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Kensington Gardens, Mount Walk

Cycle and Monitoring Study for The Royal Parks
27 October 2016
Executive Summary

This chapter summarises the key findings of the study
Executive Summary

Atkins Intelligent Space has been commissioned by The Royal Parks (TRP) to undertake a pedestrian and cyclist space use assessment of Mount Walk at Kensington Gardens. The purpose of the commission was to monitor cyclist and pedestrian behaviour along Mount Walk to evaluate the impact of the installation of cycle speed calming measures along the route, in so far as the results of the study can be used as baseline evidence before the installation of these measures. The speed calming measures proposals were based on TRP experience as well as previous studies carried out by Atkins1.

To that end, the project set to review the use of Mount Walk by surveying and analysing cyclist and pedestrian flows, cyclist speeds, pedestrian comfort levels and lastly the patterns of interaction between cyclists and pedestrians. Survey took place over four days: Saturday 9th, Sunday 10th, Tuesday 12th and Wednesday 13th May 2015.

The key findings are:

Pedestrian activity (Chapter 3 - Page 15)

- Pedestrian flows on the weekend were observed to be approximately 60% higher than the weekdays. Sunday was the busiest day when on average 341 pph were observed using Mount Walk and adjacent areas. For weekdays, Wednesday was the busiest day when 234 pph on average were observed along the survey locations.
- Looking specifically at Mount Walk, the lowest flows were observed early in the morning, increasing steadily across the day. The highest flows were observed in the afternoon for both weekdays and weekends.
- Pedestrian flows along Lancaster Walk are higher compared to Mount Walk as this route is an important North /South pedestrian route.

Cyclist activity (Chapter 4 - Page 19)

- Mount Walk is popular commuter route with associate behaviour.
- In contrast to pedestrians, cyclist flows on the weekdays were observed to be slightly higher compared to the weekend (approximately 10%).
- Cyclists flows along Mount Walk are consistent along its entire length, confirming the ‘transitional space’ character of the route. Cyclists using Mount Walk are likely to use the whole length of it as part of a wider route within this part of London, in particular connecting Kensington Gardens to Hyde Park, across West Carriage Drive.
- During weekdays, we can clearly observe a commuter pattern: high flows early in the morning and late afternoon, with much lower values in between. There is a large difference between the peak hour flow (approximately 800 cyclists per hour (cph) were observed between 8:00 and 9:00) and average values during lunchtime (around 200 cph). During the 18:00 - 19:00 evening peak, approximately 600 cph were observed.
- During the weekend, the time profile is very different: a more homogeneous flow was observed, with low values early in the morning (very similar to the pedestrian profile) increasing steadily throughout the day until 18:00.
- Similar to the volume of cyclists, cyclist speed was observed to be higher during the weekday compared to the weekend. This is largely a result of the weekday commuter peak, both morning and evening. The average speed for the weekday was 12.52 miles per hour (mph) compared to 8.97 mph at the weekend.
- Analysis of cyclist speed percentage distribution show a different pattern between weekdays and weekends. At weekends, the majority of users (68%) cycle below 10mph and only a small fraction (15%) of cyclists were observed above the TRP 8 to 12mph design speed. During the weekdays the pattern is reverse, only 23% of all cyclists were observed at speeds below 10mph and 55% were observed above the TRP 8 to 12mph design speed. The table below summarises the number of cyclists according to the recorded speed and day of the week.

### Speed 2015

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<tr>
<td>10-12 mph</td>
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<td>1311</td>
<td>17.63%</td>
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<td>3632</td>
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<td>1231</td>
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<td>9074</td>
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<td>7438</td>
<td>100%</td>
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</table>

1 The studies are:


Pedestrian and cyclist shared use analysis (Chapter 5 - Page 27)

- Looking at volumes of pedestrians and cyclists, the volume of cyclists was approximately twice the number of pedestrians during the weekday. The implication is that Mount Walk can be perceived mainly as a cyclist route and discourage people of using it. At weekends, the distribution of pedestrians and cyclist is much more homogeneous (approximately 1:1).
- During the weekday, the morning peak hour is when the potential for a great number of interactions is high due to the high volume of cyclists. However, Mount Walk is not as busy for pedestrians during that time, i.e. the pedestrian peak hours do not coincide with the highest cyclists flows. This suggests that the potential for conflict is reduced, although park managers have witnessed conflict at the junction of Mount Walk and Lancaster Walk (which is a popular route for pedestrian in the early morning).
- For the afternoon period, the interface between pedestrians and cyclists varies somewhat from the morning peak. Although cyclist flows are significantly lower, pedestrian flows are higher and therefore the potential for conflict increases.
- At weekends, the distribution and volumes of cyclists and pedestrians is very similar and substantially higher compared to the weekday, suggesting that, as for the weekday afternoon period, the potential for conflict is higher.
- Analysis of cyclist speeds against pedestrian flows also shows that at the weekend, cyclist speeds decline as pedestrian flows increase, suggesting that weekend cyclists (who use the park as a leisure activity, not as a through route as the weekday commuters do) are not only aware, but also conscious of the potential conflict between pedestrians and cyclists. For weekdays, the highest cyclist speeds were recorded during the period of lowest pedestrian flows.
- We might conclude that the potential for conflict is higher at the weekends. However, we must bear in mind that the severity of the ‘collision’ between cyclists and pedestrian during the morning and afternoon weekday peak will be much higher due the speed component. Further, for weekdays, it is clear that between the morning and afternoon peak, there is more conflict in the afternoon peak period as speed remains high and pedestrian flows are substantially higher compared to the morning period.
• In terms of safety and comfort, analysis showed that there is a predominant direction for cyclists, i.e., a clear west-east direction for the weekday morning peak and the opposite in the afternoon. This pattern helps to minimise pedestrian and cyclist conflicts by the orderly use of space.

• During the weekend, when cyclist and pedestrian peak hours coincide, the fact that cyclists are not commuting but on a leisure ride (and at much lower speeds) implies that both users have the potential to share the available space without major issues.

User behaviour (Chapter 6 - Page 31)

• From observations using CCTV, Mount Walk users behave in a very confident way, high levels of perceived safety seem evident. Even if the distance between cyclists and pedestrians can often be considered small, all suggest that both cyclists and pedestrians generally behave in a calm and relaxed manner with no perceived conflict between them. Park managers have, however, witnessed cases when cyclists have collided with pedestrians as well as verbal abuse, albeit from a minority of users.

• In such an open, flat space, visibility levels are very high and both users with different agendas.

• Pedestrians walking along Lancaster Walk or other north-south routes often stop at the junctions and, possibly guided by the white line as well as the view of passing cyclists, look and wait before crossing.

• Unlike the rest of Mount Walk, Mount Gate can restrict any ‘overtaking’ in case of too many pedestrians and cyclists approaching the route. Still, there is self levelling process where both pedestrians and cyclists are aware of and find way to each other.

Pedestrian and cyclist potential conflicts (Chapter 6 - Page 31)

• As a result of its configuration, the Broadwalk and Mount Walk junction was the single location where the highest number of minor conflict was observed, most of them between 8:00 and 9:00. Most of the remaining conflicts took place along the intersections but without a specific time of the day.

