Twickenham Additional Surveys Reference number **108715** 03/06/2019

TRAFFIC SURVEY REPORT, TWICKENHAM,





TWICKENHAM ADDITIONAL SURVEYS

TRAFFIC SURVEY REPORT, TWICKENHAM

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1. INTRODUCTION

1.1 General

- 1.1.1 SYSTRA has been commissioned by the London Borough of Richmond upon Thames (LBR) (the Client) to undertake a series of additional parking, servicing and turning count traffic surveys and associated data analysis in central Twickenham.
- 1.1.2 SYSTRA was previously commissioned to undertake a series of access, parking and servicing surveys, between the **18th and 31st March 2019**, and preparation of a survey analysis report.
- 1.1.3 This study's aim is to ascertain vehicle and servicing movements as well as identifying parking stress across the defined survey area during a scheduled event day at the nearby Twickenham Stadium on Saturday 4th May 2019 to ascertain the impact from the closure of Church Street to vehicle traffic. The road closure took place between 12:00 and 22:00.
- 1.1.4 The following streets form part of the survey area:
 - Bell Lane;
 - Church Street (between Water Lane and Church Lane);
 - King Street;
 - The Embankment (between Wharf Lane and Bell Lane);
 - Water Lane;
 - Wharf Lane; and
 - The service road behind Nos 3 33 King Street.
- 1.1.5 SYSTRA will compare the trends in the parking data to those within the surveys undertaken in March 2019, in order to further understand the impact of the closure of Church Street on adjacent roads, as well any potential increase in traffic due to the matchday event.
- 1.1.6 The survey area is shown in **Figure 1** below, with the closed section of Church Street highlighted in yellow.



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1.1.7 The scope of the work is based on information provided by Mick Potter of LBR on 04/04/19 and subsequent clarification discussions.

1.2 Report Structure

- 1.2.1 The report is structured as follows:
 - Section 2: Parking Surveys Data analysis of the parking survey results to ascertain parking stress levels within the parking survey area. Identification of trends in demand and type of permit users using graphs. Evaluation of the impact of the road closure on capacity, compared to the data collected between 18th-31st March.
 - Section 3: Manual Classified Turning Counts (MCCs) Presentation of traffic flow diagrams during key network peak hours (08:00-09:00 & 17:00-18:00) at the identified junctions where MCCs have been undertaken and well as a 24 hour flow diagram for the King Street/ Water Lane/ Church Street Junction. Key traffic flows have been summarised and analysed.
 - Section 4: Servicing Activity Data analysis of the servicing activity, identifying trends including volume of servicing activity, time taken for loading/ unloading to occur and key locations where servicing activity is occurring.
 - Section 5: Summary Presents a summary of the key findings from the survey analysis.

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2. PARKING SURVEYS

2.1 Introduction

- This section summarises the results of the parking survey undertaken. The data is presented 2.1.1 and analysed below to identify the parking stress levels across the survey area.
- The spatial scope of the parking surveys is as shown in Figure 1. 2.1.2
- 2.1.3 Figure 2 shows a map of LBR CPZ Zone D, detailing the types of parking spaces available within the survey area and immediate surrounding area.



Extract from LBR Zone D CPZ Map

The parking occupancy surveys were carried out between 12:00-13:00 on Saturday 4th May 2.1.4 and consisted of a single beat. It is noted that the weekend of Saturday 4th May was a Bank Holiday weekend, which could have influenced the recorded parking stress levels.

2.2 **Survey Results**

- 2.2.1 Full parking survey results have been supplied alongside this report. It is noted LBR has its own parking survey methodology, which considers 90% as the threshold for "high" parking stress, however for robustness, a threshold of 85% was used. Therefore, parking stress levels exceeding 85% are identified in red.
- When collecting the parking survey results on 4th May, the following capacity on each street 2.2.2 was recorded, as shown in Table 1.

