

**Proposed Residential Development
at
Hayden's Lane
Lucan
County Dublin**

**Traffic Report
As Response
To Further Information Request**

**South Dublin County Council
Planning Ref: SD21A/0359**

**Prepared for
Green Construction Ltd**

March 2022



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1.0 Introduction.

- 1.1 TPS M Moran & Associates are retained by Green Construction Ltd to undertake a Traffic Report relating to a proposed residential development that consisted of 74 apartment units, 42 parking spaces, and 160 resident and visitor cycle parking spaces on lands off Hayden's Lane, Lucan, County Dublin.
- 1.2 This development proposal was lodged seeking planning permission from South Dublin County Council on the 22nd of December 2021 and this planning application Planning Ref: SD21A/0359 is now the subject of a Further Information request.
- 1.3 This Further Information request was issued on the 28th of February 2022, with Item 8 being traffic and transportation related stating the following:

SDCC's Roads Department requests the following additional information:

(a) In line with the requested amendments to density the applicant is requested to submit a revised car parking strategy. This should provide for a higher car parking ratio than proposed. Please refer to Table 11.23: Maximum Parking Rates (Residential) – from the South Dublin County Development Plan 2016-2022.

(b) Taking in Charge maps as per SDCC's Appendix 6 of the TIC standards.

(c) A revised layout showing pedestrian access to Hansted estate and pedestrian crossing point to the footpath on the west side of Hayden's Lane.

(d) A revised/updated traffic impact assessment highlighting the Hayden's Lane/Old Forge junction and the Griffeen Avenue roundabout junction.

2.0 Revised Residential Development Proposal.

- 2.1 Prior to commenting on the above, we consider it worthwhile to advise that the proposed development has been revised to now include a reduction from 74 residential apartments to 66 units with 50 parking spaces and 160 cycle spaces for residents and visitors.
- 2.2 The revised residential development units are now made up of 66 apartment units, of which 18 are one-bedroom, 42 are two-bedroom apartments and 6 are three-bedroom apartments.
- 2.3 In order to establish the likely trip generation for this reduced development scheme we have reviewed the above development within the TRICS 2021(b) trip rate database (Trip Rate Information Computer System) has again been reviewed. TRICS 2021(b) is a database, which uses traffic survey information to estimate traffic generation for land use development planning purposes.
- 2.4 The database consists of over 7500 traffic surveys, which therefore yields empirical rather than theoretical daily, AM, and PM peak hour trip rate generation figures. The TRICS 2021(b) Database trips for the proposed land use development derived from similar residential apartment developments in Ireland are shown in Table 1.0 below with a copy of the TRICS 2021(b) output file attached within Appendix 1.0.

TOTAL VEHICLES		ARRIVALS		DEPARTURES		TOTALS						
TRIP RATE VALUE PER 1 DWELLS	Total Rate: 1.098 Peak: 17:00-18:00	Total	Estimated Trip rate	Total rate: 1.179 Peak: 08:00-09:00	Estimated Trip rate	Total rate: 2.277 Peak: 08:00-09:00	Total					
No. Days	Ave. DWELLS	Trip Rate	Estimated Trip rate	No. Days	Ave. DWELLS	Trip Rate	Estimated 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												
06:00-07:00												
07:00-08:00	15	71	0.042	2.802	15	71	0.181	11.955	15	71	0.223	14.757
08:00-09:00	15	71	0.071	4.670	15	71	0.232	15.317	15	71	0.303	19.987
09:00-10:00	15	71	0.075	4.919	15	71	0.084	5.542	15	71	0.159	10.461
10:00-11:00	15	71	0.039	2.553	15	71	0.064	4.234	15	71	0.103	6.787
11:00-12:00	15	71	0.052	3.425	15	71	0.065	4.296	15	71	0.117	7.721
12:00-13:00	15	71	0.068	4.483	15	71	0.084	5.542	15	71	0.152	10.025
13:00-14:00	15	71	0.085	5.604	15	71	0.075	4.981	15	71	0.160	10.585
14:00-15:00	15	71	0.107	7.036	15	71	0.075	4.981	15	71	0.182	12.017
15:00-16:00	15	71	0.095	6.289	15	71	0.072	4.732	15	71	0.167	11.021
16:00-17:00	15	71	0.109	7.223	15	71	0.069	4.545	15	71	0.178	11.768
17:00-18:00	15	71	0.185	12.204	15	71	0.078	5.168	15	71	0.263	17.372
18:00-19:00	15	71	0.170	11.208	15	71	0.100	6.600	15	71	0.270	17.808

Projected 66 Residential Apartment Daily Trip Generation.

