travel-in-london-report-14)

to analyse the revised set of data provided by TfL, presented in TRP's study.

London Borough of Richmond upon Thames (LBRuT)

- TRP engaged with the LA on the 28th May with regard to the monitoring of the trial. Further engagement with LBRuT and TfL took place following this first contact.
- Stantec contacted LBRuT on 25th November 2021 with regard to the scope and methodology of the study, requesting feedback on the proposed approach and data to undertake the analysis
- Correspondence was exchanged with LBRuT transport officer with regard to the extent of the data request, and partial data was provided on 10th December 2021.
- Further discussions were held between LBRuT and Stantec, and the outstanding data was provided on 7th February 2022.
- A meeting between LBRuT/ TRP/ Stantec took place 15th February 2022 to discuss the initial findings of the study, and as an opportunity to raise concerns and questions by LBRuT

- Concerns were raised by LBRuT's transport officer with regard to this trial and other local traffic restrictions i.e. Hammersmith Bridge Closure, East Sheen measures, 20mph borough-wide, traffic signal adjustments in SRN with no previous consultation.

Royal Borough of Kingston upon Thames (RBKuT)

- Stantec contacted RBKuT on 25th November 2021 with regard to the scope and methodology of the study, requesting feedback on the proposed approach and data to undertake the analysis
- Limited data was provided by RBKuT on 15th December 2021.
- Further to this, Stantec have approached RBKuT to request a meeting to discuss the initial findings of the study and raise any questions and/ or concerns, however no response has been received.
- No concerns were raised by RBKuT with regard to this trial.

1.6 Report Structure

This report is set out in the following structure:

- **Section 2:** Richmond Park Trial
- **Section 3:** Off-Park Data Analysis
- **Section 4:** On-Park Data Analysis
- **Section 5:** Accident Analysis
- **Section 6:** Summary of Findings

2. Richmond Park

2.1 Overview

Richmond Park is situated within the London Borough of Richmond upon Thames. It is bounded by residential development to the north, west and south, and Richmond Golf Park to the east. A plan showing the location of the park within its surrounding area and access gates is shown in **Figure 2.1**.

2.2 Accessibility to Park

Richmond Park can be easily accessed by means of public transport services, including railway, London Underground, London Overground and bus services.

The gates shown in **Figure 2.1** provide vehicular, pedestrian and cycle access to the park, with the exception of Robin Hood Gate which is permanently closed to vehicular traffic. Pedestrian gates are open 24 hours except during the deer cull in November and February. During these months, pedestrian gates open at 07:30 and close at 20:00. Until August 2020. Prior to the trial implementation, vehicle gates were open from 07:00 in the summer and 07:30 in the winter, and throughout the day until dusk (variable time) all year round.

Figure 2.1: Richmond Park Site Location Plan



2.3 Richmond Park Movement Trial Scheme

The TRP introduced the following vehicle traffic restrictions at Richmond Park:

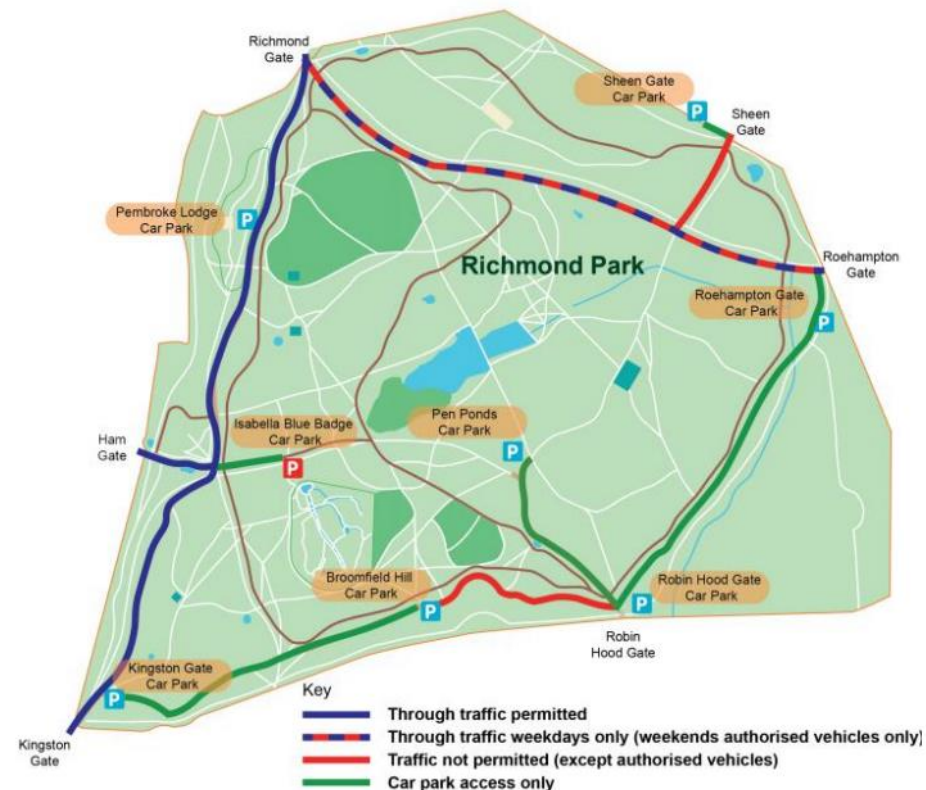
- Restrict all cut-through traffic between Broomfield Hill Car Park and Robin Hood Car Park;
- Close the vehicle link between Sheen Gate and Sheen Cross; and
- On weekends restrict all through-traffic between Roehampton, Sheen and Richmond Gates.

A plan showing the Richmond Park Trial Scheme is presented in **Figure 2.2** with further details of the Trial scheme outlined in the Royal Parks Movement Strategy document³.

The start date of the Trial was the 15th August 2020 and initially planned be in place for 6-months however in February 2021 an extension to the trial was agreed as a result of the COVID-19 pandemic. On this basis the Trial scheme is still in place at the time of publishing this report.

TRP's intention is to make the restrictions of the Trial at Richmond Park a permanent feature subject to the findings and recommendations presented in this report. Changes to the scheme may be implemented based upon the conclusions presented.

Figure 2.2: Richmond Park Trial Scheme Plan



³https://www.royalparks.org.uk/_data/assets/pdf_file/0007/118942/MovementFactSheet_Richmond.pdf

2.4 Other Local Schemes

In addition to the Richmond Park Trial scheme, other local schemes have been introduced in the area around the park, some of these have been subject to review as part of the Cabinet Report⁴ prepared by LBRuT in February 2021. This report concluded that further data analysis was required in order to provide recommendations.

Local schemes that may have had an impact on local traffic are illustrated in **Figure 2.3** and outlined below:

- **East Sheen Experimental TRO:** Following complaints regarding rat-running vehicles using Palmerston Road, the London Borough of Richmond upon Thames (LBRuT) introduced several experimental traffic restrictions in East Sheen (Parkside area) in October 2018. These were removed in January 2020 following complaints from residents regarding increased traffic levels.
- **Hammersmith Bridge Closure:** In April 2019, the London Borough of Hammersmith and Fulham (LBH&F) announced the indefinite closure of Hammersmith Bridge to vehicular traffic. A cabinet report prepared by the LBRuT suggested that this closure caused a significant increase in local traffic levels, and in May 2019 additional experimental traffic measures were introduced to reduce the amount of rat-running traffic using Coval Road and Temple Sheen Road.
- **20mph Borough-wide:** following consultation by LBRuT in 2018, a borough-wide 20mph speed limit scheme was passed by the Council's Cabinet in March 2019. These included all roads within LBRuT with the exception of TfL Red Routes, which were excluded from the scheme.
- **Ultra Low Emission Zone (ULEZ):** The ULEZ was introduced in April 2019, as part of London's Mayor plan to purify the air after broad evidence of dangerous levels of air pollution in London. Vehicles need to meet the ULEZ emission standards set by TfL, or pay a daily charge to drive inside the zone. Whilst the ULEZ covered the area of the Congestion Charge Zone initially, this was expanded to its North and South Circular Roads (see **Figure 2.3**) in October 2021.

⁴ [LONDON BOROUGH OF RICHMOND UPON THAMES](#)

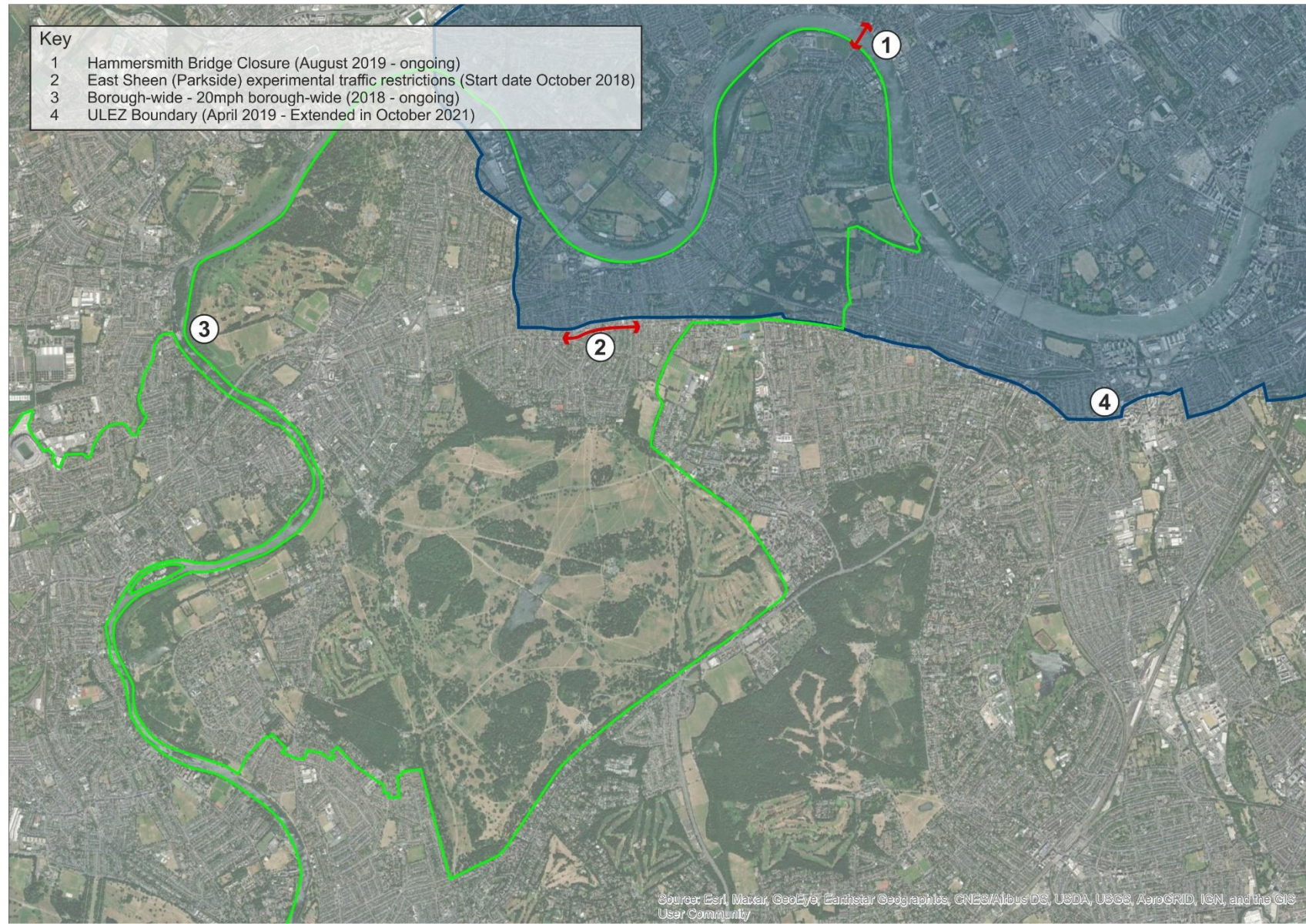
2.5 Summary of Local Schemes

It is expected that together with the trial scheme at Richmond Park, other local schemes and the COVID-19 pandemic may have impacted traffic in and around Richmond Park is outlined in **Table 2.1**.

Table 2.1: Summary of Other Local Schemes

Scheme Name	Roads affected
East Sheen Experimental TRO	<ul style="list-style-type: none"> • East Sheen area local roads (pre-Jan. 2020)
Hammersmith Bridge Closure	<ul style="list-style-type: none"> • A205 Clifford Ave • A205 Upper Richmond Rd • Roehampton Lane
20mph borough wide	<ul style="list-style-type: none"> • All roads – effects on journey times
ULEZ Extension	<ul style="list-style-type: none"> • A205 Clifford Ave • A205 Upper Richmond Rd

Figure 2.3: Other Local Schemes Plan



3. Off-Park Data Analysis

3.1 Overview

To assess the impact of the scheme on the surrounding road network to Richmond Park, off-park data was obtained from TfL, LBRuT and RBKuT which included the following data types:

- Vehicle Journey Time Data.
- Bus Journey Time Data.
- Vehicle Volume Data.

The analysis undertaken seeks to assess the change in journey time or volume at key highway links pre and post implementation of the Movement Trial within the park. It should be read in the context of the traffic environment (see Section 1.4) and other local schemes (see Section 2.4).

Effects of Hammersmith Bridge Closure

Before the closure of Hammersmith Bridge to traffic on 13th August 2019, the bridge used to carry in the region of 22,000 vehicles on an

average day (DfT Road Traffic Statistics⁵). It is expected that, as a result of this closure, traffic that used to travel via the bridge has reassigned onto the local highway network, including roads around Richmond Park which connect with the bridge e.g. Roehampton Lane, Upper Richmond Road.

3.2 Methodology

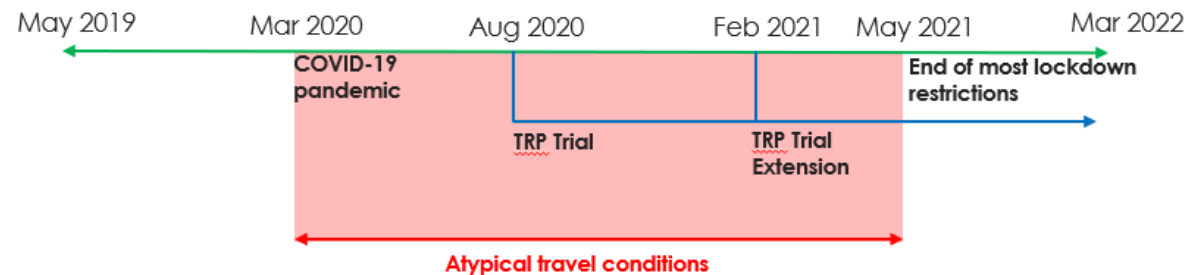
The off-park data analysed in this report uses May 2019 as the ‘Pre-Trial Year’ and May 2021 as the ‘Post-Trial Year’. May has been selected as the assessment month as it generally considered to be a neutral month with respect to commuter traffic. Furthermore, as shown in **Figure 3.1** due to the COVID-19 Pandemic, data between March 2020 and April 2021 could not be used due to atypical travel conditions were present associated with travel restrictions.

In May 2021, the UK Government announced the easing of most lockdown restrictions, therefore operation of the road network is likely to more representative of pre-pandemic travel behaviour.

Analysis of August data has also been undertaken alongside May as August is one of the peak periods for visitors to the Royal Parks, however it should be noted that travel patterns may not be as representative of typical travel conditions due to school summer holidays and associated lower levels of daily commuters. Where relevant, brief commentary of the August results have been provided within this report with supplementary detailed analysis provided in the appendices.

For the off-park datasets, analysis has been undertaken for both Weekday and Weekend periods. The analysis of the Weekday includes

Figure 3.1: Timeline of Travel Conditions



⁵ [Road traffic statistics - Manual count point: 8472 \(dft.gov.uk\)](https://www.dft.gov.uk/road-traffic-statistics)

the data recorded for Tuesday, Wednesday and Thursday and excludes data for Monday and Friday as Tuesday through Thursday are considered to be more representative of a 'neutral' weekday whereas Monday and Friday often exhibit different travel behaviour especially for AM and PM commuter traffic. . This is in line with guidance prescribed by the Department for Transport on paragraphs 3.3.6 and 3.3.7 of TAG Unit M1.2⁶. The Weekend analysis has been undertaken for both Saturday and Sunday with the results for each presented separately.

For the Weekday data an AM, PM and Daily period have been assessed, and for the Weekend data an Inter Peak (IP) and Daily period. Each time period covers the following hours:

- **AM:** 07:00-10:00 (3 hours)
- **IP:** 10:00-16:00 (6 hours)
- **PM:** 16:00-19:00 (3 hours)
- **Daily:** 07:00-19:00 (12 hours)

Analysis of the AM, IP and PM time periods are provided in the following formats:

⁶ [TAG Unit M1.2 - Data Sources and Surveys \(publishing.service.gov.uk\)](https://www.gov.uk/publishing.service.gov.uk)

Vehicle and Bus Journey time

1. Hourly average of the journey time provided in seconds per kilometre (secs/km).
2. Hourly average of the journey time provided in seconds across the whole route (secs/route).
3. Percentage change (%).

Vehicle Volume

1. Change in number of vehicles (no. of vehicles)
2. Percentage change (%).

The analysis of the vehicle and bus journey time data provides an hourly average across the total 12 hour time period for the Daily time period. For the vehicle volume data however, the Daily time period is rather a total traffic flow across the 12 hour period to give an understanding of the total number of vehicles throughout the day.

The percentage change between 2019 and 2021 recorded for each of the datasets has been assigned a classification of impact to highlight where changes have occurred. The following scale has been applied:

- Decrease – **Green**
- 0% to 15% – **Light Blue**
- 15% to 30% – **Medium Blue**
- Greater than 30% – **Dark Blue**

Within the report, comparison summary tables with the percentage change between the Pre and Post-Trial year is provided as well as summary of the key findings of the results.

Further analysis tables which include the recorded raw journey times (secs/km and secs/route), and vehicle flow (no. of vehicles) are provided the following appendices:

- **Appendix A:** *Reassignment Routes identified from CORN Map*
- **Appendix B:** *Detailed vehicle Journey Time Analysis (May)*
- **Appendix C:** *Detailed vehicle Journey Time Analysis (August)*
- **Appendix D:** *Detailed Bus Journey Time Analysis (May)*

- **Appendix E:** *Detailed Bus Journey Time Analysis (August)*
- **Appendix F:** *Detailed Vehicle Volume Analysis (May)*
- **Appendix G:** *Detailed Vehicle Volume Analysis (August)*
- **Appendix H:** *Detailed Vehicle Volume Analysis (LBRuT and RBKuT Data)*

Within the further analysis, data from 2020 is also provided (where available) for context but has not been used in the analysis due to significant changes in travel behaviours due to the COVID-19 Pandemic.

3.3 Vehicle Journey Time Data

Overview

The impact of the Richmond Park Movement Trial on journey times for general traffic surrounding the park has been assessed using vehicle journey time data obtained from TfL. It should be read in the context of the traffic environment (see Section 1.4) and other local schemes (see Section 2.4).

The vehicle journey time data is extracted from TfL's INRIX database; this combines an anonymous, real-time GPS probe data from over 60 different providers. This data is then assigned to TfL's Common Operational Road Network (CORN). This network comprises of small road links which usually run between intersections.

TfL have provided journey time data for their CORN for links within a 1km radius of the Richmond Park.

Methodology

Ten journey time routes have been identified from the available data of which each route is made up of multiple links within the CORN. These include four primary routes which cover the perimeter of the park, and six additional secondary routes which include highway links that provide connection from park gates to the strategic road network.

A map illustrating the location of each of the ten vehicle journey time routes included in this assessment is shown in **Figure 3.2**.

For each of the ten routes assessed, the average vehicular journey time in seconds per kilometre (secs/km), seconds across the whole route (secs/route) and percentage change (%) has been calculated by direction and time period.

Analysis of the vehicle journey times for the month of May is presented within this section with the associated comparison tables and a summary of the findings. Detailed analysis tables including journey time data for the full length of each link, are presented in **Appendix B**.

A high level summary of the August results are also provided within this section with the detailed comparison tables presented in **Appendix C**.