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Table 1.	Survey Area Parking Capacity, by Street	
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STREET	CAPACITY
Water Lane	14
Wharf Lane	10
Bell Lane	0
The Embankment	67
Church Street	8
King Street (South Side)	0
Service Road (off Wharf Road)	0
Survey Area Total	99

- 2.2.3 It is noted that Church Street was closed for parking during this period, and is therefore not included in the analysis below.
- 2.2.4 Bell Lane, King Street and the Service Road were recorded showing minimal parking stress levels, with either no vehicles or one vehicle parked during the survey period. This is due to the presence of double yellow lines prohibiting parking on King Street and the physical width of the carriageway making it physically impossible to park without blocking the carriageway on Bell Lane and the Service Road off Wharf Lane. Therefore, these three streets have been excluded from the parking analysis and calculations below.
- 2.2.5 It is noted that spaces for solo motorcycle parking were not included within the capacity figures for each street. Parked motorcycles have been excluded from the occupancy figures.
- 2.2.6 **Table 2** provide a comparison of the parking stress recorded during the event day compared to the average weekend non-event day scenario.

Table 2. Parking Stress Comparison			
STREET NAME	CAPACITY	EVENT DAY STRESS	NON-EVENT DAY STRESS
Water Lane	14	100%	86%
Wharf Lane	10	50%	80%
The Embankment	67	91%	90%
Survey Area Total	91	88%	88%

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- 2.2.7 The overall survey area parking stress level was recorded as 88% during both event and nonevent day survey periods. This does not exceed LBR's 90% high stress threshold.
- 2.2.8 Water Lane was recorded with the highest event day parking stress with all 14 spaces occupied. Water Lane also exceeds the 'high' stress threshold in the non-event day survey period, with an average of 12 of 14 spaces occupied.
- 2.2.9 The Embankment recorded a parking stress above the 'high' stress threshold of 91% with 61 out of 67 spaces occupied during the event day survey period. This is slightly higher than the non-event day average parking stress level of 90%.
- 2.2.10 Wharf Lane recorded a lower parking stress level in the event day scenario, with five out of ten spaces occupied, compared to the eight spaces occupied on average during the non-event day survey period.

2.3 Parking Permit Analysis

2.3.1 SYSTRA has further analysed the parking data, taking into account the type of parking permits displayed on parked vehicles. **Table 3** provides further information regarding each type of parking permit.

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Table 3. Types of Permits

PERMIT TYPE	MEANING
Resident	Allows residents to park within CPZ hours of operation (08:30-18:30, Monday to Saturday, Pay & Display maximum stay two hours).
Resident Visitor	Allows visitors of residents to park within CPZ hours of operation (08:30-18:30, Monday to Saturday, Pay & Display maximum stay two hours).
Business Permit	Allows employees whose business is located within the CPZ to park.
Richmond Card	Allows those who live in the borough to get parking discounts, including 30 minutes free in any pay and display bay or council owned car park.
Blue Badge	Allows those with a Blue Badge to park in Disabled Bays for no specific time limit.
Indigo Parking Services Dispensation Notice	Allows vehicles to park without a permit.
Pay and Display	Allows people to park for a charge.
Visitor Other	Encompasses vehicles parked using mobile/online payments or a virtual visitor permit to park during CPZ operational hours. Includes all vehicles parked without a permit outside of CPZ operational hours.

- 2.3.2 **Figure 3** shows a comparison of the permit breakdown recorded across the survey area, between the event day surveys and the averaged results from the Saturday daytime nonevent day surveys. It is noted that the variety of Penalty Charge Notices (PCNs) has been included within the retrospective permit (PCN with a Pay and Display ticket or PCN with a Resident permit).
- 2.3.3 Due to the low numbers of Resident Visitor, Disabled, Indigo, Business and Richmond Card parking permits recorded, these have been grouped together into the 'Other' category, for ease of reporting. Bell Lane, King Street and the=Service Road off Wharf Lane have been omitted from the graphs below due to minimal parking activity on these streets across all survey periods. Due to the closure of Church Street, this road is also excluded.

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- 2.3.4 Resident permits were the most common types of permits observed in the event day survey period, with 55 recorded. As the street with the highest level of parking provision, The Embankment recorded the highest number of parked vehicles, at 71% of the total number of vehicles recorded parked within the survey area, including motorcycles.
- 2.3.5 14 vehicles with no permits displayed were recorded across the whole event day survey period (Visitor Other category). The Embankment recorded the highest number of vehicles with no permits displayed during the event day survey period, at nine vehicles.
- 2.3.6 Resident permits were the most common type of permit recorded on both event and nonevent day surveys, comprising 69% of total permits on the event day and 53% on average of the total permits on the non-event survey periods.
- 2.3.7 The Embankment recorded the highest number of permits in both event and non-event survey periods.
- 2.3.8 It can be seen that the proportion of vehicles using Pay & Display permits to park on The Embankment decreases in the event day survey period. It is noted that only six pay and display bays are available on event days within the survey area, compared to 12 on a normal day.
- 2.3.9 Overall, the difference between the number and proportion of permit holder parking between event and non-event day survey periods are relatively minor.

