

💊 0121 794 8390

# Bourne, South Kesteven Traffic Impact Assessment

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Client:Barratt David Wilson HomesDate:28 January 2022Job NoJ326325Prepared by:ESP / ALFApproved by:ALF / BDF

# 1. Introduction

- 1.1.1 mode transport planning (mode) has been appointed by Barratt David Wilson (BDW) Homes to provide initial highways and transportation analysis and advice on the above site for development of up to c.900 dwellings through the South Kesteven Local Plan Review.
- 1.1.2 This Technical Note (TN) will:
  - Provide a review of proposed BDW Trip Distribution vs Trip Distribution of Competing Site; and,
  - Provide a review of Off-Site Junction Impacts.
- 1.1.3 The BDW site along with the competing site of similar capacity situated illustratively to the northeast of the town that has been historically promoted, are shown within **Figure 1.1**.

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### Figure 1.1 Site Location



## 2. Trip Rates

### 2.1 Overview

2.1.1 This section provides an overview of the methodology used to calculate the travel demand associated with the development proposals, including forecast vehicle trip generation.

### 2.2 Residential Vehicle Trip Generation

2.2.1 To establish the forecast traffic generation for the proposed development, the 'Residential 03 – A Houses Privately Owned' category of the TRICS Database (v.7.8.4) was examined.

- 2.2.2 A size filter of 650-1,050 dwellings was chosen along with the following site location category 'edge of town'. Sites situated in Greater London, Wales, Scotland and Ireland were de-selected. Residential zone area was selected as location sub-category. Sites were further filtered by their public transport accessibility rating (i.e., sites with a comparable level of bus service provision), to provide a more robust and comparable assessment.
- 2.2.3 A summary of the trip rates and associated traffic generation, based on 900 dwellings, is provided in **Table 2.1** below and the full TRICS output is appended to this note, for reference.

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)			12-Hour (07:00-19:00)		
Land Use	In	Out	2-Way	In	Out	2-Way	In	Out	2-Way
Trip Rate	0.147	0.451	0.598	0.415	0.168	0.583	2.279	2.285	4.564
Traffic Gen (900 units)	132	406	538	374	151	525	2,051	2,057	4,108

### Table 2.1 Trip Rates & Traffic Generation (900 dwellings)

2.2.4 **Table 2.1** shows that the proposed development is forecast to generate 538 and 525 two-way vehicular trips during the AM and PM peak hours, respectively; with 4,108 two-way trips forecast over a 12-hour period (between 07:00-19:00).

# 3. Traffic Distribution and Assignment

### 3.1 Overview

3.1.1 This chapter describes the methodology and assumptions employed in the calculation of development traffic distribution and assignment on the local highway network.

### 3.2 Vehicle Trip Distribution

- 3.2.1 The distribution of residential vehicular trips has been derived from the 'Journey to Work' (JtW) Origin & Destination (OD) dataset obtained from the 2011 Census. Data from the 2021 Census is not available at the time of this initial assessment and is not expected to be published until 2022 (initial findings) and 2023 (full results).
- 3.2.2 For the purpose of the assessment, the existing JtW patterns of residents living within the combined Middle Super Output Areas (MSOAs) E02005485: South Kesteven 010 and E02005486: South Kesteven 011 have been examined and are considered to be representative of the proposed development location.



- 3.2.3 The JtW OD data assessed contains vehicle work trips to destinations across the UK split down to MSOAs (within South Kesteven & South Holland Districts), and all UK local authority districts and regions.
- 3.2.4 Journeys to each workplace destination have been routed using Google Maps 'Directions' function to assign the forecast trips onto the local highway network. The likely routes taken to and from the proposed developments (both BDW and the alternative competing site) have been assigned a 'Zone'. A total percentage distribution has then been given to each of the Zones identified. This methodology has been undertaken for both the BDW site and the competing site located to the north-east of the town centre.
- 3.2.5 The resultant distribution percentages and associated traffic generation is summarised in **Tables 3.1** and **3.2**.