• In total, 18 cases of conflict were observed during Tuesday over a period of 6 hours and 15 cases on Sunday over a period of 4 hours, giving an average of 3 and 3.75 conflicts per hour along the entire route. However, further analysis of ‘non-conflict’ cases gave a clear 99% of all cycle journeys.

• Out of all occurrences, only two cases of very close proximity were recorded. In both cases there is no indication of physical contact and both cyclists managed to stop before the pedestrian or other cyclist.

• It is concluded that, as analysed with quantitative and qualitative observations and time profiles, potential conflicts between different kind of users - and different priorities - are minimum.

Level of Service (Chapter 7 - Page 41)

Our results show that at present Mount Walk provide a sufficient clear width for the observed flows.

Conclusions and recommendations (Chapter 8 - Page 47)

Mount Walk is a popular, well used path by pedestrians and cyclists alike. From the information collected via CCTV, Mount Walk users behave in a confident and civilised manner and Mount Walk is principally a safe route.

As in many areas of the urban environment, Mount Walk does have a different character between weekdays and weekends.

During weekdays, cyclists dominate the route in particular during the morning and afternoon commute peak periods. At the weekends, a different character is observed. Whereas pedestrians use the path the same way (leisure), the ‘commuter cyclist’ no longer exists and all cyclists using Mount Walk are ‘leisure cyclists’. There is not a sharp peak of flows as observed during weekdays and the daily distribution of cyclists and pedestrians is almost identical. Cyclist speeds are much lower.

Unlike during weekdays, cyclists are not ‘single individuals’; families, group of friends and tourists were often observed and it is unlikely that the route will be perceived as a cycle route, as during the weekdays.

Most importantly, qualitative behavioural analysis and interactions along the Mount Walk suggested that both cyclists and pedestrians generally behave in a calm and relaxed manner with no perceived conflict between them. In such an open, flat space, visibility levels are very high and both cyclists and pedestrians can see each other with enough time to anticipate and adapt to the situation in a safe manner.

It has also been observed that, when the path width is not enough to host all, both cyclists managed to stop before the pedestrian or other cyclist.

Despite being a popular, well used path, it could be argued that during the weekday, the dominance of cyclists and their speed could create a perception to the public that Mount Walk is essentially a cycle route where pedestrians have less priority, in disagreement to TRP Pathway Code of Conduct. This may dissuade pedestrians using the route. Further, we can conclude that although the potential for conflict albeit very small is higher at the weekends, the severity of the ‘collision’ between cyclists and pedestrian during weekdays is likely to be higher due the speed component.

Lastly, it is important to highlight the implications of the findings of this study on vulnerable user groups. Although the pedestrian survey did not make a distinction according to user groups, naturally any potential conflict between cyclists and pedestrians, even though minor, will have a far more significant impact on vulnerable people.

Recommendations

Speed calming measures along the route are likely to reduce cyclist speeds at key locations along the route and/or act to increase awareness of other users at conflict points. This may reduce the speed of commuter cyclists, the majority of whom were identified in this report as travelling faster than the TRP 8 to 12mph design speed. It is also concluded that the differentiated surface finish is very likely to reinforce the safety of Mount Walk for all users as well as reiterate the balance between cyclists and pedestrians. It is not considered that the measures proposed will negatively impact the appeal of the route for cyclists, and it may improve the appeal for pedestrians.

Further details are provided within the analysis and commentary that follows.
Introduction

This chapter summarises the goals of our commission, Kensington Gardens background and current conditions of Mount Walk
Kensington Gardens, Mount Walk

Project aims

Atkins Intelligent Space is a consultancy company providing expertise on pedestrian movement and space use. We work to help improve public space, minimise social risks and maximize economic benefits. The practice uses science-based methods to turn pedestrian movement from an undervalued resource into a tangible and manageable asset.

As a business operation within Atkins since 2007, Intelligent Space is based in central London and carries out projects on a national and international level. Since Atkins Intelligent Space foundation, we have been working for renowned clients among government bodies, property owners, developers and consultants.

Developing public spaces that are vibrant and economically sustainable depends on understanding the problems that are faced and created by pedestrians and other space users. Atkins Intelligent Space state of the art tools and processes provide stakeholders in urban developments of all scales with effective strategies for pedestrian movement.

Atkins Intelligent Space and Kensington Gardens, Mount Walk

Atkins Intelligent Space has been commissioned by The Royal Parks (TRP) to undertake a pedestrian and cyclist space use assessment of Mount Walk at Kensington Gardens.

Mount Walk is a shared use path and is currently part of a cycle route that connects Kensington Gardens to the west and Hyde Park to the east. Mount Walk is a popular route for both commuter and leisure cyclists. Mount Walk is also a popular path for those visiting Kensington Gardens due to its strategic position linking the Serpentine Gallery to Kensington Palace, two attractions with great historical significance within the park.

In line with The Royal Parks “Shared Use Routes Criteria for Success and The Pathway Code of Conduct”, pedestrians have priority over all other users of pathways. However, the need to provide a safe environment for members of the public, as well as cyclists, is paramount for the performance of the park; in particular with the potential for increase in the number of cyclists using the route as a result of the proposed East West Cycle Superhighway.

One of the main concerns by the park managers is potential for conflict and the perception of conflict by park users, specially when some users feel intimidated by others and could gradually stop using Mount Walk.

The objective of the study is therefore to collect evidence of various interactions along Mount Walk, observing pedestrians and cyclist’s behaviours and any potential conflict between the two so that the park managers, combined with TRP own experience and previous studies carried out by Atkins, can make an informed assessment on the need for speed calming measures along the route and what the design of the proposed measures should be.

To that end, the following tasks were undertaken:

- Inception and progress meetings with members of The Royal Parks management team.
- Mount Walk existing conditions survey.
- Video footage surveys of pedestrian and cyclist flows and overall patterns of space use.
- Automatic Traffic Counter (ATC) cyclists speed survey.
- Data analysis of all collected data including users interaction and pedestrians and cyclists comfort assessment.
- Report and recommendations.

This report is organised as follows:

- Chapter 1: Executive summary page 05
- Chapter 2: Introduction page 09
- Chapter 3: Pedestrian activity page 15
- Chapter 4: Cyclist activity and speed analysis page 19
- Chapter 5: Pedestrian and cyclist shared use analysis page 23
- Chapter 6: Users behaviour & potential conflict analysis page 31
- Chapter 7: Level of Service page 41
- Chapter 8: Conclusions and recommendations page 47

Introduction

Kensington Gardens was originally the western section of Hyde Park, which had been created by Henry VIII in 1536 to use as a hunting ground. It was separated from the remainder of Hyde Park in 1728 and designed by Henry Wise and Charles Bridgeman in order to form a landscape garden, with features including the Round Pond, formal avenues and a sunken Dutch Garden. The land surrounding Kensington Gardens was predominantly rural and remained largely undeveloped until the Great Exhibition in 1851.

Many of the original features survive along with Kensington Palace. Through time, new buildings were added such as the Albert Memorial, the Serpentine Gallery, the Speke’s monument as well as the Diana, Princess of Wales’ Memorial Playground, which was opened in June 2000. At present, Kensington Gardens covers 242 acres. In 2014, over 10.3 million people visited the park.

