Royal Borough of Kensington and Chelsea

EXHIBITION ROAD

Pedestrian Behaviour Study

70042046-PBS
APRIL 2018

Royal Borough **of Kensington and Chelsea**

EXHIBITION ROAD

Pedestrian Behaviour Study

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EXECUTIVE SUMMARY

INTRODUCTION

WSP has been appointed by the Royal Borough of Kensington and Chelsea to review pedestrian user behaviour and interaction on Exhibition Road. Data has been obtained on footfall, pedestrian queuing, vehicle movement, vehicle speed and parking, whether pedestrians are stopping before crossing and whether they are crossing through moving traffic etc. to establish any links between pedestrian crossing behaviour and such factors.

The Council undertook monitoring surveys every six months between April / May 2012 and November / December 2013. Since then new 'Exhibition Road Quarter' at the V&A Museum which contains new galleries, a shop and a café has opened and this may have resulted in a change in pedestrian movement patterns. The new entrance to the V&A from Exhibition Road was open on to the public in July 2017 including a new entrance from the pedestrian tunnel. Where possible, i.e. if data was available for November 2013, a comparison has been made between surveys undertaken in November 2013 and those collected in this study in January 2018 that enables us to understand how user behaviour has changed. Both sets of surveys were undertaken on a typical weekday and weekend day (i.e. with no roadworks / special events taking place). No measurements were taken, for either survey, on the usage of the pedestrian tunnel.

SURVEY RESULTS

The figure below summarises the key survey results.

TRAFFIC / PEDESTRIAN ACTIVITY

Traffic

85th %ile – 27mph, a 21% increase in vehicle speeds

1% decrease in vehicle flows

Av. gap in traffic is 10s on a weekday, compared to 15s on a weekend

Pedestrian Activity

Negligible change in **flows** on Exhibition Road – Approx. 3% increase

Significant increase in **crossing** activity – 59% increase

CROSSING BEHAVIOUR

35% pedestrians stopped before crossing

The majority of pedestrians are crossing through 'no traffic' (with no vehicles 40m either side).

The majority of pedestrians cross just north of the Natural History Museum, opposite Museum Lane.

Parking occupancy slightly higher on a weekend (66%) than a weekday (52%).

CONFLICTS

No collisions recorded during the survey.

No 'major' conflicts recorded during the survey.

228 'negotiations'* were recorded (out of 9,306 crossing movements).

More negotiations recorded on a weekday (4%) than on a weekend (2%), with majority in the area between the Natural History Museum and V&A Museum.

***'Negotiation' definition**: In response to an unexpected action, a vehicle or pedestrian has to brake / stop or change direction to avoid a collision, but movement is generally calm and controlled.*

Ultimately the survey results have been used to answer the question 'how easy and safe is it to cross the road?' The strongest indicator about whether it is 'safe' to cross Exhibition Road is the results of the conflicts summarised above (whereby no major conflicts / collisions were recorded). A number of 'negotiations' were recorded, which is where a pedestrian / driver will compromise their movement to accommodate the other (i.e. a driver reducing their speed to allow a pedestrian to safely cross the road or a pedestrian taking a step back when seeking to cross the road, to allow the driver to continue their journey).

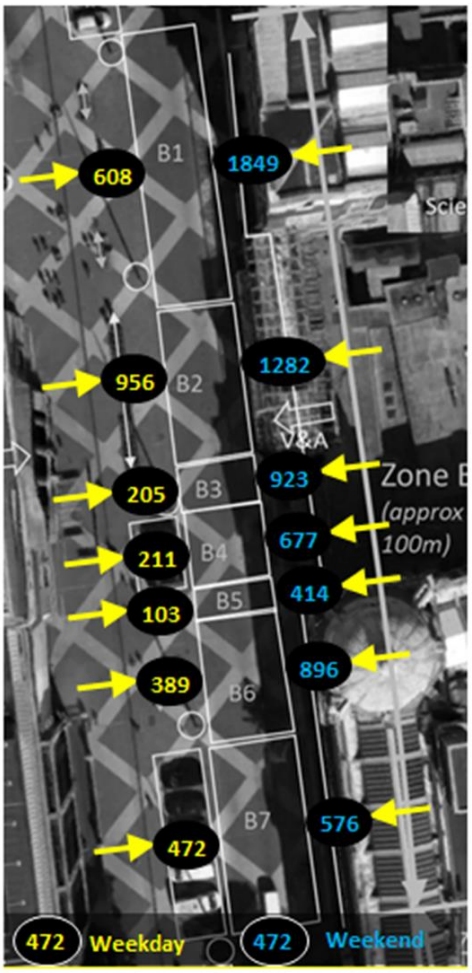
This type of behaviour / negotiation is expected on a street such as Exhibition Road, where the street design aims to empower pedestrians giving them greater autonomy when crossing the road, whilst at the same time maintaining an important vehicular through fare. The majority of negotiations were recorded in the area between the Natural History Museum and the V&A Museum where the crossing desire line is greatest, albeit a

higher proportion of pedestrians were recorded in a 'negotiation' further south on Exhibition Road, where a number of parking bays are located.

A review of the video footage highlighted that vehicles parking and stopping on the west side of Exhibition Road near to the Natural History Museum entrance reduce visibility for those crossing eastbound. In some cases, this resulted in pedestrians having to step out onto the 'carriageway' for adequate forward visibility and hastening their crossing movement due to fast approaching vehicles.

In addition to the number of conflicts recorded, there are a number of indicators discussed in the report that help answer the question, about how *'easy'* and '*safe'* it is to cross Exhibition Road. Namely:

- Gaps recorded in traffic – Gaps less than 6 seconds means pedestrians may have less time to make the decision to cross and cross more quickly. The survey results confirmed there is a high number of gaps greater than six seconds on both a weekday and weekend indicating plenty of opportunities for pedestrians to cross. The opportunities to cross is particularly important for a road such as Exhibition Road, given the lack of dedicated crossing facilities that would be present on a more traditional street with such high footfall.
- People not stopping before crossing – It is likely that the more people that do not stop before crossing, the less safe it is when traffic flows are relatively high. The survey results showed a link between the number of pedestrians stopping before crossing in hours where traffic was greatest (with 38% of pedestrians stopping between 11am – 5pm, compared to just 27% between 6pm – 11pm when flows are lower). The other 62% and 73% respectively, were not recorded stopping, albeit it is important to note that this does not mean they did not look before crossing.
- Pedestrians crossing through stationary traffic / moving traffic – Indicates the type of environment pedestrians are crossing in. Generally the higher percentage of people crossing through moving traffic (defined as vehicles being within 40m of the pedestrian crossing location) the less pedestrian friendly the environment is compared to the pedestrians crossing through no traffic. The survey result indicated approximately 1 in 3 pedestrians cross through 'moving traffic', with pedestrian crossing activity increasing by 59% since the 2013 surveys. The majority of pedestrians cross through 'no traffic'.
- The volume of traffic – High flow of traffic typically contributes towards having an adverse effect on the ease of crossing the road and potentially creating a more hostile pedestrian environment. The survey results confirmed that there has been a negligible change in vehicle flows -1% since the 2013 surveys.
- The speed of traffic – Linked to the above, the survey results confirmed an increase in speed of traffic (+5mph) from 22mph to just over 27mph (85th percentile). This is likely to have an adverse impact on pedestrian crossing environment, partly as it reduces the size of the gaps within which pedestrians can cross (noting that vehicle flows have stayed constant with those recorded in 2013).



CONCLUSIONS AND FUTURE CONSIDERATIONS

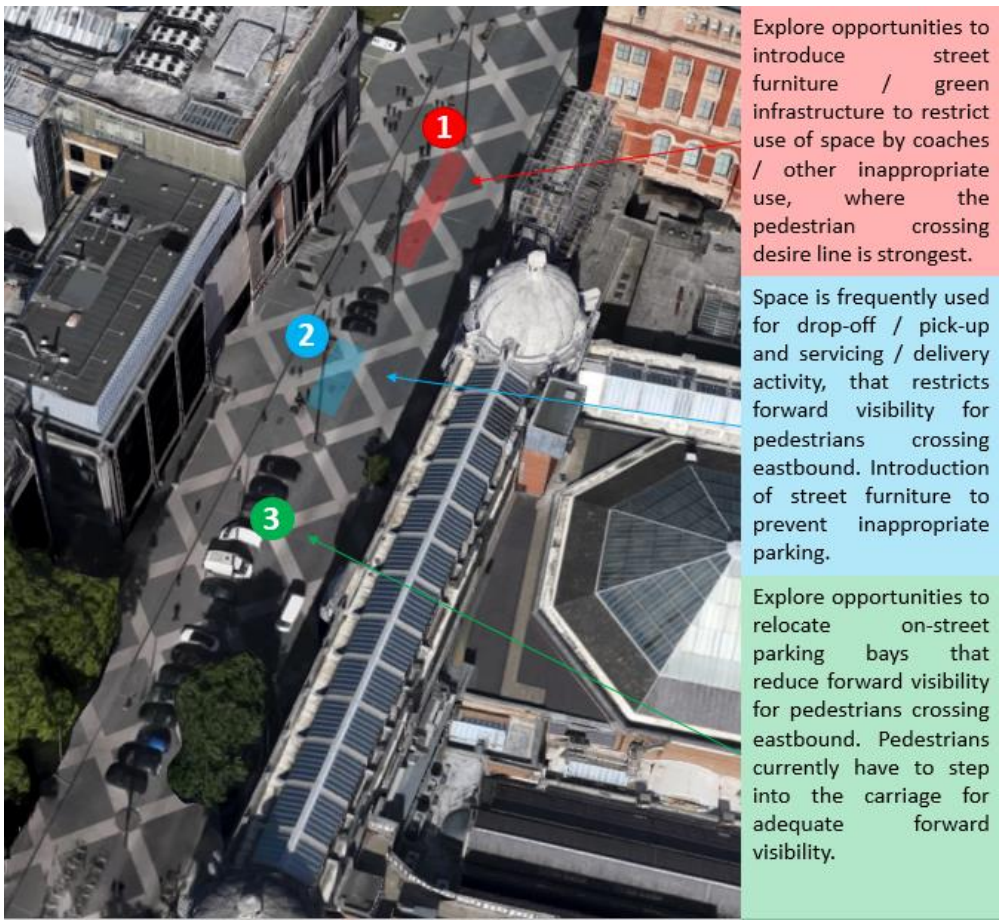
The survey results show that despite the number of pedestrians visiting Exhibition Road remaining relatively consistent with levels recorded in 2013, the number of pedestrians crossing Exhibition Road in the vicinity of the museum entrances has significantly increased. The typical number of crossing activity recorded on a weekday and weekend is illustrated on the right, highlighting the key desire lines.

A thorough investigation of the survey data collected indicated that there is little correlation between the characteristics of pedestrian / traffic flow, pedestrian behaviour and the number of conflicts / negotiations recorded.

The main trend observed is that the probability of a 'negotiation' taking place is greater on a weekday when pedestrian flows / crossing activity are lower (although vehicle flows are higher). This could be linked to the fact drivers will take more care when travelling through Exhibition Road when there is a noticeable increase in pedestrian activity (i.e. on a weekend) compared to when travelling through a much quieter and less pedestrian congested environment.

The key issues identified that adversely affect crossing activity is linked to relatively high traffic speed and flow and poor forward visibility due to vehicle parking and stopping. Prevent parking / stopping at locations 1 and 2 highlighted in the figure below would better facilitate crossing movement on the main desire lines.

Initial consideration about measures that can contribute towards achieving this objective is set out in the image to the right. The installation of street furniture and green infrastructure / relocation of parking bays will contribute towards improving forward visibility for pedestrians on the main crossing desire lines. Furthermore, such furniture can be positioned to help introduce visual narrowing for drivers to help reduce speeds and create an environment that helps drivers better recognise their surroundings and amend their driving behaviour accordingly.



Any future proposals will need to involve liaison with Westminster City Council, the museums and local residential groups. A trial with temporary installation of street furniture and green infrastructure to reduce speed and improve visibility could be monitored to allow an informed decision to be made about whether the measures should be made permanent, or whether other measures should be considered.

1

INTRODUCTION

1 INTRODUCTION

1.1 BACKGROUND & OBJECTIVES

1.1.1. WSP has been appointed by the Royal Borough of Kensington and Chelsea to review pedestrian user behaviour and interaction on Exhibition Road.

1.1.2. Data has been obtained in January 2018 on footfall, pedestrian queuing, vehicle movement, vehicle speed and parking to establish any links between pedestrian crossing behaviour and such factors.

1.1.3. The study area extends out from Cromwell Road in the south to Imperial College Road to the north with a particular focus on the new entrance to the V&A located on Exhibition Road which opened to the public in July 2017, which may have changed pedestrian movement patterns. The new entrance to the V&A from the pedestrian tunnel may have also altered pedestrian flows. Comparison has also been made with certain results from the previous surveys carried out in November 2013. No measurements were taken, for either survey, on the usage of the pedestrian tunnel.

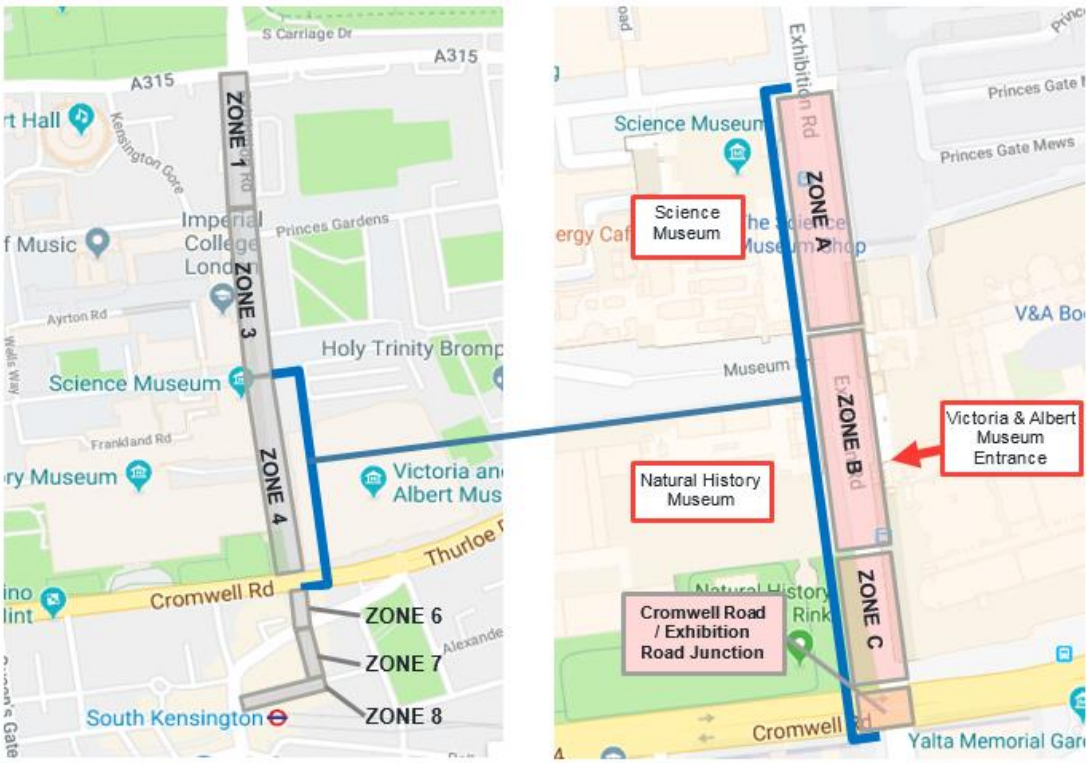
1.2 PREVIOUS ASSESSMENTS & STUDY SCOPE

1.2.1. Following completion of the Exhibition Road scheme in December 2011, an assessment of user behaviour was undertaken in four phases every six months between April 2012 and November 2013.

1.2.2. The study area was split into eight numbered sections and encompassed the length of Exhibition Road from Kensington Gore to Thurloe Street.

1.2.3. Where possible, i.e. if data was available for November 2013, a comparison has been made between the November 2013 results and the January 2018 results. This is for the area referred to as Zone 4 in the previous assessment. A comparative plan indicating the 2013 and 2018 study area has been provided in the figure below.

Figure 1 – 2012-2013 & 2018 Study Area



1.2.4. For 2018, surveys were carried out for the three sections shown above, which are as follows:

- **Zone A**: From Imperial College Road to south side of Science Museum;
- **Zone B**: From Science Museum south side to Natural History Museum;
- **Zone C**: From Natural History Museum to Cromwell Road.

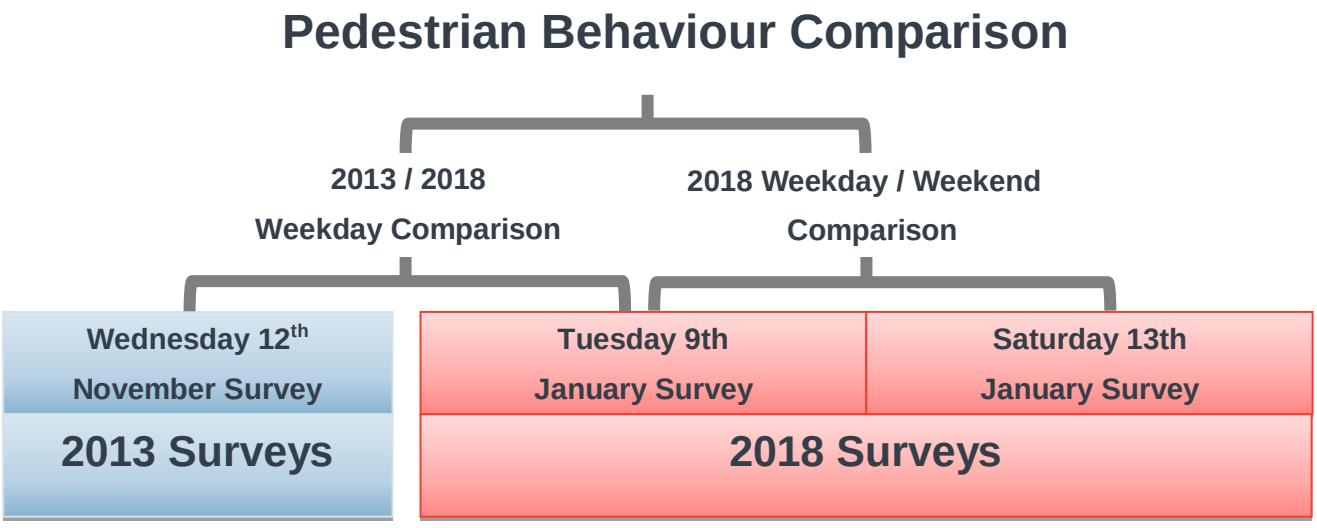
1.2.5. The study area also includes the junction with Exhibition Road and Cromwell Road.

1.2.6. The following survey data was obtained:

- Pedestrian flow (see Chapter 2);
- Pedestrian crossing counts (see Chapter 3);
- Pedestrian junction crossing counts (see Chapter 4);
- Traffic flow (see Chapter 5);
- Traffic speed (see Chapter 6);
- Parking Occupancy / Movement (see Chapter 7);
- Cycle Parking (see Chapter 8);
- Pedestrian Queuing (see Chapter 9);
- Gaps in traffic (see Chapter 10);
- Pedestrians stopping / not stopping (see Chapter 11);
- Pedestrians crossing through stationary / moving traffic (see chapter 12); and
- Pedestrian conflicts (see Chapter 13).

1.2.7. The above surveys shown in **blue** are those which we have compared with the previous 2013 assessment. The figure below summarises the dates collected for both 2013 and 2018 that have been used to inform the findings of the report. The following should be noted:

- There may be some seasonal variation between typical activity in the month of November and in the month of January, however we do not anticipate this to have a material impact on the results and conclusions drawn.
- It is considered likely that more pedestrians will use the pedestrian tunnels during the winter months compared to the summer months.
- There would be differences between surveys undertaken between term-time and school holidays. All surveys have taken place during school term.
- There is no weekend comparison between 2013 and 2018.



1.2.8. The information from the study is used to help answer the following questions regarding user behaviour:

- Do pedestrians look before crossing the road?
- Does pedestrian queuing impede pedestrian flow and influence crossing location?

- How strong is the desire line across the road to the V&A courtyard entrance, where are the desire lines and where are pedestrian coming from? (E.g. mainly Natural History Museum, south from Cromwell Road)?
- How easy and safe is it to cross the road?
- Does parking occupancy influence crossing location?
- How many vehicles are travelling above the speed limit?
- How does overall crossing movement, speed, vehicle flow and pedestrian flow compare to the Phase 4 study?

2

PEDESTRIAN FLOW

2 PEDESTRIAN FLOW

2.1 SURVEY METHODOLOGY

2.1.1. A pedestrian screen line count was commissioned in order to ascertain the changes in pedestrian flow on Exhibition Road between 2013 and 2018 and to provide a 2018 weekday / weekend comparison.

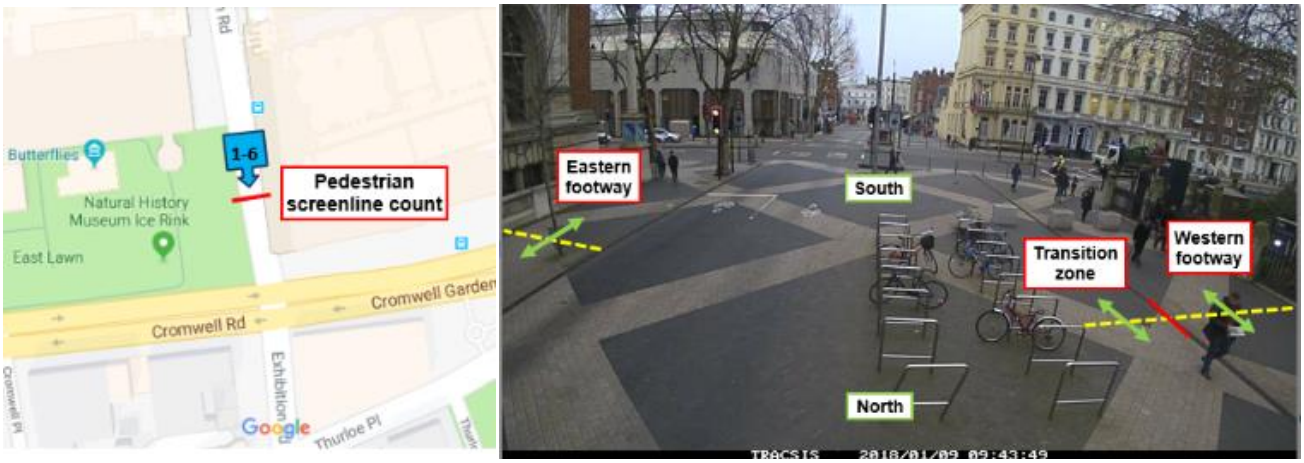
2.1.2. The details of the survey data used to inform this chapter is summarised in the table below.

Table 1 - Pedestrian Flow Surveys Summary

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Screen Line Count	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight		
2013 Pedestrian Screen Line Count	Wednesday (12th November 2013)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	N/A	None

2.1.3. The location of the screen line count can be viewed in the figure below.

Figure 2 - Location of Pedestrian Flow Surveys



2.2 RESULTS: PEDESTRIAN FLOW COMPARISON 2013 – 2018 (WEEKDAY)

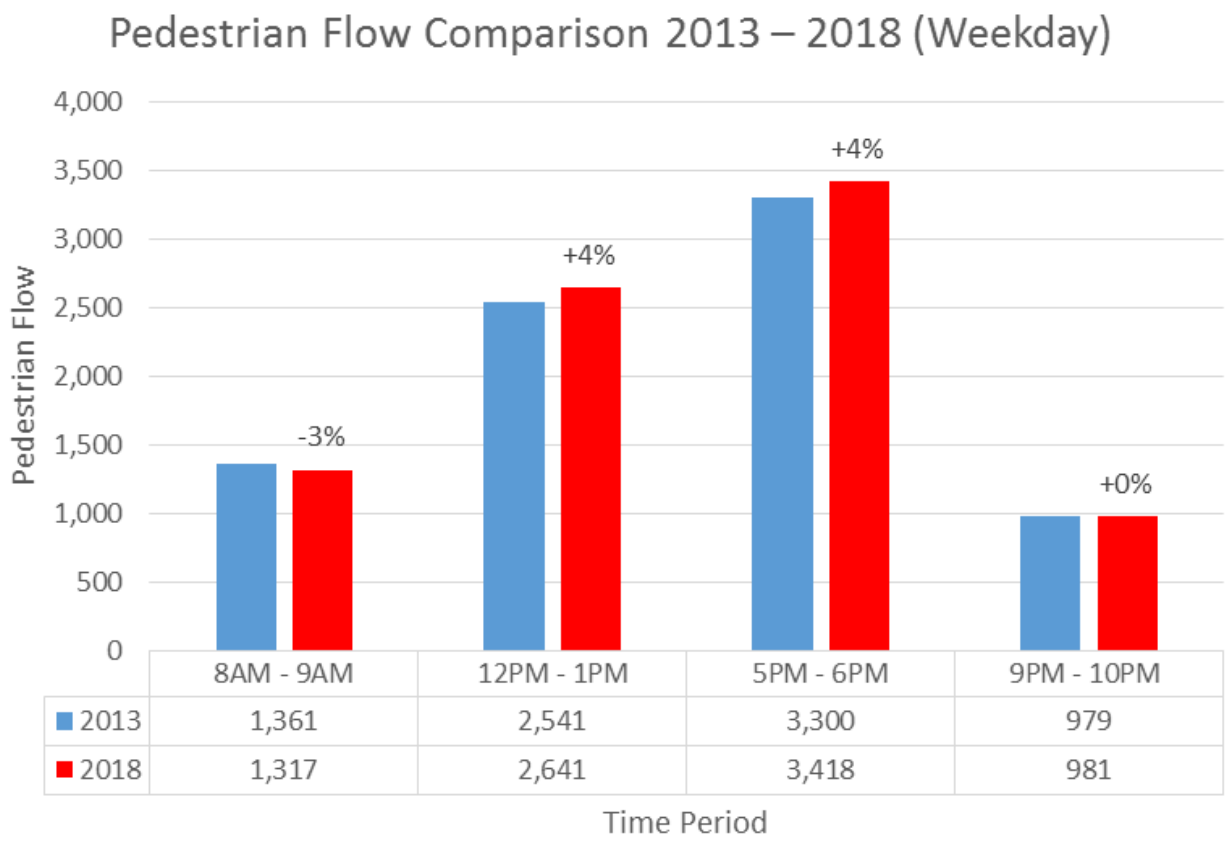
2.2.1. The table below sets out the survey data used to inform the assessment to understand any change in pedestrian flow on a weekday since 2013.

Table 2 - Pedestrian Flow Surveys Summary - 2013 / 2018 Weekday Comparison

Survey	Date	Time Period	Conditions	Incidents / Site
2018 Pedestrian Screen Line Count	Tuesday (9th January 2018)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	Dry	None
2013 Pedestrian Screen Line Count	Wednesday (12th November 2013)		N/A	None

2.2.3. The results of the comparison are illustrated in the figure below.

Figure 3 - Pedestrian Flow Comparison 2013 – 2018 (Weekday)



2.2.4. The following results were observed:

- The maximum difference in pedestrian movements occurred between 12pm – 1pm – a 4% increase over the 4 year period.
- The only reduction in pedestrian movements between 2013 and 2018 were identified during 8am – 9am with 1,361 movements recorded in 2013 and 1,317 in 2018 – a 3% reduction.
- The total change in pedestrian flow across the 4 time periods between 2013 and 2018 equated to +3% difference. The V&A new entrance opened in July 2017.
- It is considered that pedestrians are more likely to use the pedestrian tunnels during the winter months when the weather is more inclement.

Conclusion: When comparing 2013 and 2018 pedestrian counts, there is negligible change varying across the four times periods.

2.3 PEDESTRIAN FLOW COMPARISON – WEEKDAY VS WEEKEND

2.3.1. The table below sets out the survey data used to inform the assessment to understand any change in pedestrian flow between the weekday and weekend survey days in 2018.

Table 3 - Pedestrian Flow Surveys Summary - 2018 Weekday / Weekend Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Screen Line Count	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight		

2.3.2. The results of the comparison are illustrated in the figure below and detailed overleaf.

Figure 4 - Pedestrian Flow Comparison 2018 (Weekday / Weekend)

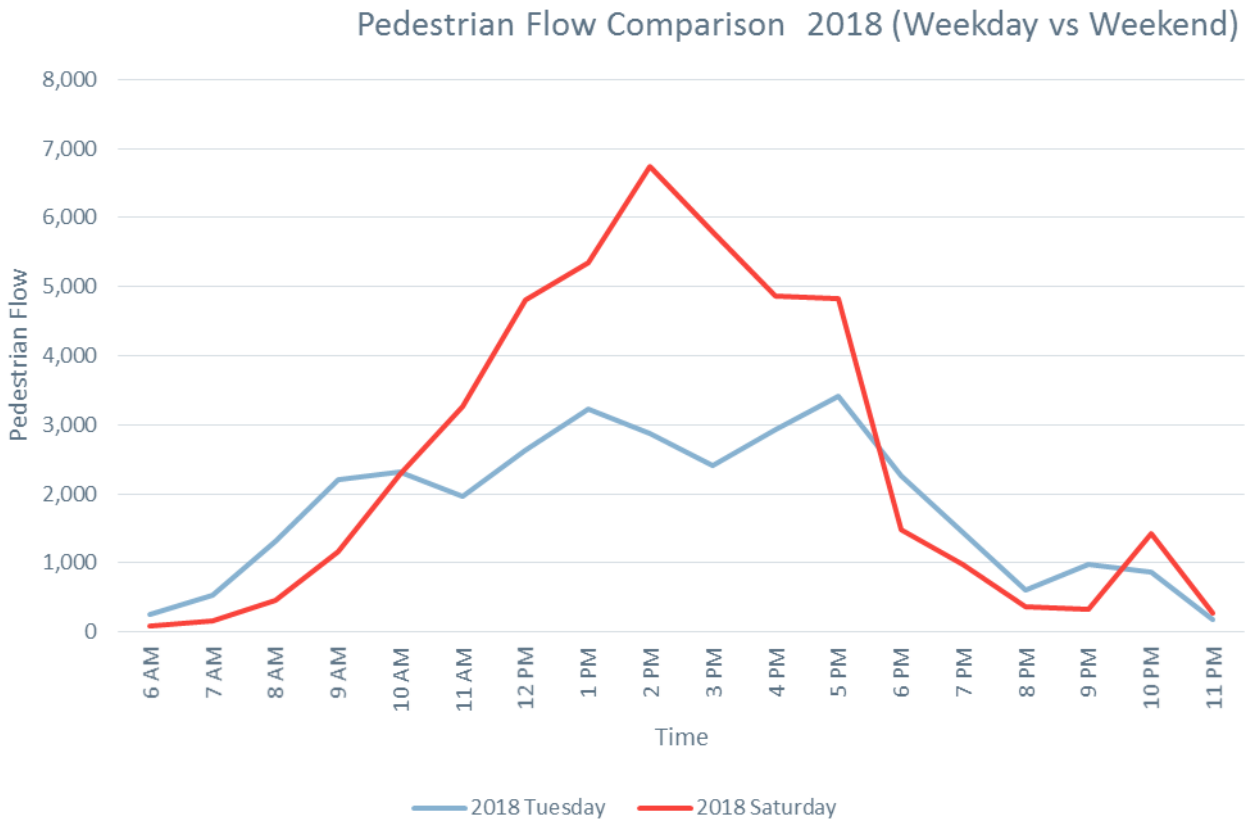


Table 4 - Pedestrian Flow Comparison 2018 (Weekday / Weekend)

Time Period			2018 Tuesday	2018 Saturday	Absolute Change	% Change
6 AM	-	7 AM	256	87	-169	-66%
7 AM	-	8 AM	523	158	-365	-70%
8 AM	-	9 AM	1,317	464	-853	-65%
9 AM	-	10 AM	2209	1158	-1051	-48%
10 AM	-	11 AM	2,315	2,275	-40	-2%
11 AM	-	12 PM	1,970	3,273	1,303	+66%
12 PM	-	1 PM	2,641	4,812	2,171	+82%
1 PM	-	2 PM	3,222	5,340	2,118	+66%
2 PM	-	3 PM	2,871	6,748	3,877	+135%
3 PM	-	4 PM	2,400	5,786	3,386	+141%
4 PM	-	5 PM	2,932	4,869	1,937	+66%
5 PM	-	6 PM	3,418	4,829	1,411	+41%
6 PM	-	7 PM	2,268	1,489	-779	-34%
7 PM	-	8 PM	1,451	981	-470	-32%
8 PM	-	9 PM	598	356	-242	-40%
9 PM	-	10 PM	981	325	-656	-67%
10 PM	-	11 PM	868	1,422	554	+64%
11 PM	-	12 AM	182	265	83	+46%
Total			**32,422**	**44,637**	**12,215**	**+38%**

2.3.3. The following results were observed:

- Over the 18 hour survey period, 9 hour periods recorded higher pedestrian flow, with the greatest absolute change occurring during 3pm – 4pm which recorded 3,386 more pedestrian movements, equivalent to a 141% increase.
- The higher overall pedestrian flow recorded on the weekend survey day is consistent with the higher visitor numbers expected at the museums accessible from Exhibition Road during weekends when compared to weekdays.
- Results showed a reduction in the number of pedestrians during the early morning hours of the weekend when compared to the weekday, with the 6am – 11am recording reductions in pedestrian movements of between 2% and 70%. Pedestrian movements recorded during the late evening also show a decrease between 6pm – 10pm of between 32% and 67% followed by an increase in the hours of 10pm – 11pm and 11pm to midnight showing an increase of 64% and 46% respectively.
- The above can partly be attributed to the number of staff and students accessing Imperial College during the weekday.

Conclusion: A higher overall number of pedestrian flows were recorded during the 2018 weekend survey day than a typical weekday; 44,637 compared to 32,422 over the 18 hour period (a 38% increase).

3

PEDESTRIAN CROSSING COUNTS

3 PEDESTRIAN CROSSING COUNTS

3.1 SURVEY METHODOLOGY

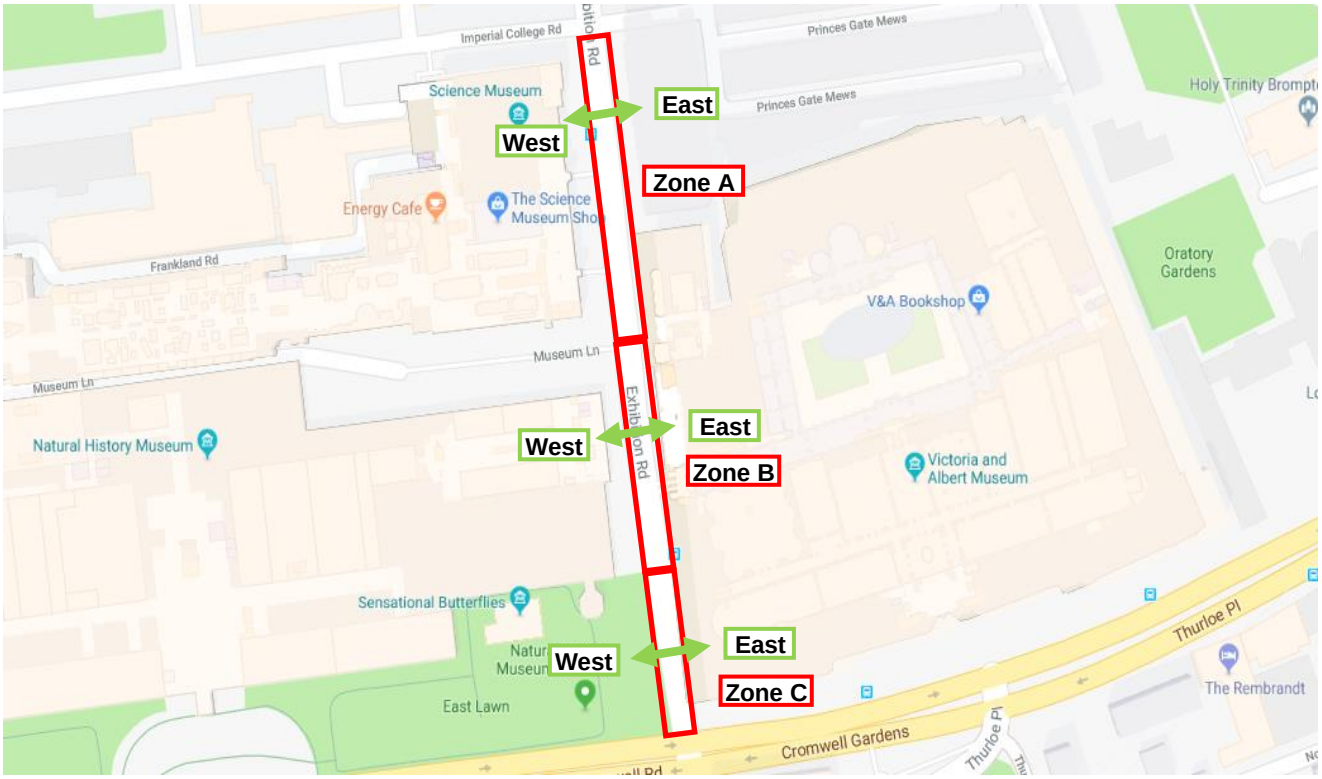
3.1.1. Pedestrian crossing movements on Exhibition Road were recorded in order to ascertain the changes in pedestrian crossing flows between 2013 and 2018 and to provide a 2018 weekday / weekend comparison, the details of which are summarised below.

Table 5 - Pedestrian Crossing Movement Surveys Summary

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Crossing Count	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight		
2013 Pedestrian Crossing Count	Wednesday (12th November 2013)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	N/A	None

3.1.3. The location of each count can be viewed in the figure below.

Figure 5 - Pedestrian Crossing Movement Survey Locations



3.2 RESULTS: CHANGE IN PEDESTRIAN CROSSING MOVEMENT (2013 VS 2018)

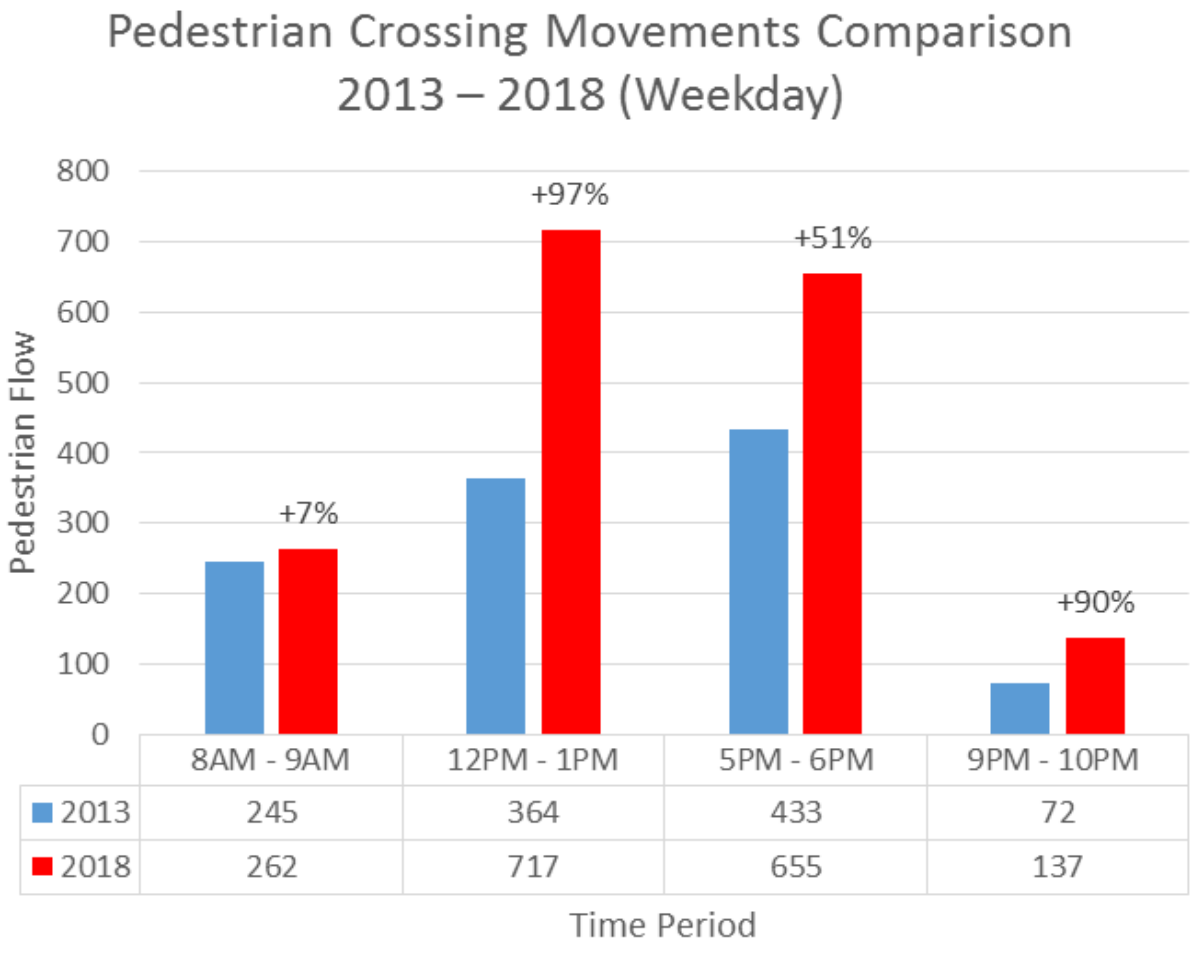
3.2.1. The table below sets out the survey data used to inform the assessment to understand any change in pedestrian flow on a weekday since 2013.