Table 1.0

- 2.5 The projected daily traffic levels that would be expected to be generated by the 66 residential units on the subject site shown within Table 1.0 above, indicates that the proposed development generates negligible daily trips.
- 2.6 The extent of peak hour trips during the AM and PM peak hour traffic periods of 0800hrs to 0900hrs and 1700hrs to 1800hrs are further summarised within Table 2.0 below:

Time Period	Inbound	Outbound	Total
AM Peak Hour	5	16	21
PM Peak Hour	13	6	19

66 Residential Units AM and PM Peak Hour Trip generation.

Table 2.0.

- 2.7 From the above, it can be seen the proposed residential development of 66 units generates very limited daily or peak hour trips.

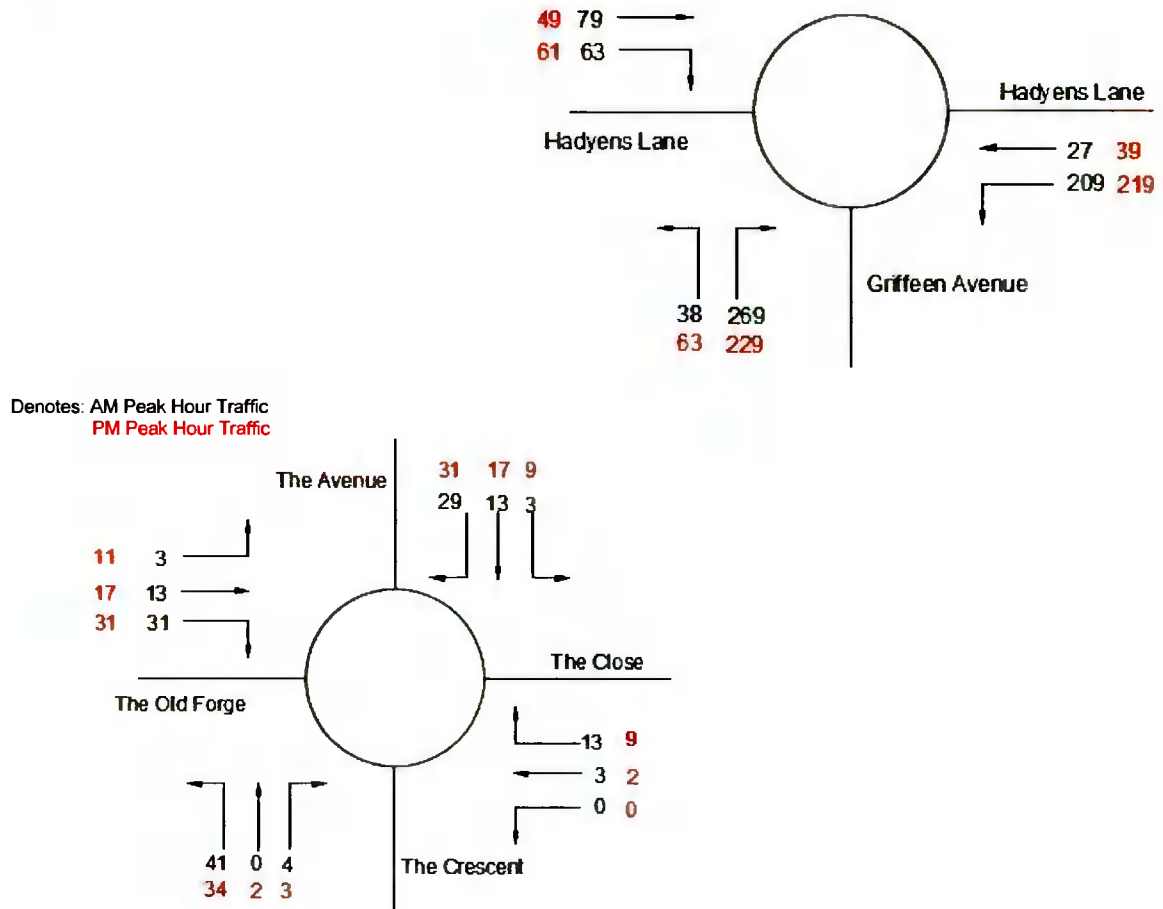
3.0 Response to Item 8 of Further Information.

- 3.1 Item 8(a) of the Further Information seeks the provision of additional car parking more in accordance with the South Dublin County Development Plan standards than currently proposed stating:

(a) In line with the requested amendments to density the applicant is requested to submit a revised car parking strategy. This should provide for a higher car parking ratio than proposed. Please refer to Table 11.23: Maximum Parking Rates (Residential) – from the South Dublin County Development Plan 2016-2022.

- 3.2 As previously discussed, the development sought permission for 74 residential apartments with 42 car parking spaces. It is now proposed to amend this proposal to reduce the extent of residential apartments to 66 units and increase the parking provision to 50 spaces.
- 3.3 The extent of maximum car parking based on the proposed 66-unit development being within Zone 2 of the Development Plan is shown outlined within Table 11.24 of the current South Dublin Development Plan 2016 to 2022 which suggests 0.75 spaces for 1-bedroom apartments, 1 space per 2-bedroom apartments and 1.25 spaces per 3-bedroom apartments.

