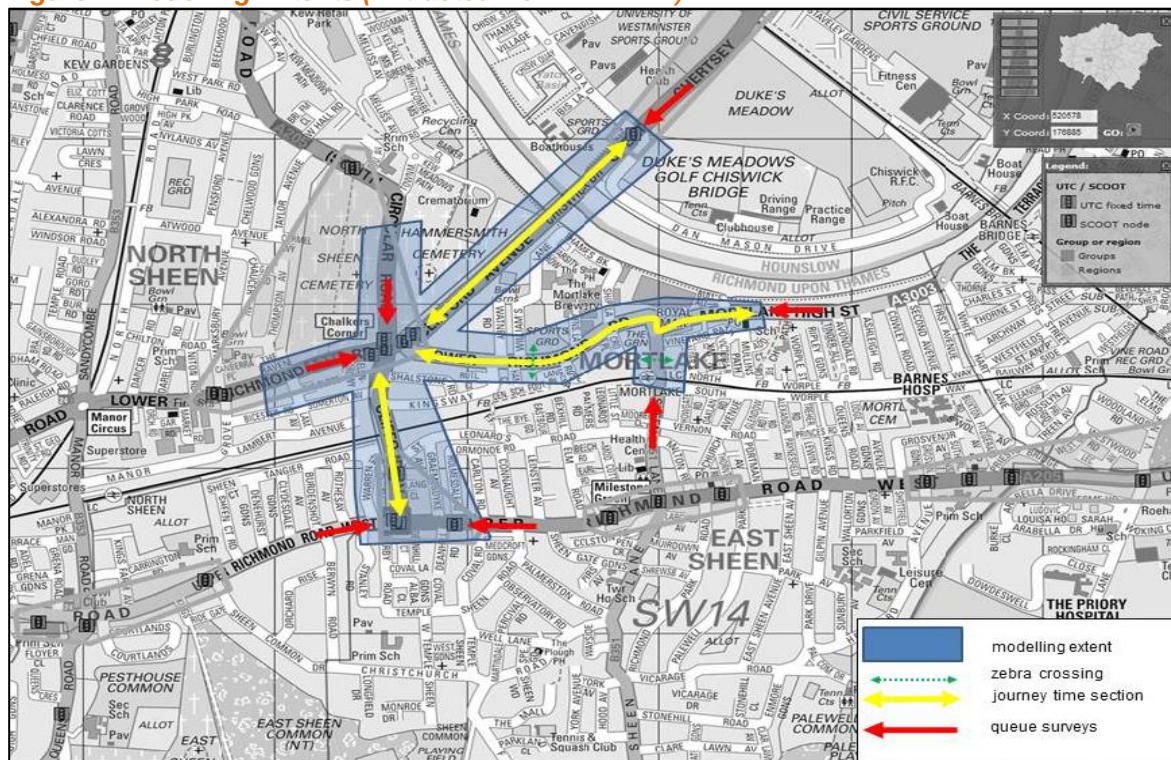


Job Name: Stag Brewery, Mortlake
Job No: 38262
Note No: TN041 – Final
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Checked By: Greg Callaghan
Subject: Stag Brewery VISSIM Modelling Summary

1.1 Introduction

- 1.1.1 This technical note has been produced by Stantec on behalf of Reselton Properties to provide a summary of the Forecast Modelling undertaken to mitigate the highway impacts of the Stag Brewery development, Mortlake.
- 1.1.2 Initial consultation was undertaken with TfL to confirm the modelling extents. Subsequently, a Modelling Expectations Document was received from TfL on 17.03.20 which indicated the extent illustrated in Figure 1 below.