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3. MANUAL CLASSIFIED TURNING COUNTS

3.1 Introduction

- 3.1.1 This section summarises the results of the Manual Classified Turning Counts (MCCs) undertaken, across the survey area. The survey data has been presented and analysed below to demonstrate the traffic levels across the survey area.
- 3.1.2 **Figure 4** shows the location of the junctions where MCC data was collected.



- 3.1.3 The following junctions were surveyed:
 - King Street/Church Street/Water Lane;
 - Water Lane/The Embankment;
 - The Embankment/Bell Lane; and
 - Wharf Lane/Service Road at rear of 3-33 King Street.
- 3.1.4 Counts were carried out over a **24 hour period on Saturday 4th May** using video cameras.
- 3.1.5 The vehicle counts for each junction took into account the turning movement of vehicles.

3.2 Survey Results

3.2.1 **Table 4** summarises the total peak period results of the MCC surveys, showing the number of vehicles approaching from each arm across the four junctions. The flow has been calculated for both AM (08:00 – 09:00) and PM (17:00 – 18:00) peak periods and reflects inbound vehicular flows to the junction.

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JUNCTION	ARM	AM FLOW	PM FLOW
	King Street (N)	680	478
King Street/Church	Church Street	0	0
Street/Water Lane	Water Lane	0	0
	King Street (S)	764	388
The	The Embankment (N)	2	3
Embankment/Bell	The Embankment (S)	10	6
Lane	Bell Lane	1	1
The	The Embankment (N)	4	8
Embankment/Water	The Embankment (S)	2	0
Lane	Water Lane	41	29
	Wharf Lane (N)	0	0
Wharf Lane/Service Road	Service Road	3	1
	Wharf Lane (S)	27	41

Table 4. Total Peak Period Vehicle Flow (08:00-09:00) and (17:00-18:00)

3.2.2 The junctions are discussed below in further detail.

King Street/Church Street/ Water Lane

- 3.2.3 The King Street/Church Street/Water Lane junction is a four arm junction located on the main high street in Central Twickenham. King Street runs northeast to southwest and forms one of the major through routes in the Twickenham area. Water Lane is a one-way side street running southeast towards the River Thames. Church Street is a one-way narrow side street running east and is a pedestrian zone restricted to servicing vehicles or blue badge holders, however as previously identified it was closed for vehicles during the event day scenario between 12:00-22:00 on the 4th May. It is noted that Church Street branches off Water Lane approximately 10 metres away from the junction with King Street, however it was decided to include Church Street within this junction for ease of reporting.
- 3.2.4 It is evident that the King Street/Church Street/Water Lane junction is the busiest junction in terms of vehicle flow across the survey area. The vast majority of flow makes a through movement on King Street, with northbound traffic slightly heavier in the AM peak and southbound traffic slightly heavier in the PM peak. There are minimal flows from King Street to Church Street in the AM peak, and zero flow from King Street to Church Street in the PM peak time period.

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- 3.2.5 As both Water Lane and Church Street are one-way orientated away from the junction, no traffic enters the junctions from these arms.
- 3.2.6 **Figure 5** shows the vehicle flows at the King Street/Water Lane/Church Street junction during the event scenario on the 4th May 2019.



Figure 5. King Street/Water Lane/ Church Street Peak Period Vehicle Flows

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3.2.7 **Figure 6** shows the total number of flows over the 24 hour period at the King Street/ Water Lane/ Church Street junction.



Figure 6. King Street/Water Lane/ Church Street 24 hour Vehicle Flows

3.2.8 **Figure 6** shows that over the 24 hour event day survey period, a total of 1046 vehicles were recorded turning into Water Lane from King Street, of which 195 vehicles turn into Church Street (outside of road closure time period) and 851 vehicles travel down Water Lane.

