75-81 George Street, Richmond

Cycle Level of Service Audit

WYG

11/27/2019

Canadian & Arcadia Ltd

75-81 George Street, Richmond

Cycling Level of Service (CLoS) Audit

A112323

November 2019

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Limitations

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1 Introduction

General

1.1 WYG has been commissioned by Canadian & Arcadia Ltd (the 'Applicant') on request of the London Borough of Richmond upon Thames (LBRuT) Council to prepare a Cycling Level of Service (CLoS) Audit report in support of the proposed mixed-use development at 75-81 George Street, Richmond, TW9 1HA within LBRuT (the 'site').

1.2 The LBRuT are the Local Planning Authority (LPA) responsible for determining planning applications within the area and are also the Local Highways Authority (LHA).

1.3 A Transport Assessment (TA) and Framework Travel Plan (FTP) have been produced to support the development and have been submitted as part of the planning application to LBRuT on 31st July 2019. LBRuT Highways have since requested a CLoS Audit to be produced which this report addresses.

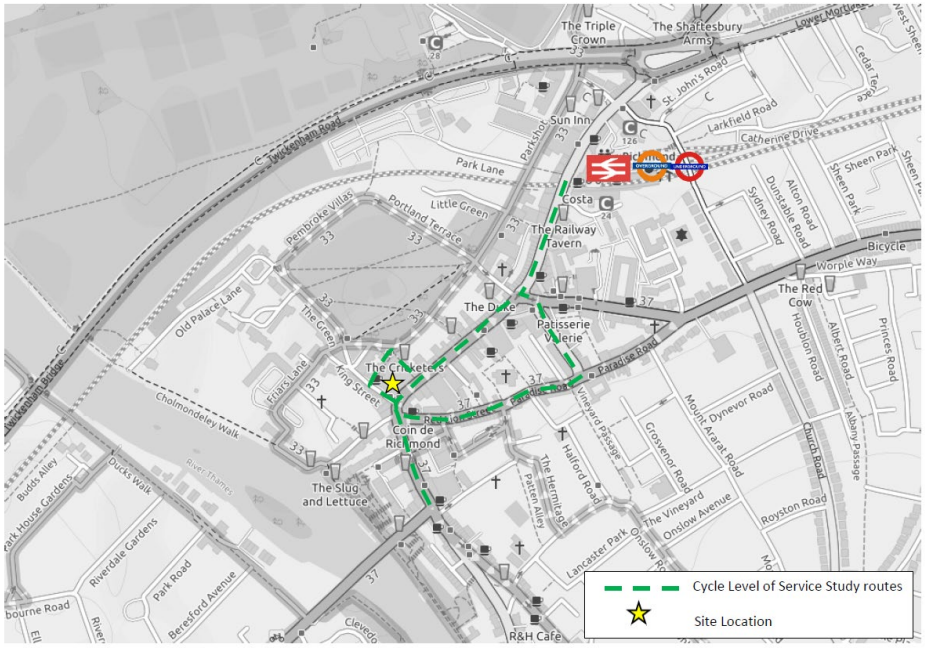
1.4 The scope and content of this CLoS Audit document produced for 75-81 George Street was agreed with the LBRuT via email correspondence on 14th October 2019.

CLoS Overview

1.5 CLoS is a methodology developed by Transport for London (TfL) to assess the performance of cycling infrastructure for routes and schemes, and for individual junctions. It is focused on 'rideability', the experience of cycling and the performance of links and junctions.

1.6 The CLoS audit has been undertaken for six links and four junctions defined within the study area, in the vicinity of the site. The study area generally covers the area between the site, Richmond Rail and Underground Station and Bridge Street. The CLoS study area is shown in **Figure 1.1**.

Figure 1.1 CLOS Study Area



Source: OpenStreetMap, October 2019

1.7 The CLoS audit was carried out by WYG on 23rd October 2019 and was undertaken in accordance with Chapter 2 of the London Cycling Design Standards produced by TfL in June 2014.

2 Site Location and Background

2.1 The site is located on the northern side of George Street (A307), in Richmond town centre. The site is located in an area of predominately retail and commercial land uses comprising Richmond town centre. The site is bound by Golden Court to the east, George Street to the southeast, King Street to the southwest and commercial/residential properties to the north off Paved Court. The existing site is currently occupied by a House of Fraser department store and measures a total Gross Floor Area (GFA) of 7,312m^2 over five floors (including basement).

2.2 The site frontage is on George Street which provides all pedestrian and cycle access. Vehicular access can be gained via a servicing entrance on King Street. A loading bay is located on King Street, adjacent to the servicing entrance.

2.3 A strategic location plan, showing the location of the site in the context of the wider surrounding area, is provided in **Figure 2.1**.

