ROBERT DOUGHTY CONSULTANCY

PROPOSED FOOD ENTERPRISE ZONE, HOLBEACH

DEVELOPMENT SCENARIOS AND TRIP GENERATION TECHNICAL NOTE

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INTRODUCTION

1. The Robert Doughty Consultancy are intending to promote a new education/employment development, referred to as a Food Enterprise Zone (FEZ), on behalf of Lincolnshire County Council (LCC) and South Holland District Council (SHDC). The site is located on land west of the A151 on the western edge of Holbeach, as shown in **Figure 1**.

2. The FEZ will allow new growth and investment in food, farming and agri-technologies. Currently, there are no firm details on the size (GFA) or type of development that will be promoted, although it is understood that it will primarily be B1b research and development type use, with some B2 industrial and B8 storage and distribution use. The current masterplan, shown in **Figure 2**, includes seven different zones, with a total developable area of 49,940sqm (excluding the education zone). Based on a 40% development density, this equates to approximately 20,000sqm of building space.

3. In addition, the masterplan includes an education zone, with a total developable area of 9,520sqm, which would provide 3,800sqm of building space assuming a 40% development density. As part of this, the University of Lincoln are submitting a separate planning application for a 1,360sqm GFA 'Centre of Excellence in Agri Food' with 100 parking spaces. This D1 educational use will include research and teaching laboratories, test kitchens, conference facilities etc, and will be in addition to the existing Holbeach campus. The illustrative layout is shown in **Figure 3**.
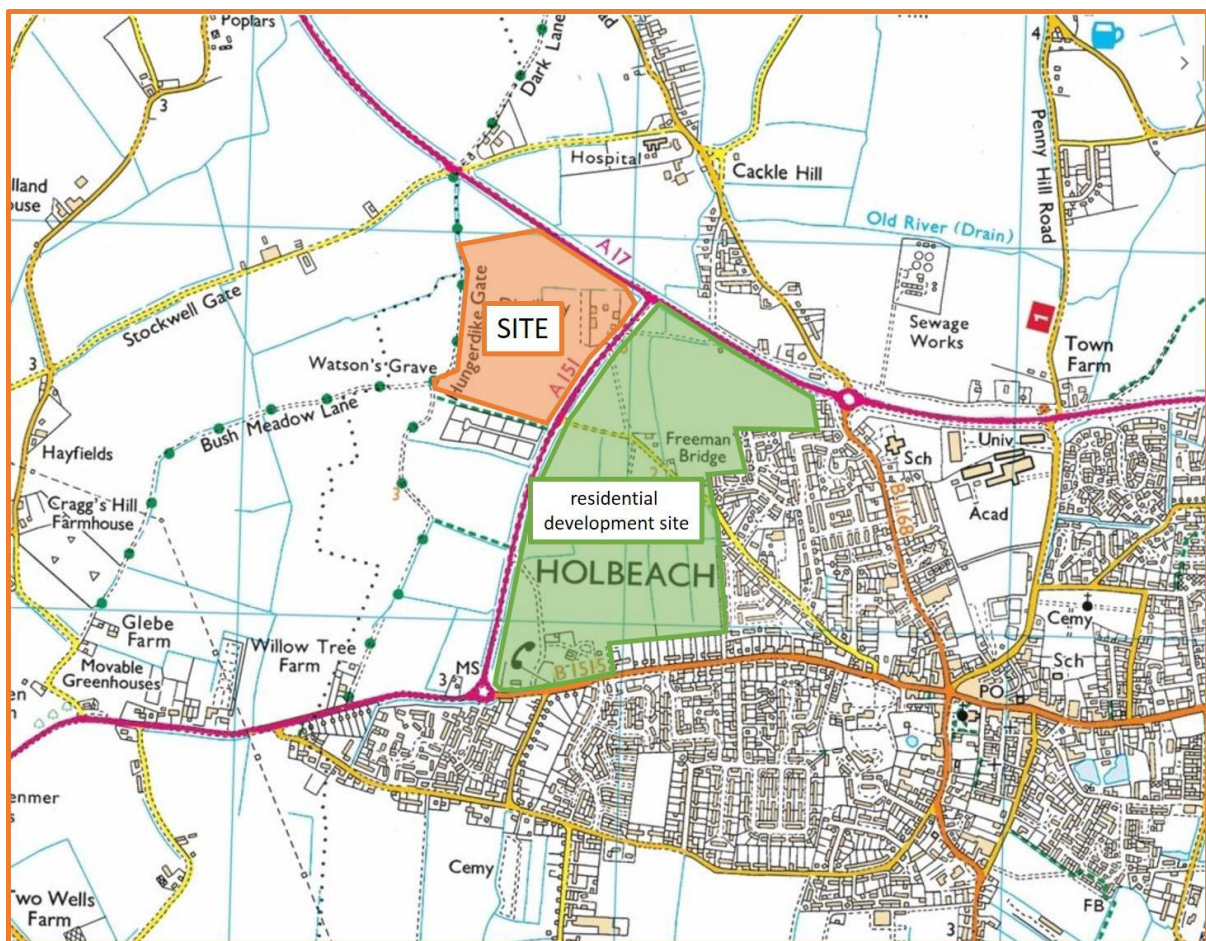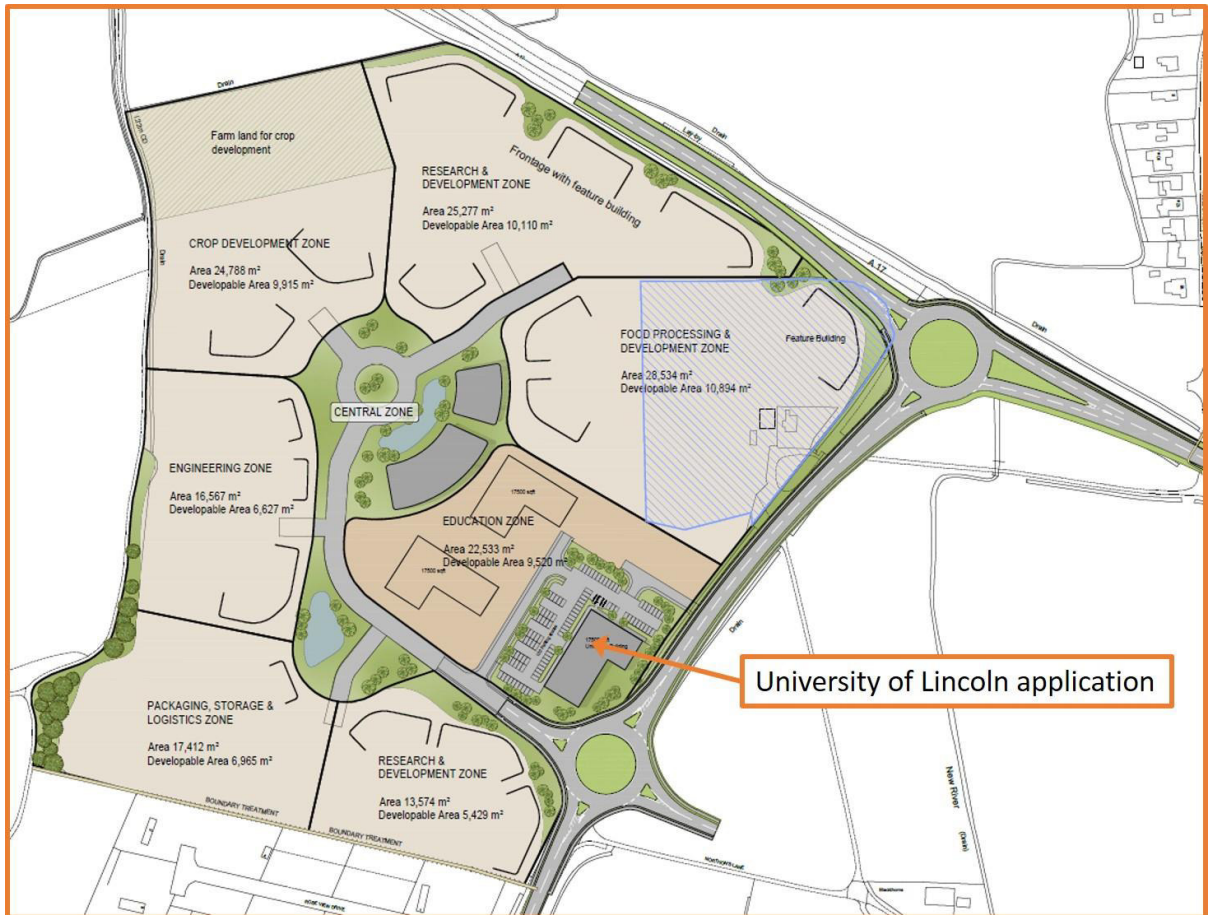