- 3.4 Based on these maximum parking standards some 64 car parking spaces would be required to serve the development. It is proposed to provide 50 parking spaces and 160 resident and visitor bicycle parking spaces within the development site at surface level some 78% in compliance with the development plan car parking standards.
- 3.5 We consider that reducing the number of residential units to 66 from 74 and increasing the parking provision from 42 spaces to 50 spaces this extent of car parking is more than sufficient to serve this residential development.
- 3.6 Furthermore, as outlined within our Traffic Impact Assessment which supported this application, the development site also complies with the following South Dublin County Council development related parking objectives, which are:
- The proximity of the site to public transport and the quality of the transport service it provides.
 - The proximity of the development to services that fulfil occasional and day today needs.
 - The existence of a robust and achievable Workforce Management or Mobility Management Plan for the development.
 - The ability of people to fulfil multiple needs in a single journey.
- 3.7 Item 8(b) of the Further Information requires the following:
- (b) Taking in Charge maps as per SDCC's Appendix 6 of the TIC standards.*
- 3.8 We have been advised that it is not the intention of the applicant to have this residential development taken into the charge of the Local Authority with the development when complete being operated by a Management Company.
- 3.9 Item 8(c) of the Further Information requires:
- (c) A revised layout showing pedestrian access to Hansted estate and pedestrian crossing point to the footpath on the west side of Hayden's Lane.*
- 3.10 This proposed pedestrian access arrangement is shown within Oppermann Associates Design Brief which indicates a raised pedestrian crossing point adjacent to the existing Hansted Estate boundary which connects with the new pedestrian footpath along the frontage of the application site.
- 3.11 Item 8(d) of the Further Information requires the applicant to undertake:
- (d) A revised/updated traffic impact assessment highlighting the Hayden's Lane/Old Forge junction and the Griffeen Avenue roundabout junction.*
- 3.12 In order to determine the traffic impact of the proposed residential development on the above roundabout junctions we have commissioned a series of AM and PM classified traffic surveys at both junctions. These traffic surveys were undertaken from 0700hrs to 1000hrs and 1600hrs to 1900hrs periods within which the AM and PM peak hours can be identified.
- 3.13 From these surveys the AM peak hour was identified as being from 0800hrs to 0900hrs with the evening peak hour being from 1700hrs to 1800hrs. The busiest peak period was the AM Peak hour with all these classified traffic turning movements shown within Figure 1.0 below.



Existing AM and PM Hour Traffic Surveys.

Figure 1.0

- 3.14 To determine a "worst case" traffic modelling scenario for the above, we have added and doubled all the projected trips associated with the reduced residential development to the key junction, this being the Griffeen Road and Hayden's Lane. We do not consider that The Avenue/Old Forge roundabout will experience any development related traffic as there is nothing for this traffic to have an origin or destination through these road links.
- 3.15 The impact the traffic associated with the proposed development may have on the Griffeen Road and Hayden's Lane roundabout junction has been determined by modelling the above junction using the computer-modelling program ARCADY10.
- 3.16 ARCADY10 is a traffic modelling program developed by the Transport Research Laboratory in the UK for the assessment of at grade roundabout junctions.
- 3.17 ARCADY10 output results consist of tables of demand flows for each time segment of the time-period analysis. These tables contain start and finish times for each arm, traffic demand data, capacity, the ratio of flow to capacity findings, start queue length, end queue length, and queuing delay.
- 3.18 This traffic-modelling period covers the busiest recorded AM peak period from 0800hrs to 0900hrs. A copy of the PM peak hour ARCADY10 data and results are attached as Appendix 2.0 to this report with a summary of the output results shown within Table 3.0 below.

Name
Arm 1 HAYDEN'S LANE NORTH
Arm 2 GRIFFEEN AVENUE
Arm 3 HAYDEN'S LANE SOUTH

Roundabout Geometry

V - Approach road half-width (m)	E - Entry width (m)	F - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)
3.00	3.00	0.0	10.5	30.0	26.0
3.00	3.00	0.0	10.5	30.0	24.0
3.00	3.00	0.0	15.5	30.0	23.0

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	265	87	840	0.316	265	0.5	6.895	A
2	344	35	871	0.395	343	0.7	7.511	A
3	192	296	770	0.249	192	0.4	6.847	A

AM Peak Hour ARCADY10 Summary Table.