Figure 2.1 Strategic Location Plan

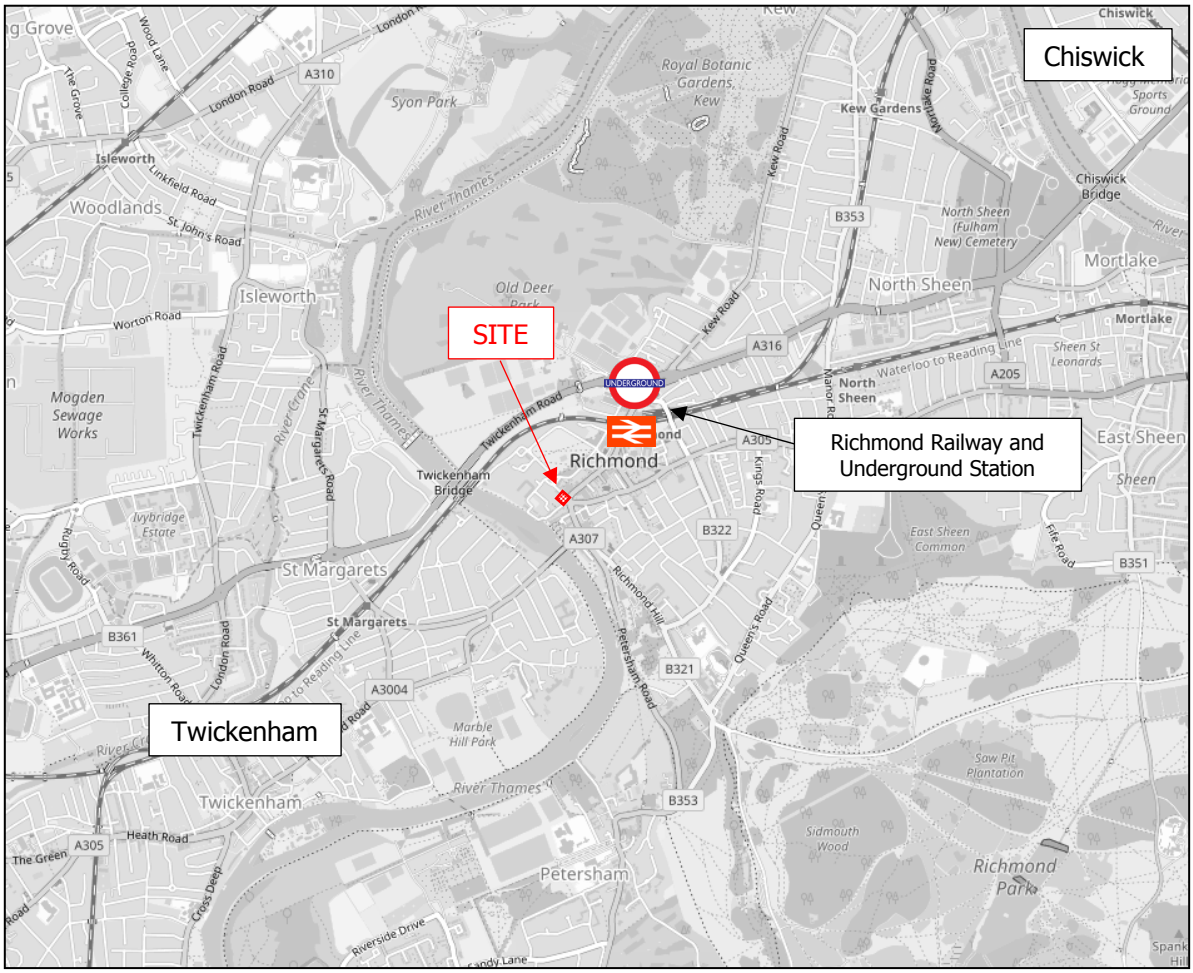


Image Source: OpenStreetMap with WYG Annotations, October 2019

Proposed Development

2.4 The development proposals are for the refurbishment of the existing building, retaining the basement, ground floor and first floor levels as retail, replacing the existing upper floors with office space and constructing a rooftop extension for further office space. New and refurbished pedestrian accesses

will be provided off Golden Court, King Street and George Street. The development will be car-free; therefore, no car parking is currently proposed. The development will provide cycle parking and changing facilities in the basement. The loading bay on King Street will be retained to serve the development.

Cycle Network

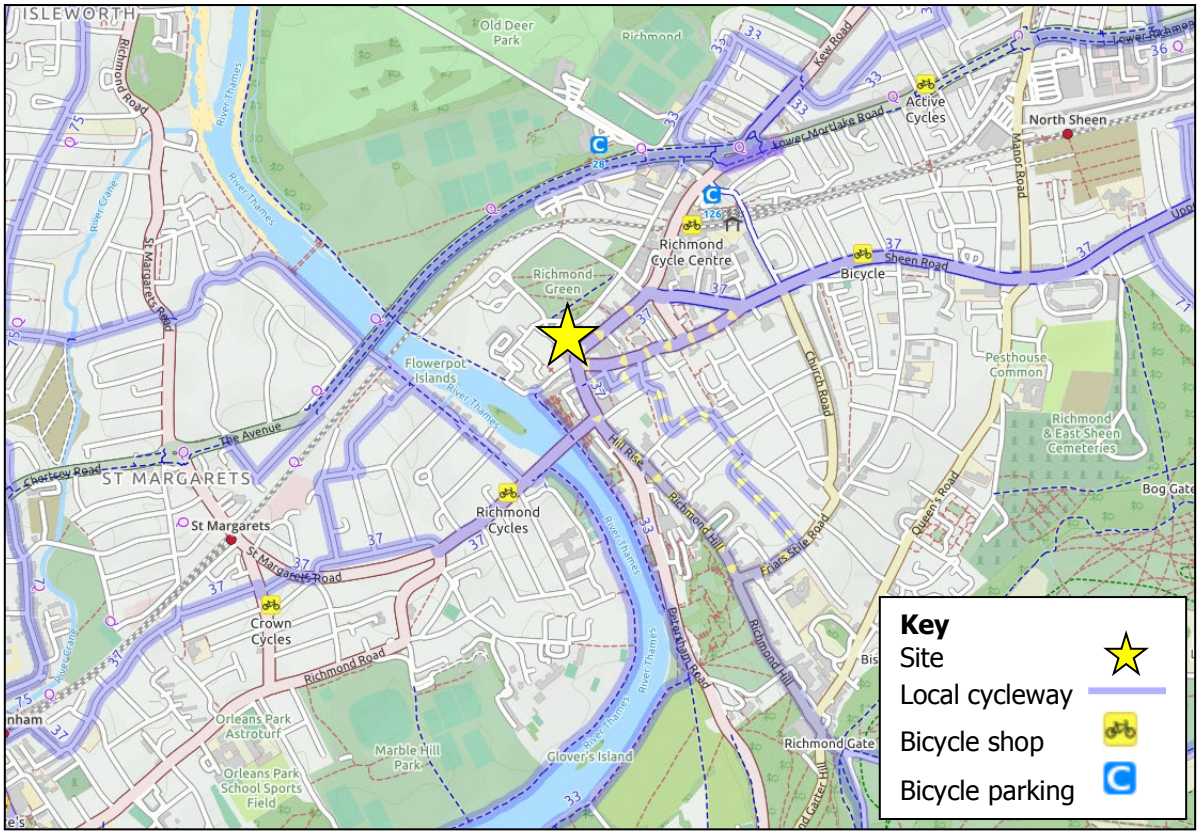
2.5 There are a number of cycle routes within proximity of the site, which are part of the London Cycle Network (LCN), these include the following:

- Cycle Route 33 – Leatherhead – (Chessington) – Kingston – Richmond; approximately 170 metres to the southwest of the site along the River Thames;
- Cycle Route 36 – A316 – (Sunbury) – Twickenham – Hammersmith; approximately 480 metres to the north of the site along the A316; and,
- Cycle Route 37 – A316 parallel, (Feltham) – Twickenham – Richmond – (Wandsworth) – Central London, immediately adjacent to the site along George Street.

2.6 Cycle Route 33 comprises an off-road cycle route along the eastern side of the River Thames. The route heads south towards Kingston, through Ham House and Garden before becoming an on-road route along the A307 until reaching Kingston upon Thames town centre. Cycle Route 36 comprises an off-road shared pedestrian and cycle path following the A316 towards Hammersmith. Cycle Route 37 comprises an on-road cycle route immediately adjacent to the site along George Street.

2.7 **Figure 2.2** shows the location of these cycle routes (highlighted in purple) in relation to the site, which is indicated by the yellow star.

Figure 2.2 Local Cycle Network



Source: OpenStreetMap Cycle Map with WYG Annotations, October 2019

3 Traffic Survey

3.1 WYG commissioned an independent traffic survey company to undertake Automated Traffic Counts (ATCs) on George Street and Red Lion Street over a 7-day period from Wednesday 23rd October to Tuesday 29th October 2019. The data is included in **Appendix A**.

Automatic Traffic Count (ATC) Surveys

3.2 **Table 3.1** sets out the daily flow, AM peak flow and PM peak flow over the week for George Street and Red Lion Street and the percentage of HGVs.