Figure 1: General site location

![FEZ masterplan showing development zones including Farm land for crop development, Research & Development Zone (Area 25,277 m², Developable Area 10,110 m²), Crop Development Zone (Area 24,788 m², Developable Area 9,915 m²), Food Processing & Development Zone (Area 28,534 m², Developable Area 10,894 m²), Central Zone, Engineering Zone (Area 16,567 m², Developable Area 6,627 m²), Education Zone (Area 22,533 m², Developable Area 9,520 m²), Packaging, Storage & Logistics Zone (Area 17,412 m², Developable Area 6,965 m²), Research & Development Zone (Area 13,574 m², Developable Area 5,429 m²), with University of Lincoln application labelled]

Figure 2: FEZ masterplan

![University of Lincoln Centre of Excellence masterplan showing 100 parking spaces, Temporary site access (pre-completion of junction improvement scheme), Proposed University Building 1360m², Surface water attenuation 750m², Roundabout - Part of Peppermint Junction improvement scheme, SITE AREA: 0.965ha]

Figure 3: University if Lincoln Centre of Excellence in Agri Food masterplan

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4. The FEZ development will be accessed via a new four arm roundabout in the vicinity of the existing A151/Northon's Lane T-junction. This roundabout already has planning consent and will be provided together with a three arm roundabout at the existing A17/A151 T-junction to the north. These roundabouts are referred to as the Peppermint Junction improvement scheme (application reference H09-1169-15).

5. It is understood that highway work will start in 2017, and therefore both of these roundabouts will be constructed in advance of the proposed FEZ development, and in advance of a proposed large scale residential development of approximately 1,000 dwellings on the eastern side of the A151, known as Holbeach West (application reference H09-0468-16). A copy of the masterplan for that scheme is shown in **Figure 4.**

Figure 4: Illustrative masterplan for the Holbeach West residential development

6. The purpose of this Technical Note is to understand:
   - what assumptions have been made regarding the proposed FEZ site and associated traffic generation within the design of the Peppermint Junction improvement scheme;
   - what development scenarios could be promoted at the FEZ site without exceeding the consented traffic generation included in the design of the Peppermint Junction improvement scheme; and
   - what highway impact the proposed FEZ may cause, and what off-site mitigation may be required if the consented traffic generation is exceeded.

PEPPERMINT JUNCTION IMPROVEMENT SCHEME AND TA FINDINGS

7. The Peppermint Junction improvement scheme involves replacing the existing A17/A151 priority-controlled ghost island right turn lane T-junction with a new three arm roundabout. In addition, the existing A151/Northon's Lane T-junction to the south will be stopped up, and a new four arm roundabout will be installed. The Peppermint Junction improvement scheme has planning consent, and will be provided through LEP funding, LCC funding and developer contributions. It is therefore assumed that both the FEZ development and Holbeach West developments will have to provide an appropriate contribution towards the highway works. The layout of the two roundabouts forming the improvement scheme is shown in **Figure 5.**

Figure 5: Peppermint Junction improvement scheme

8. The improvement scheme has been progressed to enable development of land to the east and west of the A151 for employment and residential development respectively. In addition, it will allow through-traffic to continue along the principal road network instead of seeking a route through Holbeach. It is understood that traffic currently avoids the A17/A151 T-junction due to the difficulty turning right into and out of the A151. The improvement scheme will therefore increase traffic flows along the A151, but reduce traffic flows through Holbeach.