Table 3.0

- 3.19 From the above Table 3.0, it is indicated that the Griffeen Road and Hayden's Lane roundabout junction operates with ample capacity to accommodate the proposed residential development.
- 3.20 This table also indicates that during the peak traffic period this junction experiences almost free-flow traffic conditions with no material queuing projected within this junction, operating with a reserve capacity of over 60% during this traffic modelling period.
- 3.21 The relative Level of Service within this junction is identified as A within the above ARCADY10 assessment representing "almost free flow urban traffic conditions", as set out within the Highway Capacity Manual.
- 3.22 Urban Level of Service gauges, in a qualitative manner, the extent of congestion within a road link. Variables such as travel time and traffic speed form part of the qualitative description. Level of Service A represents almost free-flow traffic conditions falling to a Level of Service F indicating the road link is over capacity.

4.0 Conclusions.

- 4.1 The proposed development has been reduced from 74 residential apartments to 66 units with an increase in parking from 42 spaces to 50 parking spaces and 160 cycle spaces for residents and visitors.
- 4.2 Capacity assessments have been undertaken at the critical road link junction, this being the Griffeen Road and Hayden's Lane roundabout junction which identified the junction has ample reserve capacity to accommodate the proposed residential development.
- 4.3 We consider that the above addresses the traffic and transportation issues raised within Item 8 of the Further Information request issued by South Dublin County Council on the 28th of February 2022.

Appendix 1.0

TRICS2021(b) Output File

Calculation Reference: AUDIT-764101-220315-0308

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED

TOTAL VEHICLES

Selected regions and areas:

12 CONNAUGHT	
GA GALWAY	1 days
13 MUNSTER	
WA WATERFORD	1 days
14 LEINSTER	
LU LOUTH	3 days
15 GREATER DUBLIN	
DL DUBLIN	8 days
16 ULSTER (REPUBLIC OF IRELAND)	
MG MONAGHAN	1 days
17 ULSTER (NORTHERN IRELAND)	
AN ANTRIM	1 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: No of Dwellings
Actual Range: 20 to 332 (units:)
Range Selected by User: 18 to 372 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/13 to 19/05/21

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:

Monday	2 days
Tuesday	6 days
Wednesday	2 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	15 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:

Edge of Town Centre	4
Suburban Area (PPS6 Out of Centre)	8
Edge of Town	1
Neighbourhood Centre (PPS6 Local Centre)	2

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:

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.

Secondary Filtering selection:

Use Class:

C3 15 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®.

Population within 500m Range:

All Surveys Included

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	3 days
15,001 to 20,000	2 days
20,001 to 25,000	1 days
25,001 to 50,000	8 days

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

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	3 days
50,001 to 75,000	2 days
125,001 to 250,000	1 days
250,001 to 500,000	1 days
500,001 or More	7 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	5 days
1.1 to 1.5	10 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:

No 15 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 15 days

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

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions
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LIST OF SITES relevant to selection parameters

1	AN-03-C-02 BLOCK OF FLATS SUMMERHILL AVENUE BELFAST KNOCK Edge of Town Residential Zone Total No of Dwellings: 22 <i>Survey date: FRIDAY</i> 28/11/14	ANTRIM <i>Survey Type: MANUAL</i> DUBLIN
2	DL-03-C-11 BLOCK OF FLATS WYCKHAM WAY DUBLIN DUNDRUM Neighbourhood Centre (PPS6 Local Centre) Residential Zone Total No of Dwellings: 96 <i>Survey date: TUESDAY</i> 10/09/13	<i>Survey Type: MANUAL</i> DUBLIN
3	DL-03-C-12 BLOCK OF FLATS BOOTERSTOWN AVENUE DUBLIN Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 47 <i>Survey date: TUESDAY</i> 10/09/13	<i>Survey Type: MANUAL</i> DUBLIN
4	DL-03-C-13 BLOCK OF FLATS SANDYFORD ROAD DUBLIN Neighbourhood Centre (PPS6 Local Centre) Built-Up Zone Total No of Dwellings: 52 <i>Survey date: TUESDAY</i> 10/09/13	<i>Survey Type: MANUAL</i> DUBLIN
5	DL-03-C-14 BLOCKS OF FLATS BALLINTEER ROAD DUBLIN DUNDRUM Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 140 <i>Survey date: TUESDAY</i> 10/09/13	<i>Survey Type: MANUAL</i> DUBLIN
6	DL-03-C-15 BLOCKS OF FLATS MONKSTOWN ROAD DUBLIN MONKSTOWN Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 20 <i>Survey date: WEDNESDAY</i> 01/10/14	<i>Survey Type: MANUAL</i> DUBLIN
7	DL-03-C-16 BLOCKS OF FLATS BOTANIC AVENUE DUBLIN DRUMCONDRA Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 31 <i>Survey date: TUESDAY</i> 22/11/16	<i>Survey Type: MANUAL</i> DUBLIN
8	DL-03-C-17 BLOCKS OF FLATS FINGLAS ROAD DUBLIN FINGLAS Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 332 <i>Survey date: FRIDAY</i> 23/10/20	<i>Survey Type: MANUAL</i> DUBLIN

LIST OF SITES relevant to selection parameters (Cont.)

