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ELLAND – TRANSPORT NEEDS ASSESSMENT

Final Report

30/07/2015

Quality Management

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Elland – Transport Needs Assessment

Final Report

30/07/2015

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1 Introduction

1.1 Study Context

1.1.1 The need was identified in 2013, in part as a result of the public consultation exercise for the West Yorkshire Railplan 7, for a re-fresh of the previous 2009 stations study to be carried out. The study aim is to identify which further sites within West Yorkshire and its immediate surrounds might be suitable for further new rail stations, and re-fresh the 2009 list due to the considerable committed and planned changes to the rail network and services in West Yorkshire e.g. as a result of the Northern Hub and electrification programme and construction of stations identified in the original shortlist.

1.1.2 As part of the New Stations Study re-fresh, consultants working for Metro (now the West Yorkshire Combined Authority, WYCA) investigated the possibility of constructing a new station at Elland. The study recommended that Elland station be taken forward for further development.

1.1.3 The objective of this study is to prepare a Transport Needs Assessment (TNA) for the area around Elland, setting out the current transport provision in the area and future needs, taking into account relevant influencing factors. It will consider bus, road and rail infrastructure, alongside current and future patterns of trip making, and examine whether provision is adequate for current and future needs. The study also focuses on establishing whether there is a need for a new railway station at Elland, which is proposed to be located where the Calder Valley Line crosses Lowfields Way on a viaduct.

1.1.4 Influencing factors for the future transport needs of the area will include the following aspects:

- The quantum and likely position of future land use development;
- The current and future performance of the relevant transport network;
- Current and future demographic trends; and
- Existing physical and/or infrastructure constraints.

1.1.5 This report therefore summarises the work completed during the study, and presents the findings and conclusions in the following report sections:

- The agreed Assessment Area forms the basis of a standardised area for the mapping outputs and analysis. This inception stage also summarised the work undertaken to date include details of any consultation exercises, any data available as part of these studies, and any datasets particularly relevant to the TNA.
- Quantification of growth aspirations and transport impact (forecast demand by site and by mode) to provide an indication of the likely changes in transport demand within the study area.
- Current and future demographic trends using analysis of available Census 2011 data (and comparisons with previous Census datasets) describing the demographic trends in the area, using the outputs of previous growth task to project forward with estimated changes over time.
- Capacity on the existing network and with future proposals (future baseline) – Using current and any proposed timetable and mapping information to provide an indication of existing and proposed transport networks, including all modes (bus, rail and highway).
- Summary of physical locational constraints in order to understand any potential constraints on the network also identifies whether there are any proposed or committed schemes that need to be taken into account and seeks to identify other opportunities that may be presented.

1.1.6 The conclusion is a summary of the study demonstrating whether, based on the evidence base gathered as part of the study; the future transport needs of the area will be met. If it is deemed that further intervention is required, this will be highlighted with specific reference to the potential for a new rail station at Elland.

2 Quantification of Growth Aspirations and Transport Impact

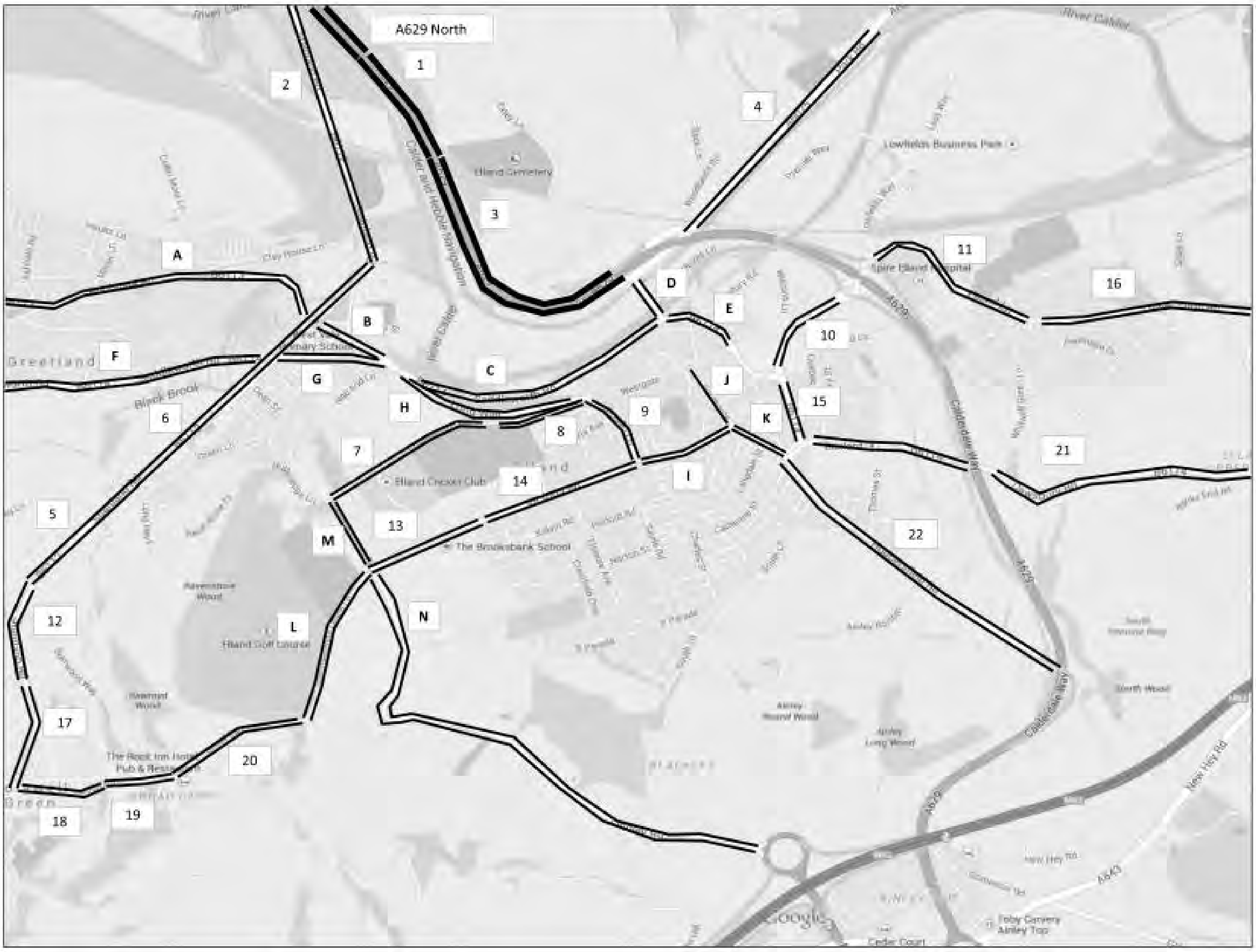
2.1.1 The initial analysis sought to assess the local highway network in Elland and consider how a range of identified developments in Elland may impact on the future performance of the local highway network. In order to undertake the assessment, an Annual Average Daily Traffic (AADT) flow link stress map was produced.

2.1.2 The stress map illustrates whether traffic flow (AADT) on the local highway network was having any impact on the capacity of the local highway links. It should be noted that the link stress map does not include any form of junction capacity analysis on the local highway network; it only considers the links themselves.

2.1.3 An analysis of junction capacity within the local highway network is discussed later in this section.

2.1.4 Figure 1 demonstrates the extent of the Elland local highway network and the location of each link/ counter for which traffic flows were obtained.

Figure 1 - Elland Local Highway Network Link Counters



2.2 AADT Data (and Count Data Conversion to AADT)

2.2.1 The Calderdale C2C website provided AADT data for count points 1 – 21 (including the A629 North counter); count points 22 and A – N were provided to WSP under previous commissions from Calderdale Council.

2.2.2 The month selected from the Calderdale C2C website for counter points 1 -21 and the A629 North counter was in line with DMRB[1] classification of a neutral month (April, May, June, September and October).

2.2.3 The counters, and the associated months in which data was obtained, can be seen in Table 1. Where data for a neutral month was not available, an alternative month with available data was chosen to maintain a complete dataset.

2.2.4 Data for one working week (Monday – Friday) was selected for each site. Where the five days of data was not available it has been noted in Table 1.

Table 1 - Counter Data Details

Counter	Month	Year
A629 North	March	2009
1	May	2012
2	June (4 days)	2013
3	June	2013
4	January	2008
5	February	2008
6	October (4 days)	2006
7	November	2013
8	November	2013
9	November	2013
10	July	2014
11	November	2013
12	July/ August	2013
13	November	2012
14	November	2013
15	July (4 days)	2013
16	November	2013
17	November (4 days)	2013
18	September/ October	2010
19	November (4 days)	2013
20	November (4 days)	2013
21	May	2009

[1] DMRB Volume 13 Section 1 Part 4 Traffic Flow Input to COBA

2.2.5 It can be observed from Table 1 that data was not always available for the same year, with years ranging from 2006 - 2013. In order to produce a base year for the analysis, all flows were growthed by their respective years to 2014 using the TEMPRO and NTM Growth factors seen in Table 2.

Table 2 - TEMPRO Growth Rate

Year	Growth Rate
2006 - 2014	1.029
2008 - 2014	1.030
2009 - 2014	1.031
2010 - 2014	1.031
2012 - 2014	1.021
2013 – 2014	1.010

2.2.6 Count points A – N only provided 12 hour data for each site. In order to convert the 12 hour data into Annual Average Daily Traffic (AADT) data; the total 12 hour traffic flow was growthed using formula taken from DMRB[2]. The formula included the application of an E Factor (1.15) and an M Factor (358).

2.2.7 The M factor was based on the Seasonality Index for October and divided by 254 (the number of working days in a year) to coincide with the A – N sites 12 hour data, which was undertaken in October 2014.

2.2.8 Data for link/ counter 22 was presented as AADT for an average workday, data for link/ counter 22 was also recorded in October 2014.

2.2.9 Once the 2014 base AADT flows for the local highway network had been established using the methodology described above, the capacity of each link was calculated.

2.3 Capacity Calculations

2.3.1 To calculate the capacity of links in the local highway network a capacity formula was undertaken using formula from DMRB[3]. This is set out below and in Table 3 and Table 4:

Capacity = (A-B*Pk%H) *(where Pk%H is the percentage of heavy vehicles in the peak hour).*

Table 3

	A	B
Single Carriageway	1380	15.0
Dual Carriageway	2100	20.0
Motorway	2300	25.0

[2] DMRB Volume 13 Section 1 Part 4 - Traffic Flow Input to COBA

[3] DMRB, Vol 5, section 1, Part 3, TA 46-97

Table 4

	Pk%H
Motorway	13.5
Trunk Road	10.4
Principal Road	5.6

2.3.2 In order to be more representative of some of the more rural roads in the Elland highway network, additional capacity parameters were taken from the COBA Manual[4,] as set out in Table 5.

2.3.3 The formula for capacity from DMRB was still applied with the Table 4 'A' factors in place of those seen in Table 3 and a percentage of HGVs in the peak hour (Pk%H) presumed at 3%, in place of the Pk%H factors seen in Table 4.

Table 5

	A (MAX)
Rural Single Carriageways	1600
Rural All Purpose Dual Carriageways and Motorways	2250
Urban Roads	800
Small Town Roads	1200
Suburban Roads	1700

2.3.4 In addition to calculating the capacity of the link, a Congestion Reference Flow (CRF) for the links was also required. The CRF of a link is defined as a standard measure and is an estimate of the AADT flow at which the carriageway is likely to be 'congested' (or above capacity) on an average day.

2.3.5 CRF was calculated using the CRF formula taken from DMRB[5], as seen below and in Table 6:

CRF = CAPACITY * NL * Wf * 100/PkF * 100/Pkd * AADT/AAWT

Table 6

Traffic Characteristic	Motorway	Trunk Road	Principal Road
PkF	10	9.4	9.6
PkD	56.3	57.4	58.4
AADT/AAWT	0.93	0.97	0.98

2.3.6 Congestion along the links occurs when the daily traffic demand exceeds the maximum sustainable daily capacity (throughput) of the link. It should be noted that the CRF is a measure of the performance of the link between junctions however the colouring of the links would usually tend to infer junctions at either end of stressed links are also likely to be stressed.

2.3.7 A colour based system has been adopted to identify links which are experiencing different levels of congestion on the local highway network, as can be seen in Table 7 below.

[4] COBA Manual, Vol 13, Section 1, Part 5

[5] DMRB, Vol 5, section 1, Part 3, TA 46-97 (Table D/1)

Table 7

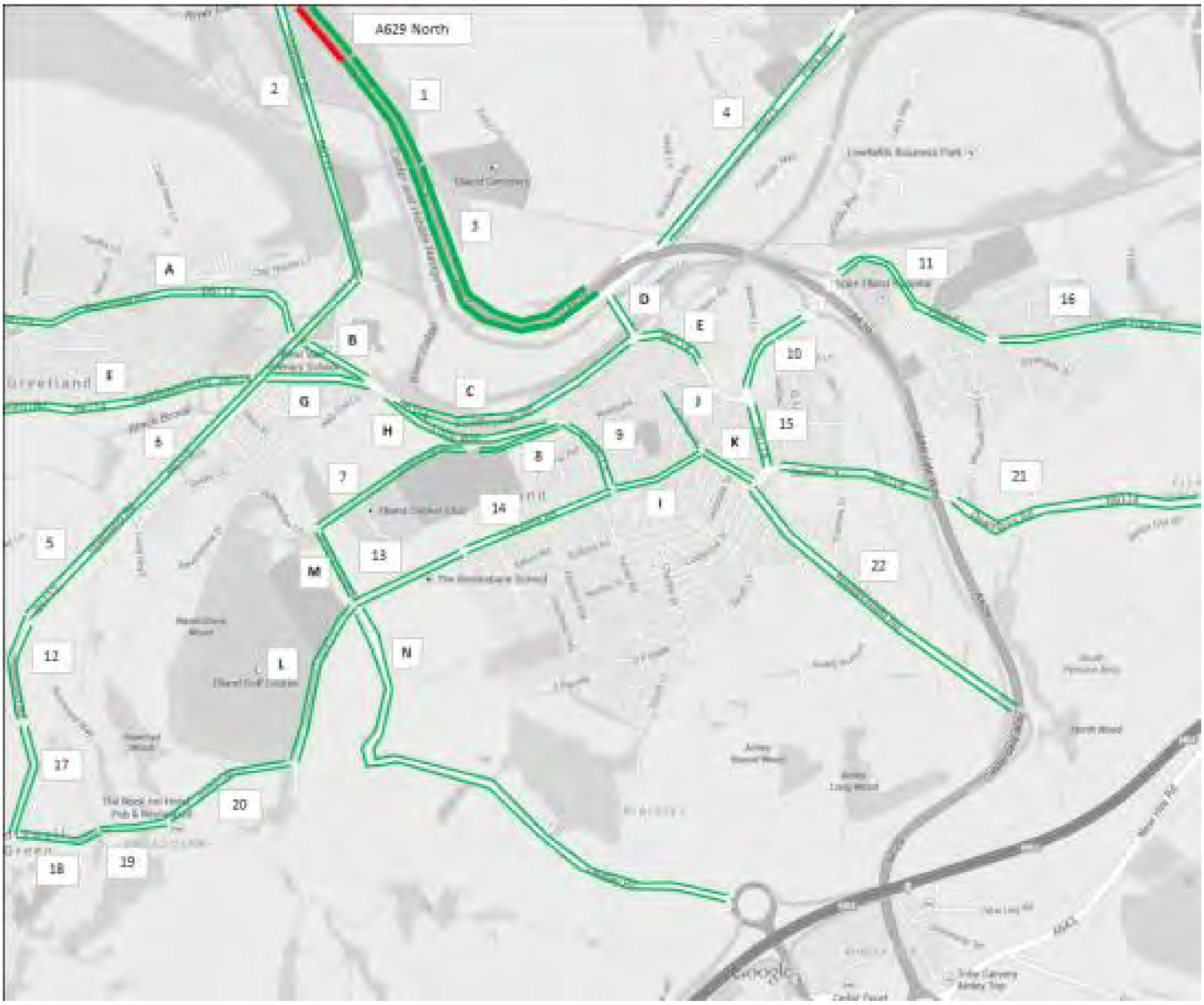
Level of Congestion	Colour of Link
0% - 69%	(Green)
69.1% - 79%	(Light Orange)
79.1% - 99%	(Dark Orange)
99.1% - 100%+	(Red)

2.3.8 The level of congestion on a link, as referred to in Table 7, has been derived by dividing the total AADT flow of a link against the CRF of the link. A link can operate up to 100% capacity; as such the final level of congestion shown in Table 7 is inclusive of capacities over 100% in order to demonstrate links that are operating over capacity on the local highway network.

2.3.9 Links coloured dark orange should be considered as a potential warning to future capacity issues and as an indicator to current problems on links and/or their associated junctions.

2.3.10 As can be seen in Figure 2 no link on the local highway network, other than at the A629 North currently exceeds a level of congestion above 69% (green).

Figure 2 - Existing levels of congestion on the Elland local highway network



2.3.11 Although the link capacity analysis of average flows using the AADT data did not show any capacity issues on the local highway network other than at the A629 North, it was expected, as is observed in many locations, that capacity issues would be seen in the AM (08:00 – 09:00) and PM (17:00 – 18:00) peaks hours. As such individual analysis of the AM and PM peak hours were undertaken. The data for each peak hour was multiplied by 24 in order to assess the link capacity for the said AM or PM peak hour.

2.3.12 The results for the AM and PM peak hour link capacity tests can be seen in Figure 3 and Figure 4 respectively.

Figure 3 - AM Peak Hour Link Capacity

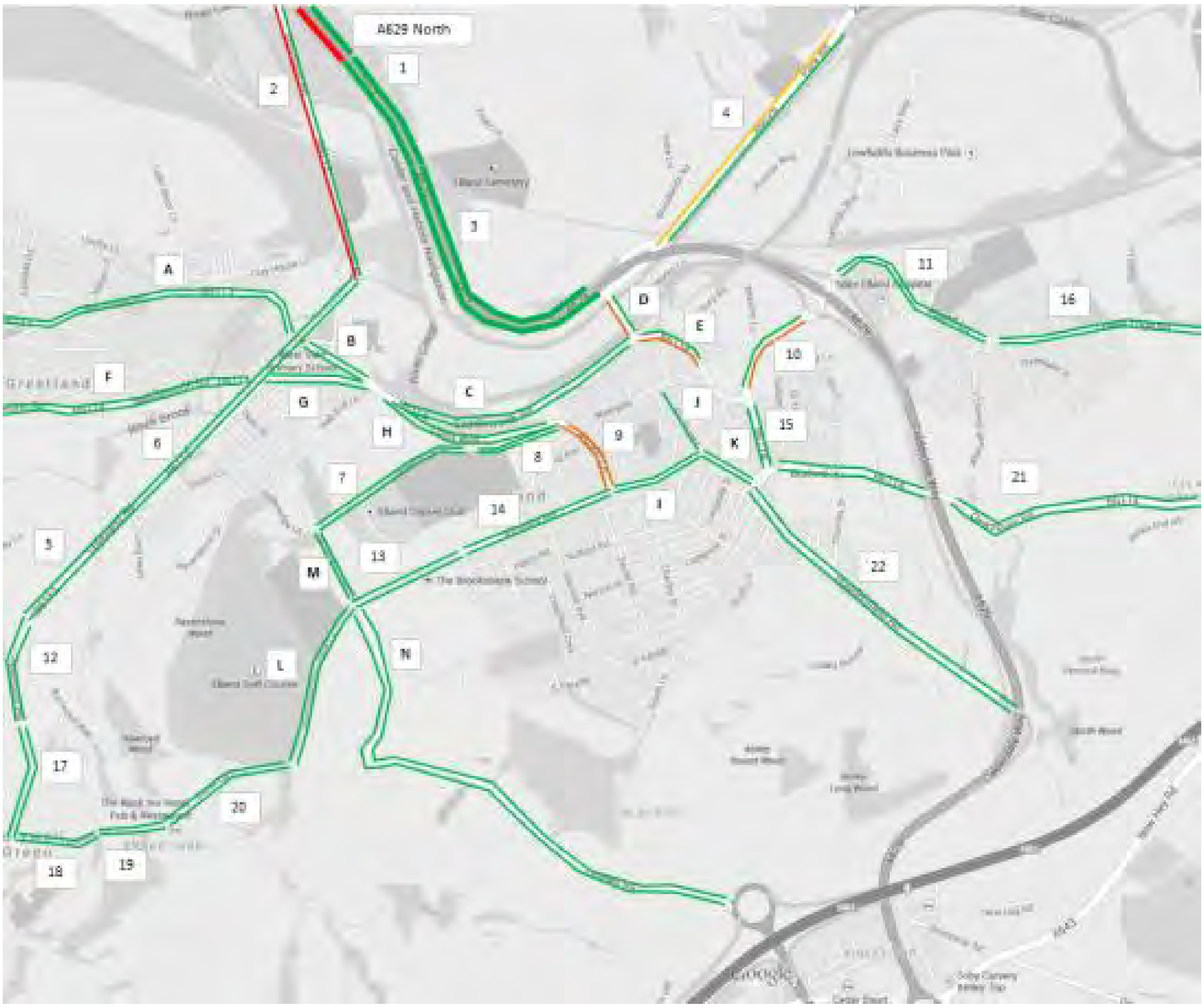
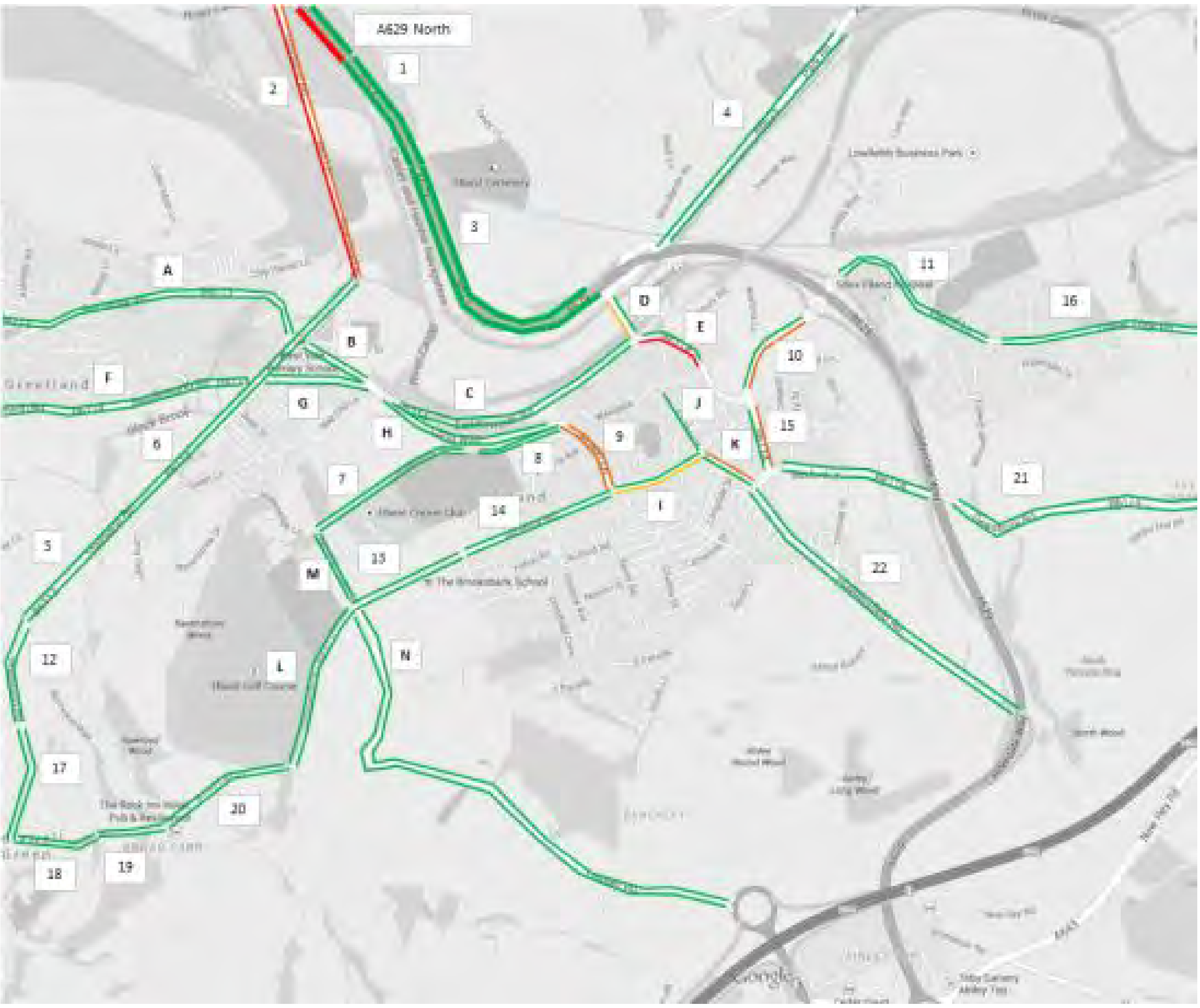


Figure 4 - PM Peak Hour Link Capacity



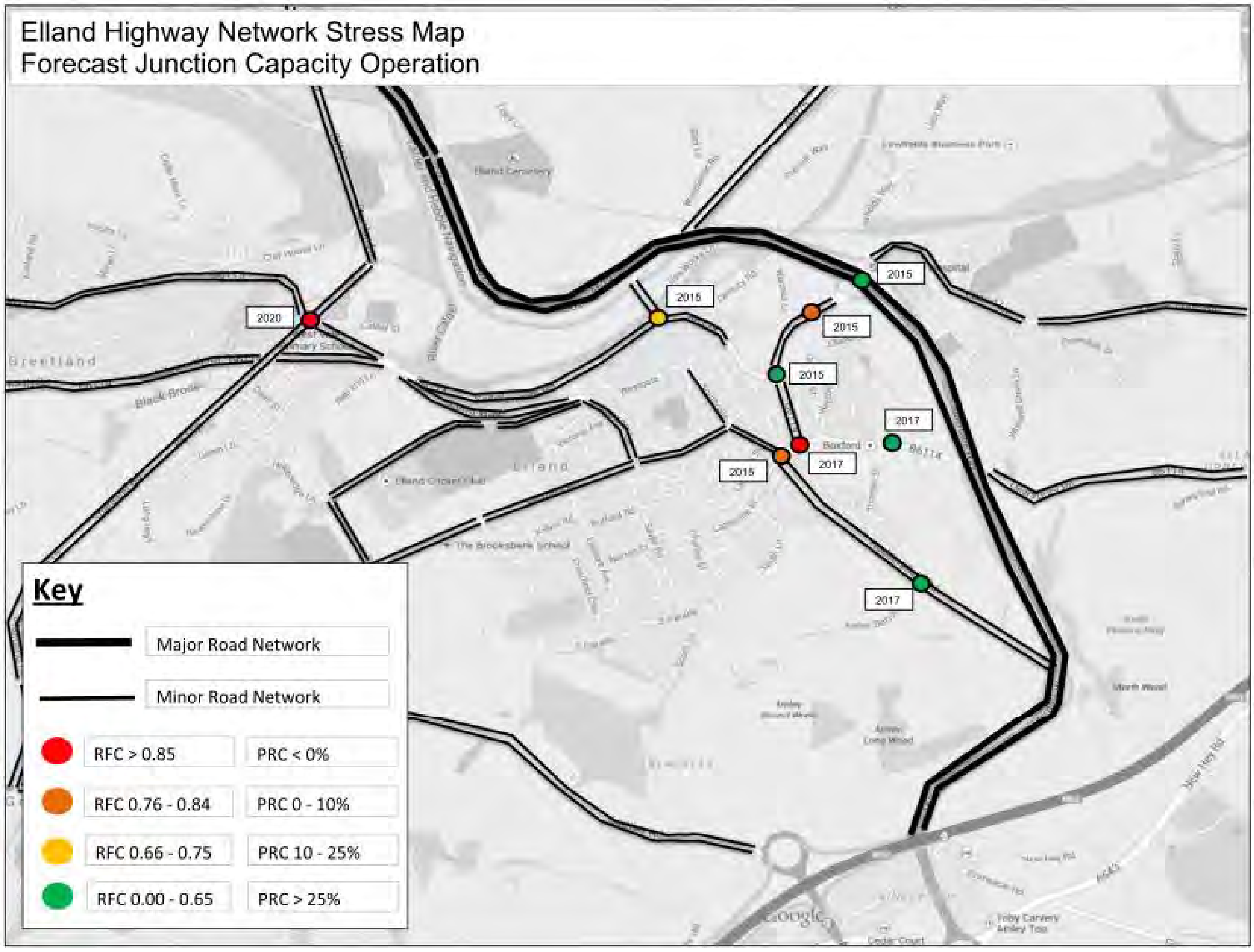
2.3.13 As can be seen, a number of links experience varying ranges of congestion during the AM and PM peak hours:

- A number of links near the centre of Elland (9, 10, D and E) all experience congestion during both peak hours.
- In the case of links 9, 10, D and E the capacity issues occur on the same side of the link during both peaks.
- Two more links in central Elland (I and K) experience capacity issues in the PM peak.
- Link 2 northbound experiences capacity issues in both peak periods and capacity issues southbound during the PM peak.

2.4 Junction Capacity Analysis

2.4.1 To supplement the link capacity analysis, a range of junction capacity assessments were obtained from Calderdale Council (from a number of Transport Assessments (TAs)). All TAs used 2010 base traffic flow data to form their junction analysis. In order to be more representative of the year of assessment for this analysis (2014) the 'with development' future year capacity results for each junction were chosen. The results chosen were the "worst case" results between the AM and PM peaks in order to demonstrate the junctions operating at their worst across a whole day. The results from the said junction assessments can be seen in Figure 5.

Figure 5 - Junction Capacity



2.4.2 As can be seen the junction capacity analysis shows varying levels of congestion across the network.

2.4.3 RFC refers to Ratio to Flow Capacity, a value given to assess the performance of a priority junction. RFC values between 0.00 and 0.85 are generally accepted as representing stable and acceptable operating conditions. Values between 0.85 and unity represent variable operation (i.e. possible queues building up at the junction during the period under consideration and increases in vehicular delay moving through the junction). RFC values in excess of unity represent overloaded conditions (i.e. congested conditions).

2.4.4 PRC refers to Practical Reserve Capacity, a value given to assess the performance of a signalised junction. A negative PRC indicates the junction is operating over capacity.

2.4.5 The two measures (RFC and PRC) are given side by side in the key as the ranges shown next to one another are considered to be of the same capacity value.

2.4.6 As suggested earlier, the colouring of the links would usually tend to infer junctions at either end of stressed links are also likely to be stressed. Figure 5 shows correlation with this suggestion as the junctions in the vicinity of links 9, 10, D and E as seen in Figures 3 and 4 generally experience levels of congestion. Furthermore the junction in the vicinity of Link 2 is also highlighted in Figure 5 as operating over capacity.

Analysis of existing traffic count data and committed developments indicates that a number of highway links and the associated junctions will be operating over capacity, with some already experiencing congestion as a result of being over capacity, particularly during the morning and evening peak.

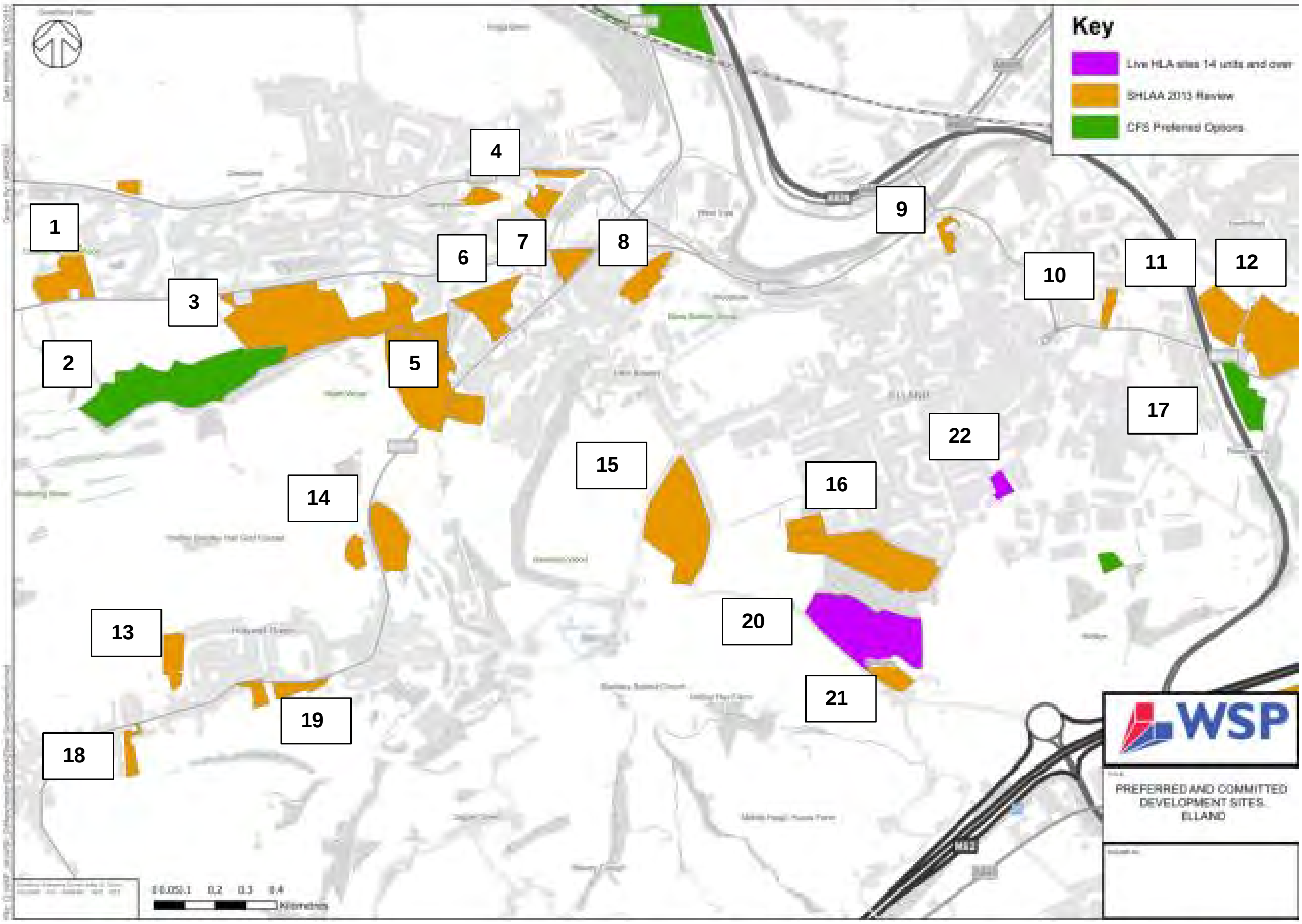
2.5 Identified Developments

2.5.1 Having taken into account the existing local highway network, the purpose of this element of the study was to consider how a range of identified developments in Elland may impact on the local highway network. In order to produce this information, estimated traffic flows for identified developments within the local highway network were generated. A series of tasks were undertaken to produce the required information, which are detailed in the following sections.

2.5.2 Initially, Calderdale Council provided WSP with GIS data detailing a range of identified developments across Elland, such as: 'Live HLA sites 14 units and over' which included one 21 dwelling development and one 120 dwelling development, a range of 'Strategic Housing Land Availability Assessment (SHLAA) 2013' dwelling developments and 'CFS Preferred Options' developments which included one Industrial/ Commercial use development and one Mixed Use development.

2.5.3 The data was uploaded into ArcGIS; in total 22 developments were identified for use in this assessment, as can be seen in Figure 6 below.

Figure 6 - GIS Map of Identified Development Sites in Elland



2.5.4 The GIS data also provided the size of each development, expressed as either the number of dwellings on a site or the size of the site in hectares, depending on the type of development in question. The identified sizes and type of development were used to generate trip rates using data contained in TRICS 7.1.3[6].; these trip rates informed the calculation of total trips (arrivals and departures) to and from each development.

2.5.5 Trip rates were generated for the residential developments that were identified within the ‘Live HLA sites of 14 units and over’ and the ‘SHLAA 2013 Review’.

2.5.6 The GIS data showed many of the residential developments were of similar sizes. A logical approach was therefore to use a single trip rate, assuming the parameters used to produce trip rates for all developments of a similar size would show minimal difference; it was also more efficient to undertake ‘banded’ trip generation.

2.5.7 The developments were banded into categories of 0-50 dwellings, 50- 150 dwellings, and 150- 300 dwellings. For each band, trip rates for arrivals and departures, across a 12 hour period (07:00 – 19:00) were generated in TRICS. Although the trip rates within each band remained fixed, to ensure accuracy the trip rate was multiplied by the number of dwellings specified for each development within its respective band.

[6] TRICS is the national standard system of trip generation and analysis in the UK and is used as an integral part of the Transport Assessment process

2.5.8 Table 8 shows the trip rates generated for the 'Live HLA sites of 14 units and over' and the 'SHLAA 2013 Review' sites of 0 - 50 dwellings.

Table 8 - Trip Rates Generated for Sites of 0 - 50 Dwellings

0 – 50 Dwellings	Arrival Trip Rate	Departure Trip Rate
07:00-08:00	0.071	0.261
08:00-09:00	0.157	0.412
09:00-10:00	0.162	0.201
10:00-11:00	0.139	0.137
11:00-12:00	0.175	0.206
12:00-13:00	0.19	0.148
13:00-14:00	0.166	0.144
14:00-15:00	0.181	0.201
15:00-16:00	0.263	0.212
16:00-17:00	0.316	0.188
17:00-18:00	0.361	0.17
18:00-19:00	0.23	0.148

2.5.9 In order to demonstrate the output using the above methodology Table 9 and Table 10 show the trip rate results for a site with 19 dwellings and a site with 44 dwellings respectively, both using trip rates from the 0 – 50 dwelling band seen in Table 8.

Table 9 - Number of Trips for 19 Dwelling Development

19 Dwellings	Arrival Trips	Departure Trips
07:00-08:00	1	5
08:00-09:00	3	8
09:00-10:00	3	4
10:00-11:00	3	3
11:00-12:00	3	4
12:00-13:00	4	3
13:00-14:00	3	3
14:00-15:00	3	4
15:00-16:00	5	4
16:00-17:00	6	4
17:00-18:00	7	3
18:00-19:00	4	3
12 Hour Total	**46**	**46**

Table 10 - Number of Trips for 44 Dwelling Development

44 Dwellings	Arrival Trips	Departure Trips
07:00-08:00	3	11
08:00-09:00	7	18
09:00-10:00	7	9
10:00-11:00	6	6
11:00-12:00	8	9
12:00-13:00	8	7
13:00-14:00	7	6
14:00-15:00	8	9
15:00-16:00	12	9
16:00-17:00	14	8
17:00-18:00	16	7
18:00-19:00	10	7
12 Hour Total	**106**	**107**

2.5.10 Table 11 shows the trip rates generated for the ‘Live HLA sites of 14 units and over’ and the ‘SHLAA 2013 Review’ sites of 50 -150 dwellings.

Table 11 - Trip Rates Generated for Sites of 50 - 150 Dwellings

50 – 150 Dwellings	Arrival Trip Rate	Departure Trip Rate
07:00-08:00	0.068	0.299
08:00-09:00	0.157	0.401
09:00-10:00	0.174	0.226
10:00-11:00	0.148	0.188
11:00-12:00	0.181	0.164
12:00-13:00	0.194	0.168
13:00-14:00	0.19	0.172
14:00-15:00	0.177	0.188
15:00-16:00	0.269	0.203
16:00-17:00	0.3	0.176
17:00-18:00	0.368	0.202
18:00-19:00	0.251	0.183

2.5.11 Table 12 shows the trip rates generated for the 'Live HLA sites of 14 units and over' and the 'SHLAA 2013 Review' sites of 150 -300 dwellings.

Table 12 - Trip Rates Generated for Sites of 150 - 300 Dwellings

150 – 300 Dwellings	Arrival Trip Rate	Departure Trip Rate
07:00-08:00	0.089	0.31
08:00-09:00	0.15	0.461
09:00-10:00	0.156	0.208
10:00-11:00	0.145	0.188
11:00-12:00	0.184	0.171
12:00-13:00	0.205	0.199
13:00-14:00	0.18	0.172
14:00-15:00	0.187	0.178
15:00-16:00	0.307	0.205
16:00-17:00	0.335	0.208
17:00-18:00	0.445	0.268
18:00-19:00	0.332	0.27

2.5.12 Although the trip rates generated vary on the number of dwellings in each development, other parameters used to produce the TRICS model remain fixed across the analysis. The fixed parameters are detailed below:

- Land Use: 03 - Residential;
- Category: A - Houses privately owned;
- Regions and areas: deselected Greater London, Wales, Scotland, Northern Ireland and the Republic of Ireland;

- Selection by: Include all surveys;
- Date Range: 01/01/00 to 20/05/14;
- Selected survey days: Monday- Friday; and
- Selected Locations: Suburban Area, Edge of Town, Neighbourhood Centre.

2.5.13 A similar premise was used to produce the trip rates for the 'CFS Preferred Options' sites. A single trip rate was identified for the two development sites; the trip rate was multiplied by the specific number of hectares for each development.

2.5.14 Table 13 shows the trip rates generated for the 'CFS Preferred Options' sites.

Table 13 - Trip Rates Generated from CFS Preferred Options Sites

CFS Preferred Options	Arrival Trip Rate	Departure Trip Rate
07:00-07:30	4.793	1.876
07:30-08:00	9.066	1.91
08:00-08:30	10.003	3.786
08:30-09:00	9.239	4.62
09:00-09:30	6.982	5.175
09:30-10:00	5.592	4.585
10:00-10:30	5.21	5.523
10:30-11:00	5.453	5.071
11:00-11:30	5.245	5.557
11:30-12:00	5.453	6.738
12:00-12:30	5.419	6.426
12:30-13:00	4.967	5.523
13:00-13:30	5.592	6.947
13:30-14:00	5.696	4.654
14:00-14:30	4.515	4.759
14:30-15:00	3.89	4.898
15:00-15:30	4.064	4.724
15:30-16:00	4.307	5.592
16:00-16:30	4.272	6.391
16:30-17:00	4.446	9.274
17:00-17:30	2.813	10.629
17:30-18:00	1.424	6.495
18:00-18:30	0.903	3.89
18:30-19:00	0.382	1.25

2.5.15 The fixed parameters for TRICS when generating trip rates for this development are detailed below:

- Land Use: 02- Employment;

- Category: D - Industrial Estate;
- Regions and areas: deselected Greater London, Wales, Scotland, Northern Ireland and the Republic of Ireland;
- Selection by: Include all surveys;
- Date Range: 01/01/06 to 22/10/13;
- Selected survey days: Monday- Friday; and
- Selected Locations: Suburban Area, Edge of Town, Neighbourhood Centre.

2.5.16 One of the 'CFS Preferred Options' sites was identified as a Mixed Use site. Trip rates for mixed use developments cannot be generated within TRICS. As such, the above criterion for an industrial estate employment site was also used to assess the impact of the mixed use site.

2.5.17 The resulting trips generated from the above tables for each individual development site provided trips for each site across a 12 hour period (07:00 – 19:00).

2.5.18 In order to convert the 12 hour data into Annual Average Daily Traffic (AADT) data, the total 12 hour trips for each development (arrivals and departures) were growthed using formula taken from DMRB[7]. The formula included the application of an E Factor (1.15) and an M Factor (358). The M factor was based on the Seasonality Index for October and divided by 254 (the number of working days in a year). A Seasonality Index for October was used to coincide with the AADT data used for the existing link stress map as discussed earlier, for which the majority of data was recorded in October.

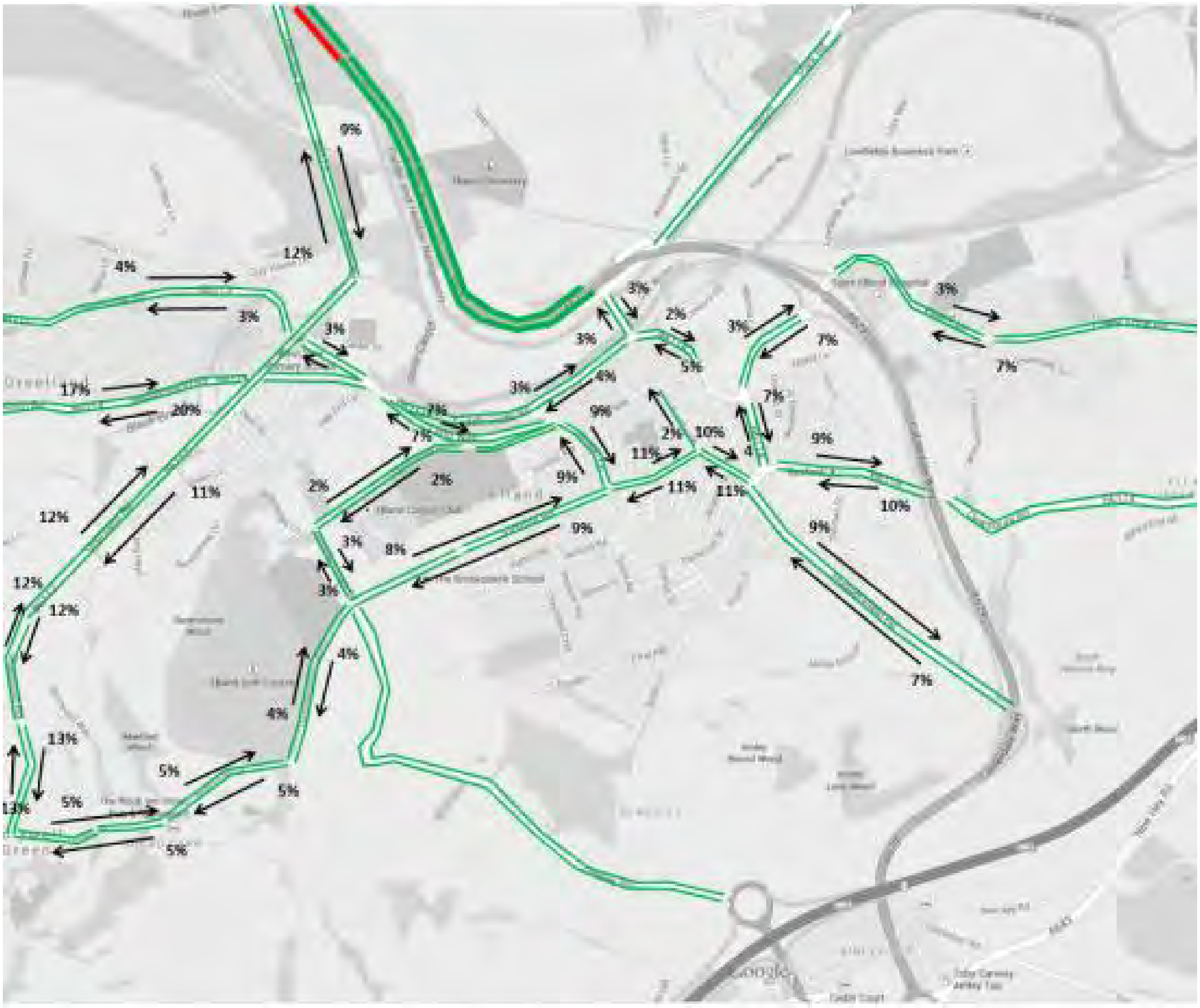
2.5.19 The resultant AADT data for each development was added to actual traffic flow data on links on the existing Elland local highway network, as discussed earlier in this section.

2.5.20 From a previous commission with Calderdale Council, WSP was in possession of traffic turning count data for across the Elland local highway network. The turning count data was used to produce turning distributions on the network which the development flows were assigned to. In total 100% of development trips (from all developments shown, arrivals and departures) were added to the local highway network. The increase of the development traffic to the highway network did not increase any links close to capacity.

2.5.21 The percentage increases in link flows as a result of 100% of development trips have been added to the local highway network as can be seen in Figure 7.

[7] DMRB Volume 13 Section 1 Part 4 Traffic Flow Input to COBA

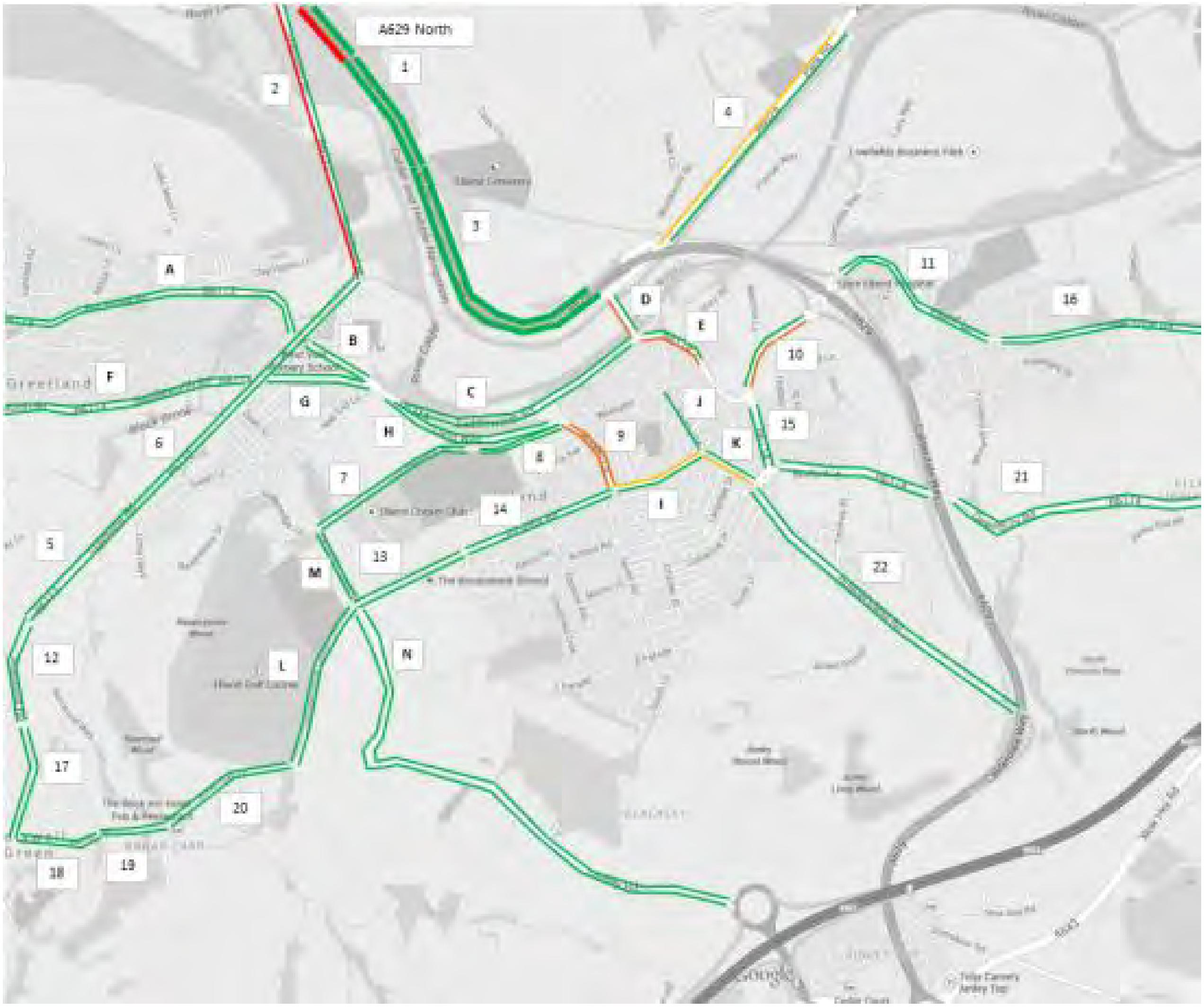
Figure 7 - Percentage Increase in Traffic Flow as a result of Development Trips on the Local Highway Network



2.5.22 Given that 100% of the identified development trips assigned to the existing local highway network (AADT) did not increase any links close to capacity; 100% of identified developments have also been assigned to the AM peak link scenario and the PM peak link scenario.

2.5.23 The AM Peak scenario plus development traffic can be seen in Figure 8 and The PM Peak scenario development traffic can be seen in Figure 9.

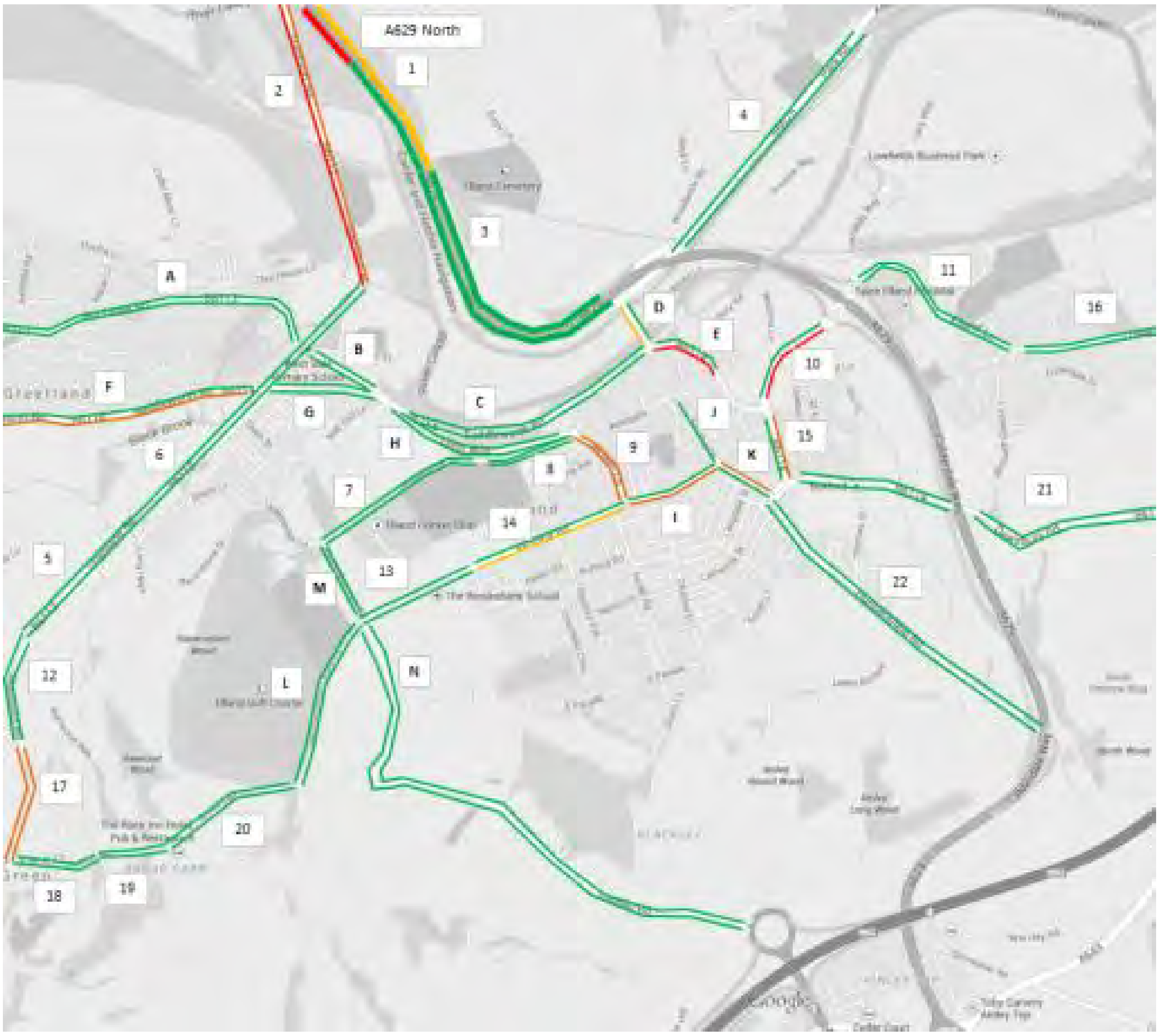
Figure 8 - AM Peak + 100% Identified Development



2.5.24 In comparison with Figure 3 (AM link capacity without development), Figure 8 shows a minimal increase on links as a result of 100% of identified development flows being assigned to the AM Peak local highway network.

2.5.25 Links I and K do see increases from a green level of congestion (0 - 69%) to light orange (69.1% - 79%).

Figure 9 - PM Peak + 100% Identified Development



2.5.26 In comparison with Figure 4 (PM link capacity without development), Figure 9 shows increases on links as a result of 100% of identified development flows being assigned to the PM Peak local highway network.

- A629 North and Link 1 both see an increase in southbound traffic from a green level of congestion (0% - 69%) to a light orange level of congestion (69.1% - 79%).
- Link 14 sees an increase in westbound traffic from a green level of congestion (0% - 69%) to a light orange level of congestion (69.1% - 79%).
- Link F sees an increase in westbound traffic from a green level of congestion (0% - 69%) to a dark orange level of congestion (79.1% - 99%).
- Link 17 sees an increase on the both northbound and southbound traffic from a green level of congestion (0% - 69%) to a dark orange level of congestion (79.1% - 99%).
- Links I see increases in westbound traffic, from a light orange level of congestion (69.1% - 79%) to a dark orange level of congestion (79.1% - 99%).

- Link 10 sees an increase in southbound traffic from a dark orange level of congestion (79.1% - 99%) to a red level of congestion (99% - 100%+).