Table 3.1 Daily Vehicle Flow

Day	George Street - Eastbound				Red Lion Street - Westbound			
	Total Flow	AM Peak	PM Peak	% HGVs	Total Flow	AM Peak	PM Peak	% HGVs
Monday	7032	492	448	0.67%	8303	495	592	1.22%
Tuesday	7196	516	516	0.68%	8268	575	573	1.28%
Wednesday	7479	531	504	0.83%	9504	538	744	1.15%
Thursday	7672	504	456	0.59%	9398	551	708	0.95%
Friday	7847	456	247	0.76%	10083	472	745	1.39%
Saturday	7398	247	174	0.62%	9080	372	621	1.00%
Sunday	6101	174	492	0.79%	7195	266	555	0.72%

3.3 The average daily weekday flow recorded for George Street was 7,445 vehicles and for Red Lion Street was 9,111 vehicles.

3.4 85th percentile speed data has been extracted from the ATC to understand if there are any speeding issues on the links assessed. **Table 3.2** shows the average 85th percentile speed data on each of the links during the survey period.

Table 3.2 Weekday 85th Percentile Speeds in mph

Period	George Street - Eastbound	Red Lion Street - Westbound
Weekday	21.5	23.5

3.5 The 85th percentile speed recorded on both roads are well below the 30mph speed limit which suggests that the road typology and traffic congestion reduces the number of vehicles exceeding the speed limit.

3.6 This information has been used to inform the CLOS audit link scores which are described in Chapters 4 and 5.

4 Methodology

Link Assessment Tool

4.1 The CLoS link scoring system is based on six design outcomes that break down into specific factors. The design outcomes and factors are provided in **Table 4.1**.

Table 4.1 CLoS Design Outcomes and Factors

Safety	Directness	Coherence	Comfort	Attractiveness	Adaptability
Collision risk	Journey time	Connections	Surface quality	Impact of walking	Public transport integration
Feeling of safety	Value of time	Wayfinding	Surface material	Greening	Flexibility
Social safety	Directness		Effective width without conflict	Air quality	Growth enabled
			Gradient	Noise pollution	
			Deflections	Minimise street clutter	
			Undulations	Secure cycle parking	

4.2 Each factor is broken down into indicators and auditors apply a score ranging from 0-2 to each indicator. The score is based on whether there is a basic, good or high level of provision. The zero score or 'basic' level of service might trigger the need for improvement, but this depends on the overall context of the route and of the project.

4.3 Certain factors also have 'critical' scores, which describe circumstances that should be a cause for particular concern. To be given greater weighting in the scoring system the score for critical factors is multiplied by three.

Junction Assessment Tool

4.4 As collisions tend to be clustered around junctions, a supplementary process for assessing junctions has been developed. This may be used to inform either a broader assessment for a given location or scoring of the collision risk criteria in the CLoS assessment.

4.5 Rather than going through the entire CLoS assessment for each possible movement of a cyclist through a junction, an estimation of potential conflict can be carried out through briefly assessing each of the potential movements in turn and marking them on a plan of the junction. Each movement can be rated and marked on the plan according to how safely and comfortably it can be made by cyclists:

- Red arrow – where conditions exist that are most likely to give rise to various collision types.
- Amber arrow – where the risk of those collision types has been reduced by design layout or traffic management interventions.
- Green arrow – where the potential for collisions has been removed entirely.
- 'Green' should be taken to mean suitable for all cyclists; 'red' means suitable only for a minority of cyclists (and, even for them, it may be uncomfortable to make).

4.6 Any banned movements for cyclists are shown in black with a cross at the end. Movements that can be made but would involve a particularly high level of risk to the cyclist are noted with a red cross at the end. These are movements that most cycle trainers would advise against making.

Junction Scoring

4.7 A score can be given based on each turning movement: 0 for red, 1 for amber and 2 for green. This allows a total score to be generated for the junction. The CLoS junction scoring system is based on the criteria provided in **Table 4.2**.

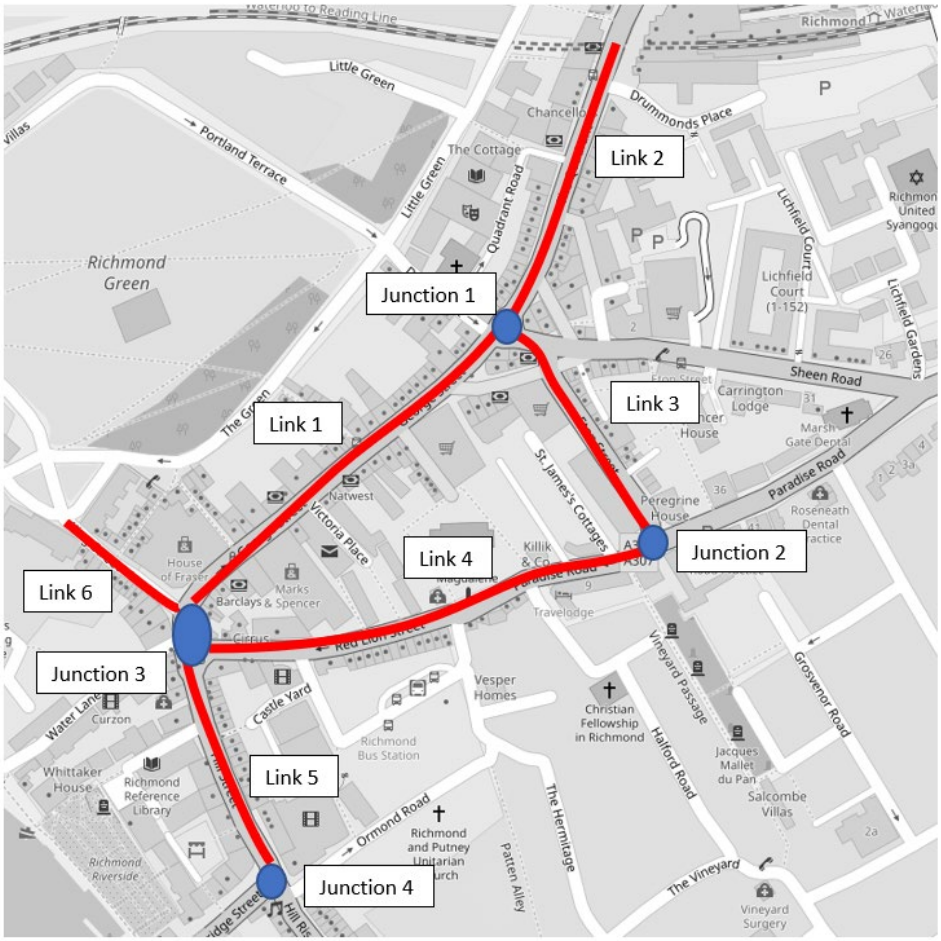
Table 4.2 CLoS Design Outcomes and Factors

