

Technical Note

Trip Generation Note

Land at John Mason International

Project Number: 22036
Doc Number: TN02
Prepared for: Linden Hill – Capital Assets – ALX Ltd

6 September 2022

Rev	Issue Purpose	Author	Checked	Reviewed	Approved	Date
A	Draft	ESG	DJT	ESG	DJT	06/09/2022

1. Introduction

Preamble

- 1.1 This Technical Note (TN) has been prepared on behalf of Linden Hill – Capital Assets – ALX Limited in order to address highways objections related to development proposals (Ref: 22/00284/OUT) located at Land at John Mason International Site, 35 Wilson Road, Huyton Business Park, L36 6AE ('the site'). It follows discussion with National Highways (NH) and Knowsley Metropolitan Borough Council (KMBC) transport officers.
- 1.2 As the comments made by NH and KMBC are similar in nature, this note addresses all points collectively.

2. Revised Trip Generation

- 2.1 Concerns were initially raised by NH and KMBC in relation to the site selection criteria and trip rates used to assess the proposed development. Subsequent discussions between all parties have agreed a set of trip rates for assessing the proposed development. These are summarised in **Table 2.1** for the peak hour periods with the full output files included as **Appendix A**.

Table 2.1 Revised Trip Rates per 100sqm

Mode	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Vehicle Trip Rates	0.13	0.26	0.40	0.37	0.26	0.63

- 2.2 The trip rates used are comparable to those generated in June 2022 for a roughly similar sized B8 land use in this area. This original search resulted in eight sites but two have been discounted, one due to potential Covid impacts on the survey and the second due to levels of public transport and parking that are inconsistent with the provision in the vicinity of Tarbock island.

Net Change

- 2.3 It was agreed that the trip rates should be applied to both the existing and proposed floor areas to calculate the net change in trip generation. This was undertaken accordingly, and the results are summarised in **Table 2.2** for the peak hour period and across the day.

Table 2.2 Net Change in Trip Generation

Net Impact	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
Net Difference in Vehicle Trips	13	7	20	4	9	13

- 2.4 **Table 2.2** demonstrates that the site will cause an additional 20 two-way vehicle trips in the AM peak and 13 in the PM peak. Therefore, demonstrating that the impact of the development on the existing highway network will be nominal.

VISSIM Modelling

- 2.5 In discussions with NH, it was agreed that WSP would be commissioned to undertake a run of the VISSIM model for the Tarbock island and this was undertaken accordingly.
- 2.6 As the development proposals do not as yet have any preferred occupier, it was agreed that it would be most appropriate to distribute traffic based on the existing turning proportions at Tarbock Island. For robustness, it was assumed that all vehicle movements will pass through the junction.
- 2.7 The model includes all committed development flows, background growth and committed highway interventions up to 2030 as advised by KMBC.
- 2.8 The outputs present the comparison between the following modelling scenarios:
- The Base year Models – Presented under scenario ‘Base AM’ and ‘Base PM’
 - 2030 Forecast year Do Nothing models – Presented under scenarios ‘2030 DN AM’ and ‘2030 DN PM’
 - 2030 Mitigation layout with development which presents the previously accepted scheme – Presented under scenarios ‘2030 DS4 T2 AM’ and ‘2030 DS4 T2 PM’
 - The modelling work done as part of this project – Presented under scenarios ‘2030 DS4 Wilson Rd AM’ and ‘2030 DS4 Wilson Rd PM’

- 2.9 The summary results (as received from WSP) are provided below for each modelled scenario and give an indication of the change to network performance, queue, and Journey time as a result of the proposed development.

Table 2.3 Average Speeds

Average Speed (mph)							
AM Peak				PM Peak			
Base AM	2030 DN AM	2030 DS4 T2 AM	2030 DS4 Wilson Rd AM	Base PM	2030 DN PM	2030 DS4 T2 PM	2030 DS4 Wilson Rd PM
48	41	44	42	48	36	46	46

Table 2.4 Network Performance Summary

Network Performance Summary								
Peak	Scenario	Average Delay (s)	Average Speed (mph)	Total Distance (km)	Total Travel Time (Hrs)	Total Delay (Hrs)	Total Vehicles	Latent Demand
AM Peak	Base AM	46	48	306,357	3,952	737	58,240	0
	2030 DN AM	87	41	332,619	5,029	1,536	63,741	125
	2030 DS4 T2 AM	71	44	346,358	4,932	1,285	65,245	45
	2030 DS4 Wilson Rd AM	79	42	346,604	5,091	1,439	65,309	49
PM Peak	Base PM	52	48	331,316	4,330	901	61,963	0
	2030 DN PM	133	36	355,916	6,205	2,513	67,909	37
	2030 DS4 T2 PM	60	46	374,890	5,058	1,161	69,316	6
	2030 DS4 Wilson Rd PM	60	46	375,050	5,049	1,148	69,354	11