Figure 3.2: Vehicle Journey Time Routes Study Area

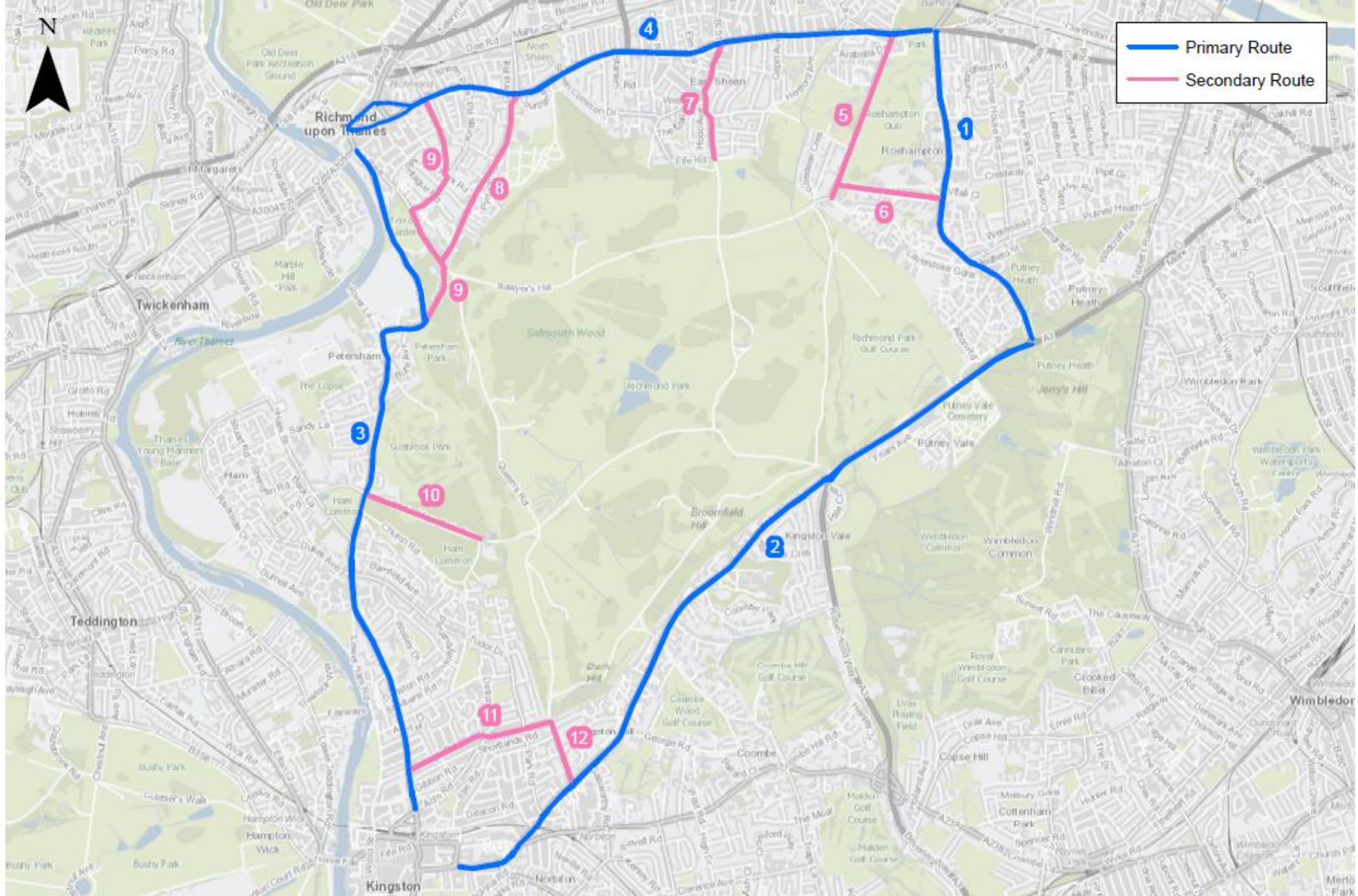


Table 3.1: Vehicle Journey Time 2019 to 2021 Comparison Summary (May Weekday)

Vehicle Journey Time Summary - May Weekday (Average Hour)									
Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Hour AM (07:00-10:00)		Average Hour PM (16:00-19:00)		Average Hour Daily (07:00-19:00)	
				2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)
1	Roehampton Lane	2.6	EB	193	11%	163	-5%	171	2%
		2.6	WB	148	0%	157	-1%	152	0%
2	A308 / A3	5.9	NB	128	0%	129	-1%	124	0%
		5.9	SB	133	-2%	136	14%	130	6%
3	A307	5.4	NB	154	-3%	142	2%	144	6%
		5.4	SB	129	3%	132	0%	136	0%
4	Upper Richmond Road West	4.5	EB	226	17%	234	3%	223	8%
		4.5	WB	272	-18%	305	-8%	270	-12%
5	Priory Lane	1.3	NB	153	-1%	182	-8%	159	-3%
		1.3	SB	130	12%	123	4%	122	8%
6	Clarence Lane	0.8	EB	238	-13%	362	-38%	277	-28%
		0.8	WB	171	-7%	146	1%	152	-5%
7	Sheen Lane	0.9	NB	152	-2%	165	-4%	158	-3%
		0.9	SB	148	-2%	152	-1%	149	-1%
8	Queens Road (Richmond)	1.4	NB	137	1%	137	4%	540	0%
		1.4	SB	125	10%	119	6%	120	7%
9	Richmond Hill / Friars Stile Road	1.9	EB	141	1%	142	1%	139	1%
		1.9	WB	144	8%	142	0%	140	3%
10	Ham Gate Avenue	0.9	NB	106	-1%	105	-1%	105	-1%
		0.9	SB	106	-6%	106	0%	105	-2%
11	Richmond Park Road / Acre Road	1.1	NB	203	-3%	190	-1%	191	-2%
		1.1	SB	222	-13%	201	-10%	211	-8%
12	Queens Road (Kingston)	0.5	NB	138	4%	131	2%	133	2%
		0.5	SB	149	1%	166	1%	156	1%

Summary of Results – May Weekday

Table 3.1 provides the May 2019 (pre-trial) to May 2021 (post-trial) vehicle journey time comparisons during the weekday. The table presents the recorded journey time of the route in 2019 (secs/km) and the percentage (%) change to 2021. A summary of the recorded results is provided below.

Weekday AM

- Majority of routes recorded a reduction in journey time with an average change of $\pm 0\%$ across all routes with a range of between -18% to +17%.
- Largest decreases recorded along the following routes:
 - Upper Richmond Road West WB [4] -48 secs/km (-214 secs/route, -18%).
 - Clarence Lane NB [6] -30 secs/km (-24 secs/route, -18%).
- No significant increases recorded. Largest increase was recorded along Upper Richmond Road West EB [4] which recorded an increase of +39 secs/km (+178 secs/route, +17%). All other recorded increases were no greater than +12%.

Weekday PM

- Majority of routes recorded a reduction in journey time with an average change of -2% across all routes with a range of between -38% to +14%.
- Largest decrease was recorded along Clarence Lane EB [6] of -139 secs/km (-110 secs/route, -38%).
- No significant increases recorded. Largest increase was recorded along A308 / A3 SB [2] which recorded an increase of +19 secs/km (+114 secs/route, +14%). All other recorded increases were no greater than +6%.

Weekday Daily (Average Hour)

- Majority of routes recorded a reduction in journey time with an average change of -3% across all routes with a range of between -28% to +8%.
- Largest decreases recorded along the following routes:
 - Clarence Lane EB [6] of -78 secs/km (-62 secs/route, -28%).
 - Upper Richmond Road West WB [4] -32 secs/km (-143 secs/route, -12%).

- No significant increases recorded. Largest increase was recorded along the following routes:
 - Upper Richmond Road West EB [4] of +17 secs/km (+78 secs/route, +8%).
 - Priory Lane SB [5] of +10 secs/km (+13 secs/route, +8%).
- All other recorded increases were no greater than +7%.

Summary Statement

The majority of the links recorded decreases in vehicle journey times during the weekday time periods with no significant increases recorded.

The largest increase recorded was in the AM along Upper Richmond Road West (eastbound) of +39 secs/km which equates to +17%. All other increases recorded were no greater than 14% with the average change not exceeding $\pm 0\%$.

Table 3.2: Vehicle Journey Time 2019 to 2021 Comparison
Summary (May Weekend)

Vehicle Journey Time Summary - May Weekend (Average Hour)											
Journey Time Route No.	Location	Distance of Route (km)	Direction	Saturday				Sunday			
				Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)		Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)	
				2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)
1	Roehampton Lane	2.6	EB	138	1%	129	-1%	125	-1%	119	-2%
		2.6	WB	131	-2%	125	-1%	121	-2%	116	-1%
2	A308 / A3	5.9	NB	115	1%	109	2%	110	0%	103	1%
		5.9	SB	130	8%	116	3%	113	6%	105	2%
3	A307	5.4	NB	141	-1%	384	3%	127	-1%	348	2%
		5.4	SB	129	-1%	358	2%	118	1%	339	1%
4	Upper Richmond Road West	4.5	EB	220	9%	193	5%	185	7%	164	5%
		4.5	WB	290	-4%	211	0%	207	-3%	169	-1%
5	Priory Lane	1.3	NB	134	23%	385	5%	143	12%	376	8%
		1.3	SB	110	6%	319	8%	114	16%	332	5%
6	Clarence Lane	0.8	EB	185	-15%	157	-11%	163	-3%	152	-5%
		0.8	WB	133	-15%	117	-10%	137	-5%	120	-8%
7	Sheen Lane	0.9	NB	161	-3%	150	-2%	150	0%	145	-1%
		0.9	SB	150	0%	143	-1%	145	1%	141	0%
8	Queens Road (Richmond)	1.4	NB	115	5%	473	2%	109	0%	447	1%
		1.4	SB	114	3%	109	2%	115	2%	107	2%
9	Richmond Hill / Friars Stile Road	1.9	EB	140	-1%	134	0%	146	0%	140	0%
		1.9	WB	141	1%	133	1%	146	0%	136	1%
10	Ham Gate Avenue	0.9	NB	105	-1%	101	0%	112	0%	106	0%
		0.9	SB	106	0%	104	0%	110	0%	109	-1%
11	Richmond Park Road / Acre Road	1.1	NB	191	6%	218	10%	214	10%	181	47%
		1.1	SB	194	21%	190	29%	185	11%	212	1%
12	Queens Road (Kingston)	0.5	NB	129	-1%	121	-1%	128	-1%	122	0%
		0.5	SB	155	0%	147	0%	154	2%	146	2%

Summary of Results - May Weekend

Table 3.2 provides the May 2019 (pre-trial) to May 2021 (post-trial) vehicle journey time comparisons during the weekend. A summary of recorded results is provided below.

Saturday & Sunday IP

- Majority of routes recorded a decrease or small levels of increase in vehicle journey time with an average change of +2% on both a Saturday and Sunday. The level of change across the two weekend days ranges between -15% to +23%.
- Largest decrease was recorded on a Saturday along Clarence Lane [6] -28 sec/km (-22 secs/route, -15%) in the EB, and -20 secs/km (-16 secs/route, -15%) in the WB. All other recorded decreases across the weekend ranged between -1% to -5%.
- Largest increase was recorded along the following routes:
 - Priory Lane NB [5] +31 secs/km (+40 secs/route, +23%) on a Saturday.
 - Richmond Park Road / Acre Road SB [11] of +41 secs/km (+46 secs/route, +21%) on a Saturday.

- Priory Lane SB [5] of +19 seconds/km (+24 secs/route, +16%) on a Sunday.
- All other recorded increases were no greater than +12%.

Saturday & Sunday Daily (Average Hour)

- Majority of routes recorded a decrease or small levels of increase in vehicle journey time with an average change of +2% and +3% on a Saturday and Sunday respectively. The level of change across the two weekend days ranges between -11% to +47%.
- Largest decrease was recorded on a Saturday along Clarence Lane [6] -18 secs/km (-14 secs/route, -11%) in the EB, and -12 secs/km (-9 secs/ route, -10%) in the WB. All other recorded decreases across the weekend ranged between -1% to -8%.

- Largest increase was recorded along the following routes:
 - Richmond Park Road / Acre Road SB [11] +55 secs/km (+61 secs/route, +29%) on a Saturday, and +84 secs/km (+95 secs/route, +47%) on a Sunday.
- All other recorded increases were no greater than +10%.

Summary Statement

The majority of the links recorded either a decrease or small increases in vehicle journey times during the weekend time periods with the exception of localised larger increases on Priory Lane and Richmond Park Road / Acre Road.

The largest increase was recorded along Richmond Park Road / Acre Road (southbound) of +84 secs/km which equates to +47%.

Summary of Results – August

A high-level summary of August 2019 (pre-trial) to August 2021 (post-trial) vehicle journey time comparisons for both the weekday and weekend is provided below.

Weekday

- Majority of routes recorded either a decrease or small level of increase in journey time across all three periods (AM, PM & Daily). The average change and range for each time period is as follows:
 - AM recorded an average change of $\pm 0\%$ and range of between -12% to +8%.
 - PM recorded an average change of +3% and range of between -7% to +54%.
 - Daily recorded an average change of +3% and range of between -10% to +32%.

- Largest decreases recorded along the following routes in the following time periods:
 - A308 / A3 SB [2] -16 secs/km (-97 secs/route, -12%) in the AM, and -15 secs/km (-87 secs/route, -10%) in the Daily.
 - A307 NB [2] -48 secs/km (-260 secs/route, -10%) in the Daily.
- Largest increases was recorded along the following routes:
 - Priory Lane SB [5] +75 secs/km (+97 secs/route, +54%) in the PM, and +94 secs/km (+121 secs/route, +23%) in the Daily.
 - Clarence Lane EB [6] +58 secs/km (+46 secs/route, +32%) in the Daily.
- All other recorded increases were no greater than +14%.

Saturday & Sunday

- Majority of routes recorded either a decrease or small level of increase in journey time across the weekend. The average change for each time period is as follows:
 - Saturday IP recorded +4%.
 - Sunday IP recorded +4%.
 - Saturday Daily recorded +5%.
 - Sunday Daily recorded +6%.
- Largest decreases across the weekend were recorded on a Saturday in the IP along the following routes:
 - A308 / A3 SB [2] -18 secs/km (+105 secs/route, -12%).
 - Richmond Park Road / Acre Road [2] -22 secs/km (+24 secs/route, -12%).

- Largest increases was recorded along the following routes on Saturday:
 - Clarence Lane EB [6] recorded:
 - +131 secs/km (+103 secs/route, +67%) in the IP.
 - +116 seconds/km (+91 secs/ route, +66%) in the Daily.
 - Richmond Park Road / Acre Road [11] recorded:
 - +60 secs/km (+67 secs/route, +36%) SB in the IP.
 - +59 secs/km (+67 secs/route, +38%) NB in the Daily.
 - +38 secs/km (+43 secs/route, +24%) SB in the Daily.
 - All other recorded increases on a Saturday were no greater than +10%.
- Largest increases was recorded along the following routes on Sunday:
 - Clarence Lane EB [6] recorded:
 - +50 secs/km (+40 secs/route, +32%) in the IP.
 - +75 secs/km (+59 secs/ route, +49%) in the Daily.
 - Richmond Park Road / Acre Road [11] recorded:
 - +54 secs/km (+60 secs/route, +33%) NB in the IP.
 - +77 secs/km (+87 secs/route, +43%) NB in the Daily.
 - +55 secs/km (+62 secs/route, +38%) SB in the Daily .
 - All other recorded increases on a Sunday were no greater than +13%.

Summary Statement

The majority of the links recorded either a decrease or small increases in vehicle journey times during both the weekday weekend. The average increase in journey time across all routes did not exceed +6% which was recorded on a Sunday.

Localised larger increases were recorded along Clarence Lane and Richmond Park Road / Acre Road with increases ranging between +33% to 67% recorded.

3.4 Bus Journey Time Data

Overview

The impact of the Richmond Park Movement Trial on journey times for general traffic surrounding the park has been assessed using bus journey time data obtained from TfL. It should be read in the context of the traffic environment (see Section 1.4) and other local schemes (see Section 2.4).

The bus journey time data captures the 'travel time' and 'dwell time' of bus services from one bus stop to another along a specified bus route.

TfL provided data for bus services included on their CORN within 1km radius of Richmond Park.

Methodology

Seven bus services were identified which routes pass via the perimeter road network of the park. From these selected bus services, a small section of the bus route has been analysed which is made up of multiple 'bus stop to bus stop' links.

A map illustrating the location and length of the seven bus services used in this assessment is shown in **Figure 3.3**.

For the purpose of this assessment, all analysis undertaken accounts for travel time only and does not include the dwell time. This decision was made as there are a number of external factors that can affect the dwell time of buses which are likely to be unrelated to the Richmond Park movement trial.

For example, although lockdown restrictions were not in place in May/August 2021, due to the contagious nature of the virus, the levels of public transport usage recorded in 2021 are lower than pre-COVID times. The changes in bus patronage effects the dwell time due to the time taken to board the bus at each stop.

For each link, the average bus travel time in seconds per kilometre (secs/km) has been calculated for the section of each bus service shown in **Figure 3.3** by direction and for each time period.

Analysis of the bus journey times for the month of May is within this section with the associated comparison tables and a summary of the findings. Detailed analysis tables with for the May assessment including journey times for the full length of each bus route analysed, are presented in **Appendix D**.

A high-level summary of the August results are also provided within this section with the detailed comparison tables presented in **Appendix E**.

Figure 3.3: Richmond Park Bus Services Study Area

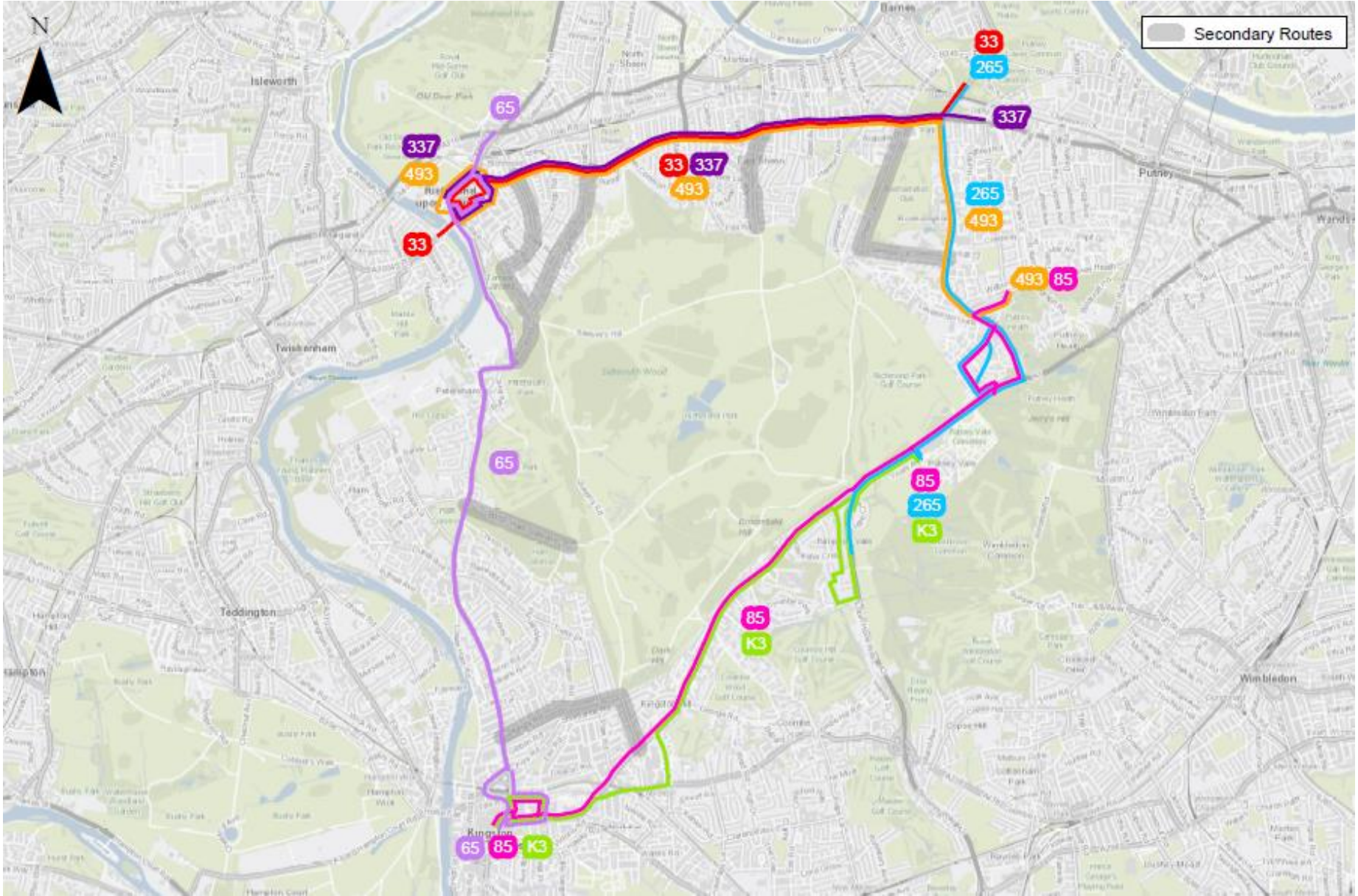


Table 3.3: Bus Journey Time 2019 to 2021 Comparison
Summary (May Weekday)

Bus Journey Time Summary - May Weekday (Average Hour)												Associated VJTR
Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Hour AM (07:00-10:00)		Average Hour PM (16:00-19:00)		Average Hour Daily (07:00-19:00)			
					2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)		
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	250	15%	279	-1%	251	5%	4	
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	346	-32%	525	-34%	386	-28%		
65	Eden Street	Richmond George Street	6.6	NB	228	-9%	233	-6%	220	-6%	3	
	Richmond George Street	Eden Street	6.6	SB	179	-10%	185	-17%	180	-14%		
85	Clarence St	Medfield Street	8.0	NEB	174	-1%	174	0%	171	0%	2	
	Medfield Street	Clarence St	6.4	SWB	183	-16%	189	-3%	181	-11%		
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	176	2%	165	0%	167	1%	1 & 2	
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	180	-1%	195	-2%	182	-1%		
337	Wakefield Road	Roehampton Lane	4.6	EB	250	19%	271	3%	249	9%	4	
	Roehampton Lane	Wakefield Road	4.5	WB	325	-31%	510	-41%	368	-32%		
493	Richmond George Street	Medfield Street	5.0	EB	246	4%	270	2%	247	3%	1 & 4	
	Medfield Street	Richmond George Street	6.1	WB	312	-25%	440	-36%	336	-26%		
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	146	0%	140	5%	142	2%	2	
	Asda Roehampton	Richmond Town Centre	6.2	SWB	159	1%	150	4%	152	2%		

Summary of Results – May Weekday

Table 3.3 provides the May 2019 (pre-trial) to May 2021 (post-trial) bus journey time comparisons during the weekday. The table presents the recorded journey time of the route in 2019 (secs/km) and the percentage (%) change to 2021. A summary of the recorded results is provided below.