Table 6 - Pedestrian Crossing Movements Survey Summary - 2013 / 2018 Weekday Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Crossing Count	Tuesday (9th January 2018)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	Dry	None
2013 Pedestrian Crossing Movement	Wednesday (12th November 2013)		N/A	None

3.2.3. The results of the comparison are illustrated in the figure below.

Figure 6 - Pedestrian Crossing Movement Comparison 2013 – 2018 (Weekday)



3.2.4. It is important to note that the V&A new entrance opened in July 2017 and can now be accessed via the pedestrian tunnels. The following results were observed:

- When comparing 2013 and 2018 pedestrian counts, there is a clear increase in pedestrian crossing movements, with increases recorded during all 4 time periods.
- The maximum difference in pedestrian movements occurred between 12pm – 1pm – a 97% increase over the 4 year period.
- The total change in pedestrian crossing movements across the 4 time periods between 2013 and 2018 equated to 59%.
- The increase in crossing movements recorded at 8am – 9am is considered to be linked to the new café in the Exhibition Quarter, whilst the increase between 12pm – 1pm and 5pm – 6pm is linked to the V&A and courtyard being open.
- Review of the survey video footage identified a significant number of pedestrians leaving the Natural History Museum between the hours of 9pm – 10pm indicating that a late evening event / course may have taken place – providing an explanation for the large (over 90%) increase in pedestrian movements recorded during this period.

Conclusion: There is a clear increase in pedestrian crossing movements between 2013 and 2018 across all time periods, despite pedestrian flows remaining relatively consistent.

3.3 RESULTS: CHANGE IN PEDESTRIAN CROSSING MOVEMENT – WEEKDAY VS WEEKEND (2018)

3.3.1. The table below sets out the survey data used to inform the assessment to understand any change in pedestrian crossing movement's between the weekday and weekend survey days in 2018.

Table 7 - Pedestrian Crossing Movement Surveys Summary - 2018 Weekday / Weekend Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Crossing Count	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight		

3.3.3. The results of the comparison are illustrated in Figure 7 and detailed overleaf.

Figure 7 – Pedestrian Crossing Movement Comparison 2018 (Weekday / Weekend)

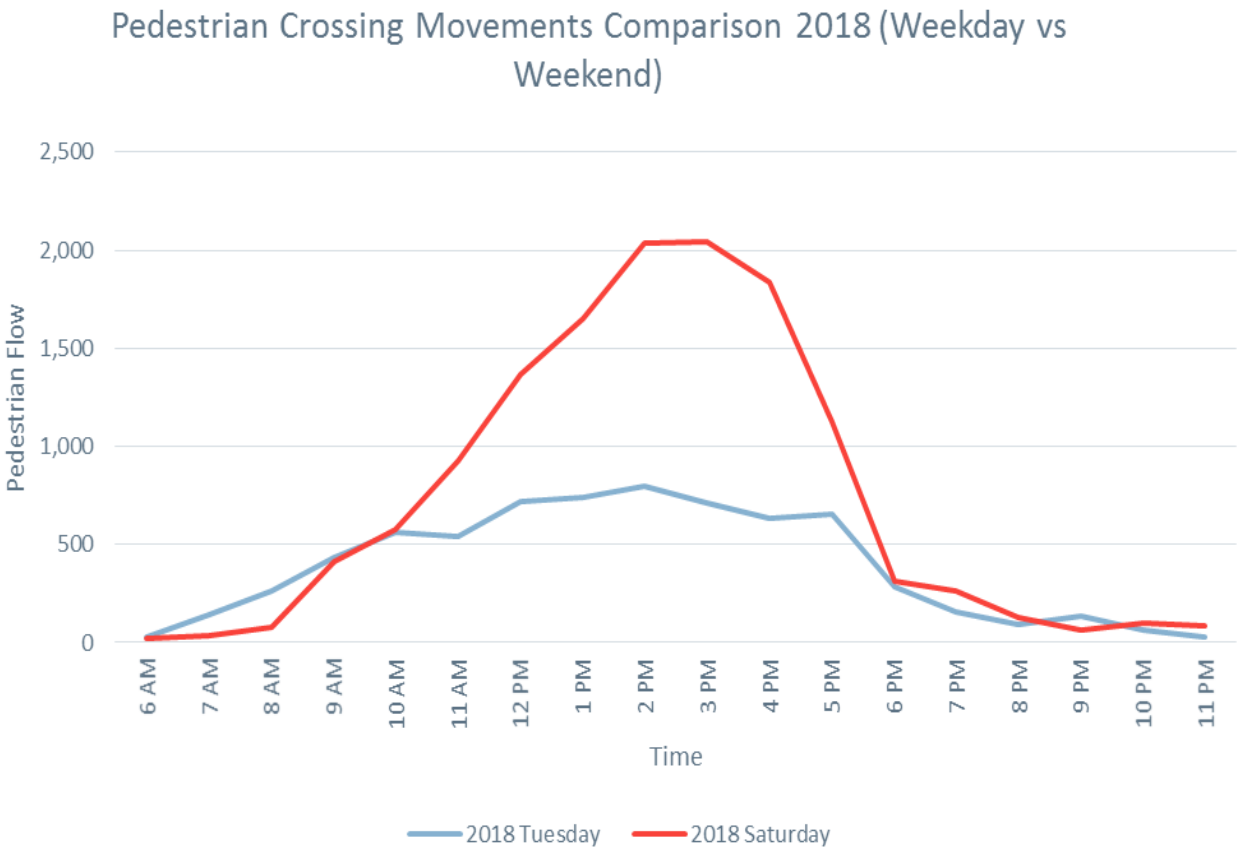


Table 8 – Pedestrian Crossing Movement Comparison 2018 (Weekday / Weekend)

Time Period			2018 Tuesday	2018 Saturday	Absolute Change	% Change
6 AM	-	7 AM	30	22	-8	-27%
7 AM	-	8 AM	145	35	-110	-76%
8 AM	-	9 AM	262	81	-181	-69%
9 AM	-	10 AM	435	414	-21	-5%
10 AM	-	11 AM	562	576	14	+2%
11 AM	-	12 PM	538	928	390	+72%
12 PM	-	1 PM	717	1,369	652	+91%
1 PM	-	2 PM	742	1,652	910	+123%
2 PM	-	3 PM	800	2,036	1,236	+155%
3 PM	-	4 PM	713	2,042	1,329	+186%
4 PM	-	5 PM	632	1,837	1,205	+191%
5 PM	-	6 PM	655	1,122	467	+71%
6 PM	-	7 PM	285	311	26	+9%
7 PM	-	8 PM	158	263	105	+66%
8 PM	-	9 PM	95	125	30	+32%
9 PM	-	10 PM	137	66	-71	-52%
10 PM	-	11 PM	66	98	32	+48%
11 PM	-	12 AM	25	88	63	+252%
Total			**6,997**	**13,065**	**6,068**	**+87%**

3.3.4. The following results were observed:

- The higher overall pedestrian flow recorded on the weekend survey day is consistent with the higher visitor numbers expected at the museums accessible from Exhibition Road during weekends when compared to weekdays.
- Results showed a reduction in pedestrian movements during the early morning hours of the weekend when compared to the weekday, with the 7am – 8am and 8am – 9am hour periods recording reductions in pedestrian movements of 76% and 69% respectively.

Conclusion: A markedly higher overall number of crossing movements were recorded during the 2018 weekend survey day compared with the weekday survey; 13,065 compared to 6,997 over the 18 hour period (an 87% increase).

3.4 ASSESSMENT OF PEDESTRIAN FLOW AND PEDESTRIAN CROSSING MOVEMENTS

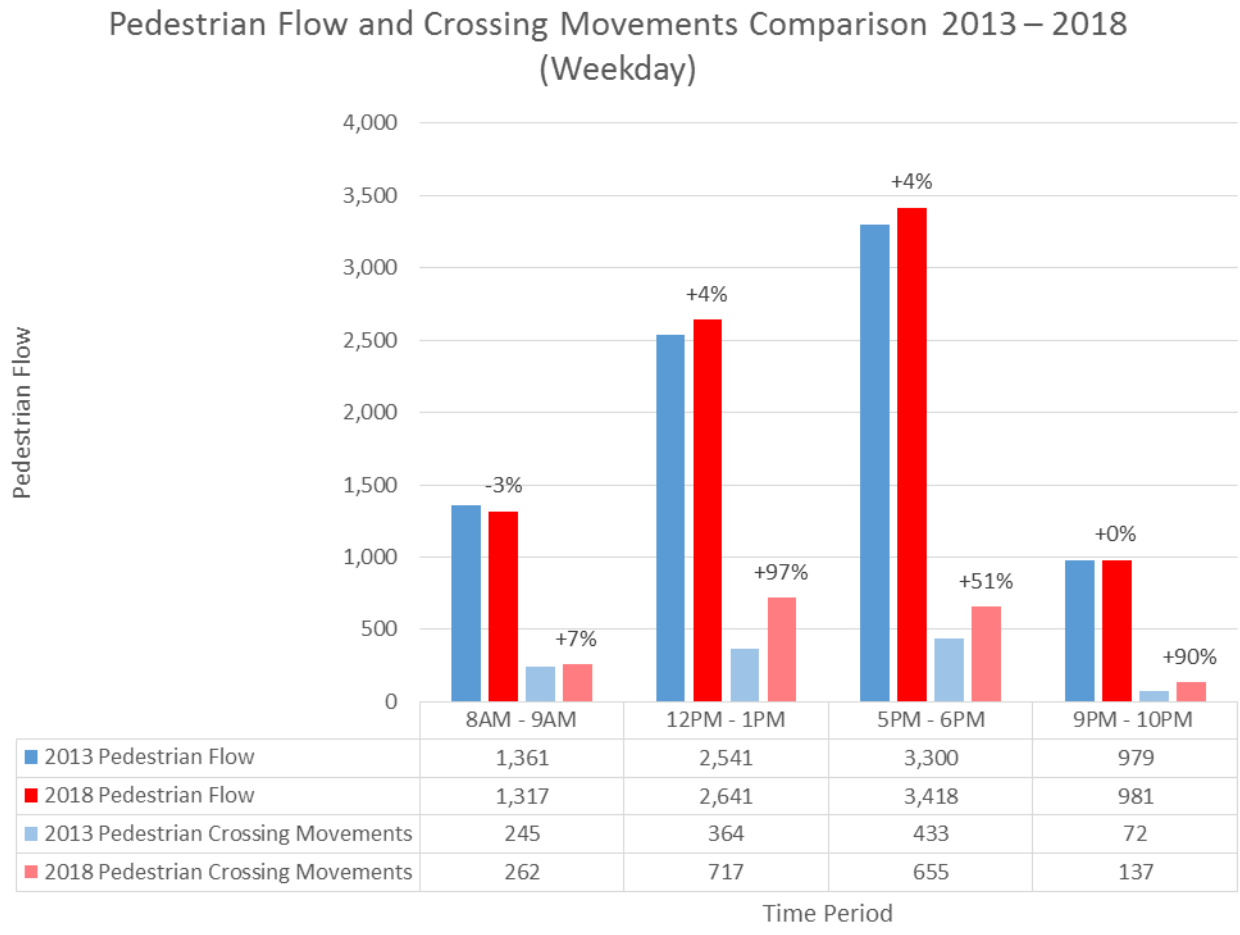
3.4.1. The table below sets out the survey data used to inform the assessment to understand the change in pedestrian crossing movements and flow between the weekday survey days in 2013 and 2018.

Table 9 - Pedestrian Crossing Movement & Flow - 2013 / 2018 Weekday Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Crossing Count & Flow	Tuesday (9th January 2018)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	Dry	None
2013 Pedestrian Crossing Movement & Flow	Wednesday (12th November 2013)		N/A	None

3.4.3. Figure 8 looks at the relationship between pedestrian flow and pedestrian crossing movements across the 2013 – 2018 for the comparable weekday time periods.

Figure 8 - Pedestrian Flow and Crossing Movements Comparison 2013 – 2018 (Weekday)



3.4.4. The following results were observed:

- A negligible change in pedestrian flow was observed across the 4 time periods when comparing 2013 and 2018 pedestrian counts; varying between a reduction of 3% and an increase of 4%.
- However there is a clear increase in pedestrian crossing movements between 2013 and 2018 across all time periods, with a maximum increase of 97% during the 12pm – 1pm time period.

- The increase in crossing movements recorded at 8am – 9am is considered to be linked to the new café in the Exhibition Quarter, whilst the increase between 12pm - 1pm and 5pm – 6pm is linked to the V&A and courtyard being open.

Conclusions: ***There is an increase in pedestrians crossing Exhibition Road in 2018 since the opening of the Exhibition Quarter compared to 2013, despite total pedestrian flows remaining relatively consistent.***

3.4.5. The table below confirms the percentage of people crossing against the total pedestrian flows recorded and the variation in changes between a typical weekday in 2013 and 2018 and a weekday and weekend in 2018. Please note all numbers have been rounded to the nearest whole number.

Table 10 – % Pedestrian Crossing Activity compared to Pedestrian Flow & Changes

Time Period	Weekday 2013 % Crossing Movements compared to Pedestrian Flows	Weekday 2018 % Crossing Movements compared to Pedestrian Flows	Weekend 2018 % Crossing Movements Compared to Pedestrian Flows	Change % 2013 – 2018 (Weekday)	Change % Weekday Vs Weekend (2018)
6 AM - 7 AM		12%	25%		+14%
7 AM - 8 AM		28%	22%		-6%
8 AM - 9 AM	18%	20%	17%	+2%	-2%
9 AM - 10 AM		20%	36%		+16%
10 AM - 11 AM		24%	25%		+1%
11 AM - 12 PM		27%	28%		+1%
12 PM - 1 PM	14%	27%	28%	+13%	+1%
1 PM - 2 PM		23%	31%		+8%
2 PM - 3 PM		28%	30%		+2%
3 PM - 4 PM		30%	35%		+6%
4 PM - 5 PM		22%	38%		+16%
5 PM - 6 PM	13%	19%	23%	+6%	+4%
6 PM - 7 PM		13%	21%		+8%
7 PM - 8 PM		11%	27%		+16%
8 PM - 9 PM		16%	35%		+19%
9 PM - 10 PM	7%	14%	20%	+7%	+6%
10 PM - 11 PM		8%	7%		-1%
11 PM - 12 AM		14%	33%		+19%
Average	**13%**	**20%**	**27%**	**+7%**	**+7%**

Conclusions: There has been a 7% increase in the percentage of crossing movements compared to pedestrian flows between 2013 and 2018 (weekday).

4

PEDESTRIAN JUNCTION CROSSING COUNTS

4 PEDESTRIAN JUNCTION CROSSING COUNTS

4.1 SURVEY METHODOLOGY

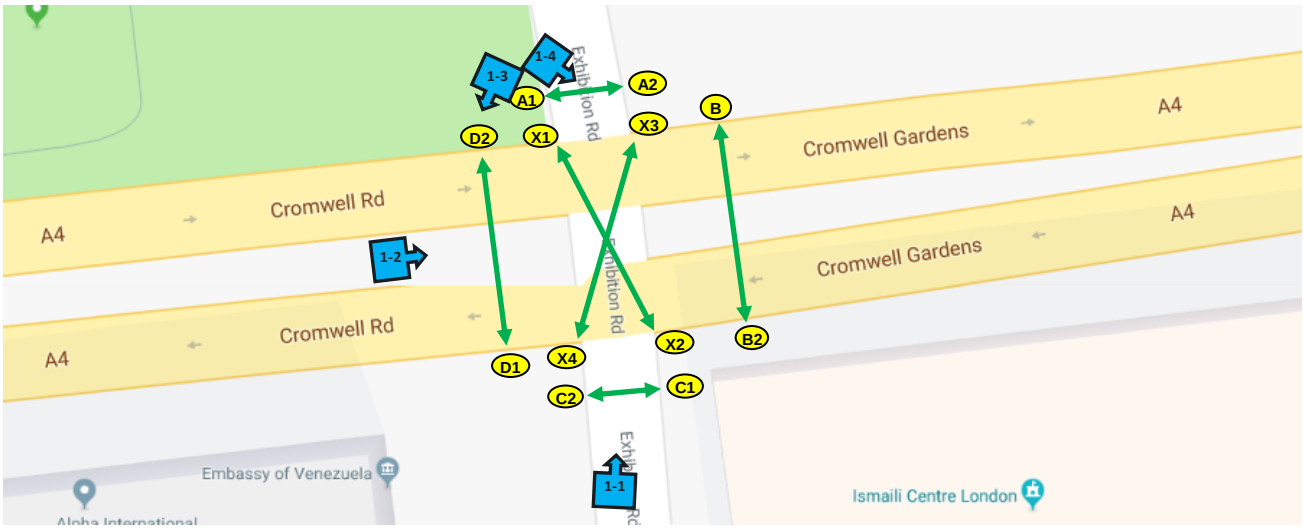
4.1.1. A pedestrian crossing survey was commissioned at the Cromwell Road / Exhibition Road signalised junction in order to ascertain the changes in pedestrian crossing flows between 2013 and 2018 and to provide a 2018 weekday / weekend comparison, the details of which are summarised below.

Table 11 – Pedestrian Junction Crossing Surveys Summary

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Junction Crossing Survey	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight		
2013 Pedestrian Junction Crossing Survey	Wednesday (12th November 2013)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	N/A	None

4.1.2. The location of each count can be viewed in Figure 9.

Figure 9 – Signalised Junction Pedestrian Crossing Counts Survey Location



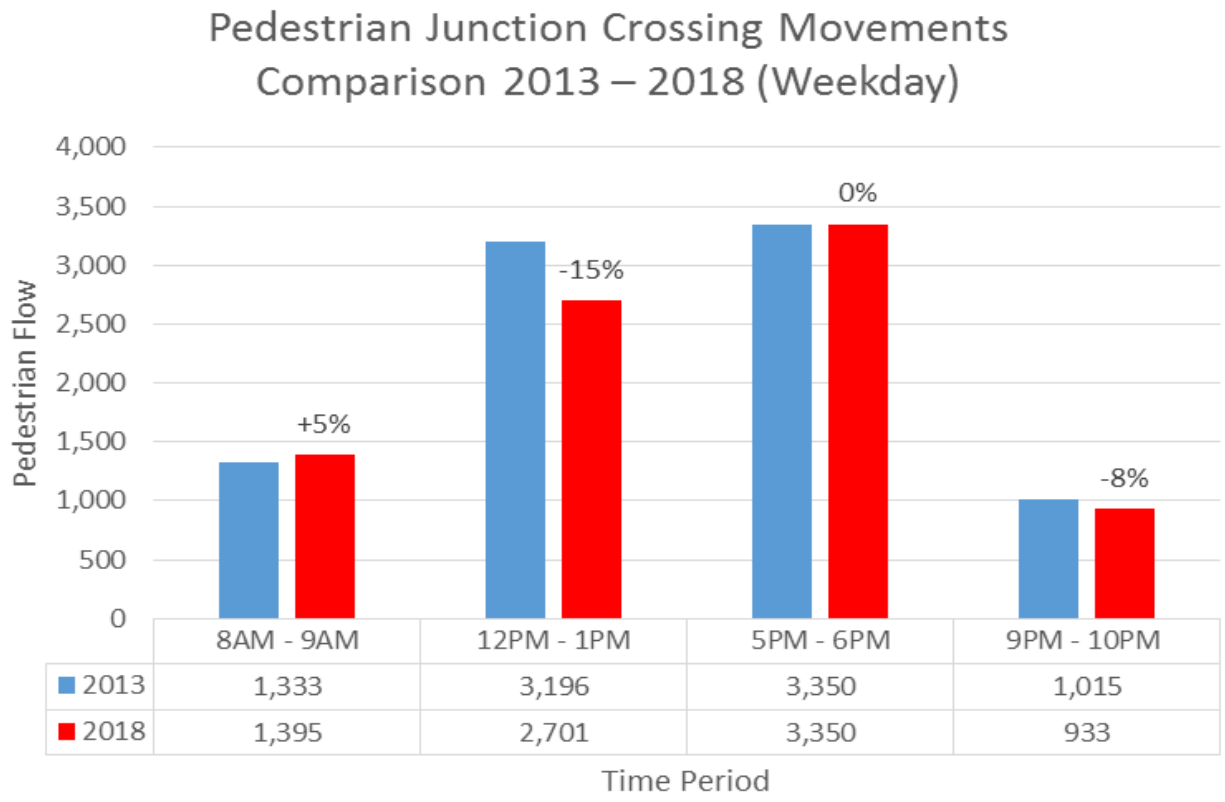
4.2 RESULTS: PEDESTRIAN JUNCTION CROSSING SURVEY 2013 – 2018 (WEEKDAY)

4.2.1. The table overleaf sets out the survey data used to inform the assessment to understand any change in pedestrian junction crossing counts on a weekday since 2013 to 2018.

Table 12 - Pedestrian Junction Crossing Surveys Summary - 2013 / 2018 Weekday Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Junction Crossing Survey	Tuesday (9th January 2018)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	Dry	None
2013 Pedestrian Screen Line Count	Wednesday (12th November 2013)		N/A	None

Figure 10 - Comparison of Pedestrian Crossing Movements at the Cromwell Road / Exhibition Road junction 2013 – 2018 (Weekday)



4.2.3. The following results were observed:

- The largest increase in pedestrian movements was observed between 8am – 9am where 1,333 movements were recorded in 2013 and 1,395 in 2018 – an increase of 5%.
- The greatest decrease in pedestrian movements was observed between 12pm – 1pm where 3,196 movements were recorded in 2013 and 2,701 in 2018 – a decrease of 15%.
- The general trend exhibited by the 2013 survey data that saw a gradual increase in crossing movements from the morning period to late afternoon, followed by a decrease in movements in the evening period was also exhibited by the 2018 survey data.
- The total change in pedestrian junction crossing movements across the 4 time periods between 2013 and 2018 equated to -6%.

Conclusion: No significant changes were observed in pedestrian crossing movements between 2013 and 2018 across the 4 time periods assessed, with the net change in movements varying between +5% and -15%.

4.3 PEDESTRIAN JUNCTION CROSSING MOVEMENTS COMPARISON – WEEKDAY VS WEEKEND

4.3.1. The table below sets out the survey data used to inform the assessment to understand any change in pedestrian junction crossing counts between the weekday and weekend survey days in 2018.

Table 13 - Pedestrian Junction Crossing Surveys Summary – 2018 Weekday / Weekend Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Pedestrian Junction Crossing Survey	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight		

4.3.2. The results of the comparison are illustrated in the figure below and detailed in the subsequent table.

Figure 11 - Weekday / Weekend Junction Pedestrian Crossing Movements Comparison 2018

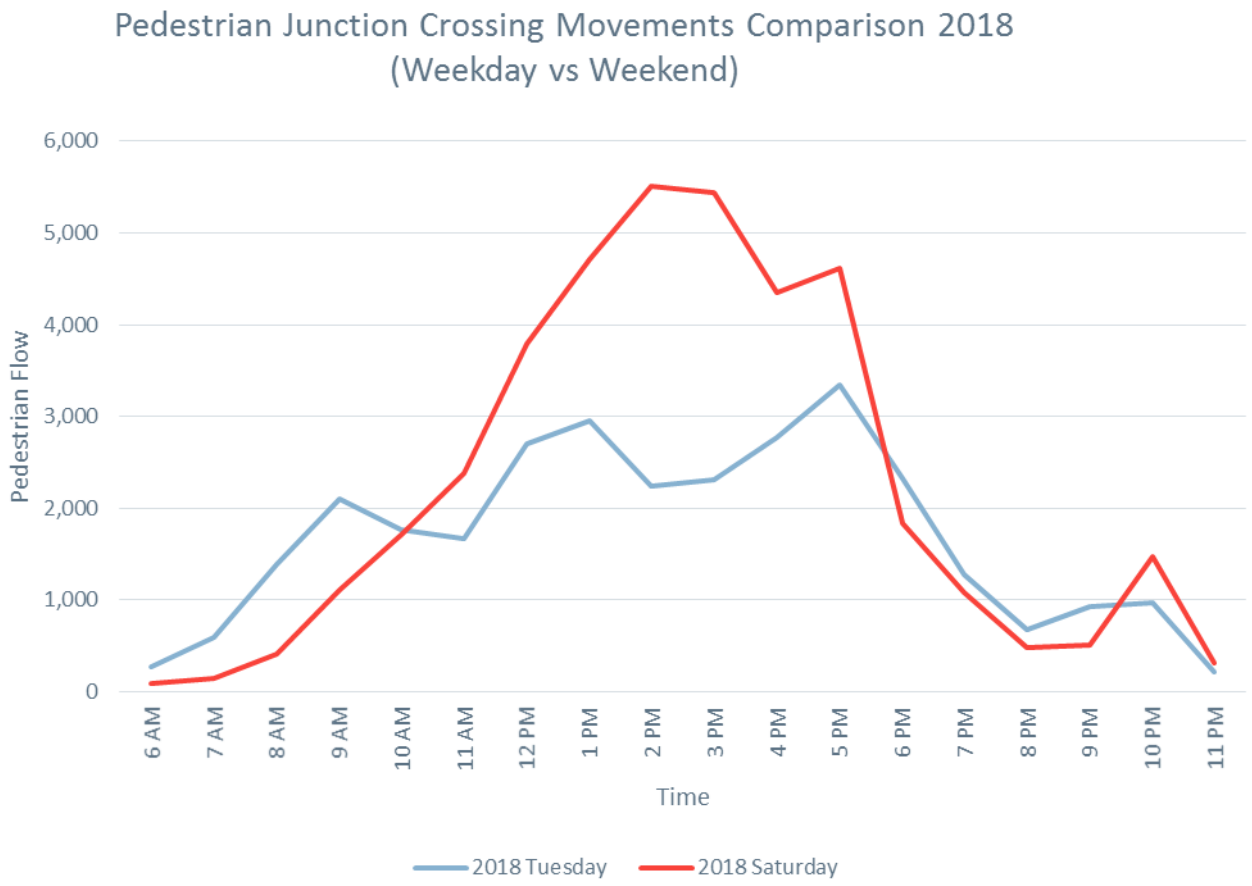


Table 14 - Weekday/Weekend Junction Pedestrian Crossing Movements Comparison 2018

Time Period			2018 Tuesday	2018 Saturday	Absolute Change	% Change
6 AM	-	7 AM	264	90	-174	-66%
7 AM	-	8 AM	593	141	-452	-76%
8 AM	-	9 AM	1,395	414	-981	-70%
9 AM	-	10 AM	2,106	1,115	-991	-47%
10 AM	-	11 AM	1,767	1,710	-57	-3%
11 AM	-	12 PM	1,672	2,386	714	+43%
12 PM	-	1 PM	2,701	3,790	1,089	+40%
1 PM	-	2 PM	2,951	4,713	1,762	+60%
2 PM	-	3 PM	2,234	5,509	3,275	+147%
3 PM	-	4 PM	2,317	5,442	3,125	+135%
4 PM	-	5 PM	2,774	4,353	1,579	+57%
5 PM	-	6 PM	3,350	4,621	1,271	+38%
6 PM	-	7 PM	2,321	1,842	-479	-21%
7 PM	-	8 PM	1,282	1,086	-196	-15%
8 PM	-	9 PM	669	477	-192	-29%
9 PM	-	10 PM	933	512	-421	-45%
10 PM	-	11 PM	975	1475	500	+51%
11 PM	-	12 AM	215	316	101	+47%
Total			**30,519**	**39,992**	**9,473**	**+31%**

4.3.3. The following results were observed:

- Over the 18 hour period 9 hours recorded higher pedestrian flow, with the greatest absolute change occurring during 2pm – 3pm - a 147% increase.
- The peaks and troughs in pedestrian movements were more defined in the weekend survey data than the weekday – with a flatter profile in pedestrian crossing activity forming over the weekday 18 hour period. Subsequently a slight reduction in pedestrian movements was recorded in the weekend morning and evening periods and a significant increase during the midday / afternoon periods.

Conclusion: The greater number of overall pedestrian crossing movements at the junction on the weekend survey day (+31%) is consistent with higher overall pedestrian flows recorded across the study area during the weekend period when compared to the weekday discussed in Chapter 2.

5

TRAFFIC FLOW

5 TRAFFIC FLOW

5.1 SURVEY METHODOLOGY

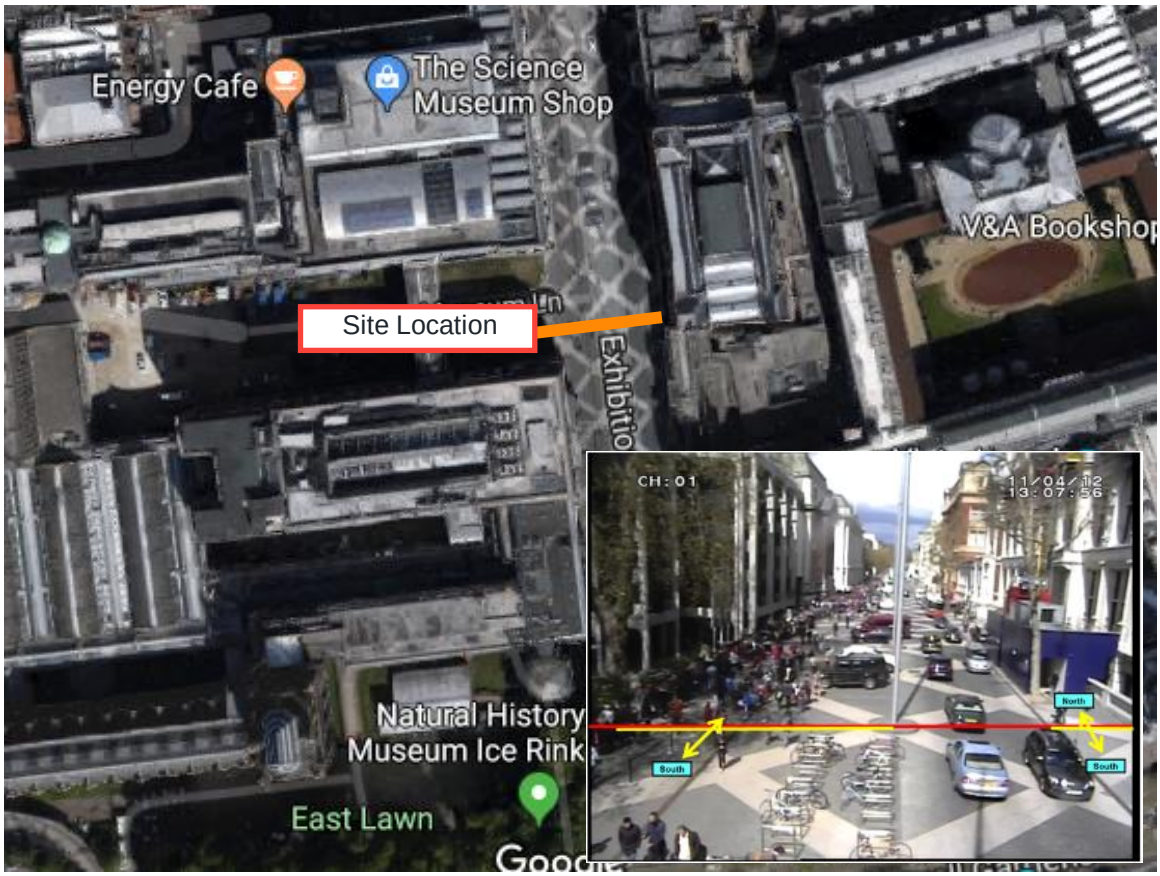
5.1.1. A vehicle screen line count was commissioned in order to ascertain the changes in vehicular flow on Exhibition Road between 2013 and 2018 and to provide a 2018 weekday / weekend comparison. The details of the survey data used to inform this chapter is summarised below.

Table 15 - Traffic Flow Surveys Summary

Survey	Date	Time Period	Incidents / Site Observations
2018 Vehicle Screenline Count	Tuesday (9th January 2018)	6am - midnight	None
	Saturday (13th January 2018)		
2013 Vehicle Screenline Count	Wednesday (12th November 2013)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	None

5.1.4. The exact location of the screen line can be viewed in the figure below.

Figure 12 - Traffic Flow & Speed Screenline Count Survey Location



5.2 RESULTS: TRAFFIC FLOW COMPARISON 2013 – 2018 (WEEKDAY)

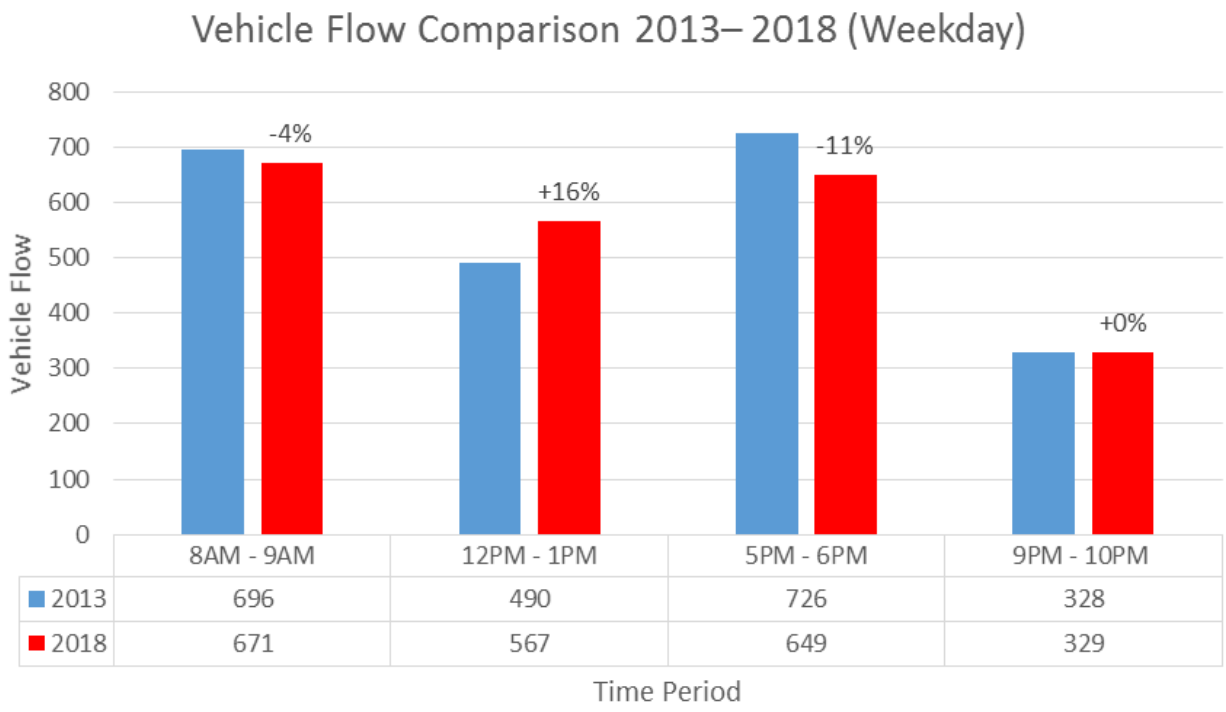
5.2.1. The table below sets out the survey data used to inform the assessment to understand any change in vehicular flow on a weekday since 2013.

Table 16 - Vehicle Flow Surveys Summary - 2013 / 2018 Weekday Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Vehicle Screenline Count	Tuesday (9th January 2018)	8am – 9am 12pm – 1pm 5pm – 6pm 9pm – 10pm	Dry	None
2013 Vehicle Screenline Count	Wednesday (12th November 2013)		N/A	None

5.2.3. The results of the comparison are illustrated in the figure below.

Figure 13 - Vehicle Flow Comparison 2013 – 2018



5.2.4. The following results were observed:

- The maximum difference in vehicular movements occurred between 12pm – 1pm where 490 vehicular movements were observed in 2013 and 567 vehicular movements in 2018 – a 16% increase over the 4 year period.
- The largest decrease in vehicle movements was observed between 5pm – 6pm where 726 movements were recorded in 2013 and 649 in 2018 – a decrease of 11%.
- The same level of traffic flow was observed in 2013 and 2018 during the period 9pm – 10pm varying by 1 recorded vehicle.

- There is a negligible change, varying across the 4 time periods from a reduction of 11% to an increase of 16%.

Conclusion: When comparing 2013 and 2018 vehicle flows, the total change in vehicle flows across the 4 time periods between 2013 and 2018 equated to -1% difference. The negligible change is similar to the change recorded in pedestrian flows (discussed in Chapter 2) whereby there has been a 3% increase.

5.3 VEHICLE FLOW COMPARISON – WEEKDAY VS WEEKEND

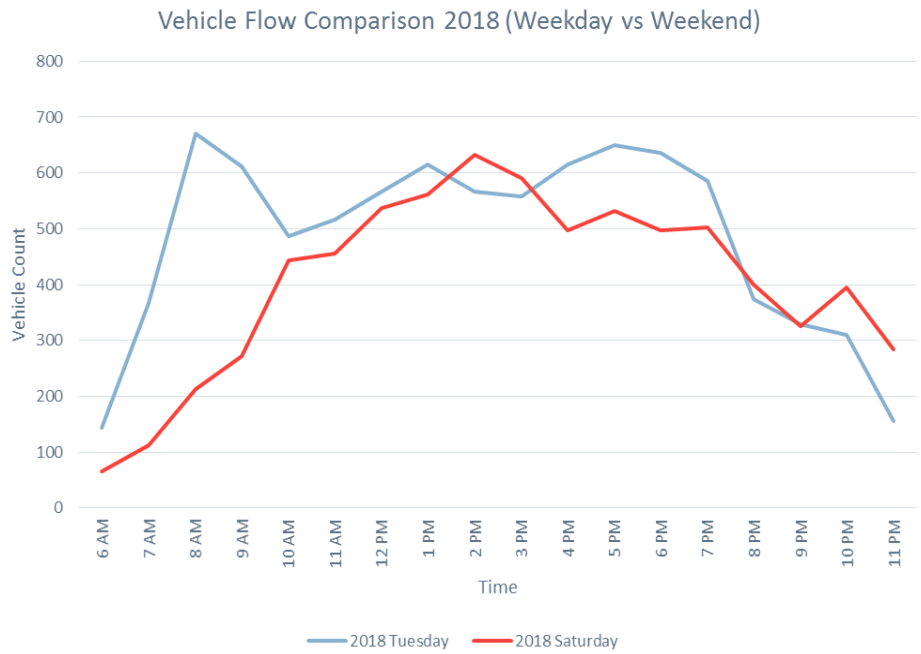
5.3.1. The table below sets out the survey data used to inform the assessment to understand any change in vehicular flow between the weekday and weekend survey days in 2018.

Table 17 - Vehicle Flow Surveys Summary - 2018 Weekday / Weekend Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Vehicle Screen Line Count	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight		

5.3.2. The results of the comparison are illustrated in the figure below. Details on vehicle flows by vehicle type is included within **Appendix B**.