2.5.27 It can be seen that more links experience higher levels of congestion in the PM peak than in the AM peak. The same identified development flows have been applied to both the AM and PM peaks however the PM peak base flows were generally higher than those seen in the AM, as such when the identified development flows were applied to the PM peak there was greater cause for the links to present higher levels of congestion.

2.6 Summary of Highway Network Analysis

2.6.1 A link AADT stress map for the existing Elland local highway network was produced that showed no capacity issues for links on the local highway network.

2.6.2 AM and PM peak hour link stress maps were also produced for the local highway network which showed capacity issues on links within the local highway network. A number of links near the centre of Elland (9, 10, D and E) all experienced congestion during both peak hours. In the case of links 10, D and E the capacity issues occurred on the same side of the link during both peaks.

2.6.3 To further the capacity analysis of the local highway network a range of junction capacity assessments were obtained from Calderdale Council. Junctions in the vicinity of links which experienced levels of congestion were also shown to experience levels of congestion.

2.6.4 Trips for identified future developments were generated in TRICS and assigned to the local highway network. The identified development trips did not increase any AADT link flows beyond capacity and the increases in flow have minimal impact on the existing AADT local highway network.

2.6.5 The identified development flows were applied to both the AM and PM peak link capacity scenarios. Minimal increase was seen as a result of the identified development flows on the AM peak link capacity scenario; however a number of increases were seen on the PM peak link capacity scenario.

2.6.6 The most relevant links which experience increase as a result of the identified junctions are those junctions which otherwise were not experiencing any significant level of congestion (Green) and as a result of the identified developments begin to experience congestion, particularly links F and 17 which jump from a green level of congestion (0% - 69%) to dark orange (79.1% - 99%) as a result of the identified developments.

2.6.7 The A629 North remains constantly over capacity (99.1% - 100%+) across all scenarios (AADT, AM Peak, PM Peak, AM Peak + 100% CD and PM Peak + 100% CD).

The conclusion of the highway analysis is that, without intervention, there would be increasing congestion around the centre of Elland and on the A629, following future growth and planned developments being delivered. This is primarily caused by junction capacity, and would be most acute during morning and evening peak periods where many links would see an increase os between 10-15% in the number of vehicles. Where links or junctions are already at or close to capacity, this will simply result in greater congestion and increased delay.

2.7 Calder Valley Rail Line

2.7.1 The Calder Valley Rail Line connects 2.5 million residents, 23,000 businesses and 120 multi-national companies to the Leeds and Manchester City Regions. The network which the Calder Valley line serves is shown in Figure 10. The Line links Leeds with Manchester via Bradford, Halifax and Rochdale, as well as several intermediate towns in the Upper Calder Valley. It also provides a link between York and Blackpool North, and Huddersfield via Brighouse. The route is now used by the Grand Central service to London Kings Cross in addition to the local Northern Rail services.

Figure 10 - Calder Valley Line

2.7.2 Despite the initial success of the Calder Valley Line a series of studies discussed in this report have concluded that the line underperforms in practical and operational terms, and it is not serving the towns and cities along the length of the route in a manner which is desired for the 21st century.

2.7.3 Poor reliability, slow journeys, overcrowding and uneven service intervals have been cited as some of the key issues. Reports issued by Arup in 2011 and 2012 look at the key issues of containment, antiquated track and signals, low line speeds and poor rolling stock.

2.7.4 With regards to issues of containment, most services operate only between Manchester and Leeds resulting in poor connectivity. Antiquated track and signals currently restrict the line speeds of the Calder Valley Line, resulting in an average line speed of 25 mph. This is not competitive with the M62 and strategic highway. The industry operates on the basis that rail services should be at least 25% faster than the highway to engender a modal shift. This slow operation also restricts the introduction of new services, faster services or new stations.

2.7.5 Finally, poor rolling stock results in a poor passenger experience; the rail operator, currently Northern, is unable to provide catering services, flexible space for prams, bikes, wheelchairs or luggage, adequate capacity and quality, Wi-Fi or business class services.

2.7.6 This section reviews the Calder Valley Line, beginning by detailing specific information relating to the operation, performance, expectations of the line and its role within the Northern Hub, and the constraints imposed on the line. We then consider why the Calder Valley Line and potential development of Elland station plays an important role in alleviating congestion along the M62, with specific reference to Elland and the A629 Calderdale Way.

2.7.7 The chapter concludes by exploring the economic case for the Calder Valley line, analysing the relationship that transportation plays in fuelling economic growth in Calderdale, and outwards to Leeds and Manchester.

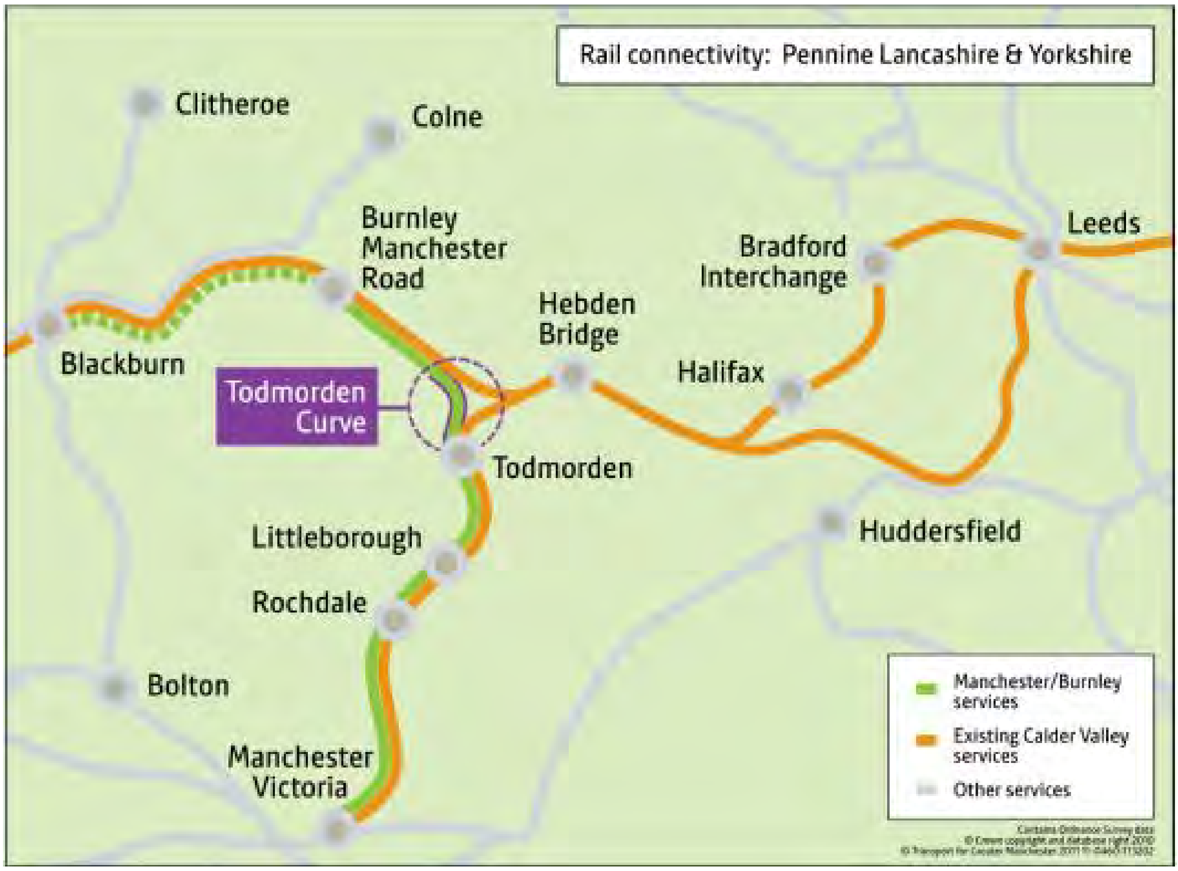
Despite providing good connectivity to many areas in the Calder Valley, the Calder Valley Line is currently considered to be underperforming, with low journey speeds, poor quality rolling stock, overcrowding and an uneven timetable in many places cited as some of the main problems.

2.8 The Calder Valley Line: Operation, performance and constraints

2.8.1 The Calder Valley line operates to the south of the Pennines, beginning at Leeds and running through Bradford, Halifax, Todmorden and Rochdale, until it terminates at Manchester. The line covers an area from the borders of the former Todmorden Urban District, through Todmorden, Hebden Bridge, Mytholmroyd, Luddenden Foot to Sowerby Bridge and Copley. The area also embraces a number of hilltop villages and settlements which rely for most of their services on the towns and large villages in the valley bottom.

2.8.2 The Upper Calder Valley line also connects to the newly constructed route to Blackpool North. On the 31st October 2011, the government announced £8.8 million of funding from the Regional Growth Fund for the re-instatement of the Todmorden Curve. The new short section of track connects Burnley to Manchester via the Calder Valley, benefiting passengers by potentially cutting travel time by up to 40 minutes. Work to reinstate the 500-metre Todmorden Curve is now complete, regular rail services were delayed because of a lack of rolling stock, but will start in May 2015.

Figure 11 - Diagram of the Route of the Todmorden Curve



2.8.3 The services running between the upper Calder Valley and Leeds via Brighouse provide commuter services from the intermediate stations on the Dewsbury line, along with local services from Huddersfield to Leeds (via Dewsbury).

2.8.4 Table 14 below provides current journey times between some of the main stops along the Calder Valley Line.

Table 14 - Journey Times between Calder Valley Stations

Station	Leeds	Bramley	New Pudsey	Bradford Interchange	Sowerby Bridge	Halifax	Hebden Bridge	Manchester Victoria
Leeds		28	27	34	66	52	69	109
Bramley	28		24	32	68	48	68	105
New Pudsey	27	24		23	58	40	58	101
Bradford Interchange	34	32	23		50	28	46	90
Sowerby Bridge	66	68	58	50		37	32	76
Halifax	52	48	40	28	37		33	77
Hebden Bridge	69	68	58	46	32	33		59
Manchester Victoria	109	105	101	90	76	77	59	

2.8.5 Below, Table 15 shows a table summarising the frequency of some of the main routes operating on the Calder Valley Line.

Table 15 - Frequency of Services Operating on the Calder Valley Line (Trains per hour – tph)

Route	Monday to Saturday Frequency		Sunday Frequency
	Daytime	Late evening	
Leeds- Bradford Interchange- Halifax	4 tph	2 tph	3 tph
Leeds- Bradford Interchange- Halifax- Rochdale- Manchester Victoria	2 tph	1 tph	1 tph
Leeds- Bradford Interchange- Halifax- Huddersfield	1 tph	1 tph	2 hourly
Leeds- Bradford Interchange- Halifax- Blackburn- Preston- Blackpool	1 tph	2 hourly	1 tph
Leeds- Dewsbury - Brighouse- Todmorden- Manchester Victoria	1 tph	No Service	No Service
Bradford Interchange- Halifax- Brighouse- Mirfield- Wakefield Kirkgate- Pontefract Monkhill- Doncaster- London	Four trains a day	Four trains a day	Four trains a day

2.8.6 These frequencies equate to the following number of trains per hour:

- 3 trains per hour (tph) between Leeds and Manchester Victoria (2 fast and 1 semi fast);
- 1 tph semi-fast from Bradford to Manchester;
- 1 tph from Leeds via Dewsbury and Todmorden;
- 2 stopping trains / hour between Rochdale and Manchester Victoria; and
- 1tph between Leeds and Huddersfield.

2.8.7 The West Yorkshire Rail Plan 7, prepared as an integral part of the Local Transport Plan, highlights a number of issues with the Calder Valley Line including peak overcrowding (where demand exceeds the available seating and standing capacity), rolling stock that is over 25 years old and overall represents a poor performing line with an inadequate service pattern. A key challenge is highlighted to introduce a more regular service pattern to stimulate demand, and to improve quality (diesel in the short term with a longer term aspiration for high quality electric units).

2.8.8 The Greater Manchester Rail Policy (2012- 2014), also relevant to this line, demonstrates that the frequency of operation will need to increase to accommodate the forecast growth rate in peak passenger numbers within Rochdale and the Calder Valley, this is highlighted in red.

Table 16 - Table showing the Average Compound Annual Growth Rate in Peak Passenger Numbers for a Selection of Rail Corridors from Northern England

Corridor/ Route	DfT/ RUS average compound annual growth rate in peak passenger numbers (%)		
	Up to 2014	2015- 2019	After 2020
Rochdale and Calder Valley	**2.5**	**3**	**1.6**
Stalybridge/ Huddersfield	2.8	3.7	2.7
Leeds and beyond	2.5	2.5	2.1
Glossop and Hadfield	0.5	3.7	2.7
Marple via Hyde	2.8	3.7	2.7
Marple via Bredbury and Hope Valley	2.7	3.7	2.7
Hazel Grove, Buxton, Macclesfield, Stoke-on- Trent and Crewe local services and Manchester Airport	2.5	3.7	2.7
Average peak passenger numbers for rail corridors from Leeds to Greater Manchester	2.52	3.24	2.35

2.8.9 The table shows that the growth rate of passengers at peak times on the Rochdale and Calder Valley Corridor is forecast to be highest between 2015 and 2019, with growth rates of 3%.

2.8.10 For more specific insight, station usage reports and data form the Office of Rail Regulation (ORR) has been used to produce the exact growth rates for specific stations along the Calder Valley corridor. The ORR published estimates of the total numbers of people entering, exiting and changing at each station in Great Britain.

2.8.11 Table 17 shows the growth rates of passenger usage at specific stations along the Calder Valley line, from Leeds to Manchester Victoria (via Dewsbury). Only one station shows negative growth.

Table 17 - Growth in Selected Station Usage along the Calder Valley Corridor (Leeds - Manchester via Dewsbury)

Origin TLC	Station Name	2008/09 Entries & Exits	2009/10 Entries & Exits	2010/11 Entries & Exits	2011/12 Entries & Exits	2012/13 Entries & Exits	Growth from 2008/9 to 2012/13 (%)
LDS	**Leeds**	22,421,732	21,978,372	24,491,616	25,051,436	26,200,916	16.86%
MLY	**Morley**	269,686	270,722	328,558	347,618	304,066	12.75%
BTL	**Batley**	237,212	241,766	272,638	276,764	263,850	11.23%
DEW	**Dewsbury**	1,247,872	1,271,144	1,455,884	1,483,420	1,603,702	28.51%
MIR	**Mirfield**	260,198	281,122	317,298	333,654	393,088	51.07%
BGH	**Brighouse**	146,714	179,500	223,186	267,020	349,036	137.90%
SOW	**Sowerby Bridge**	255,378	258,918	298,254	322,070	348,092	36.30%
MYT	**Mytholmroyd**	142,526	133,194	147,660	158,544	158,436	11.16%
HBD	**Hebden Bridge**	581,936	627,456	713,926	761,778	735,560	26.40%
TOD	**Todmorden**	416,364	459,426	525,084	568,870	541,770	30.12%
WDN	**Walsden**	112,608	95,548	99,048	92,686	101,616	-9.76%
LTL	**Littleborough**	358,176	344,284	354,046	384,834	376,934	5.24%
SMB	**Smithy Bridge**	125,274	134,410	141,048	163,064	167,054	33.35%
RCD	**Rochdale**	971,588	1,001,526	1,061,152	1,107,430	1,118,236	15.09%
CAS	**Castleton**	122,678	120,382	126,592	153,010	150,108	22.36%
MIH	**Mills Hill**	228,836	256,506	283,096	341,382	326,962	42.88%
MSO	**Moston**	76,736	89,032	110,494	139,626	134,966	75.88%
MCV	**Manchester Victoria**	5,789,892	5,869,855	6,361,049	6,782,225	6,851,175	18.33%

2.8.12 The average growth across stations on the Calder Valley Line has been just over 31%. Stations which have exceed this level include those around Elland, Mirfield (51%), Brighouse (137%), Sowerby Bridge (36%). Only one station has seen a decline, Walsden (also in Calderdale) at around 9%.

2.8.13 The data shows that growth in usage is particularly high at Brighouse Station, with growth rates of 137% in the five years since 2008; this is likely to be a result of the recent introduction of the Northern Calder Valley Line half hourly service in 2008, and the Grand Central line in 2010. Brighouse is the nearest station for residents of Elland aiming to use rail lines. It is possible that some of the growth at Brighouse may result from commuters living in Elland and using it as the nearest station. To understand how growth has changed annually over recent years, data for Brighouse is shown in Table 18 below.

Table 18 - Usage Growth at Brighouse Station (2012/2011 - 2009/2008)

	Passenger Usage in Year of Study	Passenger Usage in the previous year of Study	Growth in Usage (%)
Brighouse 2013/ 2012 Data	349,036	267,020	30.7
Brighouse 2012/ 2011 Data	267,020	223,186	19.6
Brighouse 2011/ 2010 Data	223,186	179,500	24.3
Brighouse 2010/ 2009 Data	179,500	146,714	22.3
Brighouse 2009/ 2008 Data	146,714	89,309	64.3

2.8.14 Although there does not appear to be evidence explaining where, geographically, growth has come from, growth has been consistent, and it is therefore likely that it is not solely concentrated around the introduction of new lines. The introduction of a rail station in Elland may help spread some of the passenger growth at Brighouse and alleviate pressure on parking, by providing a more local access point to the rail network for those living in and around Elland. It is likely that rail customers are travelling further than they would wish to get access to the rail services at Brighouse.

Despite the observed issues with the Calder Valley Line, significant passenger growth has been observed across almost all stations on the line. This has increased pressure in some areas where overcrowding on trains, or insufficient parking at stations is now preseting a constraint to further growth.

2.9 Northern Hub Improvements

2.9.1 The performance of stations along the Calder Valley line is directly affected by the improvements delivered by Northern Hub. The Northern Hub scheme, which was committed by Government in the July 2012 HLOS, is the £560 million investment package designed to transform rail travel across the north of England, providing better services and more capacity. Central to the project will be resolving the rail bottleneck on the approaches to Manchester to allow more routes, more capacity and quicker journey times across the Northern towns and cities.

2.9.2 Scheduled to complete in 2019, the project delivers up to 700 more trains to run each day and provide space for 44 million more passengers a year, as well as freeing up important capacity on the rail network for freight. By improving the connections between the cities and towns of the North, the Northern Hub is forecast to lead to the creation of up to 23,000 jobs and stimulate £4.2 billion of benefits to the Northern economy.

2.9.3 Figure 12 shows some of the projects included as part of the Northern Hub

Figure 12 - Northern Hub Rail Network and Planned Improvements (Source: Network Rail)

2.9.4 Of the Northern Hub budget, £36m was identified for track, service and signal improvements for the Calder Valley Line. The Hub scheme's primary focus is on improving fast services using the Calder Valley Line, but it will also provide opportunities to incrementally improve others, including local stopping services and revised journey patterns to improve connectivity between main centres in West Yorkshire if implemented with complementary schemes.

2.9.5 In addition to the Hub scheme, Network Rail is also expected to deliver the following complementary schemes to stations along the Calder Valley Line within Control Period 5 (1st April 2014 – 31st March 2019):

- Bradford Mill Lane Junction Capacity Improvements (CP5 HLOS) – this project was commenced in CP3 to provide additional capacity and flexibility into Bradford Interchange station by enabling parallel moves; and
- Hebden Bridge to Bradford Interchange Re-signalling and Re-control (CP5 Signalling Renewal) – as a standalone scheme, this project would deliver a renewal of the signalling infrastructure between Hebden Bridge and Bradford Interchange, alongside a re-control project to close local signal boxes on the route and move the signalling control to the Route Operating Centre in York.

2.9.6 Peripheral projects (most are not directly located on the Calder Valley line) that have interfaces are:

- TransPennine Electrification (Manchester Piccadilly to York/Selby via Huddersfield) – requires the Calder Valley Line as a diversionary route from January 2017;
- Huddersfield Station Capacity Improvements – will be delivered alongside TransPennine Electrification;
- Leeds Station Capacity Improvements – will be delivered alongside TransPennine Electrification; and
- Low Moor New Station – delivery in 2015 (WYCA funded scheme on the Calder Valley Line being delivered by Network Rail).

2.9.7 It is also understood that the Northern Hub interventions will allow improved service delivery and the current Indicative Train Service Specification (ITSS) agreed in December 2012 provides 3 trains per hour (Manchester to Leeds), 1 train per hour (Blackpool to York), 1 train per hour (Huddersfield to Leeds via Bradford Interchange) and 1 train per hour (Manchester to Leeds via Hebden Bridge and Dewsbury), plus the Grand Central service from Bradford to London, and a freight service.

2.9.8 A subsequent ITSS, agreed in October 2013, adds a further Manchester to Leeds service (up to 4 trains per hour), plus a Leeds and Bradford to Halifax shuttle. It is the provision of these services that are expected to follow from infrastructure improvements from the West Yorkshire (Plus) Transport Fund (WY+TF). This will be achieved by reducing signalling headways from 7 minutes to 4 minutes, and by delivering approximately 60 seconds of journey time improvements over Milner Royd Junction by increasing the speed limit to a blanket 60mph through track realignment.

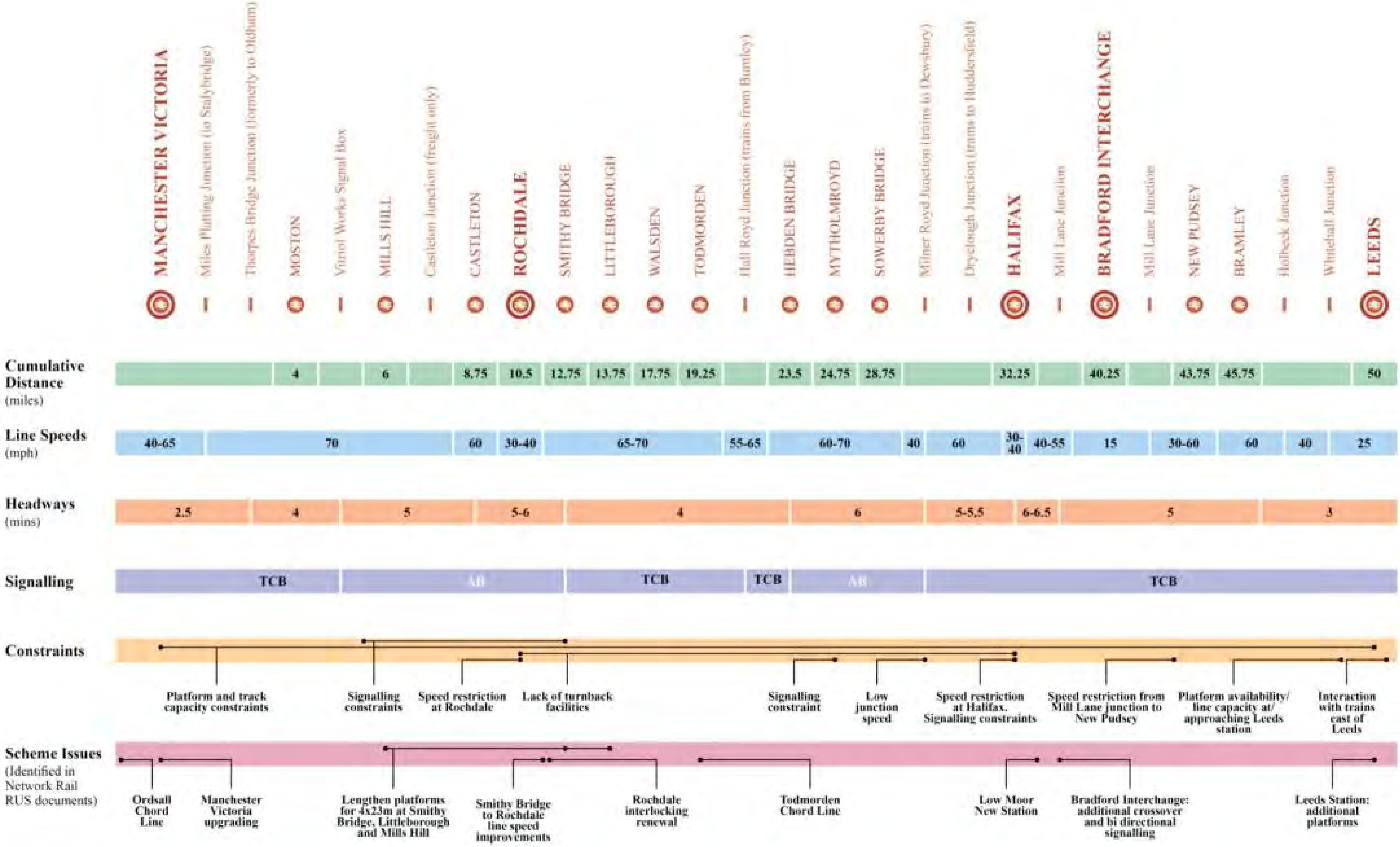
2.9.9 The Northern Hub Scheme and additional Network Rail projects have been designed to help alleviate some of the constraints imposed on the functioning of the Calder Valley Line. In 2011, Calderdale Council presented 'Calder Valley Line- Developing a Strategic Vision', within which, common with other studies referred to as part of this study, they identify the following issues and constraints on the line:

- Slow journey times compared with other corridors;
- Confused mixture of limited stop and stopping trains;
- Evidence of suppressed demand from several stations;
- Self-contained nature of the timetable;
- Peak overcrowding to both Leeds and Manchester;
- Poor quality rolling stock;
- Inadequate service pattern from certain stations; and
- Poor modal integration and insufficient car parking.

2.9.10 These issues must be addressed to better accommodate the growth in peak passenger rates, and for any proposed enhancement of the line.

2.9.11 Figure 13 shows further constraints on the Calder Valley line.

Figure 13 - Network Constraints on the Calder Valley Line



2.9.12 As discussed earlier in the chapter, the Calder Valley Line connects 2.5 million residents, 23,000 businesses and 120 multi-national companies to the Leeds and Manchester City regions; however the line is not operating to its full potential and studies referred to throughout this study have observed problems across the Calder Valley line and at individual stations.

2.9.13 Station and train capacity provided along the line results in overcrowding at times and adjacent stations to the proposed site of Elland Station may see an easing of demand for parking and pedestrian access should the station at Elland be introduced, as some passengers are diverted to the new station.

> The committed northern hub improvements impacting upon the Calder Valley Line will help increase the capacity of rail services operating through to Leeds and Manchester. This will provide opportunities to introduce further rail services across the Calder Valley Line; making train travel a more desirable and convenient transport choice by alleviating a number of the problems identified.

2.10 Elland Station Service Proposals

2.10.1 Adding Elland station calls to existing rail services is expected to increase journey times by two minutes. Despite this detriment, there is still expected to be a positive revenue outcome, with a forecast of around 240,000 passengers annually. Work undertaken for the New Stations Study[8] in 2014 indicated, using analysis of the December 2013 Working Timetable, the likely potential to accommodate additional stops on rail services passing through the proposed site of Elland Station. The conclusion was that:

- The hourly Huddersfield – Leeds (via Halifax) service could potentially accommodate a station call at Elland, by reducing some of the extended dwell time timetabled at Halifax. Some of this will be removed when Low Moor Station opens, but sufficient time should remain; and
- The Manchester Victoria – Leeds service has dependencies with the Trans Pennine services from Heaton Lodge East Junction and Leeds, giving limited opportunity for any change in timings. Despite electrification, the introduction of additional Trans Pennine services is unlikely to change this conclusion, and there are additional constraints at the Manchester Victoria end, because of tight turnarounds (below the standard minimum of 10 minutes).

2.10.2 Re-diagramming of trains following electrification may however provide the opportunity to accommodate calls within the turnaround times at Leeds, but this will be dependent on the timing of Trans Pennine Trains. A further timetable assessment will therefore be needed as part of the Business Case analysis when the future timetable states and traction are more clearly defined.

2.10.3 The following sections consider several compelling arguments supporting the introduction of a rail station at Elland Station. This includes the highway network surrounding Elland, and how the introduction of a train station at Elland may help ease congestions at links and junctions across the network. In addition, the consideration of the economic argument, discussing how a train station at Elland would help to support access to employment opportunities for in large employment hubs, essentially Leeds and Manchester, widening the labour pool, and facilitating a more mobile workforce.

[8] New Railway Stations in North and West Yorkshire Feasibility Study, Atkins for WYCA (2014)

2.11 A629 and M62 Congestion

2.11.1 This section identifies the current baseline and future baseline traffic demand around Elland, focusing primarily on the A629 Calderdale Way with reference to the implications on the M62. We explore extracts from the Calderdale Core Strategy Transport Study, identifying current and future traffic demands on the wider Calderdale transport network, focusing more specifically on changes to the A629 Calderdale Way.

2.11.2 The section then discusses how these delays may impact on the M62, by examining the existing conditions of junctions 18-29, concluding by discussing the feasibility of introducing a train station in Elland to help alleviate some of the increasing congestion.

2.11.3 The Calderdale Core Strategy Transport Study predicts trip rates on the wider transport network in Calderdale. This allows forecasts of where increases in traffic or increases in demand for public transport may cause stress on the existing networks, and guides development of possible transport improvements and interventions.

2.11.4 A number of diagrams illustrating the traffic impacts are included in Appendix F to this report and are described here.

2.11.5 Figure 14 and 15 show the baseline traffic flow across Calderdale, prior to any development, demonstrating traffic flows of between 1000-2000 trips during AM and PM peaks leading up to the A629 Calderdale Way.

2.11.6 The Calderdale Core Strategy Issues and Options sets out three different approaches for future development in Calderdale:

- In approach 1, development is focused in the eastern parts of Calderdale, particularly in Halifax, Sowerby Bridge, Brighouse, Elland, Shelf and Northowram;
- In approach 2, there is an enhanced role for development in Todmorden, however, there is still a significant focus on eastern parts of Calderdale, particularly in Halifax, Sowerby Bridge, Brighouse and Elland; and
- In approach 3, development is apportioned between settlements much in line with their current size. As in all three approaches, there is a significant focus on eastern parts of Calderdale, particularly in Halifax, Sowerby Bridge, Brighouse and Elland, but also a significant development in Todmorden.

2.11.7 New traffic demand, associated with development in each of the Core Strategy approaches was assigned to the Network Conditions Model (NCM). Figures 16-21 show how the new traffic assigns to the network in each approach in the morning and evening peak hours.

2.11.8 Figures 16-21 identifying the new traffic demand associated with development in each of the Core Strategy approaches demonstrate:

- Approach 1: AM and PM flows on approach to the A629 Calderdale Way will remain the same, and decrease in traffic demand during PM peaks. Flows will dramatically increase along the A629 Calderdale Way, with 2000-3000 trips southbound and 1000-2000 trips northbound. Flows during PM peaks also increase, with 1000-2000 trips going southbound and northbound.
- Approach 2: AM and PM flows on approach to the A629 Calderdale Way will remain the same from those travelling north, yet increase to 2000-3000 trips for those travelling southwards towards A629 Calderdale Way.

Flows also increase along the A629 Calderdale Way during the AM peak, 2000-3000 trips southbound and 1000-2000 trips northbound. Flows during PM peaks also increase, with 1000-2000 trips going southbound and northbound.

- Approach 3: AM and PM flows on approach to the A629 Calderdale Way will remain the same. Flows will dramatically increase along the A629 Calderdale Way, with 2000-3000 trips southbound and 1000-2000 trips northbound. Flows during PM peaks also increase, with 1000-2000 trips going southbound and northbound.

2.11.9 Figures 22-27 then show the addition of the base traffic and the new development traffic in each approach in the morning and evening peak hours. This represents our forecasts of future year traffic flows on the network if all LDF development occurs.

2.11.10 Figures 28-33 show the volume/capacity for each future year traffic scenario. Similarly to the volume/capacity assessment in the base year, this refers to link capacity only, and does not reflect junction capacity.

2.11.11 Below is a summary of the demand imposed upon the road network, given each of the Core Strategy's approaches.

- In Core Strategy, Approach 1:
  - Demand above link capacity on the A629 between Halifax and Elland (AM only), close to capacity (PM);
    Demand close to link capacity on the A629 from Elland to the M62 (AM);
    Demand close to link capacity on the A6026 between Sowerby Bridge and Elland (AM only).

- In Core Strategy, Approach 2:
  - Demand close to link capacity on the A629 between Halifax and Elland (AM and PM);
    Demand close to link capacity on the A629 from Elland to the M62 (AM);
    Demand above link capacity on the A6026 between Sowerby Bridge and Elland (AM only).

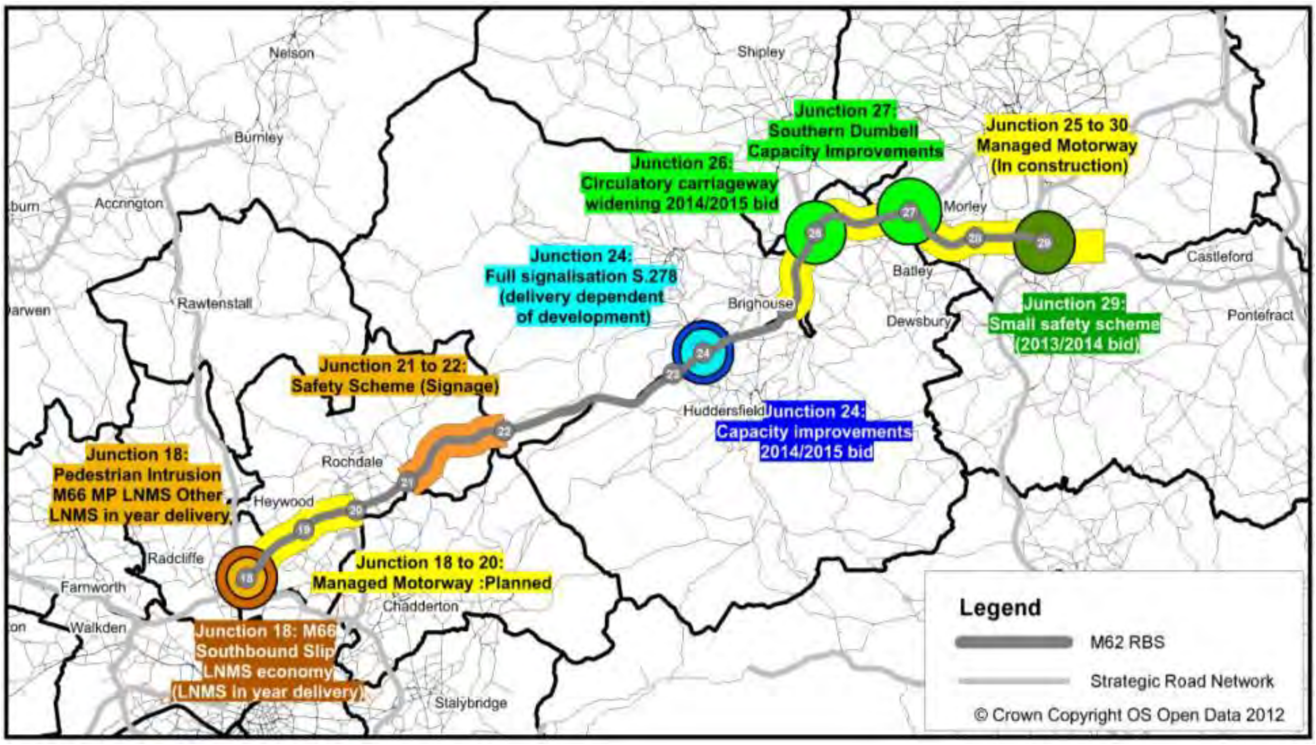
- In Core Strategy, Approach 3:
  - Demand above link capacity on the A629 between Halifax and Elland (AM and PM);
    Demand close to link capacity on the A629 from Elland to the M62 (AM only);
    Demand above link capacity on the A6026 between Sowerby Bridge and Elland (AM only).

2.11.12 To further understand the demand in traffic generated around Elland, the chapter now turns to consider the operation of junctions along the M62. The M62 between junctions 18 to 29 is of direct significance to the five West Yorkshire Authorities of Bradford, Calderdale, Kirklees, Leeds and Wakefield and the Greater Manchester Authorities of Bury, Oldham and Rochdale.

2.11.13 The route is key to road-based access to Manchester Airport and large freight distributers as far afield as Wigan and Stockport. The Highways Agency has been working closely with all of the local authorities in both the Manchester and Leeds City Regions on their development plans, all of which are at different stages of completion.

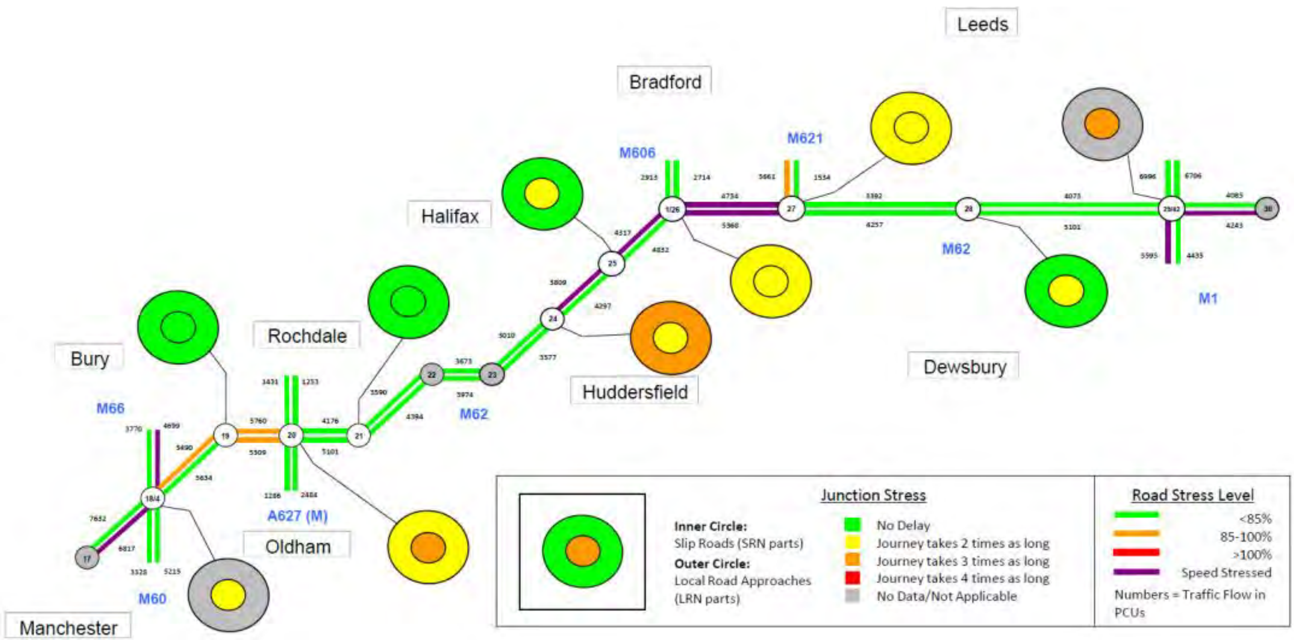
2.11.14 Figure 34 shows the M62 between junctions 18 to 29 along with improvement schemes currently proposed

Figure 14 - M62 Schematic Diagram – Committed SRN Schemes[9]



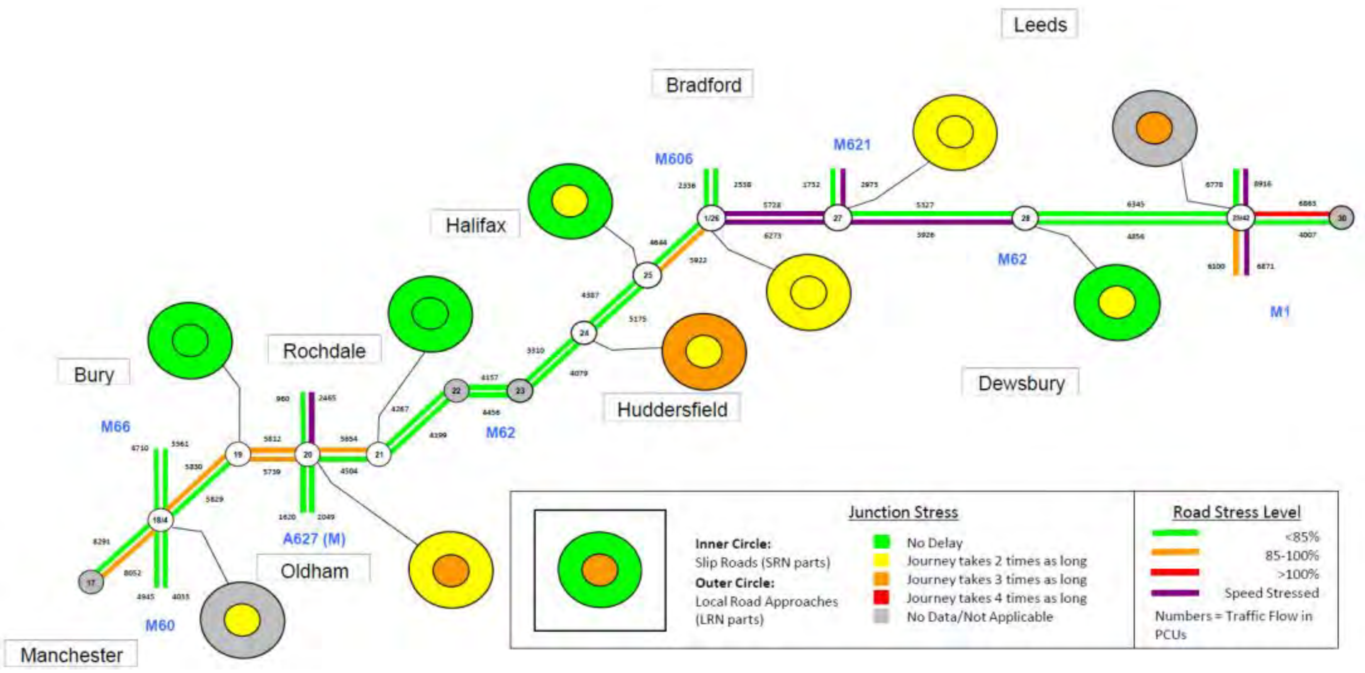
2.11.15 Figures 35 and 36, below, show the congestion at specific junctions along the M62. Of which junction 24 appears particularly congested.

Figure 15 - AM peak congestion at junctions along M62 (2011)



[9] M62 J 18-29 Route Based Strategy – Highways Agency March 2013

Figure 16 - PM peak congestion at junctions on M62 (2011)



2.11.16 The figures show the majority of cluster sites exist within the West Yorkshire area, between junctions 24 and 29, reflecting the high traffic volumes on this section of the route. Junction 24, which leads on from Elland is one of the most congested junctions on the Leeds-Manchester M62.

2.11.17 In December 2014, the West Yorkshire (Plus) Transport Fund (WY+TF) announced allocations of £1.4 billion worth of projects to improve transportation across West Yorkshire. Phase 1 of this fund, which is to be delivered by 2021, aims to deliver highway network efficiency across the West Yorkshire strategic highway network, as well as improving the Halifax - Huddersfield A629 corridor with further improvements to Halifax town centre. Phase 2 which is due to be on site by 2021 discussed the introduction of M62 Junction 24a on A641 Bradford Road south of Brighouse.

2.11.18 Although yet to be committed, these proposed improvements would help alleviate some of the problems identified with the A629 and M62. However, as the arterial route between Huddersfield and Halifax, the impact of construction could be significant, and could also result in induced demand as a result of greater capacity.

2.11.19 The introduction of a station at Elland could help ease the existing traffic on the A629 and junctions on the M62. It could also help mitigate the congestion that would result from improvements to the A629 and M62; this could help contribute to an overall modal shift toward train use across the Elland MSOA.

Existing congestion on the Strategic Road Network, particularly focussing on the M62 and A629 for Elland, will be alleviated to a certain extent by improvements proposed by Highways England. Forecast future growth however is expected to cause further difficulties and the growth proposed as part of the Local Plan process will have to be delivered in a more sustainable way in order for the area to remain attractive for inward investment or new residents.

2.12 Economic Impact

2.12.1 This section considers the outline economic case for the introduction of a rail station at Elland, discussing the socio-economic relationship Elland has with the larger employment hubs of Leeds and Manchester and adjacent centres of Huddersfield, Halifax and Bradford.

2.12.2 The Calder Valley Line creates a multitude of economic opportunities through the accessibility it creates across West Yorkshire to Greater Manchester. To begin, consideration is given to how the line supports Calderdale's financial district and additional aspects of Calderdale's unique economy.

Following this, the section considers the importance of the Calder Valley Line in contributing towards both Leeds' and Manchester's economies.

2.12.3 In 2009, both Oxford Economics and Ekosgen, in their separate reports, stressed the need for Calderdale to develop the resilience of its economy[10,] which is heavily dependent on the financial services and manufacturing sectors. Connecting to employment outside of the borough and attracting inward investment is vital to sustaining and growing Calderdale's local economy and providing stability for the growing population. This applies specifically to areas such as Elland which have several deprived communities and some areas which show a high percentage of households in social rented housing.

2.12.4 A 2009 study by Steer Davis Gleave showed that Calderdale's existing highway network was at capacity and that future housing and employment growth must be met by better utilisation of public transport assets. Further work by Arup, commissioned by Calderdale Council, showed an exigent need for continued investment in rail. This need was to enable the 1.1m people commuting in the corridor to access jobs and for the districts along the line, including those in Bradford and Rochdale, to deliver their growth aspirations. The Calder Valley Line is continuously helping commuters access Calderdale's unique employment market, supporting economic growth and Calderdale's financial and manufacturing sectors.

2.12.5 Creating a station at Elland as part of the Calder Valley Line, could be of particular importance to the growth of Elland's business and industrial sectors, as a quantified summary of the flow data for methods of travel to work, shows that the levels of outbound trips (3994 trips) are almost half the levels of inbound trips (7298 trips) (see Appendix A in Annotated Maps documents). Better access to Elland therefore increases the available labour pool and market for those businesses based in Elland, encouraging inward investment.

2.12.6 Within Elland there are only 866 internal trips, accounting for 11.9% of Elland's workforce (see Appendix C in Annotated Maps documents). This shows that 88.1 % of Elland's economy currently depends on inbound travel. What is more, many of these inbound trips come from areas situated near to stations along the CVRL, such as Sowerby Bridge, Mytholmroyd and Hebden Bridge (see Figure 2 and 3 in Annotated Maps documents).

2.12.7 Opening up transport corridors to the Elland MSOA Travel to Work Area may help develop and grow Elland's economy, and help encourage a more sustainable method of travelling inbound to Elland other than the more congested routes along the A629 and M62.

2.12.8 As well as supporting Calderdale's local economy, the Calder Valley Line may aid in providing access to employment to those who work outside of Elland. Figures obtained from Appendix C show that only 21.7% of Elland's working population work within Elland, the remaining 78.3% of the working population source employment outside the MSOA. The Calder Valley Line would provide a direct transport link to sources of employment in key economic hubs such as Leeds and Manchester; and as well as supporting job generation Elland.

[10] Leeds City Region Secretariat and Yorkshire Futures (2009). Progress in the Leeds City Region.

2.13 Leeds City Region

2.13.1 The Leeds City Region Enterprise Partnership's (LEP), Strategic Economic Plan 2014 sets out how Leeds has transformed itself in the last 20 years. It is the second biggest local authority area in England, home to 800,000 people and has a working population of 550,000. In the last decade it created more jobs than any English city outside London and it employs more people in the knowledge economy than anywhere except the Capital.

2.13.2 The LEP's new vision for the Leeds City Region is to unlock the potential of the City Region, developing an economic powerhouse that will create jobs and prosperity. Current forecasts indicate that the LEP are on course to add £7.4bn and 52,000 jobs to the Leeds City Region economy by 2021.However, with the tools and resources to fully implement the LEP's Plan, there will be a dramatic acceleration in growth, creating a further £5.2bn in economic output and an additional 62,000 jobs. So by 2021, the City Region economy will be almost a quarter (23%) bigger, and we will have more than doubled job growth to 9.2%.

2.13.3 However, despite forecasts in job growth, there is currently a considerable shortfall of people (50,000+) qualified at all levels and most pronounced at levels 3 and 4 when compared to the national average, especially when set against a forecast increased demand for higher level skills in Leeds City Region of 9.8 % at Level 4 from 2011-2020 (provided by the Regional Economic Intelligence Unit for the LEP).

Figure 17 - Skills set for Level 3 and 4

Skill Level	Examples of NQF qualifications	Examples of QCF qualifications
3	- A levels - GCE in applied subjects - International Baccalaureate - Key Skills level 3	- BTEC Awards, Certificates, and Diplomas at level 3 - BTEC Nationals - OCR Nationals - NVQs at level 3
4	- Certificates of Higher Education	- BTEC Professional Diplomas Certificates and Awards - HNCs - NVQs at level 4

2.13.4 As a solution to this problem, the LCR LEP have set out how they aim to use improved transport links to encourage an increased volume in skilled labour and a more mobile workforce. In doing so the LEP refer to policies and funding set out by the Department of Transport - an Engine for Growth; the West Yorkshire & York Local Transport Plans 2011-26; EU Transport White Paper 2011; and the Leeds City Region Draft Investment Plan (2013).

2.13.5 These documents identify the key role that connectivity plays in supporting economic growth by enhancing mobility, bringing people and places closer together for jobs and for doing business and meeting carbon reduction targets. As a result the LEPs approach recognises that if transport is inferior, jobs growth is constrained with a significant detrimental impact on economic performance.

2.13.6 One of the LEPs options for delivering better transportation and therefore encouraging economic growth are initiatives funded through the WY+TF.

2.13.7 As part of the City Deal with government, authorities in West Yorkshire and York are creating a Transport Fund of £1.6bn over the coming decade. Whilst the current transport network supports a significant volume of passenger and freight movement, decades of under-investment means that the capacity of the network has not kept pace with economic and population growth leading to problems of delays, congestion and crowding experienced across the area which will hamper future economic growth.

2.13.8 The focus of the WY+TF is on job creation and economic growth and supports each of the 4 LEP strategic priorities, with the package of investment carefully targeted to maximise economic impact. The WY+TF, which currently includes 32 schemes, is specifically targeted at increasing employment opportunities and economic growth, creating 20,000 jobs and increasing economic output (GVA) by £2.4bn each year by 2035. The package produces a Benefit Cost Ratio of 5:1, and for every £1 spent provides a £2.90 return in GVA. The Transport Fund will:

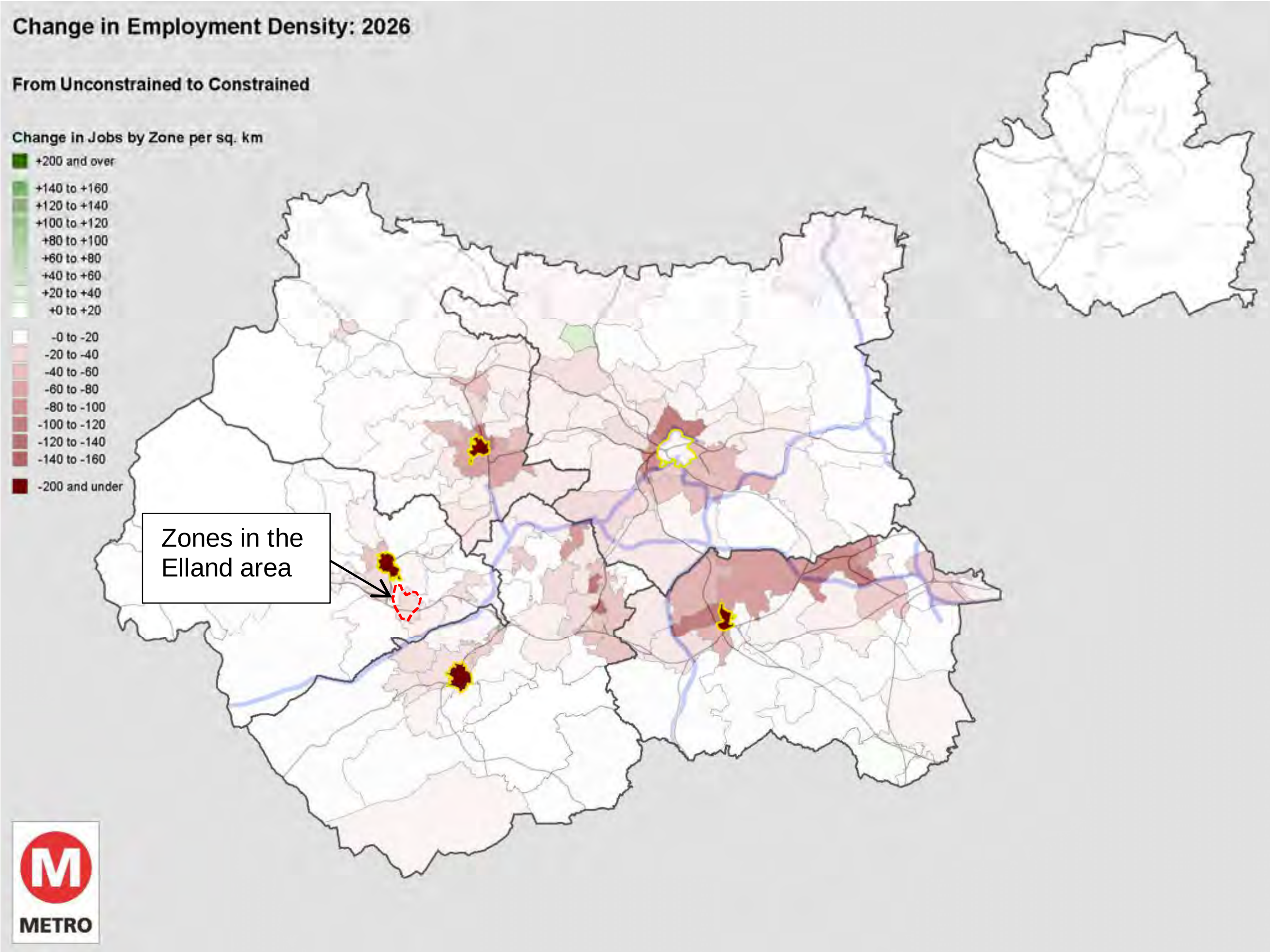
- unlock and enable growth in existing employment sites and open up new sites allocated for employment and housing;
- increase the productivity of businesses by reducing transport costs, expanding labour catchments and expanding the number and range of accessible employment opportunities;
- improve access and connectivity to employment, skills and business opportunities; and
- facilitate the move towards a resource smart City Region by reducing the carbon impact of transport and encouraging sustainable land use growth.

2.13.9 The Urban Dynamic Model, which is a strategic land use, transport, carbon and economic model, was used to predict the scale and distribution of locations where future employment growth would be constrained because of rising transport costs such as public transport fares, highway congestion and rail crowding. The findings demonstrated:

- 22,000 jobs would be constrained in West Yorkshire and York;
- there would be a reduction in the size of labour pools for employers in West Yorkshire and York to recruit from (average reduction of 23% in 2026);
- there would be a reduction in the number of accessible jobs for commuters in West Yorkshire (average reduction in accessible jobs of 18% in 2026, but 20% for commuters from the most deprived communities); and
- there would be rising costs and reduced productivity for business.

2.13.10 The map below shows where future employment growth would be constrained because of rising transport costs.

Figure 38: Potential constraints on employment growth as a result of rising transport costs



2.13.11 The scale and distribution of the UDM's forecast of constraints in employment and housing growth is an important basis for identifying where new transport infrastructure schemes would be most effective in unlocking growth. The spatial evidence suggested employment constraint would be experienced:

- globally across the (urban) area;
- within all urban centres, but particularly Bradford, Halifax, Huddersfield, York and Wakefield (indicated by the darker areas);
- within and a long a number of corridors and key potential growth areas including: Aire Valley Leeds,M62 between Castleford and south Leeds, Canal Road Bradford and the A62 corridor east of Huddersfield; and
- in areas surrounding the urban centres, and particularly focused in in the northern edges of Leeds city centre (including the University and Hospital areas).

2.13.12 The constraints that result from rising transportation costs will also impact on Elland. Poor connectivity is already an issue with comparative journey times to main centres being far worse by public transport when compared to other adjacent centres (e.g. Brighouse to Leeds by rail is 32-35 minutes, but Elland to Leeds by bus, including interchange as there is no direct service could be between 90-110 minutes – the equivalent car journey time would be around 25 minutes).

2.14 Manchester City Region

2.14.1 As the neighbouring City Region directly connected by the Calder Valley Line, the economy of Manchester is also directly relevant to Elland.