Weekday AM

- Majority of bus services recorded a decrease in journey time with an average change of -3% across all services with a range of between -19% to +15%.
- Largest decreases were recorded along the following services:
 - Bus Service **33** WB -110 secs/km (-603 secs/route, -32%).
 - Bus Service **337** WB -100 secs/km (-449 secs/route, -31%),
 - Bus Service **493** WB -77 secs/km (-471 secs/route, -25%).

- Largest decreases were recorded along the following services:
 - Bus Service **33** EB +38 secs/km (+204 secs/route, +15%).
 - Bus Service **337** EB +48 seconds/km (+224 secs/route, +19%).
- Bus Services **33** and **337** run along Upper Richmond Avenue and has an associated vehicle journey time **Route 4**, along the northern corridor of Richmond Park.
 - The changes in both vehicle and bus journey times along this link recorded increases of circa 15% to 20%.

Weekday PM

- Majority of bus services recorded a decrease in journey time with an average change of -7% across all services with a range of between -36% to +5%.
- Largest decreases were recorded along the following services:
 - Bus Service **33** WB -179 seconds/km (-978 secs/route, -34%),
 - Bus Service **337** WB -207 seconds/km (-933 secs/route, -41%),
 - Bus Service **493** WB and -158 seconds/km (-963 secs/route, -36%)
- No significant increases in bus journey times were recorded with the largest increase of just +5%.

Weekday Daily (Average Hour)

- Majority of bus services recorded a decrease in journey time with an average change of -4% across all services with a range of between -32% to +9%.
- Largest decreases were recorded along the following services:
 - Bus Service **33** WB -110 secs/km (-601 secs/route, -28%).
 - Bus Service **337** WB -116 secs/km (-523 secs/route, -32%),
 - Bus Service **493** WB -89 secs/km (-542 secs/route, -25%).
- No significant increases in bus journey times were recorded with the largest increase of just +9%.

Summary Statement

The majority of the bus services recorded decreases in journey times during the weekday time periods. The AM recorded localised larger increases in journey times of circa +15% along Bus Services 33 and 337 (both run along the northern corridor of Richmond Park).

Table 3.4: Bus Journey Time 2019 to 2021 Comparison
Summary (May Weekend)

Bus Journey Time Summary - May Weekend (Average Hour)													
Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Saturday				Sunday				Associated VJTR
					Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)		Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)		
					2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)	2019 (secs/km)	Change to 2021 (%)	
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	243	13%	211	9%	203	14%	186	9%	4
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	370	-19%	264	-10%	240	-5%	201	-5%	
65	Eden Street	Richmond George Street	6.6	NB	226	-7%	198	-6%	193	-1%	176	-2%	3
	Richmond George Street	Eden Street	6.6	SB	192	-19%	173	-17%	169	-12%	155	-14%	
85	Clarence St	Medfield Street	8.0	NEB	164	-4%	155	-3%	157	-2%	150	-2%	2
	Medfield Street	Clarence St	6.4	SWB	187	-13%	166	-17%	161	-11%	151	-15%	
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	156	-3%	150	-4%	151	0%	142	0%	1 & 2
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	169	-3%	159	-3%	158	-2%	150	-2%	
337	Wakefield Road	Roehampton Lane	4.6	EB	250	15%	217	10%	214	15%	194	12%	4
	Roehampton Lane	Wakefield Road	4.5	WB	355	-18%	241	-7%	226	-6%	187	-2%	
493	Richmond George Street	Medfield Street	5.0	EB	231	9%	205	5%	202	10%	185	8%	1 & 4
	Medfield Street	Richmond George Street	6.1	WB	324	-18%	228	-7%	215	-3%	180	0%	
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	140	-10%	131	-5%	129	-2%	121	-2%	2
	Asda Roehampton	Richmond Town Centre	6.2	SWB	155	-6%	141	-3%	136	7%	133	1%	

Summary of Results – May Weekend

Table 3.4 provides the May 2019 (pre-trial) to May 2021 (post-trial) bus journey time comparisons during the weekend. A summary of the recorded results is provided below.

Saturday & Sunday IP

- Majority of services recorded either a reduction or small level of increase with an average change across all routes of -3% on a Saturday and +3% on a Sunday.
- Largest decreases were predominantly recorded on a Saturday IP at the following services:
 - Bus Service **33** WB -69 secs/km (-378 secs/route, -19%).
 - Bus Service **337** WB -65 secs/km (-293 secs/route, -18%).
 - Bus Service **493** WB -57 secs/km (-348 secs/route, -18%).
- No large decreases were recorded on a Sunday IP with the largest decrease at Bus Service **337** WB of 6%.

Largest increases recorded on both a Saturday and Sunday does not exceed +15% increase in journey time. These were recorded along Bus Service **337** EB and recorded the following levels of increase:

- +37 secs/km (+170 secs/route, +15%) on a Saturday IP.
- +31 secs/km (+145 secs/route, +15%) on a Sunday IP.
- Bus Services **337** runs along Upper Richmond Avenue and has an associated vehicle journey time **Route 4**, along the northern corridor of Richmond Park.
 - The changes in the EB direction to both vehicle and bus journey times along this link recorded increases ranging from circa +7% to +15%.

Saturday & Sunday Daily (Average Hour)

- Majority of services recorded a reduction in journey time with an average change across all routes of -2% on a Saturday and +1% on a Sunday.
- No large decreases were recorded across the weekend with the largest decrease recorded on a Saturday Daily time period

along Bus Service **33** WB -26 secs/km (146 secs/route, -10%).

- Largest increases recorded on both a Saturday and Sunday does not exceed +12% increase in journey time. These were recorded along Bus Service **337** EB and recorded the following levels of increase:
 - +22 secs/km (+102 secs/route, +10%) on a Saturday Daily.
 - +23 secs/km (+107 secs/route, +12%) on a Sunday Daily.
- Bus Services **337** runs along Upper Richmond Avenue and has an associated vehicle journey time **Route 4**, along the northern corridor of Richmond Park.
 - The changes in the EB direction to both vehicle and bus journey times along this link recorded increases ranging from circa +5% to +12%.

Summary Statement

The majority of the bus services recorded decreases in journey times during the weekend time periods. The largest increases were recorded along Bus Service 337 (along the northern corridor of Richmond Park) in the EB direction ranging between of +10% to +15%.

Summary of Results – August

A high-level summary of August 2019 (pre-trial) to August 2021 (post-trial) bus journey time comparisons for both the weekday and weekend is provided below.

Weekday

- Majority of services recorded reduction in bus journey time an average change across all routes of -3% in the AM, -2% in the PM, and -1% in the Daily.
- No large decreases were recorded with the largest reduction recorded along Bus Service **65** NB of -21 secs/km (-136 secs/route, -11%). The remaining decreases in journey time range between -1% to -10%.
- No large increases were recorded across the three time periods with the largest recorded on Bus Service **85** NB +12 secs/km (+96 secs/route, 7%).

Saturday

- Majority of services recorded increases in bus journey with an overall range of -14% to +24%. An average change of +5% in the IP and +4% in the daily was recorded.

- Largest decrease recorded along Bus Service **65** SB -31 secs/km (-207 secs/route, -14%). Remaining decreases range from -10% to -1%.
- Largest increases recorded along the following services:
 - Bus Service **337** WB +47 secs/km (+212 secs/route, +21%) in IP and +31 secs/km (+140 secs/route, +17%) in the Daily.
 - Bus Service **493** +30 secs/km (+150 secs/route, +16%) EB and +46 secs/km (+278 secs/route, +23%) SB in the IP.
 - Bus Service **K3** NEB +24 secs/km (+75 secs/route, +24%) EB

Sunday

- Majority of services recorded either decreases or small levels of increase in bus journey with an overall range of -25% to +44%. An average change of +1% in the IP and ±0% in the daily was recorded.
- Largest decreases recorded in Daily time period along Bus Service **K3** NB -40 secs/km (-124 secs/route, -25%). Remaining decreases range between -1% to -11%.

- No significant increases recorded with the largest increases recorded along the following services:
 - Bus Service **337** WB +26 secs/km (+119 secs/route, +14%)
 - Bus Service **493** WB +25 secs/km (+150 secs/route, +13%)
- All other recorded increases in bus journey time were no greater than +10%.

Summary Statement

The majority of the bus services recorded decreases in journey times during a weekday and a Sunday with no increases greater than +14%.

Saturday recorded predominantly an increase in bus journey times with localised large increases of circa +20% along Bus Services 337 and 493 (both located along the northern corridor of Richmond Park). The average increase in bus journey time on Saturday does not exceed +5%.

3.5 Vehicle Volume Data

Overview

The impact of the Richmond Park Movement Trial on the traffic flows on the strategic highway links surrounding the park has been assessed by reviewing traffic counts from multiple sources including TfL, LBRuT and RBKuT. It should be read in the context of the traffic environment (see Section 1.4) and other local schemes (see Section 2.4).

- Six ATC sites have been provided by TfL which cover the strategic road network around the park.
- Three ATC counts were provided by LBRuT which cover one location to the north and two to the west of the park.
- One ATC and one Manual Classified Turning Count (MCTC) were provided by RBKuT which are both located to the south of the park.

A map illustrating the location of each traffic count analysed and the respective source of the data shown in **Figure 3.4**.

For AM, IP and PM time periods assessed, an average hourly vehicle flow by direction has been calculated and used to derive the percentage change. For this Daily period a total

traffic flow across the 12-hour period has been presented and used to derive the percentage change.

Methodology (TfL Data)

For the analysis of the TfL ATCs the Pre-Trial year used is 2019 as per the off-park methodology described in **Section 3.2**.

The analysis of the changes in vehicle volume for the month of May is provided within this section with the associated comparison tables and a summary of the findings. Detailed analysis tables with for the May assessment are presented in **Appendix F**.

A high level summary of the August results are also provided within this section with the detailed comparison tables presented in **Appendix G**.

Methodology (LBRuT Data)

LBRuT provided Stantec with vehicle volume data along a number of local roads for the weekday and weekend periods of September 2019, September 2020 and September 2021.

Due to anomalies in the data provided by LBRuT, the results of this set of data have been excluded from the report. Further information is provided in Section 3.6.

Methodology (RBKuT Data)

No pre-trial data was available for ATC and MCTC counts provided RBKuT, therefore the Department for Transport (DfT) permanent count database has been interrogated to find appropriate and comparable pre-trial data.

A high level summary of the findings for the RBKuT data is provided with this section with detailed comparison tables presented in **Appendix H**. Within the detailed comparison tables, the pre-trial month and year used for each ATC has been specified.

Limitations of Borough Data

It should be noted that there are a number of limitations to the assessment of data provided by LBRuT and RBKuT.

Pre-trial data has been obtained from varied sources where data was available and, on this basis, it has not been possible to obtain all data from 2019 or for the matching month pre to post trial.

Due to the nature of usage of the park and specific restrictions on vehicular access to the park relating to daylight hours, variance is expected across months. This should be considered in review of these datasets.

Figure 3.4: Richmond Park ATC and MCTC Locations

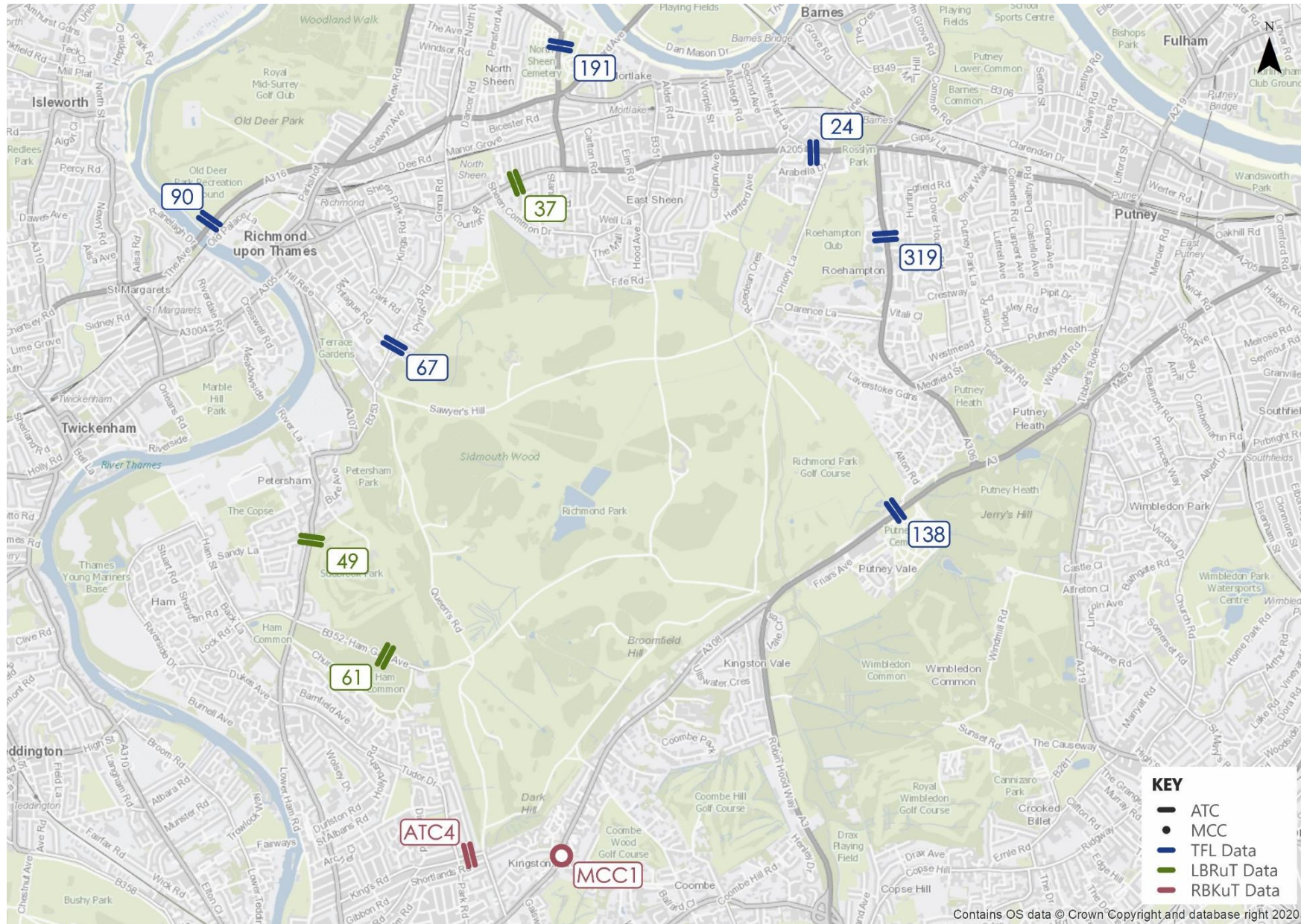


Table 3.5: TfL Data Vehicle Volume 2019 to 2021 Comparison
Summary (May Weekday)

Vehicle Volume Summary - May Weekday (Average Hour)								
ATC Ref.	Location	Direction	Average Hour AM (07:00-10:00)		Average Hour PM (16:00-19:00)		Average Hour Daily (07:00-19:00)	
			2019 (Vehicles)	Change to 2021 (%)	2019 (Vehicles)	Change to 2021 (%)	2019 (Vehicles)	Change to 2021 (%)
TfL 67	B353 Queen's Road	NB	519	8%	403	19%	1,688	10%
		SB	313	46%	374	23%	1,321	27%
TfL 90	A316 Twickenham Road	NEB	833	-46%	777	-5%	3,010	-18%
		SWB	2,028	42%	1,726	-23%	6,559	-1%
TfL 191	A205 Clifford Avenue	NB	1,290	7%	1,755	5%	5,695	-2%
		SB	3,318	1%	3,481	-2%	12,254	1%
TfL 24	A205 Upper Richmond Avenue	EB	504	1%	507	5%	2,314	6%
		WB	625	30%	750	50%	2,673	29%
TfL 319	A306 Roehampton Lane	NB	1,129	30%	1,257	26%	4,987	29%
		SB	718	22%	848	16%	3,121	19%
TfL 138	A3 Kingston Road	NB	623	-7%	523	-11%	2,487	-6%
		SB	1,341	-6%	1,371	-4%	5,608	-3%

Summary of TfL Results – May Weekday

Table 3.5 provides the May 2019 (pre-trial) to May 2021 (post-trial) vehicle volume comparison during the weekday for the data provided by TfL. The table presents the recorded vehicle volume in 2019 (no. of vehicles) and the percentage (%) change to 2021. A summary of the recorded results is provided below.

Weekday AM

- Varied level of change in vehicle volume with recorded average increase of +11% across all ATCs and range of -46% to +46%.
- Largest decrease recorded at A316 Twickenham Road NEB [TfL_90] -923 Vehicles (-46%).

- Largest increases recorded at the following locations:
 - B353 Queen's Road SB [TfL_67] +144 vehicles (+46%).
 - A316 Twickenham Road SWB [TfL_90] +536 vehicles (+42%).
 - A205 Upper Richmond Avenue WB [TfL_24] +190 vehicles (+30%).
 - A306 Roehampton Lane [TfL_319] +147 vehicles (+30%) in the NB, and +75 vehicles (+22%) in the SB.

Weekday PM

- Varied level of change in vehicle volume with recorded average increase of +8% across all ATCs and range of -23% to +50%.
- Large decrease recorded at A316 Twickenham Road SWB [TfL_90] -401 vehicles (-23%).
- Largest increases recorded at the following locations:
 - Queen's Road (B353) [TfL_67] +78 vehicles (+19%) NB and +86 vehicles (+23%) SB.
 - A205 Upper Richmond Avenue WB [TfL_24] +263 vehicles (+50%)
 - A306 Roehampton Lane [TfL_319] +107 vehicles (+26%) NB and +68 vehicles (+16%) SB.

Weekday Daily (Average Hour)

- Varied level of change in vehicle volume with recorded average increase of +8% across all ATCs and range of -18% to -29%.
- Large decrease recorded at A316 Twickenham Road NEB [TfL_90] -1,194 vehicles (-18%) across the day.
- Largest increases recorded at the following locations:
 - B353 Queen's Road SB [TfL_67] +360 vehicles (+27%) across the day.
 - A205 Upper Richmond Avenue WB [TfL_24] +716 vehicles (+29%) across the day.
 - A306 Roehampton Lane [TfL_319] +518 vehicles (+29%) NB and +283 vehicles (+19%) SB, across the day.

Summary Statement

A varied level of change in vehicle volume was recorded across all three weekday time periods ranging between -46% to +50%. The following locations recorded the largest increases:

- A205 Upper Richmond Avenue
 - B353 Queen's Road
- A316 Twickenham Road
- A306 Roehampton Lane

It is expected that increases in traffic volumes along Roehampton Lane and Upper Richmond Avenue are partially related to the closure of Hammersmith Bridge in August 2019.

Table 3.6: TfL Data Vehicle Volume 2019 to 2021 Comparison
Summary (May Weekend)

Vehicle Volume Summary - May Weekend (Average Hour)										
ATC Ref.	Location	Direction	Saturday				Sunday			
			Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)		Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)	
			2019 (Vehicles)	Change to 2021 (%)	2019 (Vehicles)	Change to 2021 (%)	2019 (Vehicles)	Change to 2021 (%)	2019 (Vehicles)	Change to 2021 (%)
TfL 67	B353 Queen's Road	NB	427	11%	1,470	10%	390	12%	1,286	12%
		SB	349	29%	1,246	22%	356	21%	1,172	15%
TfL 90	A316 Twickenham Road	NEB	1,474	-6%	5,445	-15%	1,522	-17%	5,154	-10%
		SWB	1,291	15%	4,470	19%	1,176	21%	4,470	8%
TfL 191	A205 Clifford Avenue	NB	701	-13%	2,500	-9%	734	-17%	2,357	-13%
		SB	674	3%	2,593	1%	648	3%	2,339	-1%
TfL 24	A205 Upper Richmond Avenue	EB	804	10%	3,041	12%	779	14%	2,842	13%
		WB	609	35%	2,606	24%	690	21%	2,541	19%
TfL 319	A306 Roehampton Lane	NB	422	37%	1,716	30%	454	18%	1,668	19%
		SB	382	32%	1,295	35%	337	31%	1,130	30%
TfL 138	A3 Kingston Road	NB	4,271	3%	8,076	1%	4,517	-13%	7,873	-9%
		SB	4,944	2%	8,798	0%	4,442	5%	7,777	1%

Summary of TfL Results – May Weekend

Table 3.6 provides the May 2019 (pre-trial) to May 2021 (post-trial) vehicle volume comparison during the weekend for the data provided by TfL. A summary of the recorded results is provided below.