Factors needing removal or mitigation	Possible improvements	Further improvements
RED	**AMBER**	**GREEN**
Heavy left turn movement with high HGV mix Opposed right turns with general traffic accelerating quickly into opportunistic gaps Left slip lane Guard-railing Large junction radii High speed motor traffic through junction Uphill gradients Wide junction crossings No clear nearside access Multiple lanes	Entry treatment at side road junction Continuation of lane across junction Right-turn protected island Tight corner radii; pinch points removed (avoiding nearside lane of 3.2- 3.9m) Bus lane of 3.0-3.2m or of 4.5m or more 2m wide central feeder lane ASLs (preferably 5m+ deep) Signal adjustments to cycle movements	Left turn ban for general traffic Opposing right turn banned for general traffic Physically protected turn Left bypass of signals Segregation of cycle movements using dedicated cycle signals Raised tables Area-wide speed limit/reduction

5 CLoS Audit

5.1 The audit area focuses on the road network surrounding the site and the route that connects to Richmond Rail and Underground Station. The area to be assessed was agreed with LBRuT and is shown in **Figure 5.1.** Correspondence with LBRuT has been provided in **Appendix B** for reference**.** Photos providing a snapshot of the routes are provided in the **Appendix C** for information. The scope of the audit is detailed within **Table 5.1.**

Figure 5.1 Cycle Links and Junctions Assessed



Source: OpenStreetMap, October 2019

Table 5.1 CLoS Assessment Links and Junctions

Link / Junction Number	Location
Link 1	George Street
Link 2	The Quadrant
Link 3	Eton Street
Link 4	Red Lion Street – Paradise Road
Link 5	Hill Street
Link 6	King Street
Junction 1	George Street / The Quadrant / Eton Street
Junction 2	Eton Street / Paradise Rd
Junction 3	Red Lion Street / Hill Street / George Street
Junction 4	Bridge Street / Hill Street

Links

5.2 The resultant link scores are summarised for the existing scenario in **Table 5.2** and are included in full in **Appendix D.** The proposed development does not involve any changes to on-street cycle provision and therefore the proposed scenario is the same as the existing situation.

5.3 The link assessment has found that the cycling environment around the proposed development is generally of an acceptable standard, with good provision along the routes. All audited roads have similar scores overall ranging between 53 to 57.

5.4 Hill Street and King Street score slightly higher than the other routes due to fewer side roads resulting in conflicting traffic, lower vehicle speeds due to layout and/or less frequent kerbside activity. Eton Street, Paradise Road and Red Lion Street score slightly higher than The Quadrant and George Street due to cycle lane provision, wide lanes and greening providing an attractive environment.

5.5 Due to the car free nature of the development, it is unlikely that the proposed development will have a negative impact on the CLoS score.

Table 5.2 CLoS Links Audit

Factor	Max Score	Link 1 - George Street	Link 2 - The Quadrant	Link 3 - Eton Street	Link 4 - Red Lion Street/Paradise Road	Link 5 - Hill Street	Link 6 - King Street
Safety	48	20	20	27	24	26	28
Directness	8	3	5	3	3	5	5
Coherence	6	3	3	3	3	3	3
Comfort	20	16	15	12	13	11	9
Attractiveness	12	6	6	6	7	5	8
Adaptability	6	5	4	4	4	4	4
Total	**100**	**53**	**53**	**55**	**54**	**54**	**57**

Junctions

5.6 The scores of the junction assessments are summarised in **Table 5.3**. Maps detailing the junction assessment scores can be found in **Appendix E**. The scores are given based on each movement: 0 for red, 1 for amber and 2 for green.

Table 5.3 CLoS Junctions Audit

Junction	Number of Movements			Total	Score	Max Score	% of Maximum Score
	Red	Amber	Green				
George St / The Quadrant / Eton St	0	4	2	6	8	12	67%
Eton St / Paradise Rd	0	1	1	2	3	4	75%
Red Lion St / Hill St / George St	0	3	2	5	7	10	70%
Hill St / Bridge Street	2	5	5	12	15	24	63%

5.7 The CLoS junction assessment focuses on layout, cycle provision and geometry rather than level of flow, and the assessment identifies a range of items including the presence of segregation of cycle movements using dedicated signals, right-turn protected islands, provision of advanced stop lines at signalised junctions, cycle lanes, left turn ban of general traffic and 2m wide central feeder lanes.

5.8 Junctions within the study area provide acceptable cycling provision; however, at some junctions, cyclists are mixed with motorised traffic and no dedicated facilities are provided which can be difficult to navigate for cyclists wishing to turn right. Photos and a brief description of each junction assessed is provided in this section.

Junction 1 - George Street / The Quadrant / Eton Street

5.9 The George Street / The Quadrant / Eton Street junction does not provide dedicated facilities for cyclists but the low traffic volumes together with the wide road allows cyclists to stop and undertake the turn to Eton Street safely. Moreover, this junction provides access to the LCN 37, which is part of the London cycle network. A photograph of the junction is shown in **Figure 5.1**.

Figure 5.1 George St / The Quadrant / Eton St Junction

Junction 2 - Eton Street / Paradise Road

5.10 Paradise Road provides a connection to the LCN 37. The Eton Street / Paradise Road junction is easy to navigate for inexperienced cyclists due to the bus lane which has a low volume of traffic. A photograph of the junction is shown in **Figure 5.2.**

Figure 5.2 Eton Street / Paradise Road Junction

Junction 3 – Red Lion Street / Hill Street / George Street

5.11 Red Lion Street / Hill Street / George Street junction does not provide cycle lanes, or advanced stop lines however during the CLOS audit volumes of traffic were relatively low and there were no conflicts with other vehicles. A photograph of the junction is shown in **Figure 5.3.**

Figure 5.3 Red Lion Street / Hill Street / George Street Junction

Junction 4 – Hill Street / Bridge Street

5.12 Hill Street / Bridge Street junction is a mini-roundabout with four arms without formal cycling provision. Right turn cycle access into Hill Rise from Bridge Street is considered uncomfortable as it involves crossing traffic from Bridge Street. A photograph of the junction is shown in **Figure 5.4.**

Figure 5.4 Hill Street / Bridge Street Junction

6 Summary

6.1 WYG has been commissioned by Canadian & Arcadia Ltd (the 'Applicant') to prepare a Cycling Level of Service (CLoS) Audit Report; this is to support a planning application for the development at 75-81 George Street, Richmond.

6.2 The CLoS audit study area includes six links and four junctions within the study area, in the vicinity of the site. The study area covers the route between the site and Richmond Rail and Underground Station.

6.3 The CLoS audit was carried out by WYG on 24th October 2019 and was undertaken in accordance with Chapter 2 of the London Cycling Design Standards produced by TfL in June 2014.

6.4 The proposed development does not involve any changes to on-street cycle provision and therefore the proposed scenario is the same as the existing situation.

6.5 The scores for all links and junctions were greater or equal to 54% of the maximum score. The results of the audit found that the cycling environment around the proposed development is generally of an acceptable standard, with good provision along the links and junctions assessed.