9. A TA was prepared as part of the application for the junction improvement scheme. It used base traffic flows from February 2015 to forecast future year traffic flows for 2017 (opening year) and 2032 (opening year + 15 years, to be consistent with the noise assessment), and modelled the operation of the two roundabouts with the FEZ employment development and the adjacent Holbeach West residential development in place.

10. The TA growthed the observed traffic flows from 2015 to 2032 using TEMPRO, which resulted in 29.8% and 31.9% growth in the morning and evening peak hour respectively. The proposed employment and residential development traffic was then added to the growthed figures. This methodology results in highly robust traffic flows. The TEMPRO growth factor is based on committed development in the local area. As both the residential and employment development is allocated, and thus included in the TEMPRO growth factors, the use of both TEMPRO and independently adding the employment and residential traffic results in double counting. It would therefore have been more appropriate not to include a TEMPRO growth factor, or to adjust the planning assumptions within TEMPRO (see paragraph 36). Nevertheless, this approach was approved as part of the approved TA.

11. The TA made the following assumptions regarding the FEZ employment site:
    - Site area – 15ha
    - Building area – 37,500sqm (25% development density)
    - Use – Business Park

12. The TA assumed that the residential development would comprise of 1,000 dwellings, and used the trip rates, traffic generation and distribution pattern from the Transport Assessment prepared for the residential scheme.

13. The TA used the following average trip rates from the TRICS database and forecast the traffic generation:

employment vehicle trip rates and traffic generation		arrive	depart	two-way
average trip rates (per 100sqm)	AM peak hour	1.380	0.164	1.544
	PM peak hour	0.118	1.017	1.135
vehicle trips (37,500sqm)	AM peak hour	518	62	580
	PM peak hour	44	381	425

residential vehicle trip rates and traffic generation		arrive	depart	two-way
average trip rates (per dwelling)	AM peak hour	0.149	0.400	0.549
	PM peak hour	0.359	0.214	0.573
vehicle trips (1,000 dwellings)	AM peak hour	149	400	549
	PM peak hour	359	214	573

14. The TA distributed and assigned the traffic to the two junctions using 2011 Census data as included in the Transport Assessment for the residential scheme. This methodology is not advised, because the distribution of traffic to/from an employment development will be different to those to/from a residential development. Nevertheless, it was agreed as part of the approved TA for the junction improvement scheme.

15. The resultant distribution assumed that 48% of traffic would route to/from the north and 52% would route to/from the south at the A151 four arm roundabout. Of the 48% travelling to/from the north, 7% would route to/from the A17(W) and 41% would route to/from the A17(E).

16. The operation of the A17/A151 three arm roundabout was modelled in the future year of 2032, assuming both the FEZ employment and Holbeach West residential development was in place, and the results are as follows:

	road name	lane	movement	RFC	average delay (veh/min)	queue (veh)
2032 AM	A17 E	1	Left/ahead	91.4%	0.322	5
		2	Ahead	68.7%	0.124	1
	A151	1	Left/right	46.2%	0.158	0
		2	Right	41.1%	0.151	0
	A17 W	1	Ahead	62.6%	0.085	1
		2	Ahead/right	65.3%	0.090	1
2032 PM	A17 E	1	Left/ahead	87.6%	0.207	3
		2	Ahead	74.0%	0.135	2
	A151	1	Left/right	49.5%	0.072	0
		2	Right	45.6%	0.065	0
	A17 W	1	Ahead	55.7%	0.069	1
		2	Ahead/right	57.9%	0.073	1

17. As shown, the proposed A17/A151 three arm roundabout will operate above the typically accepted 85% ratio of flow to capacity (RFC), but within 100% RFC, in both the morning and evening peak hours. The arm with the least spare capacity is the A17(E) left and ahead arm, which will operate at 91.4% and 87.6% in the morning and evening peak hours respectively. However, the queueing and delay would be minimal. These conclusions are based on robust traffic flows (with double counting included in the TEMPRO growth rates) and with a robust distribution pattern that assumes 41% of traffic will route to/from the A17(E).

