# TWICKENHAM CPZ REVIEW & CONSULTATION
# TRAFFIC SURVEY REPORT

SYSTRA

# TWICKENHAM CPZ REVIEW & CONSULTATION

TRAFFIC SURVEY REPORT

| IDENTIFICATION TABLE | |
|---|---|
| **Client/Project owner** | London Borough of Richmond upon Thames |
| **Project** | Twickenham CPZ Review & Consultation |
| **Study** | Traffic Survey Report |
| **Type of document** | Report |
| **Date** | 19/05/2020 |
| **Reference number** | 109735 |

**APPROVAL**

| Version | Name | | Position | Date | Modifications |
|---|---|---|---|---|---|
| 1 | Author | ES | Assistant Consultant | 04/05/2020 | |
| | Checked by | BF | Senior Consultant | 04/05/2020 | |
| | Approved by | EJ/ JS | Principal Consultant / Director | 04/05/2020 | |
| 2 | Author | ES | Assistant Consultant | 19/05/2020 | Added Delivery and Servicing Chapter |
| | Checked by | EJ | Principal Consultant | 19/05/2020 | |
| | Approved by | EJ/ JS | Projects Director | 19/05/2020 | |

# TABLE OF CONTENTS

# LIST OF FIGURES

## LIST OF TABLES

# 1. INTRODUCTION

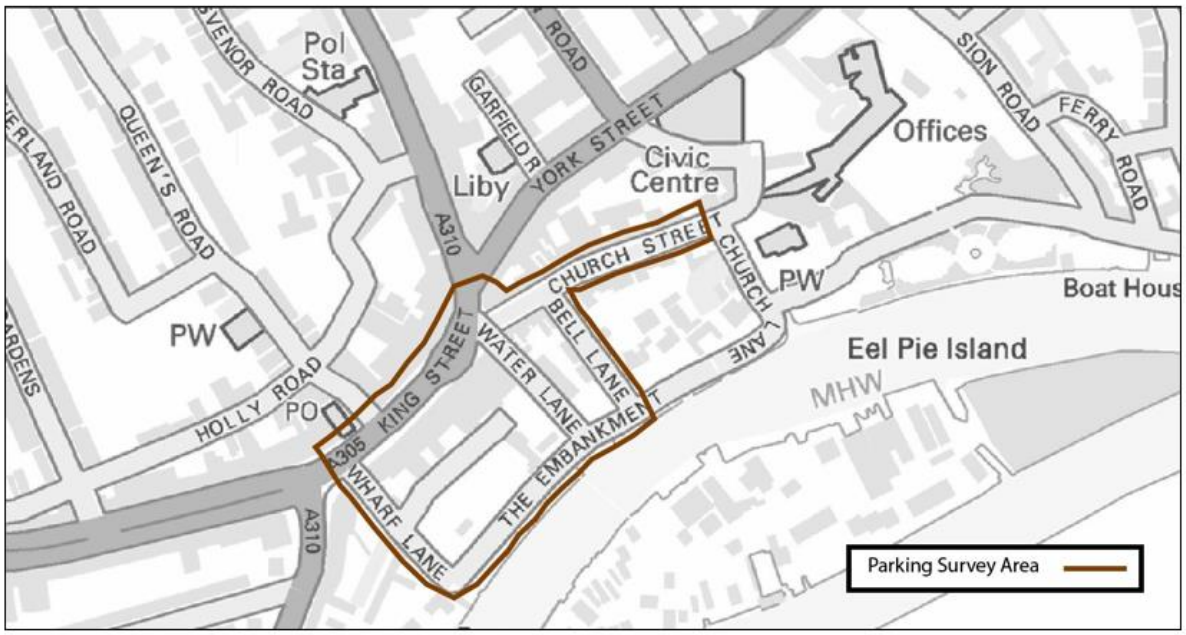
## 1.1 General

1.1.1 SYSTRA Ltd. (SYSTRA) has been commissioned by the London Borough of Richmond upon Thames (LBRuT) (the Client) to undertake a refresh of the previous study of parking, servicing and turning count traffic surveys, and associated data analysis in central Twickenham undertaken by SYSTRA in 2019.

1.1.2 The study aims to ascertain up-to-date vehicle, pedestrian and servicing movements, as well as identifying parking stress within an area of central Twickenham. The survey area remains consistent with the 2019 study to ensure a comparable set of results and includes the following streets and junctions (shown in **Figure 1** below):

- Bell Lane;
- Church Street (between Water Lane and Church Lane);
- King Street (between Wharf Lane and Water Lane);
- The Embankment (between Wharf Lane and Bell Lane);
- Water Lane;
- Wharf Lane; and
- The service road behind Nos 3 – 33 King Street (hereafter referred to as the "Service Road").

**Figure 1. General Survey Area**




1.1.3 The scope of work is based on information provided by Mick Potter, of LBRuT, on 30/01/20, on the scope of the previous study undertaken by SYSTRA in 2019, and subsequent clarification emails.

## 1.2 Context

1.2.1 This study is a refresh of SYSTRA's 2019 study which was based on survey data collected between the 18th and 31st March 2019, and Saturday 4th May 2019 (event day at Twickenham Stadium). The 2019 survey data was reported in a series of technical reports including '108715 Twickenham Surveys SYSTRA 30.05.2019', 'Twickenham Additional Surveys (Event Day 040519) and additional servicing analysis included in 108715 Twickenham Riverside, Options for Parking. Relevant comparisons have been made to these survey results throughout this report.

1.2.2 In addition, in 2019 SYSTRA undertook a review of the potential proposed parking changes along The Embankment to ascertain the impact of the removal of up to 78 car parking spaces along The Embankment, between Water Lane and Wharf Lane, and to establish what scope there is within the area for offsetting this loss by way of the creation of additional spaces an reallocation of spaces within the CPZ.

1.2.3 The surveys for this study were agreed with LBRuT to take place during two consecutive weeks in March 2020, which is exactly a year after the 2019 surveys were undertaken, to ensure directly comparative results. However, it is noted that the Covid-19 pandemic situation developed throughout March 2020, and the potential impacts that this may have had on the survey results has been carefully considered, particularly with regard to the second week of data collected. SYSTRA initially undertook a comparison of the first week and second week results for each survey, to ensure that both weeks results were showing the typical behaviours that were demonstrated in the 2019 results. This allowed SYSTRA to identify that there were no major anomalies in the data, that would impact the survey analysis and reporting.

## 1.3 Report Structure

1.3.1 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. Compares the 2019 and 2020 survey results.
- **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 four identified junctions where MCCs have been undertaken. Key traffic flows have been summarised and analysed. Compares the 2019 and 2020 survey results.
- **Section 4: Pedestrian and Cyclists** – Analysis of survey area pedestrian and cyclist flows through the presentation of diagrams highlighting key trends. Compares the 2019 and 2020 survey results.
- **Section 5: Servicing Activity** – Data analysis of the servicing activity survey results, identifying trends including volume of servicing activity, time taken for loading/ unloading to occur and key locations where servicing activity is occurring. Compares the 2019 and 2020 survey results.

- **Section 6: Changes Proposed & Recommendations** – Explains the parking/ design changes proposed along the Embankment, along with providing recommendations as to how to take the scheme forward into consultation phase, based on the survey data trends.
- **Section 7: Summary** – Provides an overall summary of the survey results and analysis reported in the study.

# 2. PARKING SURVEYS

## 2.1 Introduction

2.1.1 This section summarises the results of the parking surveys undertaken over a two-week period. The parking beat survey data is presented and analysed below to identify the parking stress levels across the survey area.. The survey area of the parking surveys is shown in **Figure 1**.

2.1.2 **Table 1** lists the approximate parking capacity on each street within the survey area. It is noted that the entire survey area falls within LBRuT Controlled Parking Zone (CPZ) D, for which the hours of operation are 08:30-18.30 Monday to Friday.

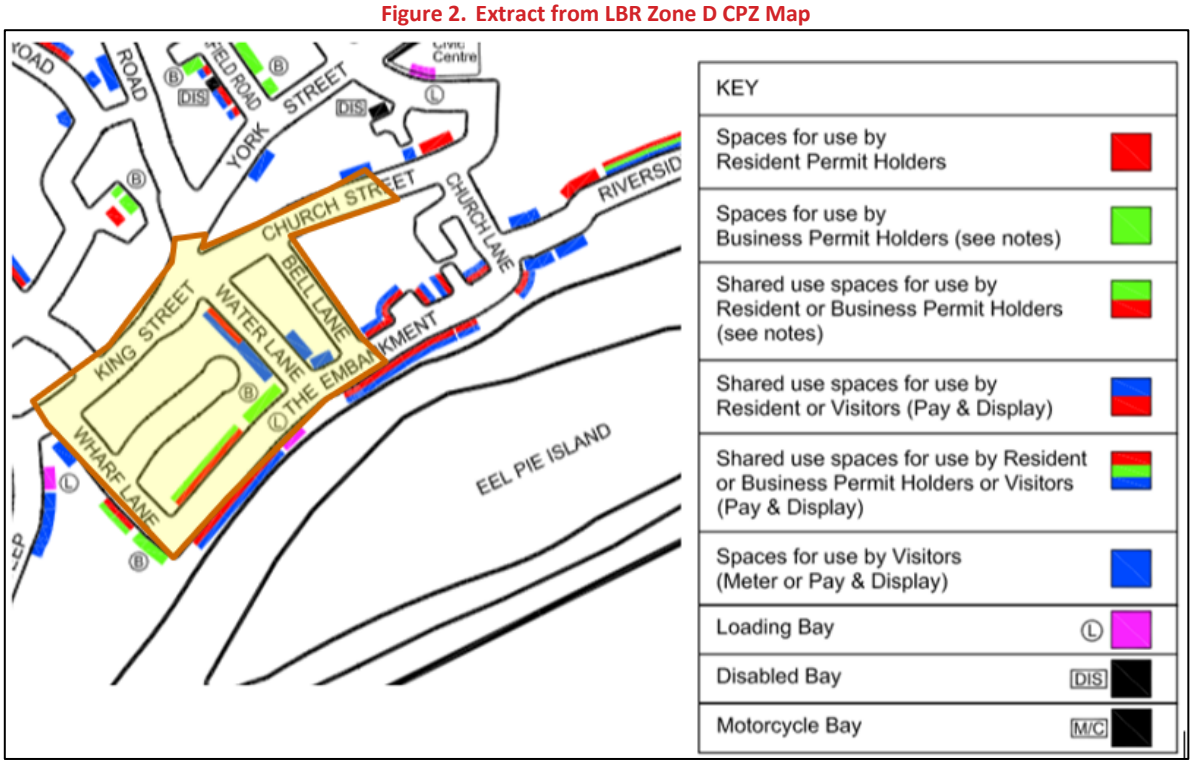
2.1.3 The full extent of Church Street has not been included in the survey scope, therefore the five residential bays located to the east of Church Street have not been assessed. Further to this, The Embankment was only assessed between the Wharf Lane and Bell Lane junctions. Approximately 28 parking bays to the east of The Embankment/ Bell Lane junction have been excluded from this report.

**Table 1. Survey Area Parking Capacity, by Street**

| 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** |

2.1.4 **Figure 2** shows a map of LBRuT CPZ Zone D, detailing the types of parking spaces available within the survey area, with the filled yellow section demonstrating the area part of the survey scope.

Figure 2. Extract from LBR Zone D CPZ Map




2.1.5 The parking occupancy surveys were carried out during the following time periods, with one beat carried out during each period. LBRuT requested that parking surveys were taken on Saturday 7th March, along with neutral weekdays and a neutral Saturday, due to an International Rugby Event being held at Twickenham Stadium, to evaluate levels of demand during event day scenarios. The timings of the matchday daytime parking survey align with the highest peak in demand associated with an event kick off time of 16:45.

**Week 1:**

Daytime Counts:

- Saturday 7th March (matchday) (15:00-16:00)

Overnight Counts:

- Sunday 8th March (01:00-05:30)

**Week 2:**

Daytime Counts:

- Saturday 14th March (15:00-16:00)
- Wednesday 18th March (08:00-10:00 and 15:00-17:00)

Overnight Counts:

- Sunday 15th March (01:00-05:30)
- Wednesday 18th March and Thursday 19th March (01:00 – 05:30)

2.1.6 It is noted that during Week 1, parking beats were attempted during the day and overnight on Tuesday 10th March into Wednesday 11th March. However, there were flood warnings in place and flooding was observed along The Embankment on Tuesday 10th March. The flooding will have had an impact on people's typical travel and parking behaviours and was observed due to lower occupancy levels during this period. As a result, this day has been excluded from the dataset and the weekday parking surveyed were repeated the following week on Wednesday 18th March.

## 2.2 Survey Results

2.2.1 Survey results and analysis are detailed below. Full parking survey results have been provided alongside this report.

2.2.2 LBRuT has its own parking survey analysis methodology, which considers 90% as the threshold for "high" parking stress, however for robustness, a threshold of 85% was used in this study. Therefore, parking stress levels exceeding 85% are identified in red.

2.2.3 **Table 2** below summarises the parking survey results averaged across both weeks the surveys were conducted, with the parking beats being recorded in the AM and PM peaks (08:00-09:00 and 17:00-18:00) of the CPZ hours of 08:30-18:30, during the weekdays. The parking stress levels are split into following four scenarios:

- Weekday Daytime (08:30-10:30 & 15:00-17:00);
- Weekend Daytime (15:00-16:00);
- Weekday Overnight (01:00-05:30); and
- Weekend Overnight (01:00-05:30).

2.2.4 The matchday results have been compiled separately in **Table 7**, to be able to easily identify the difference between an event and non-event day scenario.

2.2.5 It is noted that Bell Lane, King Street and the Service Road off Wharf Lane were recorded showing low parking stress levels, with either no vehicles or one vehicle parked in each survey period. This is due to the presence of double yellow lines prohibiting parking on King Street and the width of the carriageway making it physically impossible to park without blocking the carriageway on Bell Lane and the Service Road. Therefore, these three streets have been excluded from the parking analysis and calculations below.

2.2.6 Spaces for solo motorcycle parking were not included within the capacity figures for each street. Parked motorcycles have been excluded from the occupancy figures.

2.2.7 **Table 2** demonstrates the parking stress for the weekday daytime scenario.

Table 2. Weekday Daytime Parking Stress

| STREET NAME | CAPACITY | PARKING STRESS (08:30-10:30) | PARKING STRESS (15:00-17:00) |
|---|---|---|---|
| Water Lane | 14 | 100% | 64% |
| Wharf Lane | 10 | 80% | 70% |
| The Embankment | 67 | 81% | 85% |
| Church Street | 8 | 38% | 13% |
| **Survey Area Total** | **99** | **80%** | **75%** |

2.2.8 The results show that the overall AM peak parking stress was slightly higher than the PM peak parking stress, at 80% compared to 75% respectively. This differs from the 2019 results where the overall weekday daytime parking stress average was 70% for the AM peak and 79% for the PM peak, i.e. lower that the 2020 results in the AM and higher in the PM.

2.2.9 However, there were more cars parked in total over the whole survey area during the weekday daytime scenario in 2020, averaging at a stress of 77.5% compared to 74.5% in 2019.

2.2.10 The Embankment was recorded to have the highest parking stress levels for this period both in 2019 and 2020.

2.2.11 **Table 3** demonstrates the parking stress for the weekend daytime scenario.

Table 3. Weekend Daytime Parking Stress

| STREET NAME | CAPACITY | STRESS (15:00-16:00) |
|---|---|---|
| Water Lane | 14 | 93% |
| Wharf Lane | 10 | 60% |
| The Embankment | 67 | 73% |
| Church Street | 8 | 38% |
| **Survey Area Total** | **99** | **73%** |

2.2.12 The results show that the overall weekend daytime parking stress level was 73%, with 27 spaces remaining empty across the survey area. In comparison, only 12 spaces remained empty across the survey area in 2019.

2.2.13 In both study years, during the weekend daytime count Water Lane was shown to have the highest parking stress and exceeding the 85% threshold at 93% in 2020 and 86% in 2019.

2.2.14 **Table 4** demonstrates the parking stress for the average weekday overnight scenario.

Table 4. Average Weekday Overnight Stress

| STREET NAME | CAPACITY | STRESS (01:00-05:30) |
|---|---|---|
| Water Lane | 14 | 68% |
| Wharf Lane | 10 | 50% |
| The Embankment | 67 | 72% |
| Church Street | 8 | 25% |
| **Survey Area Total** | **99** | **66%** |

2.2.15 **Table 4** shows that The Embankment recorded the highest parking stress on average, during the weekday overnight period, at 72%. 43 out of 67 spaces were in use on the Wednesday night, while 54 out of 67 spaces were in use on the Thursday night. This is similar to the 2019 results with The Embankment recording a parking stress of 78%, with 52 spaces being occupied, on average.

2.2.16 Across all streets, 65 spaces were occupied during the weekday overnight period in 2020 and 70 were occupied in 2019. Therefore, five more spaces were observed as occupied in the 2019 surveys during the weekday overnight period.

2.2.17 **Table 5** demonstrates the parking stress for the average weekend overnight scenario.

Table 5. Average Weekend Overnight Parking Stress

| STREET NAME | CAPACITY | STRESS (01:00-05:30) |
|---|---|---|
| Water Lane | 14 | 57% |
| Wharf Lane | 10 | 70% |
| The Embankment | 67 | 68% |
| Church Street | 8 | 31% |
| **Survey Area Total** | **99** | **68%** |

2.2.18 The average weekend overnight parking stress results show that Wharf Lane had the highest stress at 70%. On average, 7 parking spaces were occupied during the survey period, with 3 remaining empty, on Wharf Lane.

2.2.19 The overall parking stress total equates to 68% which is largely consistent with the 2019 data in which the weekend overnight parking stress was 69%. Along The Embankment 46 spaces were occupied during this survey period in 2020, whilst this figure was 51 in 2019. The findings were therefore similar with the 2019 results.

## 2.3 Overall Survey Area Parking Stress

2.3.1 In summary, the overall survey area parking stress is as shown in **Table 6** for each time period.

Table 6. Survey Area Parking Stress

| SURVEY PERIOD | SURVEY AREA PARKING STRESS |
|---|---|
| Weekday Daytime | 75% |
| Weekday Overnight | 66% |
| Weekend Daytime | 73% |
| Weekend Overnight | 68% |

2.3.2 The overall survey area parking stress results demonstrate that the weekday daytime period had the highest stress at 75%. All survey area total stress levels were within the 85% threshold, as to what is defined as a 'high' stress level.

2.3.3 The weekend daytime stress was the highest result observed in 2019, with 88% stress compared to 73% this year. The average parking stress across all survey periods in 2019 was 76%, compared to 71% this year. This equates to 75 car parking spaces being occupied in total in 2019, whilst this figure is 70 in 2020. Hence, five more car parking spaces were

occupied over the whole survey area and across all survey periods in 2019, compared to 2020.

## 2.4 Event Day Parking Survey Results

2.4.1 **Table 7** below presents the parking stress results of the event day at Twickenham Stadium which occurred on Saturday 7th March. The match kick-off was 16:45, therefore the hour period prior to this was surveyed (15:00-16:00) to capture visitors arriving. It is noted that Church Street was closed for parking during this period and is therefore not included in the analysis below.

Table 7. Saturday 7Th March (Event Day) Parking Stress

| STREET NAME | CAPACITY | PARKING STRESS (15:00-16:00) |
|---|---|---|
| Water Lane | 14 | 79% |
| Wharf Lane | 10 | 40% |
| The Embankment | 67 | 73% |
| **Survey Area Total** | **91** | **70%** |

2.4.2 The overall event day survey results show that the average parking stress across the survey area as a whole does not exceed the 85% 'high' stress threshold, at 70%. Water Lane demonstrates the highest stress at 79%. This equates to 11 spaces being occupied. Overall, 64 spaces out of 91 were occupied, with 27 remaining empty.

2.4.3 These results report lower overall stress compared to the findings of the 2019 study where a parking stress of 88% was observed.

2.4.4 **Table 8** below provides a comparison of the parking stress recorded during the event day compared to the average weekend non-event day scenario in 2020.

Table 8. Event Day / Non- Event Day Parking Stress

| STREET NAME | CAPACITY | EVENT DAY STRESS | NON-EVENT DAY STRESS |
|---|---|---|---|
| Water Lane | 14 | 79% | 93% |
| Wharf Lane | 10 | 40% | 60% |
| The Embankment | 67 | 73% | 73% |
| **Survey Area Total** | **91** | **70%** | **75%** |

2.4.5 In both scenarios, Water Lane shows the highest level of stress, exceeding 90% in the non-event day scenario. The parking stress levels on The Embankment are the same at 73%

(49 spaces being occupied) in both scenarios. Across the survey area, the total average stress levels does not exceed the 85% 'high' stress threshold in the event day or non-event weekend scenarios.

2.4.6 In 2019 the total average parking stress was 88% for both scenarios, therefore higher than the 2020 results and exceeding the 85% 'high' stress thresholds. Overall in 2020, 68 spaces were occupied on the non-event day scenario, with this figure being 64 for the event day.

## 2.5 Summary

2.5.1 The parking survey results show varied levels of occupancy rates for each scenario, with the weekday daytime scenario having a total average highest stress of 75%. None of the scenarios overall exceed the 85% 'high' stress threshold. However, individual streets do exceed 85% stress in some scenarios, such as along The Embankment during the weekday (daytime) and along Water Lane during the weekend (non-event) daytime.

2.5.2 Although the results remain fairly consistent with the 2019 data, there are slight variances which is to be expected as it typical for there to be daily fluctuations in travel and parking behaviours of residents and visitors.

## 2.6 Parking Permit Analysis

2.6.1 SYSTRA has further analysed the parking data, taking into account the type of parking permits displayed on parked vehicles. **Table 9** provides further information regarding each type of parking permit.

**Table 9. Types of Permit**

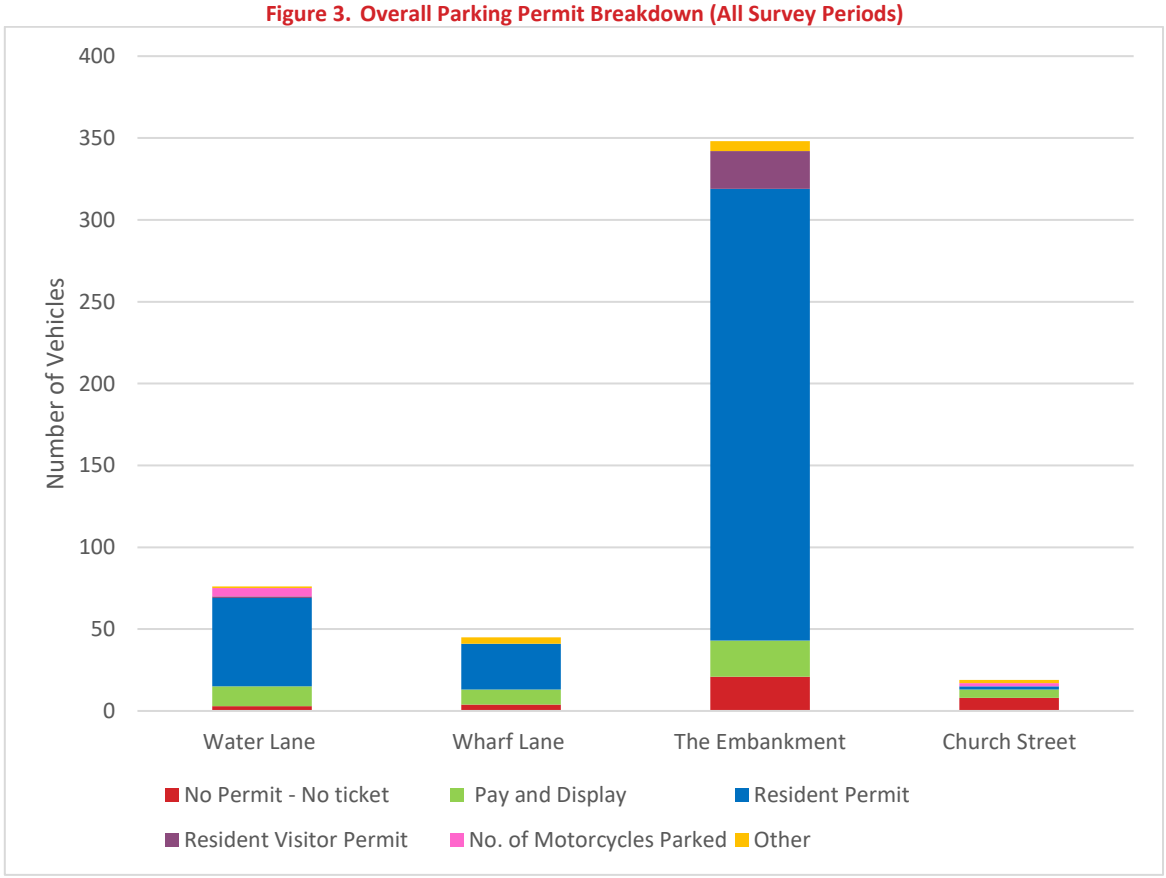
| PERMIT TYPE | MEANING |
|---|---|
| Resident | Allows residents to park within CPZ hours of operation (08:30-18:30), Monday to Saturday, Pay & Display maximum stay two hours). |
| Resident Visitor | Allows visitors of residents to park within CPZ hours of operation (08:30-18:30), Monday to Saturday, Pay & Display maximum stay two hours). |
| Business Permit | Allows employees whose business is located within the CPZ to park. |
| Blue Badge | Allows those with a Blue Badge to park in Disabled Bays for no specific time limit. |
| Pay and Display | Allows people to park for a charge. |

| PERMIT TYPE | MEANING |
|---|---|
| Operational Permit | Allows those who are clergy, carers or non-carers to park within the CPZ, to carry out day-to-day duties. |
| No Permit/ Ticket | Those who have parked within the area without any form of permit/ ticket. |
| No Permit/ Ticket (Motorcycles) | Motorcycles who have parked within the area without any form of permit/ ticket. |
| Other | Formed of the following types of permit: Surrey Parking Permit, Pay by Ringo, and a Dispensation Notice. |

2.6.2 **Figure 3** shows the overall breakdown of the total number of permits recorded across the survey area, excluding the event day. 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.

2.6.3 Due to low numbers of Business Permit, Disabled, Operational Permit and Other permits, these have all been grouped into the 'Other' category, for ease of reporting.

**Figure 3. Overall Parking Permit Breakdown (All Survey Periods)**



2.6.4 Resident permits were the most common types of permit to be observed, with 360 recorded over the survey time periods. As the street with the highest parking capacity, The Embankment recorded the highest number of vehicles parking over the four survey periods, at 71% of the total number of vehicles recorded parked within the survey area.

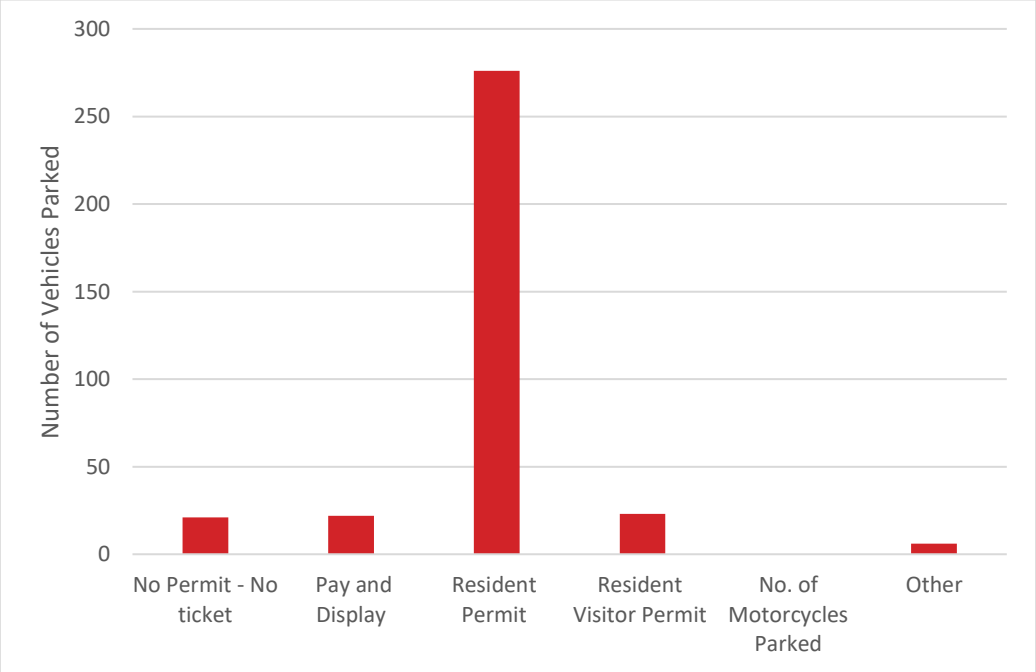
2.6.5 These results are aligned with the 2019 survey results, with The Embankment recording 70% of the total number of vehicles parked within the survey area.

2.6.6 36 vehicles with no permits displayed were recorded across the four survey periods, 21 of these along The Embankment. The weekday and weekend overnight periods received the most vehicles with no permits displayed, at 11 each. This is to be expected as the CPZ operated between 08:30-18:30 on weekdays, therefore, those parking out with these periods do not require a permit or ticket.

2.6.7 The majority of Resident Visitor permits were observed during daytime hours (14 permits). Ten permits were observed during overnight hours.

2.6.8 SYSTRA has analysed the split in parking permits observed on The Embankment, due to this being the street with the highest provision of parking. **Figure 4** identifies the overall parking permit use across all survey periods along The Embankment, excluding the event day.

**Figure 4. The Embankment Parking Permit Breakdown (All Survey Periods)**



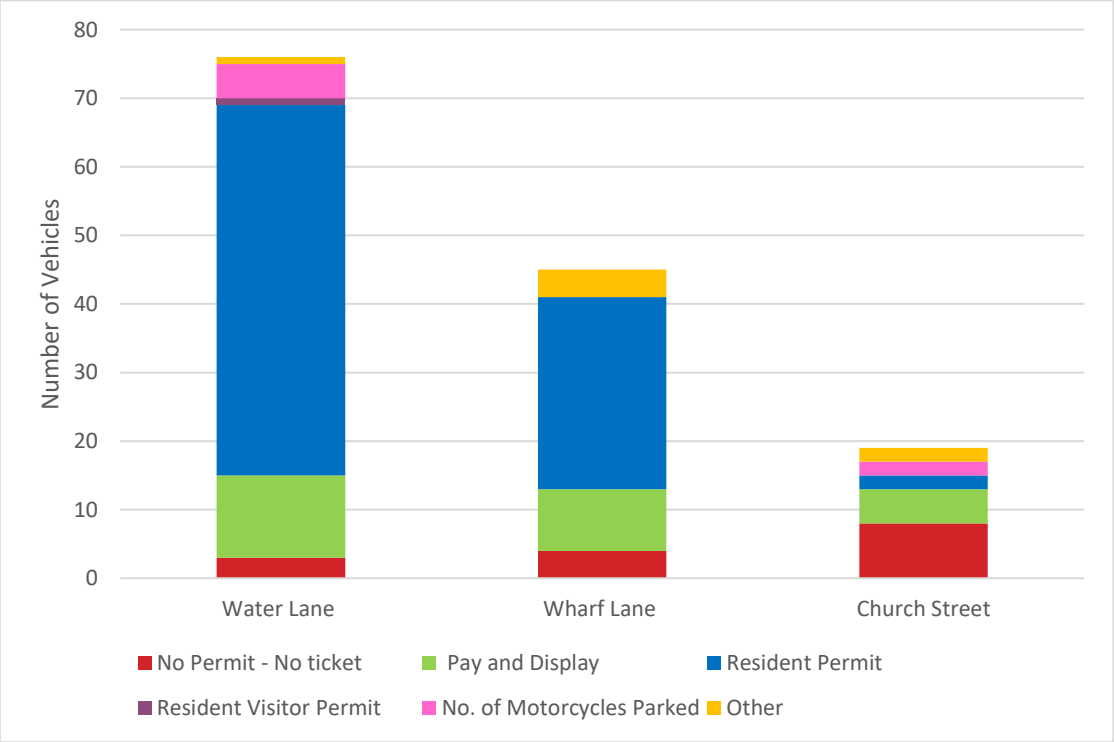

2.6.9 As shown above, Resident permits were the most common type of permit observed across the four survey periods along The Embankment. 276 Resident permits were recorded, equating to 79% of the total number of permits recorded along The Embankment. These results remain consistent with the 2019 survey results, with Resident permits making up 74% of the total number of permits along The Embankment last year.