Saturday IP

- Varied level of change in vehicle volumes recorded with majority of ATCs recording increase. The average increase across all ATCs was recorded as +13% with a range of between from -13% to +37%.
- Largest decrease recorded at A205 Clifford Avenue NB [TfL_191] -90 vehicles (-13%).
- Largest increases recorded at the following locations:
 - A205 Upper Richmond Avenue WB [TfL_24] +213 vehicles (+35%).
 - A306 Roehampton Lane [TfL_319] +155 vehicles (+37%) NB and +121 vehicles (+32%) SB.

- B353 Queen's Road SB [TfL_67] +101 vehicles (+29%).
- All other recorded increases were no greater than +15%.

Saturday Daily

- Varied level of change in vehicle volumes recorded with majority of ATCs recording increase. The average increase across all ATCs was recorded as +11% with a range of between from -15% to +35%.
- Largest decrease recorded at A316 Twickenham Road NEB [TfL_90] -827 vehicles (-15%).
- Largest increases recorded at the following locations:
 - A205 Upper Richmond Avenue WB [TfL_24] +618 vehicles (+24%) across the day.

- A306 Roehampton Lane [TfL_319] +523 vehicles (+30%) NB and +455 vehicles (+35%) SB.
- B353 Queen's Road SB [TfL_67] +276 vehicles (+22%).
- All other recorded increases were no greater than +18%.

Sunday IP

- Varied level of change in vehicle volumes recorded with majority of ATCs recording increase. The average increase across all ATCs was recorded as +8% with a range of between from -17% to +31%.
- Largest decrease recorded at the following locations:
 - A316 Twickenham Road NEB [TfL_90] -254 vehicles (-17%)
 - A205 Clifford Avenue NB [TfL_191] -124 vehicles (-17%).

- Largest increases recorded at the following locations:
 - A306 Roehampton Lane [TfL_319] +81 vehicles (+18%) NB and +103 vehicles (+31%) SB.
 - B353 Queen's Road SB [TfL_67] +75 vehicles (21%).
 - A316 Twickenham Road SWB [TfL_90] +243 vehicles (21%).
 - A205 Upper Richmond Avenue WB [TfL_24] +148 vehicles (+21%).
- All other recorded increases were no greater than +14%.

Sunday Daily

- Varied level of change in vehicle volumes recorded with majority of ATCs recording increase. The average increase across all ATCs was recorded as +7% with a range of between from -13% to +30%.
- Largest decrease recorded at A205 Clifford Avenue NB [TfL_191] -304 vehicles (-13%) across the day.
- Largest increases recorded at the following locations:
 - A306 Roehampton Lane [TfL_319] +323 vehicles (+19%) NB and +338 vehicles (+30%) SB, across the day.
 - A205 Upper Richmond Avenue WB [TfL_24] +477 vehicles (+19%) across the day.
- All other recorded increases were no greater than +16%.

Summary Statement

A varied level of change in vehicle volume was recorded across the weekend time periods ranging between -17% to +37%. The following locations recorded the largest increases:

- A205 Upper Richmond Avenue
 - B353 Queen's Road
 - A316 Twickenham Road
 - A306 Roehampton Lane

It is expected that increases in traffic volumes along Roehampton Lane and Upper Richmond Avenue are partially related to the closure of Hammersmith Bridge in August 2019.

Summary of TfL Results – August

A high-level summary of August 2019 (pre-trial) to August 2021 (post-trial) vehicle volume comparisons for both the weekday and weekend is provided below.

Weekday

- Varied level of change across the three weekday time periods (AM, IP & Daily). The following average and range in vehicle volume change was recorded:
 - AM average increase of +5% and range of between -47% to +45%.
 - PM average increase of +6% and range of between -12% to +21%.
 - Daily average of +6% and range of between -15% and +16%.

- Large decrease in vehicle volume was recorded at A316 Twickenham Road [TfL_90] of -862 vehicles (-47%) in the AM, and -916 vehicles (-15%) in the daily NEB direction.
- Largest increases were recorded in the AM time period at the following locations:
 - A316 Twickenham Road SWB [TfL_90] +501 vehicles (+45%).
 - A305 Roehampton Lane SB [TfL_319] +83 vehicles (+30%).
- Large increases were also recorded on A306 Roehampton Lane [TfL_319] both NB and SB in the PM and Daily time period with the increases ranging between +21% to +30%.

Weekend

- Both time periods for a Saturday and Sunday recorded a varied level of change at each ATC. The following average change in vehicle volume change was recorded:
 - Saturday IP +10%
 - Sunday IP +10%.
 - Saturday Daily +8%.
 - Sunday Daily +10%.
- Large decrease in vehicle volume recorded at Clifford Avenue (A205) [TfL_191] NB ranging between -12% to -18% across both time periods for the weekend.

- Largest increases were recorded at the following locations:
 - A306 Roehampton Lane SB [TfL_319] +372 vehicles (+31%) in the Saturday Daily.
 - A316 Twickenham Road SWB [TfL_90] +342 vehicles (+31%) in the Sunday IP.
- Large increases were also recorded at the following locations ranging between +15% to 29%:
 - B353 Queen's Road [TfL_67] NB and SB (all time periods, all weekend).
 - A316 Twickenham Road [TfL_90] SWB (all time periods, all weekend excluding Sunday IP where increase is greater than +29%).
- A205 Upper Richmond Avenue [TfL_24] EB and WB (all time periods, all weekend).
- A306 Roehampton Lane [TfL_319] NB and SB (Saturday IP only. Increases not on Sunday not as large)

Summary Statement

Varied level of change in vehicle volumes in both the weekday and weekend. Each time period recorded an increase in the average traffic flow across all ATCS ranging from between +5% (Weekday AM) to +10% (Weekend).

The largest increases were recorded at A316 Twickenham Road (weekday AM and Sunday IP), and A306 Roehampton Lane (weekday AM and Saturday Daily).

Table 3.7: LBRuT / RBKuT Data Vehicle Volume 2018 to 2021
Comparison Summary (Weekday)

Vehicle Volume Summary - Weekday - Borough Data											
ATC Ref.	Pre-trial Day(s)	Pre-trial Month	Pre-trial Year	Location	Direction	Average Hour AM (07:00-10:00)		Average Hour PM (16:00-19:00)		Average Hour Daily (07:00-19:00)	
						Pre-trial (Vehicles)	Change to 2021 (%)	Pre-trial (Vehicles)	Change to 2021 (%)	Pre-trial (Vehicles)	Change to 2021 (%)
LBRuT 49	w/c 17th	Sep	2018	Petersham Road (South of Sandy Lane)	NB	505	6%	481	-11%	486	-6%
					SB	312	16%	551	-7%	464	-8%
RBKuT ATC4	Monday	Oct	2018	Queen's Road (B351)	NB	427	-11%	212	16%	267	0%
					SB	231	7%	315	-1%	245	5%
RBKuT MCC1	Friday	April	2017	Kingston Hill	NB	445	-12%	504	-46%	416	-30%
					SB	510	-30%	502	-30%	465	-30%

Table 3.8: LBRuT / RBKuT Data Vehicle Volume 2018 to 2021
Comparison Summary (Weekend)

Vehicle Volume Summary - Saturday - Borough Data													
ATC Ref.	Pre-trial Day(s)	Pre-trial Month	Pre-trial Year	Location	Direction	Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)		Average Hour IP (10:00-16:00)		Average Hour Daily (07:00-19:00)	
						2018 (Vehicles)	Change to 2021 (%)	2018 (Vehicles)	Change to 2021 (%)	2018 (Vehicles)	Change to 2021 (%)	2018 (Vehicles)	Change to 2021 (%)
LBRuT 49	w/c 17th	Sep	2018	Petersham Road (South of Sandy Lane)	NB	503	-2%	457	0%	410	18%	353	17%
					SB	432	12%	392	10%	348	21%	306	18%

3.6 Summary of LBRuT and RBKuT Results – Weekday

Table 3.7 provides the pre to post-trial vehicle volume comparison for the data provided by LBRuT and RBKuT for the weekday and weekend periods. A summary of the recorded results is provided below.

Weekday

- Across all three time periods (AM, IP & Daily) the level of vehicle volume change varies with an overall range of between -46% to +16%. Across the three time periods the following average change per time period was recorded:
 - AM -4%.
 - PM -13%.
 - Daily -11%.
 - Kingston Hill [RBKuT_MCC_1] recorded the largest decreases in traffic flows in both directions across the AM and PM peak periods: -52 vehicles (-12%) NB in the AM/ -151 vehicles (-30%) SB in the AM/ -232 vehicles (-46%) NB in the PM/ -152 vehicles (-30%) SB in the PM / -1,497 vehicles (-30%) NB in the daily/ -1,656 vehicles (-94%) SB in the daily.

- Localised increases in traffic were recorded in the AM peak period along Petersham Road [LBRUT_49] during the AM peak period only, and Queen’s Road [RBKuT-ATC_4] throughout the day.

Weekend

Traffic flows along Petersham Road [LBRUT_49] have seen an average increase of +5% during both the IP and daily average hour on Saturdays. Although greater increase in traffic have been observed during the Sunday IP and daily average hour, 2021 traffic flows recorded along this road during these periods remain lower than traffic flows recorded on the equivalent Saturday periods.

Data Anomalies

Additional data was received from LBRuT, however this was excluded due to the following:

- Traffic volumes recorded in 2018 at Ham Gate Avenue [LBRuT_61] are lower than those recorded in September 2020, when travel restrictions associated with the COVID-19 pandemic were in place. As such, it is expected that the 2018 data is unreliable for the purpose of comparison.
- Major increases in traffic flow along [LBRUT_37] Sheen Road (A205) are inconsistent with smaller increases in traffic

flow recorded along Upper Richmond Avenue (also A205). This could be due to:

- The positioning of the ATC counter at a slightly different location.
- The analysis of 2018 data based on only one day, as opposed to the 2021 data which was based upon two days.
- [LBRuT_45] (Richmond Hill) 2019 results were extremely low (i.e only 2 vehicles in a hour) and was therefore excluded as it was considered to be unreliable.
- [LBRuT_24] (Sheen Lane) The 2021 ATC was broken and recorded no data and therefore no analysis was possible

Summary Statement

Varied level of change in traffic volume during weekday periods was recorded across the three ATC locations ranging from -46% to +16%. The average change in traffic along all periods was always negative i.e. average reduction in traffic volumes.

Traffic volumes recorded along Petersham Road during the weekend IP and daily average hour have remained consistent during the May

4. On-Park Data Analysis

4.1 Overview

An assessment of the internal Richmond Park road network has been undertaken to understand the changes to traffic pre and post implementation of the movement trial. The data obtained is from third-party traffic survey undertaken on behalf of Stantec and include the following:

- **Vehicle Volume data** – MCCs at access gates and ATCs along two internal roads.
- **Automatic Number Plate Recognition (ANPR) Data** – at all access gates to Richmond Park.

Figure 4.1: Richmond Park On-Park Data



4.2 Vehicle Volume Data

Introduction

To assess the changes in vehicle volumes accessing the park and within the parks internal roads, the following traffic surveys have been assessed:

Manual Classified Counts (MCC) at the following park access gates:

- **Richmond Gate**
- **Roehampton Gate**
- **Ham Gate**
- **Kingston Gate**

ATCs at the following internal roads:

- **Sawyers Hill** (between The Holly Lodge Centre and Sheen Gate)
- **Queen's Road** (between Ham Gate and Pembroke Lodge)

These surveys are intended to give an understanding of how the restrictions associated with movement trial have changed the traffic flow into and within the park.

Methodology

As part of the comprehensive traffic surveys undertaken by TRP in September 2015, MCC were undertaken at the specified access gates and two ATCs was undertaken at Sawyers Hill and Queen's Road. The MCCs were undertaken September 2015 and the ATCs in August 2015.

TRP commissioned repeat surveys at the same locations to be undertaken in November 2021 to be used to compare the two changes in traffic flow.

An assessment of the following days and time periods have been undertaken:

Weekday:

- AM: Hourly average from 07:00 to 10:00

Saturday:

- IP: Hourly average from 10:00 to 16:00

Sunday:

- IP: Hourly average from 10:00 to 16:00

Limitations

It should be noted that there are a number of limitations to the assessment of the internal vehicle volume data with respect to the comparison of 2015 data 2021 data from different months (similarly to limitations with the ANPR data analysis). A list of limitations are provided which should be considered when reviewing the results:

- Vehicular access to the park is closed at dusk which is a variable based upon the level of light.
- There are possible differences in the level of park visitor in the September and November.
- 2015 data should be taken with caution due to the age of the data (7 years old at time of writing this report).

Summary of Results

The summary tables provide the 2015 to 2021 comparison in traffic flow for each of the of Richmond Park access gates or Internal Road for Weekday, Saturday and Sunday. The results presented in **Figure 4.2** to **Figure 4.3** demonstrate the recorded traffic flow in 2015 and 2021, the change in the number of vehicles and the percentage change to 2021 respectively.

A summary of the results of the Vehicle Volume comparison are provided below.

Park Access Gates

- Predominantly a reduction in overall traffic flow passing through each of the four access gates to Richmond Park in hours analysed.
- Sheen Gate recorded a change in vehicle flow of 100% during all periods, as a result of Sheen Gate closure in August 2020 as part of TRP's trial.
- Richmond Gate recorded a change in vehicle flow between a range of -26% to +2%. Weekday AM was the only time period at this gate that recorded an increase in flow with a minor +8 vehicles (+2%) entering the park (EB). All over time periods recorded a reduction in the level of traffic flow.

- Roehampton Gate recorded reduction in flow across all time periods with the change in vehicle flow between a range of -63% to -31%. The largest decrease was recorded in the Sunday IP of -307 vehicles (-63%) entering the park (WB).
- Ham Gate recorded reduction in flow across all time periods with the change in vehicle flow between a range of -45% to -19%. The largest decreases were recorded in the Saturday and Sunday IP entering the park (EB) of -44 vehicles (-45%) and -37 vehicles (-45%) respectively.
- Kingston Gate recorded a change in vehicle flow between a range of -31% to +5%. Saturday IP was the only time period at this gate that recorded an increase in flow with a minor +18 vehicles (+5%) exiting the park (SB). All over time periods recorded a reduction in the level of traffic flow.

Internal Road ATCs

- Both internal ATCs recorded a significant reduction in traffic flow across all time periods. Sawyer's Hill recorded between a -95% to -16% reduction and Queen's Road recorded between -40% to -15% reduction.

Figure 4.2: Richmond Park Access Gates Vehicle Volume Changes (2015 to 2021)

Richmond Gate

	2015	2021	Change	Change (%)	
Entry →	550	558	8	2%	
	439	393	-46	-10%	
	502	370	-132	-26%	
← Exit	708	544	-164	-23%	
	451	408	-43	-10%	
	471	372	-99	-21%	

Ham Gate

	2015	2021	Change	Change (%)	
Entry →	187	109	-78	-42%	
	97	53	-44	-45%	
	83	46	-37	-45%	
← Exit	99	79	-21	-21%	
	99	79	-19	-19%	
	94	72	-22	-23%	

Sheen Gate

Exit ↑				Entry ↓			
2015	2021	Change	Change (%)	2015	2021	Change	Change (%)
275	0	-275	-100%	401	0	-401	-100%
178	0	-178	-100%	253	0	-253	-100%
164	0	-164	-100%	201	0	-201	-100%

Roehampton Gate

	2015	2021	Change	Change (%)	
Exit →	490	340	-150	-31%	
	353	198	-155	-44%	
	372	204	-168	-45%	
← Entry	465	244	-221	-48%	
	451	190	-261	-58%	
	484	178	-307	-63%	

Kingston Gate

Entry ↑				Exit ↓			
2015	2021	Change	Change (%)	2015	2021	Change	Change (%)
684	474	-211	-31%	333	261	-72	-22%
416	402	-13	-3%	373	391	18	5%
428	371	-57	-13%	373	365	-8	-2%

Weekday AM (7-10)
3-Hour Average

Saturday IP (10-16)
6-Hour Average

Sunday IP (10-16)
6-Hour Average

Figure 4.3: Sawyers Hill and Queen's Road Vehicle Volume Changes (2015 to 2021)

Sawyers Hill

	2015	2021	Change	Change (%)	
EB	300	182	-118	-39%	→
	441	21	-421	-95%	
	535	35	-500	-94%	

WB	415	350	-65	-16%	←
	406	38	-368	-91%	
	495	114	-381	-77%	

Queen's Road

	2015	2021	Change	Change (%)	
SB	312	264	-48	-15%	↓
	488	366	-122	-25%	
	509	324	-185	-36%	

NB	640	485	-154	-24%	↑
	471	364	-107	-23%	
	512	305	-207	-40%	

Summary of Traffic Volume Change at Richmond Park Gates

Gate Ref.	Time Period	2015 Vehicle Flow	2021 Vehicle Flow	% Change
Richmond Gate	Weekday AM	1258	1102	-12%
	Saturday IP	890	801	-10%
	Sunday IP	973	742	-24%
Sheen Gate	Weekday AM	676	0	-100%
	Saturday IP	431	0	-100%
	Sunday IP	366	0	-100%
Roehampton Gate	Weekday AM	955	584	-39%
	Saturday IP	804	388	-52%
	Sunday IP	856	381	-55%
Ham Gate	Weekday AM	286	188	-34%
	Saturday IP	195	132	-32%
	Sunday IP	176	117	-33%
Kingston Gate	Weekday AM	1017	734	-28%
	Saturday IP	789	794	1%
	Sunday IP	800	735	-8%

4.3 ANPR Data

Introduction

The volume of vehicles at each access gate and internal routing of traffic within Richmond Park has been impacted due to the road closures associated with the Movement Trial. To understand the changes that have occurred pre and post the Trial an ANPR survey was which covered the Richmond Park gates as demonstrated in **Figure 4.1**.

Methodology

As part of a comprehensive set of traffic surveys undertaken by The Royal Parks in September 2015, an ANPR survey was undertaken which captured vehicles entering and exiting the park via the park gates and created an origin-destination (OD) matrix.

The Royal Parks commissioned a new ANPR survey in November 2021. This has been used to compare against the previous ANPR results to understand the changes to OD's across Richmond Park following the implementation of the Trial Movement scheme.

An assessment of the following days and time periods have been undertaken:

Weekday (Thursday):

- AM: Hourly average from 07:00 to 10:00

Saturday:

- IP: Hourly average from 10:00 to 16:00

Sunday:

- IP: Hourly average from 10:00 to 16:00

In this report an origin-destination (OD) matrix has been presented for the time periods specified which demonstrate both the change in recorded flow and percentage change between 2015 and 2021. At the bottom of each matrix, the total flow in September 2015 is provided to give context to the level of change occurring.

The percentage change recorded for the ANPR has been assigned a classification of impact to highlight where changes have occurred. Each classification has been assigned a colour using the following system:

- Decrease – **Green**
- Increase – **Red**

Limitations

It should be noted that there are a number of limitations to the assessment of the ANPR data with respect to the comparison of 2015 data

2021 data from different months. A list of limitations are provided which should be considered when reviewing the results:

- Vehicular access to the park is closed at dusk which is a variable based upon the level of light. On this basis, the PM data collected in November 2021 is significantly lower than data collected in September 2015, therefore the PM (which covered 16:00 to 19:00) and Daily (which covered 07:00 to 19:00) time periods have not been analysed as the data is skewed due to gate not being open.
- There are possible differences in the level of park visitor between September and November as September is generally a warmer and dryer month and therefore likely to attract more visitors than November.
- 2015 data should be taken with caution due to the age of the data (7 years old at time of writing this report). Significant changes have occurred in terms of people's travel behaviour and park usage, as well as changes in the surroundings area (including the closure of Hammersmith Bridge). It is likely that the combination of these have had an impact on traffic flows within the park.

Table 4.1 to 4.4: ANPR - Weekday AM Traffic Volume Change

Weekday AM (07:00-10:00) Hourly Average - 2015 Traffic Volume							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	12	140	7	33	198	391
	Richmond Gate	158	14	26	188	87	472
	Ham Gate	21	76	2	36	29	165
	Kingston Gate	77	340	39	10	70	537
	Sheen Gate	164	51	14	29	16	275
	Total	433	622	88	296	401	1840

Weekday AM (07:00-10:00) Hourly Average - 2015 to 2021 Percentage (%)Change							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	-4	-14	1	-22	-198	-237
	Richmond Gate	28	-11	-5	0	-87	-74
	Ham Gate	-6	-42	2	-20	-29	-95
	Kingston Gate	-55	-141	-13	-7	-70	-286
	Sheen Gate	-164	-51	-14	-29	-15	-274
	Total	-201	-259	-29	-78	-400	-967

Weekday AM (07:00-10:00) Hourly Average - 2019 Traffic Volume							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	8	126	8	11	0	154
	Richmond Gate	186	3	21	188	0	398
	Ham Gate	15	34	4	16	0	70
	Kingston Gate	22	199	26	3	0	251
	Sheen Gate	0	0	0	0	1	1
	Total	231	363	59	218	1	873

Weekday AM (07:00-10:00) Hourly Average - 2015 to 2021 Percentage (%)Change							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	-32%	-10%	14%	-67%	-100%	-61%
	Richmond Gate	18%	-77%	-18%	0%	-100%	-16%
	Ham Gate	-28%	-55%	86%	-56%	-100%	-58%
	Kingston Gate	-71%	-41%	-33%	-68%	-100%	-53%
	Sheen Gate	-100%	-99%	-100%	-100%	-96%	-100%
	Total	-47%	-42%	-33%	-26%	-100%	-53%

Summary of Results

The summary tables provide the 2015 to 2021 comparison in traffic flow across the OD Matrix of Richmond Park access gates for Weekday, Saturday and Sunday. The results presented in **Table 4.1** to **Table 4.6** demonstrate the recorded traffic flow across the matrix (measured in number of vehicles) and the percentage change to 2021 respectively.