The adjacent figure shows the current layout of Kensington Gardens focusing on the stretch of Mount Walk between The Broad Walk and the West Carriage Drive.

Figure 1: Kensington Gardens, Mount Walk

Key
- Queensway Underground station
- Bus stop
- Cycle hire station
- Public toilet
- Disable public toilet
- Cafe
- Green space
- Footpath
- Building
- Road
- Water

Mount Walk

Currently Kensington Gardens offers two main shared use cyclist and pedestrian pathways - Broad Walk and Mount Walk. Mount Walk runs from Broad Walk to West Carriage Drive (leading to Hyde Park).

Along the route, in addition to the intersections with Broad Walk and West Carriage Drive, another important intersection is the one to Lancaster Walk, which connects two important landmarks: The Albert Memorial and The Physical Energy Statue (Figure 1 - Page 11) and it is also a key pedestrian route for commuters.

Nowadays, Mount Walk is a well established cycle route that forms a key east-west route for cyclists, which is particularly important for commuter cyclists and popular with leisure cyclists. The route provides a continuous connection on an off-road route and therefore has levels of high perceived safety with cyclists, whilst remaining popular with pedestrians and overall park users. Mount Walk is classified as a TRP Quietway Cycle Route with a design speed of 8 to 12mph, as such, Mount Walk is not a highway style route but a ‘parkland path’.

Mount Walk is in good condition and well maintained. The route is very pleasant, surrounded by trees with extended vistas to important park landmarks. The route is essentially flat and covered with tarmac and bond gravel sections, a finish entirely suitable for cyclists and pedestrians, making it a convenient and safe route for park users. Despite being almost 800 m long, there are no seats or benches along the route.
The Royal Parks are planning to install speed calming measures along Mount Walk late in 2015.

The interventions are a combination of inlaid granite sett rumble strips (5 or 6 setts deep) with no vertical deflection along the route represented by the black vertical lines (Figure 6) and tar spray and chip surface treatments, which are bounded by an inlaid granite sett rumble strips with no vertical deflection on any of the junction treatments, represented by the black areas along the junctions\(^1\).

Our study intends to identify current pedestrian and cyclist use of Mount Walk and identify key issues for shared use. This will assess the need for and suitability of speed calming measures.

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\(^1\) Ben Carter TRP Project Delivery Officer email communication.
Pedestrian activity

This chapter describes the observation studies that have been undertaken to examine patterns of space use within the study area.
Pedestrian flows: gate counts

Methodology

Quantitative analysis of pedestrian flows levels along Mount Walk and adjacent paths was carried out in order to establish the issues and opportunities presented by the current path configuration in the study area.

Data on pedestrians flows was collected at 17 locations, as illustrated in Figure 7. Data was collected over four days: on Saturday 9th, Sunday 10th, Tuesday 12th and Wednesday 13th May 2015, from 8:00 to 18:00 continuously via video footage.

This enabled the study of pedestrian activity on a typical weekday day including morning peak, lunch time and evening peak periods as well as during a typical weekend when the number of people enjoying public spaces is normally higher.

The weather was partially overcast with sunny spells on all four days, except for Tuesday when there was light rain in the morning. The minimum and maximum temperatures ranged from 8°C to 19°C.

Further data was collected on Sunday 19th and Wednesday 22nd July to investigate pedestrian flows until 20:00. On this occasion, the survey was restricted to locations P8 and P9 (Figure 7) and information was collected from 17:00 to 20:00. The weather was partially overcast with sunny spells on both days, and light rain on Wednesday for a period of five minutes. The minimum and maximum temperatures ranged from 13°C to 24°C.

The relevant results of the 17:00 to 20:00 survey are discussed in page 18.

Figure 7: Pedestrian flow survey locations
Pedestrian activity

Pedestrian flows

Generally, pedestrian flows on the weekend were observed to be higher than the weekdays. Sunday was the busiest day when on average (for all locations) 341 pph were observed using the paths. For weekdays, Wednesday was the busiest day when 234 pph on average were observed along the survey locations. The average flows for Tuesday were 175 pph and Saturday 270 pph.

The comparison between Sunday and Wednesday illustrates that, although the park is busier at the weekend (approximately 60%), pedestrian flows during the week are still significant.

Pedestrian flows along Lancaster Walk are higher compared to Mount Walk as this route is an important North / South pedestrian route on both days.

Figure 8: Pedestrian average flows - Wednesday (8:00 to 18:00)

Figure 9: Pedestrian average flows - Sunday (8:00 to 18:00)

Legend
Pedestrians per hour (pph)

- 440 to 1200
- 310 to 440
- 270 to 310
- 210 to 270
- 100 to 210
- 0 to 100
Pedestrian flow time profile

Looking specifically at Mount Walk (Locations P5 to P10 in Figure 7), analysis of pedestrian flows shows:

- The lowest flows - less than 100 pph - were observed early in the morning, which demonstrates that Mount Walk is not a major route for commuters.
- Flows are higher in the afternoon, in particular at weekends.
- Flows are almost double during the weekend (peak: the equivalent of 414 pph at 15:45 on Sunday) compared to weekdays (peak: the equivalent of 211 pph at 15:00 on Wednesday). This suggests that Mount Walk is more relevant as a leisure route working as a ‘destination’ for those coming to the park, rather than for daily trips working as a through route.
- The average flows for Mount Walk only are: 108 pph on Tuesday, 159 pph on Wednesday, 232 pph on Saturday and 272 pph on Sunday.

Analysis of pedestrian data collected until 20:00 shows a steady decline of pedestrian flows at the weekend after 18:00. During weekdays, and likely to be a pattern associated with the summer, we observed a small increase in the number of park users late in the day, a large percentage of those were runners using the park after 19:00 (Figure 7 - Locations P8 and P9 only).1

To investigate the impact of commuters on Mount Walk, we correlated flows along Mount Walk (Locations P5 to P10 as in Figure 7) against two parallel paths (Locations P16 and P17). The graph below shows that pedestrian flows during the early morning period is low for all locations, increasing steadily across the day (further discussed in the next page).

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1 Data collected in July was benchmarked against data collected in May for the 17:00-18:00 time period. There was a very small variation between the two data sets, flows in May (including Wednesday and Sunday) were 4% lower compared to July, which we believe is an acceptable variance and we were confident that we could process the analysis despite the gap in data collection. Just for illustration, in May pedestrian flows were 47% higher on Wednesday compared to Tuesday and 17% higher on Sunday compared to Saturday.
Cyclist activity and speed analysis

This chapter describes the observation studies that have been undertaken to examine cyclist patterns of space use within the study area.
Cyclist flows and speeds gate counts

Methodology

Quantitative analysis of cyclist flows levels along Mount Walk and adjacent paths was carried out in order to establish the issues and opportunities presented by the current path configuration. In conjunction with pedestrian flows volumes, it allows us to examine how the cyclist volume and speed affects the frequency of interaction between cyclists and pedestrians and pedestrian safety.