2.6.10 23 out of the 24 recorded Resident Visitor permits were observed along The Embankment. Alongside this, 22 pay and display permits were observed over the whole survey period along The Embankment, equating to 46% of the total number of pay and display permits recorded across the survey area, given that the Embankment has the highest parking capacities for pay and display visitor bays.

2.6.11 The Embankment was the only street to record a Business permit, with one permit identified.

2.6.12 **Figure 5** identifies the overall 'other' parking permit types across all survey periods (excluding the event day) for the survey area excluding The Embankment.

**Figure 5. All Other Streets Parking Permit Breakdown (All Survey Periods)**




2.6.13 As with the 2019 data, Water Lane recorded the highest number of motorcycles parked, with five vehicles. This equates to 71% of all motorcycles parked across the survey area. It is noted that dedicated motorcycle bays are provided on Water Lane.

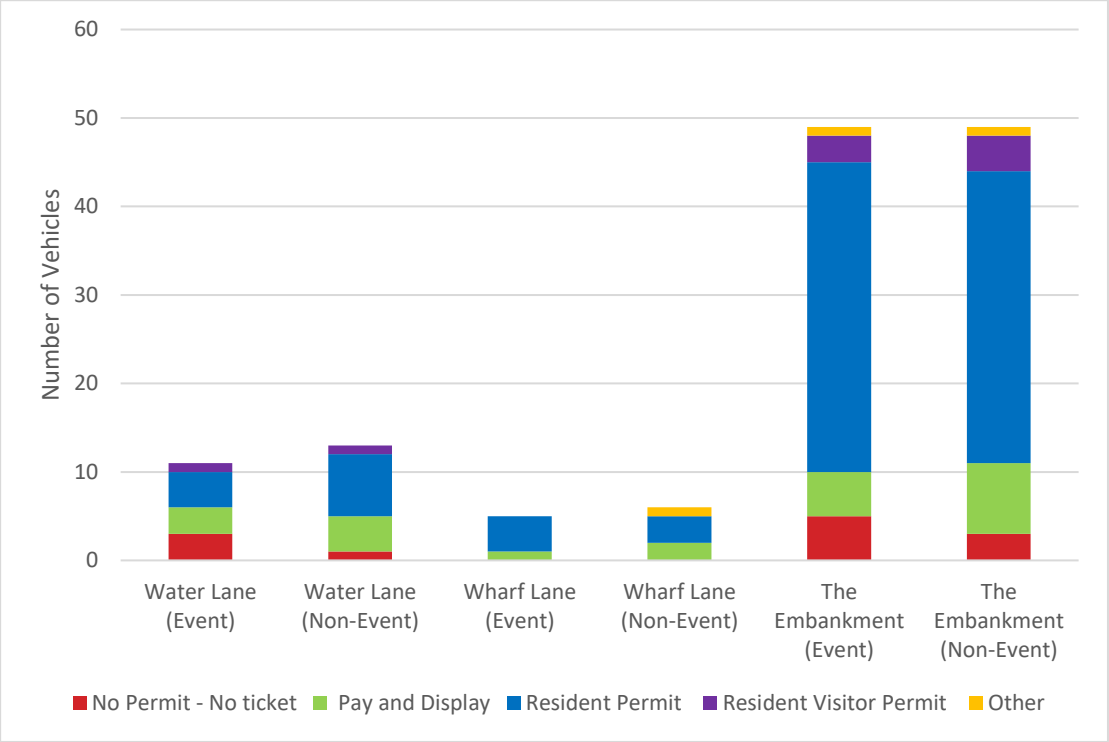
2.6.14 Operational permits were observed on both Water Lane and Wharf Lane, at one permit and two permits respectively.

2.6.15 Church Street recorded the fewest number of overall permits, at 19 in total. This equates to just 4% of the total survey area, however Church Street also contains the fewest number of useable parking spaces within the survey area.

## 2.7 Event Day Parking Permit Results

2.7.1 **Figure 6** identifies the overall parking permit split across all survey periods and all areas, showing a comparison between the event day scenario and the weekend non-event day scenario. Due to the closure of Church Street during the event day, this has been excluded from the below.

**Figure 6. Event Day Parking Permit Breakdown**




2.7.2 Similar to the weekday results, Resident permits were the most common types of permits observed in the event day survey period with 43 recorded. As the street with the highest level of parking provision, The Embankment recorded the highest number of parked vehicles, at 75% of the total number of vehicles. This figure was 71% in 2019, showing consistency in the results.

2.7.3 Resident permits were also the most common type of permit recorded non-event day scenarios, comprising 63% of total permits.

2.7.4 Eight vehicles with no permits displayed were recorded across the whole event day scenario. No motorcycles were recorded.

## 2.8 Summary

2.8.1 Overall, Residents permits make up the highest number of parking permits in the survey area in all scenarios. The Embankment has the highest number of observed Resident permits in all scenarios, also containing the highest parking capacity. The difference between the weekend event and non-event day results is relatively marginal.

2.8.2 The pattern of results generally mirrors that of the 2019 survey data, with only slight differences.

# 3. MANUAL CLASSIFIED COUNTS

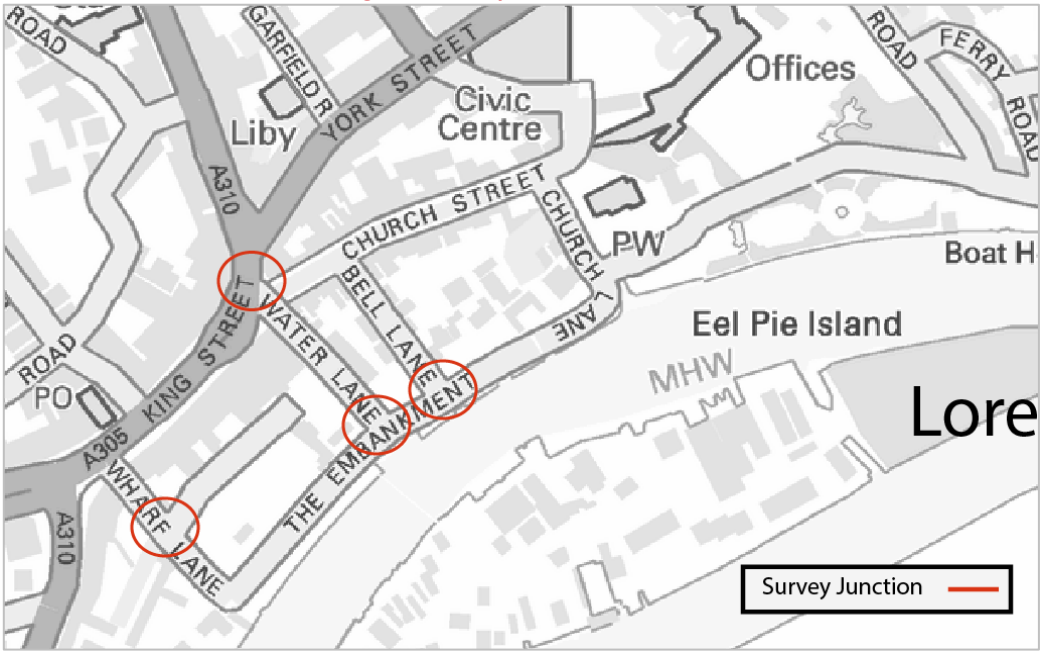
## 3.1 Introduction

This section summarises the results of the Manual Classified Counts (MCCs) undertaken over the two-week period across the survey area. The survey data has been presented and analysed below to demonstrate the traffic levels across the survey area.

3.1.1 **Figure 7** shows the location of the junctions where MCC data was collected. 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.

**Figure 7. Survey Junction Locations**




3.1.2 Counts were carried out over a 24-hour period on:

- Friday 6th March;
- Saturday 7th March (event day);
- Monday 9th March;
- Saturday 14th March;
- Monday 16th March; and
- Friday 20th March.

3.1.3 The vehicle counts for each junction recorded the turning movement of vehicles.

## 3.2 Survey Results

3.2.1 **Table 10** summarises the peak period results of the MCC surveys, showing the number of vehicles approaching from each arm across the four junctions. An average flow has been calculated for both the typical network AM (08:00 – 09:00) and PM (17:00 – 18:00) peak periods for the weekday scenarios, weekend scenario, and the event day scenario.

**Table 10. Survey Area Average Peak Period Vehicle Flows**

| JUNCTION/ARM | WEEKDAY | | WEEKEND | | EVENT DAY | |
|---|---|---|---|---|---|---|
| | AM Flow | PM Flow | AM Flow | PM Flow | AM Flow | PM Flow |
| **King Street/Church Street/Water Lane** | | | | | | |
| King Street (N) | 929 | 1043 | 684 | 830 | 711 | 743 |
| Church Street | 0 | 0 | 0 | 0 | 0 | 0 |
| Water Lane | 0 | 0 | 0 | 0 | 0 | 0 |
| King Street (S) | 1196 | 1108 | 733 | 936 | 804 | 851 |
| **The Embankment/Bell Lane** | | | | | | |
| The Embankment (N) | 2 | 3 | 1 | 10 | 5 | 6 |
| The Embankment (S) | 10 | 20 | 7 | 19 | 4 | 8 |
| Bell Lane | 0 | 0 | 0 | 0 | 0 | 0 |
| **The Embankment/Water Lane** | | | | | | |
| The Embankment (N) | 3 | 4 | 0 | 8 | 3 | 12 |
| The Embankment (S) | 3 | 3 | 1 | 6 | 1 | 1 |
| Water Lane | 41 | 67 | 58 | 63 | 48 | 45 |
| **Wharf Lane/Service Road** | | | | | | |
| Wharf Lane (N) | 0 | 0 | 0 | 0 | 0 | 0 |
| Service Road | 1 | 6 | 4 | 5 | 2 | 3 |
| Wharf Lane (S) | 25 | 49 | 36 | 58 | 29 | 38 |

*Note: slight variance in figures compared to flow diagrams due to rounding*

3.2.2 The junctions are discussed below in further detail for each scenario. The weekend scenario does not include the event day. Note, that a weekend scenario was not included in the 2019 study, therefore direct comparisons can only be made for the weekday and event day scenarios.

**King Street/Church Street/Water Lane**

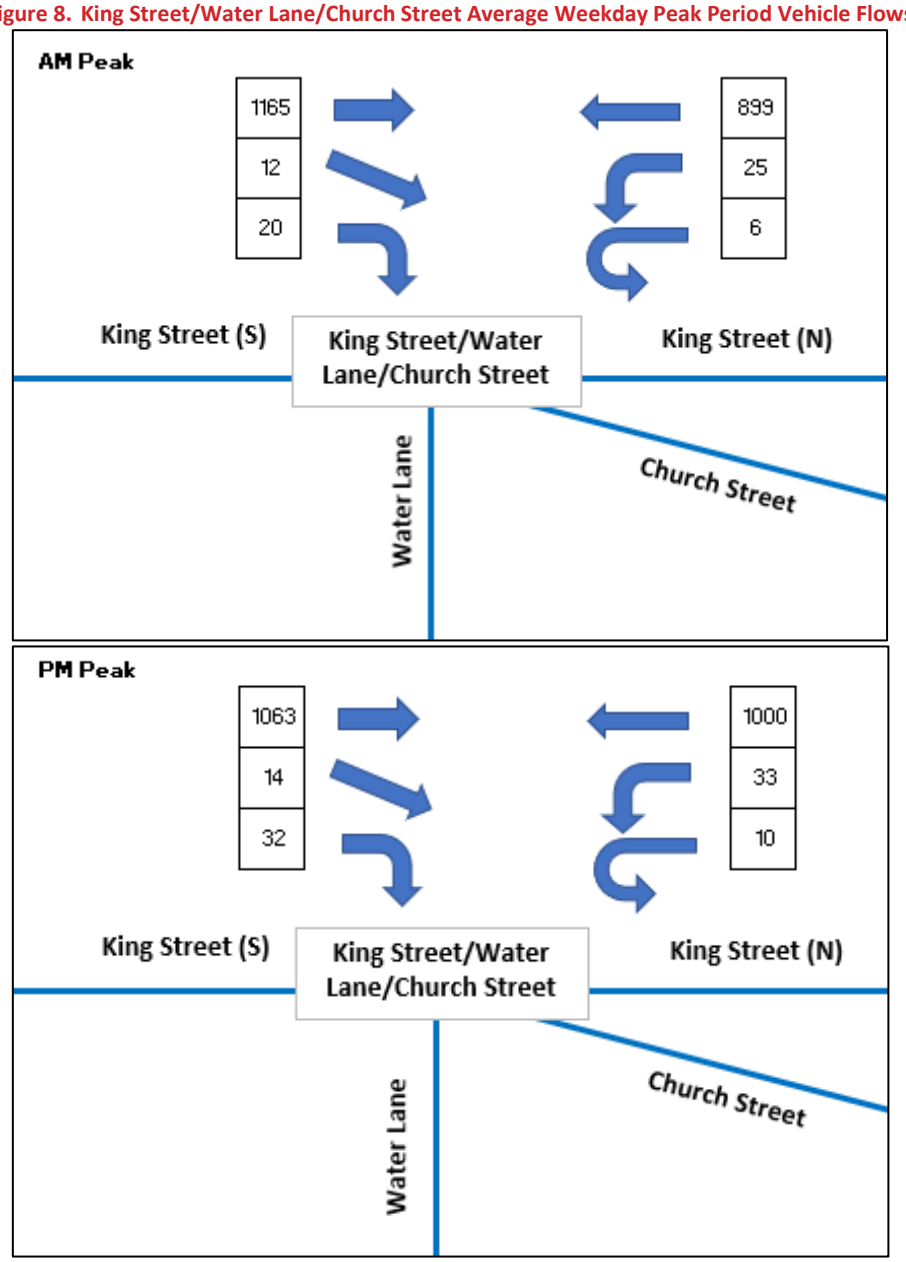
3.2.3 The King Street/Church Street/Water Lane junction is a four-arm junction located on the main high street in Central Twickenham. King Street runs northeast to southwest and forms one of the major through routes in the Twickenham area. Water Lane is a one-way side street running southeast towards 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. 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. The vast majority of vehicles makes a through-movement on King Street.

3.2.5 As both Water Lane and Church Street are one-way routeing away from the junction, no traffic enters the junctions from these arms.

3.2.6 **Figure 8** to **Figure 10** show the average peak periods turning movements at the King Street/Water Lane/Church Street junction for each scenario.

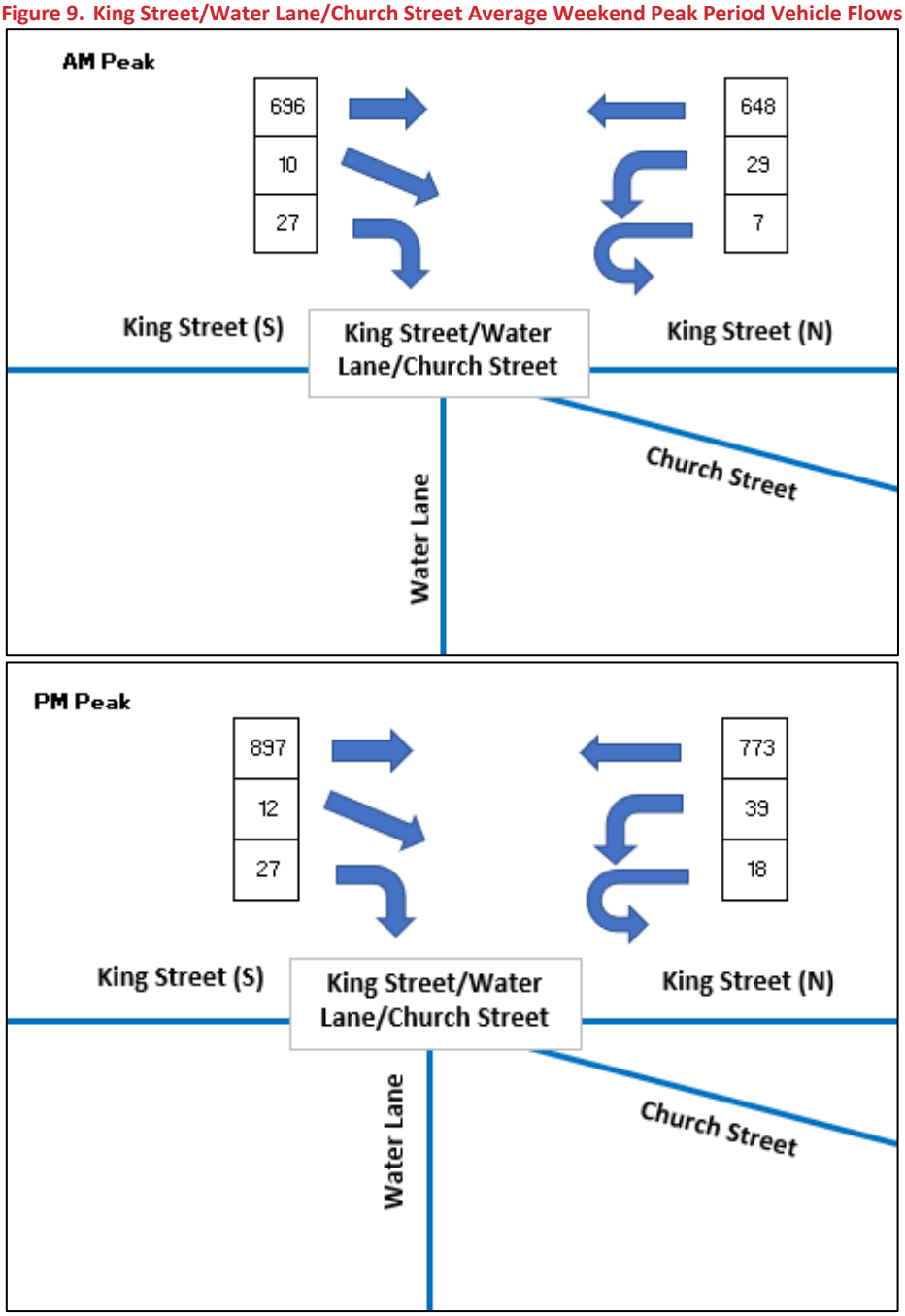
Figure 8. King Street/Water Lane/Church Street Average Weekday Peak Period Vehicle Flows




3.2.7 The results show that the King Street south to north movement contains the highest flow for both the AM and PM peaks, with 1,165 movements compared to 1,063 respectively. As shown in **Table 10**, 1,196 movements occur from King Street south towards the junction, which is the highest figure across the survey area, for the weekday survey period.

3.2.8 This is consistent with the 2019 survey results in which the King Street south to north movement also contains the most vehicle movements at 1207 for the AM peak and 1,149 for the PM peak.

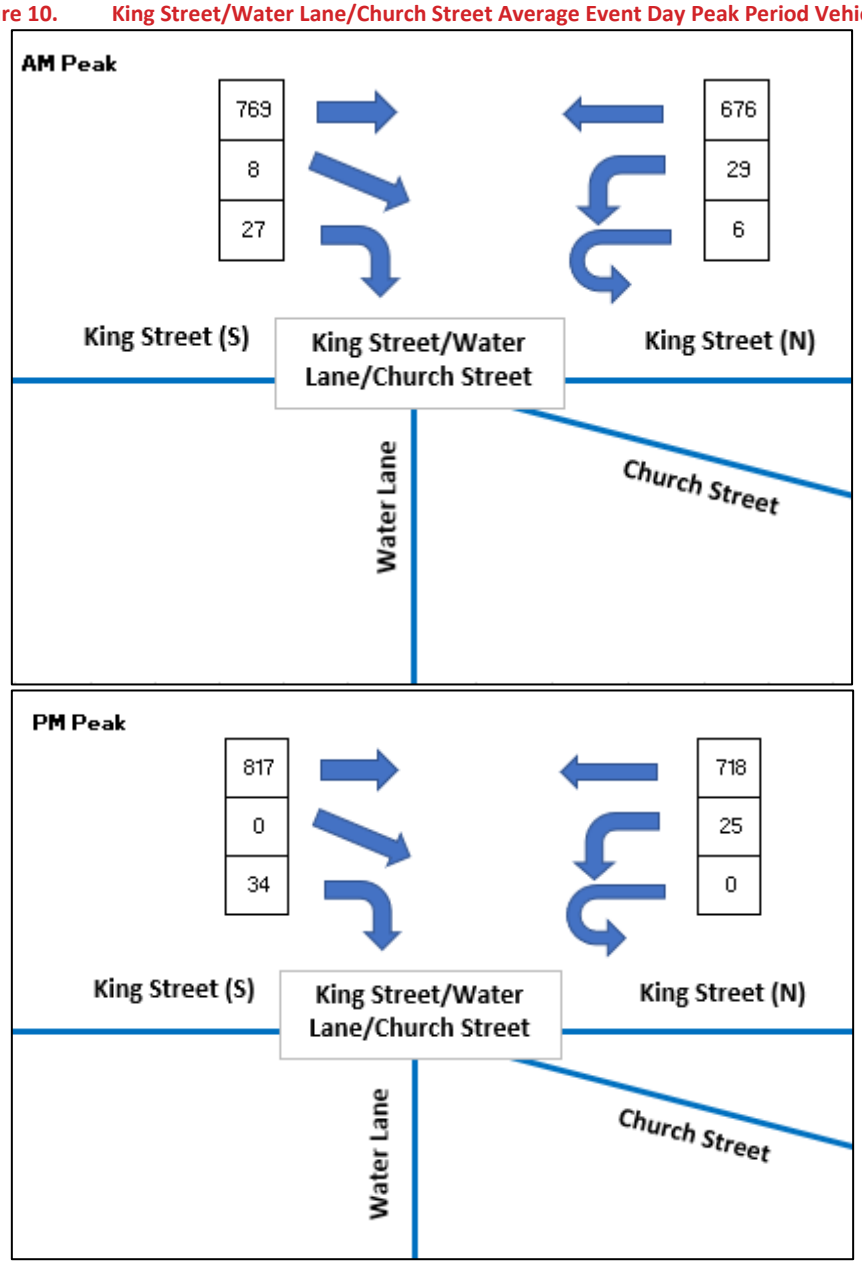
Figure 9. King Street/Water Lane/Church Street Average Weekend Peak Period Vehicle Flows




3.2.9 The weekend scenario also demonstrates that the Kings Street south to north movement has the highest flow for both the AM and PM peaks with 696 and 897 respectively.

3.2.10 Overall, there are 3,183 vehicles approaching the junction for the weekend scenario over both peaks; whilst this figure is 4,276 for the weekday scenario. It is to be expected that the AM and PM peak flows are lower at the weekend as the majority of commuters travelling during these periods will work during the weekdays.

Figure 10. King Street/Water Lane/Church Street Average Event Day Peak Period Vehicle Flows




3.2.11

3.2.12 The event day scenario has a very similar total of the number of vehicles approaching the junction compared to the 'neutral' weekend scenario, with 3,109 compared to 3,183 vehicles respectively. The results follow the same trend as the weekday and weekend scenario in that the King Street south to north movement, generates the highest number of flows.

The 2019 results reported 2,310 vehicle movements approaching the junction, therefore 799 fewer vehicles that the 2020 results.

### The Embankment/Bell Lane

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.

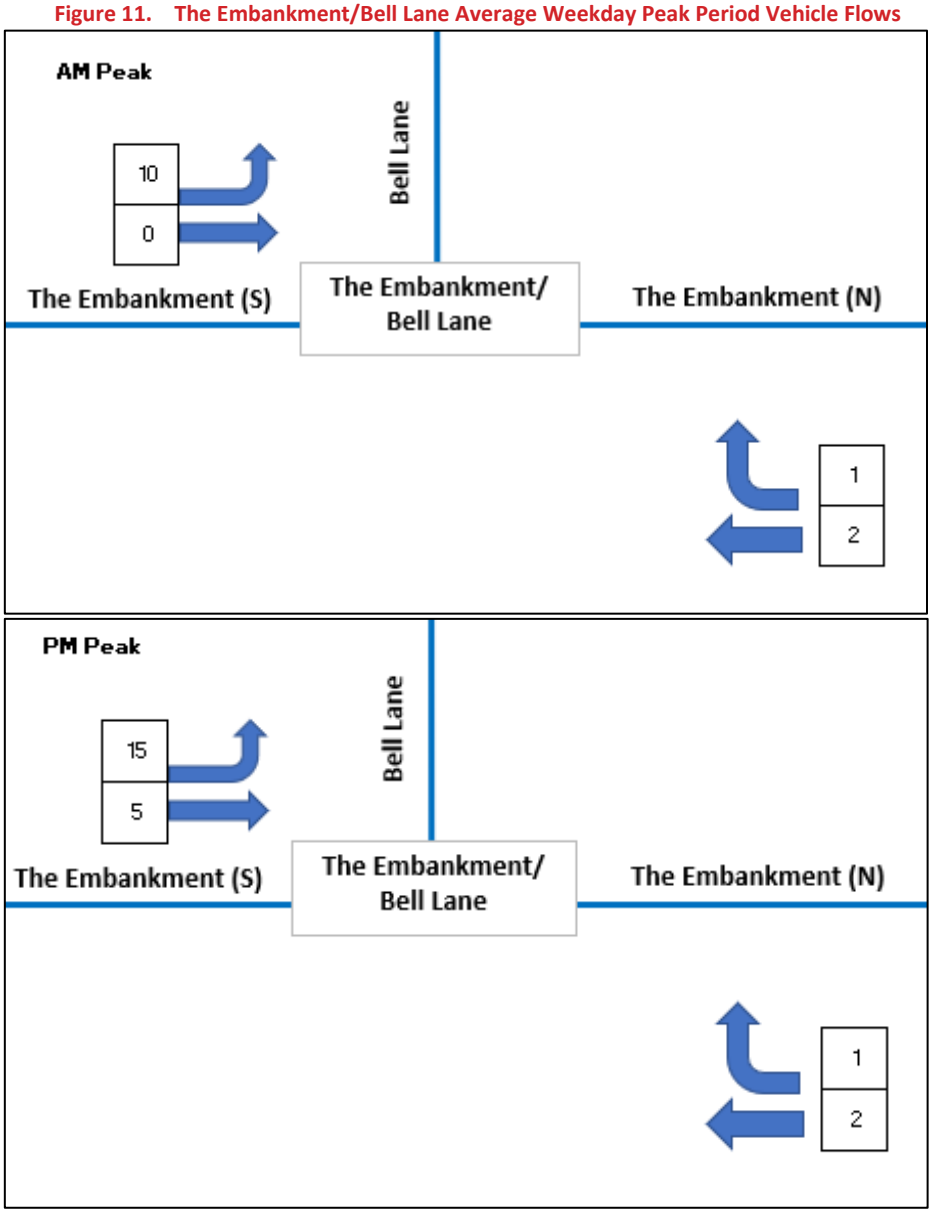
3.2.13 As Bell Lane is one-way routing away from the junction, no traffic enters from this arm.

**Figure 11** to **Figure 13** show the average peak periods flows at The Embankment/Bell Lane junction for each scenario.

3.2.14

**Figure 11. The Embankment/Bell Lane Average Weekday Peak Period Vehicle Flows**

3.2.15



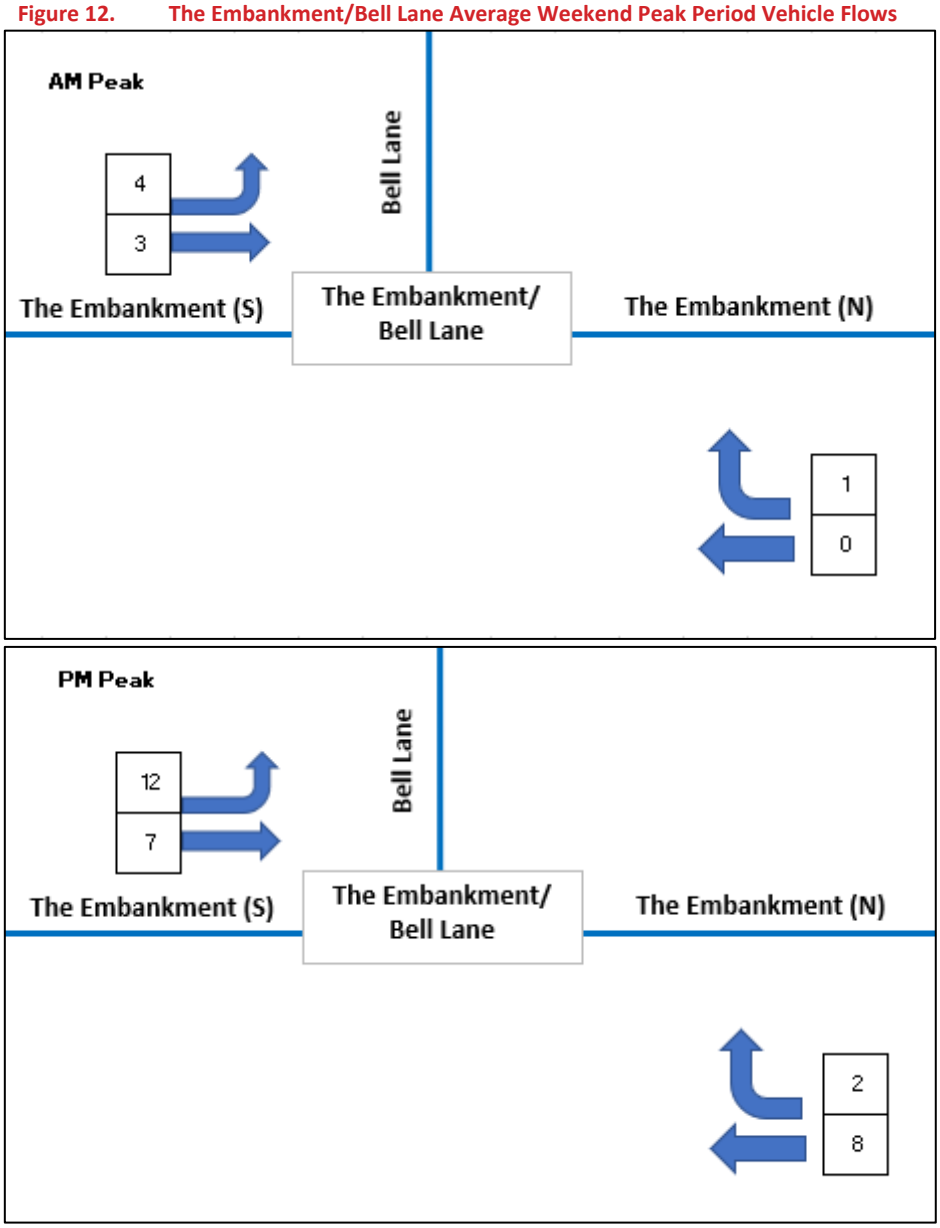
The Embankment south arm demonstrates the highest flows approaching the junction for both the AM and PM peak periods, with 10 vehicles and 20 vehicles respectively. Albeit, the vehicle flows at this junction are low in general.