The results of the ANPR vehicle volume comparison for indicated the following:

- Predominately a reduction in overall traffic flow moving through the Richmond Park in hours analysed. The resultant reduction for each time period is as follows:
 - Weekday AM recorded -996 vehicles (-52%).
 - Saturday IP recorded -478 vehicles (40%).
 - Sunday IP recorded -589 vehicles (-53%).

- The vast majority of ODs in each time period have seen a significant reduction in traffic flow, excluding a small number of localised increased ODs. These are likely to be the result of re-routing due to the movement trial restrictions (permanent closure of Sheen Gate, car park access between Kingston Gate and Roehampton Gate, weekend closure of Sawyer's Hill).

Weekday

ODs that have seen an increase in the Weekday AM include:

- Richmond Gate to Roehampton Gate recorded +28 vehicles (+18%).
- Roehampton Gate to Ham Gate to recorded +28 vehicles (+18%).
- Ham Gate to Ham Gate recorded +2 vehicles (+86%)

Summary Statement

An overall reduction in gate-to-gate traffic was observed in Richmond Park in the weekday peak period between 2015 and 2021. The overall reduction in traffic is estimated at 53% (967 fewer vehicles in November 2021 than in September 2015).

Table 4.5 to 4.9: ANPR – Saturday IP Traffic Volume Change

Saturday IP (10:00-16:00) Hourly Average - 2015 Traffic Volume							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	18	112	10	42	156	338
	Richmond Gate	99	24	20	146	42	331
	Ham Gate	13	19	3	20	19	73
	Kingston Gate	29	166	32	26	22	275
	Sheen Gate	92	32	16	25	14	178
	Total	252	351	81	259	253	1195

Saturday IP (10:00-16:00) Hourly Average - 2015 to 2021 Traffic Volume Change							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	47	-111	-10	-42	-155	-271
	Richmond Gate	-99	3	8	116	-42	-15
	Ham Gate	-13	-2	-1	2	-19	-32
	Kingston Gate	-29	84	1	-18	-22	16
	Sheen Gate	-91	-32	-16	-25	-13	-176
	Total	-185	-58	-18	34	-251	-478

Saturday IP (10:00-16:00) Hourly Average - 2021 Traffic Volume							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	65	1	0	0	1	68
	Richmond Gate	1	26	28	262	0	316
	Ham Gate	0	16	3	22	0	41
	Kingston Gate	0	250	33	8	0	291
	Sheen Gate	1	0	0	0	1	2
	Total	67	293	63	292	2	717

Saturday IP (10:00-16:00) Hourly Average - 2015 to 2021 Percentage (%) Change							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	258%	-99%	-97%	-99%	-99%	-80%
	Richmond Gate	-99%	11%	38%	80%	-100%	-4%
	Ham Gate	-100%	-13%	-21%	10%	-100%	-44%
	Kingston Gate	-100%	51%	4%	-69%	-100%	6%
	Sheen Gate	-99%	-100%	-100%	-100%	-95%	-99%
	Total	-74%	-17%	-22%	13%	-99%	-40%

Table 4.10 to 4.14: ANPR – Sunday IP Traffic Volume Change

Saturday IP (10:00-16:00) Hourly Average - 2015 Traffic Volume							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	26	113	10	35	123	308
	Richmond Gate	88	36	20	137	37	317
	Ham Gate	8	16	4	19	11	58
	Kingston Gate	22	155	31	30	19	255
	Sheen Gate	79	38	10	25	13	164
	Total	222	358	75	246	201	1102

Saturday IP (10:00-16:00) Hourly Average - 2015 to 2021 Traffic Volume Change							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	17	-113	-10	-35	-122	-264
	Richmond Gate	-88	-18	1	50	-36	-91
	Ham Gate	-8	0	-1	-6	-11	-25
	Kingston Gate	-22	23	-4	-25	-19	-47
	Sheen Gate	-78	-38	-10	-25	-12	-162
	Total	-178	-146	-25	-41	-200	-589

Saturday IP (10:00-16:00) Hourly Average - 2021 Traffic Volume							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	43	0	0	0	0	43
	Richmond Gate	0	18	21	187	0	226
	Ham Gate	0	17	3	13	0	33
	Kingston Gate	0	178	26	5	0	209
	Sheen Gate	1	0	0	0	1	2
	Total	44	212	50	205	2	513

Saturday IP (10:00-16:00) Hourly Average - 2015 to 2021 Percentage (%) Change							
O-D		To					
		Roehampton Gate	Richmond Gate	Ham Gate	Kingston Gate	Sheen Gate	Total
From	Roehampton Gate	63%	-100%	-100%	-100%	-100%	-86%
	Richmond Gate	-100%	-50%	5%	36%	-99%	-29%
	Ham Gate	-100%	2%	-32%	-30%	-100%	-44%
	Kingston Gate	-100%	15%	-14%	-83%	-100%	-18%
	Sheen Gate	-99%	-100%	-100%	-100%	-92%	-99%
	Total	-80%	-41%	-33%	-17%	-99%	-53%

Weekend

- ODs that have seen an increase in the Saturday IP include:
 - Roehampton Gate to Roehampton Gate recorded +28 vehicles (+18%).
 - Richmond Gate to Roehampton Gate recorded +28 vehicles (+18%). Richmond Gate to Ham Gate recorded +28 vehicles (+18%). Richmond Gate to Kingston Gate recorded +28 vehicles (+18%).
 - Ham Gate to Kingston Gate recorded +28 vehicles (+18%).
 - Kingston Gate to Richmond Gate recorded +28 vehicles (+18%). Kingston Gate to Ham recorded +28 vehicles (+18%).
- ODs that have seen an increase in the Sunday IP include:
 - Roehampton Gate to Roehampton Gate recorded +28 vehicles (+18%).
 - Richmond Gate to Ham Gate recorded +28 vehicles (+18%). Richmond Gate to Kingston Gate recorded +28 vehicles (+18%).
 - Ham Gate to Kingston Gate recorded +28 vehicles (+18%).
 - Kingston Gate to Richmond Gate recorded +28 vehicles (+18%).

Summary Statement

An overall reduction in gate-to-gate traffic was observed in Richmond Park in both the Saturday and Sunday IP peak period between 2015 and 2021.

The overall reduction in traffic on Saturday is estimated at 40% (478 fewer vehicles in November 2021 than in September 2015) and on Sunday is estimated at 53% (589 fewer vehicles in November 2021 than in September 2015)

5. Accident Analysis

This section summarises the results of the accident analysis carried out at key locations at and around Richmond Park, for the most recent 4-year period of available data (2018, 2019, 2020, and 2021). Accident data has been extracted from the Crashmap website. The data comes from the Department for Transport, the statistics relate only to personal injury accidents on public roads that are reported to the police, and subsequently recorded, using the STATS19 accident reporting form.

The accidents are classed into three categories: slight, serious, and fatal a definition of which is provided below:

- **Slight Injury:** Injuries of a minor nature, such as sprains, bruises or cuts not judged to be severe, or slight shock requiring only roadside attention (medical treatment is not a prerequisite for an injury to be defined as slight):
- **Serious Injury:** Injuries for which a person is detained in hospital, as an in-patient, or any of the following injuries, whether or not a person is detained in hospital; fractures, concussion, internal injuries, severe cuts and lacerations, several general shock requiring medical treatment and injuries

which result in death 30 days after the accident. The serious category therefore covers a very broad range of injuries; and

- **Fatal Injury:** Injuries which cause death either immediately or any time up to 30 days after the accident.

The extent of the accident study area is presented in **Figure 5.1** overleaf, whilst the total number of accidents recorded throughout the 3-year period have, split into user type, have been summarised in **Table 5.1**, whilst a detailed summary of the collisions recorded by junction is presented in **Appendix I**.

Key Findings

As can be seen below, a reduction in the number of collisions recorded has occurred during the period 2018 – 2021. It is expected that this is the result of measures implemented to increase safety of all users, including the Movement Strategy implemented by TRP.

Table 5.1: Summary of Accident Data (Source: Crashmap)

	Severity	2018	2019	2020	2021	Change
All Modes	Slight	13	11	11	6	-7
	Serious	5	2	2	4	-1
<i>Total</i>		<i>18</i>	<i>13</i>	<i>13</i>	<i>10</i>	<i>-8</i>
Vulnerable Road Users (Pedestrians, Cyclists, Motorcyclists)	Slight	10	10	8	5	-5
	Serious	5	1	2	3	-2
<i>Total</i>		<i>15</i>	<i>12</i>	<i>10</i>	<i>8</i>	<i>-7</i>

Figure 5.1: Accident Analysis Study Area



6. Summary of Findings

This section provides a summary of the key findings of this study. Results from the analysis of TfL's August data has been excluded from this summary but is provided in the Appendices.

6.1 Off-Park Data

Vehicle Journey Time Data

- Overall, journey times have been consistent in the weekday periods of May 2019 and May 2021, with the exception of Upper Richmond Road (western section) WB direction in the AM peak.
- Overall, journey times have been consistent in the weekend periods of May 2019 and May 2021 with the exception of some localised increases in journey times (Priory Lane, Richmond Park Road/ Acre Road)

Bus Journey Time Data

- Overall, bus journey times have been consistent in the weekday peak periods of May 2019 and May 2021 with the exception of localised increases in bus routes 33 and 337 EB during the AM peak . Bus journey times have been consistent in the weekday daily (average hour) of May 2019 and May 2021.

- Overall, bus journey times have been consistent in the weekend peak periods of May 2019 and May 2021 with the exception of localised increases along bus route 493 EB in the weekend Inter Peak period, which runs along the north-eastern corridor of the site (Upper Richmond Avenue and Roehampton Lane). Bus journey times have been consistent in the weekend daily (average hour) of May 2019 and May 2021.

Vehicle Volume Data

TfL's Data

- The following roads have experienced increases in traffic volumes during the weekday and weekend peak and daily (average hour) periods:
 - A306 Roehampton Lane
 - A205 Upper Richmond Avenue WB
 - B353 Queen's Road
 - A316 Twickenham Road SWB

Increases in traffic volume have had no impact on journey times which have generally remained consistent outside Richmond.

It is expected that increases in traffic volumes along Roehampton Lane and Upper Richmond

Avenue are partially related to the closure of Hammersmith Bridge in August 2019.

LBRUT / RBKuT Data

- An average reduction of traffic volumes was recorded across all weekday periods within local roads for which data was provided by LBRuT.
- Traffic flows recorded along Petersham Road during the weekend peak and average periods have remained consistent during the 2019 – 2021 periods.
- Due to anomalies in the data provided by LBRuT, some locations have been excluded from this analysis.

6.2 On-Park Data

ANPR Data

- An overall reduction in gate-to-gate traffic was observed in Richmond Park in all periods analysed (AM, Saturday IP, Sunday IP) between 2015 and 2021. The overall reduction in traffic is estimated at:
 - AM: 52% (966 fewer vehicles in November 2021 than in September 2015)
 - Saturday IP: 40% (478 fewer vehicles in November 2021 than in September 2015)
- Sunday IP: 53% (589 fewer vehicles in November 2021 than in September 2015)

Vehicle Volume Data

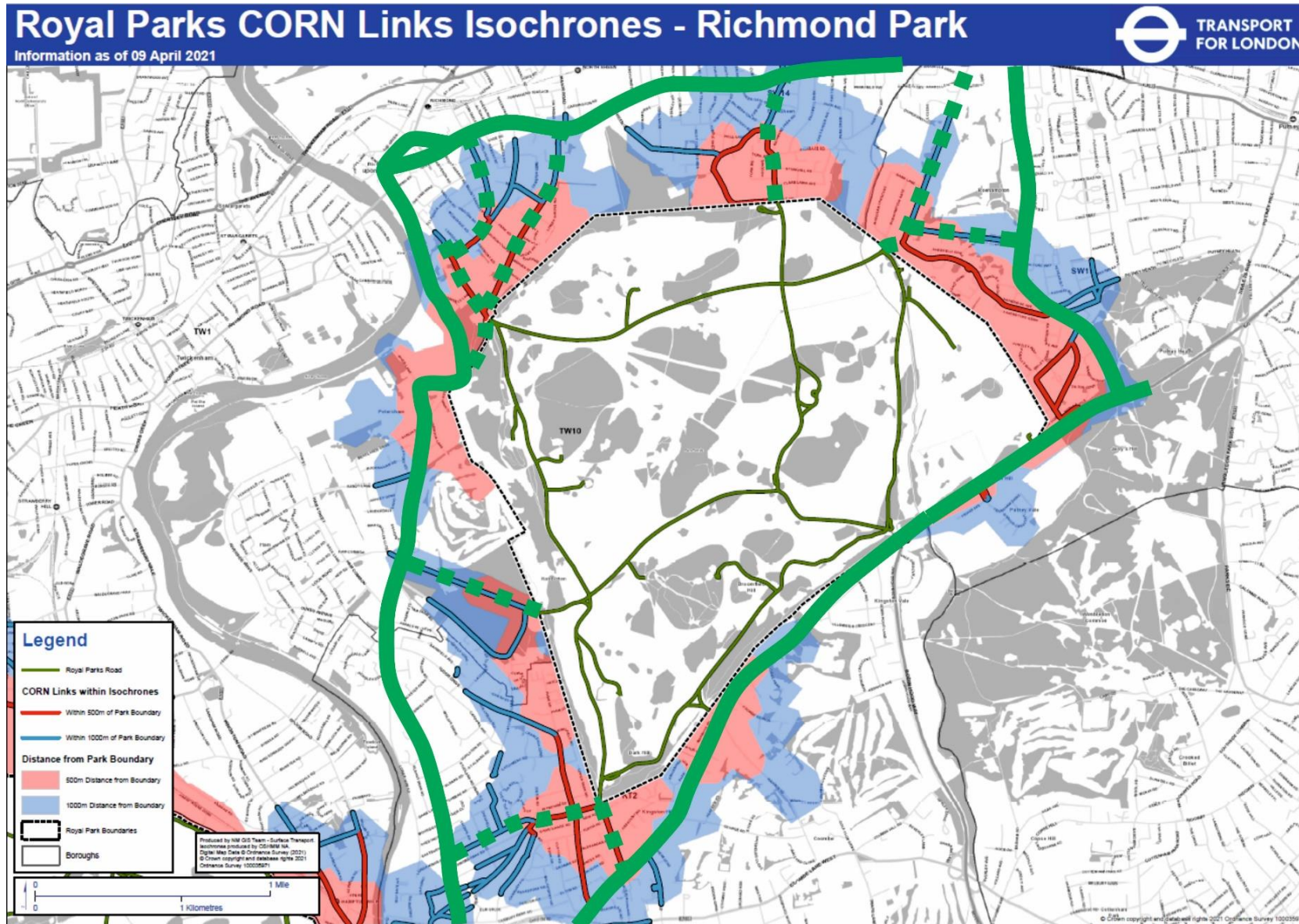
- Predominantly a reduction in overall traffic flow passing through each of the four access gates to Richmond Park in hours analysed.
- Both internal ATCs recorded a significant reduction in traffic flow across all time periods. Sawyer's Hill recorded between a -95% to -16% reduction and Queen's Road recorded between -40% to -15% reduction.

Alignment of the Trial with TRP's Movement Strategy

The overall reduction in car traffic within Richmond Park identified from the analysis of ANPR, MCTC and ATC surveys show that the trial has been successful in delivering the vision of the Movement Strategy, and in line with its principles set out below:

- ❖ We will protect and conserve our parks' special qualities
- ❖ Our parks are for people
- ❖ We will encourage the use of more sustainable ways to access our parks
- ❖ Our park roads are not intended to be commuter through-routes for motor vehicles
- ❖ We will achieve more by delivering key projects through partnership and collaboration
- ❖ We will make evidence-based decisions
- ❖ We will be proactive in our approach to future transport challenges and opportunities

Appendix A Richmond Park Reassignment Routes (based on TfL's CORN Map)



Appendix B Detailed Vehicle Journey Time Analysis - May (seconds/km)

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Weekday - May														
				Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
				2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff
1	Roehampton Lane	2.6	EB	193	133	214	+21	11%	163	137	155	-8	-5%	171	134	174	+3	2%
		2.6	WB	148	129	149	+1	0%	157	134	155	-2	-1%	152	132	153	+0	0%
2	A308 / A3	5.9	NB	128	110	128	-0	0%	129	117	127	-1	-1%	124	113	125	+0	0%
		5.9	SB	133	112	130	-3	-2%	136	121	155	+19	14%	130	117	138	+8	6%
3	A307	5.4	NB	154	135	150	-4	-3%	142	139	146	+3	2%	144	129	152	+9	6%
		5.4	SB	129	121	134	+5	3%	132	127	132	+0	0%	136	124	137	+1	0%
4	Upper Richmond Road West	4.5	EB	226	165	265	+39	17%	234	188	240	+6	3%	223	178	240	+17	8%
		4.5	WB	272	161	224	-48	-18%	305	201	281	-24	-8%	270	183	238	-32	-12%
5	Priory Lane	1.3	NB	153	124	151	-2	-1%	182	137	167	-15	-8%	159	128	154	-5	-3%
		1.3	SB	130	116	145	+16	12%	123	109	127	+5	4%	122	112	132	+10	8%
6	Clarence Lane	0.8	EB	238	135	208	-30	-13%	362	138	223	-139	-38%	277	140	199	-78	-28%
		0.8	WB	171	112	159	-12	-7%	146	107	147	+1	1%	152	107	144	-8	-5%
7	Sheen Lane	0.9	NB	152	144	148	-4	-2%	165	156	158	-7	-4%	158	150	153	-4	-3%
		0.9	SB	148	144	145	-4	-2%	152	149	151	-1	-1%	149	146	147	-2	-1%
8	Queens Road (Richmond)	1.4	NB	137	120	139	+2	1%	137	129	143	+6	4%	540	489	542	+2	0%
		1.4	SB	125	119	138	+13	10%	119	118	125	+7	6%	120	118	128	+8	7%
9	Richmond Hill / Friars Stile Road	1.9	EB	141	137	143	+2	1%	142	142	144	+1	1%	139	138	140	+1	1%
		1.9	WB	144	139	155	+11	8%	142	142	142	+0	0%	140	139	145	+4	3%
10	Ham Gate Avenue	0.9	NB	106	105	105	-2	-1%	105	105	104	-1	-1%	105	104	104	-1	-1%
		0.9	SB	106	100	100	-6	-6%	106	106	106	+0	0%	105	104	103	-2	-2%
11	Richmond Park Road / Acre Road	1.1	NB	203	203	198	-6	-3%	190	164	189	-2	-1%	191	191	187	-4	-2%
		1.1	SB	222	212	193	-29	-13%	201	186	181	-19	-10%	211	201	194	-17	-8%
12	Queens Road (Kingston)	0.5	NB	138	136	143	+5	4%	131	130	133	+2	2%	133	131	135	+3	2%
		0.5	SB	149	147	150	+2	1%	166	165	167	+1	1%	156	154	156	+1	1%

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Saturday - May										
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)					
				2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	
1	Roehampton Lane	2.6	EB	138	129	139	+1	1%	129	121	129	-1	-1%	
		2.6	WB	131	128	129	-2	-2%	125	120	123	-2	-1%	
2	A308 / A3	5.9	NB	115	108	117	+1	1%	109	103	110	+2	2%	
		5.9	SB	130	117	140	+10	8%	116	107	119	+4	3%	
3	A307	5.4	NB	141	136	140	-1	-1%	384	354	396	+12	3%	
		5.4	SB	129	124	128	-1	-1%	358	340	364	+6	2%	
4	Upper Richmond Road West	4.5	EB	220	191	241	+21	9%	193	171	203	+10	5%	
		4.5	WB	290	209	279	-11	-4%	211	173	211	-0	0%	
5	Priory Lane	1.3	NB	134	121	165	+31	23%	385	378	406	+21	5%	
		1.3	SB	110	119	117	+7	6%	319	327	346	+27	8%	
6	Clarence Lane	0.8	EB	185	142	157	-28	-15%	157	131	139	-18	-11%	
		0.8	WB	133	109	113	-20	-15%	117	103	106	-12	-10%	
7	Sheen Lane	0.9	NB	161	154	156	-5	-3%	150	146	148	-2	-2%	
		0.9	SB	150	150	150	-0	0%	143	142	142	-1	-1%	
8	Queens Road (Richmond)	1.4	NB	115	114	120	+5	5%	473	448	480	+7	2%	
		1.4	SB	114	114	117	+4	3%	109	110	111	+2	2%	
9	Richmond Hill / Friars Stile Road	1.9	EB	140	140	139	-2	-1%	134	134	133	-0	0%	
		1.9	WB	141	141	142	+1	1%	133	133	134	+1	1%	
10	Ham Gate Avenue	0.9	NB	105	104	104	-1	-1%	101	101	101	-0	0%	
		0.9	SB	106	106	106	-1	0%	104	104	104	-0	0%	
11	Richmond Park Road / Acre Road	1.1	NB	191	158	202	+11	6%	218	156	239	+21	10%	
		1.1	SB	194	192	234	+41	21%	190	192	245	+55	29%	
12	Queens Road (Kingston)	0.5	NB	129	126	127	-2	-1%	121	120	121	-1	-1%	
		0.5	SB	155	156	156	+1	0%	147	146	146	-0	0%	