			Two-Way	/ Traffic Flo	OWS
Zone	Route Assignment	Distribution			
			AM	PM	12-Hr
Δ	West Boad / A151	8%	43	42	329
/ (		070	-0	72	020
В	West Road / A6121	13%	70	68	534
С	Raymond Mays Way / Bourne Road	37%	199	194	1 <u>.</u> 520
D	West Road / Abbey Road / Spalding Road	6%	32	31	246
E	West Road / Exeter Street / St Gilbert's / North Road	6%	32	31	246
F	Raymond Mays Way / South Road / Cherry Holt Road	18%	97	94	739
G	West Road / Exeter Street	10%	54	52	411
Н	Raymond Mays Way / South Road / Cherry Holt Road / S Fen Road	2%	11	10	82

### Table 3.1 Journey to Work – Traffic Distribution (BDW site)

3.2.6 The Zones for the distribution model were classified based on the primary routes leading into/out of the BDW development site during the morning and evening peak times. These Zones can be seen in **Figure 3.1**.

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### Figure 3.1 Distribution Zones & % (BDW Site)



Table 3.2 Journey to Work – Traffic Distribution (Competing site)

Zono	Pouto Assignment	Distribution	Two-Way Traffic Flows		
-20116	Houte Assignment	DISTIDUTION	AM	PM	12-Hr
A	North Road / St Gilbert's Road / Exeter Street / West Road / A151	<u>3%</u>	<u>16</u>	<u>16</u>	<u>123</u>
B	North Road / St Gilbert's Road / Exeter Street / West Road / A6121	<u>9%</u>	<u>48</u>	<u>47</u>	<u>370</u>
<u>C</u>	North Road / South Road / Bourne Road	<u>40%</u>	<u>215</u>	210	<u>1,643</u>
D	Mill Drove / Meadow Drove / Spalding Road	<u>8%</u>	<u>43</u>	<u>42</u>	<u>329</u>
E	North Road	<u>12%</u>	<u>65</u>	<u>63</u>	<u>493</u>



7000	Doute Assignment	Distribution	Two-Way Traffic Flows			
Zone	Route Assignment	Distribution	AM	PM	12-Hr	
E	Mill Drove / Meadow Drove / Spalding Road / Cherry Holt Road	<u>18%</u>	<u>97</u>	<u>94</u>	<u>739</u>	
<u>G</u>	North Road / St Gilbert's Road / Exeter Street	<u>10%</u>	<u>54</u>	<u>52</u>	<u>411</u>	

3.2.7 The zones and respective route assignments for the distribution model were classified based on the primary routes leading into/out of the competing site during the morning and evening peak times. These zones can be seen below in **Figure 3.2**.

### Figure 3.2 Distribution Zones & % (Competing Site)





# 4. Forecast Impact Assessments

### 4.1 Overview

4.1.1 This chapter highlights the junctions that will be significantly impacted by either the BDW or the competing site.

### 4.2 Impact Assessment

- 4.2.1 The network operation has been graphically summarised using a 'RAYG' traffic light system<sup>1</sup> rating as follows:
  - 0-30 two-way flows in the peak hours (Equating to up to 1 trip per 2 minutes);
  - 31–60 two-way flows in the peak hours (Equating to 1 trip per 2-minutes to 1 trip per minute);
  - 61–120 two-way flows in the peak hours (Equating to 1 trip to 2 trips per minute); and,
  - 120+ two-way flows in the peak hours (Equating to over 2 trips per minute).
- 4.2.2 Figures 4.1 and 4.2 illustrate the impact based in the total number of two-way trips through each relevant junction throughout Bourne, utilising the BDW distribution network; these are displayed in diagrammatic form, comprising of the aforementioned traffic-light rating system, for both the AM and PM peak hours. Figures 4.3 and 4.4 illustrate the same impact graphics for the competing site.

<sup>&</sup>lt;sup>1</sup> 'RAYG' is an adaptation of the typical RAG, which allows for an additional parameter banding ('Yellow') for extra context and analysis.



