

Subject Castlewood House – Rail Trip Sensitivity Analysis

Date 3 April 2017

Job No/Ref 244914-00

Introduction

In response to comments received from Transport for London (TfL) in its letter dated 13 March 2017, a sensitivity analysis has been undertaken to revise the distribution of rail trips associated with the Castlewood House and Medius House scheme (the Proposed Development) to stations other than Charing Cross. The comment from TfL states:

“Trip generation has been carried out using a mixture of TRICS data and a first principles approach, with census data used for mode split. However, it has been assumed that all rail trips will use Charing Cross station. Census data only considers main mode and as such some trips will arrive at other mainline stations and use other modes (particularly underground) to access the site. This should be taken into account.”

This note provides an update on the trip generation set out in the Transport Assessment (TA) dated 27 January in response to TfL’s comment.

Rail Trip Sensitivity Analysis

The rail trips generated by the Proposed Development are set out in Table 25 of the TA and are summarised in Table 1. These trips are the net change in trips when the Proposed Development is compared to the trips generated by the existing occupiers of the building. The trips were based on the mode share for rail which was derived from Census data.

Table 1: Rail trip summary

Mode	AM peak hour (08:00 to 09:00)			PM peak hour (17:00 to 18:00)		
	In	Out	In	Out	In	Out
Rail	148	13	161	13	148	161

These trips were distributed to Charing Cross station given that it is the closest station to the Proposed Development and the only National Rail station considered TfL’s public transport accessibility level (PTAL) assessment.

As noted by TfL, given that the mode share obtained from the Census data considered the main mode, additional trips would be undertaken by rail users by other modes of transport when they arrive at the National Rail station to travel onwards to the Proposed Development or in travelling to National Rail stations from the Proposed Development. This analysis now considers all National Rail stations in Central London identified in TfL’s *Central London Rail Termini*¹ report from 2011. The proportion of trips arriving and departing each station was calculated based on the total station entry and exit flows obtained from the Office of Rail and Road station usage data for 2015/16². The onwards mode share from these stations was then calculated using the onwards mode share data identified from the *Central London Rail Termini* report. For most stations, the onward mode share was limited to London Underground and bus use given their proximities from the Proposed

¹ Central London Rail Termini: Analysing passengers’ travel patterns. Policy Analysis Research Report, TfL, 2011

² <http://orr.gov.uk/statistics/published-stats/station-usage-estimates>

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Development. However, for stations closer to the Proposed Development (Charing Cross, Euston, King’s Cross and St. Pancras), it was assumed that some rail users would walk or cycle to the Proposed Development. Table 2 summarises the proportion of station usage and onward mode share.

Table 2: Summary of station usage and predicted onward mode share data

Station	% usage	Predicted onward mode share		
		London Underground	Bus	Walk/cycle
Cannon Street	4%	92%	8%	-
Charing Cross	5%	29%	12%	59%
Euston	8%	65%	10%	25%
Fenchurch Street	3%	87%	13%	-
King's Cross	6%	64%	9%	26%
Liverpool Street	12%	76%	24%	-
London Bridge	10%	73%	28%	-
Marylebone	3%	86%	14%	-
Paddington	7%	90%	10%	-
St. Pancras	6%	61%	9%	30%
Victoria	15%	75%	25%	-
Waterloo	18%	83%	17%	-
Moorgate	2%	95%	5%	-

The resulting additional London Underground and bus trips for the AM and PM peak hours is set out in Table 3.

Table 3: AM and PM peak hour additional London Underground and Bus trips

Station	AM - Inbound		AM – Outbound		PM – Inbound		PM - Outbound	
	LU	Bus	LU	Bus	LU	Bus	LU	Bus
Cannon Street	5	0	0	0	0	0	5	0
Charing Cross	2	1	0	0	0	0	2	1
Euston	7	1	1	0	1	0	7	1
Fenchurch Street	4	1	0	0	0	0	4	1
King's Cross	6	1	1	0	1	0	6	1
Liverpool Street	14	4	1	0	1	0	14	4
London Bridge	11	4	1	0	1	0	11	4
Marylebone	4	1	0	0	0	0	4	1
Paddington	9	1	1	0	1	0	9	1
St. Pancras	5	1	0	0	0	0	5	1
Victoria	17	6	1	0	1	0	17	6
Waterloo	23	5	2	0	2	0	23	5
Moorgate	2	0	0	0	0	0	2	0
Total	110	25	10	2	9	2	110	25

Additional London Underground and Bus Impacts

Bus

In Section 8.4.1 of the TA, it was reported that there would be an additional 53 two-way bus trips during the AM and PM peak hours (47 trips in the inbound direction in the AM peak hour and six in the outbound direction with six trips in the inbound direction during the PM peak hour and 47 in the outbound direction). The additional bus trips from rail services shown in Table 3 have been added to these bus trips giving a total of 72 inbound bus trips during the AM peak hour and eight outbound trips with six trips in the inbound direction during the PM peak hour and 72 in the outbound direction.

