

Technical Note

Project: Land to the East of Fontwell Avenue, West Sussex

Subject: Phase I Interim Assessment Note

Client:	Dandara Ltd	Version:	A
Project No:	03545	Author:	LS/MF
Date:	20/11/2018	Approved:	MF

I Introduction

- 1.1.1 PJA has been commissioned by Dandara Ltd to provide transport planning advice in relation to a mixed-use development on Land East of Fontwell Avenue, Fontwell.
- 1.1.2 Outline planning consent was granted in 2017 (application WA/22/15/OUT) for the development of 400 new residential dwellings, 500sqm non-residential floorspace (land use classes A1, A2, A3, D1 and / or D2) and 5,000sqm light industrial floorspace (B1b or B1c). As part of this consent an improvement scheme was devised for the A29/A27 Fontwell Roundabout, the detail of which was presented in the Transport Assessment (TA) submitted as part of the planning application in 2015.
- 1.1.3 Condition 24 attached to the planning consent states that:

“No part of the development hereby permitted shall be occupied until the completion of the improvements to the A27/A29 Fontwell Roundabout shown on Drawing Number 1186-05 Rev A - Proposed Roundabout Improvements”.
- 1.1.4 The delivery of the mitigation scheme is therefore currently the main factor in delaying the commencement of housing delivery on this site. This technical note has therefore been prepared to support an application to vary Condition 24 to allow the delivery of up to 150 dwellings prior to completion of the improvements to the A27/A29 Roundabout junction.
- 1.1.5 The following sections of the note set out the estimated trip generation from an initial phase of 150 units and presents the results of a modelling exercise demonstrating the impact of these development trips on the roundabout junction.

2 Development Trip Scenarios

2.1.1 To estimate the volume of trips likely to be generated by the proposed initial phase of up to 150 units the TRICS database has been interrogated based on the following criteria:

- Privately owned houses
- All sites in England excluding Greater London
- At least 50 dwellings
- Surveyed since 2010
- Excluding sites in town centre, edge of town centre and suburban area locations

2.1.2 The full TRICS output is provided as **Appendix A**, with the results summarised in Table 2-1. These trip rates are higher than those calculated from first principles assessment used within the original TA, and this is therefore considered to be a sufficiently robust methodology.

Table 2-1: 150 dwellings residential trip generation

	AM Peak Period			PM Peak Period		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Vehicle Trip Rates	0.164	0.404	0.568	0.361	0.155	0.516
Vehicle Trips	25	61	85	54	23	77

2.1.3 The consented distribution of traffic to and from the residential development that was used within the original TA has also been used for this assessment of 150 private houses and applied to the development trip generation set out above.

2.1.4 Based on the agreed distribution, 40% of development traffic would route to the A27 with the remaining 60% of traffic routing via the A29 to the south. Therefore, the additional traffic passing through the Fontwell Roundabout during AM and PM peak hours as a result of the completing of 150 dwellings is as shown in Table 2-2.

Table 2-2: Phase 1 Trips Passing Through Fontwell Roundabout

Period	Vehicle Trips		
	Arrivals	Departures	Two-way
AM Peak	10	24	34
PM Peak	22	9	31

2.1.5 The information in Table 2-2 demonstrates that an initial phase of 150 private houses would add between 31 and 34 vehicle movements per hour through the junction; i.e. an average of just over one additional vehicle movement every two minutes. Given the existing high flows at the junction these small changes would be imperceptible, representing a change in flows of less than 1% which is well within the normally expected day to day variation in traffic flows.

3 Modelling Results

Scope of Assessment

- 3.1.1 For the modelling of an initial development phase, the impact on the A27 / A29 Fontwell Avenue / Arundel Road Roundabout (at which mitigation is proposed as part of the wider scheme) and the A27 / A29 roundabout to the northeast of Fontwell has been assessed within a VISSIM model. Both roundabouts were included so that the interaction between them could be assessed.
- 3.1.2 The impact of the proposed development has been assessed at the future year of 2022. This has been compared with the 2022 future baseline scenario. The committed development assumptions made within the TA have remained unchanged for this assessment. For consistency, the testing of the 150 dwelling scenario has been undertaken using the same model as agreed as part of the outline planning application. The only changes to the model are to reflect the reduced development quantum and to remove the proposed signalised mitigation scheme.
- 3.1.3 The 2015 VISSIM modelling results presented within the TA were based on five random seed runs, however in accordance with current practice guidance, and as a result of the level of variance/instability within the network, the base model has been re-run based on 20 random seed runs.