Figure 14 - Vehicle Flow Comparison - 2018 Weekday / Weekend Comparison



5.3.3. The following results were observed:

- A higher total overall vehicle count (8,757) was recorded during the 2018 weekday when compared to the weekend (7,316); equivalent to a 16% difference.
- The greatest absolute change in vehicle flows occurred between 8am – 9am where 458 fewer movements were recorded, equivalent to a 68% decrease and in line with the anticipated weekday peak period.
- Vehicle flows recorded across the 2018 weekday displays two distinct peaks around the morning (8am - 9am) peak travel period and the evening (5pm – 6pm) peak period.

- When comparing the weekday and weekend survey days; both exhibited a high proportion of car movements (45% on Tuesday and 56% on Saturday) as well as a significant proportion of black cab movements (25% on both survey days).
- LGV's made up 7% and 3% of the total movements on the weekday and weekend survey days respectively.
- Coaches made up less than 1% of the movements recorded on both the weekday and weekend survey days

Conclusion: Vehicle flows are higher (+16%) during a typical weekday when compared to a weekend (in contrast to pedestrian flows which are higher at weekends than on weekdays).

6

TRAFFIC SPEED

6 TRAFFIC SPEED

6.1 SURVEY METHODOLOGY

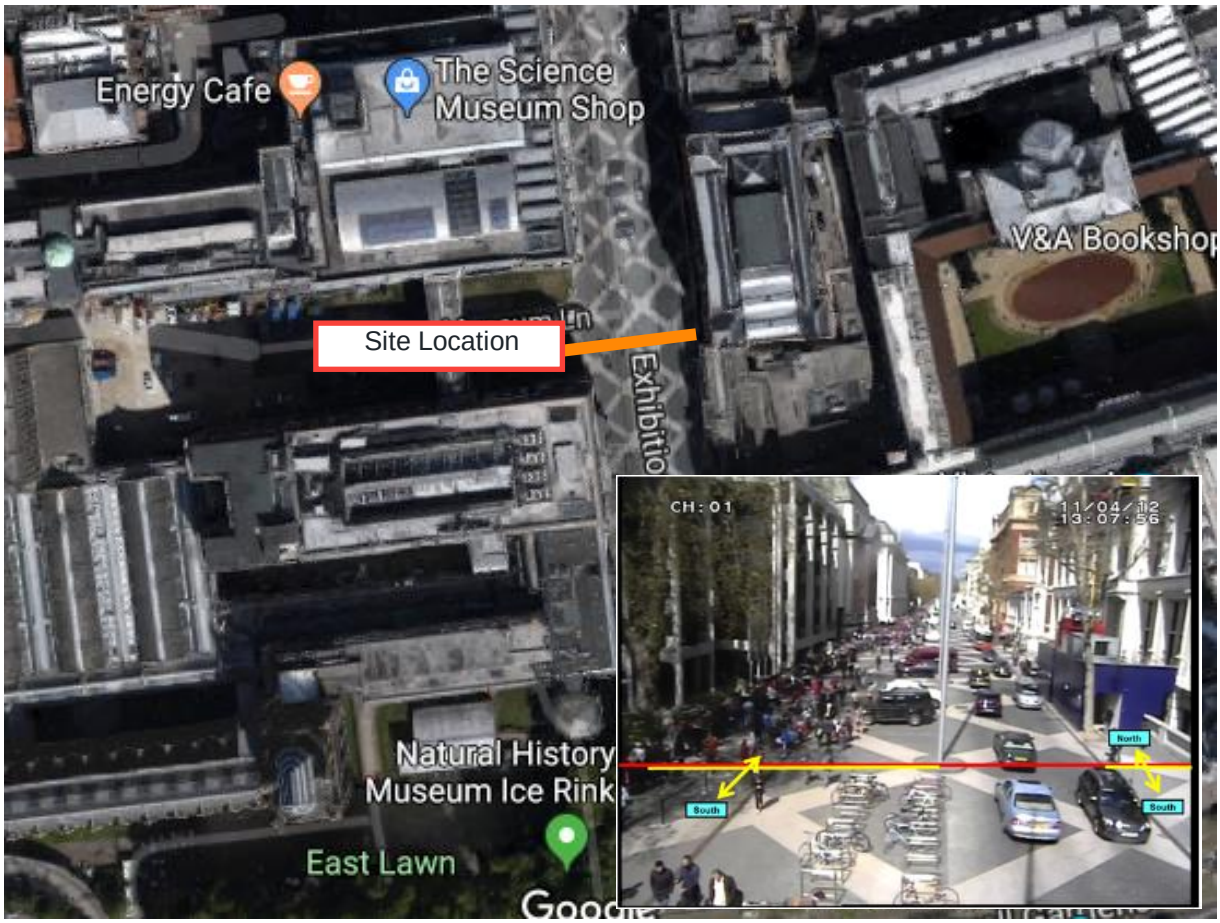
6.1.1. A traffic radar survey was commissioned in order to ascertain the changes in vehicle speeds on Exhibition Road between 2013 and 2018 and to provide a 2018 weekday / weekend comparison. The details of the survey data used to inform this chapter is summarised below:

Table 18 - Traffic Radar Surveys Summary

Survey	Date	Time Period	Incidents / Site Observations
2018 Traffic Radar	7 days from 08/01/2018	24 hours	None
2013 Traffic Radar	Wednesday (12th November 2013)	24 hours	None

6.1.2. The exact location of the traffic radar screen line can be viewed in the figure below.

Figure 15 - Traffic Radar Screenline Survey Location



6.2 RESULTS: VEHICLE SPEEDS COMPARISON 2013 – 2018 (WEEKDAY)

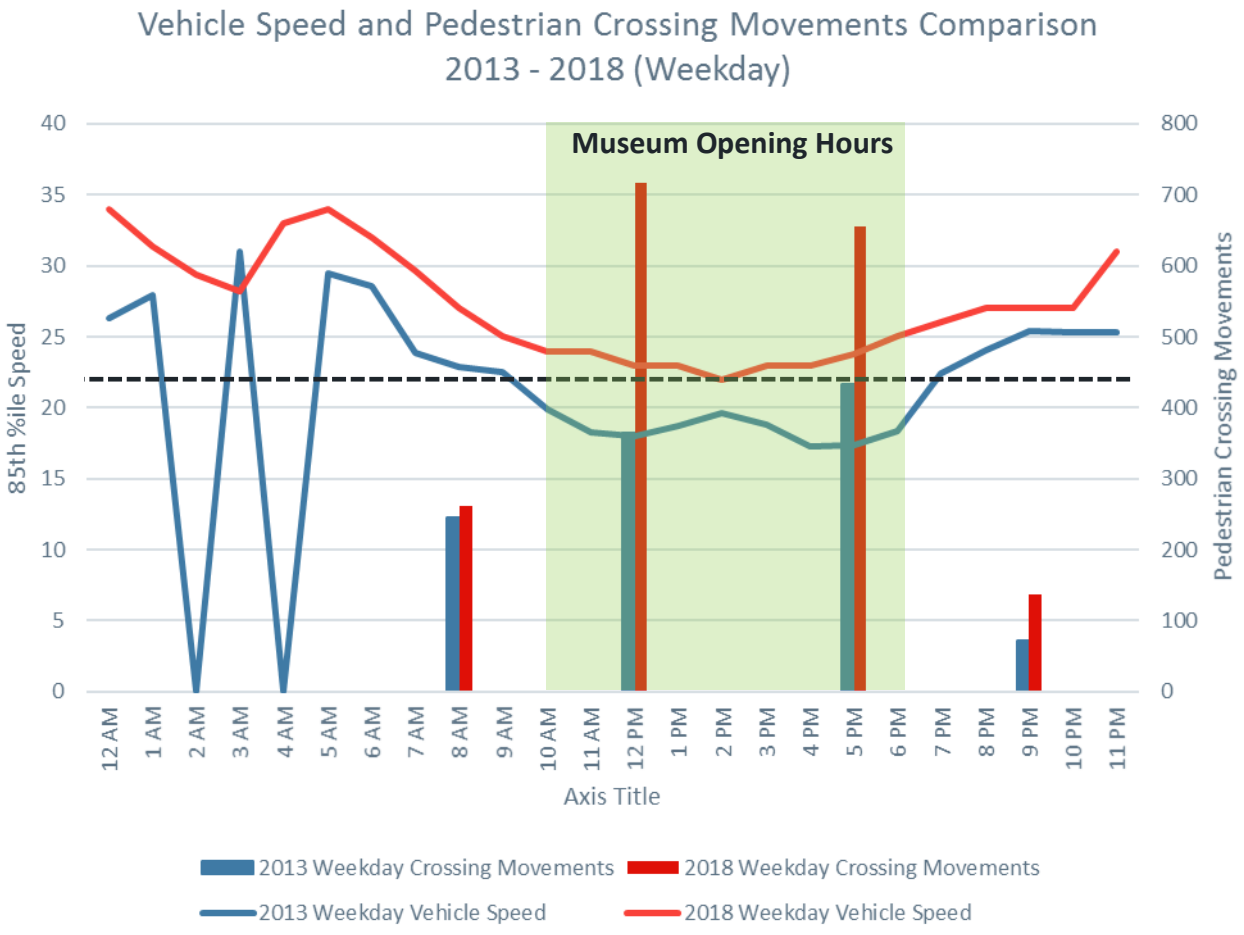
6.2.1. The table below sets out the survey data used to inform the assessment to understand any change in vehicle speeds on a weekday since 2013.

Table 19 - Traffic Radar Surveys Summary - 2013 / 2018 Weekday Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Traffic Radar	Tuesday (9th January 2018)	24 hours	N/A	None
2013 Traffic Radar	Wednesday (12th November 2013)		N/A	None

6.2.3. The results of the comparison are illustrated in the figure below. The graph incorporates pedestrian crossing activity to help understand any relationship between the change in recorded vehicle speeds and pedestrian crossing movements.

Figure 16 - Vehicle Speed Vs Crossing Movements comparison 2013 - 2018



6.2.4. The following results were observed:

- The 2013 dataset exhibited 2 anomalous readings when the 85th percentile speed was recorded as 0 between the time periods 2am – 3am and 4am – 5am.
- Overall, the change in speed across the 4 time periods between 2013 and 2018 equated to +21%.
- The greatest increase in 85th percentile speed was identified during the period 6pm – 7pm where an average speed of 17.4mph was recorded in 2013 and 23.8 mph recorded in 2018 – a 37% increase.
- There was a clear increase in pedestrian crossing movements between 2013 and 2018 across all time periods, with a maximum increase of + 97% during the 12pm – 1pm time period.
- There is no noticeable correlation between the change in observed pedestrian crossing movement between 2013 and 2018 and the change in vehicle speed across the study period.
- The 85th percentile is no longer beneath the 20mph speed limit during opening hours of the museum.

Conclusion: There is a ***significant overall increase (+21%)*** in average 85th percentile speed when comparing the 2013 and 2018 survey data. The 85th percentile speed is 27mph, compared to 22mph recorded in 2013.

6.3 VEHICULAR SPEED COMPARISON – WEEKDAY VS WEEKEND

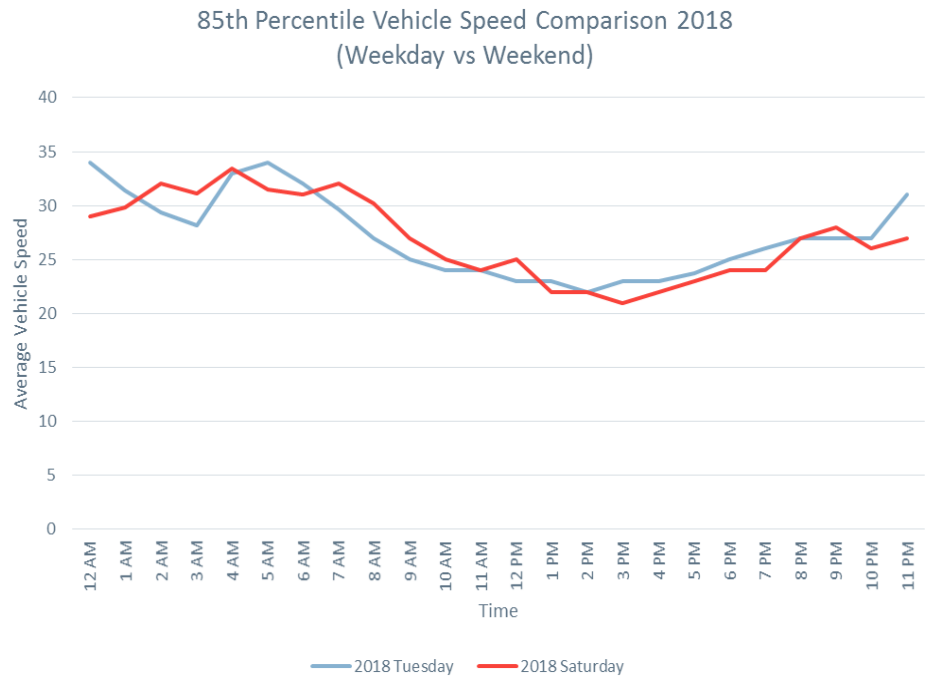
6.3.1. The table below sets out the survey data used to inform the assessment to understand any change in vehicular speeds between the weekday and weekend survey days in 2018.

Table 20 - Traffic Radar Surveys Summary - 2018 Weekday / Weekend Comparison

Survey	Date	Time Period	Conditions	Incidents / Site Observations
2018 Traffic Radar	Tuesday (9th January 2018)	24 hour	Dry	None
	Saturday (13th January 2018)			

6.3.3. The results of the comparison are illustrated in the figure below.

Figure 17 - Vehicle Speed Weekday / Weekend Comparison (2018)



6.3.4. The following results were observed:

- The weekday and weekend 2018 85th percentile speeds recorded fluctuated across the study period with 9 of the 18 time periods recording marginally higher speeds at the weekend when compared to the weekday.
- The greatest increase in speed between the weekday and weekend was identified during the period 8am – 9am that experienced a 12% increase. This may be as a result of reduced queuing and congestion outside of peak weekday periods.
- The greatest decrease in speed of -15% was identified during 12pm – 1pm, an absolute reduction of 5mph.

Conclusion: When comparing the 2018 weekday and weekend 85th percentile vehicle speeds there is a negligible difference, with comparative speeds increasing and decreasing across the study period.

6.3.5. The tables overleaf provide a more detailed breakdown of the range of vehicle speeds recorded throughout the course of a typical weekday and weekend.

Table 21 - Speed Classification (Weekday)

Tuesday	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40+	Avg	85th
12 AM	**82**	0	1	5	13	22	12	18	7	4	26	34
1 AM	**23**	0	1	2	2	6	6	5	0	1	25	31
2 AM	**11**	0	0	0	2	5	3	1	0	0	24	29
3 AM	**15**	0	0	1	6	3	4	1	0	0	22	28
4 AM	**19**	0	0	1	3	6	6	2	1	0	24	33
5 AM	**40**	0	2	2	6	8	10	8	3	1	25	34
6 AM	**129**	0	0	6	18	34	37	22	9	3	26	32
7 AM	**288**	0	4	12	39	105	85	33	9	1	24	30
8 AM	**494**	0	7	32	129	198	108	17	2	1	22	27
9 AM	**473**	0	6	48	139	194	79	7	0	0	20	25
10 AM	**423**	0	22	75	149	134	37	4	2	0	19	24
11 AM	**485**	0	17	79	160	186	39	4	0	0	19	24
12 PM	**542**	0	11	83	223	180	39	5	1	0	19	23
1 PM	**547**	1	13	57	231	213	27	2	2	1	19	23
2 PM	**537**	0	20	91	236	151	30	8	1	0	18	22
3 PM	**529**	0	17	70	227	170	35	10	0	0	19	23
4 PM	**542**	0	12	77	227	176	44	5	1	0	19	23
5 PM	**514**	0	13	68	224	150	51	4	3	1	19	24
6 PM	**497**	0	6	35	152	218	71	14	1	0	21	25
7 PM	**492**	0	9	47	137	214	63	19	3	0	21	26
8 PM	**318**	0	1	4	51	145	90	22	4	1	23	27
9 PM	**284**	0	3	15	64	101	80	19	1	1	22	27
10 PM	**304**	1	2	7	60	141	75	15	2	1	23	27
11 PM	**157**	0	3	5	16	55	44	28	6	0	25	31
Total	**7,745**	**2**	**170**	**822**	**2,514**	**2,815**	**1,075**	**273**	**58**	**16**	**522**	**652**
	100%	**0%**	**2%**	**11%**	**32%**	**36%**	**14%**	**4%**	**1%**	**0%**	**N/A**	

Table 22 - Speed Classification (Weekend)

Saturday	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40+	Avg	85th
12 AM	**100**	0	1	1	13	41	30	12	0	2	24	29
1 AM	**60**	0	0	2	4	27	18	5	3	1	25	30
2 AM	**39**	0	1	1	5	11	11	7	2	1	25	32
3 AM	**32**	0	0	3	4	6	11	6	2	0	25	31
4 AM	**23**	0	3	2	4	6	2	4	2	0	22	33
5 AM	**29**	0	0	0	2	6	10	9	2	0	27	32
6 AM	**44**	0	0	0	10	11	16	5	1	1	25	31
7 AM	**107**	0	1	8	17	29	31	13	4	4	25	32
8 AM	**171**	0	2	5	23	63	52	22	2	1	25	30
9 AM	**255**	0	4	24	46	107	56	15	3	0	22	27
10 AM	**407**	0	9	39	122	164	66	7	0	0	20	25
11 AM	**410**	0	7	41	130	173	48	10	1	0	20	24
12 PM	**522**	0	16	57	202	167	64	13	2	1	20	25
1 PM	**544**	0	18	79	258	145	37	7	0	0	18	22
2 PM	**535**	2	43	116	196	140	28	9	1	0	17	22
3 PM	**544**	2	54	142	238	88	17	2	1	0	16	21
4 PM	**477**	0	34	109	196	106	24	6	2	0	17	22
5 PM	**493**	0	33	62	197	164	28	7	1	1	18	23
6 PM	**442**	3	47	75	123	143	45	5	1	0	18	24
7 PM	**498**	0	23	69	182	161	52	6	3	2	19	24
8 PM	**390**	1	3	17	96	164	81	21	5	2	22	27
9 PM	**287**	0	1	10	44	124	88	13	5	2	23	28
10 PM	**373**	0	4	24	85	170	76	10	3	1	22	26
11 PM	**273**	0	4	17	61	116	58	15	1	1	22	27
Total	**7,055**	**8**	**308**	**903**	**2,258**	**2,332**	**949**	**229**	**47**	**20**	**518**	**647**
	100%	**0%**	**4%**	**13%**	**32%**	**33%**	**13%**	**3%**	**1%**	**0%**	**N/A**	

7

CAR PARKING OCCUPANCY & MOVEMENT

7 CAR PARKING OCCUPANCY & MOVEMENT

7.1 SURVEY METHODOLOGY

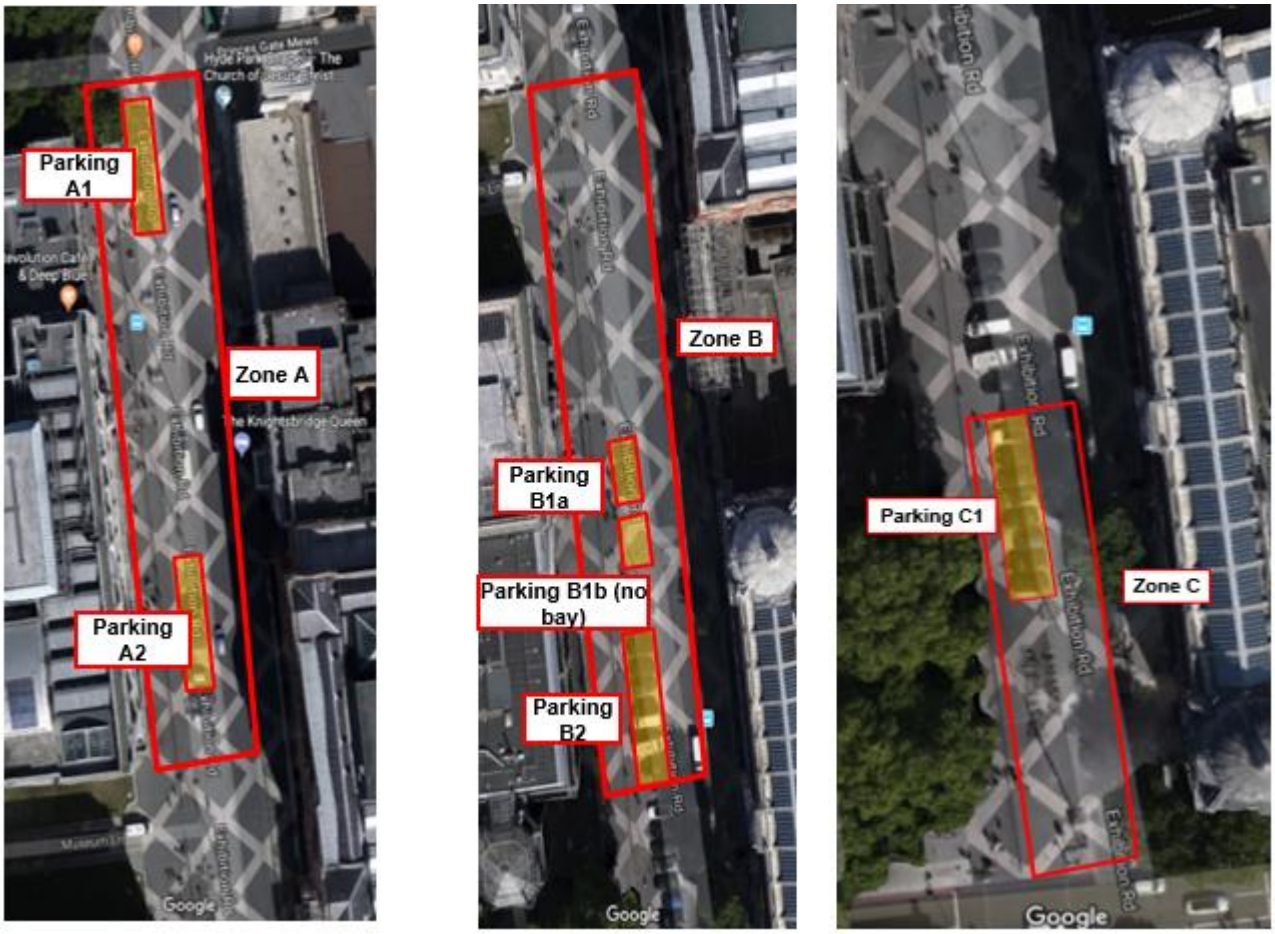
7.1.1. Activity of the parking bays in Zones A – C (from Imperial College Road to Cromwell Road) were recorded to provide data indicating current occupancy / movement and to provide a 2018 weekday / weekend comparison, the details of which are summarised below.

Table 23 - Parking Occupancy Survey Outline

Survey	Date	Time Period	Area	Reporting
Parking Occupancy / Movement	Tuesday (9th January 2018)	6am – 11pm	Exhibition Road Zone A – Car Park A1, Zone B – Car Parks B1a, B1b and B2 & Zone C – Car Park C1 (see Figure below).	▪ The number of vehicles in 5 minute snapshots distinguished by the five blocks of bays. ▪ Movement to/from parking bays. ▪ Observations of parking activity outside marked bays on east and west sides of road.
	Saturday (13th January 2018)	6am – 11pm		

7.1.2. The location of each area surveyed can be viewed in the figure below.

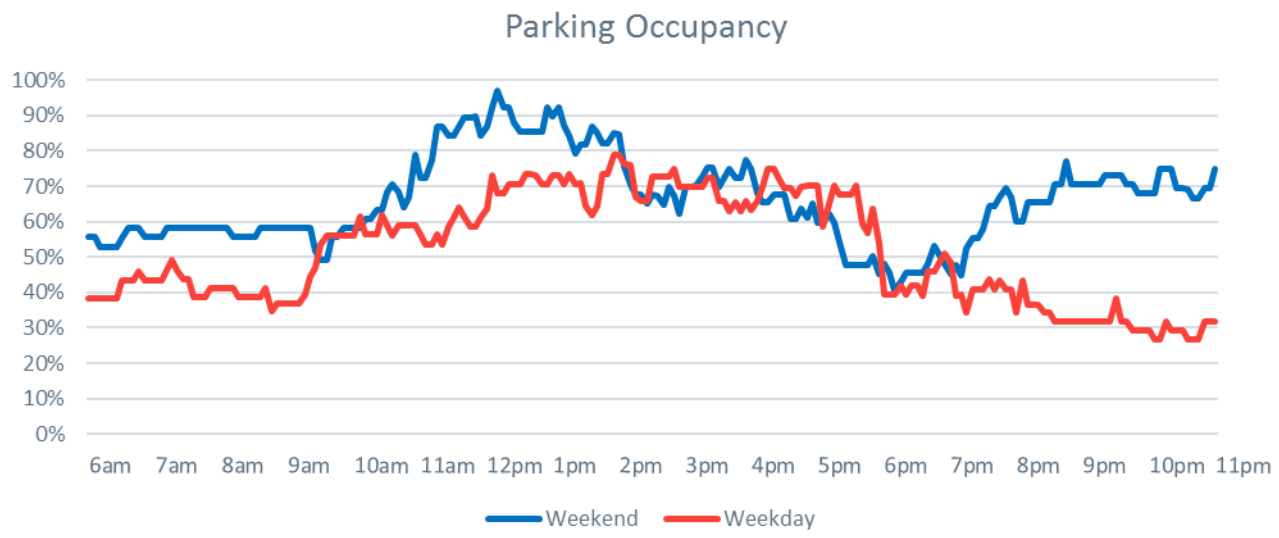
Figure 18 – Parking Occupancy Survey Locations Zone A, B and C



7.2 RESULTS: PARKING OCCUPANCY

7.2.1. The graph below illustrates the parking occupancy associated within the study area for a weekday and weekend.

Figure 19 - Parking Occupancy, Weekend vs Weekday



7.2.2. The analysis confirmed:

- Parking occupancy is at its highest in parking Zone A2 just north of Museum Lane on a weekend.
- Occupancy of bays peaks at 92% on a weekend at between 11am – 12pm and 79% on a weekday at 2pm.
- Parking zone A1 adjacent to Princes Gate Mews is the least utilised zone on a weekday.
- The average parking occupancy for all the zones combined is 66% on a weekend and peaks at 12pm.

Conclusion: Overall, use of parking bays within the study area is higher over the course of a typical weekend day compared to a weekday.

RESIDENTIAL CAR PARKING

7.2.3. Parking zone A1, B1a and C1 (illustrated in Figure 18 above) are residential bays. A separate survey was undertaken by the Council on the same day to understand whether residents or visitors were using these bays.

7.2.4. The separate survey was a snapshot survey at 5 different times of the day over the two days that this study was carried out in January 2018.

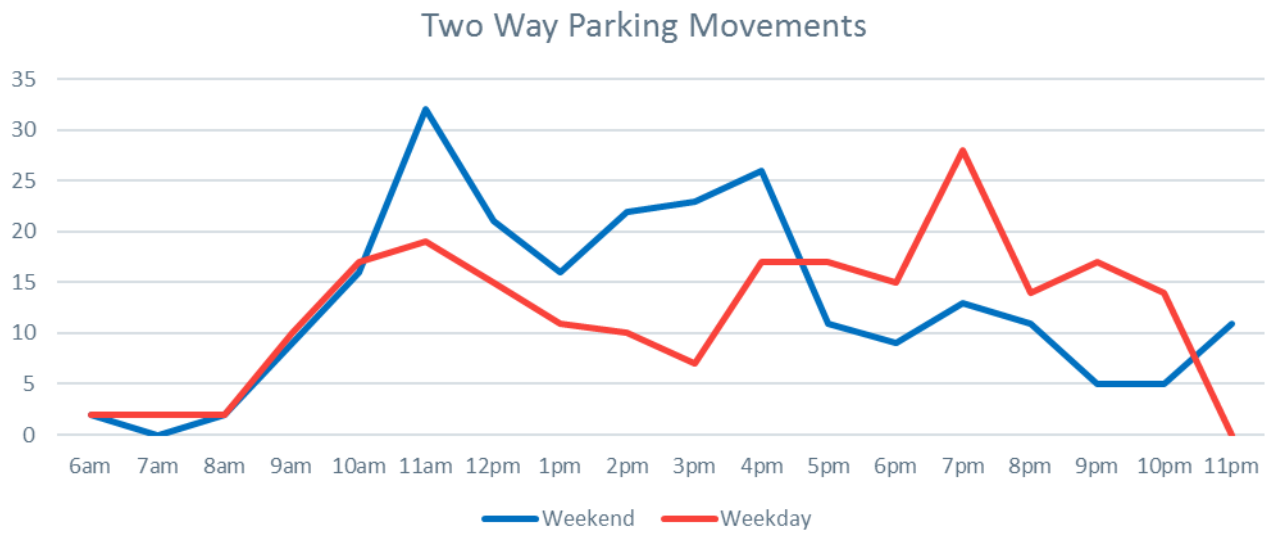
7.2.5. Average occupancy was 81%. The snapshot survey recorded 45 different vehicles parked in the resident's bays. 14 vehicles belonged to residents who live in near Exhibition Road. There was only one vehicle parked in zone B1a (see Figure 18) that was unable to be verified.

7.2.6. Parking zone C1 (nearest to the Cromwell Road / Exhibition Road junction) was primarily utilised by residents, albeit one vehicle on Tuesday and one vehicle on Saturday was recorded as not displaying a permit. There was also one car on each day displaying a disabled permit (a blue badge on one day and a purple badge on the other day).

7.3 RESULTS: PARKING MOVEMENTS

7.3.1. The following graph shows the movement of vehicles entering and exiting the three parking areas within the study area (Zone B1, B1a and B2), from the Science Museum south side to the Natural History Museum.

Figure 20 - Two Way Parking Movements, Weekend vs Weekday



7.3.2. The graph above shows:

- The level of movement into and out of the parking bays peaks at 11am on a weekend with a total of 32 movements.
- The total number of two-way movements during the weekday is 217, compared to the weekend two-way movements (234).

Conclusion: Both a weekend and weekday have a similar number of two-way movements, with more movements during the afternoon on a weekend and more movements during the evening on a weekday.

8

CYCLE PARKING

8 CYCLE PARKING

8.1 SURVEY METHODOLOGY

8.1.1. Occupancy data was obtained from TfL for the cycle docking station (for 22 cycles) outside the Natural History Museum for Tuesday 9th January and Saturday 13th January, to help understand if the occupancy of the docks has an impact on the crossing locations for pedestrians.

Table 24 - Cycle Parking Survey Outline

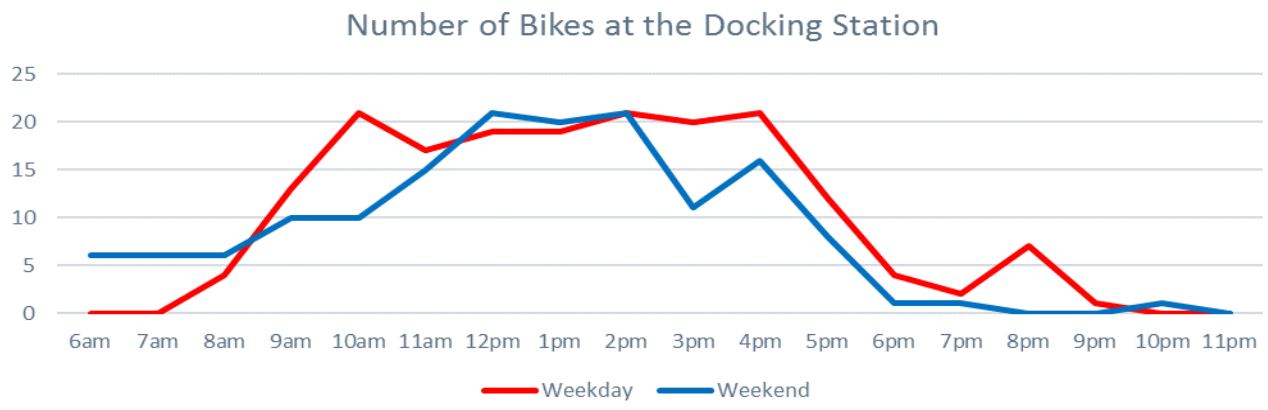
Survey	Date	Time Period	Area	Reporting
Cycle Occupancy	Tuesday (9th January 2018)	6am – 11pm	Exhibition Road, Zone B2 (see Figure below).	▪ The number of bicycles in hour snapshots that the docking station holds.
	Saturday (13th January 2018)	6am – 11pm		

Figure 21 - Cycle Parking Survey Location Zone B

8.2 RESULTS: CYCLE PARKING

8.2.1. The graph below illustrates use of the bicycles for the weekday and weekend.

Figure 22 - Number of Bikes at the Docking Station - Weekday vs Weekend



8.2.2. The graph confirms:

- The number of bikes in the docking station peaks at 10am, 2pm and 4pm on weekdays and 12pm and 2pm on a weekend.

Conclusion: Use of the cycle docking station is similar on a weekday and a weekend day, albeit the dock becomes fully occupied slightly earlier in the morning compared to a weekend.

8.2.3. The graph below looks at pedestrian crossing activity for Zone B2 (where the cycle docking station is located) to understand if the occupancy of the docks has an impact on the crossing locations for pedestrians.

Figure 23 - Number of Pedestrians Crossed compared to Number of Bikes in the Docking Station, Weekday

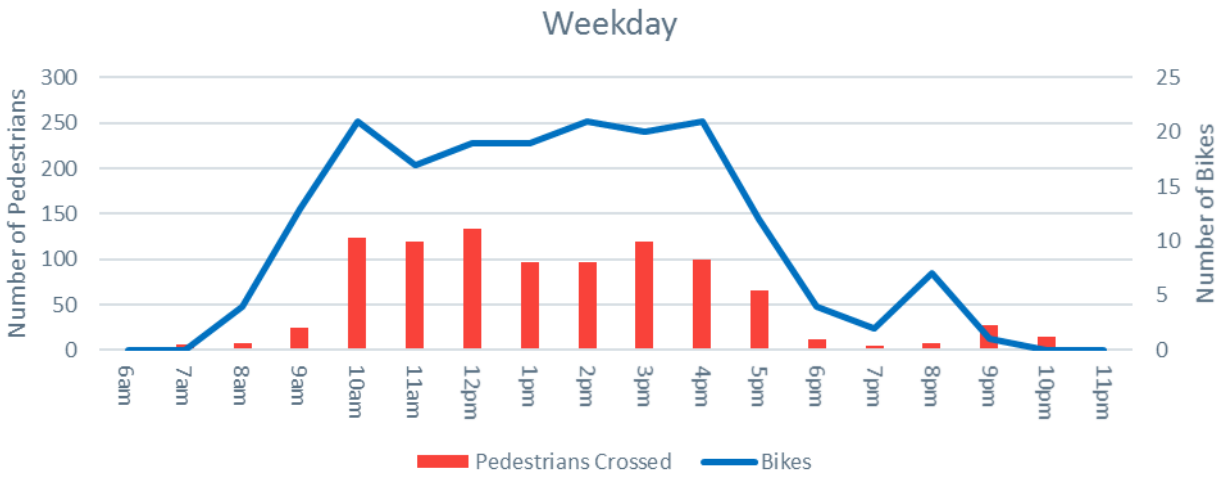
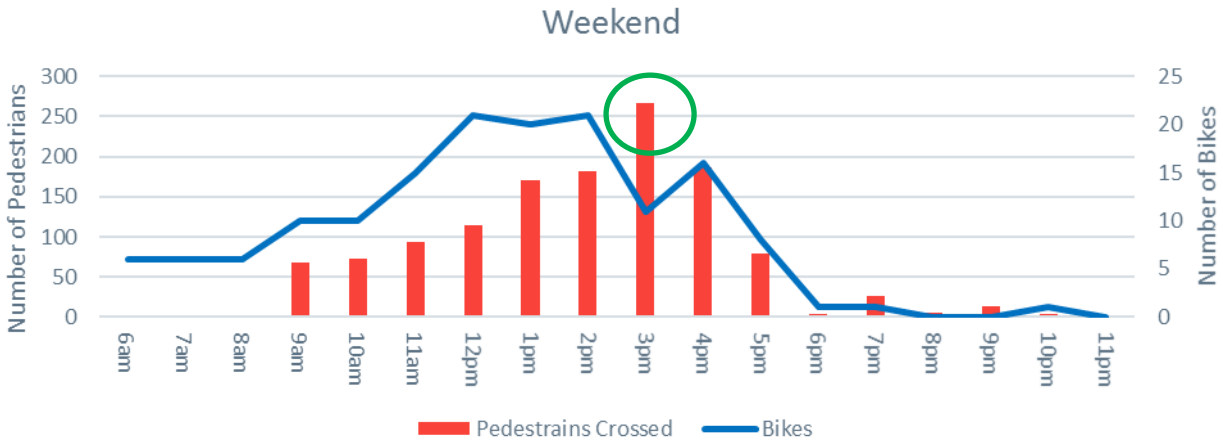


Figure 24 - Number of Pedestrians Crossed compared to Number of Bikes in the Docking Station, Weekend



Conclusion: The number of pedestrians recorded crossing at this location increases in line with the general increase in pedestrian flows despite the docking station being close to full capacity from 10am – 4pm. There is just one occasion (circled in green) recorded whereby there is a significant increase in pedestrian crossing activity that coincides with when the docking station is only half full.

9

PEDESTRIAN QUEUING

9 PEDESTRIAN QUEUING

9.1 SURVEY METHODOLOGY

9.1.1. The queues associated with the Natural History Museum and Science Museums were recorded in order to ascertain how often the queues build up and how much space they occupy. The details of the survey are set out below.

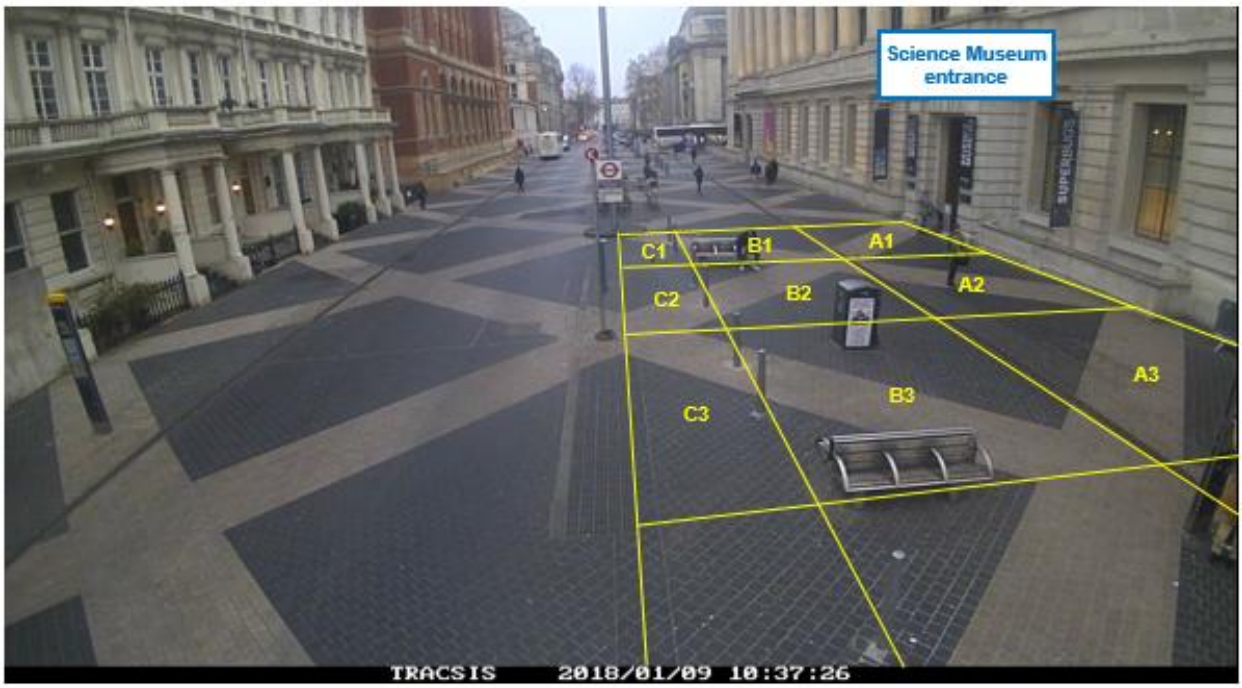
Table 25 – Pedestrian Queues Survey Outline

Survey	Date	Time Period	Area	Reporting
Pedestrian Queues	Tuesday (9th January 2018)	9am – 6pm	Exhibition Road - Natural History Museum and Science Museum Entrances (see Figure below)	▪ Reporting on the length and area of the queues over time. ▪ Where / when the queue starts and ends.
	Saturday (13th January 2018)	9am – 6pm		

9.1.2. Recording of queues started 1 hour before the museums open. The museums open at 10am and close at 6pm. A virtual grid was placed over the footway area and a snapshot of pedestrians occupying the grid was taken every 5 minutes. Cell length was set at 6m and the total grid length was 102m. The cell width varied from 2m-5m.