The resulting number of additional passengers per bus can be seen in Table 4 for the AM peak hour. This applies the same methodology as the TA of assuming that the bus trips would be undertaken on those bus routes operating closest to the Proposed Development.

Table 4: Additional peak hour trips per bus service

Route no.	Buses per hour per direction	% Distribution	Additional arrival trips	Additional arrival trips per bus service	Additional departure trips	Additional departure trips per bus service
1	9	5.17%	3.72	0.4	0.41	0.05
8	9	5.17%	3.72	0.4	0.41	0.05
10	7	4.02%	2.90	0.4	0.32	0.05
14	10	5.75%	4.14	0.4	0.46	0.05
19	8	4.60%	3.31	0.4	0.37	0.05
24	10	5.75%	4.14	0.4	0.46	0.05
25	9	5.17%	3.72	0.4	0.41	0.05
29	13	7.47%	5.38	0.4	0.60	0.05
38	15	8.62%	6.21	0.4	0.69	0.05
55	10	5.75%	4.14	0.4	0.46	0.05
73	20	11.49%	8.28	0.4	0.92	0.05
98	9	5.17%	3.72	0.4	0.41	0.05
134	13	7.47%	5.38	0.4	0.60	0.05
171	6	3.45%	2.48	0.4	0.28	0.05
176	8	4.60%	3.31	0.4	0.37	0.05
242	9	5.17%	3.72	0.4	0.41	0.05
390	9	5.17%	3.72	0.4	0.41	0.05
Total	174	100%	72	0.4	8	0.05

This results in less than an average of one additional trip per bus service based on a total of 174 services per hour. This is still considered a negligible increase and would be accommodated within existing capacities.

As the frequency of bus services for the PM peak hour would be similar to the AM peak hour, and the overall number of bus trips generated by the Proposed Development is the same, the impact on bus services would be the same as the AM peak hour and would result in a negligible increase in trips. The peak direction would, however, be away from the Proposed Development rather than towards it.

London Underground

In Section 8.4.2 of the TA, it was reported that there would be an additional 177 two-way bus trips during the AM and PM peak hours (161 trips in inbound direction in the AM peak hour and 16 in the outbound direction with 15 trips in the inbound direction during the PM peak hour and 162 in the outbound direction). The additional bus trips from rail services shown in Table 3 have been added to these bus trips giving a total of 271 inbound bus trips during the AM peak hour and 31 outbound trips with 30 trips in the inbound direction during the PM peak hour and 272 in the outbound direction.

Table 5 shows the resulting number of additional passengers per bus for the AM peak hour. This applies the same methodology as in the TA by assuming that the bus trips would be undertaken on those bus routes operating closest to the Proposed Development. It is assumed that the majority of the additional trips from National Rail stations would originate or terminate at Tottenham Court Road except for trips from St. Pancras and King’s Cross which would originate or terminate at Holborn.

Table 5: Additional arrival trips per London Underground service – AM peak hour

Station	Trains per hour (both directions)	Additional arrival trips per station	Additional trips per train
Tottenham Court Road ³	72	133	1.8
Holborn	50	92	1.8
Covent Garden	25	46	1.8
Total	147	271	1.8

The additional London Underground and Crossrail arrival trips generated by the Proposed Development would result in just under an average of two additional trip per London Underground and Crossrail train based on a frequency of 147 trains (including 24 Crossrail trains) in the AM peak hour. This is still considered a negligible increase and would be accommodated within the anticipated capacity (including Crossrail).

London Underground trips departing from the Proposed Development would result in significantly less than one trip per train with a total of eight trips using Tottenham Court Road, five trips using Holborn and three trips using Covent Garden.

As the frequency of London Underground and Crossrail services for the PM peak hour would be similar to the AM peak hour, and the overall number of London Underground and Crossrail trips generated by the Proposed Development is the same, the impact on London Underground and Crossrail services would be the same as the AM peak hour and would be accommodated within the anticipated capacity. The peak direction would, however, be away from the Proposed Development rather than towards it.

³ Includes for future increase in capacity due to Crossrail