Appendix A
ATC SURVEY DATA

George Street ATC data

Channel 1 - Northeastbound **Vehicle Flow** **Week 1**

Hr Ending	23/10/2019 Wednesday	24/10/2019 Thursday	25/10/2019 Friday	26/10/2019 Saturday	27/10/2019 Sunday	28/10/2019 Monday	29/10/2019 Tuesday	5 Day Ave	7 Day Ave
1	98	131	135	224	220	98	118	116	146
2	41	67	66	132	80	47	46	53	68
3	26	25	41	67	50	22	28	28	37
4	24	28	35	54	35	26	21	27	32
5	43	36	44	57	45	38	35	39	43
6	151	146	135	111	55	146	136	143	126
7	367	343	330	143	101	364	345	350	285
8	531	504	456	247	174	492	516	500	417
9	499	463	439	336	248	469	470	468	418
10	469	401	389	377	305	390	404	411	391
11	367	371	404	396	370	370	397	382	382
12	390	418	398	495	384	369	415	398	410
13	423	402	453	468	368	370	404	410	413
14	409	438	453	469	337	407	425	426	420
15	390	415	431	441	422	378	364	396	406
16	398	414	464	415	440	405	427	422	423
17	408	427	434	431	420	397	402	414	417
18	427	467	494	419	421	448	451	457	447
19	402	468	444	421	409	423	413	430	426
20	440	428	442	400	377	416	438	433	420
21	386	426	402	361	307	327	319	372	361
22	320	333	361	296	234	253	255	304	293
23	255	279	311	317	165	211	218	255	251
24	215	242	286	321	134	166	149	212	216
7-19	5113	5188	5259	4915	4298	4918	5088	5113	4968
6-22	6626	6718	6794	6115	5317	6278	6445	6572	6328
6-24	7096	7239	7391	6753	5616	6655	6812	7039	6795
0-24	7479	7672	7847	7398	6101	7032	7196	7445	7246

Channel 1 - Northeastbound **Average Speed** **Week 1**

Hr Ending	23/10/2019 Wednesday	24/10/2019 Thursday	25/10/2019 Friday	26/10/2019 Saturday	27/10/2019 Sunday	28/10/2019 Monday	29/10/2019 Tuesday
1	21.3	20.1	16.4	19.5	18.4	21.5	19.3
2	22.3	20.5	22.0	20.4	22.4	22.3	22.5
3	23.8	19.4	22.3	21.6	22.6	23.3	20.4
4	22.8	18.6	23.8	22.5	22.1	23.4	22.3
5	21.5	20.9	22.8	22.8	22.2	22.2	22.9
6	22.1	21.4	20.3	22.2	22.2	21.5	21.6
7	15.9	18.9	19.9	20.4	21.6	18.4	18.8
8	16.7	16.9	16.6	20.1	20.4	15.6	16.9
9	13.9	14.1	13.6	17.8	19.2	14.7	14.0
10	13.3	14.1	14.8	16.8	18.1	15.3	14.0
11	14.1	13.8	14.5	17.0	16.2	15.5	13.9
12	13.6	14.9	14.9	14.6	16.0	14.8	14.9
13	14.5	14.5	14.7	14.6	15.2	14.1	14.6
14	13.4	14.8	14.8	14.1	14.2	14.8	14.5
15	14.8	14.5	14.0	13.9	13.6	15.4	15.1
16	14.7	14.7	14.1	13.2	14.3	14.0	14.4
17	13.9	14.9	13.3	13.9	14.4	14.1	14.4
18	13.4	14.7	13.9	13.8	14.4	14.4	14.4
19	12.2	14.3	13.9	14.5	17.2	14.8	15.0
20	15.8	15.7	13.6	15.6	18.5	15.2	15.1
21	16.9	16.3	16.3	16.8	18.9	16.8	16.8
22	17.7	17.3	17.9	18.5	15.8	18.0	17.6
23	17.1	19.1	18.7	17.2	17.6	18.5	18.7
24	17.4	19.0	17.7	17.6	19.7	18.7	18.6
10-12	13.9	14.4	14.7	15.7	16.1	15.2	14.4
14-16	14.7	14.6	14.1	13.5	13.9	14.7	14.7
0-24	15.2	15.8	15.5	16.1	16.7	15.8	15.7
						Average	15.8

Channel 1 - Northeastbound **85th Percentile**

Hr Ending	23/10/2019 Wednesday	24/10/2019 Thursday	25/10/2019 Friday	26/10/2019 Saturday	27/10/2019 Sunday	28/10/2019 Monday	29/10/2019 Tuesday
1	28.7	23.6	24.0	23.7	23.9	28.7	23.2
2	28.5	28.3	28.4	23.9	28.7	28.9	28.5
3	28.6	23.3	28.3	23.8	28.5	28.5	28.3
4	28.3	23.8	28.2	28.0	28.4	28.1	28.3
5	28.3	28.8	28.2	28.5	28.1	28.8	28.0
6	28.8	28.6	28.6	28.9	28.8	28.4	28.5
7	23.0	24.0	28.4	28.4	28.5	23.5	23.2
8	23.8	23.9	23.4	28.7	28.8	23.5	23.9
9	18.8	18.2	18.7	23.5	23.6	18.2	18.6
10	18.7	18.7	18.3	23.5	23.8	18.3	18.8
11	18.0	19.0	18.6	23.5	23.0	18.1	18.9
12	18.4	18.2	18.2	18.4	23.2	18.6	18.3
13	18.9	18.5	18.2	18.4	18.1	18.2	18.5
14	18.8	18.1	18.6	18.3	18.1	18.9	18.1
15	18.4	19.0	18.1	18.1	18.3	18.1	18.6
16	19.0	18.7	18.5	18.2	18.1	18.4	18.4
17	18.9	18.0	18.9	19.0	18.0	18.3	19.0
18	18.1	18.6	18.3	18.1	18.5	18.9	18.1
19	18.9	18.1	18.8	18.4	23.7	18.8	18.9
20	23.4	23.1	18.4	18.4	23.5	23.3	23.6
21	23.5	23.8	23.3	23.5	23.8	23.7	23.3
22	23.8	23.3	23.9	23.2	23.1	23.3	23.1
23	23.1	23.0	23.6	23.5	23.2	23.1	23.5
24	23.6	23.3	23.6	23.3	23.7	23.0	23.2
10-12	18.5	18.4	18.4	18.6	23.5	18.3	19.0
14-16	18.3	18.3	18.1	18.5	18.4	18.8	18.1
0-24	18.6	23.9	18.6	23.2	23.1	23.3	23.0
						85th %ile	22.0