9.1.3. An example of the pedestrian queuing grid can be seen in the figure below.

Figure 25 - Pedestrian Queuing Grid



9.2 RESULTS: NATURAL HISTORY MUSEUM

9.2.1. The graphs below show the pedestrian queuing outside the Natural History Museum during a weekend and a weekday. It should be noted that the length of queues are considered to be longer during the summer months compared to winter months. The graphs illustrate the total number of pedestrians queuing and the length of the queue.

Figure 26 - Pedestrians Queuing at the Natural History Museum on a Weekday

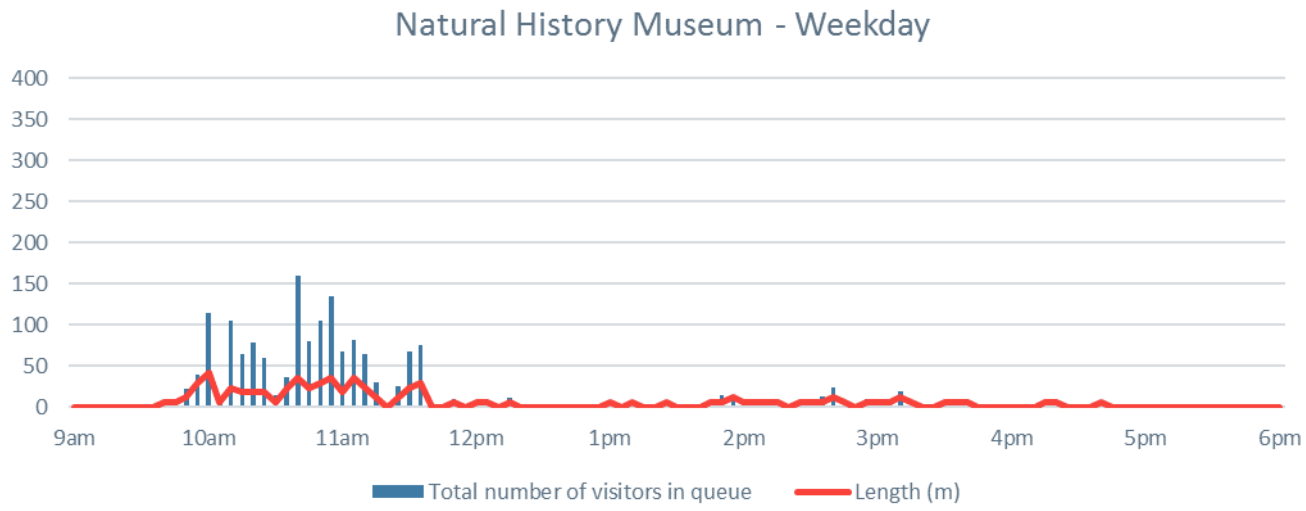
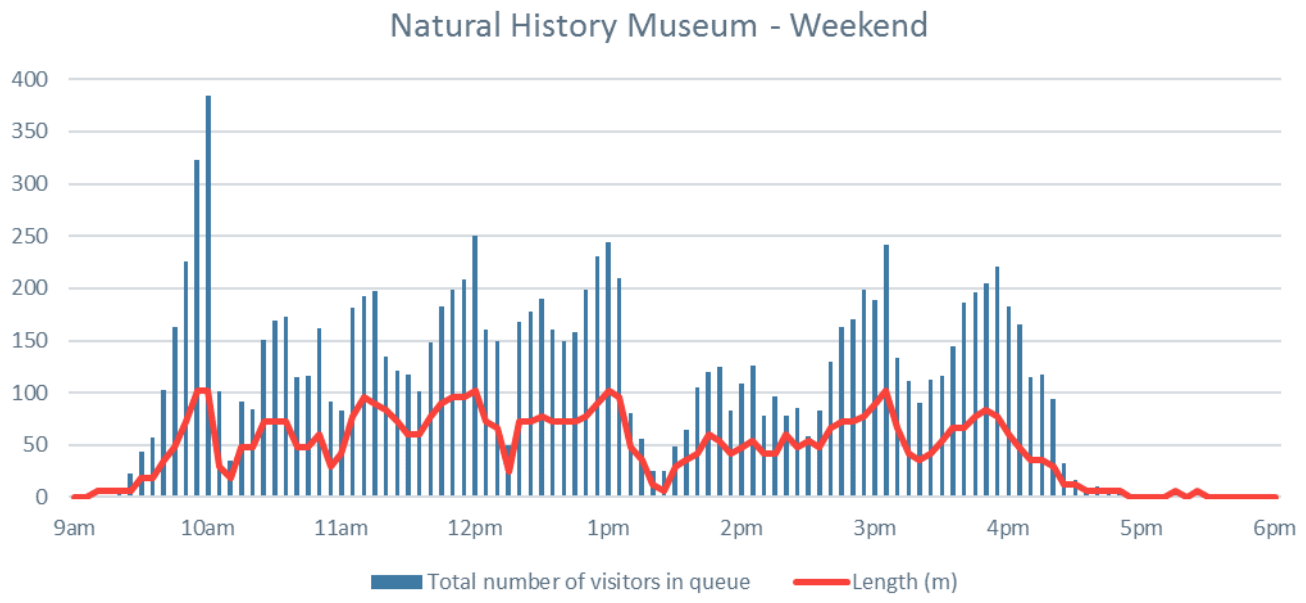


Figure 27 - Pedestrians Queuing at the Natural History Museum on a Weekend



9.2.2. The graphs above confirm:

- The length of queue peaks (approx. 42m / 115 visitors) at 10am on a weekday and 10am on a weekend (approx. 100m / 390 visitors).
- With the exception of when the museum first opens, the width of the queue does not exceed 5m.
- Queues at the Science Museum were also surveyed and showed much lower length of queues.

Conclusion: Periods of longer pedestrian queuing is more frequent on a weekend than a weekday. The width of the queue does not typically exceed 5m and does not appear to obstruct pedestrian flow travelling northbound / southbound or interfere with crossing desire lines.

10

GAPS IN TRAFFIC

10 GAPS IN TRAFFIC

10.1 SURVEY METHODOLOGY

10.1.1. The survey included a record of identifying gaps in traffic to get an appreciation of the opportunities that exists to 'easily' cross. The number of pedestrians crossing in these gaps was not recorded. The gaps in traffic were split into the following categories:

- No gaps (< 1 seconds – two or more cars travelled through together at less than 1 seconds apart)
- Gaps < 6 seconds
- Gaps > 6 seconds

10.1.2. This information was collected to understand the opportunities that exists for pedestrians to cross the road. Less than 6 second gaps, indicate a more difficult environment for pedestrians to safely cross the road. These opportunities to cross are particularly important for a road such as Exhibition Road, given the lack of dedicated crossing facilities that would be present on a more traditional street with such high footfall (e.g. Kensington High Street).

10.1.3. The categorisation of gaps has been informed by LTN 1/95 that states:

'An acceptable gap in which to cross, from kerb to kerb (or refuge), varies from person to person. The majority of pedestrians will accept a gap of 4-6 seconds at normal urban vehicle speeds to cross two lanes of traffic and even shorter gaps at slow vehicle approach speeds.'

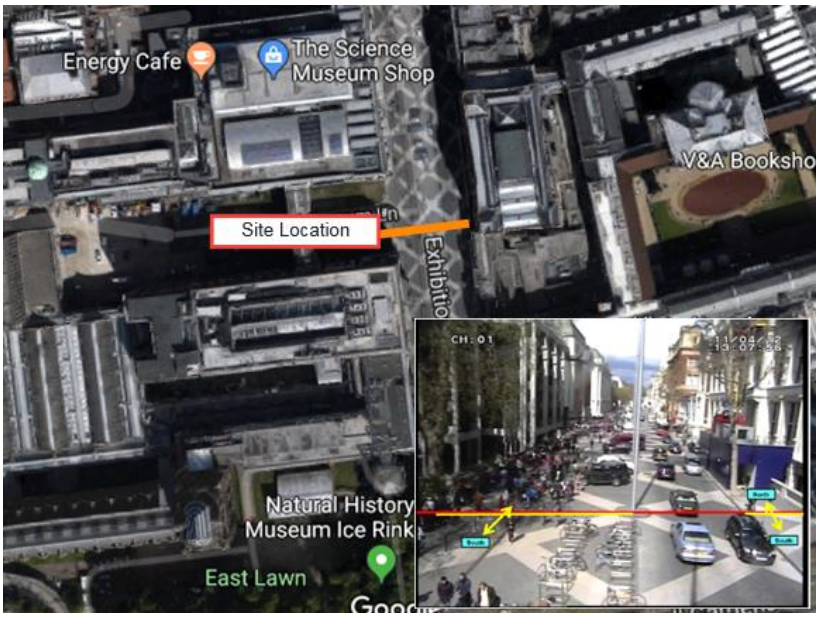
10.1.4. The survey dates and screenline used is detailed in the table and figure below.

Table 26 - Traffic Flow & Speed Screenline Count Survey Outline

Survey	Date	Time Period	Area	Reporting
2018 Traffic Radar	Tuesday 9th January 2018	24 hr period	Exhibition Road Screenline Location (See Figure below)	▪ Data on gaps between traffic in seconds.
	Saturday 13th January 2018	24 hr period		

10.1.7. The exact location of the screen line can be viewed in the figure overleaf.

Figure 28 – Traffic Flow & Speed Screenline Count Survey Location



10.2 RESULTS: GAPS IN TRAFFIC

10.2.1. The graphs below illustrate the gaps in traffic recorded on a typical weekday and typical weekend, including the 'average gap' for those greater than six seconds. The higher the number of gaps greater than six seconds, the more opportunities there are to cross Exhibition Road. The average gaps in traffic is also illustrated to help provide some context as to what the survey results tell us. For example, at 11pm the number of gaps greater than six seconds is very low however this does not mean there are fewer opportunities to cross, as highlighted by the fact the average gap in traffic significantly increases. It should be noted that "no gap" suggests a convoy of traffic (i.e where gaps are too short for pedestrians to cross).

Figure 29 - Number of Gaps Compared to Average gap over 6 seconds, Weekday

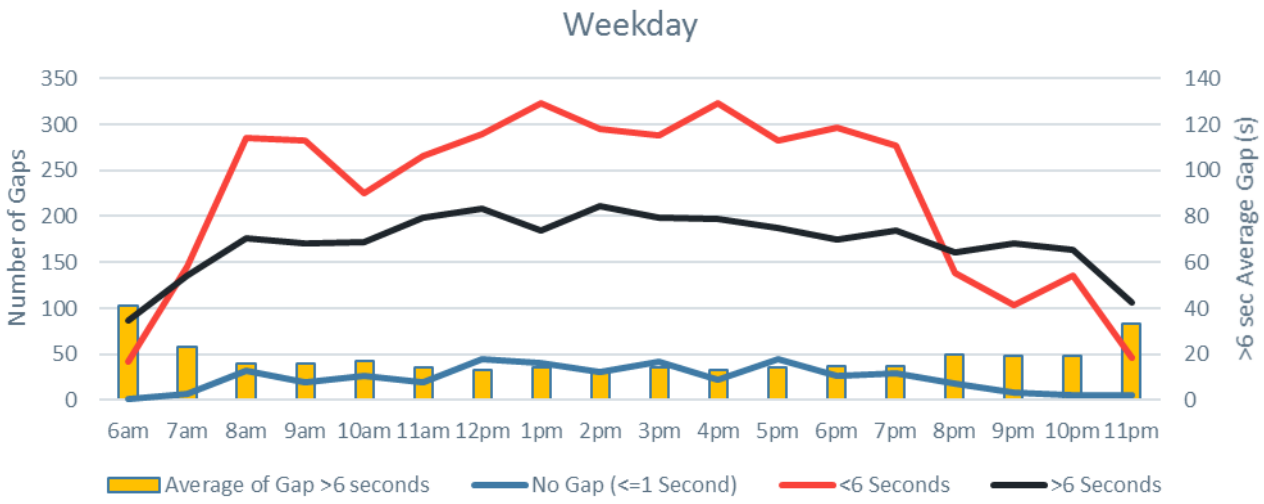
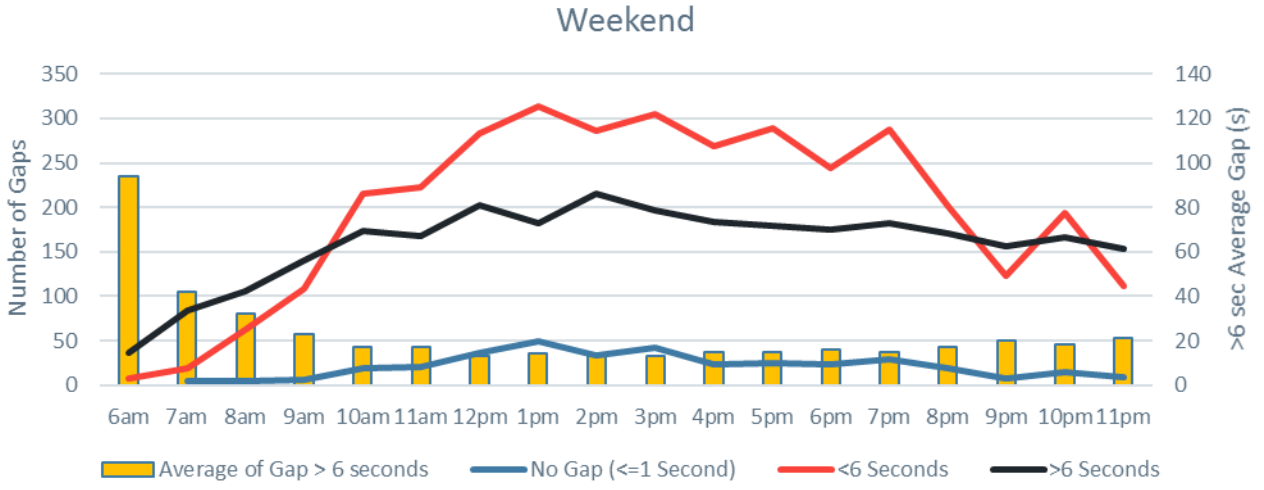


Figure 30 - Number of Gaps Compared to Average gap over 6 seconds, Weekend



10.2.2. The graphs above confirm:

- There are approximately 170 gaps greater than 6 seconds on a typical weekday within each hour period (an average of at least 3 gaps every minute) compared to 160 gaps on a weekend.
- An average of 38% of all gaps are greater than 6 seconds between 10am – 7pm on a weekday which increases to 52% outside of these hours.
- An average of 38% of all gaps are greater than 6 seconds between 10am – 7pm on a weekend which increases to 60% outside of these hours.

Conclusion: The high number of gaps greater than six seconds on both a weekday and weekend indicates there are plenty of opportunities for pedestrians to cross Exhibition Road.

10.2.3. The graphs below shows the average gap in traffic compared to the number of pedestrians crossing within Zone B1 (opposite Museum Lane) where the radar was located.

Figure 31 - Number Pedestrians Crossed Compared to Gaps > 6 Seconds, Weekday

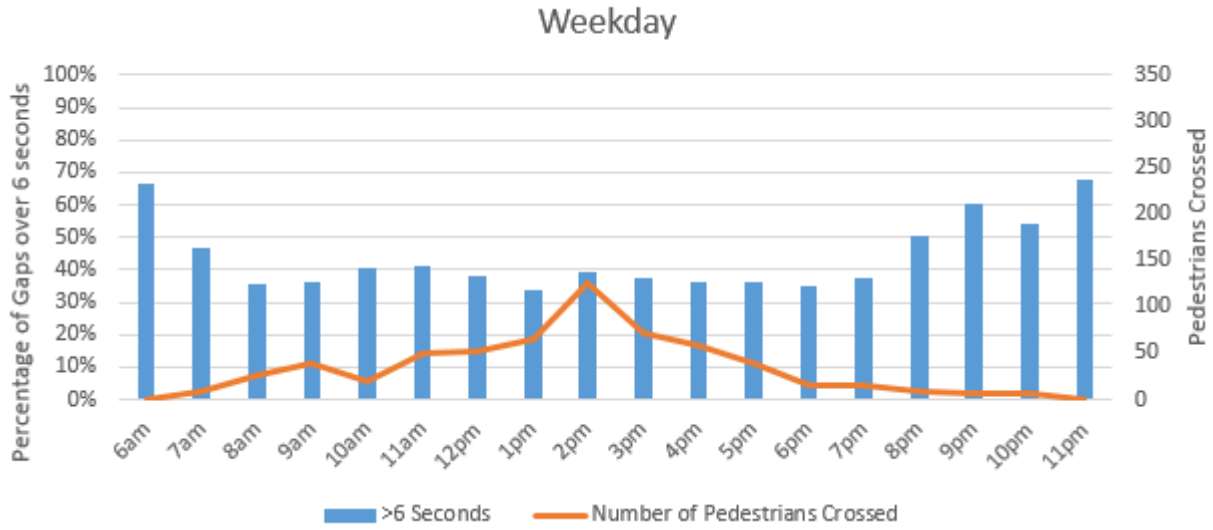
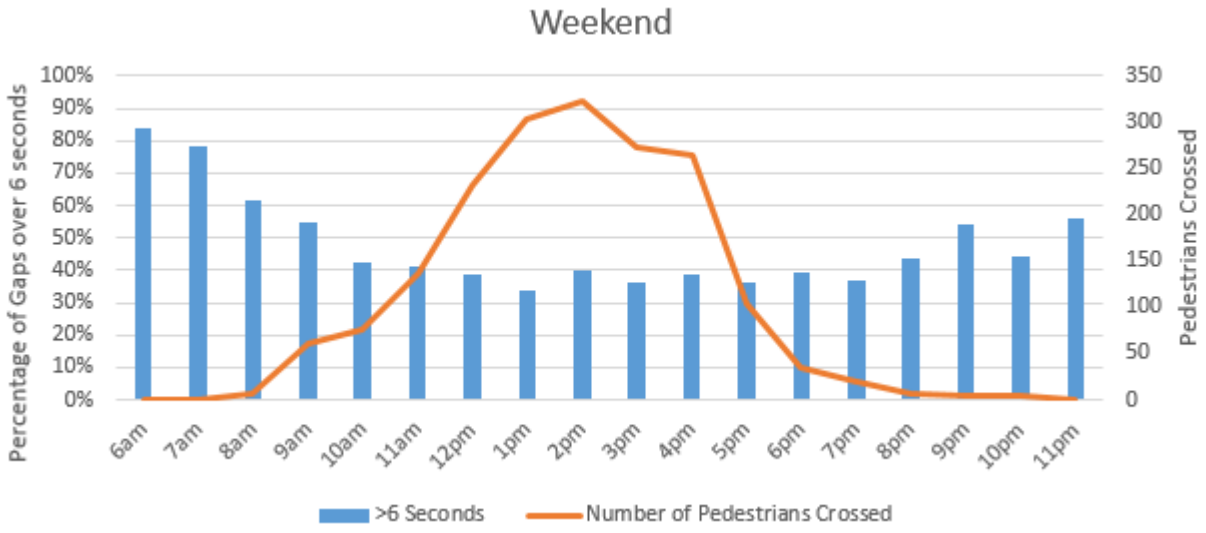


Figure 32 - Number Pedestrians Crossed Compared to Gaps > 6 Seconds, Weekend



Conclusion: The survey data does not indicate any strong correlation between the number of pedestrians crossing and percentage of gaps that are greater than six seconds. Ultimately, if pedestrians want to cross Exhibition Road, they are considered likely to wait until a gap of greater than 6 seconds presents itself.

11

PEDESTRIANS STOPPING

11 PEDESTRIANS STOPPING

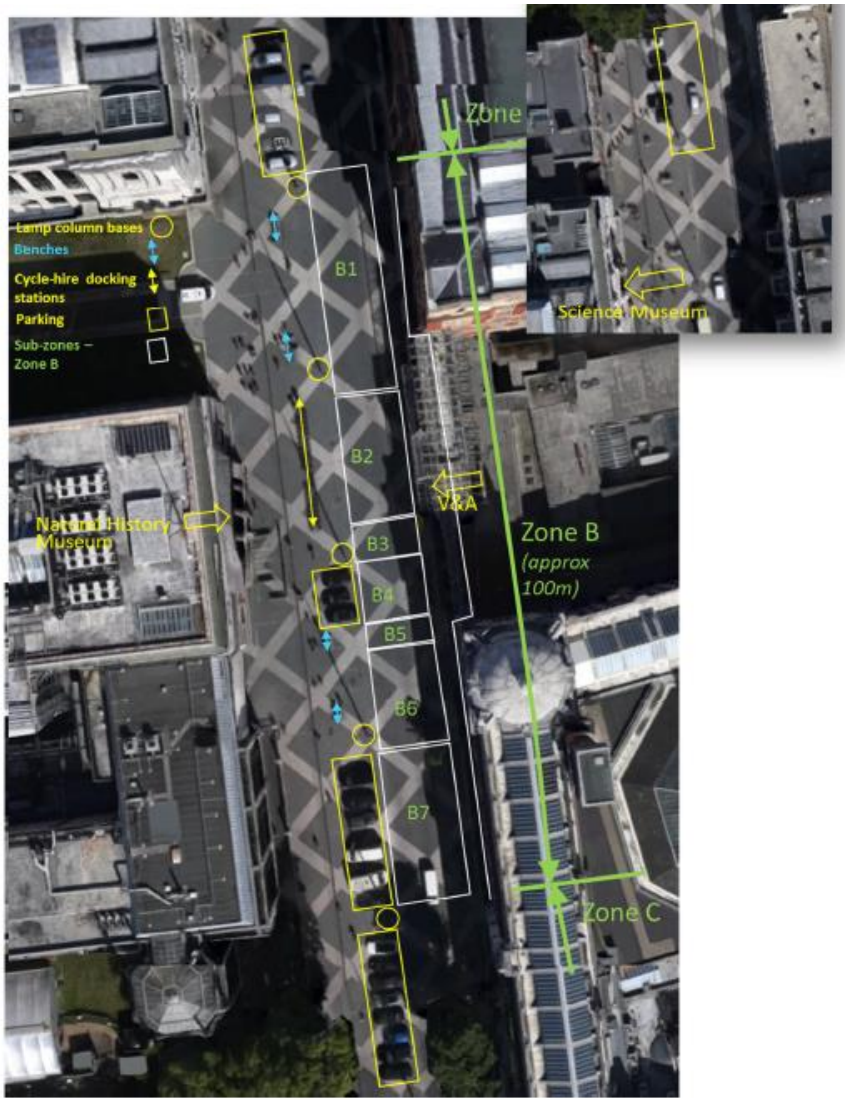
11.1 SURVEY METHODOLOGY

11.1.1. This chapter illustrates the number of pedestrians who stopped / did not stop before crossing the road on a weekday and weekend in zone B opposite the museums. The survey methodology is set out in the table below with the survey location on the figure below.

Table 27 - Survey Methodology for Pedestrian Crossing Movements

Survey	Date	Time Period	Conditions	Incidents / Site Observations
Pedestrian Crossing Movements	Tuesday (9th January 2018)	6am - midnight	Overcast with light drizzle	None
	Saturday (13th January 2018)	6am - midnight	Dry	

Figure 33 - Pedestrian Crossing Location



11.2 RESULTS: PEDESTRIAN STOPPING

11.2.1. When reviewing, it is important to note the following:

- The recording of data on pedestrians stopping/not stopping is to a degree, subjective;
  - a Pedestrians not stopping to look before crossing does not necessarily mean they will not have looked before crossing – they may have seen there is no traffic in either direction.
  - b Alternatively, it could mean that they have not realised it is a road with traffic.
- Vehicle flows per hour is informed by the traffic radar screenline opposite Museum Lane and is illustrated to enable trends to be identified e.g. are pedestrians more likely to stop before looking when vehicle flows are highest?
- Vehicle flows are typically lower at the weekend than the weekday.

11.2.2. The figures below detail the number of pedestrians who stopped / did not stop in Zone B, between the Natural History Museum and V&A Courtyard. A more detailed breakdown of crossing behaviour between each sub zone is included within Appendix B.

Figure 34 - Pedestrians Stopped and Number of Vehicles per Hour, Weekday

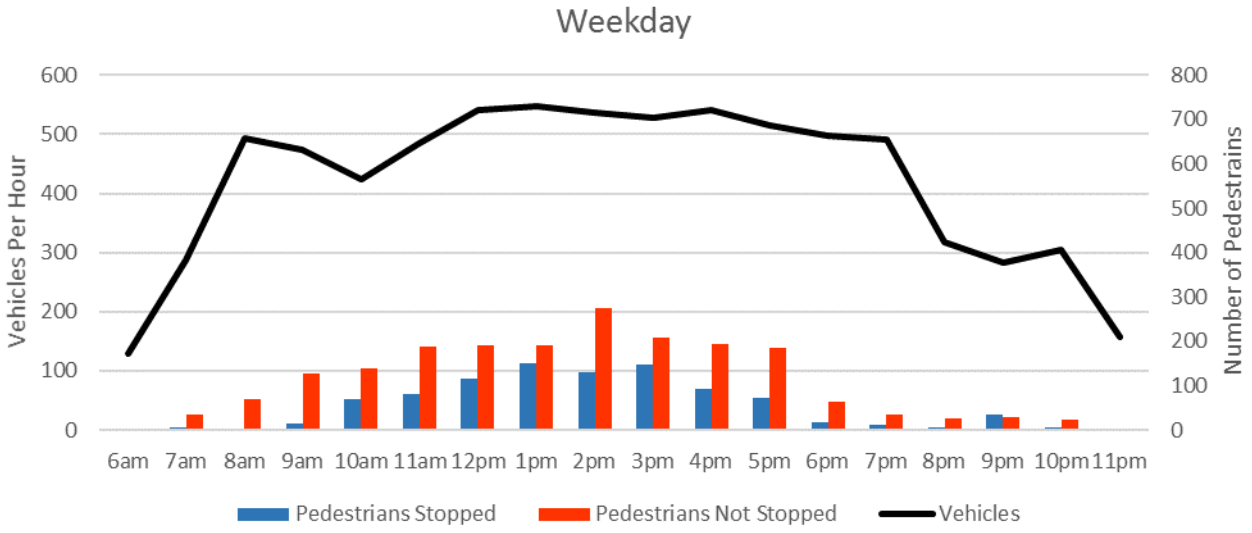
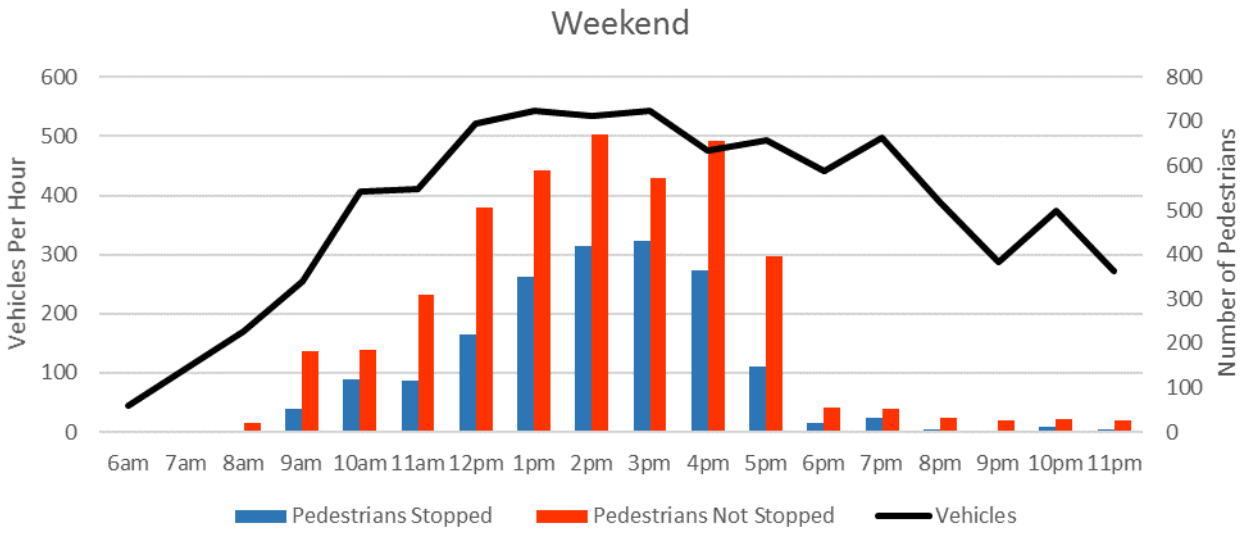


Figure 35 - Pedestrians Stopped and Number of Vehicles per Hour, Weekend



11.2.3. In summary:

- Zone B4 is the area adjacent to the Natural History Museum which comprises three parking bays. The number of pedestrians stopping before crossing is significantly higher than that observed for other parts of the study area.
- The majority of pedestrians (66%) do not stop before they cross the road.
- The majority of pedestrians are travelling eastbound (71%) on a weekend and a weekday (74%).

Conclusion: In general, the survey results indicate pedestrians are more likely to stop before crossing when vehicle flows are highest.

11.2.4. The figure overleaf summarises the above survey results in a format that enables a comparison to be made between each of the sub zones on one page.

Figure 36 - Pedestrians who have stopped and Not Stopped Before Crossing

Imperial College Road ⟷ Cromwell Road

08:00-09:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	7%	0%	0%	13%	0%	0%	0%
Not Stopped	93%	100%	100%	88%	100%	100%	100%
Total Pedestrians	27	7	2	8	1	5	22

12:00-13:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	28%	45%	36%	17%	45%	48%	23%
Not Stopped	72%	55%	64%	83%	55%	52%	77%
Total Pedestrians	53	133	22	24	11	33	31

17:00-18:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	45%	40%	43%	37%	45%	2%	10%
Not Stopped	55%	60%	57%	63%	55%	98%	90%
Total Pedestrians	40	65	21	19	11	52	49

21:00-22:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	17%	67%	33%	100%	50%	59%	43%
Not Stopped	83%	33%	67%	0%	50%	41%	57%
Total Pedestrians	6	27	6	1	2	17	7

Weekend

Imperial College Road ⟷ Cromwell Road

08:00-09:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	0%	0%	0%	0%	0%	38%	0%
Not Stopped	100%	100%	100%	0%	0%	63%	100%
Total Pedestrians	6	1	1	0	0	8	6

12:00-13:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	36%	23%	25%	37%	51%	21%	30%
Not Stopped	64%	77%	75%	63%	49%	79%	70%
Total Pedestrians	231	114	116	63	37	115	50

17:00-18:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	38%	35%	26%	23%	36%	14%	25%
Not Stopped	62%	65%	74%	77%	64%	86%	75%
Total Pedestrians	105	79	73	75	28	112	72

21:00-22:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stopped	0%	15%	67%	0%	0%	0%	0%
Not Stopped	100%	85%	33%	0%	0%	100%	100%
Total Pedestrians	5	13	3	0	0	2	7

11.2.5. The following two figures illustrate the percentage of people who did not stop / stop before crossing in addition to the number of vehicles travelling through the study the area.

Figure 37 - Pedestrians who stopped compared to number of vehicles, Weekday

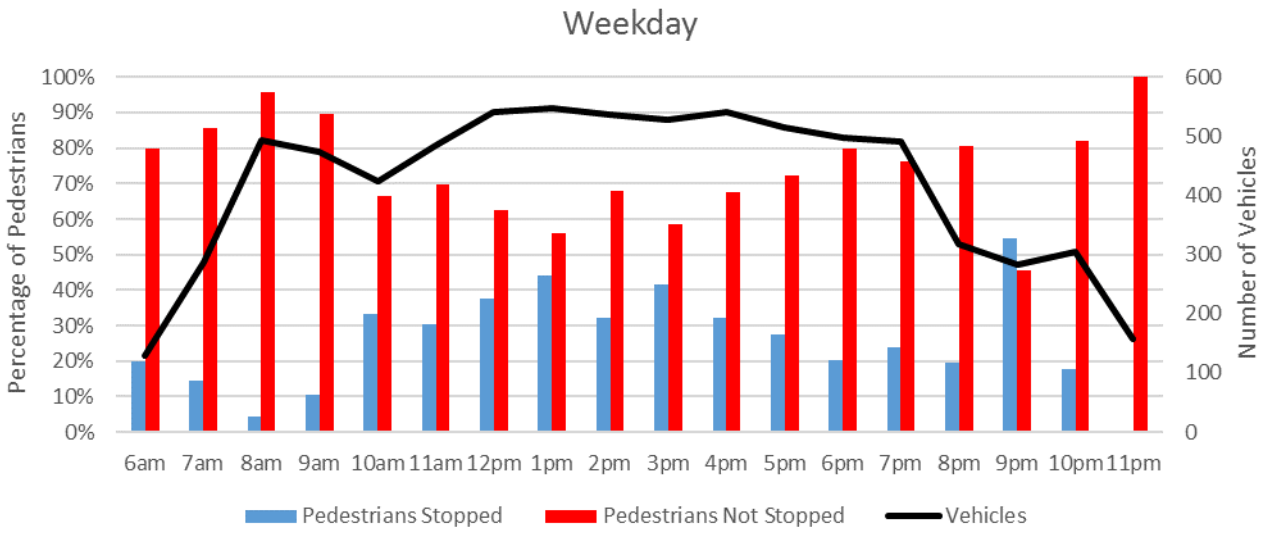
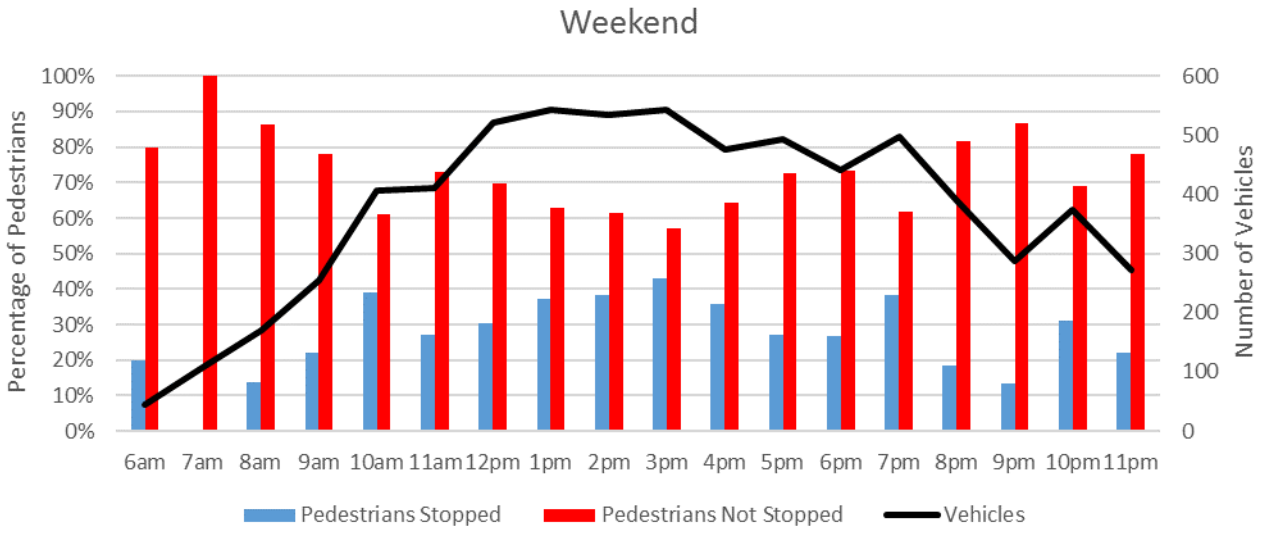


Figure 38 - Pedestrians who stopped compared to number of vehicles, Weekend



Conclusion: Overall the percentage of pedestrians who stop before crossing is similar on a weekday (26%) and weekend (27%), despite higher vehicle flows recorded on a weekday. The percentage of pedestrians stopping before crossing is however generally higher when flows are higher (between 12pm – 7pm).

11.2.6. The figures below illustrates the percentage of people who did not stop / stop before crossing in addition to typical speed of vehicles.

Figure 39 - Pedestrians who stopped compared to speed of vehicles, Weekday

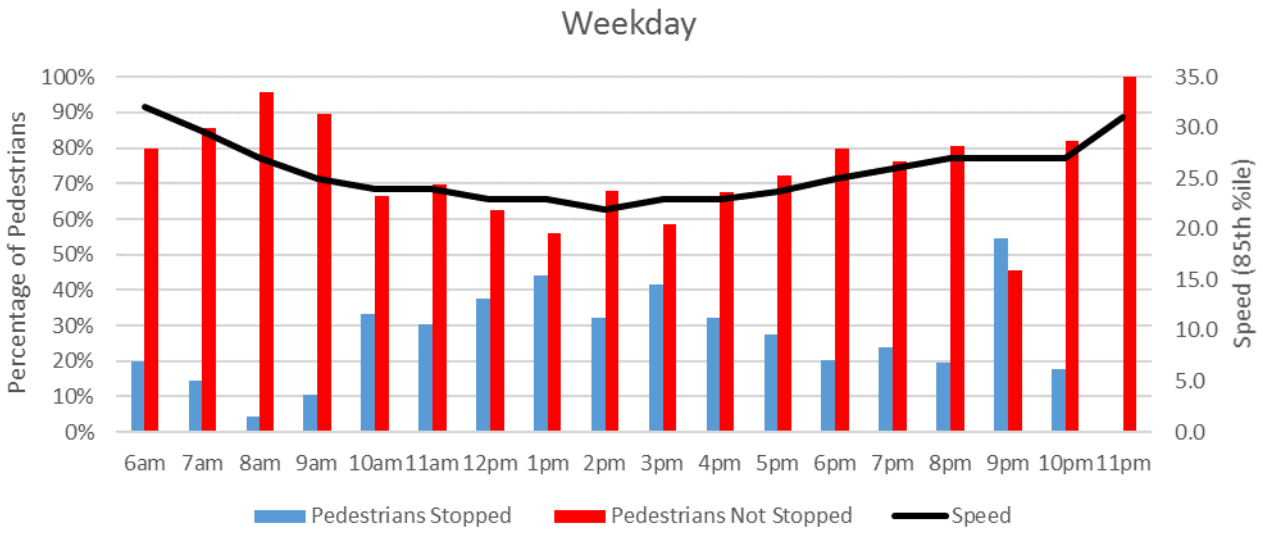
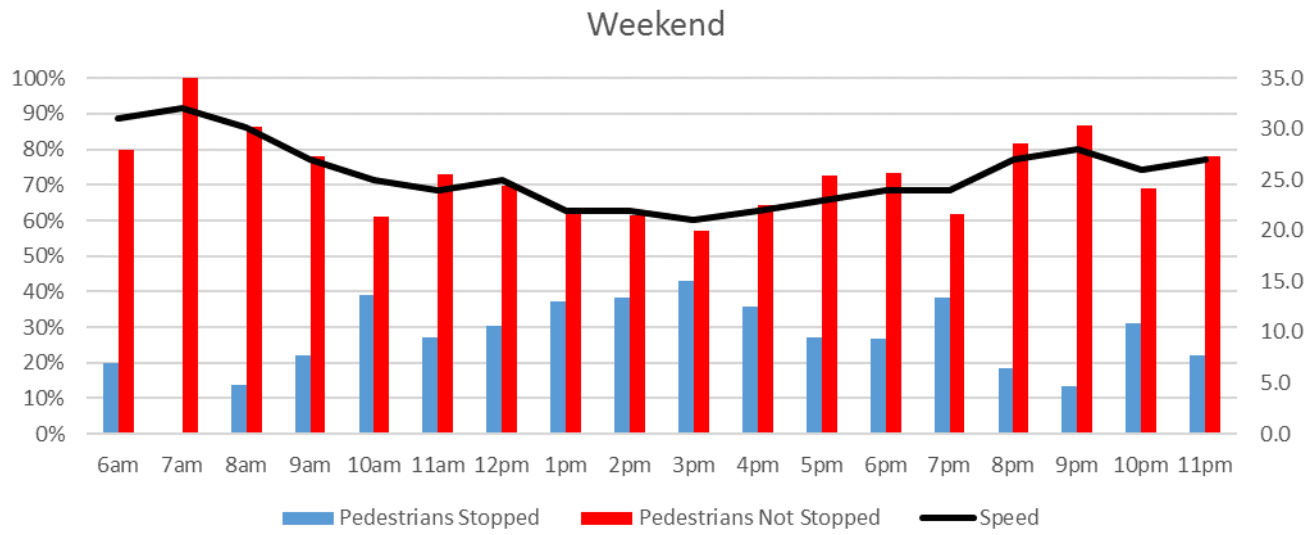


Figure 40 - Pedestrians who stopped compared to speed of vehicles, Weekend



Conclusion: The speed of vehicles recorded on a weekday is similar to that recorded on a weekend and as discussed above, the percentage of pedestrians who stop before crossing on a weekday is consistent with that recorded on a weekend. In summary, the volume of traffic rather than the speed is considered to be a greater factor in whether pedestrians stop before crossing.