Data on cyclist flows were collected at 13 locations, as illustrated in Figure 13. Data was collected over four days coinciding with pedestrian flows: on Saturday 9th, Sunday 10th, Tuesday 12th and Wednesday 13th May 2015, from 8:00 to 18:00 continuously via video footage.

Further, cyclist speed data was collected on Sunday 10th and Tuesday 12th May from 8:00 to 18:00 continuously. Data was recorded using a special thin-walled cycle tube (ATC) fixed on the path. Data was collected at five locations, as illustrated in Figure 14.

Like wise for pedestrians, further information on cyclist flows was collected on Sunday 19th and Wednesday 22nd July to investigate the pattern of cyclist flows until 20:00. The survey was restricted to locations P8 and P9 and data was collected from 17:00 to 20:00.

The relevant results of the 17:00 to 20:00 survey are discussed in page 23.
Cyclist flows

Wednesday was the busiest day when on average (for all locations) 256 cph were observed using the paths. At the weekend, Sunday was the busiest day when 236 cph were observed along the survey locations. The average flows for Tuesday were 205 cph and Saturday 152 cph. Overall, flows at the weekdays were 20% compared to weekend.

Flows along Mount Walk are consistent along its entire length, confirming the ‘transitional space’ character of the route. In contrast to pedestrians, cyclists are only allowed on a limited number of paths within Kensington Gardens. Cyclists using Mount Walk are most certain to use the whole length of it as part of a wider route within this part of London, including Mount Walk and Rotten Row along Hyde Park. This is a very popular route and underlines the potential conflict between cyclists and vehicles across West Carriage Drive.

Cyclist flows (average all day) are illustrated in Figures 15 and 16, and for the identified peak time in Figures 17 and 18, shown in the following page.
Cyclist flows during peak time

Figure 17: Cyclists average flows - Wednesday peak morning (8:00 to 9:00)

Figure 18: Cyclist average flows - Sunday peak afternoon (15:00 to 16:00)
Cyclist activity and speed analysis

Cyclist flows time profile

Looking specifically at Mount Walk (Locations C5 to C10 in Figure 13), analysis of cyclist flows along Mount Walk shows two distinct patterns:

- During weekdays, we can clearly observe a commuter pattern: very high flows early in the morning and late afternoon, with much lower values in between. There is a large difference between the peak morning flow (821 cyclists per hour were observed between 8:00 and 9:00) and values during lunchtime (around 200 cph). Cyclist flows peak at 8:30 when 222 cyclists were observed over 15 minutes (equivalent of 888 cph), followed by a second peak at 19:00.

- During the weekend, the time profile is very different: a more homogeneous flow was observed with low values early in the morning increasing steadily throughout the day (up to the Sunday peak at 15:30 when the equivalent of 498 cph were observed).

- The average flows for the survey locations were: 265 cph on Tuesday, 327 cph on Wednesday, 201 cph on Saturday and 306 cph on Sunday. Flows on Tuesday could have been smaller than expected as rain was forecasted for the day.

- Mount Walk is a useful path for more than one kind of cyclist: commuters on weekdays and leisure cyclists at the weekend.

- The cyclist weekend time profile is very similar to the pedestrian profile (further discussed in Chapter 5).

Analysis of cyclist data collected until 20:00 shows a steady decline of flows at the weekend after 18:00. During weekdays cyclists flows increase until 19:00 (second peak of the day), falling sharply afterwards. During the 18:00 - 19:00 time period, 605 cph were observed (Figure 20).

---

1 Based on Wednesday data.
Cyclist speed analysis

The adjacent images show the average speed for Tuesday and Sunday along Mount Walk, which has a design speed, for this particular section, between 8 to 12 mph. It is important to note that, being a 'quietway rote', speed is not a priority.

Similar to the volume of cyclists, cyclist speed was observed to be higher during the weekday compared to the weekend. This is largely a result of the weekday commuter peak, both morning and evening. The average for the weekday is 12.52 miles per hour compared to 8.97 mph at the weekend.

A previous study by Atkins Intelligent Space recorded an average speed of 10 mph along the Broad Walk at the weekend and 12 mph at the weekday during the evening peak (compared to 11.61 mph for the current study in Mount Walk). These results suggest that cyclist speeds have not greatly improved over the six year period.

As far as location goes, the pattern is very similar to both weekday and weekend: the lowest speeds were recorded in the mid section of Mount Walk (possibly because of three intersections close to each other) and the highest speed in the stretch between Lancaster Walk and the access to Serpentine Gallery. Nevertheless, the variation is generally small.

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Figure 21: Cyclist average speed - Tuesday (miles per hour)

Figure 22: Cyclist average speed - Sunday (miles per hour)

2 Between 17:00 and 18:00.
Cyclist activity and speed analysis

Cyclist speed analysis

Cyclist speed time profile

Further analysis shows that cyclist speeds are consistently higher on weekdays, independently of the hour of the day and of location (Figures 24 to 27)\(^1\).

For both weekdays and weekends, the maximum speed was recorded early in the morning, following a similar pattern for the rest of the day (Figure 24).

The maximum speed recorded was 26.85 mph (one individual at 8:10 on Tuesday at location S4 - Figure 14 corresponding to approximately 4 times the minimum design speed), and speeds of this nature will definitely reduce safety on the route and impact upon the enjoyment of other park users given that the path is shared.

However, when we look at the percentage distribution, we can see a very different pattern between weekdays and weekend. The table below summarises the percentage distribution according to the recorded speed: At the weekend, the majority of users (68%) cycle below 10mph\(^2\) and only a small percentage (15%) cycle above the TRP recommended 8 to 12mph design speed\(^3\). During the weekdays, however, the pattern is reverse; only 23% of all cyclists cycle at speeds below 10mph and 55% cycle above the TRP recommended 8 to 12mph design speed. These results are clear evidence to justify calming measures along Mount Walk.

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**Table 1: Percentage Distribution of Cyclist Counts by Speed Band**

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<th>Speed Band</th>
<th>Weekday Count</th>
<th>Percentage</th>
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<td>10 mph and below</td>
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<td>5032</td>
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<td>21.57%</td>
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<td>17.63%</td>
</tr>
<tr>
<td>12-16 mph</td>
<td>3632</td>
<td>40.03%</td>
<td>945</td>
<td>12.71%</td>
</tr>
<tr>
<td>16-20 mph</td>
<td>1231</td>
<td>13.57%</td>
<td>153</td>
<td>2.06%</td>
</tr>
<tr>
<td>20 mph and above</td>
<td>140</td>
<td>1.54%</td>
<td>7</td>
<td>0.09%</td>
</tr>
<tr>
<td>Total</td>
<td>9074</td>
<td>100%</td>
<td>7438</td>
<td>100%</td>
</tr>
</tbody>
</table>

---

\(^1\) The average cyclist speed has been plotted against the maximum and minimum speeds based on the top and bottom 5% (Figure 25). Taking the highest/lowest 5% helps to normalise against outliers for very high speeds such as those >30mph and very low ones such as <0.5 mph.

\(^2\) 10mph was selected based on speed signs suggesting a max speed of 10mph in Kensington Gardens.

\(^3\) Personal communication with TRP Project Delivery Officer.
Cyclist speeds and pedestrian flows analysis

Cyclists and pedestrians comparison

As a shared use space, it is relevant to compare these speed variations in relation to pedestrian flows.