Network Performance

- 3.1.4 Results for network performance are presented in Table 3-1 and Table 3-2. Full results and modelling outputs are included as **Appendix B**.

Table 3-1: AM Network Performance Data

	1. 2022 AM Peak Base + Committed	2. 2022 AM Peak Base + Committed + 150 Dwellis	Difference (between 1 and 2)
Number of vehicles on the network	421	425	+1%
Number of vehicles that have left the network	5283	5338	+1%
Total travel time (h)	342	347	+2%
Average speed (km/h)	26	26	-1%
Total delay time (h)	147	152	+3%
Latent Demand	170	205	+20%
Percentage delay per trip	43%	44%	+1%

Table 3-2: PM Network Performance Data

	1. 2022 PM Peak Base + Committed	2. 2022 PM Peak Base + Committed + 150 Dwells	Difference (between 1 and 2)
Number of vehicles on the network	351	356	+1%
Number of vehicles that have left the network	5171	5232	+1%
Total travel time (h)	322	325	+1%
Average speed (km/h)	27	27	0%
Total delay time (h)	131	133	+2%
Latent Demand	180	184	0%
Percentage delay per trip	41%	41%	+1%

3.1.5 Tables 3-1 and 3-2 demonstrate that network performance results for the interim 150 dwelling scenario show no significant changes from the baseline + committed development 2022 conditions. The average speed within the model in both the AM and PM peak hours remains unchanged with the percentage delay per trip increasing by only 1% in the AM peak and remaining unchanged in the PM peak.

Junction Delay

3.1.6 Table 3-3 demonstrates that the interim 150 dwelling scenario would not have a significant impact on the junction delay compared to the 2022 base + committed development scenario. The maximum additional delay in the AM peak would be one second, which would be imperceptible for drivers.

Table 3-3: 2022 Base + Dev AM (07:30-08:30) Junction Delays (Seconds)

	1. 2022 AM Peak Base + Committed	2. 2022 AM Peak Base + Committed + 150 Dwells	Difference (between 1 and 2)
A27 (S) – A27 (S) (U-Turn)	18	18	0
A27 (S) – A29	17	17	0
A27 (S) – A27 (W)	18	17	0
A29 – A27 (S)	33	34	+1
A29 – A27 (W)	35	36	0
A27 (W) – A27 (S)	8	8	0
A27 (W) – A29	13	12	0
Arundel Rd – A27 (W)	52	50	-2
Arundel Rd – A29 Fontwell Ave	42	42	-1
Arundel Rd – A27 (N)	57	57	-1
A27 (W) – A29 Fontwell Ave	10	10	0
A27 (W) – Arundel Rd	11	11	0
A27 (W) – A27 (N)	9	9	0

	1. 2022 AM Peak Base + Committed	2. 2022 AM Peak Base + Committed + 150 Dwells	Difference (between 1 and 2)
A29 Fontwell Ave – A27 (W)	157	158	+1
A29 Fontwell Ave (U-Turn)	0	0	0
A29 Fontwell Ave – Arundel Rd	154	154	+1
A29 Fontwell Ave – A27 (N)	153	153	+1
A27 (N) – A27 (W)	14	15	+1
A27 (N) – A29 Fontwell Ave	15	16	+1
A27 (N) – Arundel Rd	15	16	+1
A27 (N) – A27 (N) (U-Turn)	16	16	0

3.1.7 Table 3-4 indicates that the interim 150 dwelling scenario would also have negligible impact on junction delays in the PM peak, with a maximum increase of two seconds from the 2022 base + committed development scenario.