Red Lion Street ATC data

Channel 1 - Westbound **Vehicle Flow** **Week 1**

Hr Ending	23/10/2019 Wednesday	24/10/2019 Thursday	25/10/2019 Friday	26/10/2019 Saturday	27/10/2019 Sunday	28/10/2019 Monday	29/10/2019 Tuesday	5 Day Ave	7 Day Ave
1	74	114	135	209	247	68	71	92	131
2	48	60	71	182	117	51	50	56	83
3	35	22	38	85	62	31	25	30	43
4	31	24	31	56	44	36	15	27	34
5	30	43	38	32	27	29	39	36	34
6	71	68	83	53	37	68	66	71	64
7	167	180	166	90	81	171	183	173	148
8	396	440	360	197	133	390	418	401	333
9	538	551	472	372	266	495	575	526	467
10	542	477	494	393	354	493	455	492	458
11	497	477	521	440	375	495	471	492	468
12	529	499	588	521	424	493	479	518	505
13	572	540	668	652	350	543	517	568	549
14	611	509	658	617	372	524	504	561	542
15	551	581	616	648	650	513	511	554	581
16	585	624	732	617	612	481	482	581	590
17	661	676	721	616	631	583	595	647	640
18	744	708	745	621	555	592	573	672	648
19	774	685	655	581	431	593	594	660	616
20	602	629	672	507	415	538	553	599	559
21	463	473	524	458	360	387	377	445	435
22	402	417	419	386	277	285	282	361	353
23	346	340	326	401	215	271	271	311	310
24	235	261	350	346	160	173	162	236	241
7-19	7000	6767	7230	6275	5153	6195	6174	6673	6399
6-22	8634	8466	9011	7716	6286	7576	7569	8251	7894
6-24	9215	9067	9687	8463	6661	8020	8002	8798	8445
0-24	9504	9398	10083	9080	7195	8303	8268	9111	8833

Channel 1 - Westbound **Average Speed** **Week 1**

Hr Ending	23/10/2019 Wednesday	24/10/2019 Thursday	25/10/2019 Friday	26/10/2019 Saturday	27/10/2019 Sunday	28/10/2019 Monday	29/10/2019 Tuesday
1	25.4	23.0	24.8	23.4	23.4	25.4	24.6
2	25.5	24.2	25.5	24.4	25.4	25.0	25.8
3	27.7	25.1	26.0	25.1	24.8	27.5	24.6
4	27.5	25.1	26.3	26.7	24.0	26.8	26.5
5	28.6	24.4	26.9	26.1	26.1	27.9	27.1
6	27.9	24.7	26.2	25.3	25.8	27.7	24.6
7	23.9	23.9	24.1	24.7	23.6	25.0	24.4
8	22.8	21.7	21.6	23.9	24.0	22.7	22.0
9	20.6	20.8	21.2	22.7	22.4	21.0	21.0
10	19.8	20.1	20.0	22.2	20.9	20.6	20.4
11	19.9	18.8	19.4	20.8	19.1	19.9	18.9
12	19.6	16.7	18.1	19.6	16.2	16.6	16.5
13	20.0	13.1	17.5	17.6	13.7	18.6	18.6
14	19.7	14.0	16.8	17.2	11.5	20.1	20.3
15	18.1	18.3	17.2	16.4	17.2	18.3	18.1
16	19.4	17.5	18.2	17.1	17.3	18.6	18.7
17	18.6	18.7	19.0	17.5	17.2	20.1	19.9
18	18.1	18.8	18.8	17.0	19.4	20.8	20.7
19	17.6	18.0	17.9	18.5	21.3	19.8	19.8
20	19.2	18.9	17.8	18.9	21.8	20.3	20.3
21	21.1	21.1	18.9	19.9	22.0	21.8	22.0
22	21.8	21.3	21.5	21.3	22.6	22.0	21.8
23	22.7	22.5	22.2	20.0	23.7	23.3	23.5
24	23.1	22.8	22.6	20.7	24.0	24.1	24.3
10-12	19.8	17.8	18.7	20.1	17.6	18.2	17.7
14-16	18.8	17.9	17.7	16.8	17.3	18.4	18.4
0-24	20.0	19.0	19.3	19.4	19.4	20.5	20.3

Average	19.7

Channel 1 - Westbound **85th Percentile**

Hr Ending	23/10/2019 Wednesday	24/10/2019 Thursday	25/10/2019 Friday	26/10/2019 Saturday	27/10/2019 Sunday	28/10/2019 Monday	29/10/2019 Tuesday
1	33.7	28.6	29.0	28.7	28.9	28.7	28.2
2	33.5	28.3	28.4	28.9	28.7	33.9	33.5
3	33.6	28.3	28.3	28.8	28.5	33.5	28.3
4	33.3	33.8	38.2	28.0	28.4	33.1	28.3
5	38.3	33.8	33.2	33.5	33.1	38.8	33.0
6	33.8	33.6	33.6	33.9	33.8	33.4	28.5
7	28.0	29.0	28.4	28.4	33.5	28.5	28.2
8	28.8	28.9	28.4	28.7	28.8	28.5	28.9
9	23.8	23.2	23.7	28.5	28.6	28.2	23.6
10	23.7	23.7	23.3	28.5	28.8	23.3	23.8
11	23.0	24.0	23.6	23.5	23.0	23.1	23.9
12	23.4	23.2	23.2	23.4	23.2	23.6	23.3
13	23.9	18.5	23.2	23.4	18.1	23.2	23.5
14	23.8	18.1	23.6	23.3	18.1	23.9	23.1
15	23.4	24.0	23.1	18.1	23.3	23.1	23.6
16	24.0	23.7	23.5	23.2	23.1	23.4	23.4
17	23.9	23.0	23.9	24.0	23.0	23.3	24.0
18	23.1	23.6	23.3	23.1	23.5	23.9	23.1
19	23.9	23.1	23.8	23.4	23.7	23.8	23.9
20	23.4	23.1	23.4	23.4	28.5	23.3	23.6
21	28.5	28.8	23.3	23.5	28.8	28.7	28.3
22	28.8	23.3	28.9	23.2	28.1	28.3	28.1
23	28.1	28.0	28.6	23.5	28.2	28.1	28.5
24	28.6	28.3	28.6	23.3	28.7	28.0	28.2
10-12	23.5	23.4	23.4	23.6	23.5	23.3	24.0
14-16	23.3	23.3	23.1	23.5	23.4	23.8	23.1
0-24	23.6	23.9	23.6	23.2	23.1	23.3	23.0

85th %ile	23.4

Appendix B
LBRUT CORRESPONDENCE

From: Shub, Simon
Sent: 14 October 2019 15:12
To: Sarah Considine
Subject: RE: 75-81 George Street - Scope for additional transport documents

Official

Hi Sarah,

I've received some feedback regarding the study areas. Subject to Richmond Hill up to Bridge Street being added, the area should be ok.

I trust this assists.

Kind Regards,

Simon Shub
Planning Officer Major Projects and Strategic Applications
Serving Richmond and Wandsworth Councils

From: Shub, Simon
Sent: 10 October 2019 10:25
To: Sarah Considine
Subject: RE: 75-81 George Street - Scope for additional transport documents

Official

Hi Sarah,

Thank you for sending this through. I've received notification that the Transport Officer assisting me with this scheme is currently on leave until 16 October 2019, which means, unfortunately, that we may need to wait until his return for confirmation of the study areas.

Kind Regards,

Simon Shub
Planning Officer Major Projects and Strategic Applications
Serving Richmond and Wandsworth Councils

From: Sarah Considine
Sent: 06 October 2019 17:00
To: Shub, Simon
Subject: FW: 75-81 George Street - Scope for additional transport documents

Hi Simon – please see below the response from my transport consultant on the additional information requested by your transport colleagues.