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The Embankment/Bell Lane

- 3.2.9 The Embankment/Bell Lane junction is a three arm junction located on the banks of the River Thames. The Embankment runs parallel to the river on a northeast-southwest alignment, with the stretch northeast of the junction leading to a parking area with no through access for vehicles. Bell Lane is a one-way narrow street running northwest, connecting with Church Street.
- 3.2.10 The junction is lightly used by vehicles, with the heaviest movement in the AM peak flow being the Embankment (South) to Bell Lane at eight vehicles in the AM peak. There is minimal vehicle movement from Bell Lane, due to the one-way orientation away from the junction and the width of the road.
- 3.2.11 Figure 7 shows the vehicle flows at The Embankment/Bell Lane junction.

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The Embankment/ Water Lane

- 3.2.12 The Embankment/Water Lane junction is a three arm junction located on the banks of the River Thames, approximately 40m southwest of the junction with Bell Lane. Water Lane is a one-way street connecting with King Street, with vehicle traffic permitted to enter from the King Street end only.
- 3.2.13 The junction is lightly used by vehicles, with the heaviest movement for both the AM and PM peaks being Water Lane to The Embankment (South), at 32 and 23 vehicles respectively.
- 3.2.14 As Water Lane is one-way orientated running towards the junction, traffic is not permitted to enter Water Lane from The Embankment.
- 3.2.15 Figure 8 shows the vehicle flows at The Embankment/Water Lane junction.



Figure 8. The Embankment/ Water Lane Peak Period Vehicle Flows

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Wharf Lane/ Service Road

- 3.2.16 Wharf Lane/Service Road is a three arm junction located south of the King Street/ Wharf Lane junction. Wharf Lane is one-way with traffic running northwest from The Embankment to King Street. The Service Road is unnamed and runs northeast from the junction to the rear of the adjacent properties fronting King Street, with through traffic not possible.
- 3.2.17 The heaviest movement during the event scenario is Wharf Lane (South) to Wharf Lane (North), at 21 vehicles in the AM peak and 40 vehicles in the PM peak.
- 3.2.18 As Wharf Lane is one-way orientated running towards King Street, vehicles are not permitted to enter the junction from this direction or travel towards the Embankment.
- 3.2.19 **Figure 9** shows the vehicle flows at The Embankment/ Water Lane junction.

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4. SERVICING ACTIVITY

4.1 Introduction

- 4.1.1 This section summarises the results of the servicing activity surveys undertaken. The data has been presented below to analyse servicing activity across the survey area.
- 4.1.2 **Figure 10** shows the locations of sections of road and junctions where servicing activities were recorded. Sections of highway identified by the Client where servicing activity might be used in future have also been marked for reference.



- 4.1.3 The servicing surveys were carried out over a 24 hour period on Saturday 4th May.
- 4.1.4 The following servicing locations have been included:
 - Loading bays on The Embankment adjacent to footbridge leading to Eel Pie Island;
 - Unnamed Service Road off Wharf Lane; and
 - Kerb on the south side of King Street, between Water Lane and Wharf Lane.
- 4.1.5 In addition where possible, servicing activity has been identified at Wharf Lane, Water Lane, Bell Lane and the junction of Wharf Lane and the Service Road.
- 4.1.6 The length of vehicle dwell time, type of vehicle and where appropriate, the servicing location within a section of highway have been identified for each delivery or service vehicle recorded.

4.2 Servicing Activity Analysis

4.2.1 For the purposes of this analysis, servicing dwell times have been divided into four categories. These are: 0-5 minutes; 5-10 minutes; 10-20 minutes; and over 20 minutes.

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4.2.2 **Figure 11** shows the number of each type of vehicle observed making deliveries or unloading goods. It is noted that the Light Goods Vehicle (LGV) category includes small vans, box vans, minibuses, "transit" type vans, and other LGV types. The Lorry category includes vehicles classed as both OGV1 (larger rigid vehicles with two or three axles) and OGV2 (all rigid vehicles with four or more axles and all articulated vehicles). The Car category includes all Cars, along with Taxis and Minicabs.



Figure 11. Frequency of Servicing Vehicle Type, across Survey Area

- 4.2.3 The most common servicing vehicle observed in the survey area was the motorcycle (94), consisting of 42% of all servicing vehicles. Cars were the second most common servicing vehicle type, at 39% of the total (87). No bicycles were recorded over the survey period.
- 4.2.4 **Figure 12** shows the frequency of service vehicles across the survey area, broken down by street.