18. The operation of the proposed four arm roundabout was also modelled, and the results are as follows:

	road name	lane	movement	RFC	average delay (veh/min)	queue (veh)
2032 AM	Residential access (E)	1	left/ahead	11.1%	0.041	0
		2	right	27.9%	0.063	0
	A151 (S)	1	left	30.6%	0.045	0
		2	ahead/right	53.5%	0.089	1
	Employment access (W)	1	left	3.8%	0.028	0
		2	ahead/right	5.7%	0.030	0
	A151 (N)	1	left/ahead	61.0%	0.090	1
		2	right	24.6%	0.028	0
2032 PM	Residential access (E)	1	left/ahead	6.8%	0.032	0
		2	right	14.6%	0.040	0
	A151 (S)	1	left	2.2%	0.013	0
		2	ahead/right	43.9%	0.055	0
	Employment access (W)	1	left	23.4%	0.044	0
		2	ahead/right	26.2%	0.049	0
	A151 (N)	1	left/ahead	69.5%	0.126	1
		2	right	2.1%	0.014	0

19. As shown, the proposed four arm roundabout on the A151 is forecast to operate well below the 85% RFC design threshold, with minimal queueing and delay.

DEVELOPMENT SCENARIOS AND TRIP GENERATION

20. As detailed in paragraph 2, there are currently no firm details on the size (GFA) or type of development that will be promoted at the FEZ. It is currently assumed that the development will include 20,000sqm of employment plus the 3,800sqm of education use.

21. This section examines three potential development scenarios, to identify what quantum and type of development could be progressed without exceeding the consented level of traffic generation and thus triggering the requirement for off-site highway works at the two new roundabouts. Ideally, the FEZ development would not exceed the consented levels of traffic generation from the approved TA, which are as follows:

consented employment site traffic generation	arrive	depart	two-way
AM peak hour	518	62	580
PM peak hour	44	381	425

22. As agreed with the Client team, the following three development scenarios have been considered:
    - Option A: 100% B1a plus 3,800sqm education use;
    - Option B: 50% B1a, 25% B2 and 25% B8 plus 3,800sqm education use; and
    - Option C: 33% B1a, 33% B2, and 33% B8 plus 3,800sqm education use.

23. Average trip rates were therefore extracted from the TRICS 7.2.3 database for the B1 office (on the basis that B1a office use generates higher traffic flows than B1b and B1c uses), B2 industrial unit and B8 warehousing (commercial) categories. In all cases, only sites in England and outside of Greater London were selected. Furthermore, only edge of town, suburban or free-standing sites were selected. Sites with a GFA between 10,000 and 80,000sqm were selected. The TRICS outputs are contained in **Appendix A**, and the average trip rates are summarised as follows:

Proposed average trip rates		arrive	depart	two-way
B1a office use	AM	1.265	0.283	1.548
	PM	0.194	1.074	1.268
B2 industrial unit use	AM	0.503	0.048	0.551
	PM	0.027	0.373	0.400
B8 storage and distribution use	AM	0.066	0.042	0.108
	PM	0.029	0.077	0.106

24. The quantum of development that could be achieved at the site was then calculated by dividing the consented traffic generation by the relevant trip rates, using the proportions within each option.

25. The education use is likely to operate similar to an office use, with people arriving in the morning and leaving in the evening. Therefore, office trip rates were applied to this use, as follows:

education zone vehicle trip rates and traffic generation		arrive	depart	two-way
average trip rates (per 100sqm)	AM peak hour	1.265	0.283	1.548
	PM peak hour	0.194	1.074	1.268
vehicle trips (3,800sqm)	AM peak hour	48	11	59
	PM peak hour	7	41	48

26. Therefore, the employment zones should not exceed the following traffic generation (which represents the consented traffic in the table at paragraph 21 minus the education traffic in the table at paragraph 25).

net consented employment site traffic generation	arrive	depart	two-way
AM peak hour	470	51	520
PM peak hour	37	340	378

27. Based on the average trip rates in the table at paragraph 23, the following amount of development could be provided at the FEZ site without exceeding the consented traffic generation, as included in the design of the Peppermint Junction improvement scheme:

	D1 education	B1a/B1b	B2 general industrial	B8 storage and distribution
Option A	3,800sqm	18,021sqm		
Option B	3,800sqm	8,481sqm	25,000sqm	28,571sqm
Option C	3,800sqm	5,597sqm	33,000sqm	37,714sqm

28. As shown, given the low B8 trip rates, significantly more B8 use can be provided on the site than B1 use. The B8 trip rates are 15 times lower than the B1 trip rates.