12

PEDESTRIANS CROSSING THROUGH TRAFFIC

12 PEDESTRIANS CROSSING THROUGH TRAFFIC

12.1 SURVEY METHODOLOGY

12.1.1. The table below shows the survey data used to inform the assessment to understand whether pedestrians were crossing though stationary traffic, moving traffic (i.e. between gaps in traffic <40m) or no traffic (i.e. gaps in traffic >40m). This provides an indication about the pedestrian crossing environment. For example, if a pedestrian is crossing through 'moving traffic' this means there is a vehicle approaching them, and is considered a less comfortable environment to cross compared to crossing where there is no traffic.

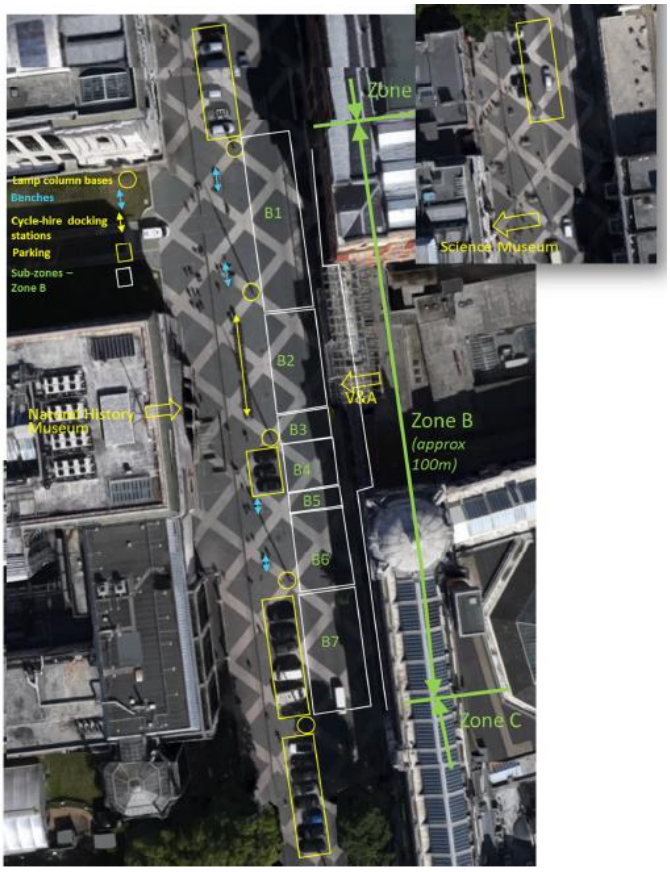
12.1.2. These terms are fairly self-explanatory however moving or stationary traffic can be in one direction or both directions. The gaps in traffic, discussed in Chapter 10 that looks at opportunities that exists to cross the road. This chapter looks at how far away traffic is when pedestrians are actually crossing the road.

Table 28 - Survey Methodology for Pedestrian Crossing Movements

Survey	Date	Time Period	Conditions	Incidents / Site Observations
Pedestrian Crossing Movements	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight	Dry	

12.1.3. The study area illustrated below has been split into seven sub zones.

Figure 41 - Traffic While Pedestrians Cross Survey Location

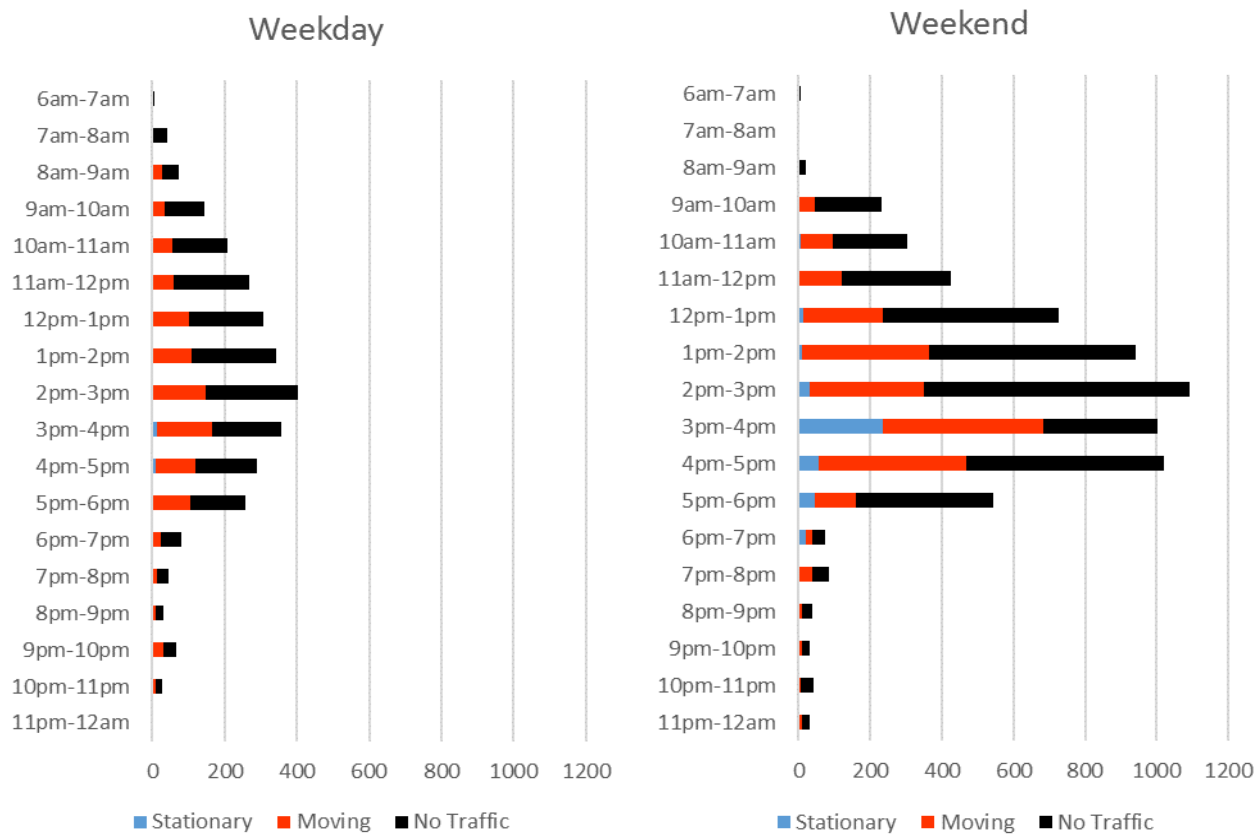


12.2 RESULTS: PEDESTRIANS CROSSING THROUGH TRAFFIC

12.2.1. The graphs below shows whether pedestrians crossed through moving traffic / stationary traffic or no traffic across all seven sub-zones combined. Separate graphs are used for weekdays and weekends albeit the scale is constant to enable a better understanding of the difference in pedestrian activity on a weekday compared to a weekend.

12.2.2. A more detailed breakdown of the survey results for each sub zone (as illustrated in the figure above) is included in Appendix B.

Figure 42 and Figure 43 - Traffic Whilst Pedestrians Crossed the road



12.2.3. It should be noted that vehicle flows are typically greater on a weekday, compared to a weekend. Overall, the following results were observed:

- Pedestrians were more likely to cross through 'no traffic' (62%). The other crossing movements recorded were through 'moving traffic' (33%) and 'stationary traffic' (5%).
- Zones B3 and 4 have the highest proportion of pedestrians crossing through moving traffic (44% and 42% respectively) that is therefore considered a less friendly crossing environment.
- Total number of pedestrians who crossed in moving traffic during the weekday was 979, compared to the weekend which saw 2,206 people cross the road through moving traffic.
- Pedestrians were observed crossing through stationary traffic on a more frequent basis in Zones B6 and B7 than at other zones, linked to the zones close proximity with the traffic signals at Exhibition Road / Cromwell Road junction.
- The majority of pedestrians are travelling eastbound (71%) on a weekend and a weekday (74%).

Conclusion: The majority of pedestrians were recorded crossing when there is no traffic.

12.2.4. To help understand the different crossing behaviour across all seven zones, the figure below summarises the above data on a single page.

Figure 44 - Traffic while pedestrians cross

Weekday

Imperial College Road ← → Cromwell Road

08:00-09:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	0%	0%	0%	0%	0%	0%	0%
Moving	48%	29%	50%	50%	0%	20%	27%
No Traffic	52%	71%	50%	50%	100%	80%	73%
Total Pedestrians	27	7	2	8	1	5	22

12:00-13:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	0%	1%	0%	4%	0%	6%	0%
Moving	28%	32%	41%	21%	18%	52%	26%
No Traffic	72%	68%	59%	75%	82%	42%	74%
Total Pedestrians	53	133	22	24	11	33	31

17:00-18:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	0%	0%	0%	0%	0%	0%	0%
Moving	0%	95%	24%	21%	18%	48%	14%
No Traffic	100%	5%	76%	79%	82%	52%	86%
Total Pedestrians	40	65	21	19	11	52	49

21:00-22:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	0%	0%	0%	0%	0%	0%	0%
Moving	0%	81%	33%	100%	0%	24%	14%
No Traffic	100%	19%	67%	0%	100%	76%	86%
Total Pedestrians	6	27	6	1	2	17	7

Weekend

Imperial College Road ← → Cromwell Road

08:00-09:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	0%	0%	0%	0%	0%	0%	0%
Moving	17%	0%	0%	0%	0%	0%	0%
No Traffic	83%	100%	100%	0%	0%	100%	100%
Total Pedestrians	6	1	1	0	0	8	6

12:00-13:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	1%	0%	0%	0%	0%	7%	4%
Moving	21%	17%	65%	86%	32%	10%	10%
No Traffic	78%	83%	35%	14%	68%	83%	86%
Total Pedestrians	231	114	116	63	37	115	50

17:00-18:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	8%	3%	5%	11%	7%	15%	7%
Moving	20%	19%	62%	9%	39%	3%	15%
No Traffic	72%	78%	33%	80%	54%	82%	78%
Total Pedestrians	105	79	73	75	28	112	72

21:00-22:00

	Zone B1	Zone B2	Zone B3	Zone B4	Zone B5	Zone B6	Zone B7
Stationary	0%	0%	0%	0%	0%	0%	0%
Moving	0%	23%	67%	0%	0%	50%	57%
No Traffic	100%	77%	33%	0%	0%	50%	43%
Total Pedestrians	5	13	3	0	0	2	7

13

PEDESTRIAN CONFLICT

13 PEDESTRIAN CONFLICT

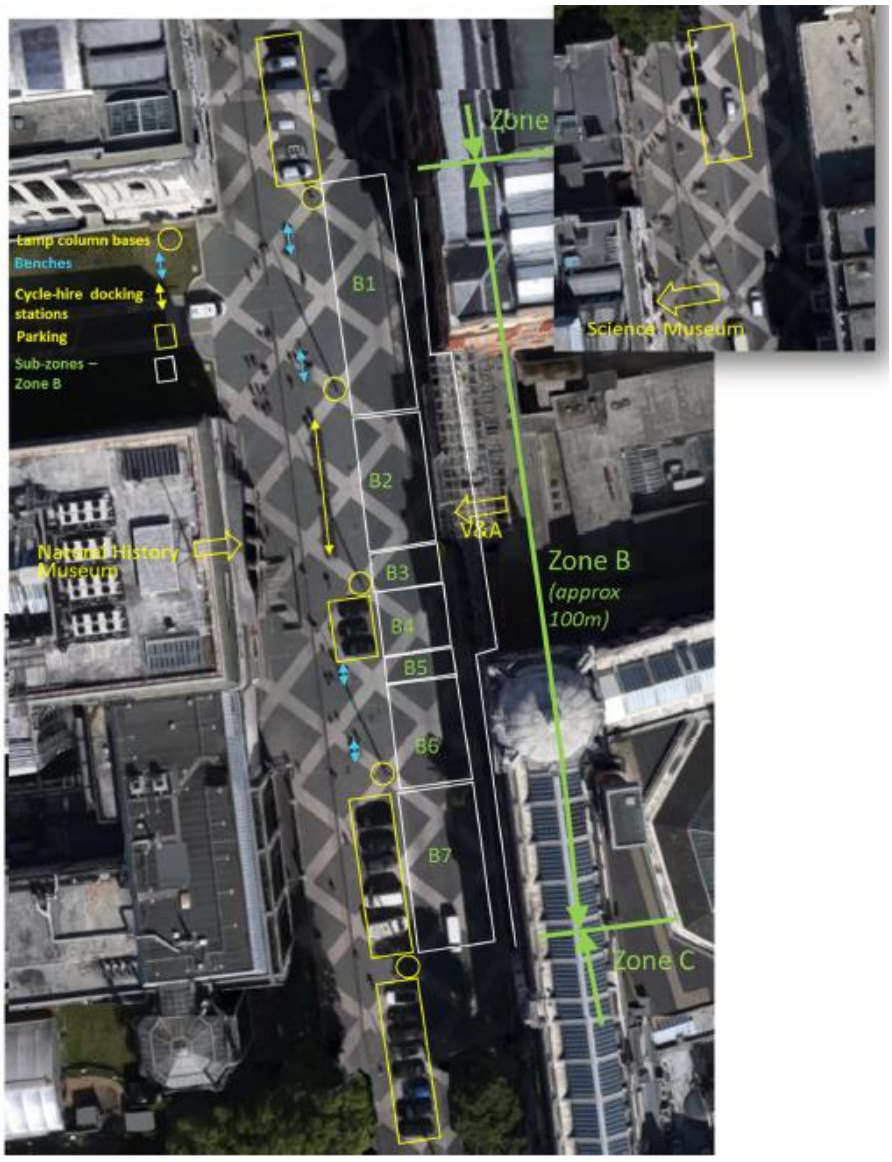
13.1 SURVEY METHODOLOGY

13.1.1. The table below sets out the survey data used to record whether there were any pedestrian conflict with vehicles when crossing. The subsequent figure illustrates the survey location and how the data has been split into a number of sub zones based on their characteristics (e.g. presence of on-street parking).

Table 29 - Survey Methodology for Pedestrian Crossing Movements

Survey	Date	Time Period	Conditions	Incidents / Site Observations
Pedestrian Crossing Movements	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight	Dry	

Figure 45 – Pedestrian Conflict Survey Location



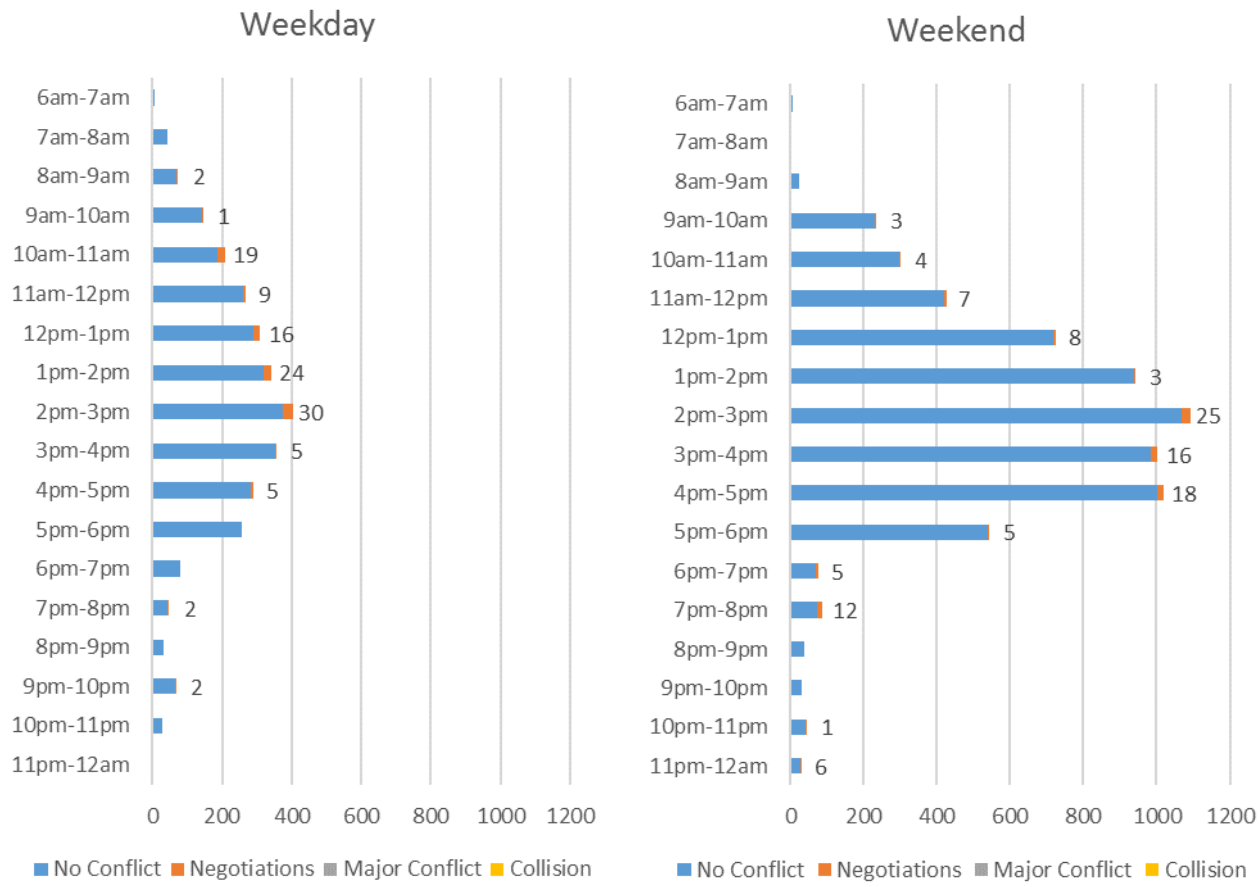
13.1.2. As detailed above, the survey recorded whether there was any pedestrian conflicts with vehicles when crossing. This came in four categories: no conflict, negotiations, major conflict and a collision. The latter three were defined as follows:

- **Negotiations:** In response to an unexpected action, a vehicle or pedestrian has to brake/stop or change direction to avoid a collision, but movement is **generally calm and controlled**.
- **Major conflict:** In response to an unexpected action, a vehicle or pedestrian has to take emergency action in what is considered to be a near miss.
- **Collision:** Actual physical contact, could be slight or severe

13.1.3. It is important to note that 'negotiations' as set out above are to be expected on a street such as Exhibition Road, where the street design aims to empower pedestrians giving them greater autonomy when crossing the road, whilst at the same time maintaining an important vehicular through fare. As described above, these movements are generally calm and controlled and involves either the driver of pedestrian making a compromise in their movement (i.e. a driver reducing their speed to allow a pedestrian to complete their crossing movement or a pedestrian taking a step back to allow a driver to continue their journey).

13.1.4. The following graphs summarise the number of pedestrian conflicts recorded for the study area (as illustrated above). A more detailed breakdown of pedestrian conflicts recorded for each sub zone is included within Appendix B.

Figure 46 and Figure 47 - Pedestrian conflict with traffic while crossing



13.1.5. The table overleaf confirms the number of pedestrian conflicts / negotiations recorded within each sub zone (as illustrated in figure 45).

Table 30 – Summary of pedestrian conflicts by each sub zone

Conflict		No Conflict	Negotiations	Major Conflict	Collision
Zone B1	Weekday	569	12	0	0
	Weekend	1830	19	0	0
Zone B2	Weekday	911	45	0	0
	Weekend	1265	17	0	0
Zone B3	Weekday	202	3	0	0
	Weekend	904	19	0	0
Zone B4	Weekday	211	0	0	0
	Weekend	669	8	0	0
Zone B5	Weekday	101	2	0	0
	Weekend	403	11	0	0
Zone B6	Weekday	372	17	0	0
	Weekend	875	21	0	0
Zone B7	Weekday	436	36	0	0
	Weekend	558	18	0	0
Sub Total	**Weekday**	**2,802**	**115 (4.1%)**	**0**	**0**
	Weekend	**6,504**	**113 (1.7%)**	**0**	**0**
Grand Total		**9,306**	**228 (2.5%)**	**0**	**0**

13.1.6. Overall, the following results were observed:

- There were no major conflicts or collisions during the two survey days.
- On average both days have similar number of negotiations - 115 for a weekday and 113 for a weekend even though there are many more pedestrian crossing movements at the weekend compared to a weekday (albeit traffic flows are higher on a weekday).
- The majority of 'negotiations' were recorded for pedestrians traveling eastbound (141) compared to those travelling westbound (87). When considering this result, it is important to note the majority of crossing movements are travelling eastbound (71% on a weekend and 74% on a weekday).
- The highest number of 'negotiations' recorded was between 2pm – 3pm (55).

Conclusion: There was no major conflicts or collisions recorded throughout the surveyed dates, and the percentage of pedestrians involved in a 'negotiation' was higher on a weekday (4.1%) compared to the weekend (1.7%).

14

SUMMARY, CONCLUSIONS & FUTURE CONSIDERATIONS

14 SUMMARY, CONCLUSIONS & FUTURE CONSIDERATIONS

14.1 SUMMARY

14.1.1. A wide variety of survey data has been collected to inform the study, the results of which are summarised below:

Pedestrian Flows

- When comparing 2013 and 2018 pedestrian counts, there is negligible difference across the four times periods (+ 3%).
- A higher overall number of pedestrian were recorded during the 2018 weekend survey day than a typical weekday; 44,637 compared to 32,422 over the 18 hour period (a 38% difference).

Pedestrian Crossing Activity

- ***There is a clear increase in pedestrian crossing movements (+59%) between 2013 and 2018 across all time periods, despite pedestrian flows remaining relatively consistent***.
- A markedly higher overall number of crossing movements were recorded during the 2018 weekend survey day compared with the weekday survey; 13,065 compared to 6,997 over the 18 hour period (a 87% difference).
- The percentage of crossing movements has increased on weekdays between 2013 (13%) to 2018 (20%) by 7%. The January 2018 survey results showed that percentage of crossing movements at the weekend (27%) was also 7% greater than on a weekday (20%).

Pedestrian Junction Crossing Counts

- No significant changes were observed in pedestrian crossing movements between 2013 and 2018 across the 4 weekday time periods assessed on the Cromwell Road / Exhibition Road junction.
- The greater number of overall pedestrian crossing movements at the junction on the weekend survey day (+31%) is consistent with higher overall pedestrian flows (+38%) recorded across the study area during the weekend period.

Traffic Flows

- When comparing 2013 and 2018 vehicle flows, there is a negligible overall change (-1%), varying across the 4 time periods from a reduction of 11% to an increase of 16%.
- ***Vehicle flows are higher (+16%) during a typical weekday when compared to a weekend***.

Traffic Speeds

- ***There is a significant increase in traffic speeds in 2018 compared to those recorded in 2013 (+21%) with the 85th percentile now just over 27mph, compared to 22mph in 2013.***
- ***The 85th percentile is no longer beneath the 20mph speed limit during opening hours of the museum as was the case in 2013***.
- When comparing the 2018 weekday and weekend 85th percentile vehicle speeds there is a negligible difference, with comparative speeds increasing and decreasing across the study period.

Car Parking Occupancy & Movements

- Overall, use of parking bays within the study area is higher over the course of a weekend day compared to a weekday.
- Both a weekend and weekday have a similar number of two-way movements, with more movements during the afternoon on a weekend and more movements during the evening on a weekday.

Cycle Parking

- Use of the cycle docking stations is similar on a weekday and a weekend day, albeit the dock becomes fully occupied slightly earlier in the morning on a weekday compared to a weekend.
- The number of pedestrians recorded crossing at the location where the docking station is positioned increases in line with the general increase in pedestrian flows, even when the docking station is approaching / at capacity (typically from 10am – 4pm).

Pedestrian Queuing

- Longer pedestrian queues are much more frequent on a weekend than a weekday. ***The width of the queue does not typically exceed 5m and does not appear to obstruct pedestrian flow travelling northbound / southbound or interfere with crossing desire lines***.

Gaps in Traffic

- The survey data does not indicate any strong correlation between the number of pedestrians crossing and the number of gaps in traffic. Ultimately, if pedestrians want to cross Exhibition Road, they are considered likely to wait until a gap of greater than 6 seconds presents itself. On average there are three gaps at least 6 seconds long each minute.

Pedestrians Stopping / Not Stopping

- The majority of pedestrians (66%) do not stop before they cross the road.
- In general, the survey results indicate pedestrians are more likely to stop before crossing when vehicle flows are highest.
- Pedestrians are more likely to stop before crossing when forward visibility is reduced due to i.e. parked vehicles.

Pedestrians Crossing through Traffic

- The majority of pedestrians were recorded as crossing when there is no traffic (i.e. gaps in traffic greater than 40m).
- Pedestrians were more likely to cross through moving traffic (33%) than stationary traffic (5%).

Pedestrian Conflict

- No major conflicts or collisions were recorded during the days surveyed.
- The majority of 'negotiations' were recorded on the weekday as opposed to the weekend. This is despite the fact that pedestrian crossing movements is significantly higher on a weekend compared to a weekday. However, vehicle flows are higher on a weekday than a weekend.

14.1.2. The table below summarises the data for the study area immediately adjacent to the new V&A courtyard (Zone B) for four hours during the weekday and weekend. Presenting the data in this simple format helps to identify if there are any relationships between the data. For example, whether pedestrian conflicts are more likely to be recorded when traffic flow and pedestrian activity is high.

Table 31 - Summary Table – Snapshot (Weekday)

	8am – 9am	12pm – 1pm	5pm – 6pm	9pm – 10pm	Max	Average
CHARACTERISTICS						
Pedestrian Flow	1,317	2,641	3,418	981	3,418	2,089
Pedestrians Crossing	72	307	257	66	307	176
Traffic Flow	671	567	649	329	671	554
Traffic Speed	28	27	23	24	28	25
Gaps in Traffic (<1 sec)	32	45	45	9	45	33
Gaps in Traffic (<6 sec)	286	289	282	104	289	240
Cycle / Car Parking Occupancy	25%	55%	74%	10%	82%	41%

CROSSING BEHAVIOUR						
Pedestrians Stopping	3%	35%	32%	53%	58%	30%
Stationary	0%	2%	0%	0%	2%	0%
Moving Traffic	32%	31%	32%	25%	56%	33%
No Traffic	68%	67%	68%	64%	85%	67%
SAFETY						
No Conflict	96%	94%	100%	99%	100%	97%
Negotiation	4%	6%	0%	1%	9%	4%
Major / Collision	0%	0%	0%	0%	0%	0%

Table 32 - Summary Table – Snapshot (Weekend)

	8am – 9am	12pm – 1pm	5pm – 6pm	9pm – 10pm	Max	Average
CHARACTERISTICS						
Pedestrian Flow	464	4,812	4,829	325	4,829	2,608
Pedestrians Crossing	22	726	544	30	726	331
Traffic Flow	213	537	532	326	537	402
Traffic Speed	31	30	25	23	31	27
Gaps in Traffic (<1 sec)	4	36	25	8	36	18
Gaps in Traffic (<6 sec)	62	283	289	123	289	189
Cycle / Car Parking Occupancy	39%	68%	40%	35%	80%	46%
CROSSING BEHAVIOUR						
Pedestrians Stopping	5%	32%	28%	12%	42%	19%
Stationary	0%	2%	8%	0%	8%	2%
Moving Traffic	2%	34%	24%	28%	49%	22%
No Traffic	69%	64%	68%	43%	93%	61%
SAFETY						
No Conflict	71%	98%	99%	71%	100%	85%
Negotiation	0%	2%	1%	0%	19%	2%
Major / Collision	0%	0%	0%	0%	0%	0%

Conclusion: Ultimately, the table shows little correlation between the characteristics of pedestrian / traffic flow, pedestrian behaviour and the number of conflicts / negotiations recorded. The main trend observed is that the probability of a 'negotiation' taking place is greater on a weekday when pedestrian flows / crossing activity are lower but traffic flows are higher. This could be linked to the fact drivers will take more care when travelling through Exhibition Road when there is a noticeable increase in pedestrian activity, compared to when travelling through a quieter and less congested (pedestrian) environment.

14.2 CONCLUSIONS

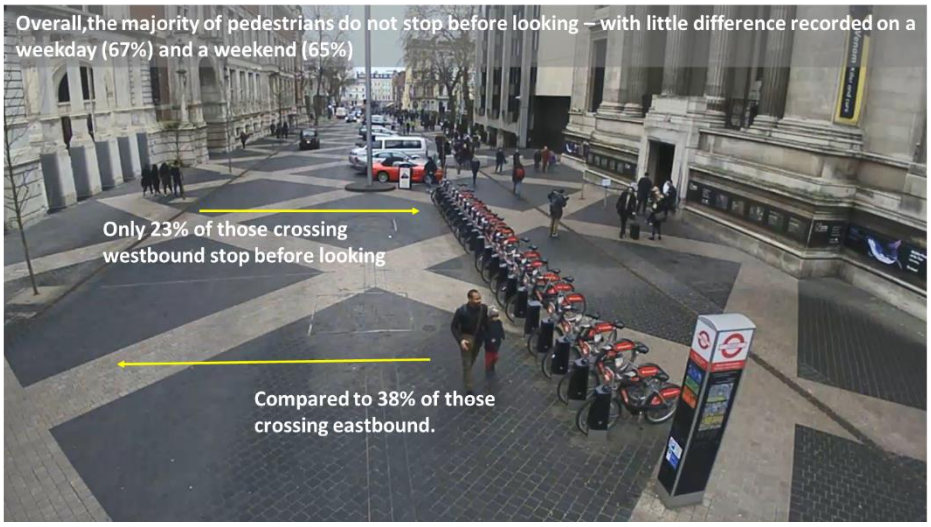
14.2.1. Below we seek to answer the questions set out in the introduction chapter. Some of the survey data collected provides a **strong** indicator about user behaviour, for example, whether it is 'safe' to cross the road based on level of pedestrian conflict recorded. Other results **imply** user behaviour, for example, that it may not be 'easy' to cross the road because there is a relatively high proportion of pedestrians crossing through short gaps in traffic, or that they need to stop before crossing to find a suitable gap.

14.2.2. The questions are set out below, together with key findings and conclusions.

Do pedestrians stop before crossing the road?

The survey results indicated:

- The majority of pedestrians (67%) do not stop before crossing the road.
- Pedestrians travelling westbound are less likely to stop before crossing (23%) than those crossing eastbound (38%). This is not as expected as eastbound pedestrians have longer to look for traffic as they move through the transition zone.

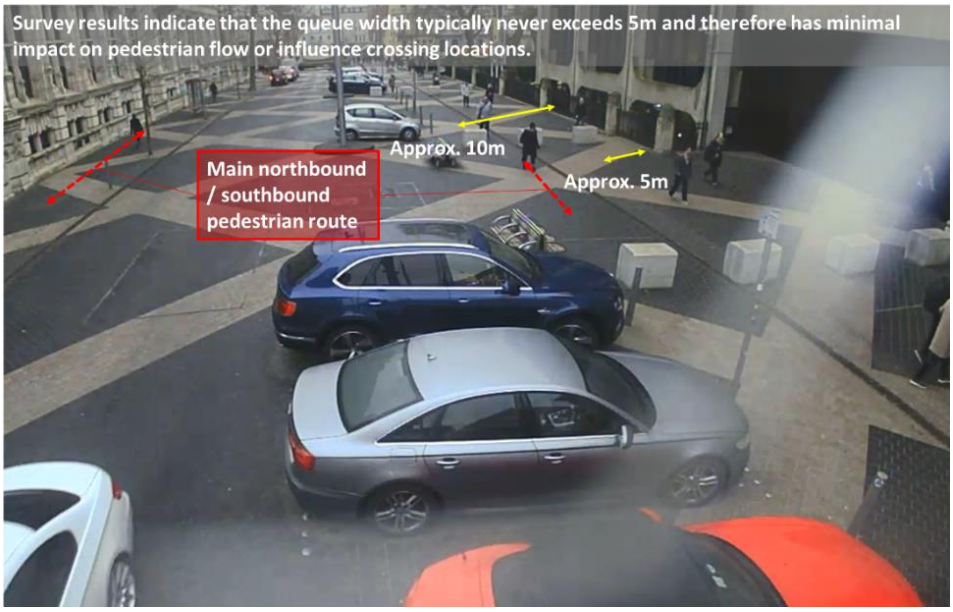


- There is little difference overall as to whether pedestrians stop before crossing on a typical weekday or weekend – 65% of pedestrians did not stop before crossing compared to 67% recorded on a weekday.
- Pedestrians are more inclined to stop before crossing when traffic flow is relatively high.
- **Conclusion:** The results indicate the majority of pedestrians do not stop before crossing the road. Those most likely to stop before crossing are travelling eastbound, from the Natural History Museum and The Science Museum, towards the V&A Museum. This may be linked to reduced forward visibility from the presence of parked cars and other obstacles, with the video footage confirming the space opposite the Natural History Museum and V&A entrance is frequently used by coaches as well as servicing vehicles, meaning pedestrians have to step into the

‘carriageway’ for improved forward visibility.

Does pedestrian queuing impede pedestrian flow and influence crossing locations?
The survey results indicated:

- The length of pedestrians queuing outside the Natural History Museum differs significantly between a weekday (max. 42m) compared to that of a weekend (max. 100m), with pedestrians recorded queuing throughout the opening hours on a weekend (1000hrs – 1800hrs) with little to no queues on a weekday from midday onwards.
- The length of the pedestrian queue outside the Science Museum is significantly lower than that recorded for the Natural History Museum. The queue peaks at approximately 12m on a weekday and 48m on a weekend during opening hours.
- The width of the queue on both days is typically no greater than 5m, with the exception of a 5min period prior to the opening of the Museums whereby queue width reached 13m.
- **Conclusion:** The clear width from the building line on the west side of the road to the inner edge of the transition zone alongside parked vehicles, docking stations etc. is approximately 10m. The fact the queue width is typically never greater than 5m means they do not impede the pedestrian flow travelling northbound / southbound and therefore the queues are not considered to influence the crossing location of pedestrians.



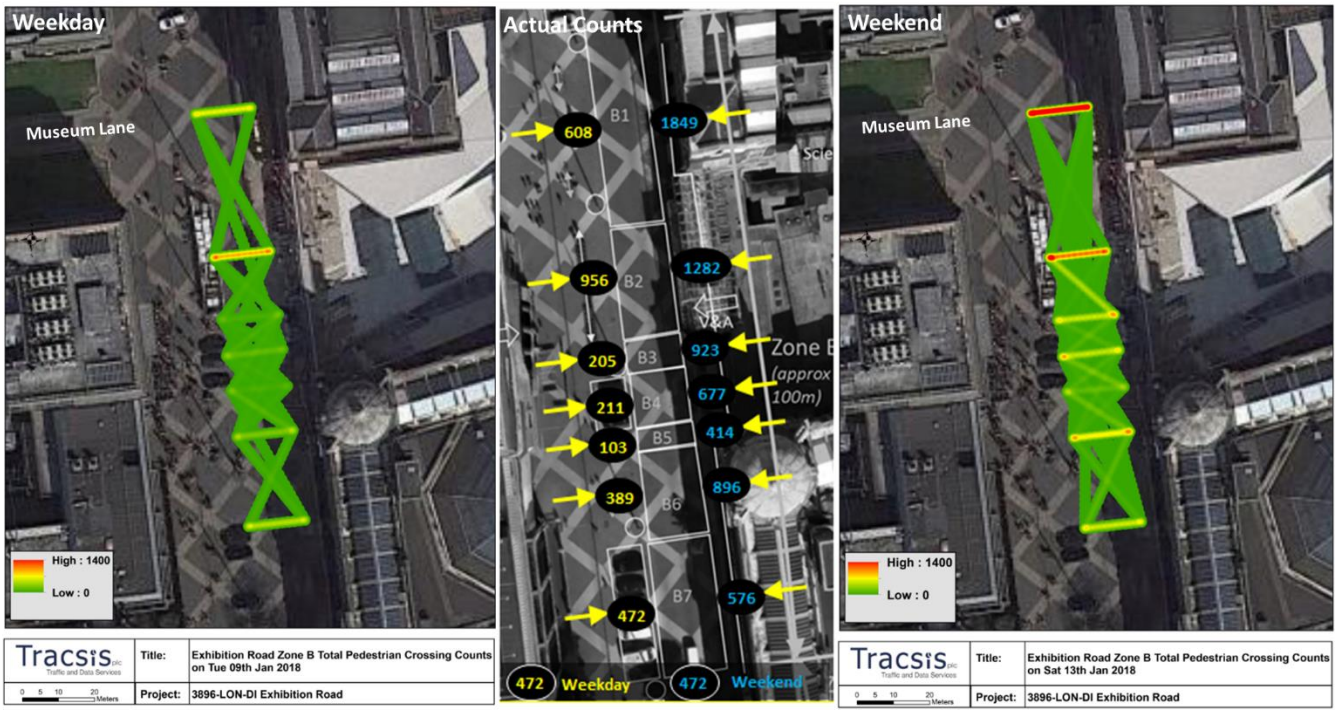
How strong is the desire line across the road to the V&A courtyard entrance? Where are the desire lines and where are pedestrians coming from?

Using the survey data reported in the previous chapters and the heat maps illustrated overleaf help identify desire lines within the study area near to the V&A courtyard. The results highlight:

- The majority of crossing activity takes place within zone B1 that coincides with Museum Lane on a weekend but there is a stronger desire line further south on a weekday (illustrated on the right).
- The difference in crossing activity between a weekend and weekday is far less in the south of the study area (zone B7 – illustrated overleaf) than the difference experienced for other zones, where there is a significant increase in crossing activity on the weekend compared to the weekday.
- The results indicate that the desired crossing zones are predominantly zones B2 to B6, nearest the two main museum entrances. There appears to be less of a desire to cross in zone B7 (to the south),

that is considered to reflect a large number of visitors will be visiting the museums on both the eastern side of Exhibition Road (V&A Museum) and western side (Natural History Museum and the Science Museum).

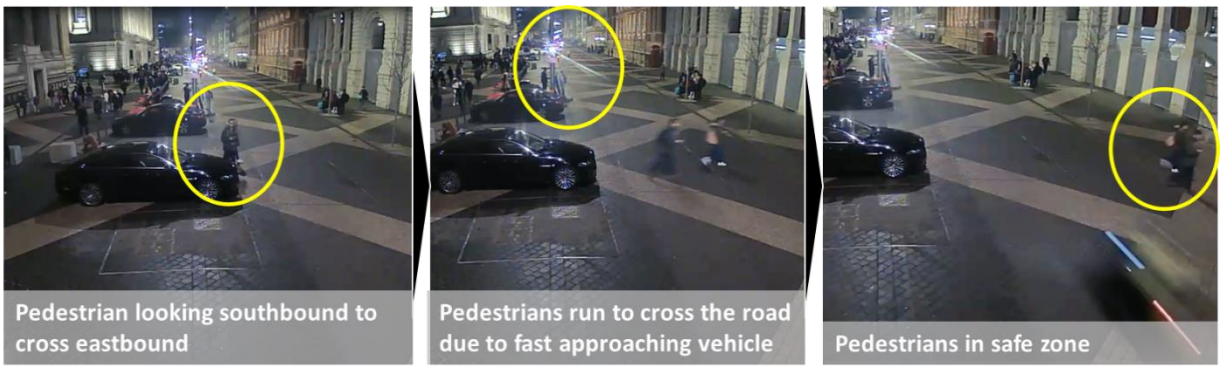
- The majority of pedestrian crossing movements recorded originate from the west and travel eastbound. This is a pattern was repeated for all zones (1-7) within Zone B on both the weekday and the weekend. 26% of crossing movements recorded on the weekday were travelling westbound and 29% on a weekend.