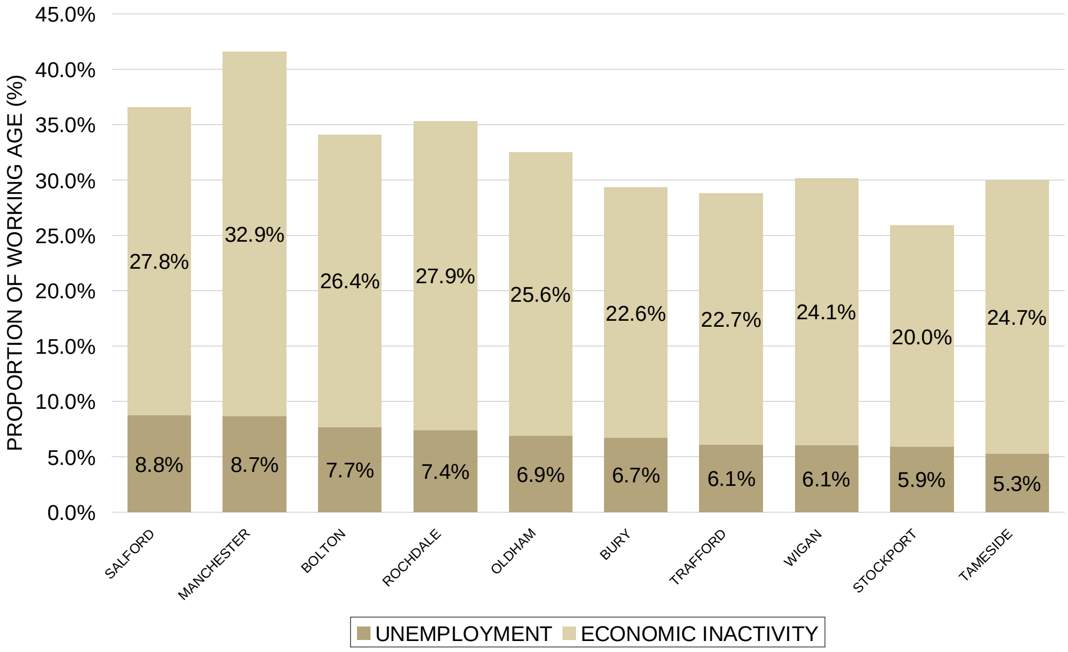
2.14.2 The Manchester City Council Core Strategy explains that similarly to Leeds, Manchester has achieved significant economic and regeneration success over the past decade with a growing and diversified economic base and population increase of nearly 20%, making it the fastest growing city in the UK. It has established the largest financial and business services sector outside London with real strengths in the digital and creative industries, health and biosciences and advanced manufacturing. The city has invested heavily in its infrastructure and repopulated its urban core.

2.14.3 However, this economic and urban regeneration success has also brought challenges - the population growth has consequently increased demand for scarce services and resources, along with rising traffic congestion and the increased task of cutting pollution and improving health outcomes.

2.14.4 The Greater Manchester Local Economic Assessment 2011 highlights that worklessness has risen over the past four years because of the near doubling of unemployment, the biggest contributor to worklessness remains economic inactivity, affecting nearly a quarter of the working-age population.

2.14.5 Figure 39 demonstrates this trend in the conurbation, with 32.9% of the city economically inactive; as well as 8.7% of Manchester's population being classified as unemployed.

Figure 39: Workless residents in Greater Manchester, June 2010[11]

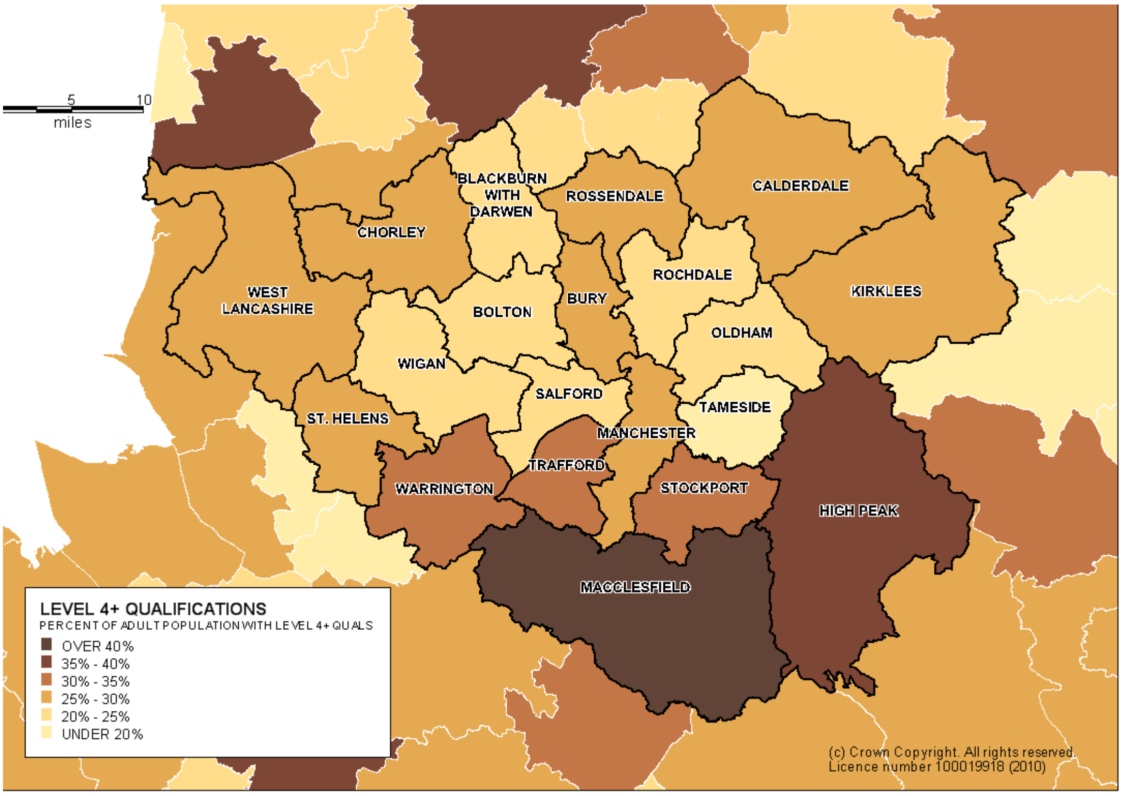


2.14.6 The key determinant of worklessness is low or inappropriate skills, with almost 20% more workless residents having no qualifications compared with the national average. Moreover, just 12.0% of economically inactive residents have level 4+ skills (compared to 29.3 % of economically active residents). A lack of skills is particularly associated with residents not participating in the labour market, or having poor access to opportunities, with nearly a third of economically inactive residents having no qualifications, compared to just over a fifth of unemployed residents.

[11] Source: Calculations by New Economy from ONS (2009) Annual Population Survey

2.14.7 Whilst the Manchester Independent Economic Review (MIER) found that the smaller proportion of higher-level skills has not prevented businesses within the conurbation accessing the higher-level skills they need, this has largely been achieved by importing skills from Greater Manchester's neighbouring authorities. As Figure 15 shows, many of the conurbation's neighbouring authorities are able to offer significantly higher proportions of graduates than the majority of Greater Manchester (including Calderdale).

Figure 40: Level 4+ Qualifications in Greater Manchester and Environs, June 2010[12]



2.14.8 It is therefore essential that Manchester is serviced by an appropriate transportation network, allowing skilled commuters to access the jobs available in the conurbation, and facilitating growth in industry and the economy in Greater Manchester.

2.15 Summary

2.15.1 To summarise, the introduction of a train station at Elland provides the opportunity to enhance Elland's economy, by encouraging an alternative and convenient inbound mode of travel, making inbound travel more convenient for commutes from surrounding areas such as Sowerby Bridge, Mytholmroyd and Hebden Bridge.

2.15.2 As Appendix C demonstrates, 78.3% of the working population source employment outside the Elland MSOA, and the Calder Valley Line could provide a direct transport link to key economic hubs such as Leeds and Manchester. As the information above suggests, this direct transport link provides opportunities for citizens in Elland to source employment from these key hubs, benefitting the working population and providing opportunities for those in Elland's MSOA who are currently unemployed.

[12] Source: Annual Population Survey, 2010

2.15.3 The information above also suggests that although there is a high level of economic growth in both Leeds and Manchester, it is anticipated that there will be a significant shortfall in the workforce eligible to accommodate Leeds' and Manchester's economic growth. Therefore, the improvement of the Calder Valley Line will facilitate growth in Leeds, Manchester and their respective City Regions by providing a workforce to account for the economic hubs' workforce deficit.

2.16 Case Studies

2.16.1 2011 UK Census data shows that Elland has a population of 11,676 however the catchment of Elland station could also include communities from neighbouring ward Greetland and Stainland, which has a population of 11,389.

2.16.2 The case studies listed below discusses station developments in areas with a similar catchment and demographic to Elland. The stations were all recently financed by the Department for Transport's 'Expanding and Improving the Rail Network' policy. The fund is managed by Network Rail and aims to aid in the development and improvement of rail services in the UK. This demonstrates a station with a catchment the size of Elland can be successfully delivered.

Case Study 1: Pye Corner

Pye Corner, Newport, will receive over £2.5 million towards a scheme worth over £3.5 million. Pye Corner is on the Ebbw Valley line in South Wales between Rogerstone and Cardiff in the Bassaleg area of the west of Newport. 2011 Census data shows that the catchment area for the station is approximately 12,353 people, similar to the population of the Elland. The station will consist of a single platform. The station will be equipped with a help point, ticket machine, CCTV and customer information screens. The station will be served by a car park accommodating 70 spaces.

Case Study 2: Ilkeston, Derbyshire

Ilkeston, Derbyshire, will receive over £4.5 million of DfT funding towards a scheme worth over £6.5 million. Ilkeston is located on the Erewash Valley line between Nottingham and Langley Mill. 2011 Census data shows the station would serve catchment population of 8,881 people, slightly less than the population of Elland. The station will consist of two platforms sufficient to accommodate trains up to 6 passenger cars and will include waiting shelters. A new car park will be provided which will accommodates 150 parking spaces, including disabled parking, cycle storage, drop off point and taxi rank. Provision will also be made for a bus stop.

Ramped and stepped access will be provided from the new footbridge to each platform as well as the proposed car park, to the east of the station. The station will be unmanned, with automated ticket machines, waiting areas on each platform, customer information screens, passenger help points, and CCTV.

2.17 Conclusions

2.17.1 This chapter has reviewed the Calder Valley Line, considering how the line operates and describes the planned improvements to mitigate problems identified in reports issued by Arup, which discusses issues of containment, antiquated track and signals, and poor rolling stock. The Northern Hub Scheme and additional Network Rail projects have been designed to help alleviate some of the identified constraints.

2.17.2 However, further analysis of data produced by The Office of Rail Regulation shows that some stations on the line are becoming more crowded, and the introduction of additional stations may be beneficial to help spread the load at existing stations, allow for further growth, whilst aiding communities by providing more convenient access to rail services.

2.17.3 The chapter also develops the case further, based on economic analysis and the current capacity of the surrounding highway network; these aspects provide further support to the introduction of a station at Elland.

2.17.4 The Calderdale Core Strategy Transport Study and M62 Junction18-29 Route-based Strategy demonstrate problems with congestion along the Calderdale A629 and junction 24 of the M62. However, the West Yorkshire Transport Fund (WYTF) announced allocations of £1.4 billion worth of projects to improve transportation across West Yorkshire by 2021. These proposed improvements should help alleviate some of the problems identified with the A629 and M62.

2.17.5 However, as the arterial route between Huddersfield and Halifax, the impact of highway construction or improvement could be significant, and result in induced traffic once completed. The introduction of a station at Elland could help ease the existing traffic on the A629 and junctions on the M62. It could also help mitigate the traffic growth that would otherwise result from improvements to the A629 and M62; contributing to an overall modal shift toward rail use across the Elland MSOA.

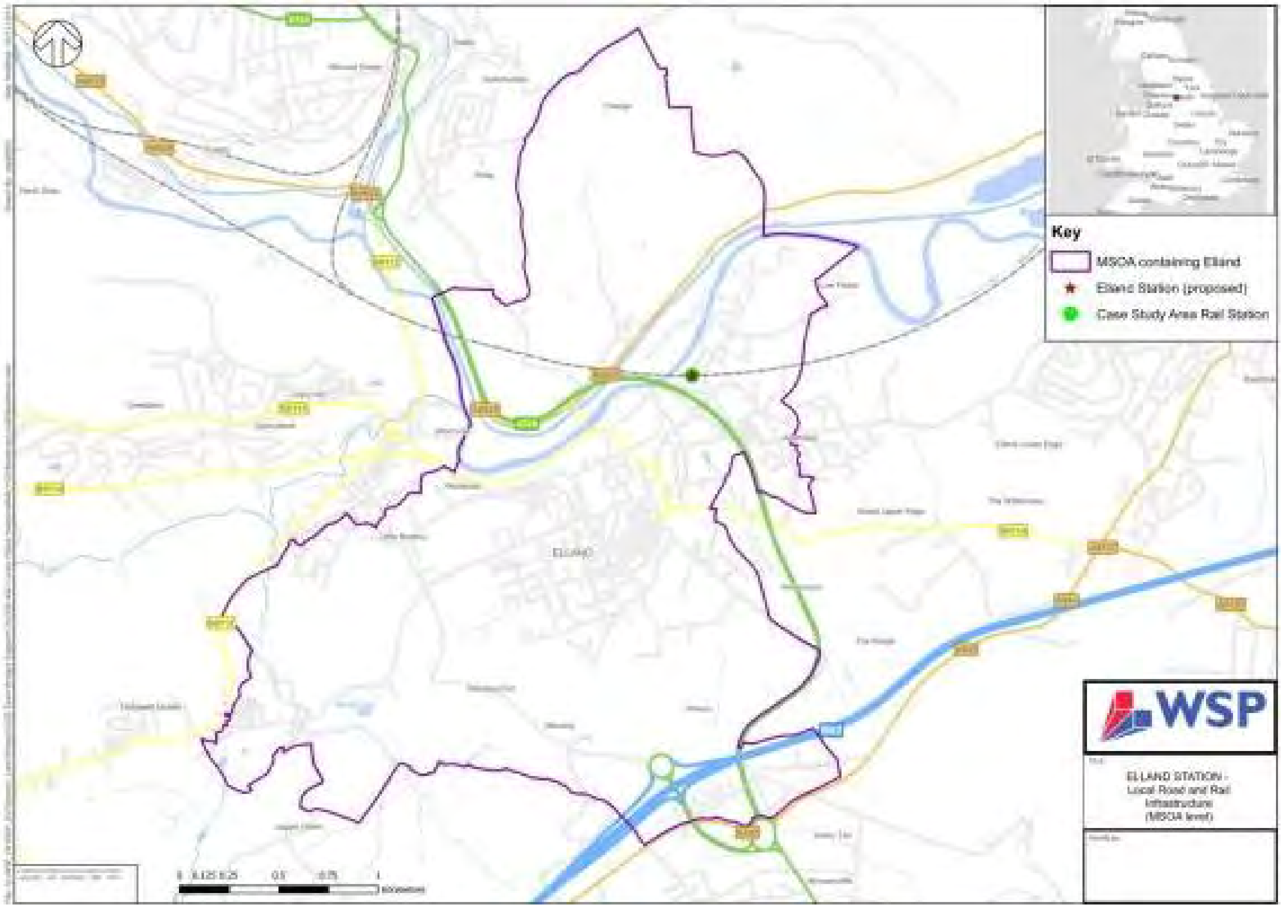
2.17.6 Finally, the introduction of a train station at Elland provides the opportunity to enhance Elland's economy, by encouraging an alternative and convenient inbound mode of travel, making inbound travel more convenient for commutes from MSOAs such as Sowerby Bridge, Mytholmroyd and Hebden Bridge. What is more, as Appendix C demonstrates, 78.3% of the working population source employment outside the Elland MSOA, and the Calder Valley line could provide a direct transport link to key economic hubs such as Leeds and Manchester. This provides a dual benefits, firstly by providing Elland with key source of employment from large regional economic hubs, and secondly by facilitating Leeds and Manchester's employee deficit.

2.17.7 Ultimately, the introduction of a station at Elland could take growing pressure off stations in the surrounding area; help alleviate some of the traffic built up around A629 and M62, providing quicker and more sustainable journeys for commuters; and help boost the economy in Elland whilst fuelling the growing labour pool in Leeds and Manchester. The introduction of a station at this scale is both feasible and viable, as shown in the case studies of stations developed by Network Rail.

3 Current and Future Demographic Trends

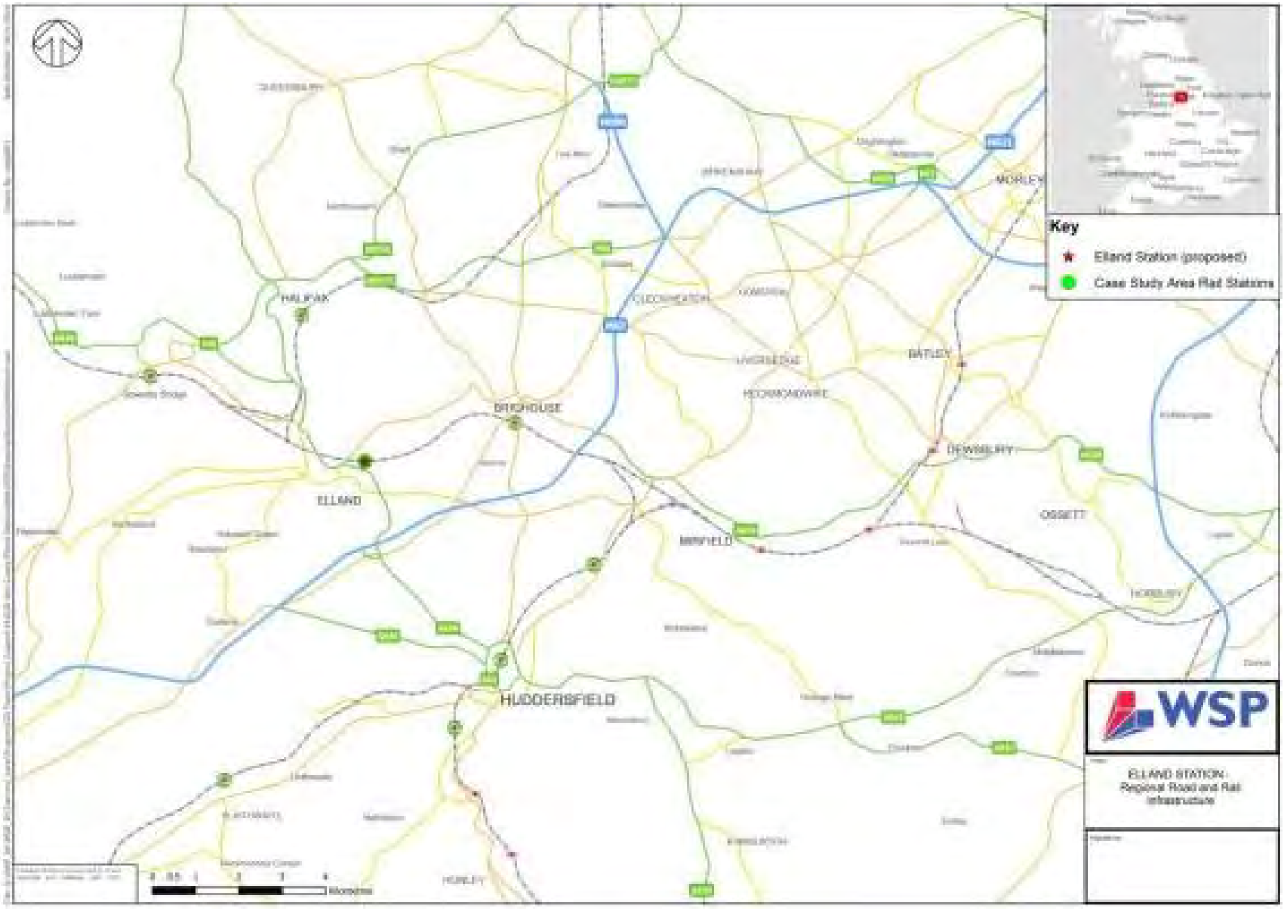
3.1.1 The maps below illustrate the location of Elland within local and regional context, with reference to the proposed station and surrounding area. Figure 41 shows the Middle Layer Super Output Area (MSOA) for Elland. Throughout further cartographic analysis, it should be assumed that these boundaries will be used to describe Elland's MSOA.

Figure 41: Elland Station- Local Road and Rail Infrastructure (MSOA level)



3.1.2 Figure 42 shows Elland, the proposed location of Elland Station and the surrounding regional road and rail infrastructure. The map demonstrates that the proposed station is situated between Sowerby Bridge and Brighouse rail stations. Larger stations within the regions include Huddersfield and Halifax, with arterial routes to the motorway accessed from Elland via the A629 Calderdale Way which leads to Junction 24 on the M62.

Figure 42: Elland Station- Regional Road and Rail Infrastructure



3.1.3 Figure 43 shows the view from the proposed location of Elland Station facing north-west, whilst Figure 44 shows the view from the proposed location of Elland Station facing south-east. Both maps were generated using GoogleEarth Pro software.

3.1.4 The figures suggest the topography of land surrounding the proposed station is relatively flat, with the railway line connecting Sowerby Bridge and Brighouse forming a bridge over Lowfields Way off the A629 Calderdale Way. The proposed station is located adjacent to the current railway line between Sowerby Bridge and Brighouse.

3.1.5 The north-west view shows the station site is surrounded by predominantly industrial units, whilst the south-east view shows that opposite the propose station site lies residential dwellings.

Figure 43: View from Elland Station Facing North-West

Figure 44: View from Elland Station Facing South-East

3.1.6 The figures accompanying this narrative are included in Appendix F in order to allow more detail to be displayed.

3.1.7 **Figure 45 and Figure 46** show the cycling catchment of the proposed location of Elland Station, and the three adjacent stations at Halifax, Brighouse and Sowerby Bridge stations. The polygons and lines used to portray the catchments are non-overlapping, and are allocated to the nearest facility. This means there is one line or polygon to nearest, single station, producing clearer outputs for those interpreting the map.

3.1.8 These figures demonstrate that the proposed station at Elland and other local existing stations, have large cycle catchments, many of which over-lap. Figure 46 highlights the majority of Elland's residential community are less than a 10-minute cycle from the proposed station, and would accommodate communities to the south-west of the region, that are currently unserved by a cycling-accessible rail station.

3.1.9 **Figure 47 and Figure 48** show the walking catchment of the proposed location of Elland Station, and the three adjacent stations at Halifax, Brighouse and Sowerby Bridge. Like the isochrone maps above, the polygons and lines used to portray the walking catchments are non-overlapping, and are allocated to the nearest station.

3.1.10 The figures demonstrate that the proposed station at Elland and other local existing stations, have self-contained walking catchments, this is unlike the overlapping cycling catchments shown in Figure 45 and 46. This means that Halifax, Brighouse and Sowerby Bridge stations are not within a reasonable walking distance from Elland's existing community, and Elland residents currently have to rely on vehicular modes of transport to access the rail network. This would not be the case should a station be introduced at Elland, therefore encouraging more sustainable and active modes of travel.

3.1.11 Subsequent maps provide analysis of the Elland MSOA, presenting a range of data relating to the Census Output Areas (COA) within Elland's MSOA boundaries.

3.1.12 **Figures 49-54** present information relating to the socio-economic characteristics of the Elland MSOA, and **Figures 55-86** illustrate information regarding the mode of travel used for each COA.

3.1.13 The data is then summarised and synthesised in relation Figure 15, which shows the method of travel to work for each MSOA, indicating further information relating to the transport needs for the Elland MSOA.

3.1.14 Figure 49 shows the IMD for areas in and around Elland. The map demonstrates that the majority of the MSOA is classified as '25 to 100% Least Deprived Areas'; however there are areas to the north-west and south-east of the MSOA which are classified as more deprived areas. To the north west of the MSOA, is an area which extends up to the proposed railway station, this can be identified as the most deprived area in the Elland MSOA, within 15-20% of the most deprived areas in the country.

3.1.15 Figure 50 shows the percentage of households in social rented housing, the information is generated using 2011 census data for each COA. This shows a high level of social housing concentrated to the west of the MSOA, with some COAs composed of 89% social/ council rent households. Although Figure 49 shows the north west of the Elland is the most deprived in the MSOA, some of the COAs included in this catchment have relatively low levels of social and council rented households, therefore there is not a direct relationship between the data displayed on Figure 49 and Figure 50, although there are some similarities areas of concentrated deprivation and the percentage of social housing.

3.1.16 Figure 51 shows the economic activity in Elland by demographic category. Pie charts are used to demonstrate the percentage of children, students, non-working, employed and retired residents who contribute to the economy in the Elland MSOA. Economic contribution from employed residents is proportionally lower in areas west of Elland, typically in COAs that are identified in Figure 50 to have the highest percentage of social and council housing.

3.1.17 In these COAs the larger economic activity appears to be generated from children, non-working and retired residents. The east of Elland shows COAs with the largest amounts of economic activity from working residents, with proportionally lower economic activity from children, non-working and retired. In general there is a lack of economic activity from students across the MSOA, suggesting that a low percentage of students live in Elland.

3.1.18 Generally, the information in Figure 51 reflects expectations generated from Figures 49 and 50, and the most deprived areas tend to be those which economy is financed by proportionally higher percentages of non-working, children and retired residents.

Figure 52 shows the percentage of residents who are classified as higher managers/professionals in the Elland COAs. In general the MSOA has low percentages of resident working as higher managers/professionals. There is also a distinct relationship between areas with higher levels of council and social housing and lower percentages of professional residents.

3.1.19 Several COAs located adjacent to the boundaries of the proposed station have proportionately higher percentages of higher managers/professionals, however generally higher percentages of higher managers/professionals lie outside the boundaries of Elland's MSOAs.

3.1.20 Figure 53 shows the percentage of households in Elland's OAs with no car/van. In general, OAs in Elland tend to have over 60% car/van ownership, which is still below the national average of 75%. The west of Elland's MSOA deviates from this tendency, demonstrating a high concentration of households with large percentages of no car/van. Some OAs in this area have over 70% of households without car/van ownership, and the majority of the western OAs fall into the '50- 100% of households' without car/van.

3.1.21 The concentration of lower car ownership in the west may be related to other qualities found predominantly in this area of the MSOA, as typically western OAs have higher levels of deprivation and social housing, with a proportionally lower percentage of economic activity generated form the working population. The maintenance and growth of transportation links to the west of Elland is therefore important, as it will help enable residents in the western OAs to access employment opportunities within and outside of the Elland MSOA, particularly among younger age brackets and those with lower incomes.

3.1.22 Figure 54 shows the number of cars/ vans per household within OAs in Elland. In general, the number of cars/vans per household in each OA appears to compliment information shown in Figure 53 OAs with larger percentages of households with no car/van also tend to show proportionally lower numbers of cars/vans per household.

3.1.23 Similarly to Figure 53, Figure 54 shows a concentration of a lower number of cars in western OAs, where there are higher levels of deprivation and social housing, with a proportionally lower percentage of economic activity generated form the working population and a lower percentage of car/van ownership. More generally, the MSOA shows that there is between 0.75-1.25 cars per household, with higher numbers of cars in the OA immediately east and west of the proposed station. Patterns also form between the high car ownership in these OAs and other demographics shown throughout the figures.

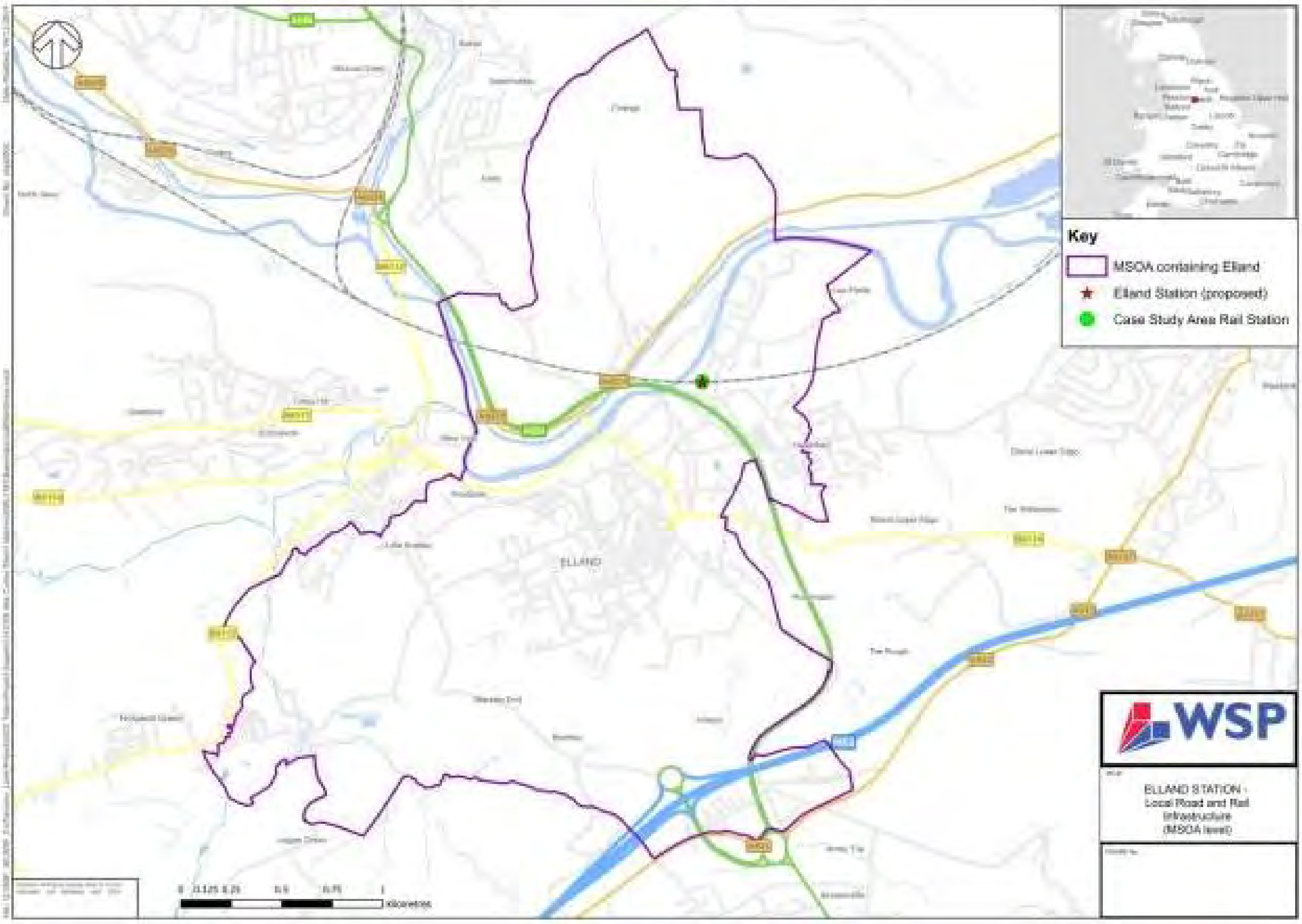
3.1.24 In terms of linkages between the different aspects, the OAs with higher numbers of cars and lower percentage of no car/van per household, tend to have lower levels of social rented housing and deprivation, with proportionally higher percentages of Higher Managers/Professionals, and larger economic activity generated from the economically active community.

3.1.25 Figure 55 uses pie charts to demonstrate the percentage of Method of Travel to Work (MTW) from usual residence within OAs in Elland.

3.1.26 The predominant MTW in the Elland MSOA is driving a car or van, potentially reflective of the unattractive journey times and relative accessibility by public transport. However, several OAs in the centre of Elland deviate from higher percentages of car/van use, and typically OAs with higher levels of deprivation and social housing, with a proportionally lower percentage of economic activity generated form the working population and a lower percentage of car/van ownership, rely on MTW such as foot and bus.

3.2 25km - 40km Method of Travel to Work (MTW)

Figure 56: Base map local Elland area (also included in appendix F)



3.2.1 This map shows the Middle Layer Super Output Area (MSOA) for Elland, as used in the demographic analysis.

3.2.2 Throughout subsequent mapping, the Elland MSOA is integrated into a 25km and 40km study area, from which multi-modal inbound and outbound trips to/from Elland have been generated. For visual clarity, desire line maps have been used to demonstrate inbound and outbound trips within a 25km radius, whereas choropleth maps have been used to capture a more detailed portrayal of inbound and outbound trips within a 40km radius.

3.3 Maps showing All Trips and Transport Modes travelling to/from Elland MSOA

3.3.1 The following maps in Appendix F show the inbound and outbound trips for all transport modes travelling to/from Elland across 25km/ 40km radius.

3.3.2 Figures 57 and 58 above, demonstrate the majority of inbound trips to Elland made by all modes of travel is concentrated to areas north-west of the MSOA, in areas surrounding Halifax such as Sowerby Bridge, Hebden Bridge and Queensbury. Other popular commuter points are found at Brighouse and MSOAs surrounding Huddersfield.

3.3.3 Figure 58 the choropleth map, shows there are also trips from MSOAs over 20km away from Elland, in MSOAs surrounding Leeds, Pontefract, Rothwell, Manchester and Salford. However the volumes of inbound trips to these MSOAs are significantly lower, often with as little as 1-5 commuters from each MSOA.

3.3.4 Figures 59 and 60 demonstrate the outbound trip destinations via all modes of travel from the Elland MSOA.

3.3.5 The choropleth map signifies that over 200 trips are contained within Elland, with neighbouring MSOAs such as Greetland and Ripponden attracting high levels of outbound trips from the Elland origin. Halifax attracts over 200 outbound trips from Elland, whilst Huddersfield attracts 101-200 outbound trips.

3.3.6 Outbound trips extend as far as Leeds, with up to 100 outbound trips made from Elland to this destination. These figures also demonstrate that there are a large number of outbound trips to destinations outside the immediate catchment of Elland, to destinations such as Bradford and Leeds. Between 11-25 outbound trips are also made to Manchester, which is within the 40km catchment. Poor transport links put Elland residents at a significant disadvantage when compared to neighbouring areas such as Brighouse, because of the comparative poor journey times (to Leeds for example).

3.3.7 In reference to Appendix A, which quantifies a summary of the flow data for methods of travel to work, it can be seen that the levels of outbound trips (3994 trips) are drastically lower than the levels of inbound trips (7298 trips). This should be noted as the high levels of inbound trips suggest Elland is generating a large amount of employment opportunities. Despite this, there are still areas of economic deprivation and unemployment in Elland; these areas also tend to have low access to cars or vans. Therefore it may be important to open up transport links to economic areas outside Elland, as evidently, despite the size of Elland’s economy; it still fails to cater for all skill levels in the MSOA.

3.4 Bus Trips travelling to/from Elland MSOA

3.4.1 The third set of maps in Appendix F show the inbound and outbound trips for buses travelling to/from Elland across 25km/ 40km radius.

3.4.2 Figures 61 and 62 show that the majority of trips by bus to Elland come from MSOAs surrounding areas such as Halifax and Huddersfield, with very few inbound bus trips made to further MSOAs. No inbound trips are made by bus from MSOA surrounding areas such as Pontefract, Rothwell, Manchester and Salford, the further inbound commute is made from MSOAs near Leeds.

3.4.3 However, when comparing the information in Figure 61 and 62, with that in Figures 57 and 58, it appears that the inbound commute into Elland is not dominated by bus travel. To encourage greater use of public transport, it could be suggested that stronger bus links are made between Elland and MSOAs nearer Halifax and Huddersfield. Figures 63 and 64 demonstrate the outbound trip destinations travelled to by bus from Elland MSOA.

3.4.4 Both figures signify that the majority of bus journeys are concentrated to trips to Halifax, with 101- 200 outbound trips. This appears to be the only prominent pattern from both figures, although the map also indicates outbound bus trips are made to MSOAs at Sowerby Bridge and MSOAs surrounding Huddersfield. The information shown on these figures illustrates the importance of maintaining and improving Elland's bus links with Halifax, which has the largest public transport trip volumes throughout the TNA.

3.4.5 Referring to Appendix A, it can be seen that bus travel accounts for 6.6% of inbound trips and 9.8%of outbound trips. This can be related to the prominent movement in bus trip outbound to Halifax and Huddersfield, reinforcing the importance of the maintenance and improvements of these routes.

3.5 Rail Trips travelling to/from Elland MSOA

3.5.1 The fourth set of maps in Appendix F show the inbound and outbound trips for trains travelling to/from Elland across 25km/ 40km radius. Understandably, Figures 65 and 66 show there are very few trips made inbound to Elland via train (32 trips to 25 destination MSOAs see Appendix D).

3.5.2 Of the trips made inbound, these journeys do not appear to take any particular patterns. This is likely to be related to the fact that Elland does not have its own train station, and commuters would have to travel to a nearby train station (e.g. Brighouse) and commute by an additional mode of transport to get into Elland. Ultimately, and logically, these figures suggest that currently there are few inbound journeys to Elland made via train, yet this is likely to change significantly if a rail station was introduced within Elland, making train travel more convenient.

3.5.3 Similarly to the previous figures, Figures 67 and 68 show there are very few trips made outbound from Elland via train and of the trips made outbound (64 trips to 30 destination MSOAs - see Appendix D); many of these trips are made to locations in Leeds or surrounding MSOAs.

3.5.4 It should be acknowledged that the number of outbound trips made by train is double the amount of inbound trips made by train, and outbound train trips account for 1.6% of all outbound MTW, whereas inbound train trips account for only 0.4% of all inbound MTW. This suggests that there is currently a larger market for outbound rail trips (i.e. with Elland as an origin) which may currently be supressed, a key consideration if a train station was developed in Elland and rail travel was made more convenient.

3.5.5 Referring to Appendix D, which shows the proportion of trips to banded distances from Elland by mode, it is shown that 78.1% of outbound trips made by train are within a 25km distance from the Elland MSOA, and 90.6% of trips are within a 40km distance; although quite high these are comparatively lower percentages than for other modes of transport. Similarly, it is shown that only 81.3% of inbound trips made by train are within a 25km distance to the Elland MSOA, and 87.5% of trips are within a 40k distance. The remaining proportions will be making journeys longer than 40km.

3.5.6 This data suggests that rail travel to/from Elland is the most desirable method of transport for longer-distance travel (i.e. proportionally higher for longer distance), and the introduction of a train station in Elland will provide journey opportunities for commuters to/from MSOAs within a greater range of Elland because of the reduced journey times and convenience offered by rail. Offering train links directly from Elland may help generate economic growth for some of the declining communities within the MSOA, providing opportunities of employment in major centres such as Leeds and Manchester.

3.6 Method of Travel to Work

3.6.1 The maps included at figures 69-72 at Appendix F use pie charts to demonstrate the proportion of inbound and outbound MTW to and from Elland from the surrounding MSOAs.

3.6.2 Figure 69 shows the total MTW inbound trips to Elland from each of the MSOAs within a 25km catchment. The map indicates that the majority of inbound trips to Elland are made by car/van, with just under a quarter of MTW inbound trips equally split between pedestrian, as a car passenger, or by bus. Developing infrastructure which compliments sustainable and active modes of travel would help to increase this mode share, particularly for localised journeys.

3.6.3 Considering Figure 70 which shows the MTW inbound to Elland from each specific MSOAs, reveals patterns in travel from particular areas within the assigned 25km catchment. Generally, car/ van travel accounts for the majority of trips into Elland from all MSOAs, this is particularly evident in MSOAs north of the study area (Northonram and Shelf), east of the study area (Brighouse), south of the study area (Scapegoat Hill and Outlane), and west (Rippenden towards Lunddenden Foot).

3.6.4 There are also distinct patterns for inbound trips by bus to Elland from MSOAs surrounding Halifax and Huddersfield, and as identified in the some of the previous data, these areas appear more dependent on modes of public transport, or demonstrate a greater propensity to use it where it is available. Maintaining and improving bus links between Halifax, Huddersfield and Elland would support and develop this market; as Figure 70 suggests approximately a quarter of Halifax and Huddersfield commuters working in Elland rely on bus as a chosen method of travel to work. When looking specifically at the Elland MSOA, it is shown that internal travel in Elland is primarily by foot. Again, ensuring walk routes are clearly defined, in good condition and safe will help to encourage the use of active modes further.

3.6.5 Figure 71 shows the total MTW outbound trips from Elland. Consistent with patterns shown in earlier analysis the map indicates that the majority of outbound trips from Elland are currently made by car/van, however with a slightly lower proportion than inbound trips.

3.6.6 Figure 72 shows the MTW outbound from Elland, to specific MSOAs in the study area. The map shows that several MSOAs in the catchment are entirely dependent on car/van use, the MSOAs are mainly concentrated to the south east and north east of the catchment area.

3.6.7 This figure also shows that numerous MSOAs surrounding and including both Halifax and Huddersfield have a larger proportion of outbound bus trips than trips by alternative modes of transport. This compliments information shown in earlier figures further emphasising the importance of maintaining and improving bus links between Elland and Halifax/Huddersfield.

3.7 Age Data and MTW

Figures 73 – 79 provide information regarding the age category of those travelling inbound to Elland.

3.7.1 Figures 73 – 77 are desire line maps that show the distribution of inbound trips from MSOAs in Calderdale for different age categories. Figure 78 uses pie charts to show the proportion of people in each age category travelling inbound to Elland. Whilst Figure 79 uses pie charts to show the proportion of inbound trips to Elland by age category from each MSOA in the Elland catchment area.

3.7.2 These figures, and data summarised in Appendix B, demonstrate the age profile of commuters travelling inbound to Elland. This shows that age 35 to 49 accounts for the highest proportion of inbound trips (37.9%), followed by aged 50 to 64 (26.2%), age 25- 34 (20.4%), age 16- 24 (12.8%) and then aged 65 and above (2.3 %). Those commuting into Elland who are aged 65 years old and above account for a very small proportion of inbound trips.

3.7.3 In reviewing these figures there are several points which emerge from the data. Firstly, the desire lines emphasise that inbound trips to the Elland MSOA come mainly from Calderdale (026) MSOA and Calderdale (027) MSOA, which cover areas such as Stainland, Outlane and Ripponden. The remaining inbound commutes come from similar MSOAs for all age categories. Understandably, because of the small amount of trips accounted for by the age category '65 years and above', MSOA inbound journeys for this age category are difficult to compare with others.

3.7.4 With reference to Figures 73 – 77 and 79, of the remaining age categories, it appears that a fewer number of trips are made by younger age to the MSOAs located further away from Elland; whereas there tends to be a larger number of longer-distance inbound trips to Elland, from the older age categories. However, this conclusion is based primarily on numerical factors and, as shown above, the younger age categories account for a smaller proportion of the trips compared to older age categories.

3.7.5 Appendix E, which shows the proportion of trips from defined distances to Elland by age category, demonstrates that the percentage of trips within a 25km distance for the age category 25- 34 years old is 58.7%. This is a comparatively lower percentage of trips than all the other age categories, and these age categories have between 91.3%- 95.7% of trips within a 25km distance. This suggests that the age category 25- 34 years have the largest proportion of commuters making trips inbound over 25km distance.

3.7.6 Figure 74 demonstrates that many of these longer-distance trips come from areas surrounding Leeds and Bradford, and therefore stronger inbound transport links from these destinations may be beneficial for maintaining and increasing the amount of 25- 34 year olds travelling to work in the Elland MSOA.

Figures 80 – 86 provide information regarding the age category of those travelling outbound from Elland.

3.7.7 Figures 80 - 84 are desire line maps that show the proportion of outbound trips from Elland to all surrounding MSOAs in Calderdale for different age categories. Figure 85 uses pie charts to show the proportion of people in each age category travelling outbound from Elland. Whilst Figure 86 uses pie charts to show the proportion of outbound trips from Elland by age category to each MSOA in the Elland catchment area.

3.7.8 These figures, and data in Appendix B, demonstrate the age profile of commuters travelling outbound from Elland. Similarly to the number of inbound trips, this shows that age 35 to 49 accounts for the highest proportion of outbound trips (38.9%), followed by aged 50 to 64 (23.9%) and age 25- 34 (21.3 %), which appear to account for similar amounts of trips, this is followed by age category 16- 24 (13.6%) years and then aged 65 and above (2.1%). Again, those commuting from Elland who are aged 65 years old and above, account for a very small proportion of outbound trips.

3.7.9 In reviewing these figures there are several points which emerge from the data. Firstly, the desire lines emphasise that outbound trips from the Elland MSOA go mainly to Halifax, Calderdale (026) MSOA, which cover areas such as Stainland and Outlane, and the Kirklees (029) MSOA, which covers areas such as Kirkheaton and Tandem.

3.7.10 There are also noticeable outbound trips to areas in Leeds for each age category, excluding those aged 65 years and above. This trip movement is particularly prominent in ages 35 to 49 years old, it can therefore be concluded that this demographic may be the most likely to travel to Leeds by train, if this option was available. Figure 86 also shows that several MSOAs in the catchment serve only one age category, but as some represent very low numbers, a high proportion of outbound commuters does not directly equate to a high actual number of outbound commuters.

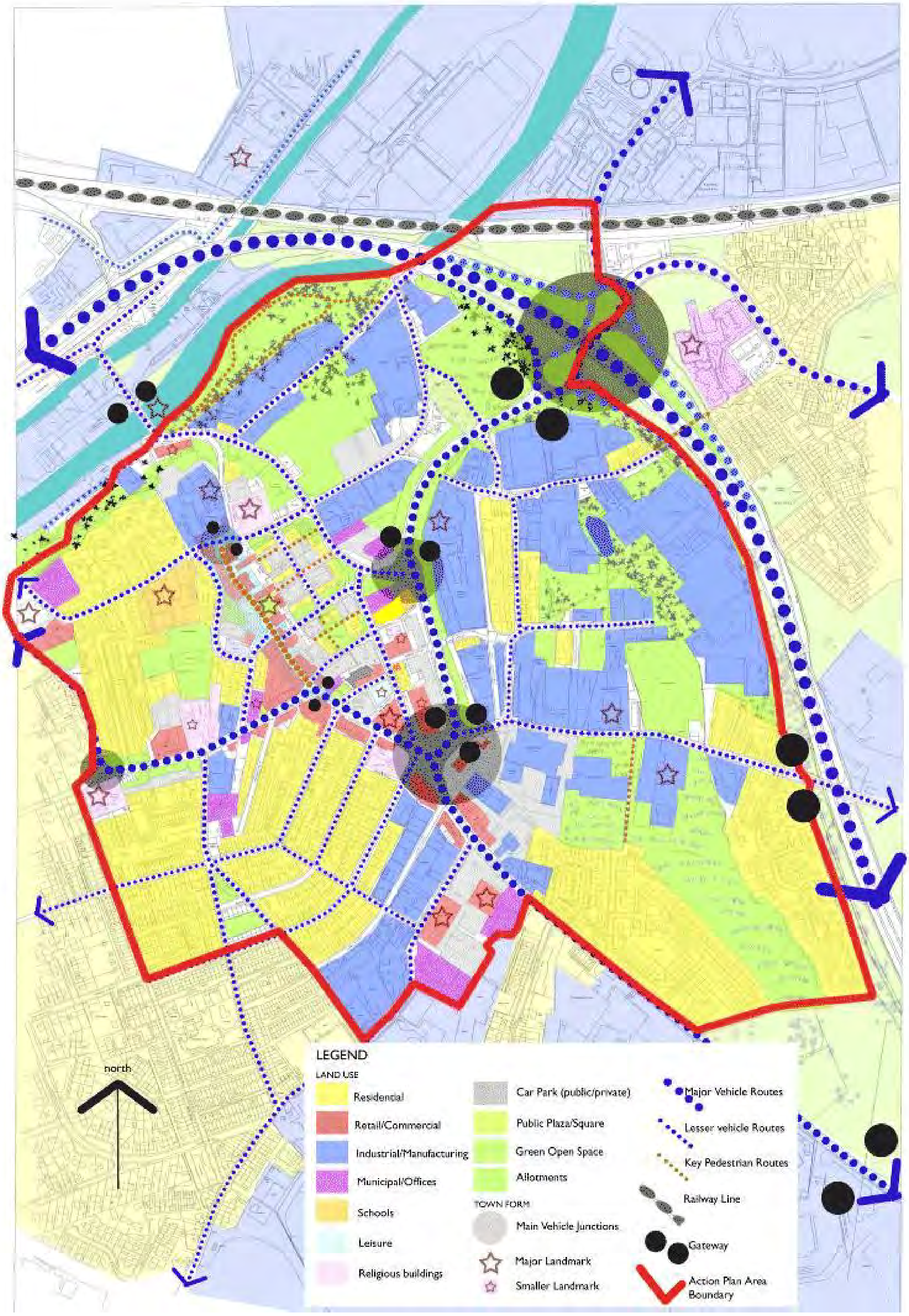
4 The Existing Local Transport Network

4.1 Local Highway Network

4.1.1 Figure 87, taken from the Elland Supplementary Planning Document (SPD), indicates the boundary of Central Elland, along with its land uses, gateways and transportation routes. The site analysis identifies the Major Vehicle Routes in Elland. The arterial route in Elland is the A629 Calderdale Way. The document also identifies additional major routes, including:

- B6114 Elland Riorges Link;
- Huddersfield Road;
- Victoria Road to Southgate; and
- Lowfields Way.
- The main vehicular junctions in Elland are identified as:
- A629 Calderdale Way/ B6114 Elland Riorges Link;
- Huddersfield Road/ Southgate/ B6114 Elland Riorges Link;
- B6114 Elland Riorges Link/ Elland Riorges Link;
- Southgate/ Westgate; and
- Victoria Road/ Jepson Lane.

Figure 87: Extract of Elland SDP (Figure 1 Site Analysis)



4.1.2 It has been identified that Calderdale MBC aspires to provide a new train station for Elland located on the north side of A629 Calderdale Way accessed from Lowfields Way. Lowfields Way and the A629 Calderdale Way form the primary highway network adjacent to the proposed location for Elland Rail Station.

Lowfields Way

4.1.3 The primary vehicular access route to the proposed station site is via Lowfields Way, this is a two-way single carriageway road, with speed restrictions of 30 mph. Acting as the key route through the industrial site, Lowfield Way is laid out and lit to traditional industrial estate road standards with a 7.3 metre wide carriageway and 1.8 metre wide footways to both sides apart from a small length of highway where the footway terminates on its eastern side (approximately 84 metres from the roundabout) and "birds mouth" type fencing has been erected from that point up to the boundary of the RAJ transport unit.

4.1.4 There are currently no Traffic Regulation Orders (TROs) restricting on street parking or waiting along the site frontage

A629 Calderdale Way

4.1.5 Access to Calderdale's wider transport network from Lowfields Way is gained via its merge with A629 Calderdale Way, which links the M62 motorway and Huddersfield to the south with Halifax to the northwest. A629 Calderdale Way is a two-way, dual carriageway with speed restrictions of 50mph.

Dewsbury Road

4.1.6 Dewsbury Road is a classified road (B6114) of variable width. It is a two-lane single carriageway road, with speed restrictions of 30 mph. The road benefits from footways on both sides of the road and street lighting. On-site observations of Dewsbury Road were carried out between 11:00- 13:00 hrs. It was observed that during these hours Dewsbury Road was lightly trafficked and it was noted that the carriageway accommodates the movements of large vehicles associated with Heathfield Industrial Estate and Ardeth Engineering's premises. Dewsbury Road has an incline on the approach to the junction with Elland Riorges Link, where it forms a priority junction permitting left out movements only, with the right turn being accommodated by undertaking a U turn manoeuvre at the adjacent roundabout with Southgate and Huddersfield Road.

Figure 88: Dewsbury Road

Figure 89: Dewsbury Rd to Elland Riorges Link

Figure 90: Dewsbury Road/ Elland Riorges Link junction.

4.1.7 The Elland Riorges Link is a two-way single lane carriageway that operates with a speed restrictions of 30 mph. The link leads from Calderdale Way A629 joining Dewsbury Road and finally forming a four arm roundabout junction with Huddersfield Road/ Southgate and Catherine Street. It was observed on site that the road appeared to be reasonably well trafficked, and is used as a primary link into Elland.

4.1.8 Figure 91 shows the Elland Riorges Link, Figure 92 shows the Elland Riorges Link/ Huddersfield Road/ Southgate/ Catherine Street roundabout

Figure 91: ***Elland Riorges Link***

Figure 92: ***Huddersfield Road***

4.1.9 Huddersfield Road is a two-way single carriageway that lead south from the Elland Riorges Link/ Southgate/ Catherine Street/Huddersfield Road roundabout, where it operates with 30 mph speed restrictions until it begins to merge with the Calderdale Way A629 where the speed restrictions increases to 50mph.

4.1.10 It provides the route to industrial areas south of Elland, and provides a merge only onto the southbound A629 Calderdale Way, with access into Elland from the A629 being taken further to the north via the Elland Riorges Link. Figure 93 shows Huddersfield Road, Figure 94 shows Huddersfield Road (Service Road).

Figure 93

Figure 94

Catherine Street

4.1.11 Catherine Street is a 30 mph single carriageway road with a slight decline as it leaves south west of the roundabout with Elland Riorges Link/Huddersfield Road/ Southgate. It should be noted that Catherine Street does not form a junction directly onto the roundabout, with traffic existing having to cross the path to traffic existing onto Southgate.

4.1.12 Although predominantly residential in nature, with dwelling frontages opening directly onto Catherine Street, there are a number of retail outlets and a car sales show room taking access from Catherine Street close to the roundabout with Huddersfield Road/ Elland Riorges Link.

4.1.13 Double yellow lines and designated pay and display parking spaces are in place along Catherine Street and these appeared to be adhered to with no parking immediately off the roundabout. Figure 95 shows Catherine Street, Figure 96 shows the exit from Catherine Street.

Figure 95

Figure 96

Southgate

4.1.14 Southgate begins as a two-way, single carriageway as it runs north-west to south-east towards the roundabout junction with Elland Riorges Link, and then operates as a one-way, single lane as it runs through the heart of Elland town centre, terminating at a junction with Westgate. Both links of Southgate have a speed limit of 30 mph. During on site observations Southgate appeared to be highly trafficked and due to the retail nature, had a high footfall, with the zebra crossing prior to the roundabout being well used. Figure 97 shows Southgate.

Figure 97

Westbury Street

4.1.15 Westbury Street is a two-way, single carriageway residential street with a 30mph speed restriction. The road takes access from Dewsbury Road, and is approximately 50m east of the Dewsbury Road/Elland Riorges Link junction and provides access to a residential area and the Heathfield Industrial Estate. The carriageway does not have any parking restrictions, and on street parking was noted on both sides of the street. With regards to the junction with Dewsbury Road, this compromises a simple priority junction with visibility to the left being restricted by the wall of the residential block to the eastern side.

Eastgate/ Wistons Lane

4.1.16 Eastgate/ Wistons Lane is an adopted highway from its junction with Briggate to the west, to Century Road to the northeast. Along the first section of Eastgate the carriageway varies in width from 6.5m – 7.2m, with footways provided on both sides. Eastgate then turns into Wistons Lane to the east and narrows to between 5.0 – 5.5m. Eastgate/ Wistons Lane is a two-way single carriageway road and is subject to a 30mph speed limit, is illuminated by street lighting and is relatively steep toward it's junction with Briggate.

4.1.17 Eastgate/ Wistons Lane provides access to a number of commercial and residential properties, some of which have limited or no off street parking provision. No parking restrictions exist, therefore on street parking occurs associated with these properties, predominantly on the southern side of the carriageway on Eastgate and on both sides of the carriageway on Wistons Lane. The visibility at the junction on to Briggate is restricted to the south. A pedestrian link is provided from Eastgate/ Wistons Lane on to the Elland Riorges Link, which provides access to bus stops and Elland Lane to the east.

Century Road

4.1.18 Century Road is an unadopted highway from its junction with Briggate to the west, to Wistons Lane to the east, providing access to a number of commercial properties. Century Road varies in width from 6.2-7.7m, with 1.7m wide footways provided on both sides for the initial 35m section from Briggate and then for a further 115m on the north side of the carriageway. It is assumed that Century Road is a two-way single carriageway road is subject to a 30mph speed limit and is illuminated.

4.1.19 No parking restrictions exist, therefore parking occurs predominantly on the northern side of the carriageway, with echelon parking occurring off the highway on the southern side. Visibility at the Junction on to Briggate is partially restricted to the north due to the presence of parked cars and the vertical alignment of the carriageway.

4.1.20 At the end of Century Road beyond its junction with Wistons Lane, bollards are located to prevent access by motor vehicles. However, access is maintained for pedestrians and cyclists, with a link through to the Lowfields area on the north side of Calderdale Way. This link forms part of the proposed Elland Cycle Network included in the Central Elland SPD, which links Lowfields to the north to Elland Town Centre to the south via Wistons Lane and Riverside Park, which is located on the north side of Century Road.