29. In all scenarios, the acceptable level of development (in terms of traffic generation) is consistent with the existing masterplan (Option A), or greatly exceeds the level of development that could realistically be achieved at the site (Option C). It is therefore recommended that further consideration is given to the development size and quantum before the Transport Assessment for the development is produced.

HIGHWAY IMPACT

30. As detailed in paragraph 27, approximately 18,000sqm of B1 office employment (as the highest traffic generator) and 4,000sqm of education use could be provided at the FEZ site without exceeding the consented traffic generation. Alternatively, a combination of B1, B2 and B8 employment plus education development could be progressed. Any of the development options listed should therefore be achievable without the need for further assessment or mitigation works at the A17/A151 roundabout or the A151/access roundabout that are being promoted under the Peppermint Junction improvement scheme.

31. However, this level of traffic will still generate impacts at other off-site junctions. The extent of the study area will only be defined once the traffic has been distributed and assigned. However, as a rule of thumb, the study area will comprise any junction experiencing an increase of 30 or more two-way trips in a peak hour.

32. The approved distribution pattern assigned 52% of traffic to and from the south via the A151 and 41% of traffic to/from the A17(E). It is therefore likely that assessments will be required at the following junctions:
    1. A151/Spalding Road/Greenwich Avenue roundabout to the south
    2. A151/Wignal's Gate T-junction to the south-west
    3. B1168/West End/High Street traffic signal controlled crossroads within Holbeach
    4. A17/B1168 roundabout to the north-east.

34 Mitigation measures will be required where the development traffic results in a severe impact. However, as noted in Paragraph 8, the proposed Peppermint Junction improvement scheme will allow traffic to route via the A151 and thus reduce traffic through Holbeach. As a result, the net increase in traffic at Junctions 3 and 4 listed above as a result of the development may be minimal, and may negate the need for mitigation. Furthermore, the TA prepared for the Holbeach West

residential development notes that there are limited options for mitigation at Junction 3, and that *"it is expected that the queuing at the junction would likely lead to divers re-routing via the A151 and A17 to reach their destinations and avoid this junction".*

35   Furthermore, mitigation measures are proposed at Junction 2 (to upgrade the existing T-junction to include a ghost island right turn lane) as part of the Hall Gate residential development, and this can be taken into account should that development be approved.

36   All junction assessments will need to take into account the committed residential development of 900 dwellings at Hall Gate (reference H09-0521-14), and the proposed Holbeach West residential development.

37   Should additional development over and above the amounts listed in the table at paragraph 27 be promoted, further assessment may be required at the two roundabouts forming the Peppermint Junction improvement scheme. However, further mitigation should not be required given that the traffic flows used in the design of the junctions were robust. It would therefore be possible to forecast more realistic traffic flows using adjusted planning assumptions within TEMPRO (paragraphs 10 and 17), and using a revised distribution pattern for the employment use (paragraphs 14 and 17) within any subsequent modelling works.

38   Overall, the Transport Assessment prepared to support the design of the Peppermint Junction improvement scheme used highly robust trip rates. As a result, the quantum and type of development that can be provided at the FEZ site is not heavily restricted. An initial assessment concludes that approximately 18,000sqm of B1 office and 4,000sqm of education use could be provided. Alternatively, a mix of B1, B2 and B8 uses could be provided. It is recommended that further consideration is therefore given to the development proposals, and this can then be assessed as part of the subsequent Transport Assessment work.

APPENDIX A

TRICS OUTPUTS

ADC Infrastructure Limited   The Lace Market   Nottingham   Licence No: 855401

Calculation Reference: AUDIT-855401-160802-0801

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use   : 02 - EMPLOYMENT
Category   : A - OFFICE
VEHICLES

Selected regions and areas:
02   SOUTH EAST
    HC   HAMPSHIRE   1 days
    SC   SURREY   3 days
09   NORTH
    TW   TYNE & WEAR   1 days

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

Filtering Stage 2 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: 10293 to 70291 (units: sqm)
Range Selected by User: 10000 to 80000 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 23/05/14

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   3 days
Wednesday   1 days

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

Selected survey types:
Manual count   5 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 undertaking using machines.