Please can you as your team to confirm the proposed study areas, so we can begin our assessments.

Thanks
Sarah

From: lucy.mascarenhas
Sent: 04 October 2019 11:27
To: Sarah Considine
Cc: doug.mcdougall; jack.smith; alvaro.guzman; Collard, Matthew
Subject: 75-81 George Street - Scope for additional transport documents

Hi Sarah,

I understand you are liaising with the Council on our behalf. Therefore, please could you send the attached proposed study areas for the requested CLoS, PERS and Healthy Streets audits and Collision Analysis to the LBRuT Highways Officer for approval? Once we have confirmation that they are happy with the study areas we can commence with the audits and analysis.

The areas for the audits are based on the location of key public transport links in the site vicinity and the locations of disabled parking, as mentioned within our Transport Assessment. These audits will be undertaken in accordance with TfL guidance.

The area for the collision analysis covers the key walking routes to/from the site and has been informed by the location of collisions within the site vicinity using the crashmap server. The scope of the collision analysis is detailed below.

A technical note will be produced as an Addendum to the Transport Assessment and will cover the following:

- A map showing personal injury collisions occurring over the latest 5 years within the agreed study area, supplied by TfL;
- Summarise collisions by year and severity;
- Identify collision hotspots and trends in collisions at these locations eg. at junctions;
- Assess frequency of collisions by mode to see if there are any trends in collision factors;
- Suggest improvements to reduce collisions within the study area based on the analysis; and,
- Summarise findings.

Kind regards,

Lucy Mascarenhas
Principal Transport Planner

Appendix C
PHOTOS

Figure 1.1 The Quadrant

Figure 1.2 George St - The Quadrant - Eton St Junction

Figure 1.3 Praed St - Edgware Road - Chapel St Junction

Figure 1.4 Eton Street

Figure 1.5 Eton Street

Figure 1.6 Paradise Rd

Figure 1.7 Paradise Rd

Figure 1.8 Red Lion Rd

Figure 1.9 Red Lion St - Hill St - George St Junction

Figure 1.10 Hill Street Rd

Figure 1.11 Hill Street Rd

Figure 1.12 Red Lion St - Hill St - George St Junction

Figure 1.13 George Street

Figure 1.14 George Street

Figure 1.15 George Street

Figure 1.16 George Street

Figure 1.17 George St - The Quadrant - Eton St

Figure 1.18 The Quadrant

Figure 1.19 King Street

Figure 1.20 King Street

Appendix D
LINK CLOS AUDIT

Factor	Indicator	Critical*	Basic CLoS (score=0)	Good CLoS (score=1)	Highest CLoS (score=2)	Link 1 - George Street	Link 2 - The Quadrant	Link 3 - Eton Street	Link 4 - Red Lion Street	Link 5 - Hill Street	Link 6 - King Street
Safety. Max Score 48						20	20	27	24	26	28
Collision Risk	Left/right hook at junctions	Heavy streams of turning traffic cut across main cycling stream	Side road junctions frequent and/or untreated. Conflicting movements at major junctions not separated	Fewer side road junctions. Use of entry treatments. Conflicting movements on cycle routes are separated at major junctions	Side roads closed or footway is continuous. All conflicting streams separated at major junctions	3	3	3	3	6	6
	Collision alongside or from behind	Nearside lane in range 3.2m to 4.0m	Cyclists in wide (4m+) nearside traffic lanes or cycle lanes less than 2m wide	Cyclists in dedicated cycle lanes at least 2m wide	Cyclists separated from motorised traffic	0	0	3	3	0	0
	Kerbside activity or risk of collision with door	Cycle lanes <1.5m alongside parking/loading with no buffer	Frequent kerbside activity / effective width for cyclists of 1.5m	Less frequent kerbside activity / effective width for cyclists of 2m	No kerbside activity / No interaction with vehicles parking or loading	0	0	6	3	6	0
	Other vehicle fails to give way or disobeys signals		Poor visibility, no route continuity across junctions and unclear priority	Clear route continuity through junctions, good visibility, priority clear for all users, visual priority for cyclists across side roads	Cycle priority at signalised junctions; visual priority for cyclists across side roads	1	1	1	1	1	1
Feeling of Safety	Separation from heavy traffic		Cyclists in general traffic lanes or cycle lanes less than 2m	Cycle lanes at least 2m wide	Cyclists physically separated from other traffic at junctions and on links, or no heavy freight	0	0	1	1	0	0
	Speed of traffic (where cyclists are not separated)	85th percentile greater than 30mph	85th percentile greater than 25mph	85th percentile 20-25mph	85th percentile less than 20mph	3	3	3	3	3	6
	Total volume of traffic (where cyclists are not separated)	>1,000 vehicles/ hour at peak	500 - 1,000 vehicles / hour at peak (but becomes 'critical' if 5 per cent or more are HGVs	200 - 500 vehicles / hour at peak (but becomes 'basic' if 2 per cent or more are HGVs)	<200 vehicles / hour at peak	3	3	0	0	0	6
	Interaction with HGVs	Frequent, close interaction	Frequent interaction	Occasional interaction	No interaction	3	3	3	3	3	3
Social Safety	Risk/fear of crime		High risk: 'ambush spots', loitering, poor maintenance	Low risk: area is open, well designed and maintained	No fear of crime: high quality streetscene and pleasant interaction	2	2	2	2	2	2
	Lighting		Long stretches of darkness	Short stretches of darkness	Route lit thoroughly	2	2	2	2	2	2
	Isolation		Route passes far from other activity, for most of the day	Route close to activity, for all of the day	Route always overlooked	2	2	2	2	2	1
	Impact of highway design of behaviour		Layout encourages aggressive behaviour	Layout controls behaviour throughout	Layout encourages civilised behaviour: negotiation and forgiveness	1	1	1	1	1	1
Directness. Max Score 8						3	5	3	3	5	5
Journey Time	Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle ahead (including other cyclists)	Cyclists can usually pass other vehicles (including cyclists)	Cyclists can always pass other vehicles	1	1	1	1	1	1
	Delay to cyclists at junctions		Journey time longer than motor vehicles	Journey time around the same as motor vehicles	Journey time less than motor vehicles	1	1	1	1	1	1
Value of time	For cyclists compared to private car use (normal weather conditions)		VOT greater than private car use value due to some sitespecific factors	VOT equivalent to private car use value: similar delay-inducing factors and convenience	VOT less than private car use value due to attractive nature of route	1	1	1	1	1	1
Directness	Deviation of route (against straight line or nearest main road alternative)		Deviation factor greater than 40 per cent	Deviation factor 20-40 per cent	Deviation factor less than 20 per cent	0	2	0	0	2	2
Coherence. Max Score 6						3	3	3	3	3	3
Connections	Ability to join/leave route safely and easily		Cyclists cannot connect to other routes without dismounting	Cyclists share connections with motor traffic	Cyclists have dedicated connections to other routes	1	1	1	1	1	1
	Density of other routes		Network density mesh width >400m	Network density mesh width 250-400m	Network density mesh width <250m	1	1	1	1	1	1