Figure 1: Modelling Extents (Extracted from TfL MED)



1.1.3 The TfL MED indicated the inclusion of the following junctions within the VISSIM model:

- 20/011, 24/201 & 24/202 - A205 Clifford Avenue/Mortlake Road/A316 Lower Richmond Road/Chalkers Corner
- 24/199 & 24/200 - A316 Clifford Avenue/A3003 Lower Richmond Road/Chalkers Corner

- 25/068 - Great Chertsey Road/Hartington Road/Dan Mason Way
- 24/147 - A205 Clifford Avenue by Tangier Road
- 24/004 - A205 Upper Richmond Road West/A205 Clifford Avenue
- 24/215 - A205 Upper Richmond Road/Deanhill Road by Graemesdyke
- Sheen Lane/Lower Richmond Road/Mortlake High Street Roundabout
- Existing development access road – Lower Richmond Road/Ship Lane Junction
- Lower Richmond Road/Hanson Close Junction

1.1.4 A full TfL VISSIM Model Auditing Process (VMAP) was undertaken on the above junctions to determine the proposed mitigation for Chalkers Corner and confirm the other highway mitigations along Lower Richmond Road, Mortlake High Street and Sheen Lane are adequate for the development. This has included use of TfL Strategic Model to determine growth factors for future year models and to calculate the distribution of development trips throughout the local network.

1.2 Proposed Chalkers Corner Options

1.2.1 The highway assessment has focussed on the impacts of the development and then subsequent options for mitigation at Chalkers Corner as agreed with TfL. This has also included improvements along Lower Richmond Road, Mortlake High Street and Sheen Lane for pedestrians, cycles and buses.

1.2.2 Indicative options, identified within the Transport Assessment Addendum document – Revision B, dated July 2020 (TAA) have been modelled to alleviate the impact of the development traffic for both general traffic and buses through Chalkers Corner and along Lower Richmond Road. These include the following options:

- Option 1: LBRuT Mitigation Package
- Option 2: Chalkers Corner 'Light'
- Option 3: Lower Richmond Road Bus Lane
- Option 4: Chalkers Corner 'Light' & Bus Lane
- Option 5: Chalkers Corner Scheme (Application C) – Withdrawn

1.2.3 Option 1 LBRuT Mitigation Package identified a need to do something at Chalkers Corner, however, did not provide any scheme and instead recommended a cash sum should be allocated for future improvements at Chalkers Corner, together with an Area Wide Traffic Management Contribution, Highway Improvements and Travel Plan bond. As no option for Chalkers Corner was proposed this was not able to be tested / modelled. However, that is not to say that one of the other options at Chalkers Corner and the other highway improvements could not be captured as part of this option.

1.2.4 In addition, initial analysis suggested that the Option 3 Lower Richmond Road bus lane would not work on its own. This included a review for different lengths of bus lane, however all analysis suggested that a mitigation would still be required at Chalkers Corner and was subsequently removed from any detailed modelling.

- 1.2.5 Furthermore Option 5 was later withdrawn once the other options were confirmed to provide adequate mitigations for the development. This option has therefore been omitted from this modelling summary note.
- 1.2.6 Detailed modelling was undertaken for the existing Chalkers Corner layout and Options 2 and 4 using microsimulation software, which was taken through a full TfL VISSIM Model Auditing Process (VMAP) to determine whether any of the above options were feasible and would best mitigate the impact of the development on Chalkers Corner.
- 1.2.7 Both options provide several benefits to the wider area, including bus, pedestrian, cycle and highway improvement works. The highway works package includes proposed improvements along the Lower Richmond Road corridor including Mortlake High Street and extending down Sheen Lane towards the level crossing. Details of the improvements include the following:
- 20mph speed limit enforced between Williams Lane and Bulls Alley including Sheen Lane, between the Mortlake High Street / Lower Richmond Road junction and the Sheen Lane level crossing.
 - A new signalised crossing provided just to the west of the new access road to the school
 - Relocation of bus stops to key pedestrian desire lines
 - Relocation and widening of existing signalised crossing adjacent to Ship Lane to align better with key pedestrian desire lines
 - Extension of the two lanes on the Lower Richmond Road arm of the Sheen Lane mini-roundabout so as to provide more capacity for those heading from west to east across the roundabout
 - Provision of 'KEEP CLEAR' markings on the Sheen Lane mini-roundabout to free up the roundabout when the level crossing is down
 - Provision of an informal crossing point on the east side of the roundabout enabled by providing a kerb buildout on the corner to slow traffic and improve pedestrian/vehicle inter visibility at this location
 - Provision of a new zebra crossing to serve a desire line to the eastern portion of the development and help to reduce speeds on Mortlake High Street
 - Enlargement of the central reserve and narrowing of traffic lanes on Mortlake High Street to improve the pedestrian environment by slowing vehicle speeds
 - Provision of a new right turn lane on Mortlake High Street to provide for right turners into the development car park at the current junction with Vineyard Path.
 - Tightening of radii and footway build-out at Vineyard Path Junction.
 - Relocation of bus stops and bus stands on Mortlake High Street to allow for the new access points and the new crossing.
- 1.2.8 While both options provide the above wider benefits, which have been included in the modelling Options 2 and 4 provide alternative options for Lower Richmond Road.
- 1.2.9 The key features of the proposed Option 2 - Chalkers Corner 'light' scheme include the following:
- Provision for a left turn flare lane from Lower Richmond Road.
 - Relocation of stop lines on A205 closer to the junction.

