steer davies gleave

Temple Area Traffic Study

Final Report
June 2018

City of London Corporation

Our ref: 23203601
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1 Introduction

Scope

Steer Davies Gleave has been commissioned by the City of London Corporation to review the existing traffic and transport activity in the Temple area, before identifying and defining an initial list of interventions that can be developed further as part of the study.

The study is being undertaken in eight stages, for which the results are presented in two deliverables:

Deliverable A: Existing Conditions

- Stage 1: Project Inception
- Stage 2: Desktop Study and Gap Analysis
- Stage 3: Data Collection
- Stage 4: Data Analysis and Existing Conditions Report

Deliverable B: Final Reporting

- Stage 5: Opportunities Identification
- Stage 6: Options Development
- Stage 7: Options Assessment
- Stage 8: Reporting

The Existing Conditions Report was discussed with the City of London on 1 May. This Final Report includes the review of the existing conditions, an overview of key issues identified, and discusses a list of interventions.

Report Structure

Following this introduction, the report is structured as follows:

- Chapter 2 provides context of the Temple area in terms of planning, character and road network.
- Chapter 3 provides an overview of the data collection methodology.
- Chapter 4 discusses the analysis of movements to, from and within the Temple area.
- Chapter 5 presents the link flow analysis of the different streets in the Temple area.
- Chapter 6 presents the movements of goods vehicles and heavy vehicles through the study area.
- Chapter 7 discusses the cycling network, cycling facilities and cycle demand.
- Chapter 8 presents the analysis of the kerbside activities in the Temple area.
- Chapter 9 presents the pinch-point and swept-path analysis
- Chapter 10 provides an overview of the key issues identified through the preceding analysis and discusses a list of interventions.

2 The Study Area

The Area

The study area is bordered by Fleet Street to the north, New Bridge Street to the east, Victoria Embankment to the south and Middle Temple Lane to the west.

The area consists of predominantly one-way streets, with Tudor Street running through the middle of the area from west to east.

Figure 2.1 shows the study area with the permitted movements through- and in- and out of the area.

The main routes into the area, Bouverie Street and Salisbury Court, are one-way streets. Tudor Street is a two-way street for most of its length, however, at the eastern end of Tudor Street, traffic is only allowed to exit. Bouverie Street, Whitefriars Street, Salisbury Court, Bride Lane, and Kingscote Street / Watergate are all one-way streets with permitted cycle contraflows.

Planning Context

The delivery of TfL's North-South and East-West Cycle Superhighways in 2016 has resulted in significant changes to vehicular access routes and the volume of traffic using the Temple area.

Parallel to this study, a study is undertaken by the City of London to explore the opportunities to modify and improve vehicular access and egress for the Carmelite Street and Temple Avenue intersections with the Embankment. We understand that the delivery of any permanent changes will likely follow completion of the Thames Tideway Tunnel project.

The City of London has recently developed options, in discussion with TfL, to revise the entry points to the study area on the eastern side (Bridewell Place, Tudor Street and Watergate). As agreed, investigation of these junctions lies outside the scope of this study.

Figure 2.1: Temple area with permitted traffic movements

3 Data Collection

Traffic Surveys

To establish a robust evidence base, a range of traffic surveys was undertaken by Intelligent Data between Tuesday 9 and Monday 15 January. The survey dates were chosen so that they fell outside of holiday periods and known street works that would otherwise give atypical results.

Manual classified count (MCC) and Origin-destination (OD) survey data was also captured on Middle Temple Lane. However, during the site visit it was noted that the gate from Middle Temple Lane to Victoria Embankment was closed for the duration of the survey period due to works to the gates. Additional surveys for Middle Temple Lane were therefore undertaken between Wednesday 28 March and Friday 30 March.

Origin-destination Surveys

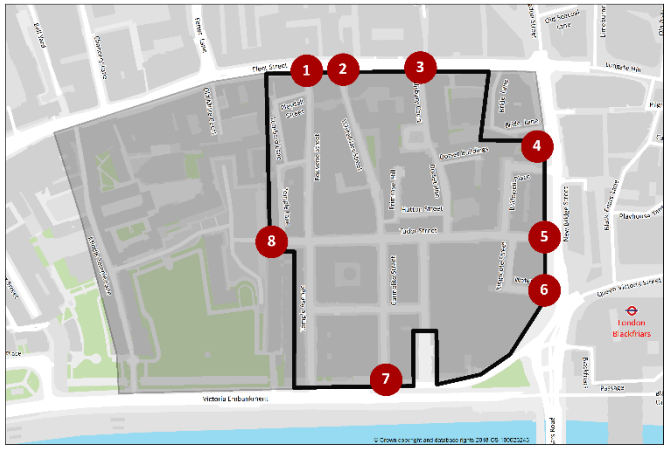
Origin-destination surveys were undertaken to ascertain how vehicles move through the area and utilised automatic number plate recognition (ANPR) cameras to establish when a vehicle passes one or more of the cameras

Note: the actual number plates captured by the cameras are anonymised, to avoid compromising privacy.

The surveys were undertaken 24-hours a day over a seven-day period continuously using the closed cordon and nodes shown in Figure 3.1.

Whilst ANPR cameras usually have high capture rates, typically >90% of number plates, manual counts were also undertaken to ensure the sample matches total on-street flows by factoring up the raw results of the OD survey.

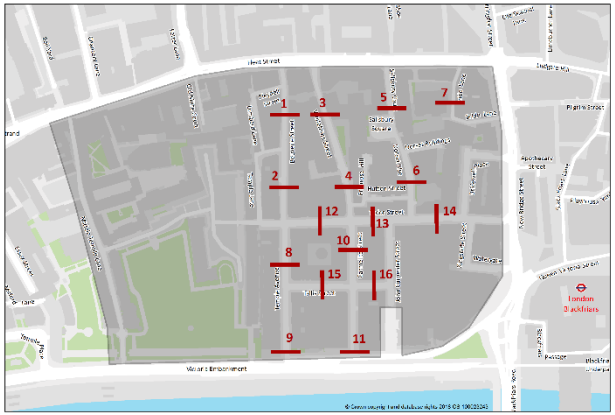
Figure 3.1: Cordon and locations of OD nodes



Automated traffic counts

Automated traffic counters (ATCs) were placed at the locations shown in Figure 3.2 for a week and used to record traffic flows over the same period.

Figure 3.2: ATC locations

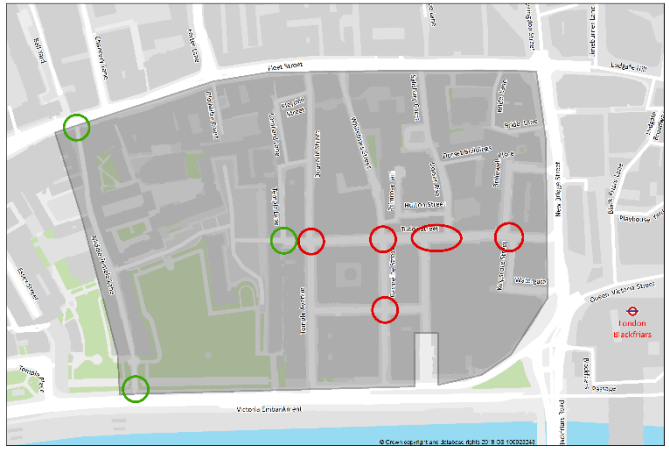


Manual classified counts

Manual classified counts were used to record turning movements at junctions and give insight into the flows and direction of traffic (split by user class). The locations used are shown in red in Figure 3.3, and the surveys were undertaken continuously over the same seven-day period.

The surveys undertaken to access/exit Middle Temple Lane are shown in green in Figure 3.3. The MCC survey on Middle Temple Lane/Fleet Street was undertaken between Tuesday 9 and Monday 15 January. The other two locations (Middle Temple Lane/Victoria Embankment and King's Bench Walk/Tudor Street) where undertaken for a three-day, 24-hour period between Wednesday 28 and Friday 30 March. The Friday results have been excluded from the analysis, as this was Good Friday and results will not provide a good representation of an average weekday in the area.

Figure 3.3: MCC locations



Queue length surveys

Cameras were placed on the Fleet Street junction with Salisbury Court to capture congestion and / or queuing that occurs along Fleet Street over a 24-hour period on Thursday 11 January.

Site Visit

To supplement the traffic surveys, site visits were also conducted on Tuesday 9 January (PM peak), Wednesday 10 January (AM peak), Wednesday 28 March (AM peak), and Monday 30 April (AM peak), and have enabled us to gain a first-hand understanding of actual conditions. In addition, whilst on site we checked that the equipment for the traffic surveys was in place.

4 Movement Analysis

Origin-Destination surveys

Analysis of the OD surveys allows us to gain insight into the use of the exit / entry points around the cordon and establish the duration of stay of traffic in the area – importantly, this enables us to determine the volume of traffic using the area as a through route. OD analysis has been undertaken for an average weekday and also for an average weekend day. The locations of the nodes are shown on the right in Figure 4.1.

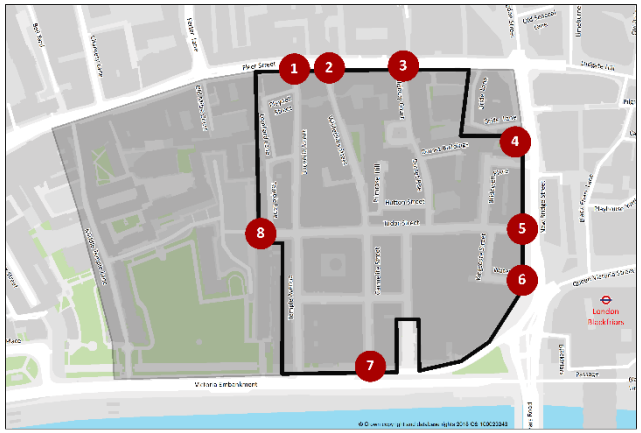
OD Analysis Approach

This section discusses the approach used to process the raw results to output OD surveys and maps. The raw data has been processed to categorise the recorded trips into 'access' and 'through' trips.

Threshold

The threshold adopted for this study is 5 minutes. In uncongested conditions, it should be possible to drive across the study area in under 3 minutes (see Table 4.1). However, the threshold chosen is slightly higher to account for delays to traffic in the study area, particularly for those vehicles affected by narrow road widths, and taxis making a short stop to pick-up and drop-off passengers.

Figure 4.1: Cordon and locations of OD nodes



The journey times have also been visualised in journey time bands in Figure 4.2 and Figure 4.3. The bandwidths for these categories have been determined by calculating the average node-to-node trip duration for both the weekday and weekend using the 7-day ANPR data.

Comparing the two datasets, analysis shows that bandwidths for a weekend slightly differ from weekday bandwidths, however, for comparison purposes we have chosen to use the weekday bandwidths for the following analysis.

Figure 4.2 shows the number of vehicles per journey time band on an average weekday, while Figure 4.3 shows the same data for an average weekend day. It

should be noted that as most trips take less than 10 minutes, the x-axis on the graphs starts with 1-minute increments for the first 10 minutes, and the increments then increase to show 5-minute intervals after that.

Both figures show that most journeys last 5 minutes or less, confirming the average journey time from node-to-node as presented in Table 4.1, while nearer the end of the bands (more than 3 hours) the number of vehicles increases again and this indicates that some vehicles are parked within the area for lengthy periods.

Matrix Development

The ANPR data provides trips chains for each recorded vehicle and describes the route of that vehicle as it crosses the various OD survey nodes. Along with an indicator of the node at which the vehicle was recorded, the survey also records the direction of travel and the journey time for each segment of the journey. MCC data provides a total number of vehicles passing through each node, along with the direction of travel. For the analysis, MCC data was assumed to provide a true count of all vehicles crossing the cordon at each site.

Table 4.1: Node-to-node Journey Time (Uncongested Conditions, Source: Google Maps)

Journey Time (minutes)	Bouverie Street	Whitefriars Street	Salisbury Court	Bridewell Place	Tudor Street (E)	Watergate	Carmelite Street	Tudor Street (W)
Bouverie Street	-	3	-	3	3	3	2	1
Whitefriars Street	-	-	-	-	-	-	-	-
Salisbury Court	-	3	-	3	2	2	3	3
Bridewell Place	-	3	-	-	1	2	2	3
Tudor Street (E)	-	-	-	-	-	-	-	-
Watergate	-	-	-	-	-	-	-	-
Carmelite Street	-	-	-	-	-	-	-	-
Tudor Street (W)	-	2	-	2	2	2	2	-

As there are some limitations associated with the ANPR cameras that can have an impact on the analysis (e.g. cameras are not able to read all number plates through their field of view), the MCC data has been used to uplift the recorded ANPR data.

These combined datasets have been used to create a final OD matrix consisting of two parts: one part being through trips (where vehicles likely pass through the study area without stopping) and the other being access trips (where vehicles either make a stop within the study area, or where vehicles make a single crossing of the cordon either in to or out of the study area).

Access Trips

Access trips are those that enter the cordon (and do not exit it), trips that exit the cordon (but do not enter it), and trips that enter the cordon, but exit the cordon after a time that is greater than the threshold.

For the latter, the assumption is based on the bandwidths discussed in the 'Threshold' section above. This means that we have assumed that vehicles that spend greater than 5 minutes in the cordon are stopping somewhere within the cordon (for example, for servicing purposes), rather than simply passing through.

Therefore, trips taking longer than 5 minutes have been included in the general analysis of movement patterns, but not in the O/D diagrams of through trips

Therefore, these trips have been split into two trip types, ones that end within the cordon, and ones that start within the cordon. For example, if a vehicle entered the cordon at node 1, and then exited at node 2 more than 5 minutes later, this has been recorded as one trip that enters the cordon at node 1, and finished within the cordon, and a second trip that starts within the cordon and exits at node 2.

Through Trips

Through trips are trips that both enter and then leave the cordon within the 5-minute threshold. By setting the threshold to 5 minutes, this allows for servicing vehicles and taxis to be captured in the through traffic group, as the amount of time they spent in the area is limited, but insight is still given in their movement through the area.

Note: It is not possible be 100% certain that all through trips do not stop in the area but if they are then they will only be stopped briefly.

Figure 4.2: Vehicles per Journey time band (weekday)

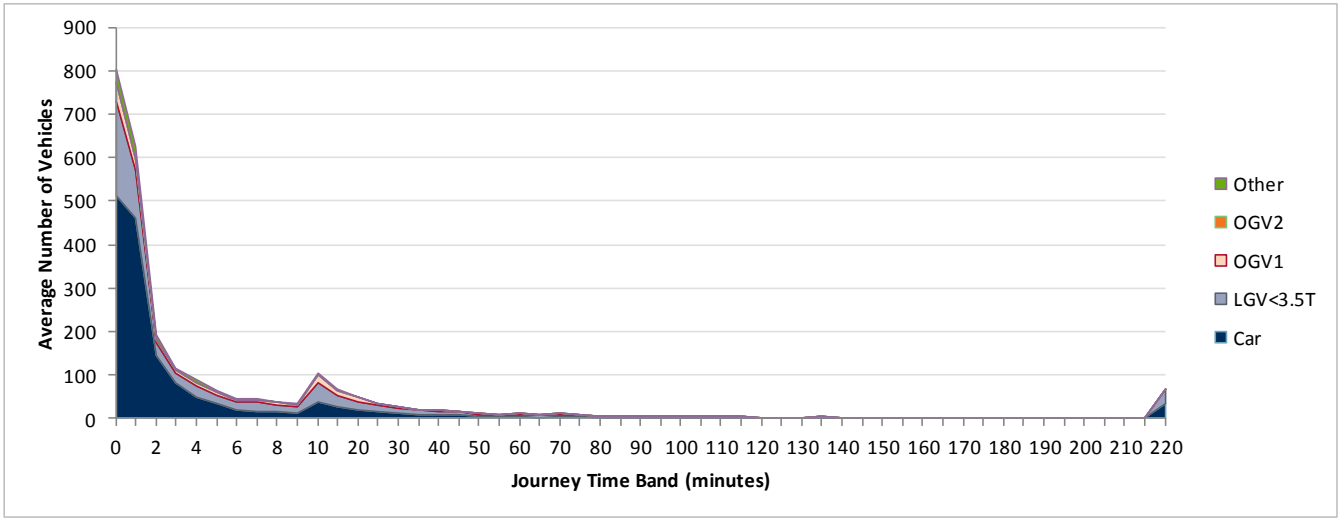
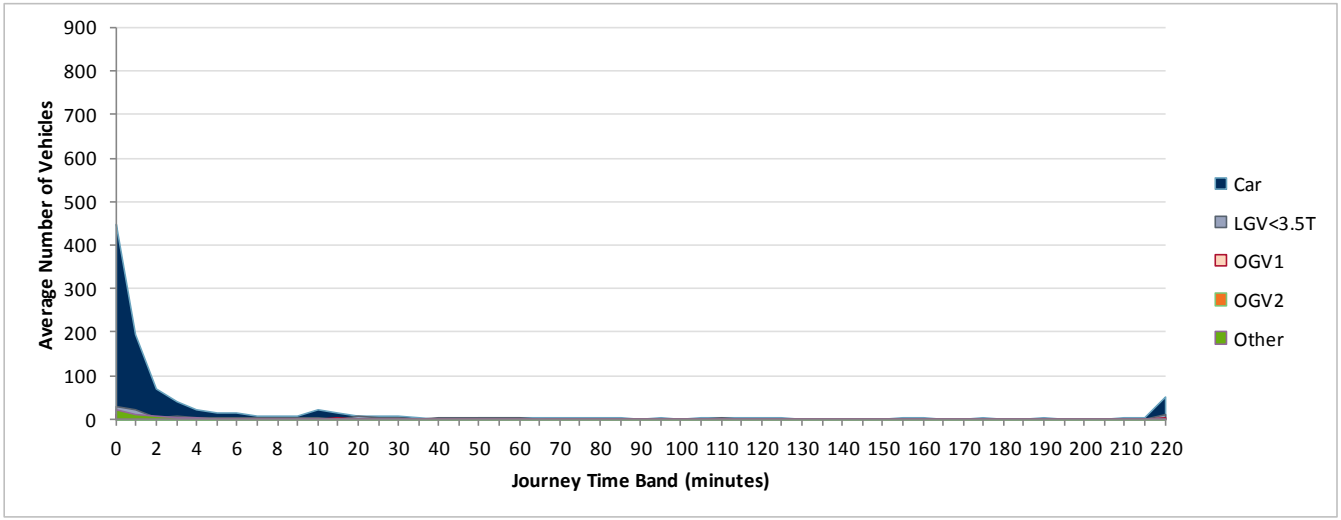


Figure 4.3: Vehicles per Journey time band (weekend)



Internal trips

It is possible that some trips may be made within the study area that do not cross the cordon; these are not detectable using the approach undertaken but internal flows are expected to be extremely low given the size of the study area.

OD Matrices

Table 4.2 shows the total number of vehicles that enter and exit the Temple area on an average weekday. The tables consist of through traffic (traffic that stays in the area less than 5 minutes) and cordon traffic (traffic that stays in the area above the threshold of 5 minutes). Traffic that has only entered the cordon (and did not exit within the 24-hour period) and traffic that only exited the cordon (and did not enter within the 24-hour period) have been excluded from this table.

Table 4.2 shows the total number of trips in the area. The table shows that most traffic enters the Temple area through Bouverie Street, and exits through Whitefriars Street.

Table 4.3 shows these movements as a percentage of the total number of trips.

Table 4.2: OD movements on average weekday – total movements

Total traffic	Bouverie Street	Whitefriars Street	Salisbury Court	Bridewell Place	Tudor Street (E)	Watergate	Carmelite Street	Tudor Street (W)	Total
Bouverie Street	1	771	2	346	343	66	177	249	1,955
Whitefriars Street	-	-	-	-	1	-	-	-	1
Salisbury Court	-	292	0	112	169	53	51	29	706
Bridewell Place	-	318	1	23	121	91	57	82	693
Tudor Street (E)	-	18	-	5	1	4	1	5	34
Watergate	-	1	-	-	-	-	-	-	1
Carmelite Street	-	1	-	-	1	-	-	-	2
Tudor Street (W)	-	261	-	47	66	3	29	1	407
TOTAL	1	1,662	3	533	702	217	315	366	3,799

Table 4.3: OD movements on average weekday – percentage of total movements

Total traffic	Bouverie Street	Whitefriars Street	Salisbury Court	Bridewell Place	Tudor Street (E)	Watergate	Carmelite Street	Tudor Street (W)	Total
Bouverie Street	-	20%	-	9%	9%	2%	5%	7%	52%
Whitefriars Street	-	-	-	-	-	-	-	-	0%
Salisbury Court	-	8%	-	3%	4%	1%	1%	1%	18%
Bridewell Place	-	8%	-	1%	3%	2%	2%	2%	18%
Tudor Street (E)	-	0.5%	-	0.1%	-	0.1%	-	0.1%	1%
Watergate	-	-	-	-	-	-	-	-	0%
Carmelite Street	-	-	-	-	-	-	-	-	0%
Tudor Street (W)	-	7%	-	1%	2%	0.1%	1%	-	11%
TOTAL	0%	43%	0%	14%	18%	5%	9%	10%	100%

Approximately 51% of all trips in the area enter through Bouverie Street, and 44% exits through Whitefriars Street.

OD Movements in the Area

The dominant movements through the study area derived from the OD analysis have been mapped for the two types of trips: through trips (most of traffic) and access/exit trips (called Cordon trips).

Figure 4.4 and Figure 4.5 show all movements that have a flow of over 100 vehicles on an average weekday, for the through movements and cordon movements respectively.

Figure 4.4 shows that the most common through trip is from Bouverie Street to Whitefriars Street. Although most of traffic uses Tudor Street to make this movements, as analysis of OGV data in chapter 6 will show, some OGVs are probably forced to use Tallis Street if they are unable to make the Tudor Street movements. This happens when illegal kerbside activity takes place on the corner of Tudor Street, which is protected by no waiting and no loading 'at any time' restrictions, that forces OGVs to continue straight ahead into Tallis Street. They then make a right turn at Carmelite Street. As the swept path analysis shows, this movement is also difficult, especially when the pay and display bay closest to the junction is in use, but video footage shows it is possible with vehicles using point turns to complete the movement from Tallis Street into Carmelite Street. As this area of the network is less busy than Tudor Street, the impact on following traffic is less significant.

After the Bouverie Street – Whitefriars Street movement, the movement from Bouverie Street to Bridewell Place also shows high daily flows, followed by Bouverie Street to Tudor Street (east).

Figure 4.4 shows that the majority movements originate from Bouverie Street. A smaller number of movements originate from Bridewell Place (213 on the average weekday), going to Whitefriars Street, and from Salisbury Court, either to Whitefriars Street (177 vehicles on the average weekday) or to Tudor Street (east), with 129 vehicles on the average weekday.

Figure 4.5 shows the cordon flows that have over 100 vehicle movements on the average weekday. These include vehicles that have entered the cordon and remain in the cordon for a period longer than the threshold of 5 minutes. Again, the Bouverie Street – Whitefriars Street is by the dominant movement. Second and third come Salisbury Court – Whitefriars Street and Bridewell Place – Whitefriars Street.

Other movements remain below 100 vehicles over the day and have not been mapped.

Figure 4.4: Dominant vehicle movements of through traffic (weekday)

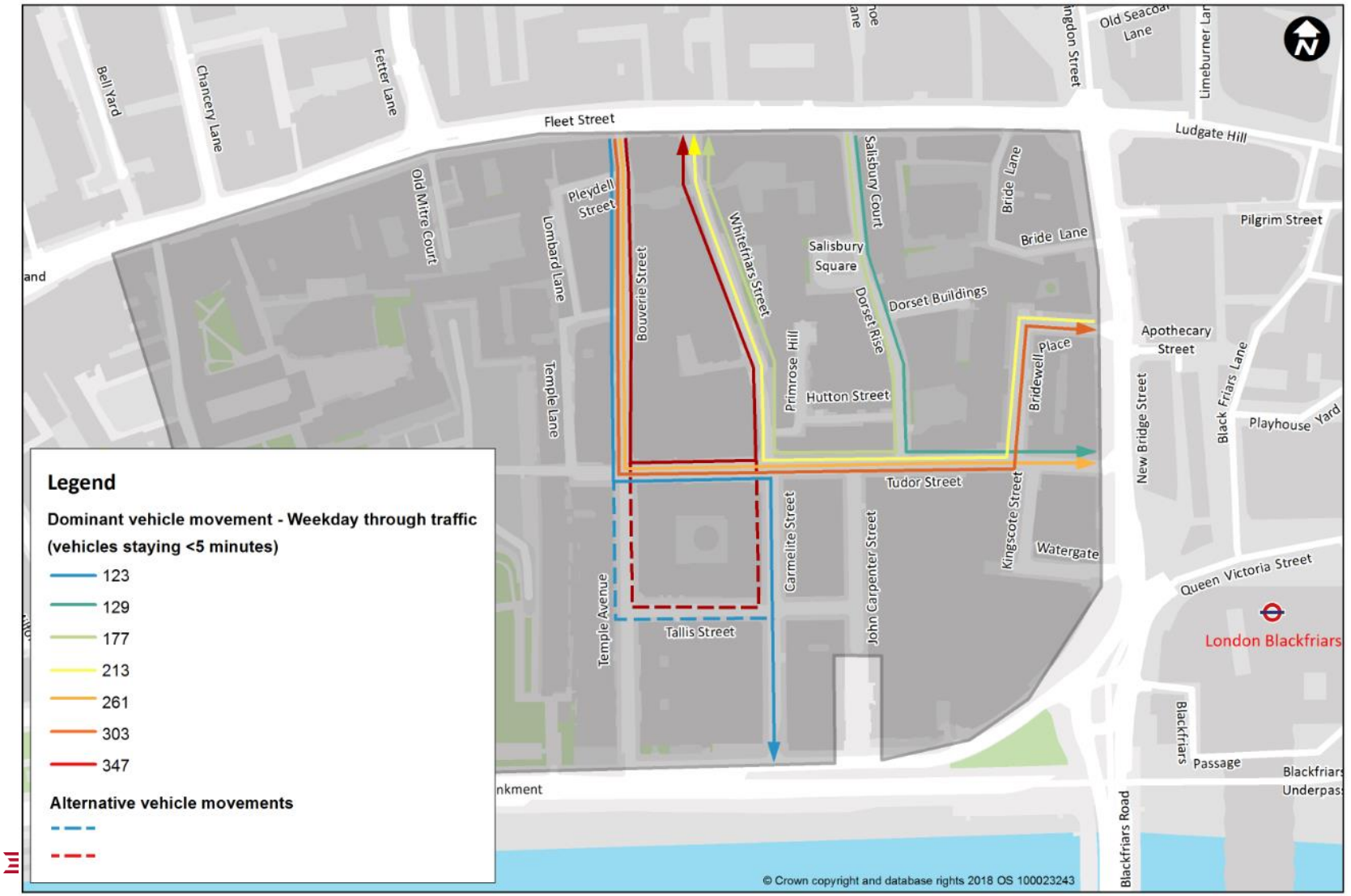
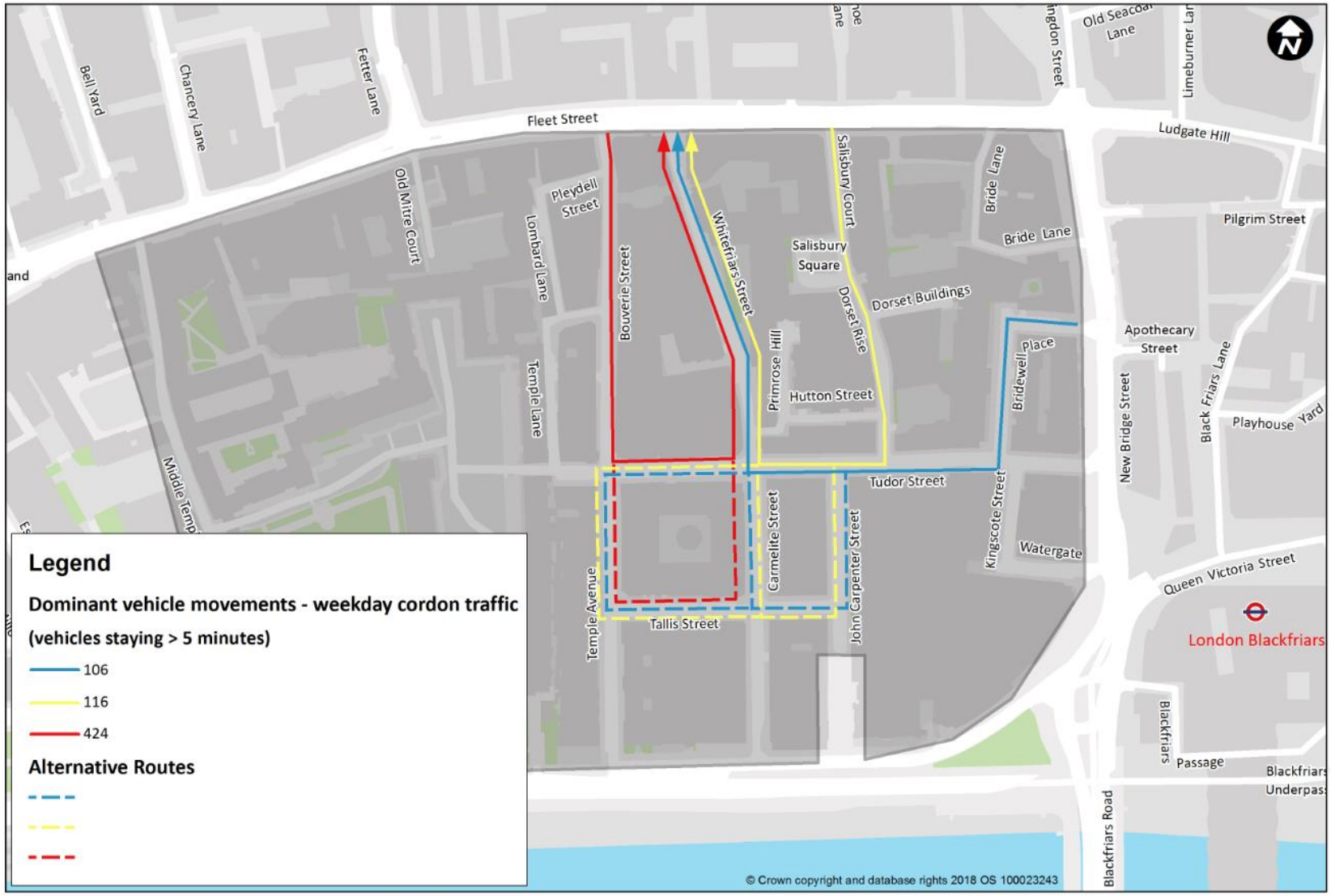


Figure 4.5: Dominant vehicle movements of cordon traffic (weekday)



OD movements by Node

The diagrams on the following pages illustrate the results for each of the 8 nodes presented in Figure 4.1, and these are discussed in the accompanying text.

It should be noted that the OD surveys relate to an average weekday and an average weekend day. These averages have been taken from 5 weekday 24-hour surveys and 2 weekend day 24-hour surveys, and therefore are not directly comparable to the survey results discussed in other sections of this report (which relate to averages of ATC or MCC analysis).

For one-way streets into/out of the area, some movements have been picked up in the other direction. These movements are likely to have been erroneously picked up by the ANPR camera, or are movements picked up from vehicles making a U-turn. As these numbers are very low, one-way streets with erroneous illegal movements are not discussed in the following section.

Bouverie Street (SB)

For both an average weekday and an average weekend day, the highest percentage of traffic (37% and 27% on a weekday and weekend respectively) enters via Bouverie Street and remains within the cordon for over 5 minutes. These movements are classed as access trips.

As shown in Figure 4.6 and Figure 4.6, traffic flows over the weekend are approximately one third of weekday flows. Similarly, to the weekday, most trips into the area are access trips. While on weekdays, most of traffic entering through Bouverie Street exits the area using Whitefriars Street, over the weekend, most vehicles exit via Tudor Street.

Figure 4.6: Weekday flows from Bouverie Street to other nodes

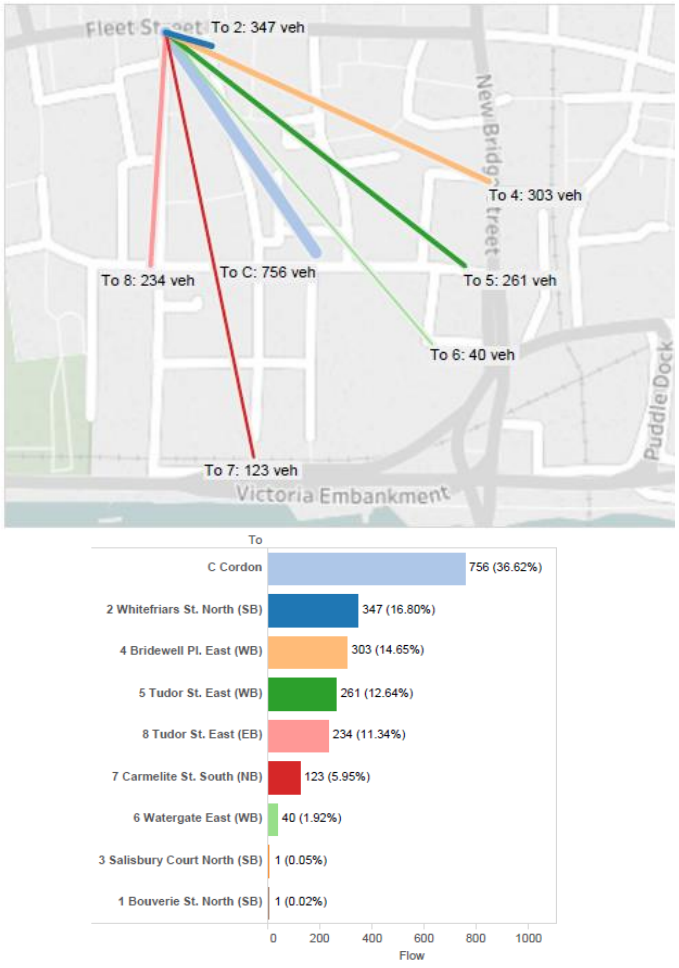
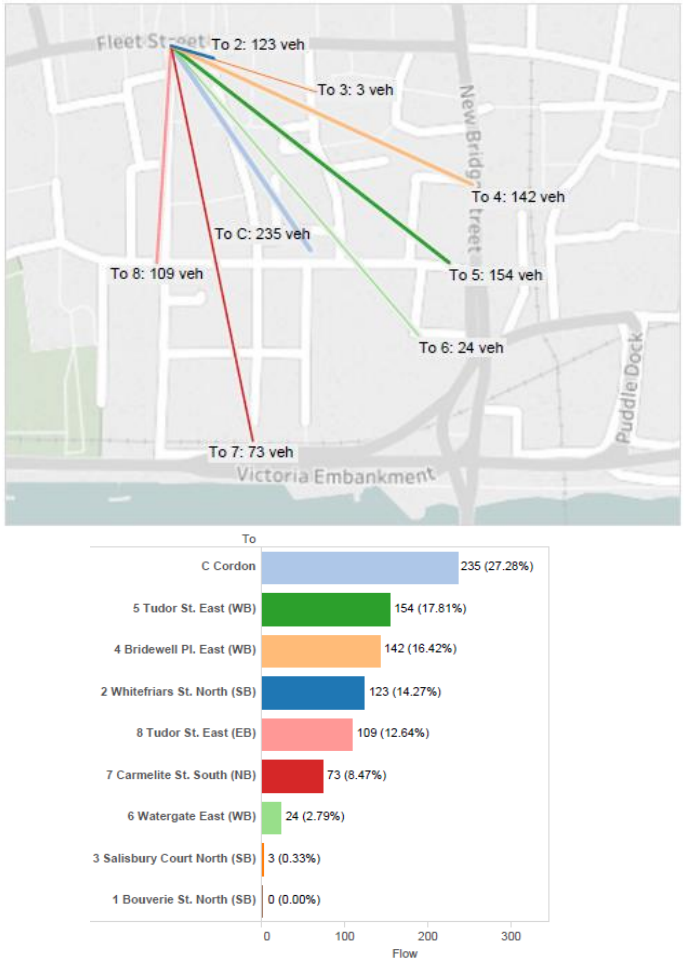


Figure 4.7: Weekend flows from Bouverie Street to other nodes



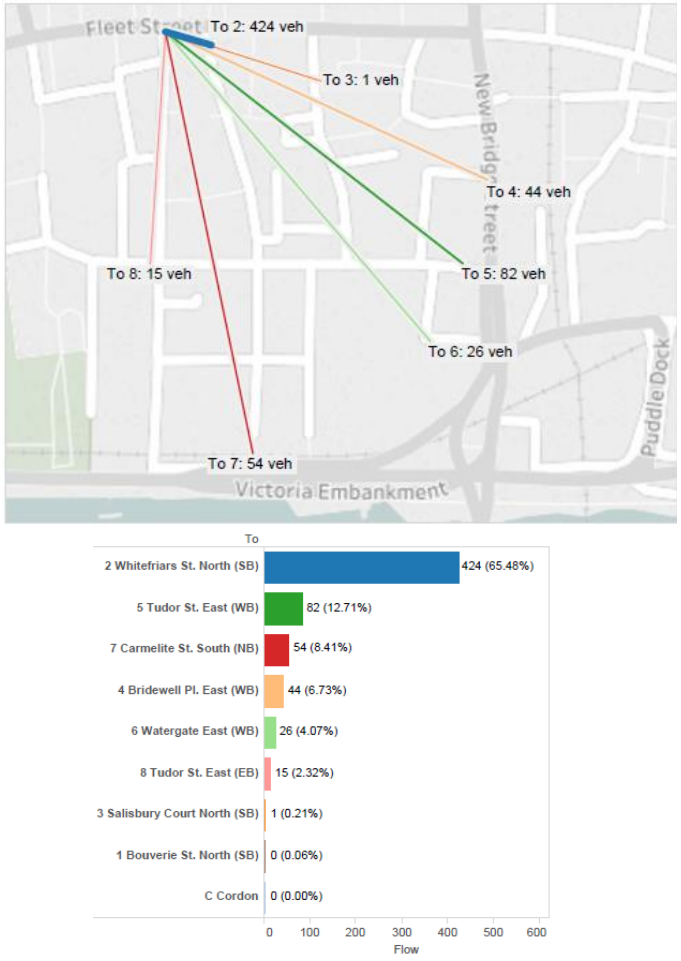
Bouverie Street (SB)

As Bouverie Street is the main point of entry, the Cordon traffic flow from the previous page has been split out to give more insight into where traffic that stays in the area over the 5-minute threshold is going.

The results are shown in the image to the right (weekday only).

Cordon traffic primarily exits the area through Whitefriars Street. Only a very small amount exits via other nodes, with Tudor Street (east), Carmelite Street and Bridewell Place showing the highest flows.

Figure 4.8: Weekday flows from Bouverie Street to other nodes (cordon traffic only)



Whitefriars Street (SB)

Figure 4.9 and Figure 4.10 show that traffic flows are similarly distributed on a weekday and a weekend, with the highest volume exiting through Whitefriars Street coming from within the Cordon (42% on both weekdays and weekends). This means that most of traffic exiting via Whitefriars Street has stayed in the area over 5 minutes.

About 20% of traffic exiting via Whitefriars Street enters at Bouverie Street. This is also apparent from Table 4.2 and Table 4.3, with most of traffic that does not remain inside the cordon having entered via Bouverie Street then exiting through Whitefriars Street (7% of all movements in- and out of the area).

As before, traffic flows on the weekend are approximately a third of those observed during the working week.

Figure 4.9: Weekday flows to Whitefriars Street from other nodes

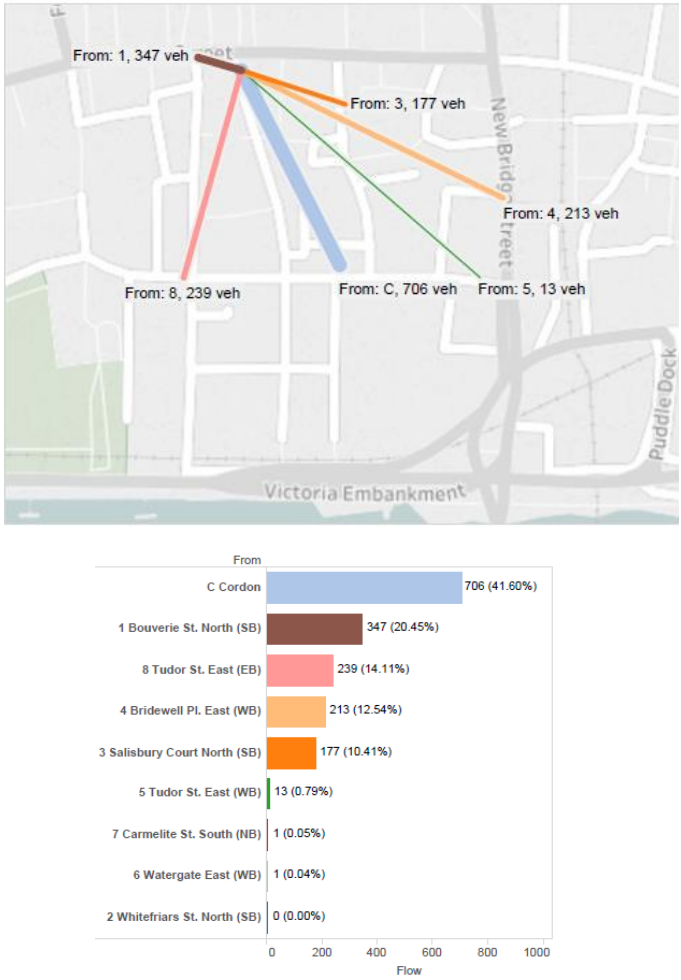
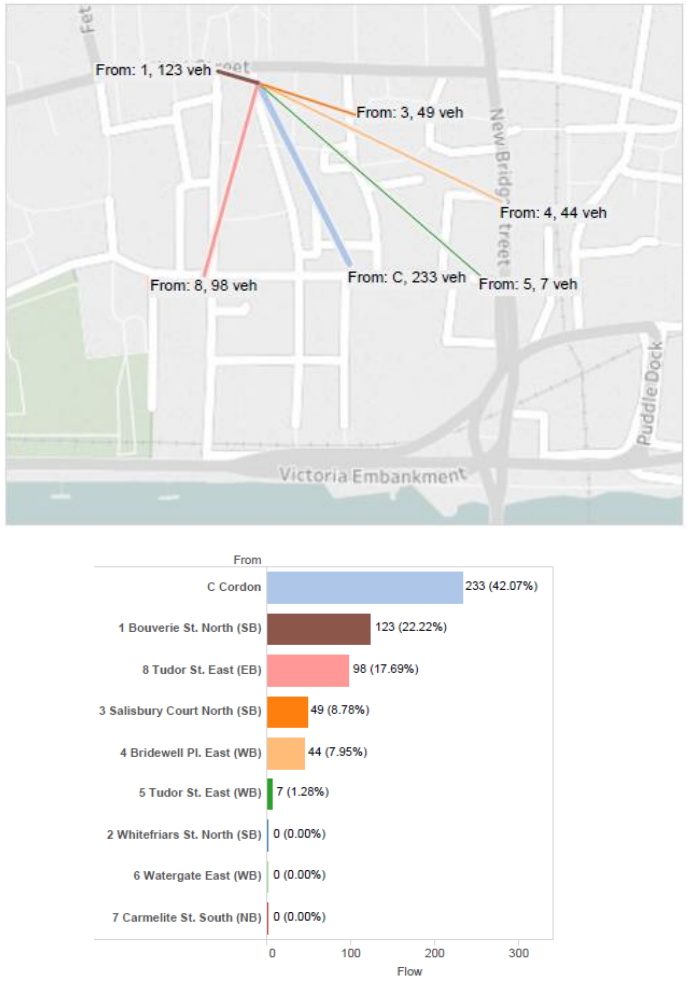


Figure 4.10: Weekend flows to Whitefriars Street from other nodes

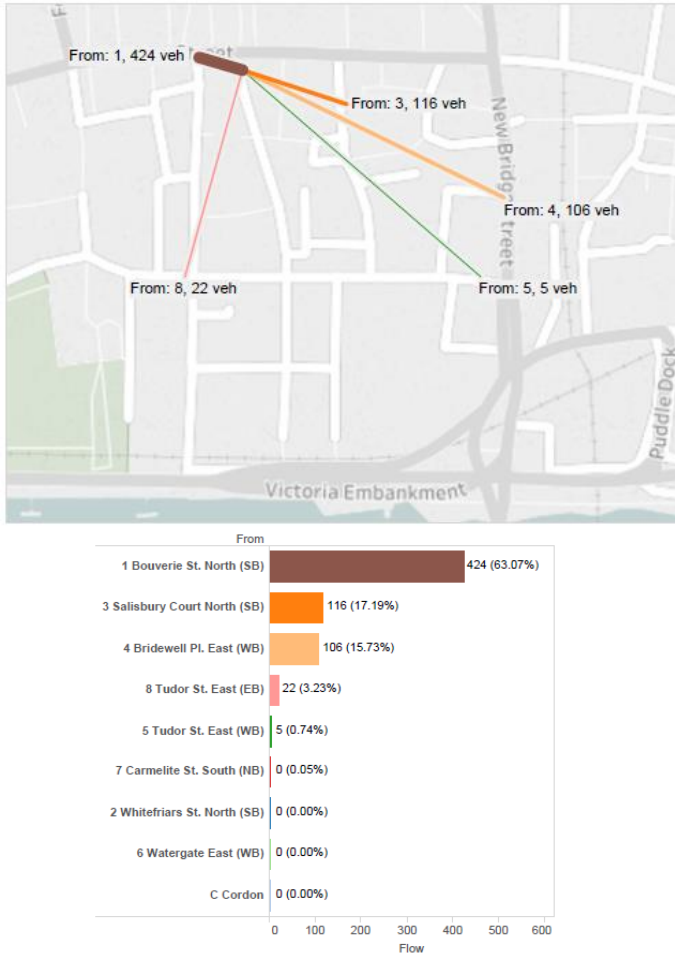


Whitefriars Street (SB)

As Whitefriars Street is the main exit point within the study area, and the Cordon traffic flow from the previous page has been split out to give more insight into where traffic that has remained in the area over the 5-minute threshold has originated from. The (weekday only) results are shown in the image to the right.

Bouverie Street is the main point of entry for cordon traffic exiting through Whitefriars Street. Other nodes with a high daily entry flow (over 100 vehicles per day) include Salisbury Court and Bridewell Place.

Figure 4.11: Weekday flows to Whitefriars Street from other nodes (cordon traffic only)



Salisbury Court (SB)

Flows from Salisbury Court to the other nodes are significantly lower than the previously described flows entering the area via Bouverie Street.

Figure 4.12 shows that, on an average weekday, 30% of the flow remains within the cordon (access traffic), while 25% exits the area through Whitefriars Street and 20% through Tudor Street east.

On the weekend, and as shown in Figure 4.13, the main direction of flows from Salisbury Court is equally split as either remaining in the cordon, or leaving through Tudor Street east and Bridewell Place.

Figure 4.12: Weekday flows from Salisbury Court to other nodes

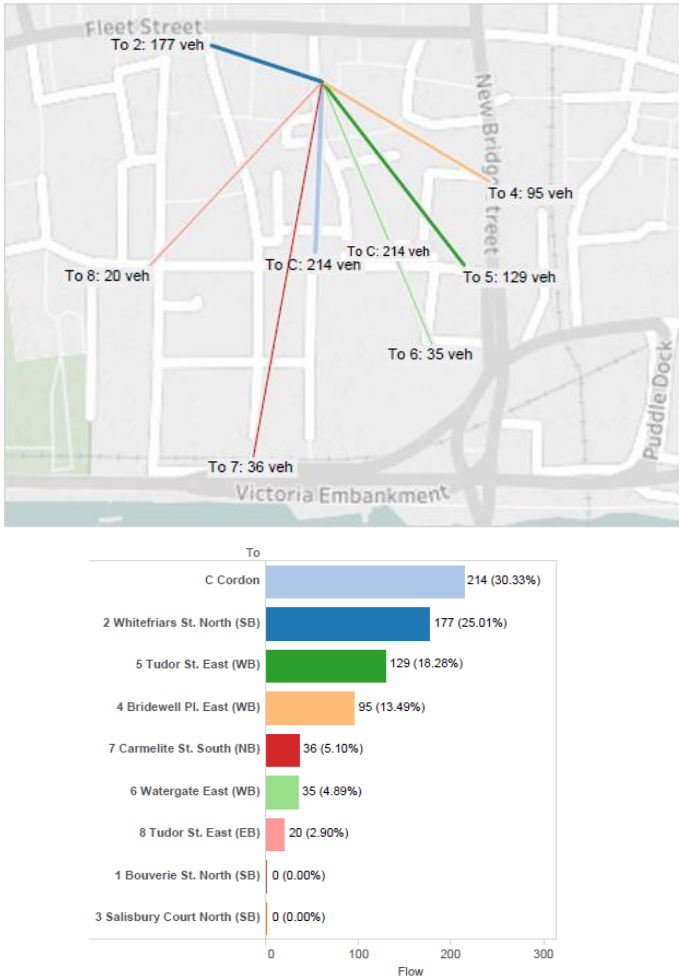
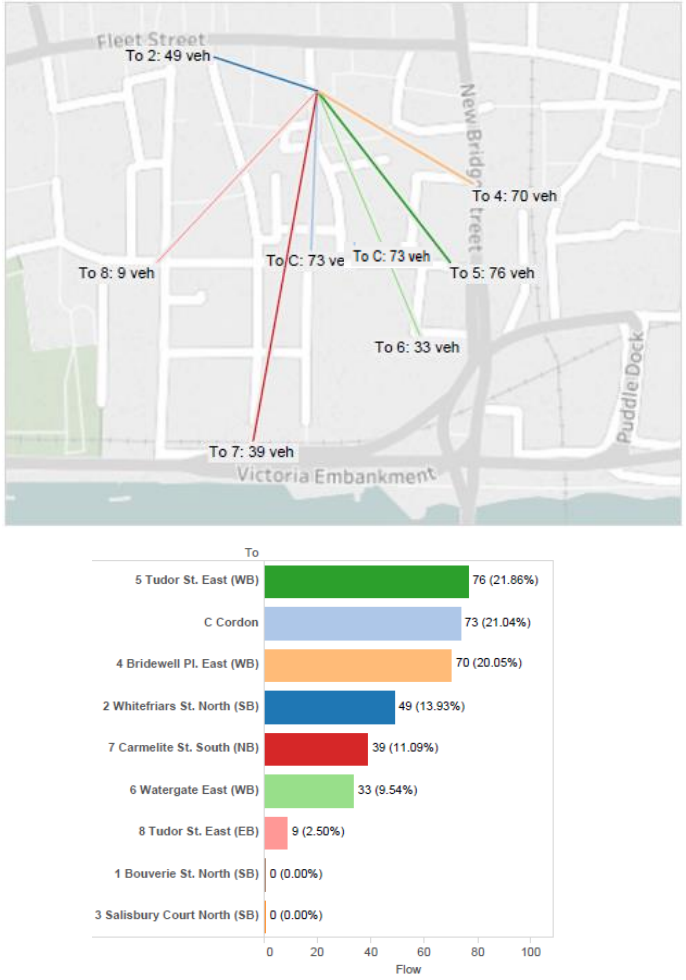


Figure 4.13: Weekend flows from Salisbury Court to other nodes



Bridewell Place (WB)

Contrary to the previously discussed nodes, Bridewell Place is two-way, and as such, vehicles can both enter and leave the area via Bridewell Place.

Figure 4.14 and Figure 4.15 show the flows that originate from Bridewell Place.

On both the average weekday and weekend, the highest proportion of the traffic entering via Bridewell Place East remains within the cordon (35% and 37% respectively). Traffic flows on the weekend are approximately half of the flows seen on the average weekday.

Figure 4.14: Weekday flows from Bridewell Place to other nodes

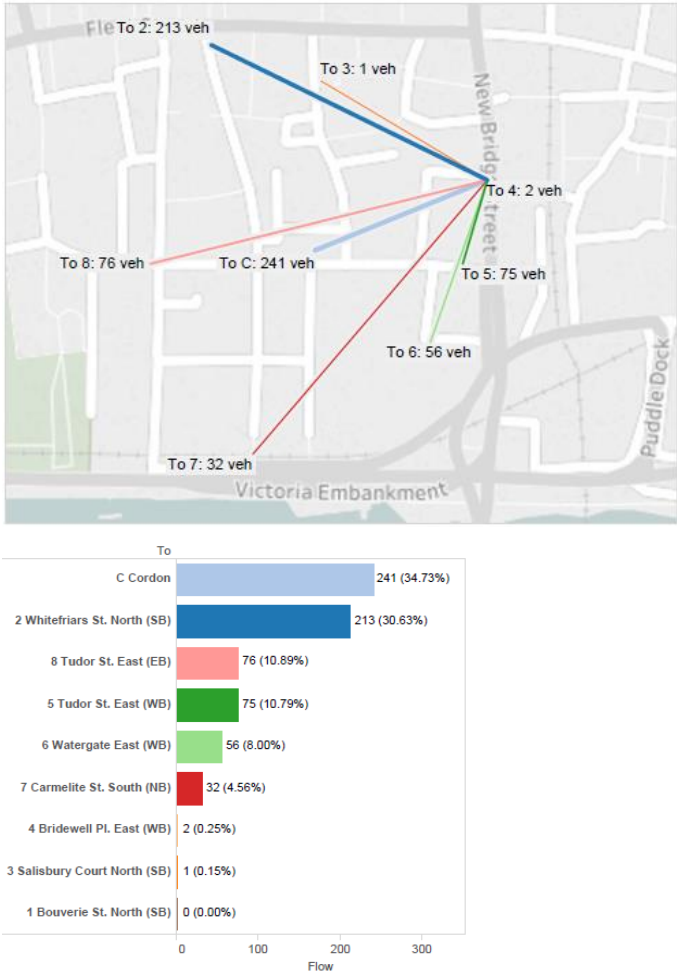
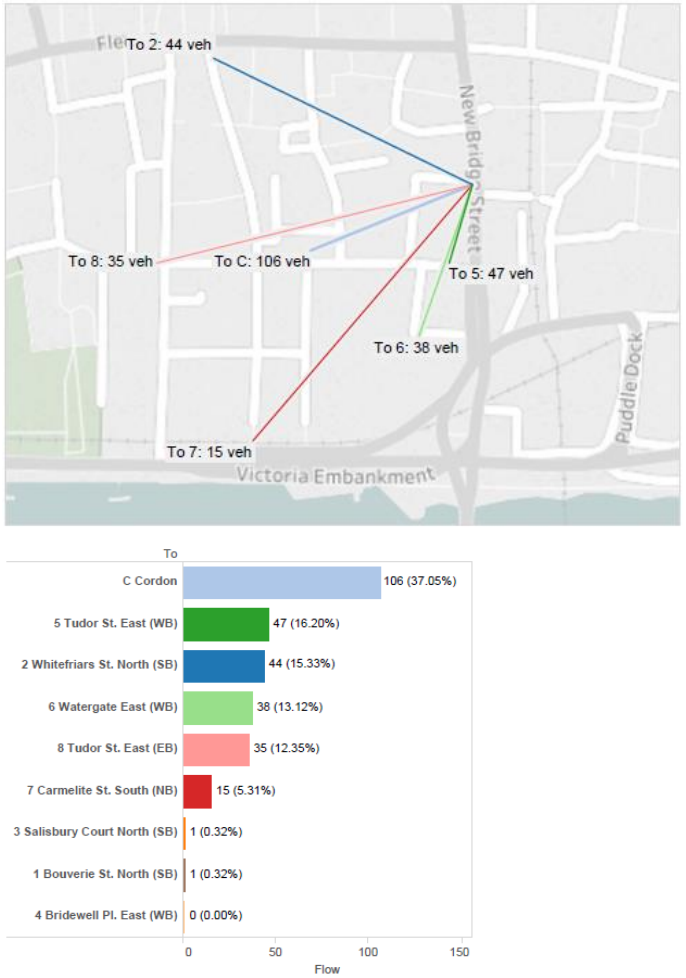


Figure 4.15: Weekend flows from Bridewell Place to other nodes



Bridewell Place (EB)

Figure 4.16 and Figure 4.17 show the flows that enter the area through other nodes and exit via Bridewell Place.

As shown opposite, flows to Bridwell Place predominantly originate from Bouverie Street, which is the source of over half of all flows to Bridewell Place on both weekdays and weekend days.

The figures also show that traffic flows are significantly higher on weekdays compared to weekends.

Figure 4.16: Weekday flows to Bridewell Place from other nodes

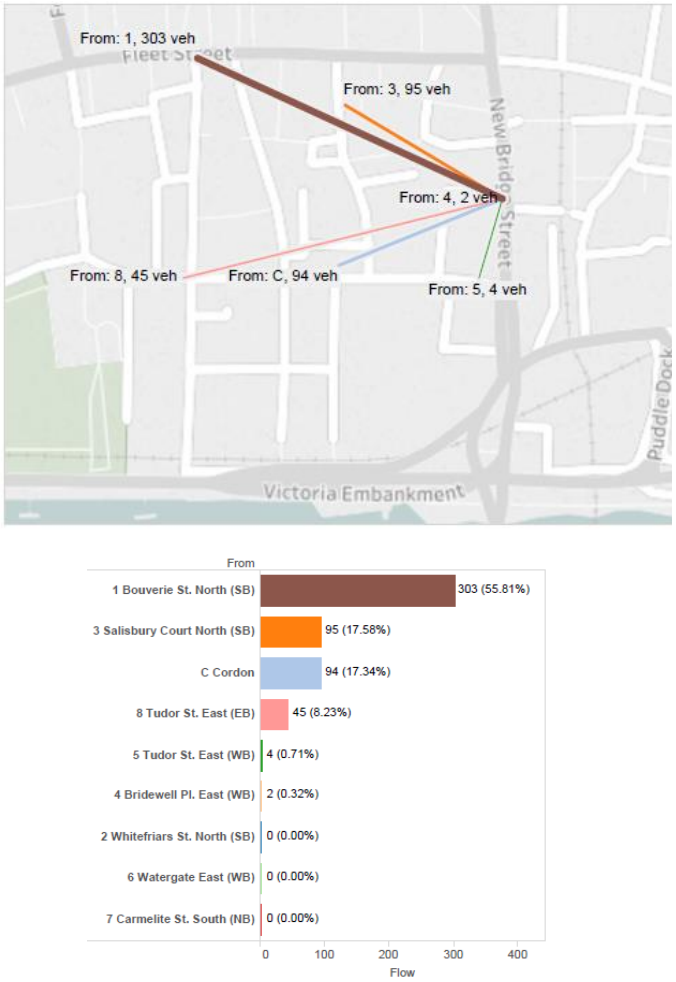
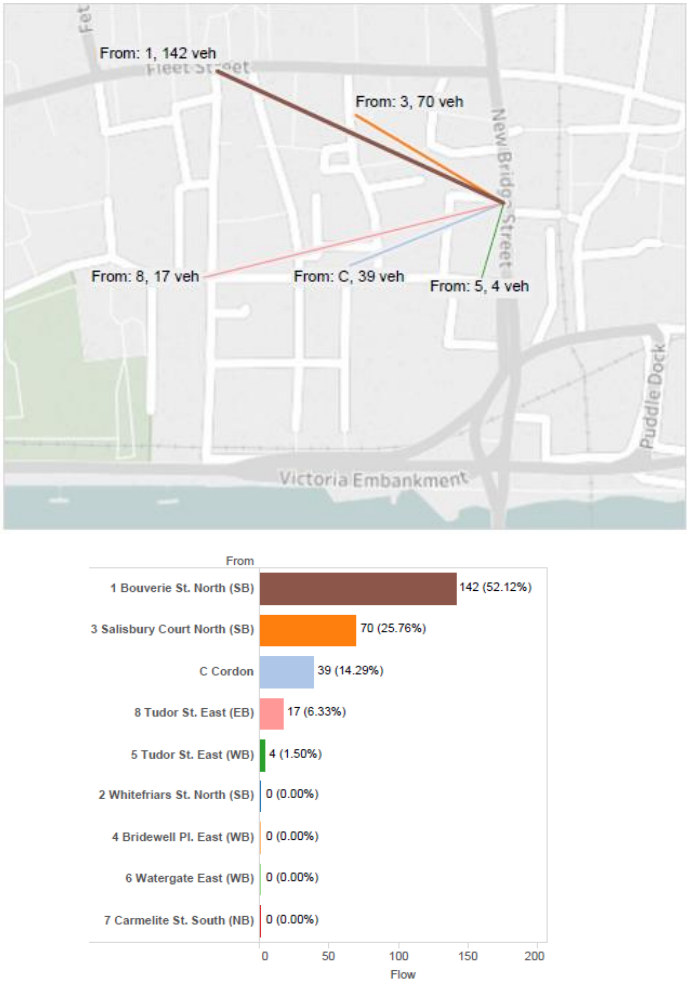
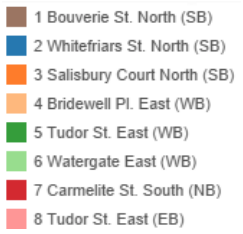


Figure 4.17: Weekend flows to Bridewell Place from other nodes





Tudor Street east (WB)

Although Tudor Street east is an exit-only point for New Bridge Road, as shown in Figure 4.18 and Figure 4.19 for a weekday and weekend respectively there is still a significant number of vehicles entering the area at this point.

On both the average week and weekend day, the highest percentage of the traffic flows entering at Tudor Street east remains within the cordon (49% and 34% respectively), and are as such considered to be access traffic. The second main destination is Whitefriars Street.

Traffic flows on weekends are approximately half of those recorded for a weekday.

Figure 4.18: Weekday Flows from Tudor Street East to other nodes

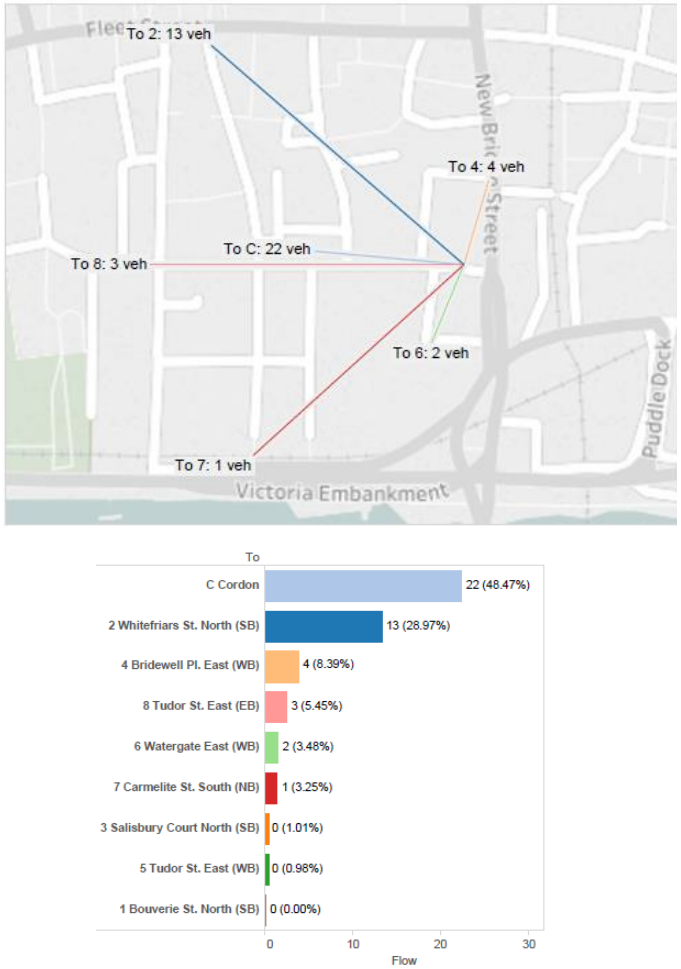
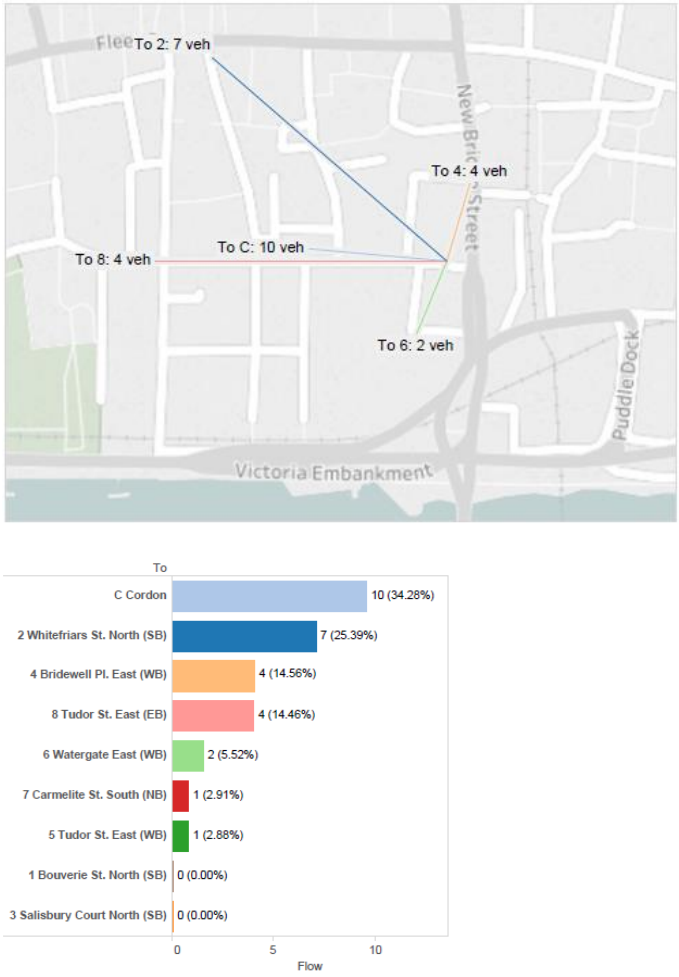


Figure 4.19: Weekend flows from Tudor Street East to other nodes



1 Bouverie St. North (SB)
2 Whitefriars St. North (SB)
3 Salisbury Court North (SB)
4 Bridewell Pl. East (WB)
5 Tudor St. East (WB)
6 Watergate East (WB)
7 Carmelite St. South (NB)
8 Tudor St. East (EB)

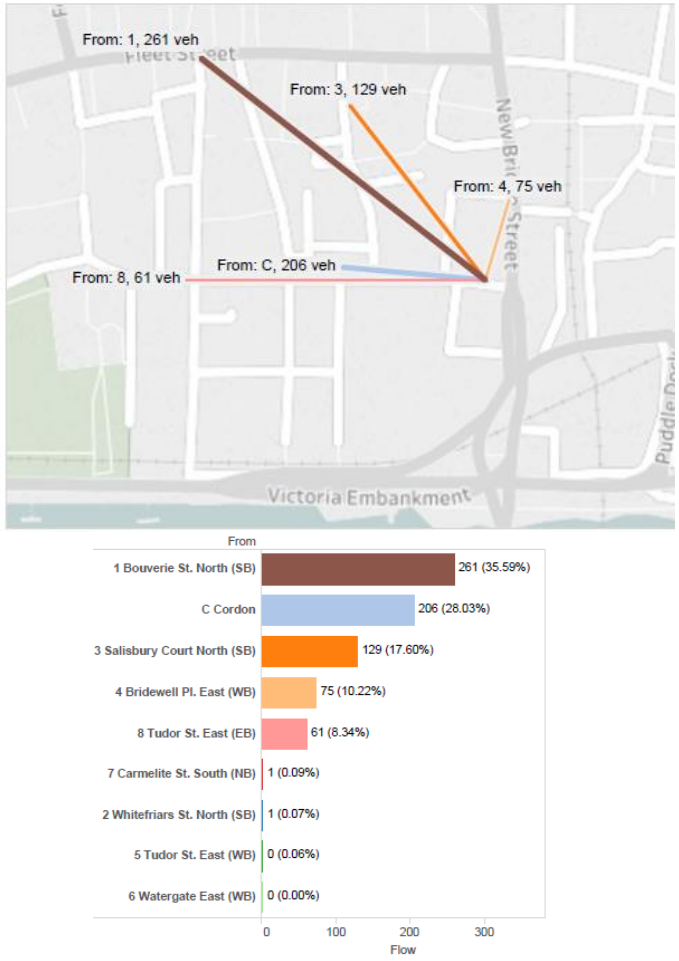
Tudor Street east (EB)

After Whitefriars Street, Tudor Street east is the node most frequently used to exit the area. As shown in Table 4.3, 14% of all traffic (including traffic going to the Cordon) exits via Tudor Street east.

Flows from other nodes to Tudor Street are highest on a weekday, while weekends see about half of that flow when compared to weekdays, as shown in Figure 4.20 and Figure 4.21.

On weekdays, flows to Tudor Street east mainly enter at Bouverie Street (36%) or are already within the Cordon (28%). Weekends see a similar pattern.

Figure 4.20: Weekday flows to Tudor Street East from other nodes



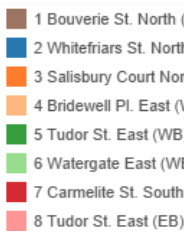
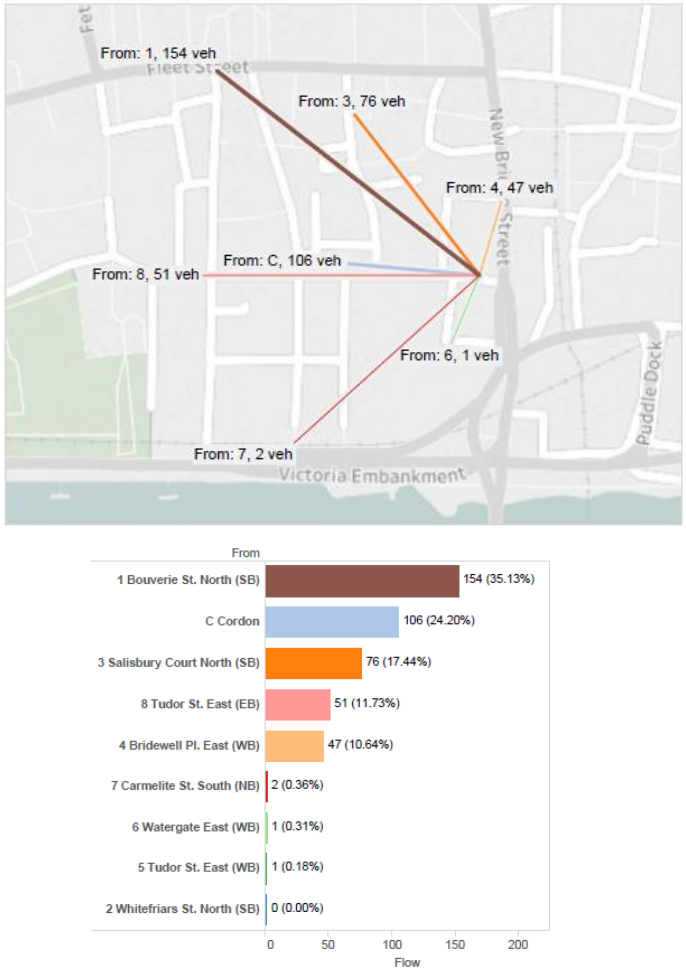


Figure 4.21: Weekend flows to Tudor Street East from other nodes



Watergate (EB)

Watergate provides an exit route (only) to New Bridge Road in the eastbound direction.

On both the average weekday and weekend day, the highest percentage of the traffic flows to Watergate comes from within the cordon, although the weekday sees a much higher share of traffic coming from the cordon (Figure 4.22), compared to the weekend (Figure 4.23). Shares are much more equally distributed on the weekend, with flows coming from the within the cordon, Bridewell Place and Salisbury Court.

Traffic flows on weekend are also significantly lower than on weekday.

Figure 4.22: Weekday flows to Watergate from other nodes

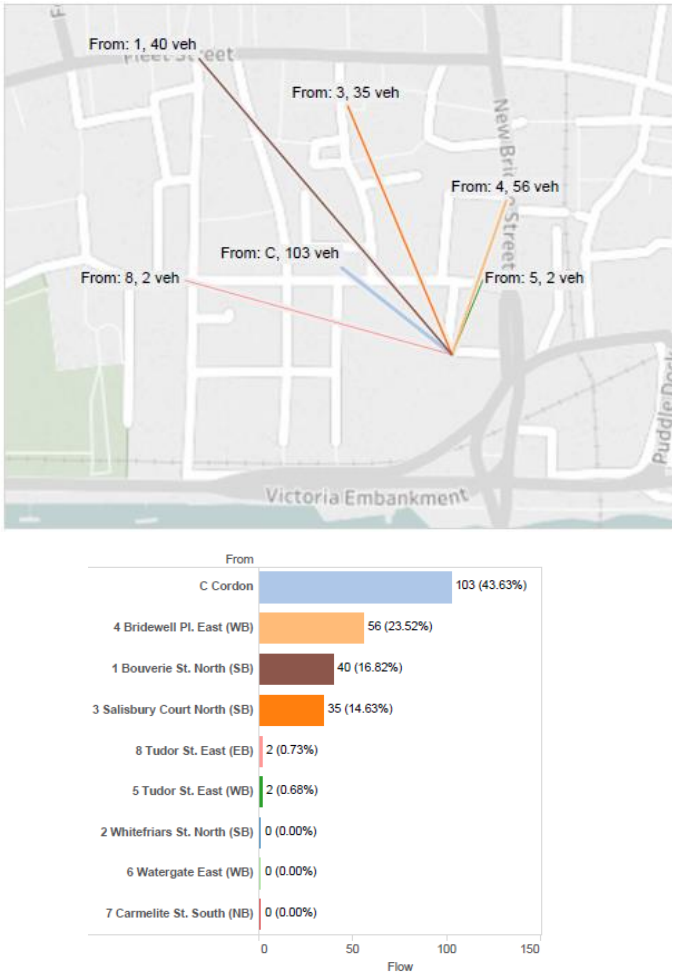
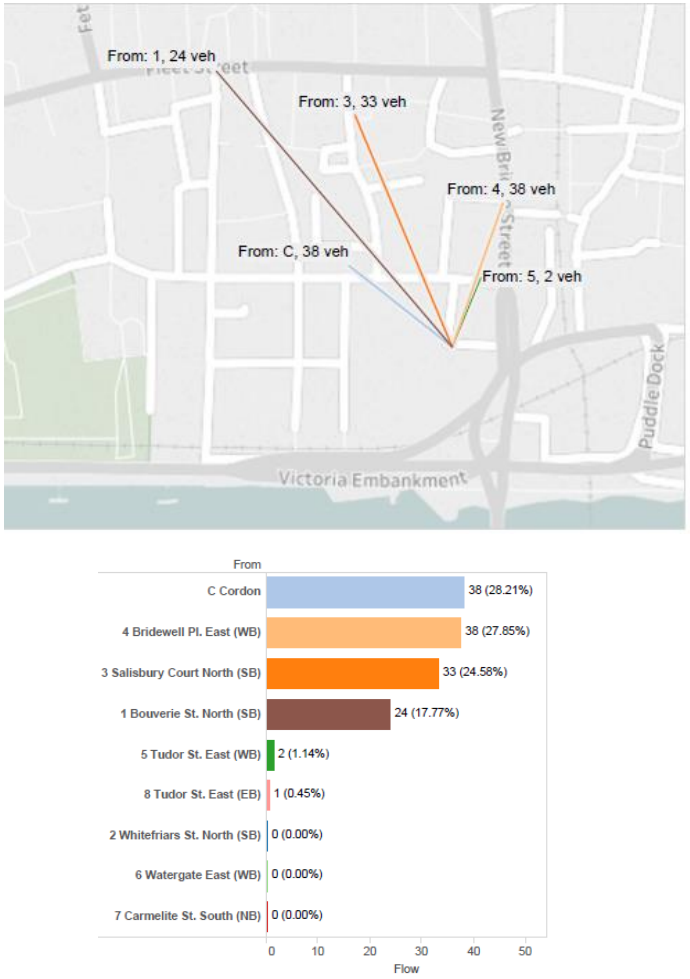
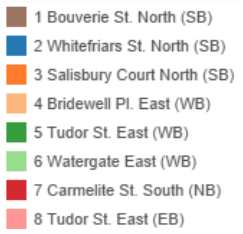


Figure 4.23: Weekend flows to Watergate from other nodes





Carmelite Street (SB)

Carmelite Street offers exit (only) onto Victoria Embankment. Flows to Carmelite Street primarily originate from Bouverie Street both during the week and over the weekend, followed by traffic originating from within the cordon, as shown in Figure 4.24 and Figure 4.25.

As for all previously described streets, traffic flows on weekend are significantly lower than on weekday.