There is a small number of vehicles approaching the junction from The Embankment north for each peak. This is consistent with the 2019 results.

3.2.16

**Figure 12. The Embankment/Bell Lane Average Weekend Peak Period Vehicle Flows**

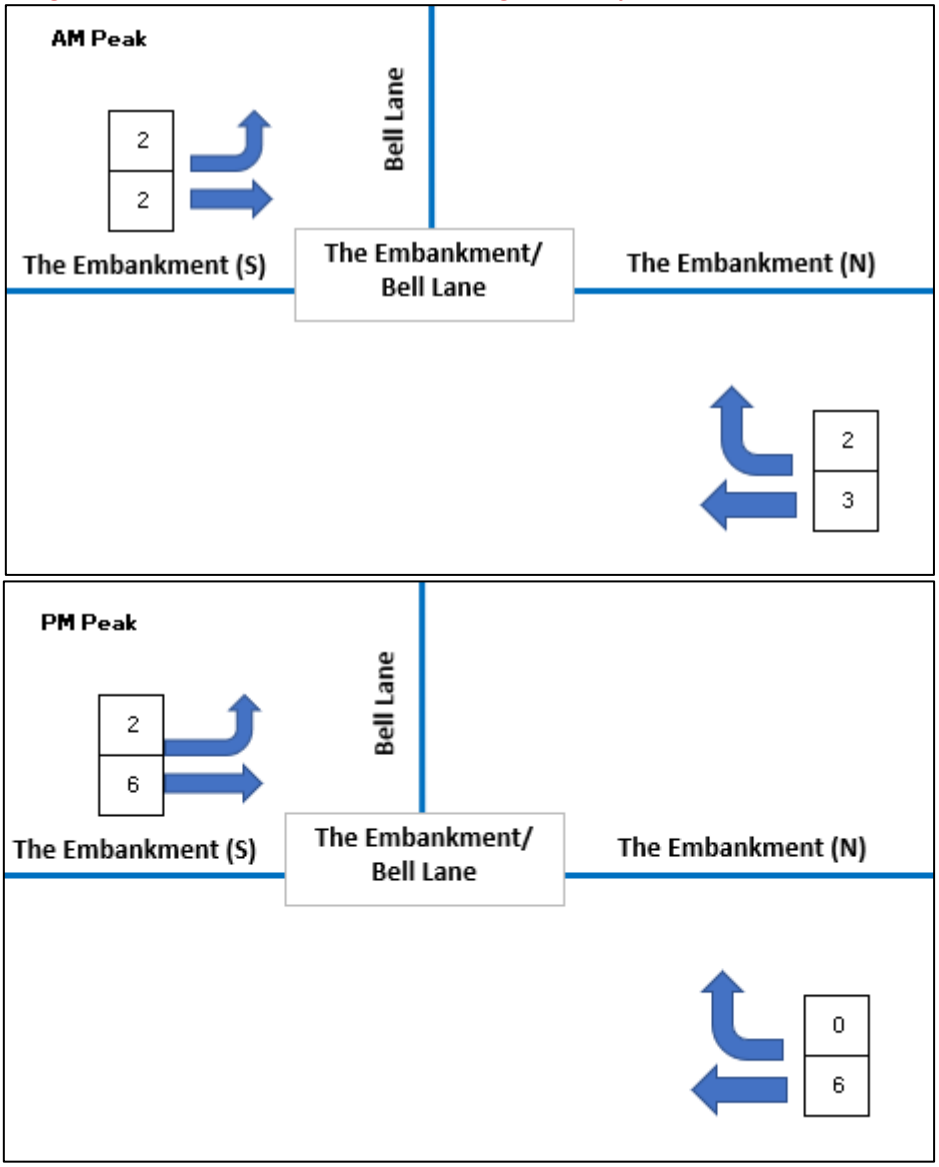
3.2.17




3.2.18

Similar to the weekday scenario, The Embankment south arm generates the highest flow on approach to the junction during the weekend AM and PM periods, with seven in the and 19 respectively, but flows in general at this junction are low.

Figure 13. The Embankment/Bell Lane Average Event Day Peak Period Vehicle Flows




3.2.19 The event day scenario generates a total of nine vehicle movements on approach to the junction for the AM peak and 14 vehicle movements for the PM peak. These figures are similar to the 2019 event day results which reported 12 movements for both the AM and PM peaks.

3.2.20

**The Embankment/Water Lane**

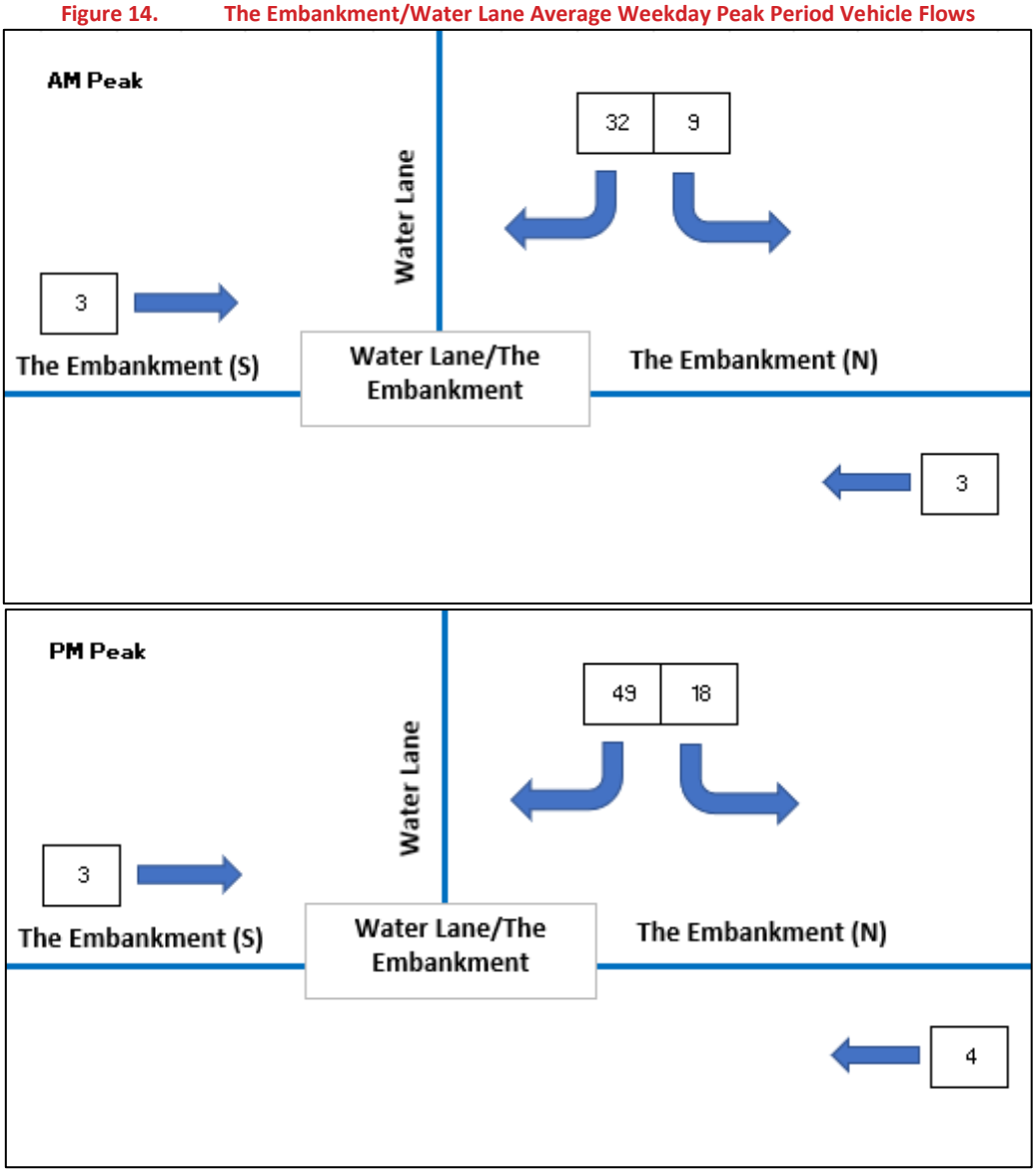
The Embankment/Water Lane junction is a three-arm junction located on the banks of the River Thames, approximately 40m southwest of the junction with Bell Lane. Water Lane is a one-way street connecting with King Street, with vehicle traffic permitted to enter from the King Street end only.

As Water Lane is one-way routeing towards the junction, traffic is not permitted to enter Water Lane from The Embankment.

**Figure 14** to **Figure 16** show the average peak period flows at The Embankment/Water Lane junction for each scenario.

3.2.21 **Figure 14. The Embankment/Water Lane Average Weekday Peak Period Vehicle Flows**

3.2.22

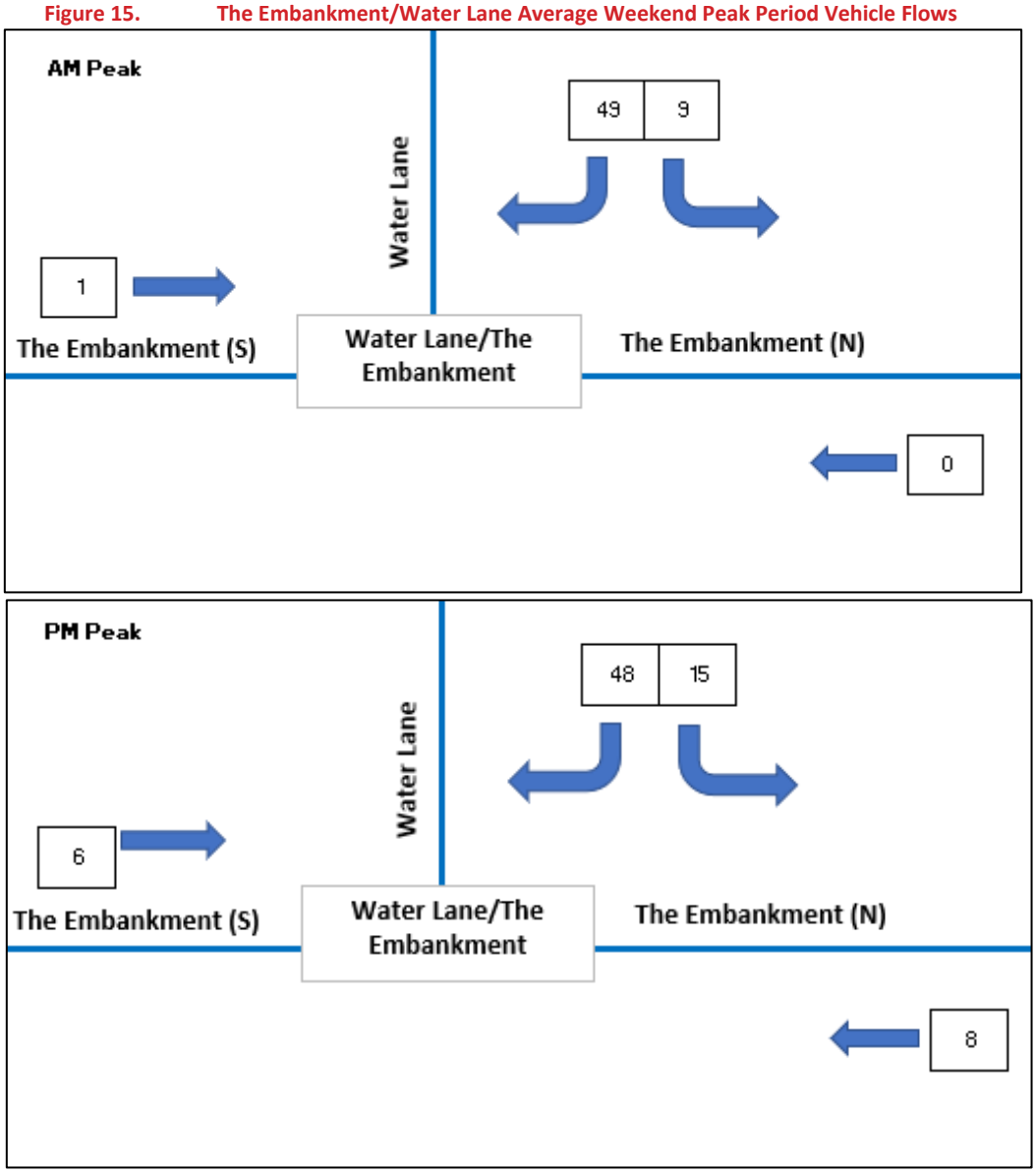



3.2.23

3.2.24 The figure above demonstrates that the highest vehicle flow was observed during the PM peak from Water Lane to The Embankment south with 49 vehicles on average. This remains consistent with the 2019 results where this figure was 41 and also the highest flow during both peaks.

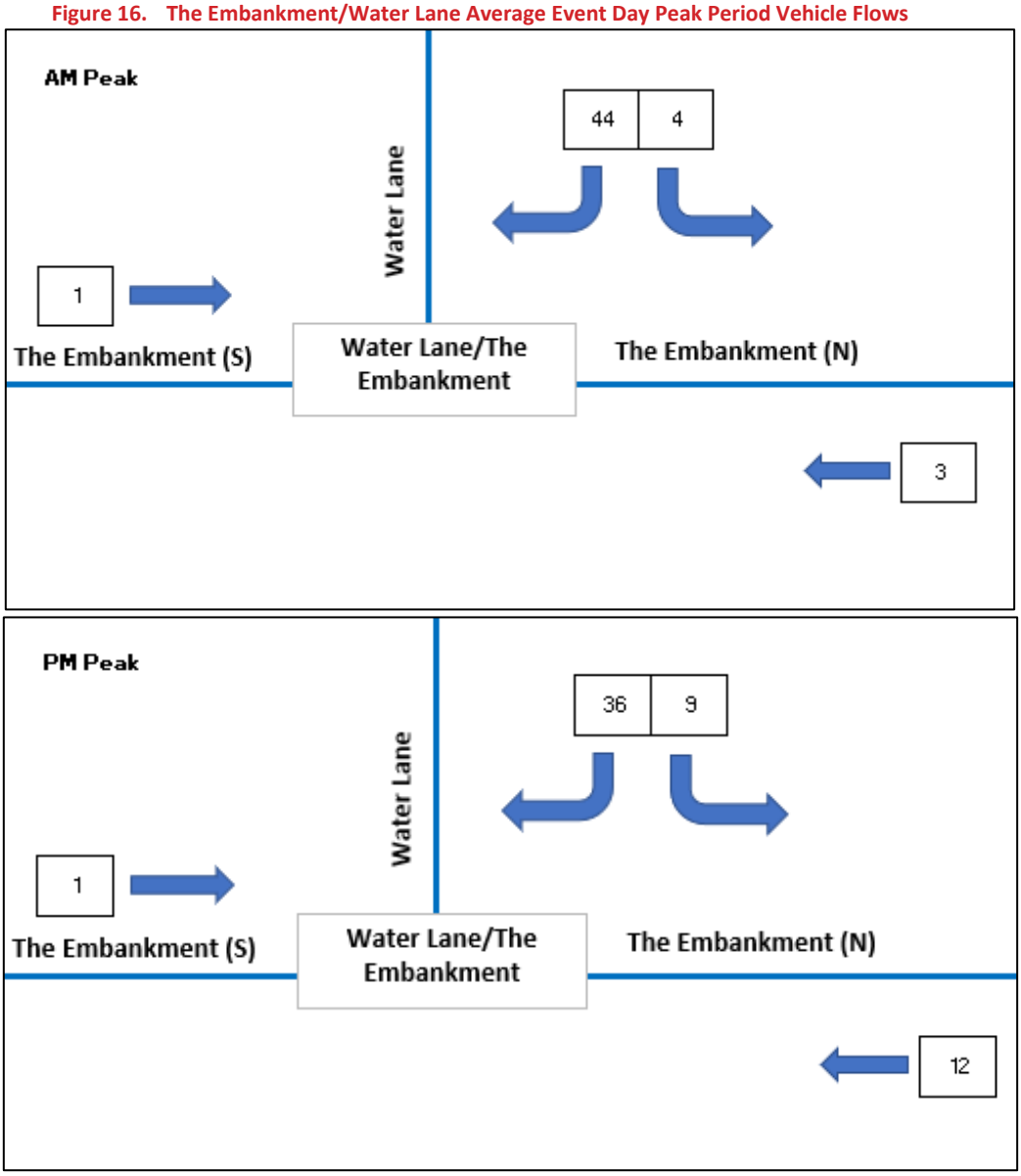
Straight-through movements for vehicles along The Embankment are low during both the AM and PM peak periods.

Figure 15. The Embankment/Water Lane Average Weekend Peak Period Vehicle Flows




3.2.25 The weekend scenario results show that there is a marginal difference in the AM and PM peak results for the Water Lane to The Embankment south movement, with 49 vehicles compared to 48 respectively. The PM peak generates 13 more straight-through vehicle movements along The Embankment compared to the AM peak.

Figure 16. The Embankment/Water Lane Average Event Day Peak Period Vehicle Flows




3.2.26

3.2.27 The event day results show a similar trend to the weekday and weekend scenario results, with the Water Lane to The Embankment south arm generating the most vehicle flows for both peaks, at 44 vehicles for the AM peak and 36 vehicles for the PM peak.

3.2.28 This mirrors the 2019 event day results, where the highest movement for both the AM and PM peaks was also Water Lane to The Embankment south, with 32 and 23 vehicles respectively.

**Wharf Lane/Service Road**

Wharf Lane/Service Road is a three-arm junction located between the river and King Street. 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.

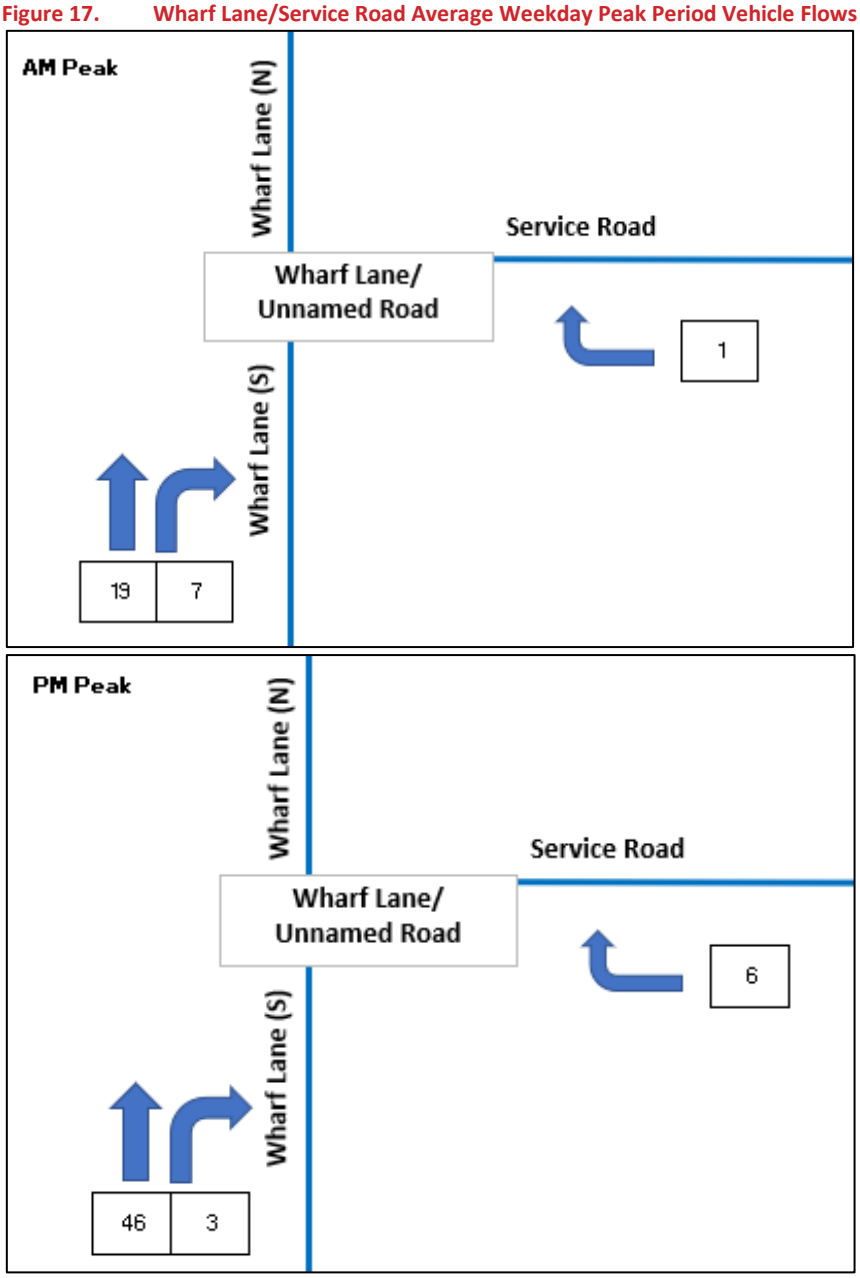
As Wharf Lane is one-way routeing towards King Street, vehicles are not permitted to enter the junction from this direction or travel towards the Embankment.

**Figure 17** to **Figure 19** show the average peak period flows at the Wharf Lane/Service Road junction for each scenario.

3.2.29

**Figure 17. Wharf Lane/Service Road Average Weekday Peak Period Vehicle Flows**

3.2.30




3.2.31

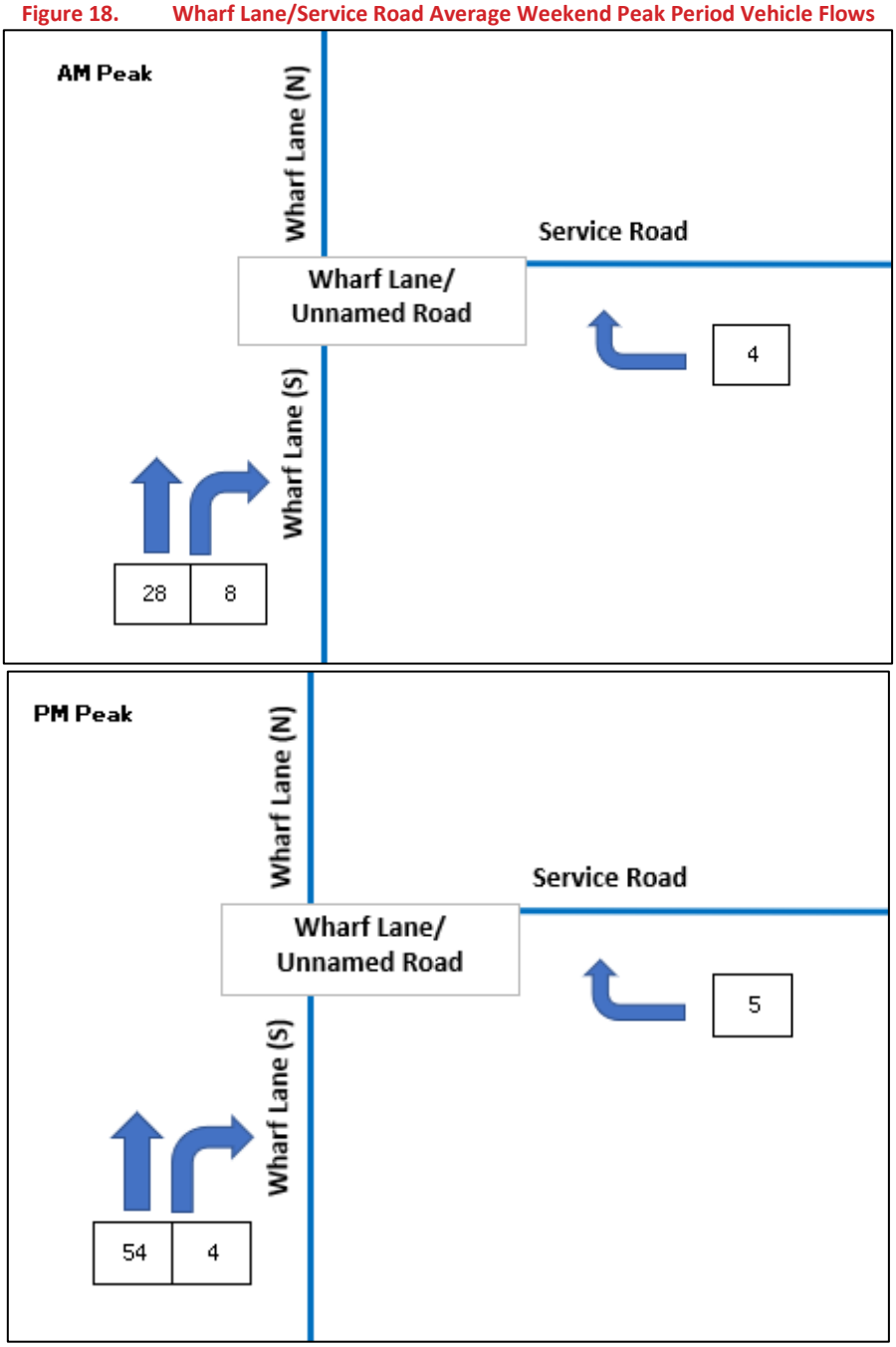
The results demonstrate that the Wharf Lane south to north movement generates the highest number of vehicles movements for both peak periods with 19 movements in the

AM and 46 in the PM weekday scenario. A total of 26 vehicles approach the junction from Wharf Lane south during the AM peak and 55 vehicles in the PM peak. A small number of vehicles were observed turning out of the Service Road in both periods (one in the AM and six in the PM).

The 2019 results show that a total of 22 vehicles approach the junction from Wharf Lane south during the AM peak and 48 vehicles during the PM peak. Therefore, following a similar pattern as the 2020 observed flows at this junction.

**Figure 18. Wharf Lane/Service Road Average Weekend Peak Period Vehicle Flows**

3.2.32

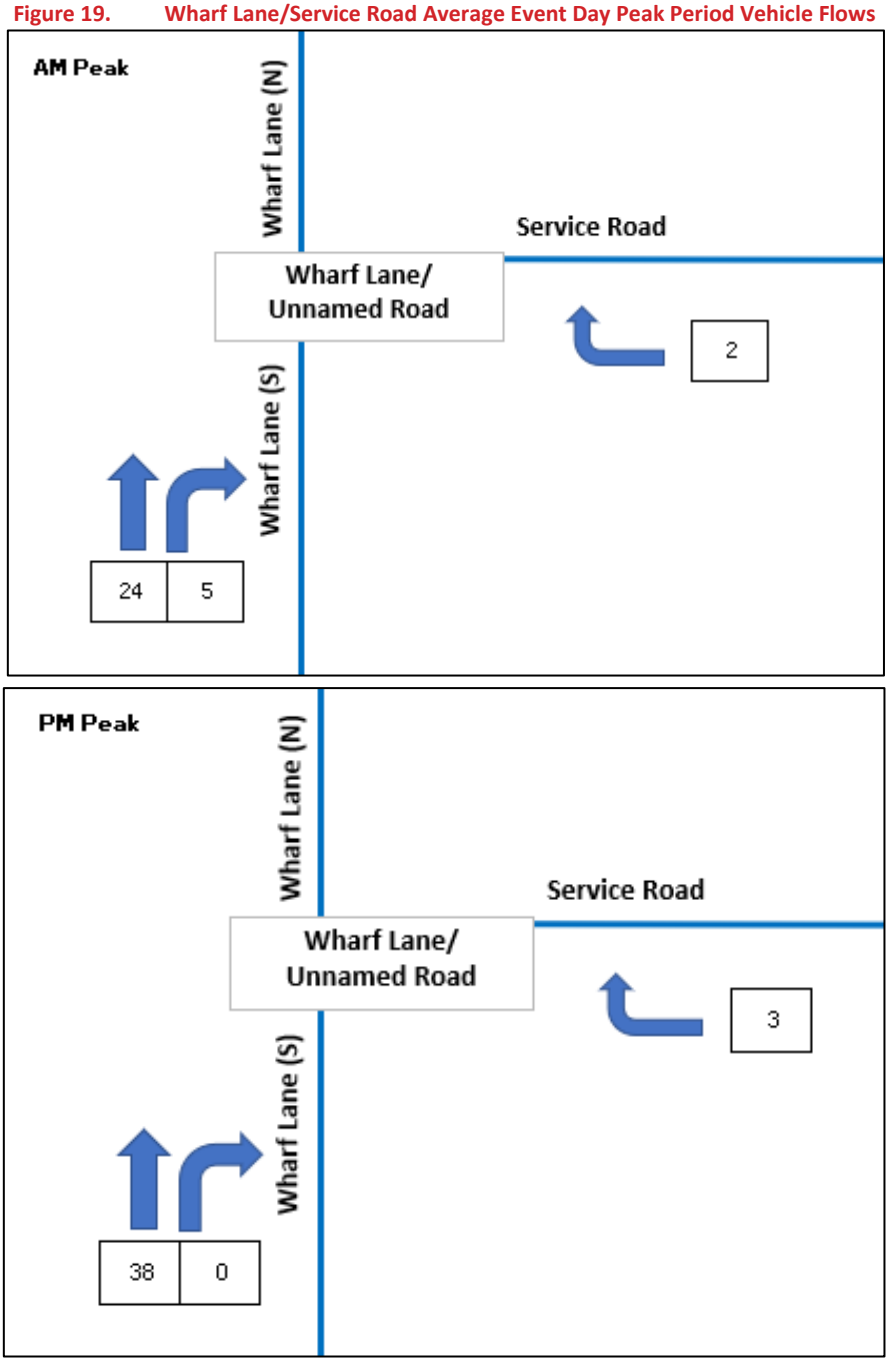


The weekend scenario results also demonstrate similar results in that the Wharf Lane south to north movement has the highest vehicle flows for both peak periods with 28 vehicles in the AM and 54 in the PM. A small number of vehicles are observed turning out of the Service Road (four in the AM and five in the PM)

3.2.33 As with the weekday results, a higher number of vehicles route through the junction in the PM peak compared to the AM peak.

**Figure 19. Wharf Lane/Service Road Average Event Day Peak Period Vehicle Flows**

3.2.34



On the event day, a total of 62 vehicles made the Wharf Lane south to north movement, over both peak periods (24 in the AM and 38 in the PM). Therefore, the non-event weekend generated 20 more vehicles making this movement across both peak periods, compared to the event day scenario.

3.2.35 This result mirrors the 2019 findings whereby 61 vehicles were observed making the Wharf Lane south to north movement during the event day scenario. The Wharf Lane south to the Service Road movement and Service Road to Wharf Lane north movement is only made by a small number of vehicles, as is expected considering the Service Road is a no-through road

3.2.36

## 3.3 Summary

3.3.1 Overall the vehicle flows show very similar trends between the weekday, weekend and event day scenarios in terms of vehicle flows and movements the junctions. The results are comparable to the 2019 results for each scenario.

# 4. PEDESTRIAN AND CYCLIST SURVEYS

## 4.1 Introduction

This section summarises the results of the pedestrian and cyclist surveys undertaken.

**Figure 7** shows the location of the junctions at which pedestrian and cycle counts were undertaken. The following junctions were surveyed:

4.1.1
- King Street/Church Street/Water Lane;

4.1.2
- Water Lane/The Embankment;
- The Embankment/Bell Lane; and
- Wharf Lane/Service Road at rear of 3-33 King Street.

The counts were taken over a 24-hour period on the following dates:

4.1.3
- Friday 6th March;
- Saturday 7th March (event day);
- Monday 9th March;
- Saturday 14th March;
- Monday 16th March; and
- Friday 20th March.