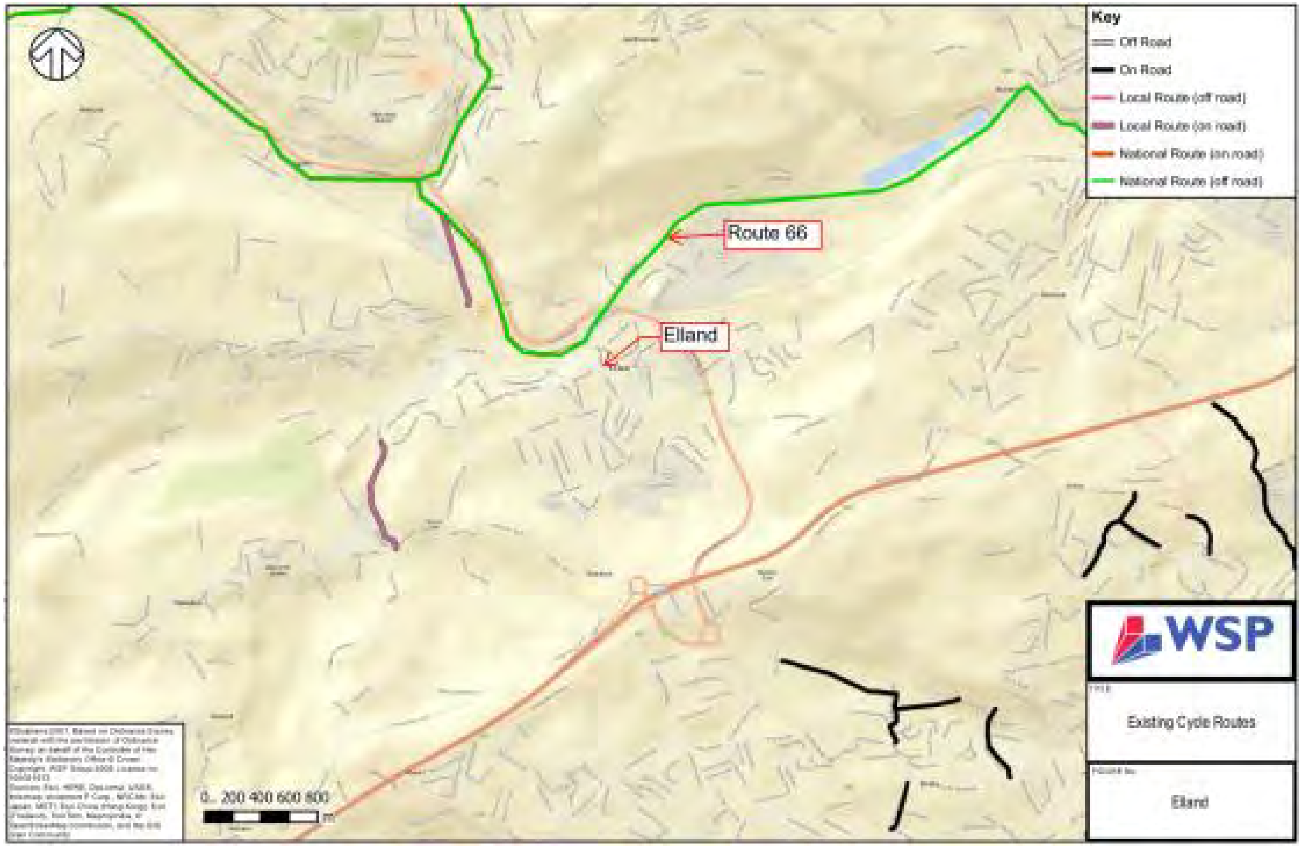
Briggate (B6114)

4.1.21 Briggate (B6114) is an adopted highway that links the Elland Riorges Link to the south via a roundabout junction, to Calderdale Way (via Elland Bridge) to the north. Within the vicinity of the site Briggate is approximately 7.7m wide with footways on both sides. Briggate is a two-way single carriageway road, and is subject to a 30mph speed limit, is illuminated and no parking restrictions are present. Briggate is a bus route with the nearest stops to the site located along the store site frontage for northbound services and approximately 40m south of the Eastgate junction for southbound services.

This section summarises the local highway network and should be read in conjunction with the earlier Section 2 which set out the capacity constraints that would be expected with future growth, development traffic and changes to the Local Plan

4.2 Cycle Network in Elland

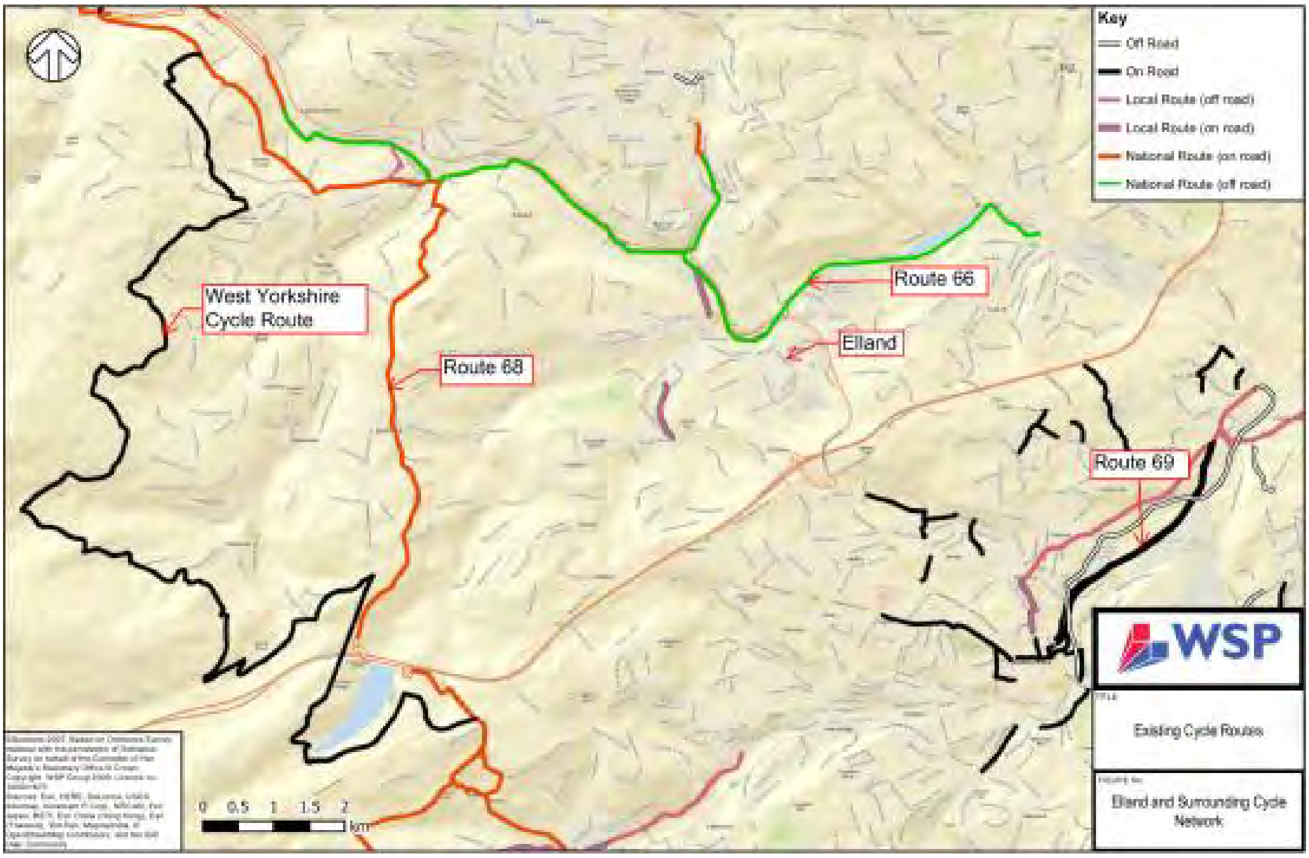
Figure 98: Local and national cycle routes surrounding Elland.



4.2.1 Figure 98 illustrates that the nearest National Cycle Route to Elland is Route 66. Route 66, known as the Hebden Bridge to Brighouse (Calder Valley Greenway), runs from central Manchester to Spurn Head via Bradford, Leeds, York, Beverley, and Kingston upon Hull.

4.2.2 Below, Figure 99 shows the cycle routes in Elland and its surrounding cycle network.

Figure 99: Wider Cycle Network



4.2.3 As well as National Route 66, the wider cycle network surrounding Elland offers a selection of additional national and local cycle routes. This includes Route 68, Route 69 and parts of the West Yorkshire Cycle Route.

4.2.4 Route 68, known as the Pennine Cycleway (South Pennines), also forms part of the National Cycle Network, running up the spine of England and through three National Parks between Derby and Berwick-upon-Tweed.

4.2.5 Route 69, known as Calder Valley Greenway (Huddersfield to Dewsbury), is part of the National Cycle Network connecting Morecambe with Grimsby via Settle, Skipton, Cullingworth, Huddersfield, Horbury, Pontefract, Althorpe and Caistor.

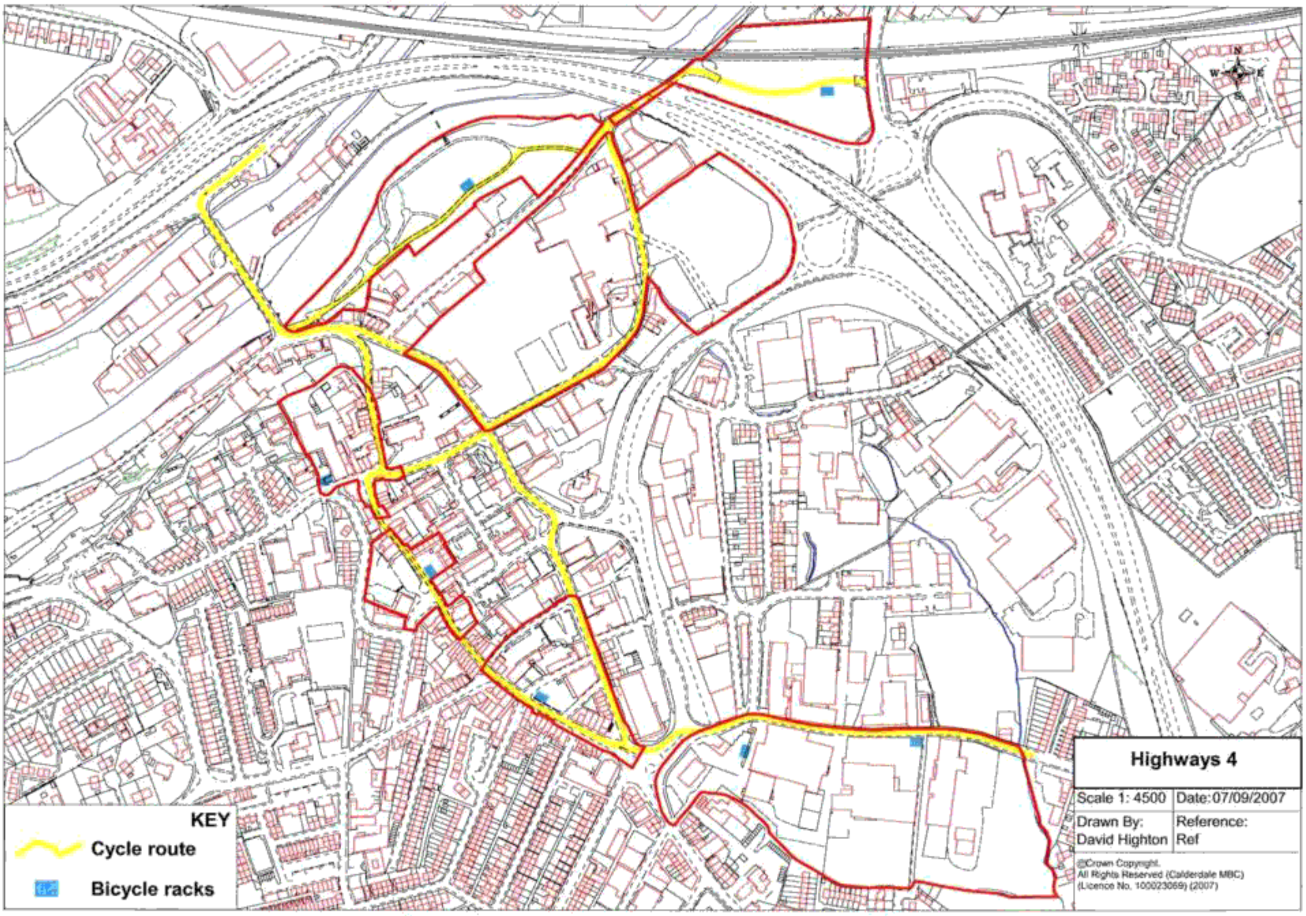
4.2.6 The West Yorkshire Cycle Route has recently been re-established and re-signposted, primarily for leisure cycling, but also more commonly for commuting. The route is mainly on road and is designed in a way that can be tackled in a series of day rides using local train services to get to or travel home from the most convenient start or finish point. It is important that the development of a train station at the site proposed in Elland would facilitate Elland's integration into the West Yorkshire Cycle Route by signposting via other identified routes and within associated publicity materials.

4.2.7 As identified in the figures above, no specific cycling facilities currently exist on Elland's local highway network. However, as part of the Central Elland SPD, Calderdale MBC has aspirations to enhance identified cycle routes within Elland, which includes routes along Wistons Lane/Eastgate and through the Riverside Park, which provide links from the Lowfields area and the national cycle network to the north and the Town Centre to the south. Dewsbury Road, Southgate and Huddersfield Road are also shown as proposed cycle routes. As a result, it is proposed to provide advance cycle stop lines with a lead in lane to allow cyclists to advance past any queuing traffic on the following approaches:

- Southgate at the junction with Huddersfield Road/ Elland Riorges Link;
- Elland Riorges Link southbound on the approach to the Southgate/ Huddersfield Road junction;
- Elland Riorges Link northbound on the approach to the Dewsbury junction;
- Dewsbury Road westbound on the approach to the junction with Elland Riorges Link; and
- Dewsbury Road southbound on the approach to the Westbury Street/ Asda Access.

4.2.8 Figure 100 below, shows the plan depicting proposed cycle route in Elland.

Figure 100: Extract of Figure 8 from the Elland SPD – Proposed Cycle Route



4.2.9 This figure demonstrates the potential to integrate the proposed rail station into the wider cycle network, as the proposed Cycle Route extends to the Lowfields area, the proposed access point for the new Station.

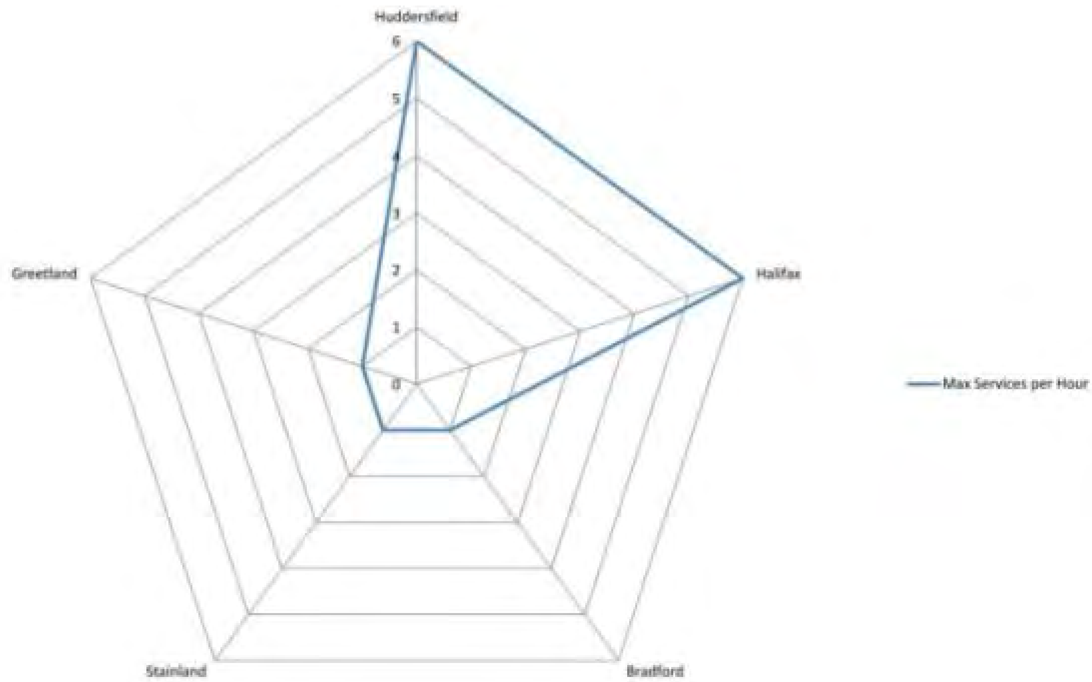
4.2.10 The proposed cycle network could also connect with the Calder and Hebble Navigation via Elland Bridge, and from there, with the wider, National Cycle Network, which proceeds north towards Halifax and beyond.

> There should be an appreciation that any new station facility should be linked into the twon centre and surrounding area by good quality cycling and walking links, in order to further promote active modes of travel. Whilst there are sections of cycle route in and around Elland, these are not particularly well linked, and improvements could be made.

4.3 Bus Network

4.3.1 This section considers the existing bus network and infrastructure. Figure101 provides an overview of the general service pattern (per hour) of bus services operating in Elland.

Figure 101: Maximum Public Transport Services per hour to and from Elland.



4.3.2 This demonstrates that the highest frequency of service from Elland to Huddersfield and Halifax is six per hour, and a maximum of one bus per hour also goes from Elland to Bradford, Stainland and Greetland.

4.3.3 The bus services specific to the study area are summarised below, which also demonstrates a lack of direct connectivity by bus to Leeds or Bradford.

Table 19: Bus Services within the Elland Study Area

No.	Route	Freq. Mon - Fri	Freq. Sat	Freq. Sun
257	Brighouse Bus Station- Woodhouse Lane- Elland Huddersfield Road	Operates 1010- 1651 every 2 hours	n/a	n/a
258	Brighouse Bus Station- Woodhouse Lane- Elland Huddersfield Road	Operates 1110 - 1533 every 2 hours	n/a	n/a
278	Wakefield- Dewsbury- Brighouse- Elland (ERL) - Halifax	Operates 0637- 2107 hourly between 0735- 1952	Operates hourly 0737- 1852	Operates hourly 0852- 1852
343	Halifax- Elland (Southgate)- Huddersfield	Operates hourly between 0720- 1820	Operates hourly between 0720- 1820	n/a
400	Halifax- West Vale- Elland	Operates 0750- 1745 every 20 mins	Operates 0910- 1730 every 20 mins	n/a
501/ 503	Halifax- Elland (Southgate)- Ainley Top- Huddersfield	Operates 0605- 2230 every 10 mins between 0750- 1803	Operates 0610- 2325 every 10 mins between 0840- 1703	Operates 0700-2230 every 30 mins between 0800- 2230
537/ 538	Huddersfield- Marsh- Outlane- Stainland- Elland (ERL)- Halifax	Operates hourly between 0635-1850	Operates hourly between 0845- 1943	Operates every 2 hours between 0943- 2143
570	Halifax- Elland (ERL)- Brighthouse- Shelf- Bradford- Elland Road- Market Street.	Operates hourly between 0915- 1717	Operates hourly 0815- 1815	n/a
573	Halifax Bus Station- Huddersfield Road- Brighouse	Operates hourly between 0800 and 1800	Operates hourly between 0800 and 1800	n/a
E3	Elland (Cathering Street)- Grasmere Drive Circular	Operates hourly between 0806 - 1515	n/a	n/a
E4	Elland- Little Bradley- West Vale Circular	Operates hourly between 0823- 1533	n/a	n/a
E5	Elland- Jagger Green	Services at 0944 and 1144 only	n/a	n/a
E6	Elland- Exley Circular	Services at 1355 and 1555 only	n/a	n/a
E7	Elland Catherine Street- Brooksbank School- Barkisland Shelter- Ripponden Brig Royd	Operates hourly between 0755 - 1819	n/a	n/a
E8	Brighouse- Elland (Huddersfield Road)- Barkisland	Operates hourly between 0732- 1733	n/a	n/a
E9	Elland- Rosemount	Services at 1424 and 1624 only	n/a	n/a

4.3.4 Weekday accessibility via bus to some areas would be considered adequate (Based on WYCA core network standards) but below desirable frequencies to many other areas. This is not unexpected considering the rural nature of many surrounding areas, with low population densities.

4.3.5 Main bus stops are located along Elland Riorges Link, Huddersfield Road, Catherine Street, Southgate and Dewsbury Road. As highlighted in Figure 101, some of these services can operate up to 6 times per hour. The latest running service through the week is the 501/503, which operates in Elland until 2230 hrs, leaving Halifax at 2215 hrs. The service operates two times per hour from 1915 onwards. This limited service would make it difficult for commuters outside Halifax or Huddersfield conurbation, for example those commuting to Leeds, Rochdale or Bradford.

4.3.6 The infrequency and early termination of the service would also make commuting via public transport difficult for shift workers in Halifax and Huddersfield. It should be noted that there are currently no bus services for workers commuting to the Industrial Estate to the north of the A692 Calderdale Way, where the new rail station is proposed.

4.3.7 There are a limited number of services operating in the Elland area during weekends, with only six services running on Saturday and three on Sunday. Frequency of these services is relatively poor, on Sundays as little as two services per hour run from Elland between 0700- 2230hrs, again making commuting for shift workers difficult.

4.3.8 Figure 102 shows the frequency of bus services operating in Elland, the data used is based on weekday (daytime) travel. This illustrates the highest frequency of bus services is located from Long Wall through to Southgate; this route offers over ten buses per hour. Sections of Victoria Road, the B6114 and A629 also offer a higher frequency of bus services, with between 5 and 10 buses per hour. However the highway network in the residential community of Elland, and even along arterial routes such as Dewsbury Road and Huddersfield Road, appear poorly served. This further emphasises the need for enhancements to public transport in Elland, particularly in eastern and northern Elland, where buses operate with a particularly low frequency.

Figure 102: Frequency of Buses in Elland

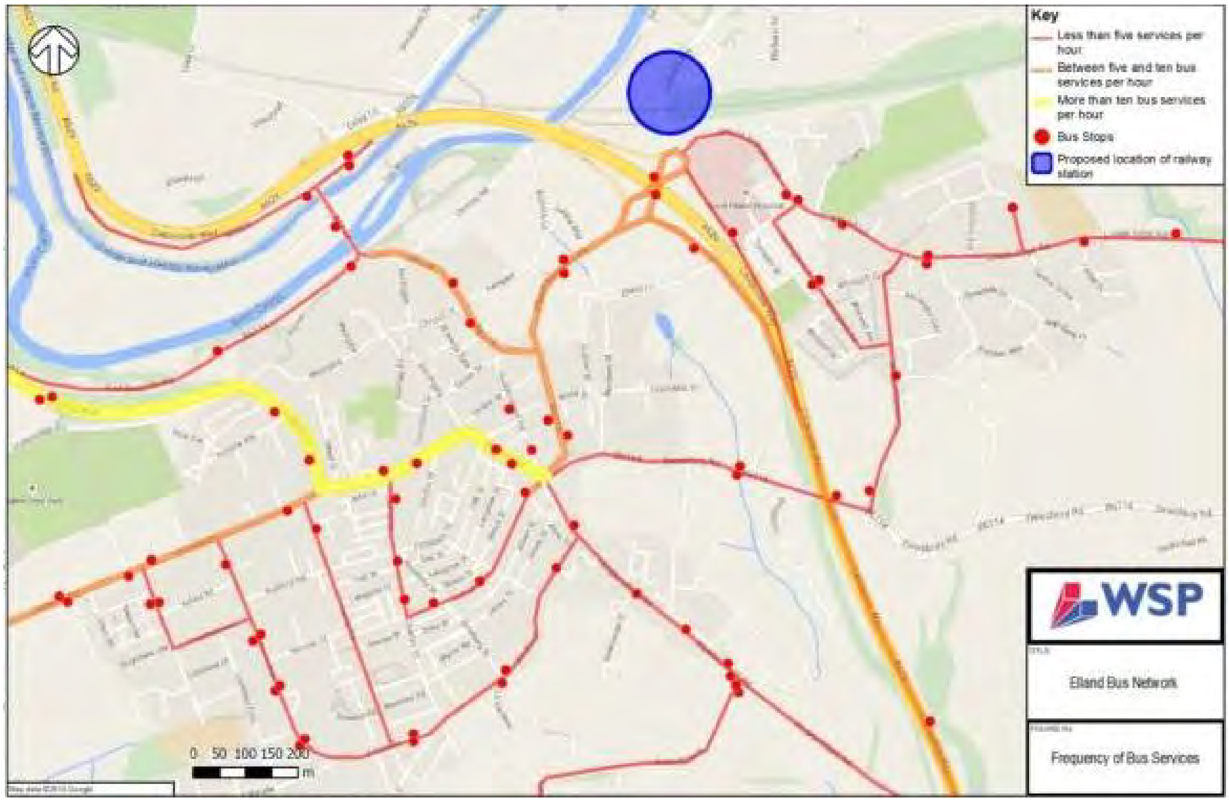
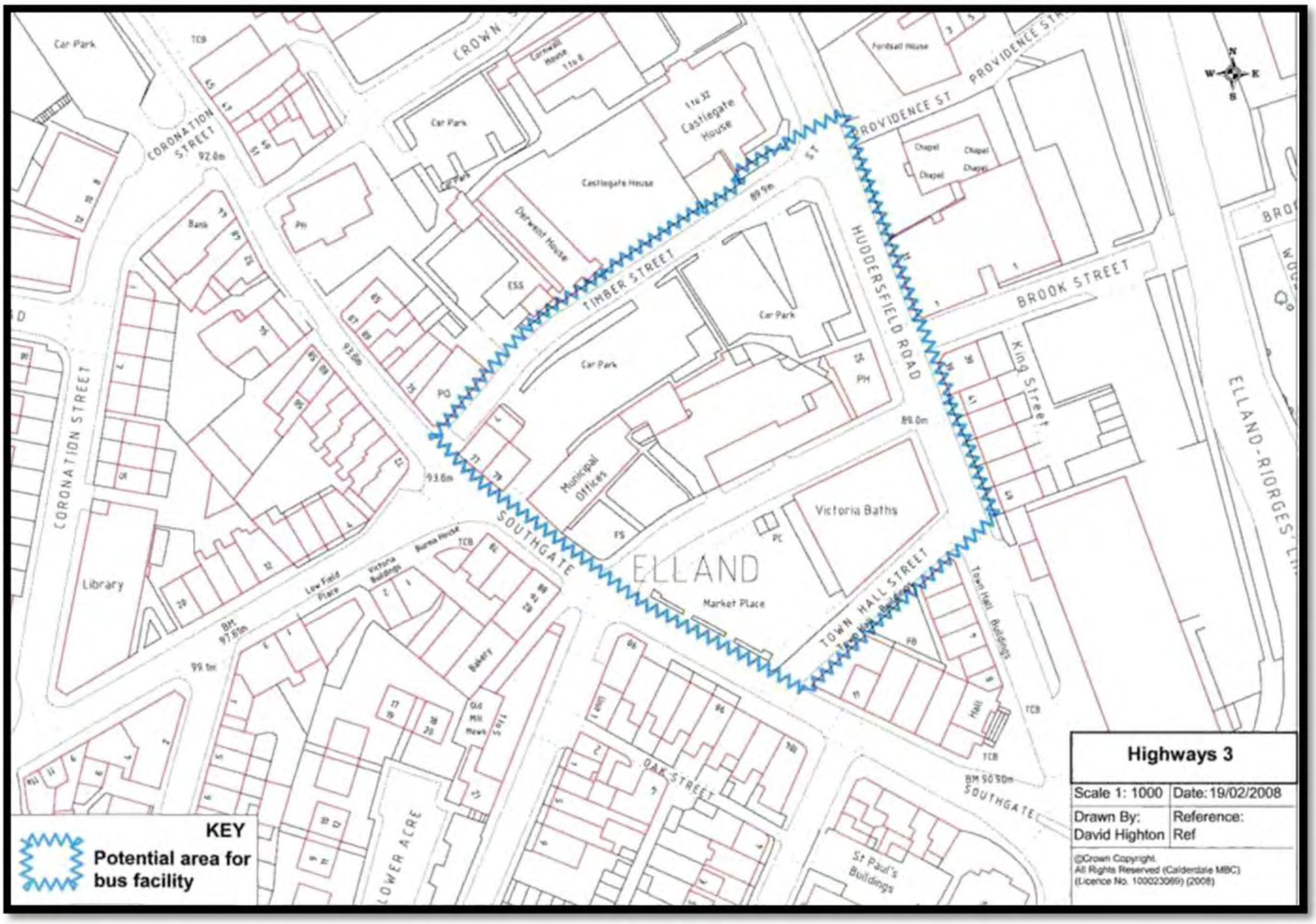


Figure 103: Frequency of Buses in north-eastern Elland

4.3.9 The Elland Supplementary Planning Document (SDP) discusses issues with public transport, proposing a central bus facility, in the area indicated in Figure 104.

4.3.10 Operating as a transport hub, this would provide a more convenient interchange for Elland Town Centre, and could allow for the removal of bus stops along Southgate, permitting a more efficient flow of traffic. The proposed location of the centralised bus stop would help to enhance the bus routes with the highest frequencies, however does not appear to aid problems with limited frequency to the north east of Elland.

Figure 104: Extract from the Elland SPD (indicative area for proposed bus facility)

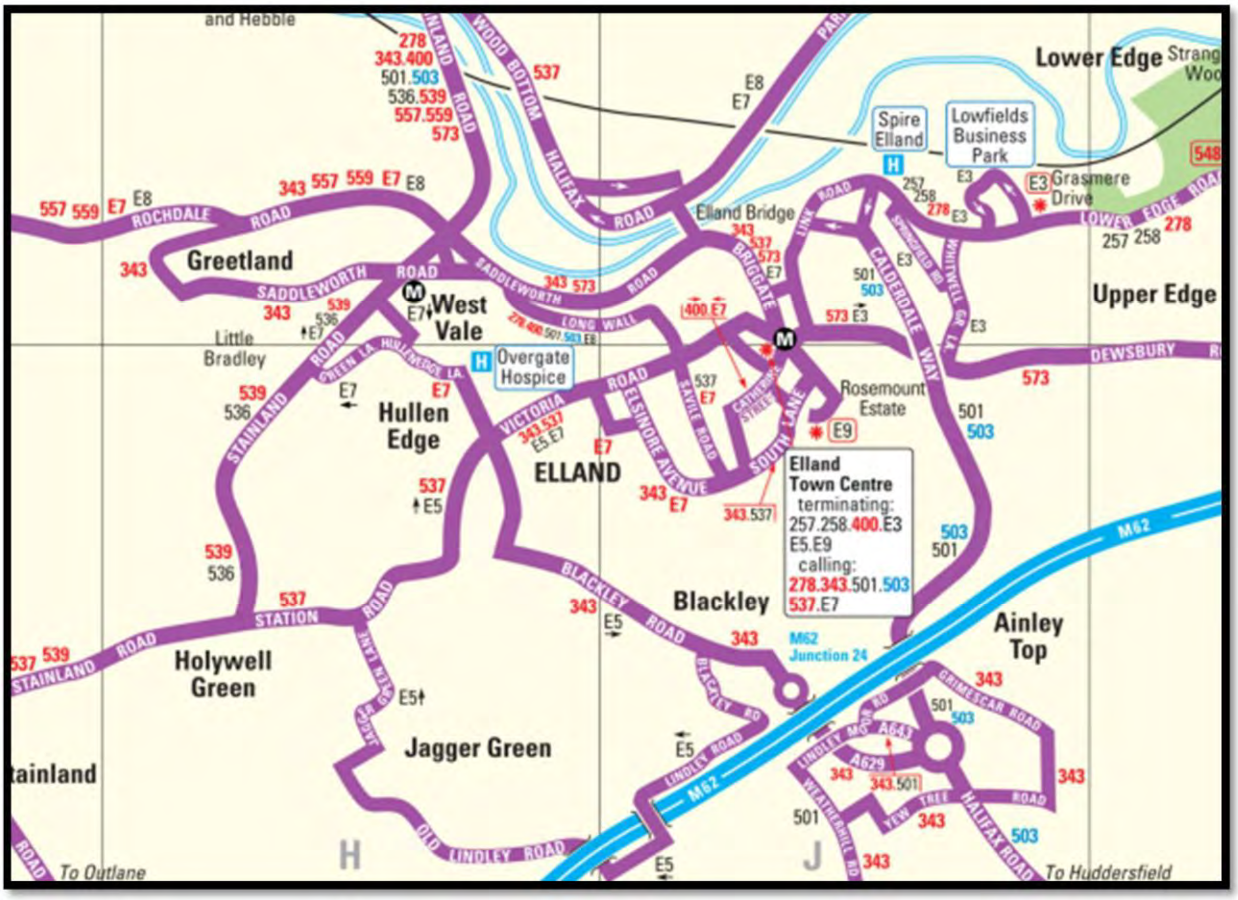


4.3.11 The exact location of a central bus facility, which would need to incorporate shelters, seating, stopping bays, and sufficient turning space would have to be agreed between the Council's Highways Department, the West Yorkshire Combined Authority, and local bus operators. It had previously been proposed to locate a bus facility along Timber Street, however, it was subsequently decided that this would present operational difficulties for bus operators.

The analysis of travel patterns and journeys to work by mode, presented earlier in this report, highlighted the role plays in journey making. The frequency and span of operation shown in this section illustrates why bus is a more practical option for certain journeys, particularly those to Huddersfield and Halifax where a good level os service is available. This is less so for longer journeys (e.g. Leeds) where rail would provide a far more effective option. Liaison with bus operators to identify where the bus is a good options should assist them in prioritising improvements on those services as part of an integrated network.

Figure 105 below is an extract of the Elland bus network, taken from the WYCA bus map of the Halifax Area.

Figure 105: Elland bus network



4.3.12 To make the information from Figure 105 more legible, WSP have constructed a series of maps which identify the main bus routes in Elland, these are summarised in Figures 106 – 110 below.

Figure 106: Grouped corridor (Long Wall/Victoria Road)

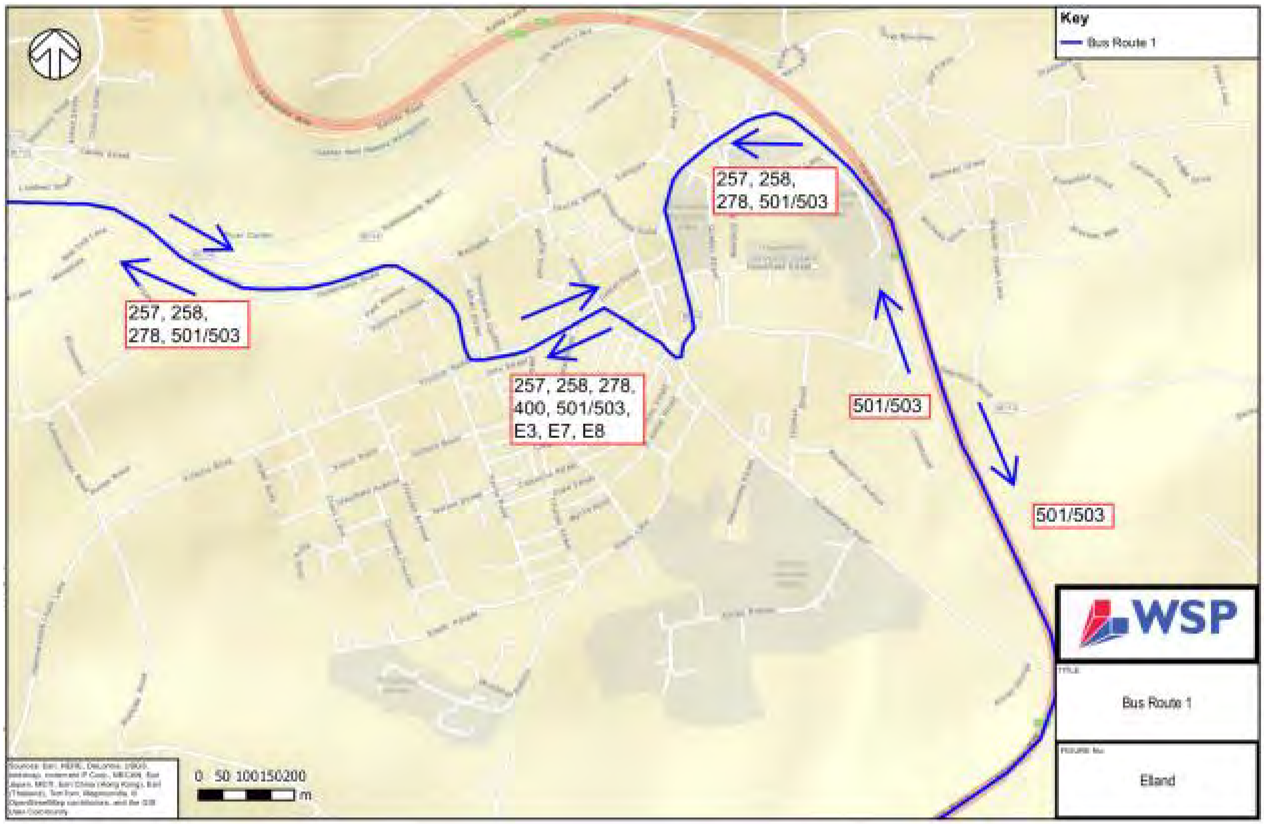


Figure 107: Grouped corridor (343/E7 loop)

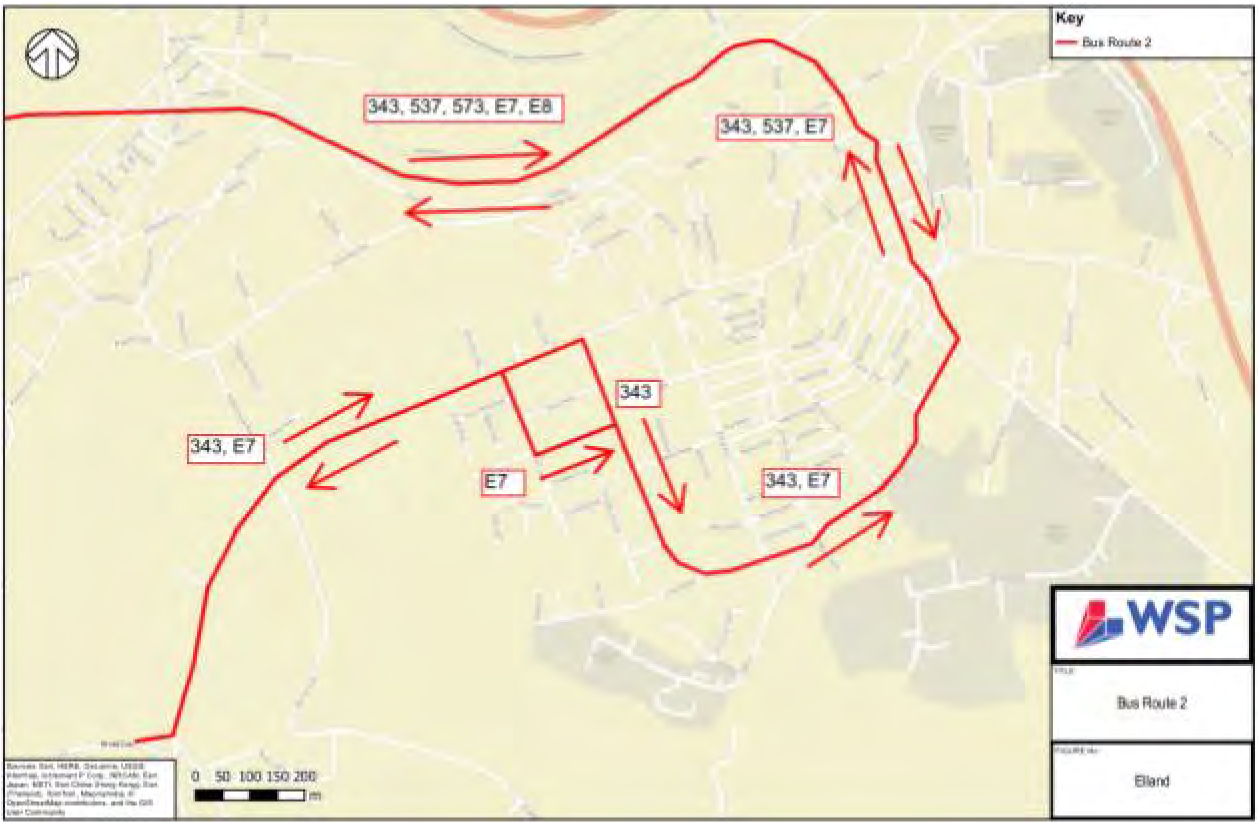


Figure 108: Grouped corridor (Long Wall/Huddersfield Road)

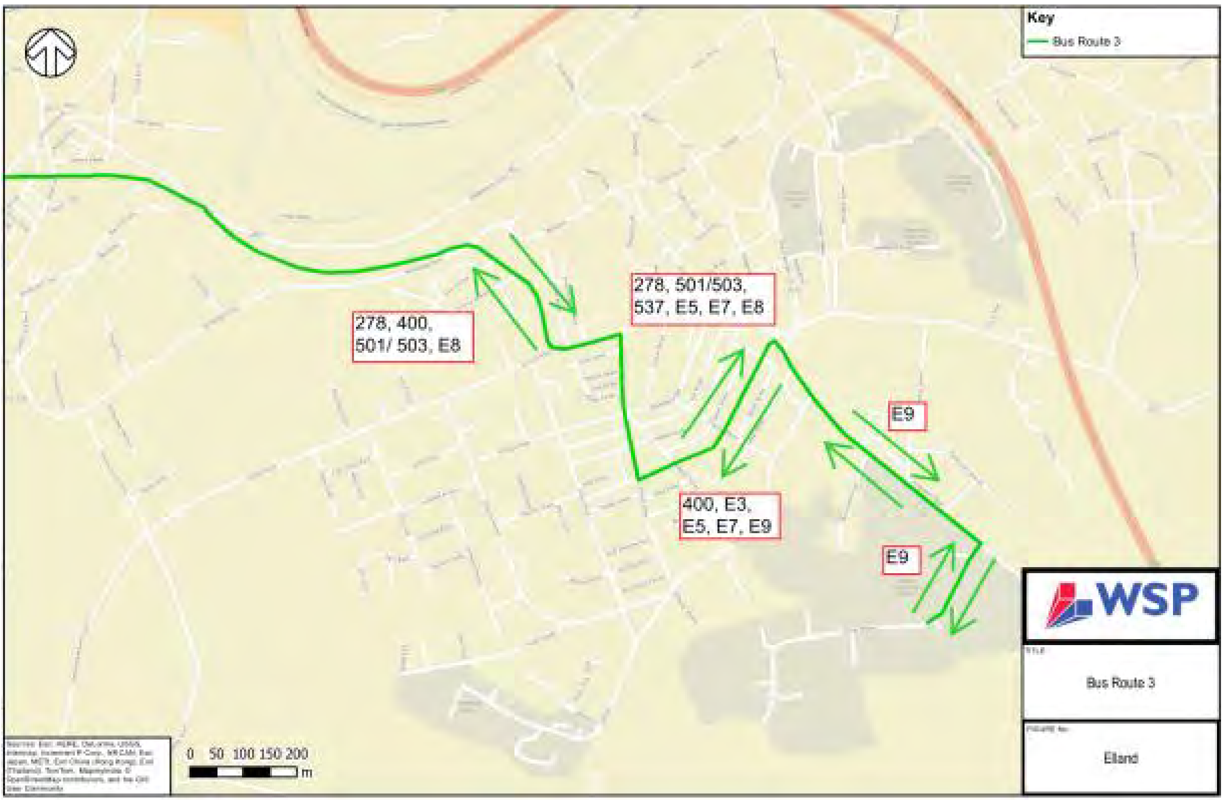
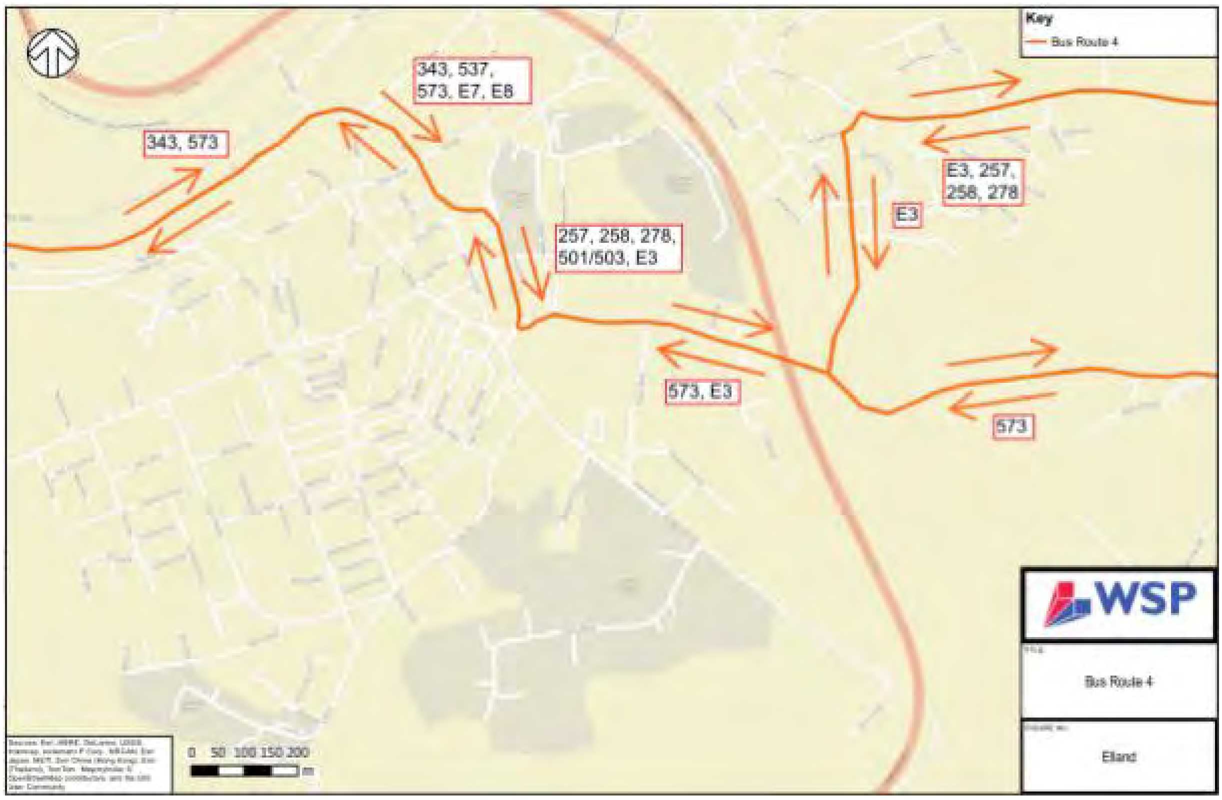


Figure 109: Grouped corridor (Long Wall/Elland Lane & Dewsbury Road)



5 Locational Constraints and Opportunities

5.1.1 There is an identified aspiration for a Rail Station in Elland, in order to provide a direct link from Elland to the regional and national rail network with a view to improving sustainable transport choices, widening opportunities through reduced travel times and direct connectivity and accommodating future growth.

5.1.2 The station is anticipated to reduce reliance on the private car and make Elland a more accessible and therefore attractive place for people to live, work in and visit in the future. Calderdale Council have identified an indicative site location and layout for the proposed station.

5.1.3 Figure 111 shows the site location. The site is ideally placed for pedestrian access to the Elland Bridge Riverside Park, Lowfields Business Park, and the Nu Swift site.

Figure 111: Proposed Station Location

However, the site does have a number of potential constraints that would need to be addressed if the objectives of a railway station are to be fully realised.

a. The station is outside the Town Centre and existing pedestrian links to the Town Centre are poor;

b. Current pedestrian access to the site is poor owing to the barrier created by the by-pass; unpleasant pathways along busy, high-speed roads; and inadequate quality of paving along the Wistons Lane route;

c. Current cycling access is poor due to a lack of infrastructure provision, throughout Elland and in this area particularly;

d. The enclosed location of the site, beyond a busy bypass, may make it difficult for rail users to find the Town Centre; and

e. The enclosed nature of the site may make it feel unsafe.

5.1.4 In order to accommodate these recognised negative attributes of the site, the following proposals have been made by Calderdale Council.

a. In order to integrate the site with the Town Centre, and other key locations, the pedestrian and cycling networks proposed in Chapter 4 should be implemented;

b. The site could also have park-and-ride facilities for motor vehicle users as well as a bus stop with services into the Town Centre. This would improve integration, and provide additional growth, in addition to addressing some of the parking capacity issues at adjacent stations (through re-assignment of trips);

c. The route into the site along Wistons Lane is considered to be the most appropriate means of pedestrian and cyclist access, owing to its proximity to the Park (Site 1.) This means of access should therefore be highlighted and promoted through the use of high quality and appropriate signs;

d. Future land uses should be allocated to maximise the use of sustainable modes, with those within walking and cycling distance of the station and higher frequency local bus services being prioritised. This may require the re-designation of some sites in the Local Plan;

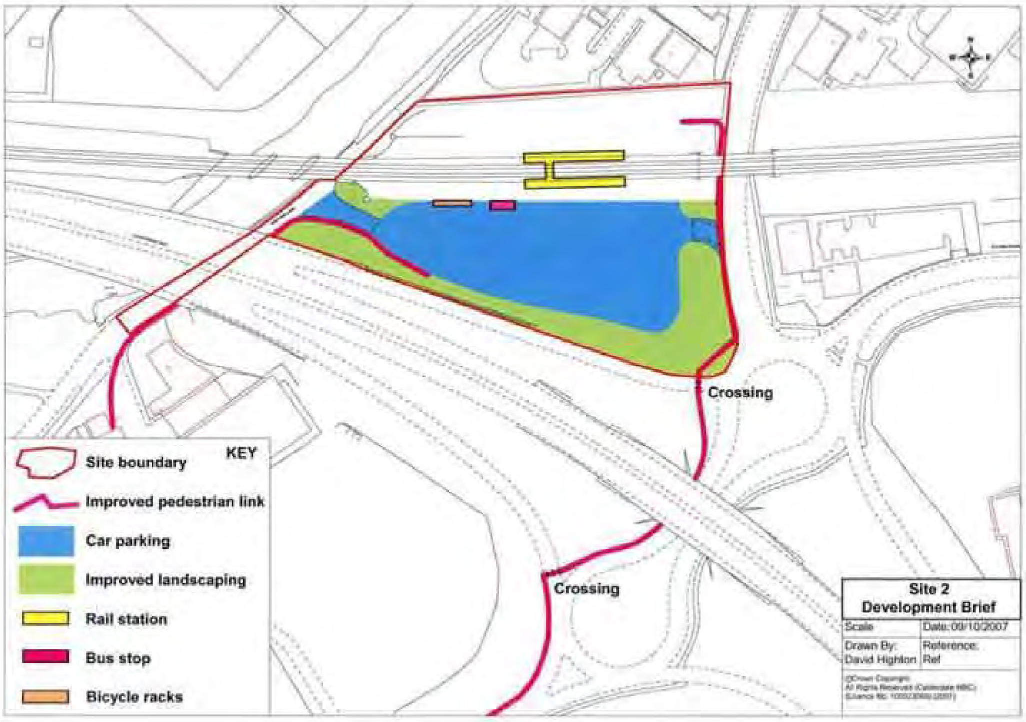
e. CCTV cameras could be located at strategic locations to enhance public safety and confidence in the proposed facility;

f. Owing to the views afforded by the landscape to the north of Elland, it is recommended that the station platforms and related structures be orientated in a manner that enhances visible permeability from the platforms;

g. The design of the station itself should utilise high quality materials and incorporate sustainable energy features, such as solar panels, wind turbines, and rain water collection technology where appropriate; and

h. Owing to the elevated position of the railway line, the built forms of the station could be designed such that they make a minimal impact on the landscape, particularly on the views to the north of Elland. Station buildings and structures should be as un-intrusive as possible and transparent construction materials should be considered.

Figure 112: Potential Development Diagram (proposed by Calderdale Council).



5.2 Park-and-Ride facility

5.2.1 An aspect of the station proposal considers the introduction of a rail park-and-ride facility. Park-and-ride is an effective way of helping to reduce traffic congestion and encourage the use of public transport by intercepting longer journeys that would otherwise be made by car.

5.2.2 If the park-and-ride facility at Elland had suitable capacity, it may encourage commuters from outside of Elland to choose to travel from Elland Station, due to the added convenience of parking capacity. This could help alleviate some of the constraints presented by growth in demand at adjacent stations such as Sowerby Bridge and Brighouse.

5.2.3 When considering the introduction of a park-and-ride, reference can be made to The Network Rail Guide to Station Planning and Design (2011) which provides guidance on the efficient integration of rail station parking. As detailed below, in order to optimise rail use, rail station parking should:

- be accessible via direct access to and from station thresholds, the same provision should be considered for taxi pick-up and drop-off points;
- incorporate short-term parking and ‘kiss and ride’ facilities; and
- be designed to minimise conflict between vehicles and pedestrians, locating parking provision for cycles, private cars, taxis and buses as close as possible to station entrances, in areas clearly marked out. This provision should not impinge on pedestrian movement and should not put pedestrians or other users at risk.

5.2.4 WSP have recently completed a study for WYCA of a number of station car park extensions where capacity has been exceeded, underpinning the evidence that rail park and ride can be a very attractive option for those that still need to use a car for at least part of their journey. Supressed demand exists at many stations where parking capacity is regularly exceeded.

5.3 Optimising revenue and generating opportunity

5.3.1 The Network Rail guidance also introduces design concepts to ‘Optimise revenue generating opportunities’, stating that, where appropriate, scheme promoters should consider opportunities to provide customer car parking. This is less of an issue for parking revenue at Elland, as parking is expected to be free of charge, but it does help to capture passenger revenue which may otherwise be lost should supressed demand be experienced.

5.3.2 It is also worth noting, however, that as described elsewhere in this report, Elland would attract demand from some other local stations where Elland provides a more convenient option. This would result in some demand (and revenue) abstraction, but this is not expected to be significant and would be fully quantified as part of the business case preparation for the station.

5.3.3 Figure 113 highlights the proposed station parking location, as proposed by Calderdale Council. However, there is also the opportunity to expand the proposed park-and-ride facility, and the diagram also shows the current brownfield land (industrial warehouse), and potential site for the expansion of the park-and-ride at Elland Station. Again, the added capacity of the proposed expansion may encourage commuters from outside Elland to use the Rail Station, optimising revenue at the station and reducing congestions elsewhere. As this report was being completed, there were understood to be some changes in land availability, and this would need to be updated as part of any subsequent business case compilation.

Figure 113: Indicative land for rail station parking

5.3.4 Figures 114 and 115 give an indication of the potential capacity at each parking facility. Figure 114 shows that if the car park proposed by Calderdale Council was used to full capacity, then it would be able to provide approximately 170 parking bays (+/- 50 parking bays). This estimation is based on optimum turning manoeuvres, and standard parking bay dimensions of 2.4m by 4.8m. However, the layout does not consider the provision of disabled parking bays (3.6m by 6m), taxi drop-off, cycle parking, or kiss-and-ride facilities. It is therefore unlikely that the design will be able to fully realise the calculated parking capacity within the land available.

5.3.5 Figure 115 shows the parking layout as designed for the approximated area of land available on the brownfield site. The estimation of parking within this area is based on optimum turning manoeuvres, and standard parking bay dimensions of 2.4m by 4.8m. The additional land would help provide up to 335 parking bays (+/- 50 parking bays). Calderdale Council's proposed site layout indicates that there would be pedestrian access provided to this parking facility, and therefore accessibility from the car park is already feasible.

5.3.6 The indicative parking figures suggest that, with the additional development of the brownfield site, there is the capacity to accommodate parking of up to 500 cars. This would provide the opportunity from numerous commuters from across Calderdale to conveniently access rail travel to key employment hubs such as Leeds and Manchester. This would help optimise revenue generated at the station and help mitigate problems associated with high levels of passenger growth at surrounding stations.

Figure 114: Indicative parking layout (option 1)

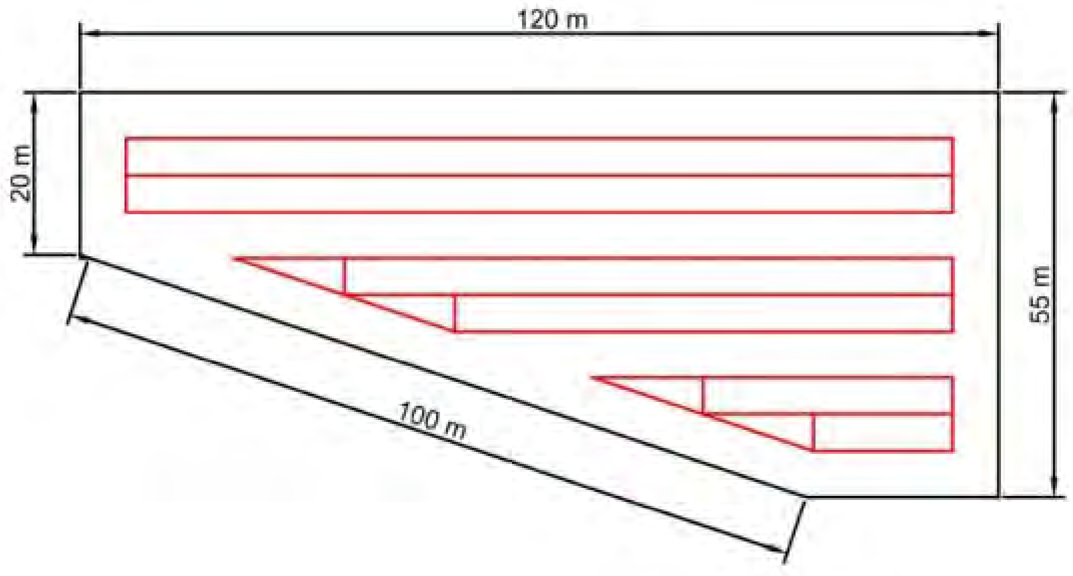
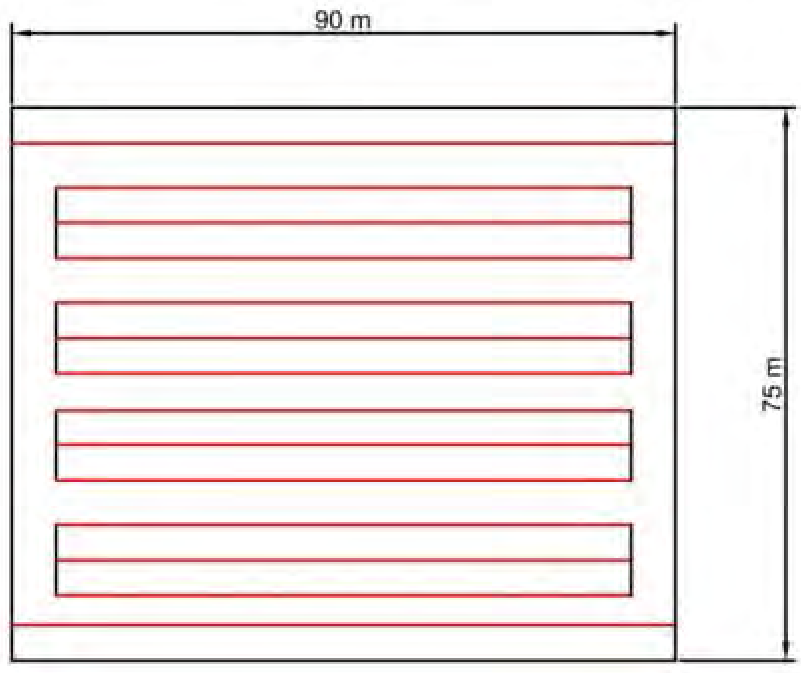


Figure 115: Indicative parking layout (option 2)



6 Summary, Conclusions and Next Steps

6.1 Summary of Analysis

6.1.1 This study provides a Transport Needs Assessment (TNA) for the area around Elland, setting out the current transport provision in the area and future needs, taking into account relevant influencing factors and considering all modes. The study also focuses on establishing whether there is a need for a new railway station at Elland, which is proposed to be located where the Calder Valley Line crosses Lowfields Way on a viaduct.