- Introduction of advanced stop lanes on Mortlake Road and Clifford Avenue South to raise awareness of cyclists.
- Improved crossing facilities.
- Widening of area between junctions by relocating stop line by 2m.

1.2.10 The proposed Option 4 Chalkers Corner 'light' and bus lane option would provide all the measures listed above together with a westbound bus lane along Lower Richmond Road. This would require the loss of parking on the southern side of the carriageway.

1.3 VMAP Modelling Stages 1-3

1.3.1 VMAP Stages 1 -3, which include the validation and calibration of the base models were approved by TfL on 08/10/2020. The modelling work undertaken as part of these stages used data captured for the study area, including junction counts, bus journey times and bus stop dwell times from iBus data and pedestrian crossing counts. This data was used to produce a calibrated and validated base model.

1.4 VMAP Modelling Stages 4-5

1.4.1 As part of the VMAP Stages 4 and 5, Future Year Scenario Models have been produced. This includes a 2031 forecast travel demand on the network for each modelled scenario to test the proposed Chalkers Corner options and highway mitigation package which have been listed below.

- 2031 Reference Case – Base + Existing Traffic development traffic (AM & PM peaks)
- 2031 Do Something – Base + Proposed developments + Highway Mitigation package + No change at Chalkers Corner (AM & PM peaks)
- 2031 Do Something – Base + Proposed developments + Highway Mitigation package + Option 2 Chalkers Corner 'Light' Mitigation (AM & PM peaks)
- 2031 Do Something – Base + Proposed developments + Highway Mitigation package + Option 4 Chalkers Corner 'Light' Mitigation + Bus Lane Option (AM & PM peaks)

1.4.2 The results of the modelling work undertaken for general traffic and bus journey times are provided on the Tables 1 and 2 below.

Table 1 – General Traffic Journey Time Summary (seconds)

	From	To	VMAP Stage 3 approved Base Models	Future Base (A)	FB + Stag Dev (B)	FB + Stag + Option 2 (C)	FB + Stag + Option 4 (D)	Diff B-A	Diff C-A	Diff D-A
AM General Traffic	Clifford Ave South/Upper Richmond Road Jn	Chalkers Corner NB approach	327	316	547	372	370	231	56	54
	Chalkers Corner	Clifford Ave South/Upper Richmond Road Jn	135	106	95	110	111	-11	5	5
	Chalkers Corner	Hartington Road Jn	80	82	79	81	81	-3	0	0
	Hartington Road Jn	Chalkers Corner	132	160	376	176	183	217	16	23
	Mortlake Roundabout	Chalkers Corner	341	458	680	433	424	222	-25	-34
	Chalkers Corner	Mortlake Roundabout	144	155	347	231	234	192	77	79
	A316 EB Entry	Chalkers Corner A316 EB approach	1142	1339	1469	1373	1376	130	34	37
	Mortlake Road North Entry	Chalkers Corner Mortlake Road SB approach	219	227	369	296	273	142	69	46
	A316 Great Chertsey Road Entry	Chalkers Corner A316 WB approach	396	388	393	389	389	4	1	1
	Lower Richmond Road Entry	Mortlake Roundabout	597	686	1109	773	695	423	87	9
	Sheen Lane Entry	Mortlake Roundabout	905	1350	1370	1388	1343	20	37	-8
	Upper Richmond Road WB Entry	Upper Richmond Road/Clifford Ave Junction	657	631	966	692	681	336	61	50
	Upper Richmond Road EB Entry	Upper Richmond Road/Clifford Ave Junction	613	657	858	758	761	201	101	104
PM General Traffic	Clifford Ave South/Upper Richmond Road Jn	Chalkers Corner NB approach	366	333	354	365	367	20	31	34
	Chalkers Corner	Clifford Ave South/Upper Richmond Road Jn	131	124	128	132	129	4	8	5
	Chalkers Corner	Hartington Road Jn	80	80	80	80	80	0	0	0
	Hartington Road Jn	Chalkers Corner	226	416	421	415	407	6	0	-8
	Mortlake Roundabout	Chalkers Corner	510	728	733	648	673	6	-79	-55
	Chalkers Corner	Mortlake Roundabout	115	115	191	175	170	76	60	54