Figure 4.24: Weekday flows to Carmelite Street from other nodes

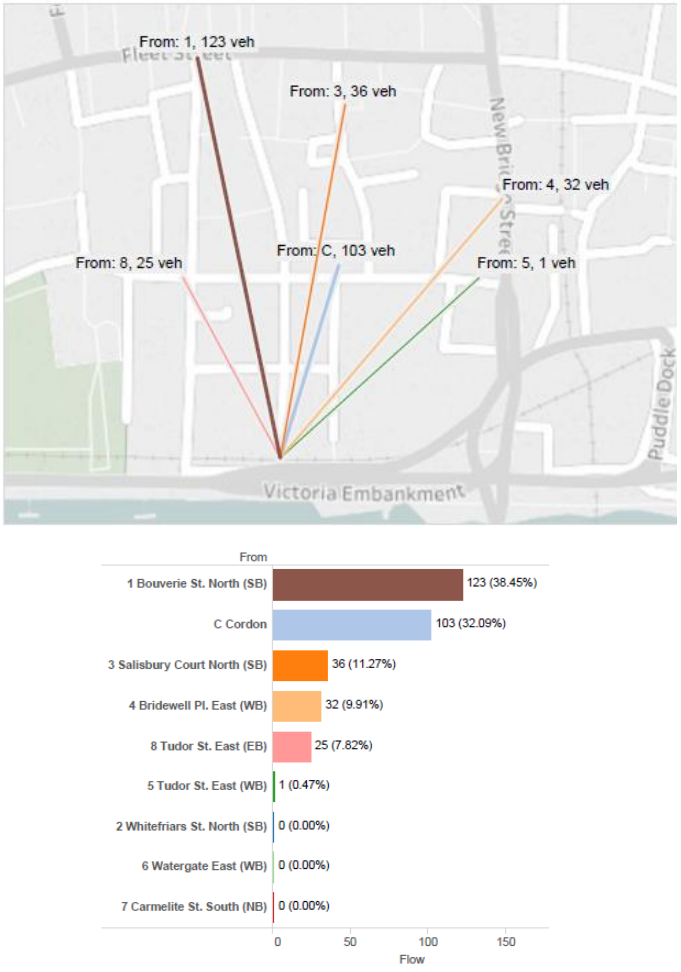
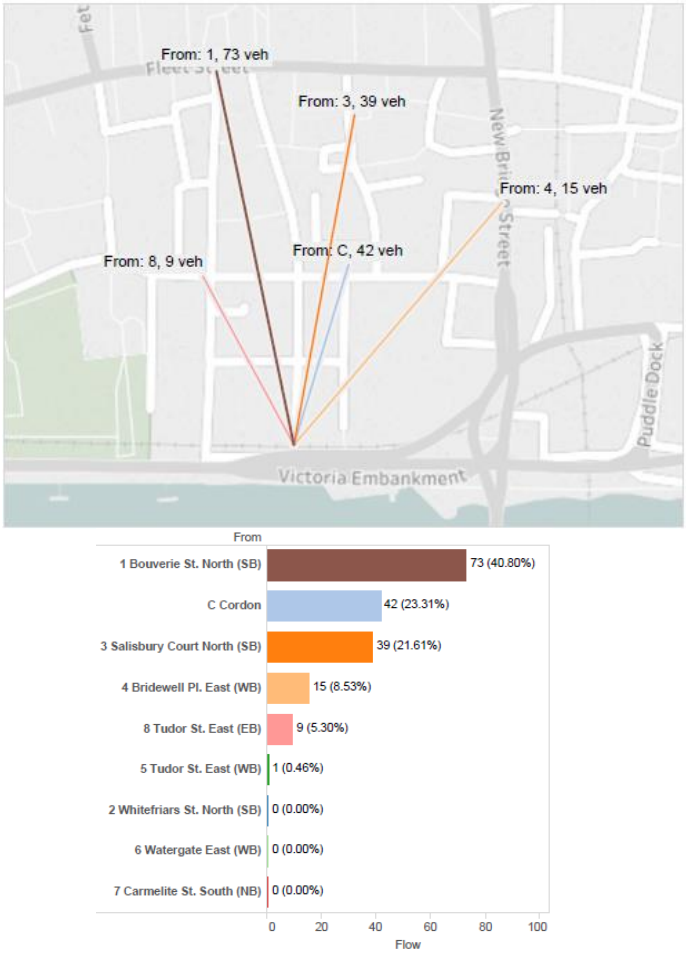


Figure 4.25: Weekend flows to Carmelite Street from other nodes



Tudor Street west (EB)

Tudor Street west offers bidirectional exit/entry into King's Bench Walk and Middle Temple Lane (both are private roads). It should be noted that the Middle Temple Lane exit onto Victoria Embankment was closed at the time of the OD surveys. To understand traffic patterns, additional MCC data has been gathered. The results of this, in comparison to earlier traffic surveys, are presented further on in this chapter.

For this section, vehicles exiting the cordon via node 8 (Tudor Street/King's Bench Walk) are treated as leaving the area, although they might be parking in the area and as such remaining inside the cordon. As such, traffic from Tudor Street to other destinations might be lower when Victoria Embankment is accessible from Middle Temple Lane.

Both the weekday and weekend flows from Tudor Street East mainly travel to Whitefriars Street.

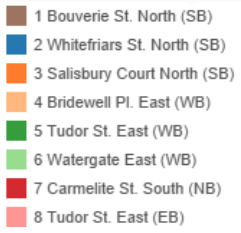


Figure 4.26: Weekday flows from Tudor Street West to other nodes

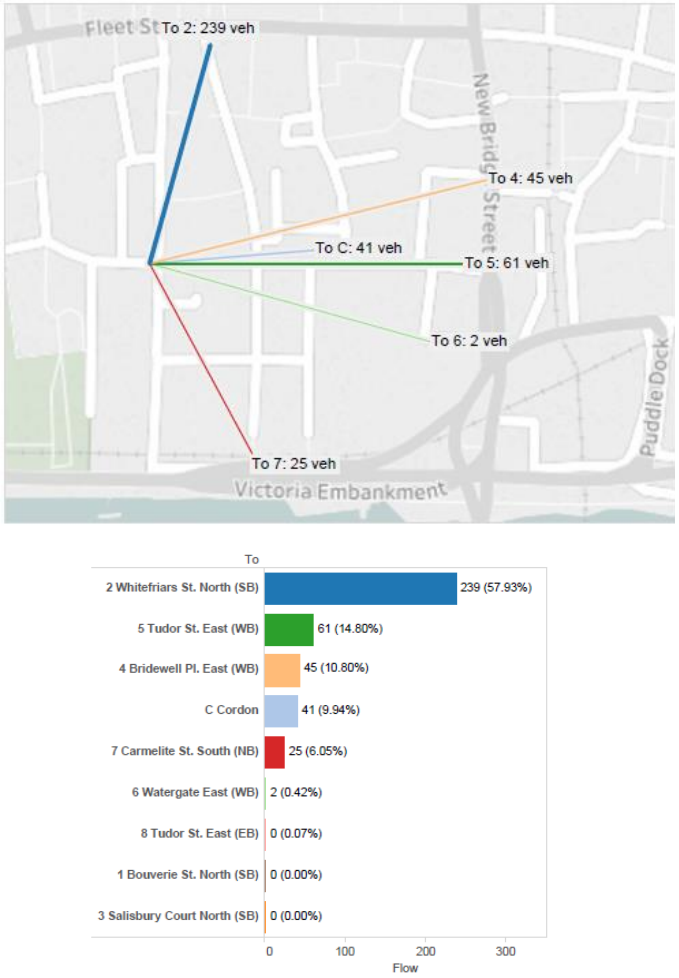
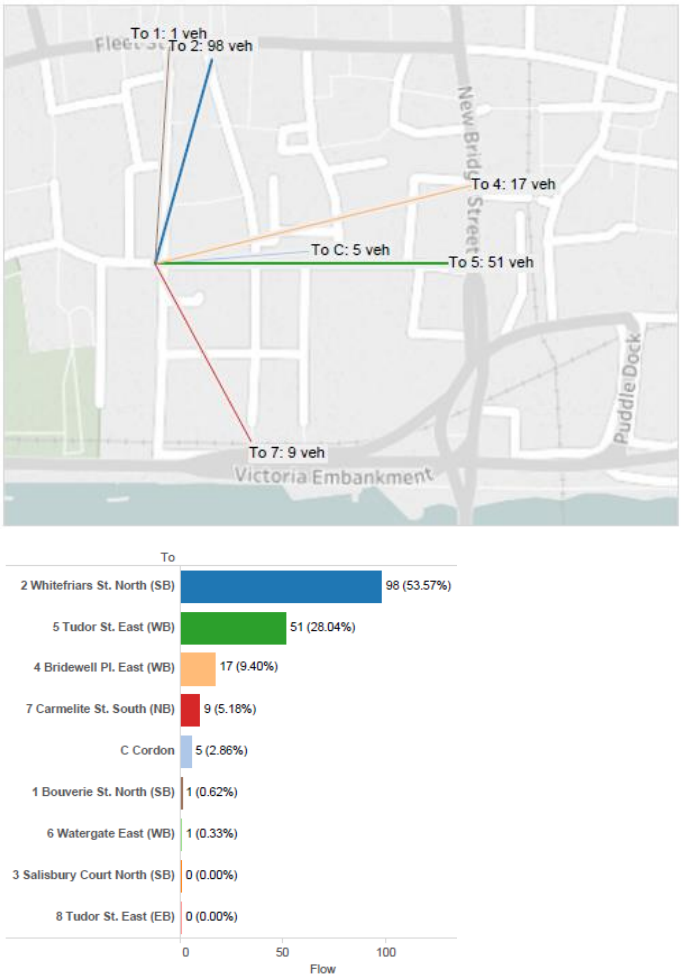


Figure 4.27: Weekend flows from Tudor Street West to other nodes



Tudor Street west (WB)

In contrast, as shown in Figure 4.28 and Figure 4.29, flows to Tudor Street east primarily originate from Bouverie Street, on both weekdays and weekend days. These flows will not change when including the Middle Temple Lane analysis, as motorised traffic can only enter the Middle Temple Lane area through the Tudor Street node. Traffic to Middle Temple Lane originating from Fleet Street are all cyclists, as shown later in this chapter.

Figure 4.28: Weekday flows to Tudor Street West from other nodes

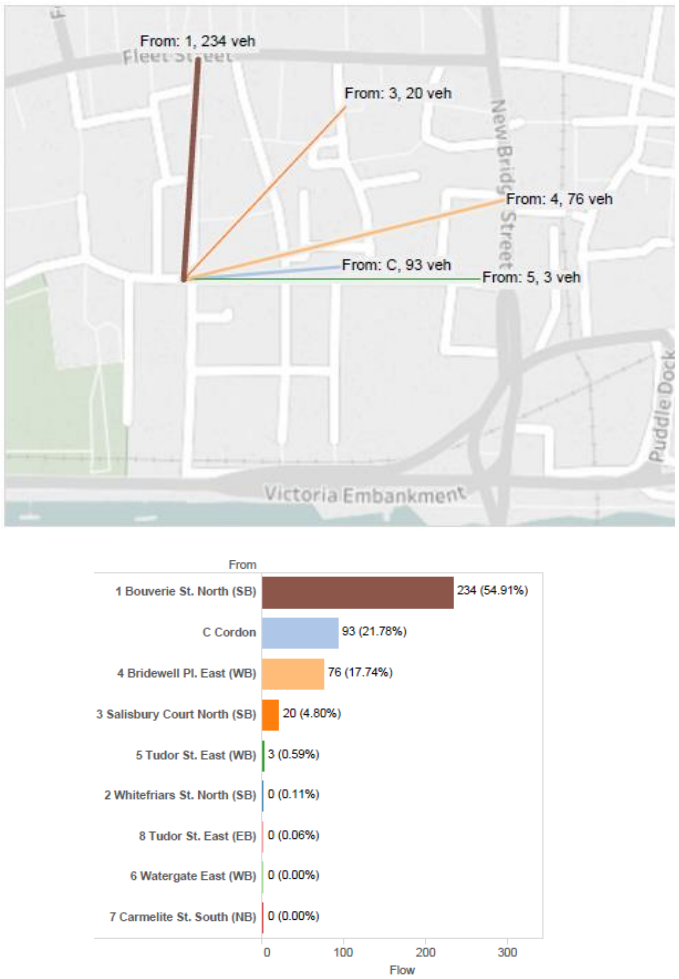
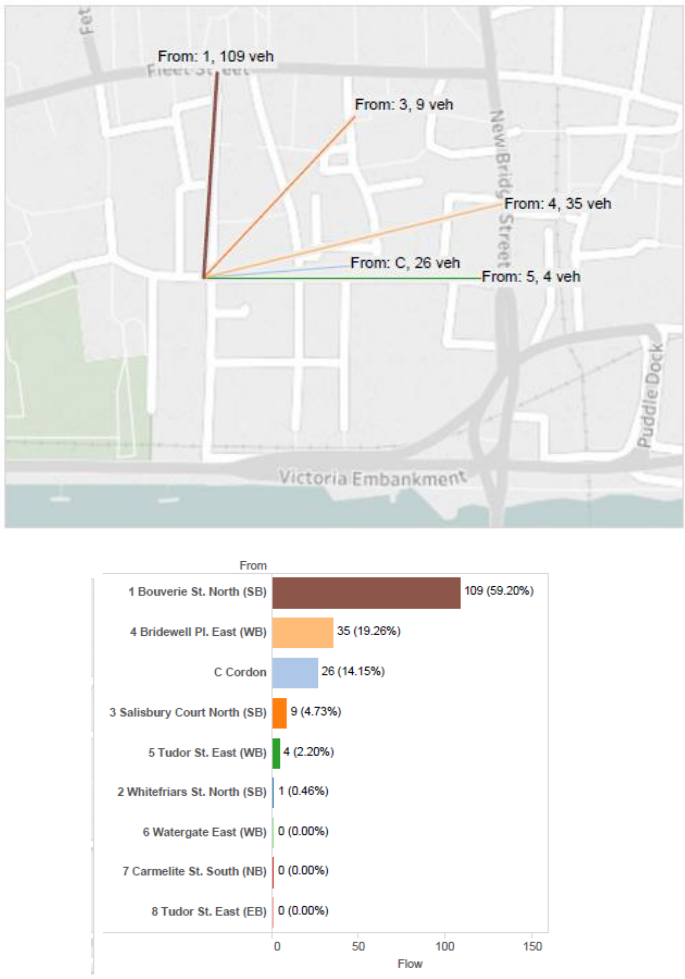


Figure 4.29: Weekend flows to Tudor Street West from other nodes



Cordon (exiting)

Cordon traffic is traffic that either enters the area and stays for over 5 minutes (designated as access traffic) or traffic that has remained in the area for over 5 minutes and leaves via the different nodes of the cordon.

Both during the week and over the weekend, the main destination of flows originating in the cordon is Whitefriars Street (approximately 50% of the total). This indicates that most of traffic that has remained in the area for over 5 minutes (e.g. for parking or loading purposes) will leave the area through Whitefriars Street.

Flows with a destination within the Cordon are more likely to enter at Bouverie Street.

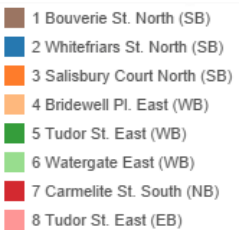


Figure 4.30: Weekday flows from Cordon to other nodes

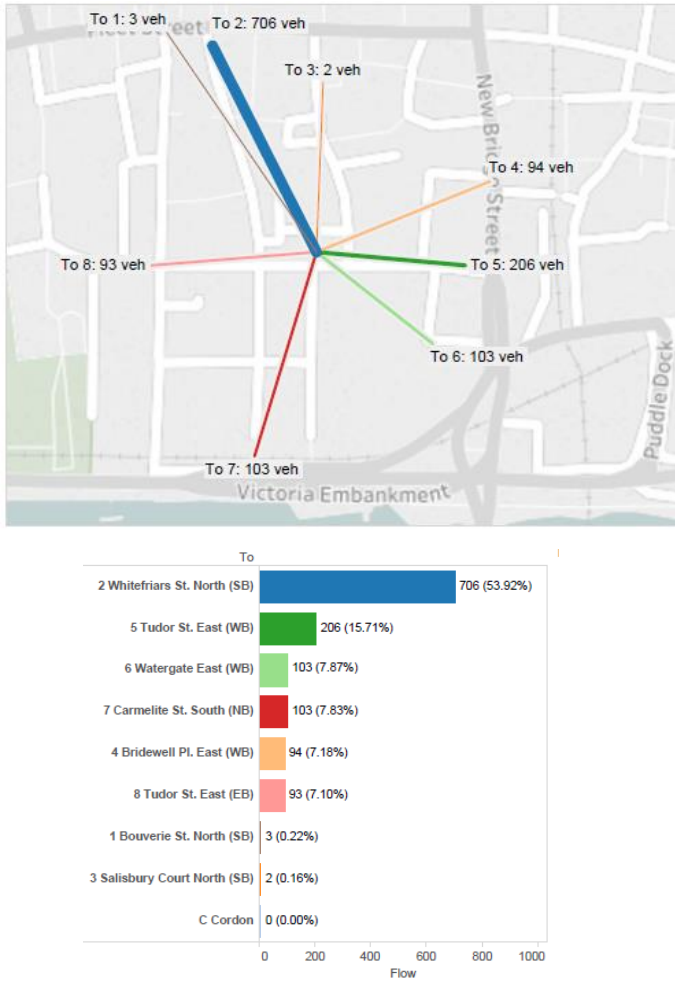
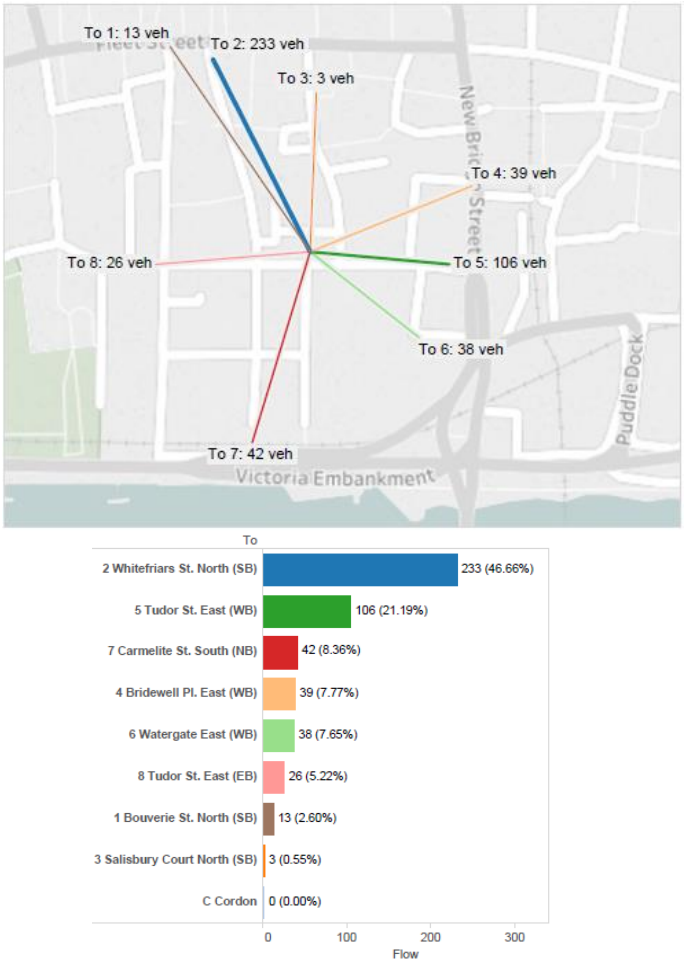


Figure 4.31: Weekend flows from Cordon to other nodes



Cordon (entering)

Figure 4.32 and Figure 4.33 show that vehicles that have the cordon as a destination (and remain there for a duration over 5 minutes) are most likely to enter at Bouverie Street.

This is the case for both the weekday as well as for the weekend.

Figure 4.32: Weekday flows to Cordon from other nodes

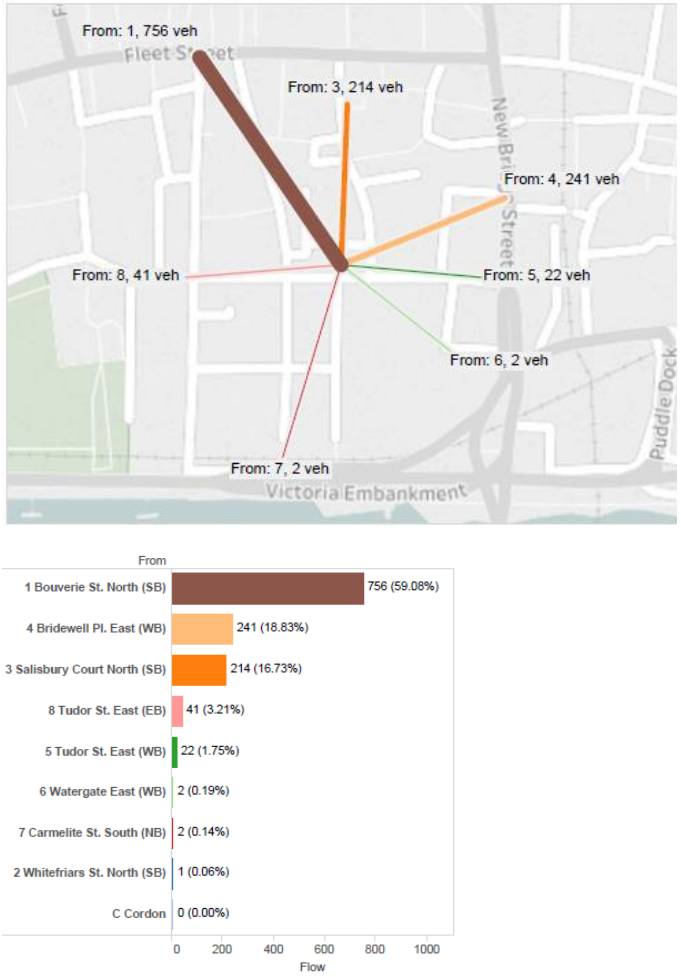
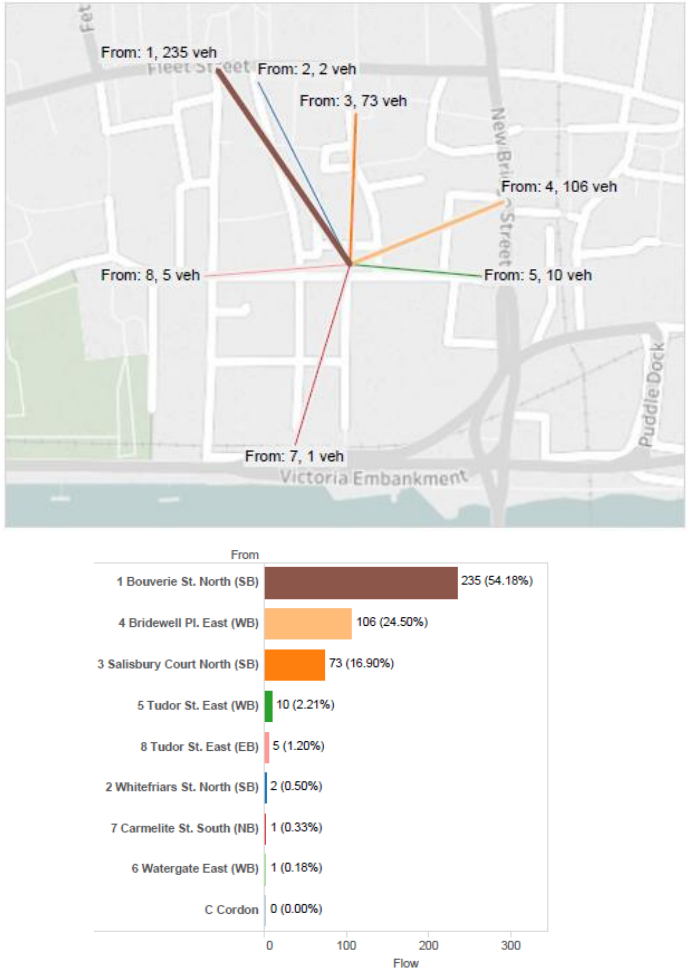


Figure 4.33: Weekend flows to Cordon from other nodes



Duration of stay

The OD data was also used to determine how long vehicles spend in the Temple Area and this allows us to infer the likely trip purpose. Given the size of the cordon area, time spent in the area has been classified into three groups based on the time taken to pass between two nodes:

- **Through Traffic** – Vehicles spending less than 5 minutes in the area are likely to be through traffic, most of which will run straight through but other vehicles may pause to drop-off and / or pick-up (briefly), including taxis,
- **Servicing / loading** – Vehicles spending between 5 and 45 minutes in the area are likely to be servicing or loading, i.e. freight vehicles making deliveries but it may include drop-off and / or pick-up activity that is not instantaneous, and
- **Parking** – Vehicles spending more than 45 minutes in the area are likely to be parked.

It should be noted that as Middle Temple Lane was closed at the time of the surveys, vehicles exiting the cordon via node 8 (Tudor Street/King's Bench Walk) are treated as leaving the area, although they might be parking in the area and as such remaining inside the cordon. Traffic to/from Middle Temple Lane is discussed in more detail in the next section.

To aid understanding, Figure 4.34 and Figure 4.35 show the percentage of vehicles on an average week and weekend day respectively by access requirement category:

- Through traffic (<5 minutes),
- Servicing / loading (5-45 minutes), and
- Parking (>45 minutes)

This split between categories can also be seen in Figure 4.2, where the journey time bands have been displayed. Three peaks can be seen in this graph: One at the start (less than 5 minutes), the second around 10 minutes, and a third after 3 hours.

The pie charts show that more vehicles spend less than 5 minutes in the area than those that do not. From this we infer that on an average weekday 70% of vehicles should be classified as through-traffic, and 76% on an average weekend.

The data also shows that on an average weekday approximately 21% of traffic accessing the study area takes between 5 and 45 minutes to pass through two nodes and is therefore considered to be servicing / loading traffic. This drops to 12% on an average weekend day.

9% of the vehicles in the area are classified as 'parking' vehicles on an average weekday, compared to 12% on an average weekend day.

Figure 4.36 shows that on an average weekday, 54% of the 'servicing / loading' vehicles are goods vehicles (LGVs, MGVs and HGVs), but a significant proportion (42%) are smaller vehicles including cars and taxis which are probably dropping off and/or picking up passengers in the area.

Freight vehicles spend an average of 24 minutes in the area. From the classification of the duration of stay, 21% is classified as through traffic (see Figure 4.37) suggesting a rather large number of freight vehicles use the Temple area as a through route, rather than servicing local businesses.

Figure 4.34: Type of traffic category (weekday)

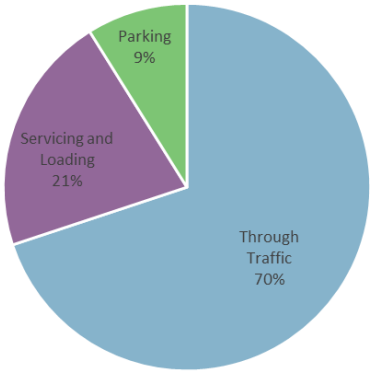


Figure 4.35: Type of traffic category (weekend)

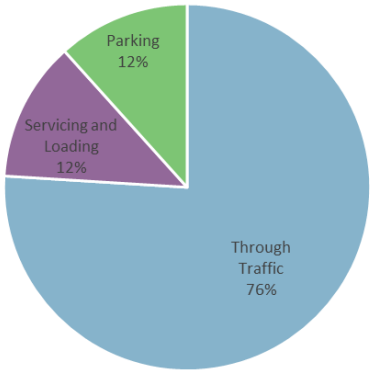


Figure 4.36: Vehicles servicing and loading (weekday)

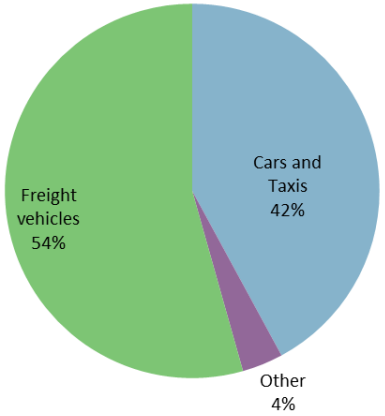
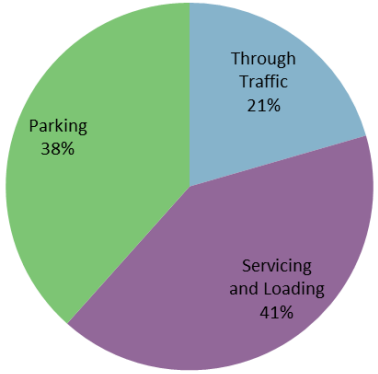


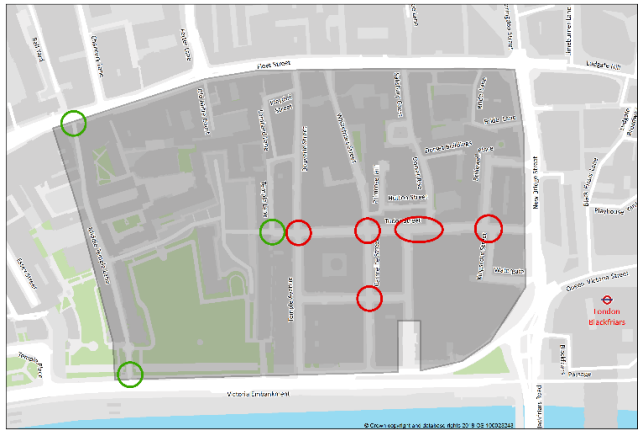
Figure 4.37: Traffic category for freight vehicles



Middle Temple Lane

MCC and OD survey data was captured on Middle Temple Lane. However, during the site visit it was noted that the gate from Middle Temple Lane to Victoria Embankment was closed for the duration of the survey period due to works to the gates. Therefore, following discussion with the client team, it was agreed that additional surveys for Middle Temple Lane would be undertaken between Wednesday 28 and Friday 30 March.

Figure 4.38: MCC locations



The survey locations coinciding with the access/exit points to Middle Temple Lane are shown in green in Figure 4.38. The MCC survey on Middle Temple Lane/Fleet Street was undertaken Tuesday 9 - Monday 15 January. The other two locations (Middle Temple Lane/Victoria Embankment and King's Bench Walk/Tudor Street) where undertaken over a continuous (24-hour) three-day period between Wednesday 28 - Friday 30 March. The Friday results have been excluded from the analysis as this was the Good Friday bank holiday and results would fail to provide an average representative day.

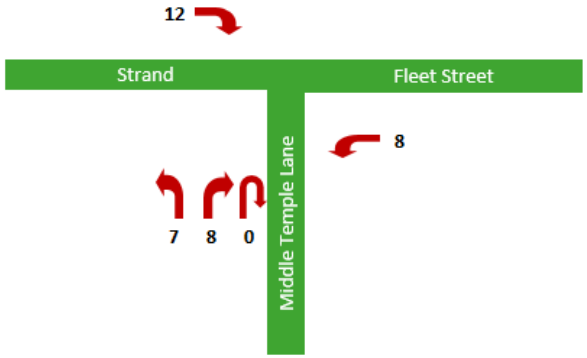
Middle Temple Lane/Fleet Street

Middle Temple Lane can be accessed from the north via Fleet Street and when looking at the MCC data recorded for this location, it became clear that cyclists alone were recorded turning into and out of Middle Temple Lane and onto Strand / Fleet Street. The surveys also showed that this only occurred only during the working week.

As shown in Figure 4.39, for the average weekday, 12 cyclists turned into Middle Temple Lane from Strand, 8 from Fleet Street, while 15 turned out onto Strand/Fleet Street from Middle Temple Lane.

Based on the MCC surveys, no other vehicles were recorded turning at this junction during the 7-day period, apart from only one motorcycle. In total, 181 cyclists turned in and out of the junction during the week the surveys were undertaken, all of which were recorded on weekdays.

Figure 4.39: Weekday Average – Cyclists / day



Movement through Middle Temple Lane

Traffic Accessing the Area

As shown in Figure 4.39, the junction of Middle Temple Lane with Fleet Street / Strand is only used by cyclists to enter the area. Therefore, Middle Temple Lane can only be accessed through Tudor Street and King's Bench Walk by motorised vehicles. As such, the analysis of traffic flows exiting the cordon through node 8 is summarised in Figure 4.28 and Figure 4.29 and shows that the average weekday and weekend traffic flows into King's Bench Walk and Middle Temple Lane.

As MCC surveys only were used to capture traffic into/out of Middle Temple Lane, rather than re-running the OD, no insight can be gained regarding the duration of stay in this area.

Traffic Exiting the Area

To determine how traffic exits the area on a normal day (i.e. when the gates to Victoria Embankment are open), MCC survey data was analysed to determine how much traffic exits the Middle Temple Lane/King's Bench Walk area. As discussed, traffic can exit the area at two points: through the exit at Middle Temple Lane/Victoria Embankment, and through King's Bench Walk/Tudor Street.

As traffic was unable to exit via Victoria Embankment during the original survey period, the nodal analysis as presented in Figure 4.26 and Figure 4.27 may give an unrepresentative and incomplete picture. As traffic exiting through Tudor Street has several options to exit the Temple Area (through a range of different nodes), it is unclear how traffic from node 8 would travel through the Temple Area on a normal day as this depends on the desired routes that were unavailable due to the Victoria Embankment gate closure. As such, we cannot draw robust conclusions on how traffic from Tudor Street (west), node 8, would travel through the area on a normal day.

However, we can find out how much traffic would usually exit through Tudor Street, and how much traffic would use Victoria Embankment.

Figure 4.40 and Figure 4.41 show the number of vehicles exiting at the two locations on Wednesday 28 March and Thursday 29 March respectively. As shown, the number of vehicles exiting onto Victoria Embankment is relatively low when compared to the number of vehicles exiting onto Tudor Street.

For the ease of understanding. Figure 4.42 and Figure 4.43 show the same data, but split into shares of total traffic per hour. Similar patterns can be observed for both days, with a peak in vehicles exiting onto Victoria Embankment between 08:00 and 11:00.

Figure 4.44 shows how the different vehicles classes are split between the two exits. As shown, most of traffic uses Tudor Street, and Victoria Embankment is only used by Cars, LGVs and very few motorcycles and cycles. Only two OGVs used the Tudor Street exit on Wednesday and Thursday. One OGV was observed to use the Victoria Embankment exit during the survey period.

Conclusions

The analysis suggests that as the route out onto Victoria Embankment appears to be used infrequently, as a result the impact of its closure during the original survey period was likely to be limited.

Figure 4.40: Total number of vehicles per exit, Wednesday 28 March

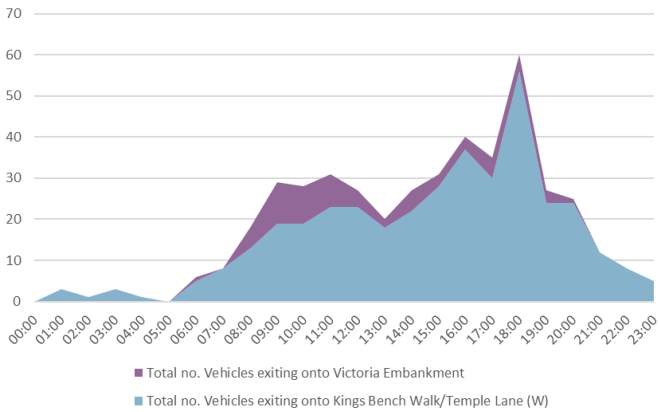


Figure 4.41: Total number of vehicles per exit, Thursday 29 March

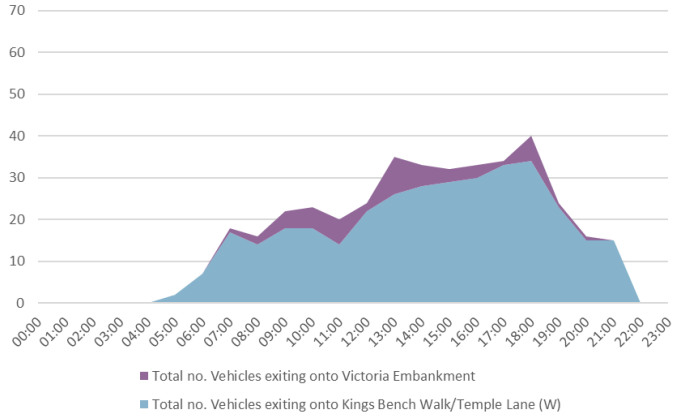


Figure 4.42: Percentage of vehicles per exit, Wednesday 28 March

Figure 4.43: Percentage of vehicles per exit, Thursday 29 March

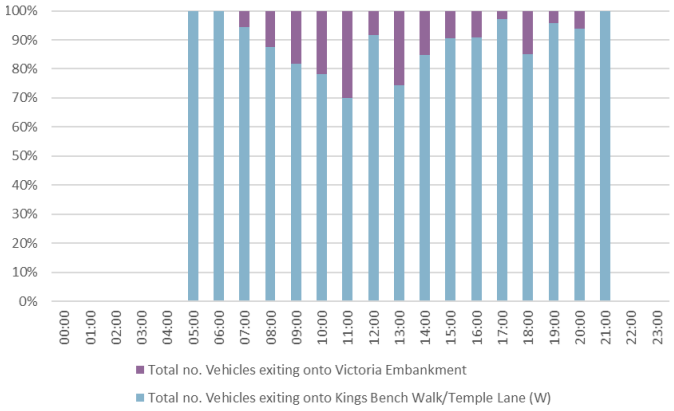
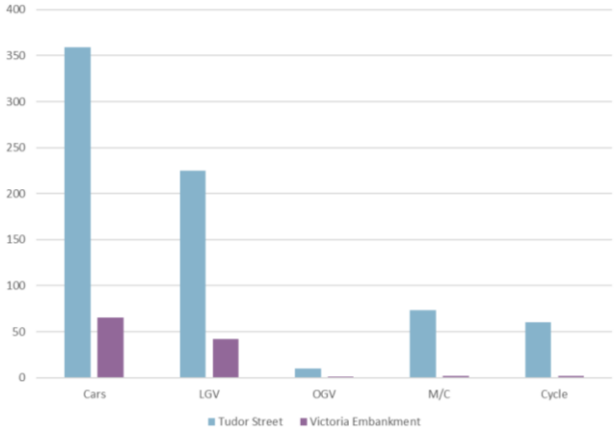


Figure 4.44: Total number of vehicles per user class per exit (2-day total)



Turning count analysis

This section provides an overview of the overall patterns of movements within the study area for the MCC locations depicted in Figure 4.45 in red.

The peak hours identified from the survey data are as follows:

Weekday

- AM Peak: 8:30-9:30
- PM Peak: 17:30-18:30

Weekend

- Peak: 13:15-14:15

Figure 4.46, Figure 4.47 and Figure 4.48 show AM, PM and weekend peak vehicle movements based on the manual classified turning counts.

Movements show a tidal pattern in the AM and PM peaks, with prevailing westbound movements along Tudor Street in the AM peak and eastbound movements in the PM peak.

Overall, flows in the area are slightly higher in the AM than in the PM peak. The weekend peak flow is approximately a quarter of that recorded in the weekday peak and the predominant movement is eastbound and no turning movements exceeded 50 vehicles per hour.

The busiest junction within the study area is the Tudor Street junction with Temple Avenue followed by the Carmelite Street / Tudor Street junction.

Figure 4.45: MCC locations

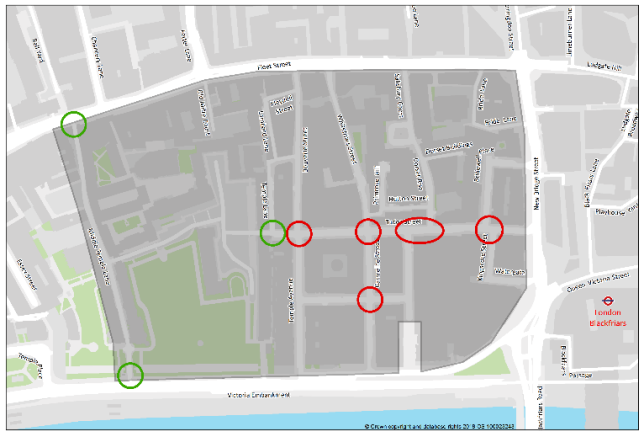


Figure 4.46: AM Peak turning movements (total number of vehicles per hour)

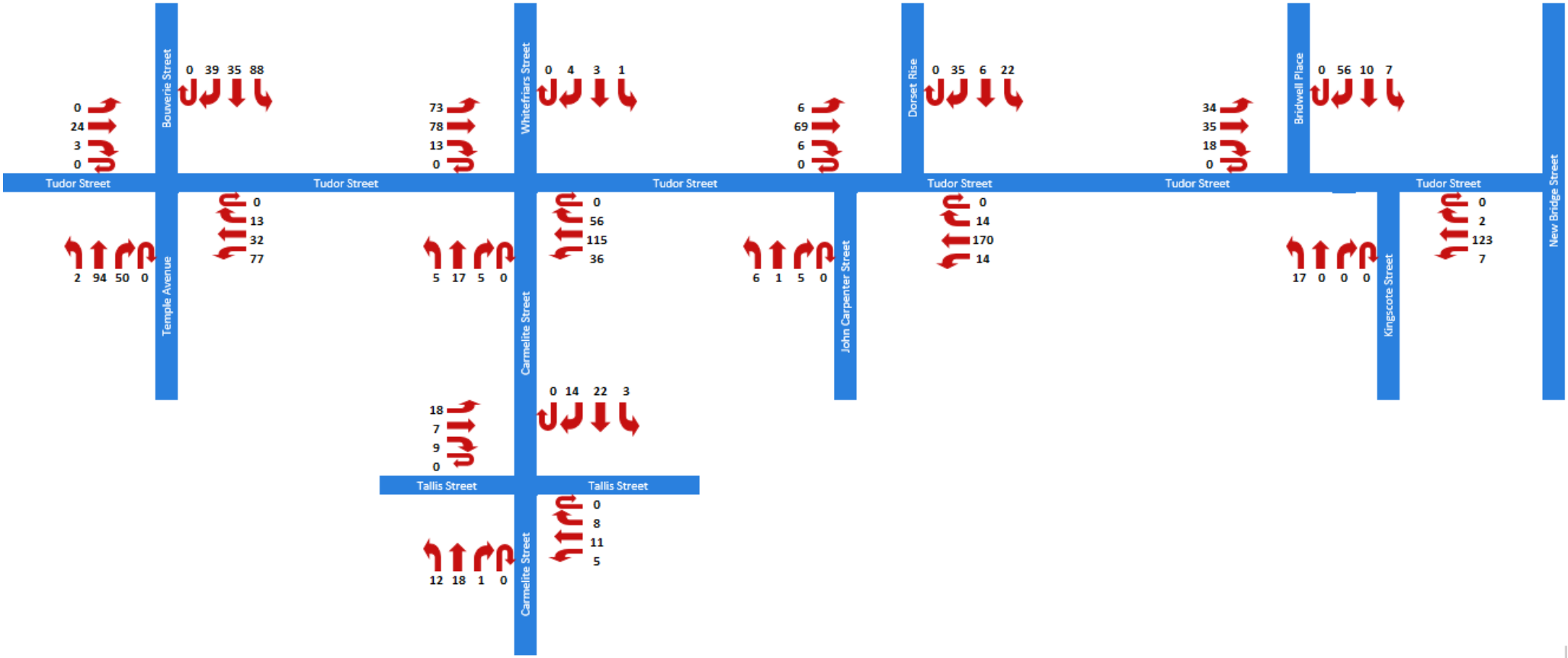


Figure 4.47: PM Peak turning movements (total number of vehicles per hour)

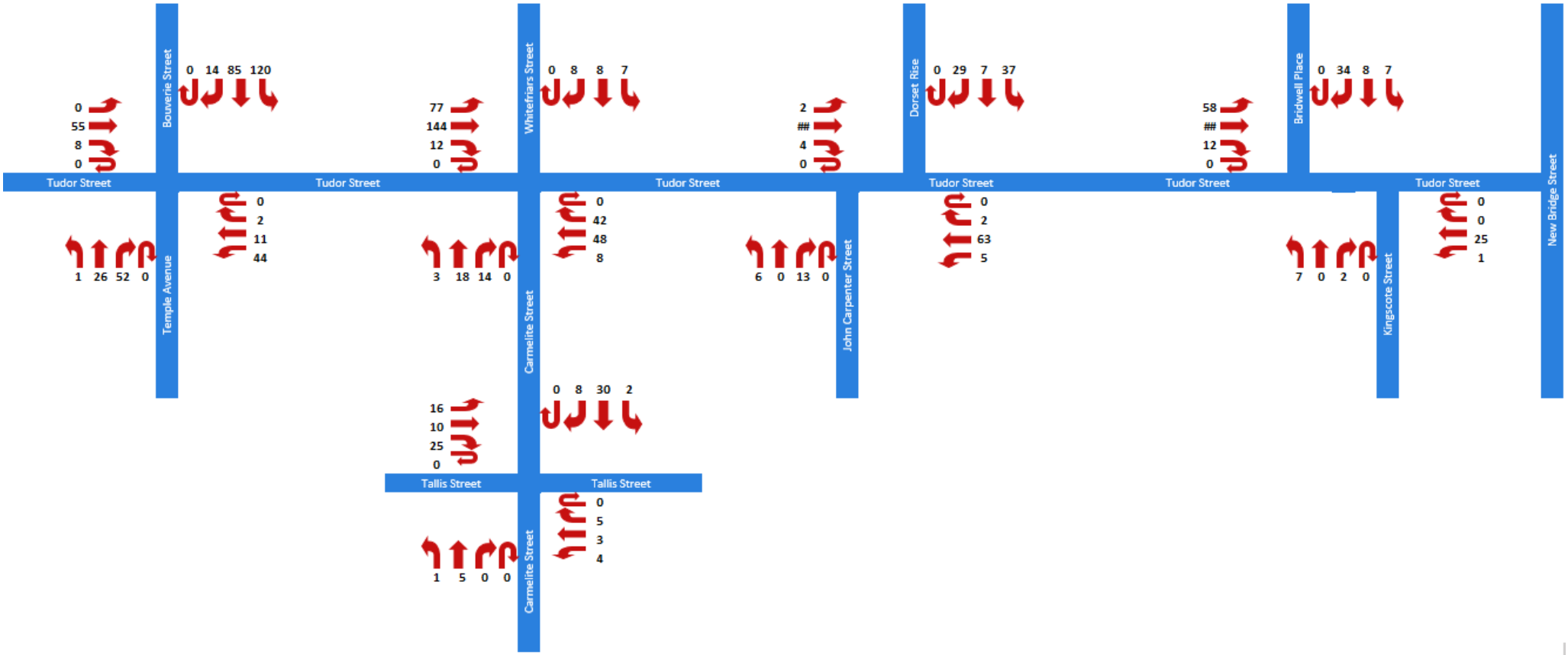
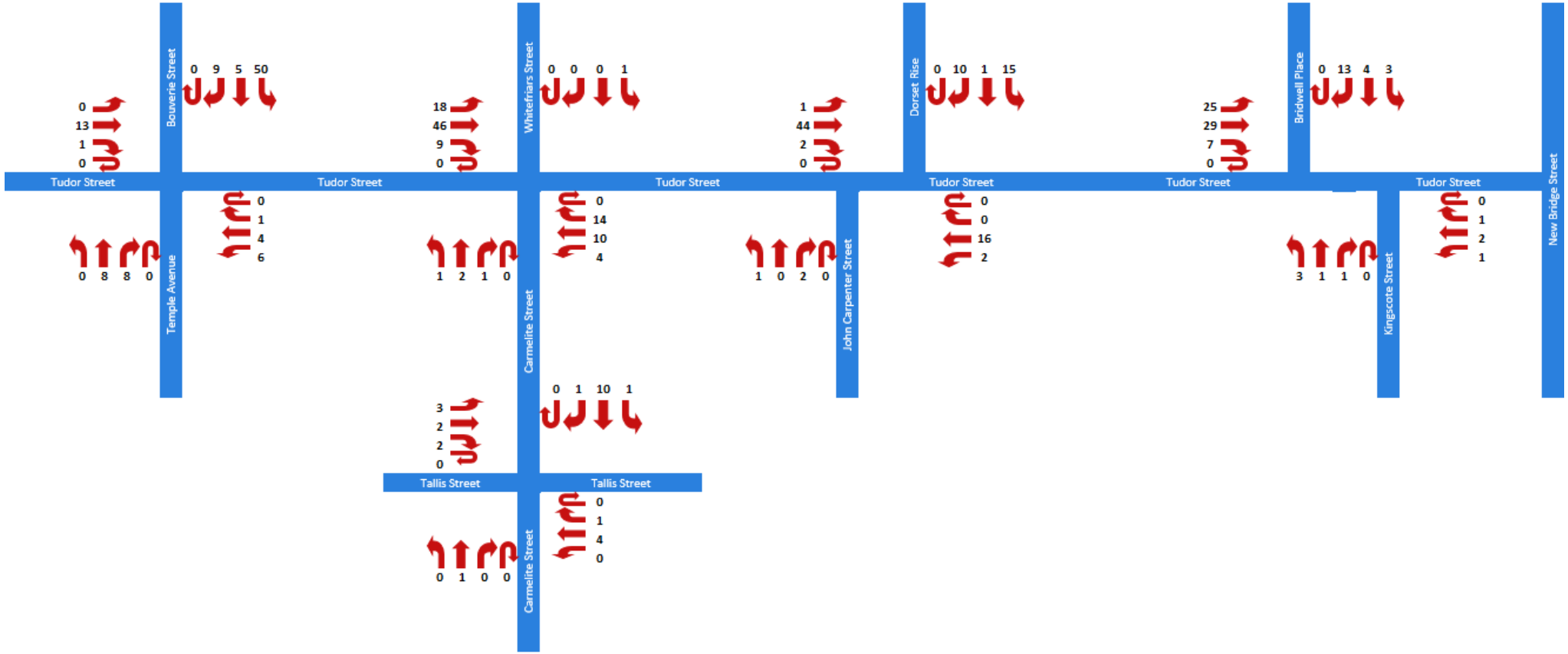


Figure 4.48: Weekend Peak turning movements (total number of vehicles per hour)



Conclusion

This chapter presented and discussed the outcomes of the OD surveys and MCC surveys, and gives insight into how traffic moves within the study area.

OD Analysis

Bouverie Street is the main entry point for movements through the area, while Whitefriars Street is the main exit point.

- 51% of all movements into the area enter through Bouverie Street
- 44% of movements out of the area exit via Whitefriars Street

OD analysis has shown that the dominant movements of traffic flow from Bouverie Street to Whitefriars Street, both for through traffic (traffic that stays in the area less than 5 minutes) as well as for cordon traffic (traffic that remains in the area for over 5 minutes).

- 20% of all traffic entering and exiting the area does so through by entering via Bouverie Street and exiting via Whitefriars Street

Although Tudor Street east is exit-only (into New Bridge Road,) there are still many vehicles entering the area at this point

- On the average weekday, around 50 vehicles make the illegal movement of entering Tudor Street from New Bridge Road.

Duration of Stay

Movements through the Temple Area have been classified into three categories: through traffic (<5 minutes in the area), servicing/loading (5 minutes – 45 minutes) and parking (>45 minutes).

- 70% of vehicles on the average weekday could be classified at through traffic and spend less than 5 minutes in the area
- 21% of traffic is servicing and loading traffic. This category consists of goods vehicles (54%) and cars and taxies (42%)
- Freight vehicles spend an average of 24 minutes in the area

Middle Temple Lane

Analysis of Middle Temple Lane surveys suggests that as the route out onto Victoria Embankment appears to be relatively little used, the impact of its closure during the original survey period was likely to be limited.

- Middle Temple Lane – Fleet Street is only used by cyclists as an exit/entry point
- Traffic exiting Middle Temple Lane predominantly uses Tudor Street while the Victoria Embankment exit is only used by a small percentage of traffic

Turning Flow Analysis

Movements through the area show a tidal pattern in the AM and PM peaks. Movements centralise around the Tudor Street/Temple Avenue/Bouverie Street junction and Carmelite Street/Tudor Street/Whitefriars Street junction. This is in line with the conclusions from the OD analysis

- Movements show a tidal pattern, with westbound AM peaks and eastbound PM peaks on Tudor Street.
- Confirming the OD analysis, the busiest junctions in the area are Bouverie Street / Tudor Street and Whitefriars Street / Tudor Street.

5 Link Flow Analysis

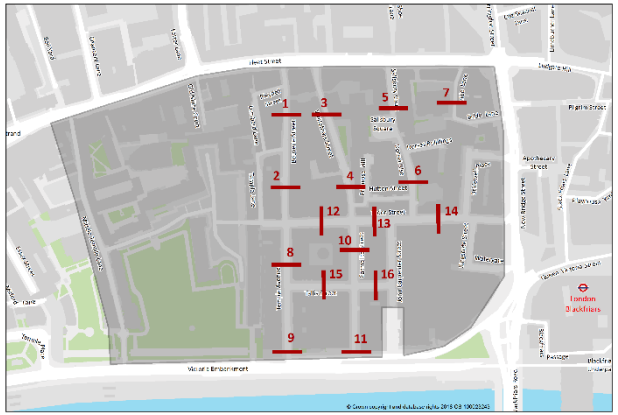
A series of site visits and a subsequent desktop analysis have been undertaken to gain an understanding of how vehicular traffic and cyclists behave within the Temple Area. This section discusses the general movements of traffic in the area on the different streets.

Automated traffic count (ATC) data has been collected and analysed for sixteen locations in the Temple Area. For each location, figures have been produced illustrating the flow profile for both the average weekday and weekend day. Charts have also been produced to show the mode split for AM and PM peak hour flows.

The following locations have been analysed:

1. Bouverie Street (north)
2. Bouverie Street (south)
3. Whitefriars Street (north)
4. Whitefriars Street (south)
5. Salisbury Court
6. Dorset Rise
7. Bride Lane
8. Temple Avenue (north)
9. Temple Avenue (south)
10. Carmelite Street (north)
11. Carmelite Street (south)
12. Tudor Street (west)
13. Tudor Street
14. Tudor Street (east)
15. Tallis Street (west)
16. Tallis Street (east)

Figure 5.1: ATC locations



Link Flows in the Temple Area

The different ATC locations have been analysed, and results have been mapped to produce link-based output that show how different vehicle classes travel through the area. The following user classes have been mapped and are shown on the following pages:

- Total traffic
- Cars and Light Goods Vehicles (LGV)
- Goods Vehicles
- Cyclists

Total traffic flows

In terms of vehicle totals, Figure 5.2 shows Bouverie Street and Tudor Street are the busiest streets in the study area with similar levels of daily traffic ranging between 2,600-2,900 vehicles. Whitefriars is the third busiest street with around 2,000-2,100 vehicles per day and Temple Avenue the comes fourth, with 1,300-1,600 vehicles, comprising mainly of cyclists.

Cars and LGVs

Figure 5.3 shows Tudor Street as the main east-west corridor in the Temple area for cars & LGVs with two-way average flows in the range of 1,800-2,100 vehicles per day. The western section of Tudor Street seems to be busier than the eastern one due to the high number of vehicles turning left from Tudor Street into Whitefriars Street. It can also be seen that the left turn from Bouverie Street into Tudor Street is a critical turning movement.

The main corridor for southbound traffic (cars & LGVs) in the study area is Bouverie Street with average daily flows in the range of 1,900-2,000 vehicles. Salisbury Court and Dorset Rise are less popular as a southbound route, with less than half the number of cars & LGVs that use Bouverie Street.

For northbound traffic, the figure shows that Whitefriars Street is the main route for northbound cars & LGVs with around 1,500 vehicles per day.

The number of cars & LGVs using the streets in the southern part of the study area is relatively low due to the traffic restrictions into and out of the area.

Goods Vehicles

Figure 5.4 shows the average daily flow of Goods Vehicles in the study area. As shown, the main Good Vehicles movements are similar to those of cars & LGVs with Bouverie Street, Whitefriars Street and Tudor Street being the most used.

Whitefriars Street and Bouverie Street see a similar number of Goods Vehicles, in the range of 110-150 per day.

In contrast with cars & LGVs, the eastern part of Tudor Street is used more by Goods Vehicles when compared to the western one, indicating that the left turn from Dorset Rise into Tudor Street is a popular turning movement for Goods Vehicles.

Pedal Cyclists

The figures show an interesting pattern where cyclists divert through the area, coming off the east-west cycle superhighway into Temple Avenue and entering the superhighway again from Tudor Street.

As seen in Figure 5.5, there is a high volume of cyclists using Temple Avenue with about 800 cyclists per day. Bouverie Street and Tudor Street also see high cycle flows and in the range of 400-500 per day. Whitefriars Street is less well-used by cyclists, with 180-210 cyclists per day, both ways.

Finally, the southbound movement along Carmelite Street and then left into the cycle superhighway seems to be a key movement for cyclists, with flows in the range of 180 cyclists per day.

Figure 5.2: Link Flows – Total Traffic (weekday)

Figure 5.3: Link Flows – Cars and LGVs (weekday)

Figure 5.4: Link Flows – Goods Vehicles (weekday)

Figure 5.5: Link Flows – Cyclists (weekday)

Flow Profiles and Mode Splits

The following pages present the ATC analysis per surveyed link. Figure 5.6 summarises the vehicles classes that were recorded in the ATC surveys.

Figure 5.6: ATC Vehicle Classifications

Axles	Groups	Description	Class		Parameters	Dominant Vehicle	Aggregate
2	1 or 2	Very Short - Bicycle or Motorcycle	MC	1	d(1)<1.7m & axles=2		
2	1 or 2	Short - Sedan, Wagon, 4WD, Utility, Light Van	SV	2	d(1)>=1.7m, d(1)<=3.2m & axles=2		
3, 4 or 5	3	Short Towing - Trailer, Caravan, Boat, etc.	SVT	3	groups=3, d(1)>=2.1m, d(1)<=3.2m, d(2)>=2.1m & axles=3,4,5		1 (Light)
2	2	Two axle truck or Bus	TB2	4	d(1)>3.2m & axles=2		
3	2	Three axle truck or Bus	TB3	5	axles=3 & groups=2		
>3	2	Four axle truck	T4	6	axles>3 & groups=2		2 (Medium)
3	3	Three axle articulated vehicle or Rigid vehicle and trailer	ART3	7	d(1)>3.2m, axles=3 & groups=3		
4	>2	Four axle articulated vehicle or Rigid vehicle and trailer	ART4	8	d(2)<2.1m or d(1)<2.1m or d(1)>3.2m axles = 4 & groups>2		
5	>2	Five axle articulated vehicle or Rigid vehicle and trailer	ART5	9	d(2)<2.1m or d(1)<2.1m or d(1)>3.2m axles=5 & groups>2		
>=6	>2	Six (or more) axle articulated vehicle or Rigid vehicle and trailer	ART6	10	axles=6 & groups>2 or axles>6 & groups=3		
>6	4	B-Double or Heavy truck and trailer	BD	11	groups=4 & axles>6		
>6	>=5	Double or triple road train or Heavy truck and two (or more) trailers	DRT	12	groups>=5 & axles>6		3 (Heavy)

MC

LGV

MGV OGV1

HGV OGV2

1. Bouverie Street (north) between Temple Lane and Pleydell Street

Figure 5.7 and Figure 5.8 show that traffic flows on weekdays are significantly higher than on the weekend. On a weekday, a pronounced peak can be seen in the morning at around 08:00, followed by a decrease in traffic over the afternoon until a second peak around 18:00.

On weekends, traffic flows build towards a lower peak around 14:00, followed by a decrease in traffic in the evening.

Both on weekdays and weekend, the traffic mix is mainly comprised of light goods vehicles (shown in orange) and cars (green), in the AM and PM hours.

However, in contrast to the weekdays, weekends morning traffic sees more than 50% of cars and 37% of light goods vehicles, with the reverse happening in the evening (60% LGV and 33% cars).

Figure 5.7: Daily traffic flows, Bouverie Street (north) – Weekday

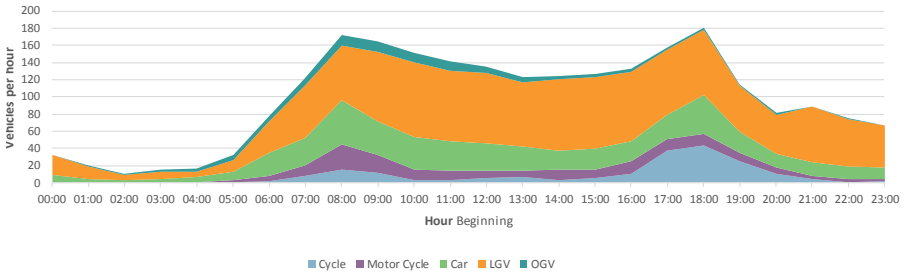


Figure 5.8: Daily traffic flows, Bouverie Street (north) – Weekend

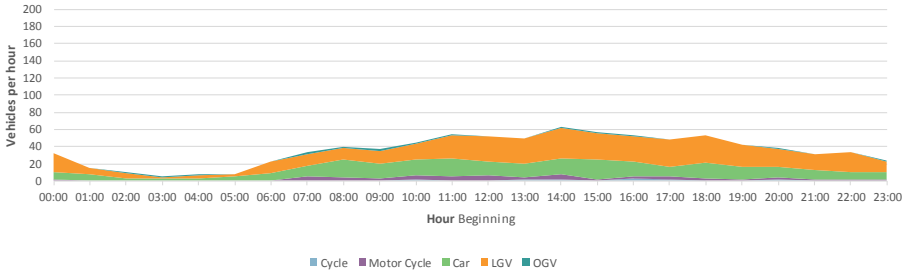


Figure 5.9: Vehicle distribution, Bouverie Street (north) – Weekday (AM)

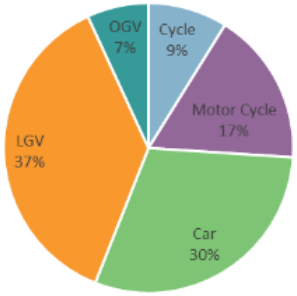


Figure 5.10: Vehicle distribution, Bouverie Street (north) – Weekday (PM)

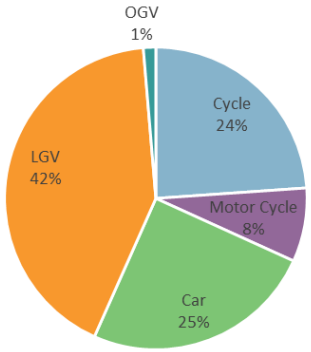


Figure 5.11: Vehicle distribution, Bouverie Street (north) – Weekend (AM)

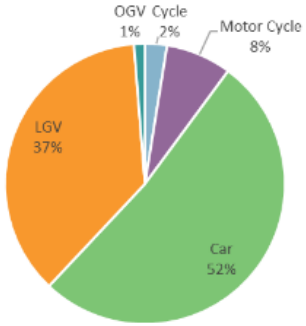
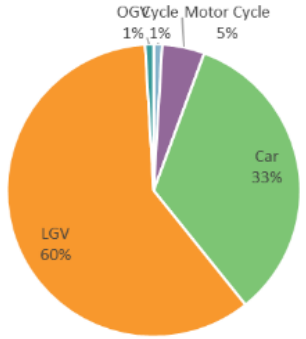


Figure 5.12: Vehicle distribution, Bouverie Street (north) – Weekend (PM)



2. Bouverie Street (south) between Tudor Street and Temple Lane

Like the northern section of Bouverie Street described above, traffic flows on weekdays are significantly higher than on weekends with peaks at around 08:00 and 18:00.

On weekends, traffic flows build towards a lower peak at around 14:00, followed by a decrease in traffic in the evening.

Figure 5.13: Daily traffic flows, Bouverie Street (south) – Weekday

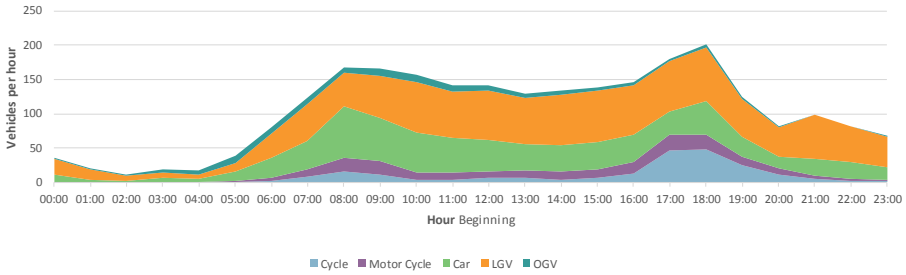
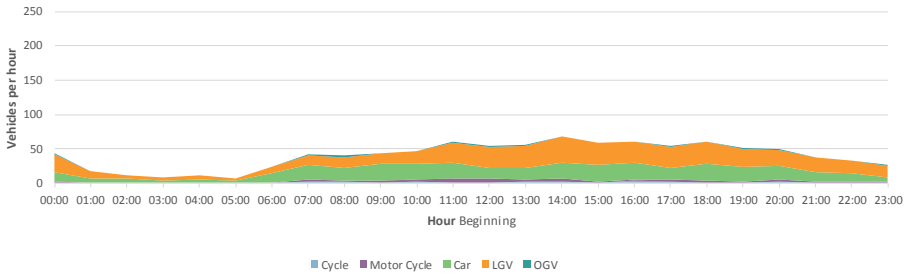


Figure 5.14: Daily traffic flows, Bouverie Street (south) – Weekend



As discussed above, both on weekdays and weekend, the traffic mix is mainly comprised of light goods vehicles (shown in orange) and cars (green), in the AM and PM hours.

Figure 5.15: Vehicle distribution, Bouverie Street (south) – Weekday (AM)

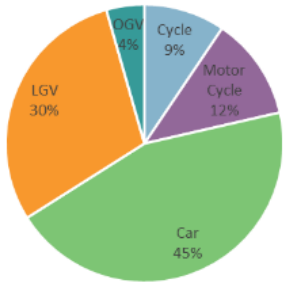
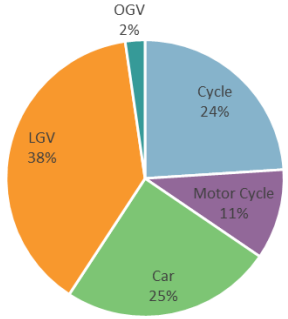


Figure 5.16: Vehicle distribution, Bouverie Street (south) – Weekday (PM)



Weekend morning traffic sees a share consisting of near 50% of cars and 37% of light goods vehicles, with the reverse happening in the evening (60% LGV and 33% cars).

Figure 5.17: Vehicle distribution, Bouverie Street (south) – Weekend (AM)

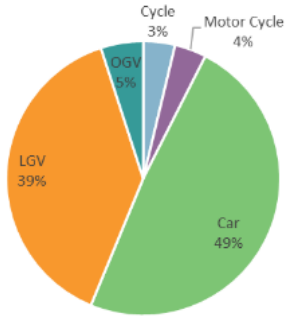
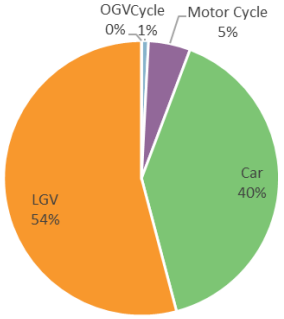


Figure 5.18: Vehicle distribution, Bouverie Street (south) – Weekend (PM)



3. Whitefriars Street (north) between Ashentree Court and Fleet Street

Traffic flows on weekdays are more than double those on weekends. On weekdays, in the early hours of the morning, traffic flows are low; flows start increasing after 04:00 to then reach a peak at 10:00. The second peak of the day can be seen at 18:00, followed by a decrease in traffic during the evening.

On weekends, traffic flows build towards a significantly lower peak around 15:00, followed by a decrease in traffic over the course of the evening.

On weekdays the traffic mix comprises of light goods vehicles (around 50%), cars (around 20%), cyclists, motorcycles and ordinary goods vehicles, in the AM and PM hours.

In contrast, on weekends the morning and evening traffic mainly sees light goods vehicles and cars.

Figure 5.19: Daily Traffic flows, Whitefriars Street (north) – Weekday

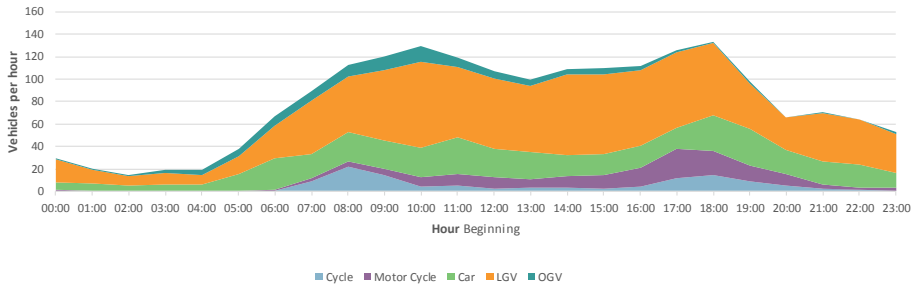


Figure 5.20: Daily Traffic flows, Whitefriars Street (north) – Weekend

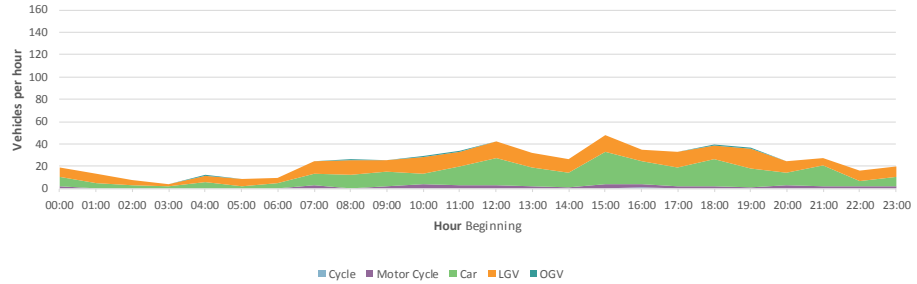


Figure 5.21: Vehicle distribution, Whitefriars Street (north) – Weekday (AM)

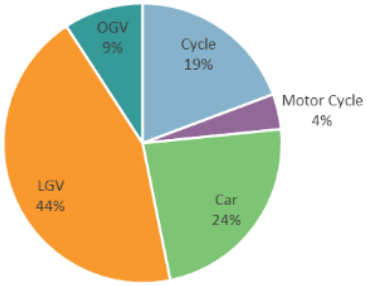


Figure 5.22: Vehicle distribution, Whitefriars Street (north) – Weekday (PM)

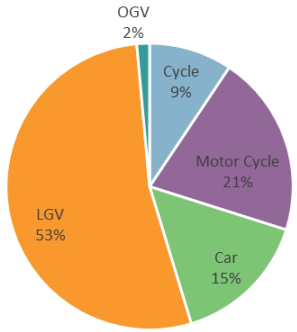


Figure 5.23: Vehicle distribution, Whitefriars Street (north) – Weekend (AM)

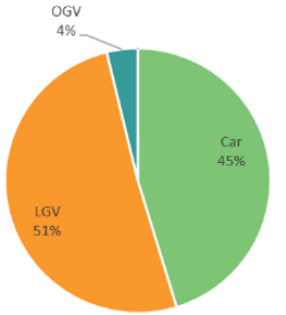
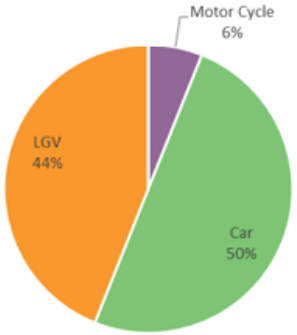


Figure 5.24: Vehicle distribution, Whitefriars Street (north) – Weekend (PM)



4. Whitefriars Street (south) between Primrose Hill and Ashentree Court

As with the section of Whitefriars Street between Ashentree Court and Fleet Street, traffic flows on weekdays are significantly higher than the flows on the weekend. The flows start increasing from 04:00 to reach a peak at around 09:00. The second peak during the day can be seen at 18:00 and this is followed by a decrease in traffic during the evening.

On weekends, there is no major variation in flows, but they generally build towards a lower peak around 12:00, followed by a second peak at 15:00.

During the week, the traffic mix is mainly comprised of light goods vehicles (in orange), with a significant component of cyclists in the AM hours (26%), which then reduced in the PM hours (8%).

On weekends the morning and evening traffic mainly sees light goods vehicles and cars.

Figure 5.25: Daily Traffic flows, Whitefriars Street (south) – Weekday

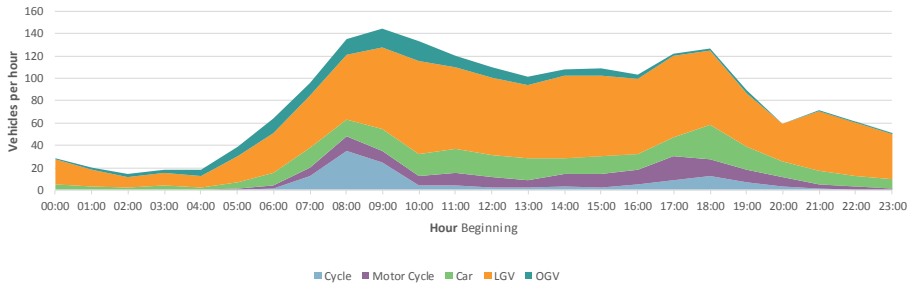


Figure 5.26: Daily Traffic flows, Whitefriars Street (south) – Weekend

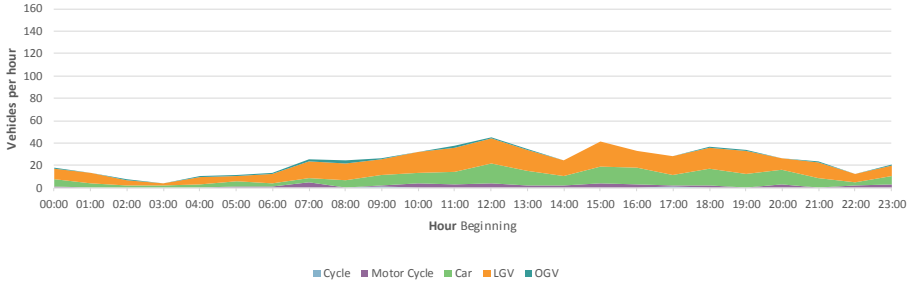


Figure 5.27: Vehicle distribution, Whitefriars Street (south) – Weekday (AM)

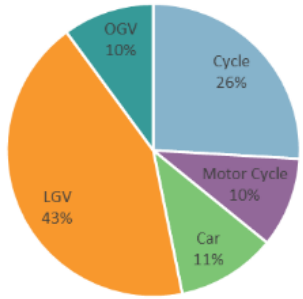


Figure 5.28: Vehicle distribution, Whitefriars Street (south) – Weekday (PM)

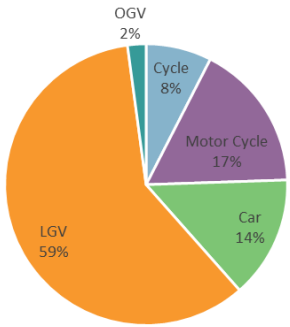


Figure 5.29: Vehicle distribution, Whitefriars Street (south) – Weekend (AM)

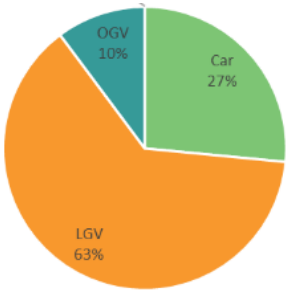
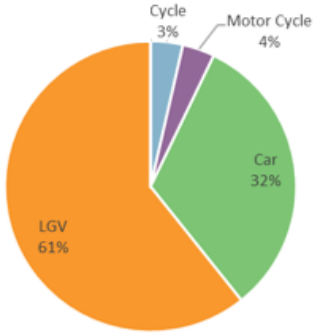


Figure 5.30: Vehicle distribution, Whitefriars Street (south) – Weekend (PM)



5. Salisbury Court

Traffic flows on weekdays are more than double the flows on weekend. Multiple peaks can be seen during the day, at 08:00, 11:00, 14:00 and 17:00. Traffic movements then decrease overnight.

The same pattern can be identified on weekends, however with significantly lower traffic flows.

On weekdays, the traffic mix is varied and comprised of light goods vehicles (orange), cars (light green), cyclists, motorcycles and ordinary goods vehicles, in the AM and PM hours.

On weekends, morning traffic sees more over 50% of cars and 20% of light goods vehicles, with the reverse happening in the evening (73% LGV and 18% cars).