Interestingly enough, at the weekend, cyclist speed decline as pedestrian flows increase (Figure 29) suggesting the cyclists are not only aware, but also conscious of the potential conflict between pedestrians and cyclists.

For weekdays, the graph suggests a potential lack of conflict. As cyclist speeds remain ‘high’, pedestrian flows remain ‘low’ in comparison to each other. However, it is clear that between the morning and afternoon peak, there is more conflict in the afternoon peak period as speed remains high and pedestrian flows are substantially higher compared to the morning period (Figure 28).

Figure 28: Average speed along the day against and average pedestrians flows (Tuesday)

Figure 29: Average speed along the day against and average pedestrians flows (Sunday)
Pedestrian and cyclist shared use analysis

This chapter compares the use of Mount Walk between pedestrians and cyclists.
Pedestrians and cyclists combined flows analysis

As part of our analysis, the next sections makes a direct comparison of both pedestrian and cyclist flows along Mount Walk and adjacent paths.

Relatively speaking, Mount Walk can be perceived mainly as a cyclist route. Although much of this pattern can be explained by how the routes are managed (Mount Walk is one of the very few routes where cyclists can ride and therefore this will channel users onto one path. Pedestrians have a much wider choice of routes and all suggest that they explore and use most paths of the park similarly, nonetheless it is important to note the potential scenario where pedestrians might avoid Mount Walk altogether due to the sheer number of cyclists.

Comparing pedestrian and cyclist flows

Looking at the figures for pedestrian and cyclist flows together, we find that movement patterns are very different for weekdays and the weekend: whereas cyclist flows are twice as high as pedestrian flows during the week, they are rather comparable during the weekend, below.
Shared Use in Mount Walk

Different types of cyclists according to time profiles

Time profiles complement the previous remark and help understand the type of cyclists and pedestrians using Mount Walk. Understanding the type of cyclists and pedestrians is crucial to considering their needs, priorities and use of Mount Walk.

With peak hours around 8:30 and then again in the afternoon, cyclists on weekdays are clearly commuters. On the contrary, cyclists during the weekend show the same time distribution as pedestrians, which suggest they are ‘leisure cyclists’, who cycle less fast and often in groups.

Analysis of the data collected until 20:00 shows a steady decline of flows at the weekend after 18:00. During weekdays cyclists flows increase until 19:00 (second peak of the day), falling sharply afterwards. During the 18:00 - 19:00 time period, 605 cph were observed (Figures 35 and 36).

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Figure 33: Cyclist and pedestrian time profile (average flow per hour): Wednesday (8:00 to 18:00 along Mount Walk)

Figure 34: Cyclist and pedestrian time profile (average flow per hour): Sunday (8:00 to 18:00 along Mount Walk)

Figure 35: Cyclist and pedestrian time profile (average flow per hour): Wednesday (8:00 to 20:00 locations P8/C8 and P9/C9 only)

Figure 36: Cyclist and pedestrian time profile (average flow per hour): Sunday (8:00 to 20:00 locations P8/C8 and P9/C9 only)
Shared Use in Mount Walk

Pedestrian and cyclist compatibility

On weekdays, the morning peak hour is when the potential for a great number of interactions is high, due to the high volume of cyclists. Conversely, from previous analysis, Mount Walk is not as busy for pedestrians during that time, i.e., the pedestrian peak hours do not coincide with the highest cyclists flows. This means that the potential for conflict is reduced.

For the afternoon peak, the interface between pedestrians and cyclists varies somewhat from the morning peak. Although cyclist flows are significantly lower, pedestrian flows are higher and therefore the potential for conflict increases.

It is speculated nonetheless that a number of pedestrians might be discouraged to use Mount Walk as a direct result of the high flows of cyclists during weekdays peak times (and the cyclists ‘high’ speed).

Directional flows

Looking at Mount Walk as an east-west connection, it is also relevant to analyse the predominant direction of their users. In terms of safety and comfort, it seems evident that a combination of high flows in both directions would increase the risk of conflict and discomforts.

In order to carry out the analysis from 8:00 to 20:00 to incorporate morning and evening peak for weekdays, we limited the analysis to Locations P8/C8 and P9/C9. Analysis shows a clear dominance of eastbound movement for cyclists during morning peak on weekdays and the reverse (as expected) for the afternoon peak. Interestingly, pedestrian analysis shows an eastbound movement throughout the day for both weekdays and weekends (Figures 37 and 38). This suggests that any potential conflict between cyclists and pedestrians is further minimised as cyclists ride following one single direction.

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1 Refer notes pages 16 and 20.
2 The shift from eastbound to westbound happens at 15:00.
Users behaviour and potential conflict analysis

This chapter provides an assessment of user behaviour along the route including a study of conflicts and interactions
User Behaviour

Methodology

Qualitative behavioural analysis and interactions along the Mount Walk was carried out in order to establish the constrains and opportunities presented along the route.

The analysis took the form of high quality and systematic observations using CCTV footage. The behavioural surveys aimed to provide a robust understanding of current pedestrian and cyclist movement patterns and to assess how effective the current design meets users’ needs and, if not, what has to be addressed before design interventions are implemented along the Mount Walk route.

To coincide with the days when information on cyclist speed was collected, information on pedestrians and cyclists interactions and general behaviour was collected on Sunday 10th and Tuesday 12th May. On Tuesday, the footage was analysed over three time periods: 8:00 to 10:00, 12:00 to 14:00 and 16:00 to 18:00. On Sunday, the analysis focused on two time periods: 12:00 to 14:00 and 16:00 to 18:00. In total, 80 hours of CCTV data were studied. For the results of the analysis, Mount Walk was divided into five areas, as seen in Figure 39:

- Area A: Broad Walk and Mount Walk junction
- Area B: Round Pond stretch
- Area C: Lancaster Walk junction
- Area D: Serpentine Gallery link
- Area E: Mount Gate and West Carriage Drive

Capacity analysis

Figure 40 summarises the maximum capacity of Mount Walk as observed during the CCTV footage exercise. The maximum capacity for the path has been observed following four main types of configuration, further illustrated in Figures 41 to 46:

- 5 pedestrians
- 4 pedestrians and 1 cyclist
- 3 pedestrians and 2 cyclists
- 4 cyclists
General comments

Qualitative observations provide a rich complementary insight to quantitative description. CCTV camera records have allowed us to observe a variety of user behaviours, both on weekday and weekend and at different hours.

Some key conclusions are:
• Mount Walk users behave in a very confident way, good levels of perceived safety seem evident.
• Even if the distance between cyclists and pedestrians can often be considered small, from the information collected via CCTV, it is suggested that both cyclists and pedestrians behave in a calmed and relaxed manner with no perceived conflict between them.
• In such an open, flat space, visibility levels are very high and both cyclists and pedestrians can see each other presumably with enough time to anticipate and adapt to the situation in a safe way.
• It was also noticed that cyclists frequently use the bicycle bell to warn pedestrians of their approach.
• It has also been observed that, when the path width is not enough to host all, both cyclists and pedestrians often use the adjacent grass space to overtake or avoid others (Figures 45 and 46) for a short period of time.
• Taking advantage of adjacent grass space, cyclists and pedestrians overtake groups of others even if the path width is not completely used. This has been observed often when those on the path are especially slower and/or show unpredictable movement behaviours, e.g. when pedestrians stop to check directions or to assist their children, cyclists use the grass.
Area A: Broad Walk and Mount Walk junction

The junction of Broad Walk and Mount Walk is possibly the most complex one due to the number of different routes and turns that both pedestrians and cyclists can take. Broad Walk is very wide and overall there are good levels of visibility at any given point within the junction, which facilitates pedestrians and cyclists to coordinate their movements.