9	DL-03-C-18	BLOCKS OF FLATS		DUBLIN
	HAROLD'S CROSS ROAD DUBLIN			
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 102			
			19/05/21	Survey Type: MANUAL
10	GA-03-C-01	FLATS		GALWAY
	BALLYLOUGHANE ROAD GALWAY			
	Suburban Area (PPS6 Out of Centre) No Sub Category Total No of Dwellings: 34			
			31/10/13	Survey Type: MANUAL
11	LU-03-C-01	BLOCKS OF FLATS		LOUTH
	DONORE ROAD DROGHEDA			
	Edge of Town Centre Residential Zone Total No of Dwellings: 52			
			12/09/13	Survey Type: MANUAL
12	LU-03-C-02	BLOCK OF FLATS		LOUTH
	NICHOLAS STREET DUNDALK			
	Edge of Town Centre Residential Zone Total No of Dwellings: 33			
			16/09/13	Survey Type: MANUAL
13	LU-03-C-03	BLOCK OF FLATS		LOUTH
	NICHOLAS STREET DUNDALK			
	Edge of Town Centre Residential Zone Total No of Dwellings: 20			
			16/09/13	Survey Type: MANUAL
14	MG-03-C-01	BLOCK OF FLATS		MONAGHAN
	MALL ROAD MONAGHAN			
	Edge of Town Centre No Sub Category Total No of Dwellings: 28			
			06/09/13	Survey Type: MANUAL
15	WA-03-C-01	BLOCKS OF FLATS		WATERFORD
	UPPER YELLOW ROAD WATERFORD			
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 51			
			12/05/15	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.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

TOTAL VEHICLES

Calculation factor: **1 DWELLS**

Estimated TRIP rate value per **66 DWELLS** shown in shaded columns

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS				DEPARTURES				TOTALS			
	No. Days	Ave. DWELLS	Trip Rate	Estimated Trip Rate	No. Days	Ave. DWELLS	Trip Rate	Estimated Trip Rate	No. Days	Ave. DWELLS	Trip Rate	Estimated 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												
06:00 - 07:00												
07:00 - 08:00	15	71	0.042	2.802	15	71	0.181	11.955	15	71	0.223	14.757
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09:00 - 10:00	15	71	0.075	4.919	15	71	0.084	5.542	15	71	0.159	10.461
10:00 - 11:00	15	71	0.039	2.553	15	71	0.064	4.234	15	71	0.103	6.787
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15:00 - 16:00	15	71	0.095	6.289	15	71	0.072	4.732	15	71	0.167	11.021
16:00 - 17:00	15	71	0.109	7.223	15	71	0.069	4.545	15	71	0.178	11.768
17:00 - 18:00	15	71	0.185	12.204	15	71	0.078	5.168	15	71	0.263	17.372
18:00 - 19:00	15	71	0.170	11.208	15	71	0.100	6.600	15	71	0.270	17.808
19:00 - 20:00												
20:00 - 21:00												
21:00 - 22:00												
22:00 - 23:00												
23:00 - 24:00												
Total Rates:			1.098	72.416			1.179	77.893			2.277	150.309

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.