Selected Locations:
Suburban Area (PPS6 Out of Centre)   2
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:
Commercial Zone   3
Residential Zone   2

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.

Filtering Stage 3 selection:

Use Class:
   B1   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® .

Population within 1 mile:
Not Known   1 days
5,001 to 10,000   2 days
10,001 to 15,000   1 days
25,001 to 50,000   1 days

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

Population within 5 miles:
Not Known   1 days
75,001 to 100,000   1 days
250,001 to 500,000   3 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   2 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   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.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
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	19974	0.020	1	19974	0.010	1	19974	0.030
06:00 - 07:00	2	45133	0.691	2	45133	0.189	2	45133	0.880
07:00 - 08:00	5	33178	0.874	5	33178	0.241	5	33178	1.115
08:00 - 09:00	**5**	**33178**	**1.265**	5	33178	0.283	**5**	**33178**	**1.548**
09:00 - 10:00	5	33178	0.670	5	33178	0.194	5	33178	0.864
10:00 - 11:00	5	33178	0.303	5	33178	0.078	5	33178	0.381
11:00 - 12:00	5	33178	0.233	5	33178	0.123	5	33178	0.356
12:00 - 13:00	5	33178	0.187	5	33178	0.197	5	33178	0.384
13:00 - 14:00	5	33178	0.222	5	33178	0.180	5	33178	0.402
14:00 - 15:00	5	33178	0.258	5	33178	0.300	5	33178	0.558
15:00 - 16:00	5	33178	0.255	5	33178	0.648	5	33178	0.903
16:00 - 17:00	5	33178	0.238	5	33178	0.966	5	33178	1.204
17:00 - 18:00	5	33178	0.194	**5**	**33178**	**1.074**	5	33178	1.268
18:00 - 19:00	5	33178	0.143	5	33178	0.519	5	33178	0.662
19:00 - 20:00	1	70291	0.175	1	70291	0.218	1	70291	0.393
20:00 - 21:00	1	70291	0.185	1	70291	0.198	1	70291	0.383
21:00 - 22:00	1	70291	0.084	1	70291	0.182	1	70291	0.266
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			5.997			5.600			11.597

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.*

Parameter summary

Trip rate parameter range selected:	10293 - 70291 (units: sqm)
Survey date date range:	01/01/08 - 23/05/14
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	2
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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

ADC Infrastructure Limited   The Lace Market   Nottingham   Licence No: 855401

Calculation Reference: AUDIT-855401-160802-0812

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use   : 02 - EMPLOYMENT
Category   : C - INDUSTRIAL UNIT
VEHICLES

Selected regions and areas:

02	**SOUTH EAST**	
	WS WEST SUSSEX	1 days
03	**SOUTH WEST**	
	DV DEVON	1 days
05	**EAST MIDLANDS**	
	NR NORTHAMPTONSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**	
	WY WEST YORKSHIRE	1 days

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

Filtering Stage 2 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: 11375 to 20000 (units: sqm)
Range Selected by User: 10000 to 80000 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 19/10/15

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
Thursday   2 days

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

Selected survey types:
Manual count   4 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 undertaking using machines.

Selected Locations:
Suburban Area (PPS6 Out of Centre)   1
Edge of Town   2
Free Standing (PPS6 Out of Town)   1

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   3
Out of Town   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.

Filtering Stage 3 selection:

Use Class:
   B1   1 days
   B2   2 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 1 mile:
1,000 or Less   1 days
1,001 to 5,000   1 days
5,001 to 10,000   1 days
25,001 to 50,000   1 days

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

Population within 5 miles:
50,001 to 75,000   1 days
125,001 to 250,000   2 days
500,001 or More   1 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   1 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   3 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.