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Sunday - May										
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)					
				2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	
1	Roehampton Lane	2.6	EB	125	116	124	-2	-1%	119	111	117	-2	-2%	
		2.6	WB	121	115	119	-2	-2%	116	112	115	-1	-1%	
2	A308 / A3	5.9	NB	110	104	111	+0	0%	103	99	104	+1	1%	
		5.9	SB	113	109	120	+7	6%	105	102	107	+2	2%	
3	A307	5.4	NB	127	125	126	-1	-1%	348	338	355	+7	2%	
		5.4	SB	118	117	119	+1	1%	339	326	343	+4	1%	
4	Upper Richmond Road West	4.5	EB	185	169	198	+12	7%	164	153	173	+9	5%	
		4.5	WB	207	179	200	-7	-3%	169	154	168	-1	-1%	
5	Priory Lane	1.3	NB	143	174	160	+17	12%	376	440	407	+31	8%	
		1.3	SB	114	118	133	+19	16%	332	331	347	+16	5%	
6	Clarence Lane	0.8	EB	163	144	158	-5	-3%	152	131	144	-8	-5%	
		0.8	WB	137	107	130	-7	-5%	120	102	110	-10	-8%	
7	Sheen Lane	0.9	NB	150	149	150	-1	0%	145	144	144	-1	-1%	
		0.9	SB	145	145	147	+2	1%	141	140	141	+0	0%	
8	Queens Road (Richmond)	1.4	NB	109	108	108	-0	0%	447	431	453	+6	1%	
		1.4	SB	115	116	116	+2	2%	107	108	109	+2	2%	
9	Richmond Hill / Friars Stile Road	1.9	EB	146	148	146	+0	0%	140	141	140	+0	0%	
		1.9	WB	146	146	146	+1	0%	136	137	138	+1	1%	
10	Ham Gate Avenue	0.9	NB	112	113	112	-0	0%	106	106	106	-0	0%	
		0.9	SB	110	111	110	-0	0%	109	109	108	-1	-1%	
11	Richmond Park Road / Acre Road	1.1	NB	214	154	235	+21	10%	181	154	265	+84	47%	
		1.1	SB	185	211	205	+20	11%	212	195	213	+1	1%	
12	Queens Road (Kingston)	0.5	NB	128	127	127	-1	-1%	122	123	122	-0	0%	
		0.5	SB	154	155	158	+3	2%	146	147	148	+3	2%	

Detailed Vehicle Journey Time Analysis (May) (total seconds across route)

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Weekday - May														
				Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
				2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff
1	Roehampton Lane	2.6	NB	501	345	557	+55	11%	424	356	403	-21	-5%	445	349	452	+7	2%
		2.6	SB	387	336	388	+2	0%	410	349	405	-5	-1%	398	345	399	+1	0%
2	A308 / A3	5.9	NEB	757	650	756	-1	0%	761	692	752	-9	-1%	734	665	736	+3	0%
		5.9	SWB	789	666	772	-17	-2%	804	718	918	+114	14%	771	692	817	+46	6%
3	A307	5.4	NB	829	726	808	-21	-3%	764	745	781	+18	2%	771	692	817	+46	6%
		5.4	SB	694	648	718	+24	3%	709	683	710	+1	0%	734	665	736	+3	0%
4	Upper Richmond Road West	4.5	EB	1022	746	1200	+178	17%	1059	853	1087	+28	3%	1008	806	1086	+78	8%
		4.5	WB	1212	717	998	-214	-18%	1358	898	1253	-106	-8%	1206	815	1062	-143	-12%
5	Priory Lane	1.3	NB	197	160	195	-2	-1%	235	177	216	-20	-8%	206	165	199	-7	-3%
		1.3	SB	168	150	188	+20	12%	159	142	165	+6	4%	159	145	172	+13	8%
6	Clarence Lane	0.8	EB	188	107	164	-24	-13%	286	109	176	-110	-38%	218	111	157	-62	-28%
		0.8	WB	135	89	126	-10	-7%	115	85	116	+1	1%	120	84	114	-6	-5%
7	Sheen Lane	0.9	NB	138	130	134	-3	-2%	149	141	143	-7	-4%	143	136	139	-4	-3%
		0.9	SB	134	130	131	-3	-2%	138	135	137	-1	-1%	135	132	133	-2	-1%
8	Queens Road (Richmond)	1.4	NEB	187	164	189	+3	1%	186	176	194	+8	4%	734	665	736	+3	0%
		1.4	SWB	173	166	191	+18	10%	165	164	174	+9	6%	167	164	178	+11	7%
9	Richmond Hill / Friars Stile Road	1.9	NB	268	260	271	+4	1%	270	269	272	+2	1%	263	261	266	+3	1%
		1.9	SB	273	264	293	+21	8%	269	269	269	+1	0%	266	263	274	+8	3%
10	Ham Gate Avenue	0.9	EB	97	96	95	-1	-1%	96	95	95	-1	-1%	96	95	95	-1	-1%
		0.9	WB	96	91	91	-6	-6%	96	96	96	+0	0%	96	94	94	-2	-2%
11	Richmond Park Road / Acre Road	1.1	EB	229	229	223	-6	-3%	214	184	212	-2	-1%	215	215	210	-5	-2%
		1.1	WB	250	239	217	-33	-13%	226	210	204	-22	-10%	237	226	218	-19	-8%
12	Queens Road (Kingston)	0.5	NB	69	67	71	+3	4%	65	65	66	+1	2%	66	65	67	+1	2%
		0.5	SB	74	73	75	+1	1%	83	82	83	+1	1%	78	77	78	+0	1%

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Saturday - May										
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)					
				2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	
1	Roehampton Lane	2.6	EB	358	335	361	+3	1%	336	314	335	-2	-1%	
		2.6	WB	342	333	336	-6	-2%	326	314	322	-4	-1%	
2	A308 / A3	5.9	NB	682	639	688	+7	1%	642	609	652	+10	2%	
		5.9	SB	769	691	829	+60	8%	688	634	708	+21	3%	
3	A307	5.4	NB	758	730	752	-6	-1%	2063	1901	2125	+63	3%	
		5.4	SB	693	668	688	-5	-1%	1927	1827	1956	+30	2%	
4	Upper Richmond Road West	4.5	EB	996	864	1090	+94	9%	873	776	920	+47	5%	
		4.5	WB	1292	932	1243	-49	-4%	941	770	940	-1	0%	
5	Priory Lane	1.3	NB	174	156	214	+40	23%	499	489	526	+27	5%	
		1.3	SB	143	154	151	+9	6%	414	424	449	+35	8%	
6	Clarence Lane	0.8	EB	146	112	124	-22	-15%	124	104	110	-14	-11%	
		0.8	WB	105	86	89	-16	-15%	93	81	83	-9	-10%	
7	Sheen Lane	0.9	NB	146	140	141	-4	-3%	136	133	134	-2	-2%	
		0.9	SB	136	136	136	-0	0%	129	129	129	-1	-1%	
8	Queens Road (Richmond)	1.4	NB	156	155	163	+7	5%	642	609	652	+10	2%	
		1.4	SB	158	159	163	+5	3%	152	153	155	+3	2%	
9	Richmond Hill / Friars Stile Road	1.9	EB	266	264	263	-3	-1%	253	255	252	-1	0%	
		1.9	WB	268	267	269	+1	1%	252	253	254	+2	1%	
10	Ham Gate Avenue	0.9	NB	95	95	95	-1	-1%	92	92	92	-0	0%	
		0.9	SB	97	96	97	-0	0%	95	95	95	-0	0%	
11	Richmond Park Road / Acre Road	1.1	NB	215	178	227	+13	6%	246	176	269	+24	10%	
		1.1	SB	218	216	264	+46	21%	214	216	276	+61	29%	
12	Queens Road (Kingston)	0.5	NB	64	63	63	-1	-1%	61	60	60	-0	-1%	
		0.5	SB	77	78	78	+0	0%	73	73	73	-0	0%	

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Sunday - May										
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)					
				2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	
1	Roehampton Lane	2.6	EB	326	300	321	-5	-1%	309	289	303	-6	-2%	
		2.6	WB	317	301	312	-5	-2%	303	293	300	-4	-1%	
2	A308 / A3	5.9	NB	651	612	654	+3	0%	607	585	615	+8	1%	
		5.9	SB	672	645	712	+40	6%	624	604	636	+12	2%	
3	A307	5.4	NB	682	674	679	-4	-1%	1871	1813	1908	+37	2%	
		5.4	SB	634	627	639	+5	1%	1822	1755	1845	+23	1%	
4	Upper Richmond Road West	4.5	EB	840	763	896	+56	7%	744	691	784	+40	5%	
		4.5	WB	923	796	892	-31	-3%	755	689	749	-5	-1%	
5	Priory Lane	1.3	NB	185	225	208	+23	12%	486	569	526	+40	8%	
		1.3	SB	148	153	173	+24	16%	430	430	450	+20	5%	
6	Clarence Lane	0.8	EB	129	114	125	-4	-3%	120	104	114	-6	-5%	
		0.8	WB	108	84	103	-6	-5%	95	81	87	-8	-8%	
7	Sheen Lane	0.9	NB	136	135	136	-0	0%	131	131	131	-1	-1%	
		0.9	SB	132	132	133	+2	1%	127	127	128	+0	0%	
8	Queens Road (Richmond)	1.4	NB	148	147	147	-1	0%	607	585	615	+8	1%	
		1.4	SB	159	161	162	+3	2%	149	151	152	+3	2%	
9	Richmond Hill / Friars Stile Road	1.9	EB	277	280	277	+0	0%	264	267	264	+0	0%	
		1.9	WB	276	277	277	+1	0%	258	259	261	+2	1%	
10	Ham Gate Avenue	0.9	NB	102	103	102	-0	0%	97	96	97	-0	0%	
		0.9	SB	101	101	100	-0	0%	99	99	98	-1	-1%	
11	Richmond Park Road / Acre Road	1.1	NB	241	174	265	+24	10%	203	174	298	+95	47%	
		1.1	SB	208	238	230	+22	11%	238	219	240	+2	1%	
12	Queens Road (Kingston)	0.5	NB	64	63	63	-0	-1%	61	61	61	-0	0%	
		0.5	SB	77	77	79	+2	2%	73	73	74	+1	2%	

Appendix C Detailed Vehicle Journey Time Analysis – August (seconds/km)

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Weekday - August														
				Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
				2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff
1	Roehampton Lane	2.6	EB	141	142	148	+7	5%	138	132	144	+5	4%	139	137	147	+8	6%
		2.6	WB	133	125	133	+0	0%	138	136	140	+2	1%	135	132	137	+2	1%
2	A308 / A3	5.9	NB	110	106	108	-2	-2%	119	122	123	+4	3%	114	113	115	+1	1%
		5.9	SB	134	116	118	-16	-12%	139	127	129	-9	-7%	142	125	128	-15	-10%
3	A307	5.4	NB	116	113	115	-1	-1%	126	126	126	-0	0%	471	414	422	-48	-10%
		5.4	SB	113	113	114	+0	0%	121	121	122	+1	1%	375	373	378	+3	1%
4	Upper Richmond Road West	4.5	EB	190	199	193	+4	2%	209	227	212	+3	1%	199	212	204	+5	3%
		4.5	WB	195	187	179	-16	-8%	230	233	219	-11	-5%	209	211	202	-7	-3%
5	Priory Lane	1.3	NB	135	153	138	+3	2%	139	153	214	+75	54%	406	449	500	+94	23%
		1.3	SB	115	116	121	+6	5%	121	115	121	-0	0%	347	344	359	+13	4%
6	Clarence Lane	0.8	EB	145	128	156	+11	8%	228	145	243	+14	6%	179	143	237	+58	32%
		0.8	WB	122	107	117	-6	-5%	124	119	118	-7	-5%	121	112	119	-2	-2%
7	Sheen Lane	0.9	NB	134	133	133	-1	-1%	147	144	143	-4	-3%	142	140	140	-2	-2%
		0.9	SB	140	137	138	-1	-1%	140	139	139	-1	-1%	140	139	139	-1	-1%
8	Queens Road (Richmond)	1.4	NB	105	105	107	+2	2%	111	111	112	+1	1%	495	492	499	+4	1%
		1.4	SB	113	115	116	+2	2%	113	115	116	+3	2%	114	115	117	+3	2%
9	Richmond Hill / Friars Stile Road	1.9	EB	125	125	125	-0	0%	138	136	137	-1	-1%	132	131	131	-0	0%
		1.9	WB	132	132	132	+0	0%	134	134	134	-0	0%	134	134	134	+0	0%
10	Ham Gate Avenue	0.9	NB	106	106	106	+0	0%	106	106	106	+0	0%	105	105	105	+0	0%
		0.9	SB	107	108	108	+0	0%	109	109	109	+0	0%	108	108	108	+0	0%
11	Richmond Park Road / Acre Road	1.1	NB	170	215	171	+1	1%	168	162	191	+23	14%	167	183	184	+17	10%
		1.1	SB	157	206	169	+12	8%	188	214	182	-7	-4%	177	210	182	+5	3%
12	Queens Road (Kingston)	0.5	NB	124	123	125	+1	1%	128	127	130	+2	1%	126	123	127	+2	1%
		0.5	SB	139	135	137	-1	-1%	155	156	155	-0	0%	147	146	147	+0	0%

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Saturday - August										
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)					
				2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	
1	Roehampton Lane	2.6	EB	130	138	143	+13	10%	123	125	131	+9	7%	
		2.6	WB	127	124	128	+1	1%	121	119	122	+1	1%	
2	A308 / A3	5.9	NB	116	114	115	-1	-1%	109	106	108	-1	-1%	
		5.9	SB	150	133	133	-18	-12%	128	116	115	-12	-10%	
3	A307	5.4	NB	131	131	130	-1	-1%	423	386	382	-40	-10%	
		5.4	SB	128	128	127	-1	-1%	359	348	355	-4	-1%	
4	Upper Richmond Road West	4.5	EB	201	224	215	+14	7%	181	193	187	+6	4%	
		4.5	WB	215	231	227	+12	6%	180	188	186	+6	3%	
5	Priory Lane	1.3	NB	147	183	151	+3	2%	406	430	401	-5	-1%	
		1.3	SB	111	120	121	+11	10%	317	343	344	+27	9%	
6	Clarence Lane	0.8	EB	194	156	325	+131	67%	176	158	292	+116	66%	
		0.8	WB	118	107	106	-13	-11%	109	107	106	-4	-3%	
7	Sheen Lane	0.9	NB	144	144	143	-1	-1%	140	140	139	-1	-1%	
		0.9	SB	141	142	141	+0	0%	135	135	135	-0	0%	
8	Queens Road (Richmond)	1.4	NB	107	107	107	+0	0%	474	459	468	-6	-1%	
		1.4	SB	111	114	113	+1	1%	107	109	109	+2	2%	
9	Richmond Hill / Friars Stile Road	1.9	EB	137	137	137	-0	0%	131	131	131	-0	0%	
		1.9	WB	140	140	140	-0	0%	131	131	131	+0	0%	
10	Ham Gate Avenue	0.9	NB	106	106	106	-0	0%	102	103	103	+0	0%	
		0.9	SB	109	109	109	-0	0%	108	108	108	-0	0%	
11	Richmond Park Road / Acre Road	1.1	NB	184	176	163	-22	-12%	154	180	214	+59	38%	
		1.1	SB	166	196	226	+60	36%	159	195	197	+38	24%	
12	Queens Road (Kingston)	0.5	NB	129	129	129	+1	1%	121	121	121	+0	0%	
		0.5	SB	145	147	146	+1	1%	139	140	140	+1	1%	

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Sunday - August									
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
				2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)
1	Roehampton Lane	2.6	EB	129	123	130	+1	1%	125	118	125	-0	0%
		2.6	WB	125	118	120	-5	-4%	122	115	117	-5	-4%
2	A308 / A3	5.9	NB	111	109	111	+0	0%	107	104	108	+1	1%
		5.9	SB	118	116	116	-3	-2%	105	104	104	-1	-1%
3	A307	5.4	NB	119	119	119	+0	0%	348	345	346	-2	-1%
		5.4	SB	116	116	116	+0	0%	352	344	356	+4	1%
4	Upper Richmond Road West	4.5	EB	171	189	181	+10	6%	159	172	167	+8	5%
		4.5	WB	167	181	184	+17	10%	150	157	160	+10	7%
5	Priory Lane	1.3	NB	144	140	144	+0	0%	427	389	403	-24	-6%
		1.3	SB	112	126	126	+14	13%	335	345	366	+31	9%
6	Clarence Lane	0.8	EB	157	172	207	+50	32%	152	145	228	+75	49%
		0.8	WB	113	104	111	-2	-1%	114	104	111	-3	-3%
7	Sheen Lane	0.9	NB	145	144	144	-1	-1%	142	142	142	-1	0%
		0.9	SB	144	143	142	-2	-1%	138	138	138	-1	0%
8	Queens Road (Richmond)	1.4	NB	102	103	103	+1	1%	465	454	470	+6	1%
		1.4	SB	110	111	112	+3	2%	106	107	108	+2	2%
9	Richmond Hill / Friars Stile Road	1.9	EB	142	142	142	-0	0%	136	137	137	+0	0%
		1.9	WB	139	142	141	+2	2%	134	135	134	-0	0%
10	Ham Gate Avenue	0.9	NB	110	111	110	-0	0%	107	107	107	-0	0%
		0.9	SB	111	112	111	+0	0%	109	110	110	+0	0%
11	Richmond Park Road / Acre Road	1.1	NB	162	161	215	+54	33%	178	155	255	+77	43%
		1.1	SB	179	204	182	+3	1%	144	227	199	+55	38%
12	Queens Road (Kingston)	0.5	NB	121	122	124	+2	2%	119	119	120	+0	0%
		0.5	SB	148	148	149	+1	1%	142	142	143	+1	1%

Detailed Vehicle Journey Time Analysis - August (total seconds across route)

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Weekday - August														
				Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
				2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff
1	Roehampton Lane	2.6	EB	366	369	385	+19	5%	360	342	373	+14	4%	362	356	383	+21	6%
		2.6	WB	346	327	347	+1	0%	360	355	365	+5	1%	352	344	357	+4	1%
2	A308 / A3	5.9	NB	650	624	638	-11	-2%	705	720	729	+23	3%	673	669	678	+6	1%
		5.9	SB	797	686	700	-97	-12%	822	754	767	-55	-7%	843	741	756	-87	-10%
3	A307	5.4	NB	625	605	617	-8	-1%	677	676	675	-3	0%	2528	2224	2268	-260	-10%
		5.4	SB	609	605	611	+3	0%	652	653	658	+7	1%	2018	2006	2035	+18	1%
4	Upper Richmond Road West	4.5	EB	858	900	875	+17	2%	946	1028	960	+14	1%	899	959	924	+25	3%
		4.5	WB	869	832	796	-73	-8%	1025	1040	977	-48	-5%	931	943	900	-32	-3%
5	Priory Lane	1.3	NB	175	198	178	+4	2%	180	199	277	+97	54%	525	581	647	+121	23%
		1.3	SB	149	150	157	+8	5%	157	149	157	-0	0%	450	446	466	+16	4%
6	Clarence Lane	0.8	EB	114	101	123	+9	8%	180	114	192	+11	6%	141	113	187	+46	32%
		0.8	WB	97	84	92	-4	-5%	98	94	93	-5	-5%	96	88	94	-2	-2%
7	Sheen Lane	0.9	NB	121	120	120	-1	-1%	133	130	130	-3	-3%	129	127	127	-2	-2%
		0.9	SB	127	124	125	-1	-1%	127	126	126	-1	-1%	127	126	126	-1	-1%
8	Queens Road (Richmond)	1.4	NB	143	143	145	+3	2%	151	151	152	+1	1%	673	669	678	+6	1%
		1.4	SB	158	160	161	+3	2%	157	160	161	+4	2%	158	160	162	+4	2%
9	Richmond Hill / Friars Stile Road	1.9	EB	237	236	237	-0	0%	262	258	260	-2	-1%	250	248	249	-1	0%
		1.9	WB	250	250	251	+0	0%	254	255	254	-0	0%	253	253	254	+0	0%
10	Ham Gate Avenue	0.9	NB	96	96	96	+0	0%	97	97	97	+0	0%	96	96	96	+0	0%
		0.9	SB	98	98	98	+0	0%	99	99	99	+0	0%	98	98	98	+0	0%
11	Richmond Park Road / Acre Road	1.1	NB	192	242	193	+1	1%	189	182	214	+26	14%	187	206	207	+20	10%
		1.1	SB	177	232	190	+14	8%	212	240	204	-7	-4%	199	236	205	+6	3%
12	Queens Road (Kingston)	0.5	NB	62	61	62	+1	1%	64	63	65	+1	1%	63	61	63	+1	1%
		0.5	SB	69	67	69	-1	-1%	78	78	77	-0	0%	73	73	73	+0	0%