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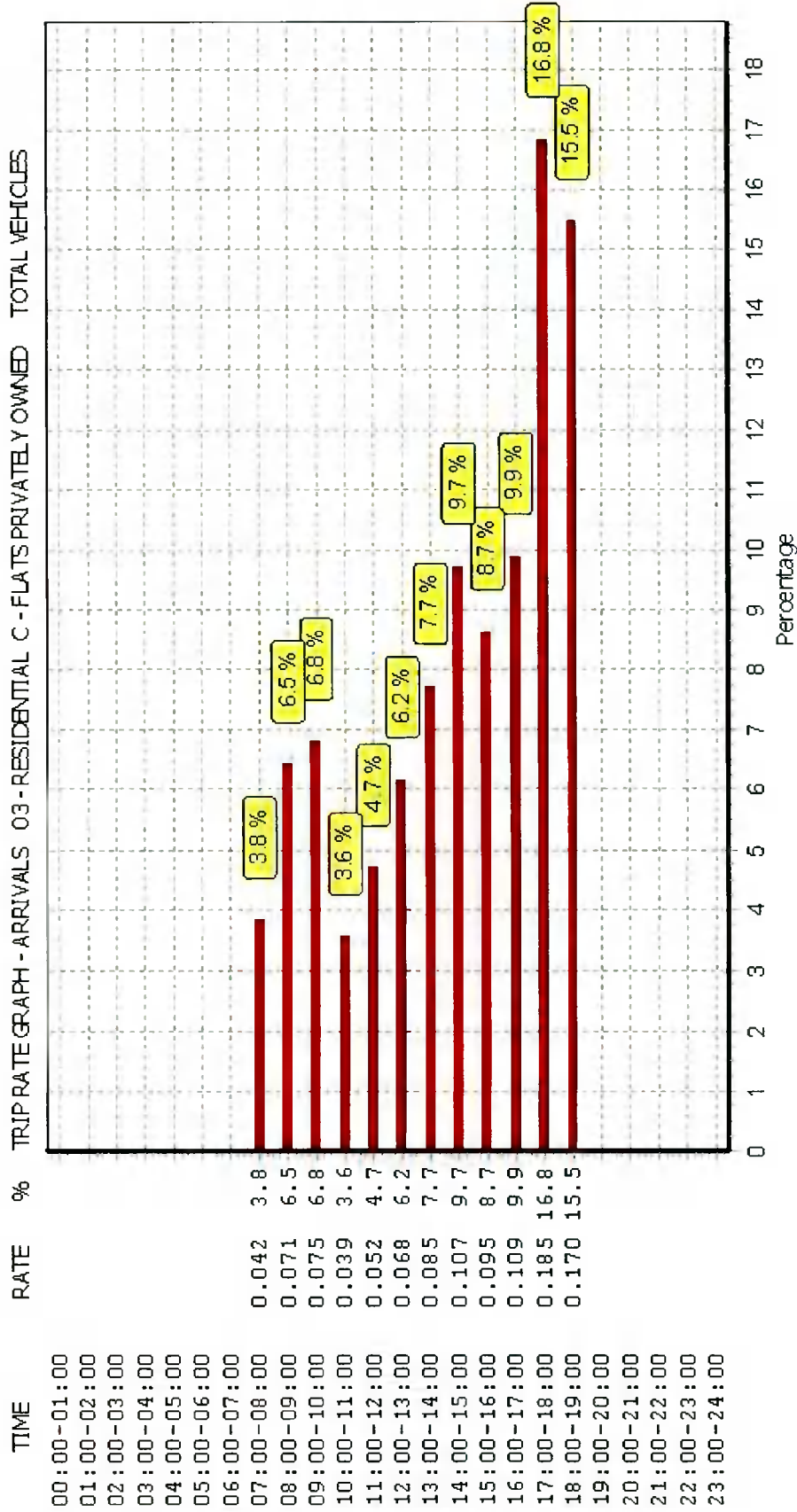
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Parameter summary

Trip rate parameter range selected: 20 - 332 (units:)
 Survey date range: 01/01/13 - 19/05/21
 Number of weekdays (Monday-Friday): 15
 Number of Saturdays: 0
 Number of Sundays: 0
 Surveys automatically removed from selection: 0
 Surveys manually removed from selection: 0