- During the weekday peak morning, there is a constant flow of cyclists coming from Broad Walk turning left on Mount Walk (Figure 47) as well as those crossing Broad Walk (Studio Walk / Mount Walk route). It is clearly a commuter flow and often cyclists drive on an ordinary manner, one behind the other.

- During the same time period, many pedestrians walk south from Broad Walk passing the junction to Mount Walk. However, pedestrians tend to 'stop and wait' until they feel that is safe to cross (Figures 49 and 50). This particular behaviour, however, can lead to a number of pedestrians selecting alternative routes where they don’t feel intimidated by the presence of cyclists1.

- Possibly, as a result of its configuration, this is the location where the highest number of minor conflicts between pedestrians and cyclists were observed. They were all recorded on the week day during the 8:00 - 9:00 time period.

- Towards mid morning and lunchtime, the potential conflict between cyclists and pedestrians disappear as the commuter flow no longer exists.

- At the weekend, the profile of the junction, as with the rest of the park, is very different. Naturally, there are no commuter cyclists and both cyclists and pedestrians seem to share the space well.

1 A user survey to identify to what extent pedestrians are intimidated or dissuaded of using Mount Walk as a result the cyclist commuter flow is recommended.
Area B: Round Pond stretch

This section of Mount Walk is the longest uninterrupted stretch of the route. There are no trees or high vegetation on either side, providing both cyclists and pedestrians good visibility of what is ahead of them.

- Despite the long stretch, cyclist speeds at this location are in line with the rest of Mount Walk. During the morning peak, in the context of the survey, the number of pedestrians were very low and cyclists could comfortably ride along the route (Figure 51). We believe that the good visibility is also a key factor in minimizing and potential conflict between cyclists and pedestrians.

- Throughout the day, there is a better balance between the number of pedestrians and cyclists, who can share the route comfortably (Figure 53).

- At the weekend, it is more common to see groups of pedestrians and families with buggies walking along the route. However, there is a ‘self-levelling’ process where all users make room for each other, including walking on the grass if necessary (Figure 54).

Figure 51: Cyclist overtaking another cyclists (weekday)
Figure 52: Cyclist overtaking another cyclist (weekday)
Figure 53: Cyclist between 2 groups of pedestrians (weekend)
Figure 54: Range of different users, pedestrians walking on grass (weekend)
Area C: Lancaster Walk junction

This section summarises the observed behaviour between the end of the Round Pond Stretch and Lancaster Drive junction.

- The overall pattern is the same as the previous areas. Cyclists and pedestrians (individuals or groups) are aware of each other and are able to share the space comfortably.

- There are 3 junctions along this stretch fairly close to each other (refer to Figure 39). Pedestrians walking along Lancaster Walk or other north-south routes often stop at the junctions and, possibly guided by the white line as well as the view of passing cyclists, look and wait before crossing. This is a typical behaviour commonly observed in the urban environment when pedestrians need to cross a road. Still, as previously discussed, this can lead to a number of pedestrians selecting alternative routes where they don’t feel intimidated by the presence of cyclists.

- This is also the stretch were the lowest cyclist speeds were recorded for both weekday and weekend. Again, it could be related to the morphology of the route, i.e., cyclists naturally slow down ahead of the junctions as a precautionary measure.

Figure 55: Example of a pedestrian waiting to cross (weekday)
Figure 56: Wide range of users (cyclist, pedestrians, skate and scooter users) sharing the space (weekday)
Figure 57: Cyclists riding orderly in line (weekend)
Figure 58: Example of a pedestrian waiting to cross (weekend)
Area D: Serpentine Gallery link

The overall pattern along this section of Mount Walk is very similar to the previous one, i.e., the intersection between paths can be a key location for conflict. However, it has been observed:

- Pedestrians walking along the diagonal route leading to the Serpentine Gallery stop at the junctions and wait before crossing (Figure 59).

- At the junction, a location where it is common for pedestrians to stop and orientate themselves, cyclists were observed to deviate from pedestrians to avoid any prospect of conflict or collision (Figure 58).

- As everywhere along Mount Walk, we observed that cyclists regularly use the bicycle’s bell to make pedestrians aware of them, which could be interpreted as a minor conflict (further discussed in page 39).

Figure 59: Example of a pedestrian waiting to cross (weekday)

Figure 60: Example of a group waiting to cross with cyclists riding on a line (weekday)

Figure 61: Cyclist deviating from pedestrians, both groups sharing comfortably the space (weekend)

Figure 62: Runner and cyclist sharing the space (weekend)
Area E: Mount Gate and West Carriage Drive

This location is the main gateway to Mount Walk for those coming from Hyde Park and/or West Carriage Drive.

- Unlike the rest of Mount Walk, the gate restricts any ‘overtaking’ in case of too many pedestrians and cyclists approaching the route.
- Still, there is self-leveling process where both pedestrians and cyclists are aware of each other.
- Much of the perceived conflict between the two groups of users takes place along West Carriage Drive western footway where, similarly to the Broad Walk junction, cyclists (commuters) cycle east-west and pedestrians walk north-south along footway.
- From the CCTV data, it seems that cyclists and pedestrians are aware of each other and both Mount Walk and Mount Gate provide sufficient clear width and visibility for the observed flows.

Dismounting

As part of our commission, we were also asked to quantify the number of cyclists who dismounted as they left the park. During the 10 hour footage survey for this location, 10 people were observed dismounting as they left the park during the weekday (Tuesday) corresponding to 0.5% of all users and 43 at the weekend (Sunday), corresponding to 3%.

Again, the nature of the users plays its role. The majority of people dismounting seem to be ‘leisure cyclists’ rather than commuters and that intersection of Mount Walk and West Carriage Drive works as a orientation/decision making point.

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1 We quantified the dismounting over 6 hours during Tuesday (8:00 to 10:00, 12:00 to 14:00 and 16:00 to 18:00) and over 4 hours on Sunday (12:00 to 14:00 and 16:00 to 18:00).
Potential conflict assessment

Methodology

Information on pedestrians and cyclists potential conflicts was collected on Sunday 10th and Tuesday 12th May using CCTV footage and the data was analysed during the same time periods as for the users behavioural analysis.

As much as possible, from information collected via CCTV footage, we tried to address the perception of a potential conflict between user groups by looking at behavioural patterns such as hesitation or confrontation between cyclists and pedestrians. For the cases where the pedestrian changed what was apparently his/her intended route as a result of the presence of a cyclist, we have also classified as ‘minor conflict’. We are aware that in several occasions it was difficult to judge and in case of a doubt, we counted as a potential minor conflict.