6.1.2 Influencing factors have included:

- The quantum and likely position of future land use development;
- The current and future performance of the relevant transport network;
- Current and future demographic trends; and
- Existing physical and/or infrastructure constraints. A link AADT stress map for the existing Elland local highway network was produced that showed no capacity issues for links on the local highway network.

6.1.3 Analysis of the current and future highway network has illustrated that, without intervention, there would be increasing congestion around the centre of Elland and on the A629, following future growth and planned developments being delivered. This is primarily caused by junction capacity, and would be most acute during morning and evening peak periods. This will impact on the ability of Elland to deliver its full potential as the network becomes more constrained.

6.1.4 In addition, on the wider strategic highway network, between junctions 24 and 29 of the M62, high traffic volumes of traffic exist on this section of the route with Junction 24, which leads on from Elland being one of the most congested junctions on the Leeds-Manchester M62 corridor.

6.1.5 Rail provision in the area suffers from a number of existing problems including slow journey times and a confusing service pattern and evidence of suppressed demand from several stations. Peak overcrowding to both Leeds and Manchester and poor modal integration and insufficient car parking are also reported. It is acknowledged that these issues must be addressed to accommodate the forecast growth in peak passenger rates, and for any proposed enhancement of the line.

6.1.6 The committed northern hub improvements impacting upon the Calder Valley Line will help increase the capacity of rail services operating between Leeds, Manchester and other key centres. This will provide opportunities to introduce further rail services or stations across the Calder Valley Line and the WY+TF acknowledges this with additional funding proposed for incremental improvements.

6.1.7 From an economic perspective, a number of studies[13] have highlighted the importance of better strategic connectivity for Elland to the future resilience of the area. Connecting to employment outside of the borough and attracting inward investment is vital to sustaining and growing Calderdale's local economy and providing stability for the growing population. The social demographic of Elland with several deprived communities and some areas which show a high percentage of households in social rented housing, makes public transport connectivity more important, as these households are less likely to have access to a car.

[13] Oxford Economics, Ekosgen and Steer Davis Gleave (all 2009)

6.1.8 These reports also complement the analysis undertaken for this TNA study, highlighting that Calderdale's existing highway network was at capacity and that future housing and employment growth must be met by better utilisation of public transport assets because of the high proportion of inbound labour to meet the economy's needs, and the need to accommodate greater outward labour mobility. Further work by Arup, commissioned by Calderdale Council, showed an exigent need for continued investment in rail with The Calder Valley Line being highlighted as being key to servicing Calderdale's unique employment market, supporting economic growth and Calderdale's financial and manufacturing sectors.

6.1.9 More recently, the Electrification Task Force, established by The Secretary of State for Transport to provide advice on the next steps for electrification in the North of England, concluded in March 2015 that the Calder Valley Line should become the top priority for electrification. This was a result of it presenting the greatest economic benefits (both in terms of direct economics such as cost savings and revenue generation and also wider benefits). It also delivers improvements in rolling stock quality and capacity, both acknowledged as particular problems on this line and the Task Force report sets out how schemes could be brought forward and their development accelerated. The improved performance offered by electric traction may also allow station stops to be accommodated in running timetables, where previously the diesel traction being used would not.

6.1.10 As well as supporting Calderdale's local economy, the Calder Valley Line may aid in providing sources of employment to those who work outside of Elland. Almost 80% of the working population in Elland source employment outside the immediate area. The Calder Valley Line would provide a direct transport link to sources of employment in key economic hubs such as Leeds and Manchester; and as well as supporting job generation Elland through improved inbound connectivity.

6.1.11 The Leeds City Region (LCR) Urban Dynamic Model has indicated the scale and distribution of locations where future employment growth would be constrained because of rising transport costs such as public transport fares, highway congestion and rail crowding. The findings demonstrated there would be a reduction in the size of labour pools for employers in West Yorkshire and York to recruit from, a reduction in the number of accessible jobs for commuters in West Yorkshire and there would be rising costs and reduced productivity for business.

6.1.12 Outside the LCR there are significant employment opportunities also being presented by areas to the south west of Calderdale in Manchester, where the need for skilled workers and graduates has been highlighted. This is already observed, with current defined trip making to adjacent urban centres including Leeds, Manchester and Bradford.

6.1.13 Current trip making by public transport unsurprisingly reflects the current network provision, with bus use largely focussed on local trips and those to Halifax, Sowerby Bridge and areas surrounding Huddersfield. The focus on trips by private car to these destinations also suggests potential for growth in bus use on these corridors. The weekday daytime network frequencies appear to be sufficient on core corridors, but outside core times, at weekends and evenings particularly, this is not the case and may be the reason for this being a less attractive option, or even unviable, for those needing more flexibility. The development of a central bus hub in Elland would provide better integration between services and make the presence of buses more prominent.

6.1.14 Of the rail trips made, these journeys do not appear to take any particular patterns. This is likely to be related to the fact that Elland does not have its own rail station, and commuters would have to travel to a nearby train station and commute by an additional mode of transport to get into Elland, supressing the likely level of demand. What is apparent however is that the number of outbound trips made by train is double that of inbound trips suggesting that the outbound market is likely to be larger. Longer distance destinations by rail are also more prevalent (more than 90%) and when looking at trips by all modes from Elland, Leeds is a significant destination, and particularly prominent in the 35 to 49 year bracket.

6.2 Conclusions

6.2.1 Qualitative evidence demonstrates the need for better local and strategic connectivity to and from Elland in order to facilitate the future aspirations for growth, and also to ensure that education and employment opportunities available outside the immediate Elland area are accessible to a wider range of residents. This mobility is also important to ensure the wider Leeds and Manchester City regions can get access to a sufficiently skilled and diverse labour pool. Access by road is not going to provide a longer term sustainable solution because of the limited capacity and issues that increased use would bring.

6.2.2 Quantitative evidence also demonstrates that many parts of the existing transport network are at, or close to, capacity, including the local highway network (local junctions and links to the M62) and the surrounding strategic highway network. The level of growth forecast in the Local Plan is likely to result in ongoing congestion, particularly during peak hours, increased cost to business, and associated problems including poor air quality and detriment to quality of life. The rail services on the Calder Valley Line have been observed to be sub-standard and overcrowding occurs at stations close to Elland (both on the stations and at car parks, etc.).

6.2.3 Improvements proposed to the highway network (both local and strategic) and rail system (through Northern Hub and associated programmes) will go some way to mitigating some of the impacts of growth, but many only deal with problems that exist today and do little to accommodate future growth. The Northern Hub improvements, when supplemented by WY+TF investment and rolling stock improvements and the potential for electrification, may provide the opportunity to introduce an additional station at Elland, where this is not currently deemed to be deliverable because of existing network constraints.

6.2.4 Trip making patterns suggest that sustainable travel options to local destinations such as Huddersfield and Halifax (including intermediate points) may be best delivered by improvements to bus services, whilst longer distance travel to Leeds, Bradford and Manchester would be better serviced by rail, with a new station at Elland. In addition to those within walking or cycling distance to the station, provision of sufficient car parking at the station would also provide the opportunity to intercept longer distance trips by car to remove them from the network.

6.2.5 Local Plan land allocation options that favour an approach which is centric to a sustainable travel network will produce a longer term benefit, in terms of accommodating growth in a sustainable way, and supporting a transport network that requires a lower level of public subsidy. This may require reconsideration of land allocations in the context of a rail station at Elland.

6.2.6 In support of the Government's approach, there is a large body of evidence, including work undertaken for the HS2 proposals, and at a more local level, studies for the Centre for Cities, ATOC and PTEG that supports the role of the railways in securing economic growth. Each highlights the benefits that improved rail links can provide to economic regeneration, quality of life and business activity. Benefits from improved rail services include a number of aspects:

- Reduced journey times allow passengers to use the time saved more productively;
- Businesses becoming become more productive by accessing a larger pool of labour and choice of suppliers and through increased exposure to competition;
- Cities and towns becoming better connected to each other and their wider outlying economies; and
- Local residents' ability to tap into higher wages and new employment opportunities that new journey opportunities will introduce.

6.2.7 The potential development of a rail station at Elland provides the opportunity for rail journeys to be made using the station both as an origin, but also a key employment destination as the location is surrounded by existing and potential employment sites.

6.3 Next Steps

6.3.1 Whilst this Transport Needs Assessment study clearly sets out current transport conditions in and around Elland, and starts to set out the way the area is expected to change in the future, there are a number of future conditions that are not yet fixed. The future demand for travel is estimated in outline, but this would need to be set out in a more quantified and targeted way in order to establish potential demand for a rail station at Elland. It also provides the opportunity to positively influence change to create the right conditions for sustainable travel options (e.g. by favouring development locations close to the public transport network, or transport hubs).

6.3.2 In physical terms there appears to be a suitable location for a rail station, including arrangements for access and car parking, but again, this would need to be explored in greater detail in order to give confidence and more clearly defined costs for construction. From a rail operational perspective, the ability to accommodate an additional station stop at Elland would need to be demonstrated, taking into account the proposed future timetable state, following Northern Hub completion. At this stage, this timetable is yet to be fixed, along with the actual impact and extent of electrification.

6.3.3 Clear links between modes need to be established, with an improved and more clearly defined walking and cycling network linking into bus and rail hubs, with associated infrastructure in place (cycle parking, signage, lighting, etc.). This sustainable network can then be clearly promoted to raise awareness and increase its use.

6.3.4 For the station itself, an Outline Transport Business Case would be required, to produce bottom-up forecasts of demand at a new station, which reflects the detailed location of housing and businesses around the proposed station site and the patterns of rail trip making from a range of analogous stations. These forecasts should reflect the vision for the station, including a park and ride role for both short and long distance trip making as well as originating trips from a significant catchment within walking distance.

6.3.5 In addition, secondary modelling will identify impacts to existing users of the route through use of the rail industry MOIRA model, with outputs adjusted at flow level in a spreadsheet to reflect local factors and compensate for known problems with MOIRA.

6.3.6 The business case should also reflect current views of growth trends with an allowance included for committed investment on the route including quality improvements. The vision for the route is that it will become a second Trans-Pennine route between the Leeds and Manchester City Regions, thus including an expectation that higher quality rolling stock will be gradually introduced raising passenger perception of rail service quality. The methodology should be guided by the PDFH and more recent ATOC PDFC research in applying service quality uplifts, minded that new stations and major service uplifts deliver greater demand uplift than the PDFH recommended values often suggest.

6.3.7 On the cost side, the practical ability to deliver the station should be assessed in greater detail, including the physical layout of the station platforms and associated infrastructure (passenger facilities, access ramps/lifts, car parking, etc.).

6.3.8 On balance, and to ensure validation against the existing demand performance at stations elsewhere in the Leeds and Manchester City Region during recent economic growth should be completed, benchmarking the forecast demand for a station at Elland against similar sized stations serving conurbations already on the network.

Appendices

Appendix A: Flow Data Summary by Method of Travel to Work

INBOUND	All MTW	WFH	Underground	Train	Bus	Taxi	Motorcycle	Car or Van	Passenger	Bicycle	On foot	Other
Totals	7298	0	1	32	484	38	86	5312	586	88	662	9
% Mode Share	100	0.0	0.0	0.4	6.6	0.5	1.2	72.8	8.0	1.2	9.1	0.1

OUTBOUND	All MTW	WFH	Underground	Train	Bus	Taxi	Motorcycle	Car or Van	Passenger	Bicycle	On foot	Other
Totals	3994	0	4	64	391	19	41	2587	258	47	578	5
% Mode Share	100	0.0	0.1	1.6	9.8	0.5	1.0	64.8	6.5	1.2	14.5	0.1

Appendix B: Flow Data Summary by Age Category

INBOUND	Aged 16 and over (Total Trips)	Aged 16 to 24	Aged 25 to 34	Aged 35 to 49	Aged 50 to 64	Aged 65 to 74	Aged 75 and above
Totals	7298	935	1489	2766	1913	170	25
% Mode Share	100	12.8	20.4	37.9	26.2	2.3	0.3

OUTBOUND	Aged 16 and over (Total Trips)	Aged 16 to 24	Aged 25 to 34	Aged 35 to 49	Aged 50 to 64	Aged 65 to 74	Aged 75 and above
Totals	3994	542	850	1552	956	84	10
% Mode Share	100	13.6	21.3	38.9	23.9	2.1	0.3

Appendix C: Internal Trips (Movement within MSOA containing Elland)

INTERNAL TRIPS	Number Trips	% Internal Trips	% of all outbound trips (by mode)	% of all inbound trips (by mode)
All Modes	866	100%	21.7%	11.9%
Non-Car	463	53.5%	42.7%	36.5%
Bus	22	2.5%	5.6%	4.5%
Train	6	0.7%	9.4%	18.8%
Bicycle	6	0.7%	12.8%	6.8%
On Foot	429	49.5%	74.2%	64.8%

Appendix D: Proportion of trips from certain distance from Elland and mode share

OUTBOUND	Number of Destination MSOAs	Number Trips all distances	Number Destination MSOAs within 25km	Number Trips within 25km	% Trips within 25km (by mode)	Number Destination MSOAs within 40km	Number Trips within 40km	% Trips within 40km (by mode)
All Modes	378	**3994**	184	3712	92.9%	269	3860	96.6%
Non-Car	105	**1084**	73	1043	96.2%	83	1056	97.4%
Bus	62	**391**	51	379	96.9%	56	384	98.2%
Train	30	**64**	19	50	78.1%	24	58	90.6%
Bicycle	19	**47**	18	45	95.7%	18	45	95.7%
On Foot	41	**578**	34	569	98.4%	34	569	98.4%

INBOUND	Number of Origin MSOAs	Number Trips all distances	Number Origin MSOAs within 25km	Number Trips within 25km	% Trips within 25km (by mode)	Number Origin MSOAs within 40km	Number Trips within 40km	% Trips within 40km (by mode)
All Modes	623	**7298**	242	6743	92.4%	382	6999	95.9%
Non-Car	119	**1267**	102	1250	98.7%	107	1255	99.1%
Bus	90	**484**	85	479	99.0%	86	480	99.2%
Train	25	**32**	19	26	81.3%	21	28	87.5%
Bicycle	44	**88**	41	85	96.6%	42	86	97.7%
On Foot	48	**662**	46	660	99.7%	47	661	99.8%

Appendix E: Travel to Work Flow Data by Age

Internal Trips

INTERNAL TRIPS	Number Trips	% Internal Trips	% of all outbound trips (by age)	% of all inbound trips (by age)
All Modes	866	100%	21.7%	11.9%
Aged 16 to 24	119	13.7%	22.0%	12.7%
Aged 25 to 34	171	19.7%	20.0%	11.5%
Aged 35 to 49	341	39.4%	22.0%	12.3%
Aged 50 to 64	205	23.7%	21.4%	10.7%
Aged 65 and above	30	3.5%	31.9%	15.4%

Proportion of trips from certain distance from Elland and age category share

OUTBOUND	Number of Destination MSOAs	Number Trips all distances	Number Destination MSOAs within 25km	Number Trips within 25km	% Trips within 25km (by age)
All Ages	378	**3994**	184	3712	92.9%
Aged 16 to 24	105	**542**	73	505	93.2%
Aged 25 to 34	181	**850**	119	777	91.4%
Aged 35 to 49	222	**1552**	139	1444	93.0%
Aged 50 to 64	171	**956**	118	896	93.7%
Aged 65 and above	40	**94**	36	90	95.7%

INBOUND	Number of Origin MSOAs	Number Trips all distances	Number Origin MSOAs within 25km	Number Trips within 25km	% Trips within 25km (by mode)
All Ages	623	**7298**	242	6743	92.4%
Aged 16 to 24	160	**935**	122	895	95.7%
Aged 25 to 34	273	**1489**	173	874	58.7%
Aged 35 to 49	389	**2766**	198	2525	91.3%
Aged 50 to 64	306	**1913**	173	1757	91.8%
Aged 65 and above	80	**195**	74	188	96.4%

Appendix F: Development Impacts, Demographic Analysis and Mapping Figures

Figure 14 - Extract of Figure 5.2 of the Calderdale Core Strategy Transport Study, showing Base Traffic Flow AM

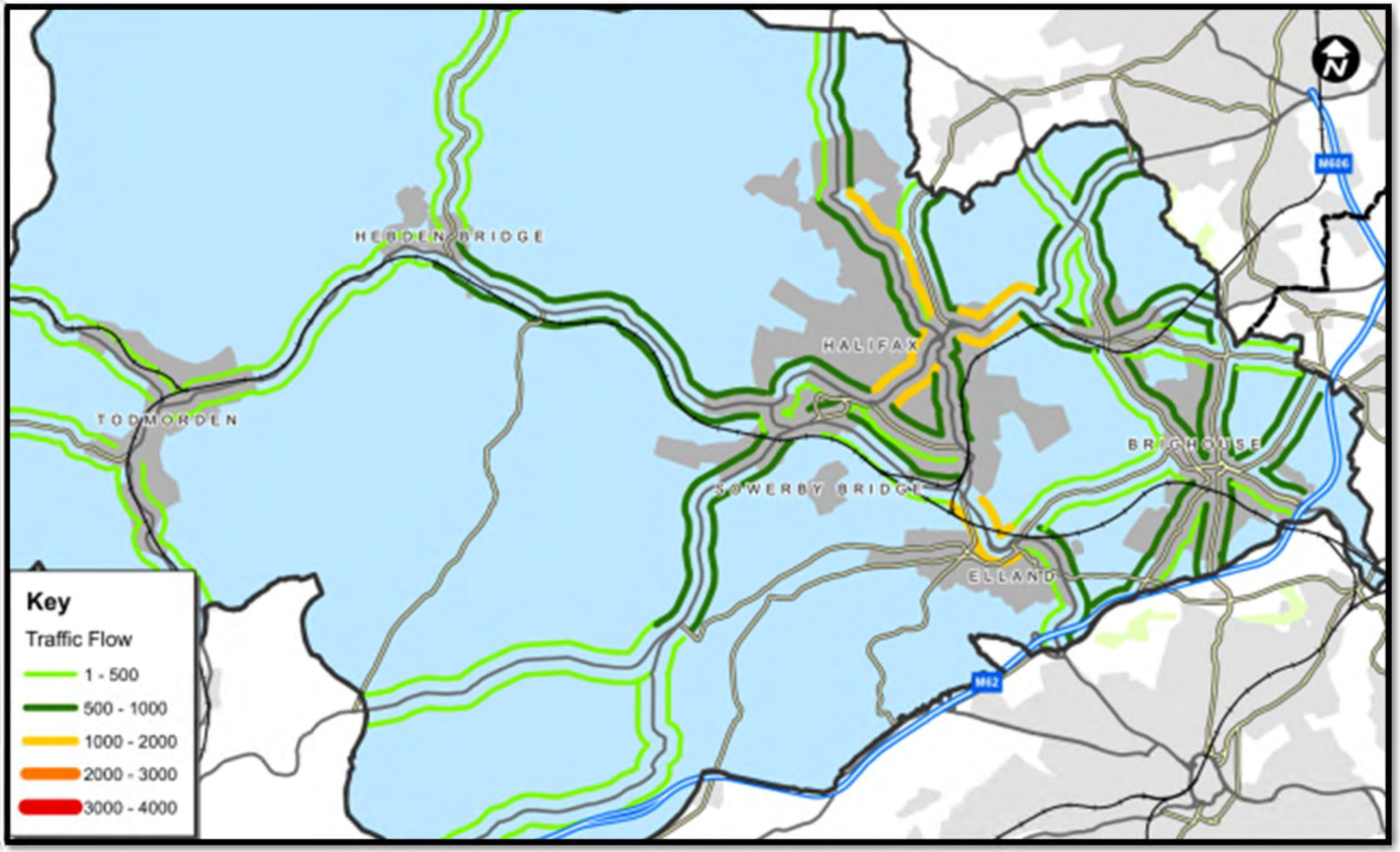


Figure 15 - Extract of Figure 5.2 of the Calderdale Core Strategy Transport Study, showing Base Traffic Flow PM

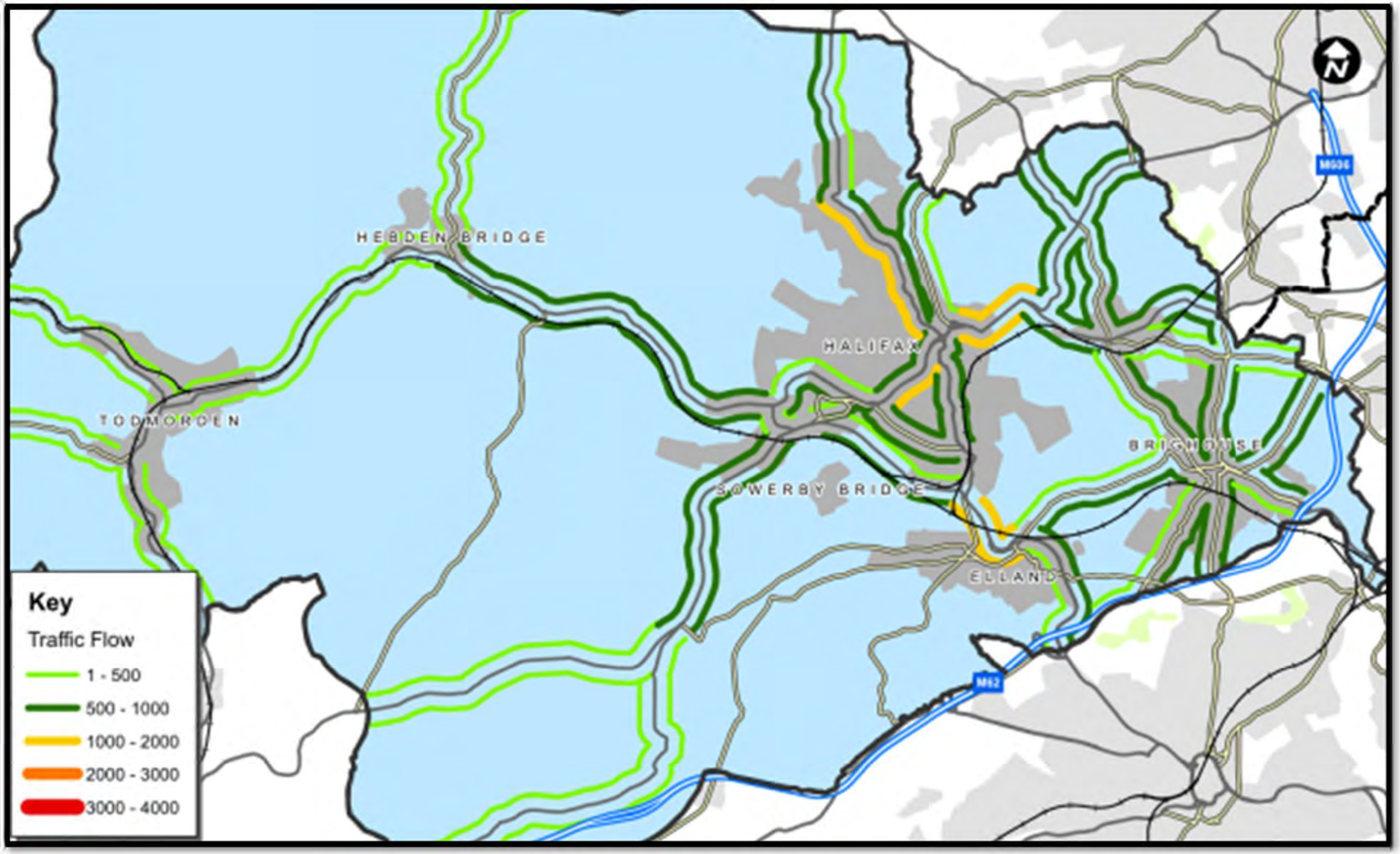


Figure 16 - LDF Traffic Demand - Approach 1 (AM Peak)

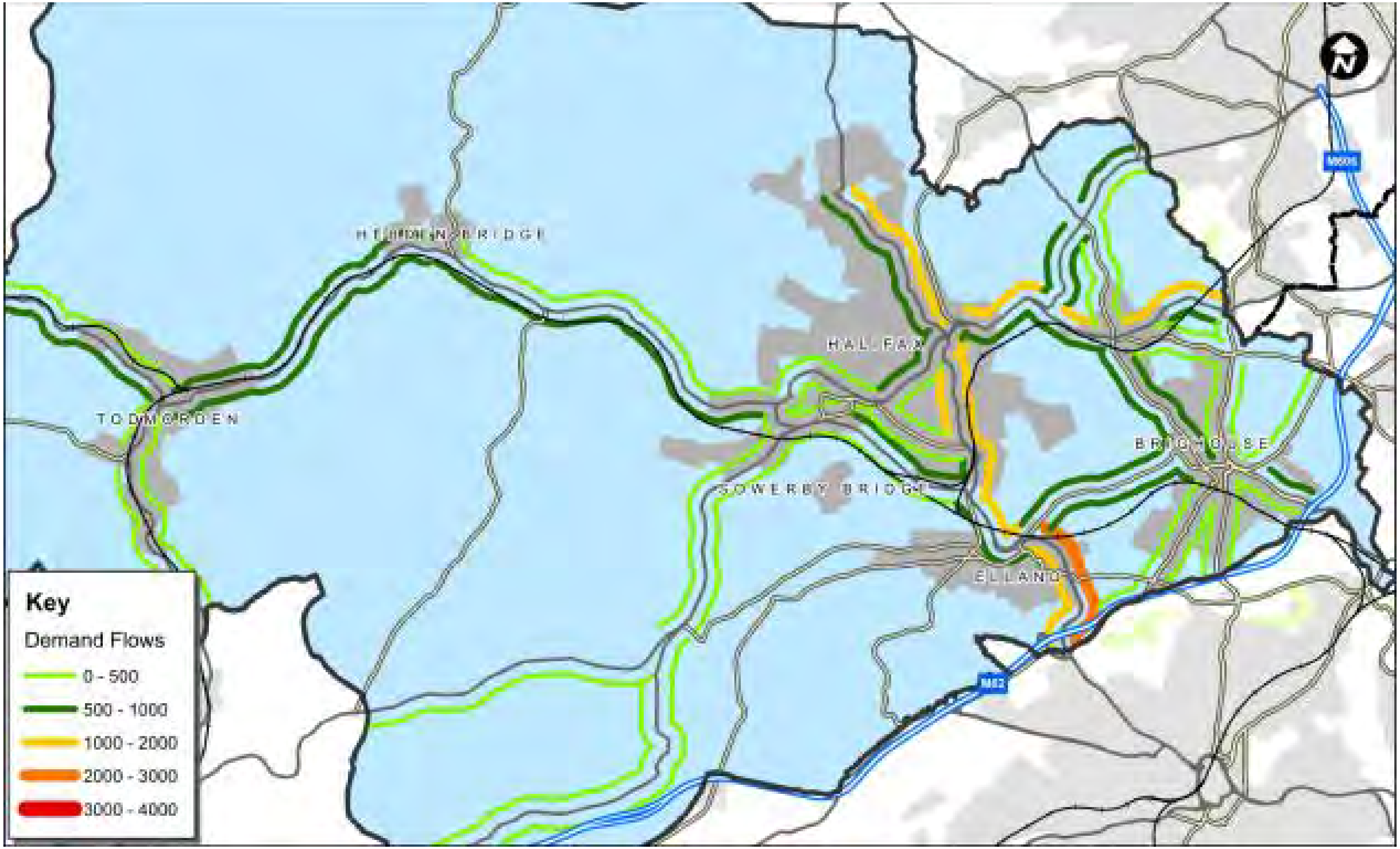


Figure 17 - LDF Traffic Demand - Approach 1 (PM Peak)

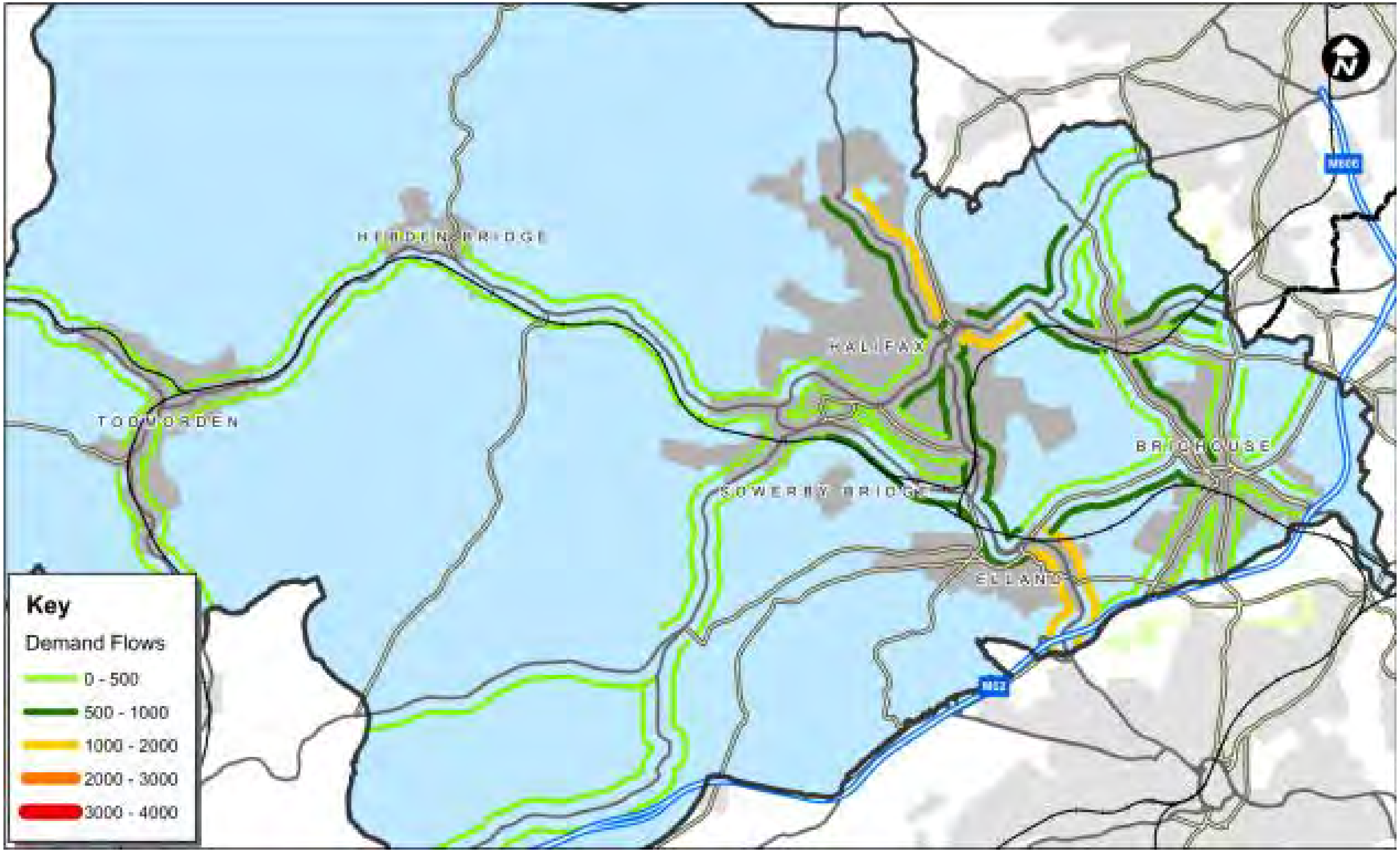


Figure 18 - LDF Traffic Demand - Approach 2 (AM Peak)

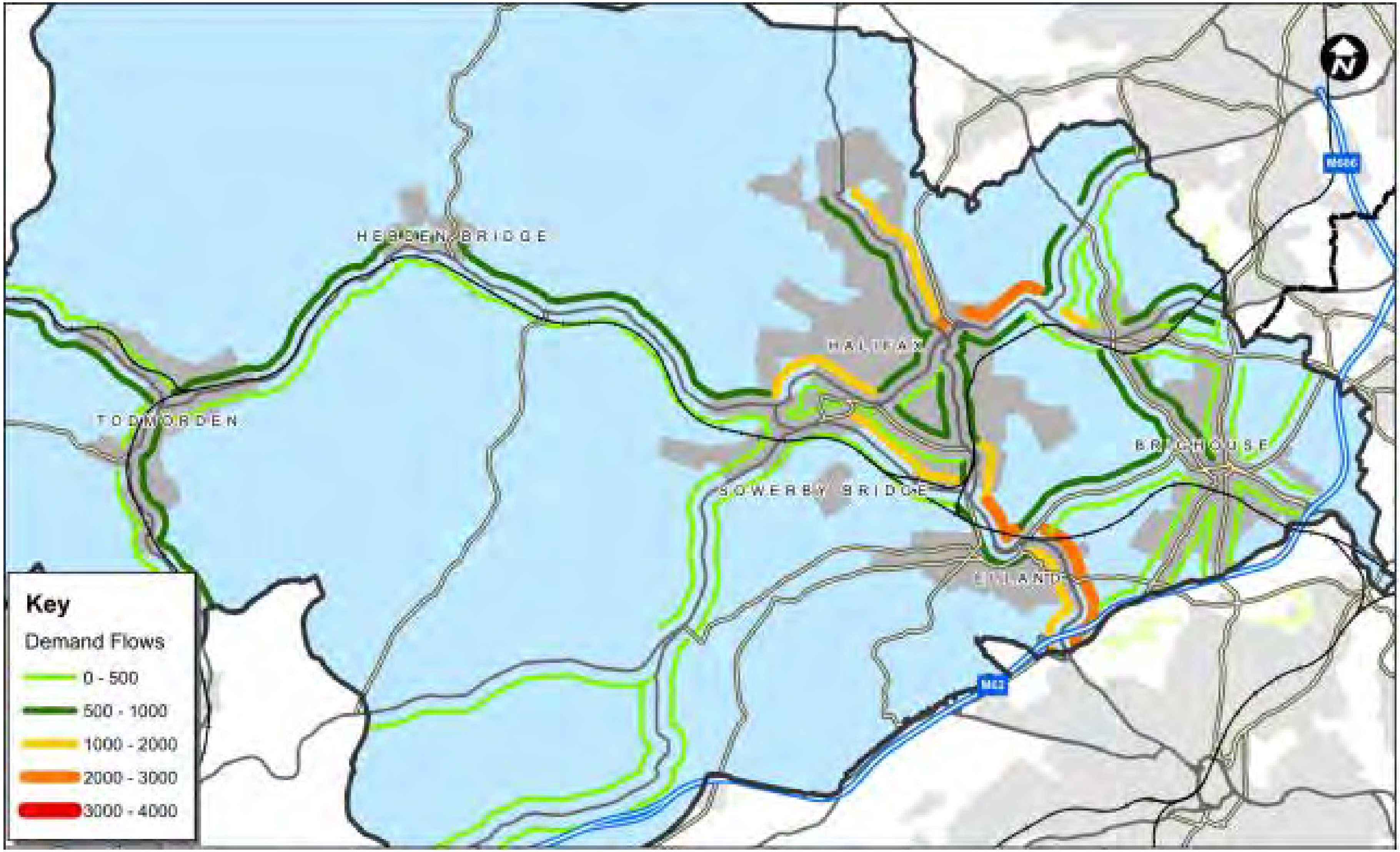


Figure 19 - LDF Traffic Demand - Approach 2 (PM Peak)

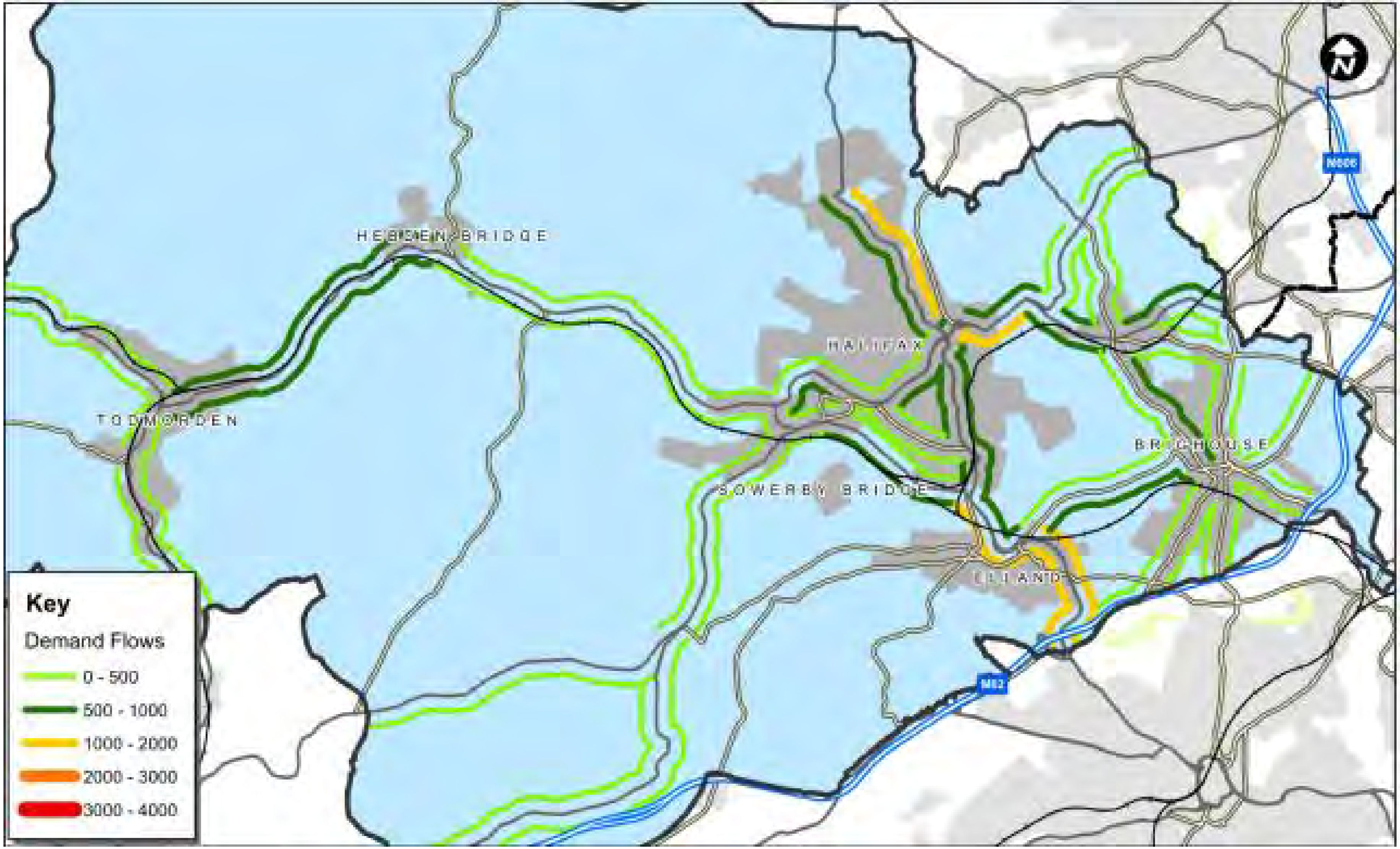


Figure 20 - LDF Traffic Demand - Approach 3 (AM Peak)

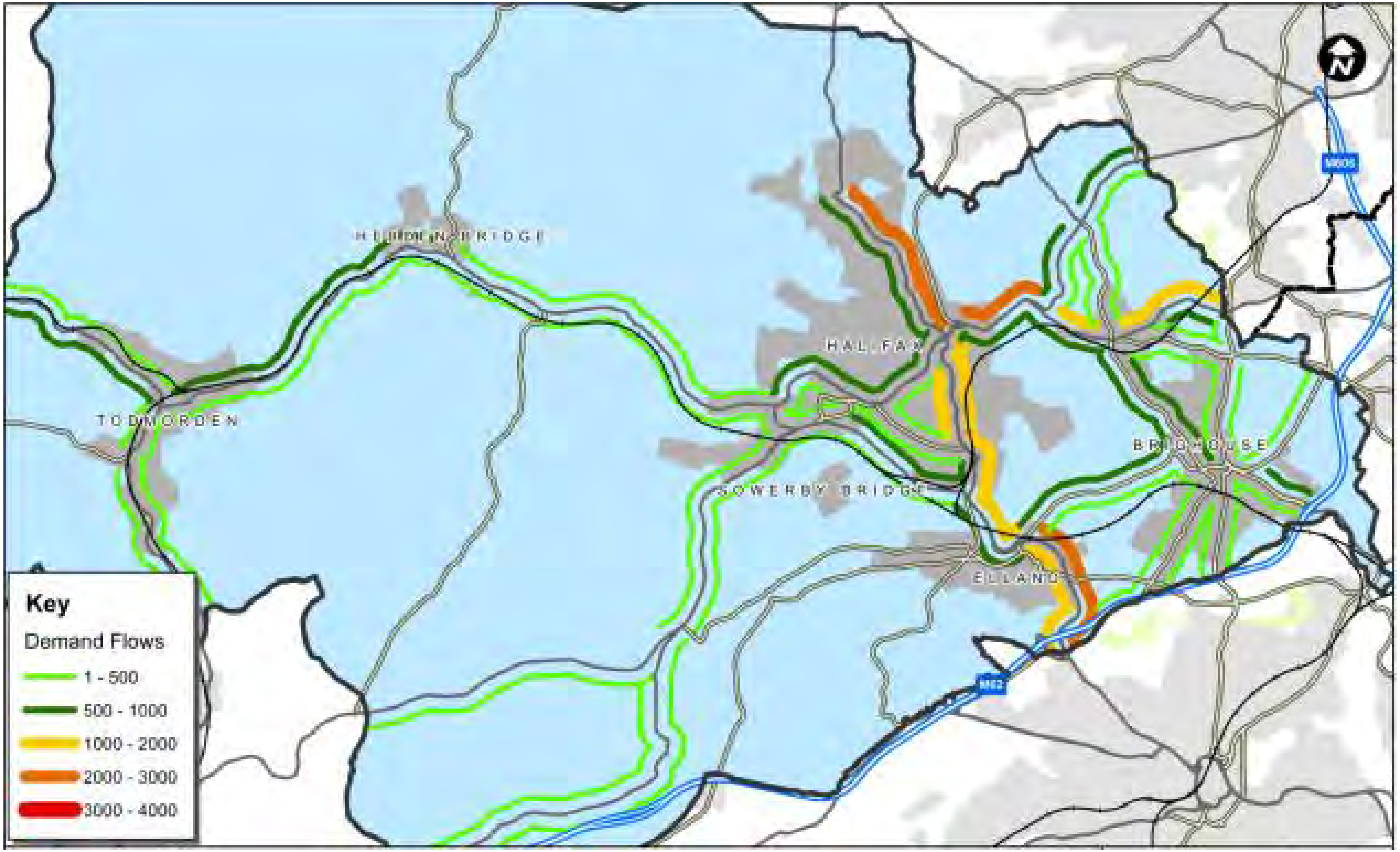


Figure 21 - Traffic Demand - Approach 3 (PM Peak)

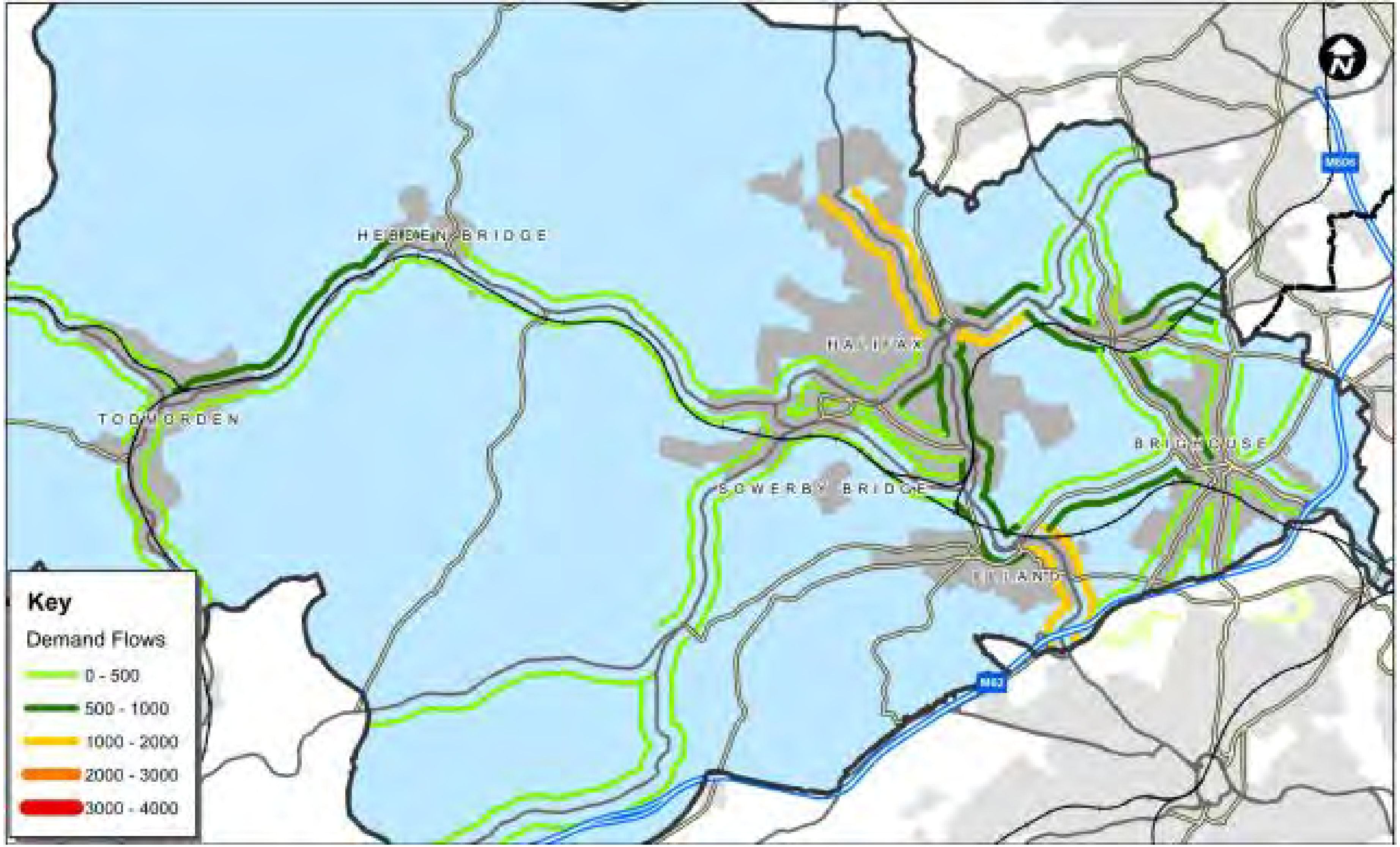


Figure 22 - Base + Additional LDF Traffic Demand - Approach 1 (AM Peak)

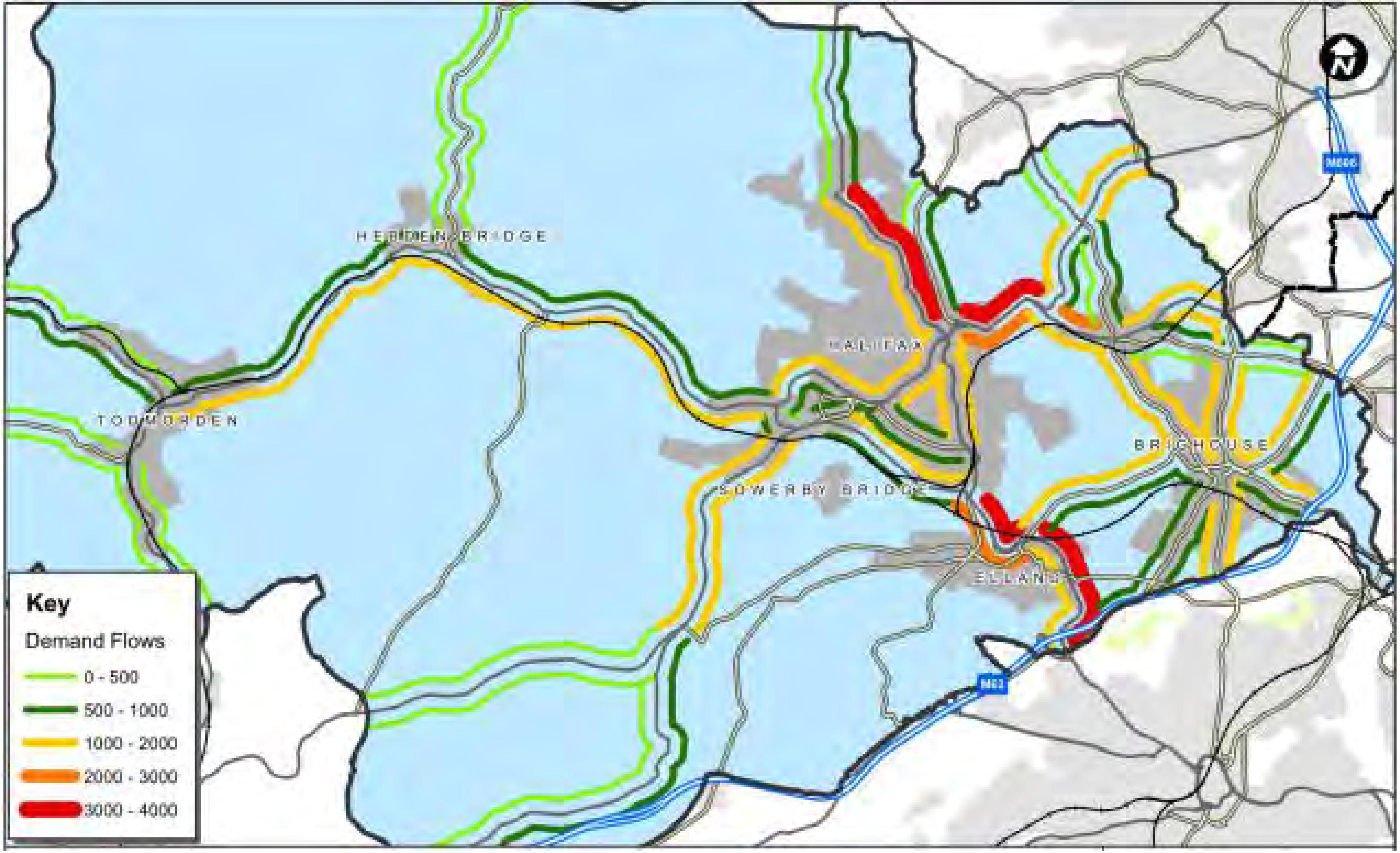


Figure 23 - Base + Additional LDF Traffic Demand - Approach 1 (PM Peak)

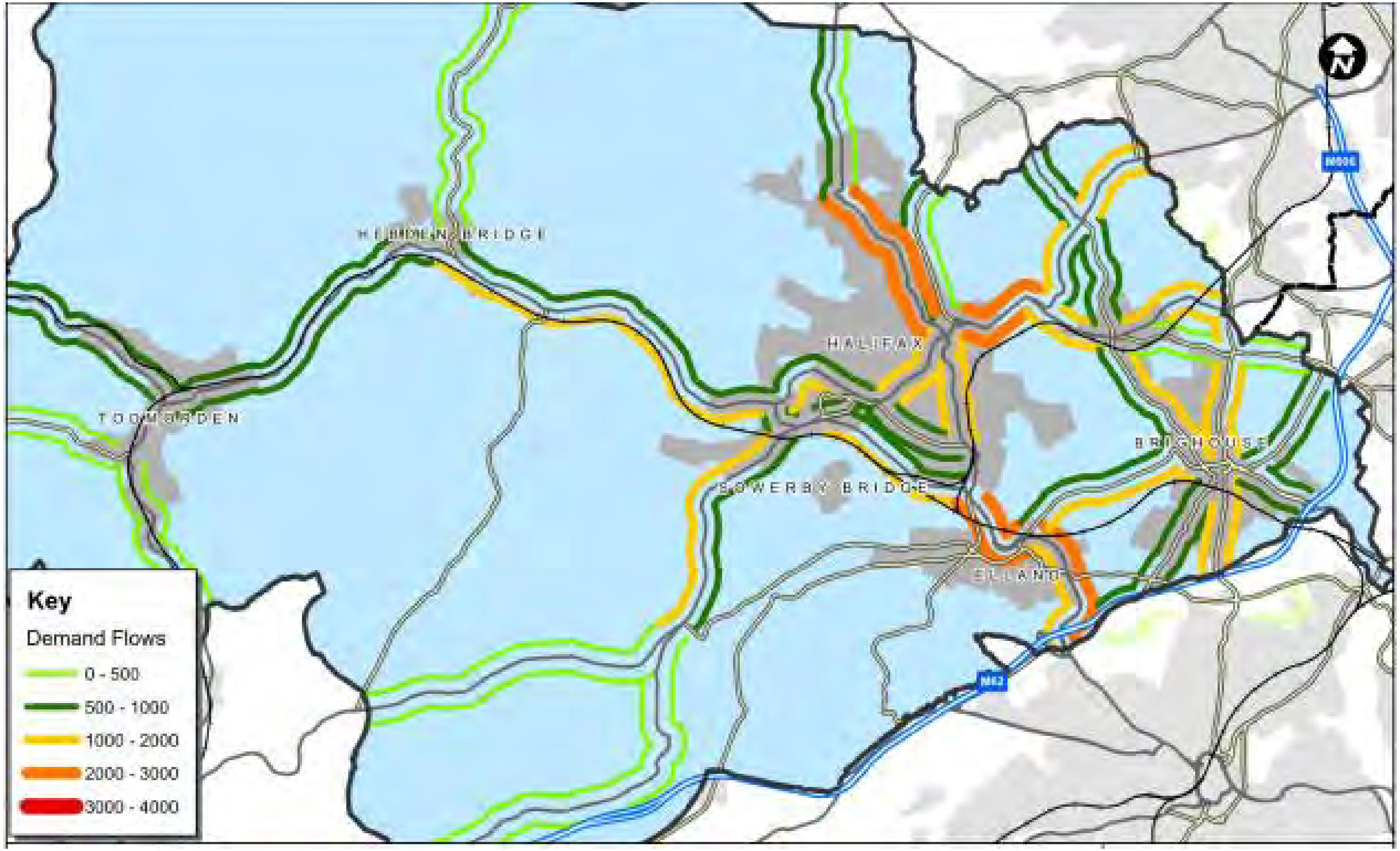


Figure 24 - Base + Additional LDF Traffic Demand - Approach 2 (AM Peak)

Figure 25 - Base + Additional LDF Traffic Demand - Approach 2 (PM Peak)