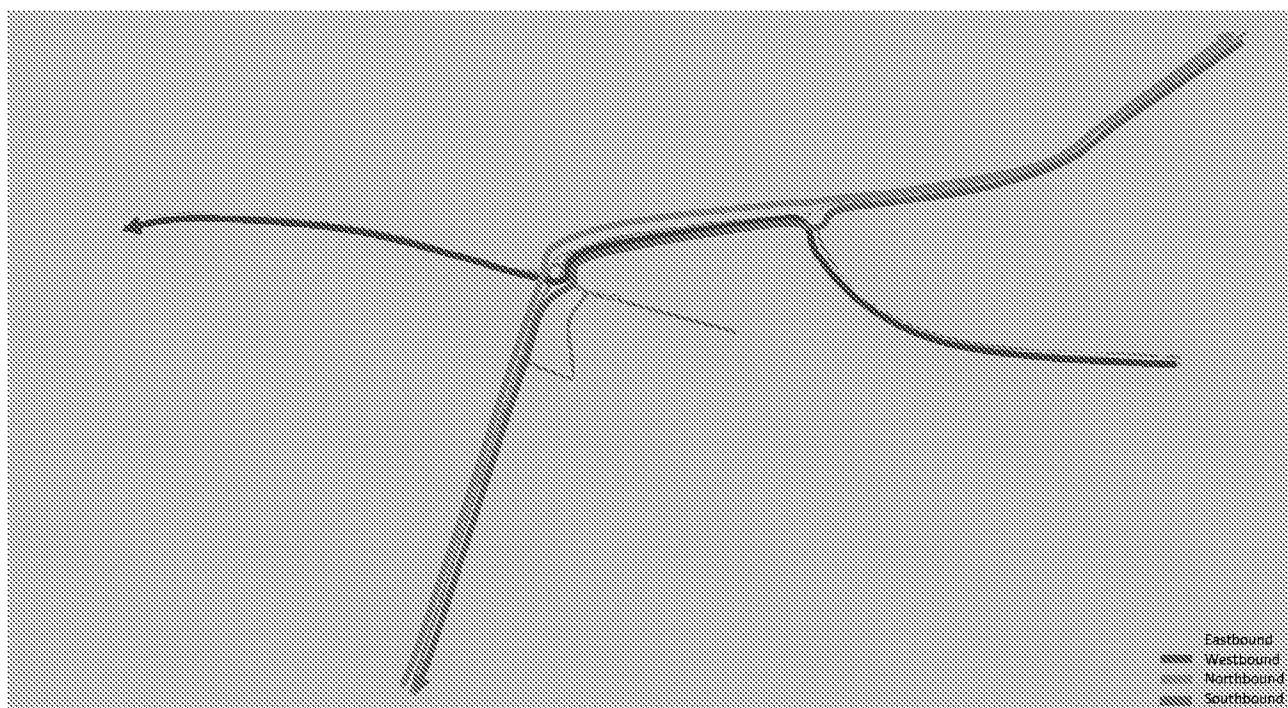
Table 3-4: 2022 Base + Dev PM (16:30-17:30) Junction Delays (Seconds)

	1. 2022 PM Peak Base + Committed	2. 2022 PM Peak Base + Committed + 150	Difference (between 1 and 2)
A27 (S) – A27 (S) (U-Turn)	8	8	0
A27 (S) – A29	8	8	0
A27 (S) – A27 (W)	8	8	0
A29 – A27 (S)	332	331	-1
A29 – A27 (W)	332	333	+1
A27 (W) – A27 (S)	7	7	0
A27 (W) – A29	10	11	+1
Arundel Rd – A27 (W)	18	20	+2
Arundel Rd – A29 Fontwell Ave	13	14	+1
Arundel Rd – A27 (N)	22	24	+2
A27 (W) – A29 Fontwell Ave	17	20	+2
A27 (W) – Arundel Rd	18	20	+2
A27 (W) – A27 (N)	15	18	+2
A29 Fontwell Ave – A27 (W)	16	16	0
A29 Fontwell Ave (U-Turn)	14	10	-4
A29 Fontwell Ave – Arundel Rd	19	19	0
A29 Fontwell Ave – A27 (N)	15	15	0
A27 (N) – A27 (W)	16	17	+1
A27 (N) – A29 Fontwell Ave	19	19	+1
A27 (N) – Arundel Rd	18	18	+1
A27 (N) – A27 (N) (U-Turn)	19	19	-1

Journey Times

3.1.8 Four journey time routes are included within the model which cover routes across the model from the north, south, east and west. A plan of the journey time routes analysed is included as in Figure 3-1.