	From	To	VMAP Stage 3 approved Base Models	Future Base (A)	FB + Stag Dev (B)	FB + Stag + Option 2 (C)	FB + Stag + Option 4 (D)	Diff B-A	Diff C-A	Diff D-A
	A316 EB Entry	Chalkers Corner A316 EB approach	1091	1096	1098	1099	1099	2	3	2
	Mortlake Road North Entry	Chalkers Corner Mortlake Road SB approach	400	232	229	231	234	-3	-1	2
	A316 Great Chertsey Road Entry	Chalkers Corner A316 WB approach	404	417	425	419	421	7	2	4
	Lower Richmond Road Entry	Mortlake Roundabout	637	913	1027	865	850	114	-48	-64
	Sheen Lane Entry	Mortlake Roundabout	419	453	460	474	484	7	21	31
	Upper Richmond Road WB Entry	Upper Richmond Road/Clifford Ave Junction	688	655	673	684	689	18	29	34
	Upper Richmond Road EB Entry	Upper Richmond Road/Clifford Ave Junction	824	779	812	809	821	33	29	42

Table 2 – Bus Journey Time Summary (seconds)

Bus Route		VMAP Stage 3 approved Base Models	Future Base (A)	FB + Stag Dev (B)	FB + Stag + Option 2 (C)	FB + Stag + Option 4 (D)	Diff B-A	Diff C-A	Diff D-A
AM PT	190 NB	272	262	270	253	266	8	-10	4
	190 SB	237	263	504	284	284	240	20	20
	33 EB	133	149	160	160	164	10	11	14
	337 EB	140	149	143	163	151	-5	14	2
	419 NB	344	354	572	432	434	217	78	79
	419 SB	453	563	787	535	505	225	-27	-58
	493 EB	128	139	165	140	148	26	1	9
	R68 NB	140	137	140	135	134	4	-1	-2
	R68 SB	144	149	271	184	186	122	35	37
PM PT	190 NB	232	240	242	244	251	2	4	11
	190 SB	329	523	540	532	513	18	9	-9
	33 EB	195	193	197	196	202	4	3	8
	337 EB	188	174	183	183	184	9	9	10
	419 NB	259	257	340	339	336	83	83	80
	419 SB	567	731	730	647	556	-1	-84	-175
	493 EB	190	192	191	193	181	-1	1	-11
	R68 NB	117	123	125	129	130	2	6	7
	R68 SB	164	139	146	149	150	7	10	11