Table 2.5 Mean Max Queue (m)

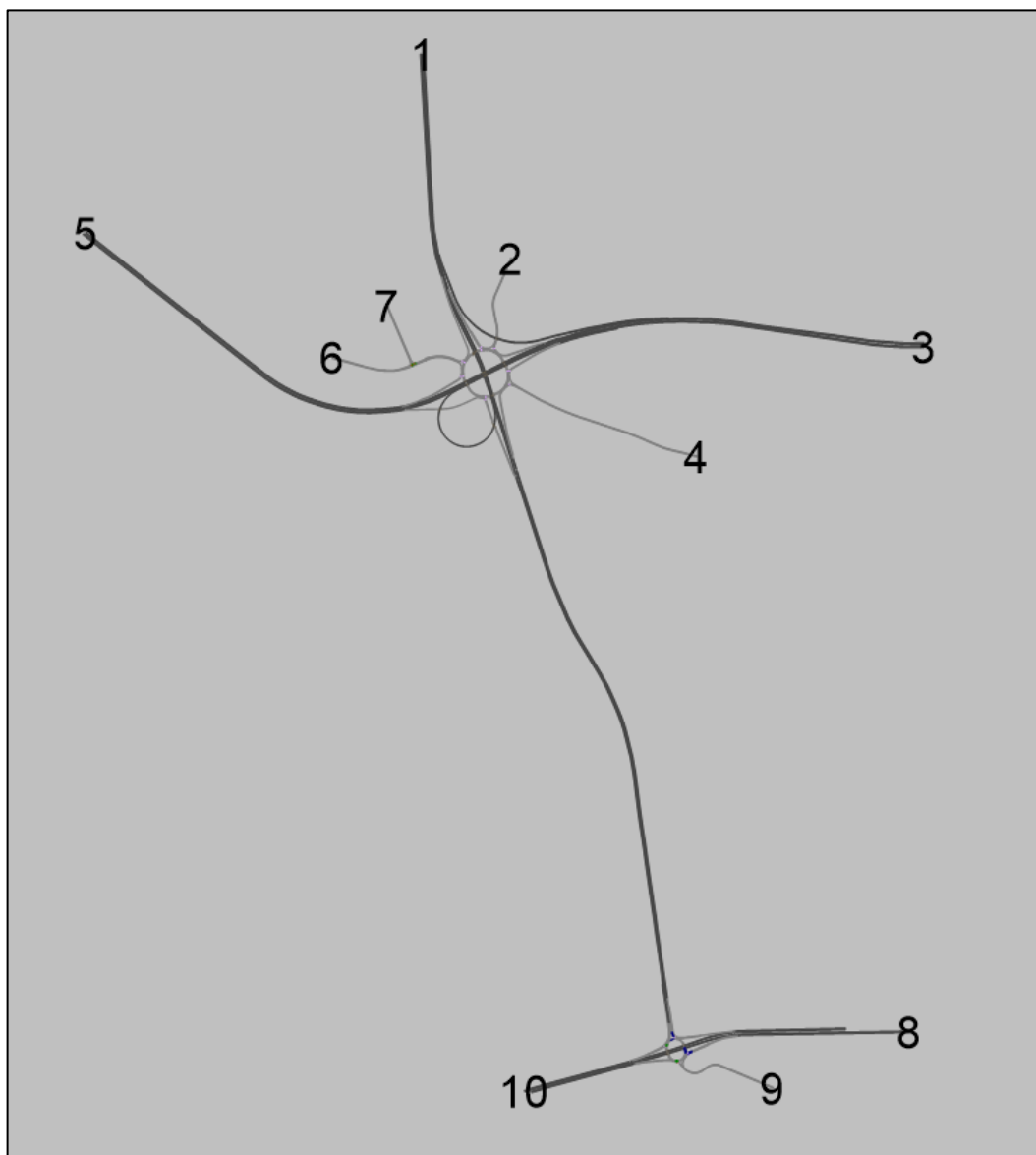
Mean Max Queue (m)									
Location	AM Peak				PM Peak				Ramp length (m)
	Base AM	2030 DN AM	2030 DS4 T2 AM	2030 DS4 Wilson Rd AM	Base PM	2030 DN PM	2030 DS4 T2 PM	2030 DS4 Wilson Rd PM	
Cronton Road	277	781	73	74	406	718	58	58	
M57N Slip	76	358	109	65	114	178	90	98	400
Windy Arbor Road	90	401	111	128	159	378	98	96	
M62 E Slip Road	91	103	104	108	67	72	110	120	360 + 380
A5080 (S)	86	101	146	165	21	29	124	126	
A5300 Slip Road	101	196	67	69	173	2,417	105	101	530
M62 W Slip Road	73	99	65	77	205	1,270	63	62	350
Circulatory at Cronton	77	88	51	52	88	96	75	75	
Circulatory at M57 N Slip	96	130	108	108	122	119	88	85	
Circulatory at M62 E Slip	111	286	104	109	63	69	118	118	
Circulatory at A5300	86	89	107	118	92	100	98	100	
Circulatory at M62 West	101	144	124	132	171	220	105	103	