Figure 5.31: Daily Traffic flows, Salisbury Court – Weekday

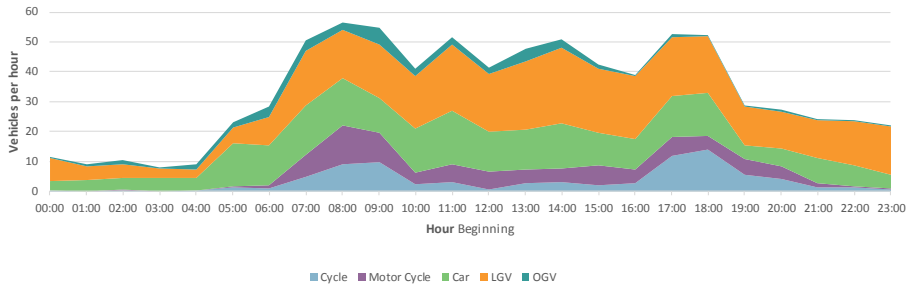


Figure 5.32: Daily Traffic flows, Salisbury Court – Weekend

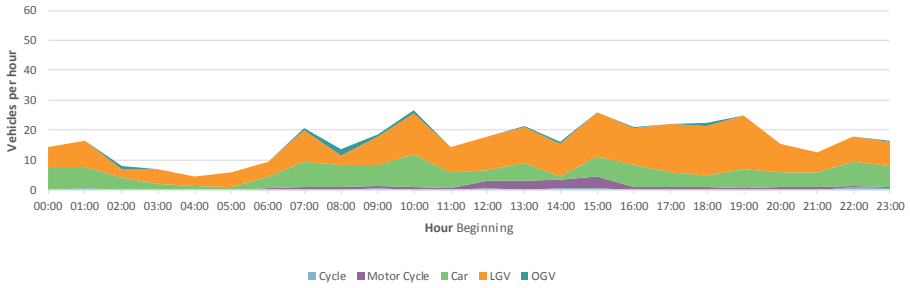


Figure 5.33: Vehicle distribution, Salisbury Court – Weekday (AM)

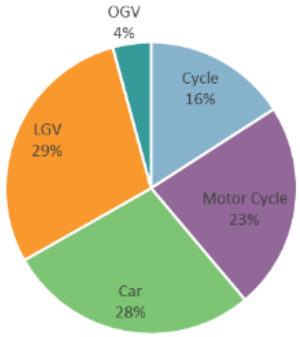


Figure 5.34: Vehicle distribution, Salisbury Court – Weekday (PM)

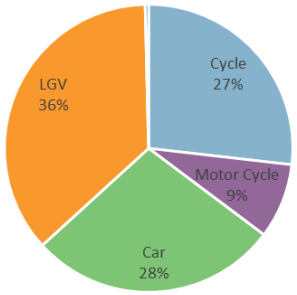


Figure 5.35: Vehicle distribution, Salisbury Court – Weekend (AM)

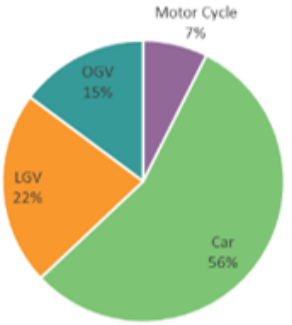
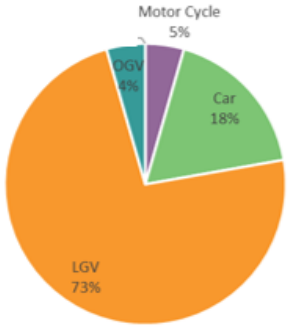


Figure 5.36: Vehicle distribution, Salisbury Court – Weekend (PM)



6. Dorset Rise

Weekday

Although Dorset Rise offers two-way flows, northbound flows are low both on weekdays and in weekend.

Traffic flows on weekdays are approximately double of flows on weekends. A pronounced peak can be seen in the morning at around 08:00, followed by a decrease in traffic over the afternoon until a second peak arises around 17:00. Traffic movements then decrease overnight again.

On weekdays, morning traffic sees more than 40% of cars and 26% of light goods vehicles. In the PM hours, the traffic mix is more equally distributed between cars, light goods vehicles, cyclists and motorcycles.

Figure 5.39: Daily Traffic flows, Dorset Rise – Weekday northbound

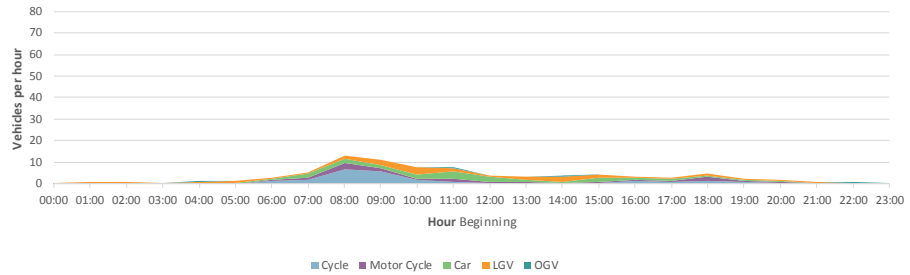


Figure 5.40: Daily Traffic flows, Dorset Rise – Weekday southbound

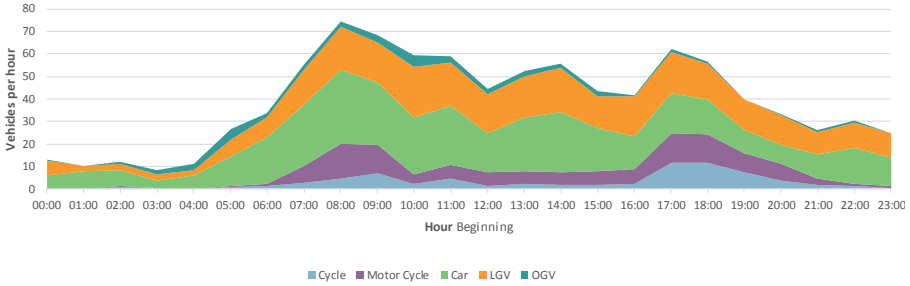


Figure 5.37: Vehicle distribution, Dorset Rise – Weekday (AM)

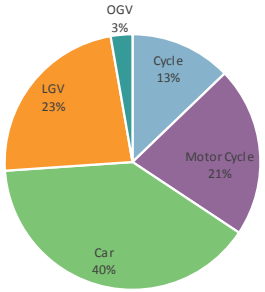
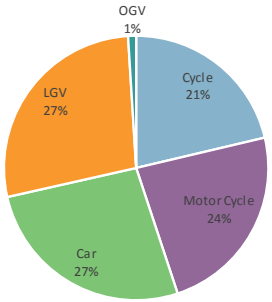


Figure 5.38: Vehicle distribution, Dorset Rise – Weekday (PM)



6. Dorset Rise

Weekend

On weekends, traffic flows are generally constant, with a lower peak around 15:00.

The traffic mix is mainly comprised of cars (shown in green) and light goods vehicles (orange), both in the AM and PM hours.

Figure 5.41: Daily Traffic flows Dorset Rise – Weekend northbound

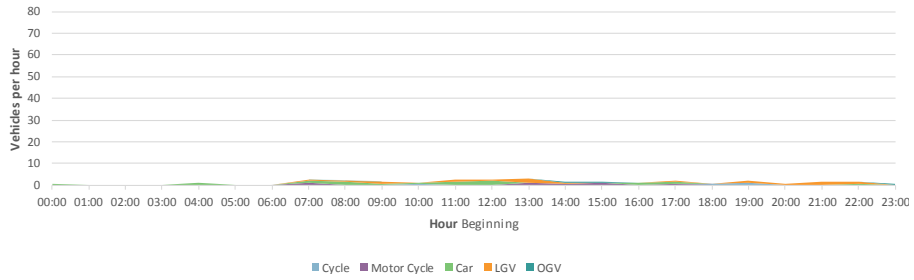


Figure 5.42: Daily Traffic flows, Dorset Rise – Weekend southbound

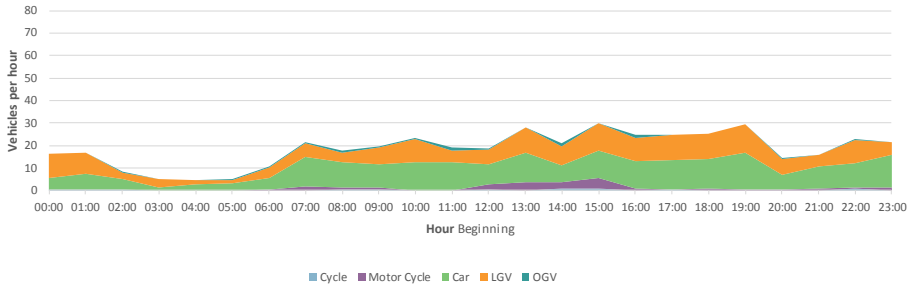


Figure 5.43: Vehicle distribution, Dorset Rise – Weekend (AM)

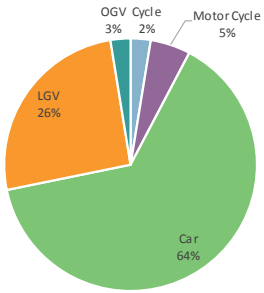
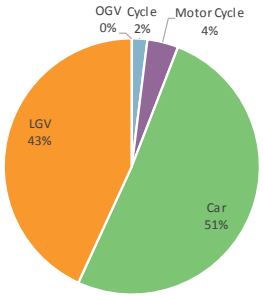


Figure 5.44: Vehicle distribution, Dorset Rise – Weekend (PM)



7. Bride Lane

Bride Lane is a narrow street on the north-eastern corner of the study area. On weekdays the traffic flows build up throughout the day to reach a peak in the afternoon (at 18:00).

In contrast, on weekends a peak can be seen in the early hours of the morning (at 01:00), followed by a second lower peak at 17:00, but flows are generally low (below 10 vehicles per hour).

Figure 5.45: Daily Traffic flows, Bride Lane – Weekday

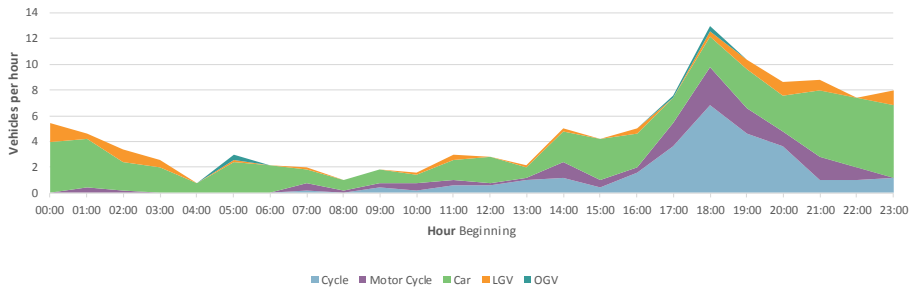
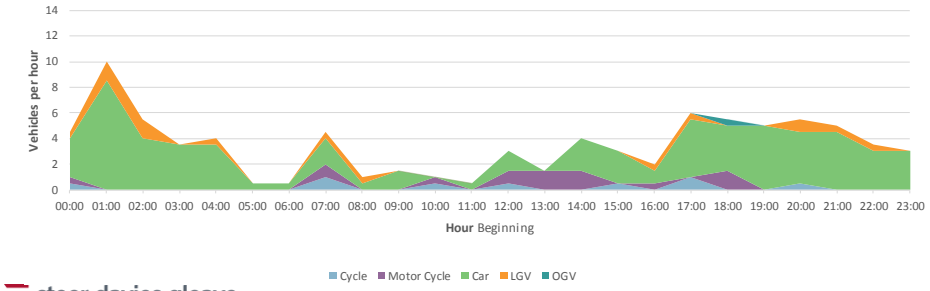


Figure 5.46: Daily Traffic flows, Bride Lane – Weekend



In the AM hours on the weekdays, cars represent the largest percentage of the traffic mix (80%). In the afternoon, this decreases to 26%, with a significant increase in the percentage of cyclists (47%), but the total flows are low.

Figure 5.47: Vehicle distribution, Bride Lane – Weekday (AM)

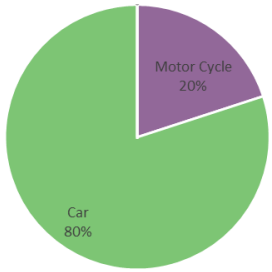
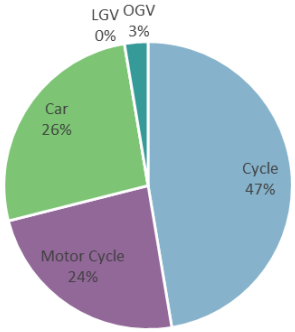


Figure 5.48: Vehicle distribution, Bride Lane – Weekday (PM)



Similarly, cars make up the largest portion of the traffic mix over the weekend, from 50% in the morning to 75% in the afternoon.

Figure 5.49: Vehicle distribution, Bride Lane – Weekend (AM)

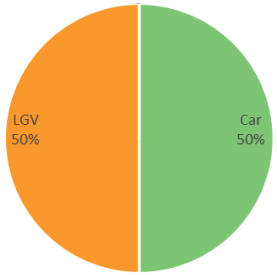
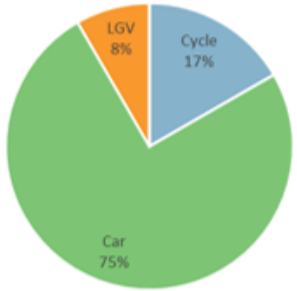


Figure 5.50: Vehicle distribution, Bride Lane – Weekend (PM)



8. Temple Avenue (north) between Tallis Street and Tudor Street

Weekday

Northbound and southbound traffic flows are similar throughout the day during weekdays. Two peaks can be identified, the first in the morning at 08:00 and second in the afternoon around 17:00. Traffic flows are significantly lower in the early and late hours of the day.

The traffic mix on weekdays is very similar in the AM and PM hours. The largest percentage is of cyclists (around 70%), with the remaining 30% split between motorcycles, cars and goods vehicles.

Figure 5.51: Daily Traffic flows, Temple Avenue (north) – Weekday northbound

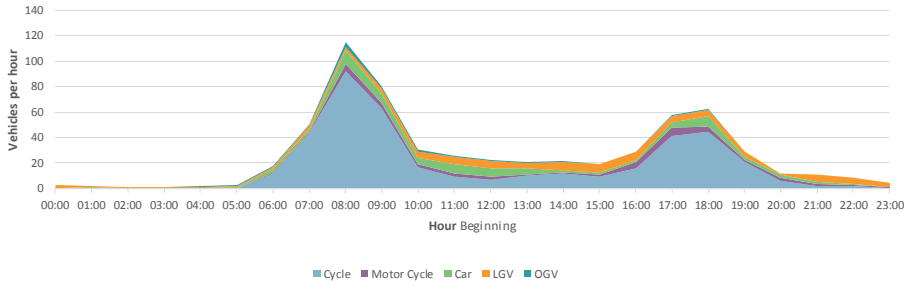


Figure 5.52: Daily Traffic flows, Temple Avenue (north) – Weekday southbound

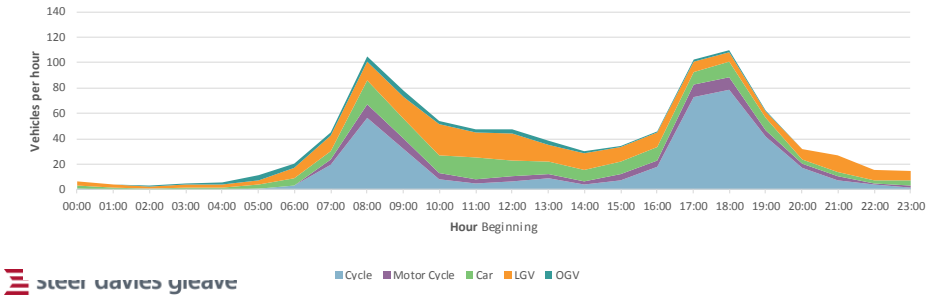


Figure 5.53: Vehicle distribution, Temple Avenue (north) – Weekday (AM)

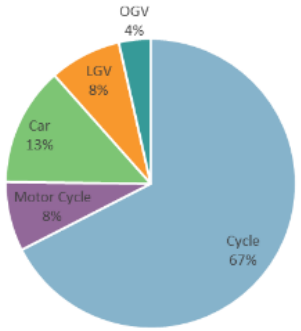
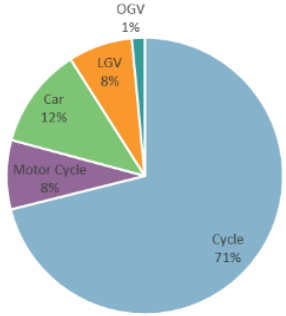


Figure 5.54: Vehicle distribution, Temple Avenue (north) – Weekday (PM)



8. Temple Avenue (north) between Tallis Street and Tudor Street

Weekend

Weekend traffic flows are significantly lower than weekday flows (i.e. peaks approximately 5 times lower than on weekday).

Northbound traffic flows build towards a peak around 11:00, followed by a general decrease in traffic in the afternoon and evening.

Figure 5.55: Daily Traffic flows, Temple Lane (north) – Weekend northbound

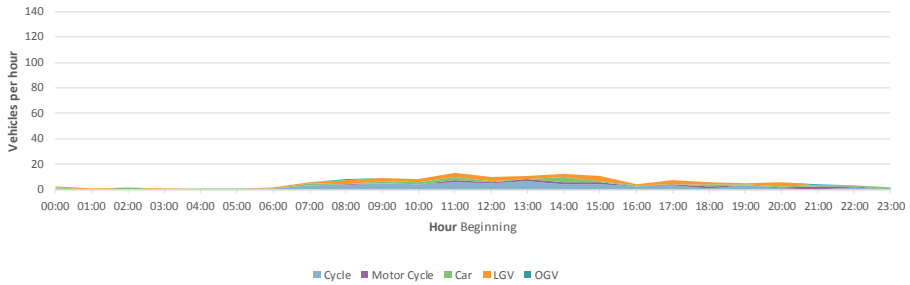
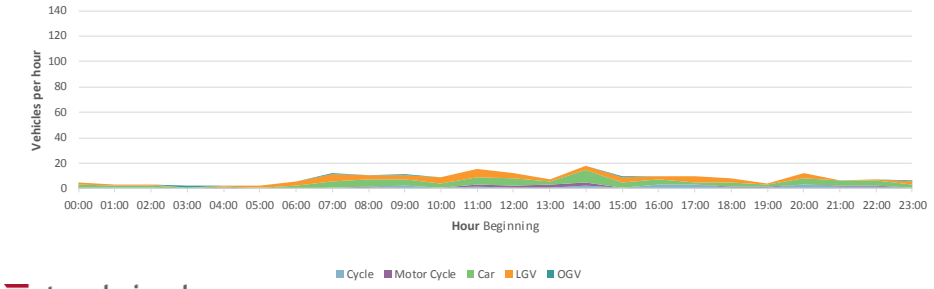


Figure 5.56: Daily Traffic flows, Temple Lane (north) – Weekend southbound



In contrast, southbound traffic flows show multiple peaks during the day, at 07:00, 11:00, 14:00 and 20:00. Traffic flows then decreases in the later hours of the evening, but traffic flows are generally low throughout the day.

The traffic mix is very similar throughout the day. The traffic is generally distributed between light goods vehicles, cars and cyclists. The percentage of motorcycles increase in the PM hours.

Figure 5.57: Vehicle distribution, Temple Lane (north) – Weekend (AM)

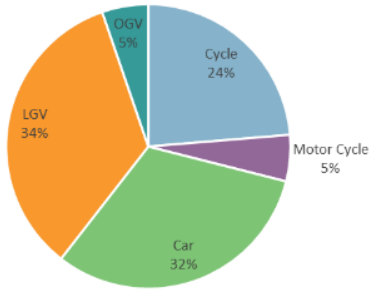
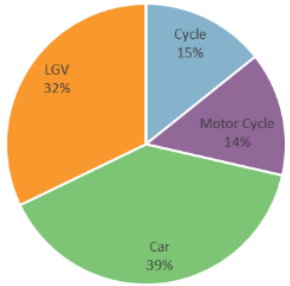


Figure 5.58: Vehicle distribution, Temple Lane (north) – Weekend (PM)



9. Temple Avenue (south) between Victoria Embankment and Tallis Street

Weekday

Northbound traffic flows are higher in the morning, with a peak at 08:00 and flows then see a decrease in the afternoon.

Conversely, southbound traffic flows are lower in the morning and increase towards the peak at 18:00. Traffic flows then decrease in the evening.

Figure 5.59: Daily Traffic flows, Temple Avenue (south) – Weekday northbound

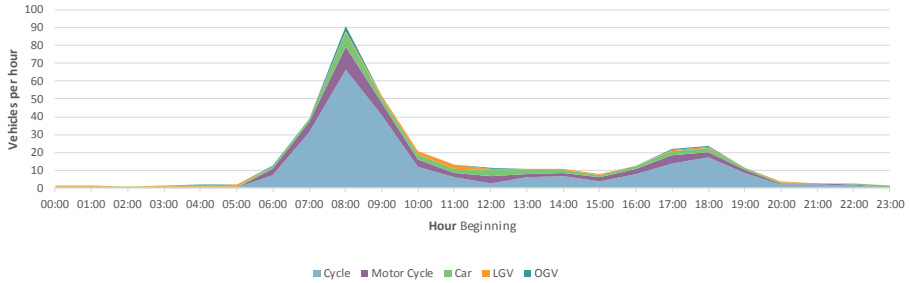
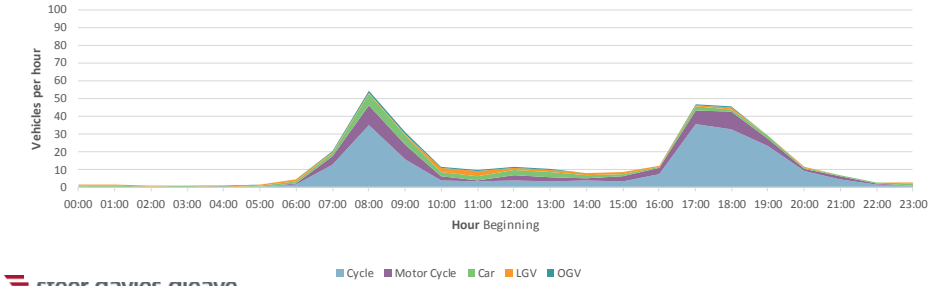


Figure 5.60: Daily Traffic flows, Temple Avenue (south) – Weekday southbound



The traffic mix on Temple Avenue between Victoria Embankment and Tallis Street is primarily of cyclists (70%), followed by motorcycles and cars, both in the AM and PM hours.

Figure 5.61: Vehicle distribution, Temple Avenue (south) – Weekday (AM)

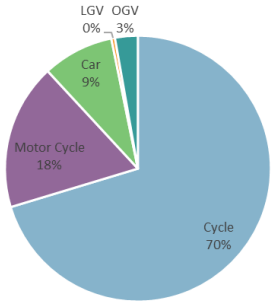
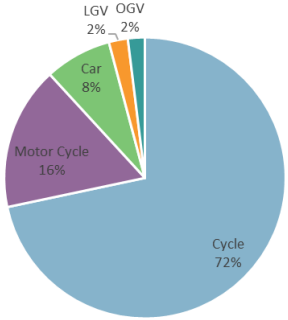


Figure 5.62: Vehicle distribution, Temple Avenue (south) – Weekday (PM)



9. Temple Avenue (south) between Victoria Embankment and Tallis Street

Weekend

Weekend traffic flows are significantly lower than weekday.

Similar traffic flows can be seen between northbound and southbound. Northbound traffic flows show multiple peaks during the day, at around 08:00, 14:00 and 22:00, but flows are very low.

Southbound traffic flows peak in the early hours of the morning, at 01:00, followed by peaks at 12:00, 17:00 and 21:00.

On weekend, the traffic mix is mainly comprised of cars (shown in green) and cyclists (orange), both in the AM and PM hours.

Figure 5.63: Daily Traffic flows, Temple Avenue (south) – Weekday northbound

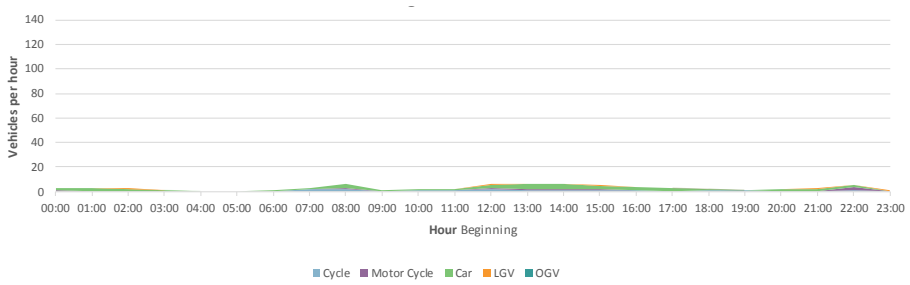


Figure 5.64: Daily Traffic flows, Temple Avenue (south) – Weekend southbound

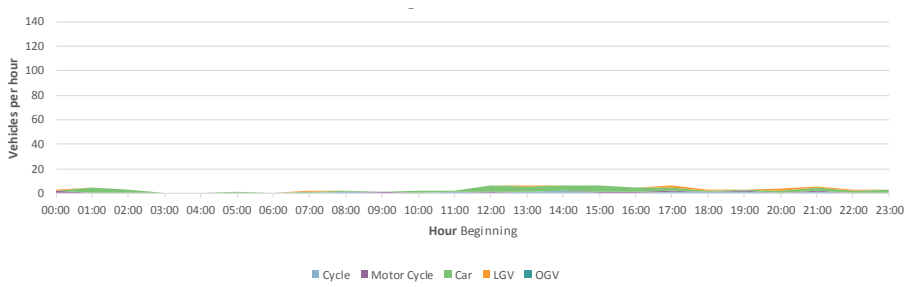


Figure 5.65: Vehicle distribution, Temple Avenue (south) – Weekend (AM)

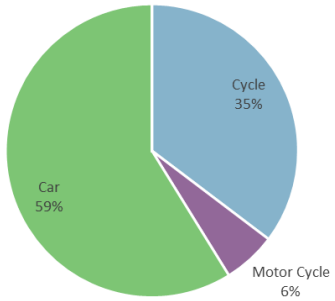
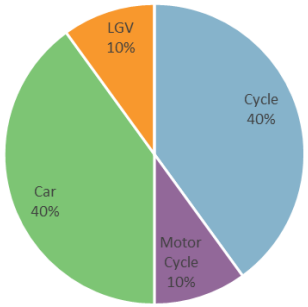


Figure 5.66: Vehicle distribution, Temple Avenue (south) – Weekend (PM)



10. Carmelite Street (north) between Tallis Street and Tudor Street

Weekday

Traffic flows on weekdays are higher than the flows on weekends. Multiple peaks can be seen during the day, at 08:00, 14:00 and 18:00. Traffic movements show a decrease overnight.

On weekdays, the traffic mix is equally distributed between cars, light goods vehicles, cyclists and motorcycles, with a high presence of cyclists.

Figure 5.67: Daily Traffic flows, Carmelite Street (north) – Weekday northbound

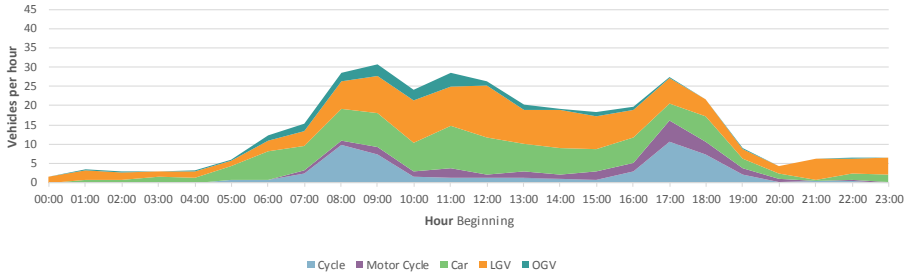


Figure 5.68: Daily Traffic flows, Carmelite Street (north) – Weekday southbound

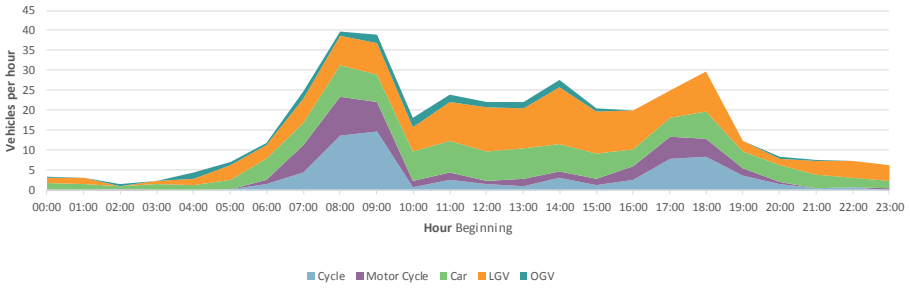


Figure 5.69: Vehicle distribution, Carmelite Street (north) – Weekday (AM)

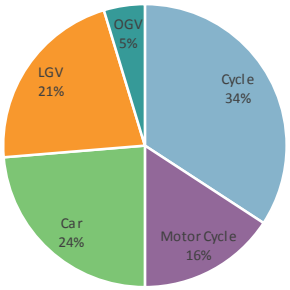
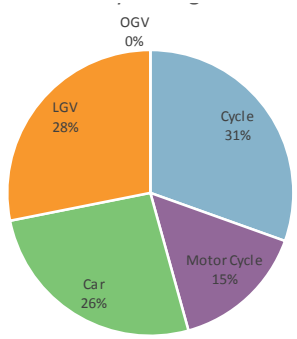


Figure 5.70: Vehicle distribution, Carmelite Street (north) – Weekday (PM)



10. Carmelite Street (north) between Tallis Street and Tudor Street

Weekend

Traffic flows on weekends peak at 07:00, 12:00 and 14:00, with values significantly lower than on weekday.

On weekend, the traffic mix is mainly comprised of cars (more than 60%), with a smaller component of light and ordinary goods vehicles, both in the AM and PM hours.

Figure 5.71: Daily Traffic flows, Carmelite Street (north)– Weekday northbound

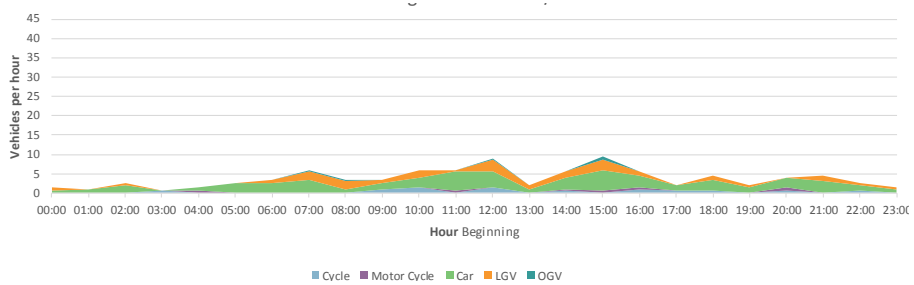


Figure 5.72: Daily Traffic flows, Carmelite Street (north)– Weekend southbound

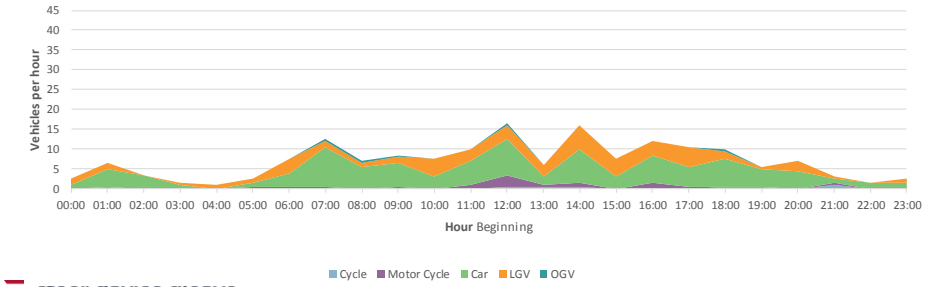


Figure 5.73: Vehicle distribution, Carmelite Street (north)– Weekend (AM)

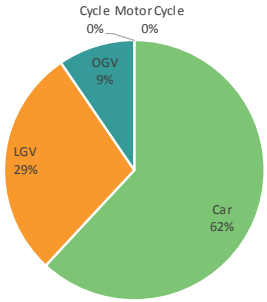
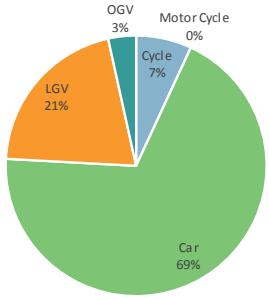


Figure 5.74: Vehicle distribution, Carmelite Street (north)– Weekend (PM)



11. Carmelite Street (south) between Victoria Embankment and Tallis Street

Traffic flows on weekday show a continuous increase in the early hours of the morning, with a first peak at 08:00. The flows are then generally constant, until a second peak is reached at 17:00. Traffic movements then decrease in the later hours of the evening.

On weekends, traffic flows build towards a lower peak around 14:00, followed by a decrease in traffic in the evening.

Morning traffic mix on weekdays is comprised of cars (44%) and cyclists (28%). In the evening, the percentage of cyclists and motorcyclists increases, with a reduction in the percentage of cars (23%).

On weekends, morning traffic sees more than 70% of cars and 27% of cyclists, with a decrease in the evening (45% cars and 15% cyclists) and an increase in light goods vehicles.

Figure 5.75: Daily Traffic flows, Carmelite Street (south) – Weekday

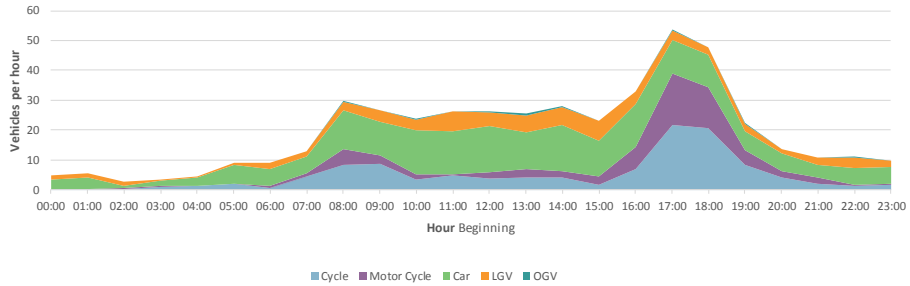


Figure 5.76: Daily Traffic flows, Carmelite Street (south) – Weekend

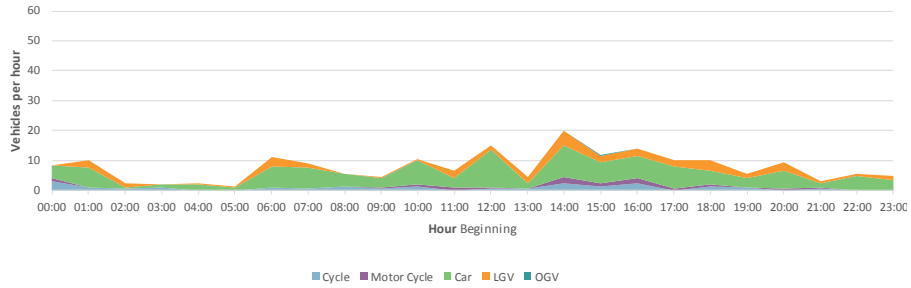


Figure 5.77: Vehicle distribution, Carmelite Street (south) – Weekday (AM)

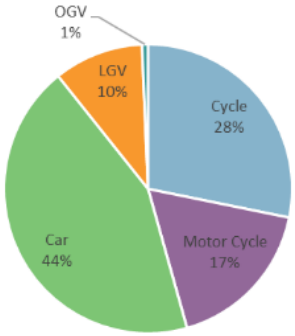


Figure 5.78: Vehicle distribution, Carmelite Street (south) – Weekday (PM)

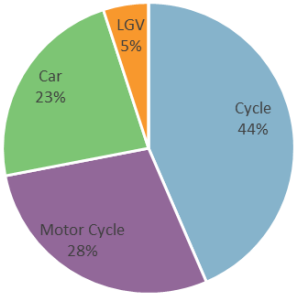


Figure 5.79: Vehicle distribution, Carmelite Street (south) – Weekend (AM)

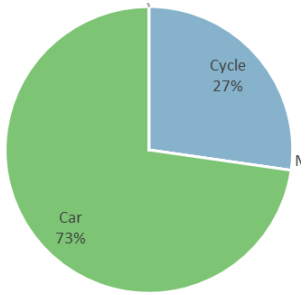
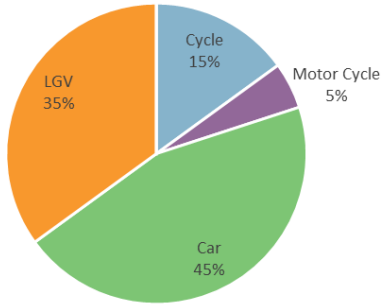


Figure 5.80: Vehicle distribution, Carmelite Street (south) – Weekend (PM)



12. Tudor Street (west) between Temple Avenue and Carmelite Street

Weekday

Eastbound traffic represents the primary direction of traffic flows on Tudor Street, between Temple Avenue and Carmelite Street. Westbound flows are significantly lower and mainly comprised of cyclists.

Traffic flows peak, both Eastbound and Westbound, at 08:00 and 18:00, with a decrease in the early and late hours of the day.

The traffic mix is mainly divided between cars, light goods vehicles and cyclists, with a 13% decrease in the percentage of cyclists in the afternoon compared to the morning peak.

Figure 5.81: Daily Traffic flows, Tudor Street (west) – Weekday eastbound

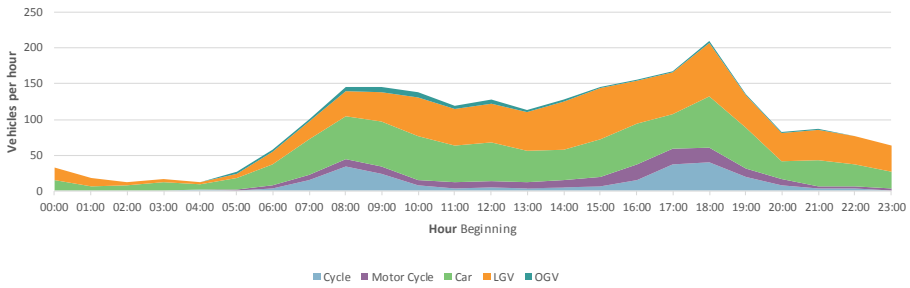


Figure 5.82: Daily Traffic flows, Tudor Street (west) – Weekday westbound

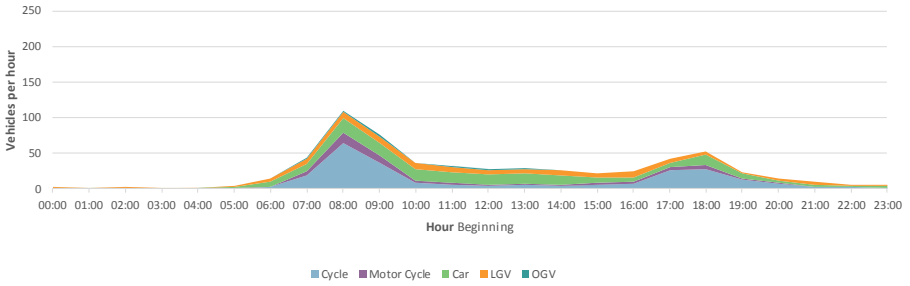


Figure 5.83: Vehicle distribution, Tudor Street (west) – Weekday (AM)

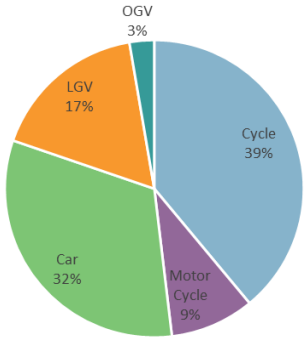
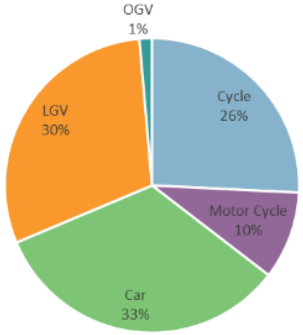


Figure 5.84: Vehicle distribution, Tudor Street (west) – Weekday (PM)



12. Tudor Street (west) between Temple Avenue and Carmelite Street

Weekend

Weekend traffic flows are significantly lower than weekday flows. As with the weekday, on the weekend, eastbound is the predominant direction of traffic flows on Tudor Street.

Whilst westbound traffic flows are constant throughout the day, Eastbound traffic flows show a constant increase up to a peak at 16:00. Traffic flows then decrease in the later hours of the evening.

On weekends, the traffic mix mainly comprises of cars (shown in green) and light goods vehicles (orange), both in the AM and PM hours.

Figure 5.85: Daily Traffic flows, Tudor Street (west) – Weekend eastbound

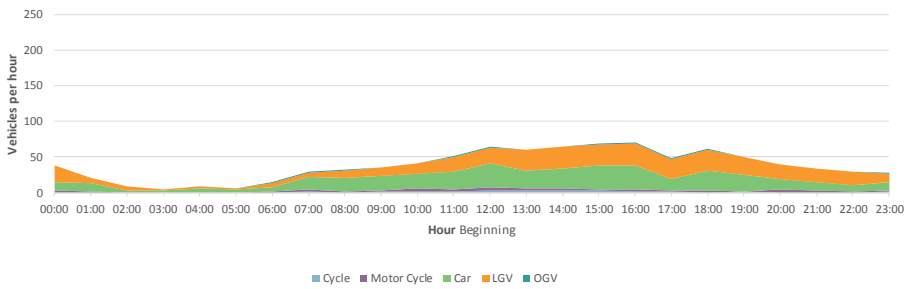


Figure 5.86: Daily Traffic flows, Tudor Street (west) – Weekend westbound

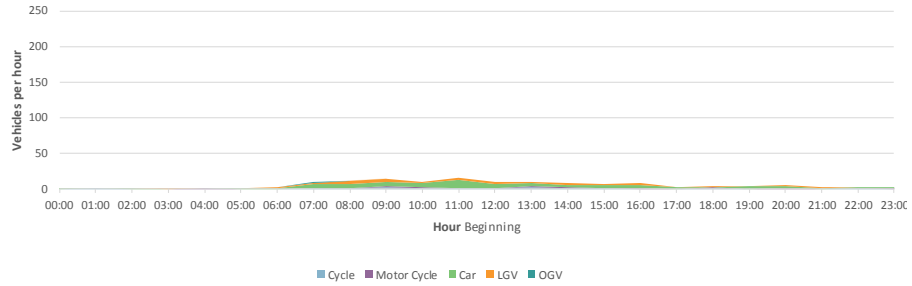


Figure 5.87: Vehicle distribution, Tudor Street (west) – Weekend (AM)

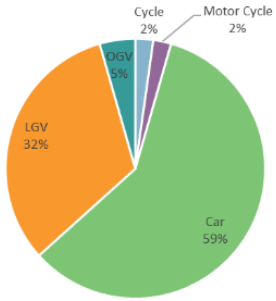
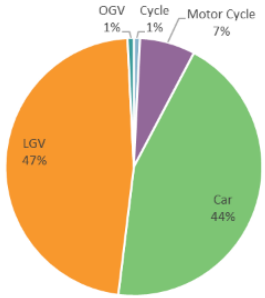


Figure 5.88: Vehicle distribution, Tudor Street (west) – Weekend (PM)



13. Tudor Street between Whitefriars Street and John Carpenter Street

Weekday

Westbound traffic flows are high in the morning, with a peak at 08:00 and then decrease in the afternoon.

Conversely, Eastbound traffic flows are lower in the morning and increase towards the peak at 18:00. Traffic flows then decrease in the evening.

In the morning, the traffic mix primarily consists of cyclists (38%), followed by cars and light goods vehicles. In the afternoon, a decrease in cyclists (to 33%) can be seen, and an increase in cars and light goods vehicles.

Figure 5.89: Daily Traffic flows, Tudor Street – Weekday eastbound

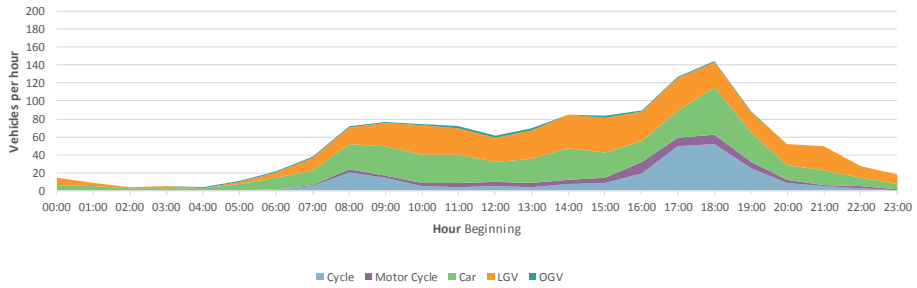


Figure 5.90: Daily Traffic flows, Tudor Street – Weekday westbound

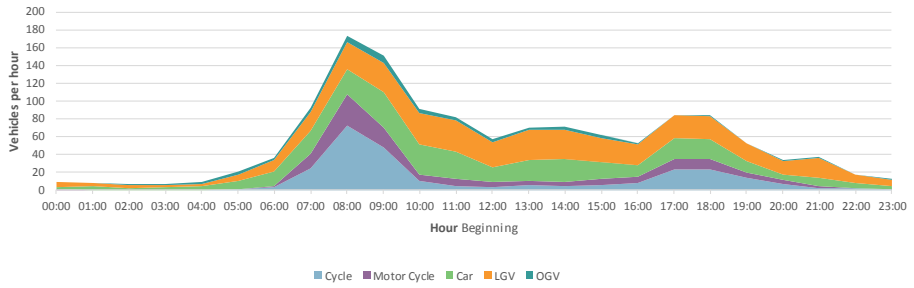


Figure 5.91: Vehicle distribution, Tudor Street – Weekday (AM)

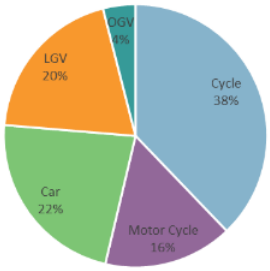
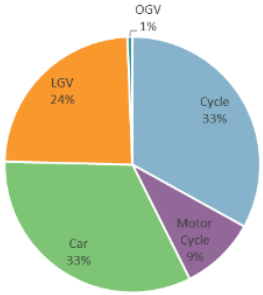


Figure 5.92: Vehicle distribution, Tudor Street – Weekday (PM)



13. Tudor Street between Whitefriars Street and John Carpenter Street

Weekend

Weekend traffic flows are significantly lower than weekday flows, at peaks approximately one third of the weekday flows.

On the weekend, Eastbound traffic flows are generally higher than Westbound flows.

Both Eastbound and Westbound traffic flows constantly increase throughout the day, with peaks at around 15:00. These are then followed by a decrease in the traffic flows in the later hours of the evening.

On the weekend, the traffic mix is mainly comprised of light goods vehicles (orange) and cars (shown in green), both in the AM and PM hours.

Figure 5.93: Daily Traffic flows, Tudor Street – Weekend eastbound

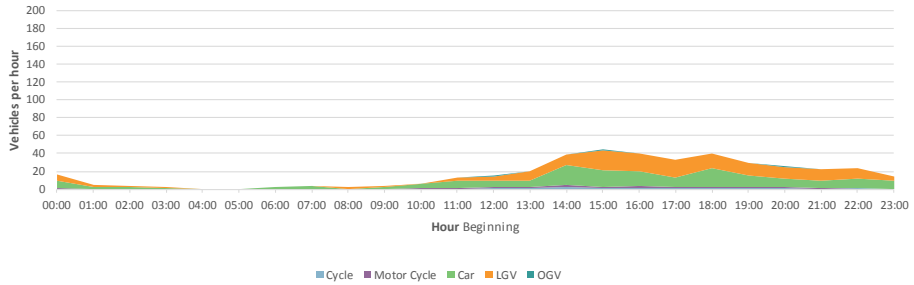


Figure 5.94: Daily Traffic flows, Tudor Street – Weekend westbound

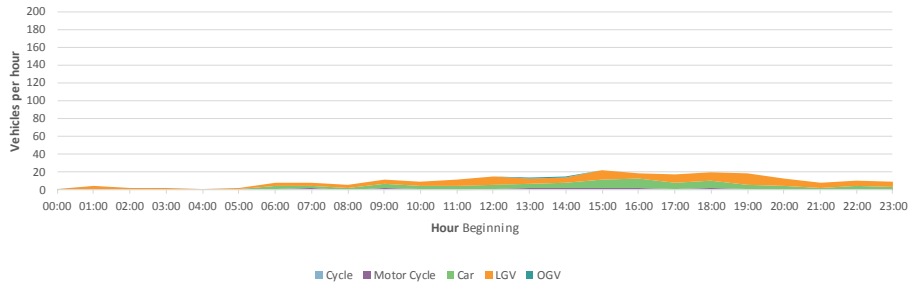


Figure 5.95: Vehicle distribution, Tudor Street – Weekend (AM)

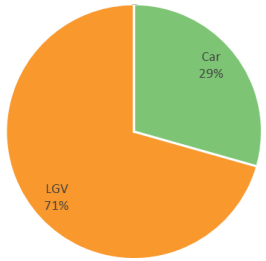
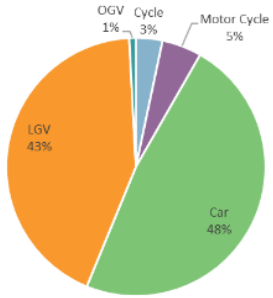


Figure 5.96: Vehicle distribution, Tudor Street – Weekend (PM)



14. Tudor Street (east) between Dorset Rise and Bridewell Place

Weekday

As for the section of Tudor Street between Whitefriars Street and John Carpenter Street, Westbound traffic flows are high in the morning, with a peak at 08:00 and then generally decrease in the afternoon.

Conversely, Eastbound traffic flows are lower in the morning and gradually increase towards the peak at around 17:00. Traffic flows then decrease in the evening.

A very similar vehicles distribution can be seen in the morning and in the afternoon. The traffic mix primarily consists of cyclists (33%), followed by motorcycles, cars and light goods vehicles. Note that in the afternoon, the percentage of motorcycles decreases, whilst cars and light goods vehicles increase.

Figure 5.97: Daily Traffic flows, Tudor Street (east) – Weekday eastbound

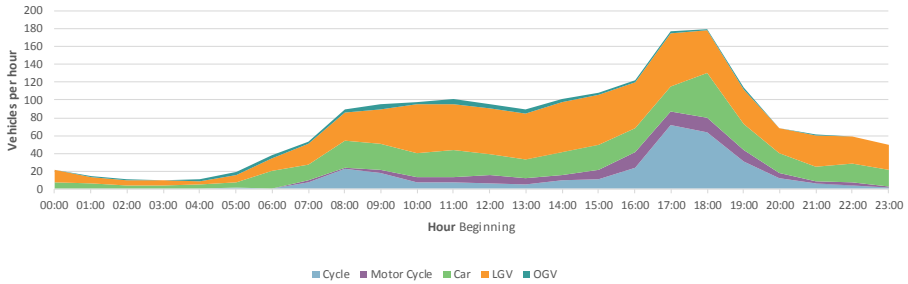


Figure 5.98: Daily Traffic flows, Tudor Street (east) – Weekday westbound

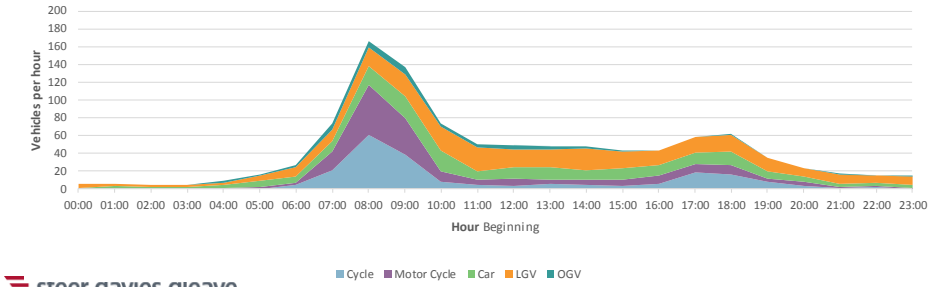


Figure 5.99: Vehicle distribution, Tudor Street (east) – Weekday (AM)

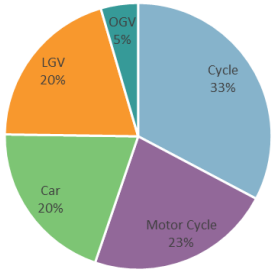
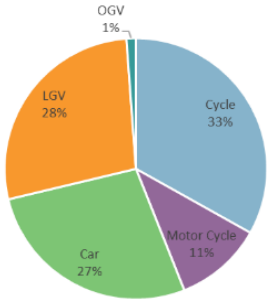


Figure 5.100: Vehicle distribution, Tudor Street (east) – Weekday (PM)



14. Tudor Street (east) between Dorset Rise and Bridewell Place

Weekend

As for the eastern sections of Tudor Street, weekend traffic flows are considerably lower than weekday flows, with Eastbound being the predominant direction of traffic flows.

Both Eastbound and Westbound traffic flows constantly increase throughout the day. However, whilst Westbound flows peak in the morning, around 07:00, and decrease for the rest of the day, Eastbound flows build towards higher peaks around 13:00, 15:00 and 18:00.

On weekend, the traffic mix is primarily comprised of light goods vehicles (orange) and cars (shown in green), with an increase in the former and a decrease in the latter during PM hours.

Figure 5.101: Daily Traffic flows, Tudor Street (east) – Weekend eastbound

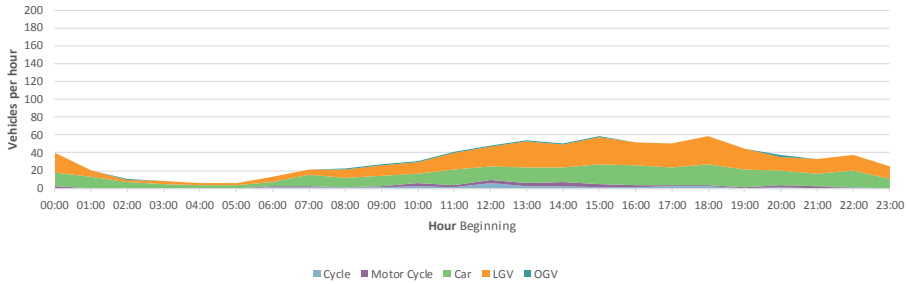


Figure 5.102: Daily Traffic flows, Tudor Street (east) – Weekend westbound

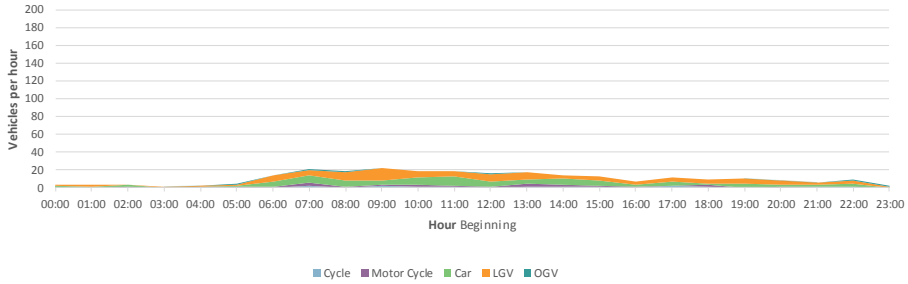


Figure 5.103: Vehicle distribution, Tudor Street (east) – Weekend (AM)

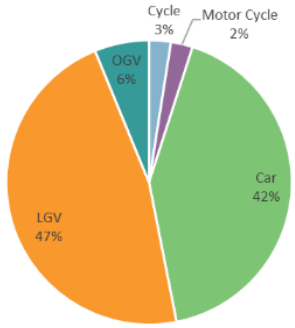
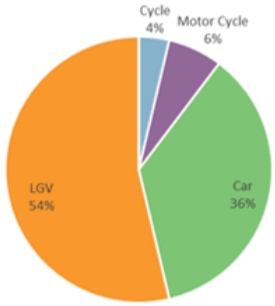


Figure 5.104: Vehicle distribution, Tudor Street (east) – Weekend (PM)



15. Tallis Street (west) between Temple Avenue and Carmelite Street

Weekday

Eastbound traffic flows are approximately double the Westbound ones. Westbound flows show a predominance of cyclists.

For both Eastbound and Westbound, traffic flows peak at 08:00 and 18:00, with a decrease in the early and late hours of the day.

The traffic mix on this section of Tallis Street does not generally change between the morning and the evening. The largest share is comprised of cyclists (more than 50%), with the remaining 50% split between cars, goods vehicles and motorcycles.

Figure 5.105: Daily Traffic flows, Tallis Street (west) – Weekday eastbound

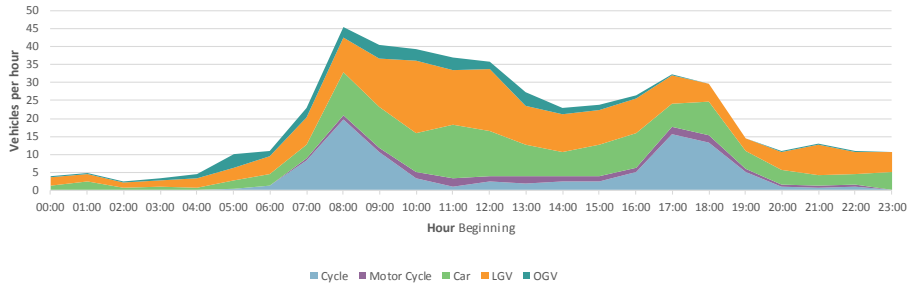


Figure 5.106: Daily Traffic flows, Tallis Street (west) – Weekday westbound

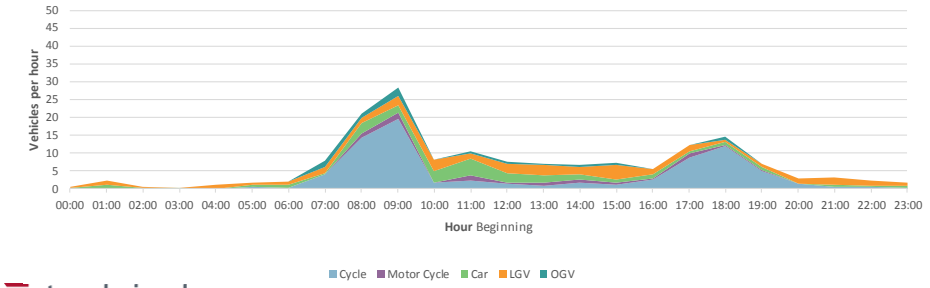


Figure 5.107: Vehicle distribution, Tallis Street (west) – Weekday (AM)

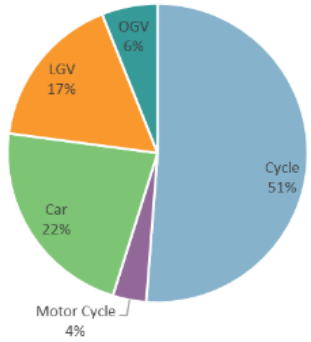
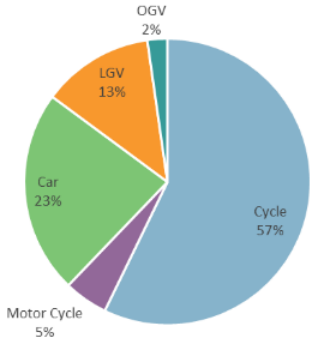


Figure 5.108: Vehicle distribution, Tallis Street (west) – Weekday (PM)



15. Tallis Street (west) between Temple Avenue and Carmelite Street

Weekend

Weekend traffic flows are considerably lower than weekday. As per weekday, Eastbound traffic flows are higher than the Westbound flows.

For both Eastbound and Westbound traffic, multiple peaks in traffic flows can be seen throughout the day.

The weekend traffic mix predominantly consists of cars, with the remaining percentage split between light and ordinary goods vehicles in the morning, and light goods vehicles and cyclists in the afternoon.

Figure 5.109: Daily Traffic flows, Tallis Street (west) – Weekend eastbound

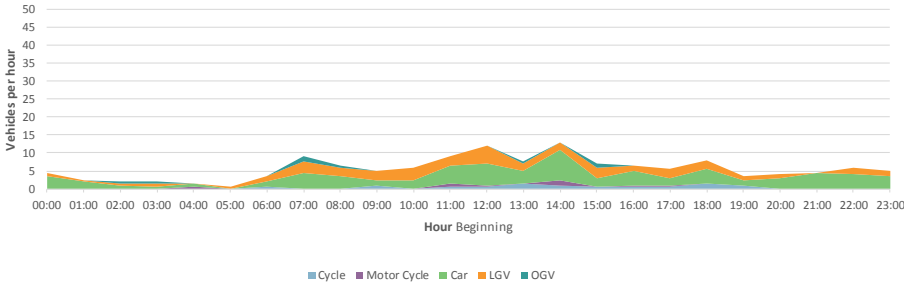


Figure 5.110: Daily Traffic flows, Tallis Street (west) – Weekend westbound

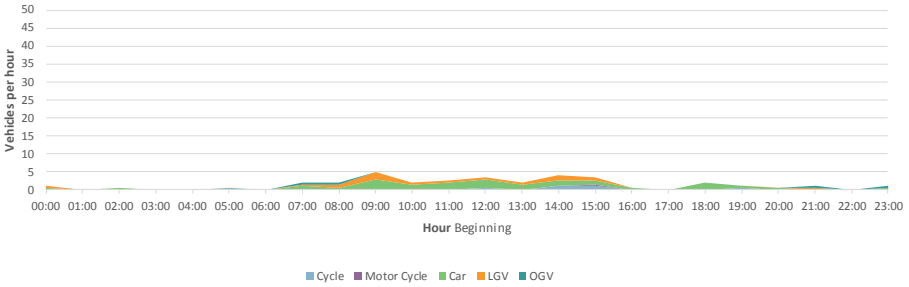


Figure 5.111: Vehicle distribution, Tallis Street (west) – Weekend (AM)

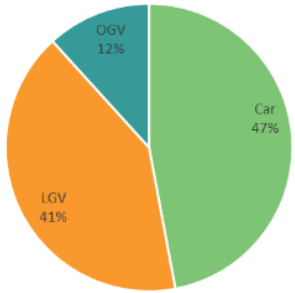
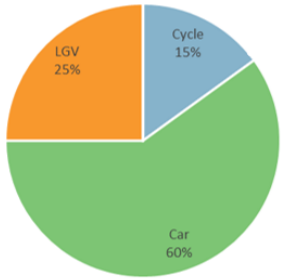


Figure 5.112: Vehicle distribution, Tallis Street (west) – Weekend (PM)



16. Tallis Street (east) between Carmelite Street and John Carpenter Street

Weekday

This section of Tallis Street exhibits similar traffic flows and traffic mix as the eastern section, between Temple Avenue and Carmelite Street.

Eastbound and Westbound traffic are very similar, with higher morning peak in the Westbound direction at around 08:00.

Figure 5.113: Daily Traffic flows, Tallis Street (east) – Weekday eastbound

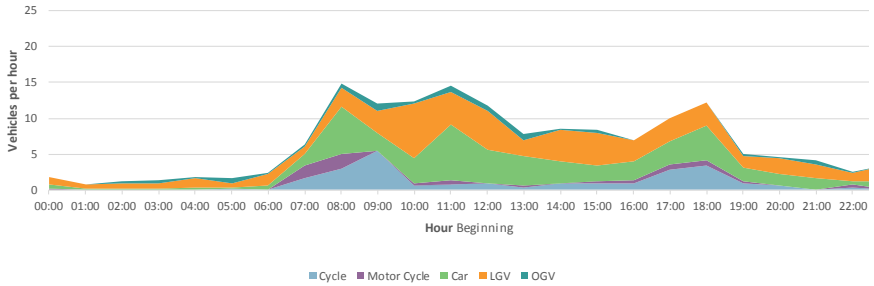
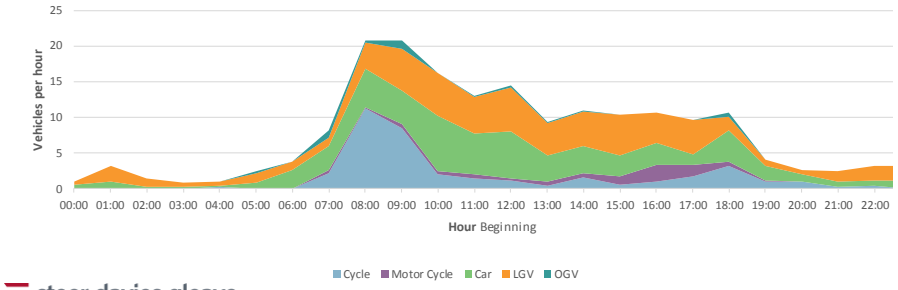


Figure 5.114: Daily Traffic flows, Tallis Street (east) – Weekday westbound



For both Eastbound and Westbound, traffic flows increase in the morning and show a decrease in the evening.

The traffic mix on this section of Tallis Street does not generally change between AM and PM hours. The largest percentage is of cyclists, which decrease in the afternoon. The reverse happens for the percentage of cars, which increases in the afternoon.

Figure 5.115: Vehicle distribution, Tallis Street (east) – Weekday (AM)

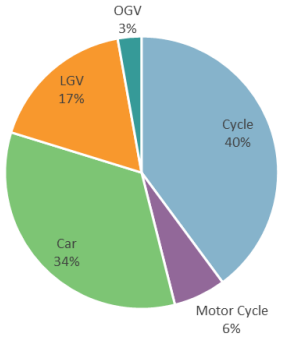
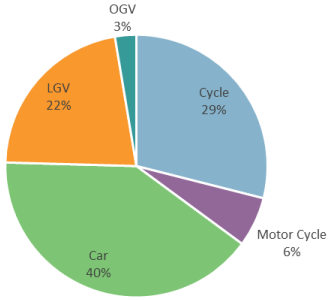


Figure 5.116: Vehicle distribution, Tallis Street (east) – Weekday (PM)



16. Tallis Street (east) between Carmelite Street and John Carpenter Street

Weekend

As with the eastern section of Tallis Street, between Temple Avenue and Carmelite Street, weekend traffic flows are lower than weekday.

For both Eastbound and Westbound, the traffic flows peak multiple times throughout the day, with higher peaks shown in the Westbound direction, at 15:00.

Weekend traffic mix is mainly of cars (around 70%) and light goods vehicles

Figure 5.117: Daily Traffic flows, Tallis Street (east) – Weekend eastbound

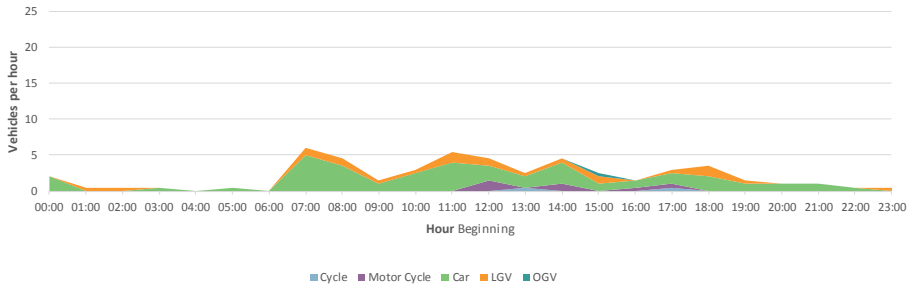


Figure 5.118: Daily Traffic flows, Tallis Street (east) – Weekend westbound

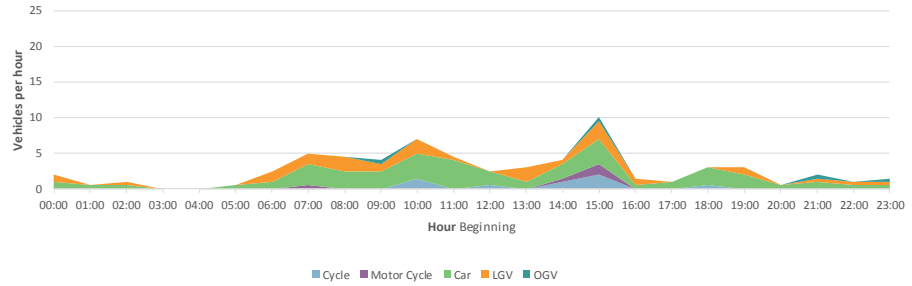


Figure 5.119: Vehicle distribution, Tallis Street (east) – Weekend (AM)

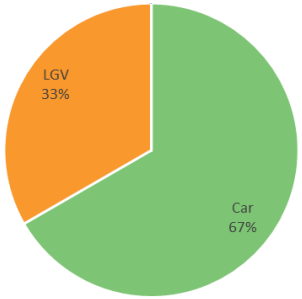
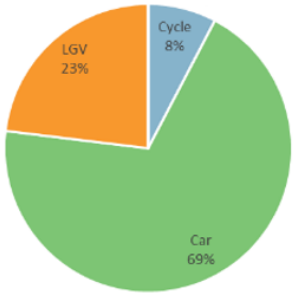


Figure 5.120: Vehicle distribution, Tallis Street (east) – Weekend (PM)



Link Speeds

The ATC loops have also recorded traffic speed on the surveyed streets within the study area. For the analysis, link speeds have been mapped and are shown overleaf.

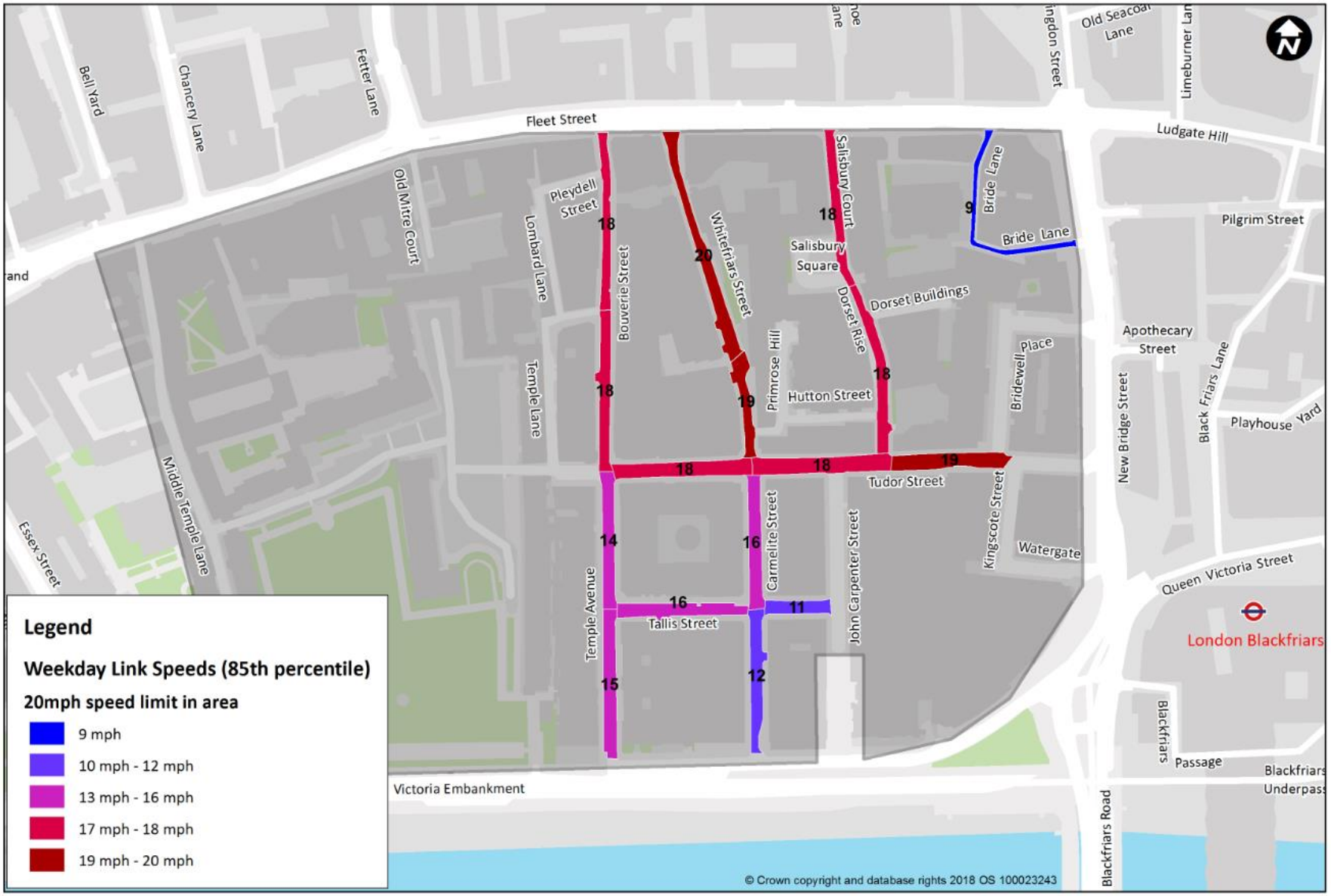
For this analysis, the 85th percentile of speeds has been used rather than the mean speeds. This is to give an indication of the speed of most of the traffic, (and excludes outliers above the 85th percentile). Mean speeds would show an 'incorrect' picture as slow vehicles will negatively and quite significantly influence the mean value.

85th percentile link speeds are shown in Figure 5.121, and as expected, streets within the southern half of the study area which have lower levels of general traffic and high numbers of cyclists also feature a lower average speed; in the range of 11-12mph along Tallis Street (east) and Carmelite Street (south) and 14-16mph along Temple Avenue, Tallis Street (west) and Carmelite Street (north).

On the other hand, the 85th percentile speed of busier roads such as Tudor Street and Whitefriars Street is approaching the 20mph speed limit, with average recorded speed between 18-20mph.

The 85th percentile speed recorded along the two southbound corridors, Bouverie Street and Salisbury Court/Dorset Rise is 18mph.

Figure 5.121: 85th percentile vehicle speeds (weekday)



Conclusion

This chapter presented and discussed the outcomes of the ATC surveys in the study area. This link flow analysis chapter has given insights into traffic volumes and traffic composition in the study area, Furthermore, vehicle speeds have been mapped.

Link Flows in the Temple area

The different link flows in the Temple area as picked up by the ATC counters have been mapped for different vehicle classes (total traffic flows, cars and LGVs, goods vehicles, pedal cyclists).

- Bouverie Street and Tudor Street carry the highest volumes of traffic, followed by Whitefriars Street
- The busiest links for cars and LGVs include Tudor Street as the main east-west corridor, with the movements from Bouverie Street and to Whitefriars Street recorded as the critical movements
- Car and LGV volumes south of Tudor Street are generally low
- Goods vehicles predominantly use Bouverie Street, Whitefriars Street and Tudor Street. The eastern part of Tudor Street is a busy link with high goods vehicle movements
- Cyclists predominantly use Temple Avenue, and Tudor Street, indicating the use the Temple Area to bypass the Cycle Super Highway connection and instead traveling through the Temple area.

Link Speeds

Analysis of the vehicles speeds on the different roads in the area has shown that speeds remain within the speed limit of 20 miles per hour

- Traffic speeds remain within the 20-mile per hour speed limit.

6 Goods Vehicle Movements

Turning Flow Analysis

For the analysis of turning movements of OGV (Ordinary Goods Vehicles) on Tudor Street and Tallis Street, the vehicles types have been split between OGV1 and OGV2. OGV1 vehicles are larger rigid vehicles with two or three axles (aggregate 2 in Figure 5.6). OGV2 (aggregate 3 in Figure 5.6) include larger and longer vehicles with four or more axles.

OGV1

Figure 6.1 shows the OGV1 movements for the average weekday. On average, during a weekday, nearly 400 OGV1 movements were observed across the study area over a 24-hour period, with the busiest movement being the left turn from Bouverie Street onto Tudor Street (32 OGV1/day) followed by the left and right turns from Tudor Street onto Whitefriars Street (23 OGV1/day).

OGV2

As the number of OGV2 vehicles in the study area is relatively low, the average is a poor representation of the number of vehicles in the area. Instead, the day with the highest number of OGV movements has been analysed, being Friday 12 January. Figure 6.2 shows the number of OGVs on this day (only).

The number of OGV2s in the study area is much lower; the MCC counted showing just 21 OGV2 movements on January 12 over the 24-hour ('all-day') observation period across all 5 count sites. This was the busiest day of the week for OGV2s compared to 0 to 6 OGV2 movements for the remaining surveyed days. For the average AM, PM and weekends peaks, the number of OGV2s is zero for all movements across all sites.