Does parking occupancy influence crossing location?

The survey results indicated:

- Little correlation between parking occupancy of the bays surveyed and crossing locations. There are hours surveyed whereby occupancy of bays is high yet crossing activity recorded within these zones was high. Similarly, there are hours surveyed whereby occupancy of bays is low and crossing activity is also low.
- A review of the video footage did however highlight that occupancy of bays may contribute towards reducing visibility for those crossing eastbound. This is explained in the snapshots below that illustrate pedestrians stepping onto the 'carriageway' to have adequate forward visibility before crossing.
- This behaviour may contribute towards the relatively high number of negotiations recorded for zone B7 where the majority of parked vehicles are located, where drivers / pedestrians have to compromise their movement to allow the other to continue their journey.



The video footage also highlighted that Zone B2 (adjacent to the Santander cycle docking station) is frequently used as a 'drop-off' point by coaches and other vehicles, as well as servicing related vehicles. These temporarily restrict pedestrian crossing activity and reduce forward visibility and means pedestrians have to step onto the 'carriageway' to have adequate forward visibility before crossing.

How many vehicles are travelling above the speed limit?

The survey results indicated:

- There is an overall increase in speed (av. +5mph) of vehicles in 2018 compared to the survey results obtained in 2013, which is despite there being a negligible difference in the volume of traffic flow and an increase in the total number of crossing movements (+59%) recorded in within the study area.
- The 85th percentile speed is 27mph for both southbound and northbound traffic. This is 7mph above the 20mph speed limit. There was a relatively high percentage of vehicles travelling over the prescribed speed limit, that can be summarised as:
  - 55% of vehicles are travelling over the speed limit.
  - 26% of vehicles are travelling 10% + 2mph above the speed limit.
  - 1% of vehicles are travelling 15mph over the speed limit.
- The majority of vehicles recorded travelling significantly over the prescribed speed limit takes place pre / post peak pedestrian activity (0600 – 0900 and 1800 – 2300).
- **Conclusion**: The study confirms that speed of traffic has increased since 2013 by 5mph (+21%). It is not possible to assess whether this increase in vehicle speed has contributed to a change in conflicts as this was not part of the 2013 study.

How *easy* and *safe* is it to cross the road?

The strongest indicator about whether it is '***safe'*** to cross Exhibition Road is the results of the number of pedestrian conflicts recorded discussed in Chapter 13. The table below summarises the number of negotiations, major conflicts and collisions recorded for the study area in the vicinity of the new V&A courtyard (Zone B). It confirmed that:

- No 'major' conflict or collisions were recorded during the days surveyed, on either the weekday or the weekend.
- The majority of 'negotiations' were recorded on the weekday (115) as opposed to the weekend (113). This is despite the fact that pedestrian crossing movements is significantly higher on a weekday compared to the weekend (albeit traffic flows are higher on a weekday).
- The majority of negotiations recorded were registered in Zones B2 and B7. The former (B2) comprises the area between the Natural History Museum and the V&A Museum where the crossing desire line is greatest on a weekend. The latter (B7) comprises a number of parking bays where although no correlation was apparent between the number of vehicles entering / exiting the bays and negotiations recorded, a review of the video footage did highlight that vehicles were potentially contributing towards pedestrians having reduced forward visibility for those crossing eastbound.

Conflict		No Conflict	Negotiations	Major Conflict	Collision
Zone B1	Weekday	569	12	0	0
	Weekend	1830	19	0	0
Zone B2	Weekday	911	45	0	0
	Weekend	1265	17	0	0
Zone B3	Weekday	202	3	0	0
	Weekend	904	19	0	0
Zone B4	Weekday	211	0	0	0
	Weekend	669	8	0	0
Zone B5	Weekday	101	2	0	0
	Weekend	403	11	0	0
Zone B6	Weekday	372	17	0	0
	Weekend	875	21	0	0
Zone B7	Weekday	436	36	0	0
	Weekend	558	18	0	0
Sub Total	**Weekday**	**2,802**	**115 (4.1%)**	**0**	**0**
	Weekend	**6,504**	**113 (1.7%)**	**0**	**0**
Grand Total		**9,306**	**228 (2.5%)**	**0**	**0**

14.2.3. In addition to the number of conflicts recorded, there are a number of indicators discussed in the report that help answer the question, about how 'easy' and 'safe' it is to cross Exhibition Road. Namely:

- **Gaps recorded in traffic** – Gaps less than 6 seconds, means pedestrians may have less time to make the decision to cross and cross more quickly. The survey results confirmed a high number of gaps greater than six seconds on both a weekday and weekend indicating there is plenty of opportunities for pedestrians to cross. The opportunities to cross is particularly important for a road such as Exhibition Road, given the lack of dedicated crossing facilities that would be present on a more traditional street with such high footfall.

- **People not stopping before crossing** – it is likely that the higher the incidences of pedestrians not stopping before crossing, the less safe it is when traffic flows are relatively high (noting that some pedestrians may not stop due to the lack of traffic and having looked to cross already). The survey results showed a link between the number of pedestrians stopping before crossing in hours where traffic was greatest (with 38% of pedestrians stopping between 11am – 5pm, compared to just 27% between 6pm – 11pm when flows are lower). The other 62% and 73% respectively, were not recorded stopping, albeit it is important to note that this does not mean they did not look before crossing.

- **Pedestrians crossing through stationary traffic / moving traffic** – Generally the higher percentage of people crossing through moving traffic (defined as vehicles being within 40m of the pedestrian crossing location) the less pedestrian friendly the environment is. For example, pedestrians crossing when a vehicle is approaching them is considered less favourable than when there is no traffic. The survey result indicated

approximately 1 in 3 pedestrians cross through 'moving traffic', with pedestrian crossing activity increasing by 59% since the 2013 surveys.

- **The volume of traffic** – High flow of traffic typically contributes towards having an adverse effect on the ease of crossing the road and potentially creating a more hostile pedestrian environment. The survey results confirmed that there has been a negligible change in vehicle flows (-1%) since the 2013 surveys

- **The speed of traffic** – Linked to the above, the survey results confirmed an increase in 85th percentile speed of traffic (+5mph) from 22mph to just over 27mph. This is likely to have an adverse impact on pedestrian crossing environment, partly as it reduces the size of the gaps within which pedestrians can cross.

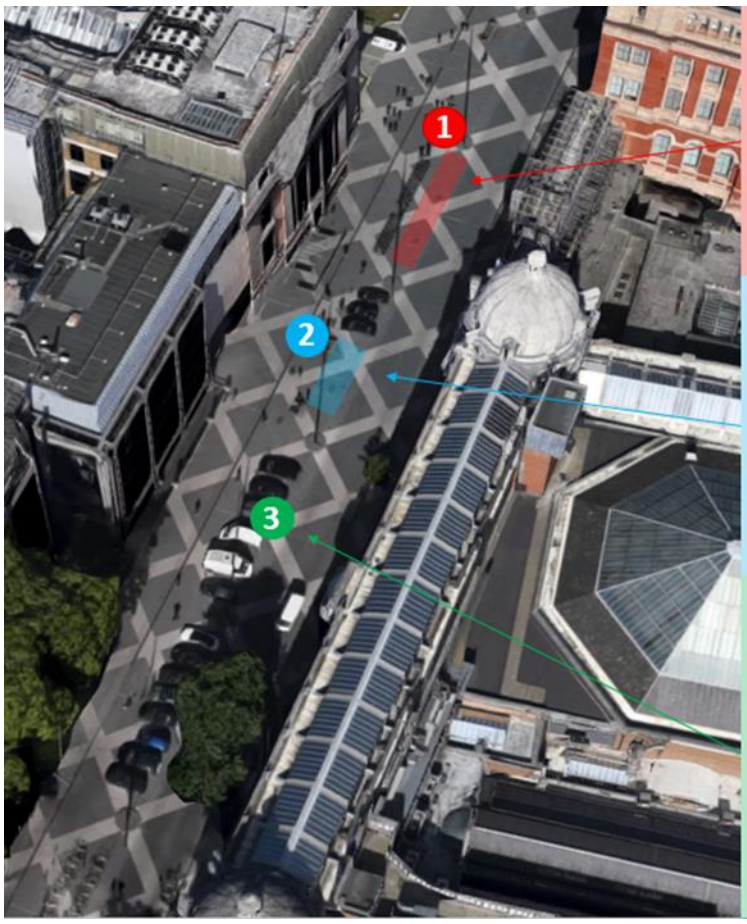
14.3 FUTURE CONSIDERATIONS

14.3.1. The key issues identified to adversely affect crossing activity is linked to:

- The increase in vehicular speeds; and
- Poor forward visibility for pedestrians crossing in areas occupied by parking bays and used by coaches / servicing and drop-off and pick-up activity.

14.3.2. Preventing parking / stopping at locations 1 and 2 highlighted in the figure below would better facilitate crossing movement on the main desire lines.

14.3.3. The installation of street furniture and green infrastructure / relocation of parking bays will contribute towards improving forward visibility for pedestrians on the main crossing desire lines. Furthermore, this installation can be positioned to help introduce visual narrowing for drivers to help reduce speeds and dependent on the type of street furniture and can contribute towards TfLs Healthy Street agenda.



14.3.4. Progression of these measures will need to consider the following:

- Liaising with the museums to understand servicing / delivery requirements, including use of the space adjacent to the Santander cycle docking station frequently used by coaches.
- Liaising with Westminster City Council and local residential groups to ensure a balanced approach is taken across the whole road.
- Undertake a trial with temporary installation of street furniture and green infrastructure (as indicted above) to reduce speed, improve visibility and indicate main desire lines to pedestrians and drivers. Monitor behaviour over a given period to inform decision making regarding whether the same/similar form of installation should be made permanent or whether other measures should be considered.

APPENDIX A - DATA COLLECTION & METHODOLOGY

The methodology and details of each survey are described in this chapter and summarised in **Table 1** below.

Table 1 – Summary of 2018 Survey Data Collection

Survey	Date	Time Period	Conditions	Incidents / Site Observations
Pedestrian Screen Line Count	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight	Dry	
Pedestrian Crossing Movements	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight	Dry	
Signalised Junction Pedestrian Crossing Movements	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight	Dry	
2018 Vehicle Screenline Counts	7 days from 08/01/2018	6am - midnight	N/A	None
2018 Traffic Radar	7 days from 08/01/2018	6am - midnight	N/A	None
Pedestrian Crossing Movements	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight	Dry	
Parking Occupancy	Tuesday (9th January 2018)	6am - midnight	Dry	None
	Saturday (13th January 2018)	6am - midnight	Dry	

PEDESTRIAN FLOW – SCREEN LINE COUNT

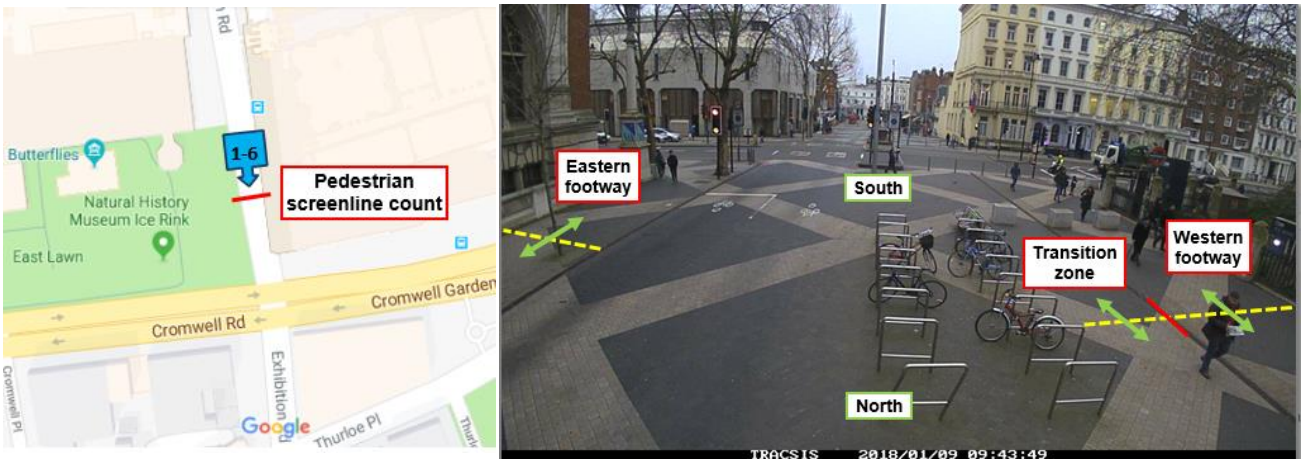
A pedestrian screen line count was commissioned in order to ascertain the changes in pedestrian flow on Exhibition Road between 2014 and 2018 and to provide a 2018 weekday / weekend comparison, the details of which are summarised overleaf.

Table 2 - Pedestrian Flow Survey Outline

Survey	Date	Time Period	Area	Reporting
Pedestrian Screen Line Count	Tuesday (9th January 2018)	6am - midnight	Exhibition Road - east footway, west footway + 'transition zone' (see below)	Bi-directional north-south/south-north hourly count.
	Saturday (13th January 2018)	6am - midnight		

The location of each count can be viewed in the figure below.

Figure 1 – Pedestrian Flow Survey Location



PEDESTRIAN CROSSING MOVEMENT

Pedestrian crossing movements on Exhibition Road were recorded in order to ascertain the changes in pedestrian crossing flows between 2014 and 2018 and to provide a 2018 weekday / weekend comparison, the details of which are summarised below.

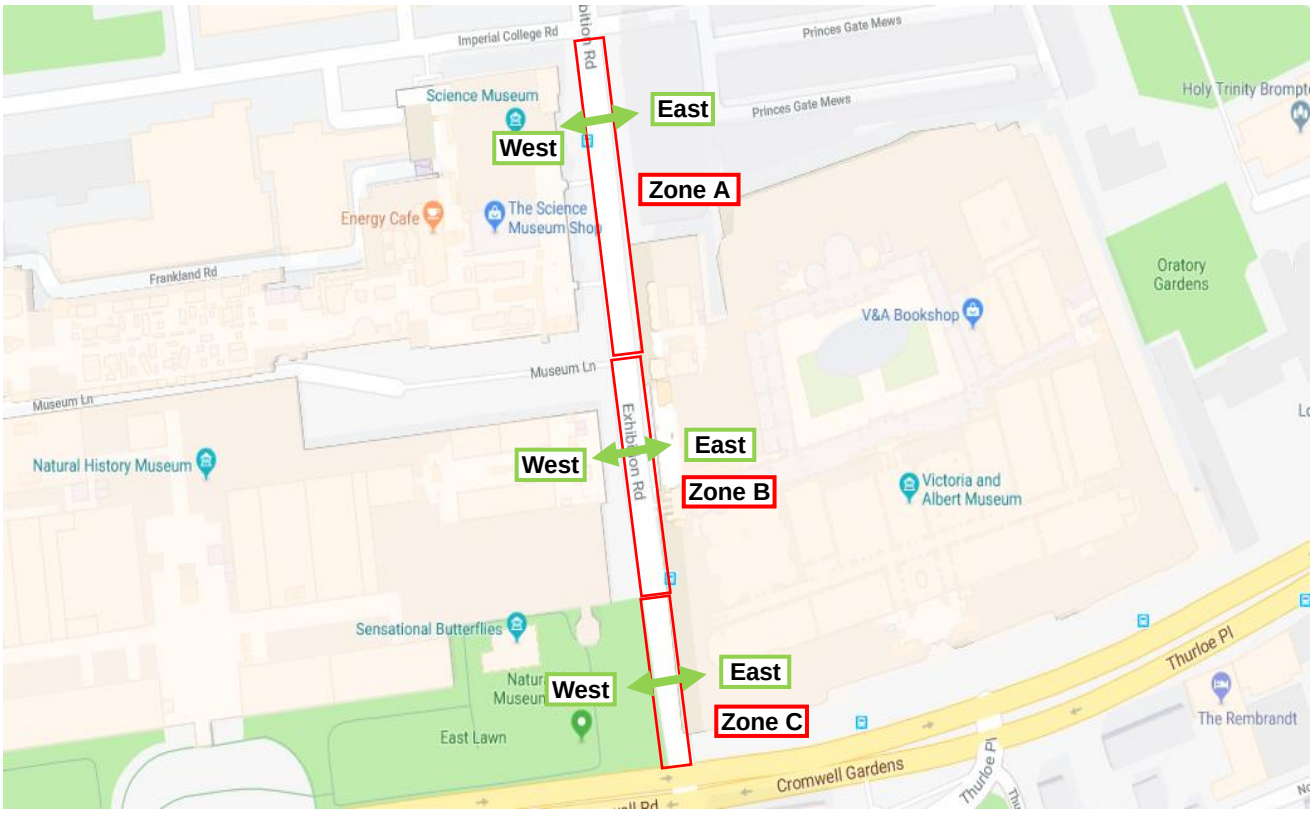
Table 3 - Pedestrian Crossing Movement Survey Outline

Survey	Date	Time Period	Area	Reporting
Pedestrian Crossing Movements	Tuesday (9th January 2018)	6am - midnight	Exhibition Road Zones A – C (see The location of each count can be viewed in the figure below.	▪ Hourly bi-directional east-west/west-east crossing movement noting: ▪ Pedestrian stopped/not stopped before crossing ▪ Pedestrian crossed: Through stationary traffic /moving traffic / no
	Saturday (13th January	6am -		

	2018)	midnight		▪ traffic Pedestrian conflict (with vehicles).

The location of each count can be viewed in the figure below.

Figure 2 – Pedestrian Crossing Movement Survey Locations



SIGNALISED JUNCTION PEDESTRIAN CROSSING COUNTS

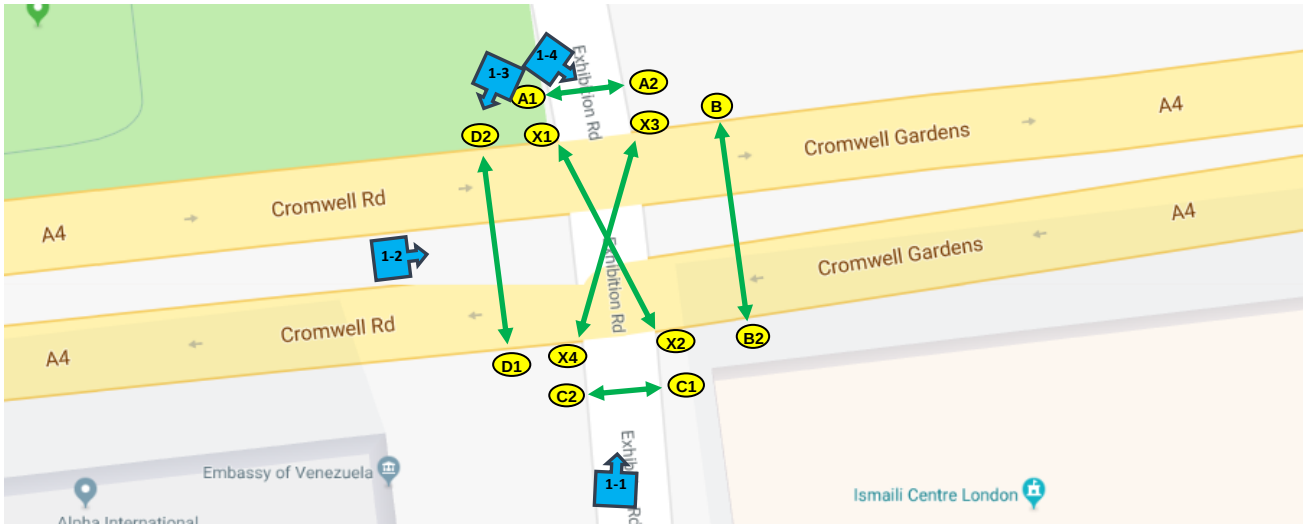
Pedestrian crossing movements, including diagonal crossing movements. Were recorded over the four junction arms at the Cromwell Road / Exhibition Road signalised crossing in order to ascertain the changes in pedestrian crossing flows between 2014 and 2018 and to provide a 2018 weekday / weekend comparison, the details of which are summarised below.

Table 4 - Signalised Junction Pedestrian Crossing Counts Survey Outline

Survey	Date	Time Period	Area	Reporting
Pedestrian Junction crossing Count	Tuesday (9th January 2018)	6am - midnight	The four junction arms at the Cromwell Road / Exhibition Road (see below)	Hourly Bi-directional crossing movement and diagonal crossing movements.
	Saturday (13th January 2018)	6am - midnight		

The location of each count can be viewed in the figure overleaf.

Figure 3 – Signalised Junction Pedestrian Crossing Counts Survey Location



TRAFFIC FLOW, SPEEDS, AND GAPS – SCREENLINE COUNTS

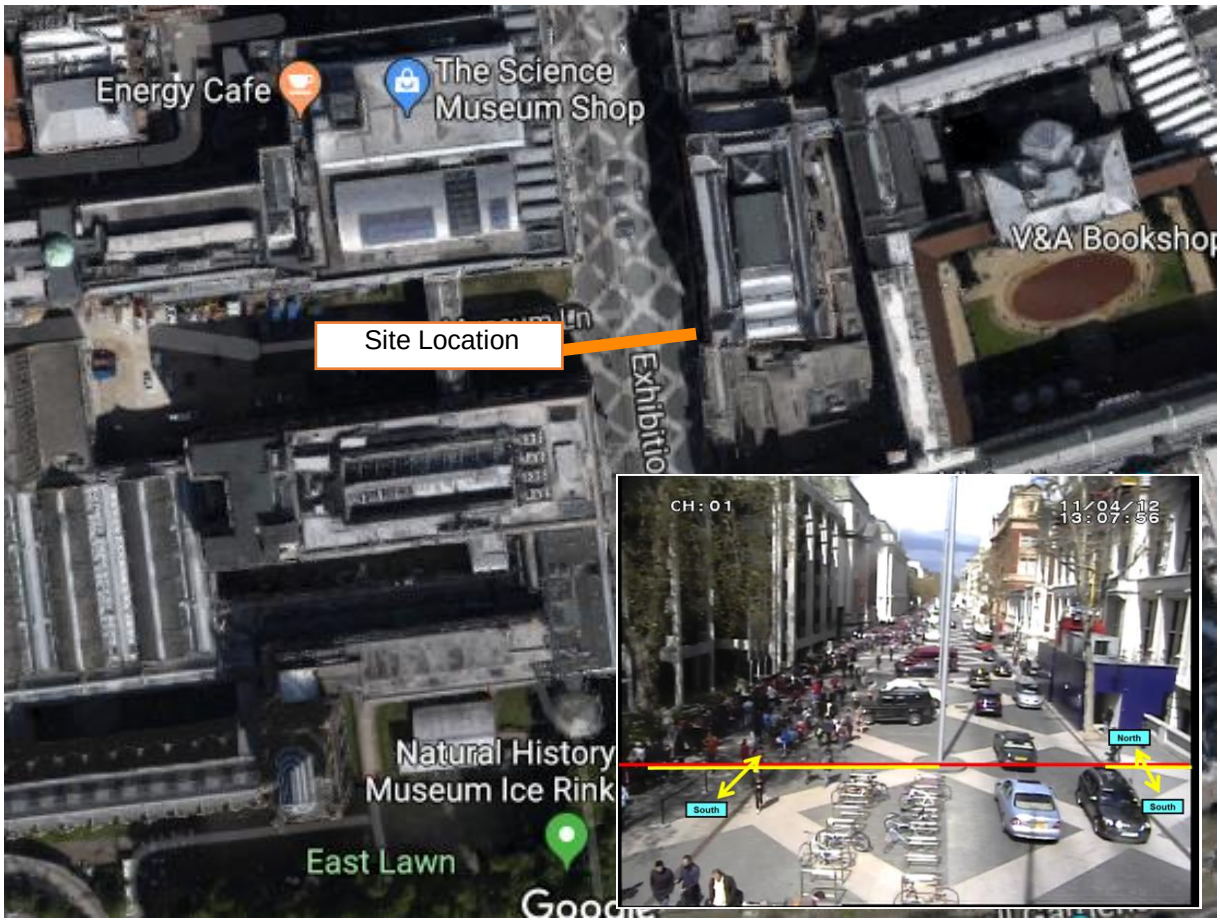
Vehicle movement, speed and gaps were recorded at a screenline on Exhibition Road in order to ascertain the changes in traffic flows between 2014 and 2018 and to provide a 2018 weekday / weekend comparison, the details of which are summarised below.

Table 5 - Traffic Flow & Speed Screenline Count Survey Outline

Survey	Date	Time Period	Area	Reporting
Vehicle Screenline Counts	ɔm 08/01/2018	ɔeriod	Exhibition Road screenline location (see The exact location of the screen line can be viewed in the figure below. Figure **4 – Traffic Flow & Speed Screenline Count Survey Location**).	Hourly Bi-directional count split by northbound and southbound direction. Classification by vehicle type.
Traffic Radar				85th%ile and average speed. Data on gaps between traffic in seconds.

The exact location of the screen line can be viewed in the figure below.

Figure 4 – Traffic Flow & Speed Screenline Count Survey Location



The survey included a record of identifying gaps in traffic, which was specified in the following categories:

- Gaps < 6 seconds
- Gaps > 6 seconds
- No gaps (< 1 seconds)

Classification of vehicles recorded is to be provided within the E-Appendix.

PARKING OCCUPANCY

Occupancy of the parking bays in Zones A - C were recorded to provide data indicating current occupancy / movement and to provide a 2018 weekday / weekend comparison, the details of which are summarised below.

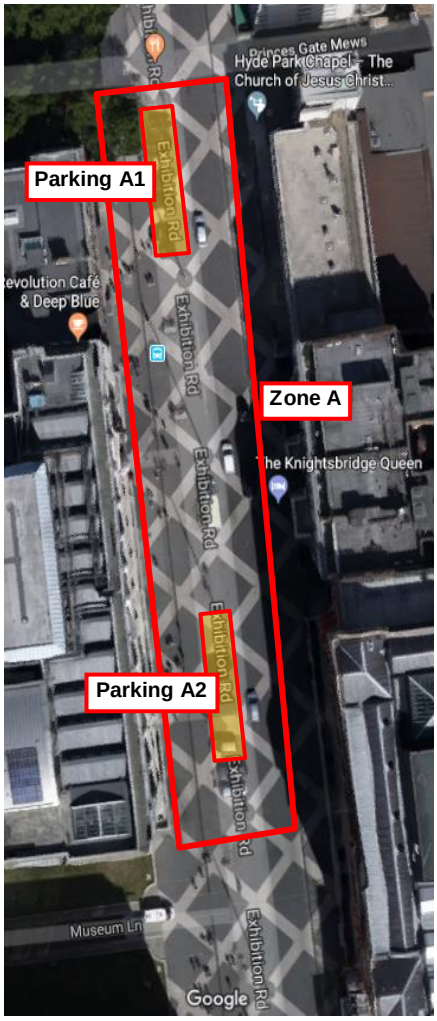
Table 6 - Parking Occupancy Survey Outline

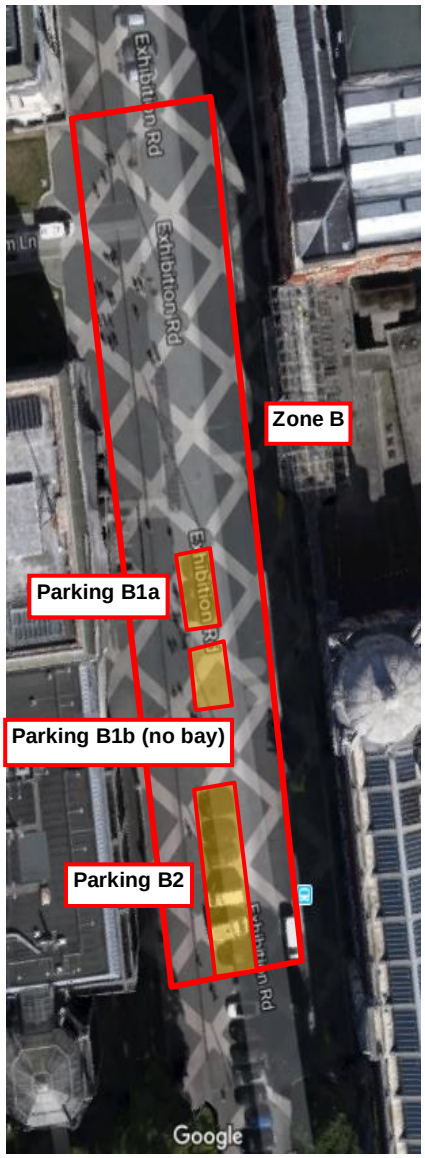
Survey	Date	Time Period	Area	Reporting
Parking Occupancy	Tuesday (9th January 2018)	6am - midnight	Exhibition Road Zones A, B, &C (see Figure 6).	The number of vehicles in 5 minute snapshots distinguished by the five blocks of bays. Movement to/from parking bays.

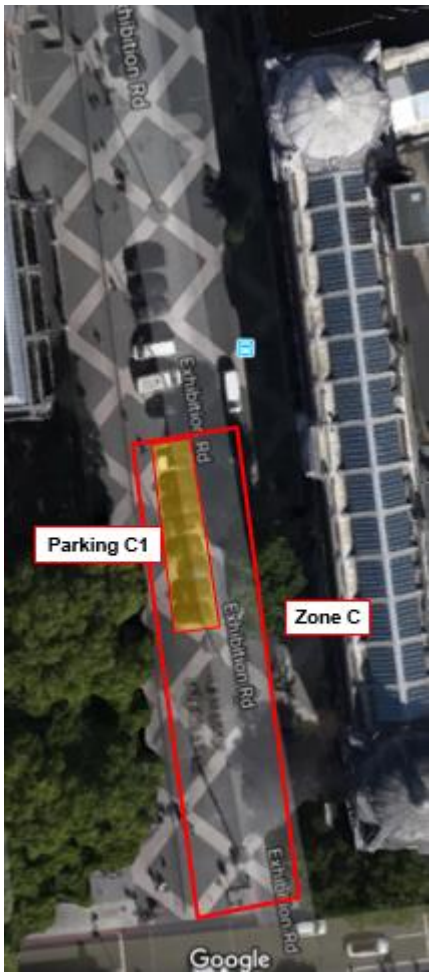
	Saturday (13th January 2018)	6am - midnight		Observations of parking activity outside marked bays on east and west sides of road.

The location of each area surveyed can be viewed in the figure below.

Figure 5 – Parking Occupancy Survey Locations Zone A







PEDESTRIAN QUEUES

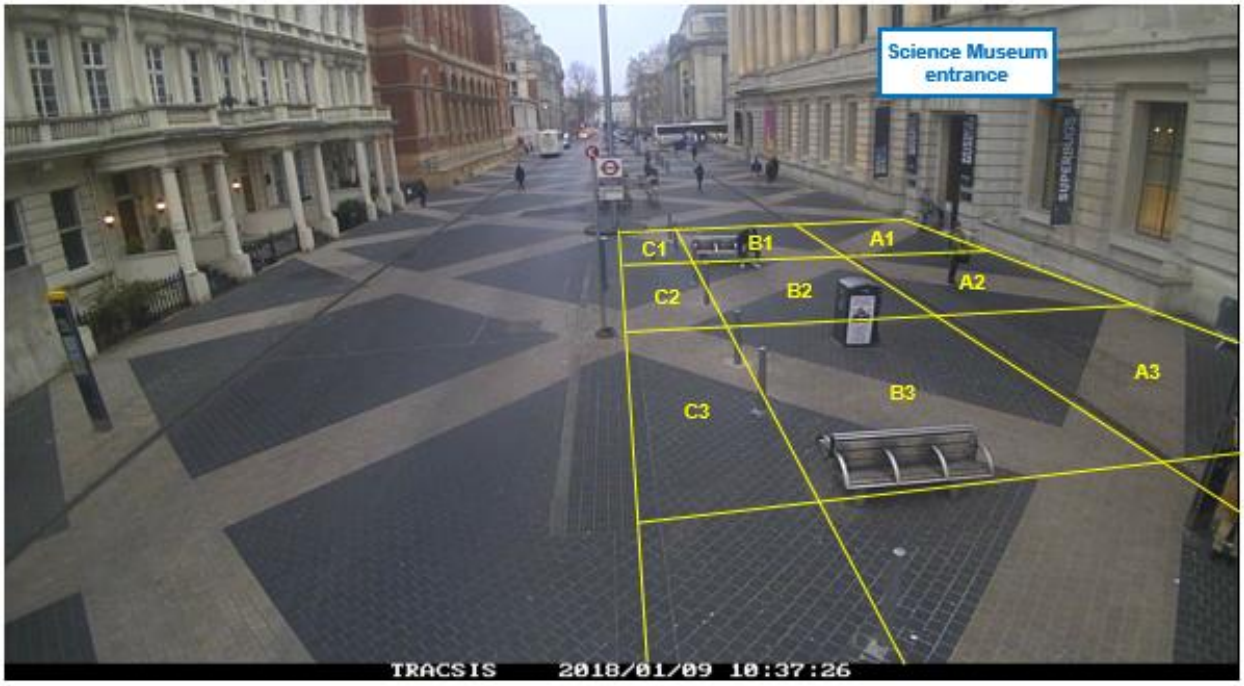
Occupancy of the parking bays in Zones A - C were recorded in order to ascertain how often queues build up and how much space they occupy and to provide a 2018 weekday / weekend comparison, the details of which are summarised overleaf.

Table 7 – Pedestrian Queues Survey Outline

Survey	Date	Time Period	Area	Reporting
Pedestrian Queues	Tuesday (9th January 2018)	9:00 – 18:00	Exhibition Road - National History Museum and Science Museum Entrances (see	▪ Reporting on the length and area of the queues over time. ▪ Where / when the queue starts and ends.
	Saturday (13th January 2018)	9:00 – 18:00		

Recording of queues started 1 hour before the museums open. Museums open at 10am, close at 6pm, so the survey period was 9am-6pm. A virtual grid was placed over the footway area and a snapshot of pedestrians occupying the grid was taken every 5 minutes. Cell length was set at 6m and the total grid length was 102m. The cell width varied from 2m-5m.
An example of the pedestrian queuing grid can be seen in the figure below.

Figure 6 Pedestrian Queuing Grid



CYCLE DOCKING STATION OCCUPANCY

Occupancy of the cycle docking stations within Zones A - C were also obtained from TfL. Each terminal sends a message approximately every five minutes detailing how many bikes there are and how many empty docking points there are at that moment. The survey data illustrates occupancy for Tuesday 9th January 2018 and Saturday 13th January 2018.

APPENDIX B - ADDITONAL DATA ANALYSIS

This appendix presents additional analysis of the survey results:

- Signalised junction pedestrian crossing activity;
- Detail on the flow of traffic by vehicle type; and
- A more detailed breakdown of pedestrian behaviour for each sub zone in the area between the new entrance to the V&A from Exhibition Road (referred to as Zone B)

SIGNALISED JUNCTION PEDESTRIAN CROSSING

An assessment of the change in pedestrian crossing movement at the Cromwell Road / Exhibition Road junction between the weekday survey data collected in 2013 and the weekday survey data collected in 2018 was undertaken for the four comparable time periods.

WEEKEND FLOW COMPARISON BY VEHICLE TYPE – WEEKDAY VS WEEKEND

An assessment has been undertaken comparing the weekday vs weekend vehicle flows by vehicle type. The results of the comparison are illustrated in the following tables.

Table 8 - Vehicle Flow by Vehicle Type – Weekday 2018

	Bi-directional Tuesday											
Hour beginning	Car (including Private Hire Vehicles)	Black Taxi	LGV - Freight (vans etc)	LGV - Passenger (Minibuses etc)	MGV - Freight (2 axles & 6 tyres)	MGV - Passenger (2 axles & 6 tyres)	HGV - Freight (3 or more axles)	Bus (PSV - 9+ seats)	Coach (Private - 9+ seats)	Motorcycles	Pedal cycles	Total
6 AM	75	9	18	0	9	2	5	7	0	6	12	143
7 AM	159	43	58	0	12	0	4	12	1	13	65	367
8 AM	318	67	60	0	17	1	2	11	1	35	159	671
9 AM	278	95	67	0	14	0	5	11	0	19	123	612
10 AM	214	102	62	2	7	0	3	11	10	18	58	487
11 AM	236	139	64	1	13	0	0	9	0	19	35	516
12 PM	237	189	57	0	5	0	2	11	1	33	32	567
1 PM	285	176	59	0	6	0	0	11	3	32	43	615
2 PM	256	184	46	0	13	0	0	11	6	22	29	567
3 PM	253	176	48	2	5	4	0	12	0	22	36	558
4 PM	283	180	42	2	3	0	0	10	2	32	61	615
5 PM	300	152	26	0	2	3	0	9	0	41	116	649
6 PM	251	137	10	0	1	0	0	10	0	67	160	636
7 PM	231	171	9	1	1	0	0	9	0	57	107	586
8 PM	167	102	5	0	1	0	0	7	0	39	53	374
9 PM	157	113	3	0	1	0	0	6	0	26	23	329
10 PM	158	99	5	1	1	0	0	6	0	19	21	310
11 PM	86	42	3	0	1	0	0	7	0	1	15	155
Total	3944	2176	642	9	112	10	21	170	24	501	1148	8757
%	45%	25%	7%	0%	1%	0%	0%	2%	0%	6%	13%	100%

Table 9 - Vehicle Flow by Vehicle Type – Weekend 2018

	Bi-directional Saturday											
Hour beginning	**Car (including Private Hire Vehicles)**	**Black Taxi**	**LGV - Freight (vans etc)**	**LGV - Passenger (Minibuses etc)**	**MGV - Freight (2 axles & 6 tyres)**	**MGV - Passenger (2 axles & 6 tyres)**	**HGV - Freight (3 or more axles)**	**Bus (PSV - 9+ seats)**	**Coach (Private - 9+ seats)**	**Motorcycles**	**Pedal cycles**	**Total**
6 AM	35	6	3	0	3	0	1	7	0	0	11	66
7 AM	52	5	16	0	11	0	1	7	0	7	13	112
8 AM	125	14	20	0	3	0	2	6	0	12	31	213
9 AM	151	39	22	0	3	0	1	10	1	15	29	271
10 AM	249	95	28	0	4	0	2	11	2	21	31	443
11 AM	235	132	14	0	2	0	0	11	0	20	42	456
12 PM	266	157	18	0	1	1	0	11	1	37	45	537
1 PM	291	168	13	0	1	0	0	13	0	32	44	562
2 PM	307	189	5	1	4	0	0	12	0	44	71	633
3 PM	314	191	13	1	0	0	0	9	0	28	34	590
4 PM	284	117	15	0	2	0	0	11	1	32	35	497
5 PM	290	135	10	0	3	1	0	12	0	32	49	532
6 PM	292	130	3	0	0	0	0	12	3	22	35	497
7 PM	294	123	6	1	1	0	0	7	8	42	20	502
8 PM	253	82	3	0	1	0	0	8	0	40	13	400
9 PM	207	69	0	1	0	0	0	5	0	28	16	326
10 PM	265	96	1	0	0	0	0	7	3	15	8	395
11 PM	204	45	3	0	1	0	0	6	5	11	9	284
Total	4114	1793	193	4	40	2	7	165	24	438	536	7316
%	56%	25%	3%	0%	1%	0%	0%	2%	0%	6%	7%	100%

The following results were observed:

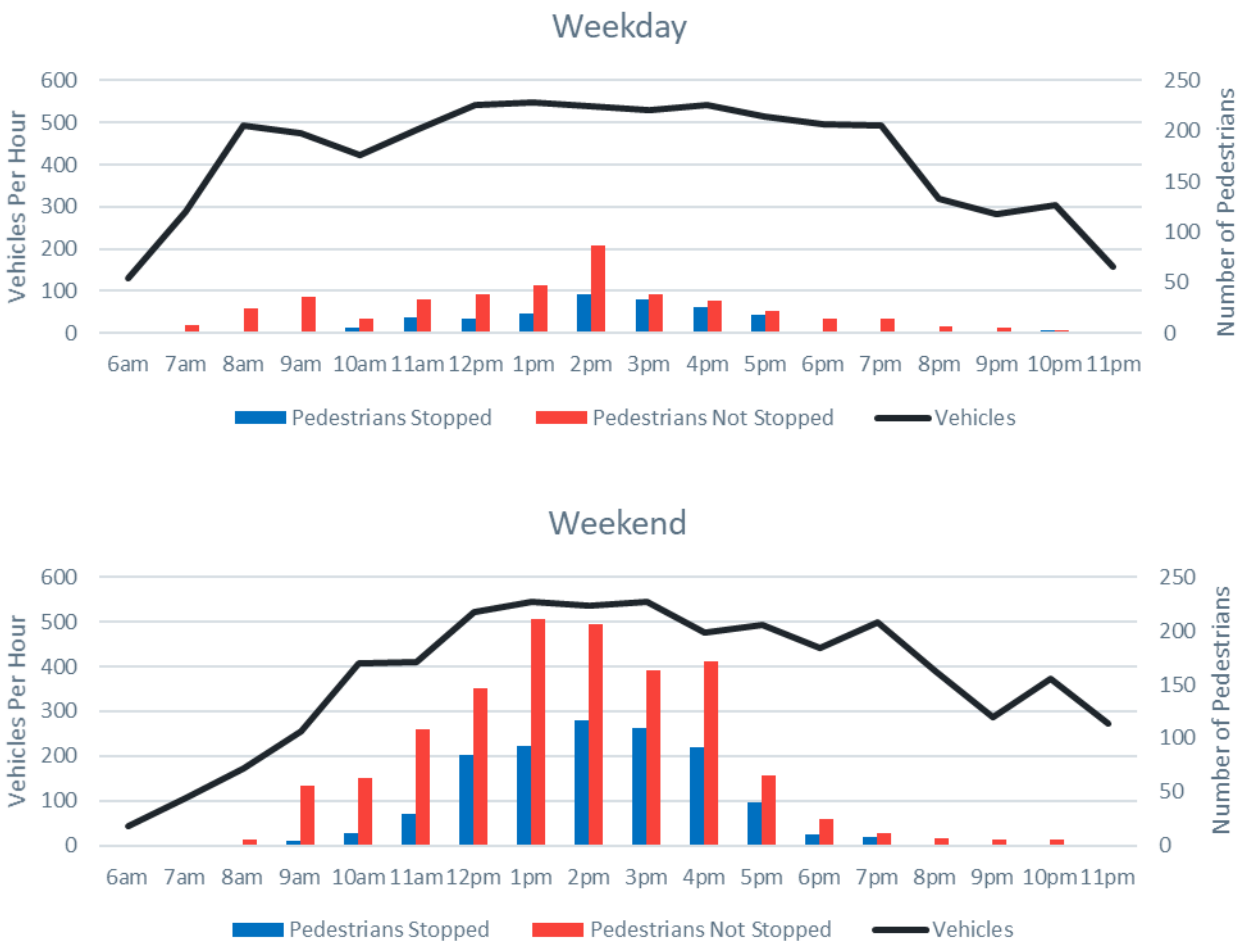
- When comparing the weekday and weekend survey days; both exhibited a high proportion of car movements (45% on Tuesday and 56% on Saturday) as well as a significant proportion of black cab movements (25% on both survey days).
- LGV's made up 7% and 3% of the total movements on the weekday and weekend survey days respectively.
- Coaches made up less than 1% of the movements recorded on both the weekday and weekend survey days.