### Figure 4.1 Traffic Impact Assessment AM Peak (BDW Site)





### Figure 4.2 Traffic Impact Assessment PM Peak (BDW Site)



- 4.2.3 **Figures 4.1** and **4.2** illustrate that the highest impact (+120 two-way trips) of the development traffic from the BDW site that will be focused along the arterial and periphery routes around the town centre, and outside of the more critical junction locations/corridor (i.e., West St/A15/Abbey Rd signalised junction). In particular, the largest levels of traffic will be routed along Raymond Mays Way, acting as a southern relief road/route for traffic heading to the south towards Peterborough. However, it is considered that Raymond Mays Way is a higher order road that is capable of and more suitable for accommodating additional traffic from the development proposals<sup>2</sup>.
- 4.2.4 The BDW site (similarly to the competing site, subsequently assessed) will also have some local impacts along junctions and corridors towards the town centre; namely, West Road, Exeter Street, A15 South Road and Cherry Holt Road.

<sup>&</sup>lt;sup>2</sup> Subject to detailed capacity assessments of individual junctions along the extent of the corridor route.



### Figure 4.3 Traffic Impact Assessment AM Peak (Competing Site)







### Figure 4.4 Traffic Impact Assessment PM Peak (Competing Site)

- 4.2.5 Figures 4.3 and 4.4 illustrate that the highest impact (+120 two-way trips) of the development traffic from the alternative competing site will be focused along the main routes and junctions through the town centre (i.e., along the A15 North Road, North Street, South Street and South Road this corridor and it's junctions along the extent are understood to be more sensitive to increases in traffic volumes.
- 4.2.6 Similarly, to the BDW development, the alternative competing site will also have some other local impacts along junctions and corridors towards and around the town centre; namely, West Road, Exeter Street, Mill Drove and Meadow Drove.
- 4.2.7 It is noted that Mill Drove and Meadow Drove can provide some alternative routing of traffic around the town centre for a potential site to the northeast; although, there would likely be a requirement to upgrade the quality and status of the highway to a higher standard sufficient to accommodate an increased level of traffic.

4.2.8 In addition, in order to sufficiently alleviate the significant impacts of traffic traversing through the town centre along the sensitive route corridors there would likely be a requirement to provide a significant piece of infrastructure by way of a relief road; which would span around the entire eastern half of the town.

### 4.3 Comparison Summary

- 4.3.1 An overall comparison of the BDW and competing site reveals that a greater number and impact of junctions that will incur two-way flows greater than 120 vehicles in the AM and PM peak hours are associated with the competing site's distribution traffic network. Predominantly through the sensitive nature of the town centre.
- 4.3.2 BDW is only 26% traffic (Zones E, D & G) whereas the competing alternative site is 62% traffic (Zones A, B, C & G).
- 4.3.3 The junctions that are impacted are understood to be more sensitive to change in traffic flows, as they are located through Bourne Town Centre in a north to south alignment. The BDW site's distribution network will result in greater flows along the southern link road (Raymond Mays Way), which is likely more suitable to accommodate increases in traffic growth.
- 4.3.4 The significant benefit of the BDW development being located adjacent to the Raymond Mays Way (effectively a south-western quarter bypass), is that c.1,520 two-way trips per day (12-hour period) can be routed along this section of the network (towards Peterborough). The distribution patterns associated with the alternative development site would route c.1,640 two-way trips directly through the town centre via North Road / South Road towards Bourne Road.
- 4.3.5 The BDW site will, as aforementioned, still have its own impacts around and within the town centre (signalised junction of West Street / North Street / Abbey Road / South Street) for traffic routing towards Zone D / Spalding Road; however, this is only in the region of c.245 over the course of the day (and c.32 in the respective AM and PM Peak Hours).
- 4.3.6 Both sites, similarly, have their own impacts on the western and northern routes around the town centre in particular, West Road / Exeter Street / St Gilbert's Road / North Road; traversing to/from Zones A, B, G & E.
- 4.3.7 Traffic from the competing development site to the north, does have an alternative route for distributing traffic to Zones D & F, via Mill Drove / Meadow Drove (as opposed to traversing through/towards the town centre); however, the standard of this road network is narrow country style roads and will likely need upgrading if being promoted to serve/carry additional traffic associated with a 900 dwelling development (forecast increased traffic is at c.1,070 per day along these currently substandard routes).