Figure 6.1: Weekday average OGV1 movements (OGV1/day)

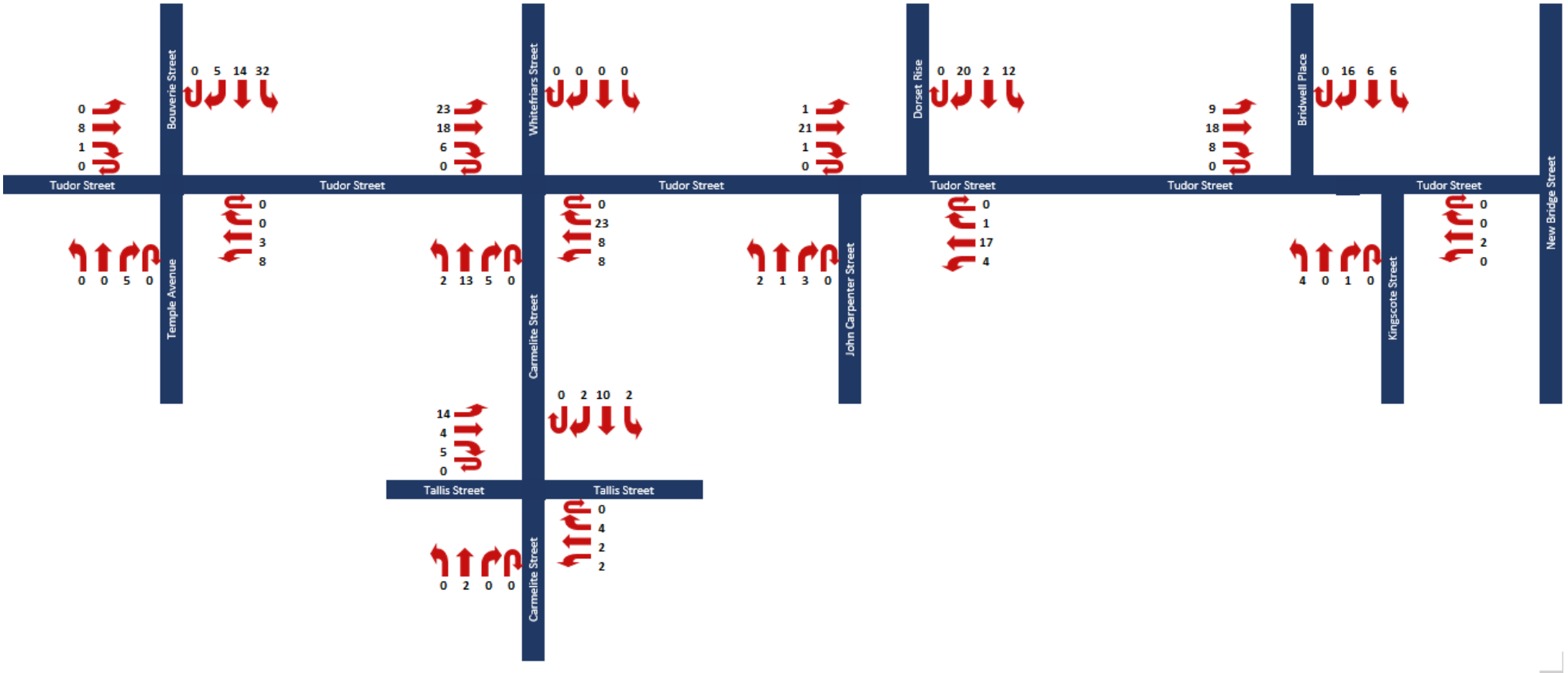
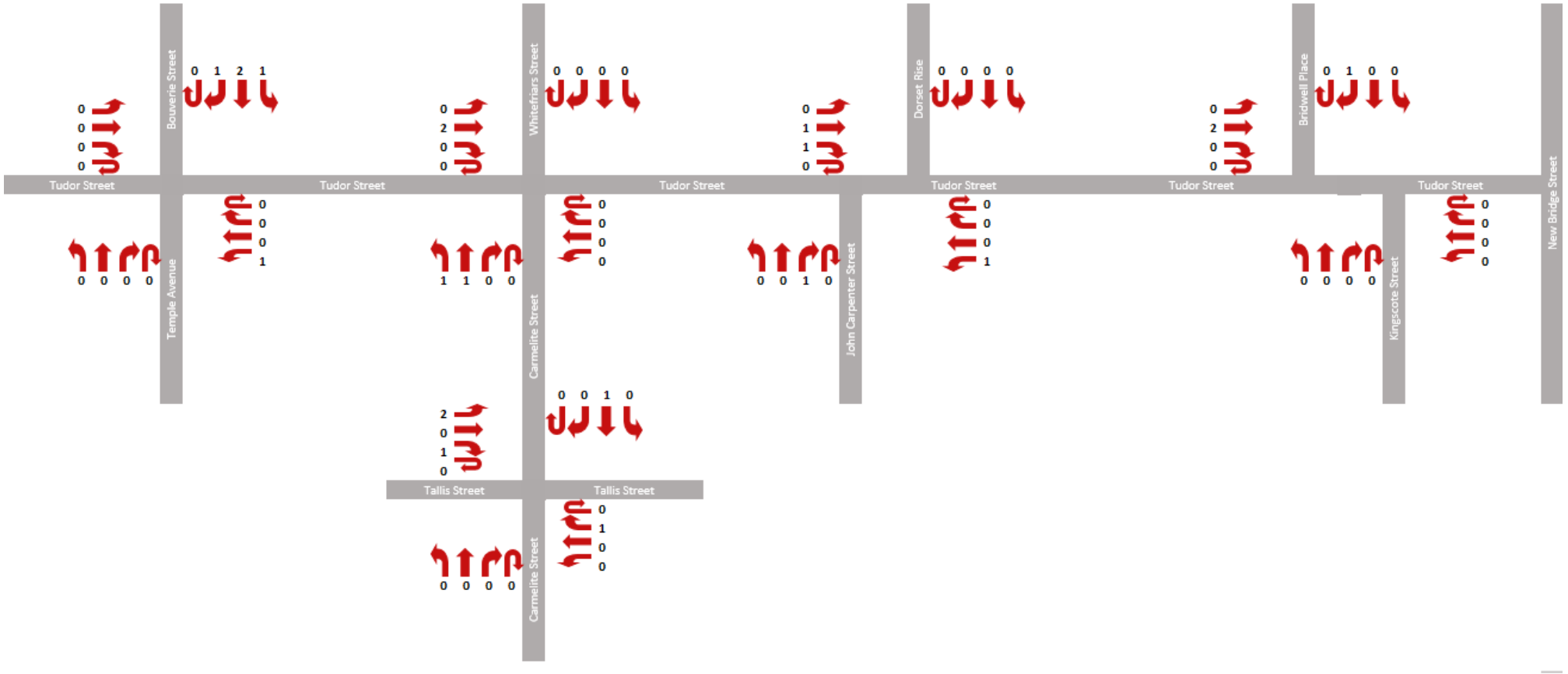


Figure 6.2: OGV2 movements 12.01.2018 (OGV2/day)



Flow Profiles and Vehicle Type Split

A series of site visits and a subsequent desktop review have been undertaken to gain an understanding of how goods vehicles within the Temple Area. This section discusses the movements of goods vehicles in the area on the different streets.

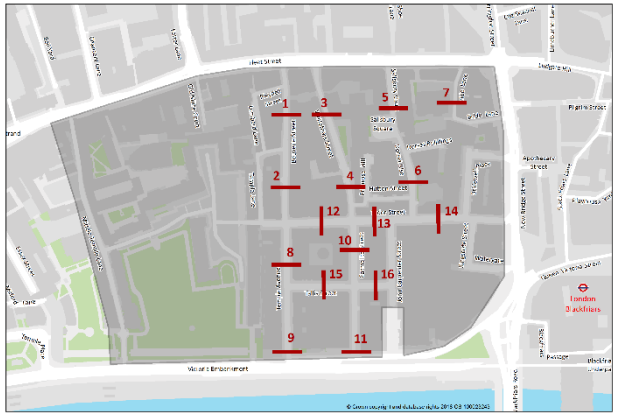
Automated traffic count (ATC) data has been collected and analysed for sixteen locations in the Temple Area. For each location, figures have been produced illustrating the flow profile for both the average weekday and weekend day. Charts have also been produced to show the mode split for AM and PM peak hour flows.

The following locations have been analysed:

1. Bouverie Street (north)
2. Bouverie Street (south)
3. Whitefriars Street (north)
4. Whitefriars Street (south)
5. Salisbury Court
6. Dorset Rise
7. Bride Lane
8. Temple Avenue (north)
9. Temple Avenue (south)
10. Carmelite Street (north)
11. Carmelite Street (south)
12. Tudor Street (west)
13. Tudor Street
14. Tudor Street (east)
15. Tallis Street (west)
16. Tallis Street (east)

Traffic data has been analysed for both weekdays as well as for weekends. However, weekend flows have shown to be very low for all locations (with a maximum of 2 vehicles in a one-hour period on Bouverie Street). As such, graphs presented in the following sections only show weekday results.

Figure 6.3: ATC locations



1. Bouverie Street (north) between Temple Lane and Pleydell Street

Average weekday flows of goods vehicles peak area relatively low on Bouverie Street, with a maximum of 12 vehicles an hour. Weekend flows see a maximum of 2 goods vehicles per hour.

The largest OGV transiting the street in the entire surveyed period is a 5+ axle articulated vehicle.

2-axle rigid vehicles are the most common OGVs on Bouverie Street (between 50% and 70% of all OGVs), both in weekday and weekend.

Figure 6.4: Vehicles distribution – Weekday (AM)

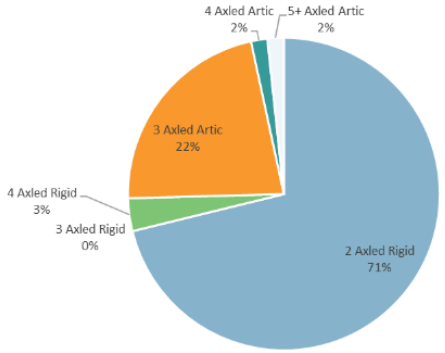


Figure 6.6: Vehicles distribution – Weekday (PM)

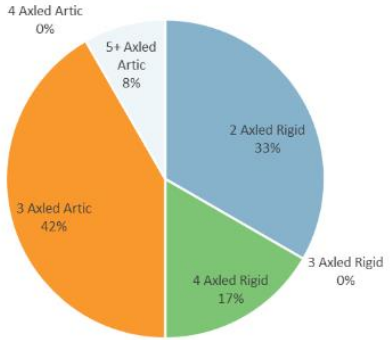


Figure 6.5: Daily Traffic flows – Weekday

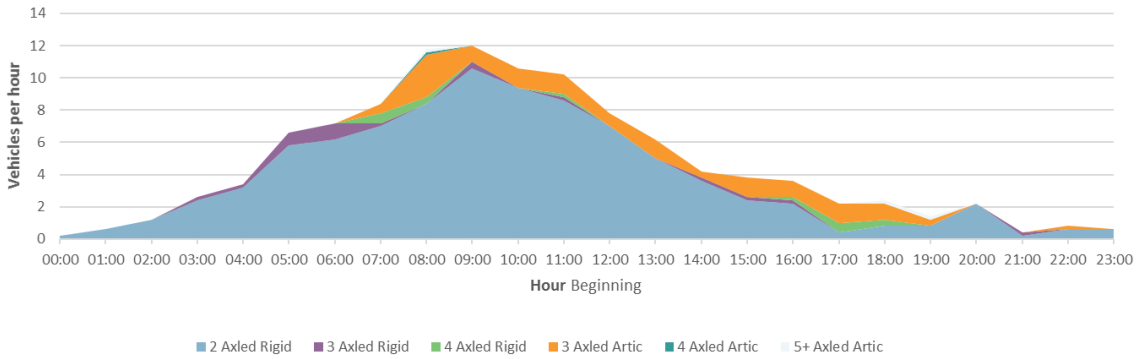
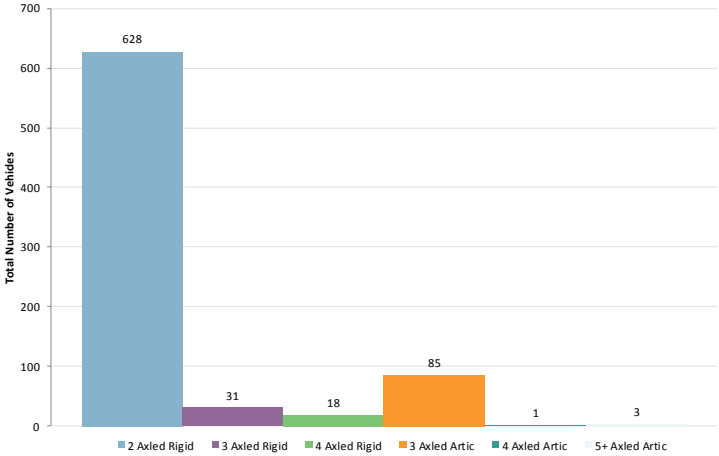


Figure 6.7: Total number of OGVs



2. Bouverie Street (south) between Tudor Street and Temple Lane

Similarly, to the section of Bouverie Street between Temple Lane and Pleydell Street, the largest OGV transiting the street in the entire surveyed period is a 5+ axle articulated vehicle.

The most common OGVs are 2-axle rigid vehicles, both on weekdays and weekends, except for weekday afternoons where 4 axle rigid vehicles are 35% of all OGVs. Weekend flows have a maximum of 2 goods vehicles per hour

Figure 6.8: Vehicles distribution – Weekday (AM)

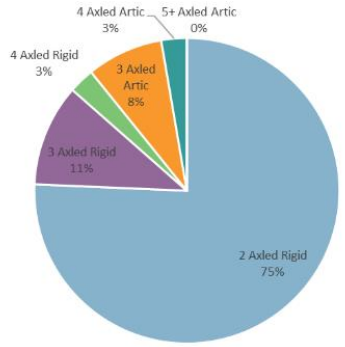


Figure 6.10: Vehicles distribution – Weekday (PM)

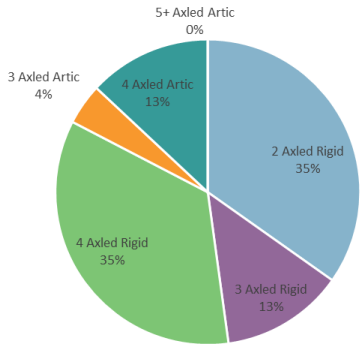


Figure 6.9: Daily Traffic flows – Weekday

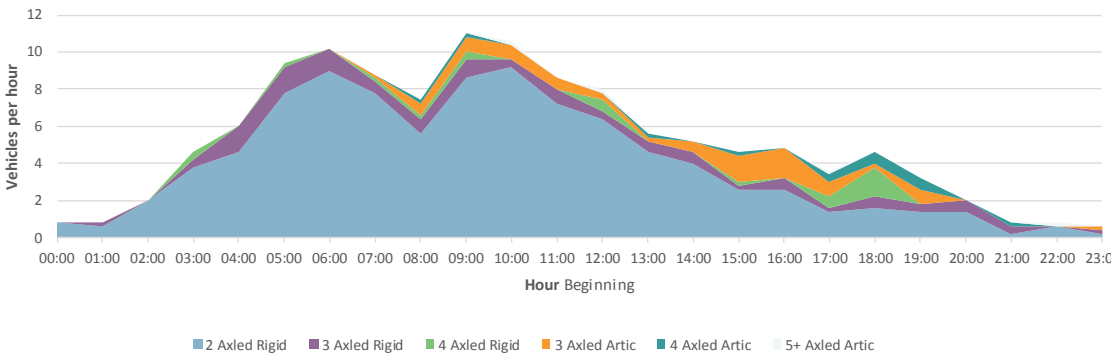
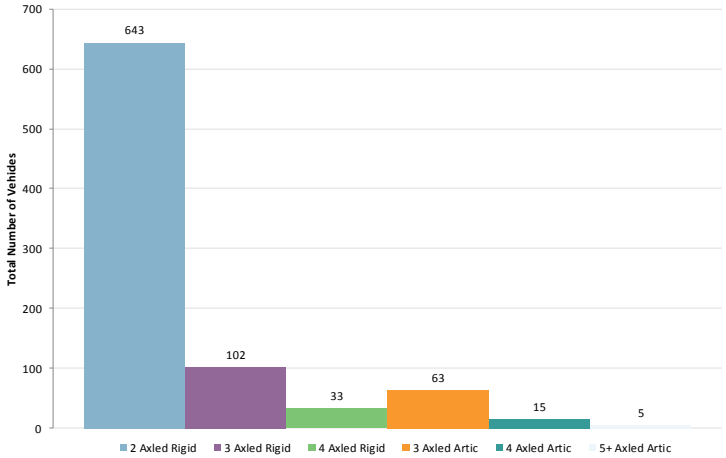


Figure 6.11: Total number of OGVs



3. Whitefriars Street (north) between Ashentree Court and Fleet Street

The largest OGV transiting the street in the entire surveyed period is a 5+ axle articulated vehicle.

The most common OGVs are 2-axle rigid vehicles, except for weekday afternoons where 3-axle articulated vehicles represent more than 50% of all OGVs. Weekend flows are very low for Whitefriars Street.

Figure 6.12: Vehicles distribution – Weekday (AM)

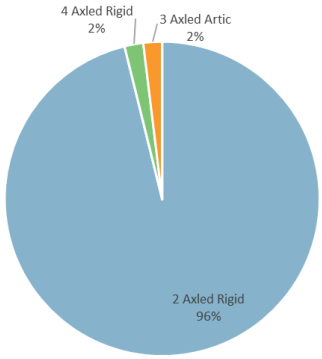


Figure 6.14: Vehicles distribution – Weekday (PM)

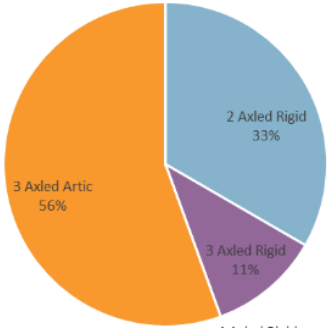


Figure 6.13: Daily Traffic flows – Weekday

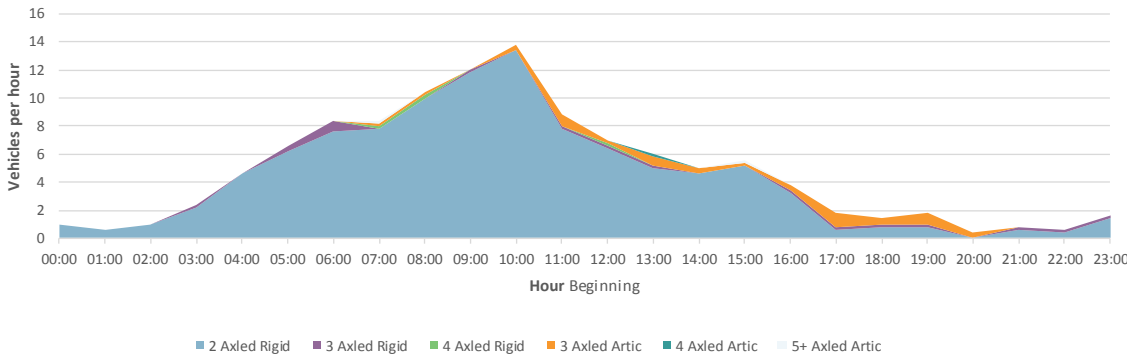
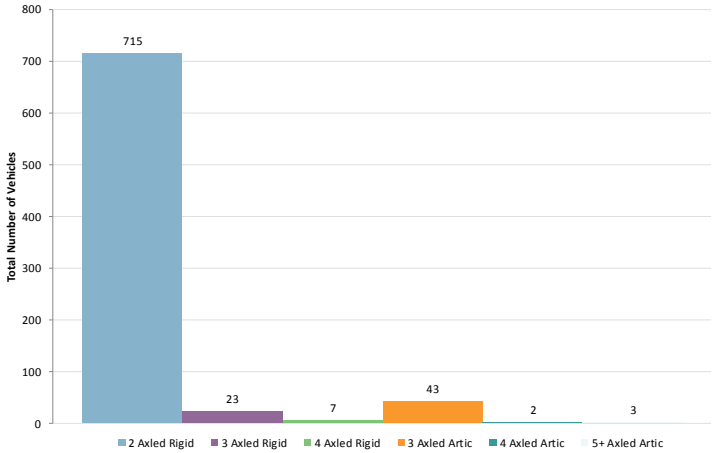


Figure 6.15: Total number of OGVs



4. Whitefriars Street (south) between Primrose Hill and Fleet Street

As per the section of Whitefriars Street between Ashentree Court and Fleet Street, the largest OGV transiting the street in the entire surveyed period is a 5+ axle articulated vehicle.

The most common OGVs are 2-axle rigid vehicles, which generally make up over 80% of all OGVs. However, on weekday afternoons the traffic mix is comprised of 2-axle rigid vehicles (38%), 3-axle articulated vehicles (31%) and 3-axle rigid vehicles (31%).

Figure 6.16: Vehicles distribution – Weekday (AM)

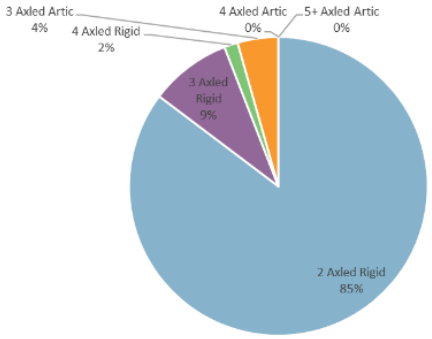


Figure 6.18: Vehicles distribution – Weekday (PM)

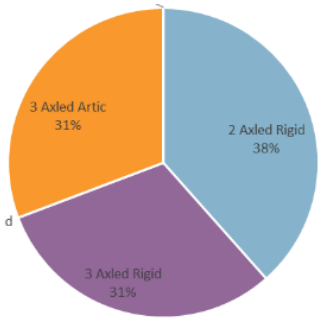


Figure 6.17: Daily Traffic flows – Weekday

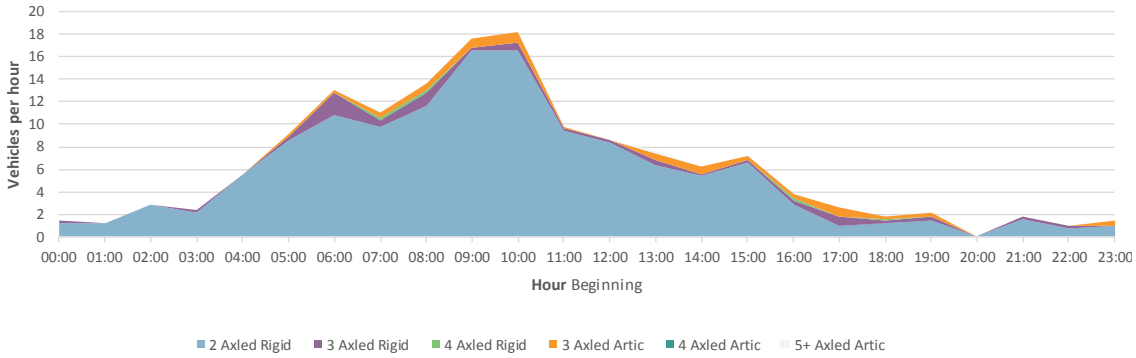
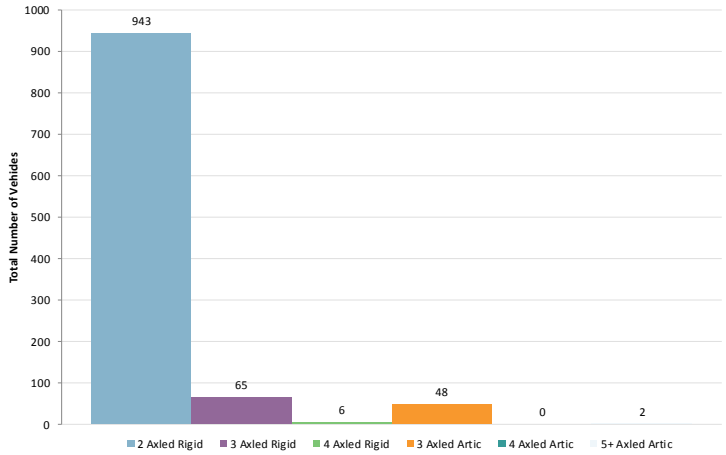


Figure 6.19: Total number of OGVs



5. Salisbury Court

OGV numbers on Salisbury Court are low on both weekdays and on weekend.

The largest OGV transiting the street in the entire surveyed period is a 4-axle rigid vehicle.

The most common OGVs are 2-axle rigid vehicles, both in weekday and weekend, and these represent more than 80% of all OGVs.

Figure 6.20: Vehicles distribution – Weekday (AM)

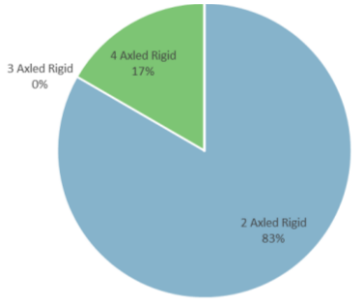


Figure 6.22: Vehicles distribution – Weekday (PM)

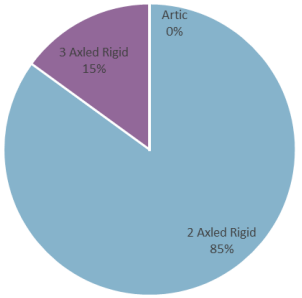


Figure 6.21: Daily Traffic flows – Weekday

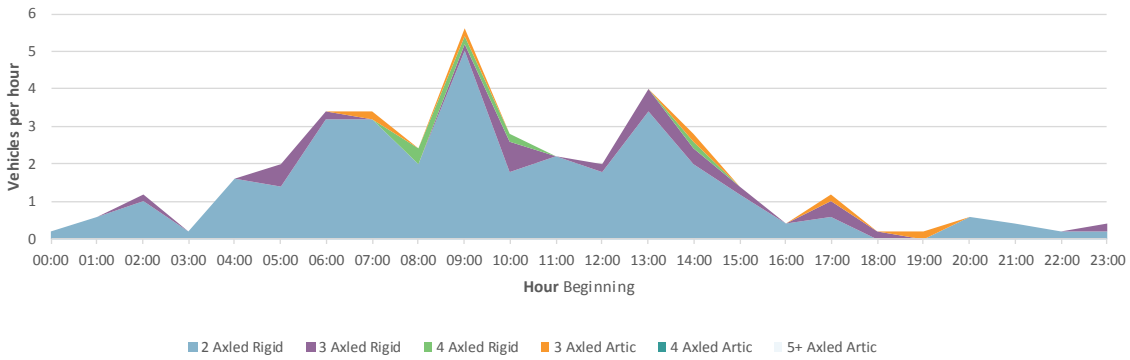
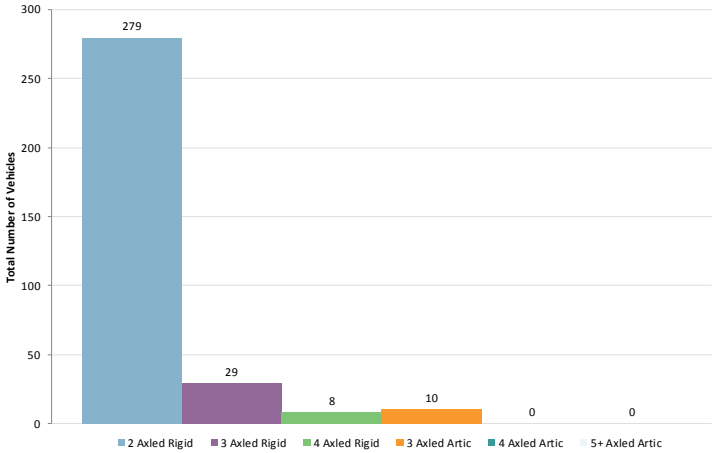


Figure 6.23: Total number of OGVs



6. Dorset Rise

Like Salisbury Court, OGV flows along Dorset Rise are low on both weekdays and during weekends.

The largest OGV transiting the street in the entire surveyed period is a 5+ axle articulated vehicle.

During the week, the most common OGVs are 2-axle rigid vehicles. However, over the weekend, the traffic mix is equally split between 2-axle rigid vehicles (in blue), 3-axle articulated vehicles (orange) and 3-axle rigid vehicles (purple).

Figure 6.24: Vehicles distribution – Weekday (AM)

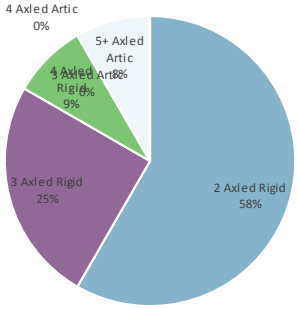


Figure 6.25: Daily Traffic flows – Weekday northbound

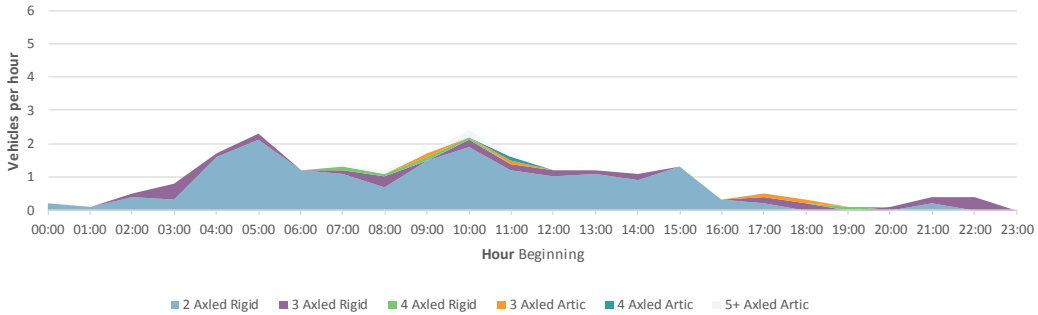


Figure 6.26: Vehicles distribution – Weekday (PM)

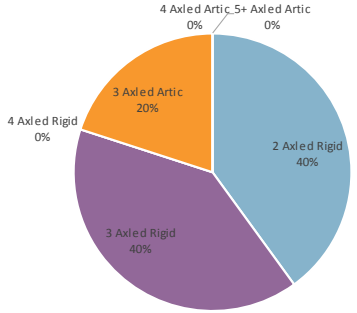


Figure 6.27: Total number of OGVs northbound

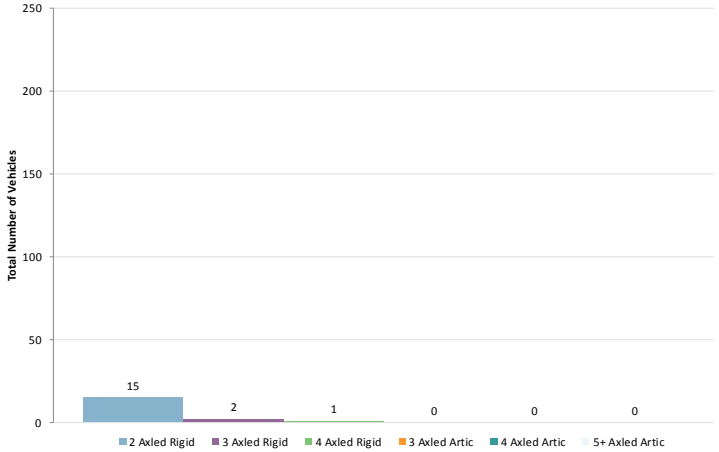


Figure 6.29: Daily Traffic flows – Weekday southbound

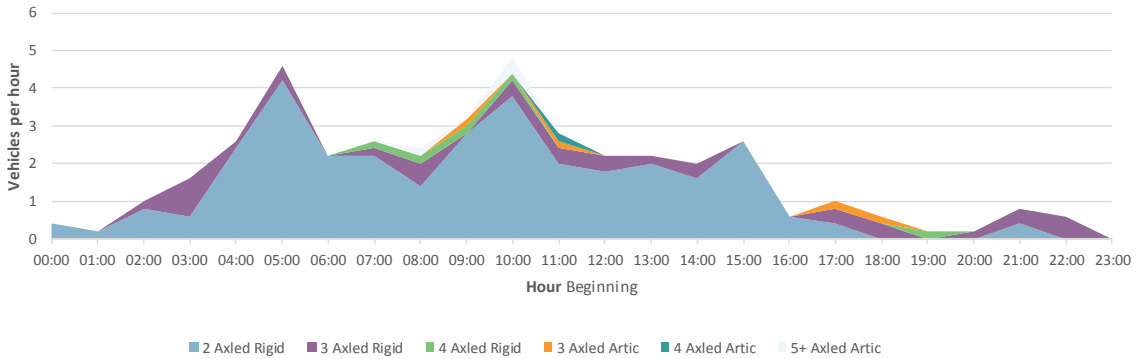
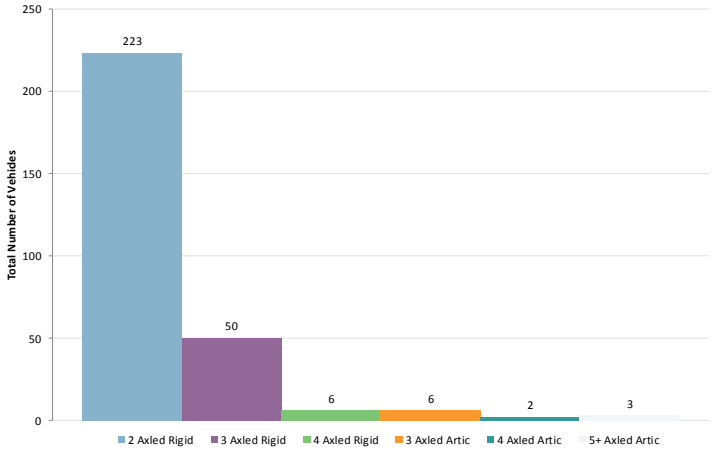


Figure 6.28: Total number of OGVs southbound

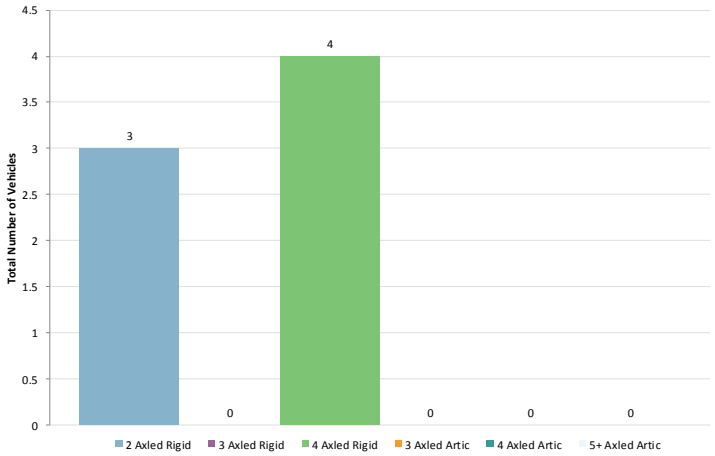


7. Bride Lane

OGV flows on Bride Lane are typically low for both weekends and weekdays. In the 7-day survey period, only 7 vehicles have been registered by the ATC loops.

The largest and most common OGV transiting the street in the entire surveyed period is a 4-axle rigid vehicle.

Figure 6.30: Total number of OGVs



8. Temple Avenue (north) between Tallis Street and Tudor Street

As Temple Avenue allows bi-directional traffic, both directions have been observed. Northbound OGV flows are significantly higher than southbound flows, with 5+ axle articulated vehicles being the largest OGV transiting the street in the entire surveyed period.

The most common OGVs are 2-axle rigid vehicles, both northbound and southbound. On a weekday, the traffic mix is mainly comprised of 2-axle rigid vehicles (in blue) and 4-axle rigid vehicles (green).

Figure 6.31: Vehicles distribution – Weekday (AM)

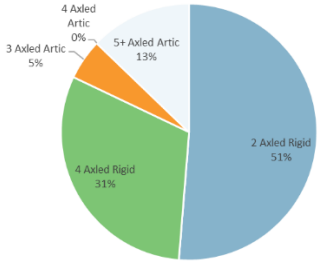


Figure 6.33: Vehicles distribution – Weekday (PM)

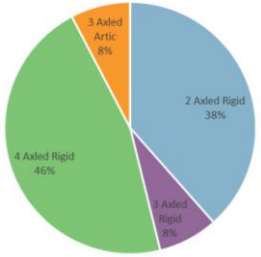


Figure 6.32: Daily Traffic flows – Weekday northbound

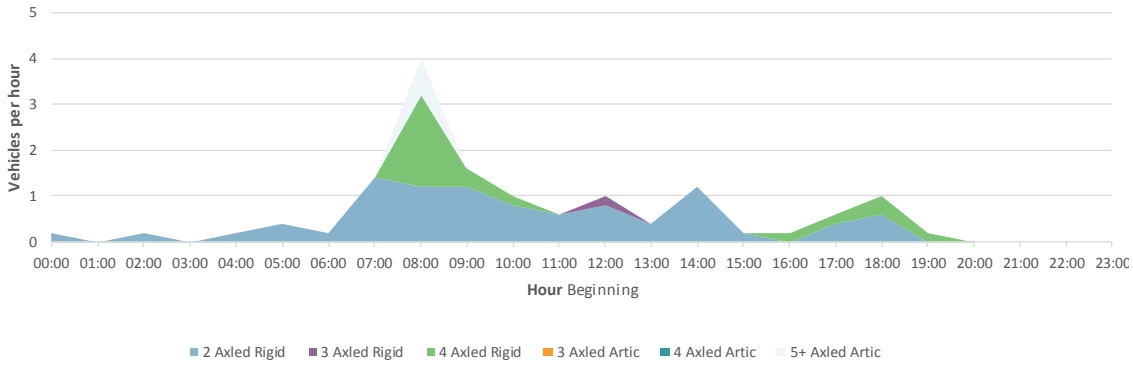


Figure 6.34: Total number of OGVs northbound

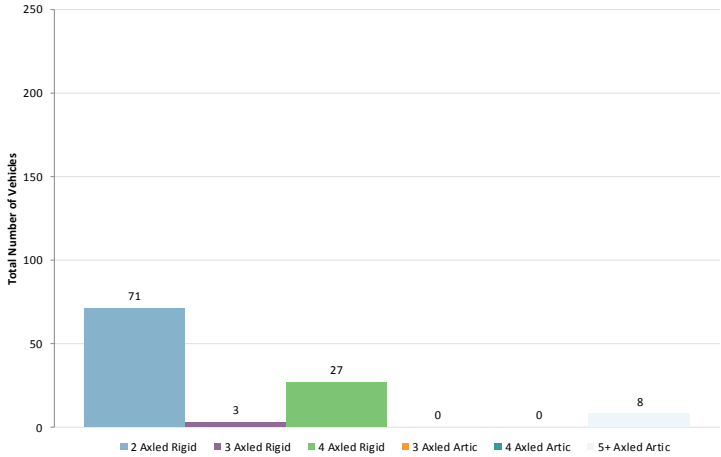


Figure 6.36: Daily Traffic flows – Weekday southbound

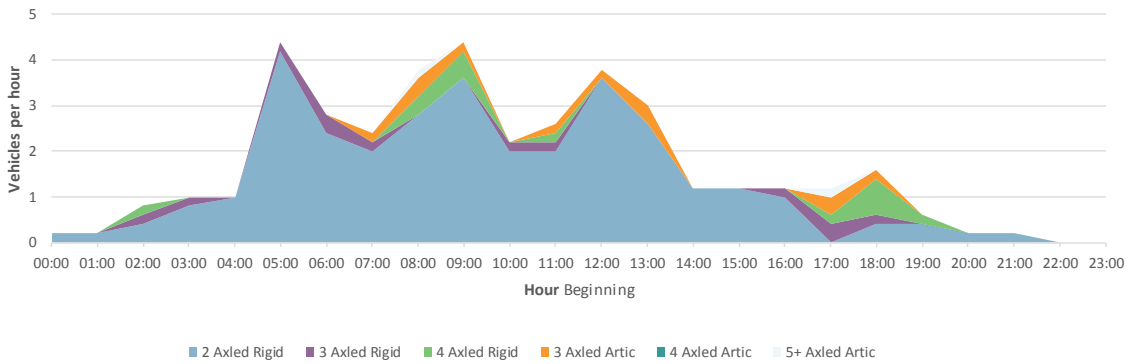
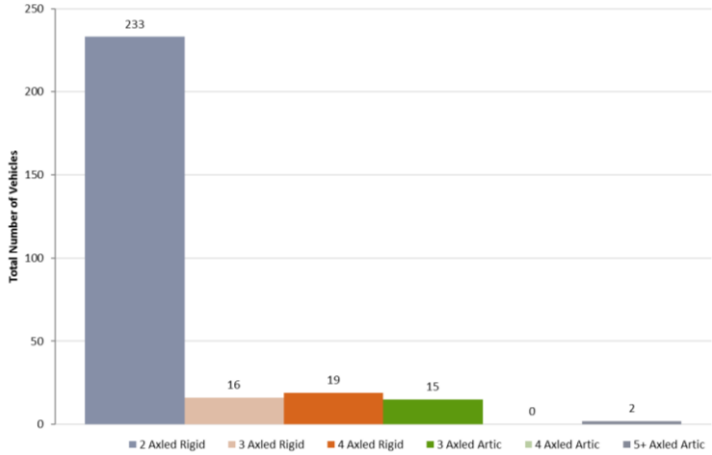


Figure 6.35: Total number of OGVs southbound



9. Temple Avenue (south) between Victoria Embankment and Tallis Street

As there is no access/exit to/from Victoria Embankment to the Temple Area, the number of OGVs crossing this ATC is very low. Several vehicles have still been captured, likely vehicles using the kerbside for loading. A 5+ axle articulated vehicle class is the largest OGV transiting the street in the entire surveyed period.

The most common OGVs are 4-axle rigid vehicles, both northbound and southbound.

Figure 6.38: Total number of OGVs northbound

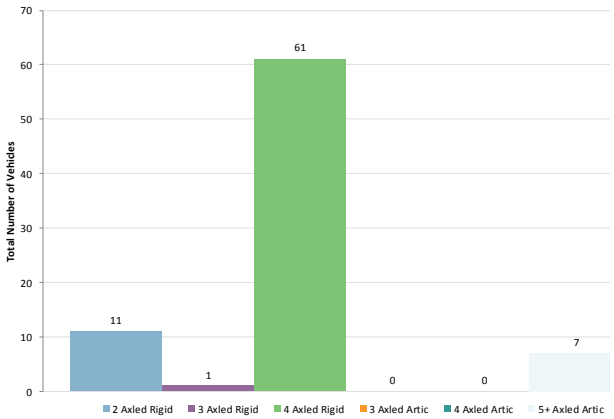


Figure 6.37: Total number of OGVs southbound

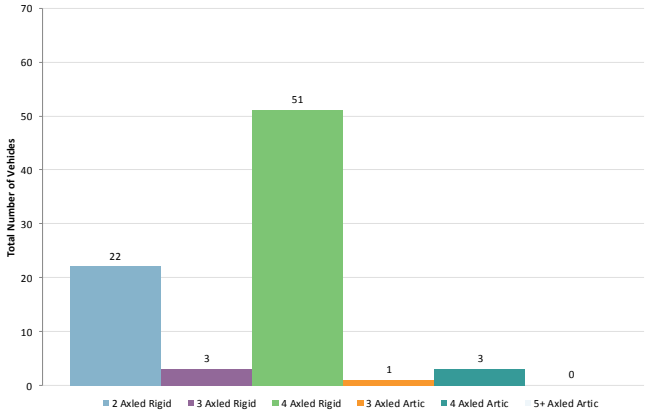


Figure 6.40: Daily Traffic flows – Weekday northbound

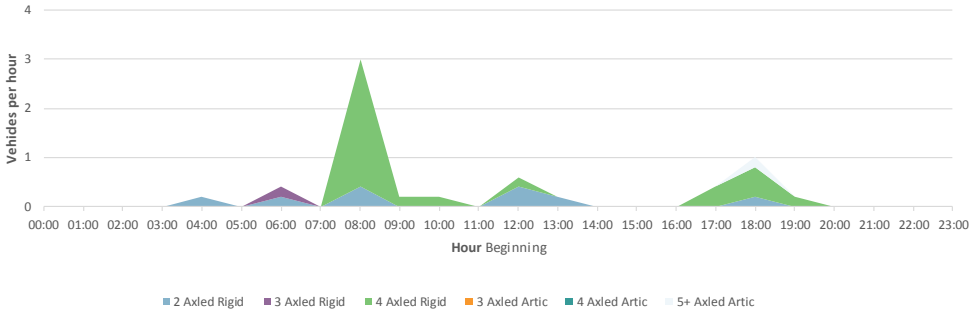
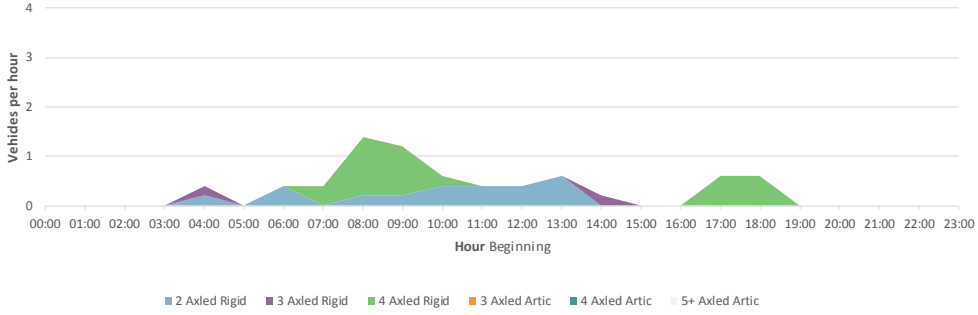


Figure 6.39: Daily Traffic flows – Weekday southbound



10. Carmelite Street (north) between Tallis Street and Tudor Street

Like other locations in the Temple area, Carmelite street sees a very low number of goods vehicles.

The largest OGV transiting the street in the entire surveyed period is a 4-axle rigid vehicle.

2-axle rigid vehicles are the most common OGVs, followed by 3-axle rigid vehicles, both during the week and over the weekend.

Figure 6.42: Total number of OGVs northbound

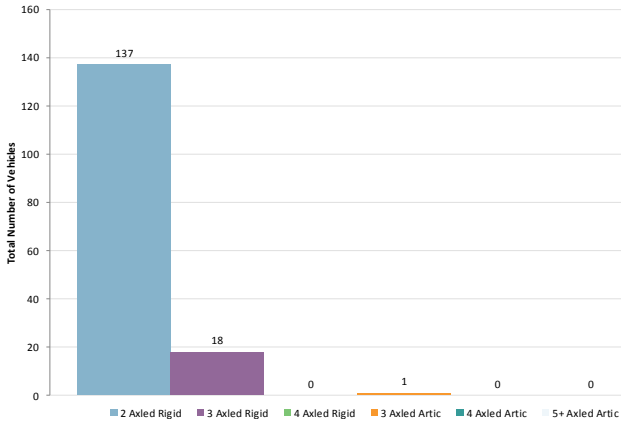


Figure 6.41: Total number of OGVs southbound

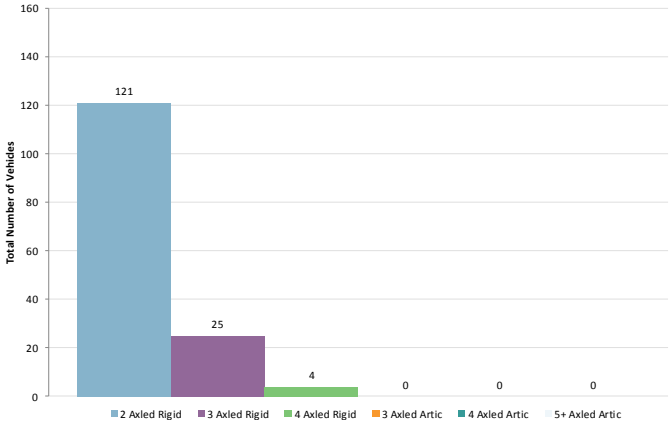


Figure 6.44: Daily Traffic flows – Weekday northbound

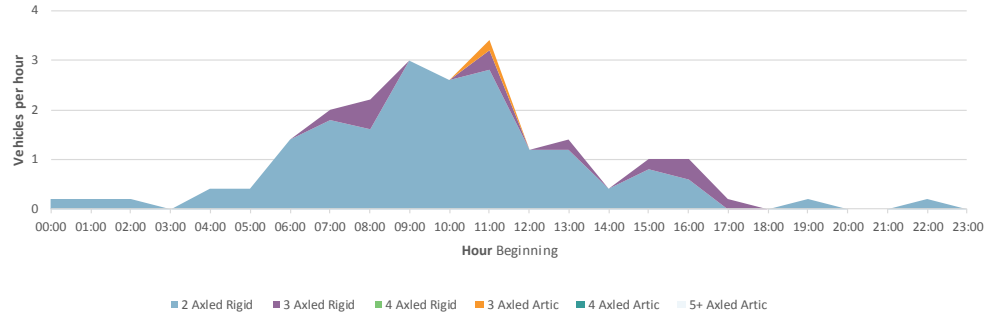
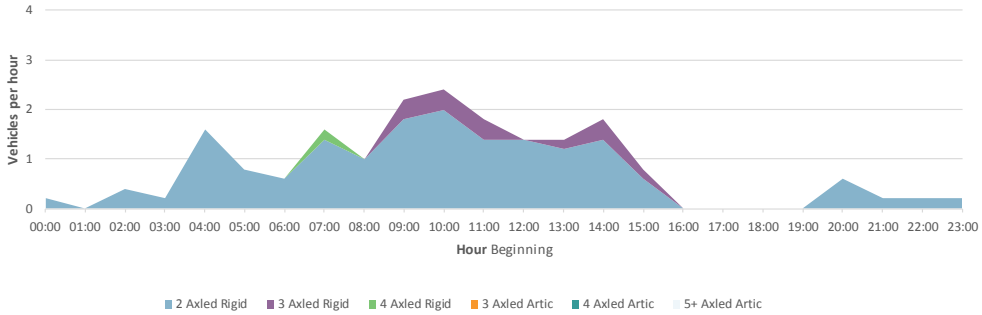


Figure 6.43: Daily Traffic flows – Weekday southbound

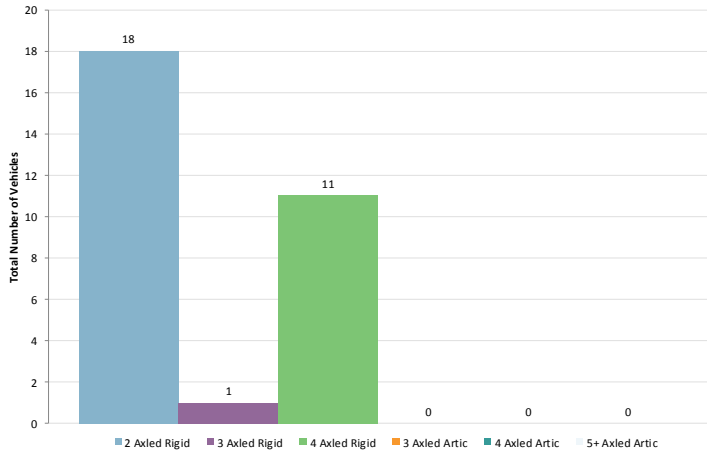


11. Carmelite Street (south) between Victoria Embankment and Tallis Street

OGVs using Carmelite Street (exiting onto Victoria Embankment) generally have low flows on both weekdays and weekends. On an average weekday, the number of OGVs using this section of Carmelite Street remains below 1 OGV per hour.

The most common OGVs are 2-axle rigid vehicles, both in weekday mornings and weekend.

Figure 6.45: Total number of OGVs



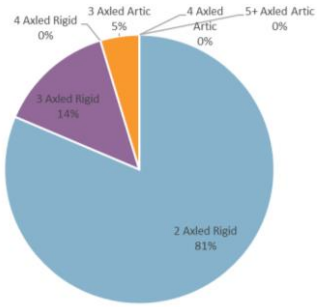
12. Tudor Street (west) between Temple Avenue and Carmelite Street

Although flows are relatively lows, OGVs traffic flows eastbound are higher than westbound flows, with 5+ axle articulated vehicles being the largest OGV transiting the street in the entire surveyed period.

The most common OGVs are 2-axle rigid vehicles, both eastbound and westbound.

On weekday, the traffic mix is mainly comprised in the AM hours of 2-axle rigid vehicles (80%) and in the PM hours of 2-, 3- and 4-axle rigid vehicles.

Figure 6.46: Vehicles distribution – Weekday (AM)



gure 6.48: Vehicles distribution – Weekday (PM)

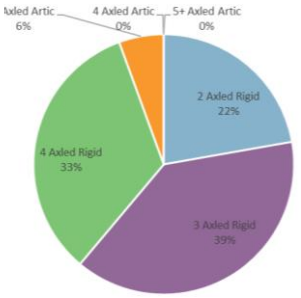


Figure 6.47: Daily Traffic flows – Weekday eastbound

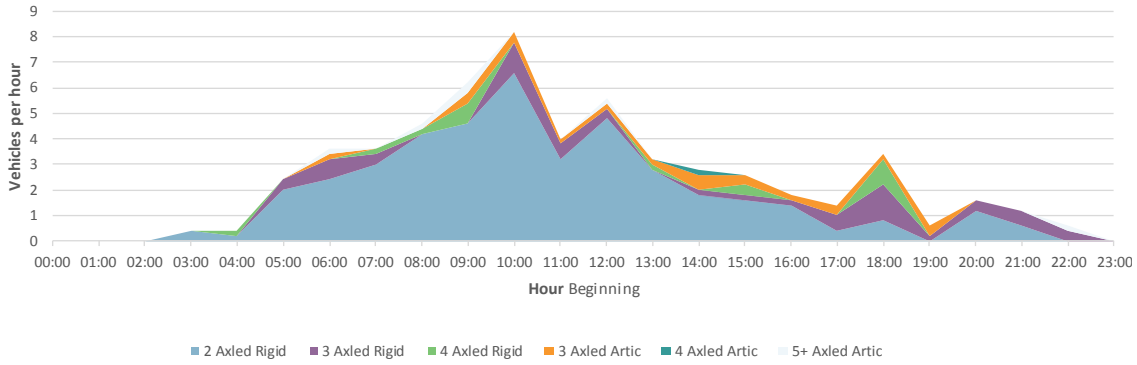


Figure 6.49: Total number of OGVs eastbound

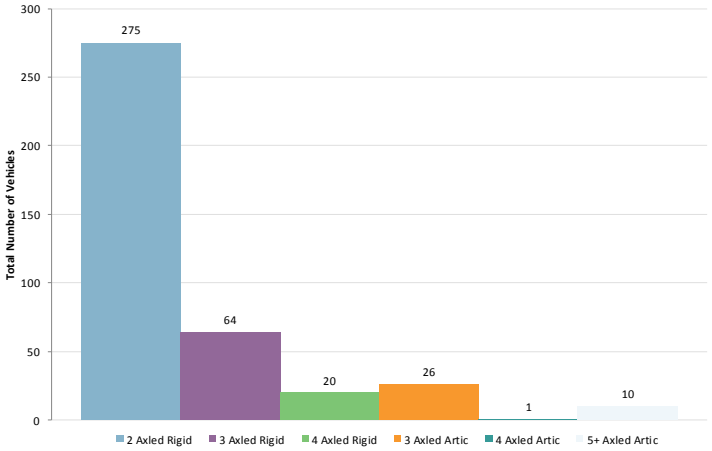


Figure 6.51: Daily Traffic flows – Weekday westbound

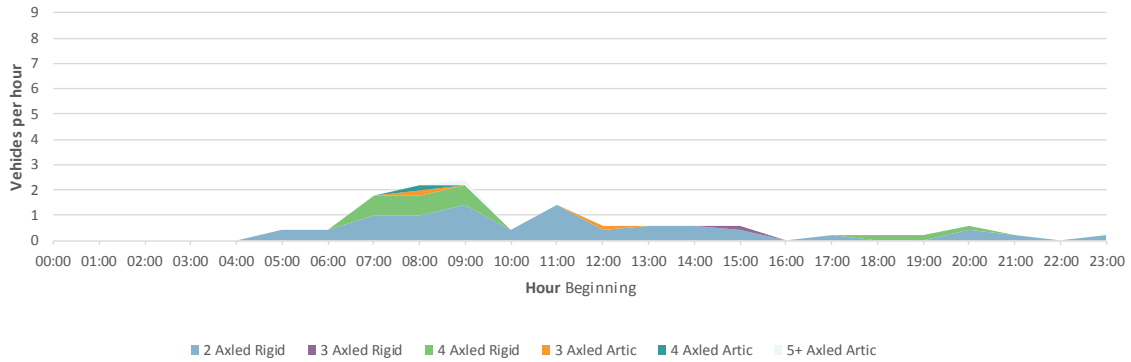
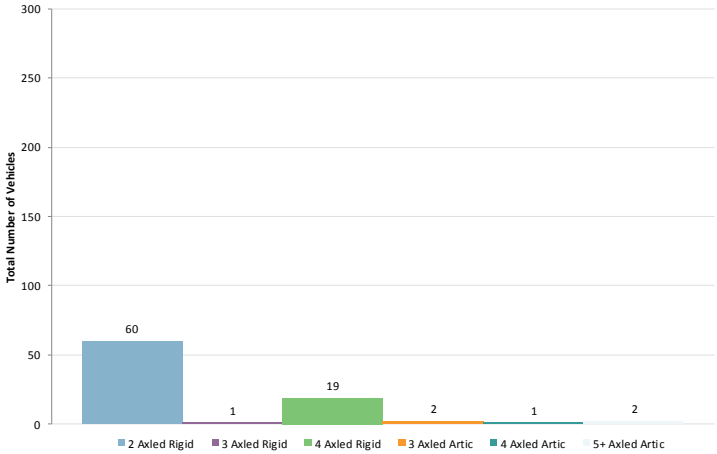


Figure 6.50: Total number of OGVs westbound



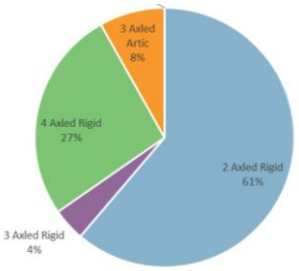
13. Tudor Street between Whitefriars Street and John Carpenter Street

OGVs traffic flows westbound are higher than eastbound, with 5+ axle articulated vehicles being the largest OGV transiting the street in the entire surveyed period.

The most common OGVs are 2-axle rigid vehicles, both eastbound and westbound.

On weekday, the traffic mix is comprised of 2-axle rigid vehicles (more than 60%), 3-axle articulated vehicles and 4-axle rigid vehicles.

Figure 6.52: Vehicles distribution – Weekday (AM)



gure 6.54: Vehicles distribution – Weekday (PM)

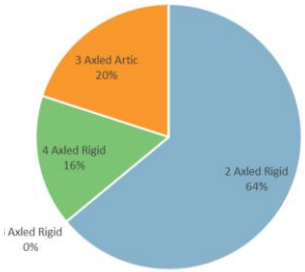


Figure 6.53: Daily Traffic flows – Weekday eastbound

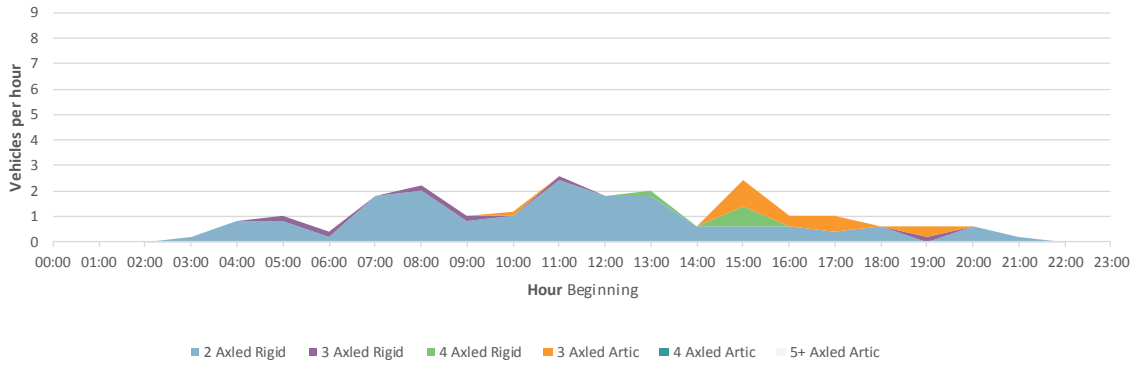


Figure 6.55: Total number of OGVs eastbound

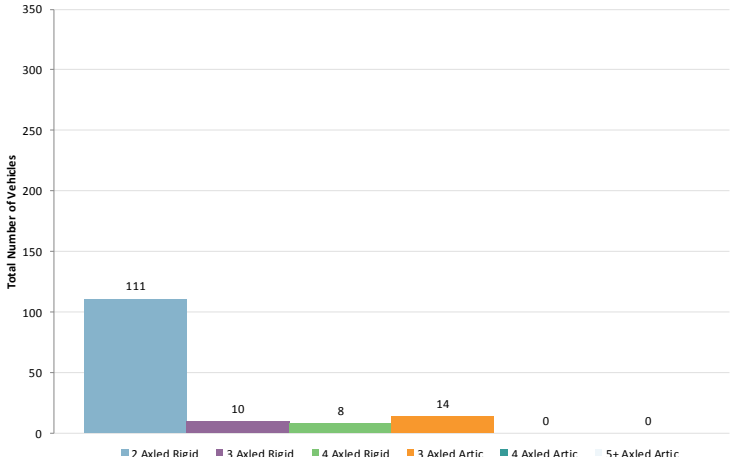


Figure 6.57: Daily Traffic flows – Weekday westbound

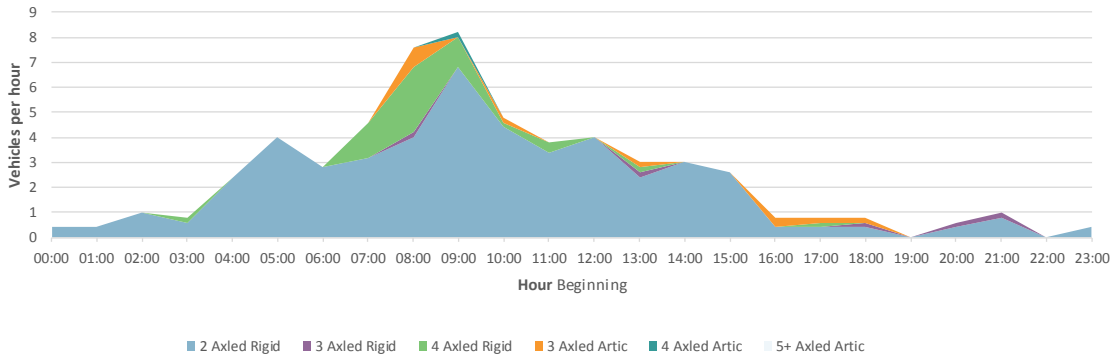
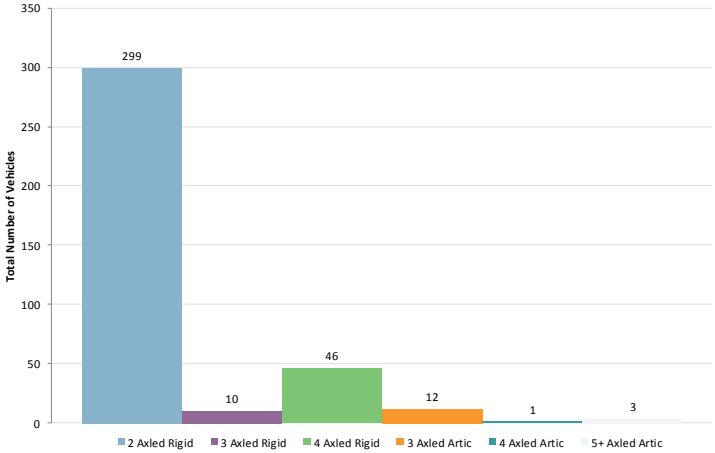


Figure 6.56: Total number of OGVs westbound



14. Tudor Street (east) between Dorset Rise and Bridewell Place

OGVs traffic flows are higher in the week than over the weekend.

The largest OGV transiting the street in the entire surveyed period is a 5+ axle articulated vehicle.

The most common OGVs are 2-axle rigid vehicles, both in weekday and weekend, apart from weekday afternoons where 3-axle articulated vehicles represent almost 40% of all OGVs.

Figure 6.58: Vehicles distribution – Weekday (AM)

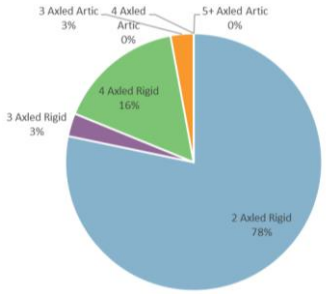


Figure 6.60: Vehicles distribution – Weekday (PM)

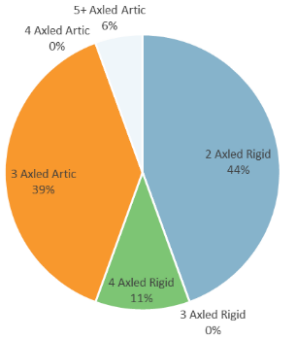


Figure 6.59: Daily Traffic flows – Weekday eastbound

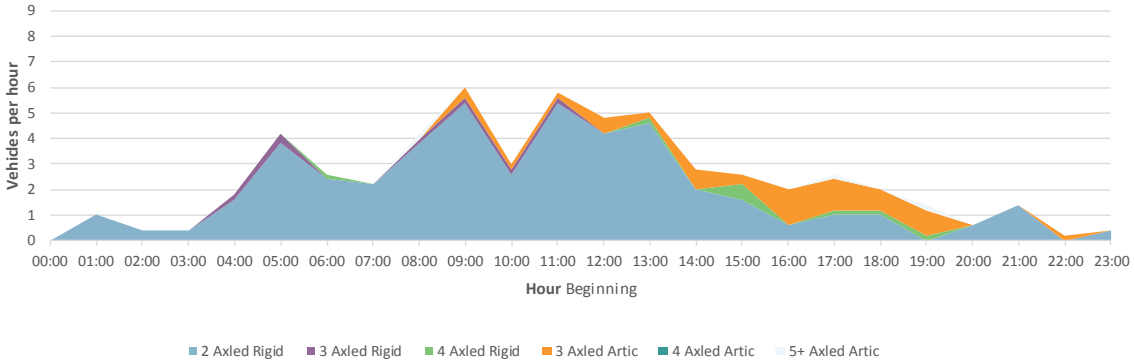


Figure 6.61: Total number of OGVs eastbound

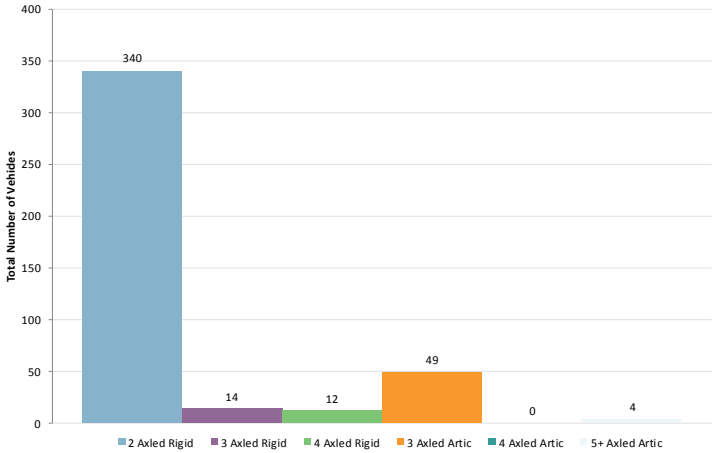


Figure 6.63: Daily Traffic flows – Weekday westbound

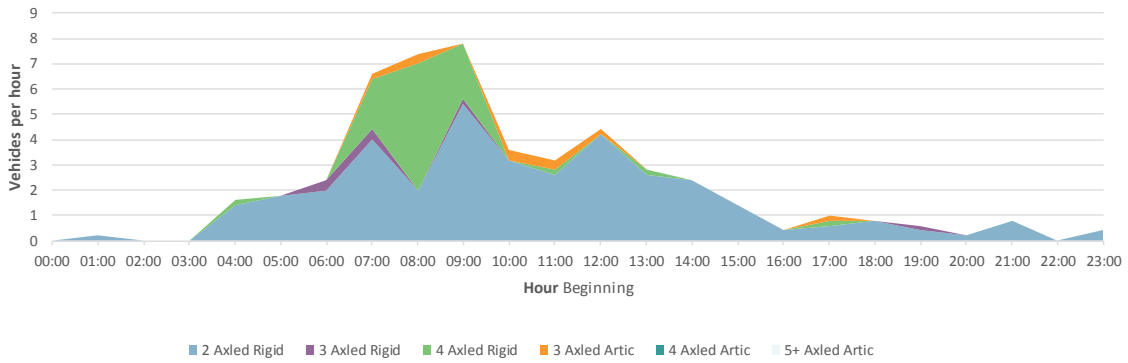
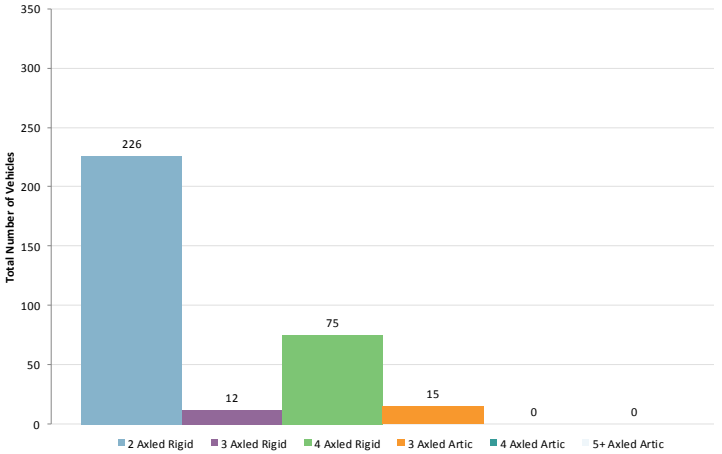


Figure 6.62: Total number of OGVs westbound



15. Tallis Street (west) between Temple Avenue and Carmelite Street

The largest OGV transiting the street in the entire surveyed period is a 4-axle rigid vehicle.

Both on weekdays and on weekend days, the most common OGVs are 2-axle rigid vehicles, with eastbound traffic flows being higher than westbound.

Figure 6.65: Total number of OGVs eastbound

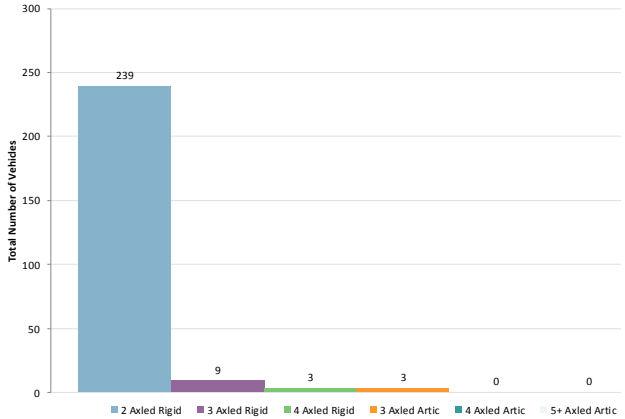


Figure 6.64: Total number of OGVs westbound

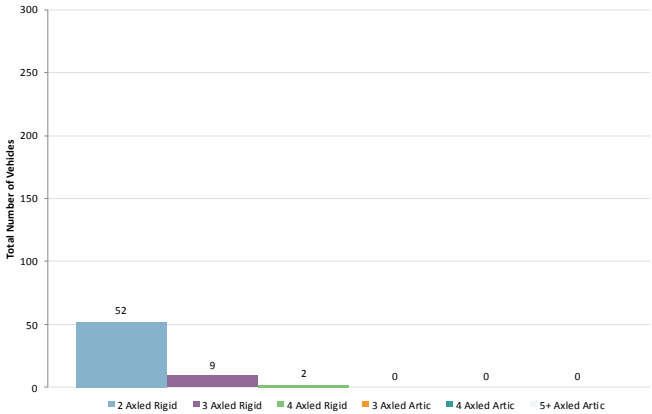


Figure 6.67: Daily Traffic flows – Weekday eastbound

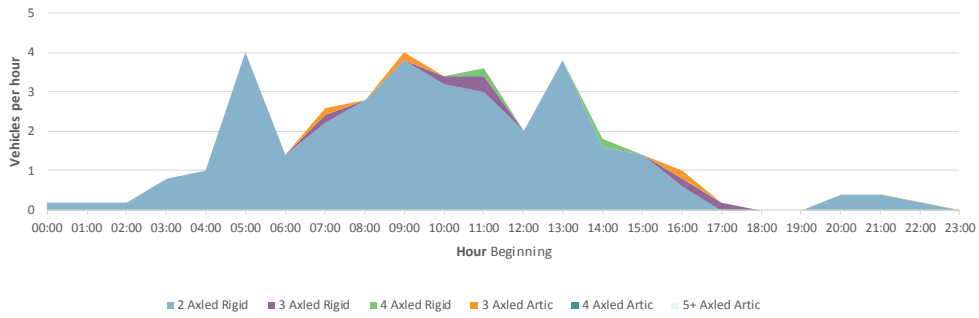
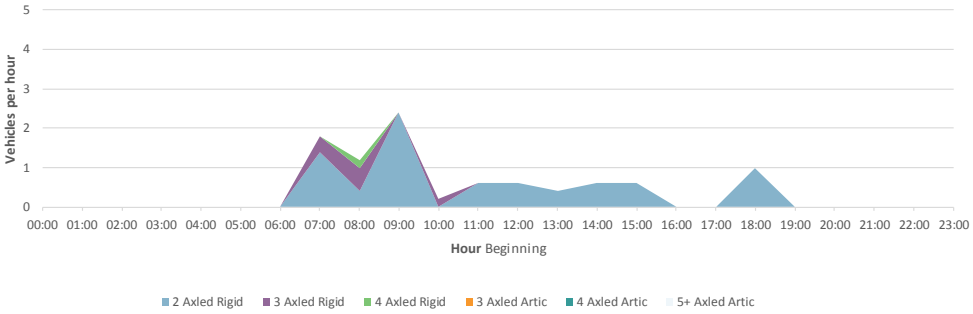


Figure 6.66: Daily Traffic flows – Weekday westbound



16. Tallis Street (east) between Carmelite Street and John Carpenter Street

The largest OGV transiting the street in the entire surveyed period is a 3-axle articulated vehicle.

As with the section of Tallis Street between Temple Avenue and Carmelite Street, both on weekdays and on the weekend, the most common OGVs are 2-axle rigid vehicles, with eastbound traffic flows being higher than westbound.

Figure 6.69: Total number of OGVs eastbound

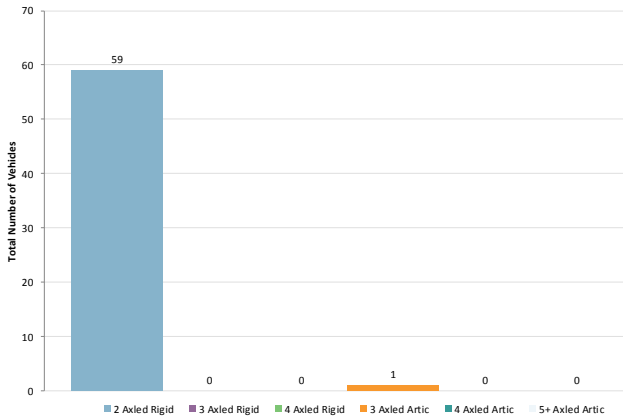


Figure 6.68: Total number of OGVs westbound

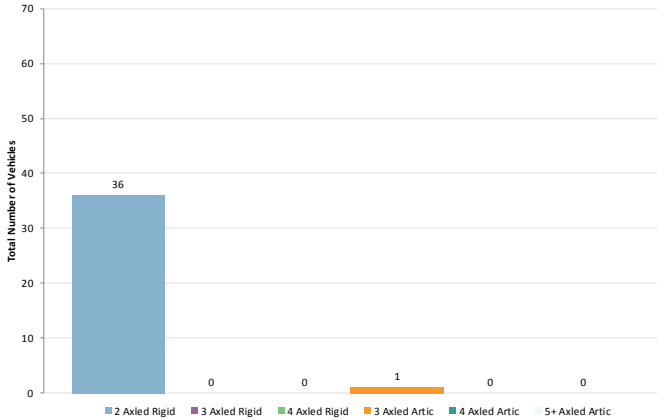


Figure 6.71: Daily Traffic flows – Weekday eastbound

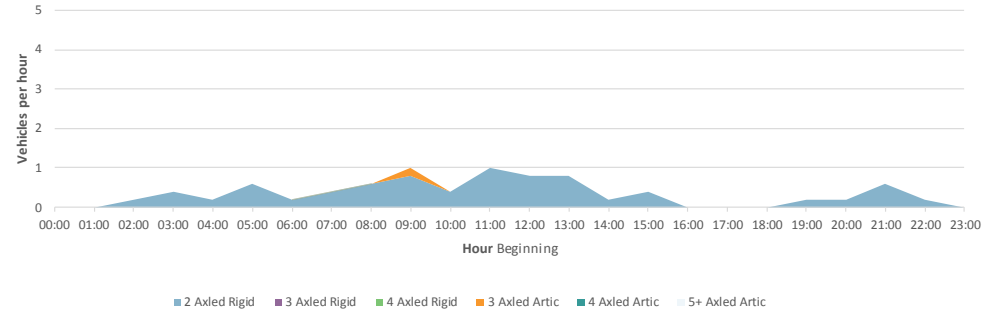
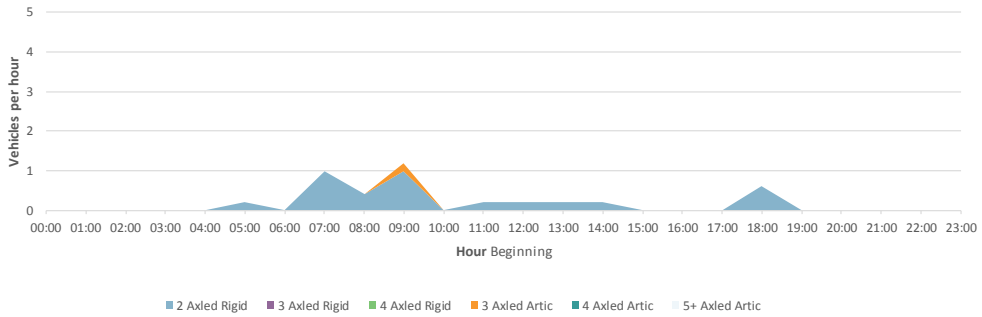


Figure 6.70: Daily Traffic flows – Weekday westbound



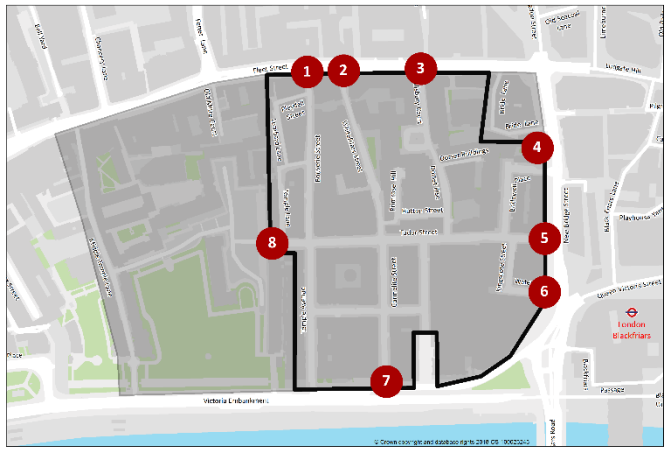
OD Movements

The diagrams on the following pages illustrate the results for each of the 8 nodes presented in Figure 6.72, and these are discussed in the accompanying text.