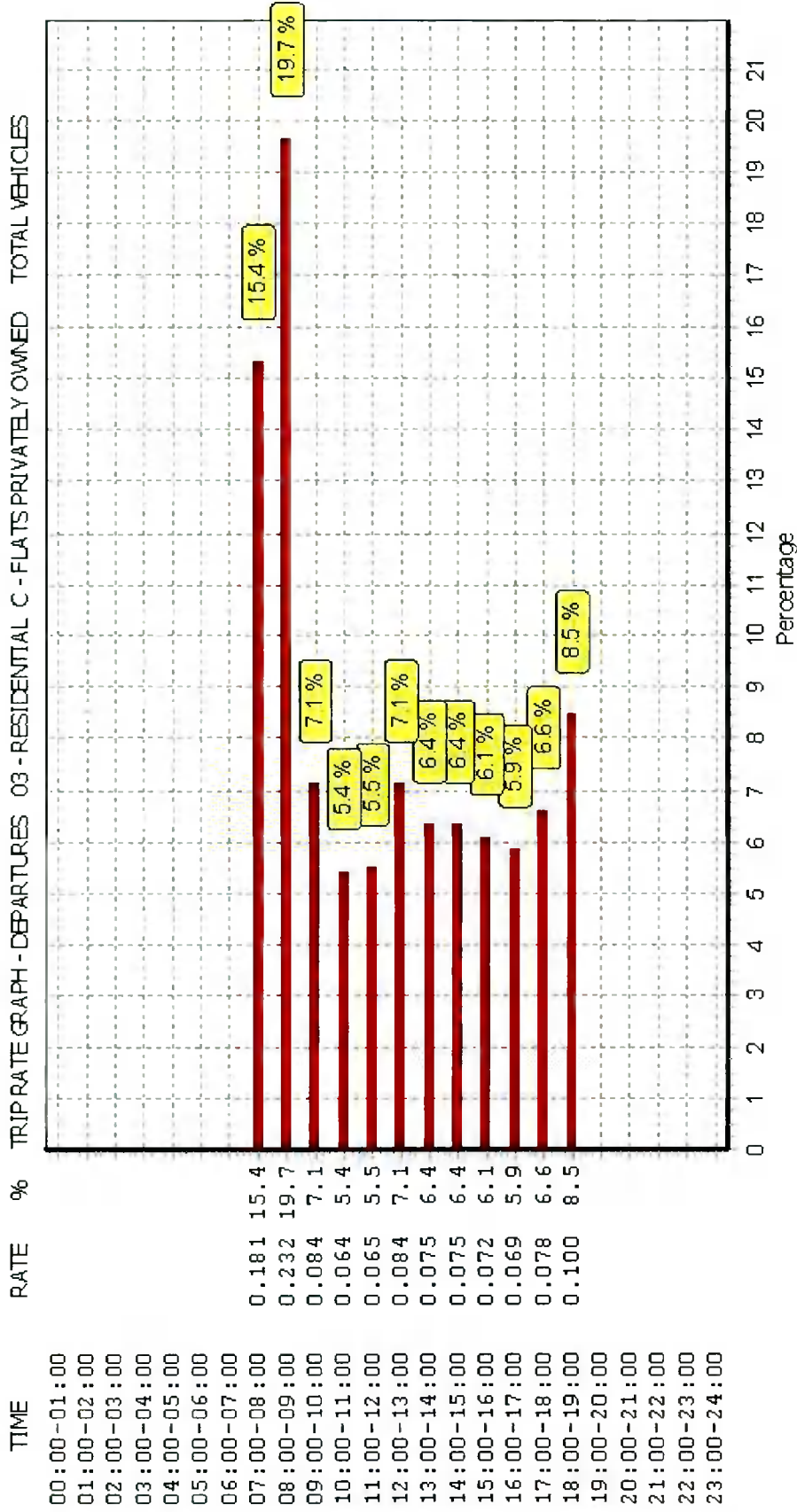
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected 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.

Licence No: 764101



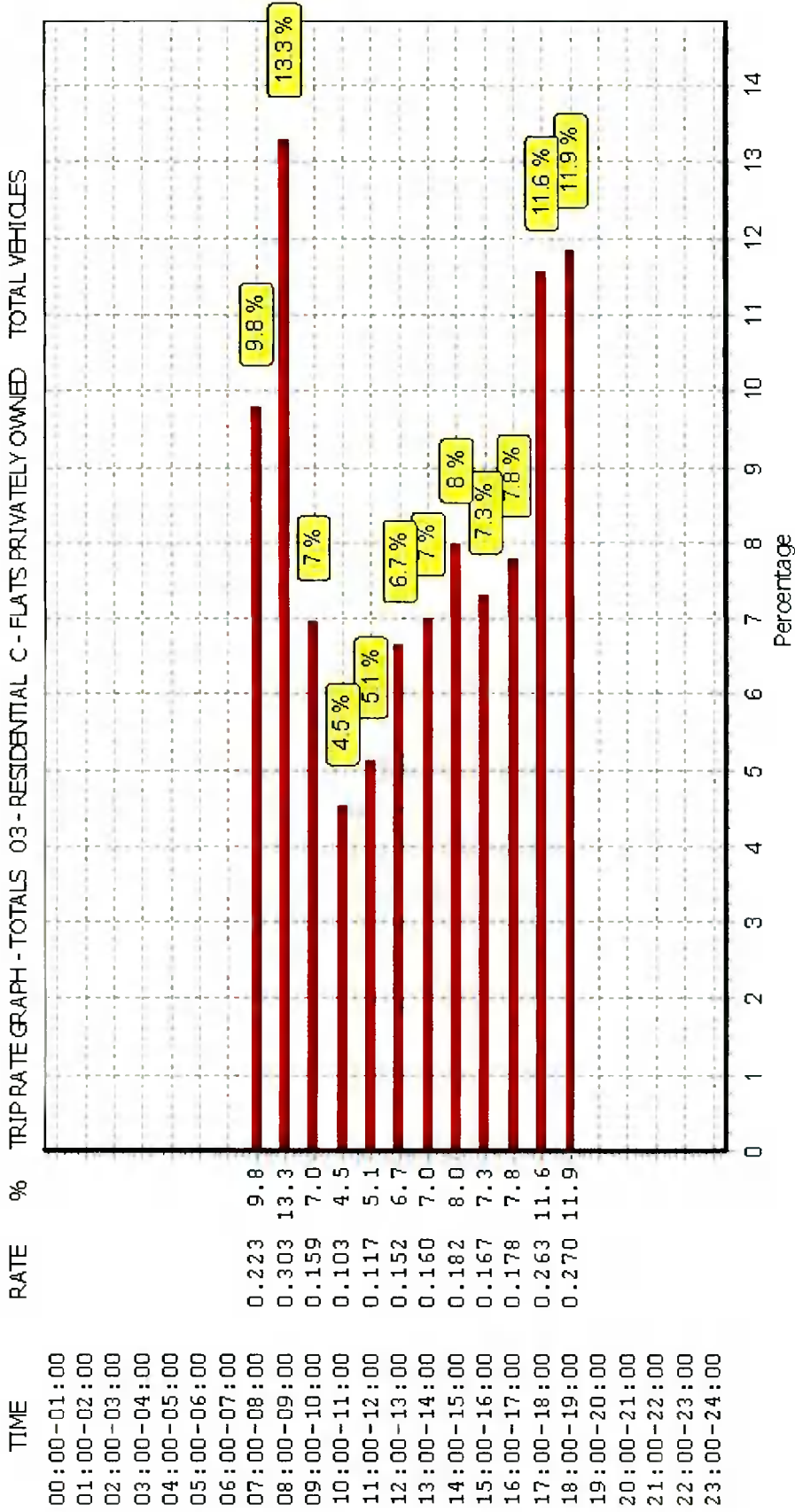
This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