Main locations

Figures 67 and 68 illustrate the location of observed conflicts between cyclists and pedestrians. The Broadwalk and Mount Walk junction was the single location where the highest number of minor conflict was observed (5 in total, 4 of these between 8:00 and 9:00). Most of the remaining conflicts took place along the intersections but without a specific time of the day.

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1 When a cyclist pass side-by-side the same or opposite direction to a pedestrian.
Typical types of minor conflict

In total, 18 cases of conflict were observed during Tuesday over a period of 6 hours and 15 cases on Sunday over a period of 4 hours, giving an average of 3 and 3.75 conflicts per hour along the entire route (Figures 69 to 72).

It is important to note that these averages are indicative, as we surveyed during the busiest time periods during a busy time of the year. An all day average is likely to be lower.

Further, to put these numbers in perspective, we compared the number of conflicts with the number of cases when cyclists overtook pedestrians without causing a conflict. We randomly selected one time period for the weekend and two during the weekday. We counted 1100 ‘non-conflict’ cases against 9 minor conflict cases, giving a clear 99% of all cycle journeys. This percentage confirms the prediction from the Atkins Intelligent Space report where, for Broad Walk, the study forecasted that 97.5% of all cycle journeys would not involve a conflict between pedestrians and cyclists.

Out of all occurrences, only two cases of very close proximity were recorded, one on Tuesday and one on Sunday as illustrated in Figures 73 and 74. In both cases there is no indication of physical contact and both cyclists managed to stop very gently before the pedestrian (Figure 73) or other cyclist (Figure 74).

It could be concluded that, as analysed with quantitative and qualitative observations and time profiles, potential conflicts between different kind of users - and different priorities - are minimum.

We were also asked in the case of conflicts, to identify the percentage of cyclists using their own bikes compared to hire ones and whether the cyclist was a commuter. Analysis showed that there was no clear pattern. Often we could not identify the type of bicycle as the cyclists were filmed from behind. As for commuters, we can assume that most cyclists at the morning and evening peak were commuters, but beyond that we couldn’t be sure.

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1 The selected areas and time periods were: Area C between 16:00 and 17:00 and area D between 17:00 and 18:00 on Tuesday, area C between 12:00 and 13:00 on Sunday.
Level of Service

This chapter provides the assessment of the pedestrian comfort experienced on the Mount Walk during the survey days.
Level of Service - Shared use

The width of a path and its capacity can be a key driver for successfully sharing space, in particular when we have two different modes, i.e., pedestrians and cyclists.

When assessing the capacity of a path and its design it is important to take into account the level of pedestrian and cyclist activity and how activity on the path varies with time. This supports an understanding of how a path functions during commuting periods or during busy weekend afternoons, when capacity issues are significant.

Methodology

The Level of Service analysis was conducted using the guidelines created as a result of a research conducted by Atkins Intelligent Space for Transport for London on shared use cycle routes in 2009.

Level of Service is a standard measurement of pedestrian capacity and level of comfort. In this context, the methodology assesses the peak volume of pedestrian flow activity and the amount of available, usable space for users. Level of Service is measured on a sliding scale to benchmark the level of comfort of routes from A, with plenty of available space to walk or cycle freely, through F, where the crowd and space available minimises the freedom of movement, as illustrated in pages 43 to 45.

Space requirements

Although the capacity of a shared use path is dependent on the level of pedestrian and cyclist activity, there are desirable minimum widths which accommodate a rudimentary level of use. Guidance on minimum and recommended widths for shared and segregated cycling routes in open spaces was taken from Kensington Gardens Studio Walk report.

Cyclist widths were taken from DfT\(^2\) and pedestrian widths were taken from guidance prepared by Atkins Intelligent Space\(^4\) for TfL’s Level of Service for London project.

Based on user widths, the recommended minimum width of an unsegregated shared use route is provided in Figure 77, which is based

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1 A shared use path is defined as a completely unmarked path (except relevant signage) where pedestrians and cyclists use the entire available width. A segregated path is defined as a path where separation of any kind (white line or grass strip) exists between pedestrians and cyclists. Mount Walk is therefore classified as a shared use path.
3 Cycle Infrastructure Design, Local Transport Note 2/08, 2008, DfT.

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5 Ibid 2.
Scenario 1: Two cyclists - Minimum distance

Figure 76: Shared use LoS - Scenario 1: Weekday AM peak hour.

Figure 77: Shared use LoS - Scenario 1: Weekday PM peak hour.

Figure 78: Shared use LoS - Scenario 1: Weekend PM peak hour.
Scenario 2: Two cyclists - Comfortable distance

Figure 79: Shared use LoS - Scenario 2: Weekday AM peak hour.

Figure 80: Shared use LoS - Scenario 2: Weekday PM peak hour.

Figure 81: Shared use LoS - Scenario 2: Weekend PM peak hour.

Legend (ppmm)
- A: 0-1.6
- B: 1.6-10
- C: 10-20
- D: 20-36
- E: 36-59
- F: 59-over
Scenario 3: Three cyclists - Minimum distance

Figure 82: Shared use LoS - Scenario 3: Weekday AM peak hour.

Figure 83: Shared use LoS - Scenario 3: Weekday PM peak hour.

Figure 84: Shared use LoS - Scenario 3: Weekend PM peak hour.

Legend (ppmm)

A: 0-1.6
B: 1.6-10
C: 10-20
D: 20-36
E: 36-59
F: 59-over
The results show that for all three scenarios and 3 different peak hours (9 assessments), Mount Walk provide a sufficient clear width for the observed flows.

Only for the 2 worst case scenarios, Mount Walk has a comfort level C (Figures 83 and 84), while for all other cases comfort levels are “B” (comfortable) or even “A” (very comfortable). The comfort level C might be less frequent than suggested due to occasional use of the adjacent grass space to overtake stopped or slower users by both cyclists and pedestrians.

However, it is important to point it out that the proposed East West Cycle Superhighway will have an impact on the Level of Service along Mount Walk. Further studies should be carried out to verify if the route will be able to cope with the expected increase levels of cyclists and the impact that will have on pedestrians.

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1 It is important to note the limitation of the current available methodology. The level of service is calculated from the effective path width remaining for pedestrians according to scenarios 1, 2 or 3 (page 42). With a possible increase in the number of cyclists as a result of the East West Cycle Superhighway, we might expect an increase of ‘3 cyclists minimum distance’ scenario compared with the ‘2 cyclists’ scenarios. Although this methodology is in line with the methodology used in previous TRP studies, we believe that more research should be carried out to develop a methodology specifically looking at shared use cyclist and pedestrian pathways.

2 Although this behaviour should not be encouraged due to the harm that it can cause to the fauna and flora of the park.
Conclusions and recommendations

This chapter of the report summarises the key findings and recommendations
Conclusions and recommendations

Atkins Intelligent Space and Kensington Gardens, Mount Walk

Atkins Intelligent Space has been commissioned by The Royal Parks (TRP) to undertake a pedestrian and cyclist space use assessment of Mount Walk at Kensington Gardens.