It should be noted that the OD surveys relate to an average weekday and an average weekend day. These averages have been taken from 5 weekday 24-hour surveys and 2 weekend 24-hour surveys, and therefore are not directly comparable to the survey results discussed in other sections of this report (which relate to averages of ATC or MCC analysis).

For one-way streets into/out of the area, some movements have been picked up in the other direction. These movements are likely erroneously picked up by the ANPR camera, or are movements picked up from vehicles making a U-turn. As these numbers are very low, one-way streets with erroneous illegal movements are not discussed. In the following section.

Figure 6.72: Cordon and locations of OD nodes



Bouverie Street North (SB)

Over half the OGV flows entering via Bouverie Street North remain within the cordon, on both the average weekday and weekend, with 56% and 58% respectively.

OGV flows during the weekend are approximately 10% of those recorded for weekdays.

Figure 6.73: OGV flows from Bouverie Street North to other nodes – Weekday

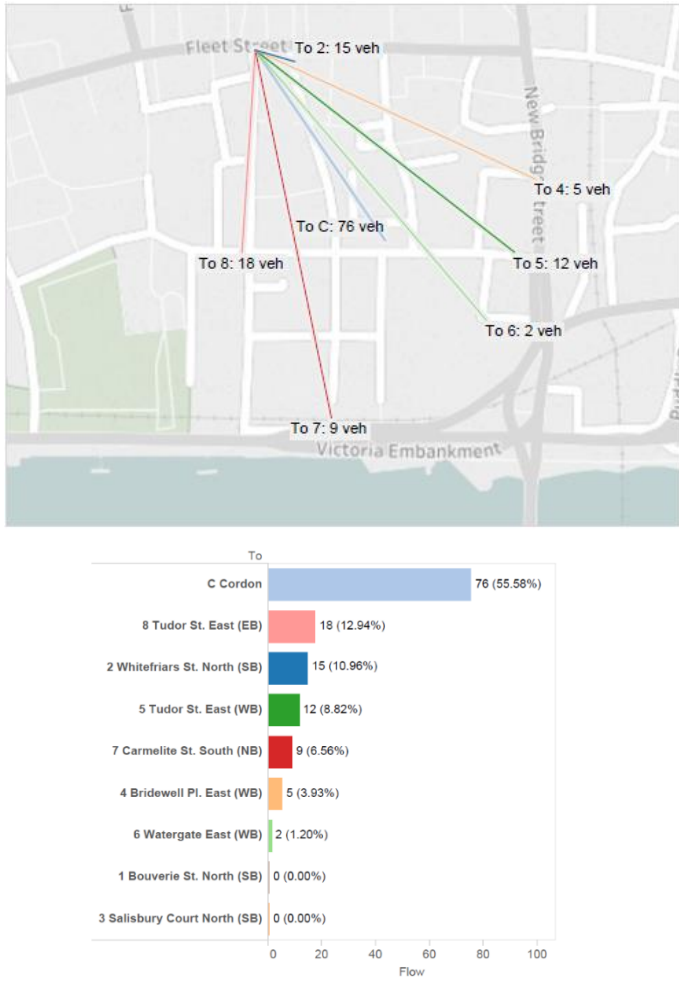
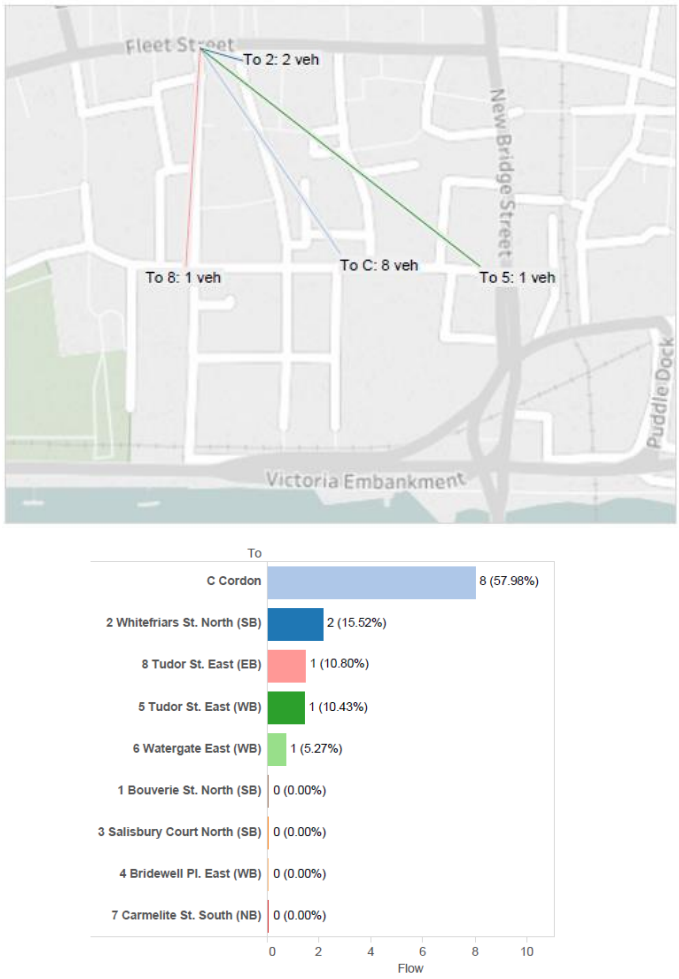


Figure 6.74: OGV flows from Bouverie Street North to other nodes – Weekend



Whitefriars Street North (SB)

Over 60% of the OGV flows towards Whitefriars Street are coming from within the cordon on the average weekday, and 40% on the weekend.

Figure 6.75: OGV flows to Whitefriars Street North from other nodes – Weekday

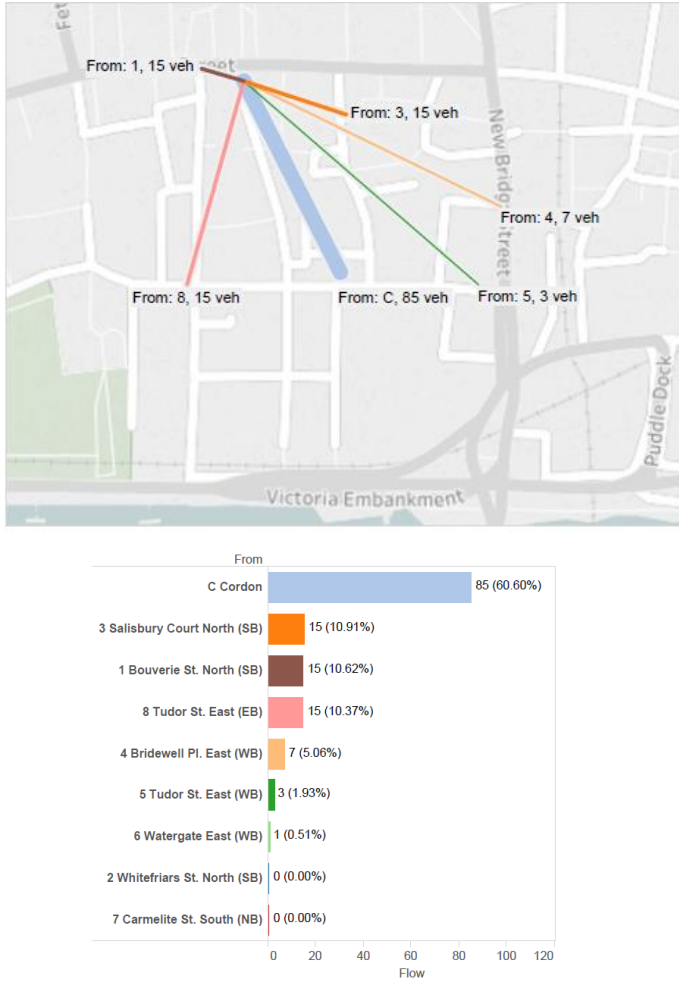
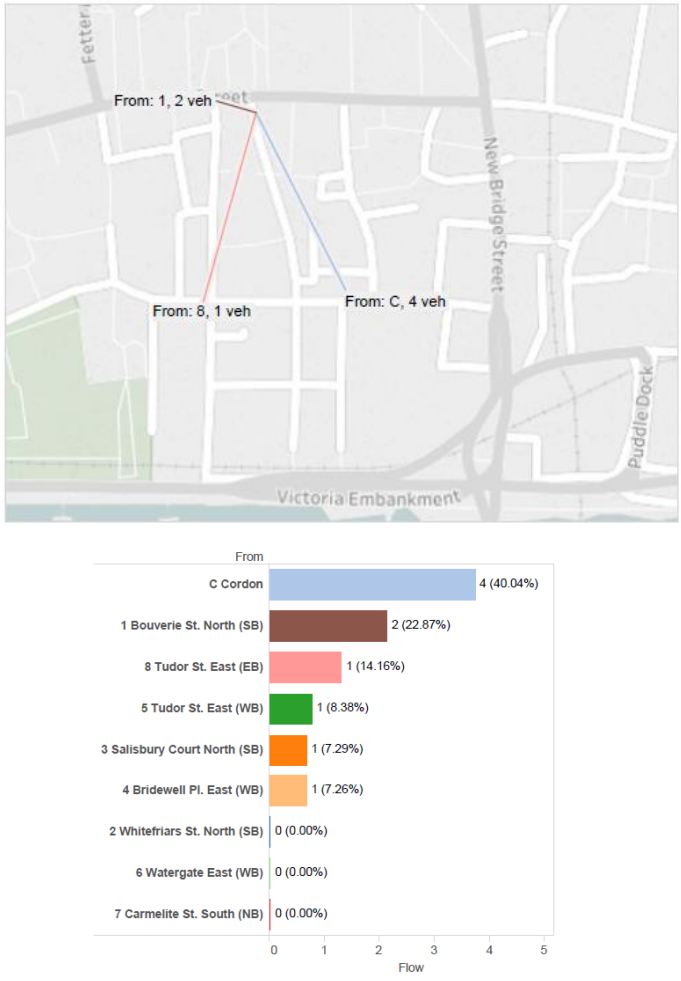


Figure 6.76: OGV flows to Whitefriars Street North from other nodes – Weekend



Salisbury Court North (SB)

Both on week and weekend days, the highest percentage of the OGV flows entering in Salisbury Court North remain within the cordon.

On a weekday, 55% of the OGV flow remains within the cordon, 24% travels to Whitefriars Street North and 10% to Tudor Street East.

Figure 6.77: OGV flows from Salisbury Court North to other nodes – Weekday

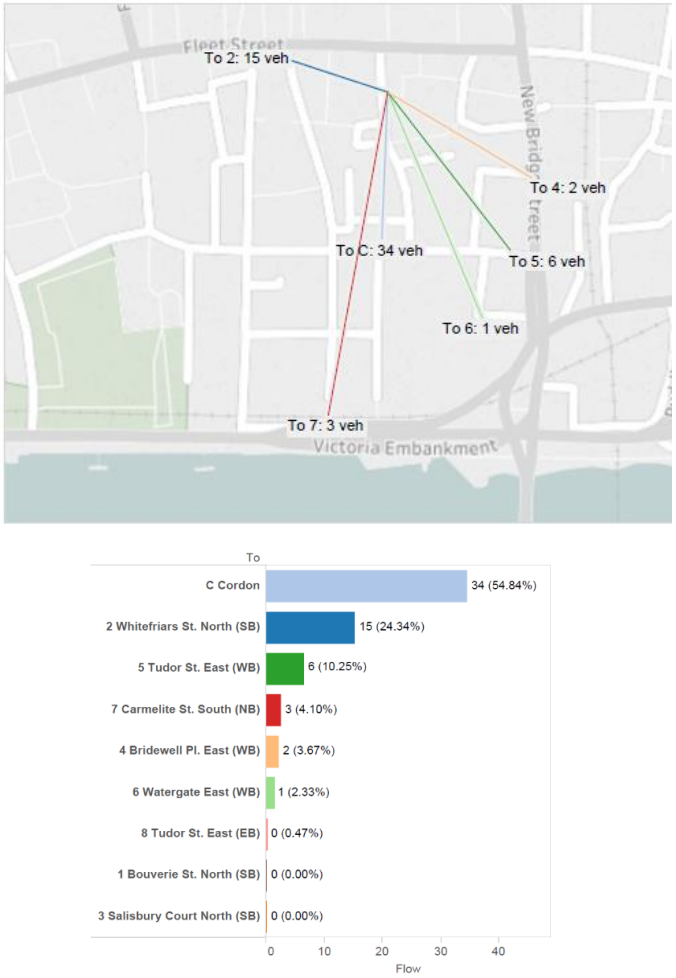
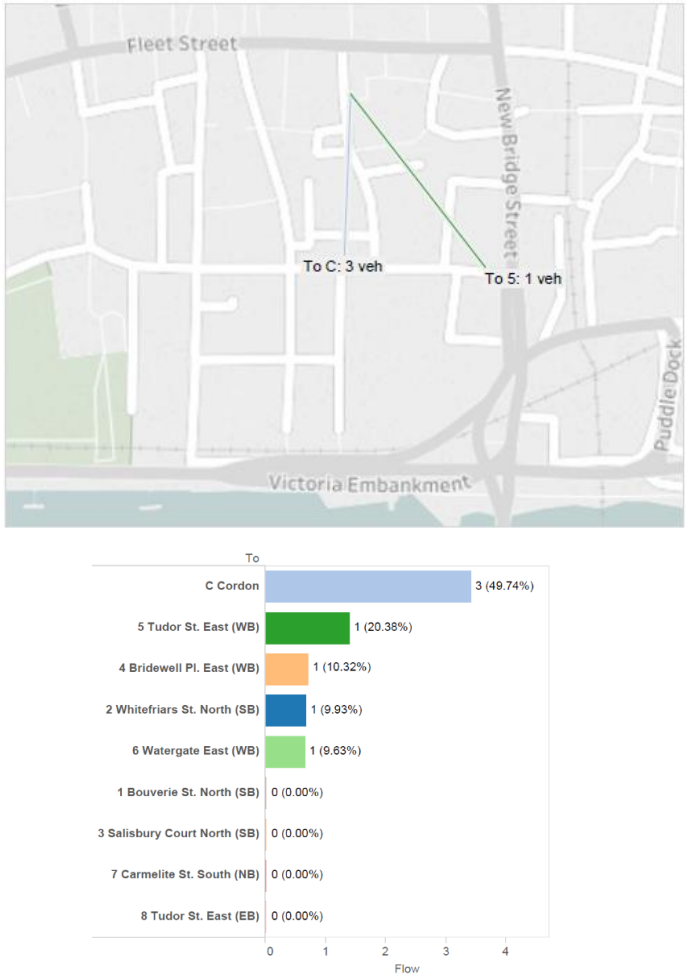


Figure 6.78: OGV flows from Salisbury Court North to other nodes – Weekend



Bridewell Place East (Bidirectional)

OGV flows from Bridewell Place East to the other nodes follow a similar pattern to those previously described, with more than half remaining within the cordon during the week (53%).

As shown in Figure 6.79, on a weekday, OGV flows to Bridewell Place East mainly enter at the cordon as well as Bouverie Street North.

On the weekend, OGV flows to Bridewell Place East are negligible.

Figure 6.79: OGV flows from Bridewell Place East to other nodes – Weekday

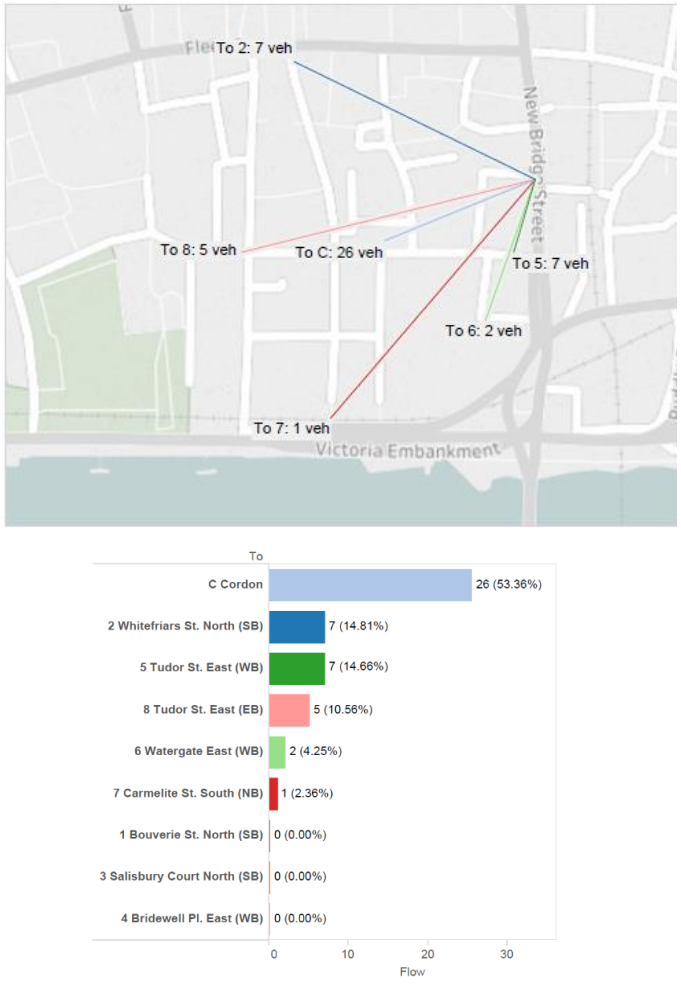


Figure 6.80: OGV flows from Bridewell Place East to other nodes – Weekend

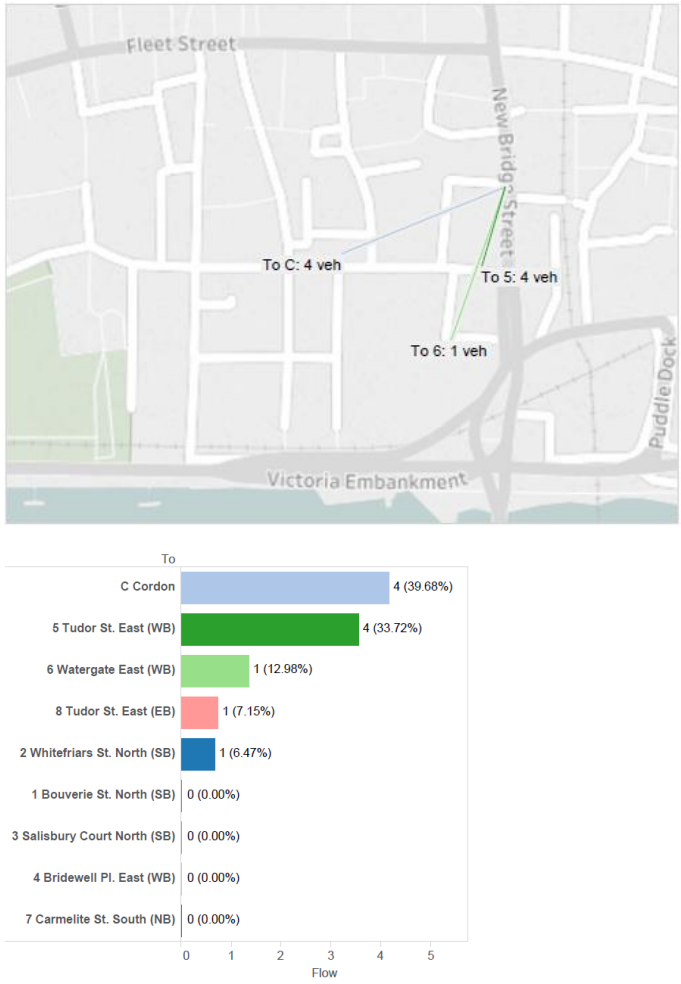
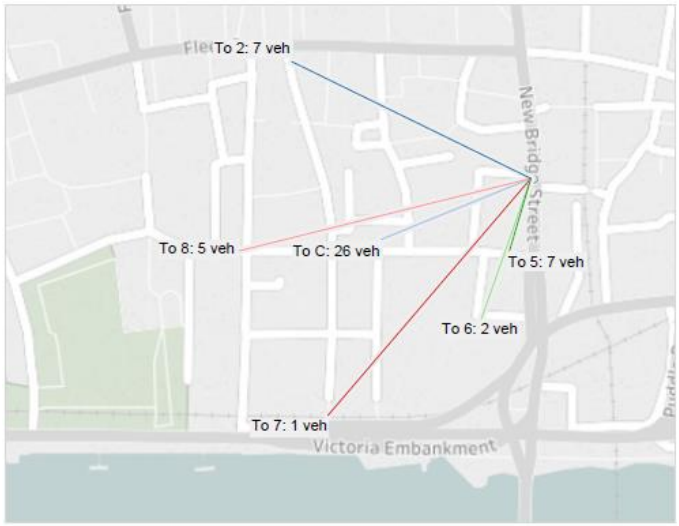
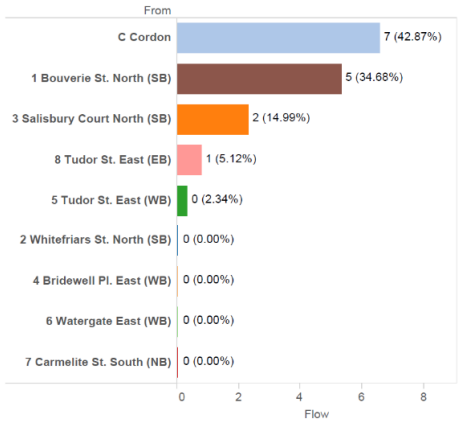


Figure 6.81: OGV flows to Bridewell Place East from other nodes – Weekday





Tudor Street east (WB)

Both on weekdays and weekend days, OGV flows entering in Tudor Street East are very low.

Nearly half of OGV flows to Tudor Street east are already within the Cordon on both the weekday and weekend.

Figure 6.82: OGV flows to Tudor Street East (WB) from other nodes – Weekday

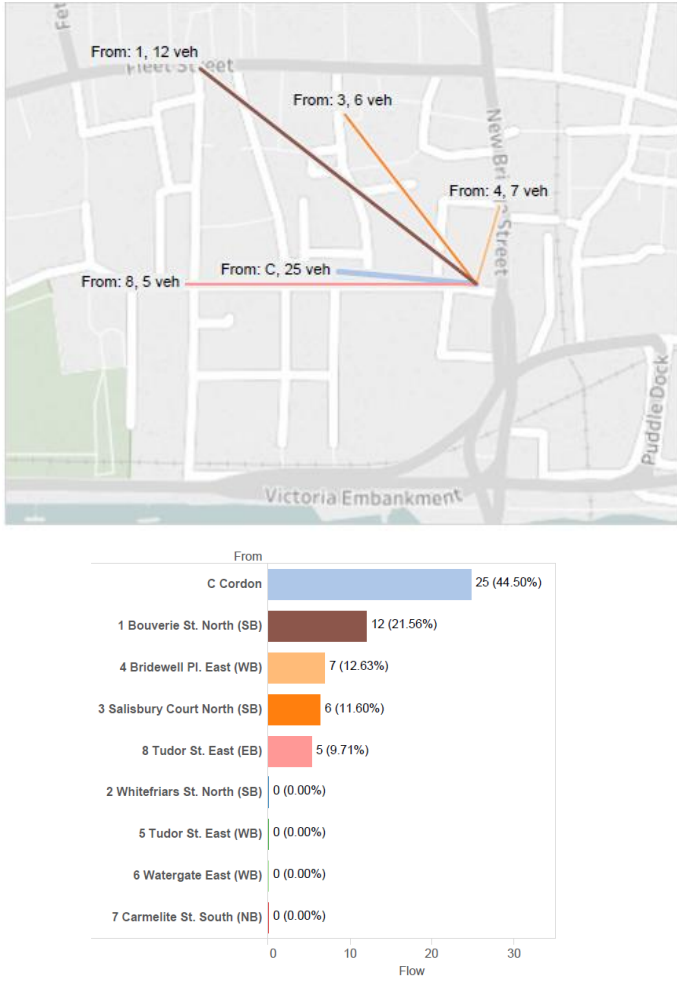
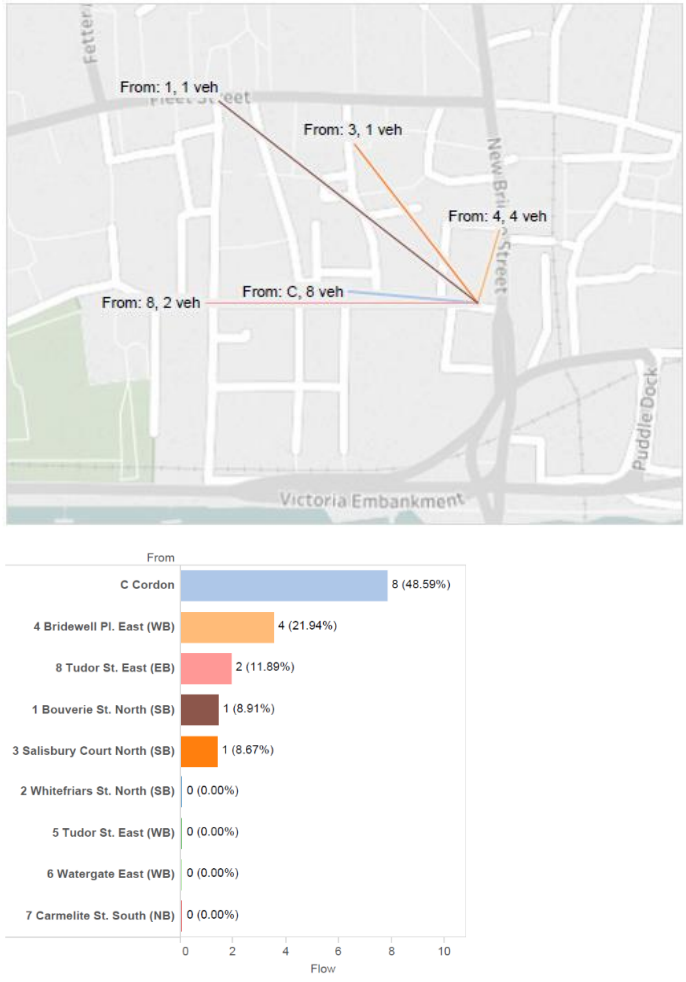
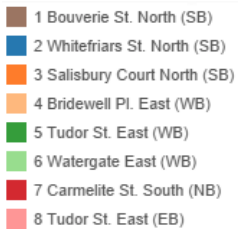


Figure 6.83: OGV flows to Tudor Street East (WB) from other nodes – Weekend





Watergate East (EB)

Throughout the week, most of the OGVs travelling to Watergate East comes from within the Cordon.

OGV flows on the weekend are significantly lower than on weekdays.

Figure 6.84: OGV flows to Watergate East from other nodes – Weekday

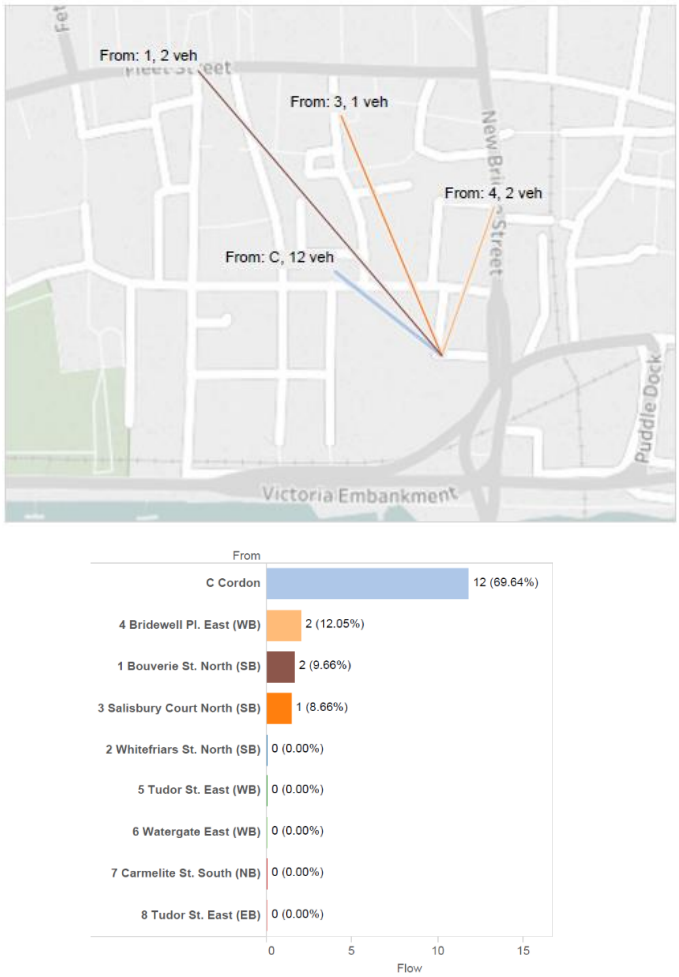
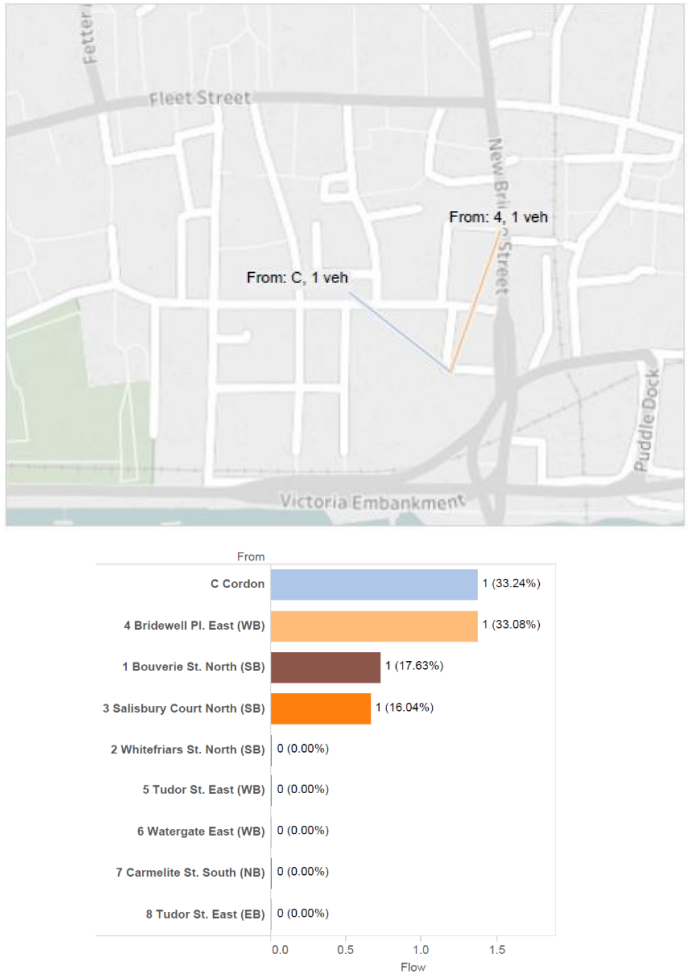


Figure 6.85: OGV flows to Watergate East from other nodes – Weekend



Carmelite Street South (SB)

On weekdays, 50% of the OGVs travelling to Carmelite Street are already within the Cordon while 31% originate from Bouverie Street.

Over the weekend, only 2 OGVs are travelling to Carmelite Street (on average) and both are already within the Cordon.

Figure 6.86: OGV flows to Carmelite Street South from other nodes – Weekday

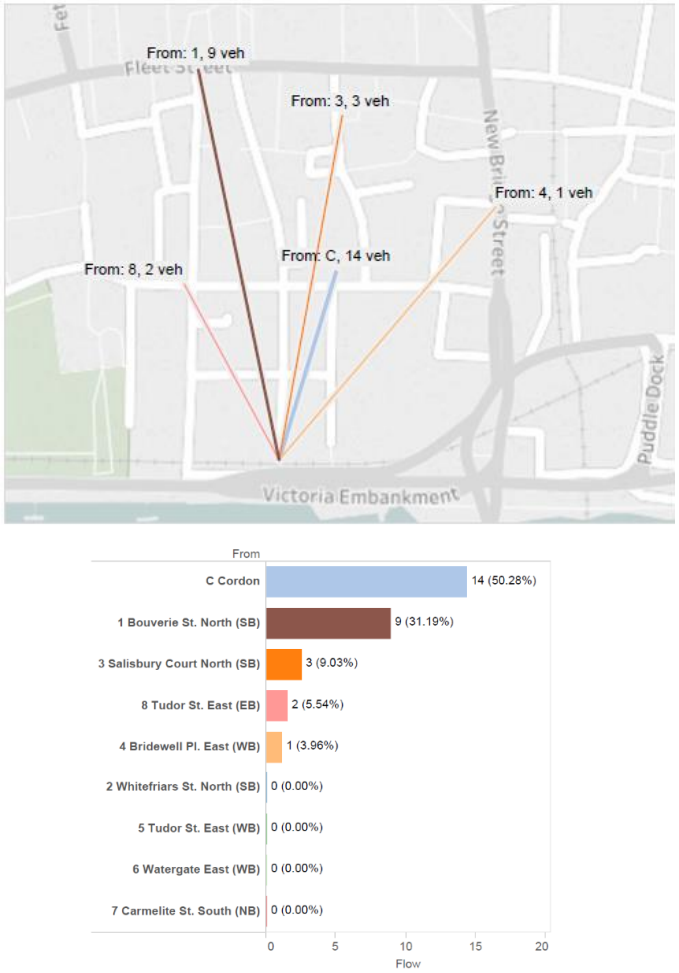
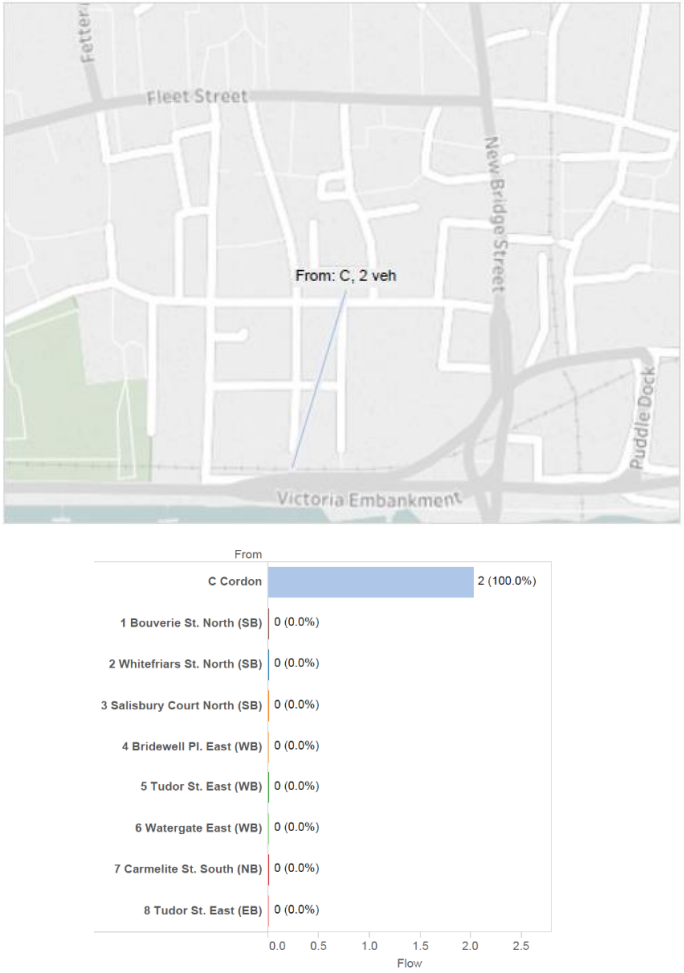


Figure 6.87: OGV flows to Carmelite Street South from other nodes – Weekend



Tudor Street east (EB)

On weekdays, nearly half (48%) of the OGVs from Tudor Street east travel towards Whitefriars Street, while more than a quarter (27%) stay within the cordon.

As with most of the streets described above, during the weekend, the number of recorded OGVs originating from Tudor Street east is very low so it difficult to draw any firm conclusions.

OGVs to Tudor Street east primarily originate from Bouverie Street North on weekdays.

Figure 6.88: OGV flows from Tudor Street East (EB) to other nodes – Weekday

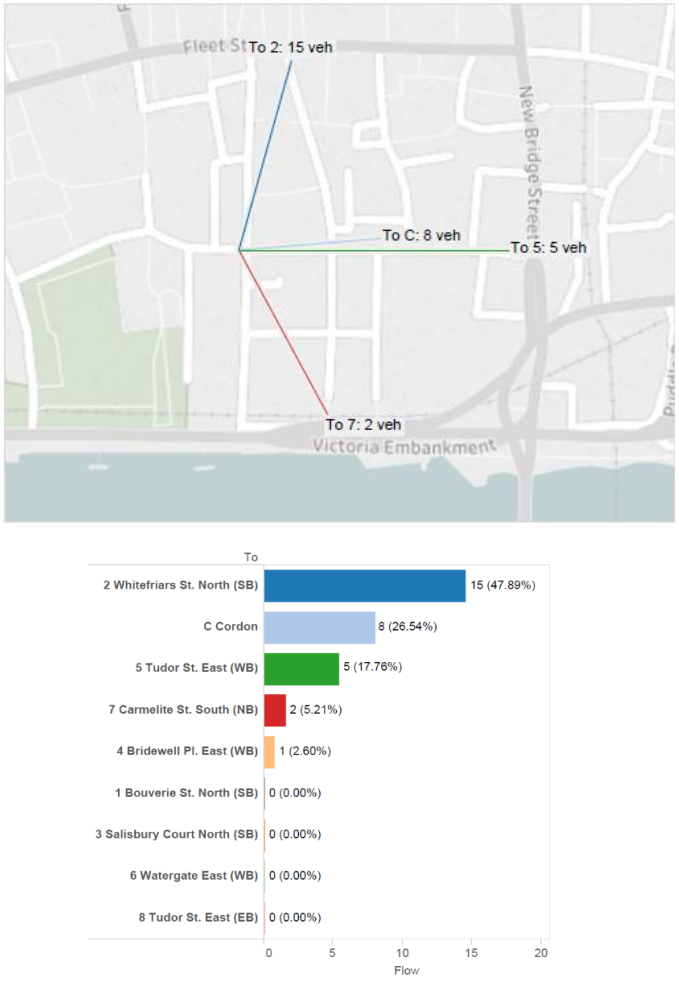


Figure 6.89: OGV flows from Tudor Street East (EB) to other nodes – Weekend

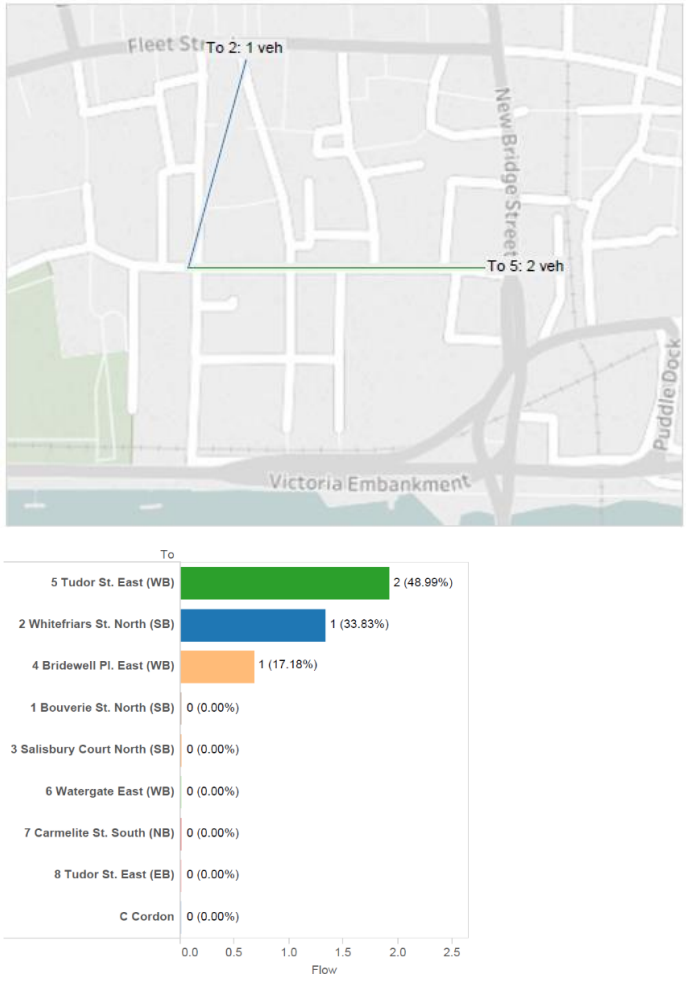


Figure 6.90: OGV flows to Tudor Street East (EB) from other nodes – Weekday

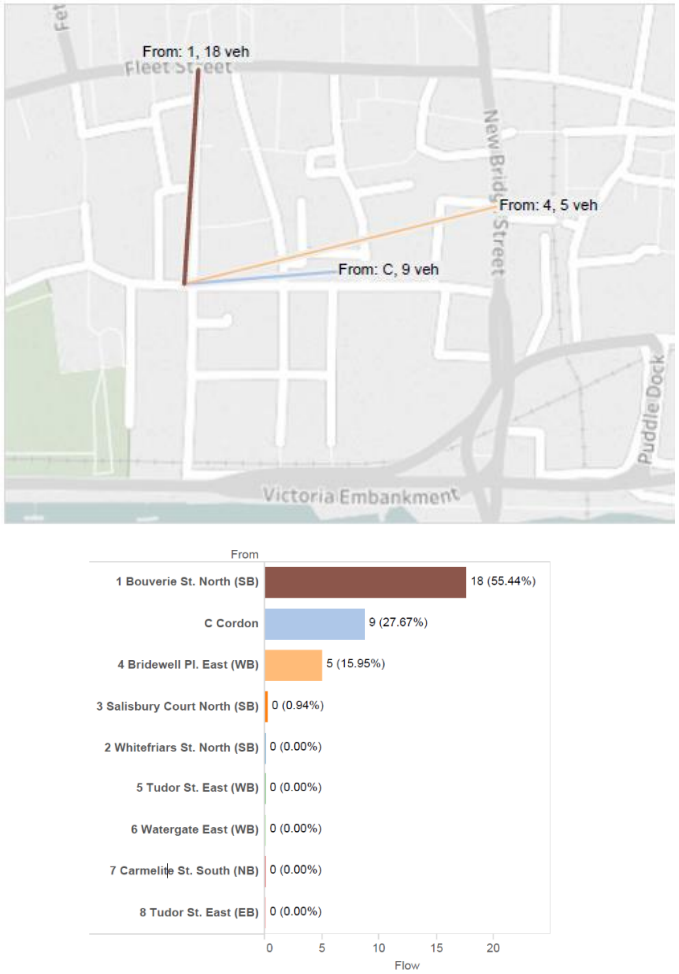
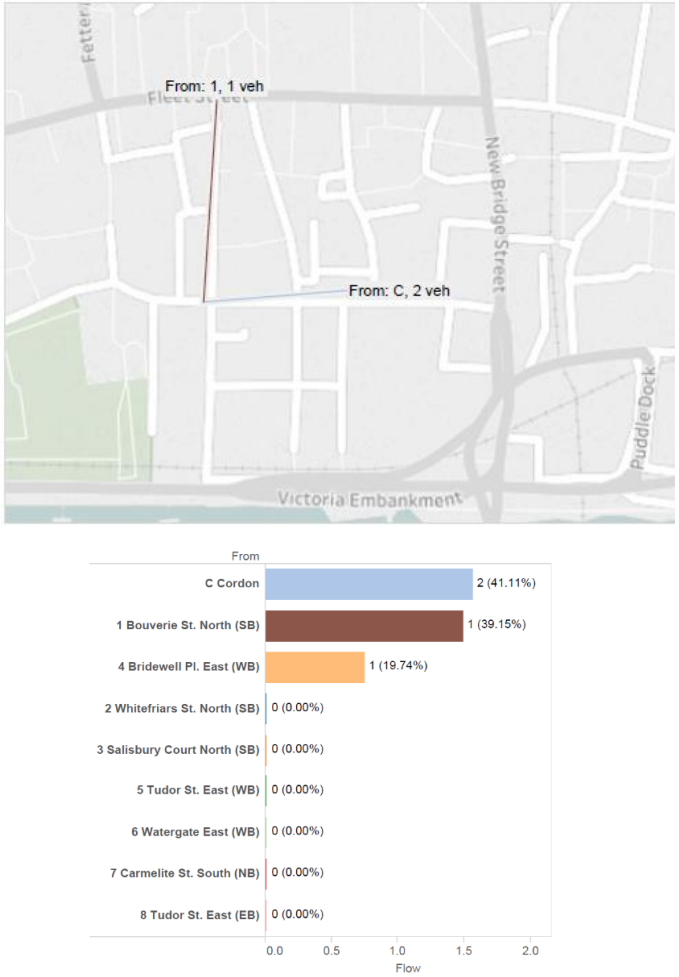


Figure 6.91: OGV flows to Tudor Street East (EB) from other nodes – Weekend



Cordon

The main destination of OGV flows originating from within the Cordon are Whitefriars Street and Tudor Street east, with Whitefriars Street being the most common destination on weekdays and Tudor Street East during the weekend.

OGV flows with a destination within the Cordon are more likely to enter at Bouverie Street on both week and weekend days.

Figure 6.92: OGV flows from Cordon to other nodes – Weekday

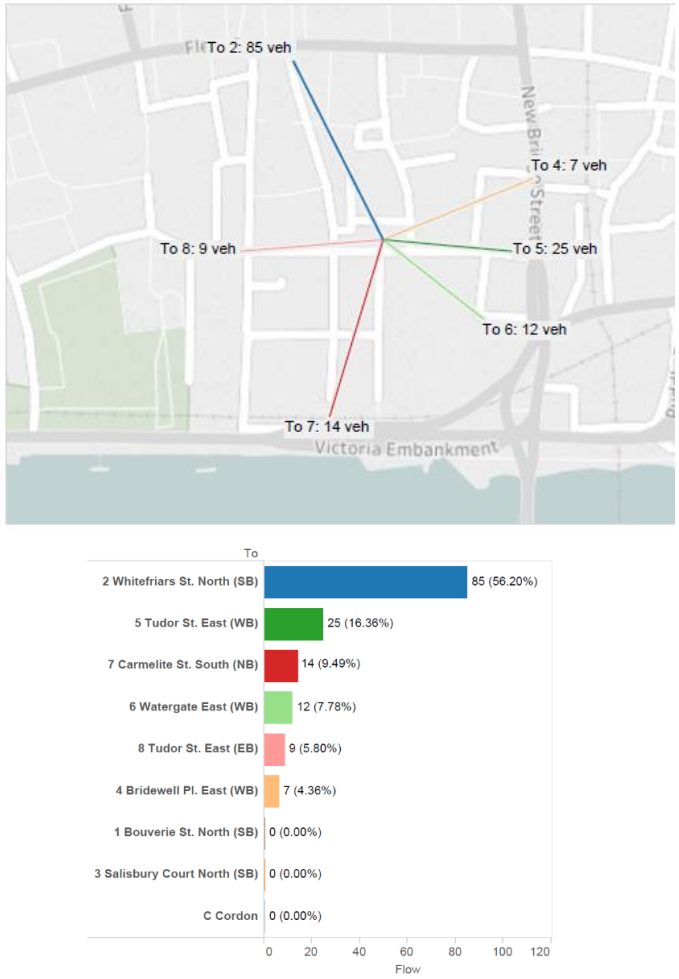


Figure 6.93: OGV flows from Cordon to other nodes – Weekend

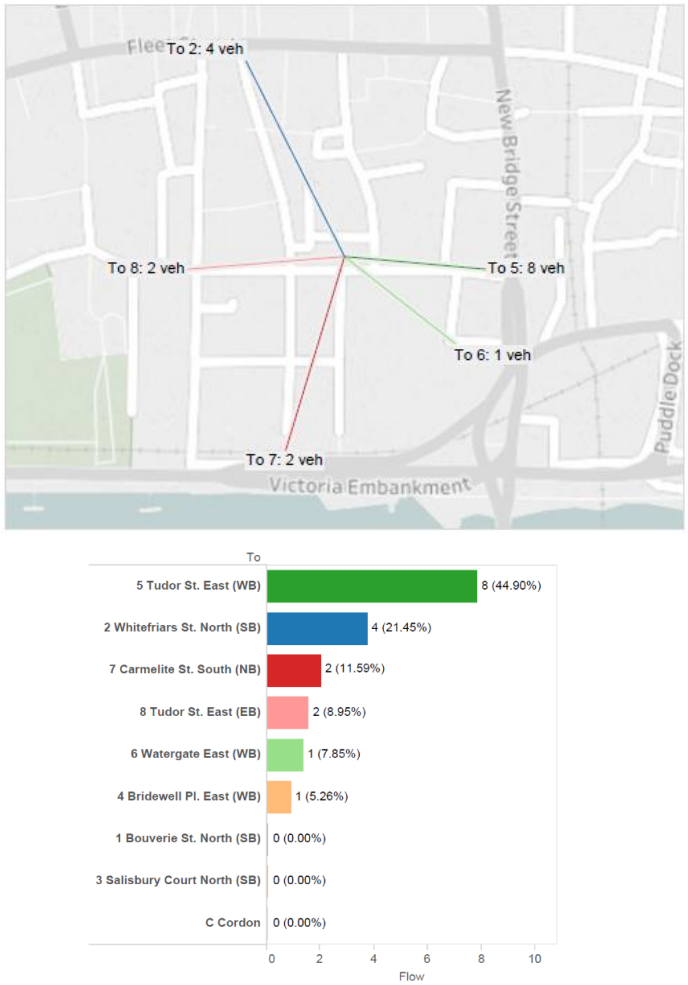
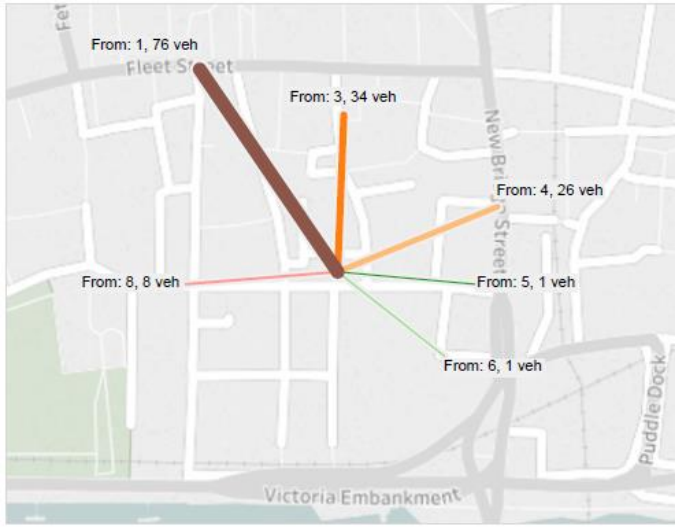


Figure 6.94: OGV flows to Cordon from other nodes – Weekday



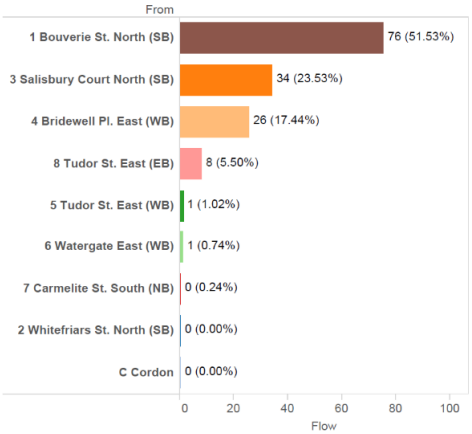
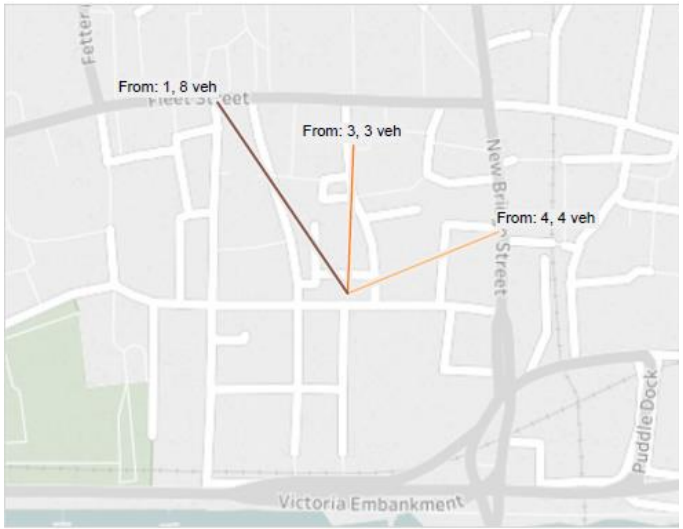
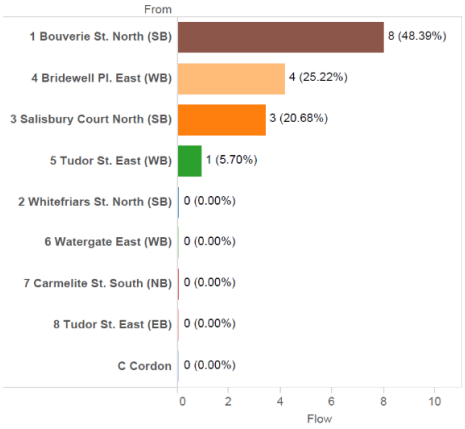


Figure 6.95: OGV flows to Cordon from other nodes – Weekend





Conclusion

This chapter presents and discusses the outcomes of analysis of goods vehicles in the study area. This chapter has summarised the turning flow analysis, flow profiles and vehicle splits (type of goods vehicles), and looked at the OD movements of goods vehicles.

Turning Flow Analysis

For the turning flow analysis, vehicles were split into OGV1 (aggregate 2 in Figure 5.6) and OGV2 (aggregate 3 in Figure 5.6) categories.

- The busiest OGV1 movements were observed from Bouverie Street to Tudor Street
- The number of OGV2 vehicles is very low in the area

Flow Profiles and vehicle splits

The analysis of the types of goods vehicles using the roads in the study area has shown which links carry the highest number of goods vehicles on an average weekday, and this gives insight into the largest types of vehicles traversing through the area.

- Most vehicles in the area are 2-axle rigid vehicles, with high volumes on Bouverie Street (over 600 per week), Tudor Street (over 300 vehicles per week), Tallis Street (nearing 300 vehicles per week) and Whitefriars Street (approaching 1000 vehicles per week).
- Of the larger vehicles, the 3-axle artic is the most common, with high flows on Bouverie Street, Tudor Street and Whitefriars Street with a maximum of 85 vehicles per week.
- The number of vehicles of the largest type (5+ axle artic) is very low, with the highest flows measured on Temple Avenue at 8 vehicles per week, Bouverie Street at 5 vehicles per week and Tudor Street (between Bouverie Street and Whitefriars Street) at 10 vehicles per week.

OD Movements

As with the analysis included in Chapter 4, Bouverie Street is the main entry point for good vehicle movements through the Temple Area, while Whitefriars Street is the main exit point out of the area.

- OD analysis has shown that the most common movement is from Bouverie Street to Whitefriars Street
- The combination of the OD analysis and the Turning Flow analysis shows that some vehicles use Tallis Street instead of Tudor Street to make the movement from Bouverie Street (entry) to Whitefriars Street (exit). This suggests these vehicles are unable to make the turn at Bouverie Street into Tudor Street.

7 Cycle Movements

Cycle Movements

Figure 7.1, Figure 7.2 and Figure 7.3 show cycle movements in the weekday AM and PM peak on Tudor Street and Tallis Street, and then the same turning movements but for the weekend.

Movement patterns for cycling are similar to those of general traffic, with flows predominantly going westbound on Tudor Street and northbound on Temple Avenue in the morning peak and the opposite tidal pattern of eastbound and southbound flows in the PM peak.

During the AM peak, over 50% of the westbound cyclists using Tudor Street turn left at Temple Avenue. Our analysis also highlights that the total number of cyclists in the area is considerably higher in the AM peak then in the PM peak.

Cycle volumes are considerably lower during the weekend peak, with no turning movement exceeding 8 cyclists per hour.

Figure 7.1: AM peak cycle movements (cycles per hour)

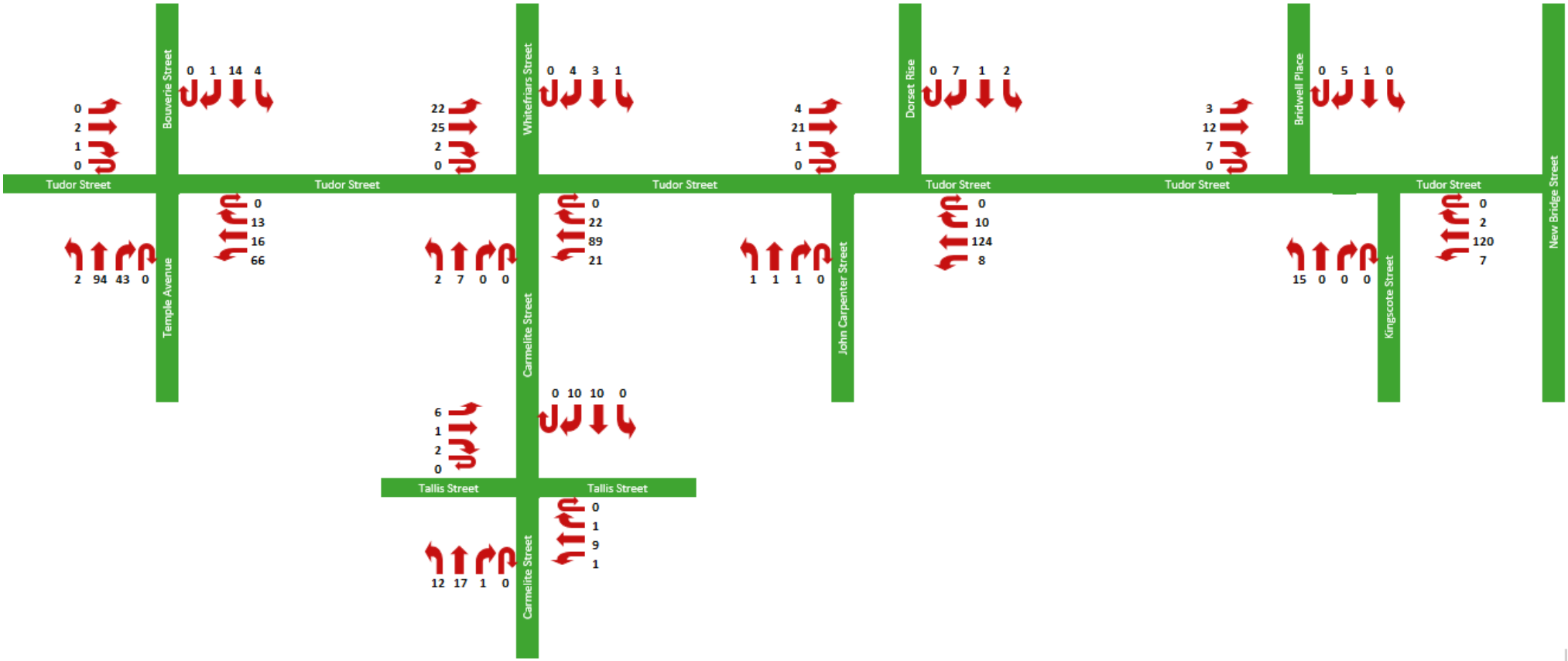


Figure 7.2: PM peak cycle movements (cycles per hour)

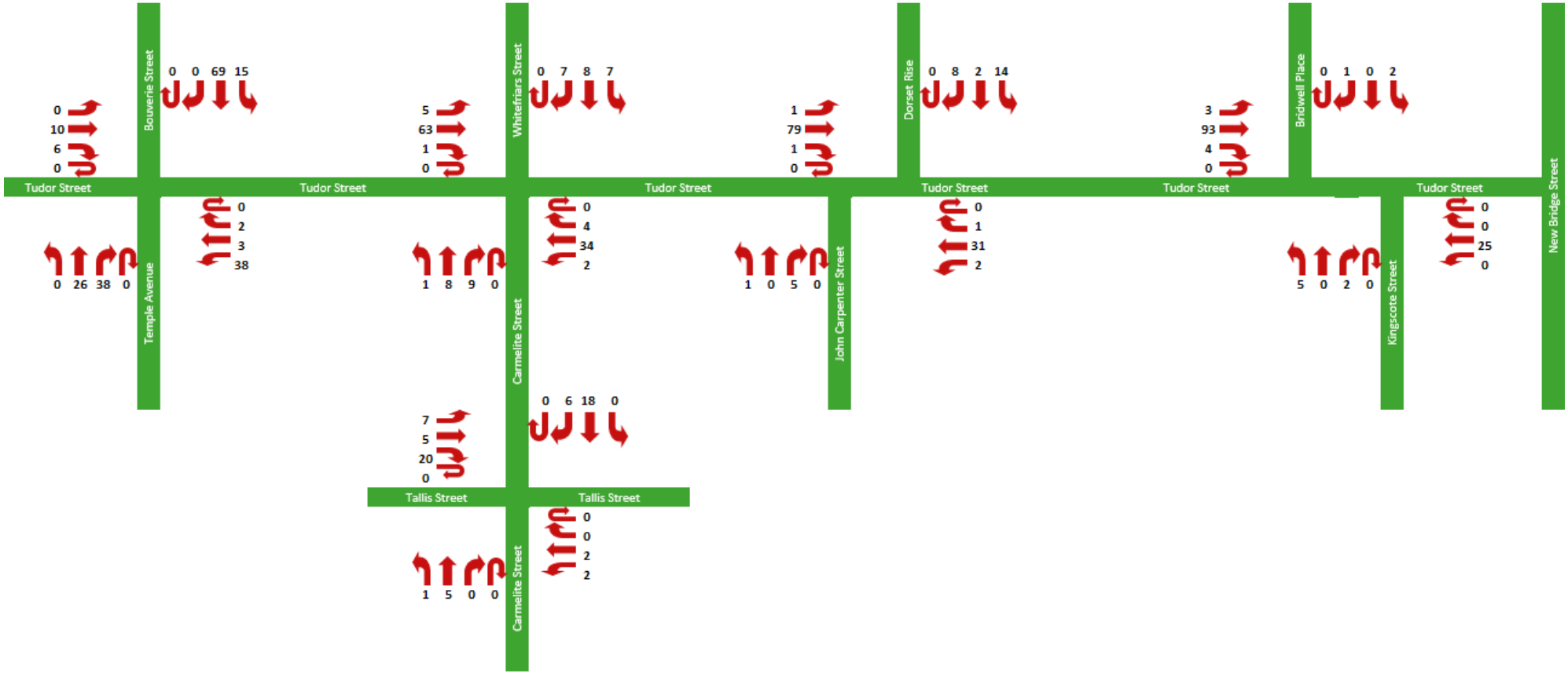
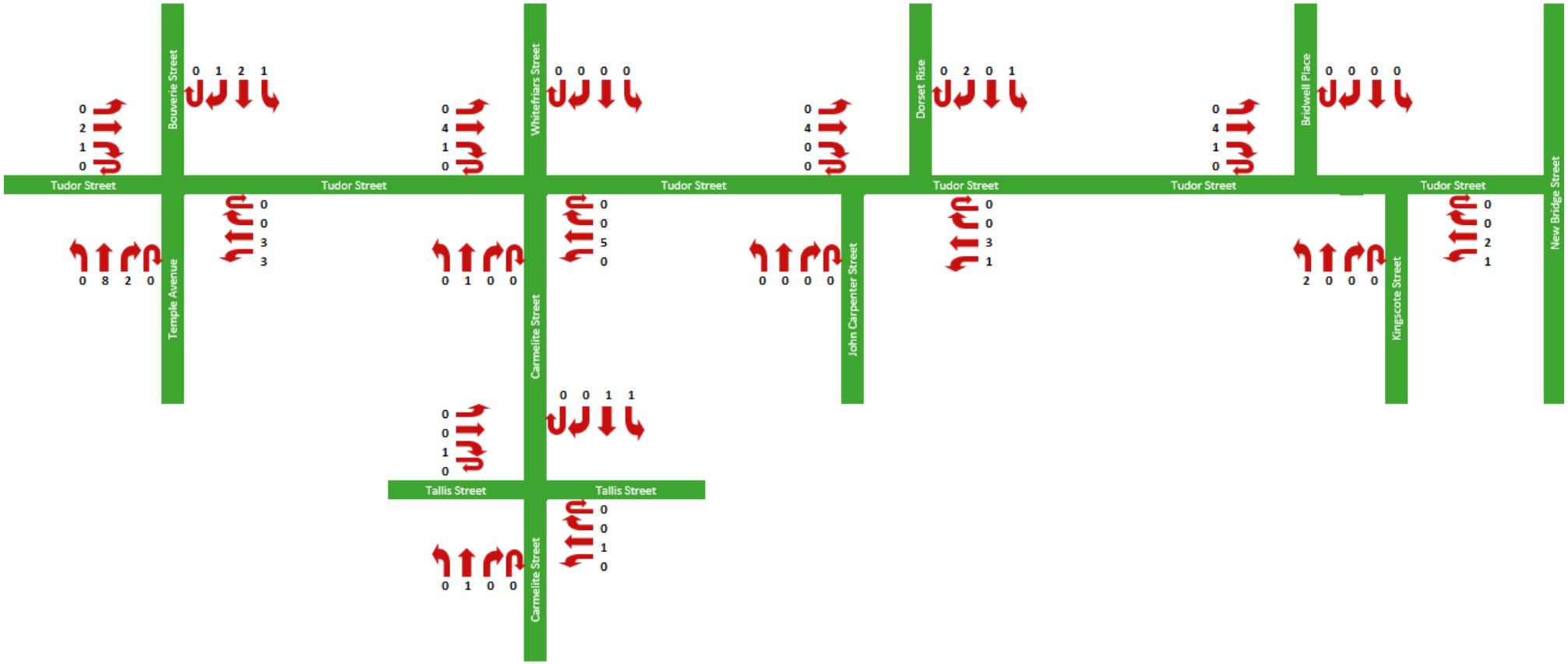


Figure 7.3: Weekend peak cycle movements (cycles per hour)



Cycle Parking

Figure 7.4 shows the locations of cycle parking within the study area. There are seven points featuring cycle stands but there are no formal cycle parking facilities on Tudor Street, Salisbury Court, Dorset Rise and John Carpenter Street at present.

Cycle Hire

There are two Santander cycle hire docking stations within the study area; these are located on Bouverie Street and Tallis Street. Cycle Hire data from the TfL has been analysed to gain insight into the origins and destinations of hire bikes in the area, and shows how well-used the stations are across the day. The data analysed is for one-week 6-12 September 2017.

Origin-Destination of cycle hire trips

Figure 7.5 shows the journeys that originate from either the docking station at Bouverie Street, or the docking station at Tallis Street. The figure shows that most trips cover shorter distances, as evidenced by the density of OD lines in the figure. However, many trips cover longer distances to docking stations as far as Clapham and Poplar.

Figure 7.6 shows a similar image for the trips to the Temple area. Again, most of distances covered are short and local, but several journeys go as far as Wandsworth in the southwest and Queen Elizabeth Olympic Park in the northeast.

Figure 7.4: Cycle facilities

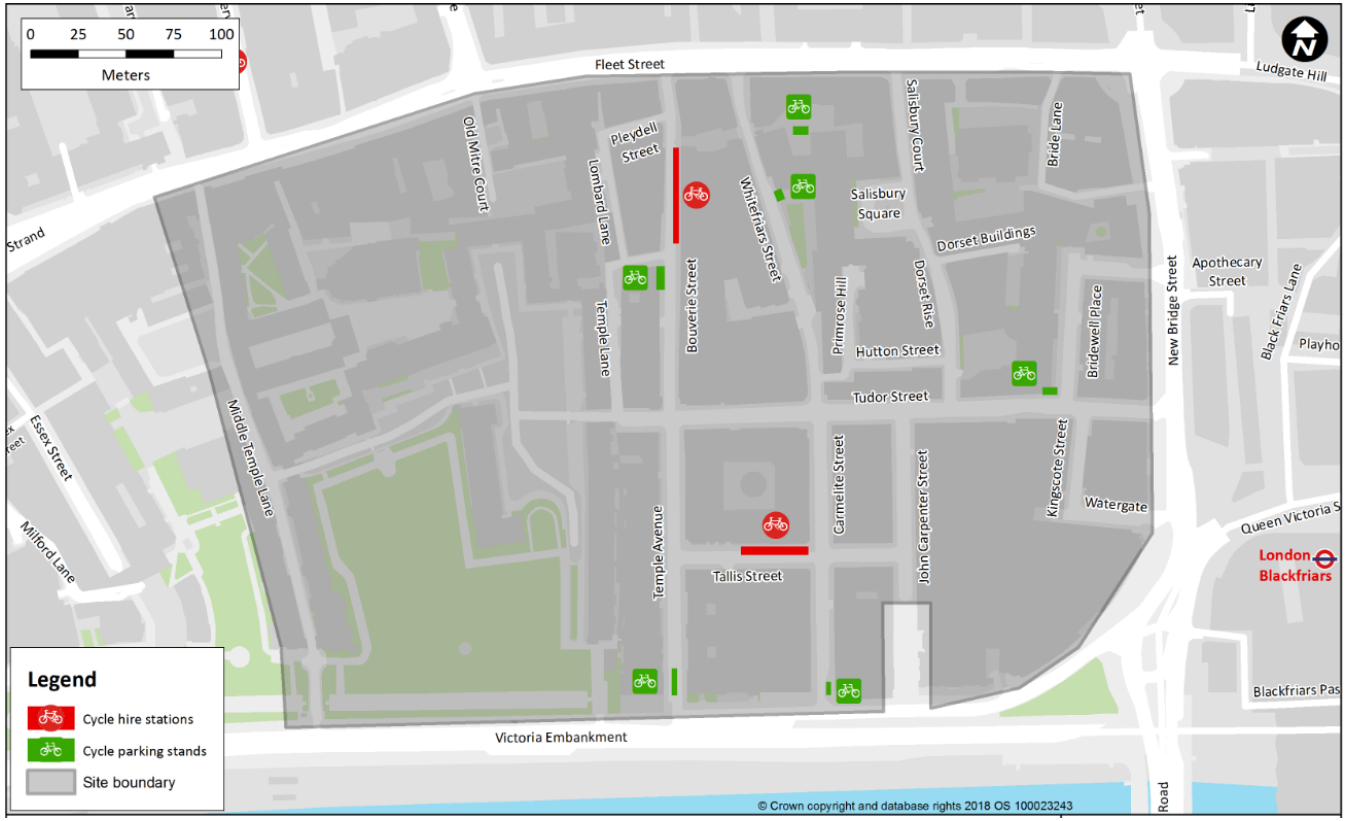


Figure 7.5: Journey originating from the Temple area over the course of one week

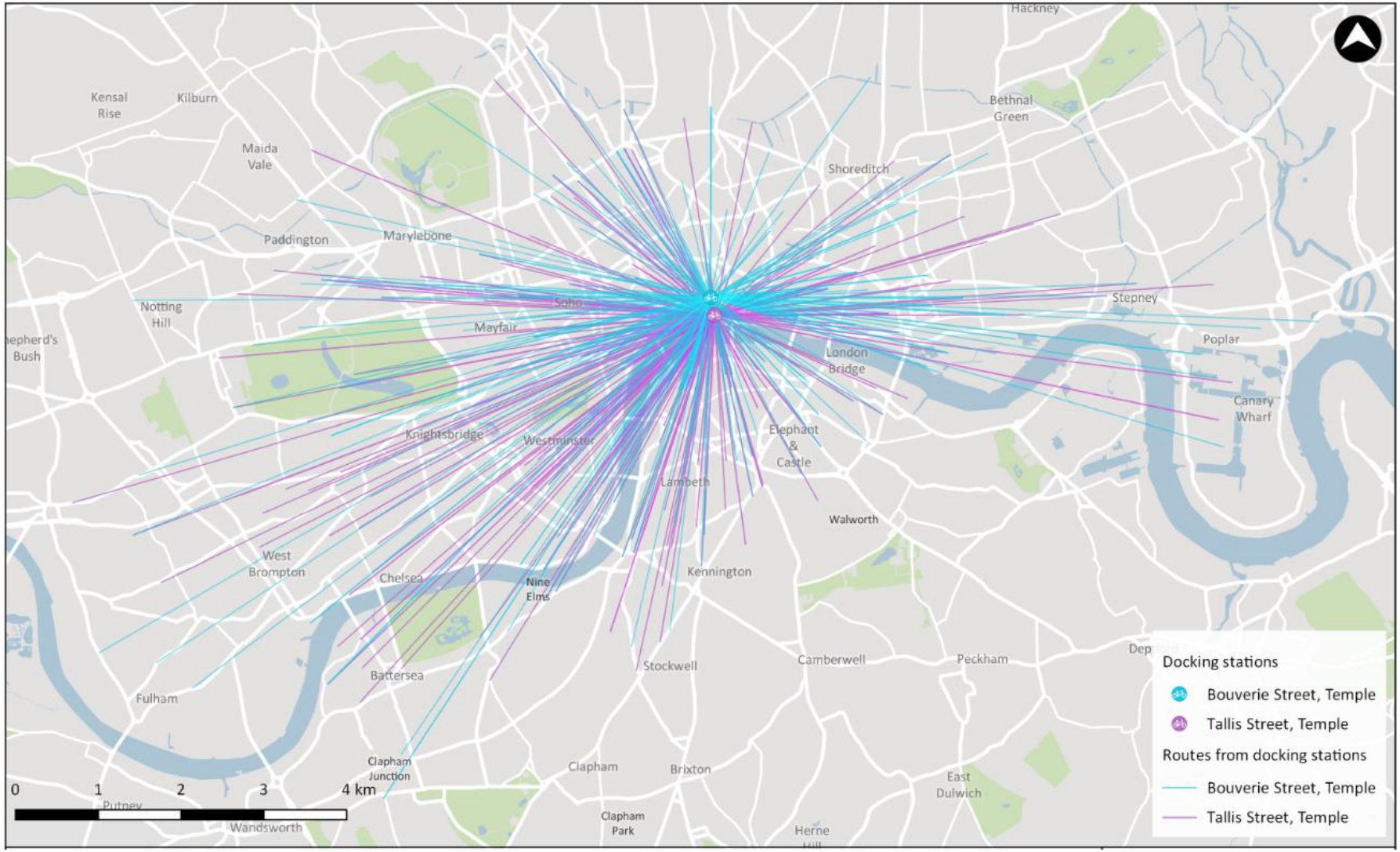


Figure 7.6: Journey ending from the Temple area over the course of one week

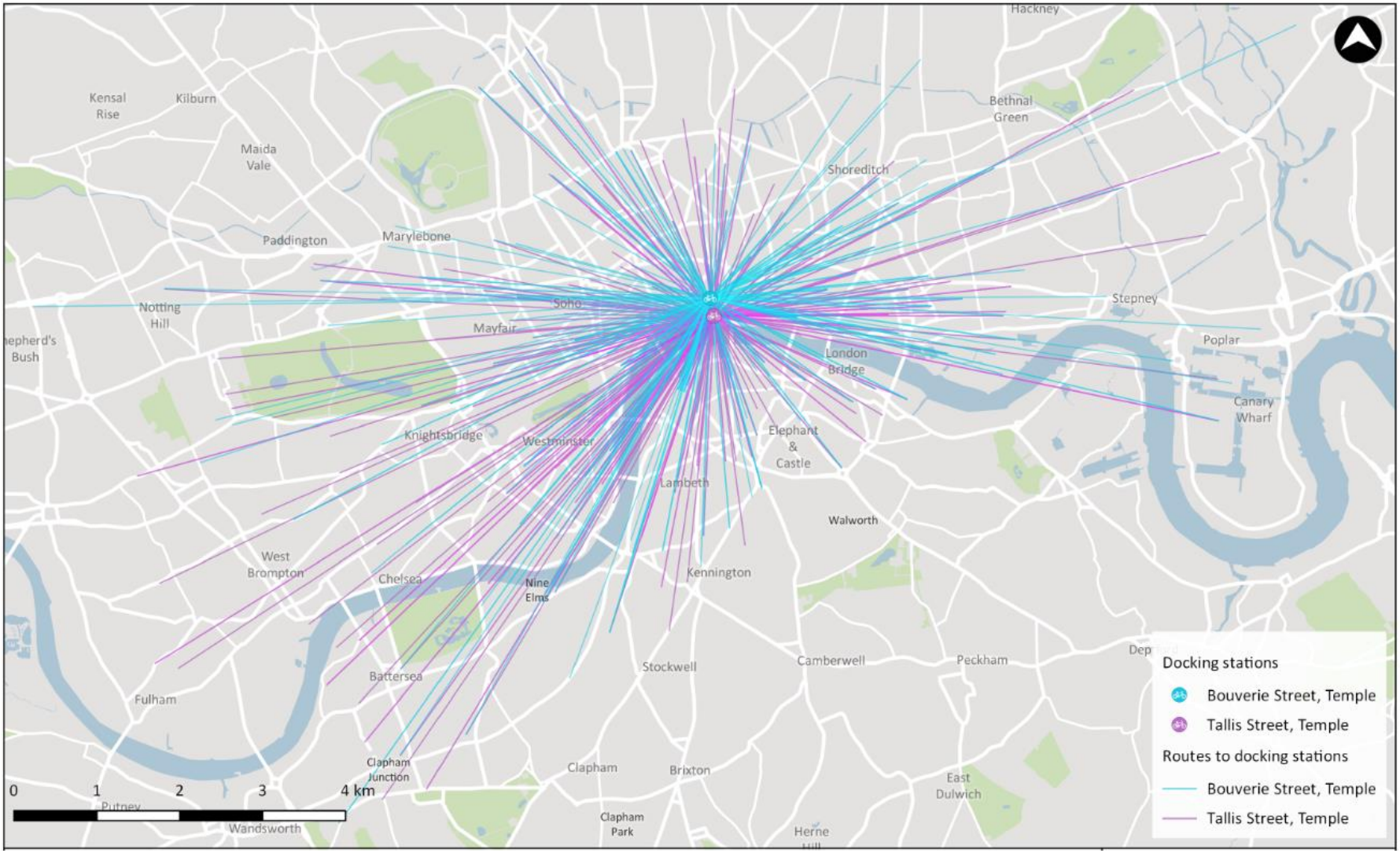


Figure 7.7: Cycle hire and docking - Bouverie Street (weekday)

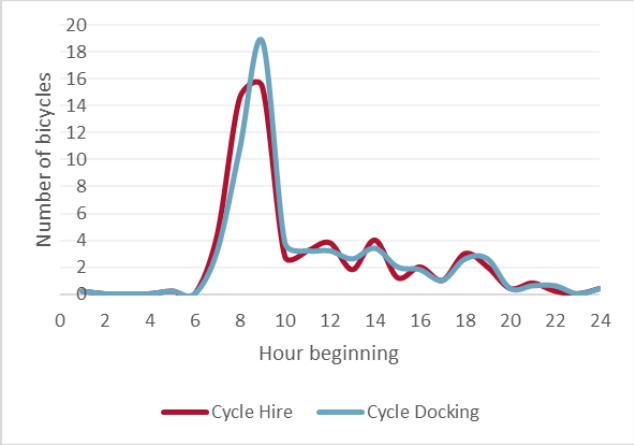


Figure 7.8: Cycle hire and docking - Bouverie Street (weekend)

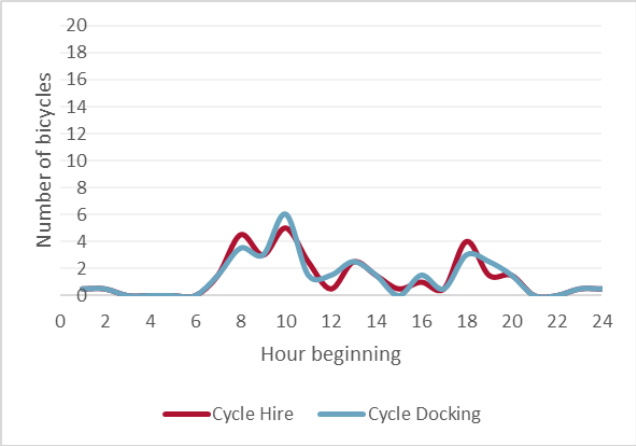


Figure 7.9: Cycle hire and docking - Tallis Street (weekday)

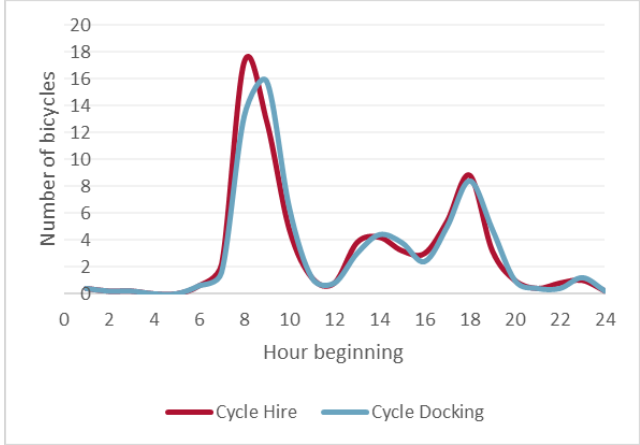
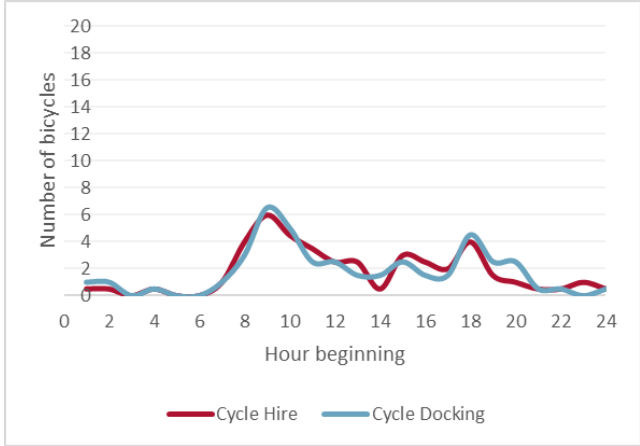


Figure 7.10: Cycle hire and docking -Tallis Street (weekend)



Cycle hire usage

Figure 7.7 and Figure 7.9 show the number of bikes hired and docked per hour for an average weekday for Bouverie Street end Tallis Street respectively.