4.1.4 Two sets of cycle survey data have been recorded. The first dataset was recorded with the MCCs and recorded standard origin-destination movements in the same way vehicles were counted, herein referred to as "on-road" cycle counts, based on a continuous carriageway movement.

4.1.5 The second dataset recorded cyclists making movements that did not follow a standard continuous carriageway movement, and mirror the possible movements made by pedestrians crossing the junctions. These datasets have been structured so that cyclists are not double counted.

## 4.2 On-Road Cyclist Survey Results

4.2.1 **Table 11** summarises the peak period results of the MCC surveys, showing the number of on-road cyclists on each arm across the four junctions for the average weekday movement, weekend movement and event day movement. An average flow of the four survey days has been calculated for both AM (08:00 – 09:00) and PM (17:00 – 18:00) peak periods.

Table 11. Survey Area Average Peak Period On-Road Cycle Flows

| JUNCTION/ARM | WEEKDAY | | WEEKEND | | EVENT DAY | |
|---|---|---|---|---|---|---|
| | AM FLOW | PM FLOW | AM FLOW | PM FLOW | AM FLOW | PM FLOW |
| **King Street/Church Street/Water Lane** | | | | | | |
| King Street (N) | 71 | 114 | 58 | 24 | 96 | 38 |
| Church Street | 1 | 4 | 1 | 4 | 0 | 0 |
| Water Lane | 0 | 1 | 0 | 0 | 2 | 2 |
| King Street (S) | 178 | 55 | 29 | 36 | 61 | 25 |
| **The Embankment/Bell Lane** | | | | | | |
| The Embankment (N) | 10 | 14 | 1 | 12 | 3 | 1 |
| The Embankment (S) | 14 | 10 | 1 | 2 | 10 | 0 |
| Bell Lane | 1 | 0 | 0 | 0 | 0 | 0 |
| **The Embankment/Water Lane** | | | | | | |
| The Embankment (N) | 11 | 14 | 0 | 12 | 3 | 4 |
| The Embankment (S) | 15 | 10 | 4 | 4 | 11 | 10 |
| Water Lane | 3 | 4 | 4 | 3 | 6 | 3 |
| **Wharf Lane/Service Road** | | | | | | |
| Wharf Lane (N) | 14 | 5 | 5 | 3 | 3 | 1 |
| Service Road | 0 | 1 | 1 | 0 | 1 | 1 |
| Wharf Lane (S) | 9 | 15 | 0 | 12 | 1 | 0 |

*Note: slight variance in figures compared to flow diagrams due to rounding*

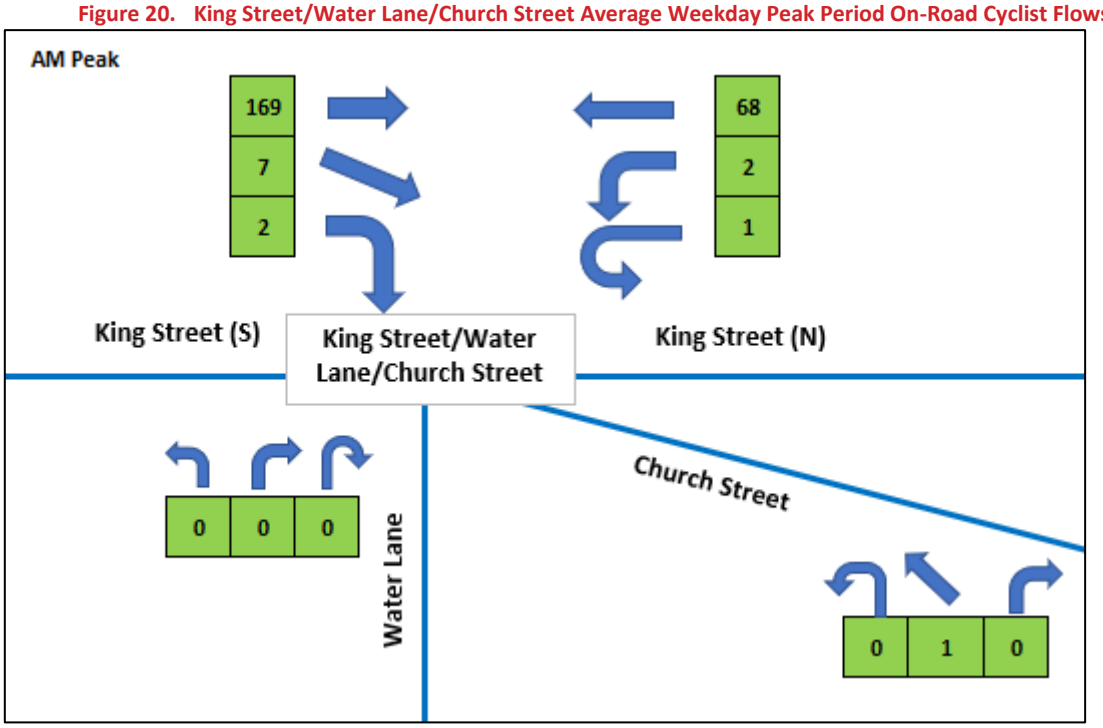
The junctions are discussed below in further detail for each scenario. Note, only the weekday scenario was included in the 2019 study, therefore comparisons are made for this scenario only.

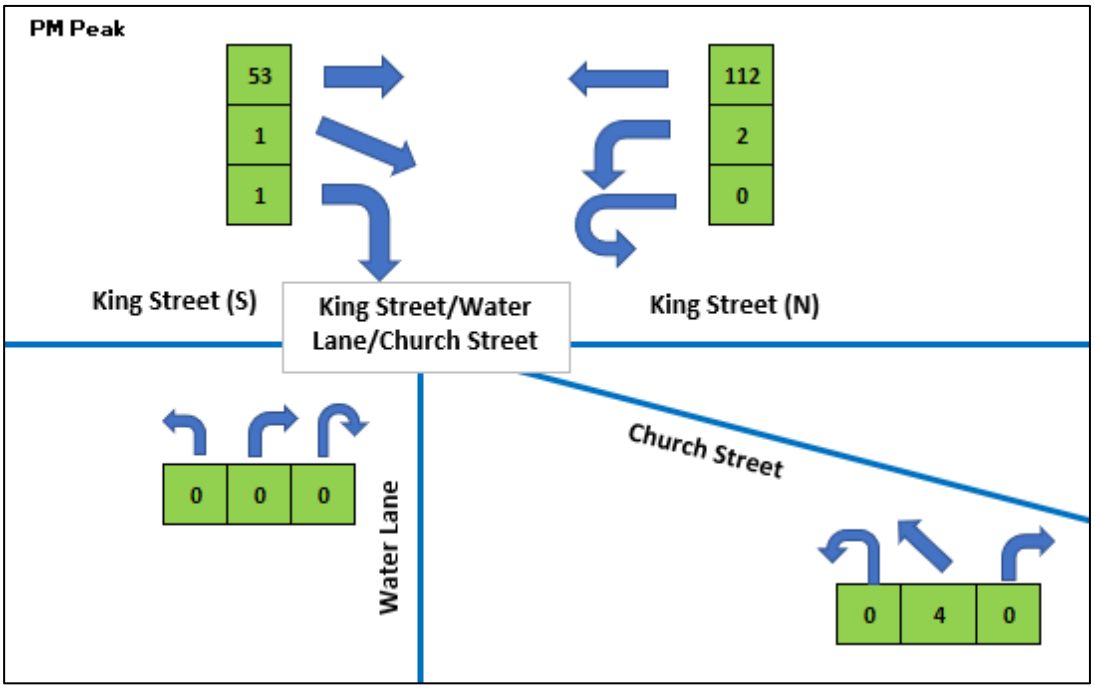
**King Street/Church Street/Water Lane**

4.2.2 The sections of Church Street and Water Lane in proximity to the junction with King Street provide a 'shared space' environment with near-level kerbsides separating footway and carriageway. This encourages vehicles to travel at slower speeds and provides a safer environment for pedestrians and cyclists.

4.2.3 **Figure 20** to **Figure 22** show the on-road cyclist flows for the King Street/Water Lane/Church Lane junction for each scenario.

4.2.4 **Figure 20. King Street/Water Lane/Church Street Average Weekday Peak Period On-Road Cyclist Flows**

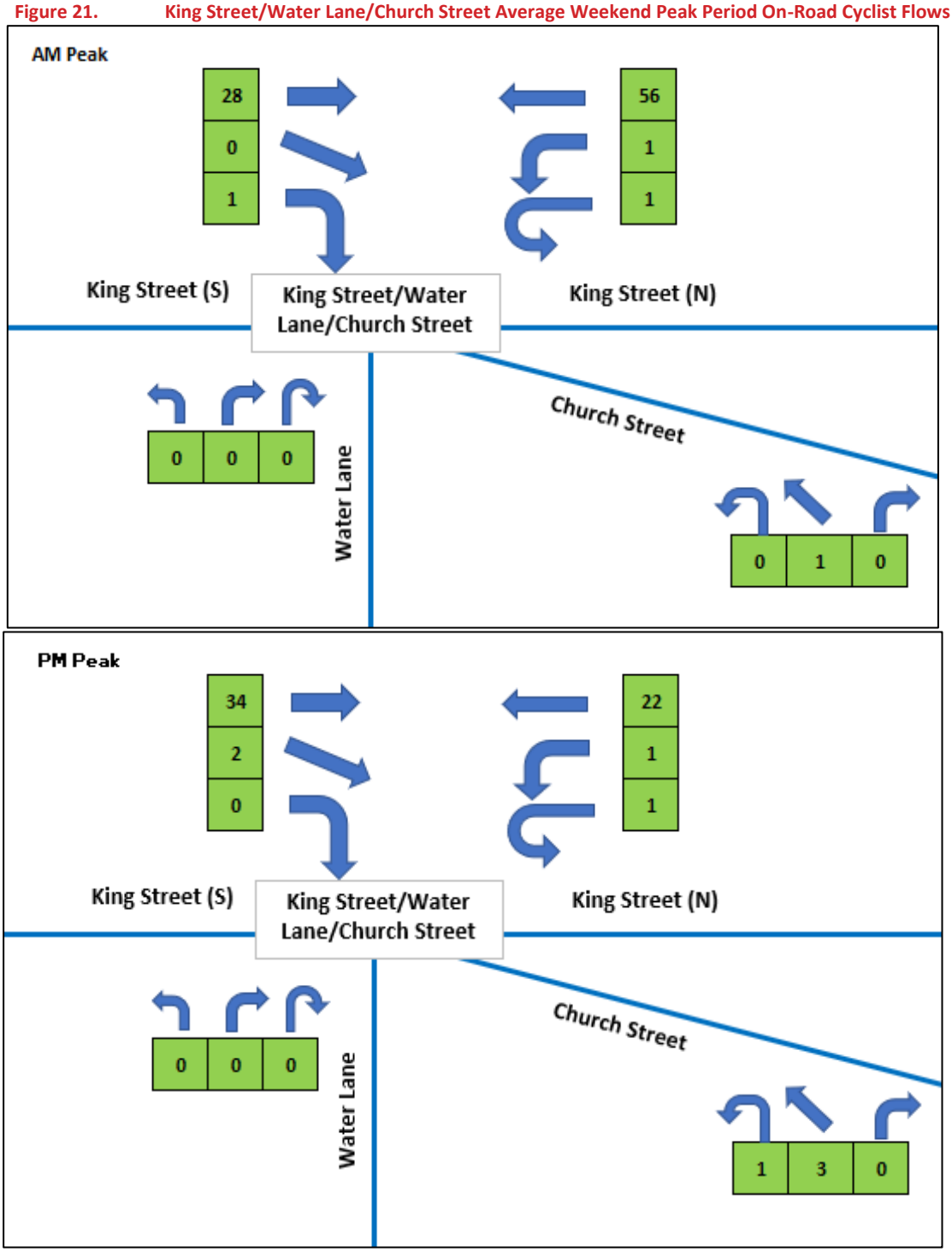





4.2.5 It is evident from the figure above that the King Street south to north movement and vice versa, generate the highest cycle movements for this junction. Overall the AM peak generates more cycle flows than the PM peak with 249 movements compared to 173 movement respectively, across the junction.

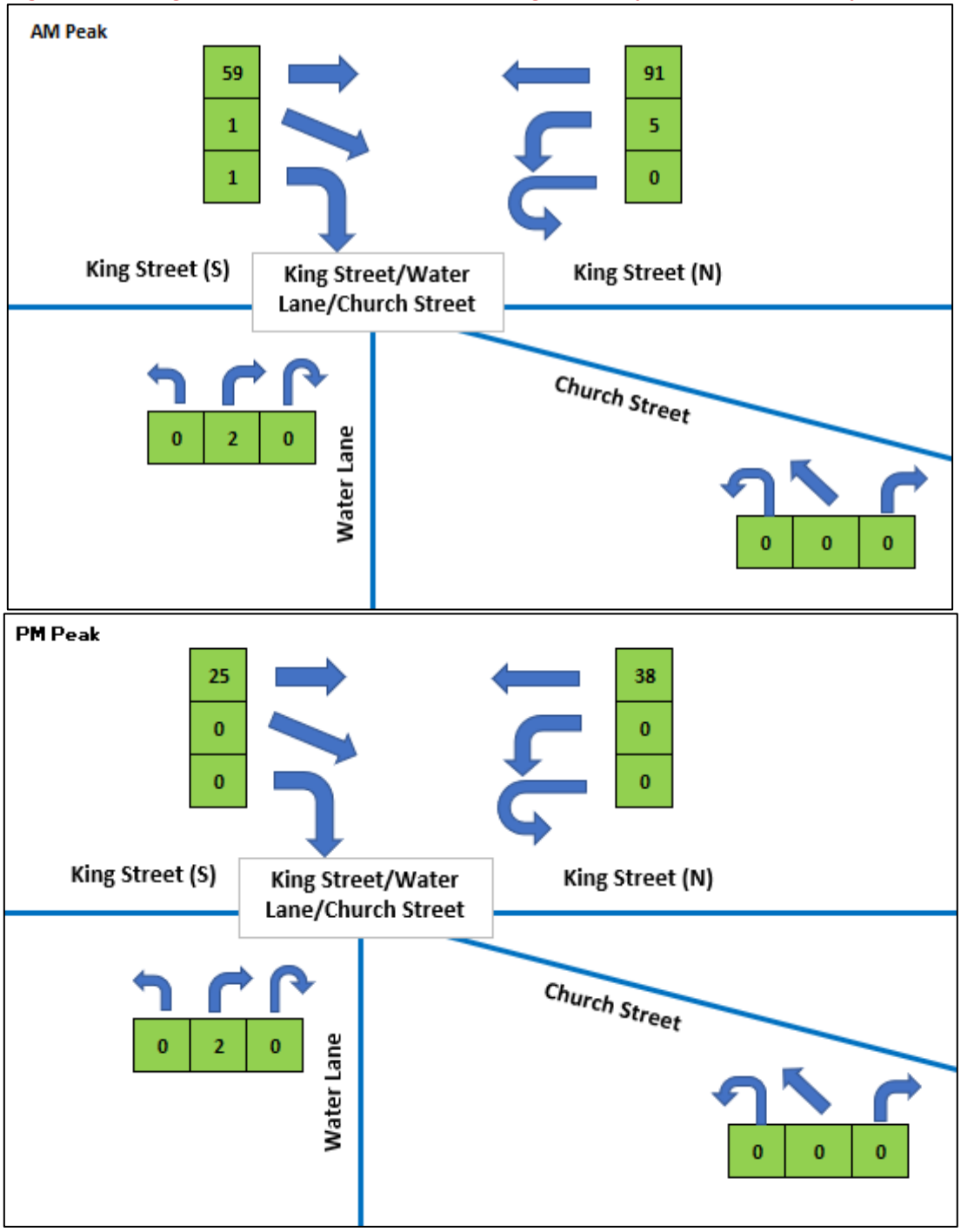
4.2.6 This result varies from 2019 results which demonstrate fewer cycle movements for the AM and PM peak periods with 202 and 205 respectively for the junction overall.

Figure 21. King Street/Water Lane/Church Street Average Weekend Peak Period On-Road Cyclist Flows




4.2.7 As would be expected, the weekend cycle flows are considerably lower than the average weekday scenario, with 152 cycle flows in total over both peak periods, compared to 423 cycle flows for the weekday scenario. It can be assumed that fewer people are travelling to and from work at the weekends; hence there is less cycle activity during the AM and PM peak periods.

Figure 22. King Street/Water Lane/Church Street Average Event Day Peak Period On-Road Cyclist Flows



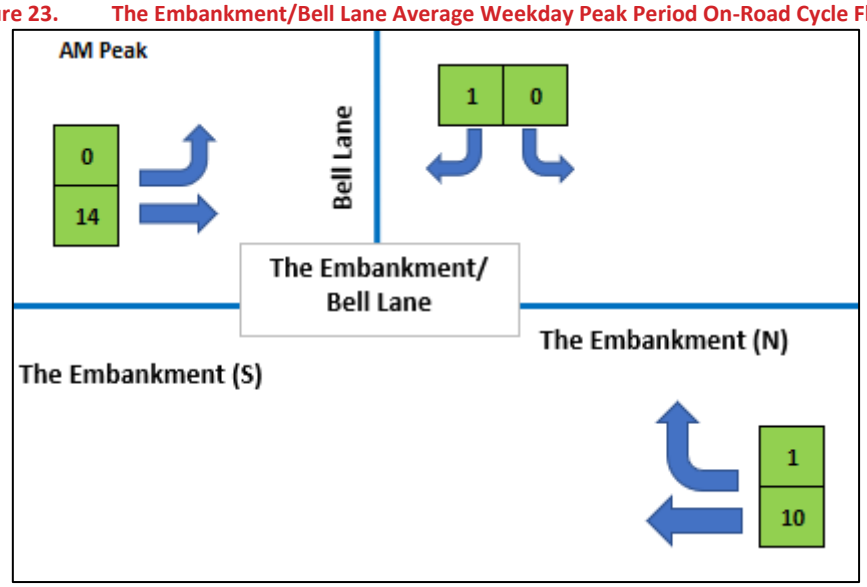

4.2.8 The event day scenario showed that a total of 224 cycle movements approaching the junction across both peak periods. This is 72 more cycle movements compared to the average weekend scenario. However, the event itself was outside of these peak period hours, so this result could have just been a general difference for the day, rather than the event day being a reason for the difference itself.

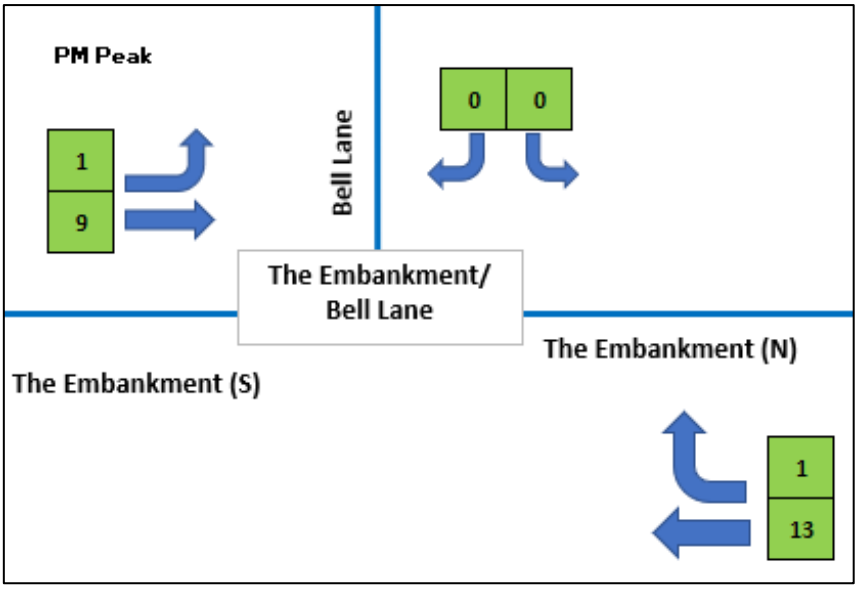
### The Embankment/Bell Lane

Cyclists at this junction are able to continue northwards along the riverside beyond the vehicle barriers. **Figure 23** to **Figure 25** show the on-road cyclist flows for The Embankment/Bell Lane junction for each scenario.

**Figure 23. The Embankment/Bell Lane Average Weekday Peak Period On-Road Cycle Flows**

4.2.9




4.2.10

4.2.11

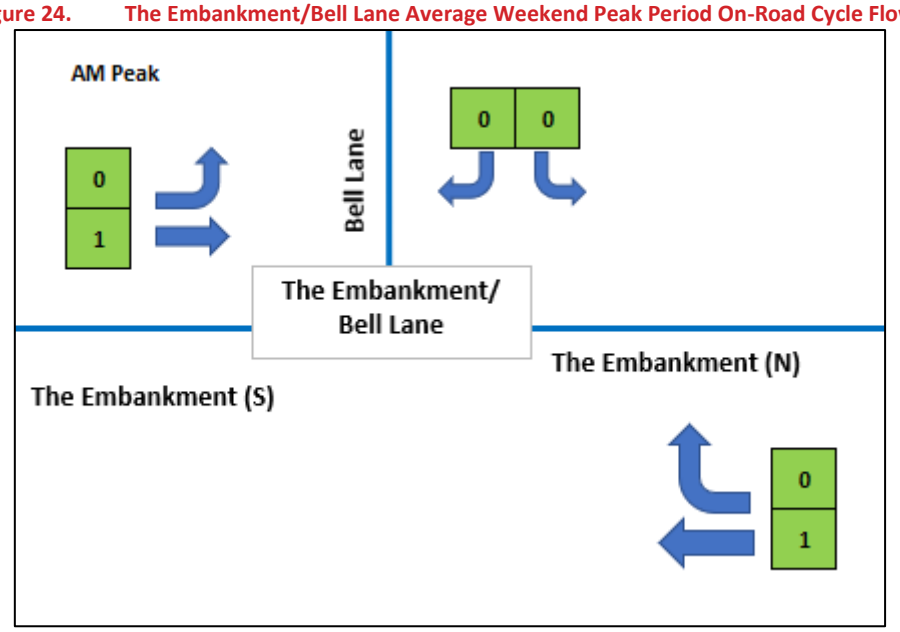
The results demonstrate that the AM peak had the highest cycle movements from The Embankment south to The Embankment north, with 14 movements. One cyclist was observed routing from Bell lane to The Embankment and vice versa.

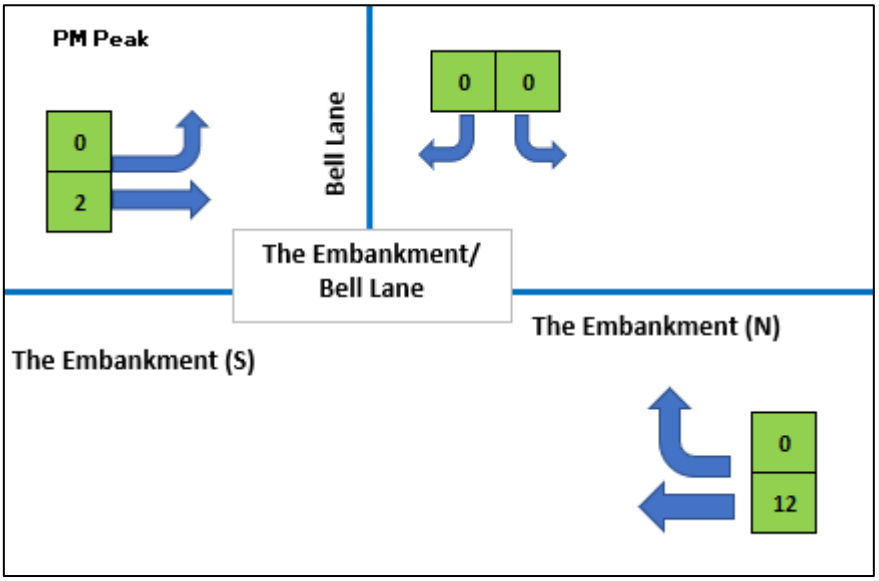
The highest number of movements in the PM peak was from The Embankment north to The Embankment south, with 13 movements, therefore, very similar to the AM peak. No cyclists were observed routeing from Bell lane to The Embankment whilst two cyclist made the reverse movement (one from The Embankment north and south respectively).

The 2019 results mirrored this pattern of movements.

**Figure 24. The Embankment/Bell Lane Average Weekend Peak Period On-Road Cycle Flows**

4.2.12

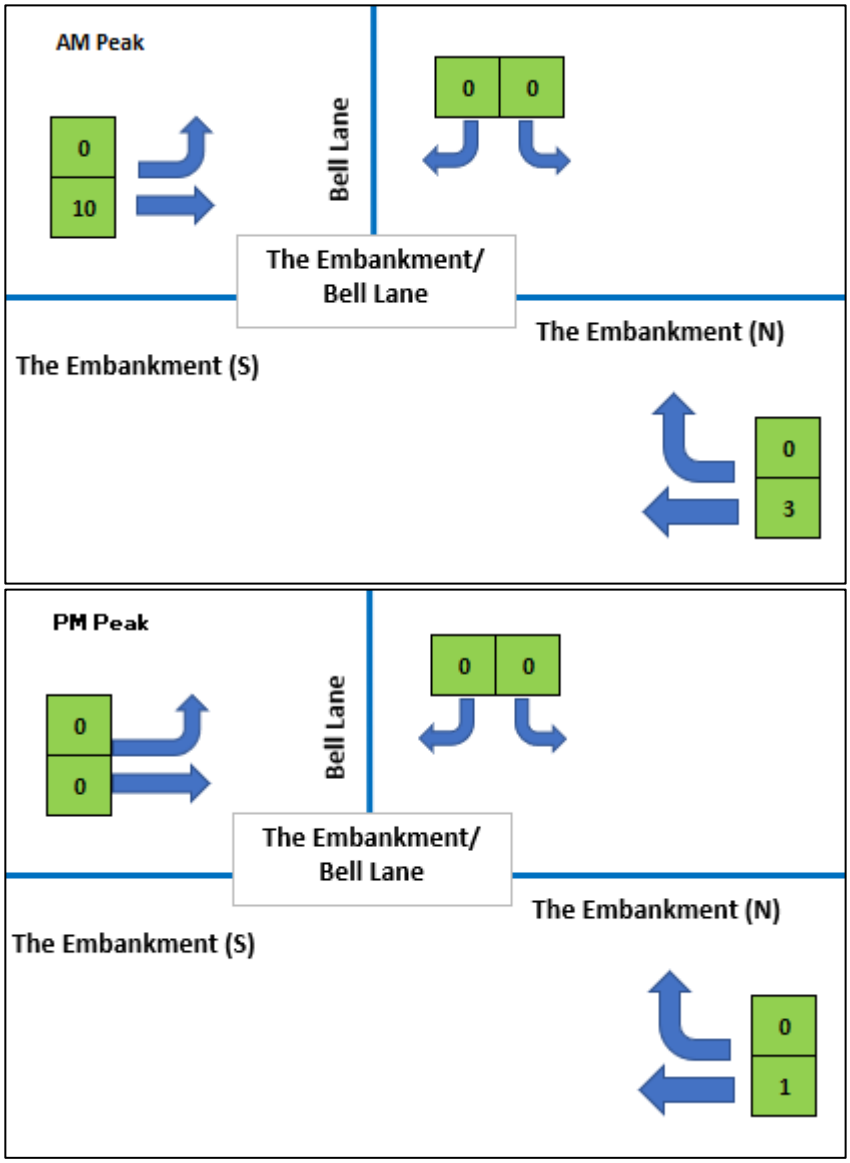



4.2.13

The figure above shows that the highest flow of cyclists was during the PM peak with 12 flows from The Embankment north to south. Overall, cycle flows were extremely light across both peak periods for the weekend scenario, with just 16 movements in total. As with the weekday results, no cyclists were observed routeing from Bell Lane onto The Embankment

Figure 25. The Embankment/Bell Lane Average Event Day Peak Period On-Road Cycle Flows




4.2.14

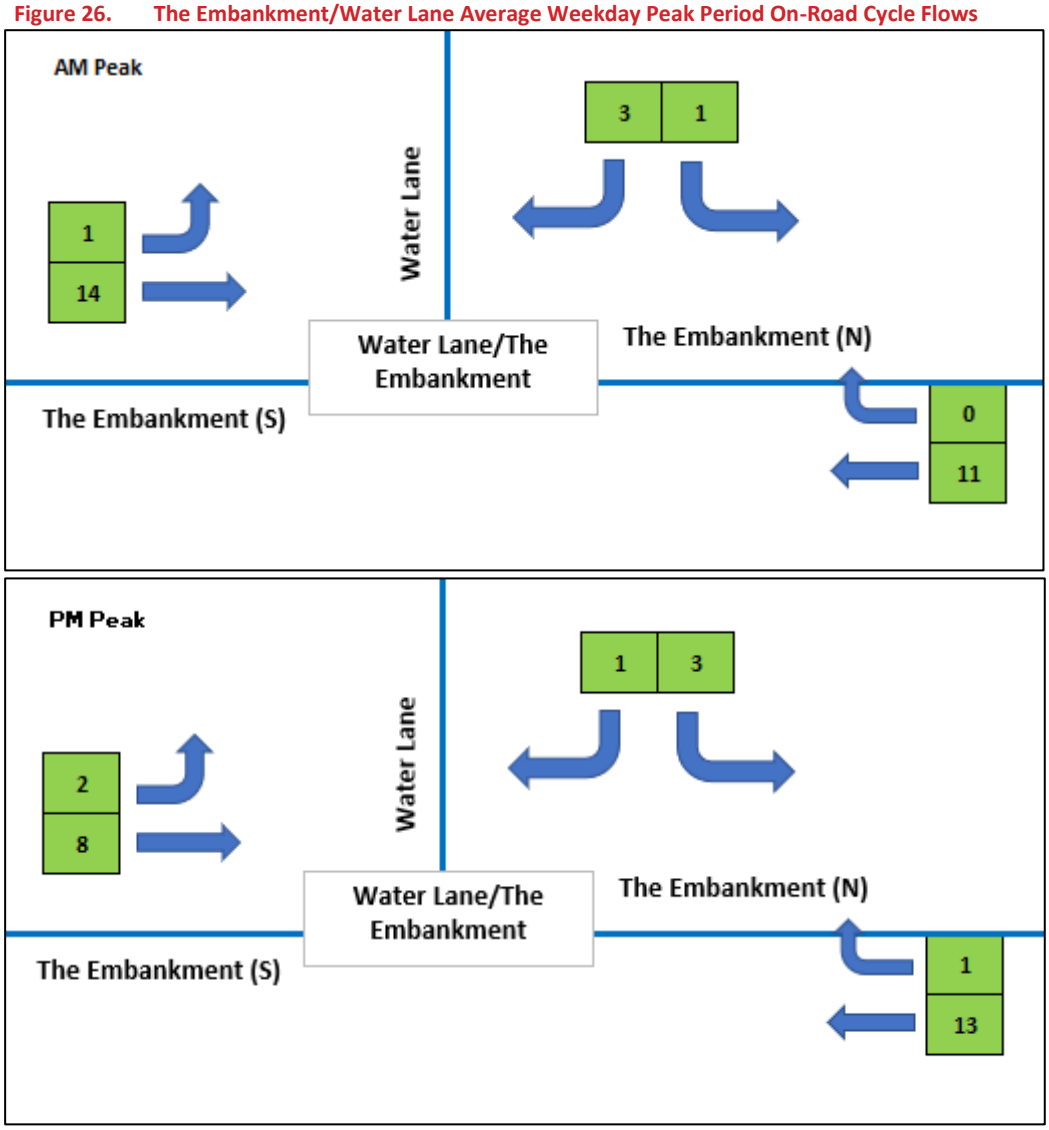
The event day scenario follows a similar pattern to the weekend scenario in that flows are very light at this junction with just 14 cycle flows in total across both peak periods for the event day. The highest cyclist movements were observed during the AM peak with 10 flows from The Embankment south to north.