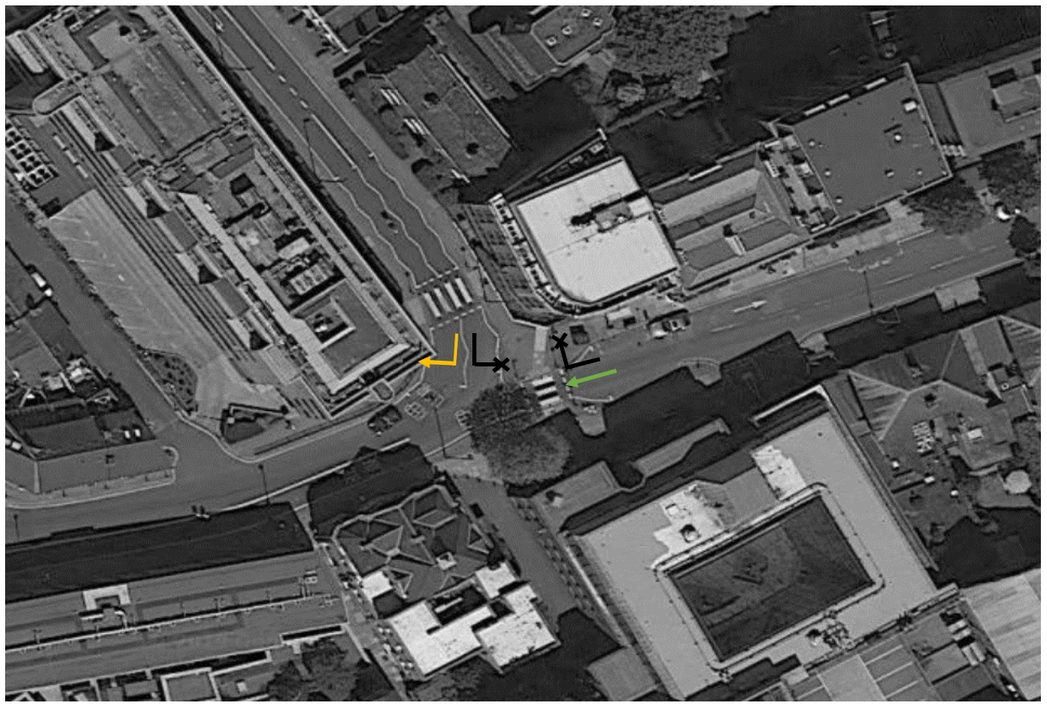
Way-finding	Signing		Basic direction signing (cyclists follow road signs and markings)	Some cycle-specific direction signing	Consistent signing of range of routes and destinations at decision points	1	1	1	1	1	1
Comfort. Max Score 20						16	15	12	13	11	9
Surface quality	Defects: non cycle friendly ironworks, raised/ sunken covers/gullies	Major defects	Many minor defects	Few minor defects	Smooth, high-grip surface	6	6	3	3	3	0
Surface material	Construction		Hand-laid asphalt or unstable blocks/sets	Machine laid asphalt concrete or HRA; smooth blocks	Machine laid asphalt concrete; smooth and firm blocks undisturbed by turning vehicles	2	2	2	2	2	2
Effective width without conflict	Clear nearside space in secondary position or motor vehicle speed/ volume in primary position	Secondary: <1.5m Primary: high motor vehicle flow	Secondary: 1.5m Primary: medium motor vehicle flow	Secondary: 1.5-2.0m Primary: low motor vehicle flow	Secondary: >2.0m Primary: no overtaking by motor vehicles	3	3	3	3	3	3
Gradient	Uphill gradient over 100m		>5 per cent	3-5 per cent	<3 percent	2	1	1	2	1	2
Deflections	Pinch points caused by horizontal deflections		(Remaining) lane width <3.2m	(Remaining) lane width >4.0m or <3.0m (low motor vehicle flow)	Traffic is calmed so no need for horizontal deflections	1	1	1	1	1	0
Undulations	Vertical deflections		Round top humps	Sinusoidal humps	No vertical deflections	2	2	2	2	1	2
Attractiveness. Max Score 12						6	6	6	7	5	8
Impact on walking	Pedestrian Comfort Level (PCL)		Reduction in PCL to C, D or E	No impact on pedestrian provision or PCL never lower than B	Pedestrian provision enhanced by cycling provision or PCL A	1	1	1	1	1	1
Greening	Green infrastructure or sustainable materials incorporated into design		No greening element	Some greening elements	Full integration of greening elements	1	1	1	2	1	1
Air quality	PM10 & NOX values referenced from concentration maps		Medium to High (data taken from London Air Quality Network – NO2 range 58-64 µg/m3, PM10 range 28-31 µg/m3, PM2.5 range 19-21 µg/m3)	Low to Medium	Low	1	1	1	1	1	2
Noise pollution	Noise level from recommended riding range		>78DB (data taken from England Noise Map Viewer)	65-78DB	<65DB	1	1	1	1	0	2
Minimise street clutter	Signing required to support scheme layout		Large amounts of regulatory signing to conform with complex layout	Moderate amount of signing, particularly around junctions	Minimal signing, eg for wayfinding purposes only	1	1	1	1	1	1
Secure cycle parking	Ease of access to secure cycle parking on- and off-street		No additional secure cycle parking	Minimum levels of cycle parking provided (ie to London Plan standards)	Cycle parking is provided to meet future demand and is of good quality and securely located	1	1	1	1	1	1
Adaptability. Max Score 6						5	4	4	4	4	4
Public transport integration	Smooth transition between modes or route continuity maintained through interchanges		No consideration for cyclists within interchange area	Cycle route continuity maintained through interchange and some cycle parking available	Cycle route continuity maintained and secure cycle parking provided. Transport of cycles available	2	1	1	1	1	1
Flexibility	Facility can be expanded or layouts adopted within area constraints		No adjustments are possible within constraints. Road works may require some closure	Links can be adjusted to meet demand but junctions are constrained by vehicle capacity limitations. Road works will not require closure; cycling will be maintained although route quality may be compromised to some extent	Layout can be adapted freely without constrain to meet demand or collision risk. Adjustments can be made to maintain full route quality when roadworks are present	1	1	1	1	1	1
Growth enabled	Route matches predicted usage and has exceedence built into the design		Provision does not match current levels of demand	Provision is matched to predicted demand flows	Provision has spare capacity for large increases in predicted cycle use	2	2	2	2	2	2
Total						**53**	**53**	**55**	**54**	**54**	**57**

**for highlighted critical indicators, score is multiplied by 3 (basic=0, good=3, highest=6)*

Appendix E
JUNCTION CLOS AUDIT

Junction 1 George St - The Quadrant - Eton St

Junction 2 Eton St - Paradise Rd



Junction 3 Red Lion St - Hill St - George St

Junction 4 Bridge Street - Hill Street