Both graphs show a clear spike in usage during the morning around the same time at 08:00, with Bouverie Street having slightly more bicycles docked than hired, while this is the opposite for Tallis Street. The Tallis Street docking station then sees a second usage peak around 18:00, while Bouverie Street stays relatively flat after the morning peak.

Figure 7.8 and Figure 7.10 show that usage is significantly lower over the weekend and although a small, later peak can be seen at both stations in the morning, the profile remains relatively flat.

Conclusion

This chapter summarises our analysis of cycle flows and cycle hire usage in the study area.

Cycle Movements

Cycle flows are high in the AM peak than they are in the PM peak. Flow patterns are broadly tidal with a heavy westbound flow in the morning peak and eastbound flows in the PM peak.

As presented in chapter 5, cyclists seem to bypass the Victoria Embankment Cycle Superhighway nearest Blackfriars Bridge and use Temple Avenue and Tudor Street instead.

- Cycle movements show a tidal pattern, with westbound movements in the AM peak and eastbound movements in the PM peak
- Cyclists predominantly use Temple Avenue, and Tudor Street, indicating they use the Temple Area to bypass the Cycle Super Highway connection and instead traveling through the Temple area.
- Bouverie Street sees a large northbound contra-cycle flow. The contra-cycle flow on Whitefriars Street is relatively low.

Cycle Parking

- There are 6 publicly accessible cycle parking facilities located in the area

Cycle Hire

The Temple area also has two Santander cycle hire docking stations, one on Bouverie Street and the other on Tallis Street.

Journeys made to and from the docking stations are relatively short, as evidenced by the density of OD lines in analysed patterns.

- The two docking stations are used most in the morning peak (08:00) and the evening peak (18:00).

8 Kerbside Activity

Waiting and loading facilities

Figure 8.1 shows the existing waiting and loading restrictions within the study area.

Waiting restrictions

The whole of the City of London is a Controlled Parking Zone (CPZ), as such waiting (or parking in layman's terms) is only in permitted in designated parking bays and the kerbside is otherwise subject to yellow line restrictions which prohibit waiting:

- Monday – Friday **7am - 7pm**
- Saturday **7am - 11am**

At locations where parked vehicles would block the carriageway or pose a risk to safety, double yellow lines are often used to prohibited waiting at any time.

Loading restrictions

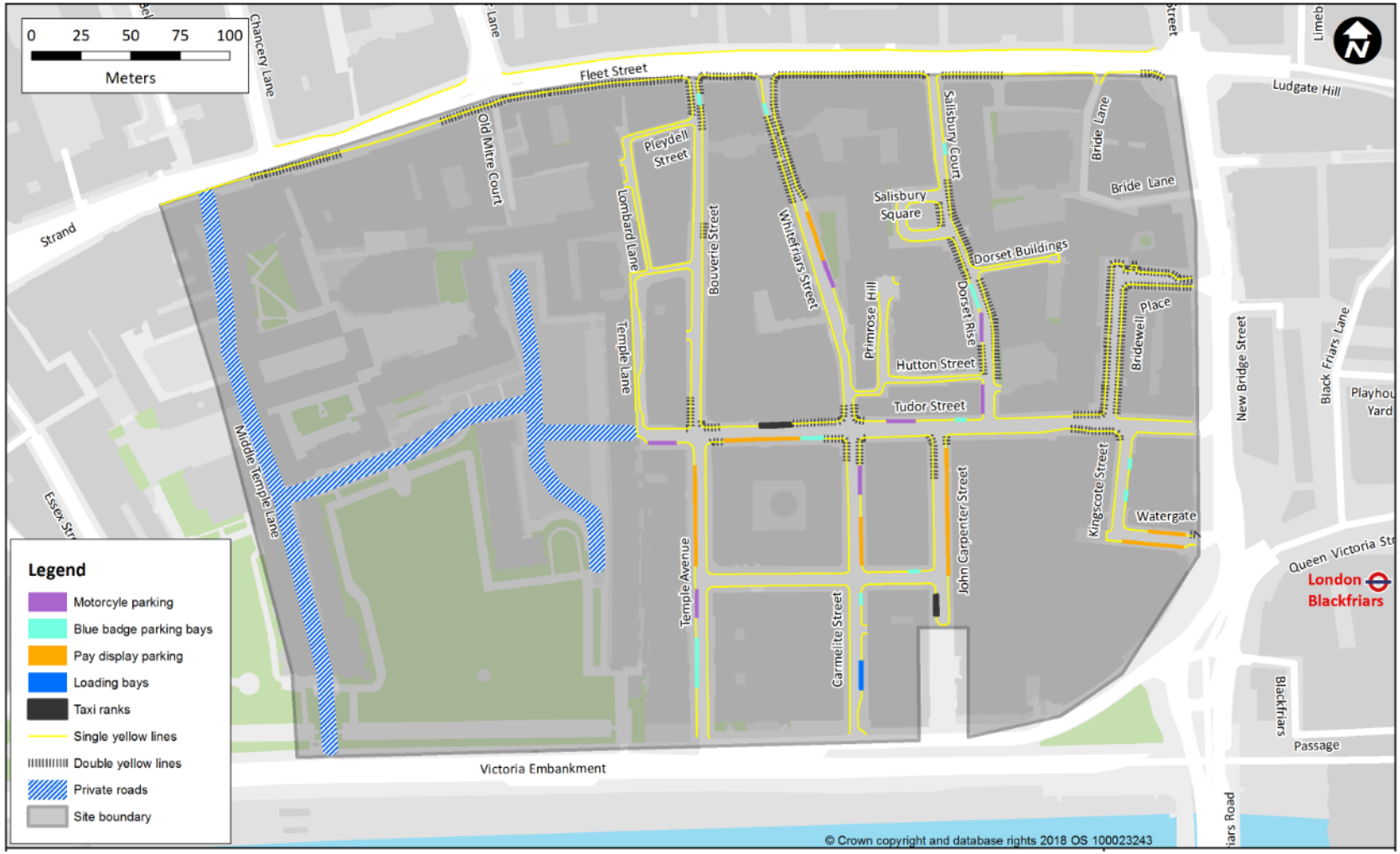
Where yellow lines are present but there is a lack of loading restrictions (i.e. no 'blips'), the kerbside can be used for loading / unloading for a maximum of 40 minutes. However, as shown there are several locations where loading is banned and these locations are generally on street corners and at pinch-points.

Marked Bays

The following summarises the marked bays that are available within the study area:

- As roads north of Tudor Street are narrower, pay and display parking is predominantly available on Tudor Street and the streets to the south including: Temple Avenue, Carmelite Street and John Carpenter Street.
- Blue badge parking bays (intended for those that are disabled or have a health condition that affects their mobility) are dispersed across the study area, with at least one bay available on most streets within the study area.
- There are currently two taxi ranks in the area: one on Tudor Street and another on John Carpenter Street.
- A loading bay is marked out on Carmelite Street.
- The area also has several motorcycle parking bays across the area as shown.

Figure 8.1: Parking and loading facilities and restrictions



Kerbside activity surveys

Kerbside activity was observed on Tudor Street (only) to understand the type and duration of usage over the period between 9 January and 15 January.

Figure 8.2 and Figure 8.3 show the composition of kerbside usage by activity type on.

Parking is the most prevalent activity both on weekdays and in weekends, followed by pick-up and drop-off of passengers. Loading activity is more intense during the working week.

Figure 8.4 and Figure 8.5 show the split by activity type by kerbside restrictions for an average weekday and weekend day respectively.

As shown, the parking facilities (parallel bay, motorcycle bay, disabled bay and taxi rank) are used as intended. However, on the weekend, the share of pick-up/drop-off activity for the motorcycle bay increases when compared to the weekday. On weekends, the single yellow lines are used more for parking purposes and this is permitted other than between 7-11am on a Saturday.

Figure 8.2: Tudor Street - kerbside activity (weekday)

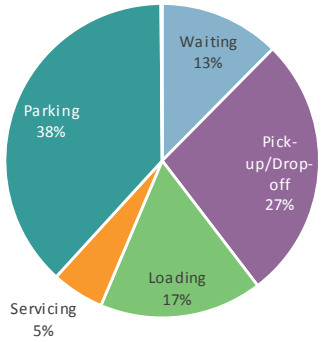


Figure 8.3: Tudor Street - kerbside activity (weekend)

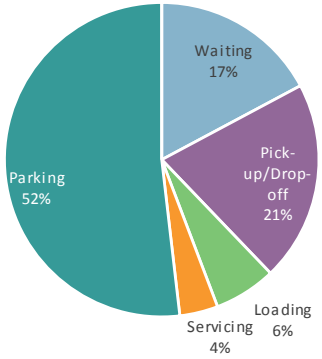


Figure 8.4: Kerbside activity by type of restriction (weekday)

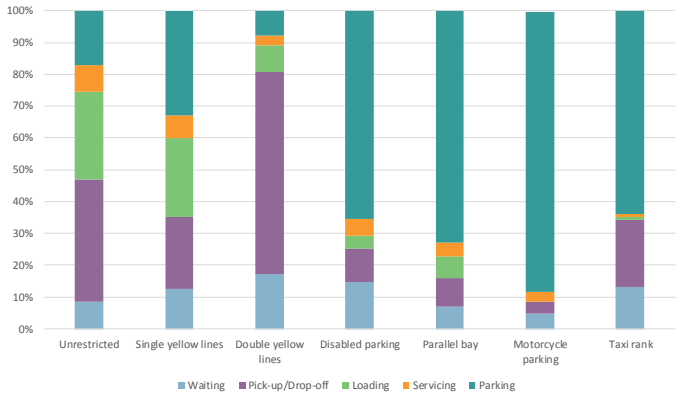
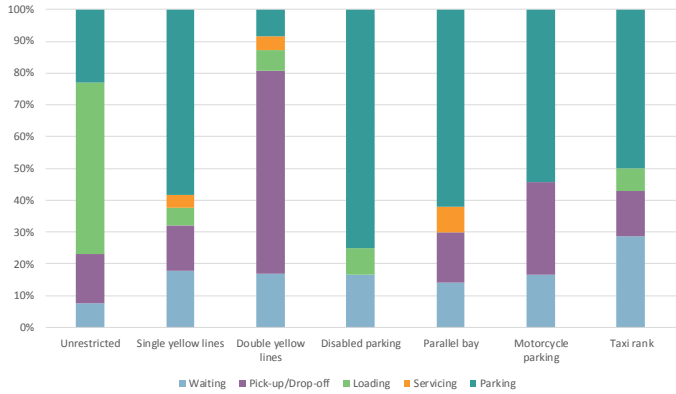


Figure 8.5: Kerbside activity by type of restriction (weekend)



Duration of stay

Figure 8.8 and Figure 8.9 show the duration of stay for the entire length of Tudor Street. Most kerbside use lasts for a relatively short length of time; with 56% of stops on a weekday lasting less than 5 minutes, and 57% over in the weekend.

Figure 8.6 and Figure 8.7 summarise the duration of stay by type of kerbside restriction, and as shown it is the single yellow lines on Tudor Street that see the highest use.

Although restricted, there are many activities on double yellow lines, but these are generally short and last no longer than 15 minutes.

Motorcycles are generally parked for lengthy periods, with most staying for a duration of between 5 and 10 hours.

On weekdays, taxi ranks are used on average for 5-15 minutes, with very few vehicles staying over an hour.

Figure 8.8: Duration of stay (weekday)

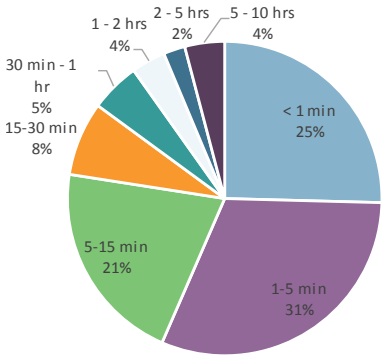


Figure 8.9: Duration of stay (weekend)

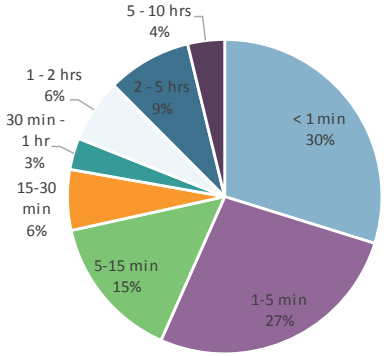


Figure 8.6: Duration of stay by type of restriction (weekday)

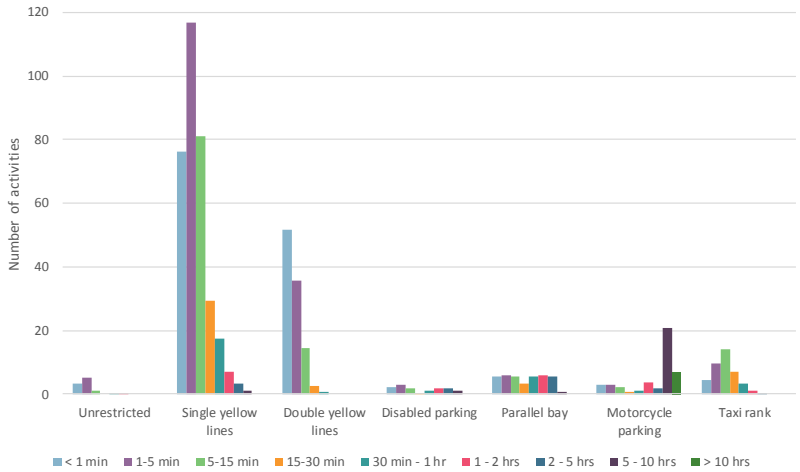
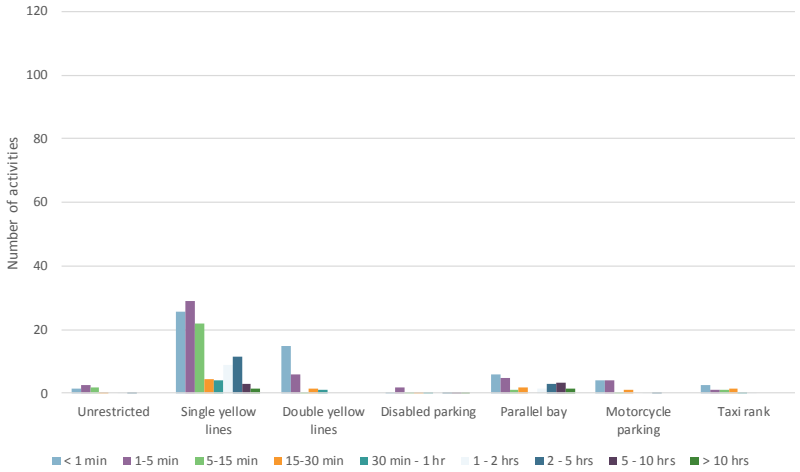


Figure 8.7: Duration of stay by type of restriction (weekend)



Kerbside usage intensity

All vehicles

Figure 8.10 shows the intensity of kerbside usage, expressed in the number of vehicles per kerbside space, where one kerbside space is defined as the average vehicle length (6m for LGVs, 12m for OGVs). The figure shows that the busiest locations are between Bouverie Street and Whitefriars Street, and between Bridewell Place and New Bridge Street.

The high intensity in kerbside activity is on the northern side of Tudor Street between Bridewell Place and New Bridge Street and could be a cause for concern, with the activities taking place so close to the junction. Although this part of Tudor Street is one-way (exit onto New Bridge Road only), parked, loading or waiting vehicles, particularly HGVs, take up space within the already constrained width, while cyclists can use the road in both directions. This could cause safety issues when an HGV is parked, another vehicle wants to overtake to get to the junction and a cyclist is travelling in the opposite direction. Given the high cycle flows on Tudor Street (especially in the AM peak), changes to the waiting and loading restrictions for this part of Tudor Street may need to be considered.

Taxis

Figure 8.11 shows the kerbside usage intensity on Tudor Street for taxis, expressed in the number of taxis per kerbside space (with one kerbside space defined at 6m). The figure shows that most of taxi activity takes place within the marked taxi bay but there is some pick-up / drop-off and even waiting activity for a limited time that also takes place on the corners of Tudor Street with Bouverie Street, Whitefriars Street and Carmelite Street.

Freight Vehicles

The kerbside activity intensity of heavy goods vehicles on Tudor Street has been mapped to give an idea of the most used locations for loading and servicing. Figure 8.12 shows the OGV activity along Tudor Street, with the intensity expressed in the number of OGVs per 12m kerbside space. The two busiest locations are on the south side between Carmelite Street and John Carpenter Street, and on the north side between Bridewell Place and New Bridge Road.

The Bridewell Place - New Bridge Road section has been discussed previously, but the section between Carmelite Street and John Carpenter Street is restricted in width due to motor cycle parking bays on the north side of the street. The intensity of goods vehicle activity on the south side of the street could suggest it is harder for vehicles to get through when both sides of the road are used for loading and servicing purposes.

Figure 8.10: Kerbside activity intensity for all vehicles

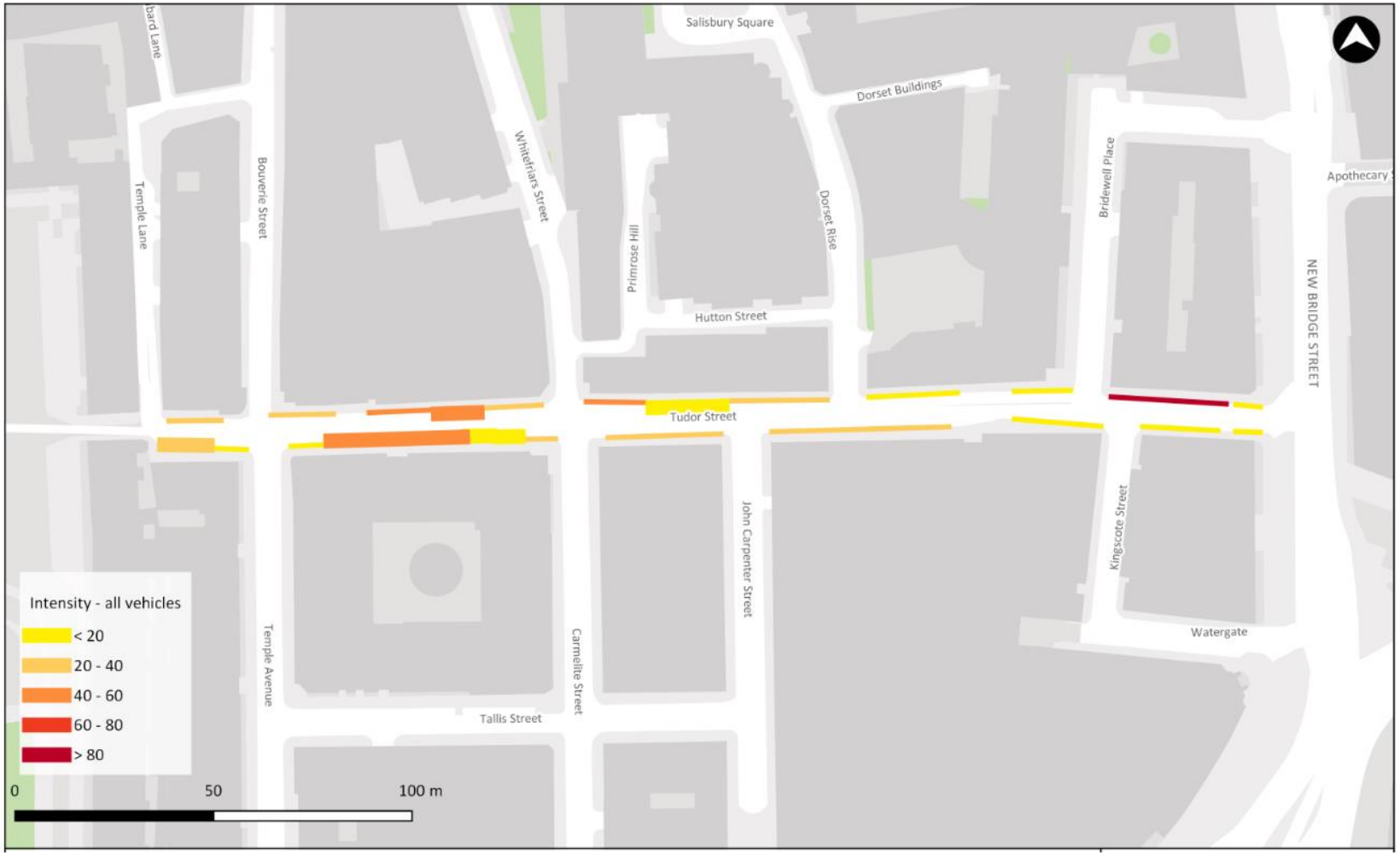


Figure 8.11: Kerbside activity intensity for taxis

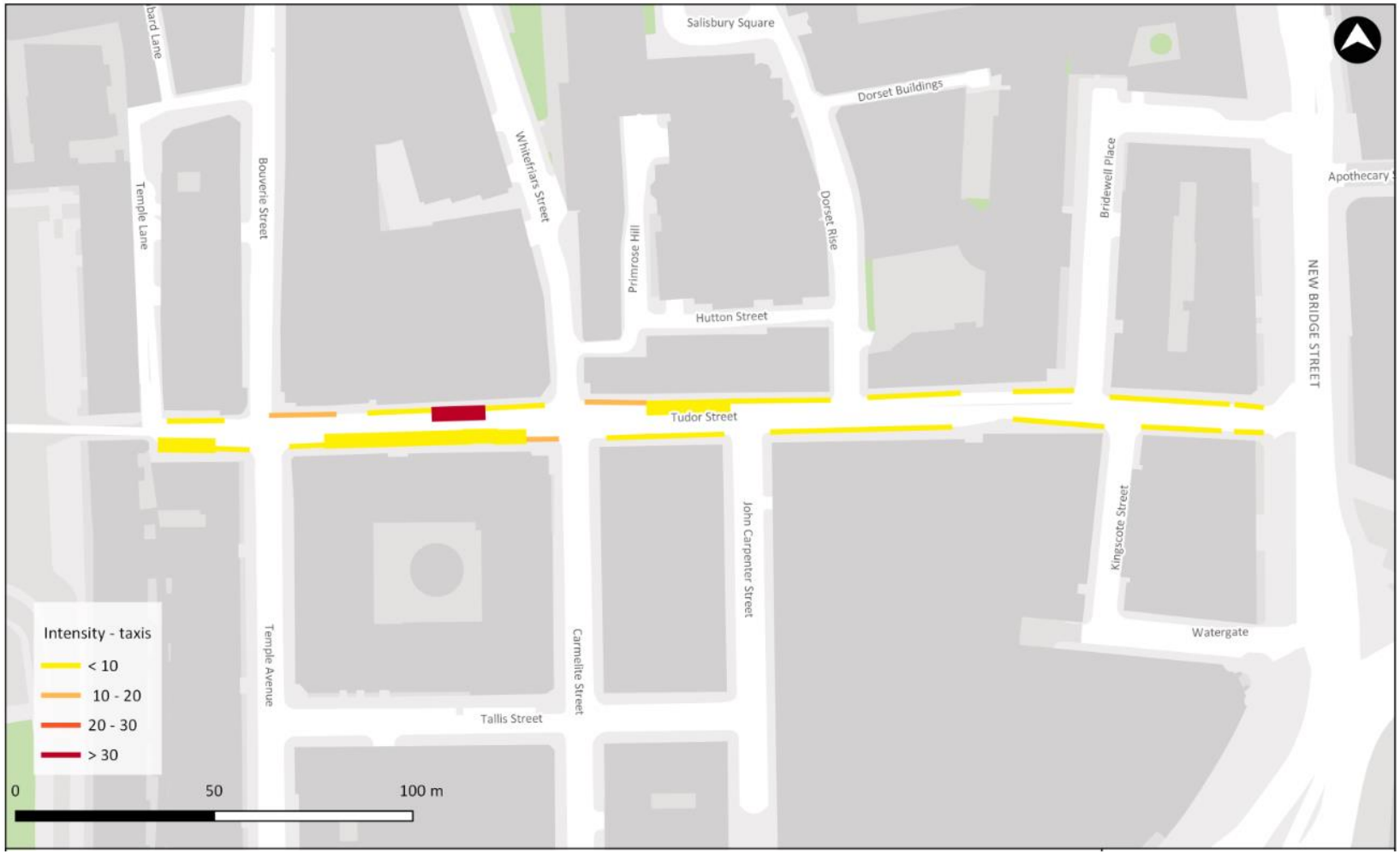
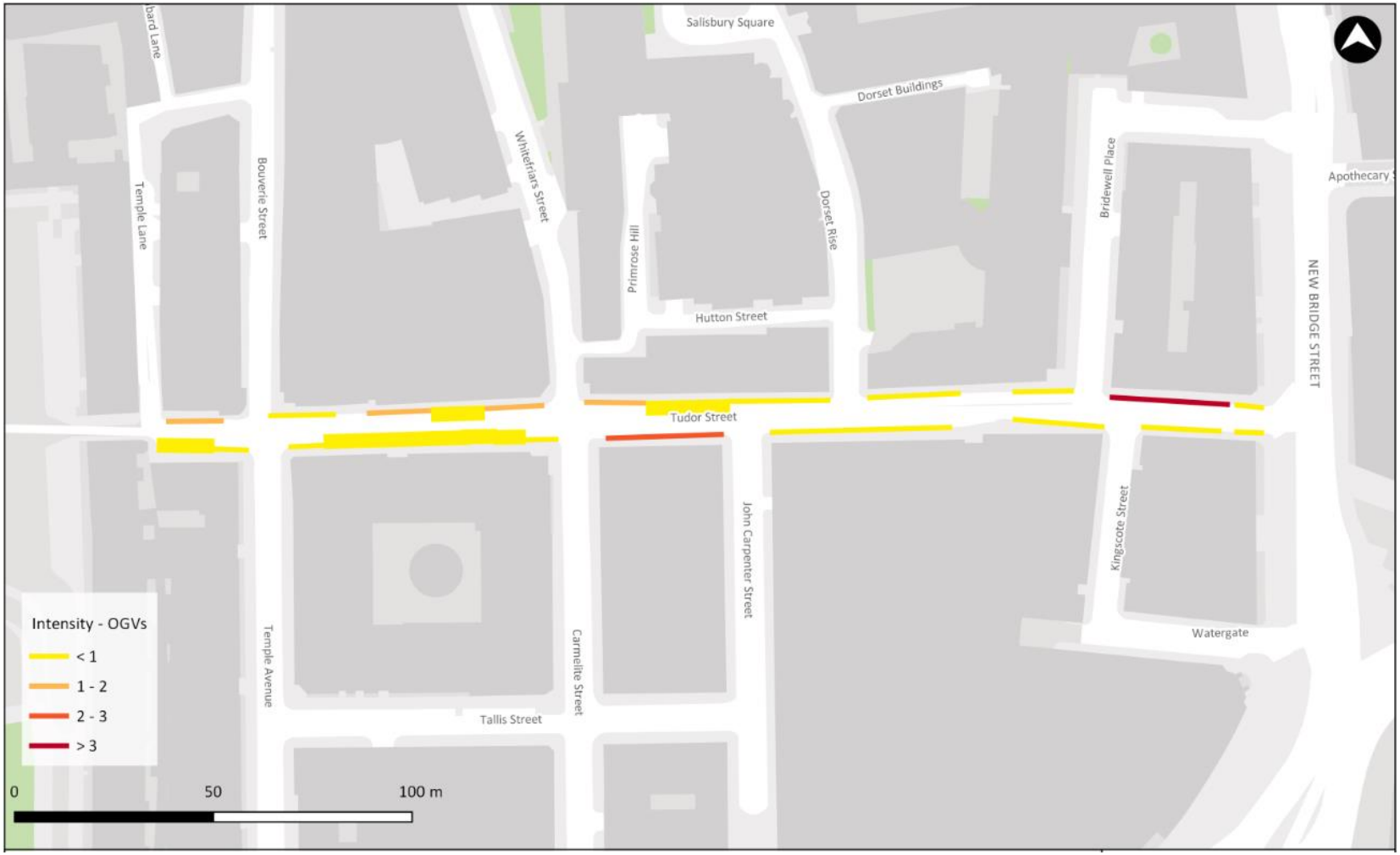


Figure 8.12: Kerbside activity intensity for freight vehicles



Occupancy by Restriction

The locations of kerbside activity have been assessed in more detail to give an idea of the occupancies during an average day for the different bays and restrictions.

Figure 8.13 shows the maximum hourly occupancy by restriction for the average weekday. The figure shows that the bays and restricted areas are usually busiest between 9 AM and 4PM. Figure 8.14 shows the same information for the average weekend. Weekend occupancy are lower than weekday occupancies. Where most parked/waiting vehicles have been counted in the motorcycle bays on an average weekday, in the weekend, the largest number of vehicles has been observed using the single yellow lines.

Figure 8.15 sets out the maximum available number of spaces in the taxi rank on Tudor Street against the hourly occupancy of the ranks. The taxi rank is used most between the AM and PM peak hours, with a second peak between 9PM and 10PM

Figure 8.13: Maximum hourly occupancy by restriction – average weekday

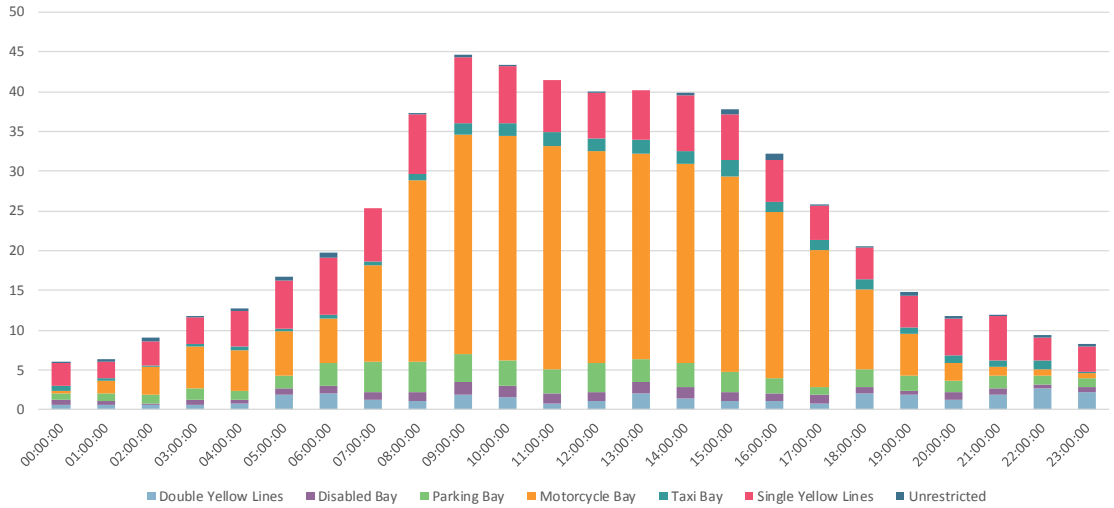
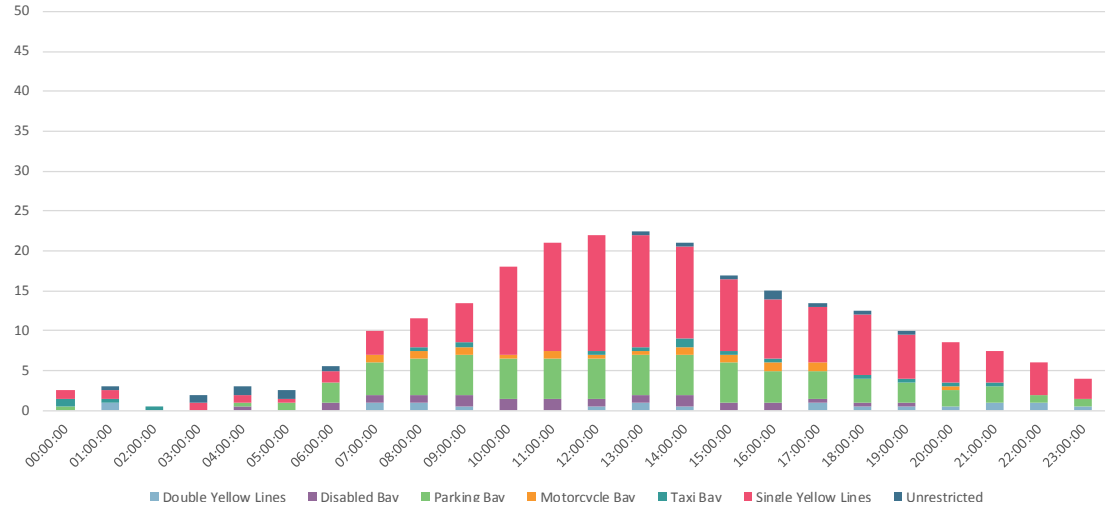


Figure 8.14: Maximum hourly occupancy by restriction – weekend average



The maximum available number of spaces in disabled bays set out against the occupancy is shown in Figure 8.16. There are three available disabled parking spaces on Tudor Street, which are most used between the hours of 8AM and 4PM.

Tudor Street has six Pay and Display bays. The occupancy rate of these bays is shown in Figure 8.17. As shown, these bays are used almost continuously between 6AM and 4PM, with a second peak at 6PM.

Motorcycle parking bays on Tudor Street offer a capacity for parking of approximately 32 motorcycles. Figure 8.18 and Figure 8.19 show the occupancies of these two bays over the day. Motorcycle spaces are in continuous use during office hours between 7AM and 5PM. Note that the usage shown to exceed capacity could be explained by users parking exceptionally close together.

Figure 8.15: Taxi Rank – Maximum Hourly Occupancy –Weekday

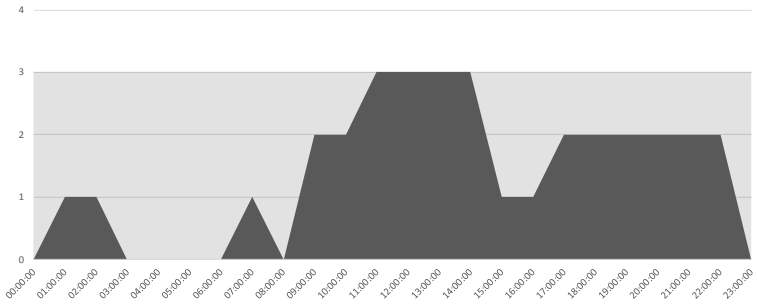


Figure 8.16: Disabled Bays – Maximum Hourly Occupancy –Weekday

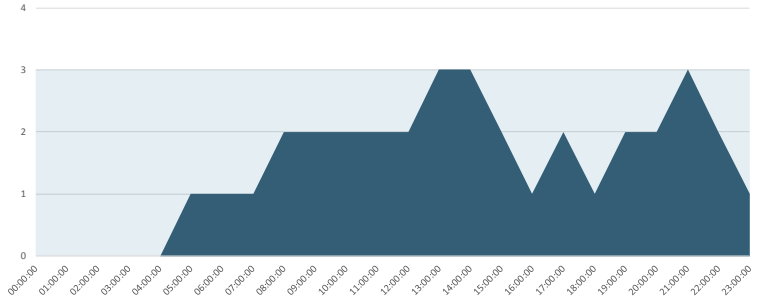


Figure 8.17: Pay and Display Bays – Maximum Hourly Occupancy –Weekday

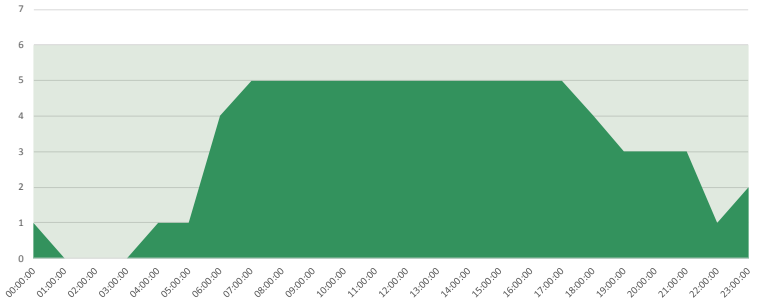


Figure 8.18: Motorcycle Bay Tudor Street west – Maximum Hourly Occupancy –Weekday

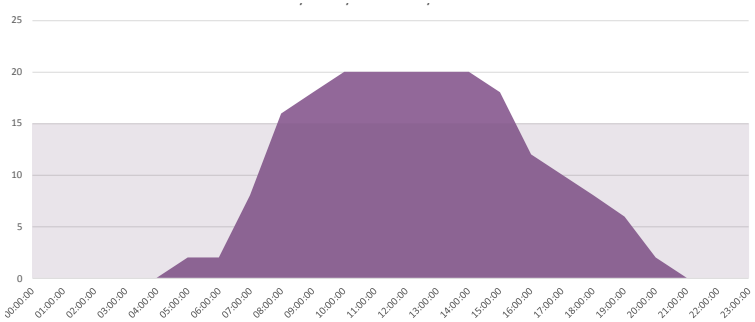
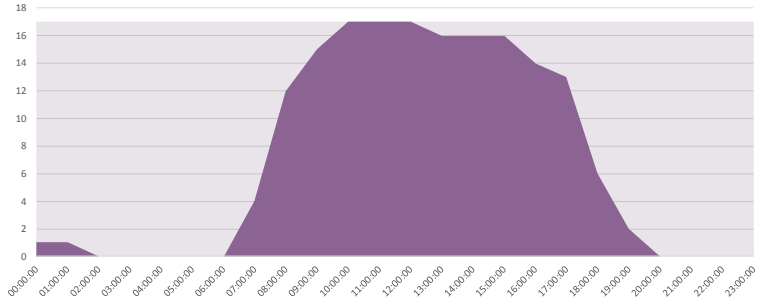


Figure 8.19: Motorcycle Bay Tudor Street (between Carmelite Street and John Carpenter Street– Maximum Hourly Occupancy –Weekday



Conclusion

This chapter summarises the kerbside activity within study the area. Kerbside activity surveys have been analysed to understand the usage of different bays in the area.

Waiting and Loading Facilities

The City of London is a Controlled Parking Zone (CPZ), and waiting it only permitted in designated parking bays. The kerbside is subject to yellow line restrictions:

- Monday – Friday **7am - 7pm**
- Saturday **7am - 11am**

The different marked bays in the study area have been mapped and usage of these bays on Tudor Street has been analysed.

Kerbside Activity Surveys

- Parking is the most prevalent activity on Tudor Street, followed by the pick-up and drop-off of passengers.

Duration of Stay

Most kerbside activity lasts for a relatively short period. Though restricted, the kerbside analysis has shown that there are many activities on double yellow lines. The parking bays on Tudor Street are used for relatively short lengths of time. However, the motorcycle bays are generally used for lengthy stays.

- Over 55% of stops on Tudor Street last less than 5 minutes
- Through restricted, there are many activities on the double yellow lines, but with a duration of the activity of less than 15 minutes
- Many motorcycles are parked for lengthy periods of 5-10 hours.

Kerbside Usage Intensity

The intensity of kerbside usage has been mapped for all traffic, taxis and goods vehicles. The busiest locations for are between Bouverie Street and Whitefriars Street, and between Bridewell Place and New Bridge Street. There is a high intensity of kerbside activities between Bridewell Place and New Bridge Street, close to the junction.

- The high intensity of kerbside activities between Bridewell Place and New Bridge Street could be a cause for concern. Parked, loading or waiting vehicles, particularly HGVs take up space within the already constrained width, while cyclists can use the road in both directions. Changes to the waiting and loading restrictions for this part of Tudor Street may need to be considered.
- The section between Carmelite Street and John Carpenter Street is restricted in width due to motorcycle parking bays on the north side of the street. The intensity of OGV activity on the south side of the street could suggest it is harder for vehicles to get through when both sides of the road are used for loading and servicing purposes.

Occupancy by Restriction

- The taxi rank on Tudor Street is used most between 09:00 and 15:00, with the bay often being used at its maximum capacity.
- 5 of the 6 available pay and display bays are in constant use between 07:00 and 17:00.
- The motorcycle parking bay on Tudor Street west is used over the available capacity, suggesting motorcycles might be parked very close together.
- The motorcycle parking bay between Carmelite Street and John Carpenter Street is also very busy between 09:00 and 17:00. Considering the width of the road at this point and loading activity to the south of this bay, this may be a cause for concern when larger vehicles try to traverse this section of Tudor Street.

9 Swept-path and pinch-point Analysis

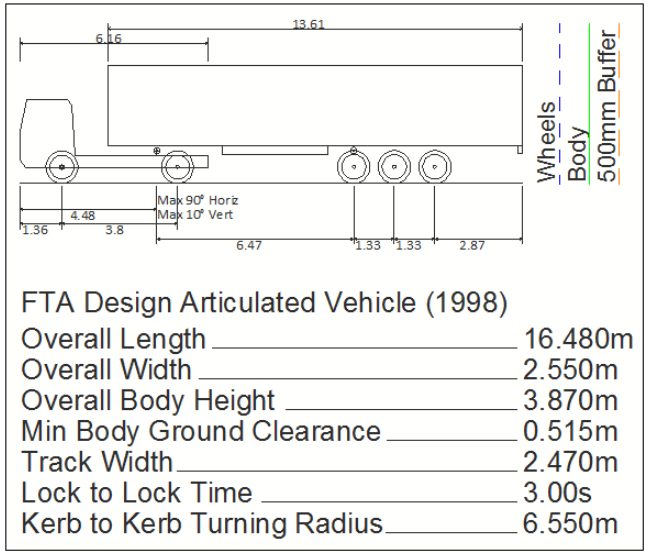
Introduction

As identified in the brief and confirmed during the site work completed as part of the study, large vehicles and Heavy Goods Vehicles (HGVs) have difficulty trying to negotiate a path through the area.

This chapter highlights the issues associated with the highway constraints and considers the potential for delays caused by features such as kerbside activity (within and outside of marked bays). It includes swept-path and pinch-point analysis to help understand where widths make it difficult for larger vehicles to manoeuvre and identify where they may be impeded.

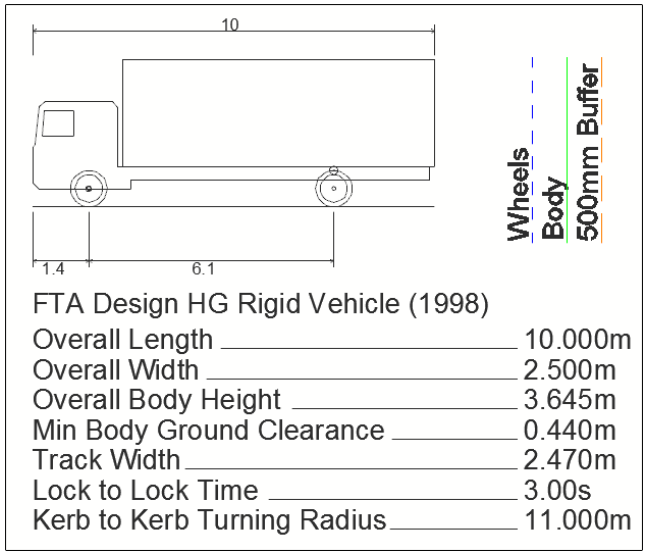
Swept-path analysis

To understand how large vehicles turn at intersections within the network, AutoTrack has been used to analyse swept-path movements for a 16.5m articulated lorry and a 10m rigid lorry; the characteristics for these industry-standard FTA design vehicles are shown opposite and overleaf.



Pinch-point analysis

The existing carriageway widths, and the locations of marked bays and other physical restrictions such cycle docking stations, etc. have also been assessed to understand how such features can impede through movement.



Options and Impacts

Following the analysis, we have suggested proposals to improve the movement of large vehicles within the study area. This is then followed by commentary on the likely impacts on affected frontages and other activities.

Bouverie Street

The following section describes the issues potentially experienced by a 16.5m articulated lorry using Bouverie Street, which is one-way southbound, and at its intersections.

The ATC survey data collected shows that there were 83 large vehicles (3+ axle articulated lorries) using Bouverie Street between Tuesday 9 and Monday 15 January.

Swept-paths

Right-turn in from Fleet Street

As lane 1 eastbound on Fleet Street is a bus lane which operates Mon-Fri, 7am-7pm, assuming articulated lorries from the west turn into Bouverie Street from lane 2 during the day, then as shown overleaf they will encroach into the **disabled bay** (which has been situated in its current location since 21 October 2013).

Although its usage has not been surveyed, as it is disabled badge holders only: Mon-Fri 4 hours (no return within 1 hour), Sat & Sun no limit, then this means that it is possible that it will be occupied legitimately for lengthy periods.

If the bay is in use then it will make it difficult for a large vehicle to complete the manoeuvre in one movement and any multipoint-turns that requires a vehicle to reverse back on to Fleet Street will pose a safety risk on this busy link and also likely cause delays.

Left-turn in from Fleet Street

Also shown overleaf, the swept path for articulated vehicles turning in from the east is even more problematic when the disabled bay is in use. The presence of bollards on each corner and repaired footway suggests that that over-running has taken place at some point.

It should be noted that drivers who are less familiar with the area may have greater difficulty undertaking these (and the other manoeuvres described later in this chapter) if they are unaware of the downstream obstructions.

It should be noted that the OS base appears to differ slightly to the existing on-street layout and the kerbline on the eastern corner is possibly less intrusive than shown. However, this has very little impact in terms easing the movement past (or through) the existing marked bay.

Options and Impacts

To reduce the issues at the Fleet Street junction, the most effective option would be to remove or relocate the disabled bay and introduce no waiting and no loading ‘at any time’ restrictions as far as the cycle

hire docking station to prohibit kerbside use. Using 24/7 restrictions would be the clearest approach as this would introduce double yellow lines (no waiting 'at any time') and be supported by double yellow blips (no loading 'at any time').

To ensure that the restrictions successfully address the existing issues it may be necessary to enforce new kerbside controls using means that the City of London deems fit.

If the disabled bay is to be relocated, then as shown in the options drawing, the most suitable location (without impacting the cycle hire docking station) would appear to be within the short section of kerb on the eastern side of the street that is available immediately north of the junction with Temple Avenue. This would not inhibit turning movements from Temple Avenue as all vehicles turn right and head south at this point.

It should be noted that any relaxation of these 'maximum' restrictions is likely to reduce the effectiveness of such a measure by the time periods exempted. However, if 24/7 restrictions are used, then the impact of these changes would be to eliminate the availability of disabled parking and other kerbside activity at the northern end of Bouverie Street.

Pinch-points

To highlight where the existing carriageway width restricts free movement, areas have been graded using a Red – Amber – Green (RAG) system. So, those areas shown in red highlight sections where the pinch-point is deemed to be a frequent and/or significant problem, amber is used for an area which may be an occasional issue and green is used for sections that although restrictive are not a significant concern. Generally, on a one-way street, if the running lane exceeds3.0m then the available width is deemed as being sufficient to enable frictionless movement for large vehicles (in a straight line).

From the north and as shown in the pinch-point analysis drawing, although the carriageway is over 5.5m wide, the positioning of the **disabled bay** and **northbound advisory cycle lane** (which indicates that contraflow cycles can be expected on this narrow street) means that through traffic will encroach onto the opposing cycle lane if the disabled bay is in use.

Further south, the next two sections highlighted in red show where the ends of the **cycle hire docking station** reduce the running lane to less than 3.0m. In this instance, it deemed to be less problematic (and therefore shown in green) as the lengths are very short and the cycle lane is curtailed along the length of the cycle hire facility.

The remaining pinch-point can be found adjacent to the two **diplomatic bays** opposite Magpie Alley, and when in use these bays will again bring through traffic into conflict with contra-flow cyclists, again this is not seen as a significant issue.

The rest of the street is narrow and generally subject to the City of London's standard CPZ hours (Monday – Friday 7am - 7pm and Saturday 7am - 11am), so any kerbside use, including legal loading (especially by larger vehicles) may impede through movement.

Options and Impacts

The sections of contra-flow cycle lane which lie opposite the marked bays and thus reduce the through width to less than 3.0m are relatively short, and therefore it is not unreasonable to expect opposing movements to give way to each other so no changes to the cycle lane markings are required. This is consistent with numerous other similar sites across the City of London where cyclists and general traffic mix without issue.

If it is considered desirable to maximise traffic throughput, and reduce conflicts and delays, then the options to achieve this would be to:

Ban all kerbside activity

Removing all the potential obstructions on the eastern kerbside (currently 3x marked bays and the cycle hire docking station) and introducing no waiting and no loading 'at any time' restrictions on both sides of the street would 'clear' the street and facilitate vehicular movement. However, introducing blanket no waiting and no loading 'at any time' restrictions would make it impossible to service the frontages along Bouverie Street and the removal of the bays may prove difficult when consulting with stakeholders. It should also be noted that the cycle hire docking station is well-used and the number of potential locations it could be relocated to is very limited due to similar spatial constraints on the other streets within the area.

Remove contra-flow cycle lane and ban kerbside activity on the western kerbline

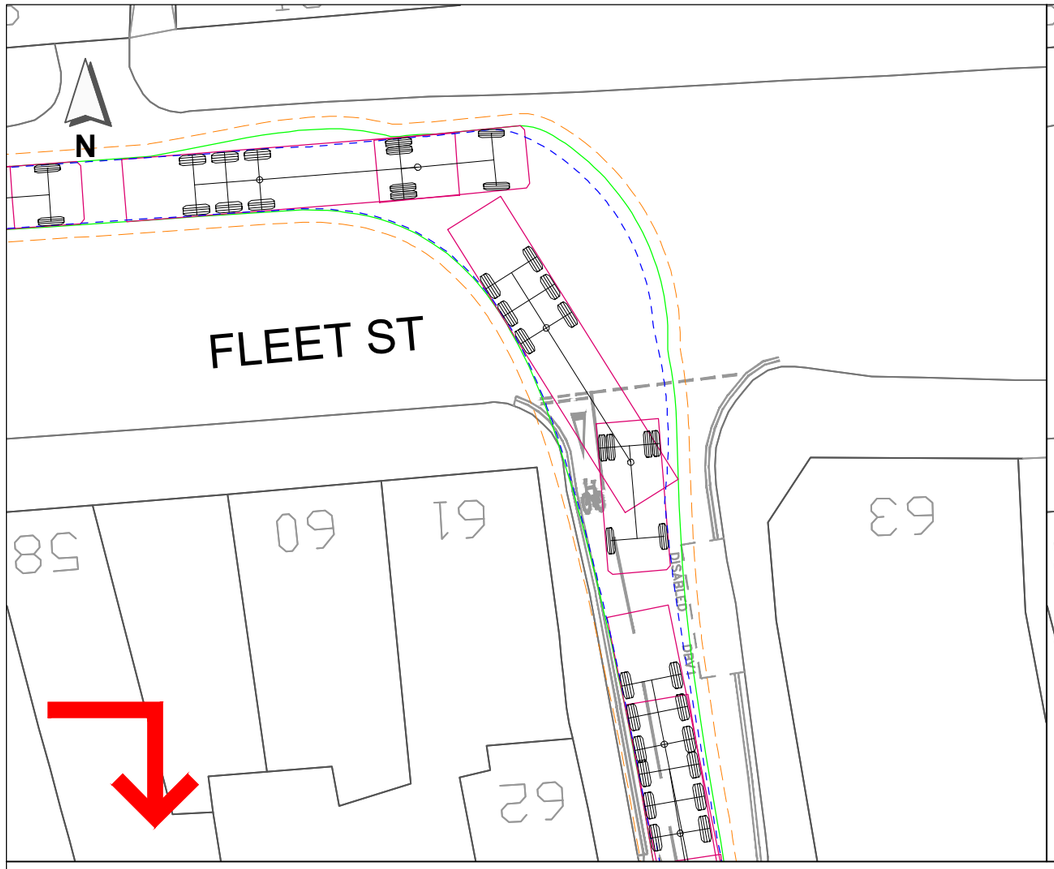
Introducing no waiting and no loading 'at any time' restrictions along the western kerbline (only)would remove conflicts and reduce friction. The impact of the proposed waiting and loading changes, which would be confined to the western kerbline, would allow the retention of activity on the eastern side of the street and would be less severe than Option 1.

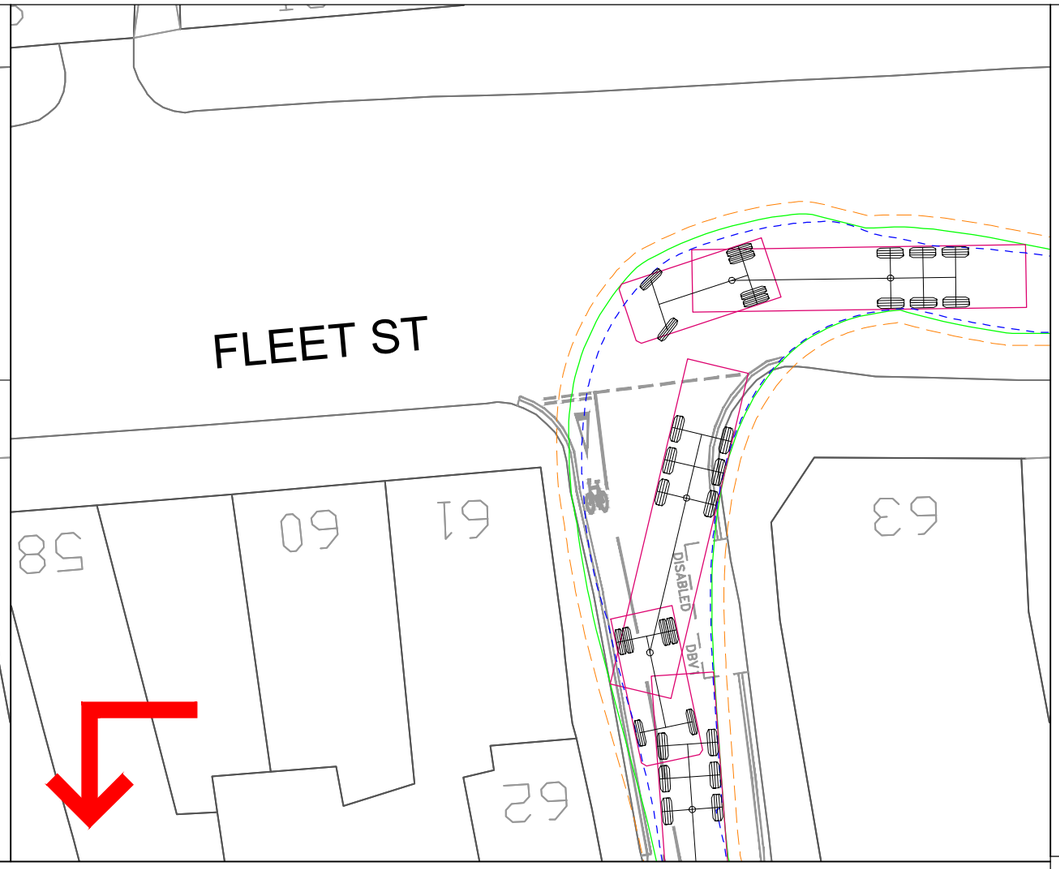
For both options, any relaxation in the proposed 'maximum' restrictions will reduce the effectiveness of such measures over any periods exempted. Equally, if unenforced then the restrictions may be flouted and less effective.

Recommendations

We would recommend the following as being the most effective combination of measures without unnecessarily compromising access and movement demands along the street.

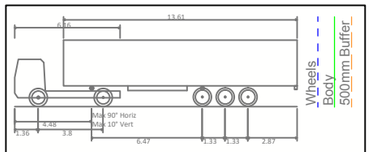
- Relocate disabled bay south to a point north of the junction with Temple Avenue.
- Extend waiting and loading restriction times and coverage along the length of the western side of Bouverie Street.





0 5.0m 10.0m 15.0m 20.0m

Vehicle Key:



FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Figure 9.1

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

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Client:
City of London

Project Title:
Temple Area Traffic Study

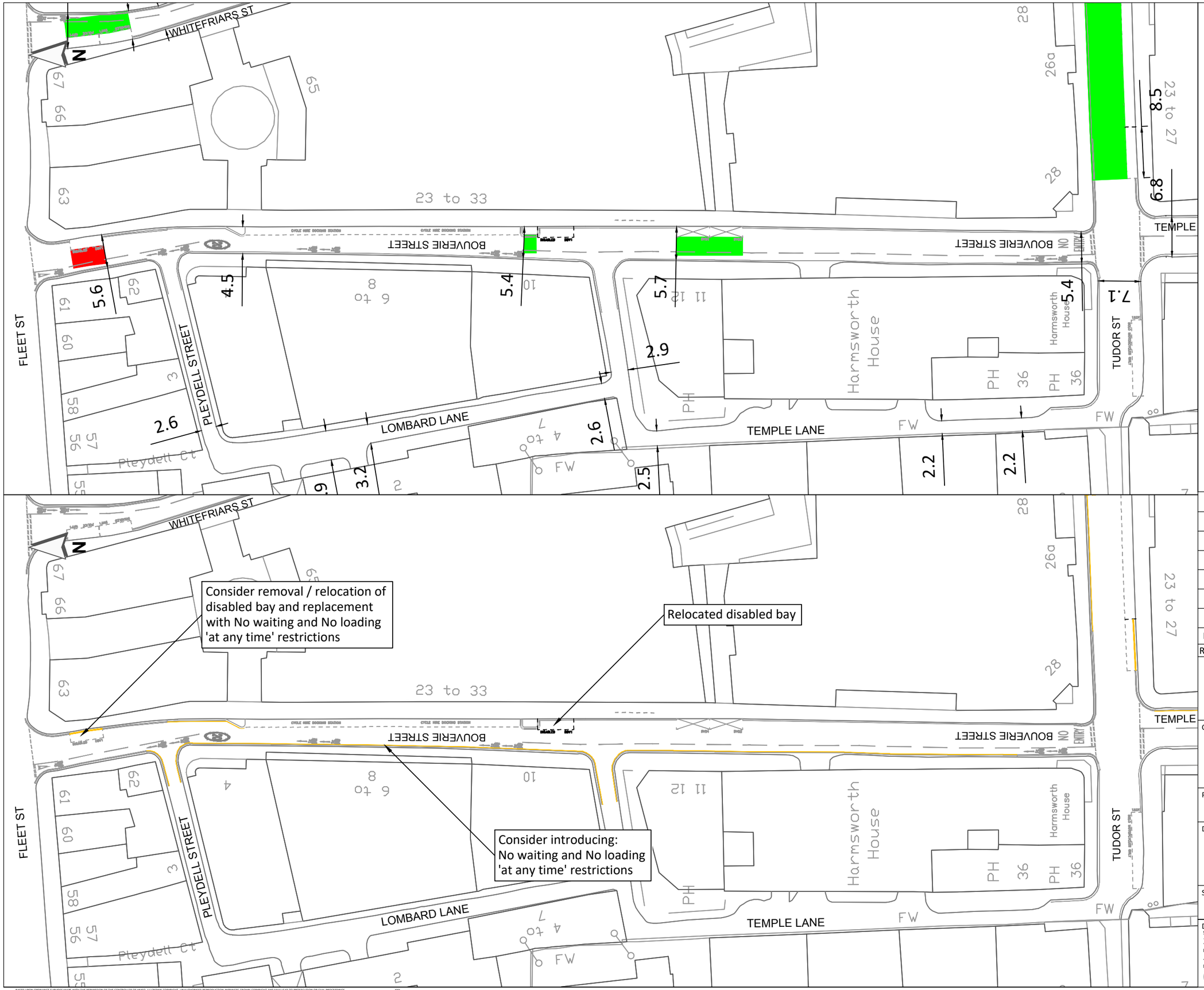
Drawing Title:
Fleet Street / Bouverie Street
Swept Path Analysis

Status:
WORK IN PROGRESS

Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN
Location --- | Type DR | Role D
Number 01

Scale: 1:250
Suitability S0
Rev. P1
Size: A3

CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-01-01.dwg
DATE: 21/05/2018



Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.2

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

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Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: Bouverie Street Pinch-point Analysis & Options

Status: WORK IN PROGRESS

Drawing Number: SDG Ref.	Originator	Volume	Scale:	Suitability
23203601	SDG	HGN	NTS	S0
Location	Type	Role	Rev.	Size:
---	DR	D	P1	A3
Number 02				

DATE: 21/05/2018 CAD REFERENCE: P:\Projects\232\03\01\CAD\Drawings\232030101-02

Whitefriars Street

The next street is Whitefriars Street and it provides a northbound link for general traffic from Tudor Street through to Fleet Street.

The OD analysis shows that it is the main route out of the area for vehicles coming from Bouverie Street. Over the surveyed period, 326OGVs per a full week were recorded using this link.

Swept Path Analysis

Left-turn in from Tudor Street

As shown in the swept path analysis, large vehicles entering from the west need to make full use of the carriageway to turn into Whitefriars Street (one-way northbound). At present the junction is protected by double yellow lines and blips, which prohibit waiting and loading 'at any time' but these restrictions revert to the City's standard CPZ hours of Mon-Fri, 7am - 7pm and Sat, 7-11am before reaching Primrose Hill. As shown, anything stopped around the junction will impede the through movement of large vehicles.

Right-turn in from Tudor Street east

Although the turn from the opposite direction is easier, as the available swept path is greater from the opposite lane, large vehicles still suffer similar problems due to the narrow carriageway.

As previously noted, the OS base appears to differ slightly to the on-street layout and the kerbline on the north-eastern corner has likely been eased as part of the recent works, however this makes very little difference to the problems caused when vehicles are stopped at the kerbside.

Options and Impacts

To ease the movement of large vehicles at this junction, it is suggested to extend the no waiting and no loading 'at any time' restrictions further north as shown in the options drawing.

As before, if 24/7 restrictions are used then the impact of these changes would be to eliminate kerbside access at the southern end of Whitefriars Street. Frontage demand is relatively limited in this section but there is likely to be some activity associated with the Natural Kitchen premises situated opposite Primrose Hill, however the further any activity can be moved from the junction, the easier it will be to accommodate the movement of large vehicles.

Turning out of Whitefriars Street and into Fleet Street

As shown, an HGV can manoeuvre past the disabled and police bays nearest Fleet Street. However, although Whitefriars Street widens at its junction with Fleet Street, if the bays are in use then any northbound vehicle will encroach into the (advisory) contraflow cycle lane.

Due to the relatively low cycle flows, and as conflicts should be manageable informally, the removal of the bays would seem to be of limited benefit and may also prove difficult if consulting with stakeholders.

However, if their relocation is deemed necessary, then there would be an option to re-designate some of the existing bays outside Fleetbank House. This would enable these specific uses to be retained, albeit at the expense of overall kerbside capacity.

Pinch points

(From the south) North of the Tudor Street junction, the carriageway is narrow and, although it is only subject to the standard CPZ restrictions, it features a contra-flow cycle lane which is marked from its starting point just north of The Harrow public house and then continues southbound until it reaches Tudor Street.

Further north, the carriageway widens adjacent to Fleetbank House and there are two lengthy sets of bays on the eastern kerbline. This greater width means that there is enough space to accommodate cyclists and through traffic adjacent to the bays in this section.

North of the bays, there are double yellow lines (no waiting 'at any time') until you reach Fleet Street. These are complemented by no loading 'at any time' restrictions that cover most of this section but localised relaxations in the loading restrictions include the western side on the approach to Fleet Street. There are also two consecutive bays (currently marked as a disabled bay and then a police bay) nearer the junction.

Due to the narrow width in this final section, much of which is less than 4.5m wide, any parked vehicles impede large vehicles and lead to delays for through traffic or even force vehicles to use the footpath if they are unable to pass on carriageway; this is a potential safety concern if it leads to conflicts with pedestrians.

Options and Impacts

If the aim is to ease the throughput of large vehicles, and in turn reduce friction and delays within the study area, then an increase in the waiting and loading restrictions along the length of Whitefriars Street is likely to be the most effective solution.

The use of no waiting and no loading 'at any time' would prohibit kerbside activity along the full length of the street but it should be possible to exempt the section adjacent to Fleetbank House, as it is wide enough to accommodate the existing bays without impeding through traffic.

As previously noted for Bouverie Street, the similar use of no waiting and no loading 'at any time' would make it difficult to service the frontages along Whitefriars Street that do not have off-street access.

It appears that the restrictions have been extended at the northern end of the street in the recent past, so it may be that the section that lacks loading restrictions on the approach to Fleet Street has been excluded to enable demand to be met.

As before, any relaxation of these 'maximum' restrictions will reduce the effectiveness of such measures over any periods exempted. Equally, if unenforced then the restrictions may be ignored.

Removing the advisory cycle lane at the northern end would reduce conflicts but would be of limited benefit as kerbside activity is the main issue in this area and cycle flows are also relatively low (with a maximum of 100 cycles over a weekday, peaking in the AM peak with 25 cyclists in the hour) given the alternative southbound routes available via Bouverie Street and Salisbury Court / Dorset Rise on either side of Whitefriars Street.

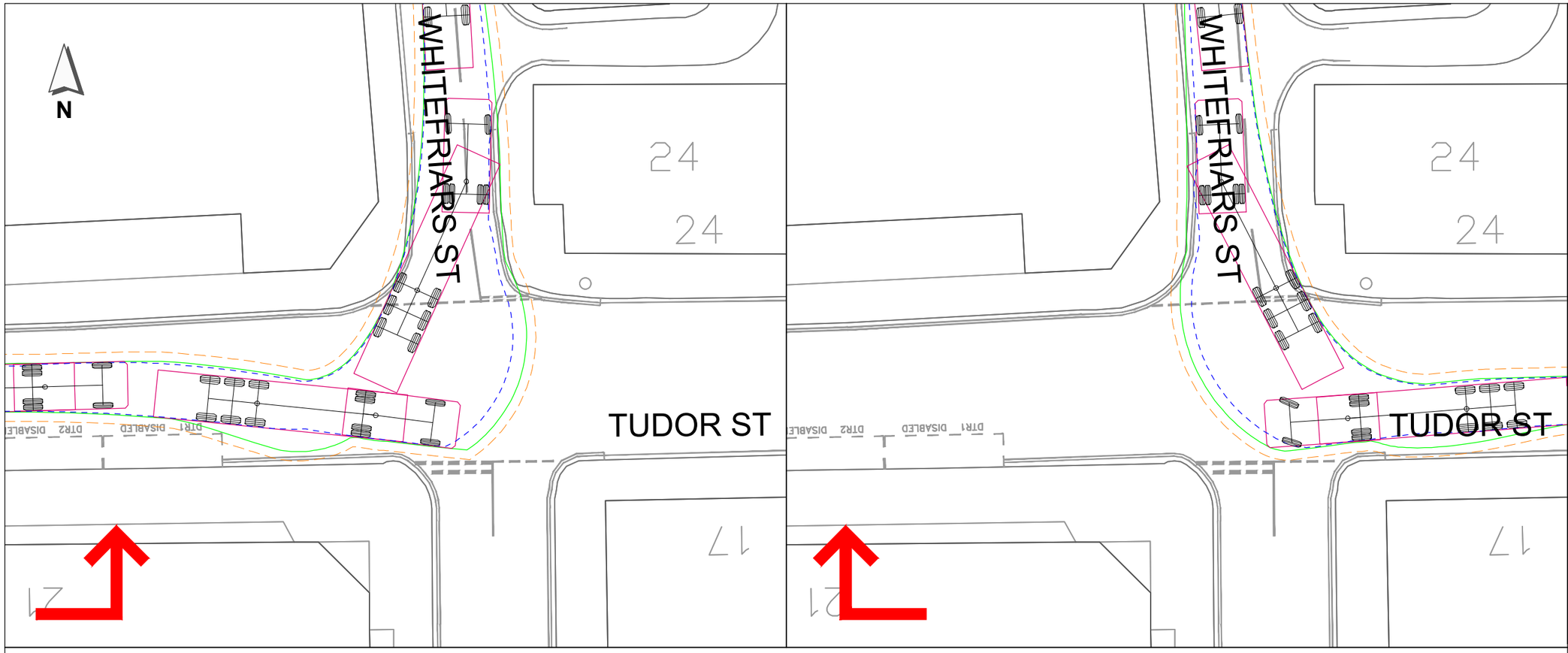
Area-wide Access Changes

An alternative approach to reducing the impact of large vehicles would be to limit the streets that large vehicles are able to use to access the area. If vehicles were no longer able to use Whitefriars Street for example, then they would have to leave via Bridewell Place (which has a 40ft / 12.2m length restriction for entry but no obvious corresponding restriction if approaching from the other end), Tudor Street or Carmelite Street, all of which would be more circuitous if they intend to head west on Fleet Street. However, if some streets were inaccessible it would reduce area-wide resilience and / or increase pressure on those that were retained.

Recommendations

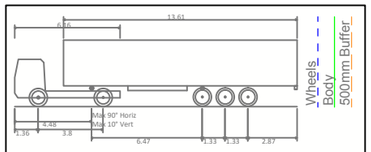
The most effective measures without unnecessarily compromising access and movement demands along the street is recommended to focus on:

- Extending the waiting and loading restriction times and coverage along the full length of the street (excluding the eastern kerbline outside to Fleetbank House and the existing section exempted from loading restrictions on the approach to Fleet Street).