4.2.15

**The Embankment/Water Lane**

**Figure 26** to **Figure 28** show the on-road cyclist flows for The Embankment/Water Lane junction for each scenario.

Figure 26. The Embankment/Water Lane Average Weekday Peak Period On-Road Cycle Flows




4.2.16 The figure above shows that the overall cycle flows across both peak periods for the average weekday scenario are similar, with 29 movements in the AM peak and 27 movements in the PM peak. The Embankment south has the highest number of overall

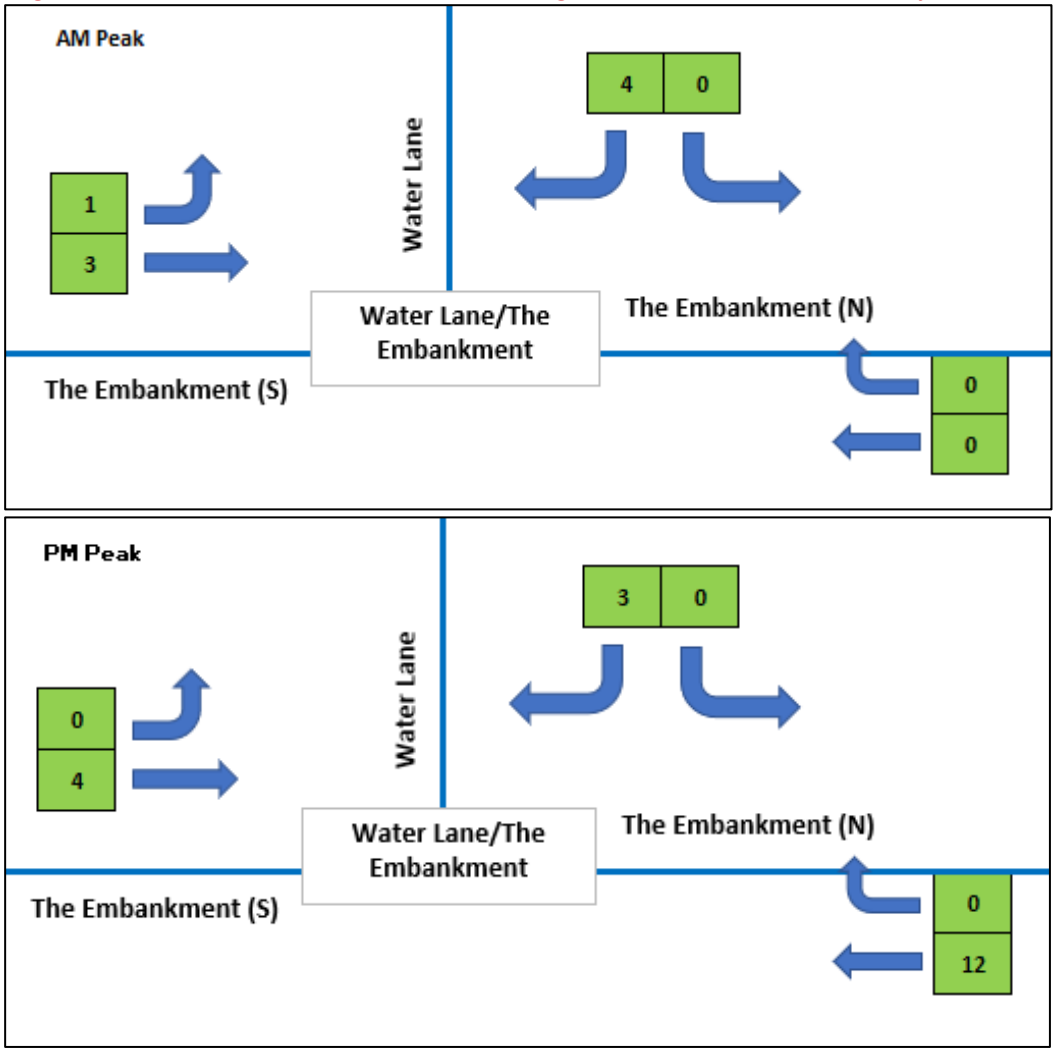
4.2.17 cyclist movements approaching the junction in the AM peak with (15). The Embankment north has the highest number of overall cyclist movements approaching the junction in

4.2.18 the PM peak (14).

There are 25 cycle movements approaching the junction in total for both The Embankment south and north, across both peak periods.

In comparison, the 2019 results show that there are 44 cycle flows approaching the junction in total over the AM peak and 28 in the PM peak. This equates to a difference of 15 cycle flows during the AM peak, when comparing the 2019 results to the 2020 results.

Figure 27. The Embankment/Water Lane Average Weekend Peak Period On-Road Cycle Flows

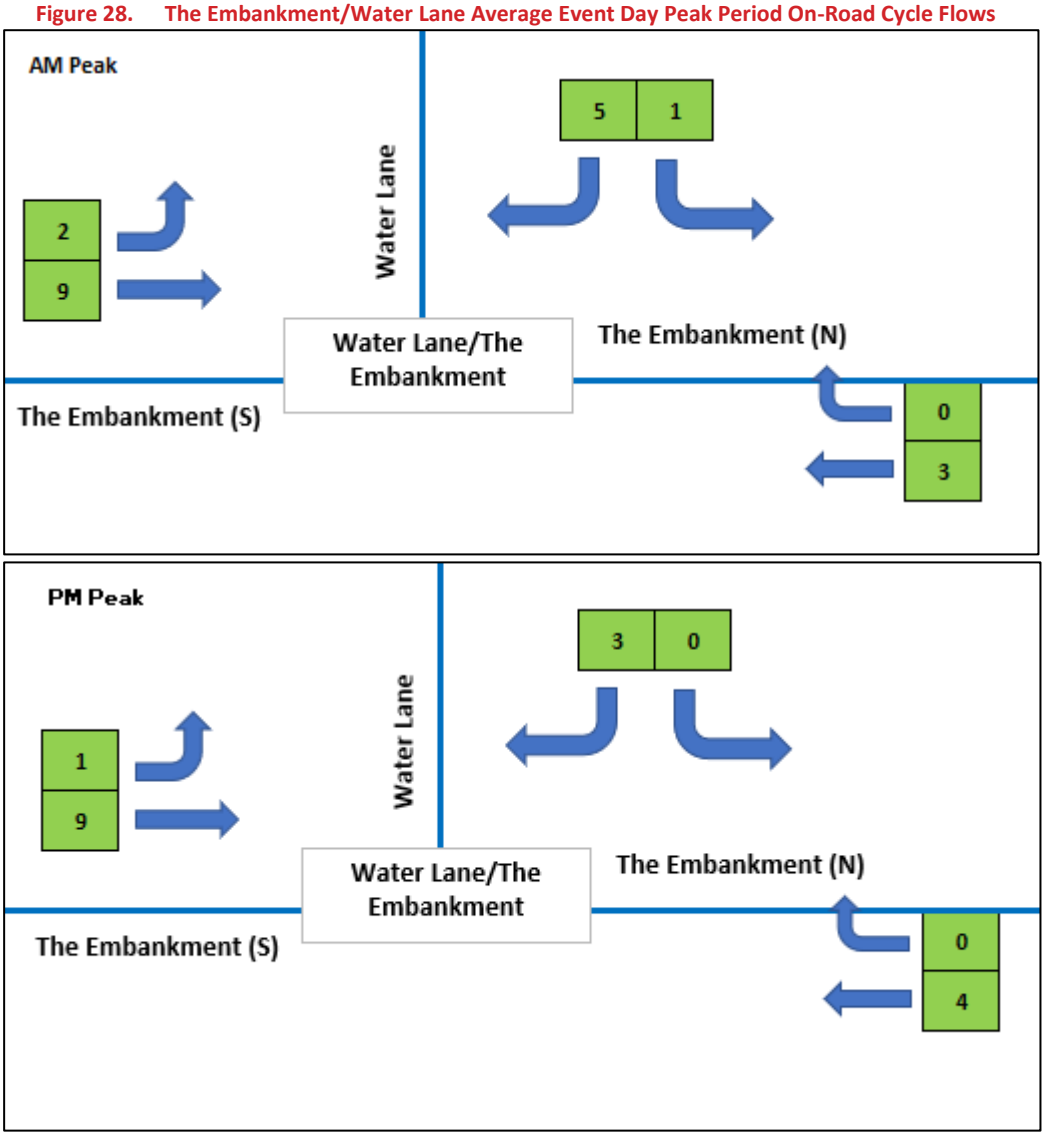



4.2.19

4.2.20 The weekend scenario shows that the highest number of cycle movements occur during the PM peak with 12 movements from The Embankment north to south. There are 39 cyclists recorded in total approaching the junction across both peak periods.

The AM and PM peak periods yield similar total cycle flows with 19 and 20 movements respectively.

Figure 28. The Embankment/Water Lane Average Event Day Peak Period On-Road Cycle Flows




4.2.21

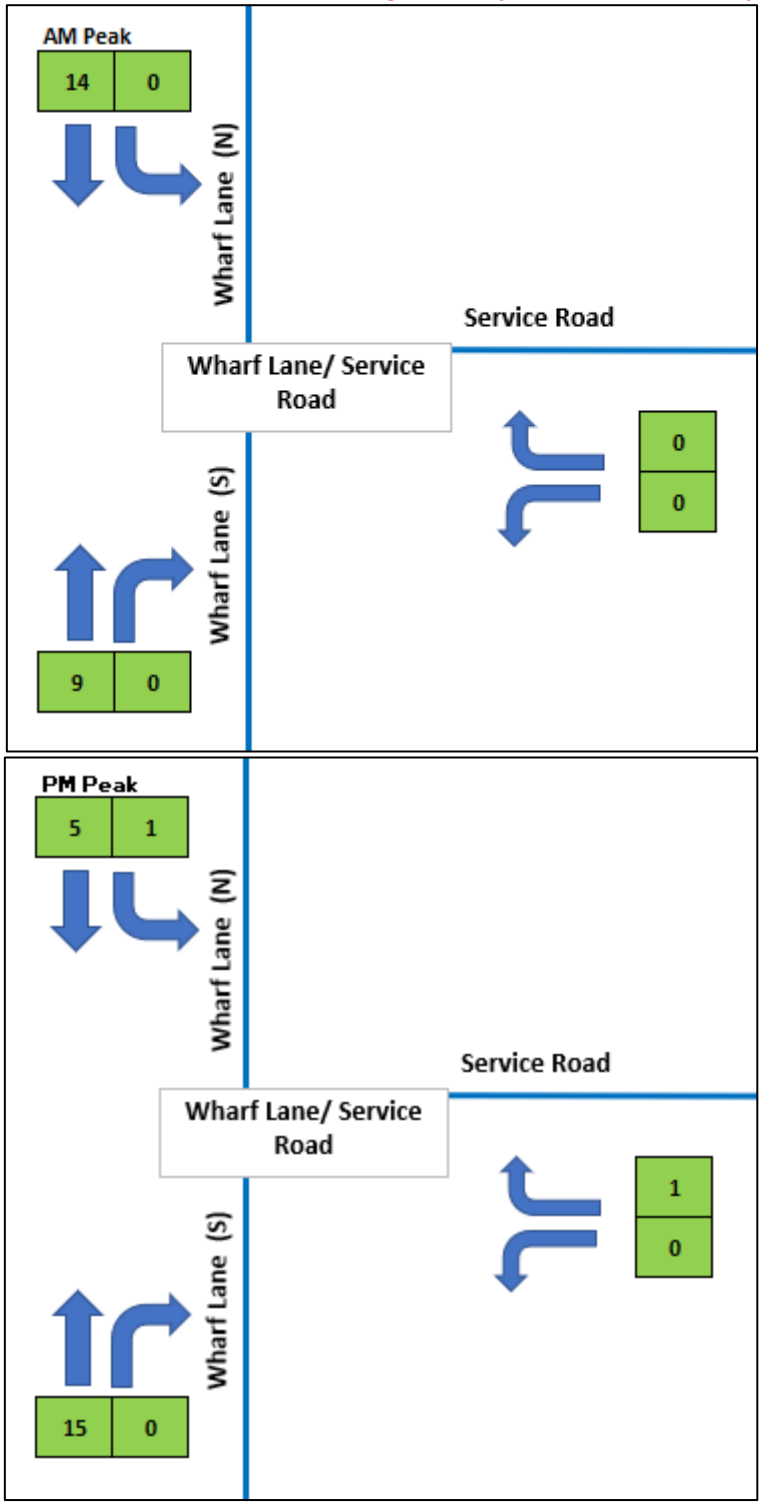
4.2.22 The event day scenario produced a similar total number of cyclist movements to the weekend scenario with 37 cyclists approaching the junction across both peak periods.

4.2.23 In both the AM and PM peak periods, The Embankment south to north arm recorded the highest flows with nine movement each.

**Wharf Lane/Service Road**

It is noted that a contraflow cycle track is painted onto the east side of the Wharf Lane carriageway running southwards towards The Embankment. **Figure 29** to **Figure 31** show the on-road cyclist flows for the Wharf Lane/Service Road junction for each scenario.

Figure 29. Wharf Lane/Service Road Average Weekday Peak Period On-Road Cycle Flows




4.2.24

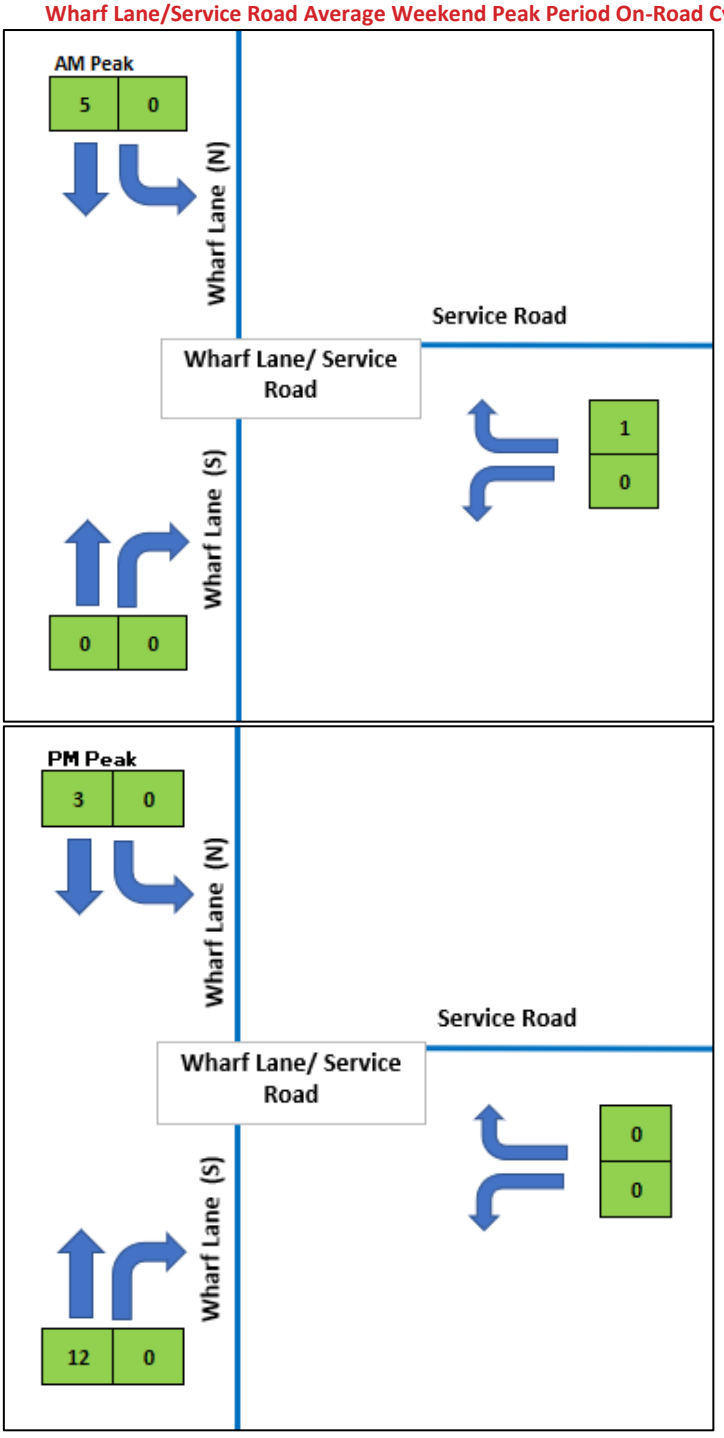
The highest average weekday scenario flow was recorded during the PM peak with 15 cycle movements from Wharf Lane south to north. The Wharf Lane south arm generates the most cycle flows approaching the junction across both peak periods, with 24 flows.

This is similar to the 2019 results, where the Wharf Lane south arm generated 34 flows on approach to the junction (also the highest number across the junction).

The Service Road sees minimal cycle movements in both 2019 and 2020 results.

**Figure 30. Wharf Lane/Service Road Average Weekend Peak Period On-Road Cycle Flows**

4.2.25



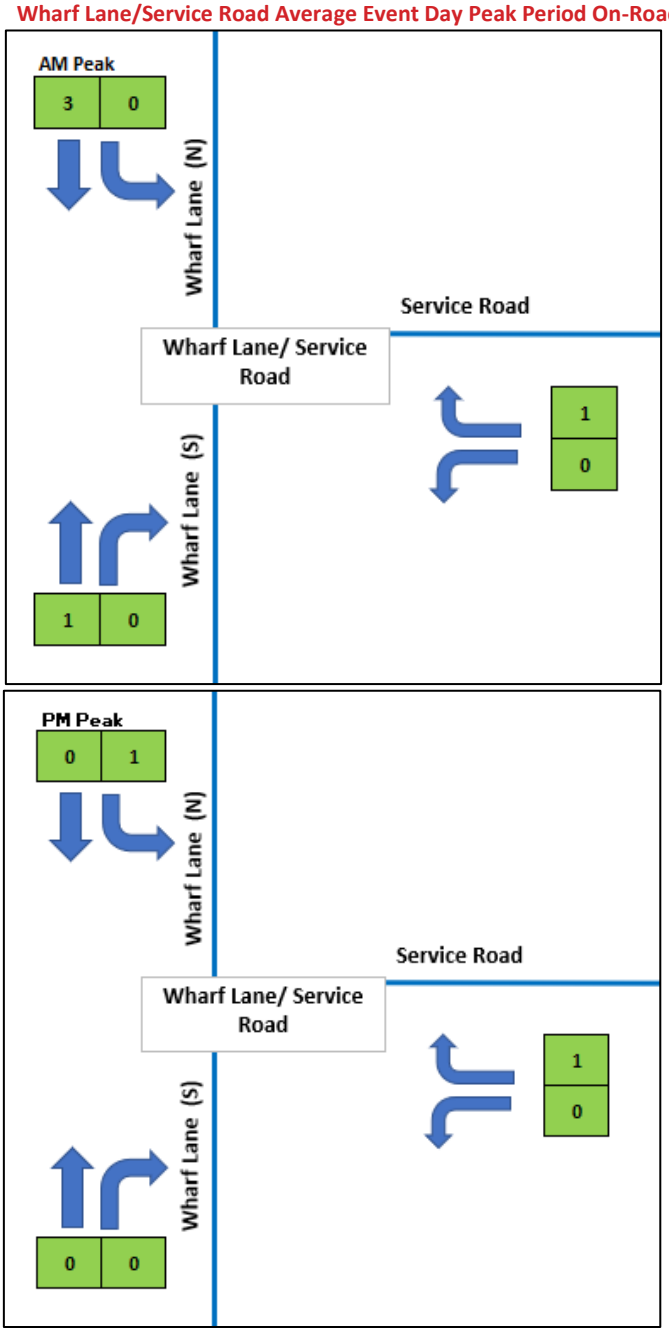
The weekend scenario shows that the highest number of cyclist movements occurs during the PM peak period with 12 movements from the Wharf Lane south to north arm. This is consistent with the weekday scenario results.

There are 21 cyclist movements in total occurring across the junction over both peak periods. In comparison, the average weekday scenario recorded 45 cyclists movements in total across the junction for both peak periods, equating to a difference of 24.

4.2.26

**Figure 31. Wharf Lane/Service Road Average Event Day Peak Period On-Road Cycle Flows**

4.2.27



Very few cyclist movements were overserved on the event day at this junction, totalling just seven flows across both the peak periods. The highest flow was recorded during the AM peak, from Wharf Lane north to south, with three movements.

4.2.28 Similar to the weekday and weekend scenarios, the Service Road generates the lowest number cyclist movements at the junction, with just one movement during each peak period.

## 4.3 Summary

4.2.29 The on-road cycling flows demonstrate similar patterns between each scenario. There were some differences in numbers for the weekday scenario compared to the 2019 flows, however, overall, the trends in data remained consistent.

4.3.1

## 4.4 Pedestrian & Other Cyclist Survey Results

4.4.1 This section summarises the peak period results of the pedestrian counts and for cyclists not observed undertaking a continuous carriageway movement on-road. An average flow has been calculated for both AM (08:00 – 09:00) and PM (17:00 – 18:00) peak periods, for the weekday scenario. The event day peak period of 15:00-16:00 (hour prior to the match kick-off) has also been analysed in detail for the event day and weekend scenario.

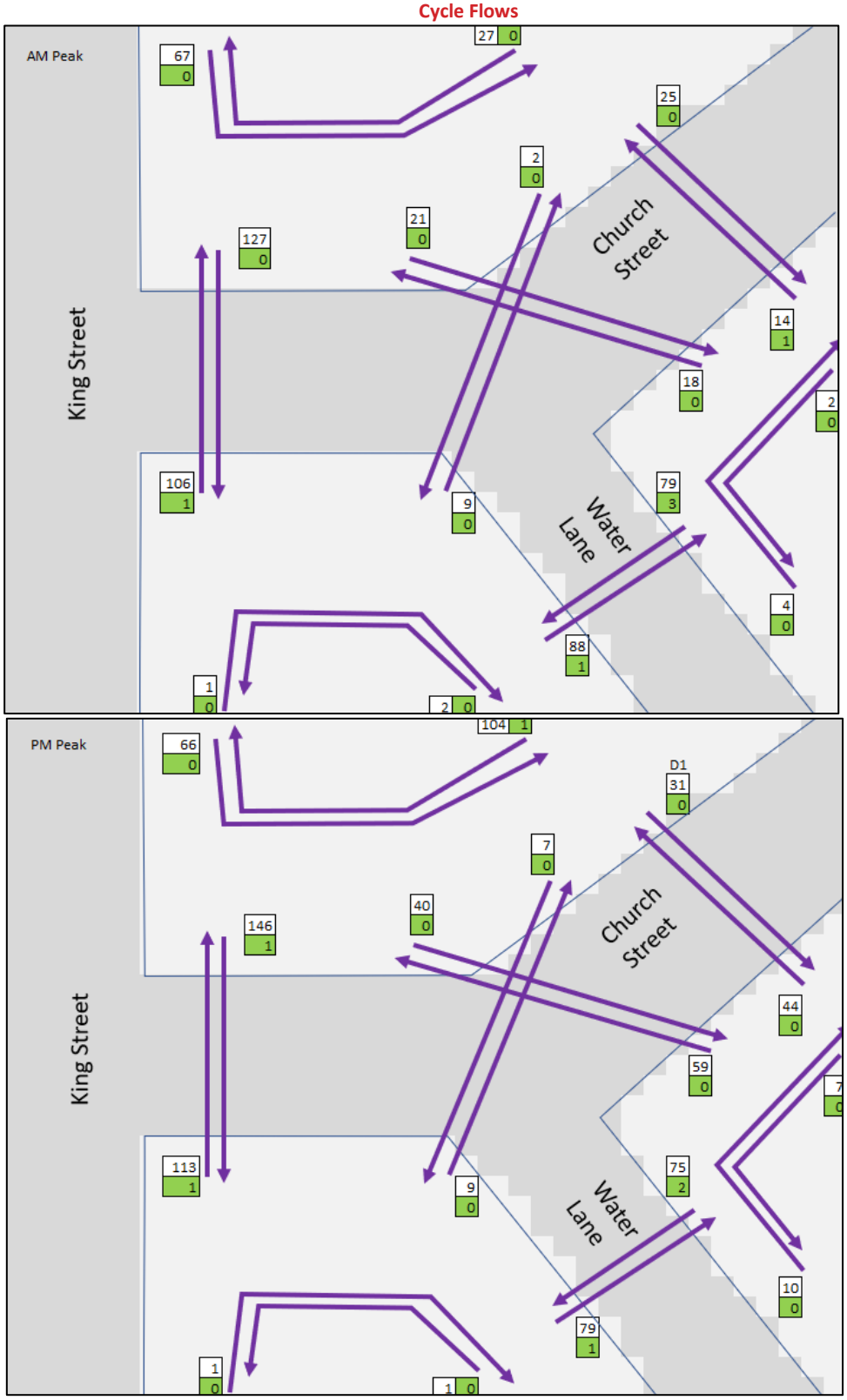
4.4.2 The junctions are discussed below in further detail for each period. The white cells in the images below show pedestrian movements, whilst the green cells show cycling movements.

**King Street/Water Lane/Church Street**

4.4.3

**Figure 32** shows the average network peak period pedestrian counts and remaining cycle movements at the King Street/Water Lane/Church Street junction, for the weekday scenario.

**Figure 32. King Street/Water Lane/Church Street Average Weekday Peak Period Pedestrian & Other Cycle Flows**



Both the AM and PM peaks of the average weekday scenario counts show that the highest pedestrian movements at this junction were recorded crossing Water Lane, between the intersections with King Street and Church Street. These figures have a two-way total of 233 pedestrians in the AM peak and 279 pedestrians in the PM peak. This mirrors the 2019 results, where the AM figure for this movement was 241 pedestrians and 319 pedestrians for the PM movement.

4.4.4 There is a total of six cycle movements taking place for both the AM and PM peak periods over the average weekday scenario. In 2019, 12 cyclists were observed in the AM peak and 16 in the PM peak.

4.4.5 The average over both weekends (weekend scenario and event day scenario), showed a two-way total of 78 pedestrian counts at the Water Lane crossing between the intersection of King Street and Church Street during the AM peak and 268 pedestrian

4.4.6 counts for the PM peak. Therefore, considerably lower pedestrian movements than observed in the weekday AM peak, but similar findings in the weekend PM peak to the weekday PM results.

**King Street/Water Lane/Church Street – Event Day Peak Period**

4.4.7 **Figure 33** and **Figure 34** below show the pedestrian and cycle counts for this junction during the 'neutral' weekend and event day for the event day peak between 15:00-16:00.

**Figure 33. King Street/Water Lane/Church Street Average Weekend Pedestrian & Other Cycle Flows (15:00 – 16:00)**

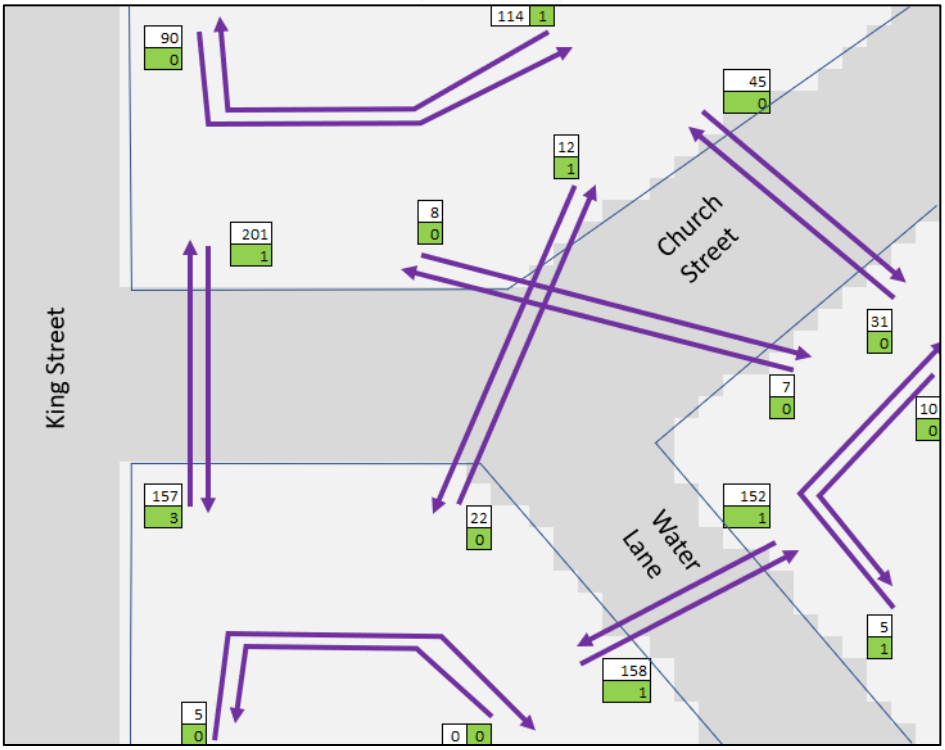
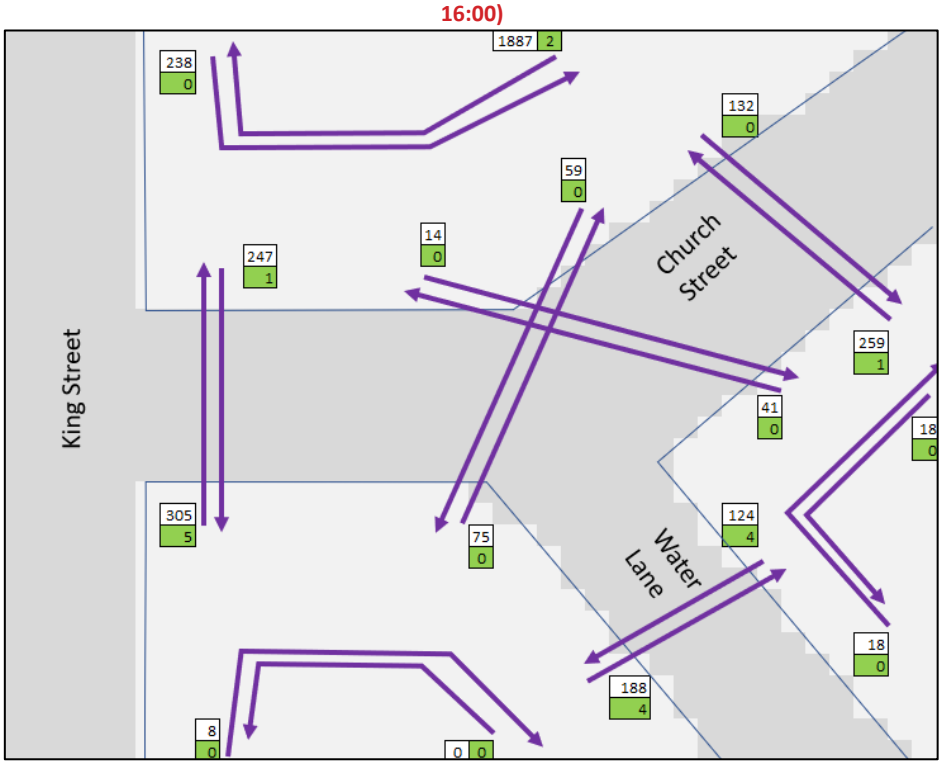


Figure 34. King Street/Water Lane/Church Street Average Event Day Pedestrian & Other Cycle Flows (15:00 – 16:00)




4.4.8 The results follow a similar pattern to the weekday network peak scenario in that the Water Lane crossing between the King Street/ Church Street intersection sees the highest pedestrian count in terms of carriageway crossings. However, as would be expected, the event day sees higher pedestrian counts at each movement.