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Saturday - August									
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
				2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)
1	Roehampton Lane	2.6	EB	339	360	372	+34	10%	318	326	341	+22	7%
		2.6	WB	333	325	335	+2	1%	317	310	319	+2	1%
2	A308 / A3	5.9	NB	688	673	680	-7	-1%	643	624	636	-8	-1%
		5.9	SB	892	791	786	-105	-12%	757	690	684	-72	-10%
3	A307	5.4	NB	703	703	698	-5	-1%	2270	2070	2053	-217	-10%
		5.4	SB	688	689	682	-5	-1%	1930	1872	1907	-23	-1%
4	Upper Richmond Road West	4.5	EB	909	1013	975	+65	7%	818	872	847	+29	4%
		4.5	WB	958	1028	1013	+55	6%	802	837	828	+27	3%
5	Priory Lane	1.3	NB	191	237	195	+4	2%	526	556	519	-7	-1%
		1.3	SB	143	155	157	+14	10%	411	444	446	+36	9%
6	Clarence Lane	0.8	EB	153	123	257	+103	67%	139	125	230	+91	66%
		0.8	WB	93	84	83	-10	-11%	86	85	83	-3	-3%
7	Sheen Lane	0.9	NB	130	130	130	-1	-1%	127	127	126	-1	-1%
		0.9	SB	128	128	128	+0	0%	122	122	122	-0	0%
8	Queens Road (Richmond)	1.4	NB	145	145	145	+0	0%	643	624	636	-8	-1%
		1.4	SB	155	158	157	+2	1%	149	151	152	+3	2%
9	Richmond Hill / Friars Stile Road	1.9	EB	260	259	260	-1	0%	248	248	248	-0	0%
		1.9	WB	266	265	265	-1	0%	247	248	248	+1	0%
10	Ham Gate Avenue	0.9	NB	96	96	96	-0	0%	93	94	94	+0	0%
		0.9	SB	99	99	99	-0	0%	98	98	98	-0	0%
11	Richmond Park Road / Acre Road	1.1	NB	208	198	183	-24	-12%	174	203	241	+67	38%
		1.1	SB	187	220	255	+67	36%	179	220	222	+43	24%
12	Queens Road (Kingston)	0.5	NB	64	64	64	+0	1%	60	60	60	+0	0%
		0.5	SB	72	73	73	+0	1%	69	70	70	+0	1%

Journey Time Route No.	Location	Distance of Route (km)	Direction	Average Vehicle Journey Time - Sunday - August										
				Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)					
				2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	
1	Roehampton Lane	2.6	EB	336	319	338	+2	1%	325	306	324	-1	0%	
		2.6	WB	325	309	313	-12	-4%	318	301	306	-12	-4%	
2	A308 / A3	5.9	NB	656	641	657	+0	0%	631	616	639	+7	1%	
		5.9	SB	701	687	685	-16	-2%	624	617	619	-4	-1%	
3	A307	5.4	NB	638	639	640	+2	0%	1871	1851	1858	-12	-1%	
		5.4	SB	622	626	624	+1	0%	1893	1849	1916	+22	1%	
4	Upper Richmond Road West	4.5	EB	775	857	821	+46	6%	720	777	756	+37	5%	
		4.5	WB	746	808	820	+74	10%	667	702	714	+47	7%	
5	Priory Lane	1.3	NB	186	181	187	+1	0%	553	503	522	-31	-6%	
		1.3	SB	145	163	164	+18	13%	434	447	474	+40	9%	
6	Clarence Lane	0.8	EB	124	136	164	+40	32%	120	115	180	+59	49%	
		0.8	WB	89	82	88	-1	-1%	90	82	87	-2	-3%	
7	Sheen Lane	0.9	NB	132	130	130	-1	-1%	129	128	128	-1	0%	
		0.9	SB	130	129	129	-2	-1%	125	125	125	-1	0%	
8	Queens Road (Richmond)	1.4	NB	138	139	139	+1	1%	631	616	639	+7	1%	
		1.4	SB	153	155	156	+4	2%	147	149	150	+3	2%	
9	Richmond Hill / Friars Stile Road	1.9	EB	269	268	269	-0	0%	258	259	259	+1	0%	
		1.9	WB	263	269	267	+4	2%	255	256	255	-0	0%	
10	Ham Gate Avenue	0.9	NB	101	101	100	-0	0%	98	98	98	-0	0%	
		0.9	SB	101	102	102	+0	0%	100	100	100	+0	0%	
11	Richmond Park Road / Acre Road	1.1	NB	182	181	242	+60	33%	200	175	287	+87	43%	
		1.1	SB	201	230	204	+3	1%	161	255	223	+62	38%	
12	Queens Road (Kingston)	0.5	NB	60	61	62	+1	2%	59	59	60	+0	0%	
		0.5	SB	74	74	74	+0	1%	71	71	71	+0	1%	

Appendix D Detailed Bus Journey Time Analysis – May (seconds/km)

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - May Weekday														
					Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	250	162	288	+38	15%	279	198	276	-3	-1%	251	184	265	+14	5%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	346	156	235	-110	-32%	525	194	346	-179	-34%	386	181	276	-110	-28%
65	Eden Street	Richmond George Street	6.6	NB	228	170	209	-20	-9%	233	193	219	-14	-6%	220	186	208	-12	-6%
	Richmond George Street	Eden Street	6.6	SB	179	154	160	-19	-10%	185	197	154	-31	-17%	180	177	154	-25	-14%
85	Clarence St	Medfield Street	8.0	NEB	174	149	173	-2	-1%	174	163	174	+0	0%	171	159	171	-0	0%
	Medfield Street	Clarence St	6.4	SWB	183	144	153	-29	-16%	189	156	182	-6	-3%	181	152	162	-20	-11%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	176	140	179	+4	2%	165	155	165	-1	0%	167	151	168	+1	1%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	180	148	177	-3	-1%	195	169	192	-3	-2%	182	162	181	-2	-1%
337	Wakefield Road	Roehampton Lane	4.6	EB	250	163	298	+48	19%	271	198	280	+9	3%	249	185	273	+24	9%
	Roehampton Lane	Wakefield Road	4.5	WB	325	143	226	-100	-31%	510	170	303	-207	-41%	368	162	252	-116	-32%
493	Richmond George Street	Medfield Street	5.0	EB	246	171	257	+11	4%	270	200	275	+5	2%	247	188	256	+8	3%
	Medfield Street	Richmond George Street	6.1	WB	312	152	235	-77	-25%	440	173	282	-158	-36%	336	168	247	-89	-26%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	146	117	147	+1	0%	140	134	147	+7	5%	142	127	144	+3	2%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	159	130	161	+2	1%	150	138	157	+7	4%	152	135	156	+4	2%

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - May Saturday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	243	201	275	+32	13%	211	186	230	+18	9%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	370	199	301	-69	-19%	264	179	237	-26	-10%
65	Eden Street	Richmond George Street	6.6	NB	226	192	210	-16	-7%	198	180	187	-11	-6%
	Richmond George Street	Eden Street	6.6	SB	192	178	156	-36	-19%	173	167	143	-30	-17%
85	Clarence St	Medfield Street	8.0	NEB	164	161	157	-7	-4%	155	152	151	-4	-3%
	Medfield Street	Clarence St	6.4	SWB	187	152	162	-25	-13%	166	147	138	-27	-17%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	156	158	151	-5	-3%	150	149	144	-6	-4%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	169	168	164	-5	-3%	159	132	154	-5	-3%
337	Wakefield Road	Roehampton Lane	4.6	EB	250	201	286	+37	15%	217	182	239	+22	10%
	Roehampton Lane	Wakefield Road	4.5	WB	355	181	290	-65	-18%	241	163	224	-17	-7%
493	Richmond George Street	Medfield Street	5.0	EB	231	197	253	+22	9%	205	182	215	+11	5%
	Medfield Street	Richmond George Street	6.1	WB	324	180	267	-57	-18%	228	162	213	-15	-7%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	140	132	126	-15	-10%	131	128	125	-7	-5%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	155	138	145	-10	-6%	141	133	137	-4	-3%

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - May Sunday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	203	193	231	+28	14%	186	178	203	+18	9%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	240	194	228	-12	-5%	201	174	192	-10	-5%
65	Eden Street	Richmond George Street	6.6	NB	193	185	190	-3	-1%	176	171	173	-3	-2%
	Richmond George Street	Eden Street	6.6	SB	169	170	148	-21	-12%	155	156	133	-22	-14%
85	Clarence St	Medfield Street	8.0	NEB	157	164	154	-3	-2%	150	186	147	-3	-2%
	Medfield Street	Clarence St	6.4	SWB	161	149	143	-18	-11%	151	144	129	-23	-15%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	151	148	151	+0	0%	142	128	142	-0	0%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	158	153	155	-2	-2%	150	134	148	-2	-2%
337	Wakefield Road	Roehampton Lane	4.6	EB	214	195	245	+31	15%	194	176	217	+23	12%
	Roehampton Lane	Wakefield Road	4.5	WB	226	177	214	-13	-6%	187	161	183	-4	-2%
493	Richmond George Street	Medfield Street	5.0	EB	202	184	223	+20	10%	185	171	201	+16	8%
	Medfield Street	Richmond George Street	6.1	WB	215	172	209	-6	-3%	180	156	180	-1	0%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	129	124	125	-3	-2%	121	118	118	-3	-2%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	136	135	145	+10	7%	133	130	134	+1	1%

Detailed Bus Journey Time Analysis – May (total seconds across route)

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - May Weekday														
					Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	1355	879	1559	+204	15%	1514	1070	1497	-16	-1%	1360	997	1433	+73	5%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	1891	854	1288	-603	-32%	2873	1060	1895	-978	-34%	2111	990	1510	-601	-28%
65	Eden Street	Richmond George Street	6.6	NB	1510	1126	1380	-130	-9%	1546	1280	1450	-96	-6%	1459	1234	1378	-81	-6%
	Richmond George Street	Eden Street	6.6	SB	1188	1020	1064	-124	-10%	1230	1304	1021	-209	-17%	1193	1175	1025	-168	-14%
85	Clarence St	Medfield Street	8.0	NEB	1394	1194	1381	-12	-1%	1390	1305	1390	+0	0%	1368	1274	1364	-4	0%
	Medfield Street	Clarence St	6.4	SWB	1178	926	990	-188	-16%	1216	1007	1175	-41	-3%	1169	980	1043	-126	-11%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	881	704	899	+18	2%	829	777	825	-4	0%	839	757	843	+4	1%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	1118	920	1102	-16	-1%	1213	1051	1192	-21	-2%	1133	1005	1123	-10	-1%
337	Wakefield Road	Roehampton Lane	4.6	EB	1158	758	1382	+224	19%	1256	917	1297	+41	3%	1156	860	1265	+109	9%
	Roehampton Lane	Wakefield Road	4.5	WB	1467	645	1018	-449	-31%	2299	765	1366	-933	-41%	1659	732	1136	-523	-32%
493	Richmond George Street	Medfield Street	5.0	EB	1230	855	1285	+55	4%	1349	998	1374	+25	2%	1235	936	1277	+42	3%
	Medfield Street	Richmond George Street	6.1	WB	1902	927	1432	-471	-25%	2678	1053	1715	-963	-36%	2047	1022	1505	-542	-26%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	454	364	456	+2	0%	434	415	455	+21	5%	440	396	448	+8	2%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	990	812	1005	+14	1%	937	858	978	+41	4%	948	842	971	+23	2%

Bus Service No.	Start	End	Distance of Route (km)	Direction	Average Bus Journey Time - May Saturday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	1314	1088	1487	+173	13%	1144	1008	1244	+100	9%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	2024	1090	1646	-378	-19%	1443	981	1298	-145	-10%
65	Eden Street	Richmond George Street	6.6	NB	1493	1269	1390	-103	-7%	1313	1190	1237	-75	-6%
	Richmond George Street	Eden Street	6.6	SB	1276	1184	1036	-240	-19%	1149	1109	951	-199	-17%
85	Clarence St	Medfield Street	8.0	NEB	1313	1289	1259	-54	-4%	1240	1213	1205	-35	-3%
	Medfield Street	Clarence St	6.4	SWB	1205	979	1044	-161	-13%	1069	946	891	-177	-17%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	784	791	758	-26	-3%	751	747	723	-28	-4%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	1049	1046	1020	-29	-3%	987	824	957	-30	-3%
337	Wakefield Road	Roehampton Lane	4.6	EB	1158	933	1328	+170	15%	1005	845	1107	+102	10%
	Roehampton Lane	Wakefield Road	4.5	WB	1601	818	1308	-293	-18%	1087	734	1010	-77	-7%
493	Richmond George Street	Medfield Street	5.0	EB	1155	981	1264	+109	9%	1021	910	1075	+53	5%
	Medfield Street	Richmond George Street	6.1	WB	1972	1094	1625	-348	-18%	1389	984	1297	-92	-7%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	435	411	390	-46	-10%	408	399	386	-21	-5%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	966	863	906	-61	-6%	881	830	857	-24	-3%

Bus Service No.	Start	End	Distance of Route (km)	Direction	Average Bus Journey Time - May Sunday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	1097	1043	1250	+153	14%	1006	962	1102	+95	9%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	1316	1061	1250	-66	-5%	1102	954	1050	-52	-5%
65	Eden Street	Richmond George Street	6.6	NB	1278	1223	1260	-18	-1%	1164	1130	1143	-21	-2%
	Richmond George Street	Eden Street	6.6	SB	1121	1127	983	-138	-12%	1028	1037	880	-148	-14%
85	Clarence St	Medfield Street	8.0	NEB	1254	1313	1228	-26	-2%	1197	1489	1176	-21	-2%
	Medfield Street	Clarence St	6.4	SWB	1041	961	924	-117	-11%	977	928	830	-147	-15%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	754	739	754	+0	0%	712	640	710	-2	0%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	981	953	965	-15	-2%	932	836	918	-14	-2%
337	Wakefield Road	Roehampton Lane	4.6	EB	991	903	1135	+145	15%	899	815	1006	+107	12%
	Roehampton Lane	Wakefield Road	4.5	WB	1021	800	964	-57	-6%	841	726	825	-16	-2%
493	Richmond George Street	Medfield Street	5.0	EB	1009	918	1111	+102	10%	925	853	1003	+78	8%
	Medfield Street	Richmond George Street	6.1	WB	1308	1050	1273	-34	-3%	1099	948	1095	-4	0%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	399	386	389	-10	-2%	376	366	367	-9	-2%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	846	839	907	+62	7%	828	808	834	+6	1%

Appendix E Detailed Bus Journey Time Analysis – August (seconds/km)

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - August Weekday														
					Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 %Diff
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	209	180	205	-5	-2%	229	207	227	-3	-1%	218	187	217	-2	-1%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	210	207	204	-6	-3%	285	289	255	-30	-10%	248	249	234	-13	-5%
65	Eden Street	Richmond George Street	6.6	NB	191	174	170	-21	-11%	221	215	190	-30	-14%	206	194	183	-22	-11%
	Richmond George Street	Eden Street	6.6	SB	167	130	163	-4	-2%	192	141	178	-14	-7%	182	135	174	-7	-4%
85	Clarence St	Medfield Street	8.0	NEB	161	154	156	-6	-3%	169	169	186	+17	10%	165	161	169	+4	2%
	Medfield Street	Clarence St	6.4	SWB	149	137	139	-10	-7%	154	157	163	+9	6%	153	148	154	+1	1%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	162	157	159	-3	-2%	157	154	157	-0	0%	157	155	158	+1	0%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	172	161	164	-9	-5%	184	178	176	-8	-4%	174	169	169	-5	-3%
337	Wakefield Road	Roehampton Lane	4.6	EB	212	190	212	-1	0%	233	225	236	+2	1%	221	205	225	+3	2%
	Roehampton Lane	Wakefield Road	4.5	WB	205	206	196	-8	-4%	256	280	237	-20	-8%	228	244	222	-6	-3%
493	Richmond George Street	Medfield Street	5.0	EB	211	202	220	+9	4%	232	238	250	+18	8%	219	221	238	+19	8%
	Medfield Street	Richmond George Street	6.1	WB	202	192	207	+5	3%	235	246	235	+0	0%	218	221	226	+8	4%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	133	133	140	+7	5%	135	134	135	+1	0%	133	133	136	+3	2%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	147	142	149	+1	1%	146	142	146	-0	0%	145	142	146	+0	0%

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - August Saturday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	213	187	221	+7	4%	197	166	197	+0	0%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	240	247	266	+25	10%	207	210	220	+13	6%
65	Eden Street	Richmond George Street	6.6	NB	209	200	194	-15	-7%	193	184	182	-11	-6%
	Richmond George Street	Eden Street	6.6	SB	220	145	184	-35	-16%	188	134	170	-18	-9%
85	Clarence St	Medfield Street	8.0	NEB	179	157	157	-22	-12%	160	150	151	-9	-6%
	Medfield Street	Clarence St	6.4	SWB	145	137	148	+2	2%	135	128	133	-2	-2%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	155	156	158	+3	2%	147	147	147	-0	0%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	165	162	170	+5	3%	156	156	157	+2	1%
337	Wakefield Road	Roehampton Lane	4.6	EB	212	216	238	+25	12%	196	186	212	+17	8%
	Roehampton Lane	Wakefield Road	4.5	WB	221	245	267	+45	21%	187	203	218	+31	17%
493	Richmond George Street	Medfield Street	5.0	EB	193	227	239	+45	23%	183	200	214	+31	17%
	Medfield Street	Richmond George Street	6.1	WB	201	222	255	+54	27%	177	188	211	+34	19%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	125	127	129	+3	3%	122	123	126	+4	3%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	138	147	142	+4	3%	134	135	136	+2	2%

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - August Sunday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)	2019 (secs/km)	2020 (secs/km)	2021 (secs/km)	Change (secs/km)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	202	160	201	-1	-1%	192	151	187	-5	-3%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	206	207	219	+13	6%	187	181	188	+2	1%
65	Eden Street	Richmond George Street	6.6	NB	192	183	181	-11	-5%	183	169	169	-14	-7%
	Richmond George Street	Eden Street	6.6	SB	169	137	167	-2	-1%	159	126	154	-5	-3%
85	Clarence St	Medfield Street	8.0	NEB	165	149	153	-11	-7%	164	142	146	-18	-11%
	Medfield Street	Clarence St	6.4	SWB	133	127	133	+0	0%	128	119	128	+0	0%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	157	148	158	+2	1%	152	140	147	-5	-3%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	160	152	159	-1	-1%	153	146	150	-3	-2%
337	Wakefield Road	Roehampton Lane	4.6	EB	205	193	218	+13	6%	189	174	201	+12	6%
	Roehampton Lane	Wakefield Road	4.5	WB	190	209	217	+28	15%	173	181	186	+13	7%
493	Richmond George Street	Medfield Street	5.0	EB	190	200	223	+33	17%	178	186	205	+27	15%
	Medfield Street	Richmond George Street	6.1	WB	183	190	219	+36	19%	164	167	191	+26	16%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	135	117	124	-10	-8%	153	114	119	-33	-22%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	136	131	140	+4	3%	134	129	134	+1	0%

Detailed Bus Journey Time Analysis – August (total seconds across route)

Bus Service No.	Route Start	Route End	Distance of Route (km)	Direction	Average Bus Journey Time - August Weekday														
					Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 %Diff
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	1134	977	1109	-25	-2%	1241	1119	1227	-14	-1%	1183	1015	1173	-9	-1%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	1149	1135	1115	-34	-3%	1561	1584	1398	-163	-10%	1356	1360	1283	-73	-5%
65	Eden Street	Richmond George Street	6.6	NB	1264	1149	1128	-136	-11%	1460	1425	1260	-201	-14%	1360	1286	1213	-148	-11%
	Richmond George Street	Eden Street	6.6	SB	1109	860	1083	-26	-2%	1275	934	1180	-95	-7%	1205	898	1158	-48	-4%
85	Clarence St	Medfield Street	8.0	NEB	1288	1235	1244	-44	-3%	1350	1348	1484	+134	10%	1318	1286	1348	+30	2%
	Medfield Street	Clarence St	6.4	SWB	961	884	895	-66	-7%	995	1011	1051	+56	6%	988	953	994	+5	1%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	811	788	796	-15	-2%	785	773	784	-1	0%	787	775	791	+4	0%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	1073	1002	1020	-53	-5%	1142	1107	1093	-49	-4%	1080	1055	1048	-31	-3%
337	Wakefield Road	Roehampton Lane	4.6	EB	986	883	982	-3	0%	1082	1046	1093	+10	1%	1026	949	1042	+16	2%
	Roehampton Lane	Wakefield Road	4.5	WB	923	929	886	-37	-4%	1155	1264	1067	-88	-8%	1028	1100	1002	-26	-3%
493	Richmond George Street	Medfield Street	5.0	EB	1056	1010	1100	+44	4%	1160	1190	1249	+89	8%	1094	1101	1186	+93	8%
	Medfield Street	Richmond George Street	6.1	WB	1229	1169	1261	+32	3%	1429	1496	1431	+2	0%	1331	1350	1380	+49	4%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	413	411	433	+21	5%	419	417	420	+2	0%	414	413	422	+9	2%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	919	884	928	+9	1%	912	888	910	-2	0%	906	886	908	+2	0%