Figure 3-1: VISSIM Journey Time Paths



3.1.9 Table 3-5 demonstrates that there would be a slight increase in northbound journey times with the addition of 150 dwellings in 2022, equating to an additional 26 seconds per vehicle in a congested network. This would be a temporary impact until the proposed mitigation at the A27 Fontwell roundabout is implemented which is specifically designed to relieve congestion on this route. Eastbound, westbound and southbound journey times would remain unchanged.

Table 3-5: Average Journey Time Comparison (AM, seconds)

	1. 2022 AM Peak Base + Committed	2. 2022 AM Peak Base + Committed + 150 Dwells	Difference (between 1 and 2)
Eastbound	155	155	0
Westbound	173	173	0
Northbound	667	693	+26
Southbound	241	241	0

3.1.10 Table 3-6 provides a comparison for PM peak journey times. This demonstrates that a very small increase in journey times would occur in all directions in the interim 150 dwellings scenario. However, the increase (of up to four seconds) would be imperceptible when compared to the 2022 base + committed development scenario.

Table 3-6: Average Journey Time Comparison (PM, seconds)

	1. 2022 PM Peak Base + Committed	2. 2022 PM Peak Base + Committed + 150 Dwells	Difference (between 1 and 2)
Eastbound	159	163	+4
Westbound	163	164	+1
Northbound	216	217	+1
Southbound	562	563	+1

Queue Lengths

3.1.11 The average maximum queue lengths for the AM and PM peak periods are set out in Table 3-7. The results indicate that in the AM peak Fontwell Avenue will experience an increase in queuing as a result of the 150 dwelling interim development scenario. However, as set out previously this increase in queuing will only result in small increases in junction delay and journey times on this route and would be a temporary impact prior to the mitigation works to the A27 Fontwell Roundabout.

3.1.12 In the PM peak there will however only be marginal increases in queue lengths equating to a maximum of two additional vehicles in a queue. As demonstrated previously this additional queuing does not materially affect the journey times of drivers along this route.

Table 3-7: Average Queue Comparison (A27/A29/Arundel Road/Fontwell Avenue Junction) (Metres)

	A27 (N)			Arundel Road			Fontwell Avenue			A27 (W)		
	2022 base + cumul.	2022 base + cumul. + 150dw	Difference	2022 base + cumul.	2022 base + cumul. + 150dw	Difference	2022 base + cumul.	2022 base + cumul. + 150dw	Difference	2022 base + cumul.	2022 base + cumul. + 150dw	Difference
07:30	1	1	0	3	3	0	58	68	+11	4	3	-1
07:45	2	3	+1	12	11	-1	230	268	+39	3	3	0
08:00	3	3	0	14	12	-3	607	673	+65	3	3	0
08:15	2	4	+2	43	34	-9	948	991	+43	1	1	0
08:30	3	5	+2	3	3	0	58	68	+11	4	3	-1
16:30	4	6	+2	3	5	+2	1	1	0	2	2	0
16:45	15	21	+6	7	11	+4	6	6	0	4	4	0
17:00	9	20	+11	4	7	+3	4	5	+1	3	4	+1
17:15	7	13	+6	3	5	+2	2	2	0	3	4	+1
17:30	9	14	+5	4	6	+2	4	4	0	3	4	+1