0 5.0m 10.0m 15.0m 20.0m

Vehicle Key:



FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Figure 9.3

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

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Client:

City of London

Project Title:

Temple Area Traffic Study

Drawing Title:

Tudor Street / Whitefriars Street
Swept Path Analysis

Status:

WORK IN PROGRESS

Drawing Number:

SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
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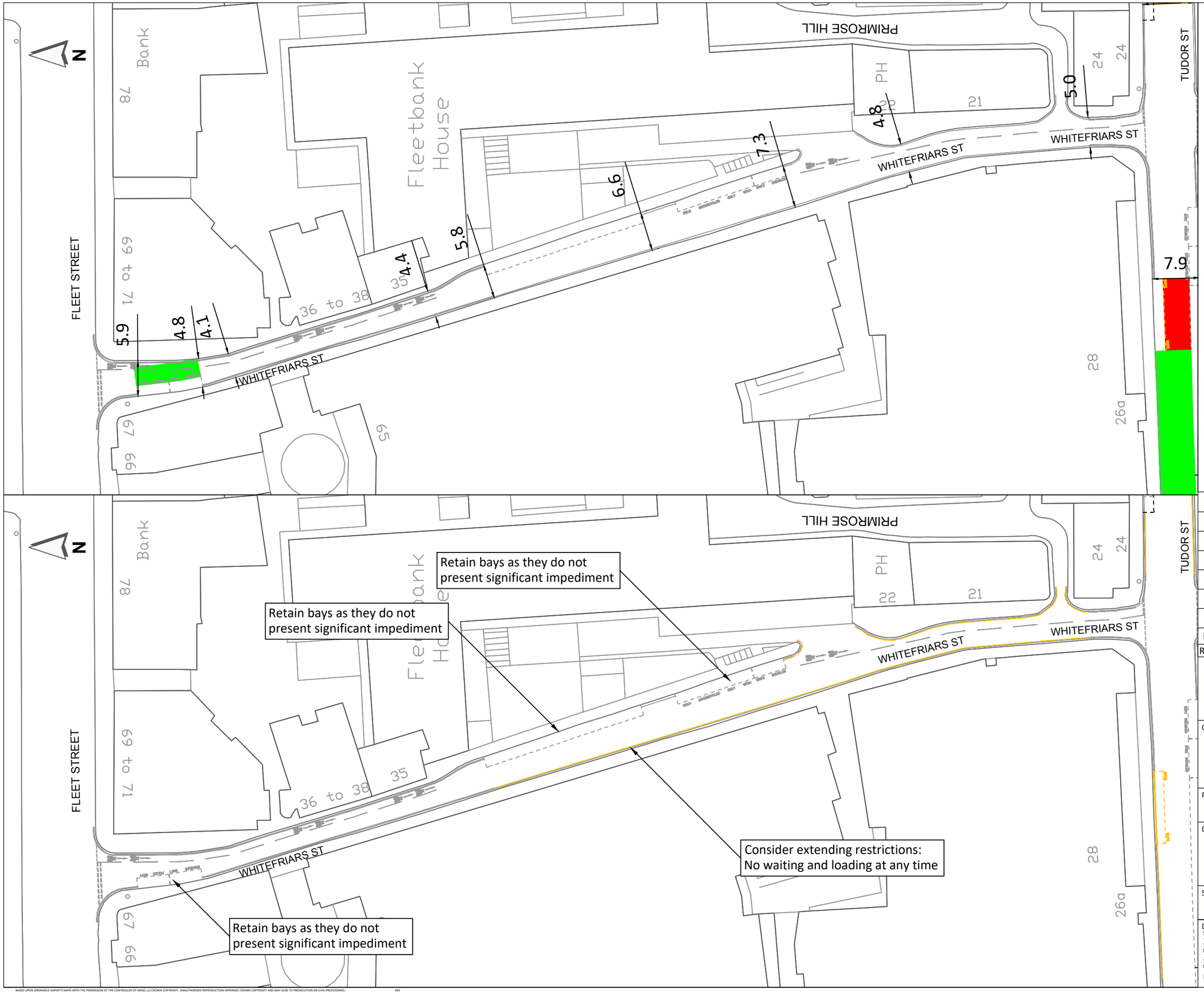
Number		
03		

Scale:	Suitability
1:250	S0
Rev.	Size:
P1	A3

CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\1200\0001-03

DATE: 21/05/2018



Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.4

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

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Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: Whitefriars Street Pinch-point Analysis & Options

Status: WORK IN PROGRESS

Drawing Number: SDG Ref. 23203601 | Originator SDG | Volume HGN | Location --- | Type DR | Role D | Number 04

Scale: NTS | Suitability S0 | Rev. P1 | Size: A3

Salisbury Court / Salisbury Square / Dorset Rise

The last remaining street that links Fleet Street to Tudor Street is Salisbury Court / Salisbury Square / Dorset Rise. Salisbury Court is one-way southbound (with a contra-flow cycle lane) but the rest of the link is two-way as Salisbury Square enables vehicles from the south to access it before turning around and heading south again to return to Tudor Street and out of the study area.

The ATC survey data collected shows that there were 11 recorded large vehicle movements using Dorset Rise between Tuesday 9 and Monday 15 January. 10 large vehicles were observed using Salisbury Court.

Swept Path Analysis

Turning in from Fleet Street

General traffic is only permitted one-way southbound at the northern end of Salisbury Court and this section is subject to the standard CPZ hour nearest the Fleet Street junction.

If no vehicles are stopped at the kerbside then the turn in from Fleet Street is achievable for a 16.5m articulated lorry, albeit only if well-executed. The presence of bollards on each corner and evidence of tyre tracks over the kerbs suggest that some encroachment onto the footway has taken place in the recent past.

Options and Impacts

To ease the movement of large vehicles at this junction, it is suggested to extend the no waiting and no loading 'at any time' restrictions to prevent kerbside use between Fleet Street and the marked bays further south.

The main impact will be on the ability to serve the frontages that do not have off-street facilities in this area.

Pinch-point Analysis

Salisbury Court

Further south, there are two consecutive marked bays before you reach Salisbury Square, the first is a Doctor's bays (restricted to permitted users between 8am-8pm) and the second is for disabled users (disabled badge holders only: Mon-Fri 4 hours (no return within 1 hour), Sat & Sun no limit).

The 3.6m width (approx.) between the bays and the opposite kerbline is sufficient to enable large vehicles to pass with ease but the presence of a marked contra-flow cycle facility (advisory) means that opposing users must give way to each other if they meet.

Options and Impacts

Between the bays and the contraflow cycle lane, the only option to ease flow when the bay is in use would be to remove them or the cycle facility.

Relocating the doctor's bay may be difficult and there is very limited opportunity to re-provide it elsewhere in the immediate vicinity without creating similar issues.

Removing the cycle lane would reduce permeability for cyclists. However, as visibility is good, vehicles and cyclists should be able to give way to each other when they meet therefore it would probably be of limited benefit to remove the cycle lane.

Salisbury Square

Salisbury Square sees the start of the two-way working along this link. The through link (rather than the 'sides' of the square) is subject to 'at any time' no waiting and no loading restrictions and although the width varies, as it is around 6.0m then unless a vehicle is parked illegally large vehicles should be able to pass through this section without significant delay. As a result, no additional measures are deemed necessary in this section.

Dorset Rise

Dorset Rise is also two-way and where bays are not marked, it is covered by no waiting and no loading at any time restrictions until you reach Hutton Street.

As it is a two-way link, we have highlighted section in amber where the width is less than 6.0m; anything less than 6.0m is considered insufficient to enable to vehicles to pass easily.

The bays on Dorset Rise have been reduced recently and only 2 no. disabled bays and a motorcycle bay remain, but if in use then the width alongside them reduces to approximately 4.0m. If opposing traffic wishes to pass it must shuttle-work to do so, but given opposing flows are relatively low along this link (as northbound traffic cannot use it as a through route) then this is usually possible without significant delay.

The final section of Dorset Rise is covered by the standard CPZ hours and there is a further motorcycle bay which can be found on the western kerbline and to the south of Hutten Street. Again, if opposing vehicles meet then one must give way until the other has cleared this relatively short section. However, although the motorcycle bay is short, its location near to the junction with Tudor Street means that if southbound vehicles are waiting on the approach to the junction then this can make it more difficult for any northbound vehicles to pass. This has been shaded red accordingly.

Options and Impacts

Increasing the no waiting and no loading restrictions to 'at any time' along with the removal of the southernmost motorcycle bay would make it easier to accommodate two-way movement along Dorset Rise, but as with other similar suggestions to increase the kerbside restrictions, this would make it more difficult to service frontage from the street.

Conversion to one-way working

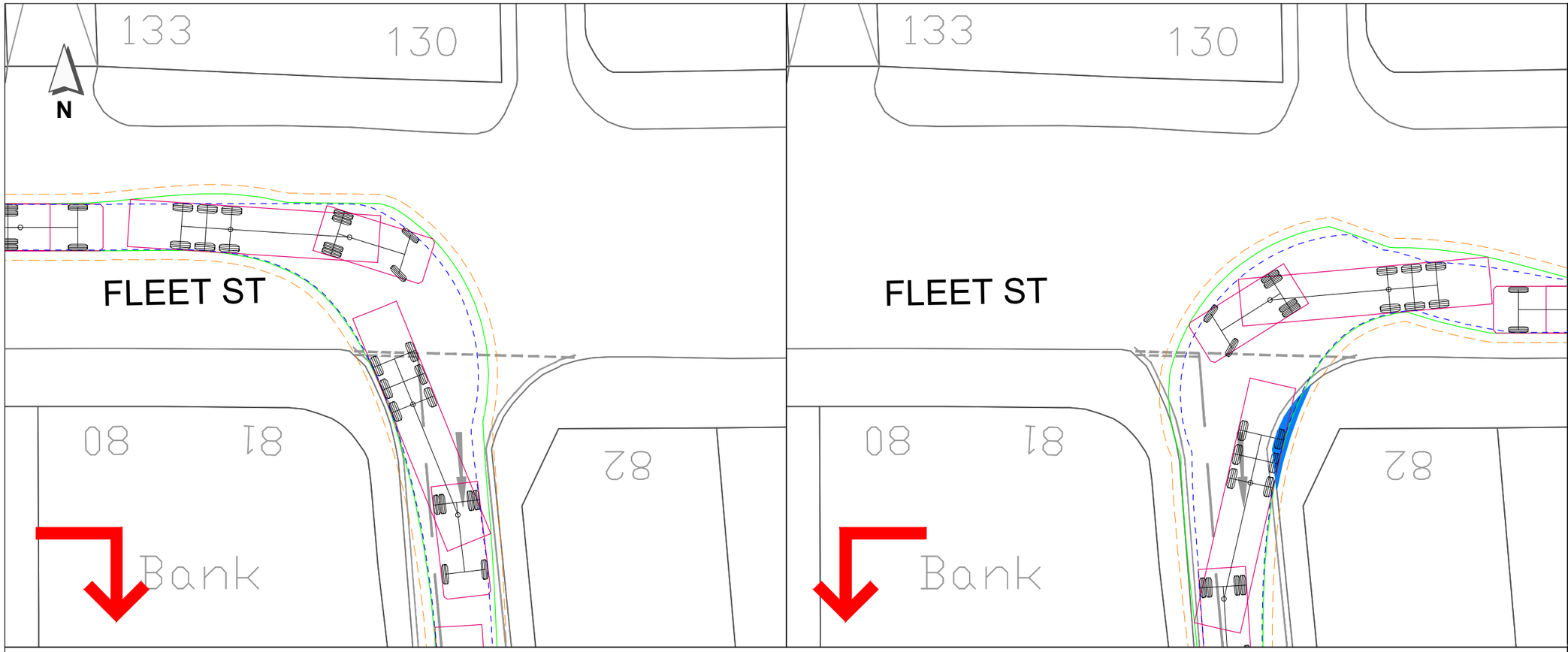
An alternative approach would be to change the southern end of this link to one- way southbound. This would reduce the frequency of opposing conflicts but come at the expense of ease of access from anywhere other than the Salisbury Court / Fleet Street junction.

However, chapter 5 has shown that northbound flows are very low on Dorset Rise, with a maximum of 60 motorised vehicles per day traveling northbound.

Recommendations

The most beneficial of the measures identified would be to:

- Remove the motorcycle bay nearest Tudor Street to ease movements at the junction, and
- Extend the waiting and loading restriction to 'at any time' along the full length of this link (excluding the retained bays)



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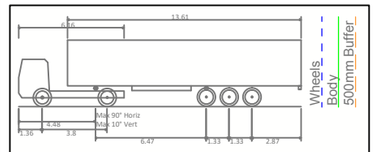
Vehicle Key:



FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.5

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

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Client:
City of London

Project Title:
Temple Area Traffic Study

Drawing Title:
Fleet Street / Salisbury Court
Swept Path Analysis

Status:
WORK IN PROGRESS

Drawing Number:

SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
---	DR	D
Number		
05		

Scale: 1:250
Suitability: S0
Rev.: P1
Size: A3

CAD REFERENCE: P:\Projects\23203601\05\Drawings\23203601-05-05.dwg
DATE: 21/05/2018

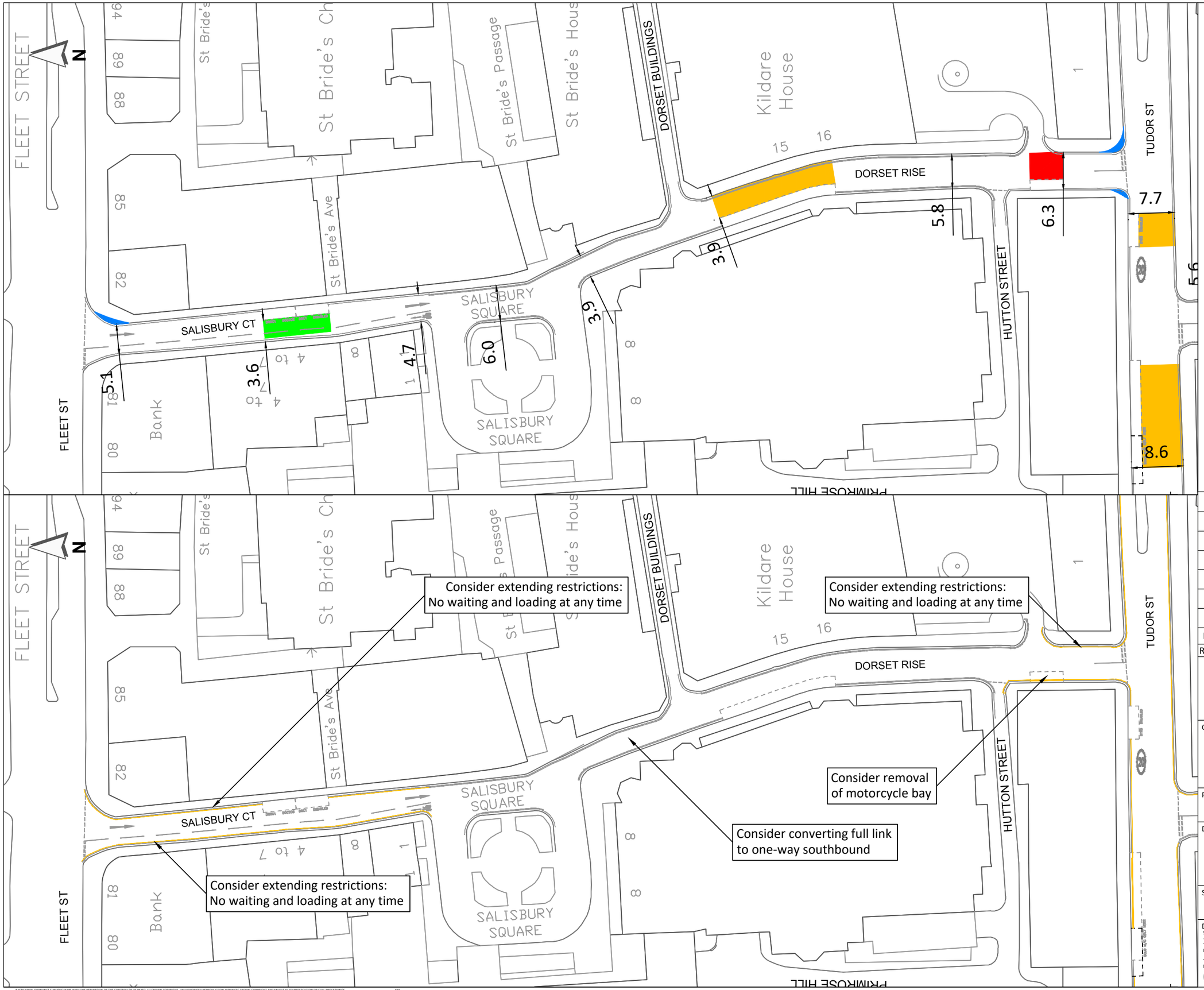


Figure 9.6

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

Project Title:
Temple Area Traffic Study

Drawing Title:
Salisbury Court - Dorset Rise
Pinch-point Analysis & Options

Status:
WORK IN PROGRESS

Drawing Number: SDG Ref.	Originator	Volume	Scale:	Suitability
23203601	SDG	HGN	NTS	S0
Location	Type	Role	Rev.	Size:
---	DR	D	P1	A3
Number 06				

Tudor Street

Tudor Street is the main east-west spine within the study area. It is around 7-8m wide along its length but the presence of marked bays, which accommodate a range of uses, means that two-way movement can be difficult when the kerbside is in use on one or both sides. As some of the bays are lengthy this can lead to delays when larger vehicles are turning into and out of the intersecting side roads and also travelling along the street.

The ATC survey data collected shows that there were 37 recorded large vehicle movements using Tudor Street (between Bouverie Street and Whitefriars Street, eastbound) between Tuesday 9 and Monday 15 January. In the same survey period and on the same location, 5 vehicles were picked up in the westbound direction.

Between Whitefriars Street and John Carpenter Street, 16 large vehicle movements were seen in the westbound direction. 14 large vehicles were picked up in the eastbound direction. Between Dorset Rise and Bridewell Place, 53 large vehicles have used Tudor Street westbound. 15 eastbound movements were picked up for this section.

Swept-path Analysis

It should be noted that the OS base appears to differ slightly at some points, however, this is likely to have limited impact only on the ability of large vehicles to complete their turning manoeuvres.

Left turn out of Bouverie Street

Note: As articulated vehicles cannot pass through the arch that leads to Inner Temple, we have focussed on reviewing the turning manoeuvre that head east.

For the turn from Bouverie Street into Tudor Street, articulated vehicles are unable to complete the movement if the bay(s) on the south-eastern corner of the junction is in use.

Right turn out of Temple Avenue

It should be noted that large vehicles are unlikely to use Temple Avenue as a through route as you cannot access Temple Avenue from Victoria Embankment.

However, and as shown, if the no waiting and no loading restrictions are observed near the junction then the right-turn from Temple Avenue into Tudor Street eastbound is negotiable without difficulty. But if there are any vehicles stopping too near to the junction then it will significantly reduce the ability of large vehicles to complete their turns.

Option and Impacts

Increasing the extents of the waiting and loading restrictions on the northern side and removing one or more bays on the opposite side would help to ease the movement of any large vehicles turning out of either Bouverie Street and Temple Avenue. This would reduce the availability of kerbside space for parking and loading, and if adopted with preceding (and subsequently) suggested measures then the impact will be to significantly reduce the amount of kerbside availability across the study area.

Turning into Whitefriars Street

The swept path analysis shows that the left turn from Tudor Street (west) into Whitefriars Street requires an articulated lorry to make full use of the carriageway and even then it is difficult to undertake the manoeuvre without over-running the inside kerb.

If the southern kerbline along Tudor Street is clear then the turn in from the east is also difficult if large vehicles can turn from their own lane. However, if the kerbside is in use, thus forcing vehicles into a more central position on the approach, then the turning manoeuvres becomes more difficult still.

Option and Impacts

The section west of Whitefriars Street is already covered by sufficient waiting restrictions so, as identified, keeping the southern kerbline between Carmelite Street and John Carpenter Street would help large vehicles turn northbound from the east. This would again reduce the opportunity to service frontages, and also reduce parking capacity at new times when the existing waiting restrictions are not in force.

Turning out of Carmelite Street

It should be noted that left turn out of Carmelite Street serves no obvious egress route within the network as vehicles cannot currently leave the area via Bouverie Street or Temple Avenue, however if a 16.5m articulated vehicle does wish to make this manoeuvre, then it is possible if the no waiting and no loading 'at any time' restrictions are observed.

The right turn out of Carmelite Street is more useful and the manoeuvre is possible in one movement but only if the single yellow lines are not occupied near the junction. If so, then the motorcycle bay is set sufficiently back from the junction to allow large vehicles to pass.

Option and Impacts

Further increases to the waiting and loading restrictions, which would give rise to the previously described impacts such as difficulty with frontage access and overall reduction in kerbside availability, would be the most effective way to improve the throughput of large vehicles.

Turning out of John Carpenter Street

As shown, the left turn out of John Carpenter Street in to Tudor Street (westbound) is not possible for a 16.5m articulated vehicle if the motorcycle bay is in use or the single yellow lines are occupied immediately opposite the junction. The right-turn out is also difficult if the same yellow lined section is occupied. The disabled bay to the east is at least set back sufficiently to enable the turn to be completed.

Option and Impacts

As shown in the options drawing, to ease movements then it is recommended to move the motorcycle bay to the west and increase the waiting and loading restrictions on either side.

Turning out of Dorset Rise

The right and left turns out of Dorset Rise are both possible if the kerbside on Tudor Street is free, however these manoeuvres become much more difficult when it is in use and the current restrictions permit loading through the day and waiting outside of the standard CPZ hours (Mon-Fri, 7am - 7pm and Sat, 7-11am) and as evidenced occupancy is prevalent across the day.

Pinch-point Analysis

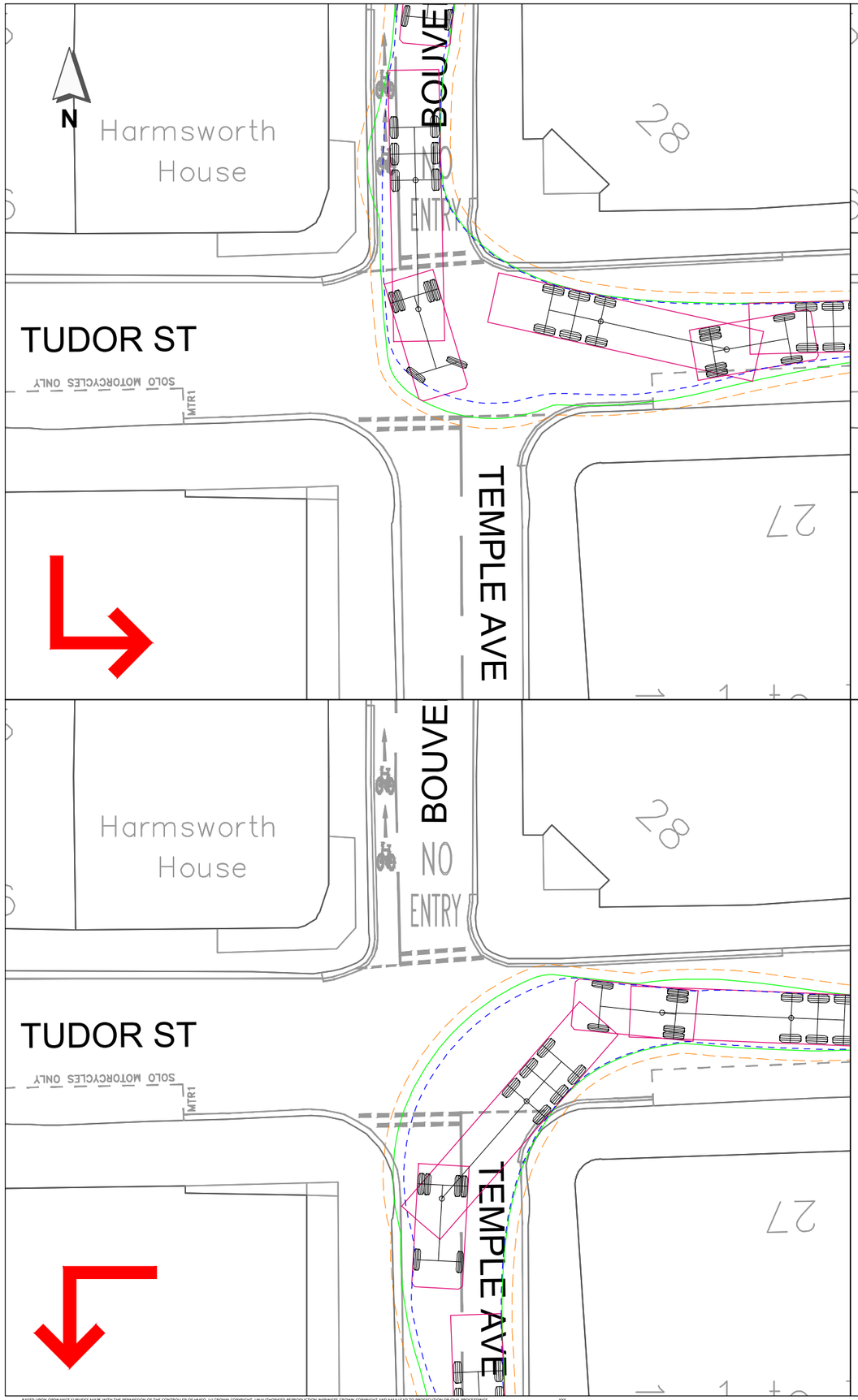
As highlighted, there are sections where the marked bays reduce the through width to less than 6m. Most of these are short sections that would allow most vehicles to pass two-way without significant delay. However, the taxi rank between Temple Avenue and Carmelite reduces the width significantly when both sides of the street are in use and requires vehicles to shuttle-work to pass this pinch-point.

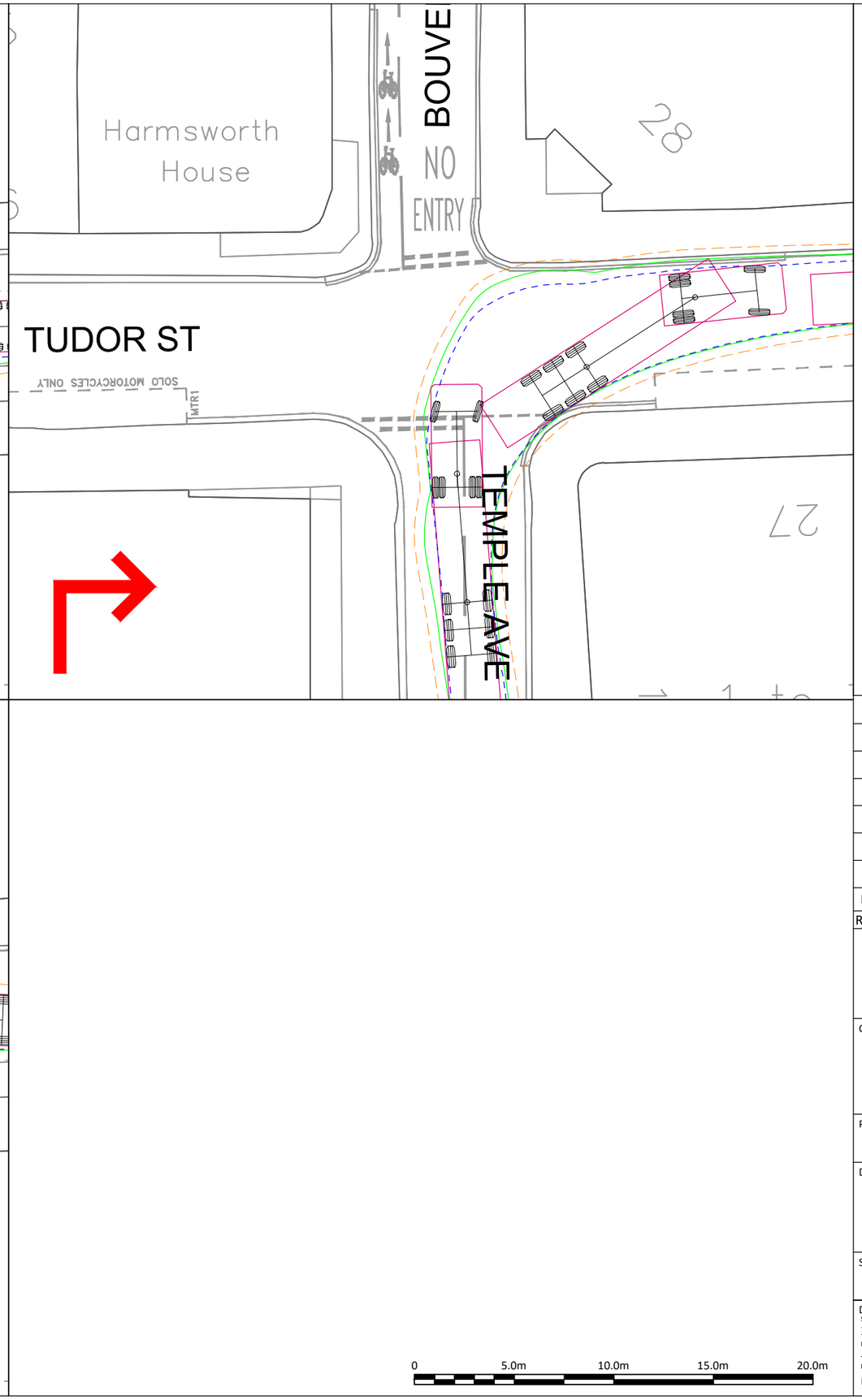
Option and Impacts

Removal of the pinpoint caused by the taxi rank would likely require it to be relocated to the southern side of the street at the expense of some existing marked bays. Provision of no waiting and no loading 'at any time' restrictions should replace it on the northern side.

Recommendations

- Reduce the number of bays on the south side of Tudor Street near the Temple Avenue junction to ease left-turning movements out of Bouverie Street
- Extend waiting and loading restriction times and coverage along the length of Tudor Street.
- Relocate the taxi rank to the southern side of the street
- Relocate and reduce the motorcycle bay to a point nearer Carmelite Street





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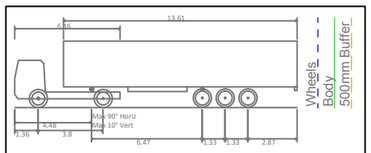

FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.7

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
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Client:
City of London

Project Title:
Temple Area Traffic Study

Drawing Title:
Tudor St / Bouverie St / Temple Ave
Swept Path Analysis

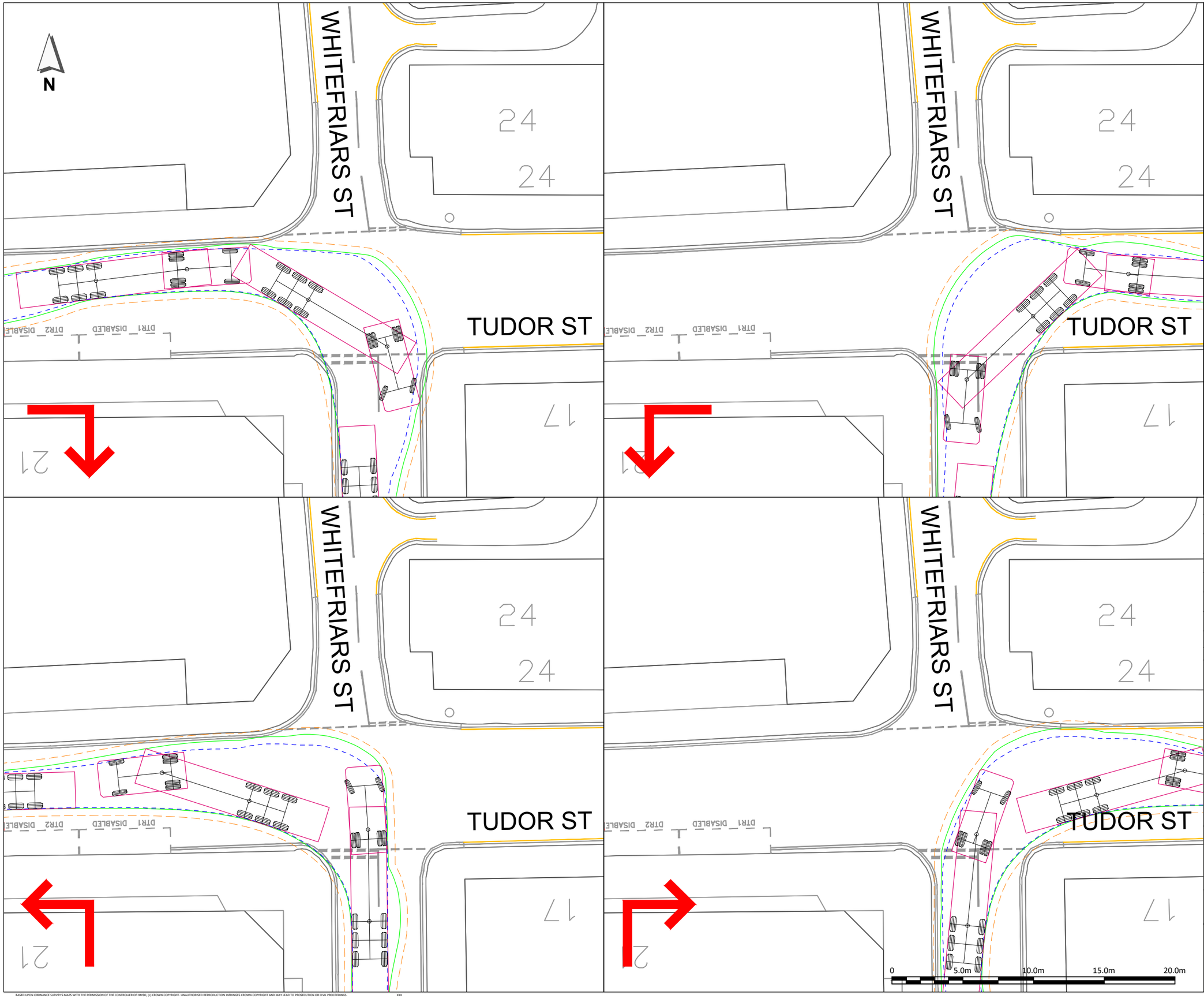
Status:
WORK IN PROGRESS

Drawing Number:

SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
---	DR	D
Number		
07		

Scale: 1:250
Suitability: S0
Rev.: P1
Size: A3

DATE: 21/05/2018 CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-07-07.dwg



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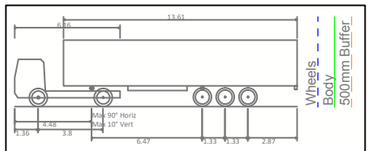


FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.8

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

Project Title:
Temple Area Traffic Study

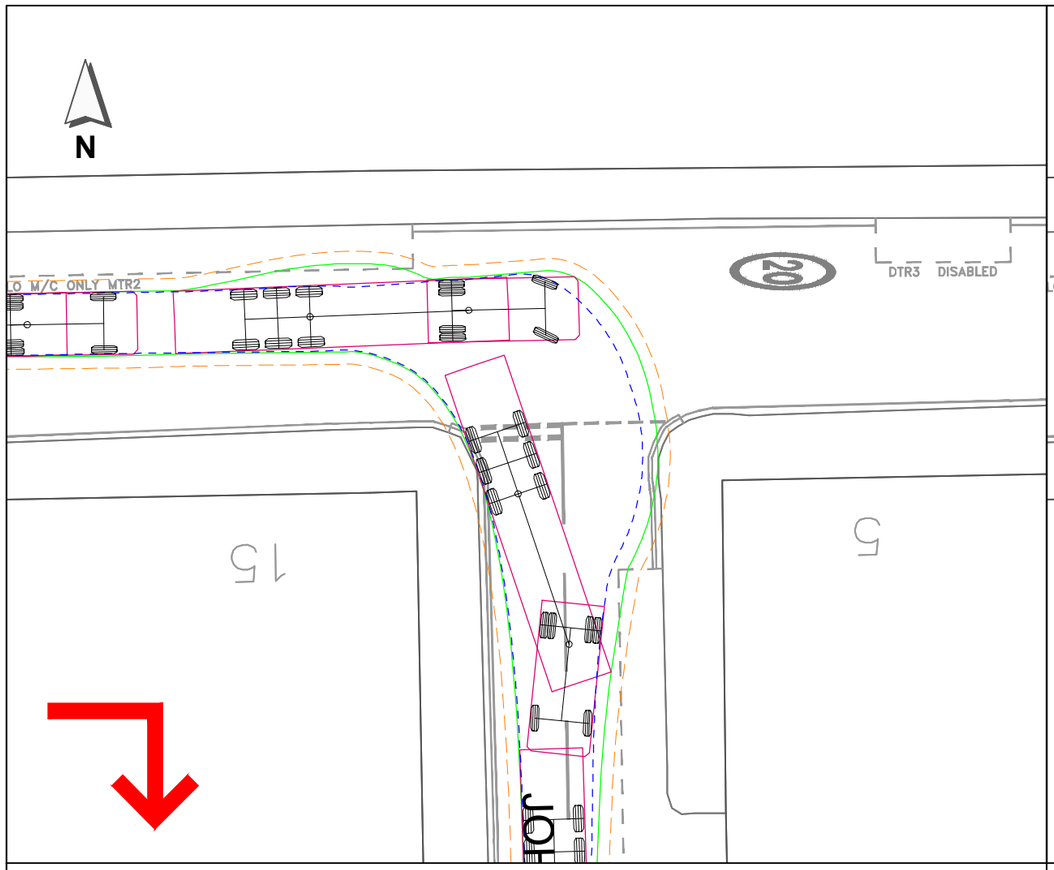
Drawing Title:
Tudor St /Whitefriars St /Carmelite St
Swept Path Analysis

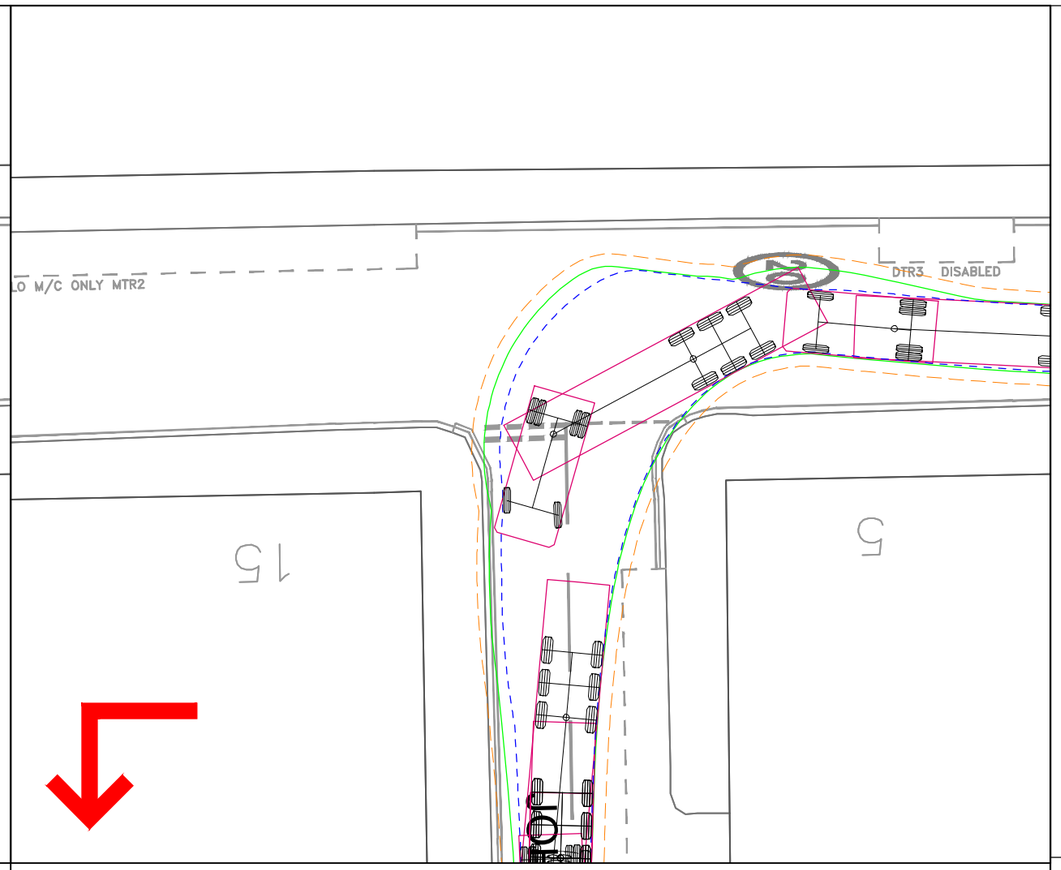
Status:
WORK IN PROGRESS

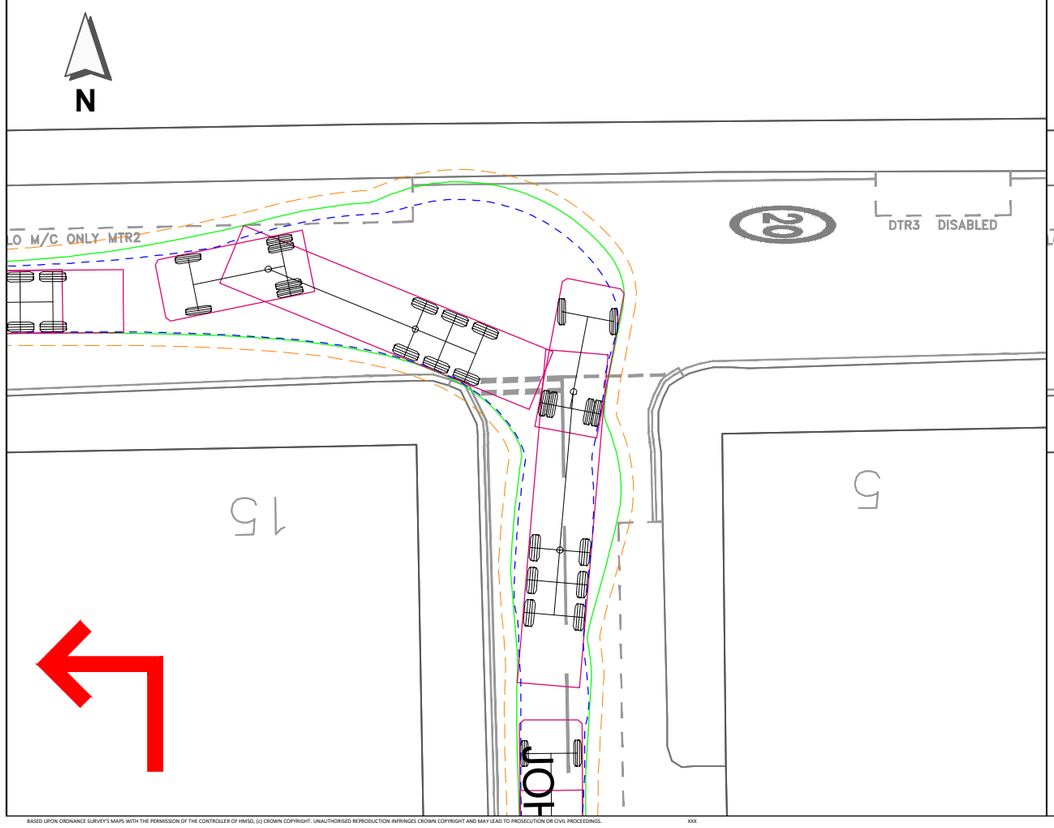
Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN
Location --- | Type DR | Role D
Number 08

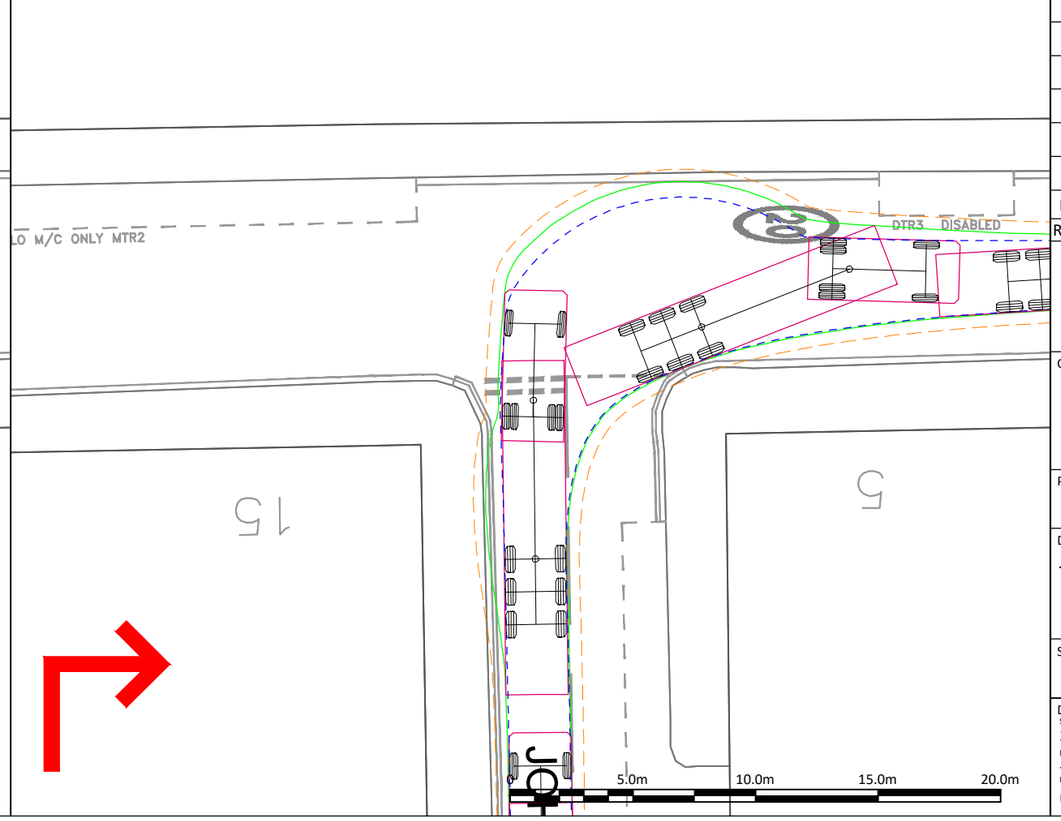
Scale: 1:250
Suitability S0
Rev. P1
Size: A3

DATE: 21/05/2018 CAD FILE REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-03 - 08









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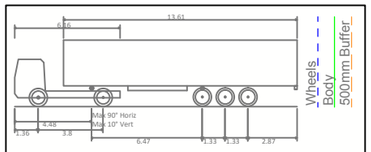

FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.9

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
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Client:

City of London

Project Title:

Temple Area Traffic Study

Drawing Title:

Tudor Street / John Carpenter Street
Swept Path Analysis

Status:

WORK IN PROGRESS

Drawing Number:

SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
---	DR	D
Number		
09		

Scale: 1:250

Suitability: S0

Rev.: P1

Size: A3

DATE: 21/05/2018 CAD FILE REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-09

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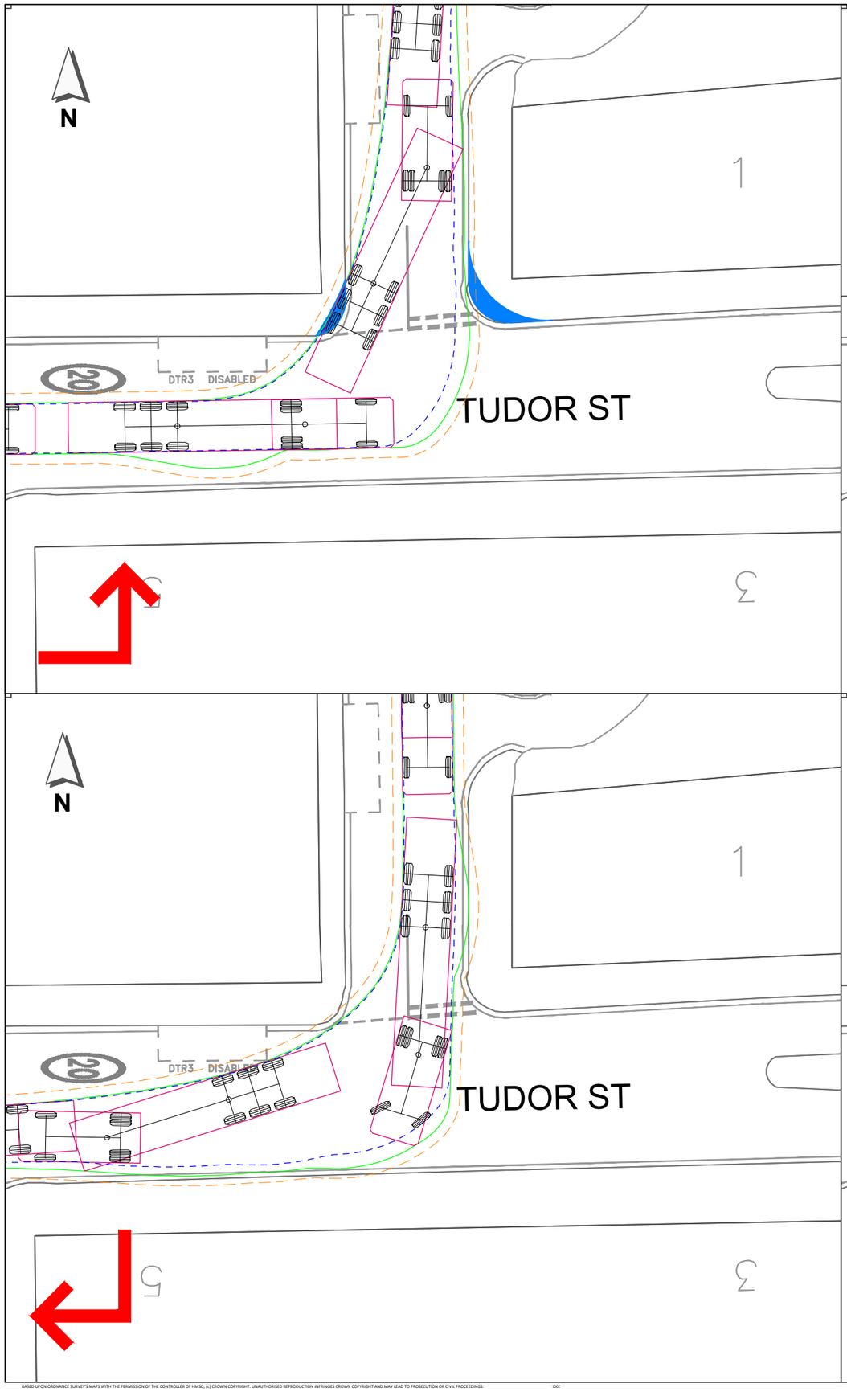

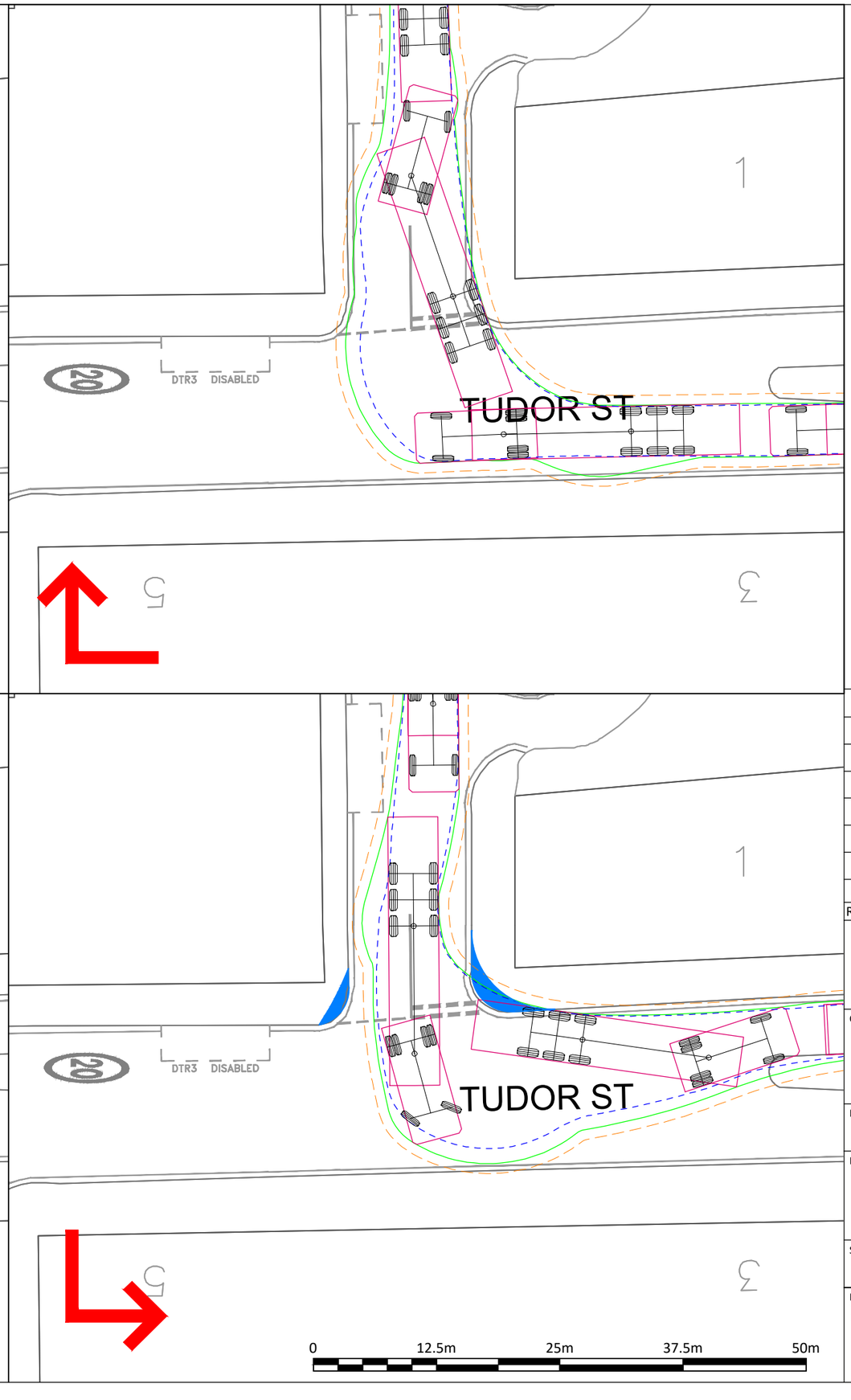

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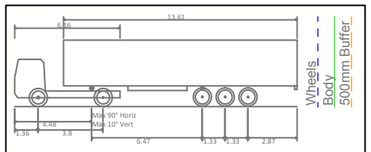


FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.10

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: Tudor Street / Dorset Rise Swept Path Analysis

Status: WORK IN PROGRESS

Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN
Location --- | Type DR | Role D
Number 10

Scale: 1:500

Suitability S0

Rev. P1

Size: A3

0 12.5m 25m 37.5m 50m

DATE: 21/05/2018 CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\1500 000 00 - SD

Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.11

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

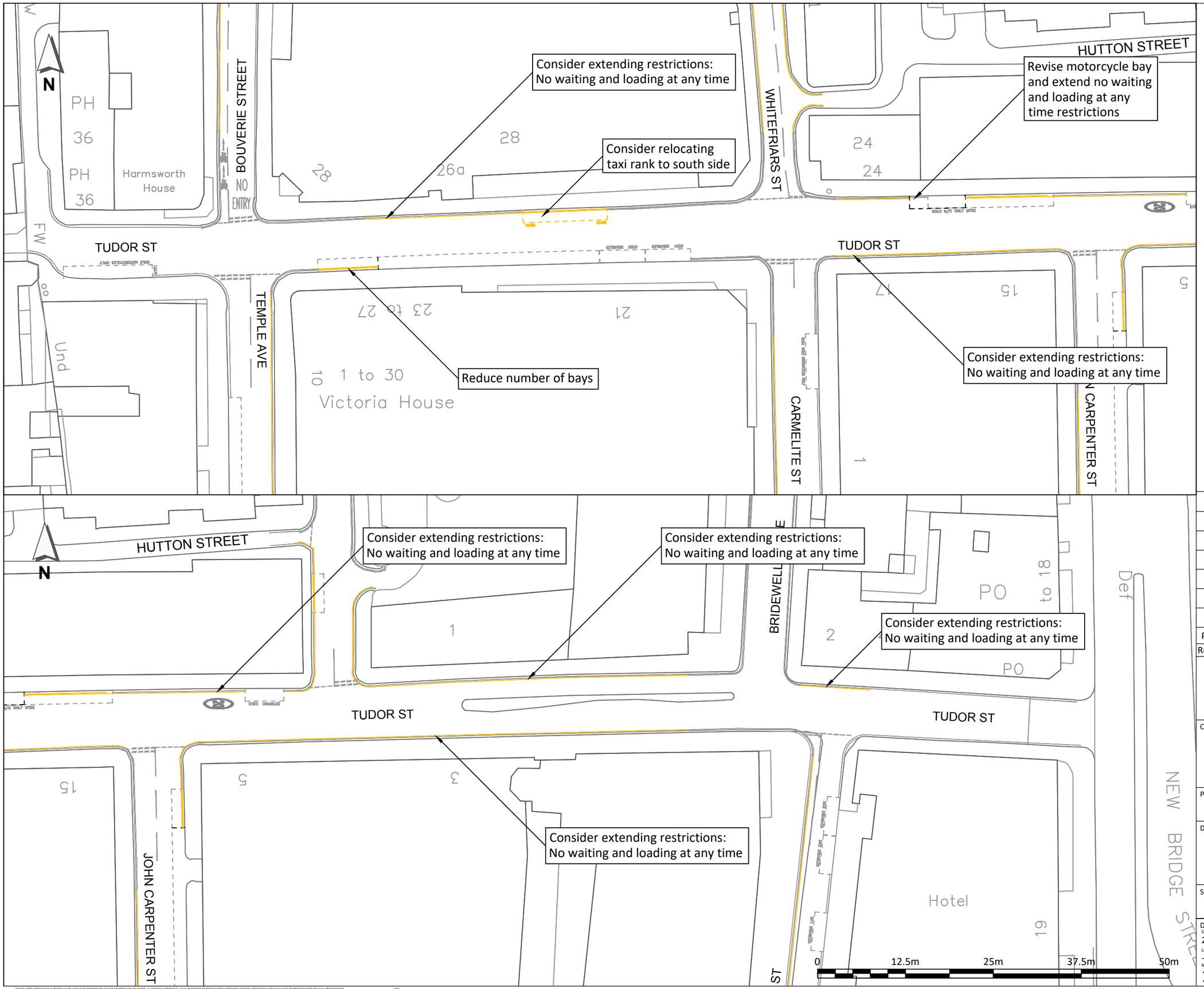
Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: Tudor Street Pinch-point Analysis

Status: WORK IN PROGRESS

Drawing Number: SDG Ref.	Originator	Volume	Scale:	Suitability
23203601	SDG	HGN	1:500	S0
Location: ---	Type: DR	Role: D	Rev.: P1	Size: A3
Number: 11				



Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.12

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: Tudor Street Options

Status: WORK IN PROGRESS

Drawing Number: SDG Ref. 23203601 | Originator SDG | Volume HGN | Location --- | Type DR | Role D | Number 12

Scale: 1:500 | Suitability S0 | Rev. P1 | Size: A3

Kingsgate Street / Watergate

The narrow width, tight turns at the intersection of these two streets and extensive provision of on-street parking means that this link is not suitable for HGVs.

It would require most, if not all, of the existing kerbside activity to be prohibited to make it accessible as a route out of the study area. As this is not an obvious route we have not made any recommendations to change the restrictions in this area.

Tallis Street

Tallis Street provides a secondary east-west connection between Temple Avenue, Carmelite Street and John Carpenter Street, and lies to the south of Tudor Street.

Its main function is for access as it serves no direct route for through traffic. The intersecting side streets are all narrow and this means that this part of the network is generally unsuitable for large vehicles, unless for strictly necessary access. We have taken the same approach to the swept path and pinch-point analysis for completeness but flows are very low.

Swept Path Analysis

Turning into and out of Temple Avenue

As shown in the swept path analysis drawing, the narrow carriageway and positioning of the marked bays on the western side of Temple Avenue mean that it is not possible for a 16.5m articulated to turn into or out of the side road. The movements are however possible for a 10m rigid lorry and this type of vehicle is more likely to deliver within the area than the larger HGVs.

Turning into and out of Carmelite Street

The same issues are experienced at the intersection of Tallis Street and Carmelite Street. The cycle dock and build-out at the junction narrow the carriageway significantly and would see a large vehicle overrun the footway if a turn from Tallis Street into Carmelite Street is required.

Turning into and out of John Carpenter Street

Again, the narrow streets and positioning of the bays on John Carpenter Street mean that turns into and out of Tallis Street / John Carpenter Street are very difficult, if not impossible, for large vehicles (especially if the bays are in use).

Options and Impacts

All the movements to and from Tallis Street would require the removal of most of the existing bays on the north-south links, particularly around the junctions. Larger kerb radii, to the detriment of pedestrian crossing movements, would also be required to accommodate several of the swept paths.

Pinch-point Analysis

Temple Avenue and John Carpenter Street

These streets are both two-way and at present do not provide vehicular paths out of the study area, however the presence of the lengthy marked bays means that widths are significantly below that necessary to accommodate free-flowing two-way movement, particularly if it involves large vehicles.

Carmelite Street

Carmelite Street does however serve as an egress route onto Victoria Embankment but if the kerbside activity is limited to the marked bays on the eastern side then friction is low as it is effectively one-way southbound only. As shown in Figure 6.45 , OGV flows using Carmelite Street to access Victoria Embankment are relatively low (60 vehicles between 9 January and 15 January), with most of the movements coming from 2 Axle Rigid vehicles (60%), and no vehicles larger than 4-axle Rigid (11 in the entire survey period).

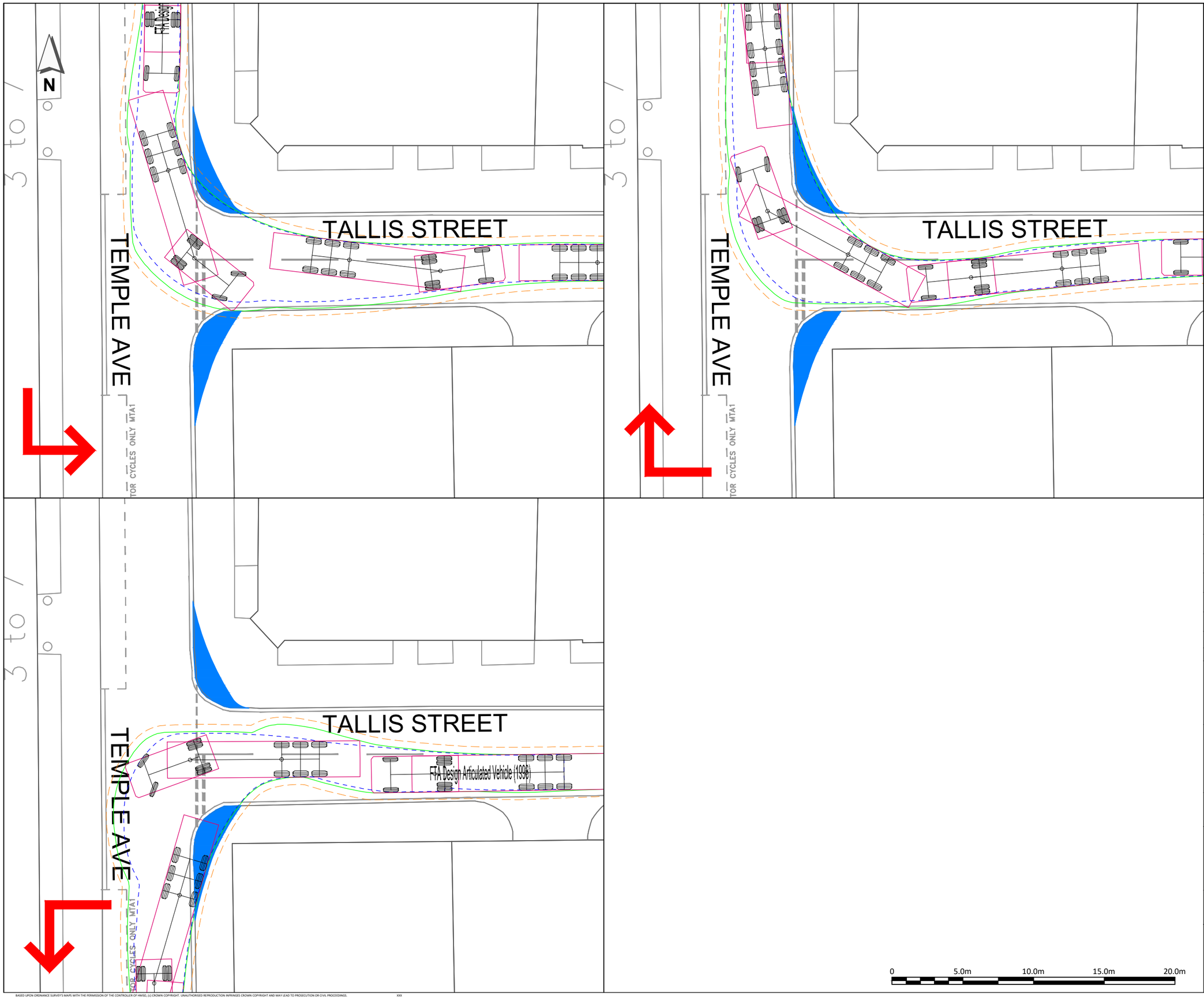
Options and Impacts

To accommodate two-way flows on Temple Avenue and John Carpenter Street then most of the marked bays would need to be removed. However, as these streets serve little purpose as through routes, such a measure seems disproportionate in its impact on kerbside availability.

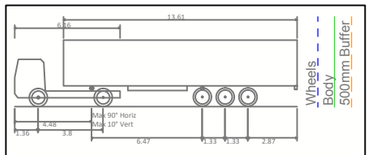
Problems along Carmelite Street only really occur when vehicles stop outside of the marked bays, so upgrading the existing single yellow lines to doubles with matching kerb blips (i.e. no waiting and no loading ‘at any time’) would help to keep the carriageway clear for access traffic on this and the other two north-south streets.

Recommendations

- Upgrade the existing no waiting and no loading restrictions to ‘at any time’ along the length of all streets south of Tudor Street (excepting the existing marked bays).



Vehicle Key:



FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.13

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave

t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: Tallis Street / Temple Avenue Swept Path Analysis

Status: WORK IN PROGRESS

Drawing Number:

SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
---	DR	D
Number		
13		

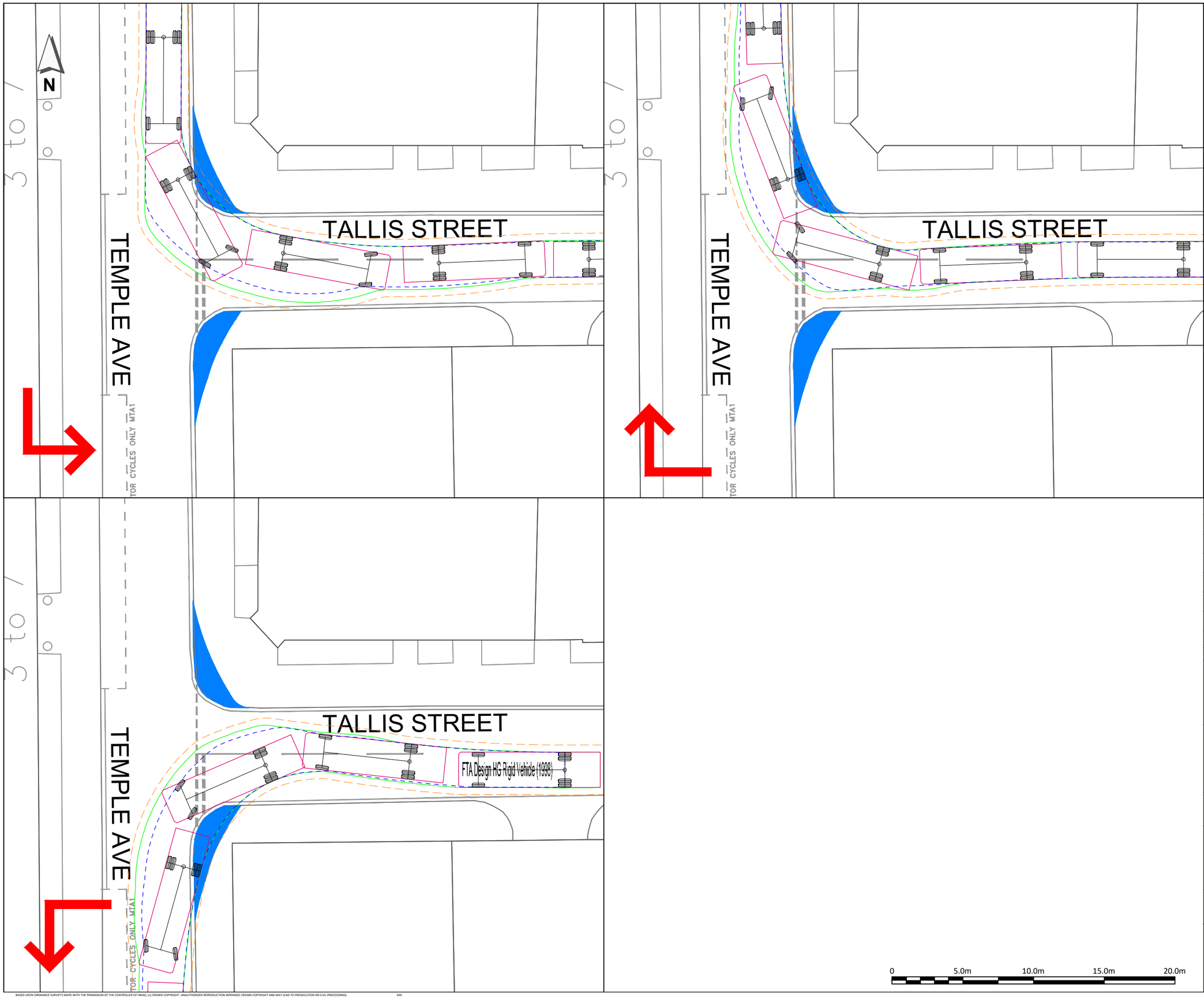
Scale: 1:250

Suitability: S0

Rev.: P1

Size: A3

DATE: 21/05/2018 CAD REFERENCE: P:\Projects\232\03\A001\CAD\Drawings\13\03\001 00 - 13



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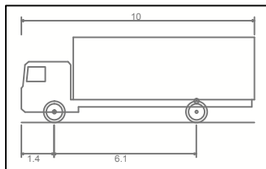


FTA Design HG Rigid Vehicle (1998)

Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	11.000m

Figure 9.14

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

Project Title:
Temple Area Traffic Study

Drawing Title:
Tallis Street / Temple Avenue
Swept Path Analysis

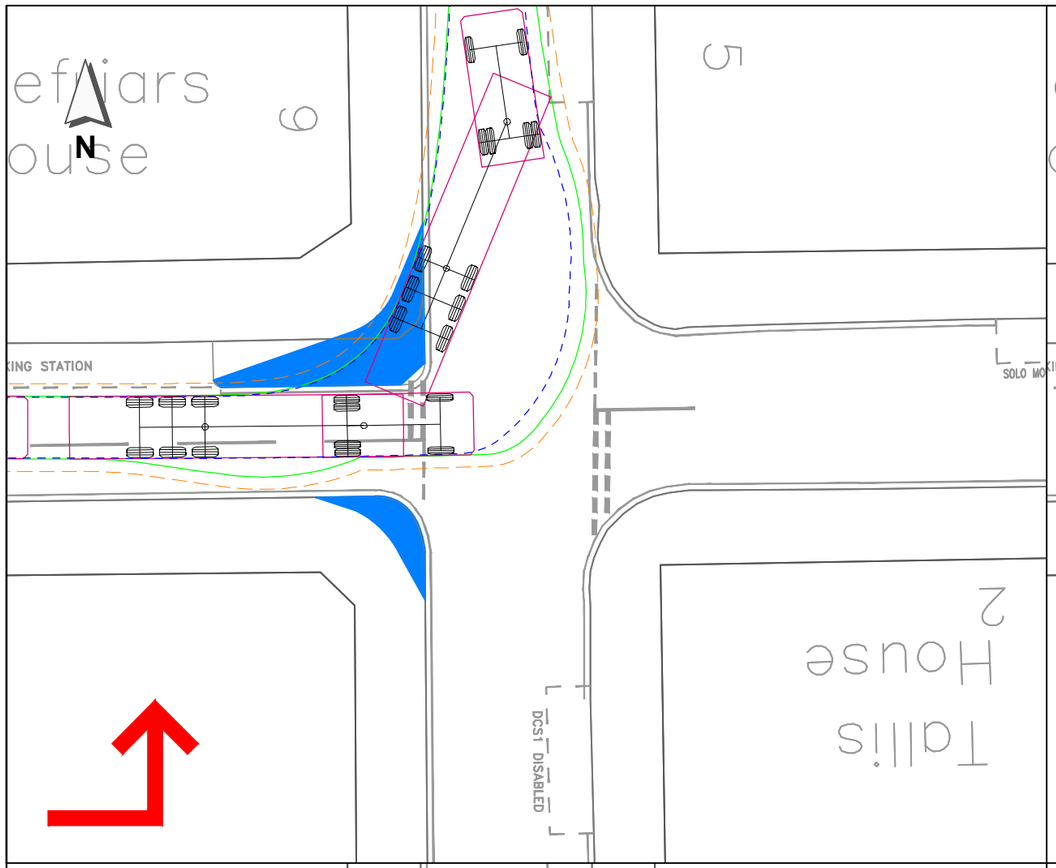
Status:
WORK IN PROGRESS

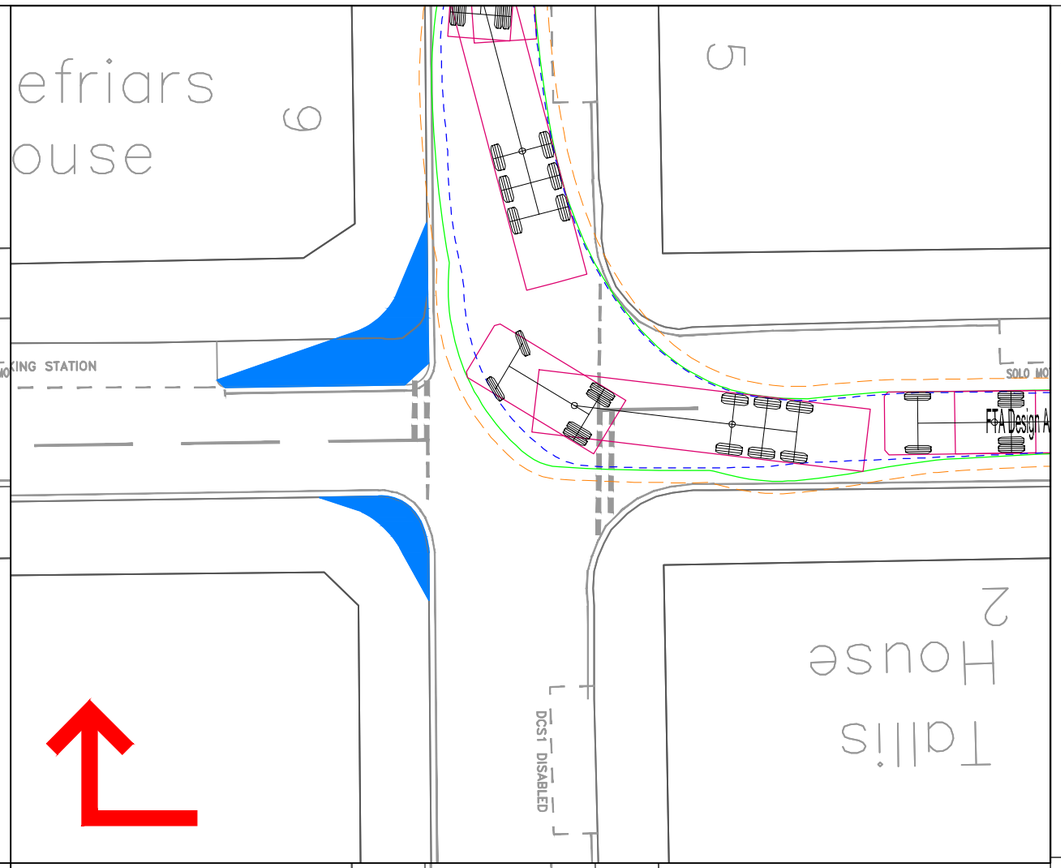
Drawing Number:

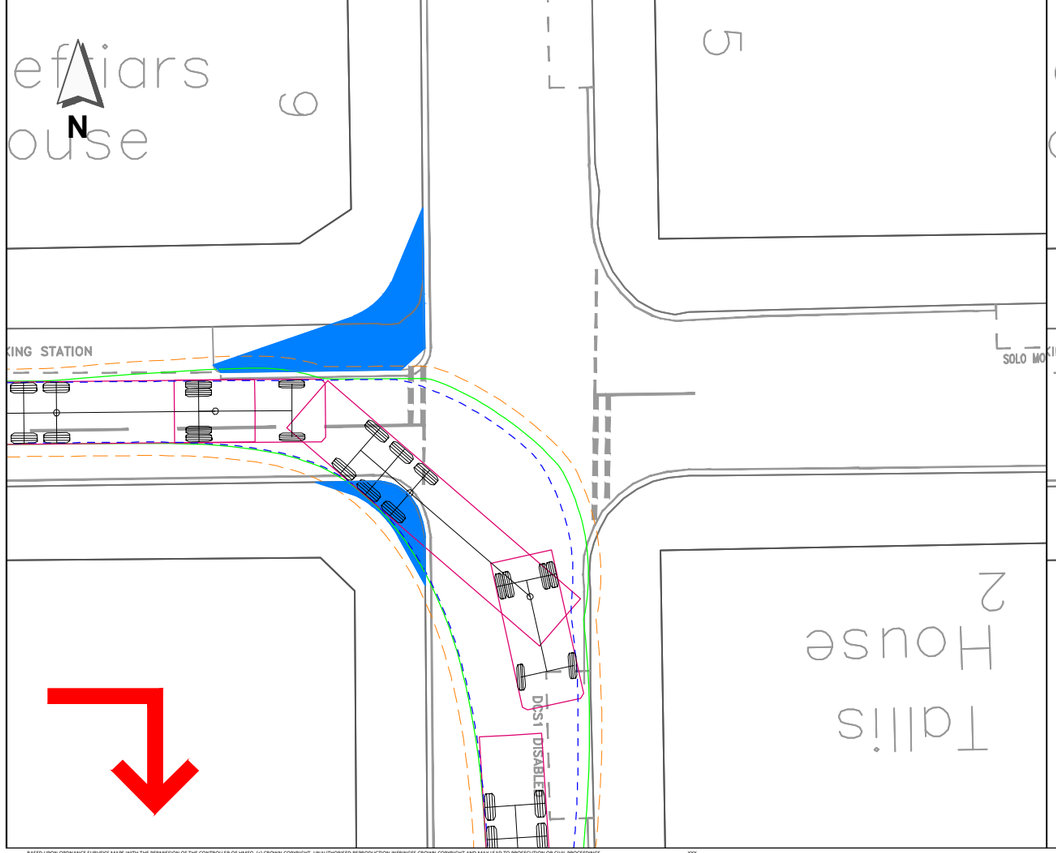
SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
---	DR	D
Number		
01		