Conclusion: Vehicle flows comprised a high proportion of car movements (45% on weekday and 56% on weekend) as well as a significant proportion of black cab movements (25% on both survey days).

PEDESTRIANS STOPPING

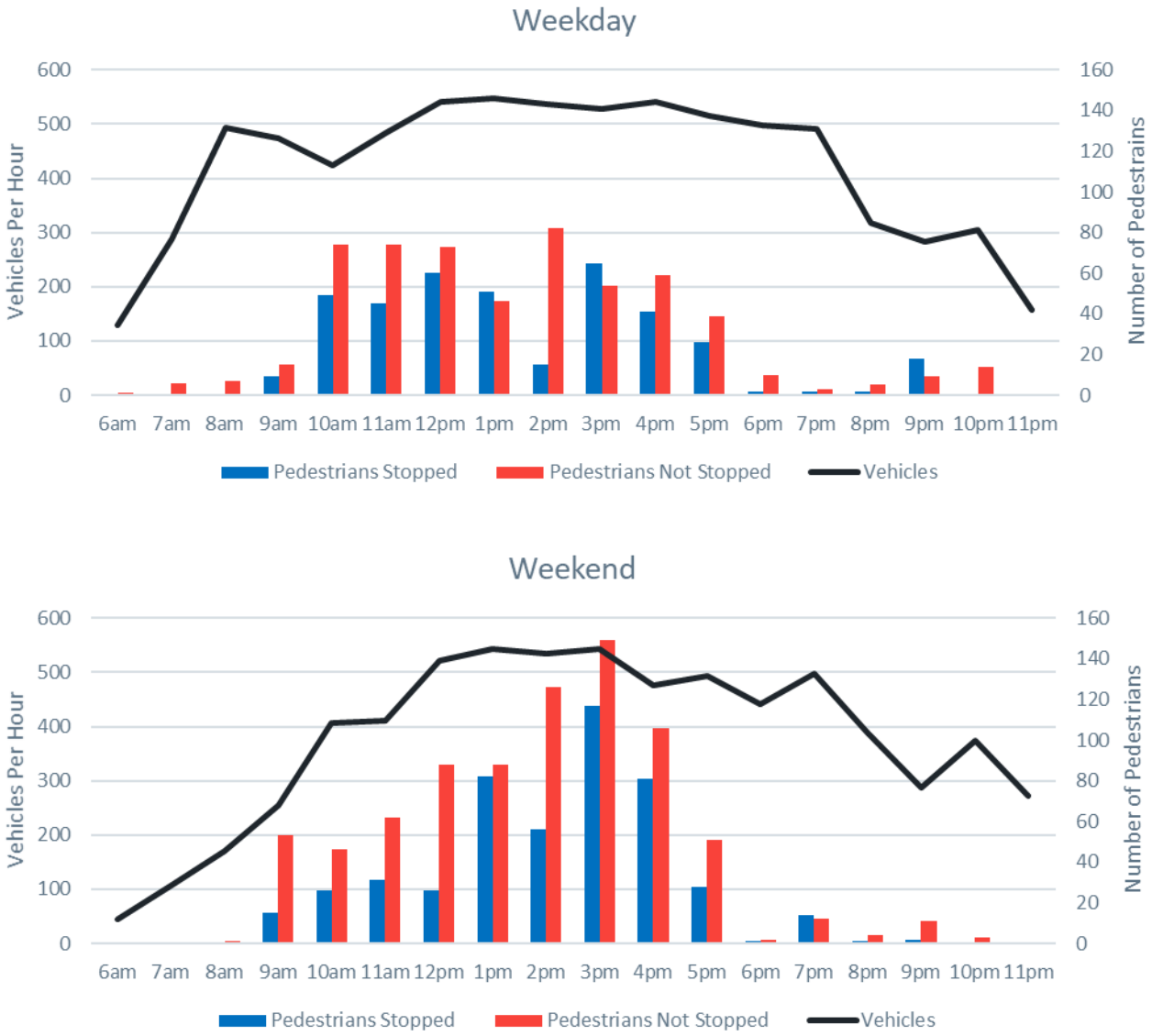
The figures below detail the number of pedestrians who stopped / did not stop in Zone B by each sub zone, between the Natural History Museum and V&A Courtyard.

Figure 7 Pedestrians Stopped and Number of Vehicles per hour, Zone B1



Conclusion: Over the course of a typical weekday 30% of pedestrians stopped before crossing, compared to 32% on a weekend.

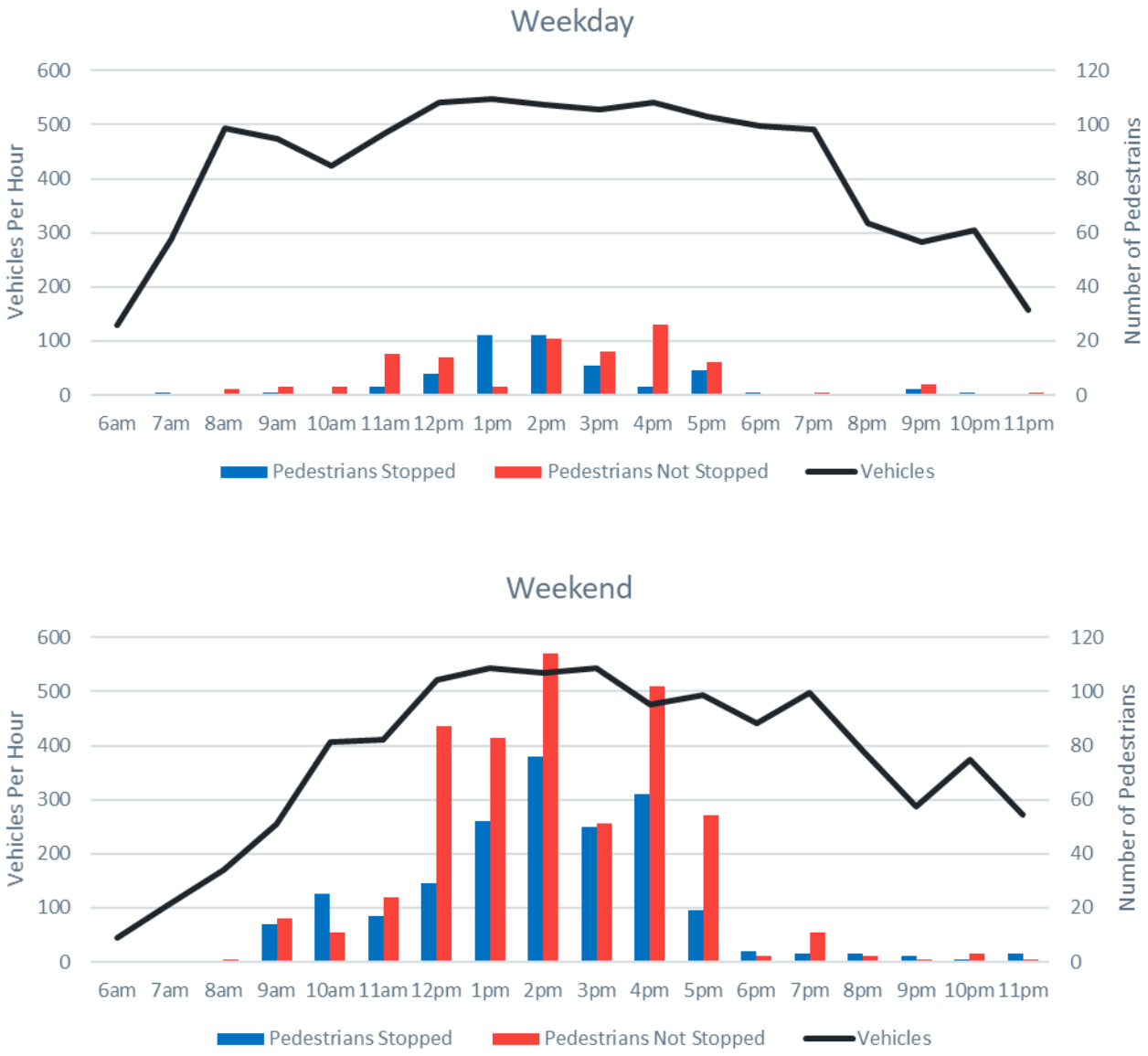
Figure 8 Pedestrians Stopped and Number of Vehicles per hour, Zone B2



The number of pedestrians who did not stop are greater than the pedestrians who stopped before crossing, with the exception of 1pm, 3pm and 9pm on a weekday and 7pm on a weekend when the number of vehicles per hour is high.

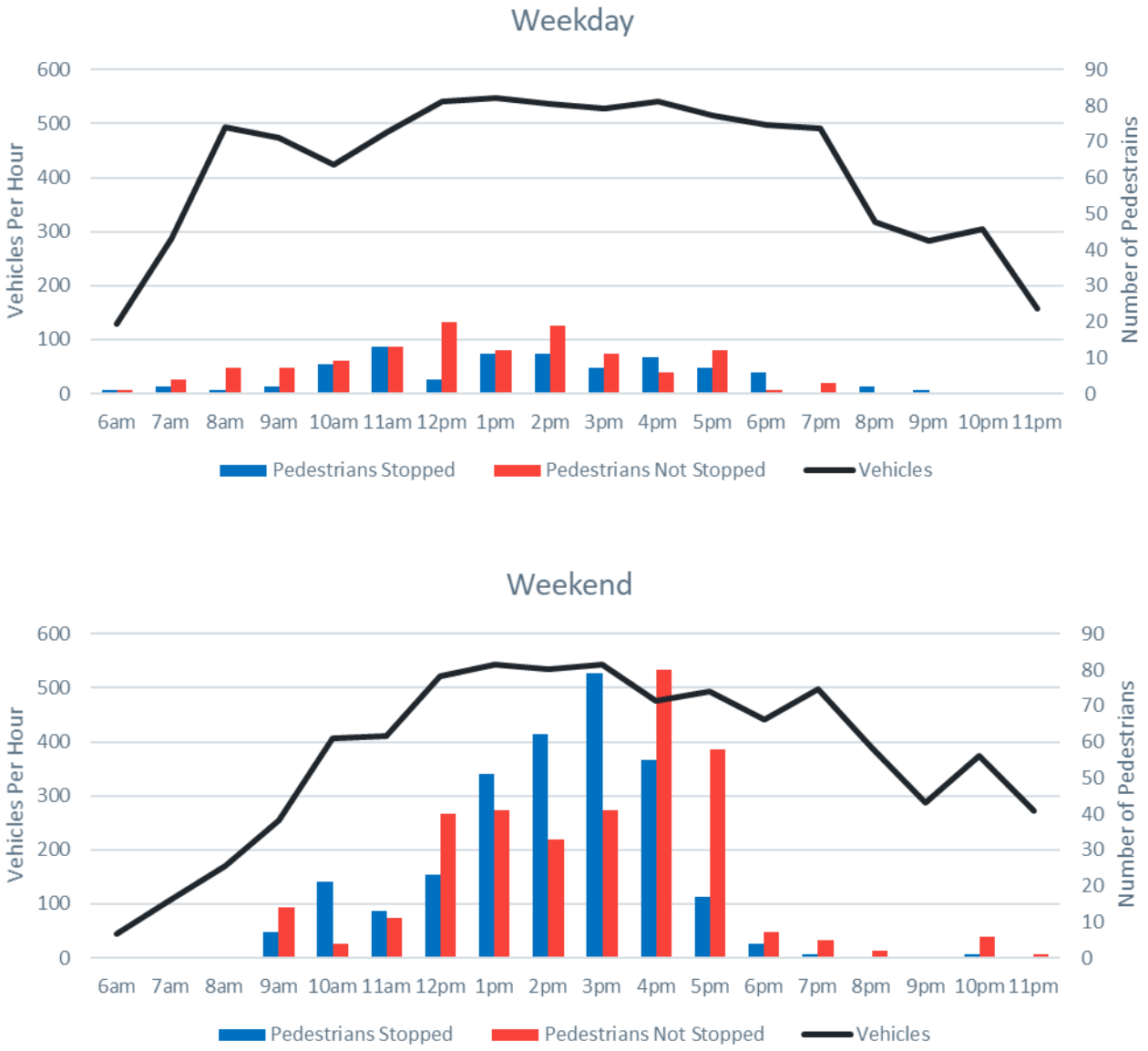
Conclusion: Over the course of a typical weekday 40% of pedestrians stopped before crossing, compared to 37% on a weekend.

Figure 9 Pedestrians Stopped and Number of Vehicles per hour, Zone B3



Conclusion: Over the course of a typical weekday 41% of pedestrians stopped before crossing, compared to 39% on a weekend.

Figure 10 Pedestrians Stopped and Number of Vehicles per hour, Zone B4

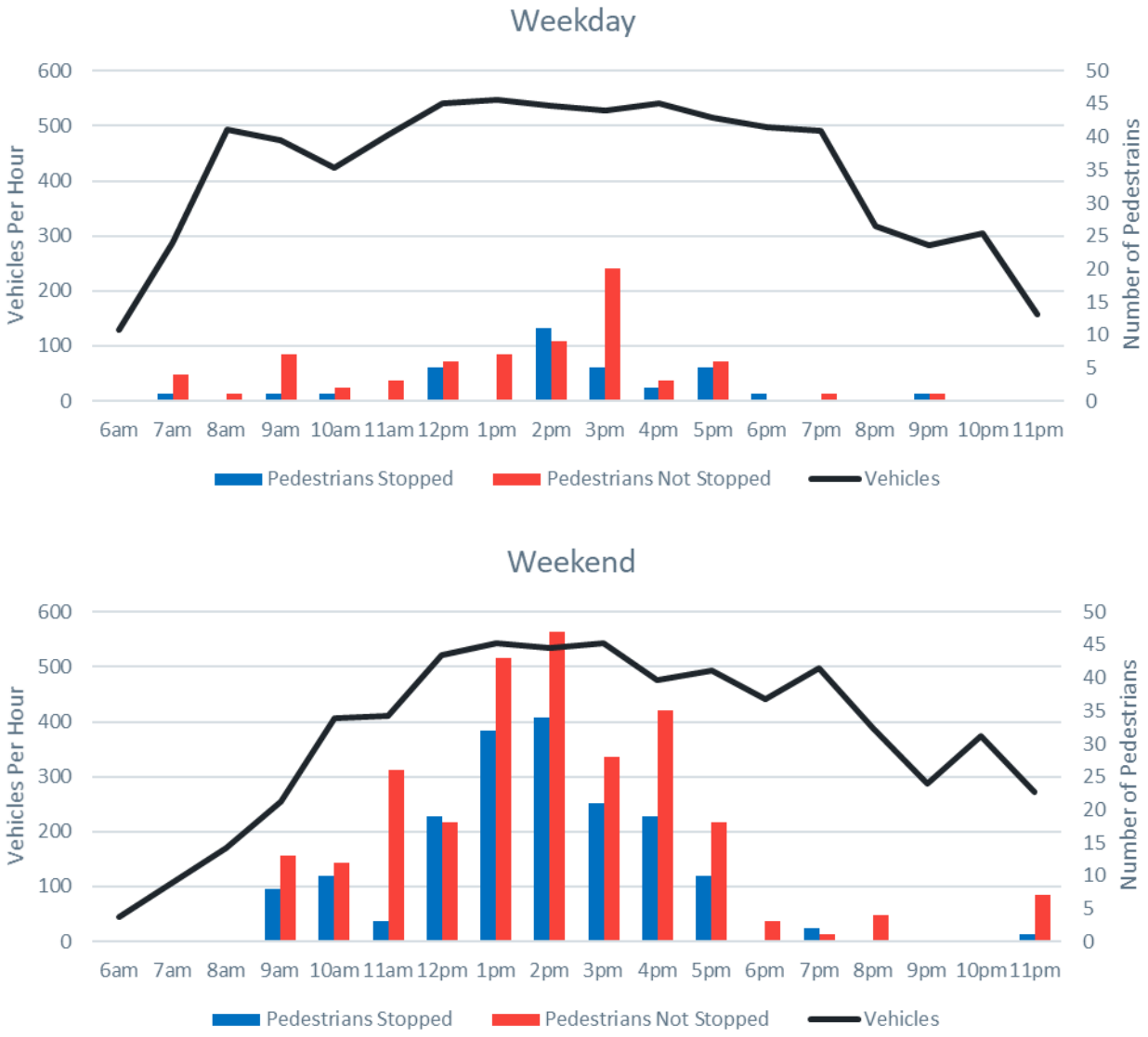


The area adjacent to the National History Museum comprises three parking bays and the number of pedestrians stopping before crossing is significantly higher than that observed for other parts of the study area.

The percentage of pedestrians stopping before crossing is particularly high between 1pm – 3pm on a weekend, when traffic flows are highest.

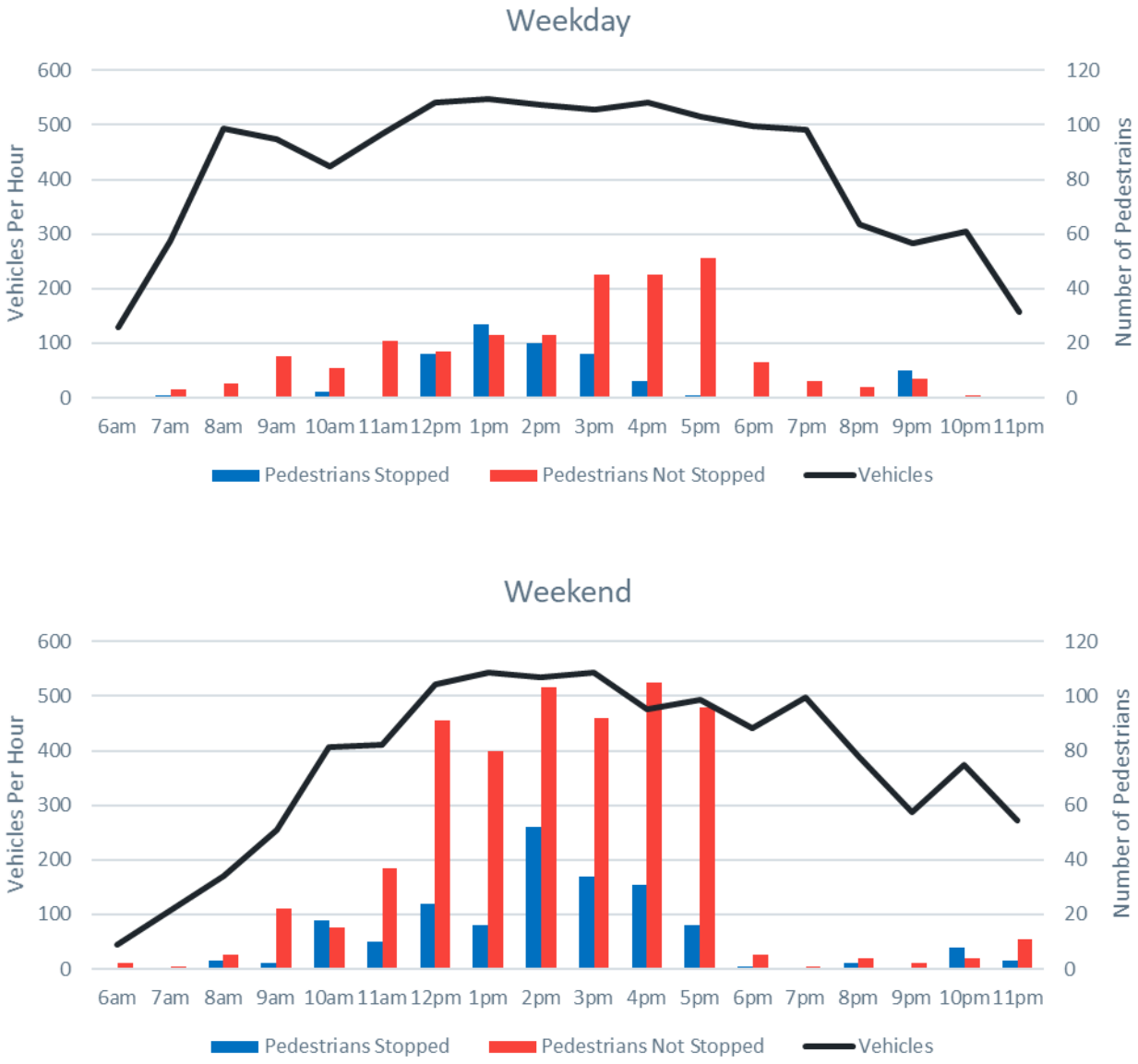
Conclusion: Over the course of a typical weekday 41% of pedestrians stopped before crossing, compared to 49% on a weekend.

Figure 11 Pedestrians Stopped and Number of Vehicles per hour, Zone B5



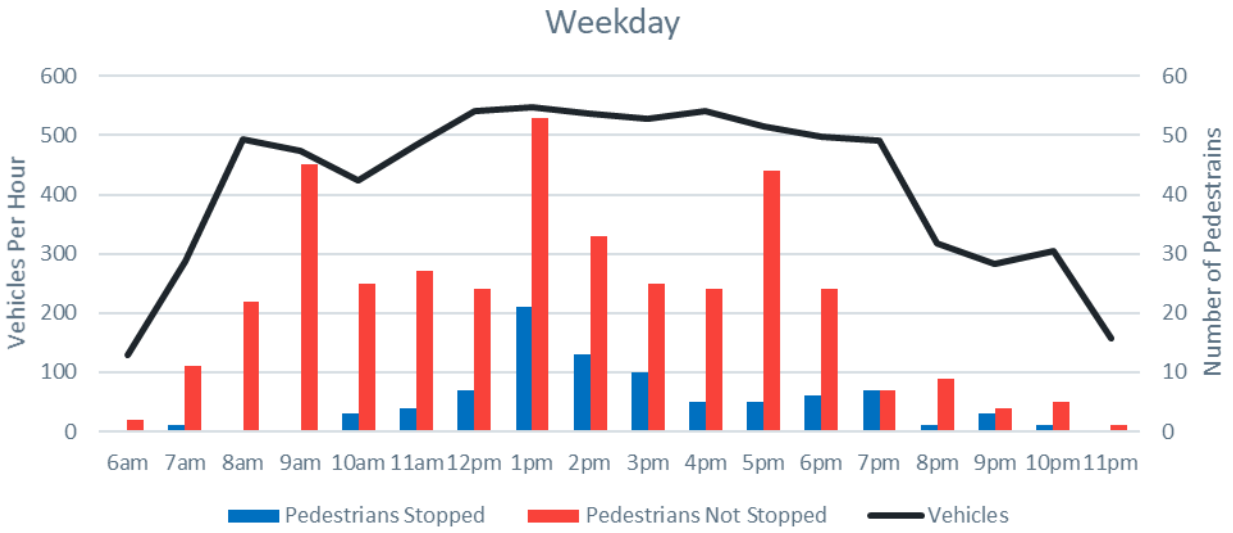
Conclusion: Over the course of a typical weekday 32% of pedestrians stopped before crossing, compared to 38% on a weekend. This sub zone has the fewest total number of pedestrians crossing.

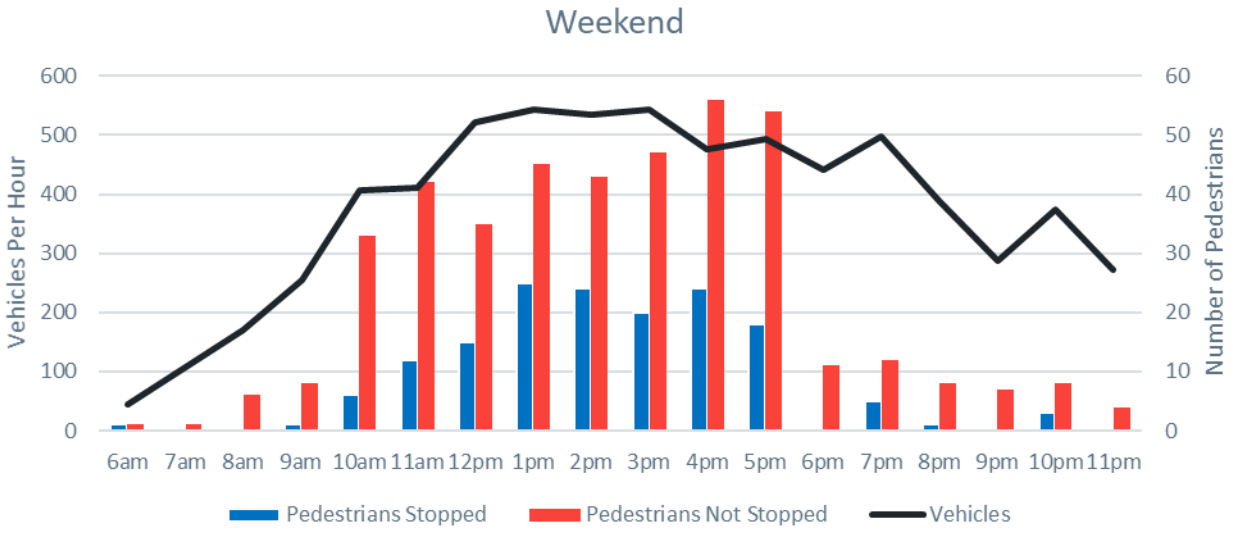
Figure 12 Pedestrians Stopped and Number of Vehicles per hour, Zone B6



Conclusion: Over the course of a typical weekday 25% of pedestrians stopped before crossing, that reflects the 25% recorded for the weekend also.

Figure 13 Pedestrians Stopped and Number of Vehicles per hour, Zone B7

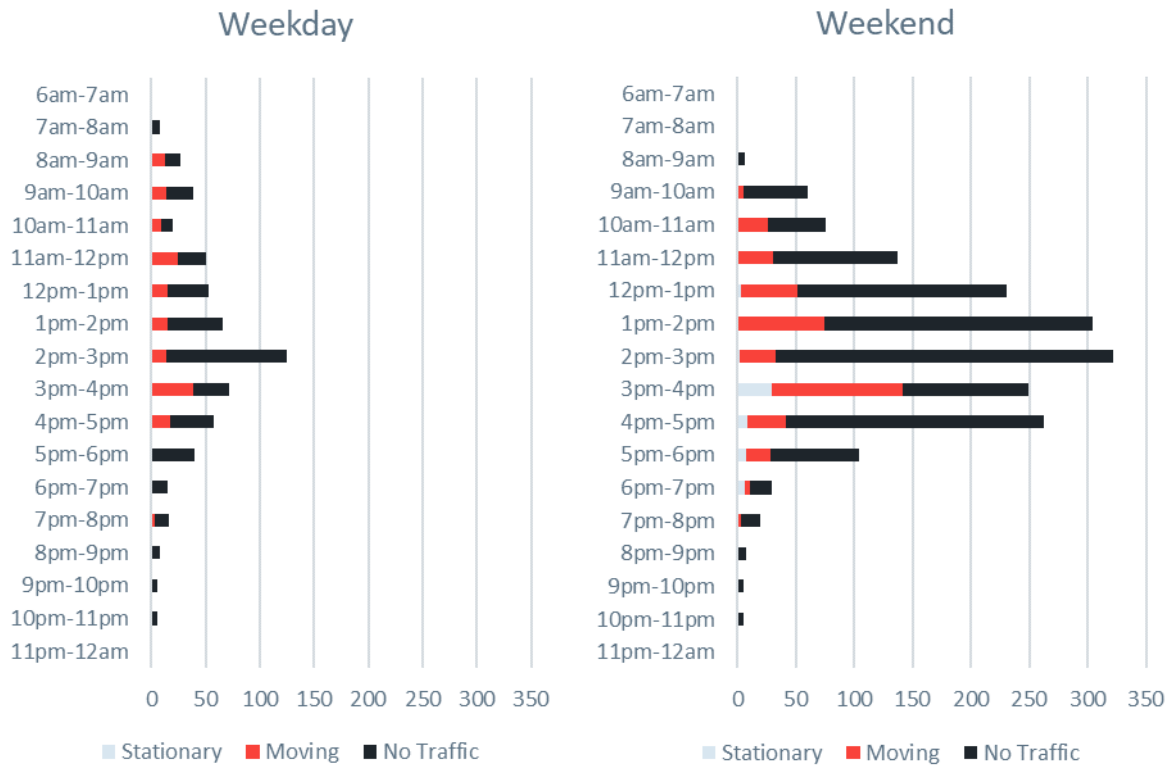




Conclusion: Over the course of a typical weekday 18% of pedestrians stopped before crossing, compared to 27% on a weekend. This is the only zone (south of Exhibition Road, nearest Cromwell Road) where the number of pedestrian recorded crossing on a weekday is broadly similar to crossing activity recorded on a weekend.

PEDESTRIAN CROSSING THROUGH TRAFFIC

Figure 14 Traffic whilst pedestrians crossed the road, Zone B1

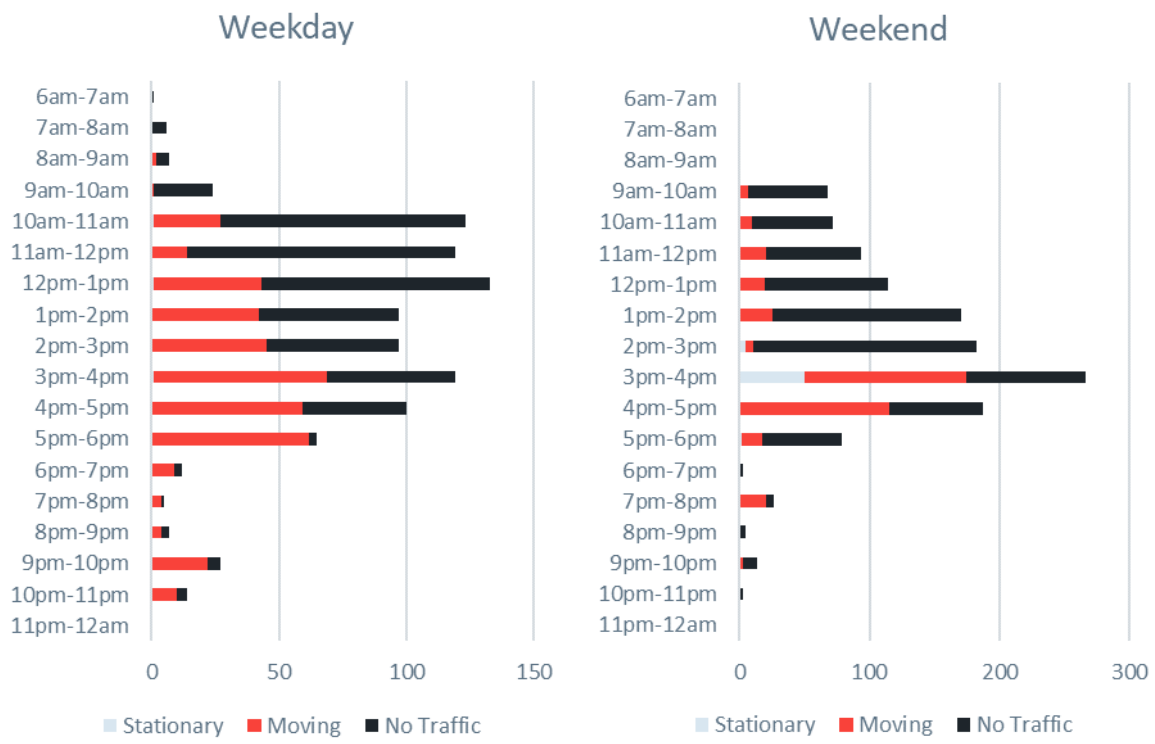


The graphs above show that:

- The majority of pedestrians cross when there is no traffic, 446 for weekday and 1,373 for weekend.
- Subtle differences were recorded between a weekday and a weekend, with more pedestrians who cross in stationary traffic on a weekend (56) compared to a weekday (1).
- The majority of pedestrians cross in an eastbound direction.

Conclusion: Overall, 73% of pedestrians were recorded crossing through ‘no traffic’ on a weekday, compared to 74% on a weekend. Vehicle flows were lower at a weekend than a weekday.

Figure 15 Traffic whilst pedestrians crossed the road, Zone B2

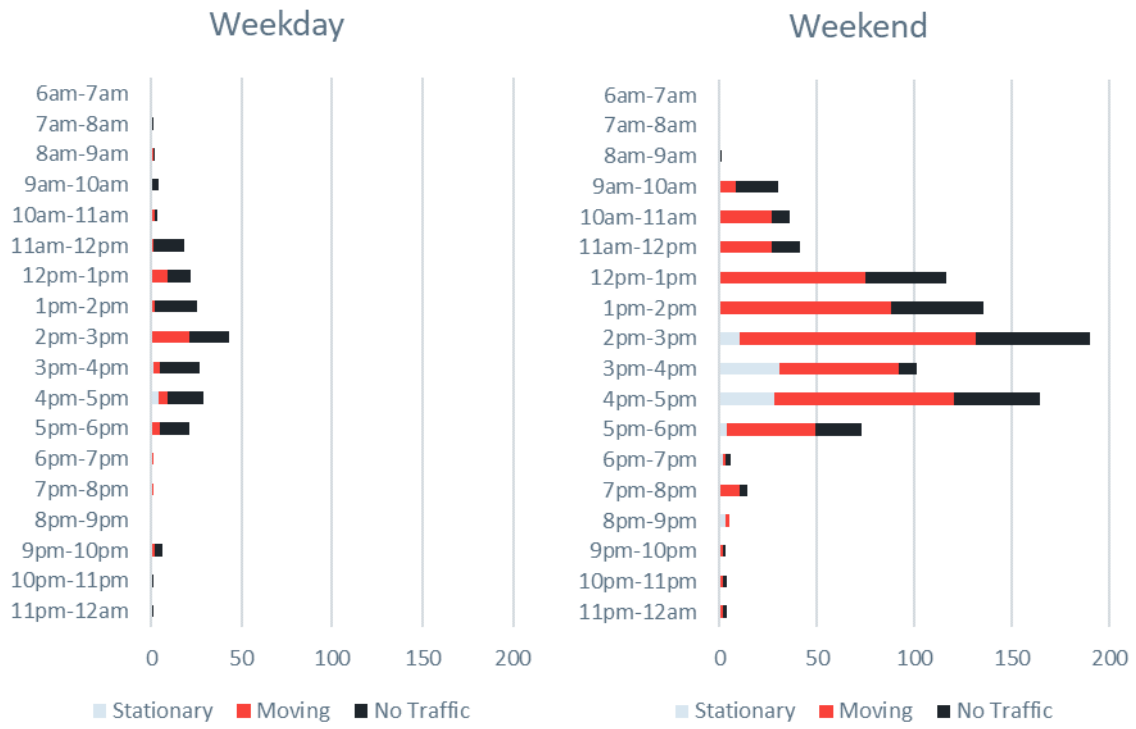


The graphs above show:

- On a weekday 410 people cross through moving traffic during the course of a weekday, compared to 364 on a weekend.
- Only 60 pedestrians cross through stationary traffic.
- There is a much higher percentage (64%) of pedestrians moving in an eastbound direction, than westbound.

Conclusion: Overall, 43% of pedestrians were recorded crossing through 'moving traffic' on a weekday, compared to 28% on a weekend.