4.4.9 There is a significant difference in the number of pedestrians crossing Church Street between the weekend and event day scenarios, with the event day seeing 315 more pedestrian counts at this crossing.

4.4.10 Furthermore, there is a significant number of additional pedestrians turning along the footway from Church Street to King Street (without crossing) on the event day compared to the 'neutral' weekend day with 1,887 movements versus 114. The difference in cycle counts between both scenarios, remains fairly minor, at eight more cycle counts over the whole junction during the event day scenario.

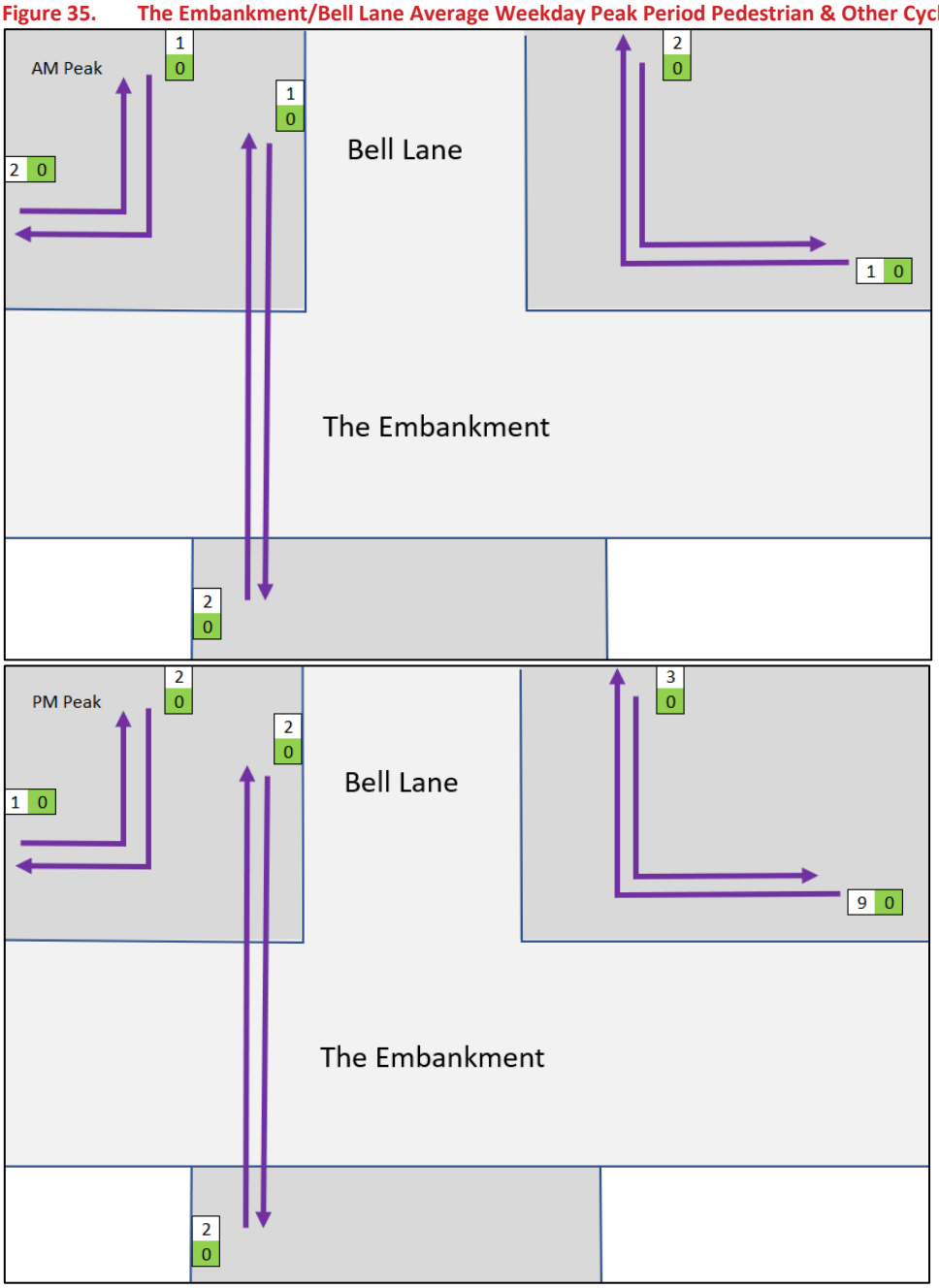
4.4.11

4.4.12 **The Embankment/Bell Lane**

**Figure 35** shows the average peak period pedestrian counts and off-road cycle movements at The Embankment/Bell Lane junction for the weekday scenario.

It is noted that pedestrians making a through movement along the Embankment are not included in the counts for this junction, due to the location of the survey cameras. The results for The Embankment/Water Lane junction provide a better indication of pedestrian flows along the Embankment.

Figure 35. The Embankment/Bell Lane Average Weekday Peak Period Pedestrian & Other Cycle Flows




4.4.13

4.4.14 The AM and PM peaks both demonstrate only a small number of pedestrian counts at this junction, with no cycle movements recorded during these peak hours. A reason for this junction being lightly used could be due to the lack of adequate footways in the immediate vicinity. The 2019 results also demonstrate that this junction is only lightly used by pedestrians and cyclists on an average weekday scenario.

A total of nine pedestrian movements in the AM peak across the whole junction and 19 in the PM peak, across the whole junction is observed.

The average weekend results show a similar trend, in that there are no cycle counts over the peak network period. 24 pedestrian counts were recorded at The Embankment north to Bell Lane movement for the PM peak over the average weekend scenario.

**The Embankment/ Bell Lane – Event Day Peak Period**

4.4.15 **Figure 36** and **Figure 37** below show the pedestrian and cycle counts for this junction during the 'neutral' weekend and event day for the event day peak.

**Figure 36. The Embankment/Bell Lane Average Weekend Pedestrian & Other Cycle Flows (15:00 – 16:00)**

4.4.16

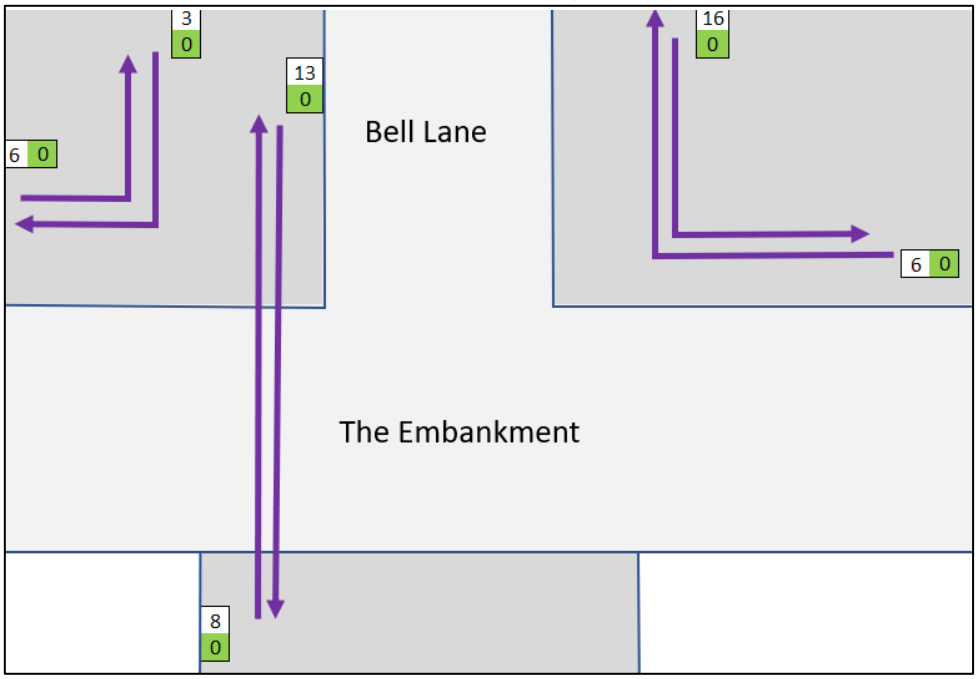
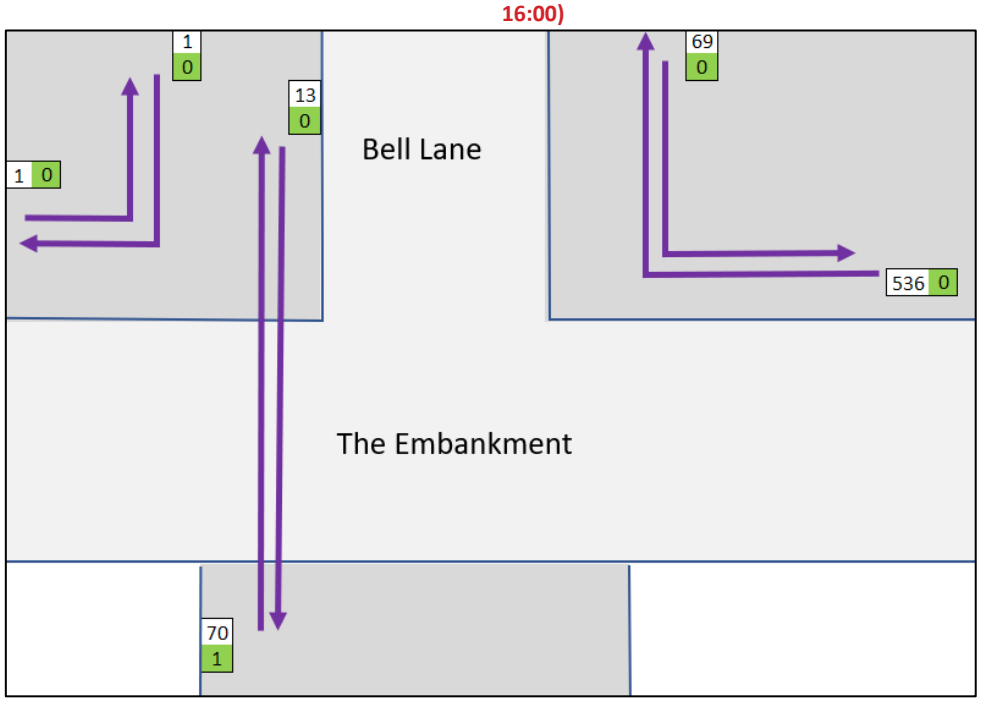


Figure 37. The Embankment/Bell Lane Average Event Day Pedestrian & Other Cycle Flows (15:00 – 16:00)



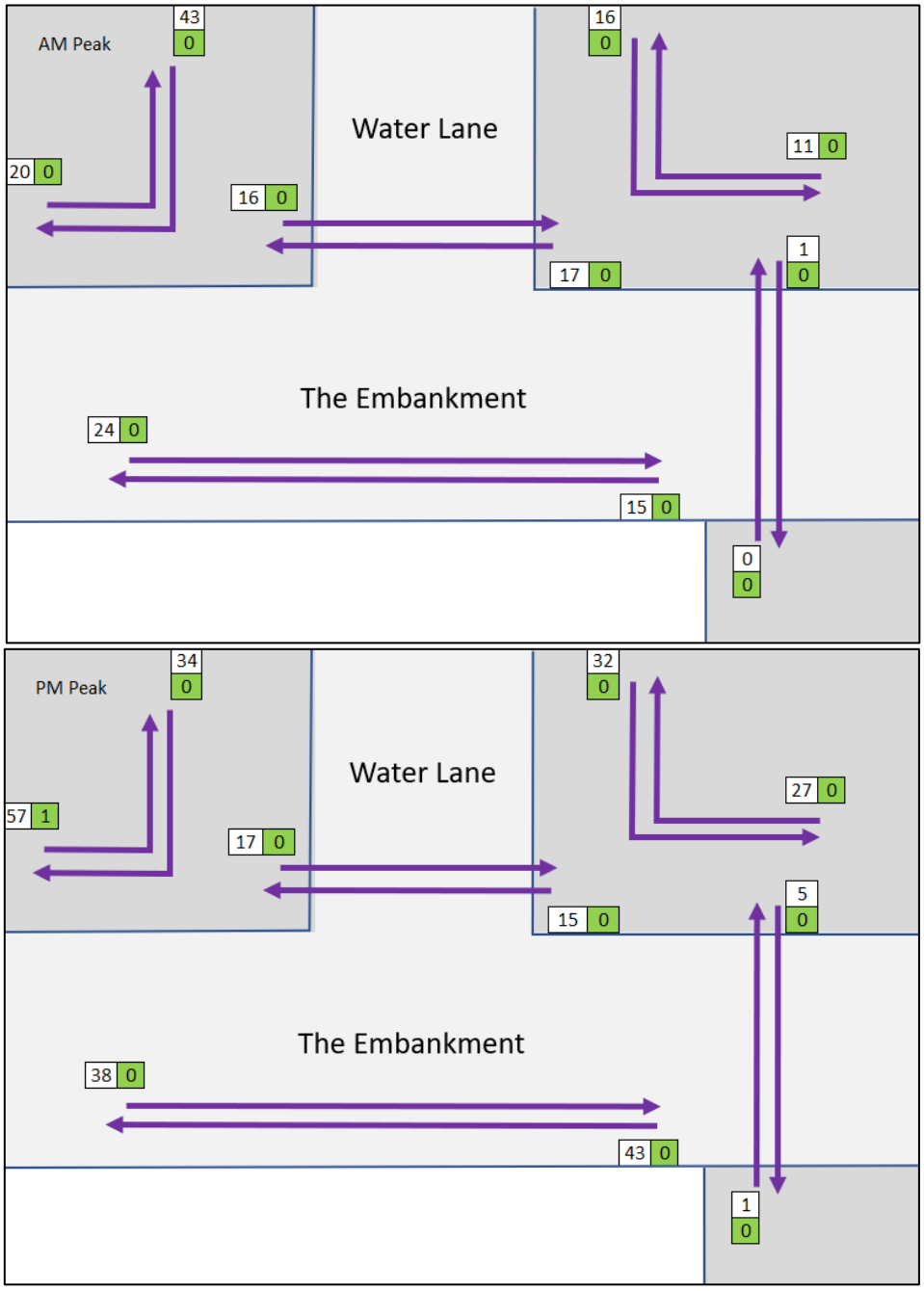

4.4.17 In comparison to the weekday scenario, both the 'neutral' weekend and event day peak period results clearly show a major increase in the number of pedestrian counts, whilst cycle counts still remain very minor. There are 52 pedestrian counts in total over the weekend scenario and 690 pedestrian counts in total on the event day scenario.

4.4.18 The majority of the counts for the event day are from The Embankment north to Bell Lane movement, with 536 pedestrian counts. This equates to difference of 530 pedestrian counts for this movement between the weekend and event day scenario. Hence; it is clear that the event day did have a significant impact on pedestrian movements, compared to the average weekend.

4.4.19 **The Embankment/Water Lane**

**Figure 38** shows the average peak period pedestrian counts and cycle movements at The Embankment/Water Lane junction the weekday scenario.

Figure 38. The Embankment/Water Lane Average Weekday Peak Period Pedestrian & Other Cycle Flows




4.4.20

The figures show that the highest pedestrian count during the weekday AM peak is 43, taking place from Water Lane to The Embankment south. The highest PM peak weekday pedestrian count is 57, taking place for the reverse movement, from The Embankment south to Water Lane. This is similar to the 2019 results, with the same movements producing the highest peaks during the AM and PM peaks (53 pedestrian counts and 72 pedestrian counts respectively).

There is only one cyclist movement across both peak periods, during the PM peak, for The Embankment south to Water Lane movement.

The average weekend network peak results for this junction varies from the weekday results. The AM peak pedestrian count movements are generally low. The highest PM peak pedestrian count movement occurs at from The Embankment north to Water Lane,

4.4.21 with 51 pedestrian movements. Cyclist counts are very low at this junction during the average weekend AM and PM scenario.

4.4.22

**The Embankment/Water Lane - Event Day Peak Period**

**Figure 39** and **Figure 40** show the pedestrian and cycle count movements for this junction during the weekend and event day for the event day peak.

4.4.23 **Figure 39. The Embankment/ Water Lane Average Weekend Pedestrian & Other Cycle Flows (15:00 – 16:00)**

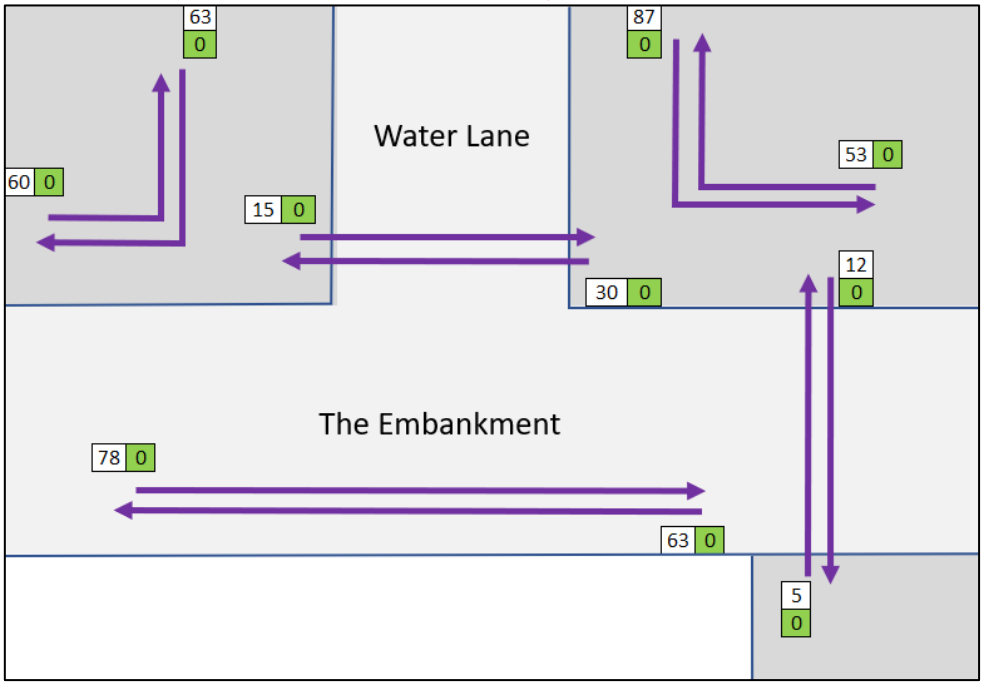
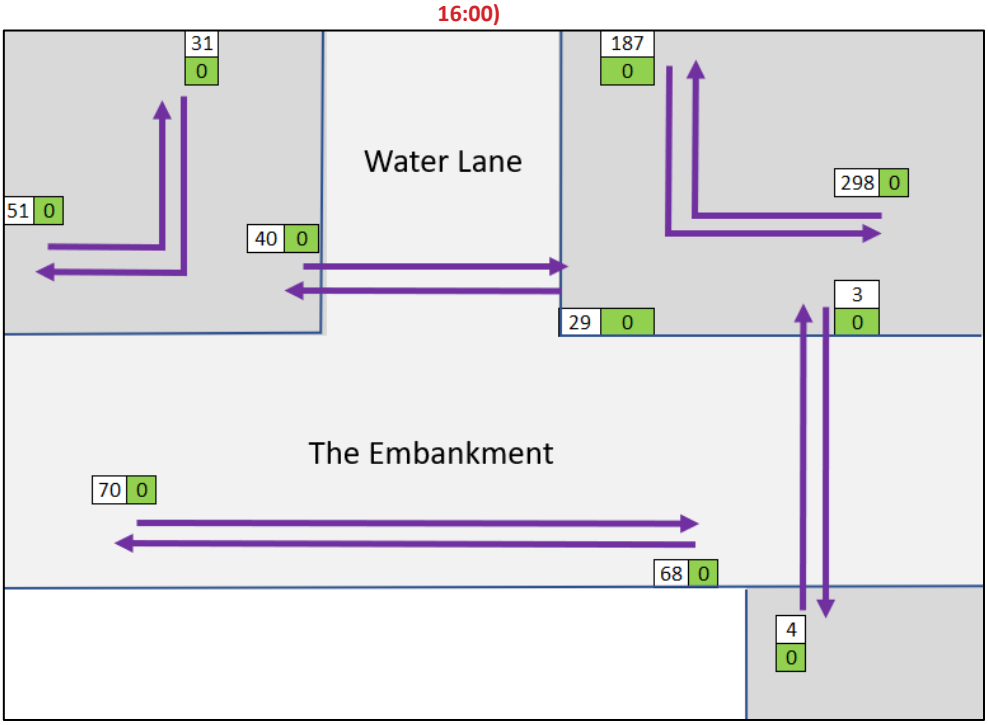


Figure 40. The Embankment/ Water Lane Average Event Day Pedestrian & Other Cycle Flows (15:00 – 16:00)



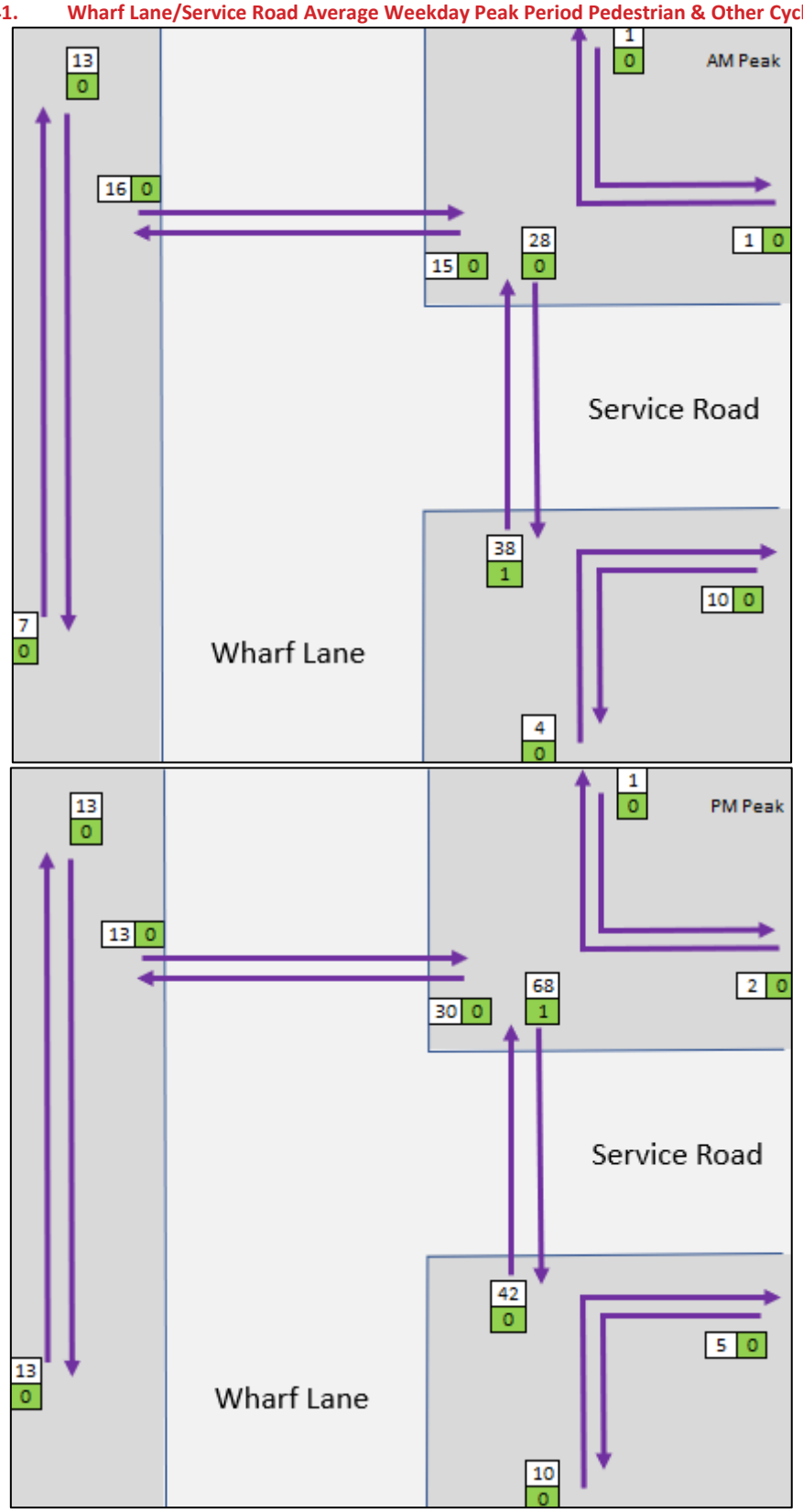

4.4.24 The highest pedestrian counts occur at different movements for the weekend and event day scenarios, compared to the weekday scenario. The most common movement for the weekend scenario was from Water Lane to The Embankment north (87 pedestrian counts). The most common movement for the event day was from The Embankment north to Water Lane with 298 pedestrian counts. Cyclist counts follow a similar trend for the weekday, weekend and event day scenario, all being low numbers.

4.4.25 There is a total of 315 more pedestrian movements at the junction during the event day peak compared to the weekend scenario peak, with the majority of this increase seen at The Embankment north/ Water Lane movement. This movement generates 345 more two-way pedestrian counts during the event day.

4.4.26 **Wharf Lane/Service Road**

**Figure 41** shows the average peak period pedestrian counts and cycle movements at the Wharf Lane/Service Road junction for the weekday scenario.

Figure 41. Wharf Lane/Service Road Average Weekday Peak Period Pedestrian & Other Cycle Flows



The results show that the highest number of pedestrian movements are observed at the Service Road crossing. The AM peak records a total of 66 two-way pedestrian counts for this movement, whilst the PM peak records a total of 110 two-way counts. This pattern mirrors the 2019 results which reported 42 two-way pedestrian counts in the AM peak and 50 two-way counts in the PM peak for this scenario. Cycle counts are low across the whole junction and in both 2019 and 2020.

4.4.27 It is noted that the western footway of Wharf Lane is lightly used by pedestrians compared to the footway on the opposite side of the road. This is likely due to the eastern footway being wider and typically not obstructed by parked vehicles.

4.4.28 The average weekend scenario demonstrated the same trend as both the 2019 and 2020 weekday scenario results, in that the Service Road crossing recorded the highest pedestrian counts (44 two-way pedestrian movements in the AM and 113 in the PM),

4.4.29 whilst the number of cyclists was very low.

**Wharf Lane/Service Road- Event Day Peak Period**

**Figure 42** and **Figure 43** show the pedestrian and cycle count movements for this junction

4.4.30 during the weekend and event day for the event day peak.

**Figure 42. Wharf Lane/Service Road Average Weekend Pedestrian & Other Cycle Flows (15:00 – 16:00)**

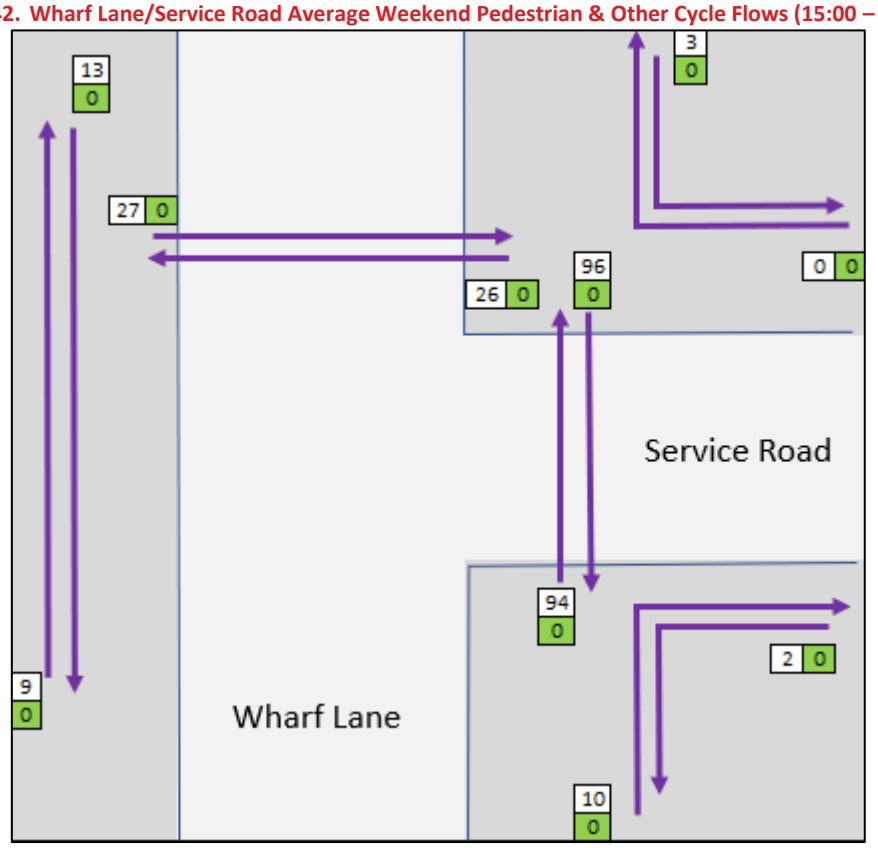
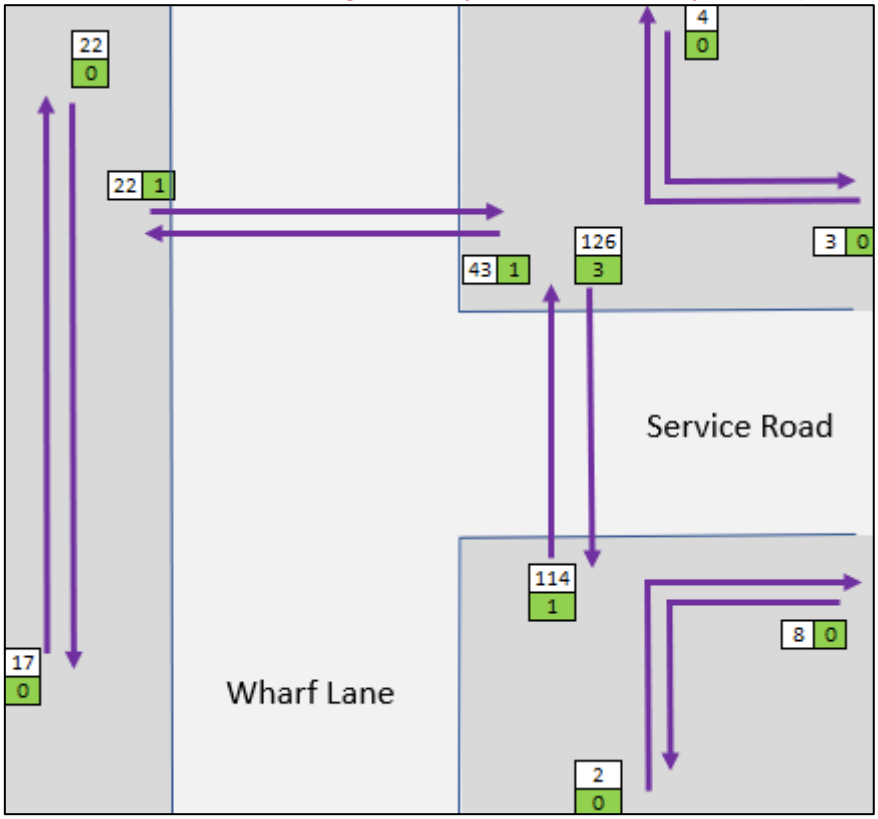


Figure 43. Wharf Lane/Service Road Average Event Day Pedestrian & Other Cycle Flows (15:00 – 16:00)




4.4.31 The results demonstrate that the weekend and event day scenarios above for the event day peak period follow the same trend as that of the weekday AM and PM scenario, with the Service Road crossing generating the highest pedestrian counts. However, the number of counts are higher during the weekend and event day, with 190 pedestrians counted during the weekend scenario and 240 pedestrians counted during the event day scenario.