Table 2.6 Max Queue (m)

Max Queue(m)									
Location	AM Peak				PM Peak				Ramp length (m)
	Base AM	2030 DN AM	2030 DS4 T2 AM	2030 DS4 Wilson Rd AM	Base PM	2030 DN PM	2030 DS4 T2 PM	2030 DS4 Wilson Rd PM	
Cronton Road	499	870	85	102	685	760	76	81	
M57N Slip	113	1,714	446	166	310	552	184	254	400
Windy Arbor Road	253	631	236	280	411	630	174	159	
M62 E Slip Road	136	158	164	193	94	97	256	286	360 + 380
A5080 (S)	303	382	236	280	42	79	281	295	
A5300 Slip Road	160	352	105	103	602	5,264	193	175	530
M62 W Slip Road	129	303	129	218	555	2,240	86	86	350
Circulatory at Cronton	98	101	79	75	101	101	103	100	
Circulatory at M57 N Slip	144	145	129	128	139	144	135	134	
Circulatory at M62 E Slip	188	515	183	196	77	86	227	227	
Circulatory at A5300	157	169	176	208	119	142	128	131	
Circulatory at M62 West	182	220	191	185	225	224	153	147	

2.10 Journey times outputs for 10 junction arms as identified in **Figure 2.1** were considered.

Figure 2.1 Journey Time Routes



2.11 The weighted average journey time in seconds from the origin arm and the average journey times are summarised in **Table 2.7** and **Table 2.8**.

Table 2.7 Weighted Average Journey Time(s) from Origin Arm

Arms	Weighted Average JT (s) from Origin Arm							
	AM Peak				PM Peak			
	Base AM	2030 DN AM	2030 DS4 T2 AM	2030 DS4 Wilson Rd AM	Base PM	2030 DN PM	2030 DS4 T2 PM	2030 DS4 Wilson Rd PM
1	272	353	303	317	244	253	243	245
2	278	522	275	295	386	611	315	313
3	260	271	274	281	249	255	260	261
4	279	301	361	380	240	261	358	359
5	241	252	248	252	259	373	242	242
6	237	407	345	344	258	304	391	393
7	320	601	318	308	409	545	295	254
8	191	198	195	196	237	375	246	246
9	158	172	272	354	210	270	211	208
10	210	230	233	233	237	441	255	255

Table 2.8 Average Journey Times

Average JT (s)							
AM Peak				PM Peak			
Base AM	2030 DN AM	2030 DS4 T2 AM	2030 DS4 Wilson Rd AM	Base PM	2030 DN PM	2030 DS4 T2 PM	2030 DS4 Wilson Rd PM
245	289	264	270	253	331	259	259