4 Summary and Conclusions

- 4.1.1 This technical note has been prepared by PJA to assess the potential for up to 150 of the 400 consented dwellings on Land East of Fontwell Avenue to be constructed in advance of the implementation of the proposed mitigation at the A27 / A29 roundabout. The development is currently subject to the condition that: *"No part of the development hereby permitted shall be occupied until the completion of the improvements to the A27/A29 Fontwell Roundabout shown on Drawing Number 1186-05 Rev A - Proposed Roundabout Improvements."*
- 4.1.2 Within this technical note the impact of the traffic generated by 150 dwellings has been assessed, on the A27 / A29 Fontwell Avenue / Arundel Road Roundabout and the A27 / A29 roundabout to the northeast of Fontwell. The modelling has been undertaken using the consented VISSIM model and has assumed no highways mitigation.
- 4.1.3 The key results are as follows:
- Overall network performance is consistent between the '2022 Baseline + Committed developments' scenario and the '2022 Baseline + Committed Developments + 150 Dwellings scenario';
 - Increases in delays of up to two seconds from the baseline are expected, which would have negligible impact;
 - In the AM peak, northbound journey times would increase by 26 seconds (3.9%), with no increase in journey times in other directions. In the PM peak, a maximum journey time increase of four seconds (2.5%) is predicted.
- 4.1.4 As set out above, the 150 dwellings interim scenario with no mitigation would have minimal impact on the operation of the highway network when compared to the future baseline.
- 4.1.5 It is therefore concluded that the residual cumulative impact would not be severe in accordance with paragraph 109 of the National Planning Policy Framework, and 150 dwellings could be occupied prior to the implementation of the mitigation at the A27 / A29 roundabout and facilitate the early delivery of required housing in this area.

Appendix A TRICS Output

Calculation Reference: AUDIT-231601-180719-0721

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED

VEHICLESSelected regions and areas:

02 SOUTH EAST	
ES EAST SUSSEX	2 days
KC KENT	1 days
SC SURREY	1 days
WS WEST SUSSEX	2 days
06 WEST MIDLANDS	
SH SHROPSHIRE	1 days
07 YORKSHIRE & NORTH LINCOLNSHIRE	
NY NORTH YORKSHIRE	1 days

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

Secondary 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: Number of dwellings
 Actual Range: 54 to 805 (units:)
 Range Selected by User: 50 to 4334 (units:)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/10 to 27/11/17

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	1 days
Tuesday	1 days
Wednesday	1 days
Thursday	4 days
Friday	1 days

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

Selected survey types:

Manual count	8 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	8
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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:

Residential Zone	7
No Sub Category	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.

Secondary Filtering selection:Use Class:

C3	8 days
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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®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,000 or Less	1 days
5,001 to 10,000	4 days
10,001 to 15,000	3 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	1 days
50,001 to 75,000	1 days
75,001 to 100,000	3 days
100,001 to 125,000	1 days
125,001 to 250,000	1 days

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

Car ownership within 5 miles:

1.1 to 1.5	8 days
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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	2 days
No	6 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	8 days
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This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	ES-03-A-03	MIXED HOUSES & FLATS	EAST SUSSEX
	SHEPHAM LANE		
	POLEGATE		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	212	
	Survey date: MONDAY	11/07/16	Survey Type: MANUAL
2	ES-03-A-04	MIXED HOUSES & FLATS	EAST SUSSEX
	NEW LYDD ROAD		
	CAMBER		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	134	
	Survey date: FRIDAY	15/07/16	Survey Type: MANUAL
3	KC-03-A-07	MIXED HOUSES	KENT
	RECVLVER ROAD		
	HERNE BAY		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	288	
	Survey date: WEDNESDAY	27/09/17	Survey Type: MANUAL
4	NY-03-A-10	HOUSES AND FLATS	NORTH YORKSHIRE
	BOROUGHBRIDGE ROAD		
	RIPON		
	Edge of Town		
	No Sub Category		
	Total Number of dwellings:	71	
	Survey date: TUESDAY	17/09/13	Survey Type: MANUAL
5	SC-03-A-04	DETACHED & TERRACED	SURREY
	HIGH ROAD		
	BYFLEET		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	71	
	Survey date: THURSDAY	23/01/14	Survey Type: MANUAL
6	SH-03-A-05	SEMI-DETACHED/ TERRACED	SHROPSHIRE
	SANDCROFT		
	SUTTON HILL		
	TELFORD		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	54	
	Survey date: THURSDAY	24/10/13	Survey Type: MANUAL
7	WS-03-A-04	MIXED HOUSES	WEST SUSSEX
	HILLS FARM LANE		
	BROADBRIDGE HEATH		
	HORSHAM		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	151	
	Survey date: THURSDAY	11/12/14	Survey Type: MANUAL
8	WS-03-A-06	MIXED HOUSES	WEST SUSSEX
	ELLIS ROAD		
	S BROADBRIDGE HEATH		
	WEST HORSHAM		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	805	
	Survey date: THURSDAY	02/03/17	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
DH-03-A-02	Low car ownership (0.6-1.0)
KC-03-A-04	Low car ownership (0.6-1.0)
NE-03-A-02	Low car ownership (0.6-1.0)
WS-03-A-07	Park homes - not a comparable housing type