4.4.32

4.4.33 Whilst there were no cycle counts during the weekend scenario, there were six cycle counts during the event day scenario, with half of them taking place over the Service Road south crossing movement.

As noted at the other junctions, the event day scenario does have a considerably higher pedestrian count than the weekend scenario, with 81 more pedestrian movements counted at this junction.

4.5.1

## 4.5 Summary

The pedestrian and off-road cycle counts show that, whilst pedestrian numbers vary across the junctions, cycle movements remain consistent low at all junctions in each scenario. The 2019 and 2020 results reported similar trends in relation to where the highest pedestrian and cycle movements occur for the majority of junctions.

4.5.2 The results also show that during the 15:00-16:00 event day peak hour, considerably more pedestrian movements were made across all junctions in comparison to an average

weekend scenario. Overall, this is an expected result for the event day, with an assumption that more people were travelling to and from Twickenham Stadium

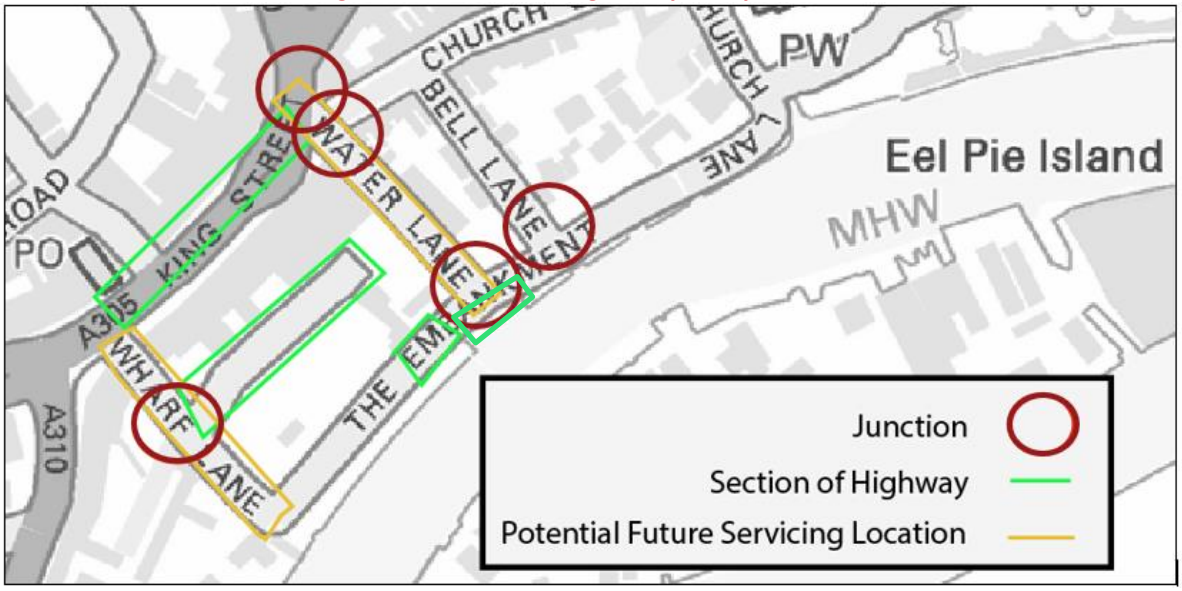
# 5. SERVICING ACTIVITY

## 5.1 Introduction

5.1.1 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.

5.1.2 **Figure 44** 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.

Figure 44. Servicing Activity Survey Area




5.1.3 The following servicing locations have been included:

- Loading bays (3no.) on The Embankment adjacent to footbridge linking to Eel Pie Island;
- Yellow line among the Embankment where it is understood that loading activities often occur when the marked loading bays are occupied;
- Unnamed Service Road off Wharf Lane; and
- South side of King Street (between Water Lane and Wharf Lane).

5.1.4 In addition, where possible, servicing activity has been identified at The Embankment/Bell Lane junction, The Embankment/ Water Lane junction, the Water Lane/ Church Street junction, the King Street/ Church Street junction and the junction of Wharf Lane and the Service Road.

5.1.5 The servicing surveys were carried out over a 24 hour period on:

- Friday 6th March 2020
- Saturday 7th March 2020 (Event Day and excluding Church Street)
- Monday 9th March 2020

- Friday 13th March 2020
- Saturday 14th March 2020
- Monday 16th March 2020

5.1.6 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. All figures reported in this section represent the average of the survey results recorded over a daily period (Weekday, Weekend, Event Day).

## 5.2 Servicing Activity Analysis

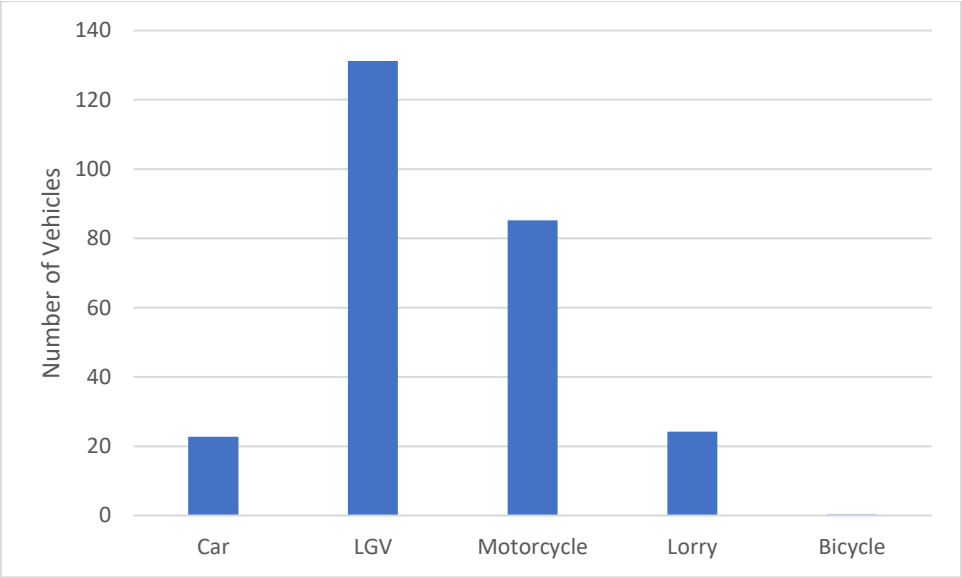
5.2.1 For the purposes of this analysis, servicing dwell times have been divided into four categories. These are: 0-5 minutes; 5-10 minutes; 10-20 minutes; and over 20 minutes.

5.2.2 It is noted that for all locations, some vehicles were recorded as having arrived or departed for conducting servicing activity, outside of the survey hours, where no duration of servicing was recorded. These records have been excluded from the average dwell time analysis, below. Further to this, for Church Street, some vehicles were recorded as not stopping. This has been excluded from the analysis below.

5.2.3 **Figure 45** to **Figure 47** shows the average number of each type of vehicle observed making deliveries or unloading goods for each of the weekday, weekend and event day scenario. It is noted that the Light Goods Vehicle (LGV) category includes small vans, box vans and "transit" type vans. 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).

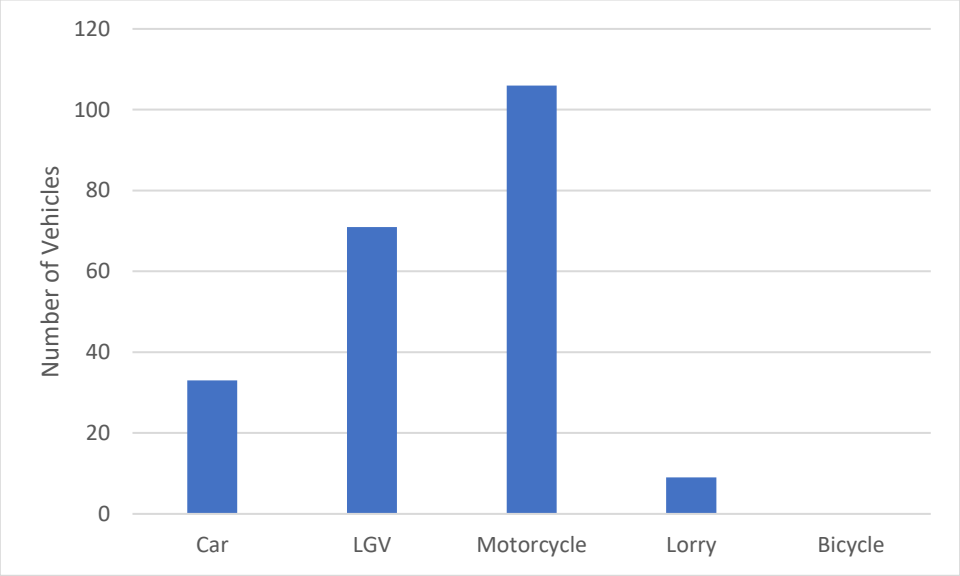
5.2.4 LGVs were the most common vehicle type recorded during the weekday scenario, making up 50% (131 vehicles), of the total number of servicing vehicles recorded during the weekday period. In contrast to this, motorcycles were the most common vehicles recorded undertaking servicing activity for both the weekend and event day scenarios, at 40% (106 vehicles) and 36% (96 vehicles), out of the total number of servicing vehicles for each respective scenario.

Figure 45. Average Weekday Frequency of Servicing Vehicle Type, across Survey Area



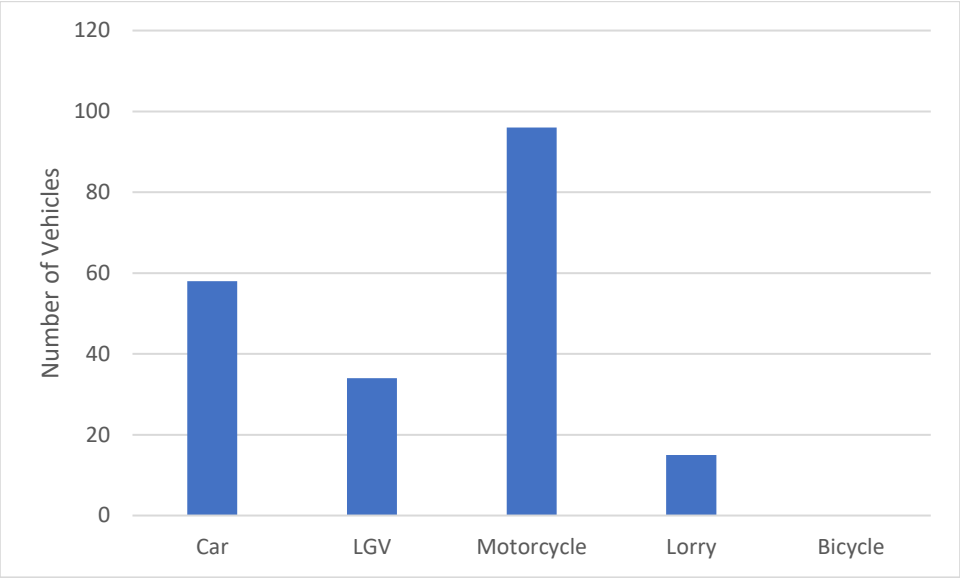

5.2.5 In total, 264 delivery and servicing vehicles were recorded over the weekday period. The most common servicing vehicle observed in the survey area was the LGVs (131 vehicles), making up half of all servicing vehicles across the weekday period.

Figure 46. Average Weekend Frequency of Servicing Vehicle Type, across Survey Area




5.2.6 The average weekend scenario shows that motorcycles were the most common servicing vehicle, at 106 vehicles, making up 40% of the total servicing vehicles recorded. 219 vehicles were recorded in total during the weekend scenario, 45 vehicles less than the average weekday period.

Figure 47. Average Event Day Frequency of Servicing Vehicle Type, across Survey Area

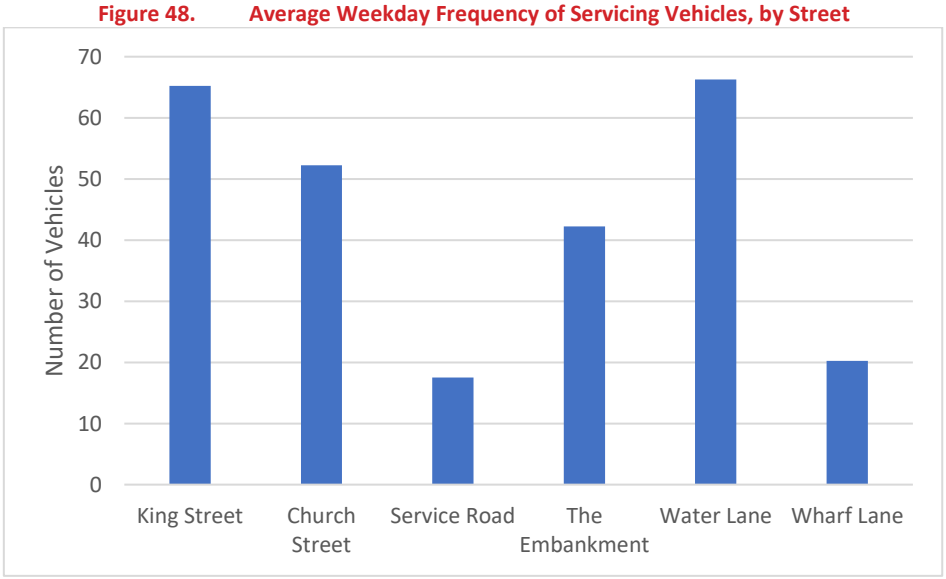



5.2.7 In total, 203 delivery and servicing vehicles were recorded during the event day. The most common servicing vehicle recorded across the survey area for the event day was the motorcycle (96 vehicles).

5.2.8 These results are consistent with the 2019 results, which also show that motorcycle was the most common type of service vehicle recorded, at 94 vehicles on average over the full survey period.

5.2.9 **Figure 48** to **Figure 50** shows the average frequency of service vehicles across the survey area, broken down by street.

Figure 48. Average Weekday Frequency of Servicing Vehicles, by Street

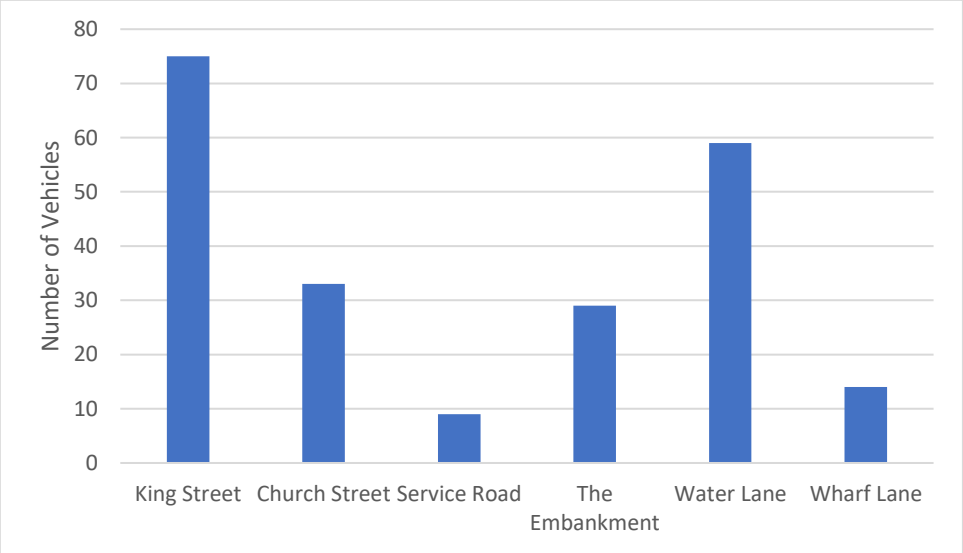



5.2.10 Water Lane recorded the highest number of service vehicles during the weekday scenario, at 66 vehicles. This made up a quarter of all vehicles recorded. King Street recorded 65

vehicles, and therefore was the second busiest street in terms of the frequency of service vehicles.

5.2.11 In contrast to this, almost half of all vehicles undertaking servicing activity were recorded on King Street in 2019.

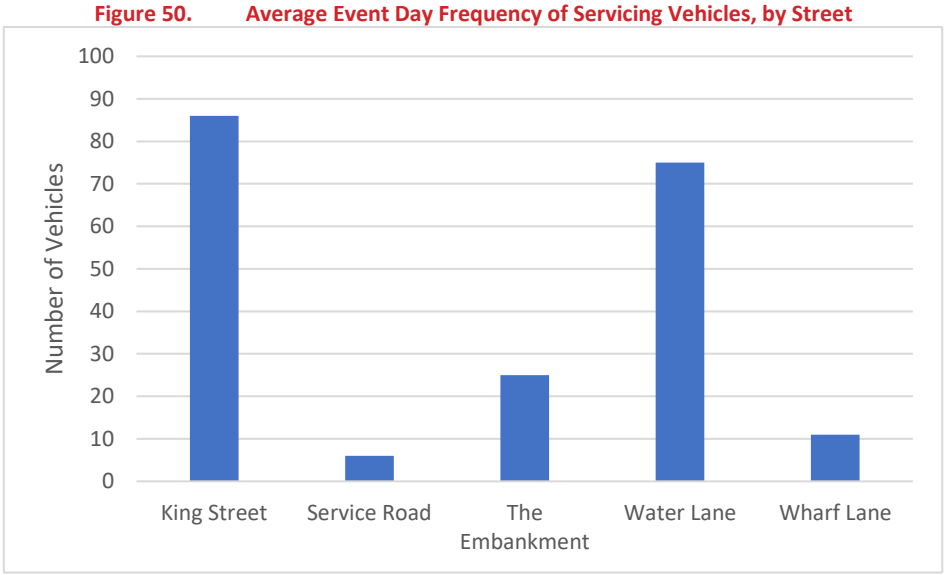
**Figure 49. Average Weekend Frequency of Servicing Vehicles, by Street**




5.2.12 During the weekend scenario, King Street recorded the highest number of vehicles undertaking servicing activity, at 75 vehicles, making up 34% of all servicing activity during this scenario.

5.2.13 The majority of the servicing activity was related to the retail units fronting King Street, between the pedestrian crossing and Water Lane. KFC was recorded to generate the most delivery and servicing trips out of the recorded destinations.

**Figure 50. Average Event Day Frequency of Servicing Vehicles, by Street**

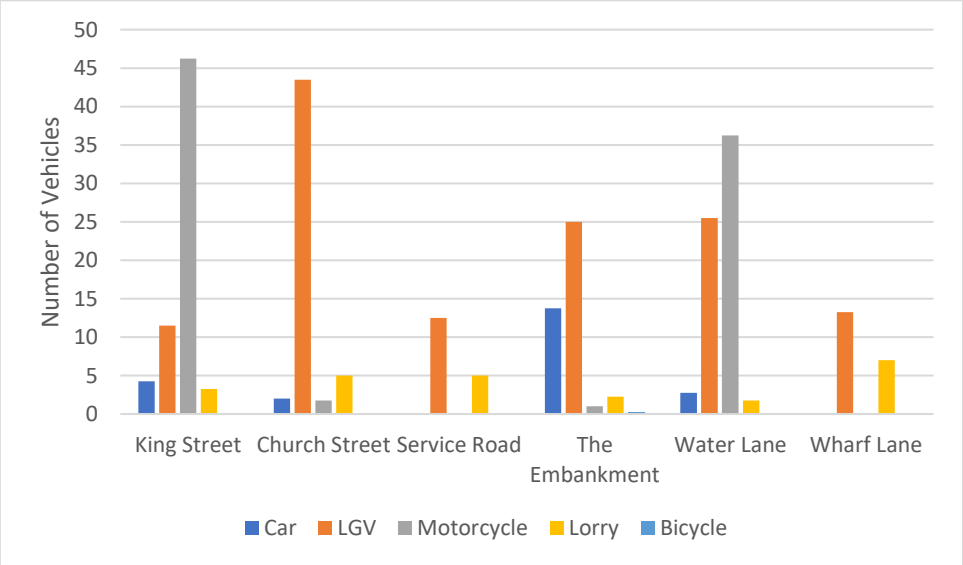


5.2.14 For consistency with 2019 surveys, Church Street has not been included in the event day analysis as it was closed during the 2019 event day, therefore, servicing activity has not been recorded for this street.

5.2.15 King Street generated the majority of servicing activity during the event day, at 86 vehicles, comprising 42% of the total number of vehicles. The 2019 results recorded that King Street also generated the highest number of servicing vehicles during the event day, comprising 68% of the total, hence reflecting a greater proportion of servicing activity along Kings Street in the 2019 event day compared to 2020.

5.2.16 **Figure 51** to **Figure 53** breaks down service vehicles in each location by vehicle type.

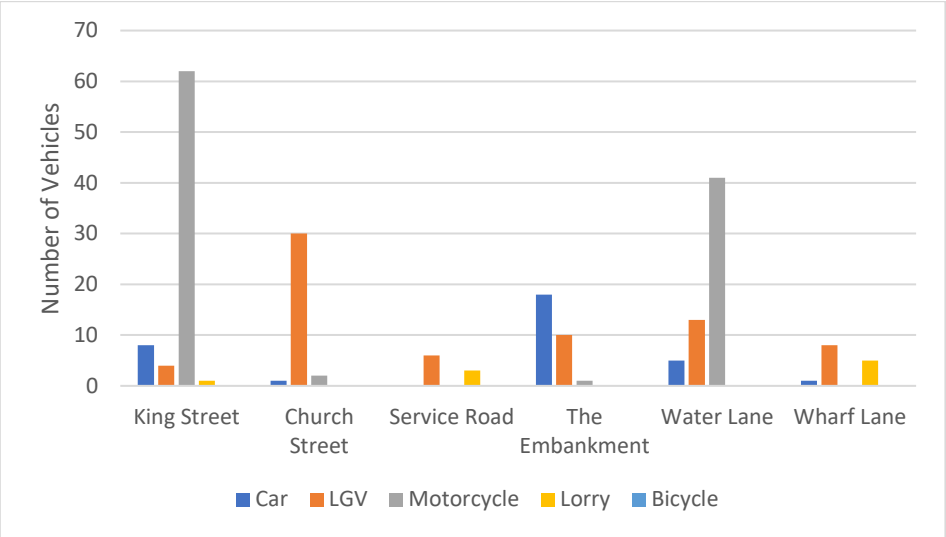
**Figure 51. Average Weekday Frequency of Service Vehicle Type, by Street**




5.2.17 Similar to the 2019 results, motorcycles are the dominant vehicle type on King Street and Water Lane, representing 70% (46 vehicles) and 54% (36 vehicles) respectively of the vehicles recorded in these locations. Furthermore, motorcycles were recorded to be undertaking servicing activity on both The Embankment and Church Street, however activity was comparatively much lower, than Kings Street and Water Lane. In total, three motorcycles were observed across both The Embankment and Church Street during the weekday scenario.

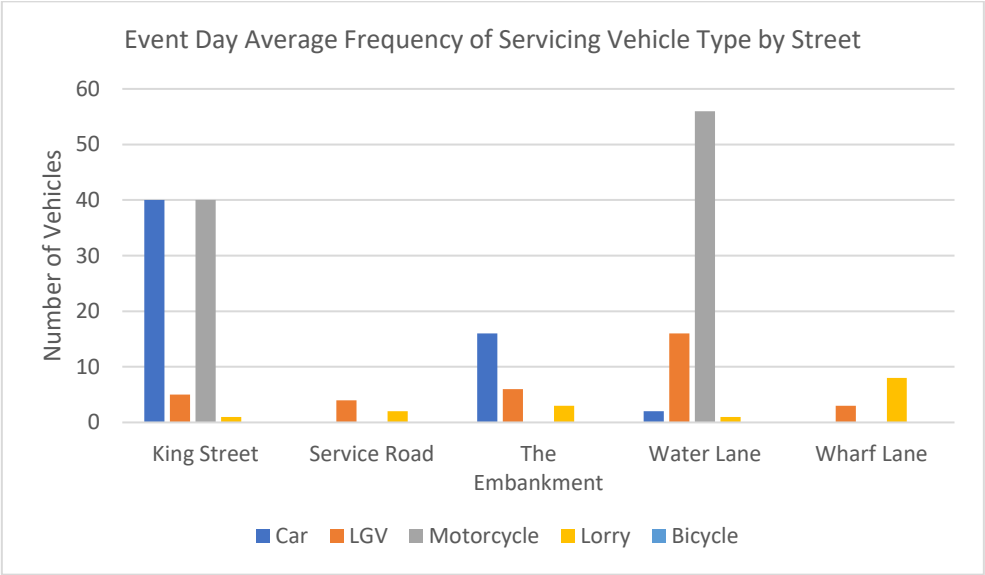
5.2.18 All other streets were dominated by LGVs undertaking servicing activity.

Figure 52. Average Weekend Frequency of Service Vehicle Type, by Street




5.2.19 The weekend scenario results follow a similar pattern to the average weekday scenario, in that motorcycles are the dominant vehicle type on King Street and Water Lane, at 82% (62 vehicles) and 69% (41 vehicles), in total. The Embankment recorded the most cars undertaking servicing trips, at 18 vehicles.

Figure 53. Average Event Day Frequency of Service Vehicle Type, by Street

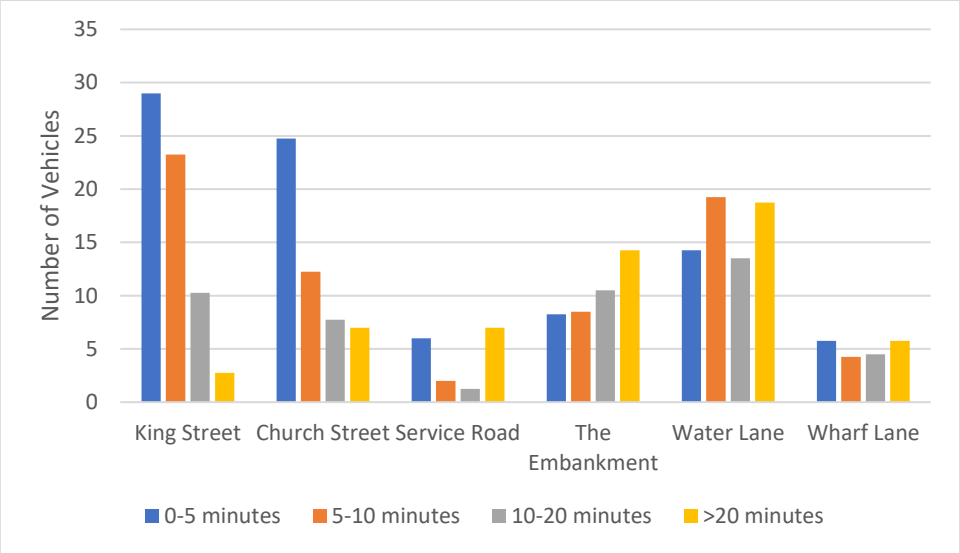



5.2.20 The event day frequency of service vehicle by type shows motorcycles were the most dominant on Water Lane, at 75% (56 vehicles), out of the total delivery and servicing trips recorded along this street. Similarly, the 2019 results show motorcycles were also dominating on Water Lane, at 69% of the total number of vehicles.

5.2.21 For this scenario, King Street was observed to have equal number of cars and motorcycles undertaking servicing activity, at 40 vehicles each.

5.2.22 **Figure 54** to **Figure 56** breaks down the vehicle dwell times, by street.

**Figure 54. Average Weekday Vehicle Dwell Times, by Street**



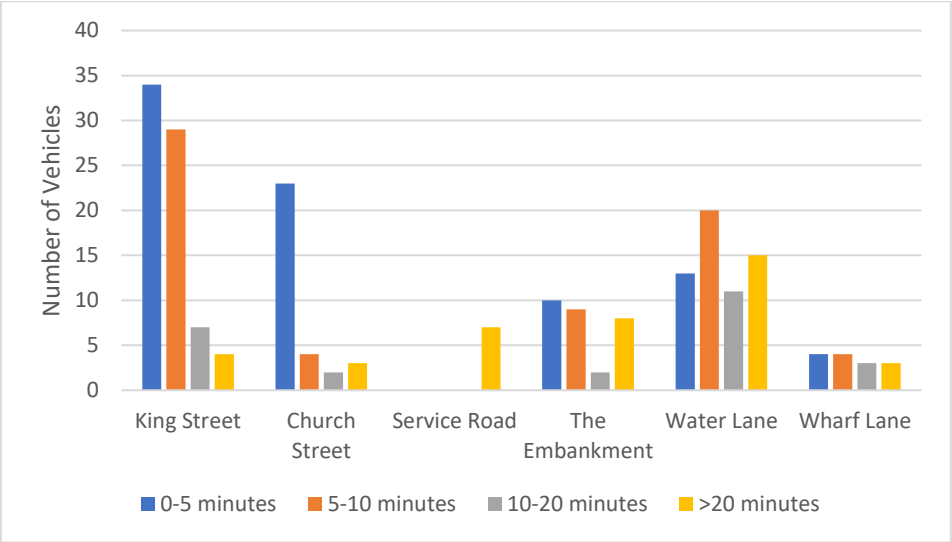

5.2.23 The results show that for the most common vehicle dwell time over the average weekday period was 0-5 minutes, on both King Street and Church Street, at 45% (29 vehicles) and 48% (25 vehicles) respectively.

5.2.24 Conversely, 33% (14 vehicles) of all vehicles recorded on The Embankment had a total dwell time of over 20mins.

5.2.25 Water Lane, the street with the highest total of servicing vehicles, had a fairly even spread of vehicle dwell times, at 14 vehicles for both 0-5 minutes and 10-20 minutes and 19 vehicles for both 5-10 minutes and over 20 minutes.

5.2.26 The trends in the results follow that of the 2019 results, where over three quarters of service vehicles, which were observed to be unloading or delivering on King Street, recorded a dwell time of 0-5 minutes. Water Lane recorded a relatively similar dwell time across all four dwell time categories in 2019.

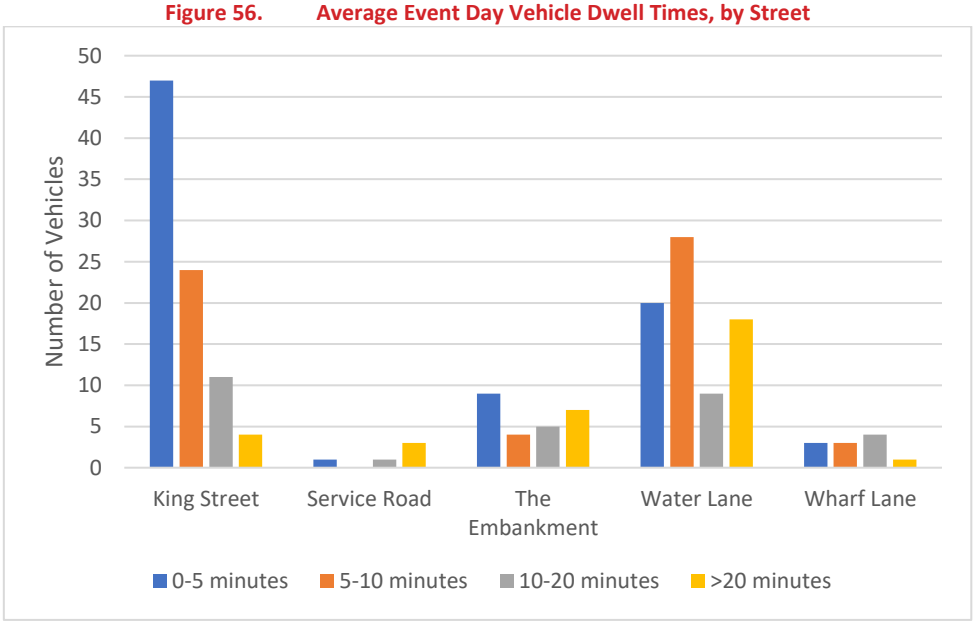
Figure 55. Average Weekend Vehicle Dwell Times, by Street




5.2.27 The weekend results follow a similar pattern to the average weekday results, in that the 0-5 minutes dwell time category was most common at King Street and Church Street, with 46% (34 vehicles) and 71% (23 vehicles) of recorded activity falling into this time category respectively.