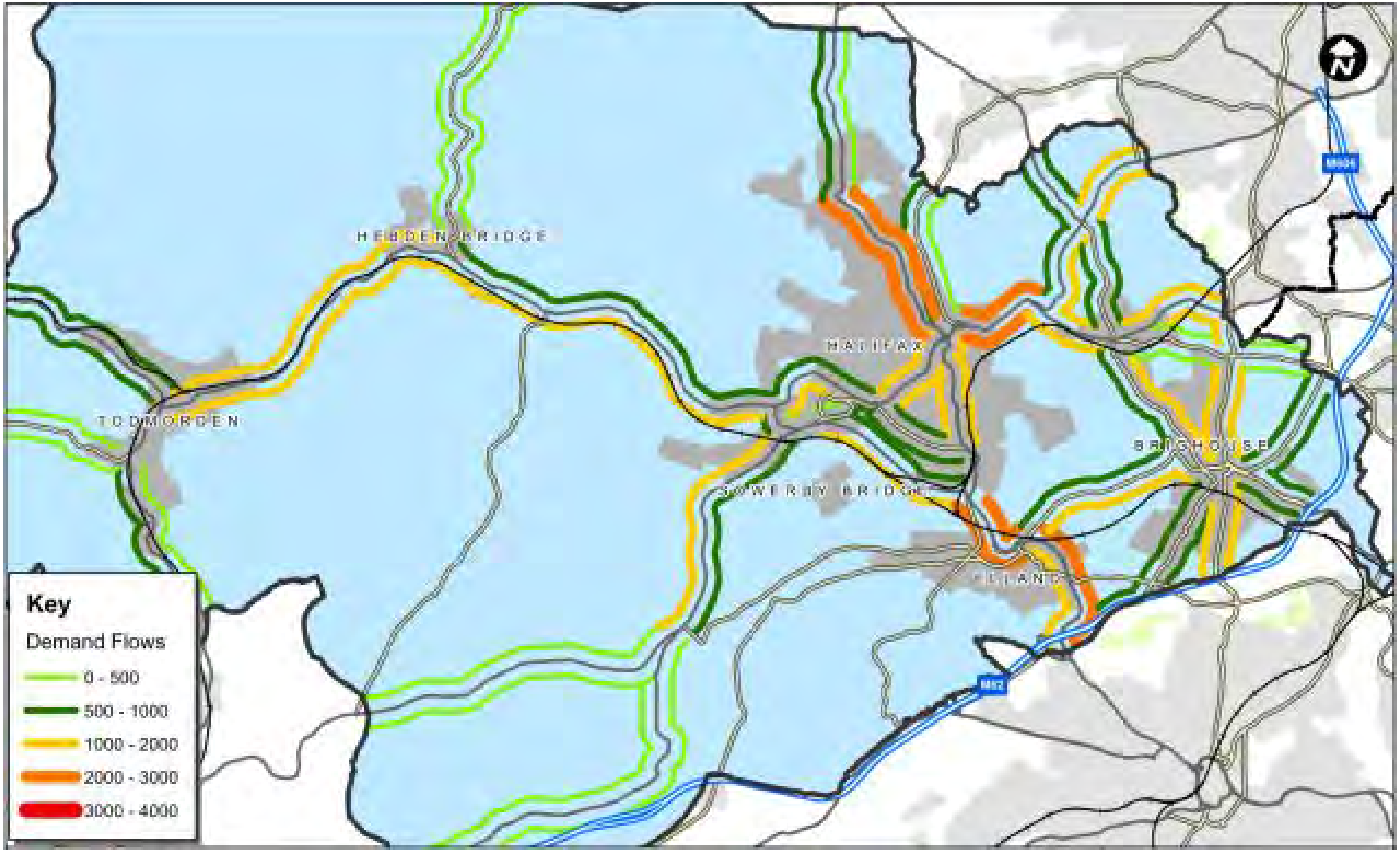


Figure 26 - Base + Additional LDF Traffic Demand - Approach 3 (AM Peak)

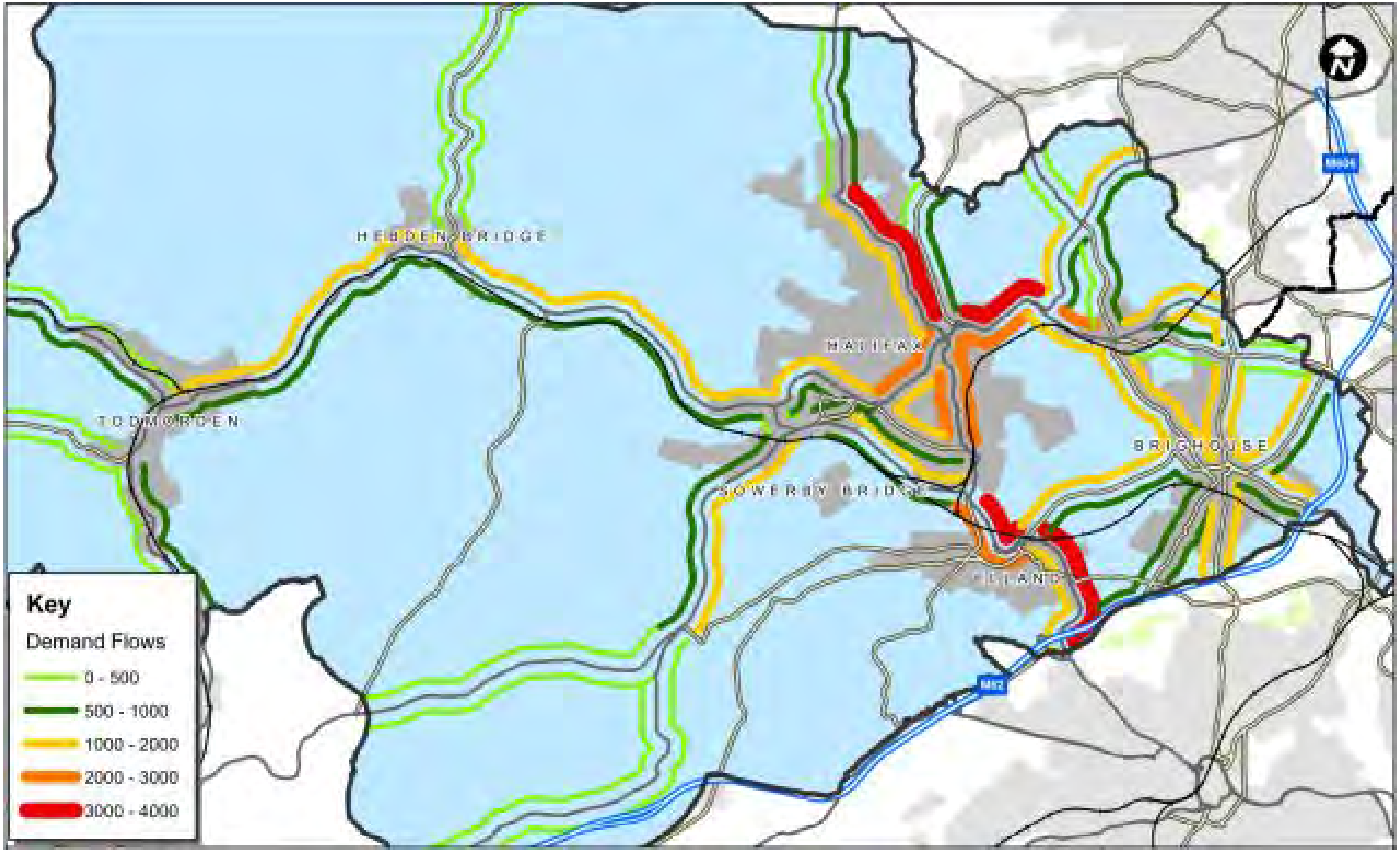


Figure 27 - Base + Additional LDF Traffic Demand - Approach 3 (PM Peak)

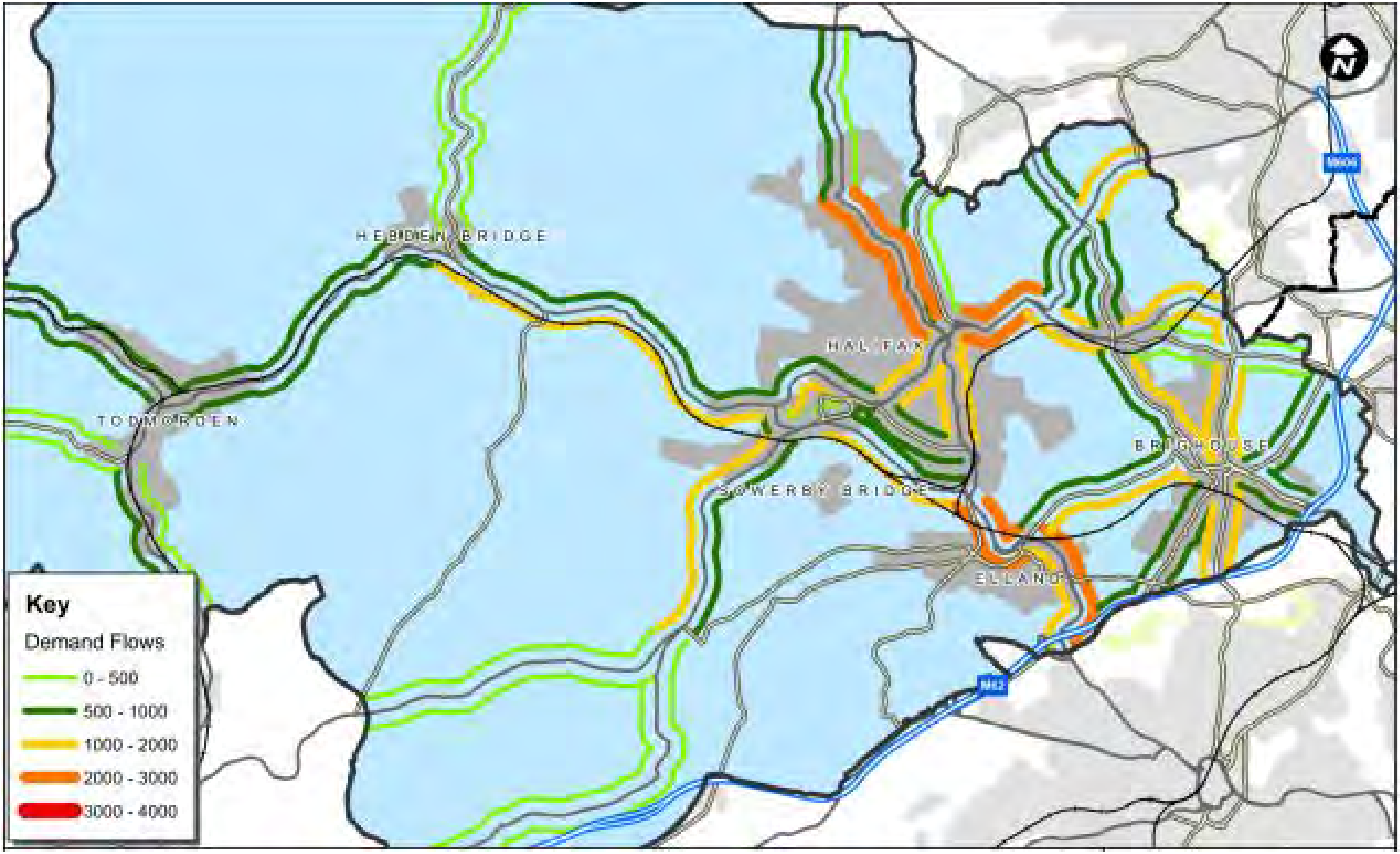


Figure 28 - Network Conditions: Traffic Volume / Capacity - Approach 1 (AM Peak)

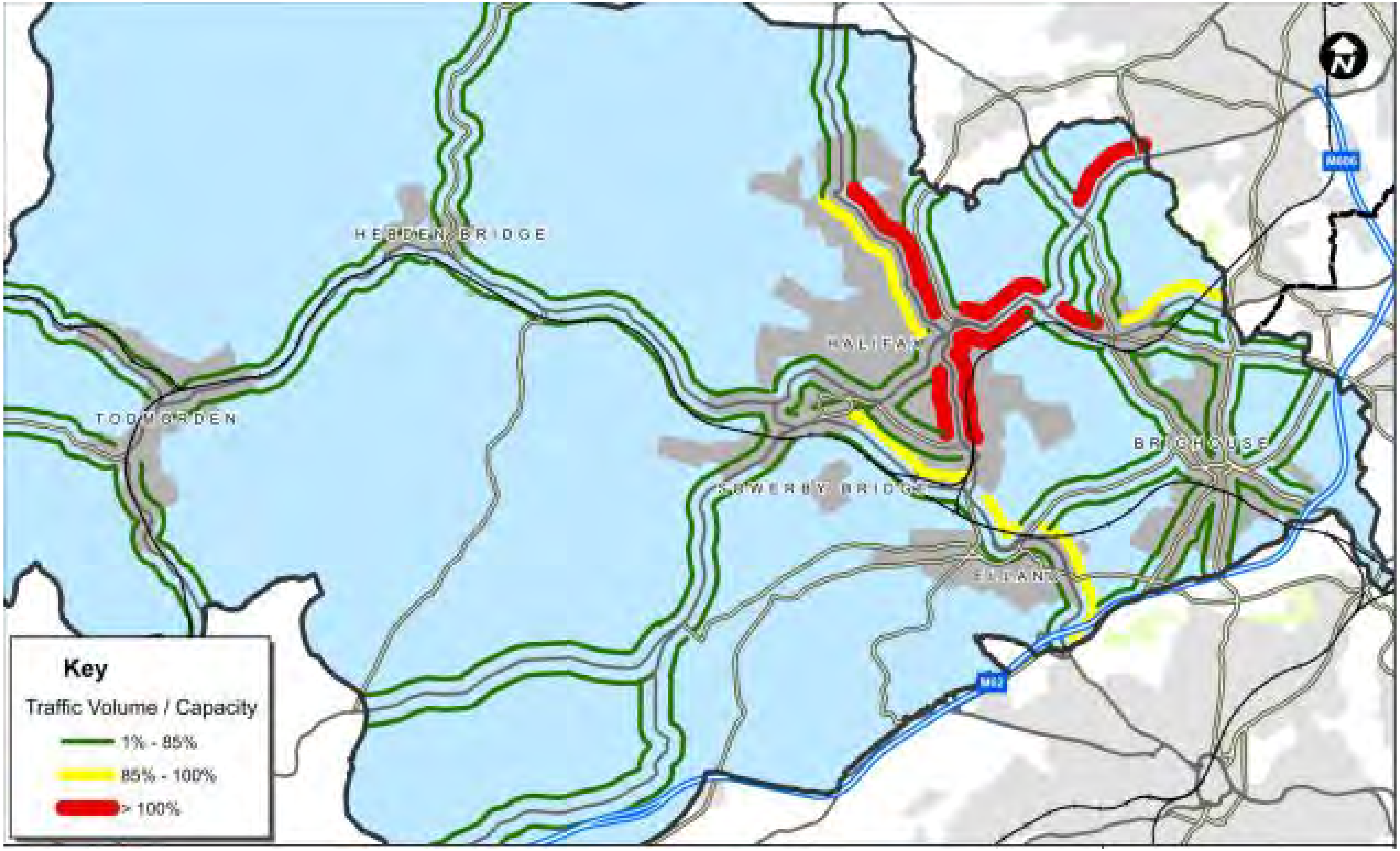


Figure 29 - Network Conditions: Traffic Volume / Capacity - Approach 1 (PM Peak)

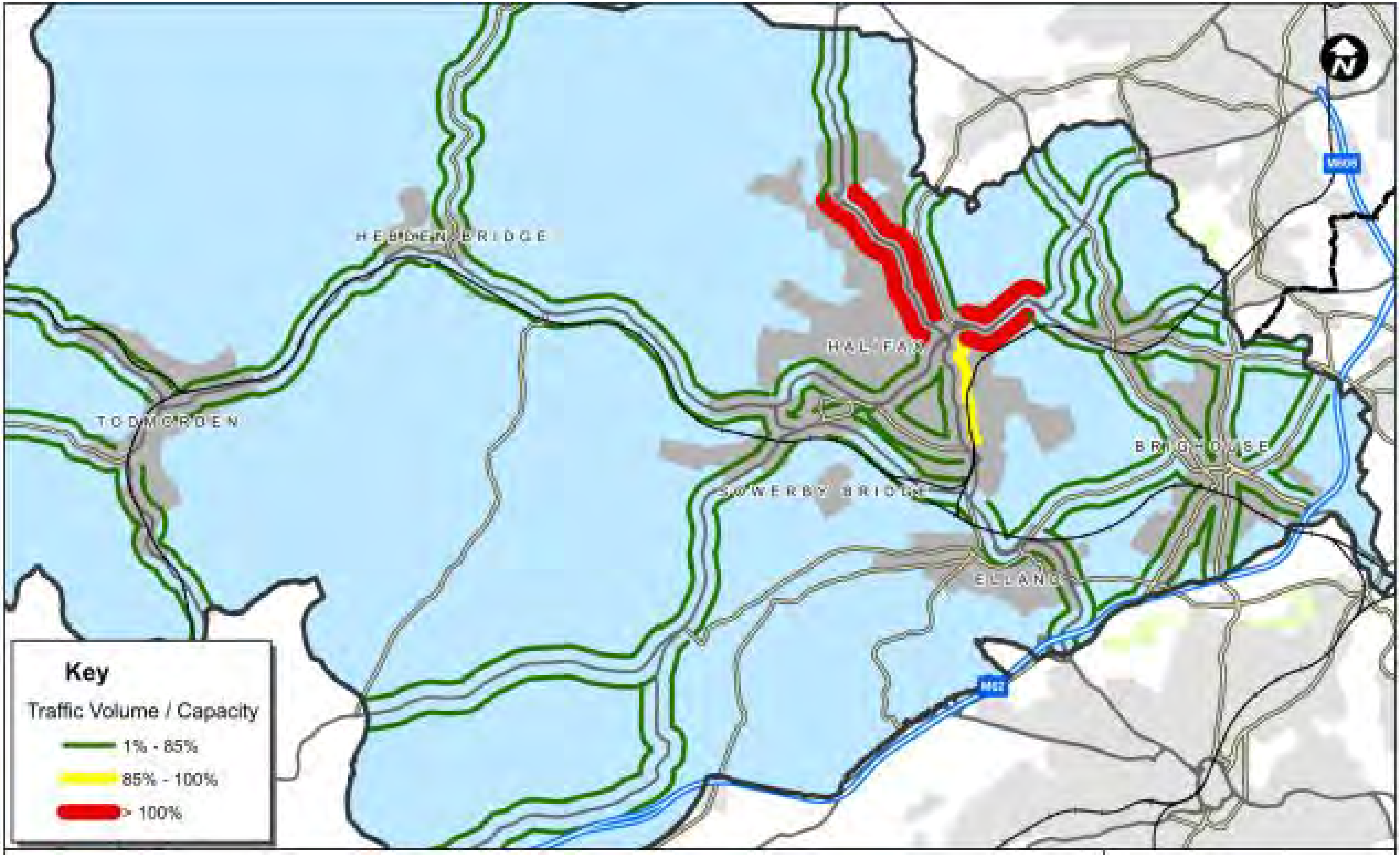


Figure 30 - Network Conditions: Traffic Volume / Capacity - Approach 2 (AM Peak)

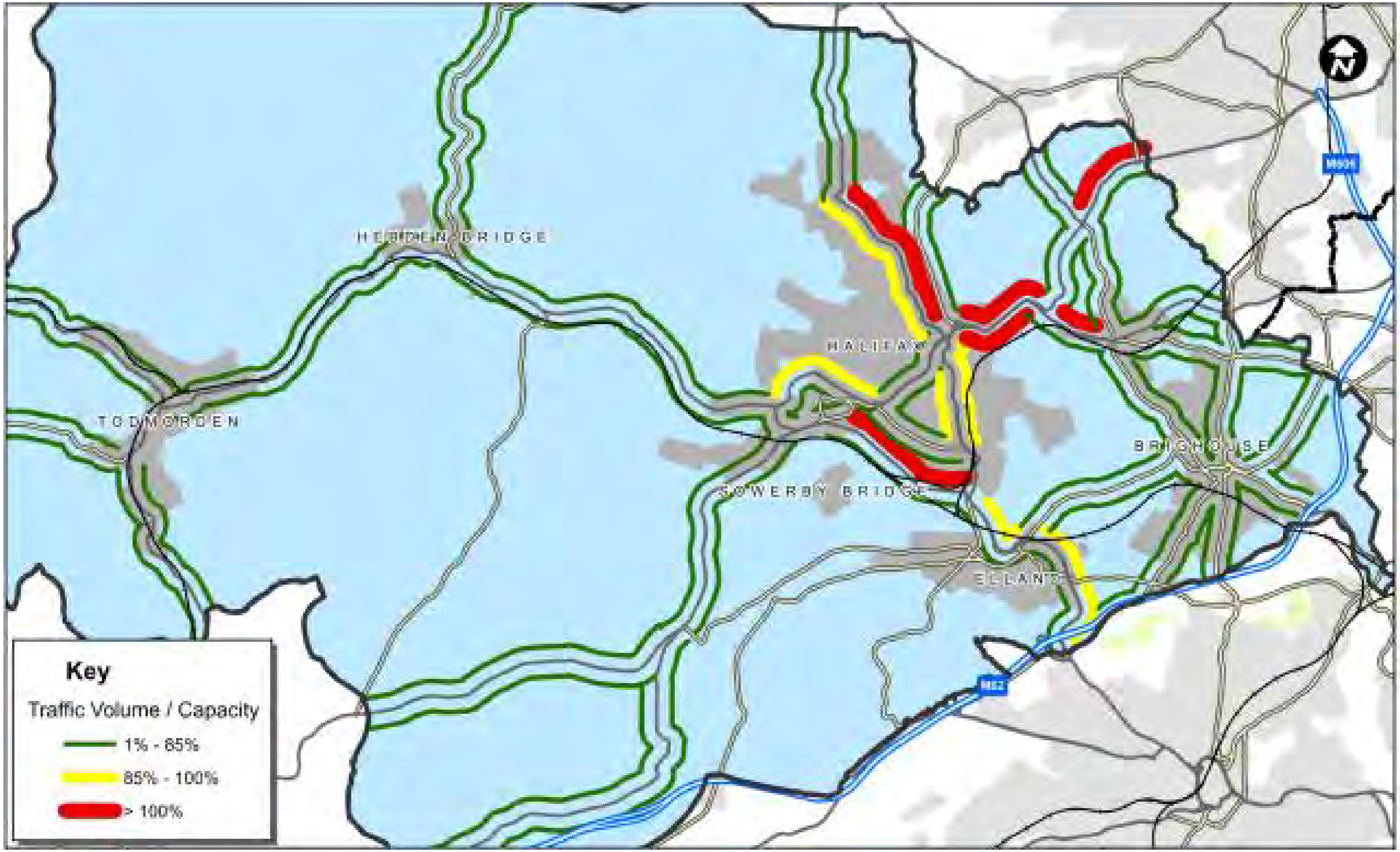


Figure 31 - Network Conditions: Traffic Volume / Capacity - Approach 2 (PM Peak)

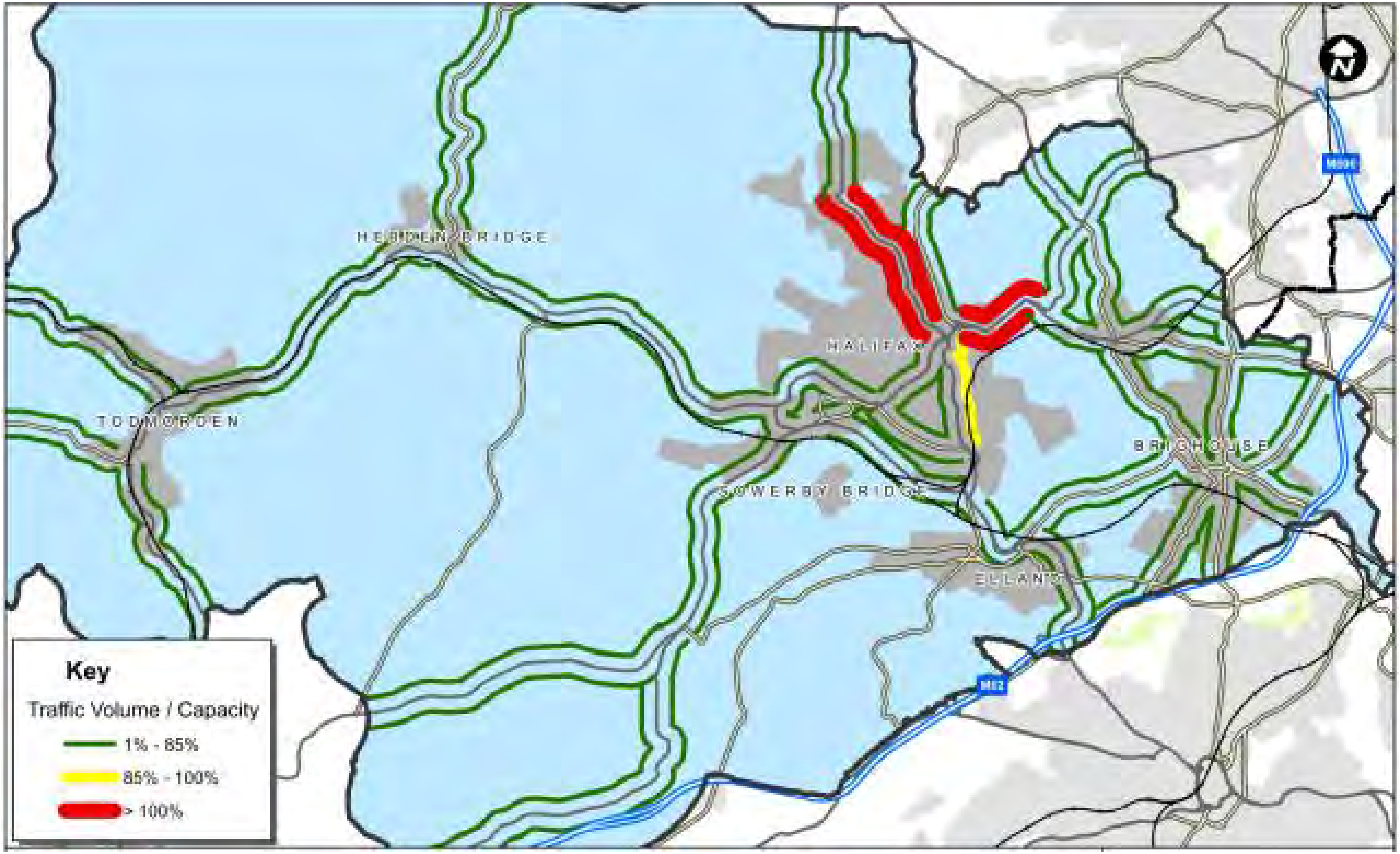


Figure 32 - Network Conditions: Traffic Volume / Capacity - Approach 3 (AM Peak)

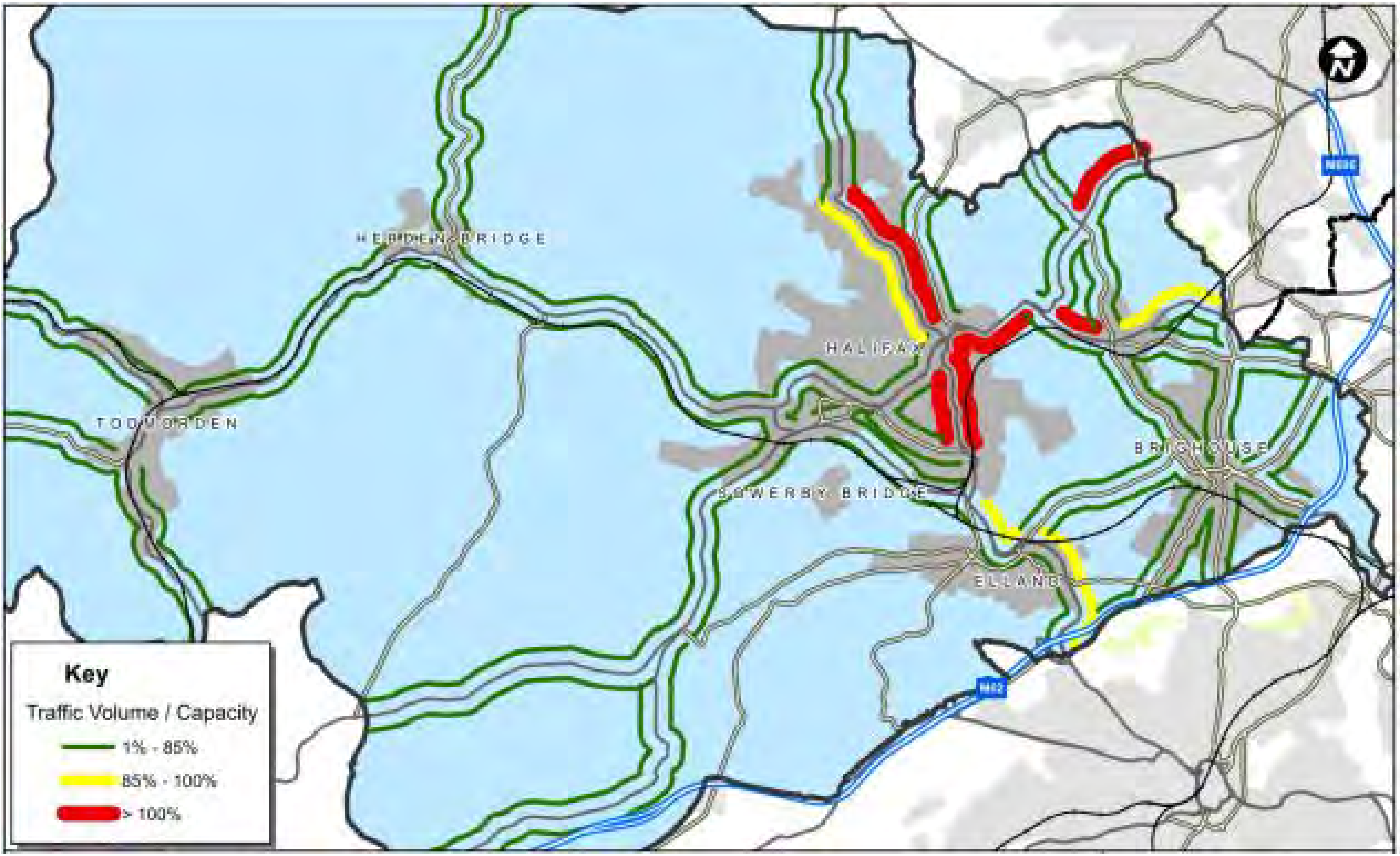


Figure 33 - Network Conditions: Traffic Volume / Capacity - Approach 3 (PM Peak)

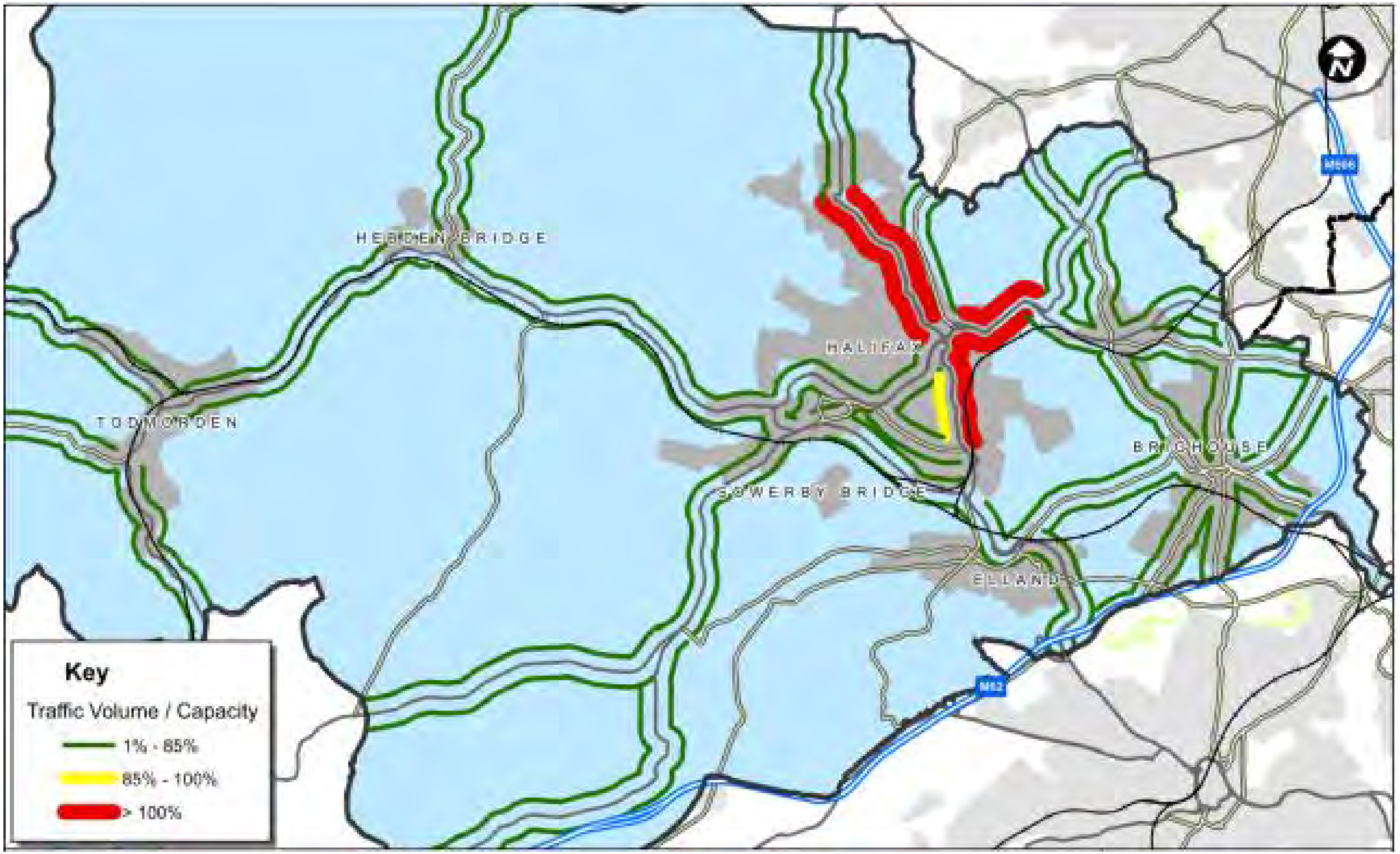


Figure 45: Polygon map showing 30 minute Cycle Isochrone Catchment from the Proposed Elland Station and Local Existing Stations

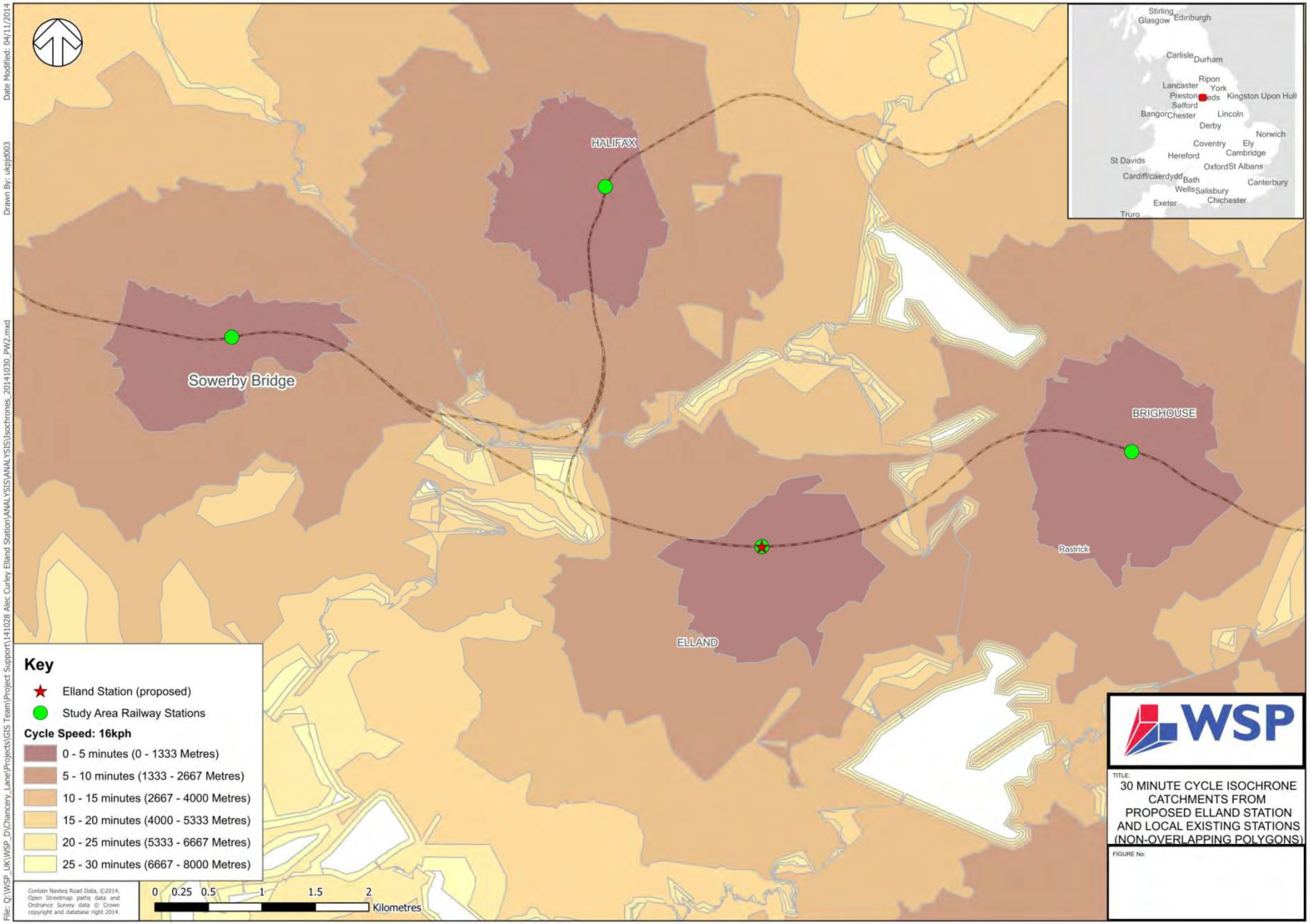


Figure 46: Line map showing 30 minute Cycle Isochrone Catchment from the Proposed Elland Station and Local Existing Stations

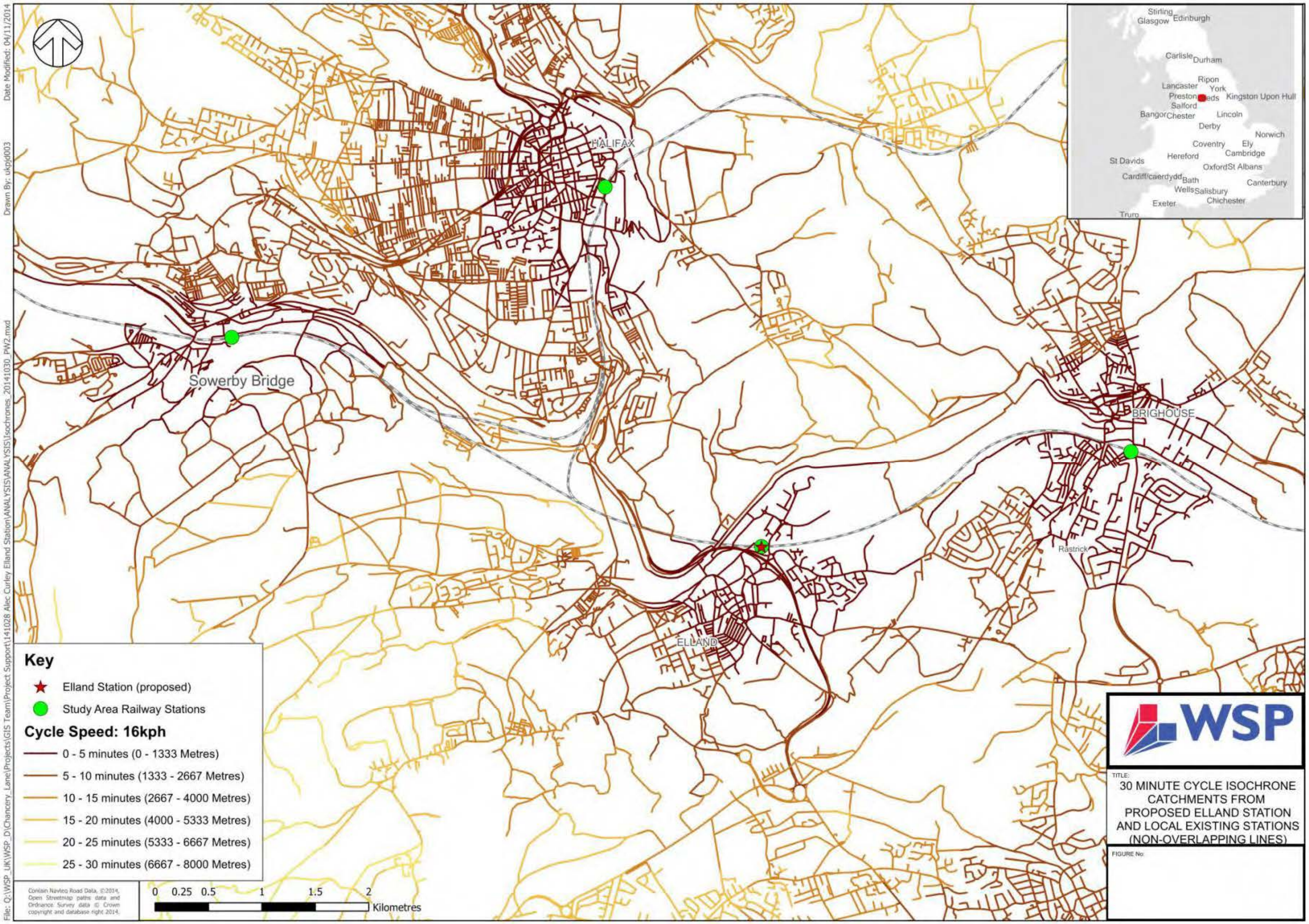


Figure 47: Polygon map showing 30 minute Walk Isochrone Catchment from the Proposed Elland Station and Local Existing Stations

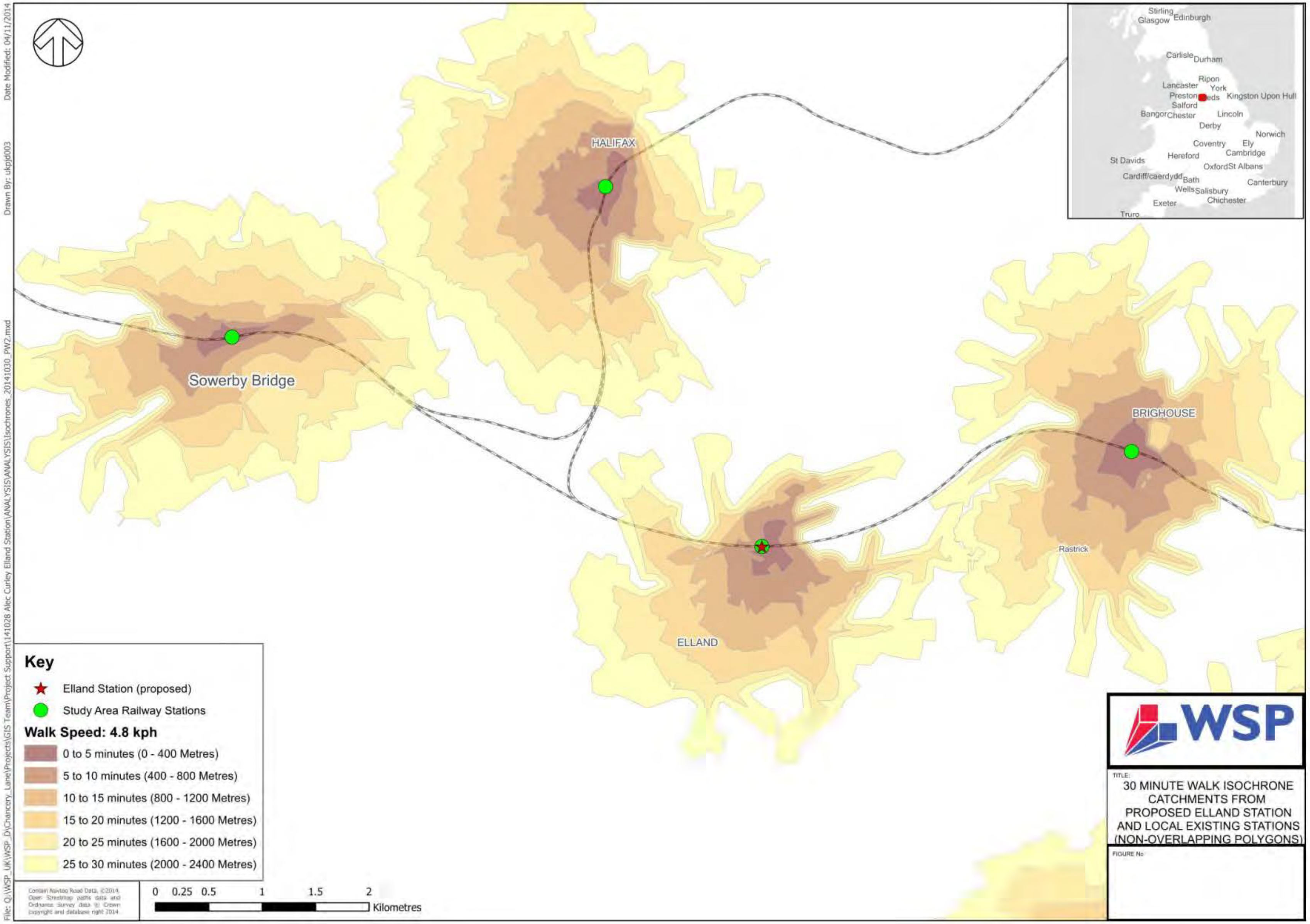


Figure 48 - Line map showing 30 minute Walk Isochrone Catchment from the Proposed Elland Station and Local Existing Stations

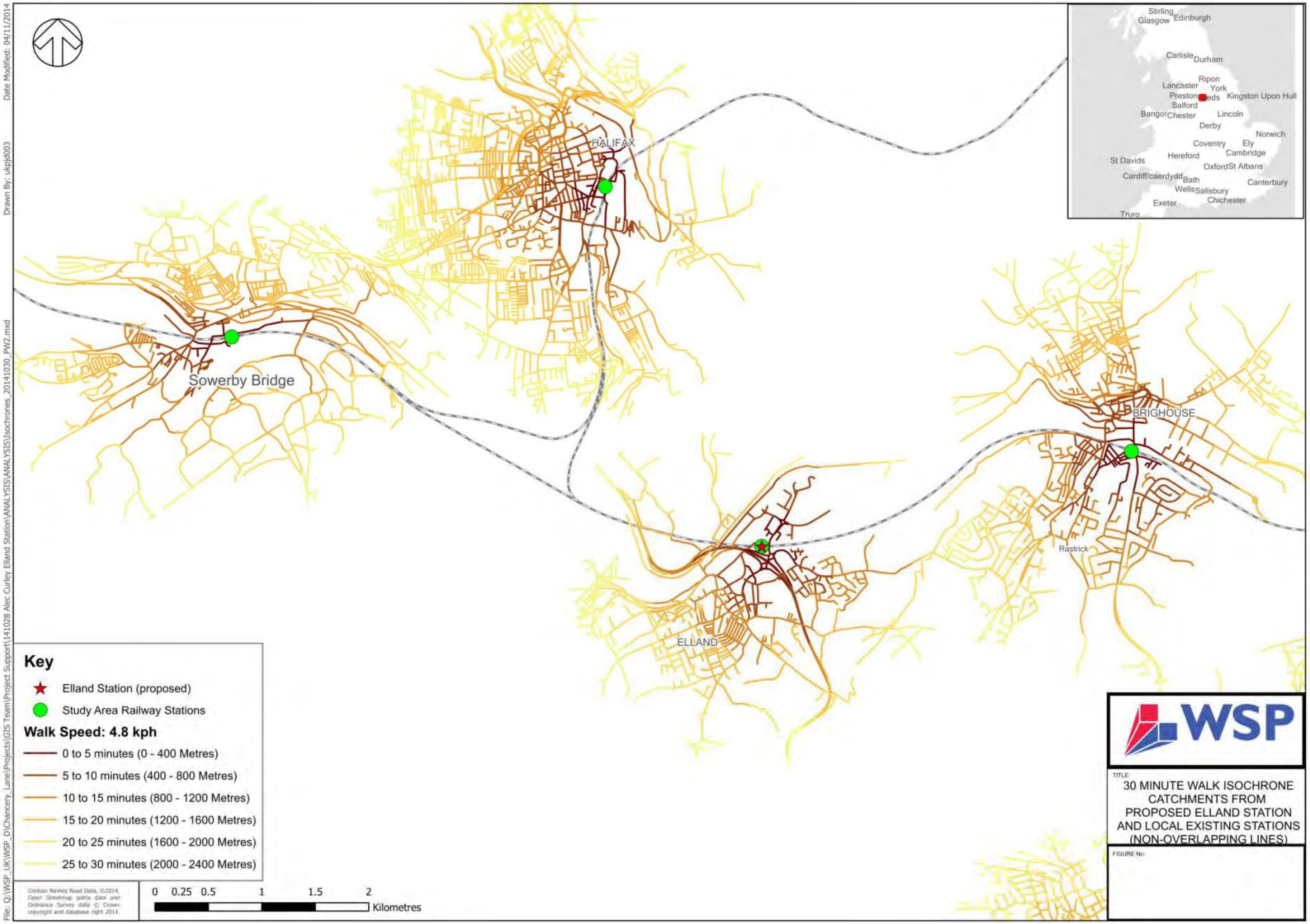


Figure 49: Index of Multiple Deprivation (IMD) in the Elland MSOA

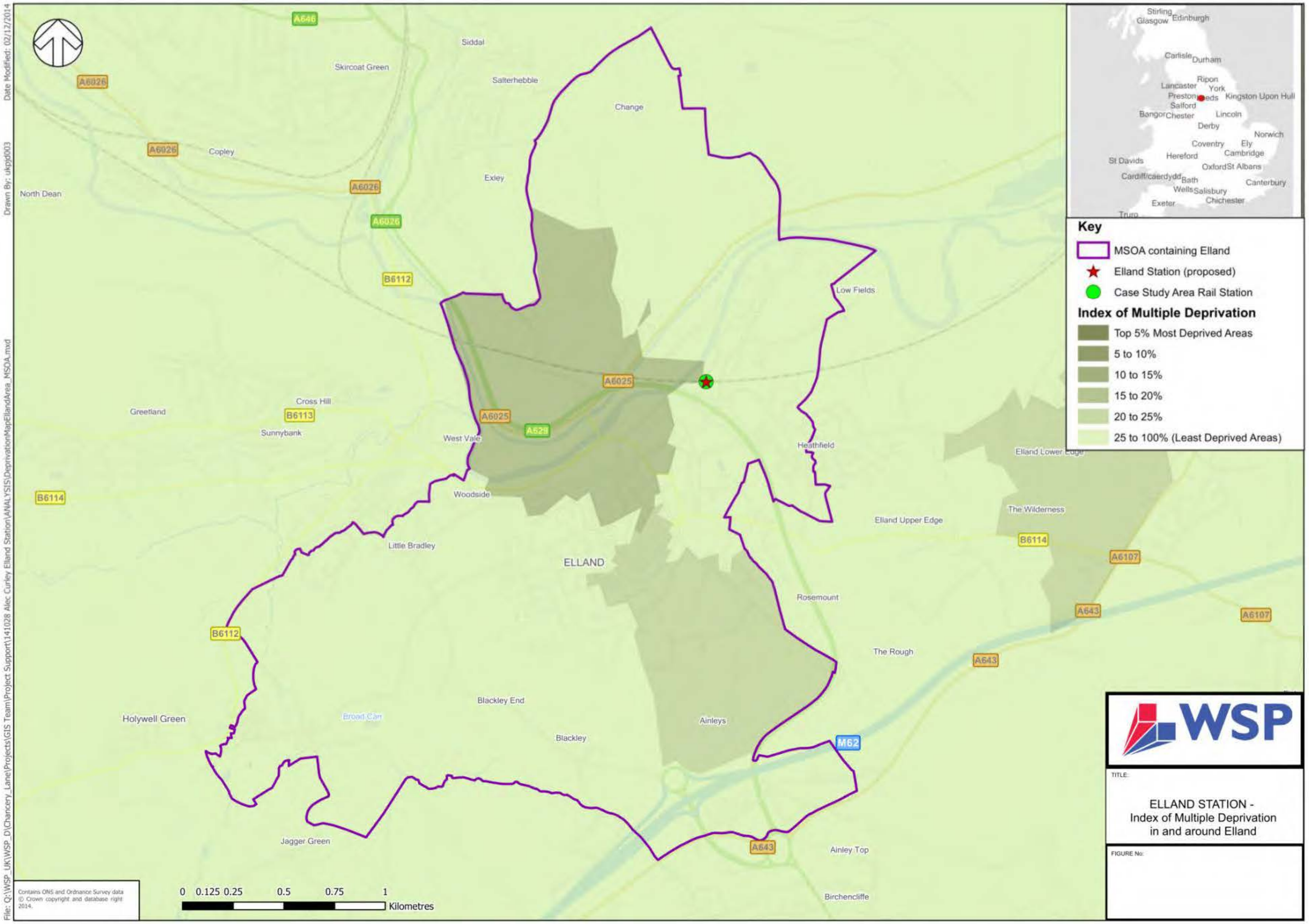


Figure 50: % of Social & Council Rent Households in COAs in the Elland MSOA

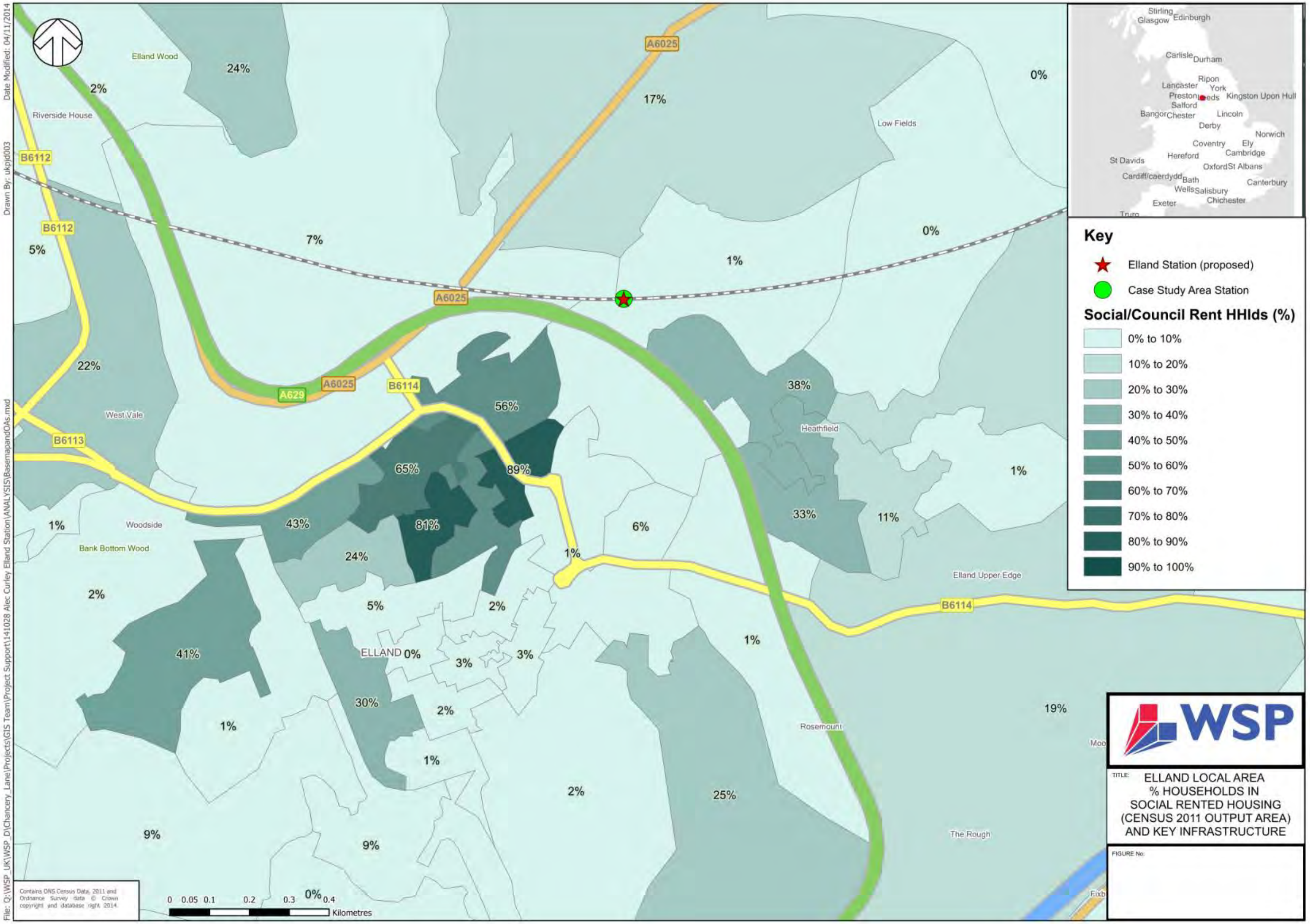


Figure 51: Economic Activity of different age categories in COAs in the Elland MSOA