Mount Walk is a shared use path and is currently part of a cycle route that connects Kensington Gardens to the west and Hyde Park to the east. Mount Walk is a popular route for both commuter and leisure cyclists. Mount Walk is also a popular path for those visiting Kensington Gardens due to its strategic position linking the Serpentine Gallery to Kensington Palace, two attractions with great historical significance within the park. The need to provide a safe environment for all members of the public including cyclists is paramount for the performance of the park; in particular with the likely increase in the number of cyclists using the route as a result of the proposed East West Cycle Superhighway.

One of the main concerns by the park managers is the potential for conflict and the perception of conflict by park users, especially when pedestrians feel intimidated by cyclists and could gradually stop using Mount Walk.

The TRP Pathway Code of Conduct points out that ‘pedestrians have priority over all other users of pathways, even in areas designated and marked for other purposes’. 2

The objective of the study was therefore to collect evidence of various interactions along Mount Walk, observing pedestrian and cyclist behaviours and any potential conflict between the two, so that the park managers can make an informed assessment on the need for speed calming measures along the route and what the design of the proposed measures should be. Park managers would take appropriate interventions, such as speed calming, and other behaviour change initiatives. The speed calming measures proposals were based on TRP experience as well as previous studies carried out by Atkins (refer footnote 1, page 7).

To that end, the following tasks were undertaken:

- Inception and progress meetings with members of The Royal Parks management team.
- Mount Walk existing conditions survey.
- Video footage surveys of pedestrian and cyclist flows and overall patterns of space use.
- Automatic Traffic Counter (ATC) cyclists speed survey.
- Data analysis of all collected data including users interaction and pedestrians and cyclists comfort assessment.

Conclusions

Mount Walk is a popular, well used path by pedestrians and cyclists alike. From the information collected via CCTV, Mount Walk users behave in a confident and civilised manner and high levels of perceived safety seem evident. As in many areas of the urban environment, Mount Walk does have a different character between weekdays and weekends.

**During weekdays**, cyclists dominate the route during the morning (8:00 to 9:00) and afternoon (18:00 to 19:00) commute peak periods. During the two peak hours, we observed approximately 35% of all cyclist flows for the day and 55% of those drove at speeds above the recommended 8 to 12mph TRP design speed. There is also a clear eastbound direction early in the morning and the opposite in the afternoon.

Conversely, during these two peak periods, pedestrian flows are low, in particular during the morning. Overall, there is a more even distribution of pedestrians along Mount Walk during the day, without a clear peak period as observed for cyclists.

At the weekends, a different character is observed. Whereas pedestrians use the path the same way (leisure), the ‘commuter cyclist’ no longer exists and all cyclists using Mount Walk are ‘leisure cyclists’. There is not a sharp peak of flows as observed during weekdays and the daily distribution of cyclists and pedestrians is almost identical. As expected, cyclist speeds are much lower where 68% of the cyclists drove at speeds below 10mph.

Unlike during weekdays, cyclists are not ‘single individuals’; families, group of friends and tourists were often observed and it is unlikely that the route will be perceived as a cycle route, as during the weekdays.

Most importantly, qualitative behavioural analysis and interactions along the Mount Walk showed that both cyclists and pedestrians behave in a calm and relaxed manner with no perceived conflict between them. In such an open, flat space, visibility levels are very high and both cyclists and pedestrians can see each other with enough time to anticipate and adapt to the situation in a safe manner.

It has also been observed that, when the path width is not enough to host all, both cyclists and pedestrians briefly use the adjacent grass space to overtake or avoid others. This patterns has also been observed when an obstruction becomes apparent such as pedestrians stop to check directions or to assist their children. In order words, there is a ‘self - levelling’ process where all users make room for each other, including walking or briefly cycling on the grass if necessary.

There is a danger, however, with an increase number of cyclists and pedestrians, users will use the route’s side space more frequently, which can damage the environment and goes against the TRP Pathway Code of Conduct.

Further, at junctions, pedestrians often stop and, possibly guided by the white lines as well as the view of passing cyclists, look and wait before crossing. We have also noticed that cyclists often use the bicycle bell to alert pedestrians.

Despite being a popular, well used path, it could be argued that during the weekday, the large number of cyclists and the speed could create a perception to the public that Mount Walk is essentially a cyclist route where pedestrian have less priority. Also, it could be suggested that the fact pedestrians are having to stop to cross Mount Walk or the constant use of bicycle bells highlights that the route could be perceived as dominated by cyclists, which could also contribute to pedestrians avoiding using the route. 4

The analysis of potential conflict between cyclists and pedestrians does show that despite all potential conflicts, Mount Walk is principally a safe route.

Sunday (or weekends) looks like the period when there is the biggest potential for conflict between the two user groups, as flows of both pedestrians and cyclists are high. Despite that, data analysis showed that, although minor conflicts were observed between cyclists and pedestrians (and the cyclists were not necessarily commuters), 99% of all cycle journeys did not appear to involve a conflict between pedestrians and cyclists. 5

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1 At the time of this report, the inputs of the East West Cycle Superhighway is unknown.
2 Refer to page 49 for the full TRP Pathway Code of Conduct.
3 For 8:00 to 9:00 and 17:00 to 18:00.
4 We have not conducted interviews with park users and therefore we don’t know to what extent, if any, pedestrians avoid using Mount Walk as a result of the presence of cyclists.
5 Including weekdays and weekend.
At weekends, the potential for conflict is lower. Yet, we must bear in mind that the severity of the ‘collision’ between cyclists an pedestrian might be much higher due the speed component.

Analysis of the Level of Service shows that Mount Walk at present provides a sufficient clear width for the observed pedestrian flows. It is important to point out that the proposed East West Cycle Superhighway will have an Impact on the Level of Service along Mount Walk. Further studies should be carried out to verify if the route will be able to cope with the expected increased levels of cyclists and the impact that will have on pedestrians.

Lastly, it is important to highlight the implications of the findings of this study on vulnerable user groups. Although the pedestrian survey did not make a distinction according to user groups, naturally any potential conflict between cyclist and pedestrians, albeit minor, will have a far more significant Impact on vulnerable people.

To that end, the potential increase in the number of cyclists, speed, and general volumes of all users both at weekdays and weekends must be closely monitored so that Kensington Gardens can continue providing a safe environment for all.

Recommendations

Speed calming measures along the route are likely to reduce cyclist speeds at key locations along the route and act to increase awareness of other users at conflict points. This may reduce the speed of commuter cyclists, the majority of who were identified in this report as travelling faster than the recommended 8 to 12mph TRP design speed. It is not considered that the measures proposed will negatively impact the appeal of the route for cyclists and it may improve the appeal for pedestrians.

Although high speeds and volumes of cyclists are concentrated over 2 hour periods during weekdays (and volumes of pedestrians during this time are proportionally much lower), the differentiated surface finish is very likely to reinforce the safety of Mount Walk for all users as well as reiterate the balance between cyclists and pedestrians.

If possible, a follow up study after the installation of speed calming measures could be carried out to analysis its effectiveness.

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6 Vulnerable user groups include the elderly, people with special needs, children as well as dogs and other small animals.

7 Outside the scope of the study.

8 We cannot comment on the specification and any potential safety issues as a result of the selected materials, design, dimensions and location of the speed calming measures and their implementation strategy.