5.2.28 The service road only recorded seven vehicles undertaking servicing activity, all with dwell times over 20 minutes.

Figure 56. Average Event Day Vehicle Dwell Times, by Street




5.2.29 The event day results follow the same trend as both the weekday and weekend scenarios, in that the 0-5 minutes vehicle dwell time was the most common recorded along King Street, at 55% (47 vehicles), out of the total number of recorded servicing activity trips

vehicles on the street. The 0-5-minute dwell time was also the most common out of all dwell time categories along The Embankment, at 36% (9 vehicles) whereas longer dwell times were recorded on Water Lane with over 18 servicing vehicles reported to dwell for more than 20 minutes.

5.2.30 Compared to 2019 event day scenario, similar trends have been identified along King Street with the majority of servicing dwell times being less than 5 minutes. Along the Embankment, the 0-5-minute dwell time is the highest reported, however 2019 data reported that almost 70% of servicing vehicles recorded greater dwell times of 10-20 minutes and over 20 minute categories.

## 5.3 Summary

5.3.1 Overall, a fairly even split of servicing trips was recorded on Water Lane and King Street during the weekday scenario, with King Street reporting the greatest proportion of servicing activity during the weekend and event scenario.

5.3.2 Different streets of the survey area record differing proportions of vehicle types undertaking servicing activity. Kings Street and Water Lane recorded the greatest proportion of motorbikes, whereas all other streets of the study area were dominated by LGVs.

5.3.3 The results follow similar trends to the 2019 results, in that the 0-5 dwell time category was the most common for servicing vehicles on King Street. There are some minor discrepancies between the 2019 and 2020 results, however these are not significant and broadly align with overall trends identified in both datasets.

# 6. PROPOSED CHANGES TO THE CPZ AND NEXT STEPS

## 6.1 General

6.1.1 This section covers the recommendations and next steps associated with the proposed removal of 78 parking spaces from Water Lane, Wharf Lane and along the Embankment between Water and Wharf Lane.

## 6.2 Proposed Changes to the CPZ

6.2.1 As set out in the Twickenham Riverside Options for Parking report, dated 09082019, a number of proposals have been considered in order to alleviate pressure associated with the removal of parking along the Embankment, which it is recognised serves a number of residents and businesses of Eel Pie Island.

6.2.2 The proposals within the Twickenham Riverside Options for Parking report have been informed through a detailed site audit (22/05/19) to understand the feasibility for the creation of new bays within the CPZ and subsequent discussions with LBRuT.

6.2.3 The main proposed strategies to alleviate the impact of the loss of 78 bays on the Embankment include a combination of creation of new bays and reallocation of parking bays to prioritise permit holders:

- Creation of 34 net additional parking spaces within the CPZ, including:
  - 23 resident permit holder bays,
  - One business permit bay,
  - Two permit holders (business/resident),
  - Two shared use resident permit holders/pay and display; and
  - Seven pay and display bays.

6.2.4 The above additional parking results in a net loss of 44 parking bays as a result of the Embankment parking removal.

- Reallocation of 98 parking spaces in vicinity of the Embankment in order to prioritise parking opportunities for permit holders rather than visitors to the area in vicinity of the Embankment. The breakdown of the future designation of reallocated spaces includes:
  - 45 permit holders only (Business and Resident),
  - 37 resident permit holders,
- 15 shared use Permit holders (business and resident)/ Pay and Display,
- One Licensed Street Trader Bay (Ice Cream Van)

6.2.5 The reallocation of spaces has resulted in conversion of shared use pay and display bays to prioritise permit holders hence helping to further alleviate pressure associated with Embankment parking removal.

6.2.6 Drawing 108715-03 rev C and Drawing 106715-09 rev A, which are included at **Appendix A**, shows the proposed additional spaces and reallocated spaces within isochrone distances from the Embankment.

6.2.7 Additionally, considering the above proposals, Drawing 108715-08 rev A at **Appendix A** shows the final proposed parking allocations proposed across the CPZ.

## 6.3 Other Proposed Improvements

6.3.1 As well as the creation of new parking spaces and reallocation of parking bays other measures have been suggested to assist with reducing the impact of parking loss along the Embankment.

6.3.2 This includes the introduction of variable message signage along key inbound routes to the Twickenham Town Centre. The purpose of these improvements is to improve wayfinding for visitors to the area and raise awareness of town centre car park opportunities and available capacities. This aims to deter visitors to the area from driving directly to the Embankment to search for parking opportunities and encourages visitors to make use of the multi-storey car parks, hence improving capacity for permit holders on street.

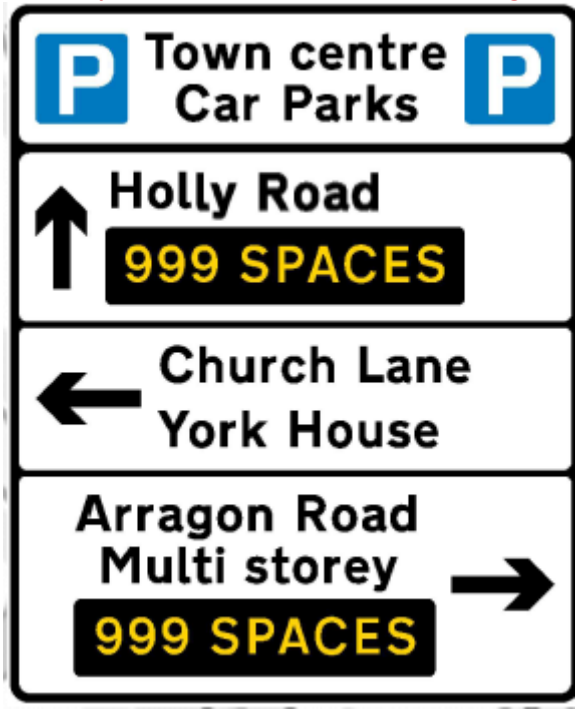
6.3.3 Car park signage improvements along the following key routes has been considered:

- A310 London Road (southbound);
- A305 York Street (westbound);
- A305 Heath Road (eastbound); and
- A310 Cross Deep (northbound).

6.3.4 **SYSTRA Drawing 108715-04** contained at **Appendix B** shows the proposed locations for four Variable Message Signs, which are located at key strategic destinations along the identified key routes. The existing signage has been reviewed and the locations are suggested in order to ensure that vehicles are routed along the most direct routes to each of the car parks, alleviating congestion through the town centre.

6.3.5 Given that Arragon Road and Holy Road car parks have 420 and 160 car parking spaces respectively, they are of an appropriate scale for the introduction of Variable Message Signs with count down counters showing spaces available at these car parks. Given that Church Road and York House car parks only have 25 and 30 spaces respectively, their smaller scale means that they are more suited to static signage. The cost of installing variable messaging on the smaller scale car parks is expected to exceed the perceived benefit of the technology. Example signs showing a combination of variable and static signage messaging is shown on **SYSTRA Drawing 108715-04** in **Appendix B** and **Figure 57** below.

Figure 57. Example Town Centre Car Park Variable Message/ Static Signage




6.3.6 Capacity counts for the town centre car parks were reported within the Twickenham Riverside Options for Parking 090819. Arragon Road and Holly Road car parks reported 53 and 144 unoccupied spaces on an average weekday and 296 and 23 unoccupied spaces on an average weekend.

6.3.7 Given the proposed reallocation of 98 spaces the reported level of spare capacity within town centre car parks can assist with absorbing the reduced availability of on street parking opportunities for visitors.

6.3.8 Alongside the improved wayfinding strategy it is felt that the proposal to encourage visitors to use the town centre car parks is an efficient way to balance the priority for parking along the Embankment for resident and business permit holders.

## 6.4 Design Options for the Embankment

6.4.1 It is understood that two options for the Embankment are currently being considered during design development with varying levels of priority for the vehicle.

6.4.2 Both design options result in the loss of 78 parking spaces along the Embankment, however option 1 seeks to maintain a vehicular access route along the Embankment between Water and Wharf Lane. Option 2 seeks to prevent vehicle access along the Embankment in a fully pedestrianised environment.

6.4.3 **Table 12** below summarises the key important factors to consider when developing the two different design options.

Table 12. Key Design Considerations for the Embankment

| OPTION 1 – MAINTAINED VEHICLE ACCESS | OPTION 2 – FULLY PEDESTRIANISED |
|---|---|
| Strategy should consider management issues, planters and landscaping could be used as a strategy to prevent illegal parking. | Signage will be essential to ensure it is clear to drivers that the Embankment is not a through road and the widened service road, which will have extended between Wharf Lane and Water Lane should be used to provide the existing east to west connection. |
| Consider whether delivery vehicles will still be able to load/ unload from the Embankment. The proposals involve removal of the three loading bays along the Embankment. It will be important to consider where loading/ unloading will take place following removal of this provision given the volumes of servicing activity recorded in this location. | Traffic movements at the Water Lane/ Embankment junction would need to be carefully managed as there would be a lot of potentially conflicting movements with vehicles making a u-turn and vehicles coming from the eastern side of the Embankment to access the service road to reach Kings Street. |
| Observed traffic flows in the AM and PM peaks are fairly low along the Embankment, with the majority of traffic routing via parallel King Street, hence fitting with the feel of the pedestrian friendly environment. | Consideration for delivery and servicing and refuse collection would be key particularly for collection of refuse from Eel Pie Island in order to minimise drag distances for waste. Turning head for refuse vehicles/ delivery vehicles is likely to be required with consideration for safety implications. |
| If the design proposes to incorporate shared space surfacing consideration should be given to the interaction between pedestrians and vehicles including materials, colour contrast and tactile to assist those with visual impairments in light of DfT publication to limit the use of shared spaces (2018). | Parking on Wharf Lane to the south side of the service road would need to be removed due to restricted widths for two way traffic. |
| | Service road would need to be widened to provide loading bays and suitable passing points. Distances from Eel Pie Island footbridge would need to be considered. |

## 6.5 Next Steps and Recommendations

6.5.1 Following the series of surveys undertaken in March 2020, which have been analysed and summarised within this report it is advisable that a consultation exercise is undertaken in order to gather feedback on the proposals and ideas relating to the design and operation of the Embankment.

6.5.2 It is recommended that the consultation exercise clearly explains the proposals and the measures that have been put forward in order to alleviate the pressure on permit holders associated with the Embankment proposals. This includes parking bay creation, reallocation of spaces and improvements to wayfinding and signage. The drawings included at **Appendix A** can help to visualise the proposed strategies and will be useful for inclusion in the consultation pack to demonstrate the numbers of net additional and reallocated bays within certain distance isochrones from the Embankment.

6.5.3 The survey data analysed within this report can be used as a useful data source in support of the proposed changes to the CPZ and it is noted that parking and servicing activity will be most affected by the proposals.

6.5.4 The proposed remediation strategy seeks to reduce the impact of the net loss of parking along the Embankment and can be further informed and developed following a programme of engagement of residents and businesses affected by the proposed changes to the CPZ. It is recommended that the impact of the proposals on delivery and servicing activity is considered and how operationally this could work in future based on the adopted design choices for the Embankment.

# 7. SUMMARY

7.1.1 SYSTRA has been commissioned by the LBRuT (the Client) to undertake a refresh of the previous study of parking, servicing and turning count traffic surveys, and associated data analysis in central Twickenham undertaken by SYSTRA in 2019.

7.1.2 This study is a refresh of SYSTRA's 2019 study which was based on survey data collected between the 18th and 31st March 2019, and Saturday 4th May 2019 (event day at Twickenham Stadium).

7.1.3 The surveys for this study were agreed with LBRuT to take place during two consecutive weeks in March 2020, which is exactly a year after the 2019 surveys were undertaken, to ensure directly comparative results. However, it is noted that the Covid-19 pandemic situation developed throughout March 2020, and the potential impacts that this may have had on the survey results has been carefully considered, particularly with regard to the second week of data collected.

7.1.4 The overall average parking occupancy levels did not exceed the 85% 'high' threshold for stress, for any scenario. The event day parking stress was lower than the average weekend stress at 70%, compared to 75% respectively.

7.1.5 Resident permits were the most common types of permits observed. Out of all the streets within the survey area, The Embankment recorded the highest number of resident permits, remaining consistent with the 2019 data.

7.1.6 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 vehicles makes a through-movement on King Street, with northbound traffic slightly heavier. All remaining junctions were relatively lightly used by vehicles during the peak hours, for all scenarios.

7.1.7 On-road cycle flows include a continuous carriageway movement or turn, with The King Street/Church Street/Water Lane junction generating the highest flows. Other cycle movements were minor for all junctions.

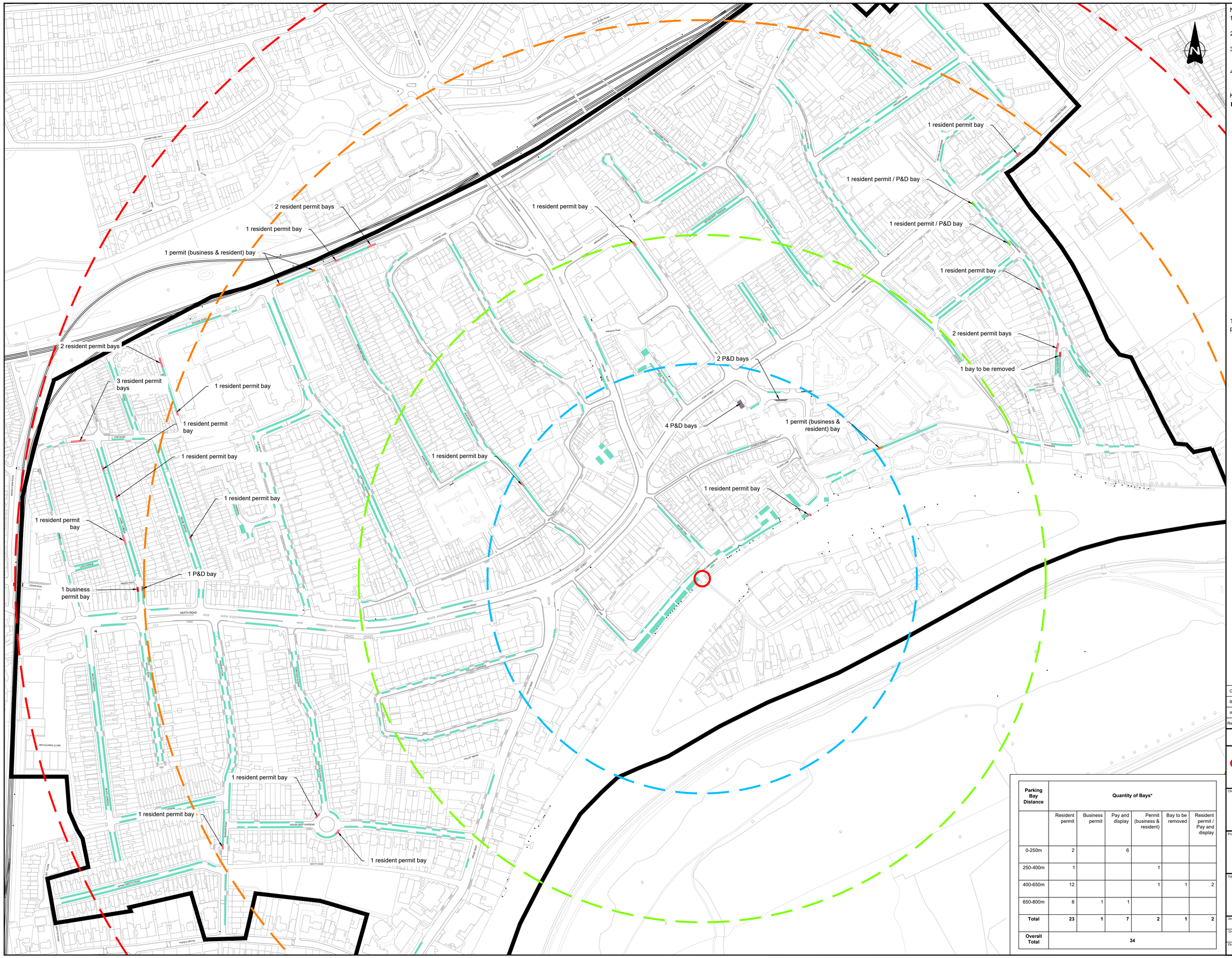
7.1.8 Off-road cycle counts remained consistently low at all junctions, in each scenario. Pedestrian counts varied between the weekday scenario, recorded during the network peak and the weekend and event day scenario, recorded during the event day peak hour of 15:00-16:00. Specifically, the event day observed a higher number of pedestrian counts, across the junctions, than the weekday scenario.

7.1.9 Overall, a fairly even split of servicing trips was recorded on Water Lane and King Street during the weekday scenario, with King Street reporting the greatest proportion of servicing activity during the weekend and event scenario. Different streets of the survey area record differing proportions of vehicle types undertaking servicing activity. Kings Street and Water Lane recorded the greatest proportion of motorbikes, whereas all other streets of the study area were dominated by LGVs. The servicing results following similar trends to the 2019 results.

7.1.10 The parking surveys conducted in 2020, did conclude similar patterns of results, when compared to the 2019 data.

7.1.11 The proposed remediation strategy to reduce the impact of the net loss of parking along the Embankment includes creation of 34 net additional parking bays, reallocation of 98 bays and improvement in wayfinding and signage to encourage visitor use of town centre car parks. The proposals can be further informed and developed following a programme of engagement of residents and businesses affected by the proposed changes to the CPZ.

# Appendix A – Proposed Changes to the CPZ




Notes:

1. Do not scale from this drawing. If in doubt refer to the project manager for clarification.
2. All dimensions are shown in metres unless otherwise stated.
3. Layout based on Ordnance Survey MasterMap, © Crown Copyright 2018. All rights reserved. Licence number 100022432.
4. Existing bays are based on layout provided by London Borough of Richmond Upon Thames.

Key:

- Zone D Boundary
- Existing Space(s)
- Existing bay to be removed to improve traffic flows / sight lines (Total = 1)
- Proposed Additional Resident Permit Holder Bay (Total = 23)
- Proposed Additional Business Permit Holder Bay (Total = 1)
- Proposed Additional Pay & Display Bay (Total = 7)
- Proposed Additional Permit Holder Bay (Resident or Business Permit Holders) (Total = 2)
- Proposed Additional Resident Permit Holder / Pay and Display Bay (Total = 2)

Total additional net spaces excluding embankment parking loss (78 spaces) = 34

- Embankment distance reference point
- Straight line distance isochrone radius of 250m
- Straight line distance isochrone radius of 400m
- Straight line distance isochrone radius of 650m
- Straight line distance isochrone radius of 800m

| Parking Bay Distance | Quantity of Bays* | | | | | |
|---|---|---|---|---|---|---|
| | Resident permit | Business permit | Pay and display | Permit (business & resident) | Bay to be removed | Resident permit / Pay and display |
| 0-250m | 2 | | 6 | | | |
| 250-400m | 1 | | | 1 | | |
| 400-650m | 12 | | | 1 | 1 | 2 |
| 650-800m | 8 | 1 | 1 | | | |
| **Total** | **23** | **1** | **7** | **2** | **1** | **2** |
| **Overall Total** | **34** | | | | | |

| Rev. | Date | Revision details | Drawn | Check. | Review | Approv. |
|---|---|---|---|---|---|---|
| C | 31/07/19 | Updated as per LBRUT comments | RM | JG | EJ | JG |
| B | 23/07/19 | Updated bay locations | DH | EJ | DM | DM |
| A | 22/07/19 | Updated figures | DH | EJ | DM | DM |



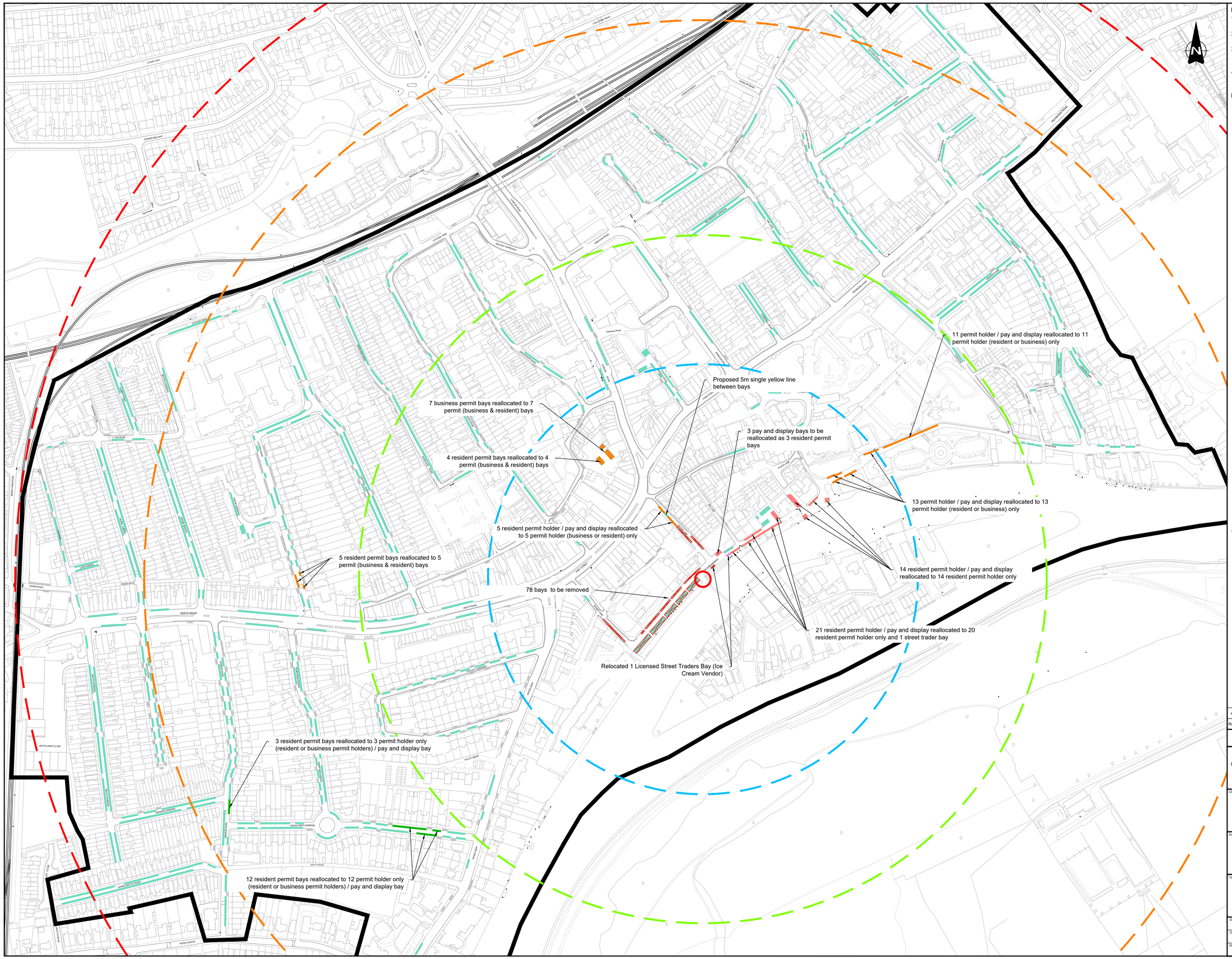
SYSTRA
5 Old Bailey
London
EC4M 7BA
E uk_london@systra.com
W www.systra.co.uk

Client: **London Borough of Richmond Upon Thames**

Project: **Twickenham Parking Surveys**

Title: Proposed Additional Bays & Isochrone CPZ Parking Layout

| Drawn | Checked | Reviewed | Approved |
|---|---|---|---|
| RM | JG | EJ | JG |
| Original drg. size: A1 | Date: 23/07/2019 | Scale: 1:2000 | Drawing Status: Information |
| Drawing Number: 108715-03 | | | Rev.: C |




Notes:

1. Do not scale from this drawing. If in doubt refer to the project manager for clarification.
2. All dimensions are shown in metres unless otherwise stated.
3. Layout based on Ordnance Survey MasterMap, © Crown Copyright 2018. All rights reserved. Licence number 100022432.
4. Existing bays are based on layout provided by London Borough of Richmond Upon Thames.

Key:

- Zone D Boundary
- Existing Space(s) (unchanged)
- Resident Permit Holder Bay
- Permit Holder Bay (Resident or Business Permit Holders)
- Permit Holder Only (Resident or Business Permit Holders) / Pay and Display Bay
- Licensed Street Traders Bay (Ice Cream Vendor)
- Existing bay(s) to be removed
- Embankment distance reference point
- Straight line distance isochrone radius of 250m
- Straight line distance isochrone radius of 400m
- Straight line distance isochrone radius of 650m
- Straight line distance isochrone radius of 800m

| Parking Bay Distance | Quantity of Bays* and Proposed Designation | | | |
|---|---|---|---|---|
| | Resident permit | Permit (business & resident) / Pay and display | Permit (business & resident) | Licensed street trader bay |
| Within 250m | 37 | | 29 | 1 |
| Within 400m | | | 11 | |
| Within 650m | | 15 | 5 | |
| Within 800m | | | | |
| **Total** | **37** | **15** | **45** | **1** |
| **Overall Total** | **98** | | | |

***78 bays to be removed not included in table**

| Rev | Date | Revision details | Drawn | Check. | Review | Approv |
|---|---|---|---|---|---|---|
| A | 31/07/19 | Updated as per LBRUT comments | RM | JG | EJ | JG |



SYSTRA
5 Old Bailey
London
EC4M 7BA
E uk_london@systra.com
W www.systra.co.uk

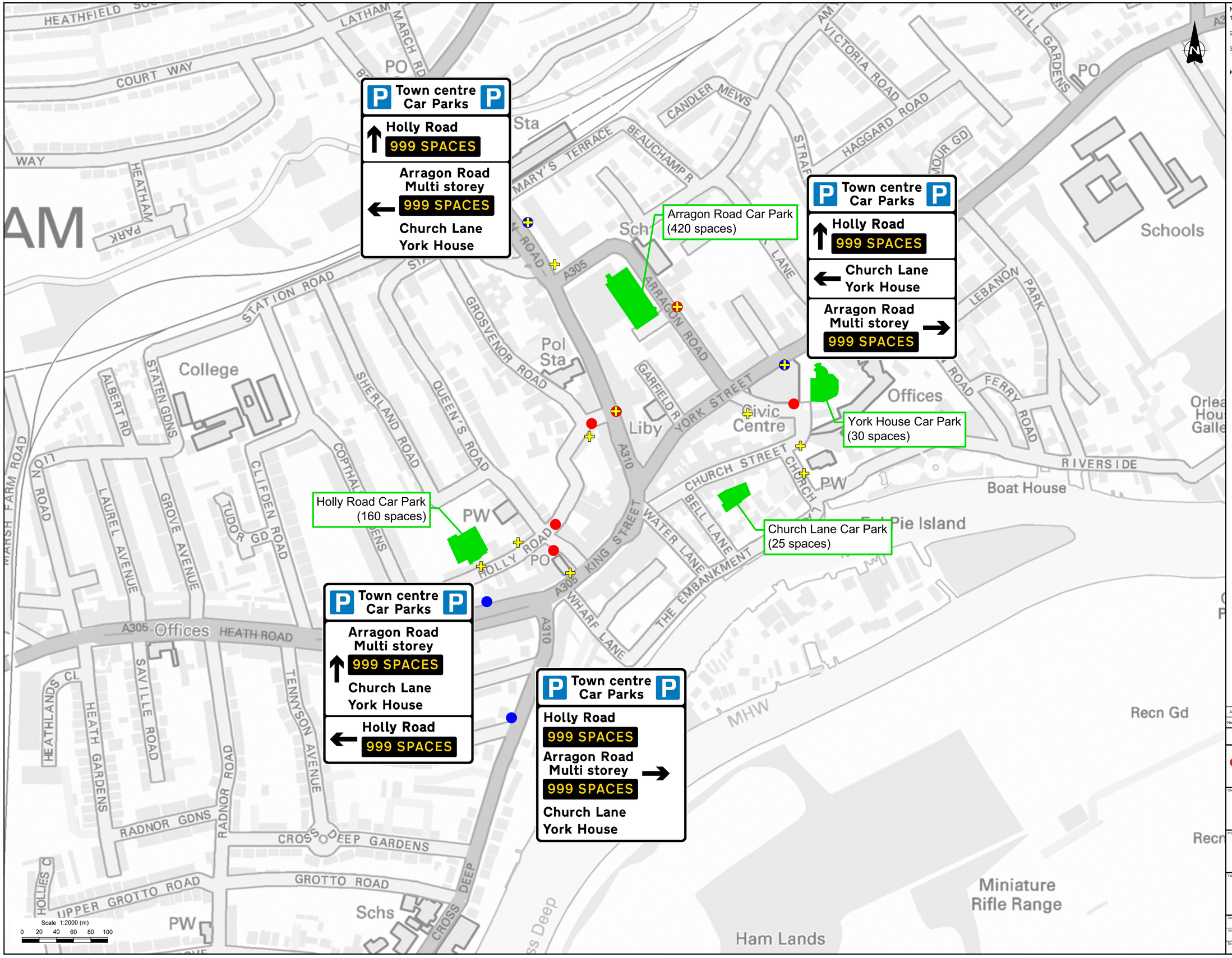
Client: **London Borough of Richmond Upon Thames**

Project: **Twickenham Parking Surveys**

Title: Proposed Reallocated Bays & Isochrone CPZ Parking Layout

| Drawn | Checked | Reviewed | Approved |
|---|---|---|---|
| DH | EJ | DM | DM |
| **Original drg. size** | **Date** | **Scale** | **Drawing Status** |
| A1 | 23/07/2019 | 1:2000 | Information |
| **Drawing Number** | | | **Rev.** |
| 108715-09 | | | A |

# Appendix B – Wayfinding Strategy




Notes:

1. Do not scale from this drawing. If in doubt refer to the project manager for clarification.
2. All dimensions are shown in metres unless otherwise stated.
3. Layout contains Ordnance Survey data © Crown copyright and database right 2016

Key:

- Proposed variable message sign
- Proposed new sign
- Existing signs for parking

| Rev | Date | Revision details | Drawn | Check | Review | Approv |
|---|---|---|---|---|---|---|
| A | 22/07/19 | Updated car park name | DH | EJ | | |



SYSTRA
5 Old Bailey
London
EC4M 7BA
E uk_london@systra.com
W www.systra.co.uk

Client: London Borough of Richmond Upon Thames

Project: Twickenham Parking Surveys

Title: Car Park Signage Strategy

| Drawn | Checked | Reviewed | Approved |
|---|---|---|---|
| MIE | - | - | - |

| Original drg. size | Date | Scale | Drawing Status |
|---|---|---|---|
| A1 | 18/07/2019 | 1:2000 | Information |

Drawing Number: 108715-04 Rev. A