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Figure 12. Frequency of Servicing Vehicles, by Street



4.2.5 68% of all vehicles undertaking servicing activity were recorded on King Street (151), with the overwhelming majority occurring on the 80m section of highway between the junction with Water Lane and the pedestrian crossing. Almost all of the servicing activity was related to the retail units fronting King Street, with KFC generating the most trips (81 trips).



4.2.6 **Figure 13** breaks down service vehicles in each location by vehicle.

4.2.7 Motorcycles were the dominant service vehicle type on Water Lane, representing 69% (24) of the total number of vehicles on Water Lane. Motorcycles and cars occupy relatively equal shares on King Street, totalling 69 and 68 vehicles respectively. Motorcycles were not recorded undertaking servicing activity at any other location.

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- 4.2.8 The Embankment recorded only cars and LGV's undertaking serving activity, at 67% (12) and 33% (6) respectively.
- 4.2.9 LGVs were the most common vehicle undertaking servicing activity on the Service Road off Wharf Lane, at 77% (7).
- Both King Street and Wharf Lane recorded four lorries undertaking servicing activity. On 4.2.10 Wharf Lane, lorries were the most common type of servicing vehicle (50%). Bell Lane recorded one LGV, amounting to all servicing activity at this location.
- Figure 14 summarises vehicle dwell times across the survey area. It is noted that this section's 4.2.11 analysis excludes vehicles where dwell time data was not recorded.



Figure 14. **Dwell Times Across the Survey Area**

- 4.2.12 43% of all servicing vehicles (93) recorded dwell times between 0-5 minutes, the highest dwell time category observed. The next highest dwell time period was 5-10 minutes at 29% (64) of all servicing vehicles. The higher dwell time categories of 10-20 minutes and over 20 minutes both recorded 15% (32) and 13% (28) of service vehicles respectively.
- 4.2.13 Figure 15 breaks down the vehicle dwell times by location.

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- 4.2.14 Over three quarters (83%) of servicing activity on King Street took place in the lower dwell time categories, of 0-5 minutes and 5-10 minutes.
- 4.2.15 Conversely, almost 70% of service vehicles observed unloading or delivering on The Embankment (11) recorded dwell times within the higher categories of 10-20 minutes and over 20 minutes.
- 4.2.16 The Service Road off Wharf Lane experienced no servicing activity vehicle dwell times of 0-5 minutes, despite this being the most frequent category overall.
- 4.2.17 Water Lane recorded a relatively even spread of dwell times across all four categories.
- 4.2.18 The most common dwell time for Wharf Lane was 0-5 minutes, with half of all recorded servicing falling within this category. Wharf Lane did not record any service vehicle dwell times in the 10-20 minutes category.
- 4.2.19 It is evident that the majority of servicing activity observed within the survey area takes place on King Street, with over half of all vehicles recorded. The most common type of vehicle observed on King Street were motorcycles with dwell times of ten minutes or less.

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5. SUMMARY

- 5.1.1 SYSTRA has been commissioned by the London Borough of Richmond Upon Thames to undertake a series of parking, servicing and turning count traffic surveys and associated data analysis in Central Twickenham, to identify the impact of the closure of Church Street due to a Twickenham Stadium event.
- 5.1.2 This follows SYSTRA's earlier commission to undertake a series of access, parking and servicing surveys between 18th-31st March 2019 and preparation of a survey analysis report.
- 5.1.3 Overall parking stress across the survey was found to be generally similar on the event day compared to non-event days, with both recording an overall stress of 88%. Higher parking stress on event days was recorded on The Embankment and Water Lane, with lower parking stress on Wharf Lane compared to the non-event day scenario.
- 5.1.4 Resident permits were the most common type of permits observed on both event and nonevent days.
- 5.1.5 The King Street/Church Street/Water Lane junction was recorded as the busiest survey area junction in terms of vehicle flow. The vast majority of flow was recorded making a through movement on King Street. All remaining junctions were relatively lightly trafficked by vehicles during the peak hours.
- 5.1.6 The majority of servicing activity observed within the survey area was observed on King Street, with over half of all vehicles recorded. 0-5 minutes was the most common dwell time, with motorcycles the most common servicing vehicle type, at 42% of the total number of servicing vehicles.

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