Summary of VISSIM Results

- 2.11 It is evident that overall, the proposed increase in trips through the network will have limited impact on the operation of the Tarbock Island junction.
- 2.12 The AM peak Average speeds in the development tests are very slightly lower than those in the DS4 T2 models that were the previously approved models; the PM speeds are similar between the two models.
- 2.13 The queues during the AM peak are comparable between the DS4 T2 models and the models for the latest tests with the following observations;
- The minor increase in flows results in slight change in flow pattern, which while leading to drop in average queues along M57N off-slip (from 109m in DS4 T2 model to 65m in the latest models) during the AM peak, has limited impact on the queues on other arms;
 - Comparison of AM peak maximum queues shows that while the maximum queues on M57 N off-slip will drop significantly from 446m observed in DS4 T2 model to 166m in the latest models, the change in flows will lead to only minor increases in queue length throughout the network. In case of M57 N off-slip, the long maximum queues in the DS4 T2 model was due to long queues observed only during 1 random seed out of the 5 used for the analysis and can be called an anomaly, which was agreed as a one-off occurrence due to the randomness in VISSIM assignment. Comparison of the queue length in the remaining 4 random seeds of the DS4 T2 AM peak models with the queue lengths in the latest models show the queues to be consistent between the two scenarios.
 - The latest model shows that even with the increased flow (minor) the queues on the off ramps will not change by much when compared to the previously approved DS4 T2 model and will not reach the Motorway main line.

- 2.14 The comparison between the PM peak models for DS4 T2 and the latest scenario, show that there will be minor increase in average and maximum queues during PM peak due to the proposed increase in traffic, which will have limited impact on network operation.
- 2.15 Comparison of journey time outputs shows that while the change in flows will result in increase in journey across the network, the change will be quite limited and, in most cases, will remain consistent.
- 2.16 It is evident therefore that the increased trips arising from the proposed development will have a negligible impact on the operation of the local highway network.

3. Parking Accumulation

- 3.1 NH requested that a longer duration trip generation (12-24 hours) should be presented with associated car parking accumulation so as to understand the timing of development traffic arrivals and traffic generation in the context of parking provision.
- 3.2 It is proposed that car parking will be provided in line with Knowsley maximum car parking standards; therefore, a total of 190 spaces are to be provided which includes 10 accessible spaces.
- 3.3 As requested, a parking accumulation exercise based on the agreed trip rates is presented in **Table 3.1**.

Table 3.1 Parking Accumulation

Time Range	In	Out	Total
05:00-06:00	41	28	12
06:00-07:00	83	44	52
07:00-08:00	27	23	55
08:00-09:00	26	13	68
09:00-10:00	29	17	80
10:00-11:00	20	18	81
11:00-12:00	19	19	81
12:00-13:00	17	15	83
13:00-14:00	26	25	84
14:00-15:00	21	28	77
15:00-16:00	13	27	64
16:00-17:00	12	24	52
17:00-18:00	8	19	40
18:00-19:00	17	13	44
19:00-20:00	36	36	44
20:00-21:00	23	36	31

- 3.4 It is evident from the results that sufficient car parking is available to accommodate demand.

4. Conclusion

- 4.1 This Technical Note (TN) has been prepared to provide further information to NH and KMBC in relation to development proposals located at Land at John Mason International Site, 35 Wilson Road, Huyton Business Park and follows consultation with both parties.
- 4.2 This TN presents the agreed trip generation for the proposed development and the results of the VISSIM modelling of the Tarbock island. It is evident from these results that the proposals would not give rise to a material increase in trip generation and would have negligible impact on the operation of the local and strategic highway network.
- 4.3 The parking accumulation exercise has demonstrated that sufficient car parking will be provided to accommodate expected demand.
- 4.4 To further offset the impact of the development proposals, the application is supported by a Framework Travel Plan.
- 4.5 For the reasons identified above, it is considered that the development should be supported in respect of transport matters.

APPENDIX A – APPROVED TRICS OUTPUT

WSP Queen Street Manchester

Licence No: 100323

Calculation Reference: AUDIT-100323-220622-0628

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : F - WAREHOUSING (COMMERCIAL)
TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	EX ESSEX	1 days
	HC HAMPSHIRE	1 days
	KC KENT	1 days
09	NORTH	
	TW TYNE & WEAR	1 days
17	ULSTER (NORTHERN IRELAND)	
	AN ANTRIM	2 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 6560 to 31000 (units: sqm)
 Range Selected by User: 6050 to 50000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/14 to 22/11/21

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	1 days
Thursday	2 days
Friday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	6 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	3
Edge of Town	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	5
Commercial Zone	1

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

WSP Queen Street Manchester

Licence No: 100323

Secondary Filtering selection:

Use Class:

n/a	1 days
B8	5 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Filter by Site Operations Breakdown:

All Surveys Included

Population within 500m Range:

All Surveys Included

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	1 days
10,001 to 15,000	1 days
15,001 to 20,000	1 days
20,001 to 25,000	1 days
50,001 to 100,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	1 days
125,001 to 250,000	3 days
250,001 to 500,000	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	2 days
1.6 to 2.0	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	5 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	6 days
-----------------	--------

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	AN-02-F-03 KENNEDY WAY BELFAST KENNEDY WAY IND. EST. Suburban Area (PPS6 Out of Centre) Industrial Zone Total Gross floor area: 12234 sqm Survey date: TUESDAY 11/10/16	PACKAGING COMPANY	ANTRIM	Survey Type: MANUAL
2	AN-02-F-04 APOLLO ROAD BELFAST BALMORAL Suburban Area (PPS6 Out of Centre) Industrial Zone Total Gross floor area: 11000 sqm Survey date: THURSDAY 14/03/19	TESCO DISTRIBUTION CENTRE	ANTRIM	Survey Type: MANUAL
3	EX-02-F-01 BRUNEL WAY COLCHESTER SEVERALLS INDUSTRIAL PK Edge of Town Industrial Zone Total Gross floor area: 6560 sqm Survey date: FRIDAY 18/05/18	SPORTS SUPPLEMENTS	ESSEX	Survey Type: MANUAL
4	HC-02-F-02 RUTHERFORD ROAD BASINGSTOKE Suburban Area (PPS6 Out of Centre) Commercial Zone Total Gross floor area: 13200 sqm Survey date: THURSDAY 16/06/16	LOGISTICS	HAMPSHIRE	Survey Type: MANUAL
5	KC-02-F-02 MILLS ROAD AYLESFORD QUARRY WOOD Edge of Town Industrial Zone Total Gross floor area: 11200 sqm Survey date: FRIDAY 22/09/17	COMMERCIAL WAREHOUSING	KENT	Survey Type: MANUAL
6	TW-02-F-01 MANDARIN WAY WASHINGTON PATTISON IND. ESTATE Edge of Town Industrial Zone Total Gross floor area: 31000 sqm Survey date: FRIDAY 13/11/15	ASDA DISTRIBUTION CENTRE	TYNE & WEAR	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
LO-02-F-02	Covid
WY-02-F-02	PT & Parking

WSP Queen Street Manchester

Licence No: 100323

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	11000	0.209	1	11000	0.145	1	11000	0.354
06:00 - 07:00	1	11000	0.427	1	11000	0.227	1	11000	0.654
07:00 - 08:00	6	14199	0.137	6	14199	0.119	6	14199	0.256
08:00 - 09:00	6	14199	0.134	6	14199	0.069	6	14199	0.203
09:00 - 10:00	6	14199	0.148	6	14199	0.087	6	14199	0.235
10:00 - 11:00	6	14199	0.101	6	14199	0.093	6	14199	0.194
11:00 - 12:00	6	14199	0.095	6	14199	0.095	6	14199	0.190
12:00 - 13:00	6	14199	0.088	6	14199	0.079	6	14199	0.167
13:00 - 14:00	6	14199	0.133	6	14199	0.128	6	14199	0.261
14:00 - 15:00	6	14199	0.109	6	14199	0.142	6	14199	0.251
15:00 - 16:00	6	14199	0.066	6	14199	0.137	6	14199	0.203
16:00 - 17:00	6	14199	0.062	6	14199	0.124	6	14199	0.186
17:00 - 18:00	6	14199	0.039	6	14199	0.096	6	14199	0.135
18:00 - 19:00	6	14199	0.085	6	14199	0.069	6	14199	0.154
19:00 - 20:00	1	11000	0.182	1	11000	0.182	1	11000	0.364
20:00 - 21:00	1	11000	0.118	1	11000	0.182	1	11000	0.300
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.133			1.974			4.107

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

The survey data, graphs and all associated supporting information, contained within the TRICS Database are published by TRICS Consortium Limited ("the Company") and the Company claims copyright and database rights in this published work. The Company authorises those who possess a current TRICS licence to access the TRICS Database and copy the data contained within the TRICS Database for the licence holders' use only. Any resulting copy must retain all copyrights and other proprietary notices, and any disclaimer contained thereon.

The Company accepts no responsibility for loss which may arise from reliance on data contained in the TRICS Database. [No warranty of any kind, express or implied, is made as to the data contained in the TRICS Database.]

Parameter summary

Trip rate parameter range selected:	6560 - 31000 (units: sqm)
Survey date range:	01/01/14 - 22/11/21
Number of weekdays (Monday-Friday):	6
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	2

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.