TRIP RATE for Land Use 02 - EMPLOYMENT/C - INDUSTRIAL UNIT
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									
06:00 - 07:00	2	12363	0.315	2	12363	0.020	2	12363	0.335
07:00 - 08:00	4	14056	0.318	4	14056	0.037	4	14056	0.355
08:00 - 09:00	**4**	**14056**	**0.503**	4	14056	0.048	**4**	**14056**	**0.551**
09:00 - 10:00	4	14056	0.128	4	14056	0.066	4	14056	0.194
10:00 - 11:00	4	14056	0.069	4	14056	0.050	4	14056	0.119
11:00 - 12:00	4	14056	0.052	4	14056	0.050	4	14056	0.102
12:00 - 13:00	4	14056	0.092	4	14056	0.141	4	14056	0.233
13:00 - 14:00	4	14056	0.180	4	14056	0.103	4	14056	0.283
14:00 - 15:00	4	14056	0.119	4	14056	0.173	4	14056	0.292
15:00 - 16:00	4	14056	0.062	4	14056	0.203	4	14056	0.265
16:00 - 17:00	4	14056	0.046	4	14056	0.334	4	14056	0.380
17:00 - 18:00	4	14056	0.027	**4**	**14056**	**0.373**	4	14056	0.400
18:00 - 19:00	4	14056	0.034	4	14056	0.151	4	14056	0.185
19:00 - 20:00	1	11375	0.044	1	11375	0.132	1	11375	0.176
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.989			1.881			3.870

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.*

Parameter summary

Trip rate parameter range selected:	11375 - 20000 (units: sqm)
Survey date date range:	01/01/08 - 19/10/15
Number of weekdays (Monday-Friday):	4
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Calculation Reference: AUDIT-855401-160802-0842

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02   SOUTH EAST
    HF   HERTFORDSHIRE   1 days
04   EAST ANGLIA
    SF   SUFFOLK   1 days
05   EAST MIDLANDS
    LN   LINCOLNSHIRE   1 days

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

Filtering Stage 2 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: 22270 to 80000 (units: sqm)
Range Selected by User: 10000 to 80000 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/08 to 11/07/13

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
Thursday   2 days

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

Selected survey types:
Manual count   3 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 undertaking using machines.

Selected Locations:
Suburban Area (PPS6 Out of Centre)   1
Edge of Town   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:
Industrial Zone   1
Commercial Zone   1
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.

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Filtering Stage 3 selection:

Use Class:
   B8   3 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 1 mile:
1,001 to 5,000   2 days
10,001 to 15,000   1 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
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   3 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   3 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.

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TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)
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	22270	0.018	1	22270	0.040	1	22270	0.058
06:00 - 07:00	1	22270	0.058	1	22270	0.063	1	22270	0.121
07:00 - 08:00	3	44857	0.082	3	44857	0.068	3	44857	0.150
08:00 - 09:00	3	44857	0.066	3	44857	0.042	3	44857	0.108
09:00 - 10:00	3	44857	0.063	3	44857	0.051	3	44857	0.114
10:00 - 11:00	3	44857	0.058	3	44857	0.054	3	44857	0.112
11:00 - 12:00	3	44857	0.051	3	44857	0.051	3	44857	0.102
12:00 - 13:00	3	44857	0.056	3	44857	0.062	3	44857	0.118
13:00 - 14:00	3	44857	0.081	3	44857	0.065	3	44857	0.146
14:00 - 15:00	3	44857	0.089	3	44857	0.102	3	44857	0.191
15:00 - 16:00	**3**	**44857**	**0.097**	**3**	**44857**	**0.108**	**3**	**44857**	**0.205**
16:00 - 17:00	3	44857	0.070	3	44857	0.100	3	44857	0.170
17:00 - 18:00	3	44857	0.029	3	44857	0.077	3	44857	0.106
18:00 - 19:00	3	44857	0.016	3	44857	0.051	3	44857	0.067
19:00 - 20:00	1	22270	0.036	1	22270	0.031	1	22270	0.067
20:00 - 21:00	1	22270	0.013	1	22270	0.031	1	22270	0.044
21:00 - 22:00	1	22270	0.031	1	22270	0.018	1	22270	0.049
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.914			1.014			1.928

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.*

Parameter summary

Trip rate parameter range selected:	22270 - 80000 (units: sqm)
Survey date date range:	01/01/08 - 11/07/13
Number of weekdays (Monday-Friday):	3
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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.