Appendix - TRICS Trip Rate Report

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mode transport limited Lombard House, 145 Great Charles Street Birmimgham, B3 3LP

Licence No: 754101

Calculation Reference: AUDIT-754101-220113-0158

#### TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:02SOUTH EASTWSWEST SUSSEX

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:	918 to 918 (units: )
Range Selected by User:	650 to 1050 (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

<u>Public Transport Provision:</u> Selection by: Include days where PT not known: Range:

Date Range: 01/01/13 to 13/10/20

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.

Yes 69 to 100

Monday-Friday 0700-1900

<u>Selected survey days:</u> Tuesday

1 days

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

Selected survey types:	
Manual count	1 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.

<u>Selected Locations:</u> Edge 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.

<u>Selected Location Sub Categories:</u> Residential Zone

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.

1

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ransport limited	Lombard	House, 145 Grea	t Charles Street	Birmimgham, B3 3LP	Licence No: 754101
Secondary Filte	ring selec	tion:			
Use Class:					
C3			1 days		
This data display: has been used fo	s the numb r this purpo	er of surveys pe ose, which can b	r Use Class classi e found within the	fication within the selected set. The Library module of TRICS®.	ne Use Classes Order 2005
<u>Population within</u> All Surveys Inclu	<u>500m Ran</u> ded	<u>ge:</u>			
10,001 to 15,000	<u>mile:</u>		1 davs		
This data displays	s the numb	er of selected su	rveys within state	ed 1-mile radii of population.	
Population within	5 miles:				
75,001 to 100,0	00		1 days		
This data display:	s the numb	er of selected su	rveys within state	ed 5-mile radii of population.	
Car ownership wi	<u>thin 5 mile</u>	<u>s:</u>			
1.1 to 1.5			1 days		
This data displays within a radius of	s the numb 5-miles of	er of selected su selected survey	rveys within state sites.	ed ranges of average cars owned	per residential dwelling,
<u>Travel Plan:</u>					
Yes			1 days		
This data displays and the number o	s the numb of surveys	er of surveys wi that were undert	thin the selected s aken at sites with	set that were undertaken at sites nout Travel Plans.	with Travel Plans in place,
PTAL Rating:					

<b>TRICS 7.8.4</b>	211221 B2	0.35 Da	tabase rig	ght of TRIC	S Consortium L	imited, 2022. All rights re	eserved	Thursday 13/01/22 Page 3
mode transpo	ort limited	Lombard	House, 1	45 Great C	harles Street	Birmimgham, B3 3LP		Licence No: 754101
LIST	OF SITES re	levant to s	selection	parameters				
1	WS-03-A-	11	MIXED	HOUSES		WEST SUS	SEX	
	ELLIS ROAD	)						
	WEST HOR	SHAM						
	S BROADB	<b>RIDGE HEA</b>	ATH					
	Edge of Tov	٧n						
	Residential	Zone						
	Total No of	Dwellings	:		918			
	Surv	/ey date:	TUESDAY		02/04/19	9 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.

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mode transport limited Lombard House, 145 Great Charles Street Birmimgham, B3 3LP

Licence No: 754101

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED TOTAL VEHICLES Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

	ARRIVALS				DEPARTURES	5	TOTALS		
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	1	918	0.053	1	918	0.296	1	918	0.349
08:00 - 09:00	1	918	0.147	1	918	0.451	1	918	0.598
09:00 - 10:00	1	918	0.139	1	918	0.156	1	918	0.295
10:00 - 11:00	1	918	0.098	1	918	0.125	1	918	0.223
11:00 - 12:00	1	918	0.114	1	918	0.125	1	918	0.239
12:00 - 13:00	1	918	0.137	1	918	0.120	1	918	0.257
13:00 - 14:00	1	918	0.134	1	918	0.155	1	918	0.289
14:00 - 15:00	1	918	0.144	1	918	0.186	1	918	0.330
15:00 - 16:00	1	918	0.263	1	918	0.172	1	918	0.435
16:00 - 17:00	1	918	0.281	1	918	0.157	1	918	0.438
17:00 - 18:00	1	918	0.415	1	918	0.168	1	918	0.583
18:00 - 19:00	1	918	0.354	1	918	0.174	1	918	0.528
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates: 2.279 2.285 4.564								4.564	

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:	918 - 918 (units: )
Survey date date range:	01/01/13 - 13/10/20
Number of weekdays (Monday-Friday):	1
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.