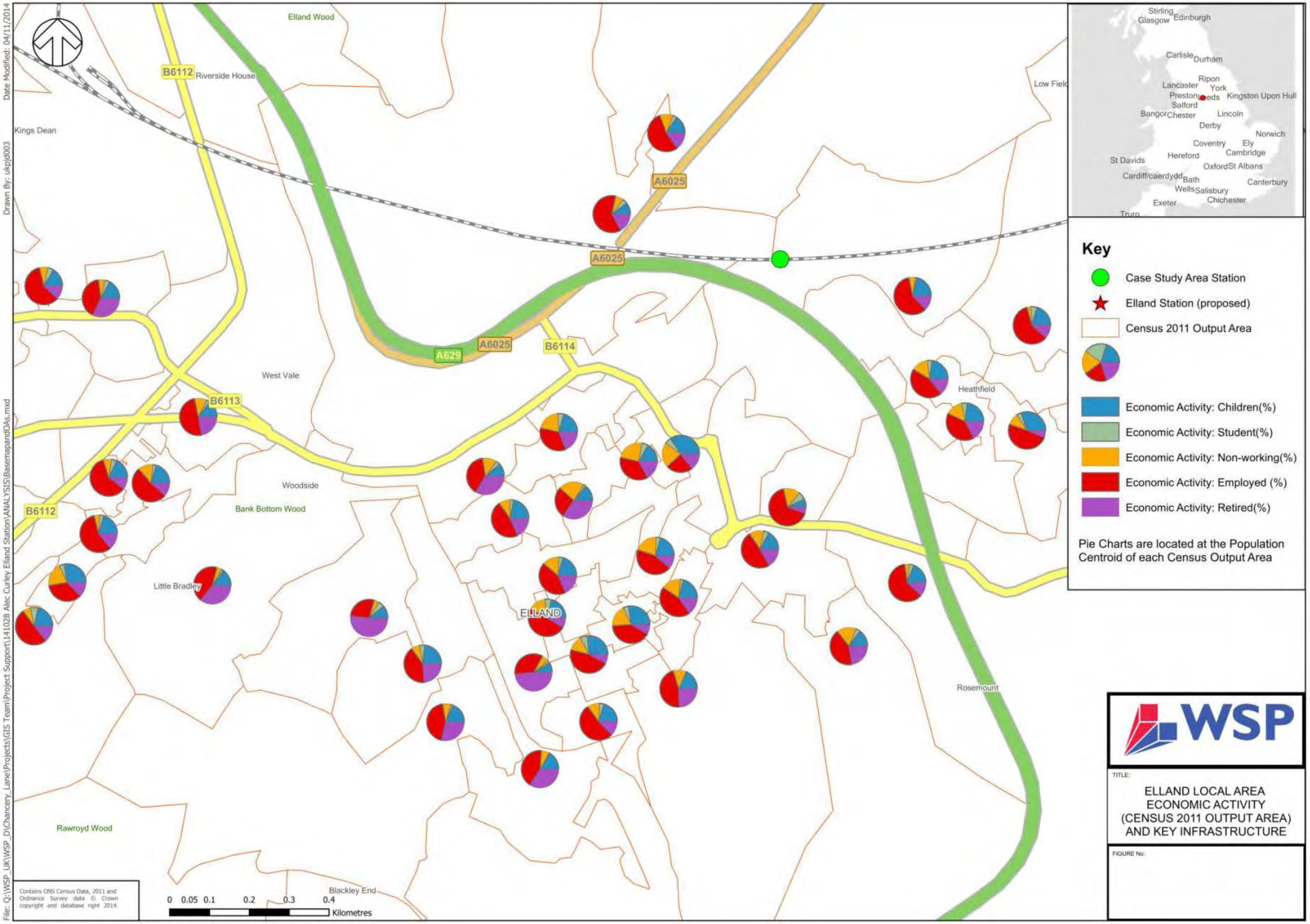


Figure 52: % of Higher Managers/Professionals in COAs in the Elland MSOA

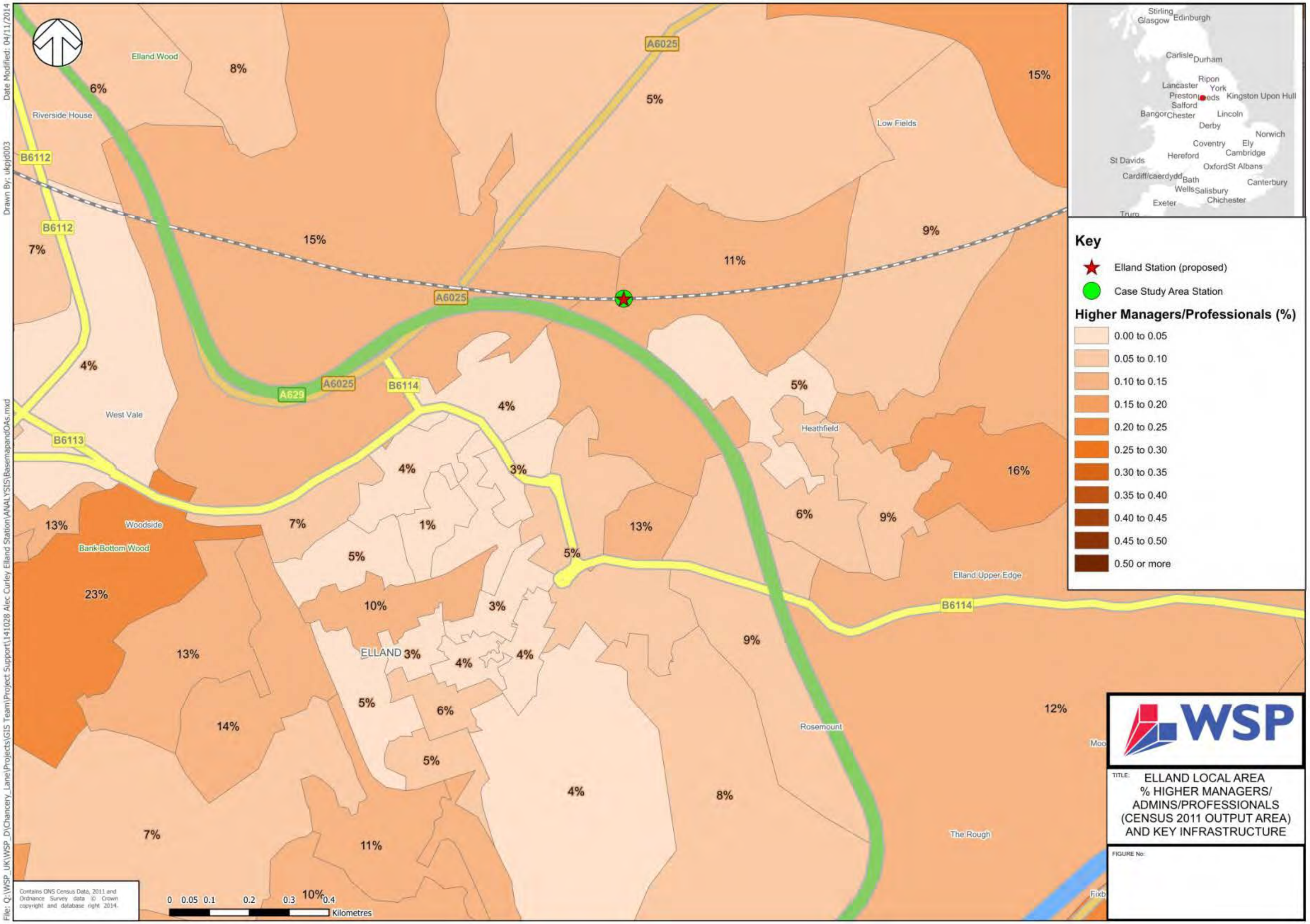


Figure 53: % of Households with no car/van in COAs in the Elland MSOA

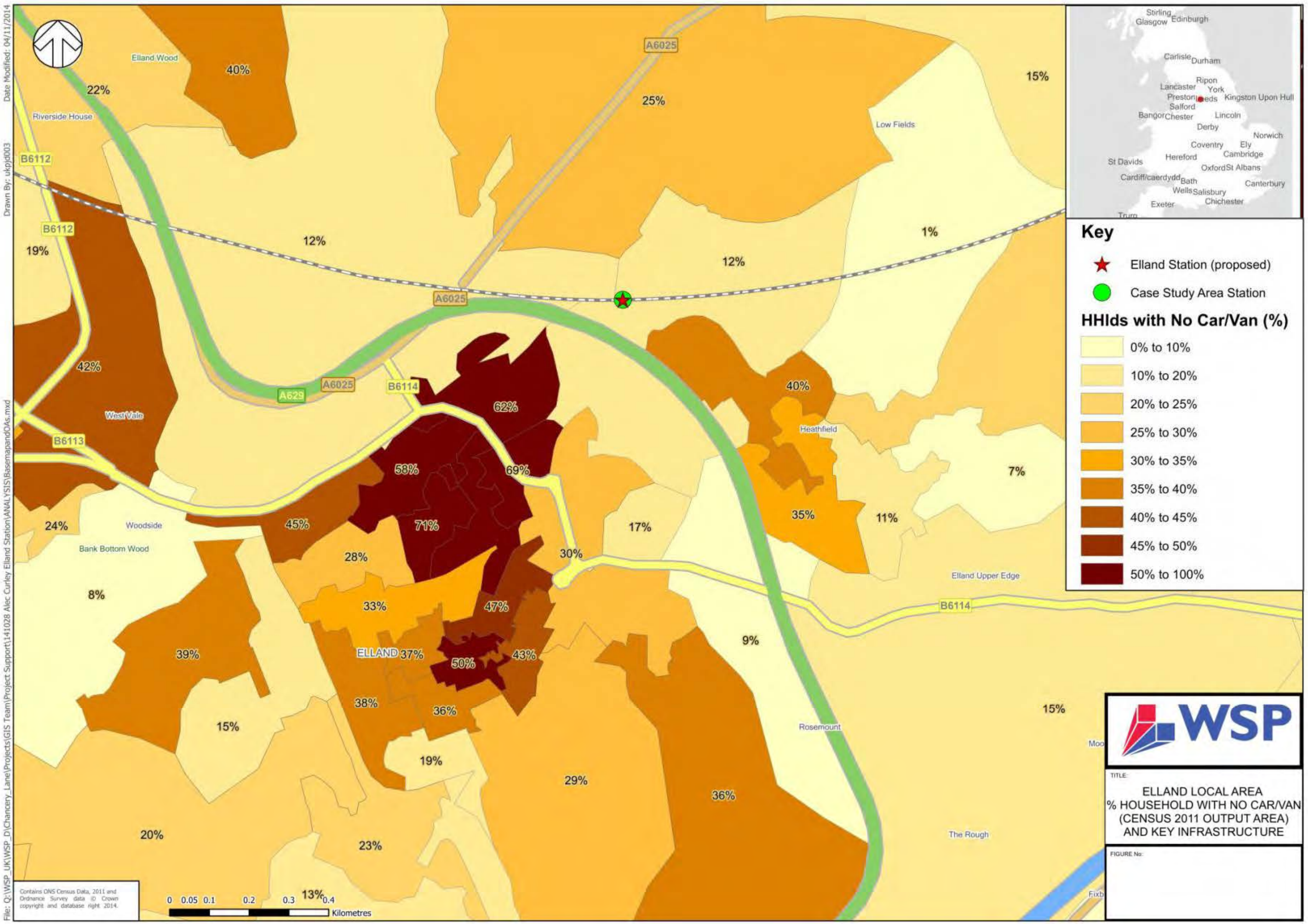


Figure 54: Number of Cars/ Vans per household within COAs in the Elland MSOA

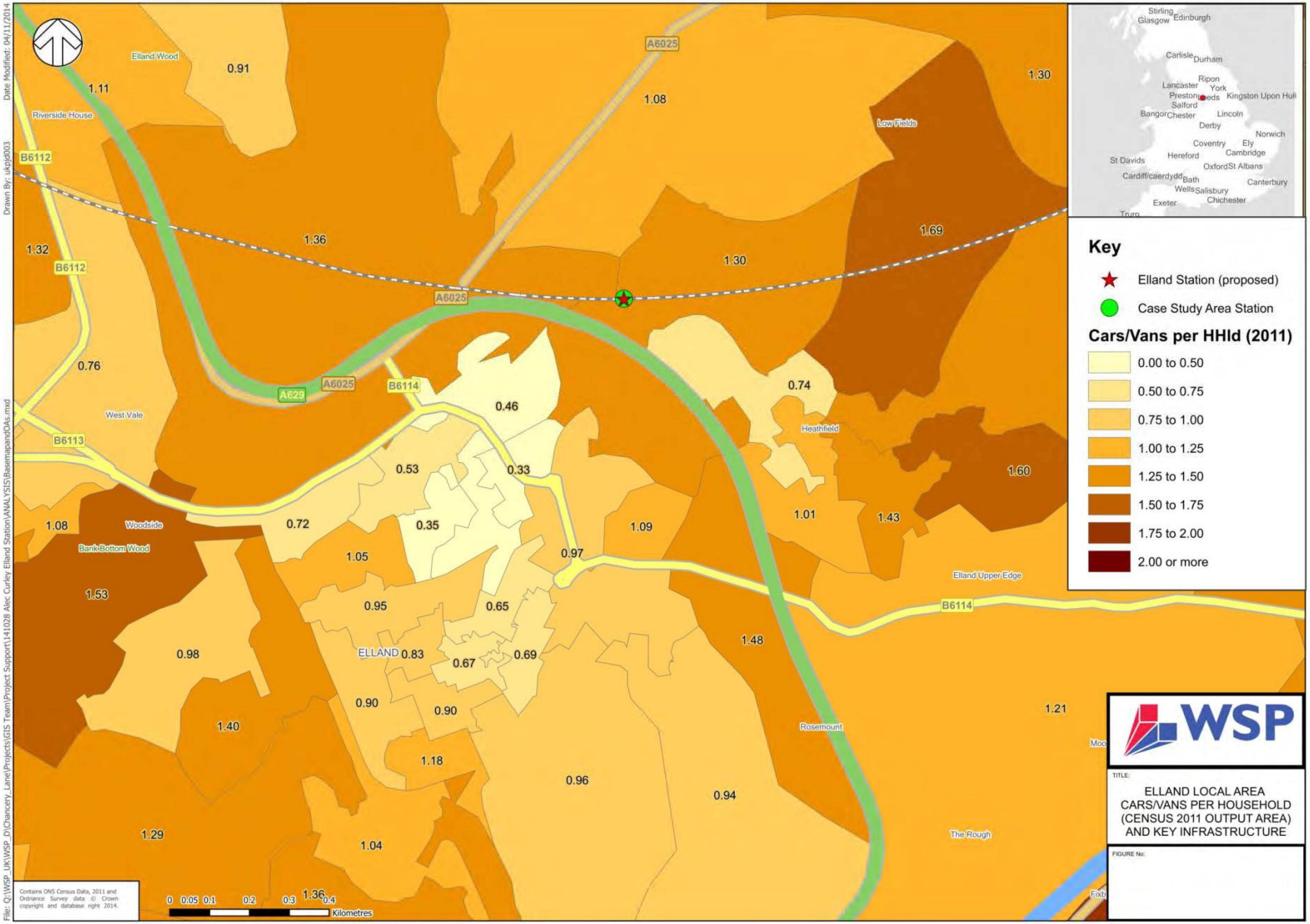


Figure 55: Method of Travel to Work from Usual Residence at COA Level

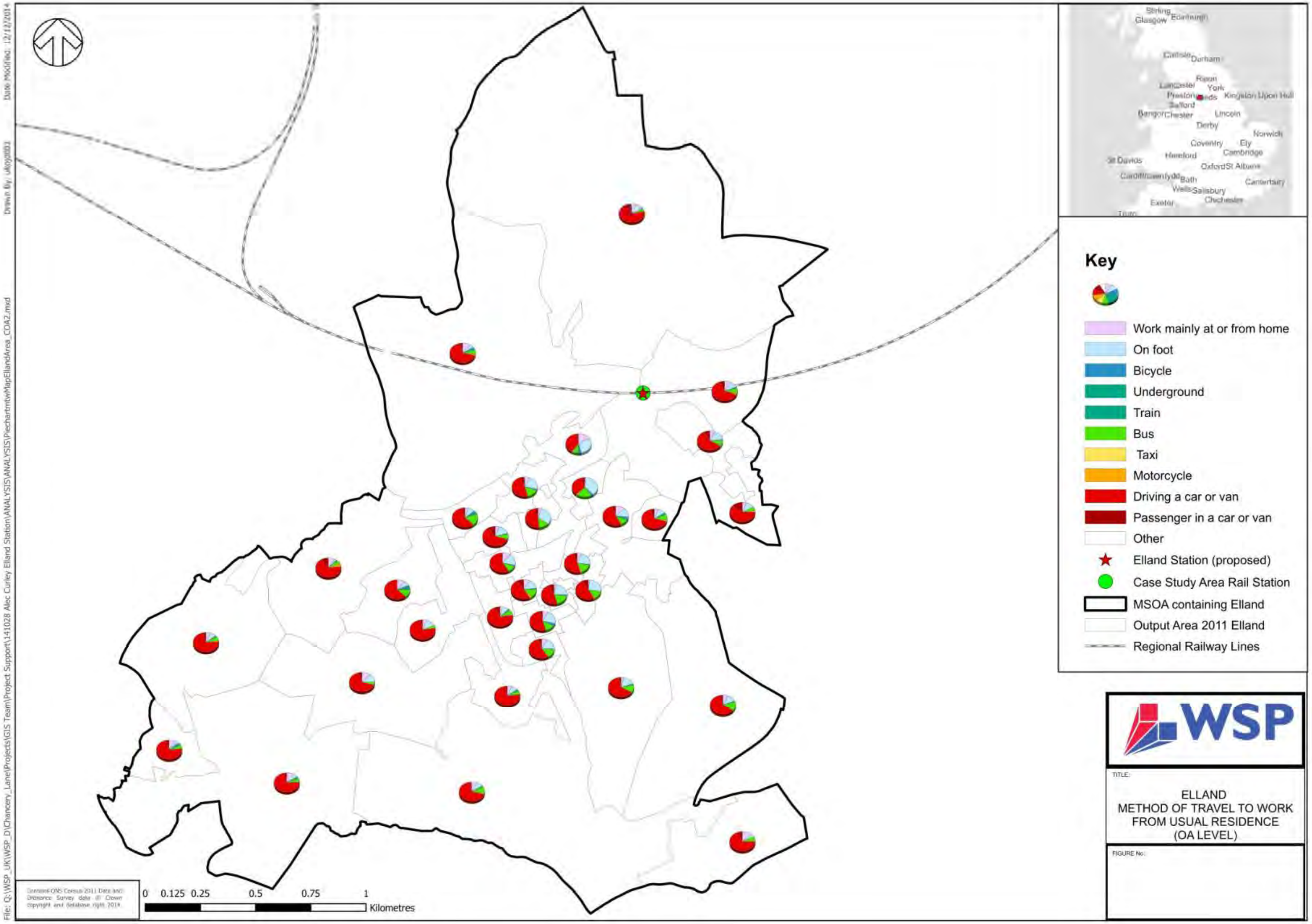


Figure 56: Base map local Elland area (also in main body of report)

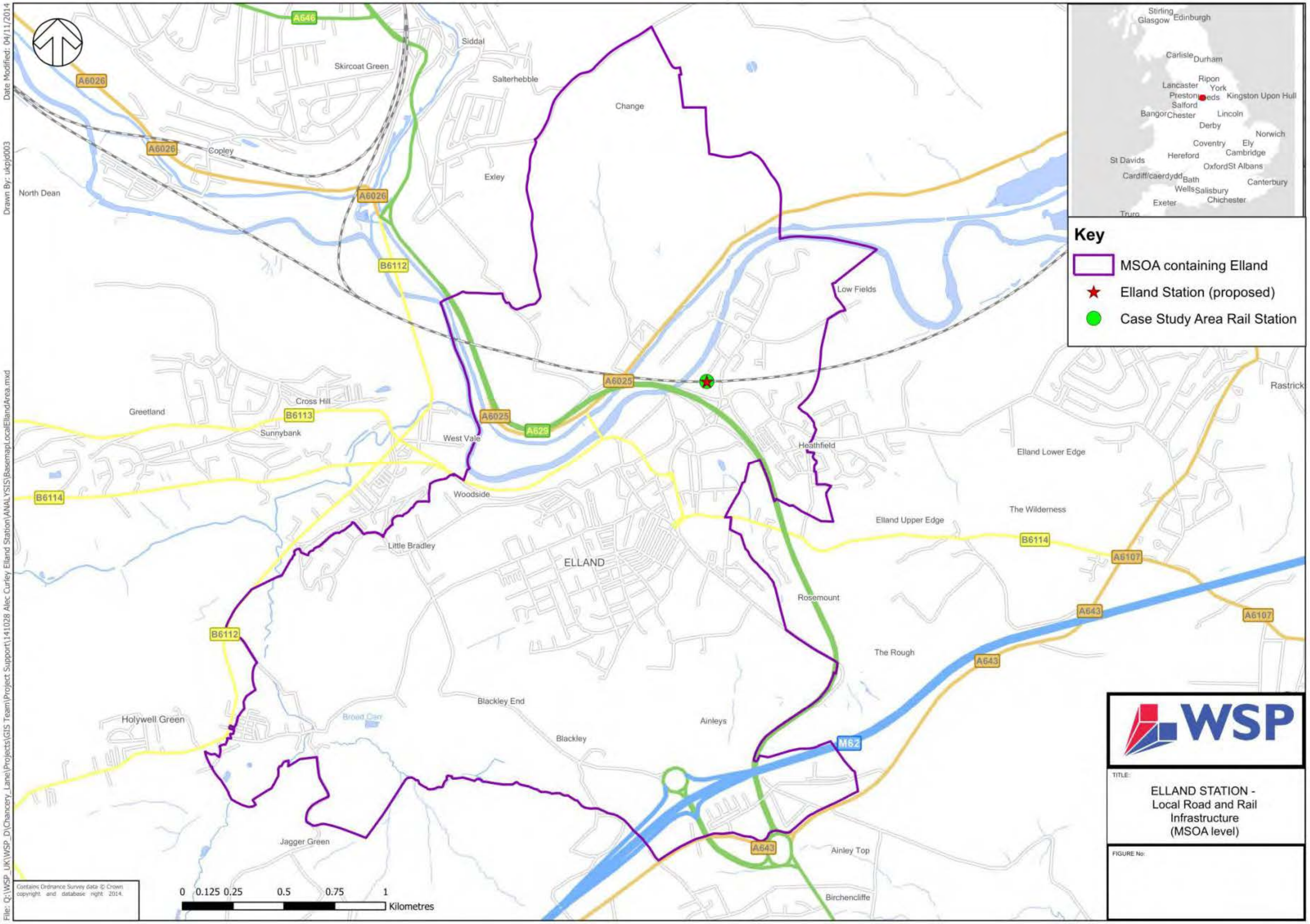


Figure 57 Desire Lines map – Inbound trips for all transport modes from Elland within 25km radius

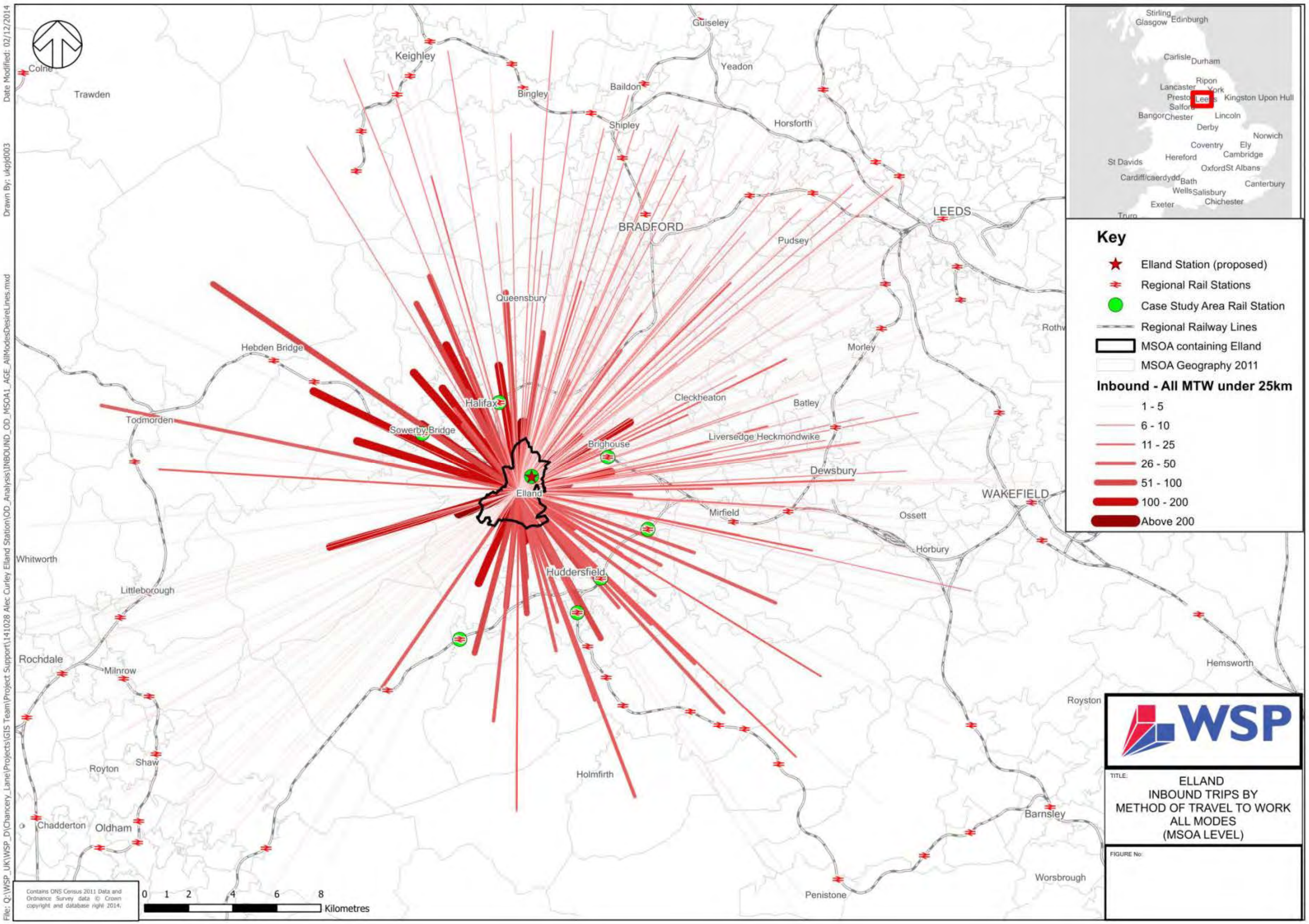


Figure 58: Choropleth map – Inbound trips for all transport modes from Elland within 40km radius

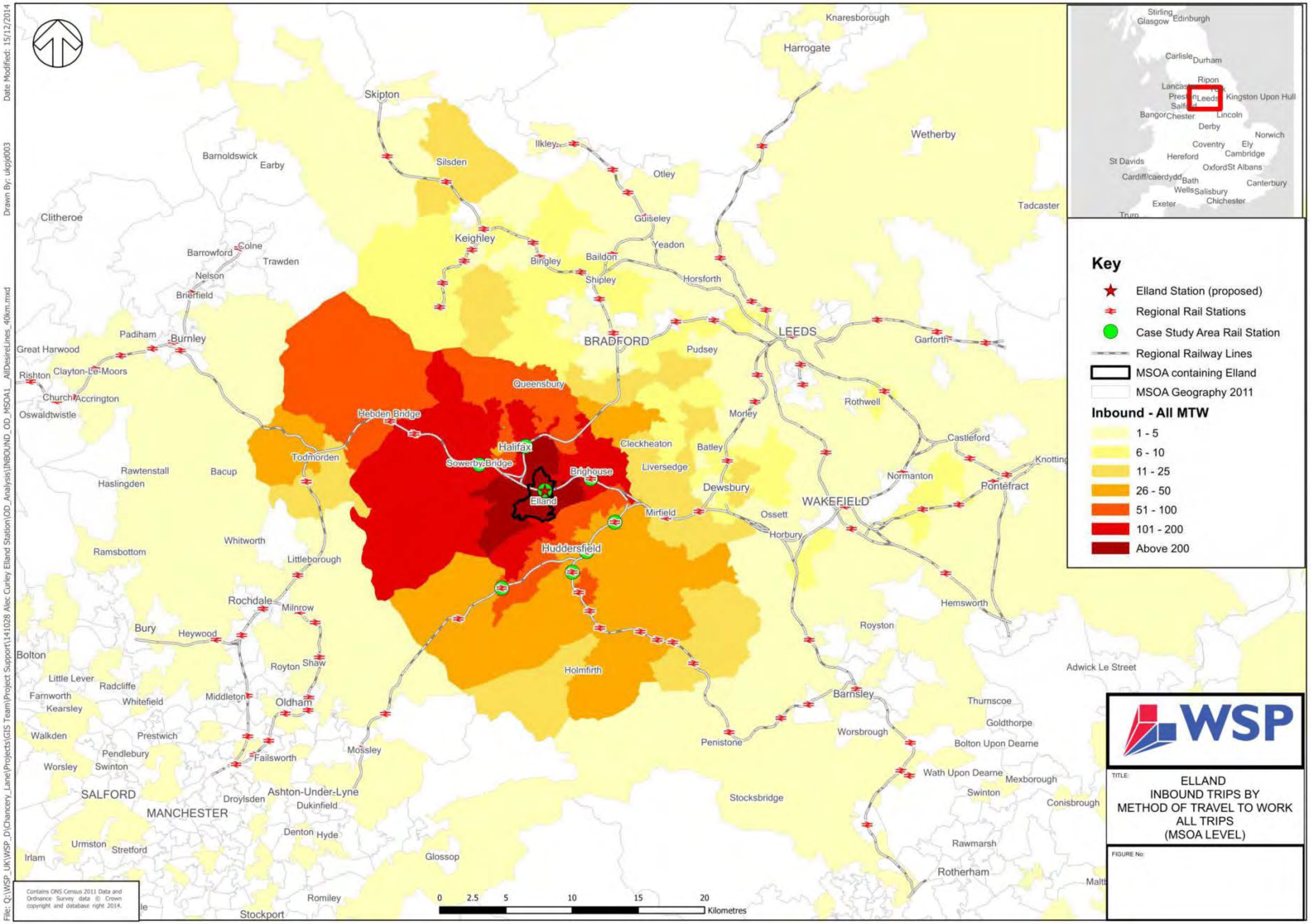


Figure 59: Desire Lines map – Outbound trips for all transport modes from Elland within 25km radius

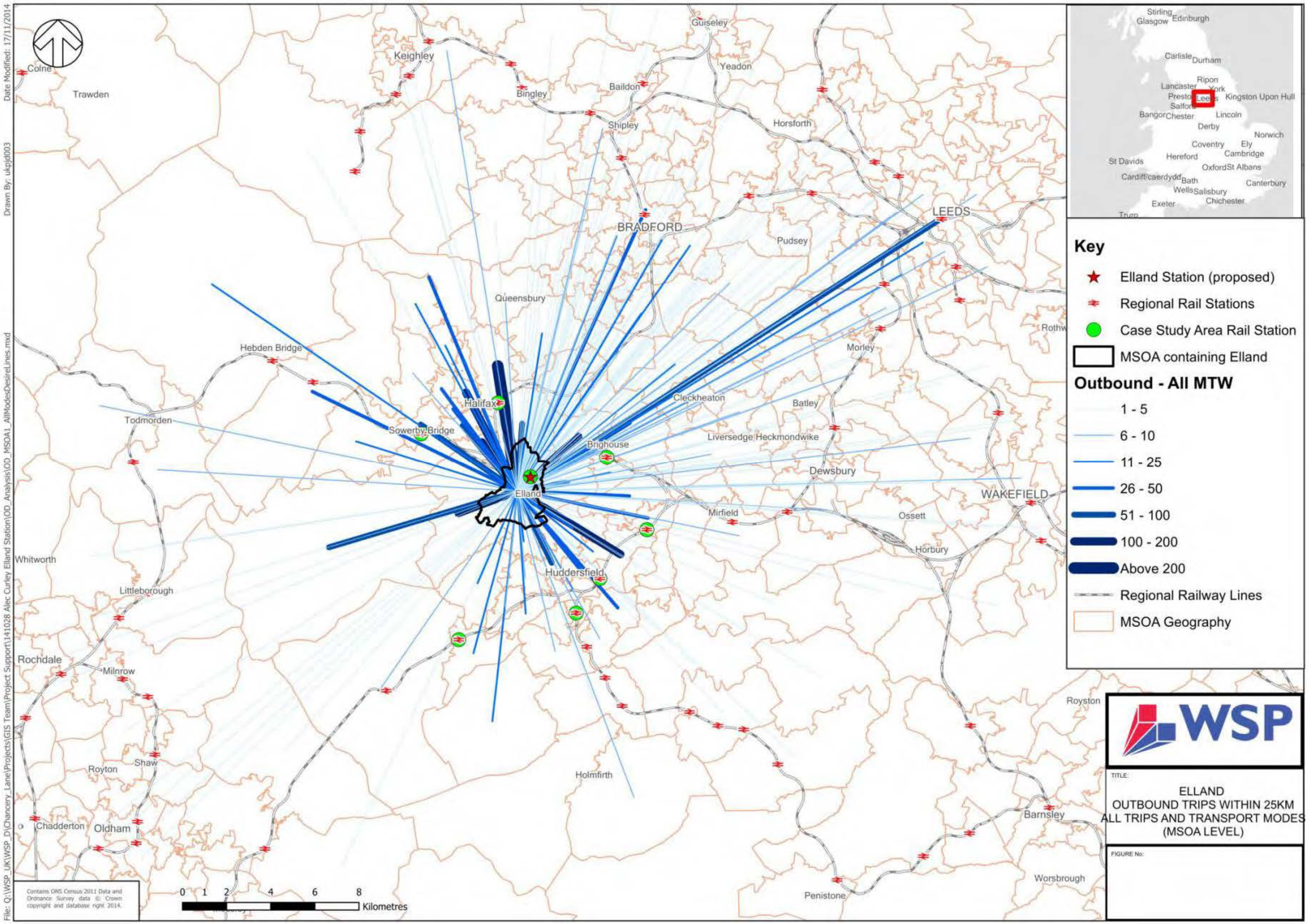


Figure 60: Choropleth map – Outbound trips for all transport modes from Elland within 40km radius

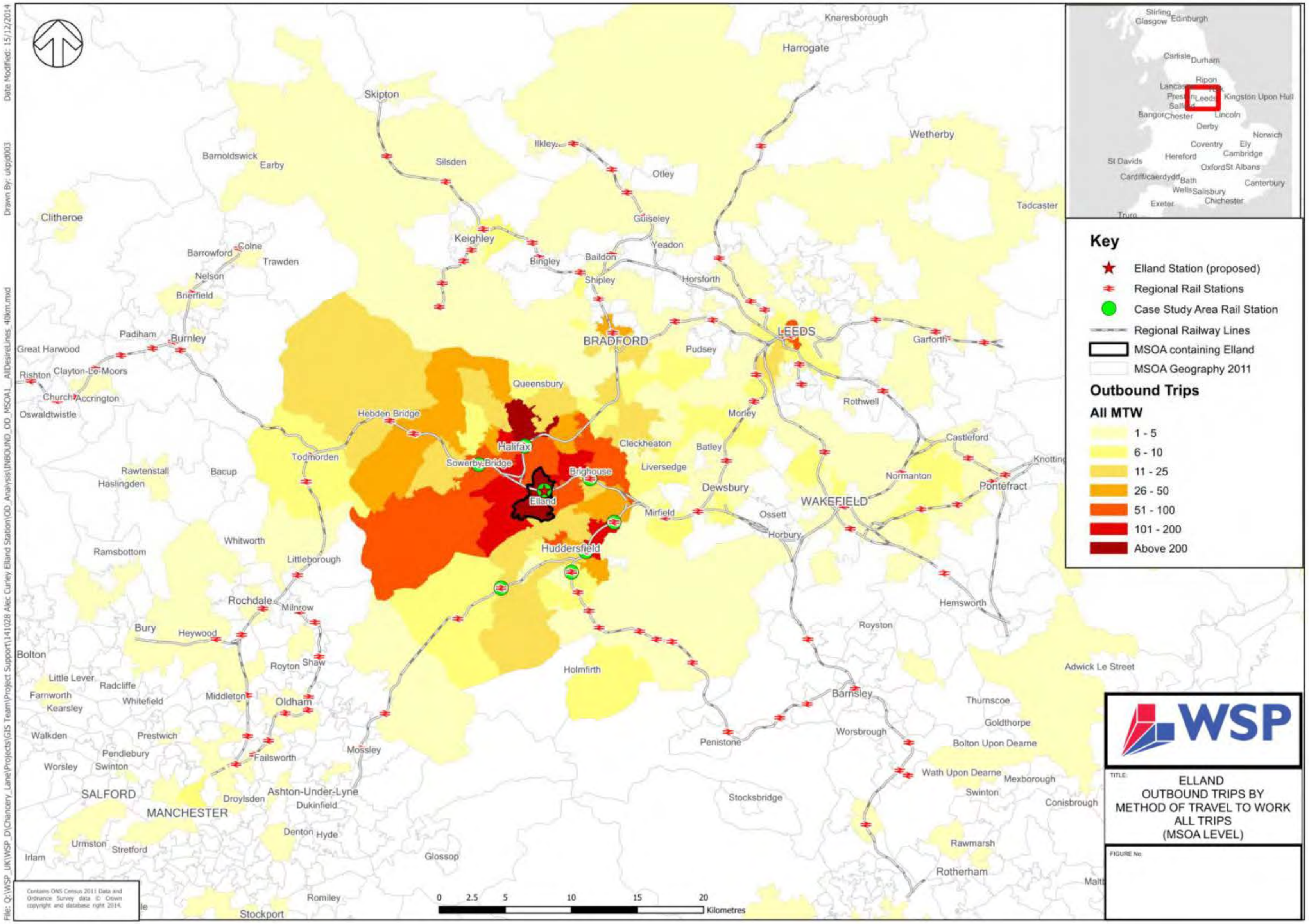


Figure 61: Desire Lines map – Inbound trips for buses to Elland within 25km radius

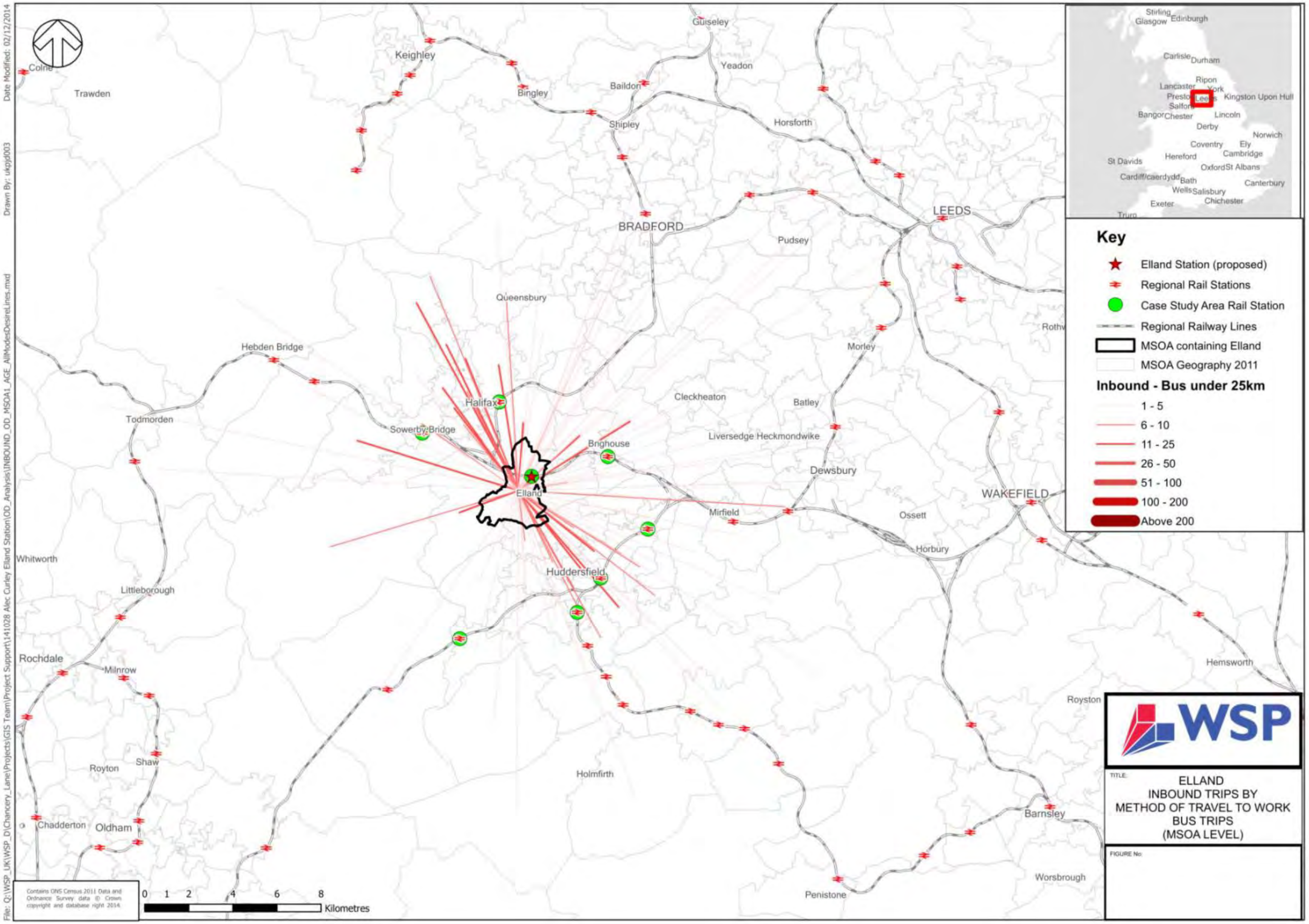


Figure 62: Choropleth map – Inbound trips for buses to Elland within 40km radius

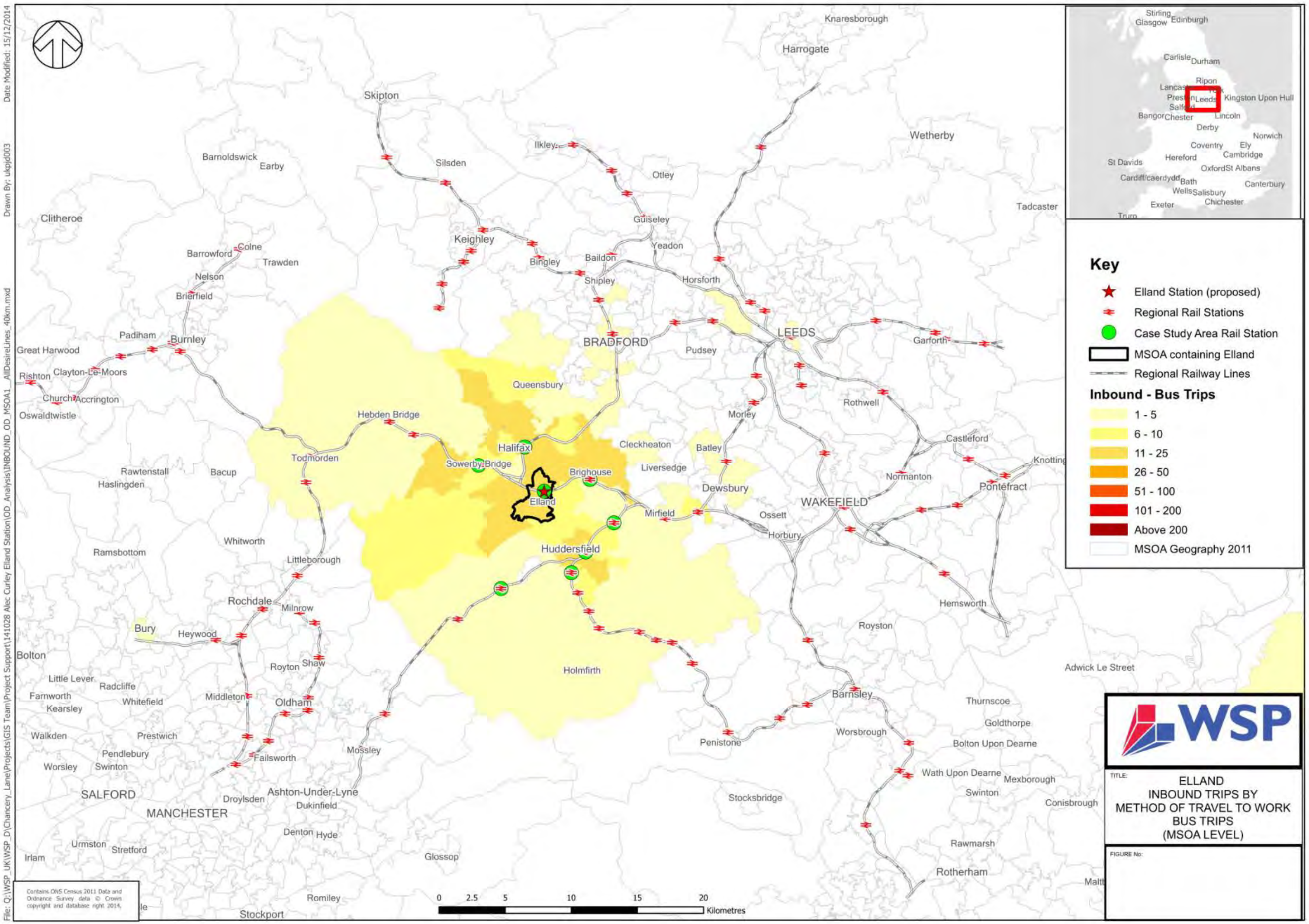


Figure 63: Desire Lines map – Outbound trips for buses from Elland within 25km radius

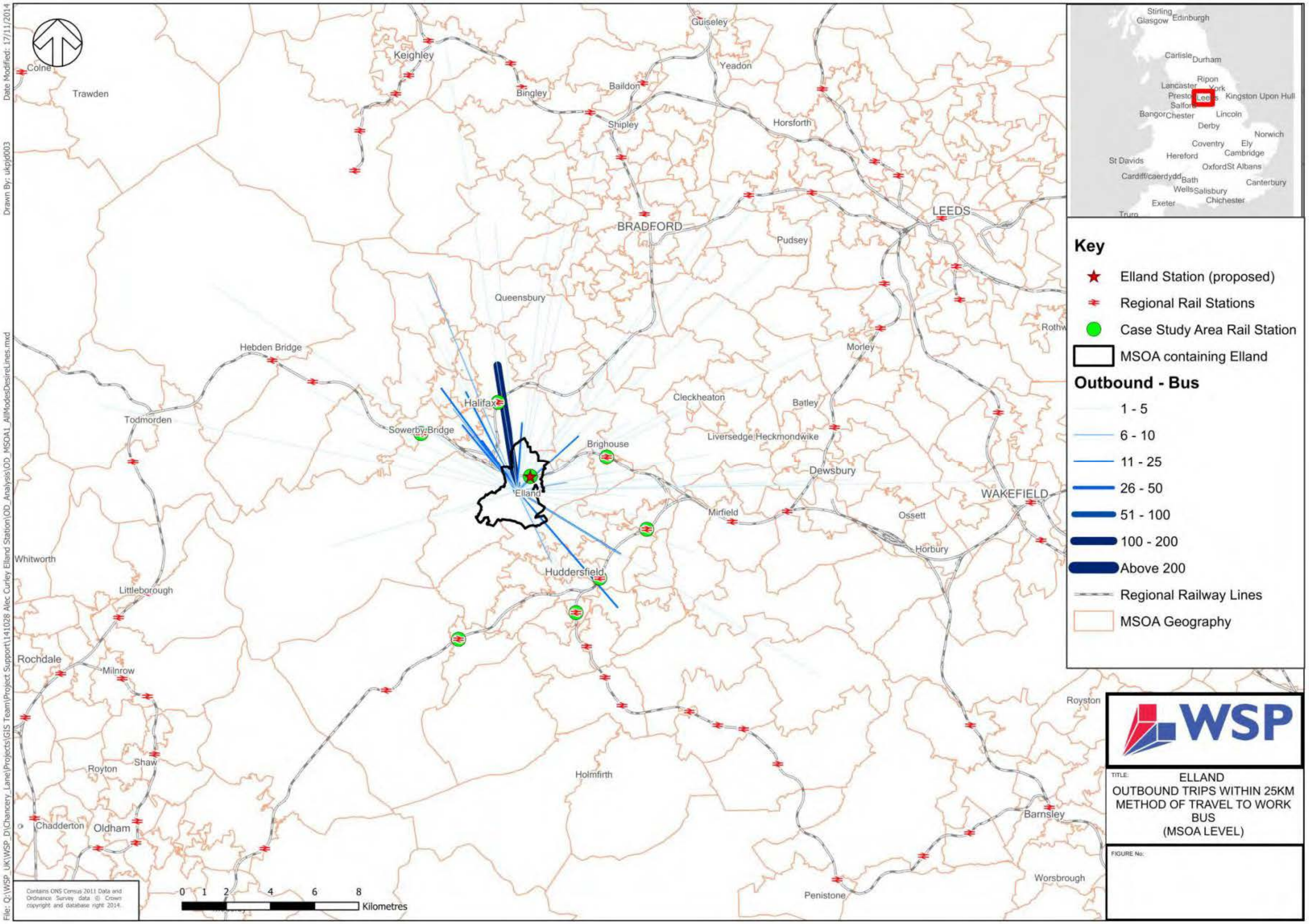


Figure 64: Choropleth map – Outbound trips for buses from Elland within 40km radius

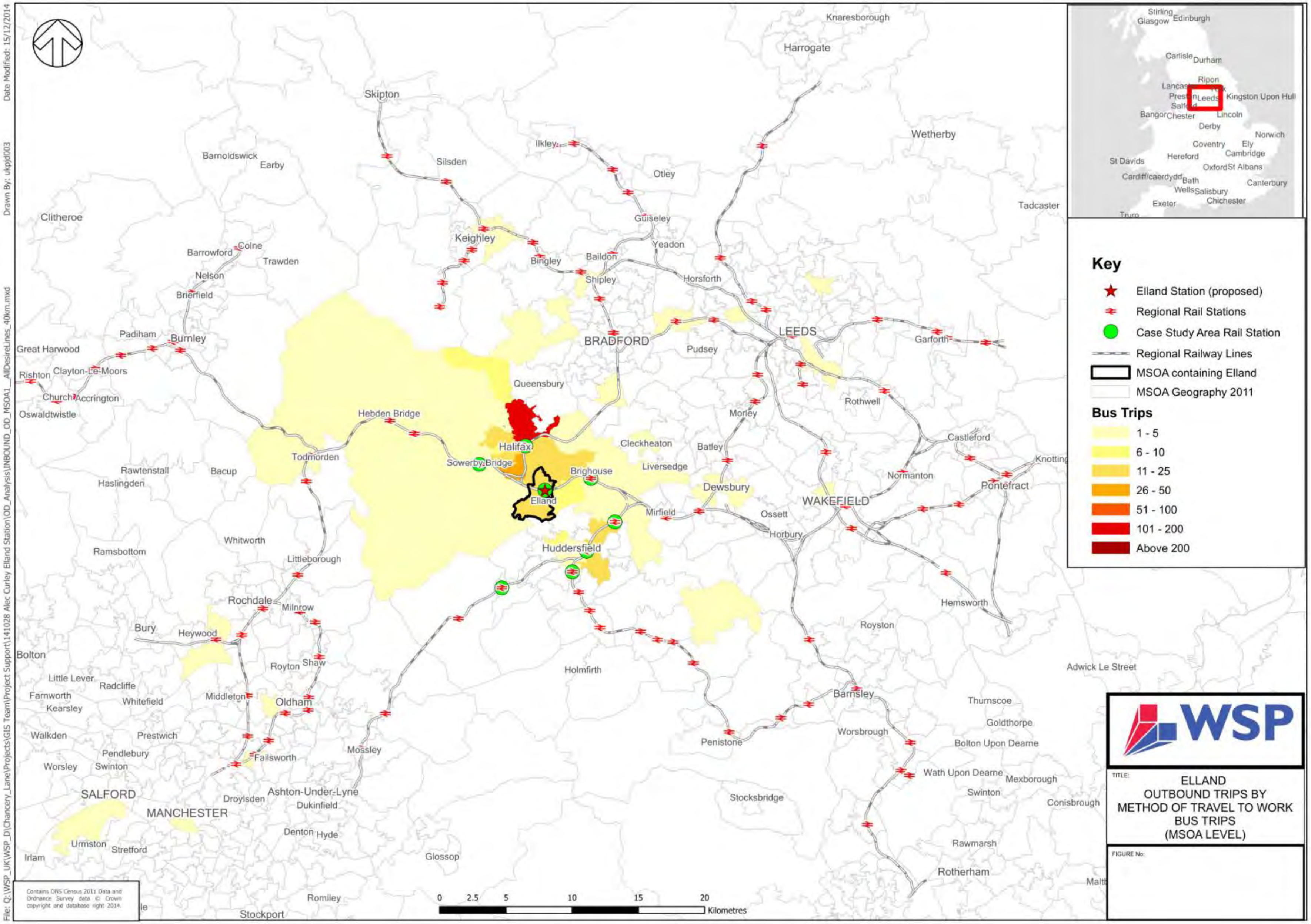


Figure 65: Desire Lines map – Inbound trips for trains to Elland within 25km radius

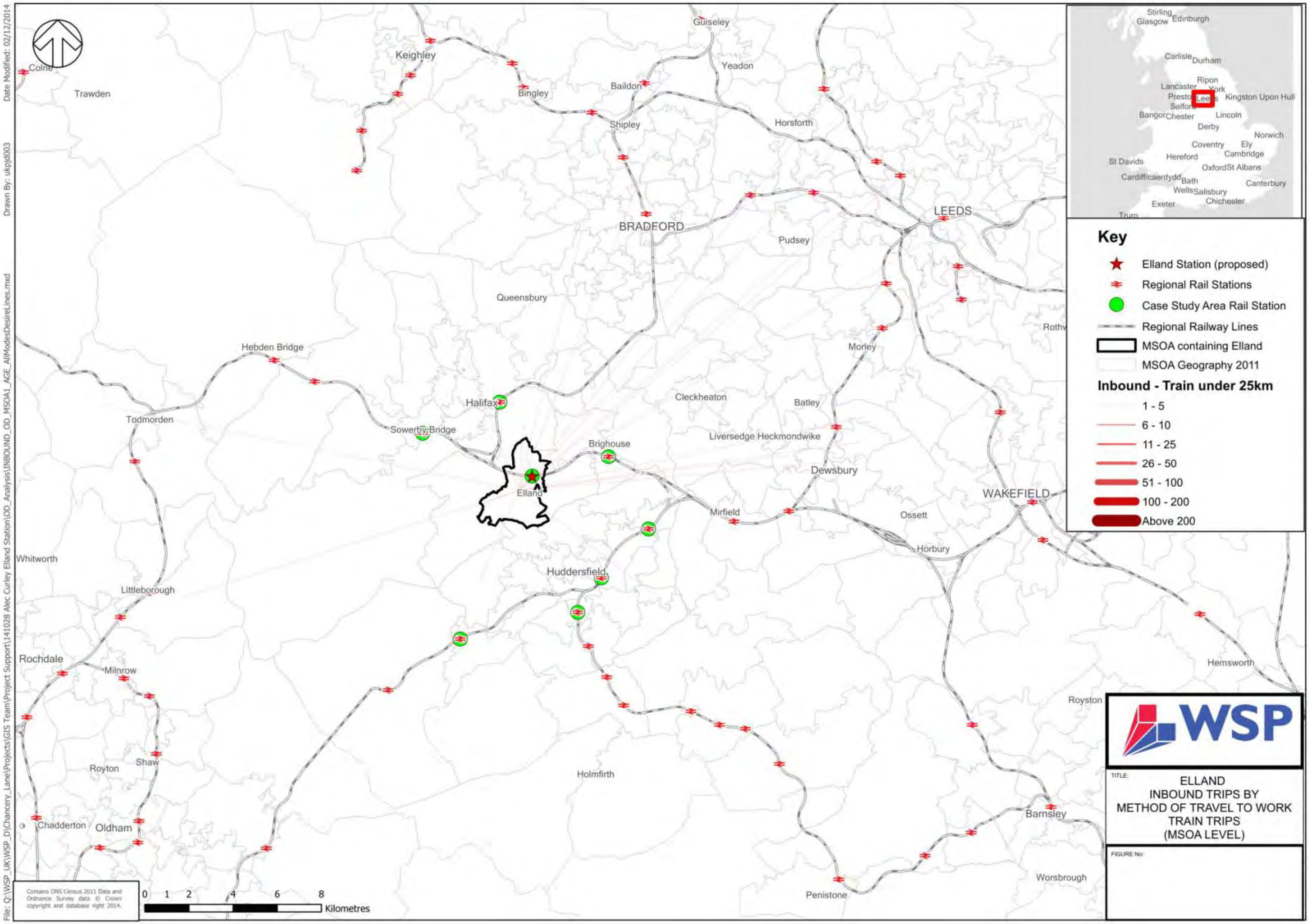


Figure 66: Choropleth map – In bound trips for trains to Elland within 40km radius