Figure 16 Traffic whilst pedestrians crossed the road, Zone B3

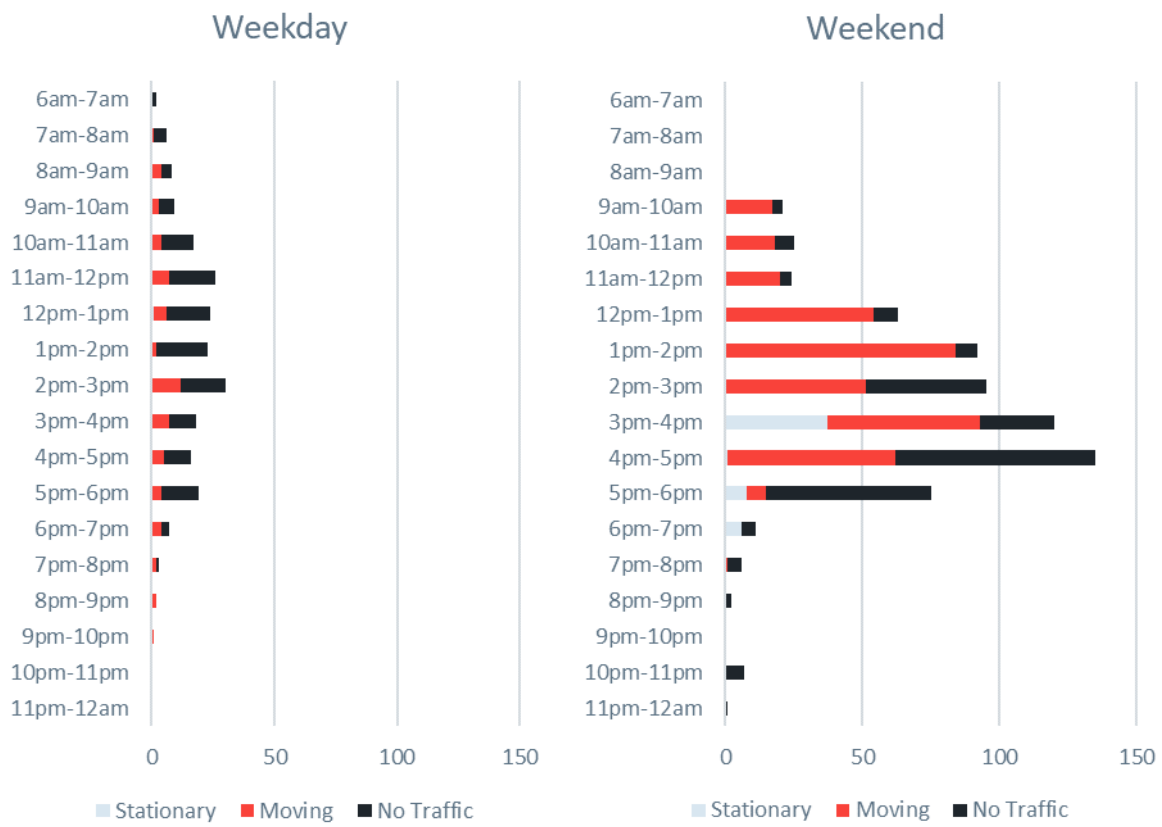


The graphs above show:

- The data shows an anomaly when nobody crossed the road on a weekday between 8pm-9pm.
- A lot more pedestrians were recorded crossing through moving and stationary traffic on a weekend (641), compared to the weekdays (59).
- As per zones discussed above (B1 and B2), the majority of pedestrians crossed in an eastbound direction (82%).

Conclusion: Whilst 23% of pedestrians were recorded crossing through moving traffic on a weekday, this increased significantly on a weekend where 61% of pedestrians were crossing through moving traffic.

Figure 17 Traffic whilst pedestrians crossed the road, Zone B4

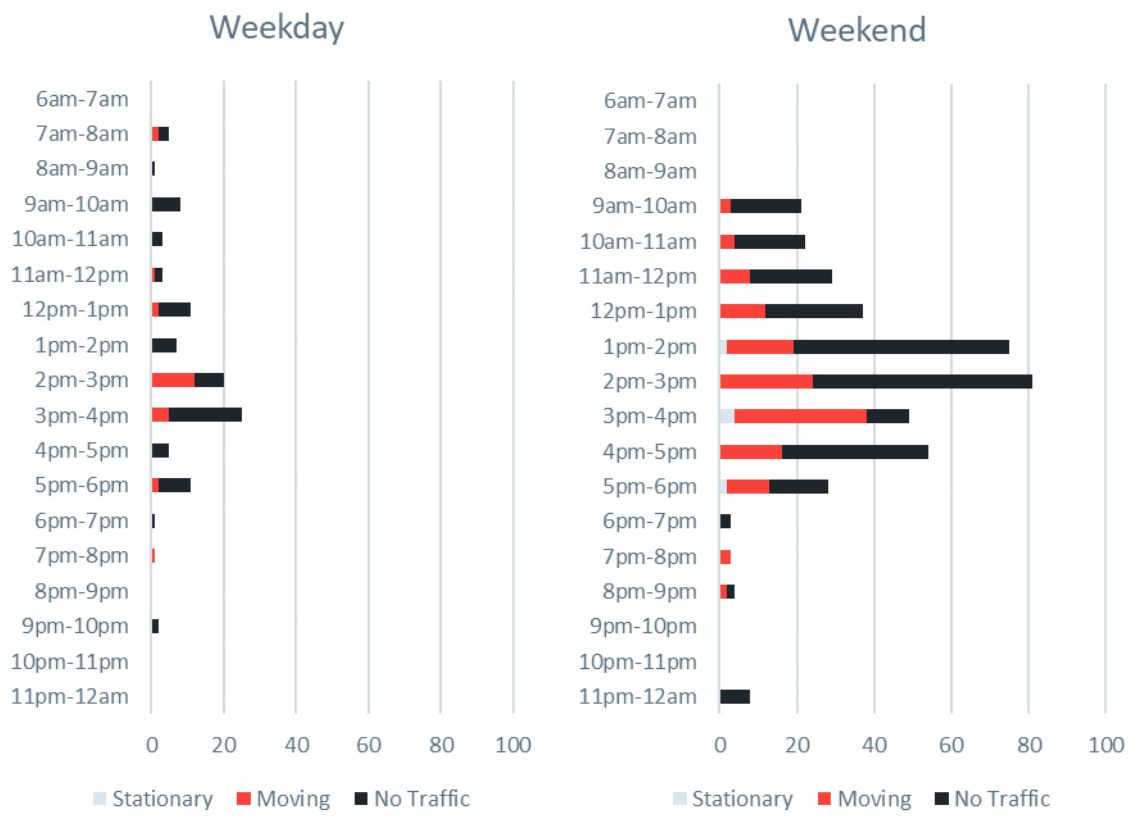


The graphs above show:

- The data shows a few anomalies when nobody crossed the road on a weekday between 10pm-12am and on a weekend between 9pm-10pm.
- There was a peak of 37 of pedestrians crossing though stationary traffic between 3pm-4pm on a weekend.

Conclusion: As per the above zone, pedestrians were much more likely to cross through moving traffic (55%) on a weekend, compared to a weekday (30%).

Figure 18 Traffic whilst pedestrians crossed the road, Zone B5

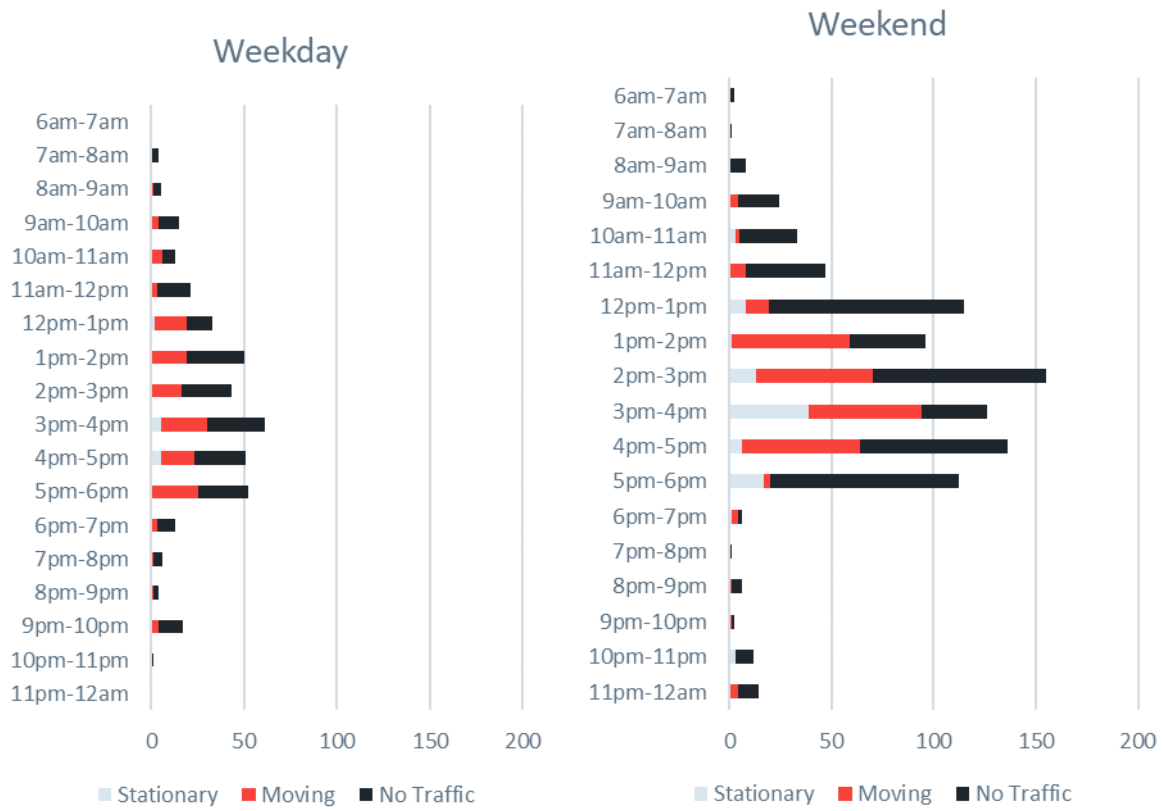


The graphs above show:

- Over both days surveyed, the majority of pedestrians (78: weekday, 272: weekend) were observed crossing through no traffic.
- No pedestrians were recorded crossing through stationary traffic on a weekday.
- Once again there are anomalies during 8pm-9pm on a weekday and 9pm-11pm on a weekend where no pedestrians were observed crossing Exhibition Road.
- Most people crossed in an eastbound direction (67%).

Conclusion: Overall, 76% of pedestrians were recorded crossing through 'no traffic' on a weekday, compared to 66% on a weekend.

Figure 19 Traffic whilst pedestrians crossed the road, Zone B6

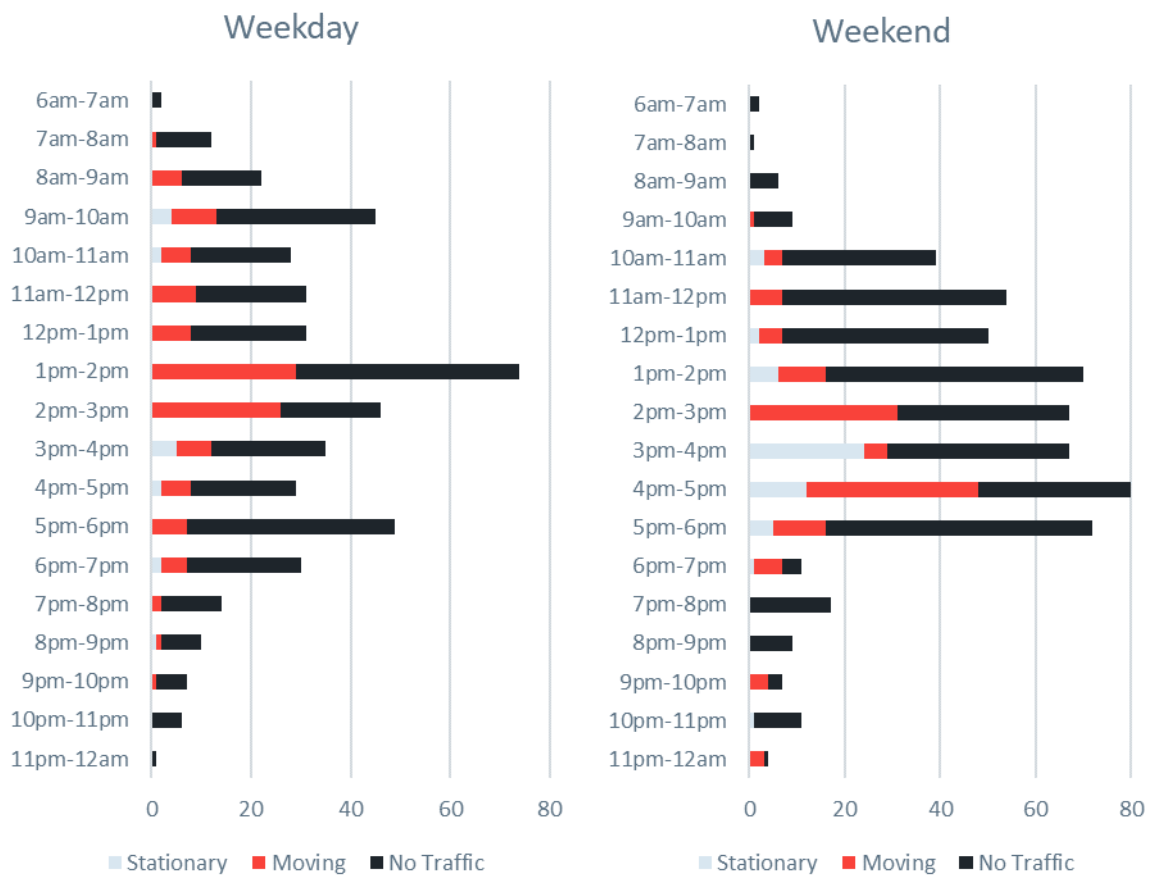


The graphs above show:

- The majority of pedestrians surveyed were recorded as crossing through no traffic. This applies to both the weekday (234) and weekend (540).
- There is also a greater percentage of people crossing through stationary traffic compared to zones B1-5, potentially linked to the proximity to the Exhibition Road / Cromwell Road traffic signals of this zone.
- In total, 389 pedestrians crossed the road on a weekday compared to 896 pedestrians on the weekend day.

Conclusion: The number of pedestrians crossing through no traffic remains consistent for both the weekday and weekend (60%), albeit there is a greater percentage of people crossing through stationary traffic (10%) on a weekend, compared to a weekday (3%).

Figure 20 Traffic whilst pedestrians crossed the road, Zone B7



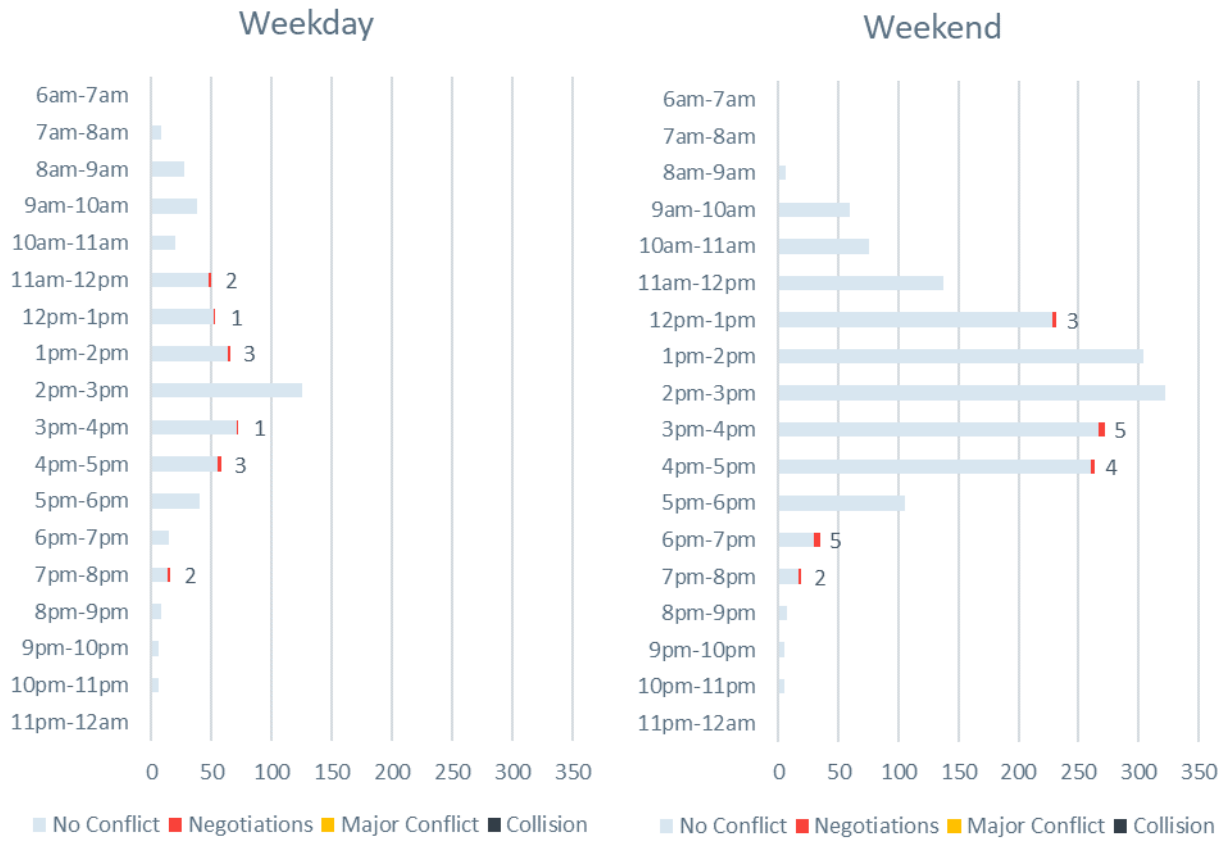
The graphs above show:

- The majority of Pedestrians cross though no traffic (333 on a weekday and 399 on a weekend).
- Pedestrians were observed crossing through stationary traffic on a more frequent basis than at other zones, linked to the zones close proximity with the traffic signals at Exhibition Road / Cromwell Road junction.
- This was more apparent on a weekend (54) than on a weekday (16).

Conclusion: Overall, 71% of pedestrians were recorded crossing through ‘no traffic’ on a weekday, compared to 69% on a weekend.

PEDESTRIAN CONFLICTS

Figure 21 Pedestrian conflict with traffic while crossing, Zone B1

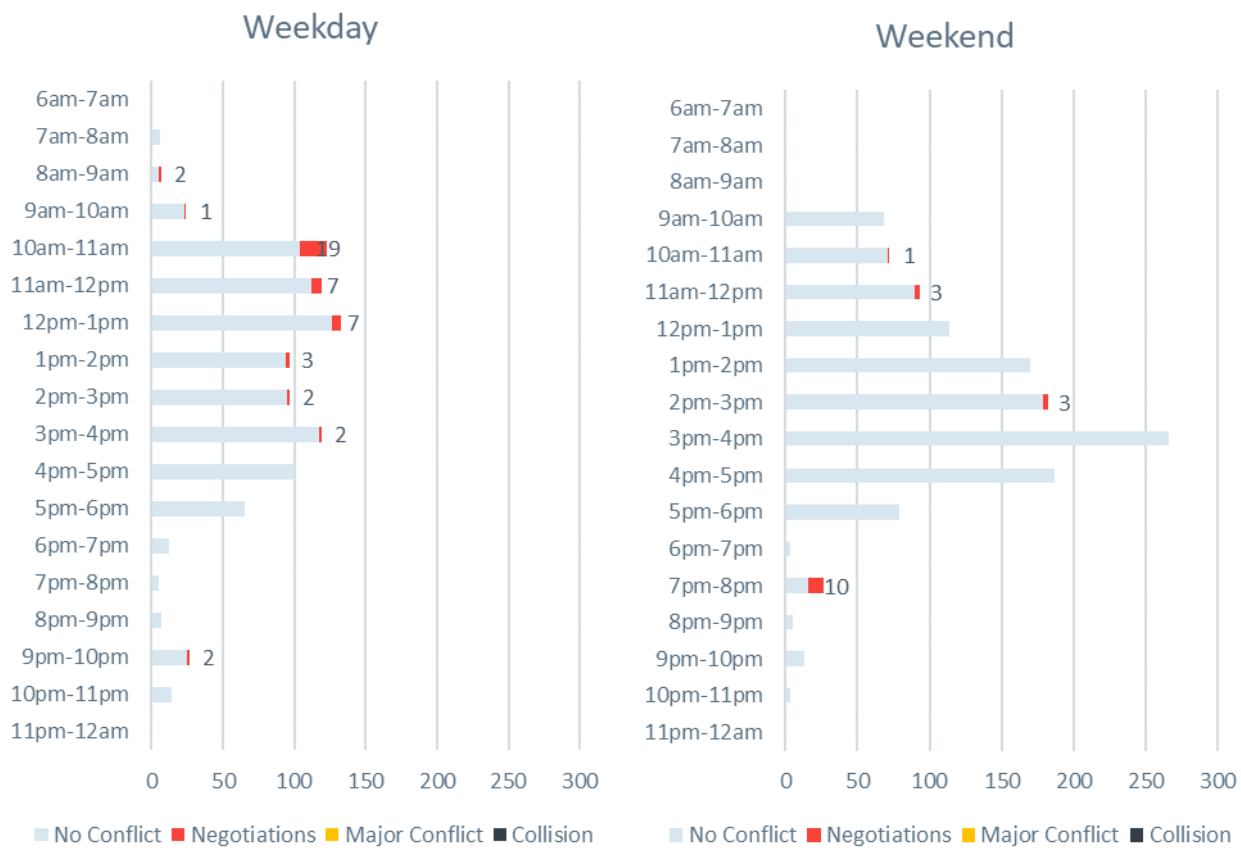


The graphs above show:

- Fewer negotiations were recorded on the weekday (12) compared to the weekend (19).
- Negotiations were recorded between 11am-8pm. There were no negotiations recorded in the early morning / late evening hours surveyed.

Conclusion: Overall, pedestrians crossing on a weekday (2%) were more likely to be involved in a negotiation than on a weekend (1.3%).

Figure 22 Pedestrian conflict with traffic while crossing, Zone B2

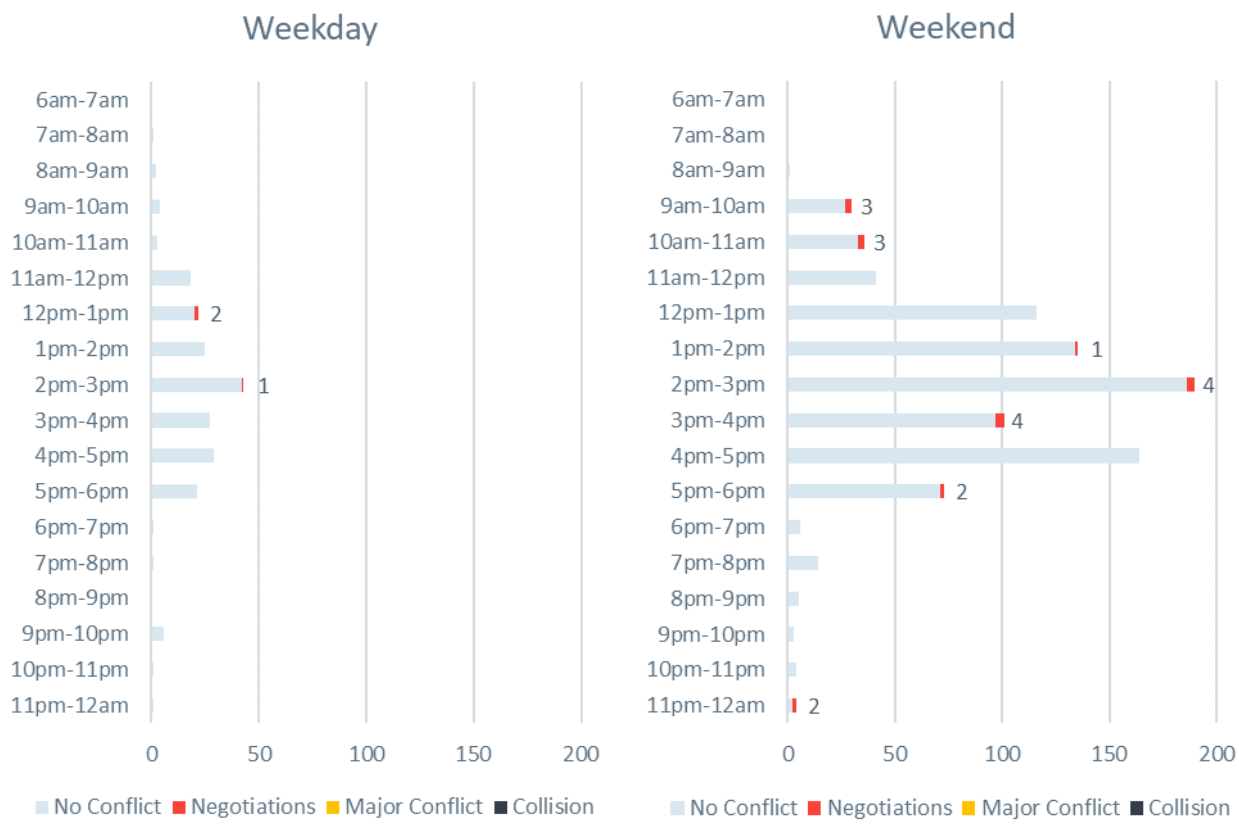


The graphs above show:

- The greatest number of negotiations recorded during the weekday was between 10am-11am (19), whereby 15% of pedestrians crossing were recorded being involved in a negotiation.
- The highest number of pedestrians involved in a negotiation took place on the weekend between 7pm-8pm, whereby 10 negotiations were recorded.

Conclusion: Overall, pedestrians crossing on a weekday (4.7%) were much more likely to be involved in a negotiation than on a weekend (1.3%)

Figure 23 Pedestrian conflict with traffic while crossing, Zone B3

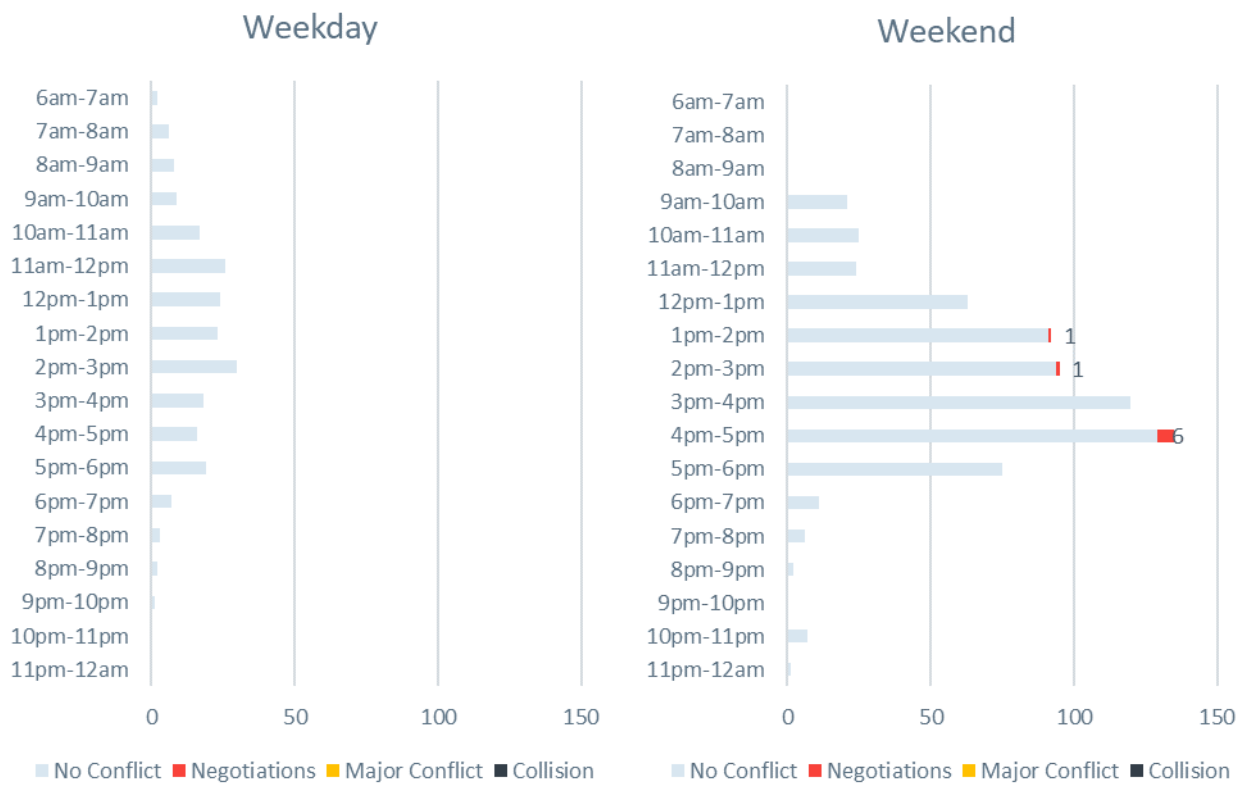


The graphs above show:

- The greatest number of negotiations was 4, which occurred between 2pm-3pm and 3pm-4pm on a weekend.
- The total number of negotiations is relatively low compared to other zones, reflecting the fact it covers a much smaller area than e.g. zone B7.

Conclusion: Overall, pedestrians crossing on a weekend (2%) were more likely to be involved in a negotiation than on a weekend (1.5%).

Figure 24 Pedestrian conflict with traffic while crossing, Zone B4

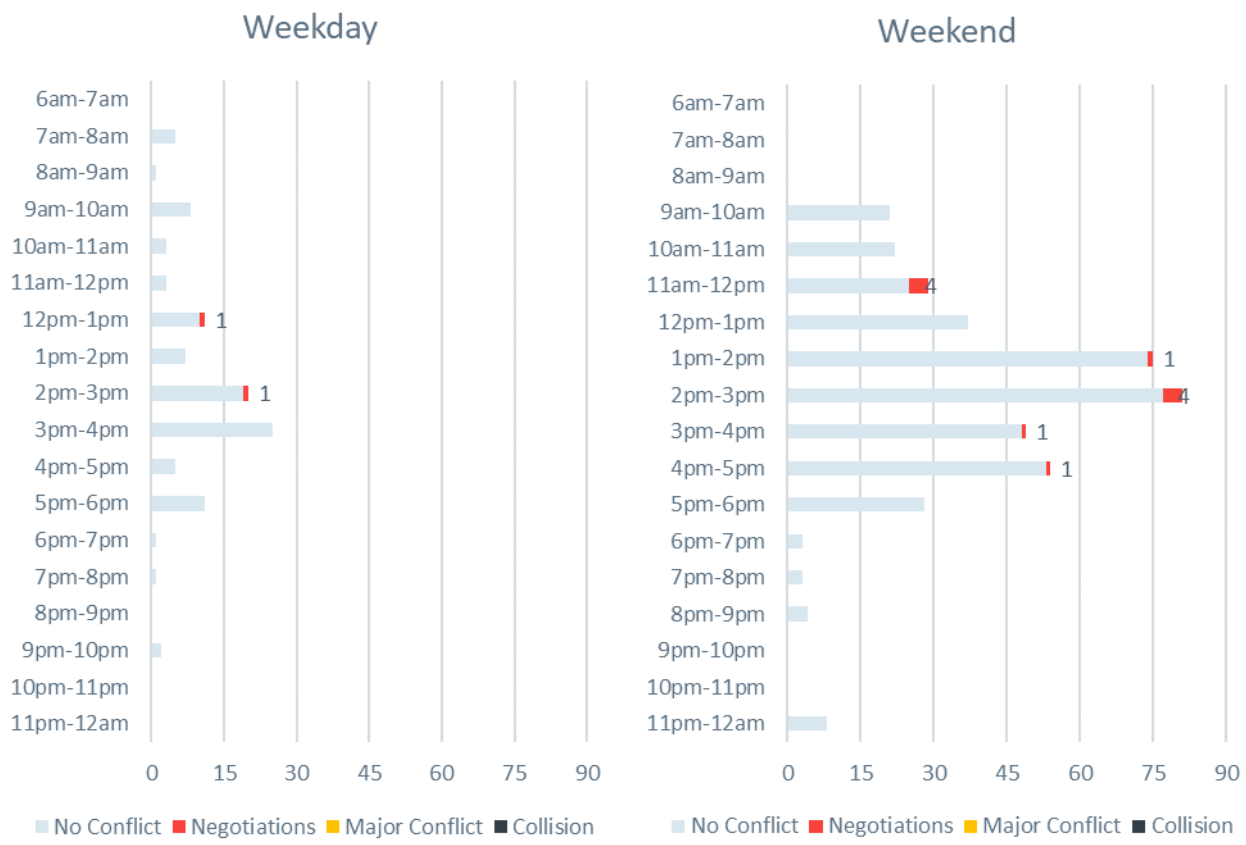


The graphs above show:

- Statistically, Zone B4 is the safest subzone (despite including a number parking bays) with no negotiations recorded on the weekday and just eight negotiations on the weekend.

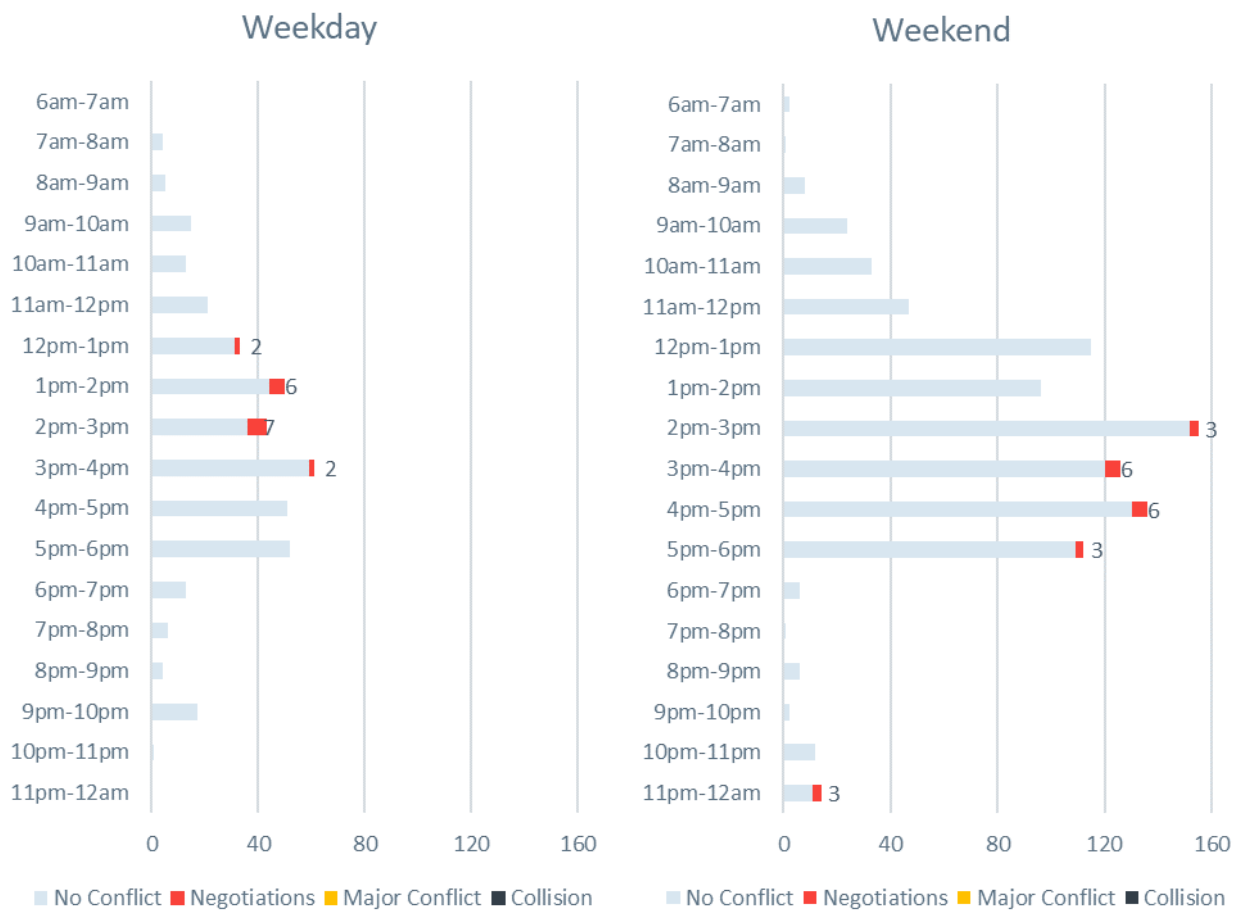
Conclusion: The majority of the negotiations (6 / 8) were recorded between 16:00 – 17:00hrs on the Saturday.

Figure 25 Pedestrian conflict with traffic while crossing, Zone B5



Conclusion: A total of 2 negotiations were recorded on the weekday (1.9%) compared to 11 (2.7%) on a weekend. This subzone has the lowest number of recorded pedestrian crossing movement.

Figure 26 Pedestrian conflict with traffic while crossing, Zone B6

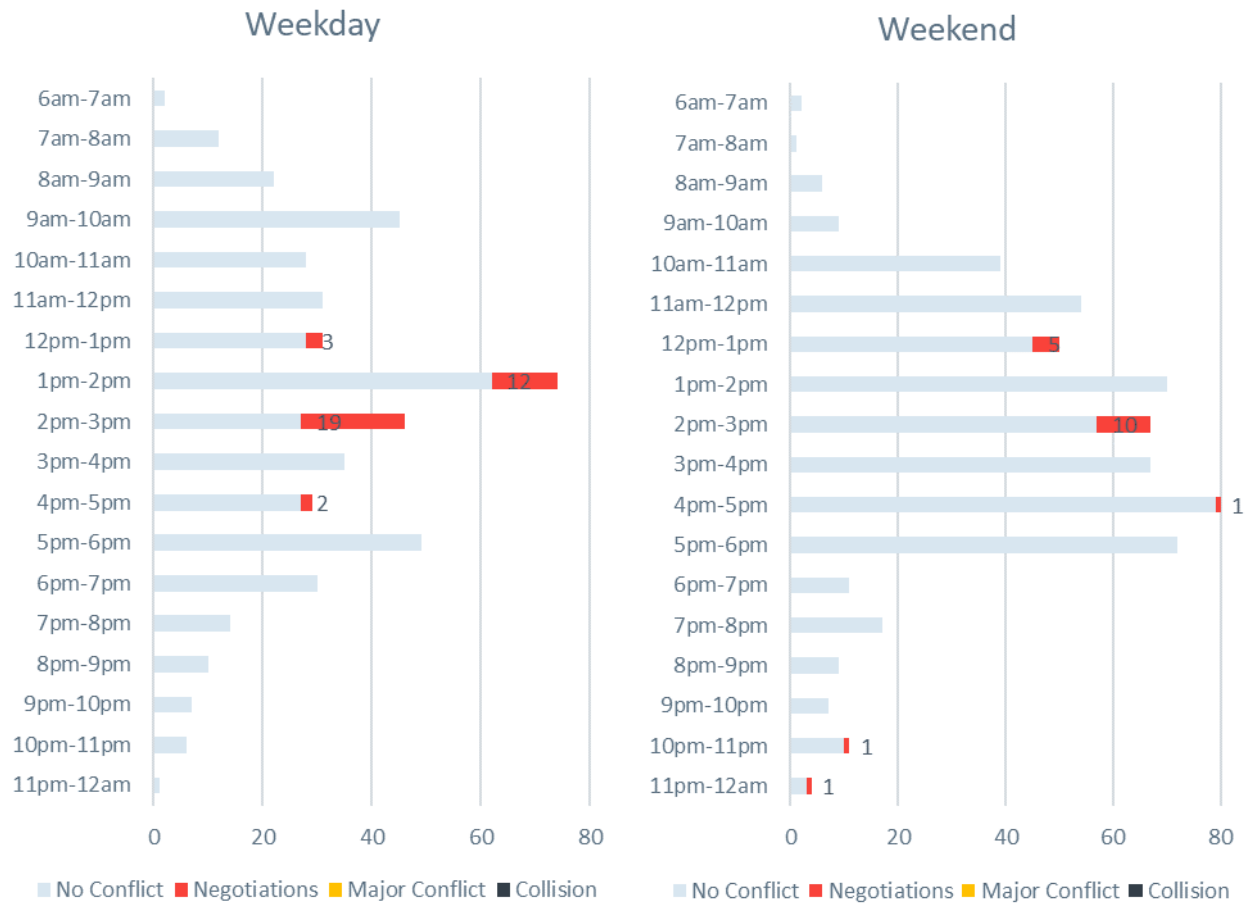


The graphs above show:

- Negotiations were recorded between 12pm-4pm on a weekday and predominantly between 2pm-6pm on the weekend

Conclusion: Although fewer negotiations were recorded on the weekday (17), the percentage of pedestrians involved in a negotiation was higher on a weekday (4.4%) compared to the weekend (2.3%).

Figure 27 Pedestrian conflict with traffic while crossing, Zone B7



The graphs above show:

- The greatest number of negotiations (19) recorded on the weekday took place between 2pm-3pm, which equated to 41% of all crossing movements.
- The majority of negotiations are concentrated during the middle of each day.

Conclusion: The percentage of pedestrians involved in a negotiation was higher on a weekday (7.6%) compared to the weekend (3.1%).

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