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This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

Licence No: 764101



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

Appendix 2.0

AM ARCADY10 Output File.

Junctions 10	
ARCADY 10 - Roundabout Module	
Version: 10.0.1.1519	
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Filename: HAYDEN'S LANE AM PEAK WITH RESIDENTIAL DEVELOPMENT AS DOUBLE WITHIN ARMS
Report generation date: 16/03/2022 11:05:44

Summary of junction performance

	AM		
	Queue (PCU)	Delay (s)	RFC LOS
	2022		
Arm 1	0.5	6.89	0.32 A
Arm 2	0.7	7.51	0.39 A
Arm 3	0.4	6.85	0.25 A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.
File summary

File Description	
Title	FURTHER INFORMATION
Location	HAYDEN'S LANE
Site number	01
Date	16/03/2022
Version	ARCADY10
Status	ISSUE
Identifier	NIALL
Client	JACKIE GREEN CONSTRUCTION
Job number	121-A27
Enumerator	LAPTOP-ICJUG9LBN\tpsmm
Description	ISSUE

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	Per Hour	s	-Min	Per Min

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2022	AM	ONE HOUR	07:45	09:15	15

Data Errors and Warnings

No errors or warnings

Junction Network

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	7.15	A

Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	7.15	A

Arms

Arms

Arm	Name	Description	No give-way line
1	HAYDEN'S LANE NORTH		
2	GRIFFEEEN AVENUE		
3	HAYDDEN'S LANE SOUTH		

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	E - Entry length (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
1	3.00	3.00	0.0	0.0	10.5	30.0	26.0		
2	3.00	3.00	0.0	0.0	10.5	30.0	24.0		
3	3.00	3.00	0.0	0.0	15.5	30.0	23.0		

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final Intercept (PCU/hr)
1	0.481	881
2	0.484	888
3	0.501	918

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
0	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	HAYDEN'S LANE NORTH	Yes	241	100.000
2	GRIFFEEEN AVENUE	Yes	312	100.000
3	HAYDDEN'S LANE SOUTH	Yes	174	100.000

Origin-Destination Data

Demand (PCU/hr)

	To		
	1	2	3
From 1	0	209	32
From 2	269	0	43
From 3	95	79	0

Vehicle Mix

Heavy Vehicle Percentages

	To		
	1	2	3
From 1	10	10	10
From 2	10	10	10
From 3	10	10	10

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.32	6.89	0.5	A
2	0.39	7.51	0.7	A
3	0.25	6.85	0.4	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	181	59	853	0.213	180	0.3	5.877	A
2	235	24	876	0.268	233	0.4	6.146	A
3	131	201	817	0.160	130	0.2	5.755	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	217	71	847	0.256	216	0.4	6.273	A
2	280	29	874	0.321	280	0.5	6.663	A
3	156	241	797	0.196	156	0.3	6.176	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	265	87	840	0.316	265	0.5	6.883	A
2	344	35	871	0.395	343	0.7	7.490	A
3	192	296	770	0.249	191	0.4	6.836	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	265	87	840	0.316	265	0.5	6.895	A
2	344	35	871	0.395	343	0.7	7.511	A
3	192	296	770	0.249	192	0.4	6.847	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	217	71	847	0.256	217	0.4	6.289	A
2	280	29	874	0.321	281	0.5	6.691	A
3	156	242	797	0.196	157	0.3	6.193	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	181	60	853	0.213	182	0.3	5.906	A
2	235	24	876	0.268	235	0.4	6.185	A
3	131	203	817	0.160	131	0.2	5.780	A