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	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	8	223	0.087	8	223	0.310	8	223	0.397
08:00 - 09:00	8	223	0.164	8	223	0.404	8	223	0.568
09:00 - 10:00	8	223	0.152	8	223	0.180	8	223	0.332
10:00 - 11:00	8	223	0.128	8	223	0.160	8	223	0.288
11:00 - 12:00	8	223	0.148	8	223	0.177	8	223	0.325
12:00 - 13:00	8	223	0.152	8	223	0.153	8	223	0.305
13:00 - 14:00	8	223	0.173	8	223	0.160	8	223	0.333
14:00 - 15:00	8	223	0.175	8	223	0.183	8	223	0.358
15:00 - 16:00	8	223	0.270	8	223	0.177	8	223	0.447
16:00 - 17:00	8	223	0.276	8	223	0.174	8	223	0.450
17:00 - 18:00	8	223	0.361	8	223	0.155	8	223	0.516
18:00 - 19:00	8	223	0.324	8	223	0.189	8	223	0.513
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:	2.410			2.422			4.832		

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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Parameter summary

Trip rate parameter range selected:	54 - 805 (units:)
Survey date date range:	01/01/10 - 27/11/17
Number of weekdays (Monday-Friday):	8
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	4

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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Appendix B Full VISSIM Model Results and Outputs

AM PEAK 7:30-8:30 Network Performance Data	2022 Base + CS	2022 Base + CS + Dev (150 dwellings) (no signals)
Number of vehicles in the network	421	425
Number of vehicles that have left the network	5283	5338
Total travel time (h)	342	347
Average speed (mph)	26	26
Total delay time (h)	147	152
Latent Demand	170	205
Percentage delay per trip	43%	44%

PM PEAK 16:30-17:30 Network Performance Data	2022 Base + CS	2022 Base + CS + Dev (150 dwellings) (no signals)
Number of vehicles in the network	351	356
Number of vehicles that have left the network	5171	5232
Total travel time (h)	322	325
Average speed (mph)	27	27
Total delay time (h)	131	133
Latent Demand	180	184
Percentage delay per trip	41%	41%

AM PEAK 7:30-8:30 Junction Delays		2022 Base + CS		2022 Base + CS + Dev (150 dwellings) (no signals)		
		Delay		Diff.	% Diff.	
		MOVEMENT Location				
		A27 (S) - A27 (S) (Uturn)	17.65	17.68	0	0.17%
		A27 (S) - A29	17.29	16.97	0	-1.88%
		A27 (S) - A27 (W)	17.57	17.28	0	-1.68%
		A29 - A27 (S)	32.63	33.83	1	3.68%
		A29 - A27 (W)	35.45	35.55	0	0.28%
		A27 (W)-A27 (S)	7.96	7.66	0	-3.77%
		A27 (W)-A29	12.71	12.24	0	-3.70%
		Arundel Rd - A27 (W)	52.46	49.98	-2	-4.73%
		Arundel Rd - A29 Fontwell Ave	42.31	41.51	-1	-1.89%
		Arundel Rd - A27 (N)	57.49	56.80	-1	-1.20%
		A27 (W) - A29 Fontwell Ave	10.00	10.18	0	1.80%
		A27 (W) - Arundel Rd	11.38	11.22	0	-1.41%
		A27 (W) - A27 (N)	9.44	9.43	0	-0.11%
		A29 Fontwell Ave - A27 (W)	157.39	158.09	1	0.44%
		A29 Fontwell Ave - Uturn	0.00	0.00	0	0.00%
		A29 Fontwell Ave - Arundel Rd	153.56	154.26	1	0.46%
		A29 Fontwell Ave - A27 (N)	152.90	153.48	1	0.38%
		A27 (N) - A27 (W)	14.31	14.99	1	4.79%
		A27 (N) - A29 Fontwell Ave	15.49	16.31	1	5.26%
		A27 (N) - Arundel Rd	14.99	15.84	1	5.71%
		A27 (N) - A27 (N) (Uturn)	15.73	15.81	0	0.51%
		Total	849	849	0	0.05%