Bus Service No.	Start	End	Distance of Route (km)	Direction	Average Bus Journey Time - August Saturday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	1155	1014	1195	+41	4%	1067	900	1067	+0	0%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	1316	1353	1453	+137	10%	1135	1150	1206	+71	6%
65	Eden Street	Richmond George Street	6.6	NB	1383	1326	1284	-99	-7%	1274	1220	1203	-71	-6%
	Richmond George Street	Eden Street	6.6	SB	1457	961	1222	-235	-16%	1245	892	1128	-117	-9%
85	Clarence St	Medfield Street	8.0	NEB	1431	1254	1258	-173	-12%	1279	1202	1208	-71	-6%
	Medfield Street	Clarence St	6.4	SWB	936	882	952	+16	2%	873	823	857	-16	-2%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	777	781	793	+16	2%	737	738	737	-0	0%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	1026	1009	1059	+32	3%	968	968	978	+10	1%
337	Wakefield Road	Roehampton Lane	4.6	EB	985	1003	1102	+117	12%	907	862	984	+77	8%
	Roehampton Lane	Wakefield Road	4.5	WB	997	1106	1202	+205	21%	844	915	984	+140	17%
493	Richmond George Street	Medfield Street	5.0	EB	965	1131	1191	+226	23%	914	1001	1068	+154	17%
	Medfield Street	Richmond George Street	6.1	WB	1225	1355	1555	+329	27%	1079	1143	1286	+207	19%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	389	394	399	+10	3%	378	383	390	+13	3%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	860	916	888	+28	3%	835	842	850	+16	2%

Bus Service No.	Start	End	Distance of Route (km)	Direction	Average Bus Journey Time - August Sunday									
					Average Hour IP (10:00-16:00)					Average Hour Daily (07:00-19:00)				
					2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)	2019 (secs)	2020 (secs)	2021 (secs)	Change (secs)	2019-2021 Difference (%)
33	Richmond Road, Twickenham	Rocks Lane Barnes station	5.4	EB	1094	864	1086	-8	-1%	1041	817	1015	-26	-3%
	Rocks Lane Barnes station	Richmond Road, Twickenham	5.5	WB	1126	1133	1199	+72	6%	1021	993	1030	+9	1%
65	Eden Street	Richmond George Street	6.6	NB	1271	1209	1201	-70	-5%	1210	1119	1120	-90	-7%
	Richmond George Street	Eden Street	6.6	SB	1124	910	1109	-15	-1%	1054	833	1019	-35	-3%
85	Clarence St	Medfield Street	8.0	NEB	1317	1192	1226	-91	-7%	1311	1136	1170	-141	-11%
	Medfield Street	Clarence St	6.4	SWB	856	818	856	+1	0%	828	767	828	+1	0%
265	A3 Kingstone Bypass	Rocks Lane	5.0	NB	784	741	794	+9	1%	761	702	738	-23	-3%
	Rocks Lane	A3 Kingstone Bypass	6.2	SB	996	949	989	-8	-1%	953	910	933	-21	-2%
337	Wakefield Road	Roehampton Lane	4.6	EB	952	897	1012	+61	6%	876	809	932	+56	6%
	Roehampton Lane	Wakefield Road	4.5	WB	855	942	980	+124	15%	779	816	837	+58	7%
493	Richmond George Street	Medfield Street	5.0	EB	950	996	1115	+164	17%	889	927	1024	+135	15%
	Medfield Street	Richmond George Street	6.1	WB	1118	1158	1334	+217	19%	1001	1018	1161	+161	16%
K3	Richmond Town Centre	Asda Roehampton	3.1	NEB	418	365	386	-32	-8%	474	354	371	-103	-22%
	Asda Roehampton	Richmond Town Centre	6.2	SWB	849	820	874	+25	3%	834	803	837	+3	0%

Appendix F Detailed Vehicle Volume Analysis – May (TfL Data)

Site	Location	Direction	Vehicle Volume Summary - Weekday - May														
			Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Total Daily (07:00-19:00)				
			2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)
Site 67	B353 Queen's Road	NB	519	221	563	+43	8%	403	256	481	+78	19%	1,688	981	1,855	+166	10%
		SB	313	180	458	+144	46%	374	269	460	+86	23%	1,321	959	1,682	+360	27%
		2w ay	833	401	1,020	+188	23%	777	525	941	+164	21%	3,010	1,940	3,536	+527	17%
Site 90	A316 Twickenham Road	NEB	2,028	634	1,105	-923	-46%	1,726	1,121	1,634	-92	-5%	6,559	3,663	5,365	-1194	-18%
		SWB	1,290	1,194	1,825	+536	42%	1,755	845	1,354	-401	-23%	5,695	3,799	5,650	-45	-1%
		2w ay	3,318	1,828	2,931	-388	-12%	3,481	1,966	2,988	-493	-14%	12,254	7,462	11,015	-1239	-10%
Site 191	A205 Clifford Avenue	NB	504	374	540	+36	7%	507	466	531	+24	5%	2,314	1,649	2,261	-53	-2%
		SB	625	486	630	+4	1%	750	477	731	-19	-2%	2,673	1,802	2,690	+17	1%
		2w ay	1,129	859	1,169	+40	4%	1,257	943	1,262	+5	0%	4,987	3,451	4,951	-36	-1%
Site 24	A205 Upper Richmond Avenue	EB	718	694	729	+11	1%	848	783	894	+46	5%	3,121	2,872	3,315	+194	6%
		WB	623	665	813	+190	30%	523	742	786	+263	50%	2,487	2,733	3,203	+716	29%
		2w ay	1,341	1,359	1,542	+201	15%	1,371	1,526	1,680	+309	23%	5,608	5,605	6,518	+910	16%
Site 319	A306 Roehampton Lane	NB	494	471	641	+147	30%	414	419	521	+107	26%	1,771	1,660	2,289	+518	29%
		SB	339	192	414	+75	22%	424	330	491	+68	16%	1,476	1,070	1,760	+283	19%
		2w ay	833	663	1,055	+222	27%	838	749	1,012	+174	21%	3,247	2,730	4,049	+802	25%
Site 138	A3 Kingston Road	NB	2,350	1,734	2,186	-164	-7%	2,359	1,499	2,099	-259	-11%	8,529	5,947	8,022	-507	-6%
		SB	2,106	1,215	1,988	-118	-6%	2,830	2,049	2,723	-107	-4%	9,276	6,796	8,971	-305	-3%
		2w ay	4,456	2,950	4,174	-282	-6%	5,188	3,548	4,822	-366	-7%	17,805	12,742	16,993	-812	-5%

Site	Location	Direction	Vehicle Volume Summary - Saturday - May																			
			Saturday										Sunday									
			Average Hour IP (10:00-16:00)					Total Daily (07:00-19:00)					Average Hour IP (10:00-16:00)					Total Daily (07:00-19:00)				
			2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)
Site 67	B353 Queen's Road	NB	427	275	474	+47	11%	1,470	965	1,621	+152	10%	390	268	436	+46	12%	1,286	875	1,441	+155	12%
		SB	349	293	450	+101	29%	1,246	979	1,522	+276	22%	356	287	431	+75	21%	1,172	888	1,347	+175	15%
		2w ay	776	569	924	+148	19%	2,716	1,944	3,144	+428	16%	746	554	868	+121	16%	2,458	1,763	2,788	+330	13%
Site 90	A316 Twickenham Road	NEB	1,474	836	1,381	-92	-6%	5,445	2,563	4,618	-827	-15%	1,522	701	1,268	-254	-17%	5,154	2,563	4,618	-536	-10%
		SWB	1,291	852	1,487	+196	15%	4,470	3,027	5,341	+870	19%	1,176	740	1,419	+243	21%	4,470	2,496	4,834	+364	8%
		2w ay	2,764	1,688	2,868	+104	4%	9,915	5,590	9,958	+43	0%	2,698	1,441	2,687	-10	0%	9,624	5,059	9,452	-172	-2%
Site 191	A205 Clifford Avenue	NB	701	399	611	-90	-13%	2,500	1,431	2,269	-231	-9%	734	358	609	-125	-17%	2,357	1,231	2,053	-304	-13%
		SB	674	429	693	+19	3%	2,593	1,542	2,626	+33	1%	648	385	668	+20	3%	2,339	1,279	2,325	-14	-1%
		2w ay	1,374	828	1,304	-71	-5%	5,094	2,973	4,895	-199	-4%	1,382	743	1,277	-105	-8%	4,696	2,510	4,378	-318	-7%
Site 24	A205 Upper Richmond Avenue	EB	804	699	887	+84	10%	3,041	2,512	3,412	+371	12%	779	648	888	+110	14%	2,842	2,186	3,213	+370	13%
		WB	609	683	822	+213	35%	2,606	2,405	3,225	+618	24%	690	611	838	+148	21%	2,541	2,063	3,018	+477	19%
		2w ay	1,413	1,382	1,709	+296	21%	5,648	4,917	6,637	+989	18%	1,469	1,259	1,727	+258	18%	5,383	4,249	6,231	+847	16%
Site 319	A306 Roehampton Lane	NB	422	389	577	+155	37%	1,716	1,386	2,239	+523	30%	454	336	536	+81	18%	1,668	1,180	1,991	+323	19%
		SB	382	278	504	+121	32%	1,295	901	1,750	+455	35%	337	229	440	+103	31%	1,130	736	1,467	+338	30%
		2w ay	804	667	1,081	+276	34%	3,011	2,288	3,989	+978	32%	791	565	975	+184	23%	2,798	1,916	3,458	+660	24%
Site 138	A3 Kingston Road	NB	4,271	2,999	4,381	+111	3%	8,076	5,399	8,129	+54	1%	4,517	2,709	3,928	-589	-13%	7,873	4,719	7,180	-693	-9%
		SB	4,944	3,501	5,019	+74	2%	8,798	5,828	8,782	-16	0%	4,442	3,165	4,656	+214	5%	7,777	5,020	7,861	+83	1%
		2w ay	9,215	6,500	9,400	+185	2%	16,874	11,227	16,911	+38	0%	8,959	5,874	8,584	-375	-4%	15,650	9,739	15,041	-610	-4%

Appendix G Detailed Vehicle Volume Analysis – August (TfL Data)

Site	Location	Direction	Vehicle Volume Summary - Weekday - August														
			Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Total Daily (07:00-19:00)				
			2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)
Site 67	B353 Queen's Road	NB	398	368	364	-34	-8%	383	393	411	+28	7%	1,470	1,487	1,495	+25	2%
		SB	259	264	276	+17	6%	350	394	402	+52	15%	1,193	1,359	1,378	+185	16%
		2w ay	657	632	640	-17	-3%	733	787	812	+79	11%	2,663	2,846	2,873	+210	8%
Site 90	A316 Twickenham Road	NEB	1,832	934	970	-862	-47%	1,558	1,545	1,622	+64	4%	6,162	5,179	5,246	-916	-15%
		SWB	1,115	1,640	1,616	+501	45%	1,597	1,359	1,407	-190	-12%	5,324	5,622	5,644	+319	6%
		2w ay	2,947	2,574	2,587	-360	-12%	3,155	2,904	3,029	-126	-4%	11,486	10,801	10,890	-596	-5%
Site 191	A205 Clifford Avenue	NB	555	507	558	+3	1%	525	493	526	+1	0%	2,438	2,195	2,309	-129	-5%
		SB	634	611	626	-8	-1%	733	630	733	-1	0%	2,675	2,406	2,634	-41	-2%
		2w ay	1,189	1,118	1,184	-5	0%	1,258	1,123	1,259	+1	0%	5,113	4,601	4,943	-170	-3%
Site 24	A205 Upper Richmond Avenue	EB	692	781	749	+57	8%	861	909	888	+27	3%	3,037	3,395	3,294	+256	8%
		WB	765	891	831	+67	9%	642	805	775	+133	21%	2,807	3,335	3,211	+404	14%
		2w ay	1,457	1,672	1,581	+124	9%	1,504	1,714	1,663	+159	11%	5,844	6,730	6,505	+661	11%
Site 319	A306 Roehampton Lane	NB	563	661	689	+125	22%	466	522	563	+97	21%	1,932	2,240	2,396	+464	24%
		SB	277	293	360	+83	30%	437	443	530	+93	21%	1,403	1,544	1,822	+419	30%
		2w ay	840	953	1,049	+209	25%	903	965	1,093	+190	21%	3,334	3,784	4,218	+883	26%
Site 138	A3 Kingston Road	NB	2,095	2,013	2,087	-8	0%	2,247	2,025	2,069	-178	-8%	7,983	7,530	7,825	-158	-2%
		SB	1,845	1,596	1,702	-143	-8%	2,742	2,417	2,616	-127	-5%	8,916	8,087	8,605	-311	-3%
		2w ay	3,940	3,609	3,789	-151	-4%	4,989	4,442	4,685	-305	-6%	16,898	15,616	16,430	-468	-3%

Site	Location	Direction	Vehicle Volume Summary - Saturday - May																					
			Saturday										Sunday											
			Average Hour IP (10:00-16:00)					Total Daily (07:00-19:00)					Average Hour IP (10:00-16:00)						Total Daily (07:00-19:00)					
			2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)	2019 (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change 2019 to 2021 (Vehicles)	Change 2019 to 2021 (%)		
Site 67	B353 Queen's Road	NB	384	367	427	+42	11%	1,326	1,269	1,431	+104	8%	325	340	402	+77	24%	1,122	1,154	1,326	+204	18%		
		SB	311	397	372	+60	19%	1,103	1,327	1,277	+174	16%	289	369	372	+83	29%	949	1,183	1,199	+250	26%		
		2w ay	696	763	798	+103	15%	2,430	2,596	2,707	+278	11%	614	710	774	+160	26%	2,071	2,337	2,526	+455	22%		
Site 90	A316 Twickenham Road	NEB	1,513	1,341	1,416	-97	-6%	5,301	4,638	4,997	-305	-6%	1,386	1,116	1,285	-101	-7%	4,681	3,804	4,334	-346	-7%		
		SWB	1,264	1,419	1,533	+269	21%	4,549	4,967	5,333	+784	17%	1,110	1,342	1,452	+342	31%	3,830	4,523	4,929	+1099	29%		
		2w ay	2,778	2,760	2,949	+172	6%	9,851	9,605	10,330	+480	5%	2,496	2,457	2,737	+241	10%	8,510	8,327	9,263	+753	9%		
Site 191	A205 Clifford Avenue	NB	721	610	589	-133	-18%	2,512	2,146	2,185	-327	-13%	711	607	596	-116	-16%	2,305	1,956	2,021	-284	-12%		
		SB	631	563	674	+43	7%	2,451	2,141	2,483	+32	1%	574	547	650	+76	13%	2,106	1,933	2,293	+187	9%		
		2w ay	1,353	1,173	1,263	-90	-7%	4,964	4,287	4,669	-295	-6%	1,285	1,154	1,245	-40	-3%	4,411	3,890	4,314	-97	-2%		
Site 24	A205 Upper Richmond Avenue	EB	759	873	886	+126	17%	2,867	3,228	3,300	+433	15%	720	842	884	+163	23%	2,598	3,012	3,154	+556	21%		
		WB	703	851	834	+132	19%	2,703	3,203	3,151	+447	17%	754	853	860	+107	14%	2,615	2,959	3,002	+388	15%		
		2w ay	1,462	1,724	1,720	+258	18%	5,570	6,432	6,451	+881	16%	1,474	1,696	1,744	+270	18%	5,213	5,970	6,156	+943	18%		
Site 319	A306 Roehampton Lane	NB	483	541	601	+119	25%	1,790	1,965	2,168	+379	21%	573	503	573	+0	0%	1,953	1,748	2,030	+77	4%		
		SB	361	390	456	+95	26%	1,219	1,317	1,591	+372	31%	378	335	412	+34	9%	1,289	1,107	1,389	+100	8%		
		2w ay	844	931	1,057	+214	25%	3,009	3,282	3,760	+751	25%	951	838	986	+35	4%	3,242	2,855	3,419	+177	5%		
Site 138	A3 Kingston Road	NB	4,067	3,940	4,058	-10	0%	7,418	7,256	7,297	-120	-2%	3,833	3,870	3,899	+66	2%	6,702	6,805	6,981	+279	4%		
		SB	4,665	4,458	4,437	-228	-5%	8,220	7,726	7,940	-280	-3%	4,149	4,217	4,237	+88	2%	7,097	7,022	7,177	+79	1%		
		2w ay	8,732	8,398	8,494	-238	-3%	15,637	14,982	15,238	-400	-3%	7,983	8,087	8,136	+154	2%	13,799	13,827	14,157	+358	3%		

Appendix H Detailed Vehicle Volume Analysis (LBRuT and RBKuT Data)

Vehicle Volume Summary - Weekday - Borough Data																				
ATC Ref.	Pre-trial Day(s)	Pre-trial Month	Pre-trial Year	Location	Direction	Average Hour AM (07:00-10:00)					Average Hour PM (16:00-19:00)					Average Hour Daily (07:00-19:00)				
						Pre-Trial (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change to 2021 (Vehicles)	Change to 2021 (%)	Pre-trial (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change to 2021 (Vehicles)	Change to 2021 (%)	Pre-trial (Vehicles)	2020 (Vehicles)	2021 (Vehicles)	Change to 2021 (Vehicles)	Change to 2021 (%)
LBRuT 49	w/c 17th	Sep	2018	Petersham Road (South of Sandy Lane)	NB	505	0	533	+28	6%	481	0	427	-54	-11%	486	0	456	-31	-6%
					SB	312	0	361	+50	16%	551	0	512	-39	-7%	464	0	428	-36	-8%
RBKuT ATC4	Monday	Oct	2018	Queen's Road (B351)	NB	427	NO DATA	382	-46	-11%	212	NO DATA	245	+33	16%	267	0	268	+1	0%
					SB	231	NO DATA	246	+15	7%	315	NO DATA	311	-4	-1%	245	0	258	+13	5%
RBKuT MCC1	Friday	April	2017	Kingston Hill	NB	445	NO DATA	393	-52	-12%	504	NO DATA	273	-232	-46%	416	0	292	-125	-30%
					SB	510	NO DATA	360	-151	-30%	502	NO DATA	350	-152	-30%	465	0	327	-138	-30%

Vehicle Volume Summary - Saturday - Borough Data													
ATC Ref.	Pre-trial Day(s)	Pre-trial Month	Pre-trial Year	Location	Direction	Average Hour IP (10:00-16:00)				Average Hour Daily (07:00-19:00)			
						Pre-trial (Vehicles)	2021 (Vehicles)	Change to 2021 (Vehicles)	Change to 2021 (%)	Pre-trial (Vehicles)	2021 (Vehicles)	Change to 2021 (Vehicles)	Change to 2021 (%)
LBRuT 49	w/c 17th	Sep	2018	Petersham Road (South of Sandy Lane)	NB	503	495	-8	-2%	457	458	+2	0%
					SB	432	483	+51	12%	392	430	+38	10%

Vehicle Volume Summary - Sunday - Borough Data													
ATC Ref.	Pre-trial Day(s)	Pre-trial Month	Pre-trial Year	Location	Direction	Average Hour IP (10:00-16:00)				Average Hour Daily (07:00-19:00)			
						Pre-trial (Vehicles)	2021 (Vehicles)	Change to 2021 (Vehicles)	Change to 2021 (%)	Pre-trial (Vehicles)	2021 (Vehicles)	Change to 2021 (Vehicles)	Change to 2021 (%)
LBRuT 49	w/c 17th	Sep	2018	Petersham Road (South of Sandy Lane)	NB	410	483	+73	18%	353	413	+60	17%
					SB	348	420	+72	21%	306	361	+56	18%

Appendix I Accident Analysis by Severity and Junction

	Junction	Slight				Serious				Total
		2018	2019	2020	2021	2018	2019	2020	2021	
All Modes	1	4	1	2			1	1	1	10
	2		1	2	1			1		5
	3	2	1	1		1			1	6
	4		1	2		1				3
	5		2			1				3
	6	3	1	2	1	1				8
	7		2							2
	8	2		2	3					7
	9	1	1						1	3
	10	1	1	1	1	1			1	6
	11									0
Total		13	11	12	6	5	1	2	4	54
Vulnerable Road Users (pedestrians and cyclists)	1	4	1	2			1	1	1	10
	2		1	2	1			1		5
	3	1	1	1		1			1	5
	4		1			1				2
	5		2			1				3
	6	3	1	2	1	1				8
	7		2							2
	8			1	2					3
	9	1	1							2
	10	1			1	1			1	4
	11									0
Total		10	10	8	5	5	1	2	3	44