- 1.4.3 A comparison of the journey time results above indicates that there is an increase in both general traffic and bus journey times with the addition of the development traffic and highway mitigations without any improvements at Chalkers Corner. This suggests that improvements are required at Chalkers Corner junction to mitigate the impact of the development.
- 1.4.4 Both Option 2 – Chalkers Corner Light and Option 4 – Chalkers Corner Light + Bus lane show significant improvements to the future base + development scenario in both peak periods for general traffic. In addition, comparing the future base without development and proposed mitigation options for general traffic there is a mix of improvements and increased delays for journey times along different routes through Chalkers Corner. The greatest benefits are to journey times along Lower Richmond Road between Mortlake Roundabout and Chalkers Corner Junction in the PM peak with over a minute saving to general traffic provided with the inclusion of the left turn flare lane. This benefit on Lower Richmond Road is slightly reduced to 55 seconds in the PM peak in Option 4 with the introduction of the Bus Lane on Lower Richmond Road.
- 1.4.5 Overall, the impact on general traffic is considered to not be significant on any routes with either Option 2 or Option 4 and TfL have confirmed that both options provide adequate general traffic mitigation for the development.
- 1.4.6 Bus journey times are shown to improve with both options for all bus routes except for Route 419 NB in both peak periods. Notably this increase in delay can be largely attributed to the increased dwell times at bus stops, which has increased from 5 - 10 seconds to 30 - 40 seconds at each bus stop as a result of the increased bus demand in the area.
- 1.4.7 The greatest benefits to bus journey times are for Route 419 SB (westbound buses on Lower Richmond Road). However notably Option 4 with the introduction of the westbound lane provides significant benefits in both peaks in comparison to Option 2 without bus lane. This includes journey time savings of 31 and 91 seconds per bus in the AM and PM Peaks, respectively.

1.5 Summary

- 1.5.1 The Highway Mitigation Proposals include a package of measures along Lower Richmond Road, Mortlake High Street and Sheen Lane, together with various options for Chalkers Corner. As part of the detailed VMAP modelling exercise undertaken both options 2 – Chalkers Corner 'light' and Option 4 – Chalkers Corner 'light' and bus lane have been tested. Both options provide an overall benefit at Chalkers Corner with regards to general traffic journey times and network performance in comparison with the proposed development scenario, which includes the package of highway measures without any proposals at Chalkers Corner. In comparison with the future base with no development the greatest benefits to journey times for general traffic and buses are shown to be along Lower Richmond Road between Mortlake Roundabout and Chalkers Corner junction in the PM peak.
- 1.5.2 It has been possible to reallocate green time to other movements through Chalkers Corner junction and provide better overall junction balance in terms of journey times for all Highway Mitigation proposals. However, a slight increase in journey times is noted on other approach arms to Chalkers Corner junction with the introduction of the proposed Stag Brewery development. Overall, the changes to general traffic journey times is shown to be similar with either Option 2 or 4 and considered to not be significant along any routes. TfL have confirmed that both options provide adequate mitigation for the development in terms of general traffic.
- 1.5.3 The bus journey time results indicate that the introduction of the Stag Brewery development is alleviated through both highway mitigation proposals, however, is shown to be significantly better with Option 4. Bus route 419 NB is the only route highlighting an increase of more than 60 seconds in journey time for both AM and PM peak periods and this is due to increased dwell times at bus stops in the development scenario models. However, due to the agreed bus contribution (£3,675,000) additional bus services could be added to Route 419 in each direction, which would reduce dwell times further at bus stops along the route. The figures generated above are therefore considered a robust worst case for the assessment and are acceptable to TfL.

- 1.5.4 Furthermore, it is noted that with the closure of Hammersmith Bridge, bus route 533 has been re-routed to travel along Mortlake High Street, Lower Richmond Road, through Chalkers Corner and across Chiswick Bridge. While this has not formed part of the modelling work, the Chalkers Corner improvements with / without the implementation of the bus lane will therefore provide added benefits to both Routes 419 and 533 in the westbound direction along Lower Richmond Road. These benefits would be further enhanced with the bus lane option (Option 4) in comparison to the without bus lane (Option 2), which provides additional bus journey time savings of 31 and 91 seconds per bus travelling westbound in the AM and PM Peaks, respectively.
- 1.5.5 Based on the assessment undertaken, it is considered that the proposed highway package together with Options 2 and 4 at Chalkers Corner and Lower Richmond Road sufficiently alleviate the impact of the proposed Stag Brewery development. However, while Option 2 provides general traffic mitigation for the development the benefit to buses with the introduction of the bus lane in Option 4 is considerably greater in both peak periods. This will help to promote sustainable travel in line with achieving the targets set out in the Intend to Publish London Plan Dec 2019 Policy T1 for 80 per cent of all trips in London to be made by foot, cycle or public transport by 2041. Option 4 is therefore considered the preferred option for the scheme.