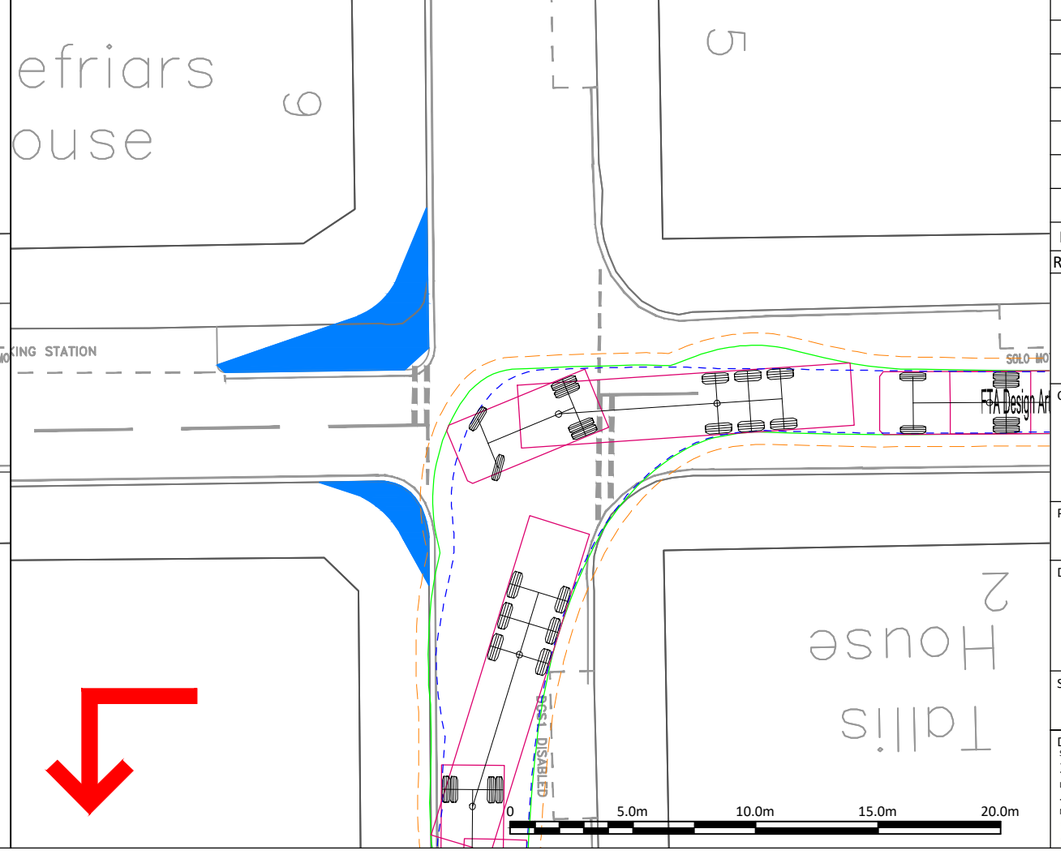
Scale:	Suitability
1:250	S0
Rev.	Size:
P1	A3

CAD REFERENCE: P:\Projects\232100\4001\CAD\Drawings\232100 3001 04 -01
DATE: 21/05/2018









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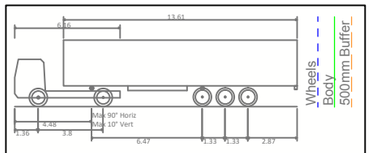


FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.15

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave

t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:

City of London

Project Title:

Temple Area Traffic Study

Drawing Title:

Tallis Street / Carmelite Street
Swept Path Analysis

Status:

WORK IN PROGRESS

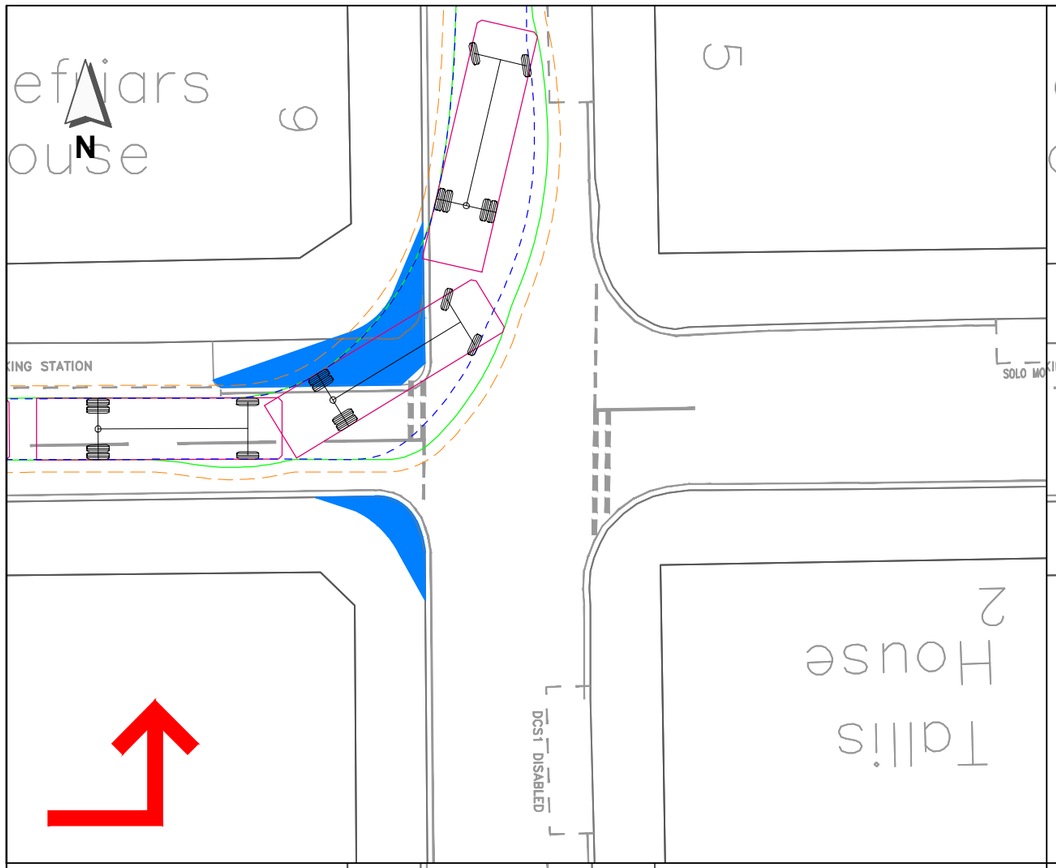
Drawing Number:

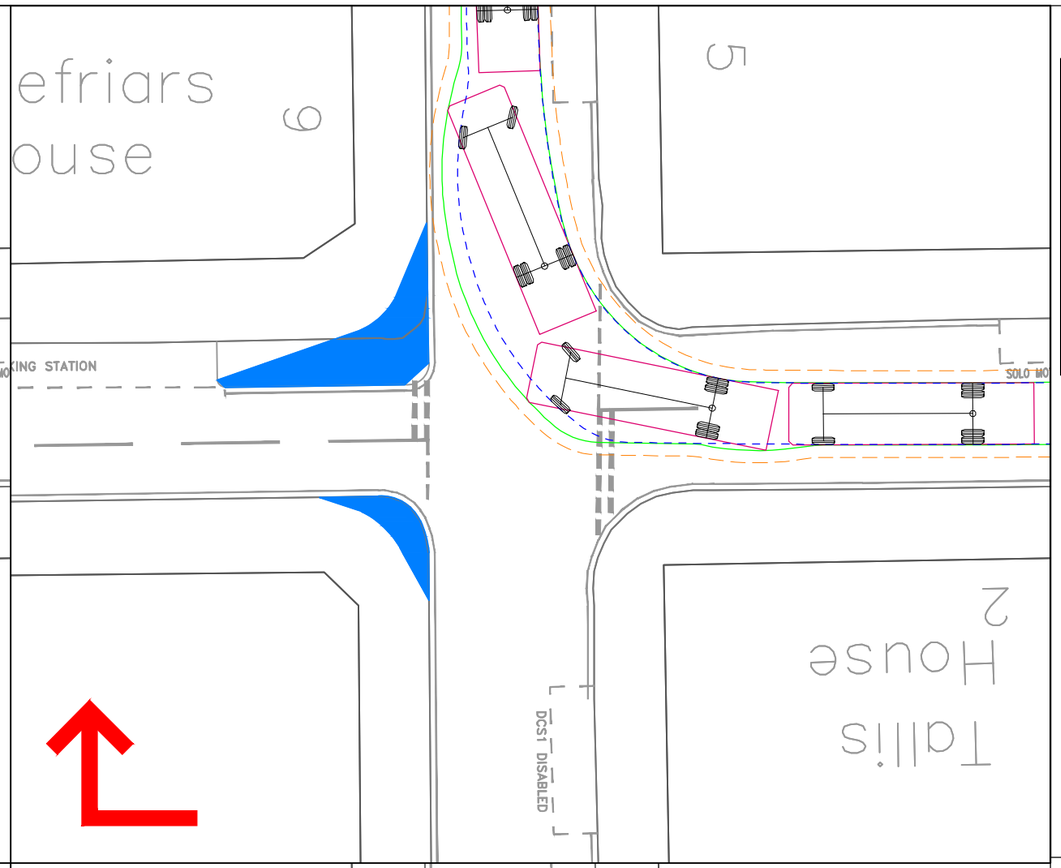
SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
---	DR	D
Number		
14		

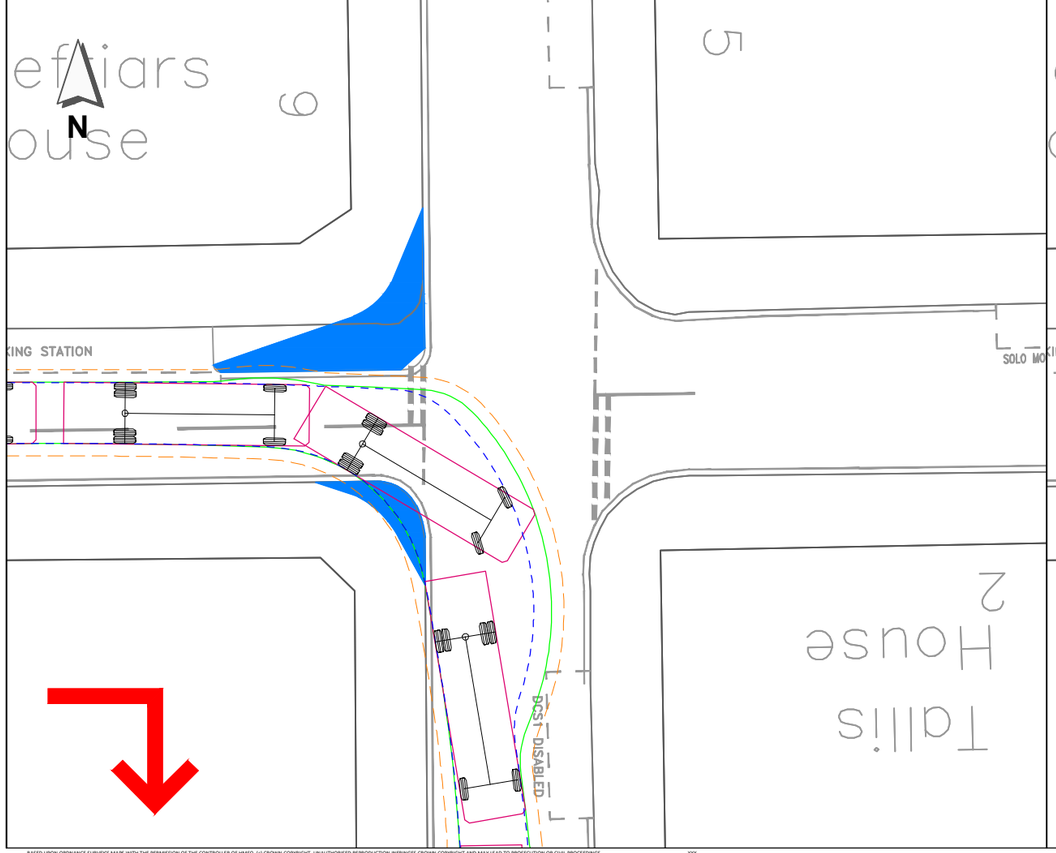
Scale:	Suitability
1:250	S0
Rev.	Size:
P1	A3

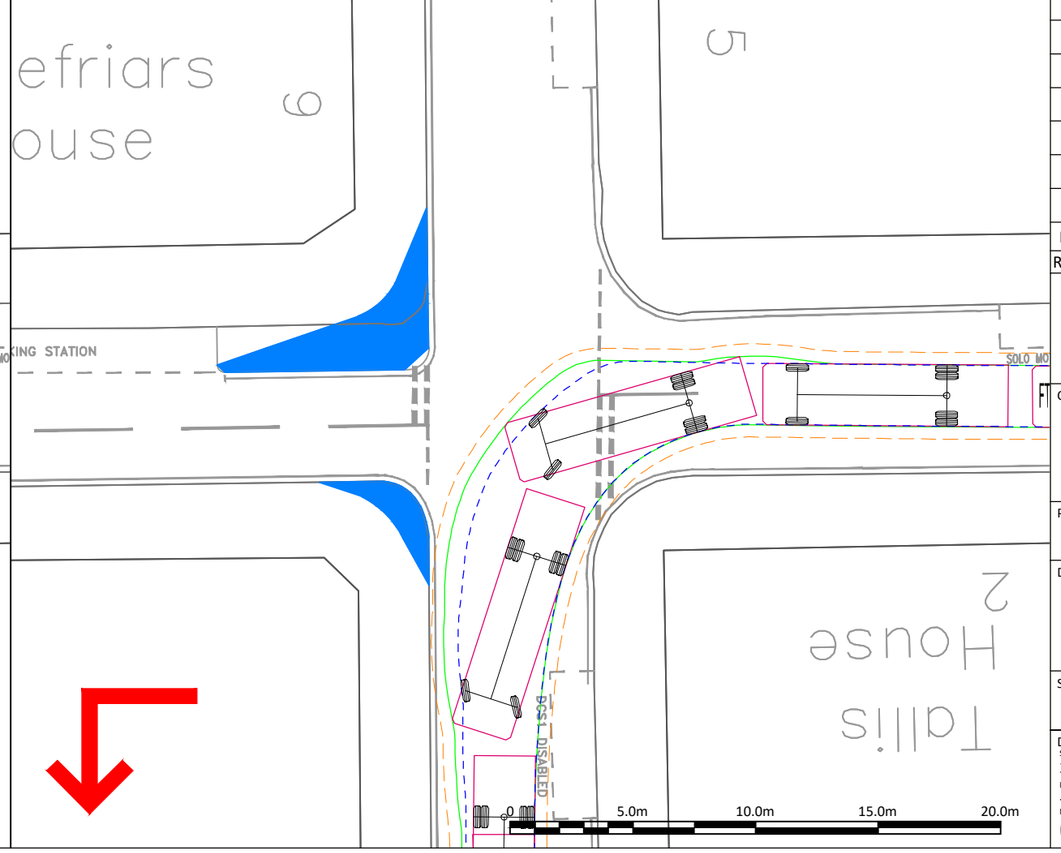
XXX

DATE: 21/05/2018 CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-03 - 14









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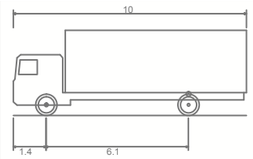

FTA Design HG Rigid Vehicle (1998)

Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	11.000m

Figure 9.16

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE			

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t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

Project Title:
Temple Area Traffic Study

Drawing Title:
Tallis Street / Carmelite Street
Swept Path Analysis

Status:
WORK IN PROGRESS

Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN
Location --- | Type DR | Role D
Number 02

Scale: 1:250
Suitability S0
Rev. P1
Size: A3

DATE: 21/05/2018 CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-04 - 02

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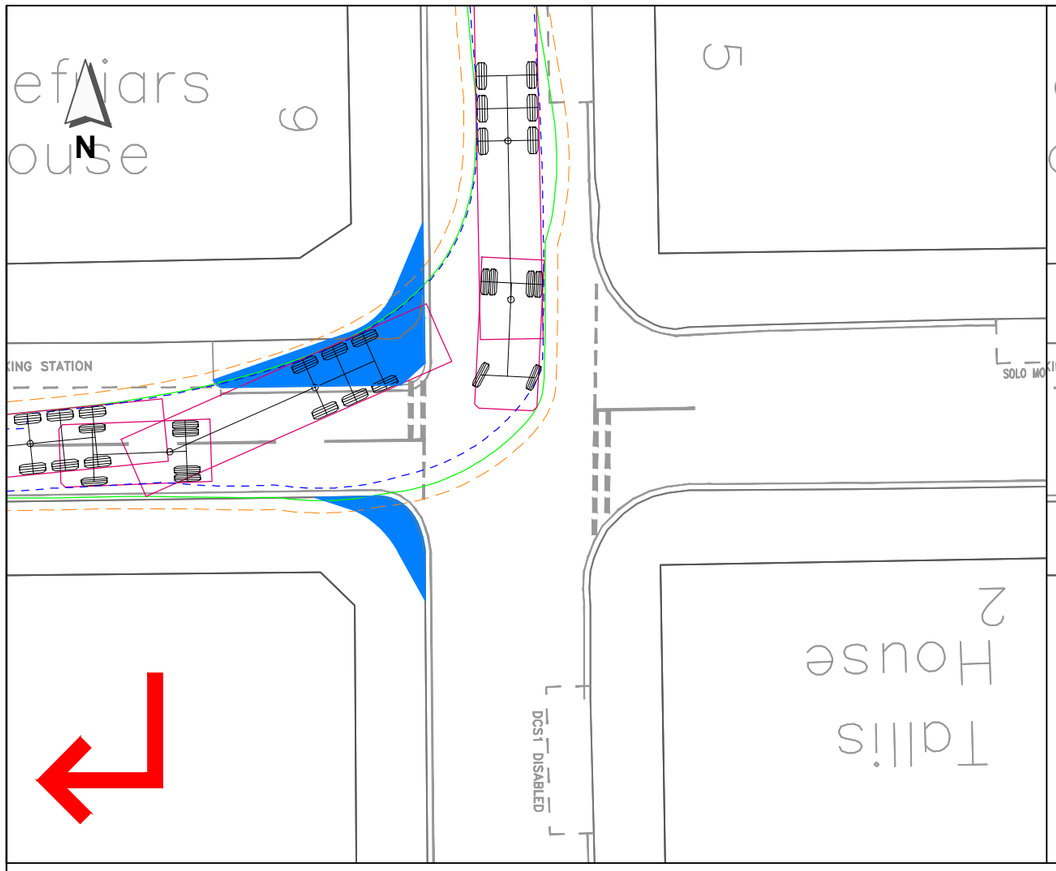

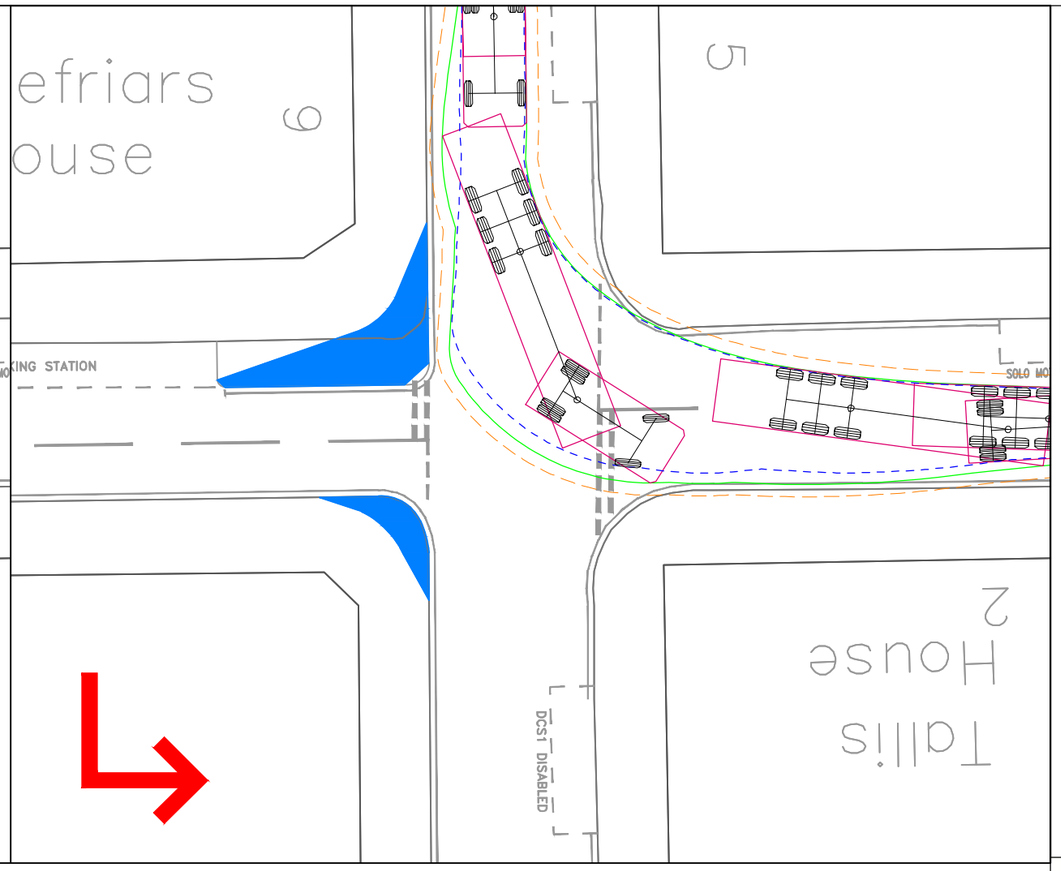

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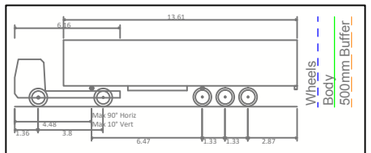

FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.17

0 5.0m 10.0m 15.0m 20.0m

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

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t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

Project Title:
Temple Area Traffic Study

Drawing Title:
Tallis Street / Carmelite Street
Swept Path Analysis

Status:
WORK IN PROGRESS

Drawing Number:

SDG Ref.	Originator	Volume
23203601	SDG	HGN
Location	Type	Role
---	DR	D
Number		
15		

Scale:	Suitability
1:250	S0
Rev.	Size:
P1	A3

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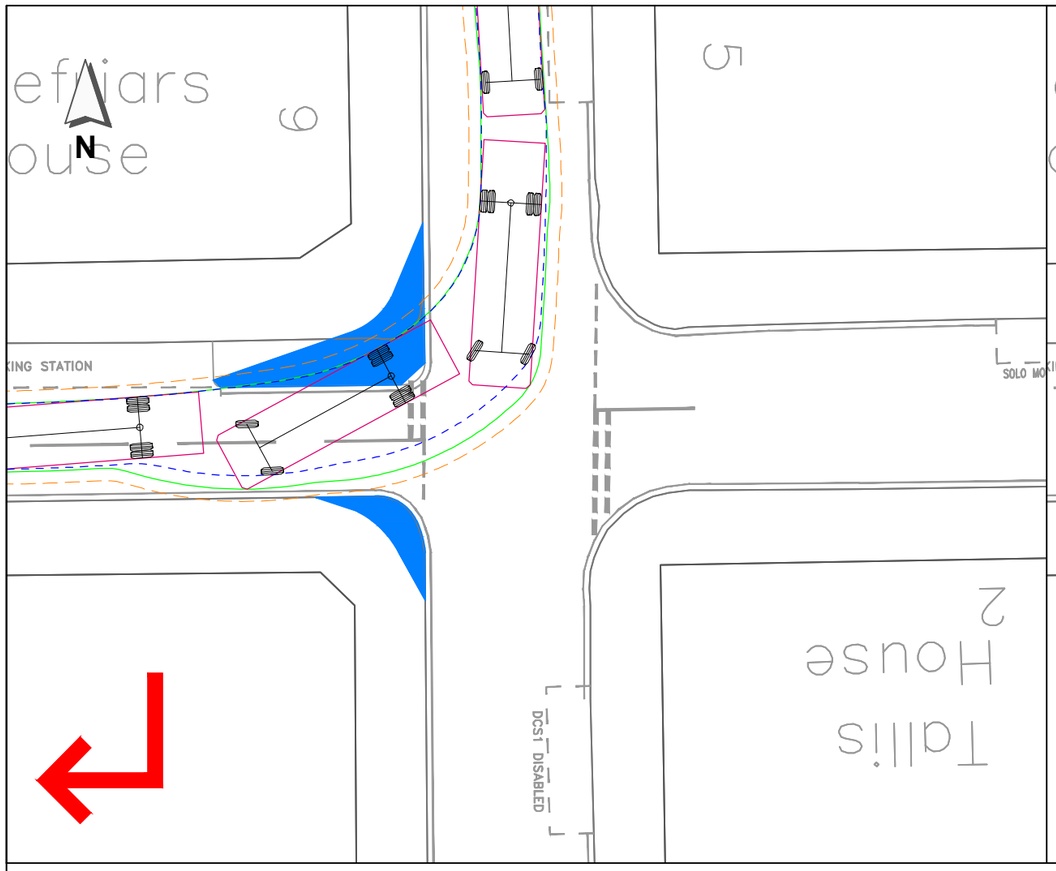
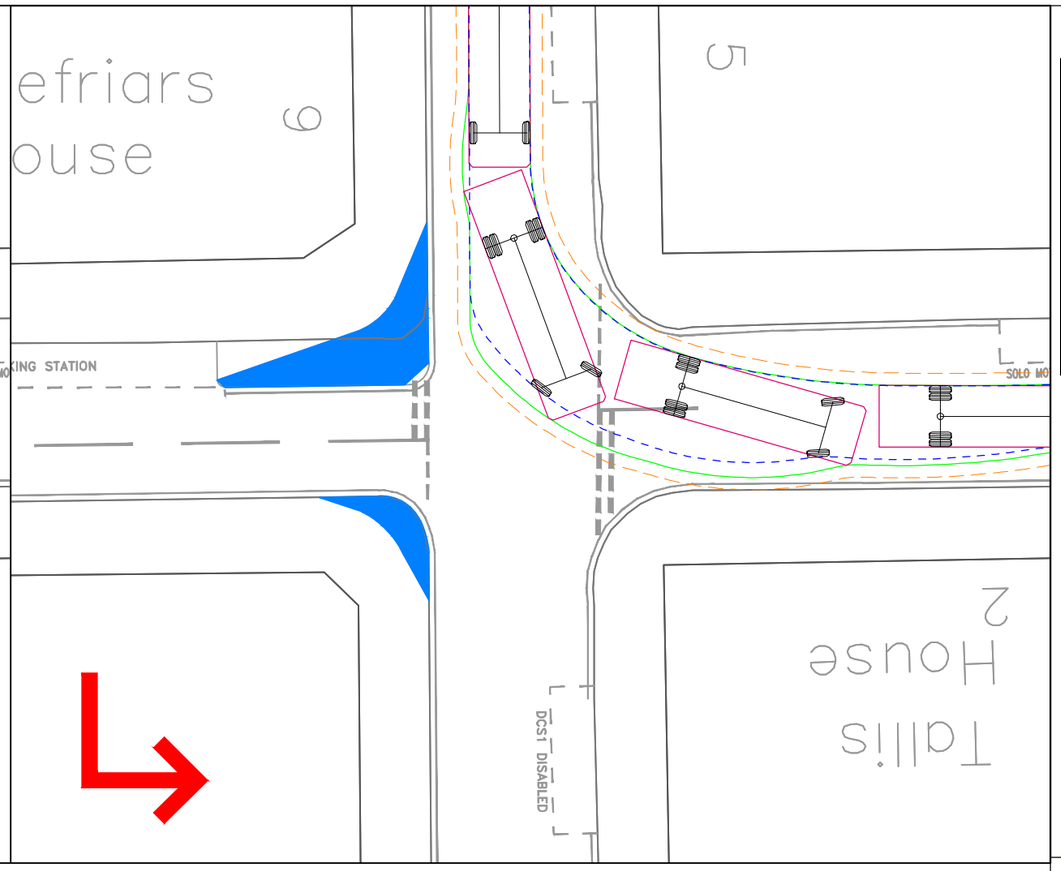
DATE: 21/05/2018





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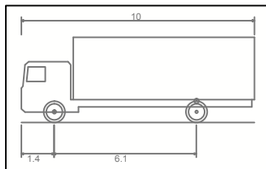


FTA Design HG Rigid Vehicle (1998)

Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	11.000m

Figure 9.18

0 5.0m 10.0m 15.0m 20.0m

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

Project Title:
Temple Area Traffic Study

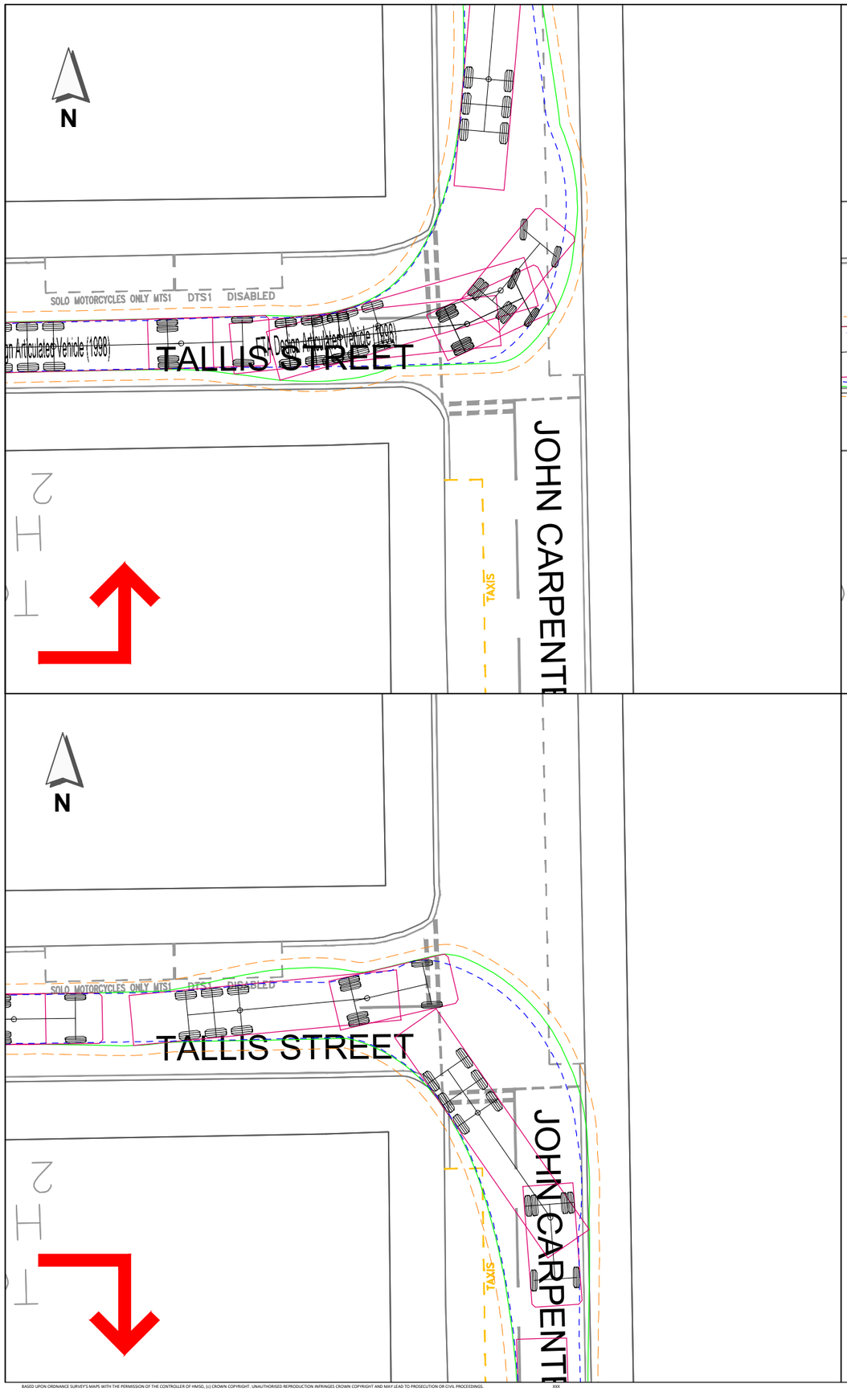
Drawing Title:
Tallis Street / Carmelite Street
Swept Path Analysis

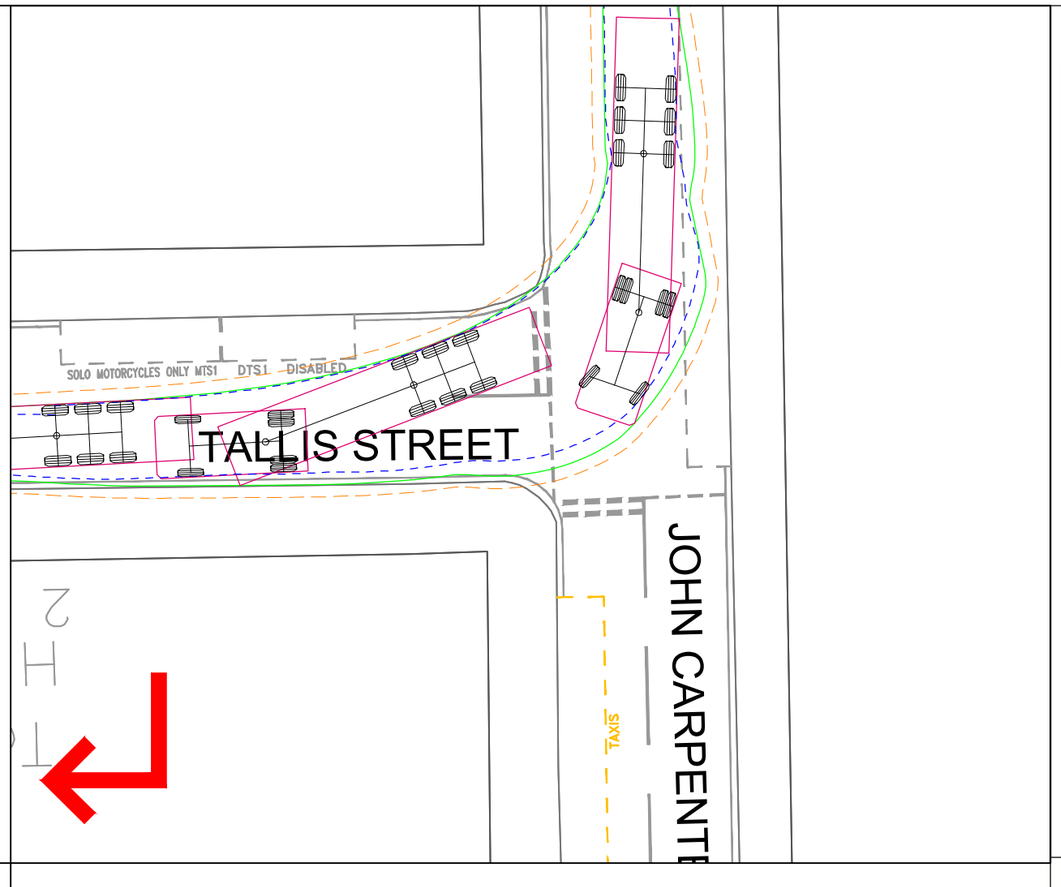
Status:
WORK IN PROGRESS

Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN
Location --- | Type DR | Role D
Number 03

Scale: 1:250
Suitability S0
Rev. P1
Size: A3

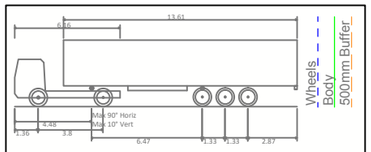
CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-03.dgn
DATE: 21/05/2018





0 5.0m 10.0m 15.0m 20.0m

Vehicle Key:



FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Key:

16.5m swept path over-run

Figure 9.19

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: Tallis Street / John Carpenter Street Swept Path Analysis

Status: WORK IN PROGRESS

Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN
Location --- | Type DR | Role D
Number 16

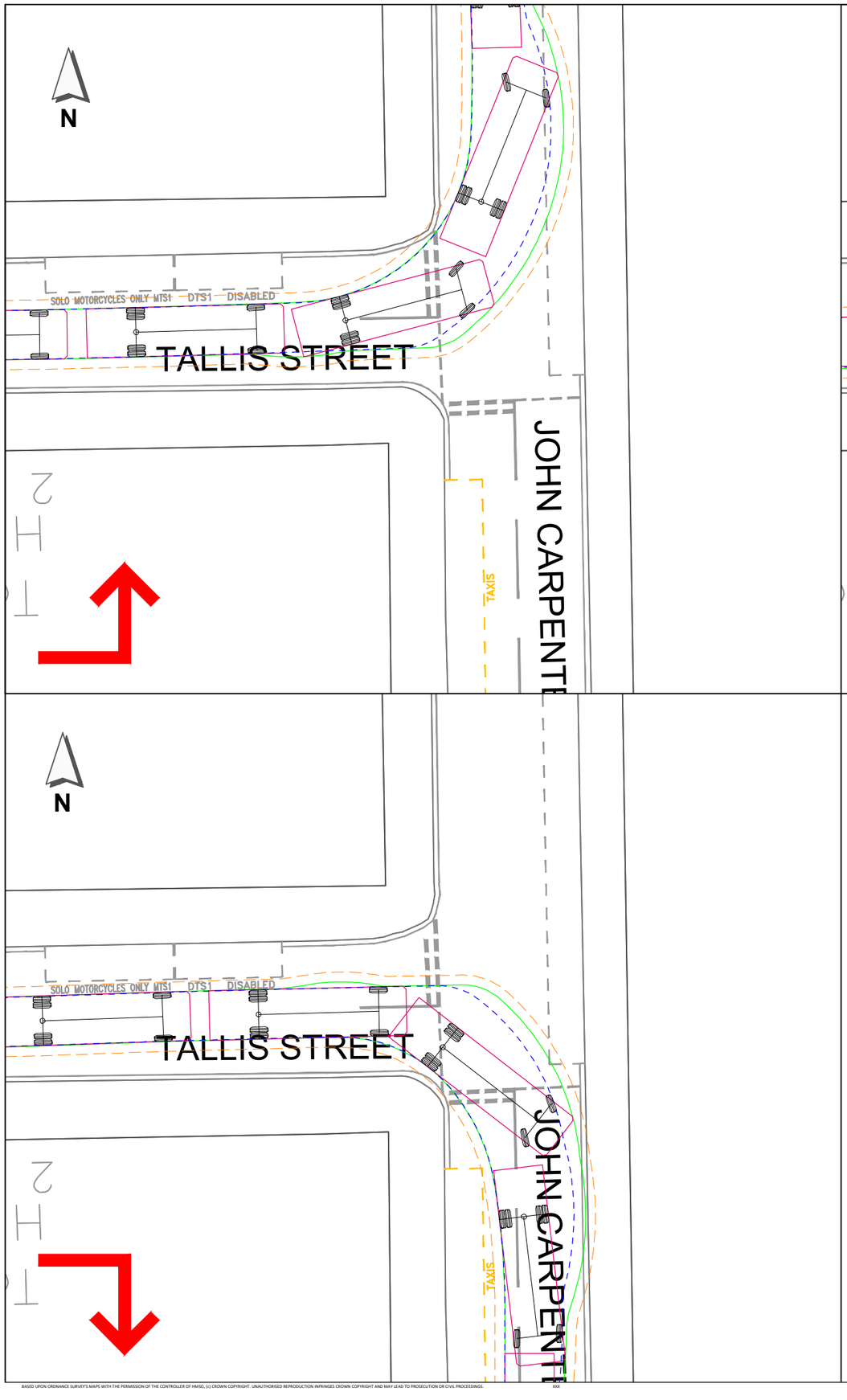
Scale: 1:250

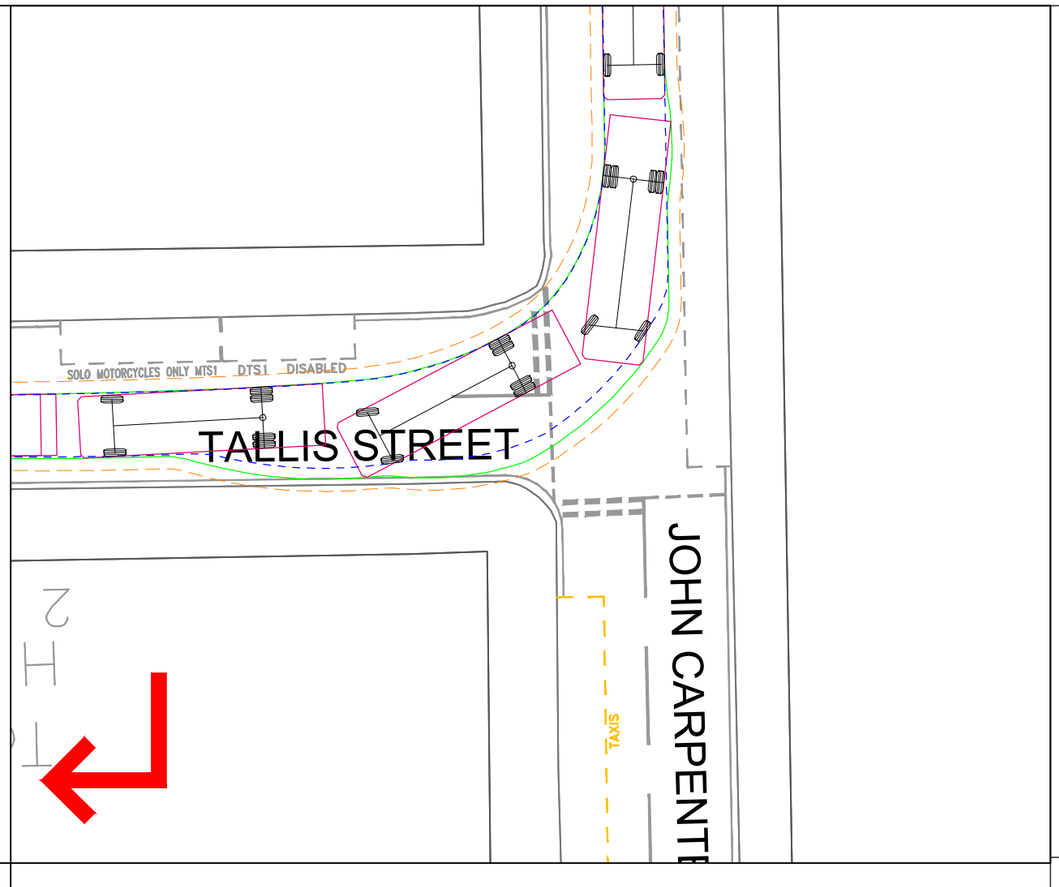
Suitability S0

Rev. P1

Size: A3

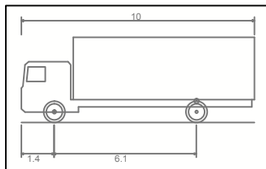
CAD REFERENCE P:\Projects\23203601\04\Drawings\23203601-03-16.dwg
DATE: 21/05/2018





0 5.0m 10.0m 15.0m 20.0m

Vehicle Key:



FTA Design HG Rigid Vehicle (1998)

Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	11.000m

Figure 9.20

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

Project Title:
Temple Area Traffic Study

Drawing Title:
Tallis Street / John Carpenter Street
Swept Path Analysis

Status:
WORK IN PROGRESS

Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN | Location --- | Type DR | Role D | Number 04

Scale: 1:250

Suitability S0

Rev. P1

Size: A3

DATE: 21/05/2018 CAD REFERENCE: P:\Projects\23203601\CAD\Drawings\23203601-04-.dwg

Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.21

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client: City of London

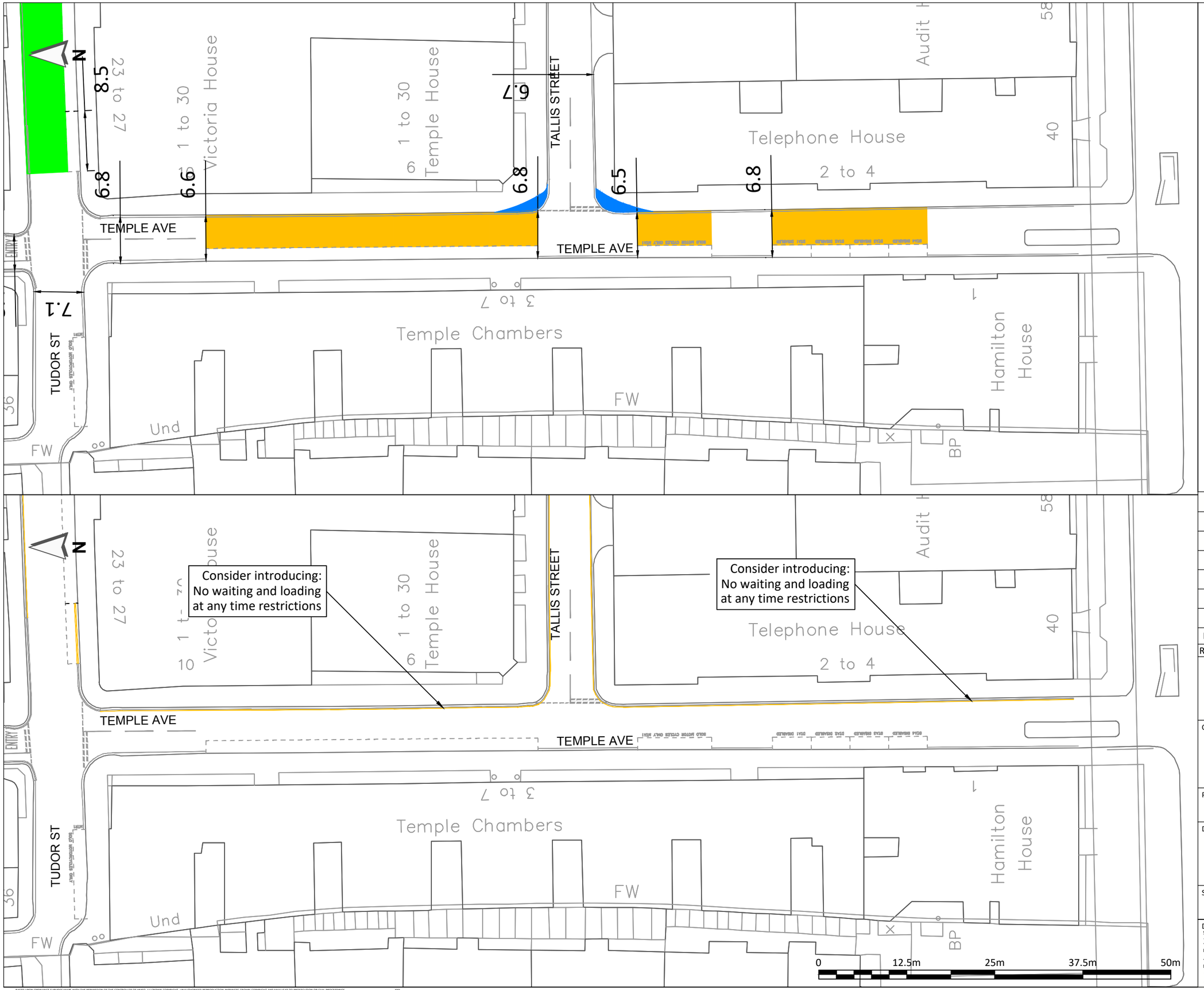
Project Title: Temple Area Traffic Study

Drawing Title: Tallis Street Pinch-point Analysis & Options

Status: WORK IN PROGRESS

Drawing Number: SDG Ref. 23203601 | Originator SDG | Volume HGN | Location --- | Type DR | Role D | Number 17

Scale: 1:500 | Suitability S0 | Rev. P1 | Size: A3



Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.22

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client:
City of London

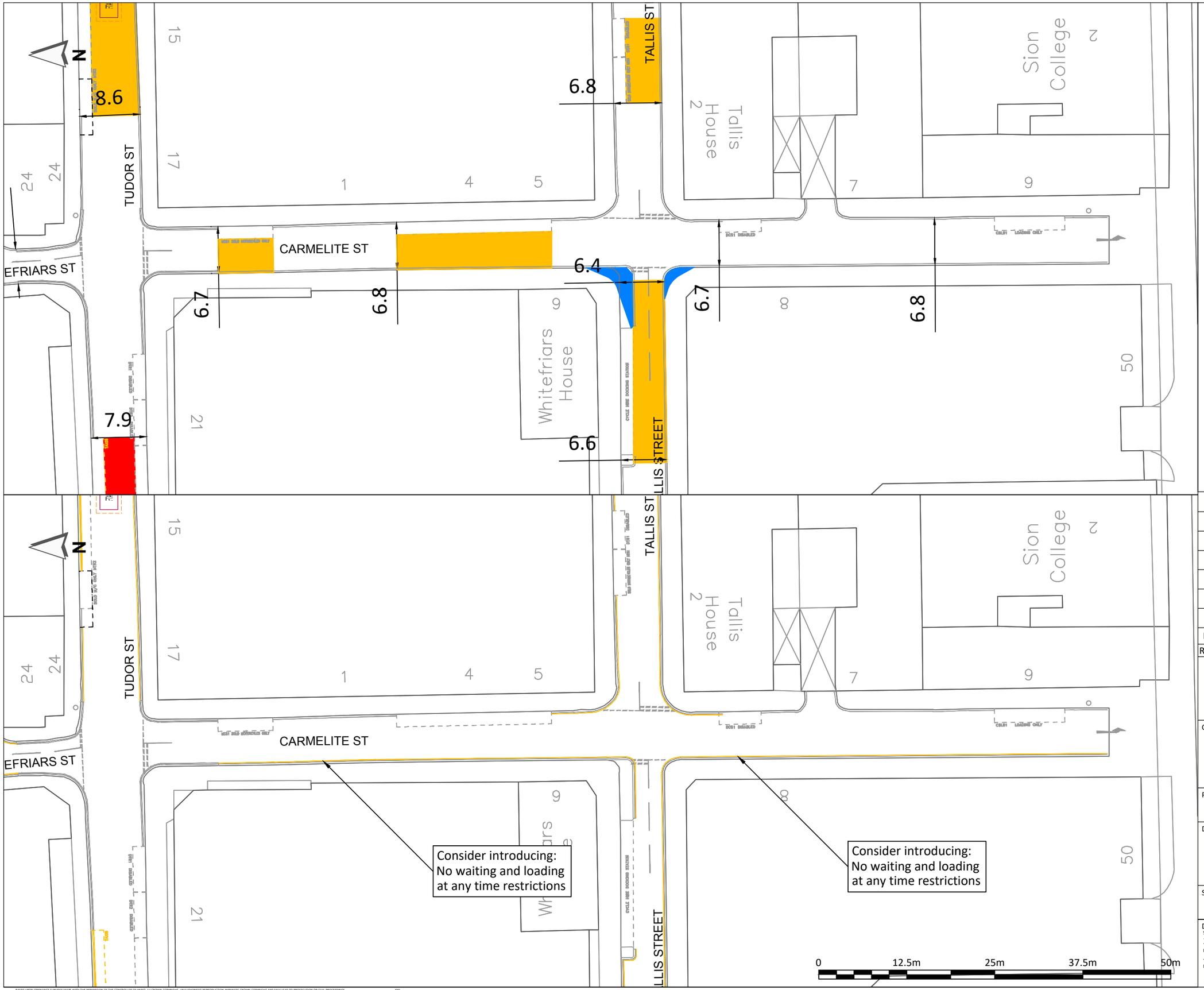
Project Title:
Temple Area Traffic Study

Drawing Title:
Temple Avenue
Pinch-point Analysis & Options

Status:
WORK IN PROGRESS

Drawing Number:
SDG Ref. 23203601 | Originator SDG | Volume HGN
Location --- | Type DR | Role D
Number 18

Scale: 1:500
Suitability S0
Rev. P1
Size: A3



Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.23

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client: City of London

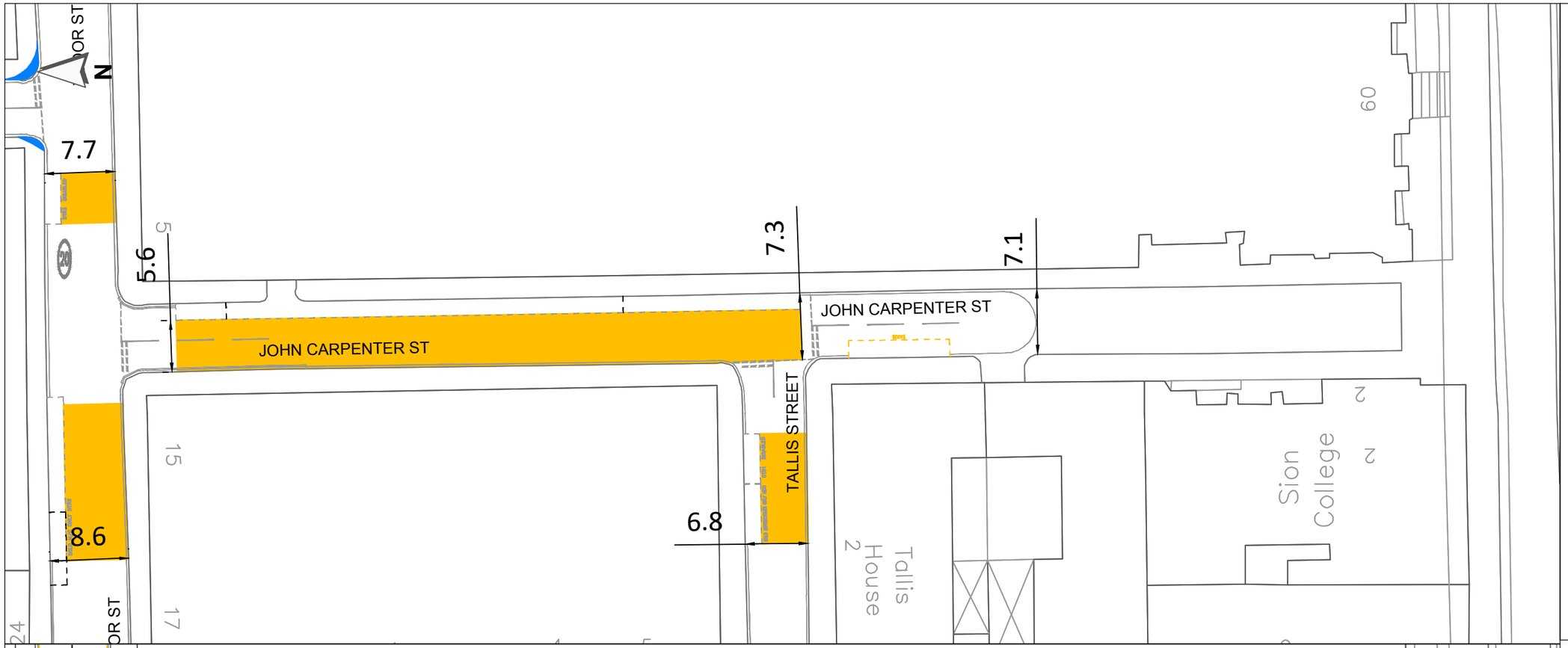
Project Title: Temple Area Traffic Study

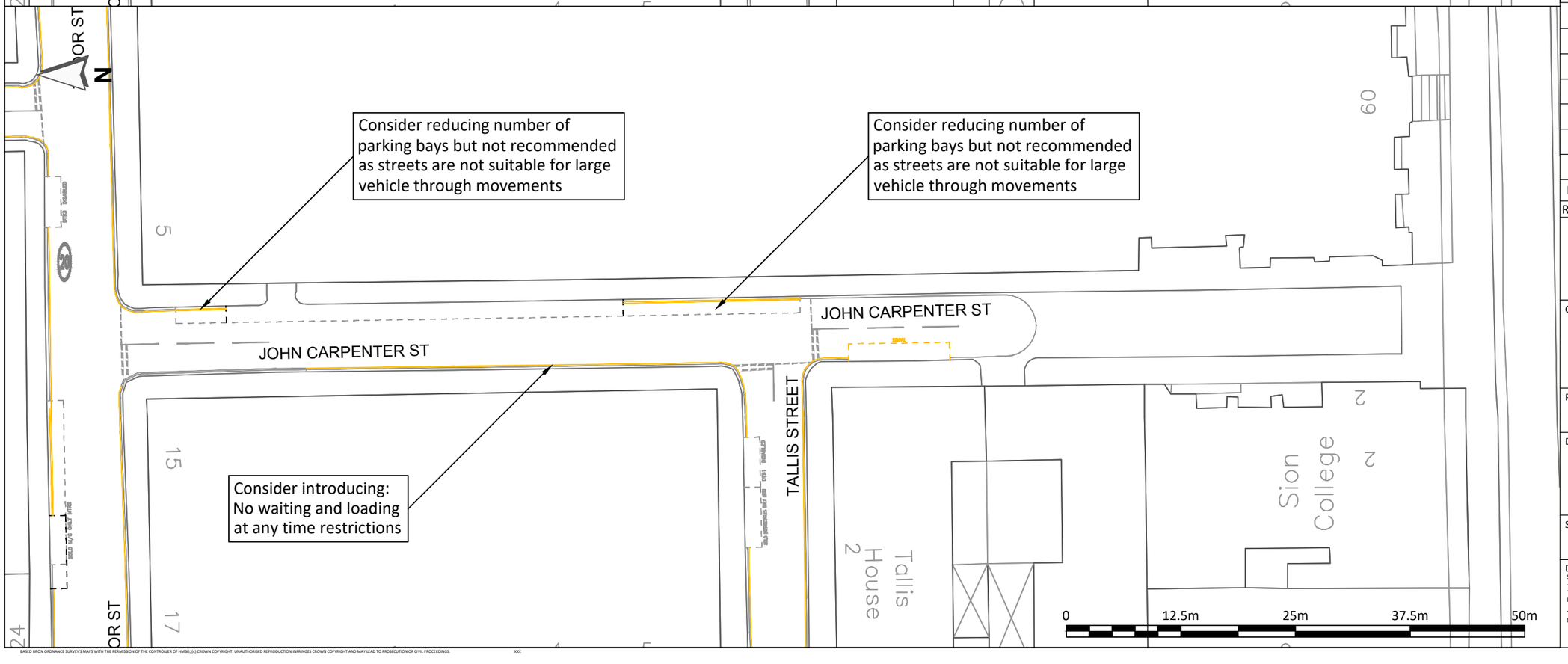
Drawing Title: Carmelite Street Pinch-point Analysis & Options

Status: WORK IN PROGRESS

Drawing Number: SDG Ref. 23203601 | Originator SDG | Volume HGN | Location --- | Type DR | Role D | Number 19

Scale: 1:500 | Suitability S0 | Rev. P1 | Size: A3





Key:

- Significant pinch-point
- Manageable pinch-point
- Insignificant pinch-point
- 16.5m swept path over-run

Figure 9.24

Rev.	Date	Comments	Des	Chk	App
P1	18MAY18	ORIGINAL ISSUE	LMD	PVC	LMD

steer davies gleave
t +44 (0)20 7910 5000 e sdginfo@sdgworld.net

Client: City of London

Project Title: Temple Area Traffic Study

Drawing Title: John Carpenter Street Pinch-point Analysis & Options

Status: WORK IN PROGRESS

Drawing Number: SDG Ref.	Originator	Volume	Scale:	Suitability
23203601	SDG	HGN	1:500	S0
Location: ---	Type: DR	Role: D	Rev.: P1	Size: A3
Number: 20				

New Bridge Street (A201)

Bridewell Place, Tudor Street and Watergate

The full length of Bridewell Place is covered by no waiting and no loading 'at any time' restrictions so no further measures (other than effective enforcement) have been identified for this link.

The turning movements into and out of this and the other intersections along New Bridge Street (A201) are being assessed as part of another workstream by the City of London.

Victoria Embankment (A3211)

Temple Ave, Carmelite St and John Carpenter St

As requested, the sections of the streets that lie south of Tallis Street that provide links to Victoria Embankment have not been assessed as they are also being reviewed by the City of London as part of another workstream.

Conclusion

Bouverie Street is one of the main routes into the study area for large vehicles. Kerbside and activity can impede movement of heavy goods vehicles along the length of the street, so to alleviate these issues it is recommended to:

- Relocate disabled bay south to a point north of the junction with Temple Avenue, and
- Extend waiting and loading restriction times (to a maximum of 'at any time') and coverage along the length of the western side of Bouverie Street.

Whitefriars Street is the only south-north link between Tudor Street and Fleet Street, and therefore forms the natural pair for large vehicle movements from Bouverie Street. It is relatively wide at the southern end of the street and the existing marked bays adjacent to Fleetbank House can be retained without inhibiting general traffic and opposing cycle flows. To eliminate the possibility of kerbside activity restricting large vehicle flows, the most effective measures would be to:

- Extend the waiting and loading restriction times, and coverage along the full length of the street (excluding the eastern kerbline outside to Fleetbank House and the existing section exempted from loading restrictions on the approach to Fleet Street).

Salisbury Court / Salisbury Square / Dorset Rise offers a southbound through route for traffic from Fleet Street. South of Salisbury Court access is also possible from the south as this section is two-way. Of the existing bays, the motorcycle bay nearest Tudor Street present the most obvious issue due to its proximity to the junction. Therefore, it is recommended that consideration is given to:

- Removing the motorcycle bay nearest Tudor Street and extending the waiting and loading restrictions on both side to the next side street (Hutton Street), and
- Although less problematic, no waiting and no loading 'at any time' restrictions could also be introduced at the northern end of the link along Salisbury Court.

Tudor Street is the main east-west spine within the study area. The presence of well-used marked bays and legal / illegal kerbside activity on the yellow lines means that through traffic and turning movements can be difficult. To ease movements, particularly for large vehicles, it is recommended to:

- Reduce the number of bays on the south side of Tudor Street near the Temple Avenue junction to ease left-turning movements out of Bouverie Street,
- Extend waiting and loading restriction times and coverage along the length of Tudor Street,
- Relocate the taxi rank to the southern side of the street, and
- Relocate and reduce the motorcycle bay to a point nearer Carmelite Street

Tallis Street lies to the south of Tudor Street and provides a secondary east-west connection between Temple Avenue, Carmelite Street and John Carpenter Street. Its main function is for access and it serves no direct route for through traffic. The intersecting side streets are all narrow and as shown by the swept path analysis, this part of the network is generally unsuitable for large vehicles. If the bays are to be retained, to ease through movement it is suggested that consideration is given to:

- Upgrading the existing waiting and loading restrictions (potentially to 'at any time') along all streets south of Tudor Street (excepting the existing marked bays).

Kingsgate Street / Watergate is unsuitable for large vehicles, so unless the wholesale removal of kerbside bays and activity was considered feasible, no changes have been proposed as there are more obvious and suitable alternatives routes out of the area.

The full length of **Bridewell Place** is covered by no waiting and no loading 'at any time' restrictions so no further measures (other than effective enforcement) have been identified for this link.

The turning movements into and out of the **New Bridge Street** junctions with **Bridewell Place, Tudor Street and Watergate** are being assessed as part of another workstream by CoL so no recommendations have been made as part of this study.

Similarly, the intersections of **Victoria Embankment** with **Temple Avenue, Carmelite Street** and **John Carpenter Street** have not been assessed as they are also being reviewed by the CoL as part of another workstream.

10 Summary and Conclusions

Chapter 1: Introduction

Steer Davies Gleave has been commissioned by the City of London Corporation to review the existing traffic and transport activity in the Temple area, before identifying and defining an initial list of interventions that can be developed further as part of the study.

Chapter 2: Study Area

The study area is bordered by Fleet Street to the north, New Bridge Street to the east, Victoria Embankment to the south and Middle Temple Lane to the west. The area consists of predominantly one-way streets, with Tudor Street running through the middle of the area from west to east.

Chapter 3: Data Collection

To establish a robust evidence base, a range of traffic surveys was undertaken by Intelligent Data between Tuesday 9 and Monday 15 January. The survey dates were chosen so that they fell outside of holiday periods and known street works that would otherwise give atypical results.

Manual classified count (MCC) and Origin-destination (OD) survey data was also captured on Middle Temple Lane. However, during the site visit it was noted that the gate from Middle Temple Lane to Victoria Embankment was closed for the duration of the survey period due to works to the gates. Additional surveys for Middle Temple Lane were therefore undertaken between Wednesday 28 March and Friday 30 March.

Origin-destination Surveys

Origin-destination surveys were undertaken to ascertain how vehicles move through the area and utilised automatic number plate recognition (ANPR) cameras to establish when a vehicle passes one or more of the cameras

Automated traffic counts

Automated traffic counters (ATCs) were used to record links flows over the same period.

Manual classified counts

Manual classified counts were used to record turning movements at junctions and give insight into the flows and direction of traffic.

Queue length surveys

Cameras were placed on the Fleet Street junction with Salisbury Court to capture congestion and / or queuing that occurs along Fleet Street.

Chapter 4: Movement Analysis

This chapter presented and discussed the outcomes of the OD surveys and MCC surveys, and gives insight into how traffic moves within the study area.

OD Analysis

Bouverie Street is the main entry point for movements through the area, while Whitefriars Street is the main exit point.

- 51% of all movements into the area enter through Bouverie Street
- 44% of movements out of the area exit via Whitefriars Street

OD analysis has shown that the dominant movements of traffic flow from Bouverie Street to Whitefriars Street, both for through traffic (traffic that stays in the area less than 5 minutes) as well as for cordon traffic (traffic that remains in the area for over 5 minutes).

- 20% of all traffic entering and exiting the area does so through by entering via Bouverie Street and exiting via Whitefriars Street

Although Tudor Street east is exit-only (into New Bridge Road,) there are still many vehicles entering the area at this point

- On the average weekday, around 50 vehicles make the illegal movement of entering Tudor Street from New Bridge Road.

Duration of Stay

Movements through the Temple Area have been classified into three categories: through traffic (<5 minutes in the area), servicing/loading (5 minutes – 45 minutes) and parking (>45 minutes).

- 70% of vehicles on the average weekday could be classified at through traffic and spend less than 5 minutes in the area
- 21% of traffic is servicing and loading traffic. This category consists of goods vehicles (54%) and cars and taxies (42%)
- Freight vehicles spend an average of 24 minutes in the area

Middle Temple Lane

Analysis of Middle Temple Lane surveys suggests that as the route out onto Victoria Embankment appears to be relatively little used, the impact of its closure during the original survey period was likely to be limited.

- Middle Temple Lane – Fleet Street is only used by cyclists as an exit/entry point
- Traffic exiting Middle Temple Lane predominantly uses Tudor Street while the Victoria Embankment exit is only used by a small percentage of traffic

Turning Flow Analysis

Movements through the area show a tidal pattern in the AM and PM peaks. Movements centralise around the Tudor Street/Temple Avenue/Bouverie Street junction and Carmelite Street/Tudor Street/Whitefriars Street junction. This is in line with the conclusions from the OD analysis

- Movements show a tidal pattern, with westbound AM peaks and eastbound PM peaks on Tudor Street.
- Confirming the OD analysis, the busiest junctions in the area are Bouverie Street / Tudor Street and Whitefriars Street / Tudor Street.

Chapter 5: Link Flow Analysis

Chapter 5 presented and discussed the outcomes of the ATC surveys in the study area. This link flow analysis chapter has given insights into traffic volumes and traffic composition in the study area, Furthermore, vehicle speeds have been mapped.

Link Flows in the Temple area

The different link flows in the Temple area as picked up by the ATC counters have been mapped for different vehicle classes (total traffic flows, cars and LGVs, goods vehicles, pedal cyclists).

- Bouverie Street and Tudor Street carry the highest volumes of traffic, followed by Whitefriars Street
- The busiest links for cars and LGVs include Tudor Street as the main east-west corridor, with the movements from Bouverie Street and to Whitefriars Street recorded as the critical movements
- Car and LGV volumes south of Tudor Street are generally low
- Goods vehicles predominantly use Bouverie Street, Whitefriars Street and Tudor Street. The eastern part of Tudor Street is a busy link with high goods vehicle movements
- Cyclists predominantly use Temple Avenue, and Tudor Street, indicating the use the Temple Area to bypass the Cycle Super Highway connection and instead traveling through the Temple area.

Link Speeds

Analysis of the vehicles speeds on the different roads in the area has shown that speeds remain within the speed limit of 20 miles per hour

- Traffic speeds remain within the 20-mile per hour speed limit.

Chapter 6: Goods Vehicle Movements

This chapter presents and discusses the outcomes of analysis of goods vehicles in the study area. This chapter has summarised the turning flow analysis, flow profiles and vehicle splits (type of goods vehicles), and looked at the OD movements of goods vehicles.

Turning Flow Analysis

For the turning flow analysis, vehicles were split into OGV1 (aggregate 2 in Figure 5.6) and OGV2 (aggregate 3 in Figure 5.6) categories.

- The busiest OGV1 movements were observed from Bouverie Street to Tudor Street
- The number of OGV2 vehicles is very low in the area

Flow Profiles and vehicle splits

The analysis of the types of goods vehicles using the roads in the study area has shown which links carry the highest number of goods vehicles on an average weekday, and this gives insight into the largest types of vehicles traversing through the area.

- Most vehicles in the area are 2-axle rigid vehicles, with high volumes on Bouverie Street (over 600 per week), Tudor Street (over 300 vehicles per week), Tallis Street (nearing 300 vehicles per week) and Whitefriars Street (approaching 1000 vehicles per week).
- Of the larger vehicles, the 3-axle artic is the most common, with high flows on Bouverie Street, Tudor Street and Whitefriars Street with a maximum of 85 vehicles per week.
- The number of vehicles of the largest type (5+ axle artic) is very low, with the highest flows measured on Temple Avenue at 8 vehicles per week, Bouverie Street at 5 vehicles per week and Tudor Street (between Bouverie Street and Whitefriars Street) at 10 vehicles per week.

OD Movements

As with the analysis included in Chapter 4, Bouverie Street is the main entry point for good vehicle movements through the Temple Area, while Whitefriars Street is the main exit point out of the area.

- OD analysis has shown that the most common movement is from Bouverie Street to Whitefriars Street
- The combination of the OD analysis and the Turning Flow analysis shows that some vehicles use Tallis Street instead of Tudor Street to make the movement from Bouverie Street (entry) to Whitefriars Street (exit). This suggests these vehicles are unable to make the turn at Bouverie Street into Tudor Street.

Chapter 7: Cycle Movements

our analysis of cycle flows and cycle hire usage in the study area is summarised in Chapter 7.

Cycle Movements

Cycle flows are high in the AM peak than they are in the PM peak. Flow patterns are broadly tidal with a heavy westbound flow in the morning peak and eastbound flows in the PM peak.

As presented in chapter 5, cyclists seem to bypass the Victoria Embankment Cycle Superhighway nearest Blackfriars Bridge and use Temple Avenue and Tudor Street instead.

- Cycle movements show a tidal pattern, with westbound movements in the AM peak and eastbound movements in the PM peak
- Cyclists predominantly use Temple Avenue, and Tudor Street, indicating they use the Temple Area to bypass the Cycle Super Highway connection and instead traveling through the Temple area.
- Bouverie Street sees a large northbound contra-cycle flow. The contra-cycle flow on Whitefriars Street is relatively low.

Cycle Parking

- There are 6 publicly accessible cycle parking facilities located in the area

Cycle Hire

The Temple area also has two Santander cycle hire docking stations, one on Bouverie Street and the other on Tallis Street.

Journeys made to and from the docking stations are relatively short, as evidenced by the density of OD lines in analysed patterns.

- The two docking stations are used most in the morning peak (08:00) and the evening peak (18:00).

Chapter 8: Kerbside Activity

The next chapter summarises the kerbside activity within study the area. Kerbside activity surveys have been analysed to understand the usage of different bays in the area.

Waiting and Loading Facilities

The City of London is a Controlled Parking Zone (CPZ), and waiting it only permitted in designated parking bays. The kerbside is subject to yellow line restrictions:

- Monday – Friday **7am - 7pm**
- Saturday **7am - 11am**

The different marked bays in the study area have been mapped and usage of these bays on Tudor Street has been analysed.

Kerbside Activity Surveys

- Parking is the most prevalent activity on Tudor Street, followed by the pick-up and drop-off of passengers.

Duration of Stay

Most kerbside activity lasts for a relatively short period. Though restricted, the kerbside analysis has shown that there are many activities on double yellow lines. The parking bays on Tudor Street are used for relatively short lengths of time. However, the motorcycle bays are generally used for lengthy stays.

- Over 55% of stops on Tudor Street last less than 5 minutes
- Through restricted, there are many activities on the double yellow lines, but with a duration of the activity of less than 15 minutes
- Many motorcycles are parked for lengthy periods of 5-10 hours.

Kerbside Usage Intensity

The intensity of kerbside usage has been mapped for all traffic, taxis and goods vehicles. The busiest locations for are between Bouverie Street and Whitefriars Street, and between Bridewell Place and New Bridge Street. There is a high intensity of kerbside activities between Bridewell Place and New Bridge Street, close to the junction.

- The high intensity of kerbside activities between Bridewell Place and New Bridge Street could be a cause for concern. Parked, loading or waiting vehicles, particularly HGVs take up space within the already constrained width, while cyclists can use the road in both directions. Changes to the waiting and loading restrictions for this part of Tudor Street may need to be considered.
- The section between Carmelite Street and John Carpenter Street is restricted in width due to motorcycle parking bays on the north side of the street. The intensity of OGV activity on the south side of the street could suggest it is harder for vehicles to get through when both sides of the road are used for loading and servicing purposes.

Occupancy by Restriction

- The taxi rank on Tudor Street is used most between 09:00 and 15:00, with the bay often being used at its maximum capacity.
- 5 of the 6 available pay and display bays are in constant use between 07:00 and 17:00.
- The motorcycle parking bay on Tudor Street west is used over the available capacity, suggesting motorcycles might be parked very close together.
- The motorcycle parking bay between Carmelite Street and John Carpenter Street is also very busy between 09:00 and 17:00. Considering the width of the road at this point and loading activity to the south of this bay, this may be a cause for concern when larger vehicles try to traverse this section of Tudor Street.

Chapter 9: Swept-path and pinch-points

Chapter 9 summarises the swept-path and pinch-point analysis within the study area.

Bouverie Street is one of the main routes into the study area for large vehicles. Kerbside and activity can impede movement of heavy goods vehicles along the length of the street, so to alleviate these issues it is recommended to:

- Relocate disabled bay south to a point north of the junction with Temple Avenue, and
- Extend waiting and loading restriction times (to a maximum of 'at any time') and coverage along the length of the western side of Bouverie Street.

Whitefriars Street is the only south-north link between Tudor Street and Fleet Street, and therefore forms the natural pair for large vehicle movements from Bouverie Street. It is relatively wide at the southern end of the street and the existing marked bays adjacent to Fleetbank House can be retained without inhibiting general traffic and opposing cycle flows. To eliminate the possibility of kerbside activity

restricting large vehicle flows, the most effective measures would be to:

- Extend the waiting and loading restriction times, and coverage along the full length of the street (excluding the eastern kerbline outside to Fleetbank House and the existing section exempted from loading restrictions on the approach to Fleet Street).

Salisbury Court / Salisbury Square / Dorset Rise offers a southbound through route for traffic from Fleet Street. South of Salisbury Court access is also possible from the south as this section is two-way. Of the existing bays, the motorcycle bay nearest Tudor Street present the most obvious issue due to its proximity to the junction. Therefore, it is recommended that consideration is given to:

- Removing the motorcycle bay nearest Tudor Street and extending the waiting and loading restrictions on both side to the next side street (Hutton Street), and
- Although less problematic, no waiting and no loading 'at any time' restrictions could also be introduced at the northern end of the link along Salisbury Court.

Tudor Street is the main east-west spine within the study area. The presence of well-used marked bays and legal / illegal kerbside activity on the yellow lines means that through traffic and turning movements can be difficult. To ease movements, particularly for large vehicles, it is recommended to:

- Reduce the number of bays on the south side of Tudor Street near the Temple Avenue junction to ease left-turning movements out of Bouverie Street,
- Extend waiting and loading restriction times and coverage along the length of Tudor Street,
- Relocate the taxi rank to the southern side of the street, and
- Relocate and reduce the motorcycle bay to a point nearer Carmelite Street

Tallis Street lies to the south of Tudor Street and provides a secondary east-west connection between Temple Avenue, Carmelite Street and John Carpenter Street. Its main function is for access and it serves no direct route for through traffic. The intersecting side streets are all narrow and as shown by the swept path analysis, this part of the network is generally unsuitable for large vehicles. If the bays are to be retained, to ease through movement it is suggested that consideration is given to:

- Upgrading the existing waiting and loading restrictions (potentially to 'at any time') along all streets south of Tudor Street (excepting the existing marked bays).

Kingsgate Street / Watergate is unsuitable for large vehicles, so unless the wholesale removal of kerbside bays and activity was considered feasible, no changes have been proposed as there are more obvious and suitable alternatives routes out of the area.

The full length of **Bridewell Place** is covered by no waiting and no loading 'at any time' restrictions so no further measures (other than effective enforcement) have been identified for this link.

The turning movements into and out of the **New Bridge Street** junctions with **Bridewell Place, Tudor Street and Watergate** are being assessed as part of another workstream by CoL so no recommendations have been made as part of this study.

Similarly, the intersections of **Victoria Embankment** with **Temple Avenue, Carmelite Street** and **John Carpenter Street** have not been assessed as they are also being reviewed by the CoL as part of another workstream.

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