PM PEAK 16:30-17:30 Junction Delays						
MOVEMENT Location		2022 Base + CS		2022 Base + CS + Dev (150 dwellings) (no signals)		% Diff.
		Delay		Diff		
A27 (S) - A27 (S) (Uturn)		8.20	8.02	0	-2.14%	
A27 (S) - A29		7.62	7.85	0	3.02%	
A27 (S) - A27 (W)		7.95	7.94	0	-0.13%	
A29 - A27 (S)		332.36	331.17	-1	-0.36%	
A29 - A27 (W)		332.06	333.06	1	0.30%	
A27 (W)-A27 (S)		6.62	7.08	0	7.03%	
A27 (W)-A29		10.25	10.76	1	4.98%	
Arundel Rd - A27 (W)		18.19	19.83	2	8.99%	
Arundel Rd - A29 Fontwell Ave		12.80	13.57	1	6.06%	
Arundel Rd - A27 (N)		21.72	23.54	2	8.38%	
A27 (W) - A29 Fontwell Ave		17.17	19.54	2	13.81%	
A27 (W) - Arundel Rd		18.07	20.11	2	11.29%	
A27 (W) - A27 (N)		15.45	17.51	2	13.34%	
A29 Fontwell Ave - A27 (W)		15.95	16.15	0	1.25%	
A29 Fontwell Ave - Uturn		13.60	9.89	-4	-27.29%	
A29 Fontwell Ave - Arundel Rd		18.90	18.51	0	-2.06%	
A29 Fontwell Ave - A27 (N)		15.05	14.91	0	-0.93%	
A27 (N) - A27 (W)		16.27	16.95	1	4.18%	
A27 (N) - A29 Fontwell Ave		18.55	19.23	1	3.69%	
A27 (N) - Arundel Rd		17.76	18.50	1	4.17%	
A27 (N) - A27 (N) (Uturn)		19.35	18.80	-1	-2.82%	
Total		944	953	9	0.96%	

AM PEAK 7:30-8:30											
Direction	Timing Point	2022 Base + CS				2022 Base + CS + Dev (150 dwellings) (no signals)					
		Min journey time (s)	Av. journey time (s)	Max journey time (s)	Standard Deviation	Min journey time (s)	Av. journey time (s)	Max journey time (s)	Standard Deviation	Actual Diff.	% Diff.
Eastbound	End of slip @ Brittens Lane-A27/A29 Roundabout (Arundel Rd)	53.80	55.50	57.00	0.00	54.10	55.50	56.60	0.00	0.00	0.00%
	A27/A29 Roundabout (Arundel Rd)-A27/A29 Roundabout	42.60	44.29	45.70	0.00	41.90	43.94	45.60	0.00	-0.35	-0.79%
	A27/A29 Roundabout-A27 Arundell Rd @ Copse Rd Ped Crossing	54.70	55.51	56.20	0.00	54.30	55.36	56.40	0.00	-0.15	-0.27%
Westbound	A27 Arundell Rd @ Copse Rd Ped Crossing-A27/A29 Roundabout	60.60	63.48	65.30	0.00	61.40	63.20	66.20	0.00	-0.28	-0.46%
	A27/A29 Roundabout-A27/A29 Roundabout (Arundel Rd)	45.20	47.15	49.20	0.00	45.20	47.90	51.30	0.00	0.75	1.69%
	A27/A29 Roundabout (Arundel Rd)-End of slip @ Brittens Lane	61.60	62.38	63.50	0.00	61.50	62.34	63.40	0.00	-0.04	-0.06%
Northbound	A29 fontwell Av. North of Eastergate Lane-A29/A27 Roundabout	341.60	540.63	667.40	0.00	432.60	567.99	742.00	0.00	27.36	6.06%
	A29/A27 Roundabout- A27/A29 Roundabout	44.40	45.84	47.50	0.00	43.80	45.48	47.10	0.00	-0.37	-0.80%
	A27/A29 Roundabout-A29 Before Mill Lane	76.90	80.04	82.40	0.00	76.10	79.55	82.10	0.00	-0.48	-0.61%
Southbound	A29 Before Mill Lane-A27/A29 Roundabout	88.30	95.50	107.70	0.00	89.40	95.62	106.40	0.00	0.12	0.13%
	A27/A29 Roundabout-A29/A27 Roundabout	51.80	54.03	56.40	0.00	51.90	54.67	58.30	0.00	0.64	1.18%
	A29/A27 Roundabout-A29 fontwell Av. North of Eastergate Lane	87.10	91.08	95.60	0.00	87.60	91.11	94.60	0.00	0.02	0.02%

PM PEAK 16:30-17:30											
Direction	Timing Point	2022 Base + CS				2022 Base + CS + Dev (150 dwellings) (no signals)					
		Min journey time (s)	Av. journey time (s)	Max journey time (s)	Standard Deviation	Min journey time (s)	Av. journey time (s)	Max journey time (s)	Standard Deviation	Actual Diff.	% Diff.
Eastbound	End of slip @ Brittens Lane-A27/A29 Roundabout (Arundel Rd)	60.10	61.49	63.60	0.00	61.40	63.61	67.60	0.00	2.12	3.45%
	A27/A29 Roundabout (Arundel Rd)-A27/A29 Roundabout	41.90	42.46	43.10	0.00	42.60	43.35	44.40	0.00	0.90	2.11%
	A27/A29 Roundabout-A27 Arundell Rd @ Copse Rd Ped Crossing	54.60	55.55	56.70	0.00	54.90	56.13	56.70	0.00	0.59	1.05%
Westbound	A27 Arundell Rd @ Copse Rd Ped Crossing-A27/A29 Roundabout	53.00	53.91	54.60	0.00	52.90	53.88	54.60	0.00	-0.04	-0.06%
	A27/A29 Roundabout-A27/A29 Roundabout (Arundel Rd)	46.10	49.95	57.20	0.00	46.90	50.58	54.60	0.00	0.63	1.26%
	A27/A29 Roundabout (Arundel Rd)-End of slip @ Brittens Lane	58.50	59.38	60.30	0.00	58.70	59.44	60.20	0.00	0.06	0.09%
Northbound	A29 fontwell Av. North of Eastergate Lane-A29/A27 Roundabout	89.30	92.88	97.60	0.00	90.50	93.14	98.10	0.00	0.26	0.27%
	A29/A27 Roundabout- A27/A29 Roundabout	42.80	43.85	44.70	0.00	43.00	44.35	45.70	0.00	0.51	1.15%
	A27/A29 Roundabout-A29 Before Mill Lane	76.60	79.23	81.20	0.00	77.50	79.48	81.90	0.00	0.25	0.32%
Southbound	A29 Before Mill Lane-A27/A29 Roundabout	300.00	408.50	511.70	0.00	316.90	408.46	567.00	0.00	-0.05	-0.01%
	A27/A29 Roundabout-A29/A27 Roundabout	54.90	57.50	63.00	0.00	54.60	58.07	63.90	0.00	0.57	0.99%
	A29/A27 Roundabout-A29 fontwell Av. North of Eastergate Lane	93.10	96.35	99.20	0.00	94.30	96.96	100.00	0.00	0.61	0.63%