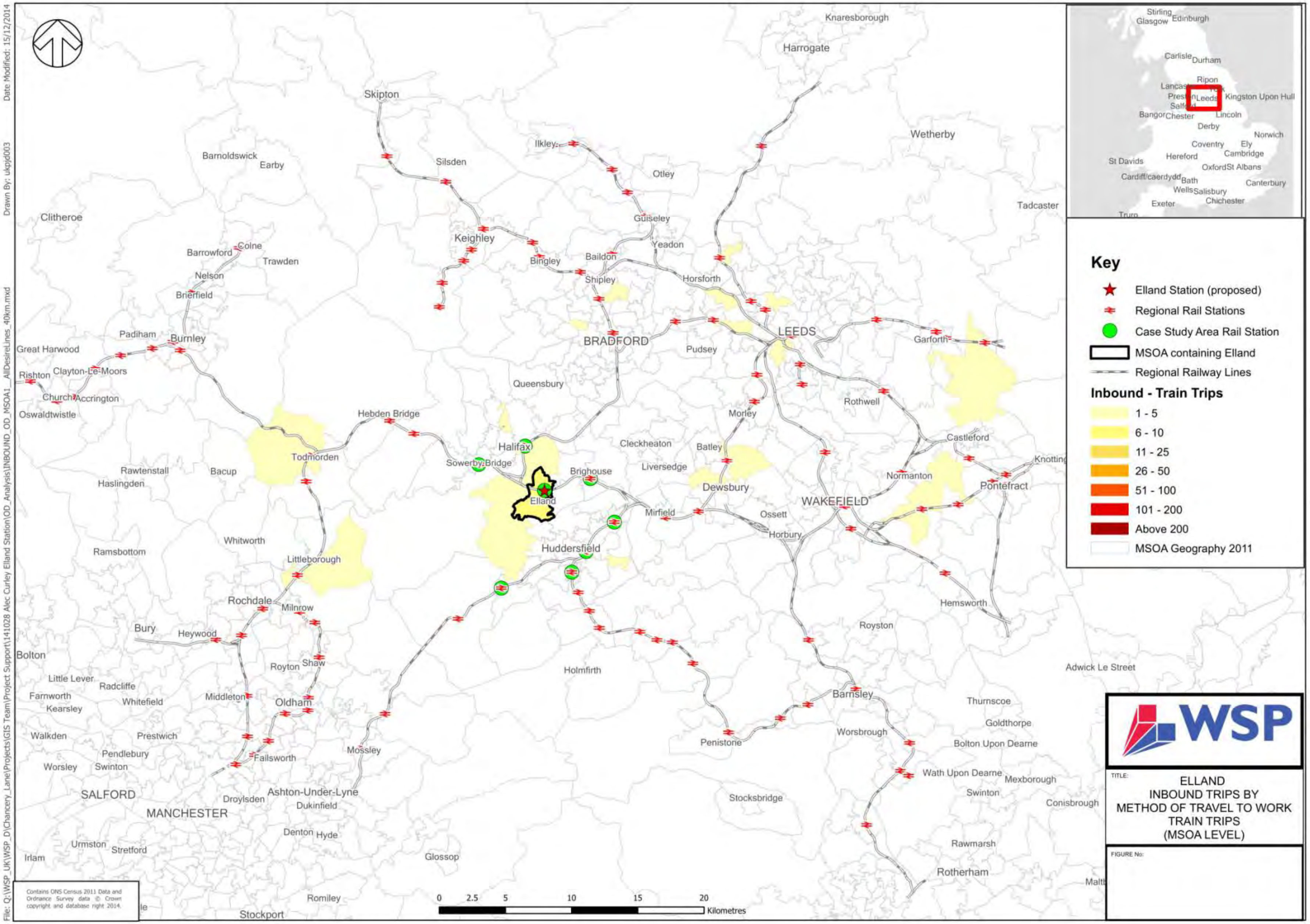


Figure 67: Desire lines map – Outbound trips for trains from Elland within 25 km radius

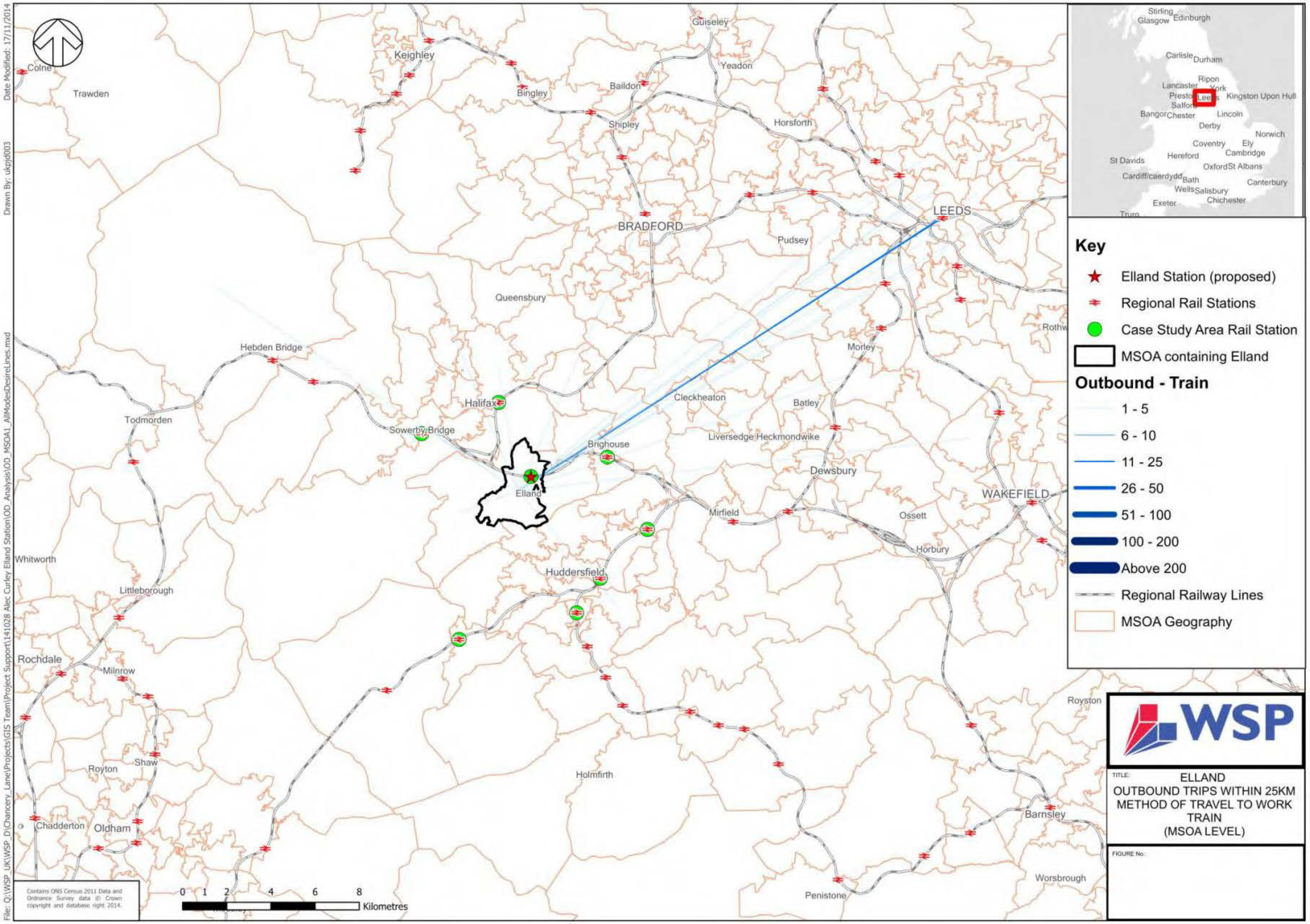


Figure 68: Choropleth map – Outbound trips for trains from Elland within 40km radius

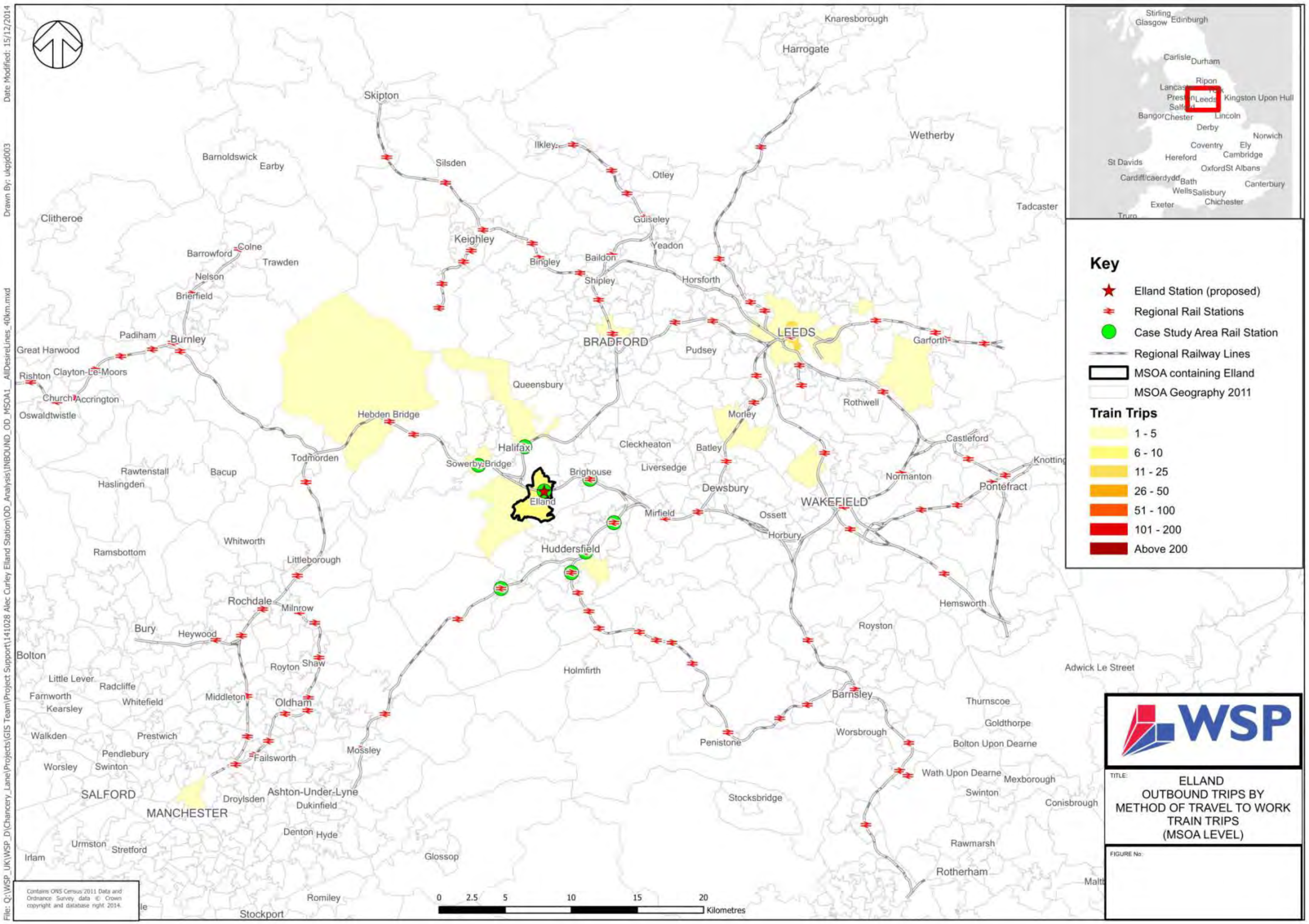


Figure 69: Total inbound trips to Elland by MTW (MSOA Level)

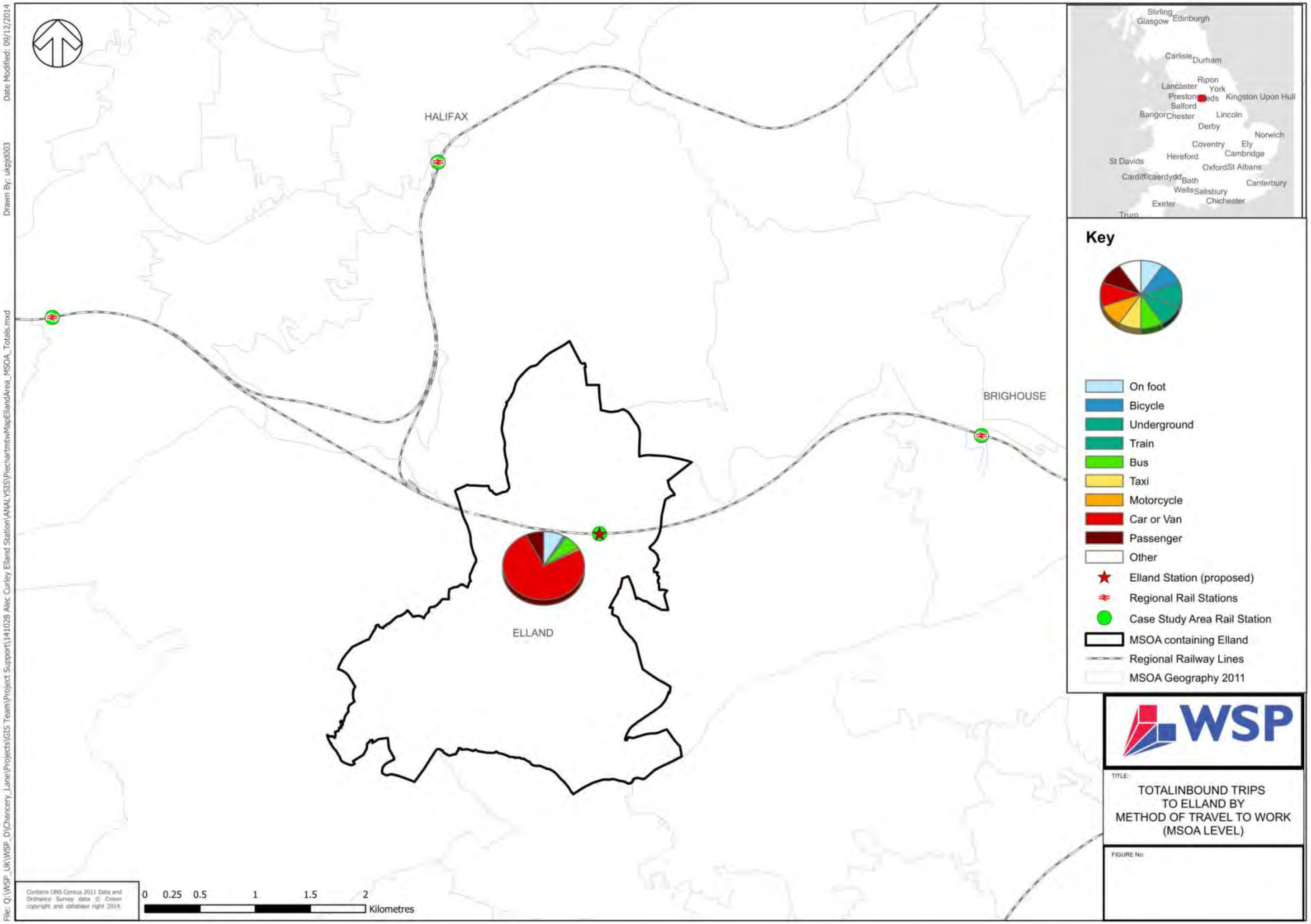


Figure 70: Total outbound trips to Elland by MTW (MSOA Level)

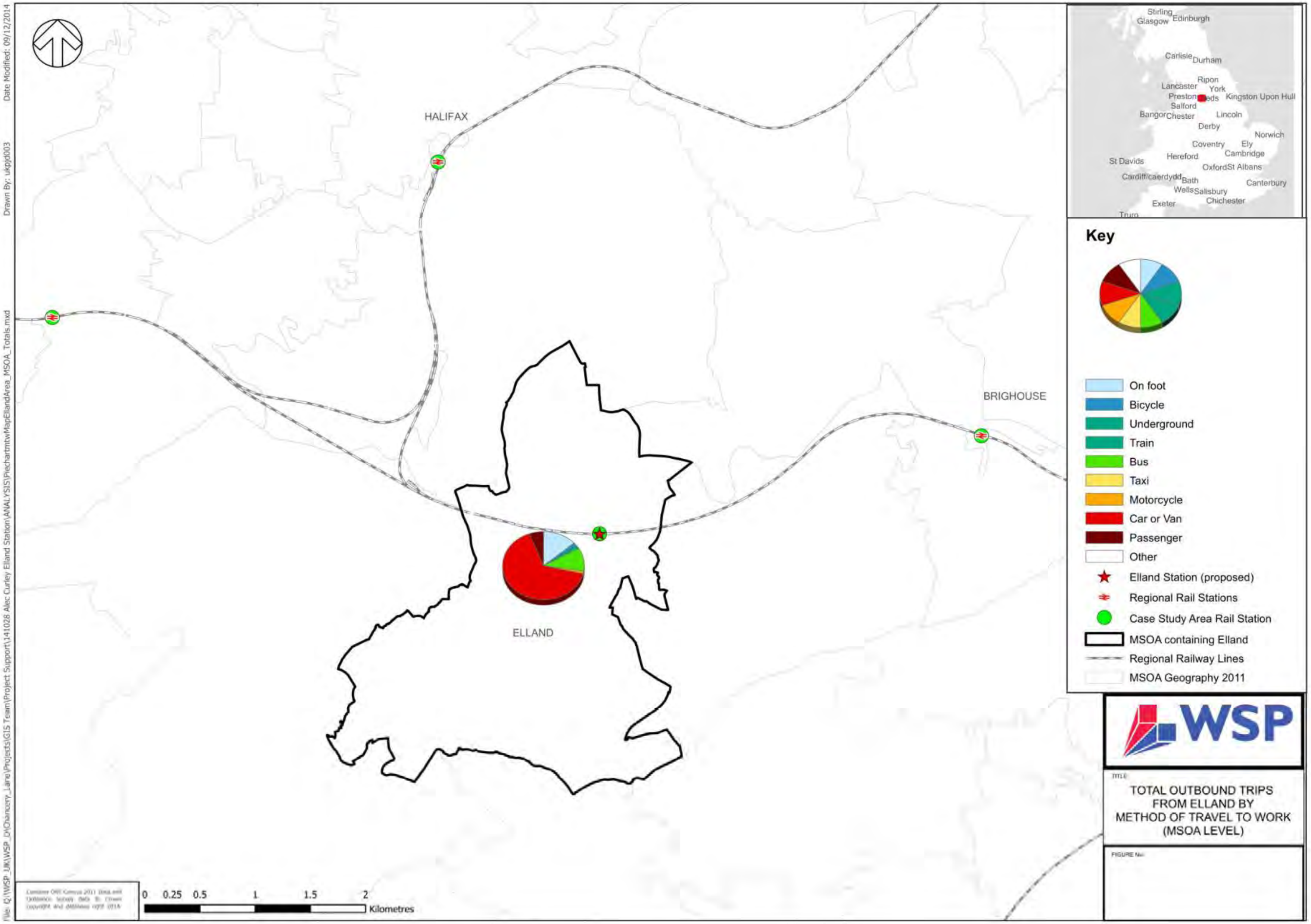


Figure 71: Total Inbound trips to Elland by MTW (MSOA Level)

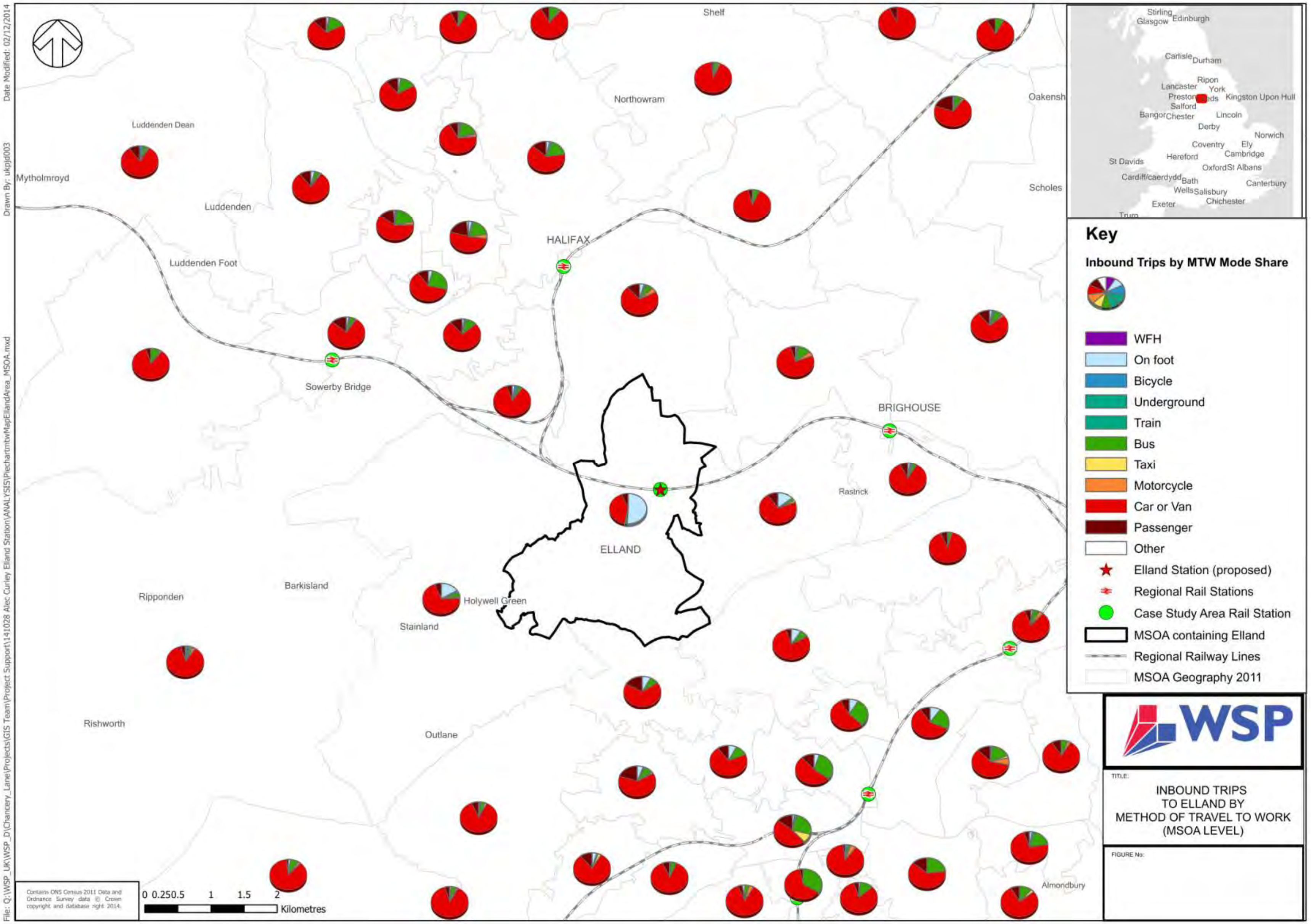


Figure 72: Total outbound trips to Elland by MTW (MSOA Level)

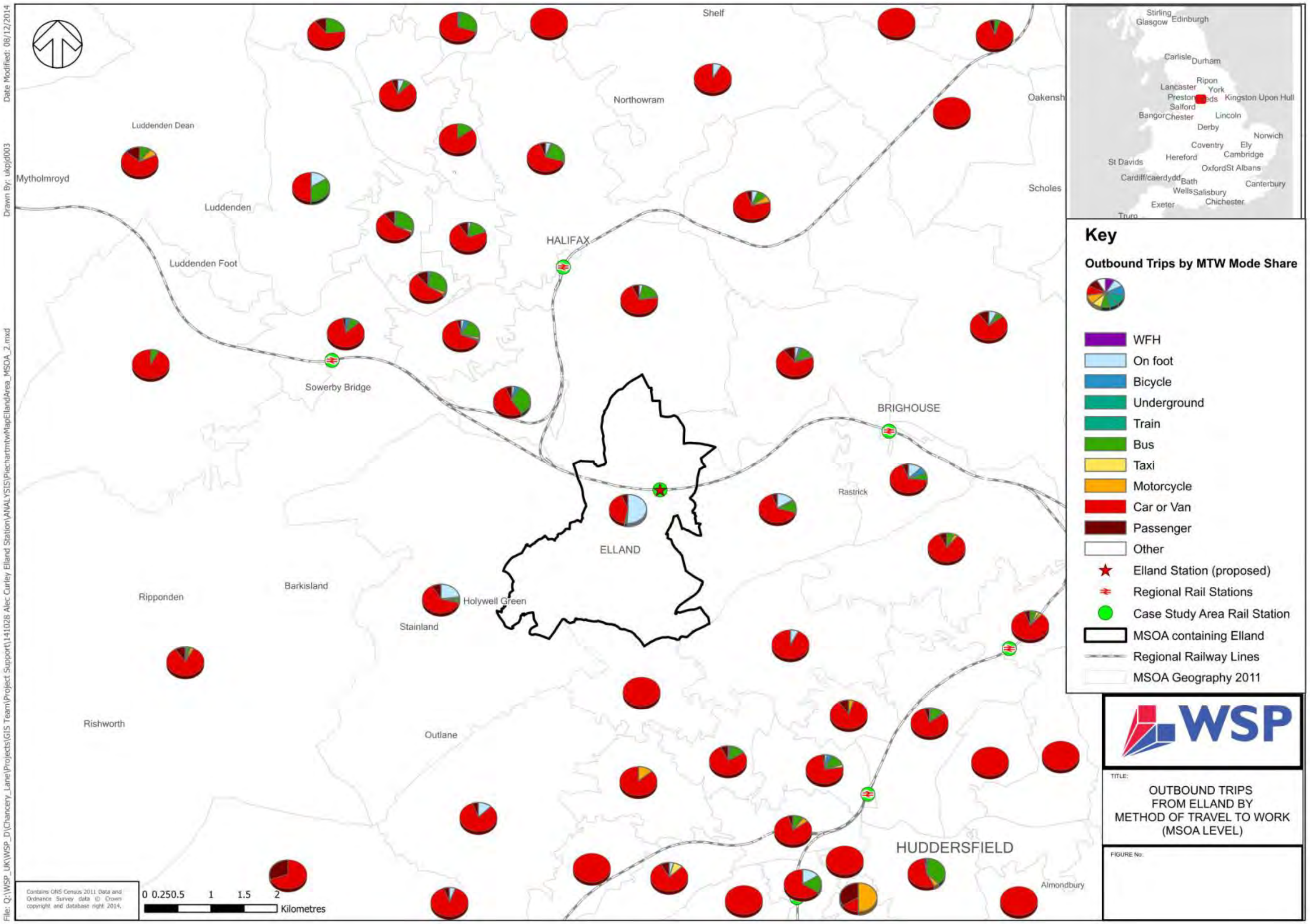


Figure 73: Elland Inbound Trips within 25km by Age Category Aged 16 to 24 years

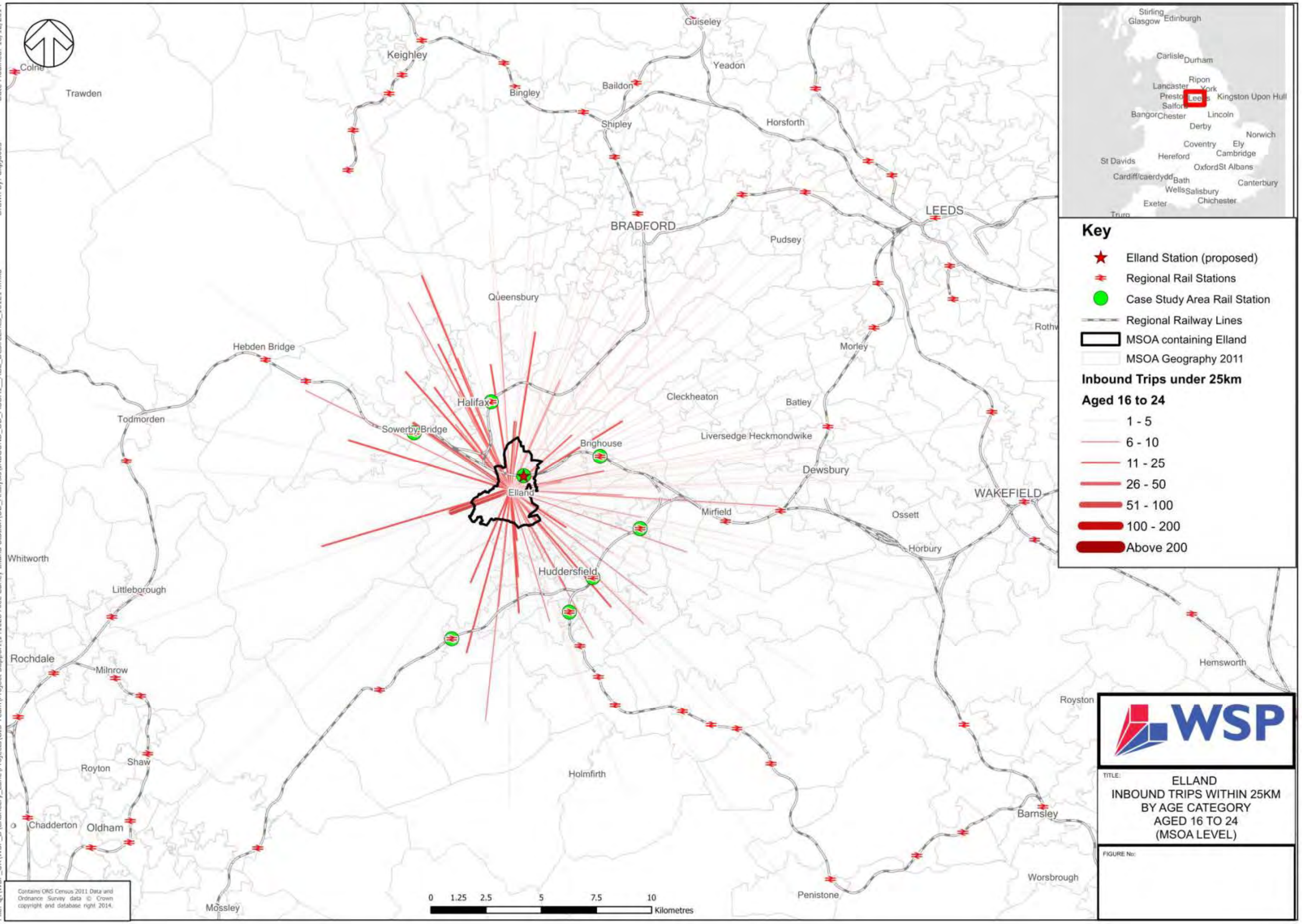


Figure 74: Elland Inbound Trips within 25km by Age Category Aged 25 to 34 years

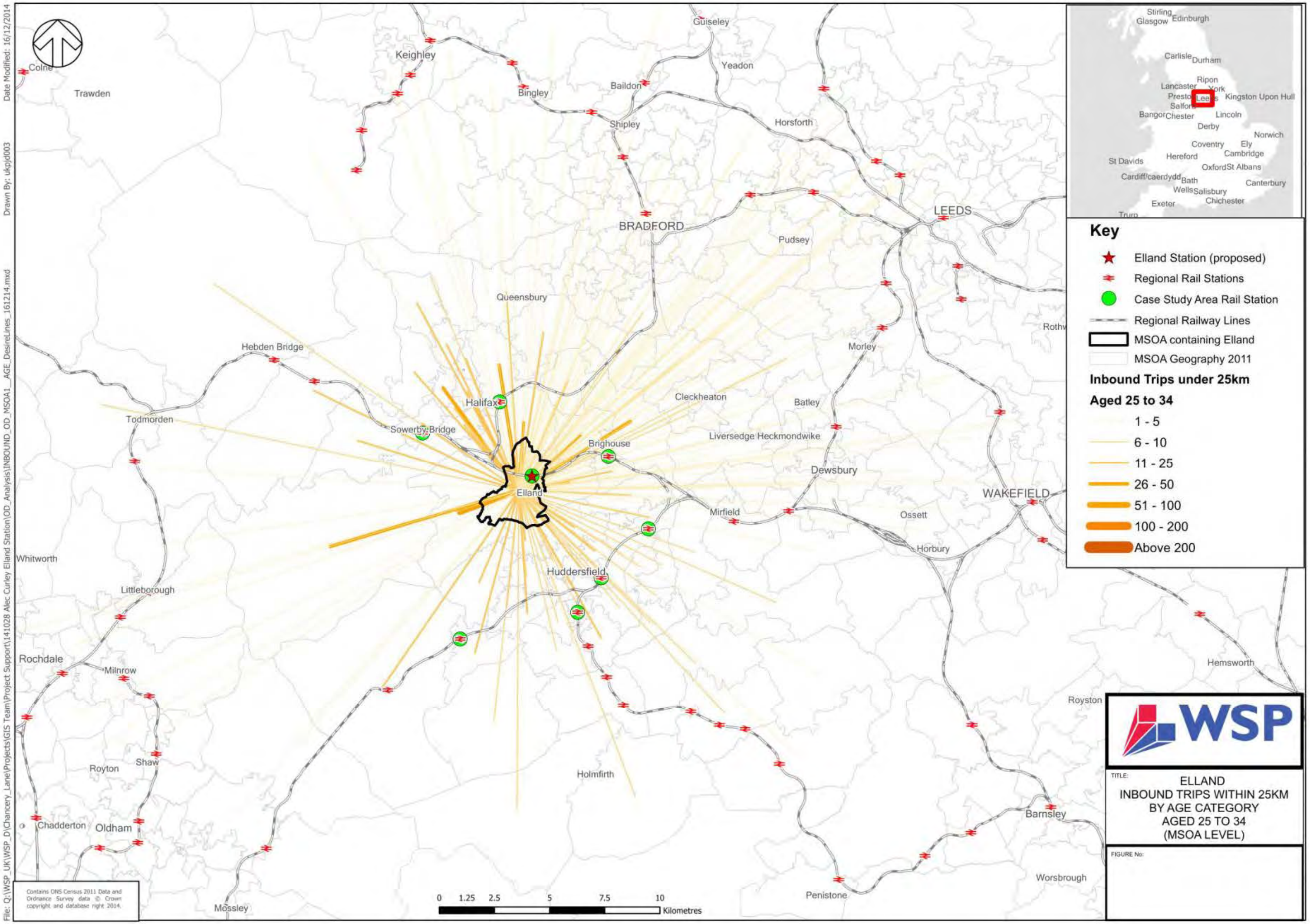


Figure 75: Elland Inbound Trips within 25km by Age Category Aged 35 to 49 years

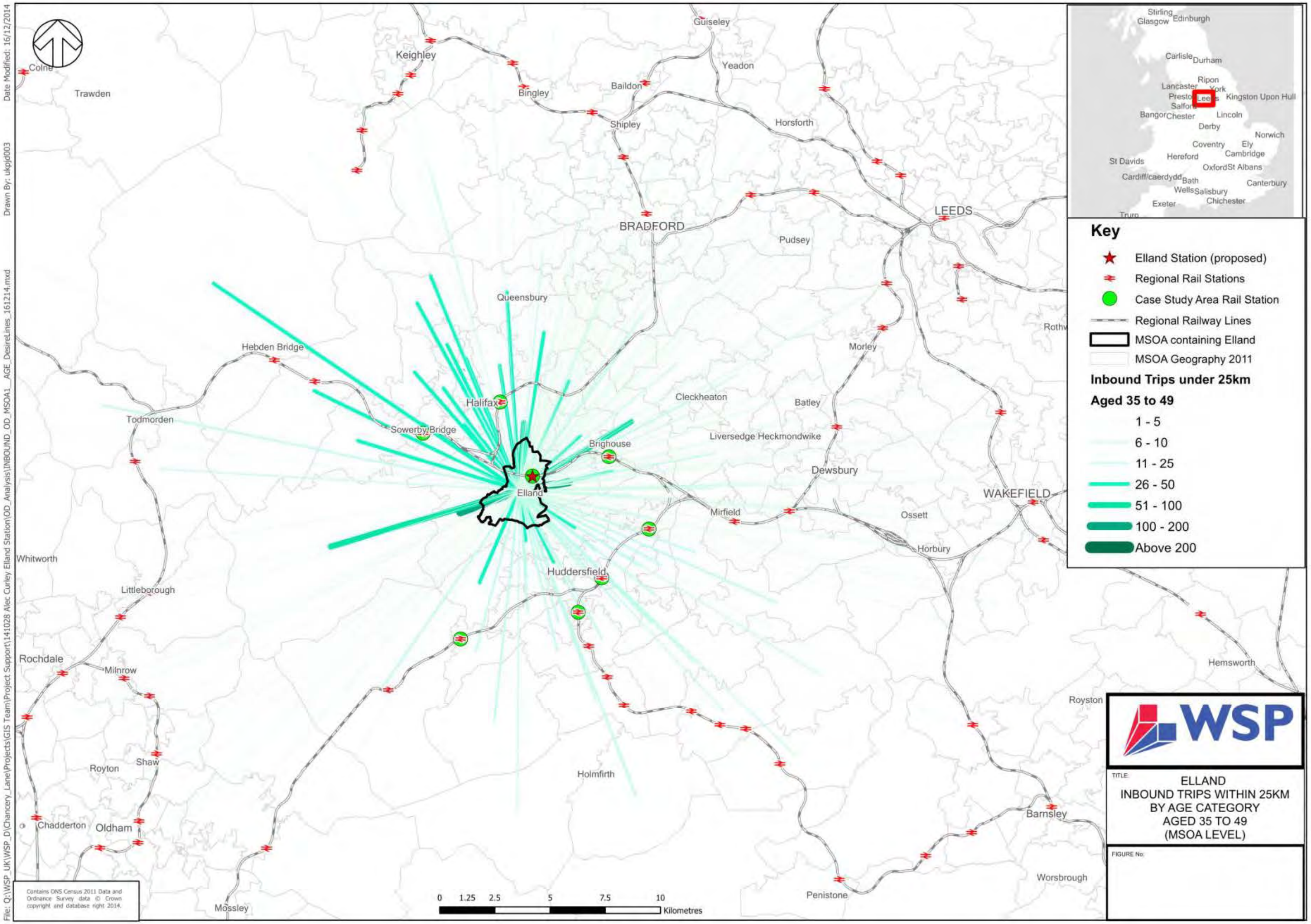


Figure 76 Elland Inbound Trips within 25km by Age Category Aged 50 to 64 years

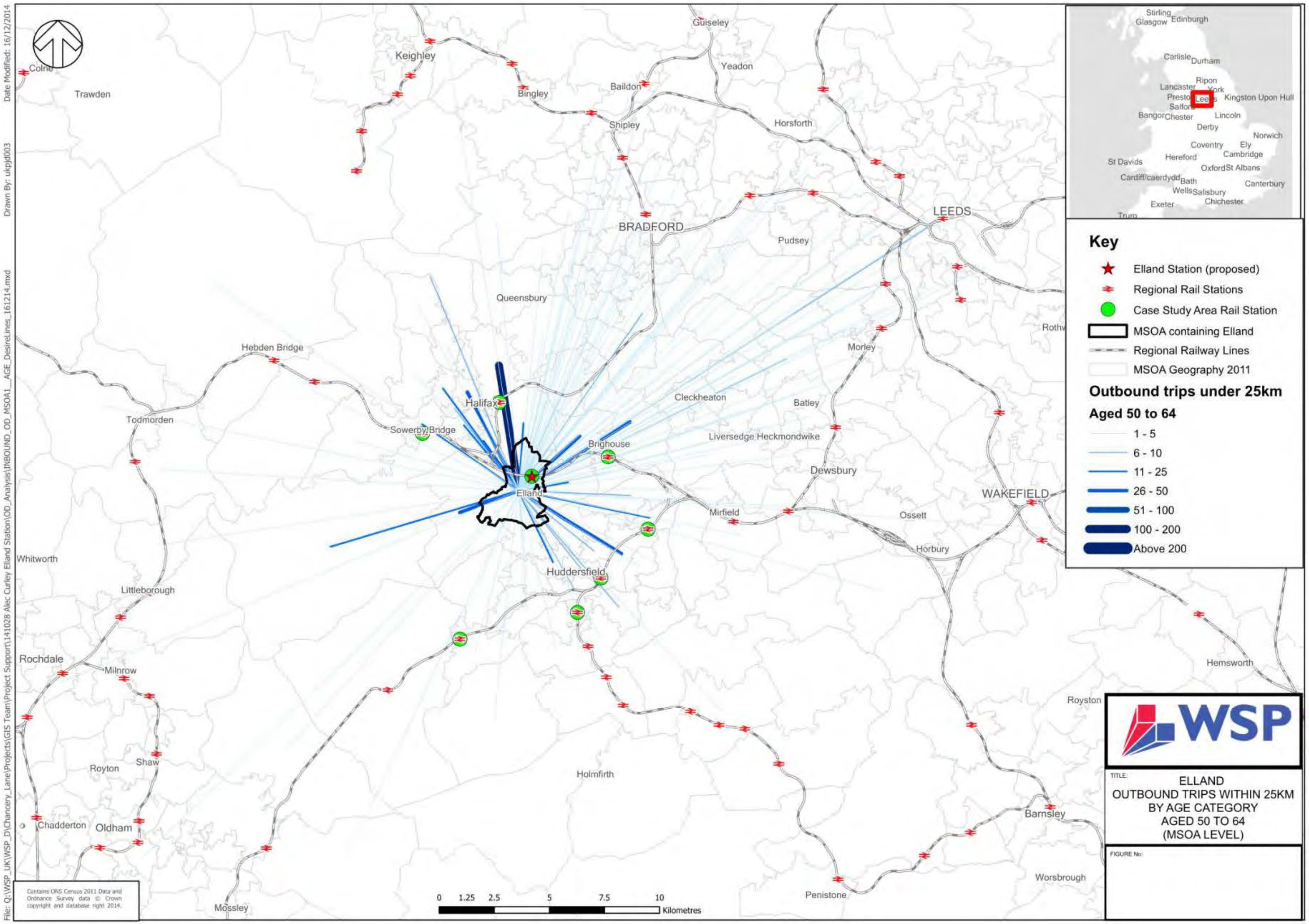


Figure 77: Elland Inbound Trips within 25km by Age Category Aged 65 years and above

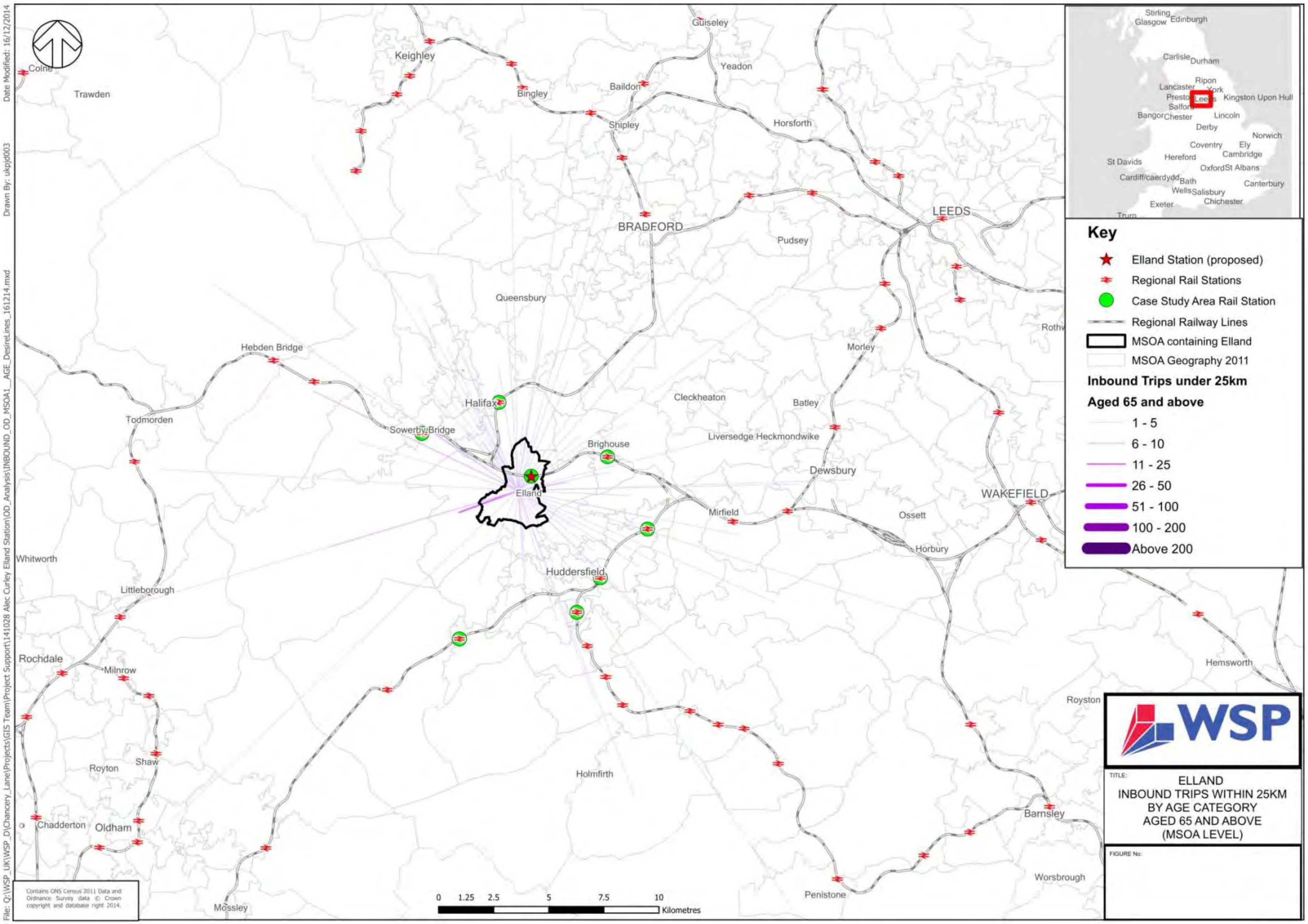


Figure 78: Pie chart showing total inbound trips to Elland by Age Category

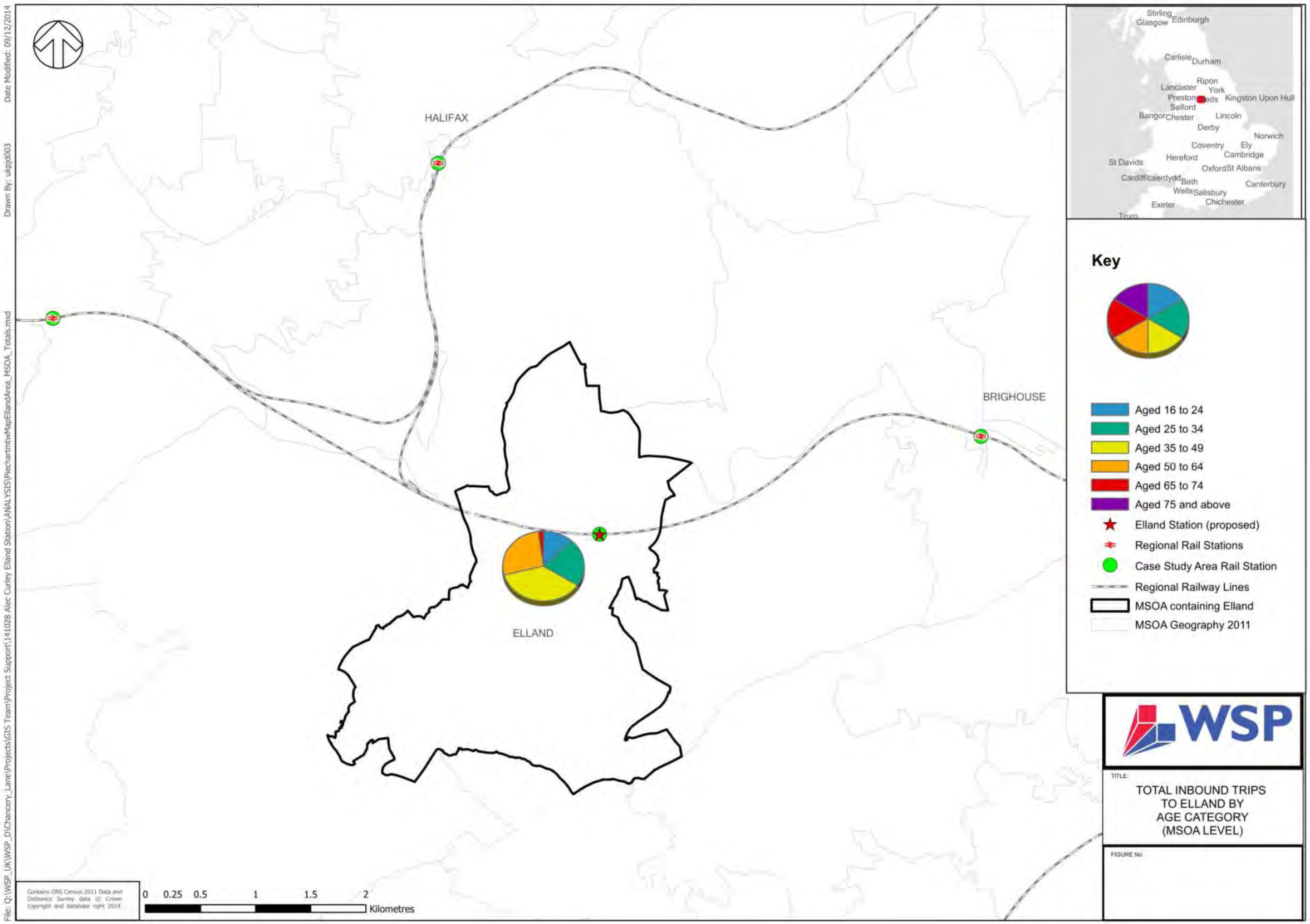


Figure 79: Pie chart showing total inbound trips to Elland by Age Category from each MSOA in the Elland catchment area

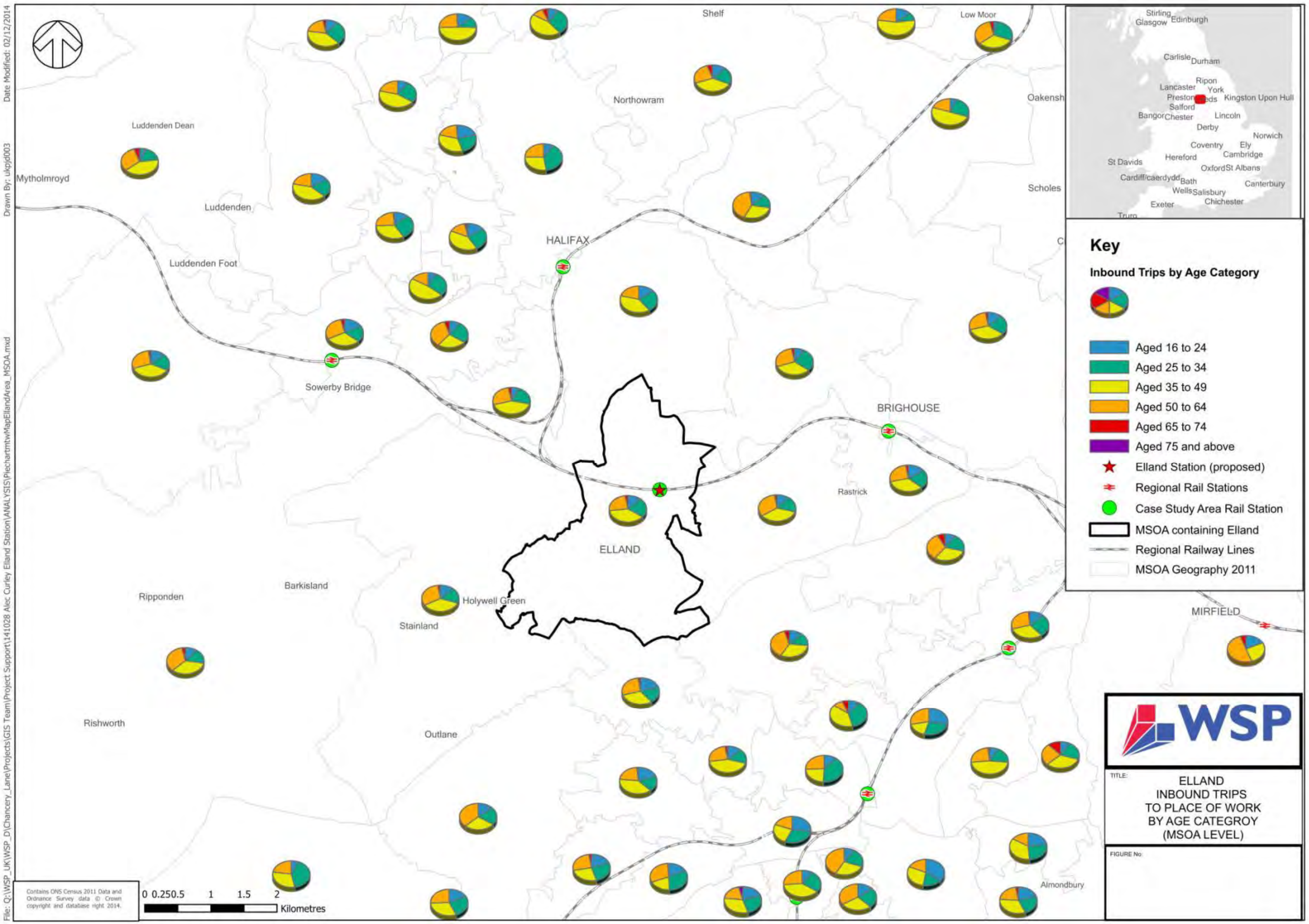


Figure 80: Elland Outbound Trips within 25km by Age Category Aged 16 to 24 years

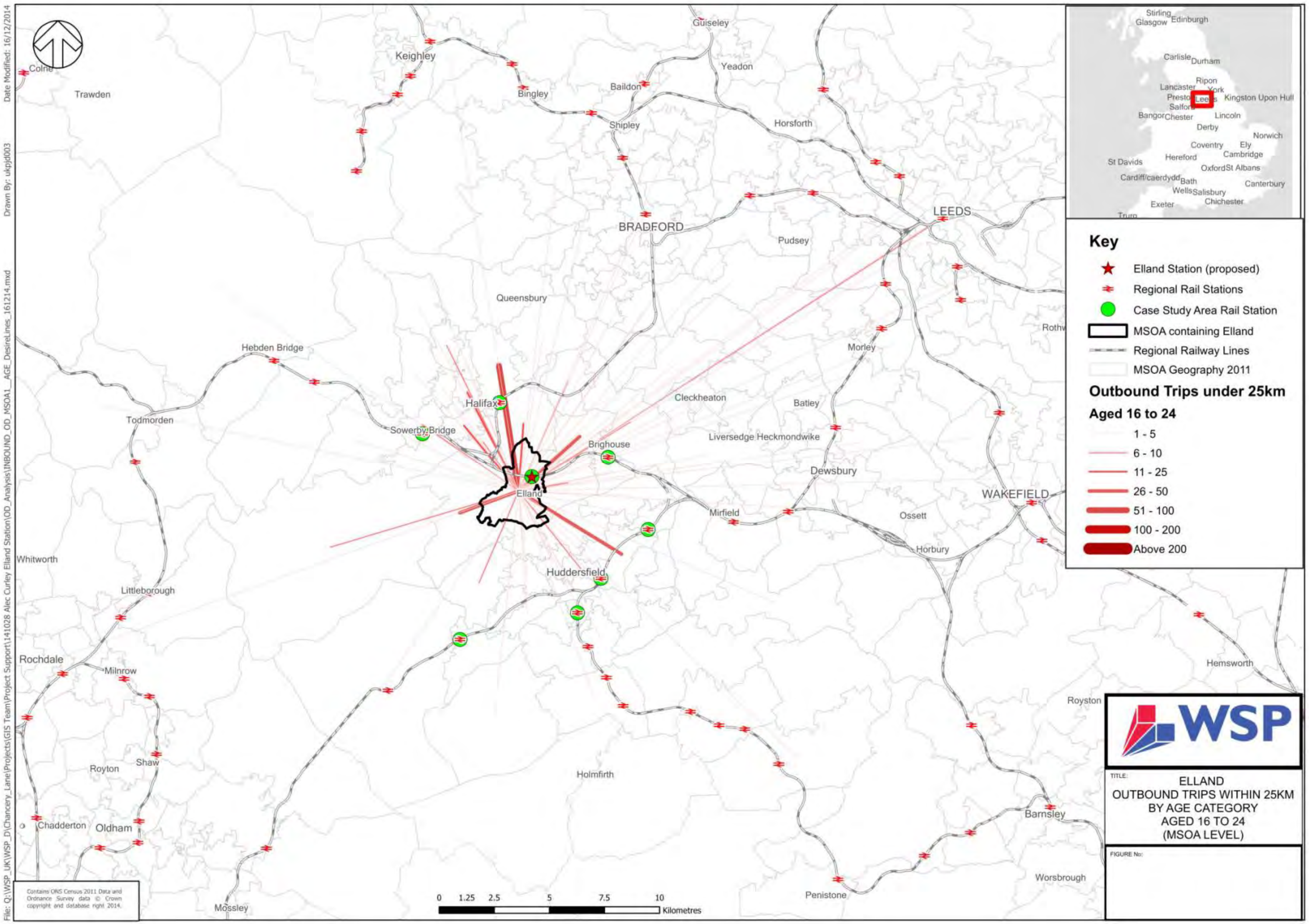


Figure 81: Elland Outbound Trips within 25km by Age Category Aged 25 to 34 years

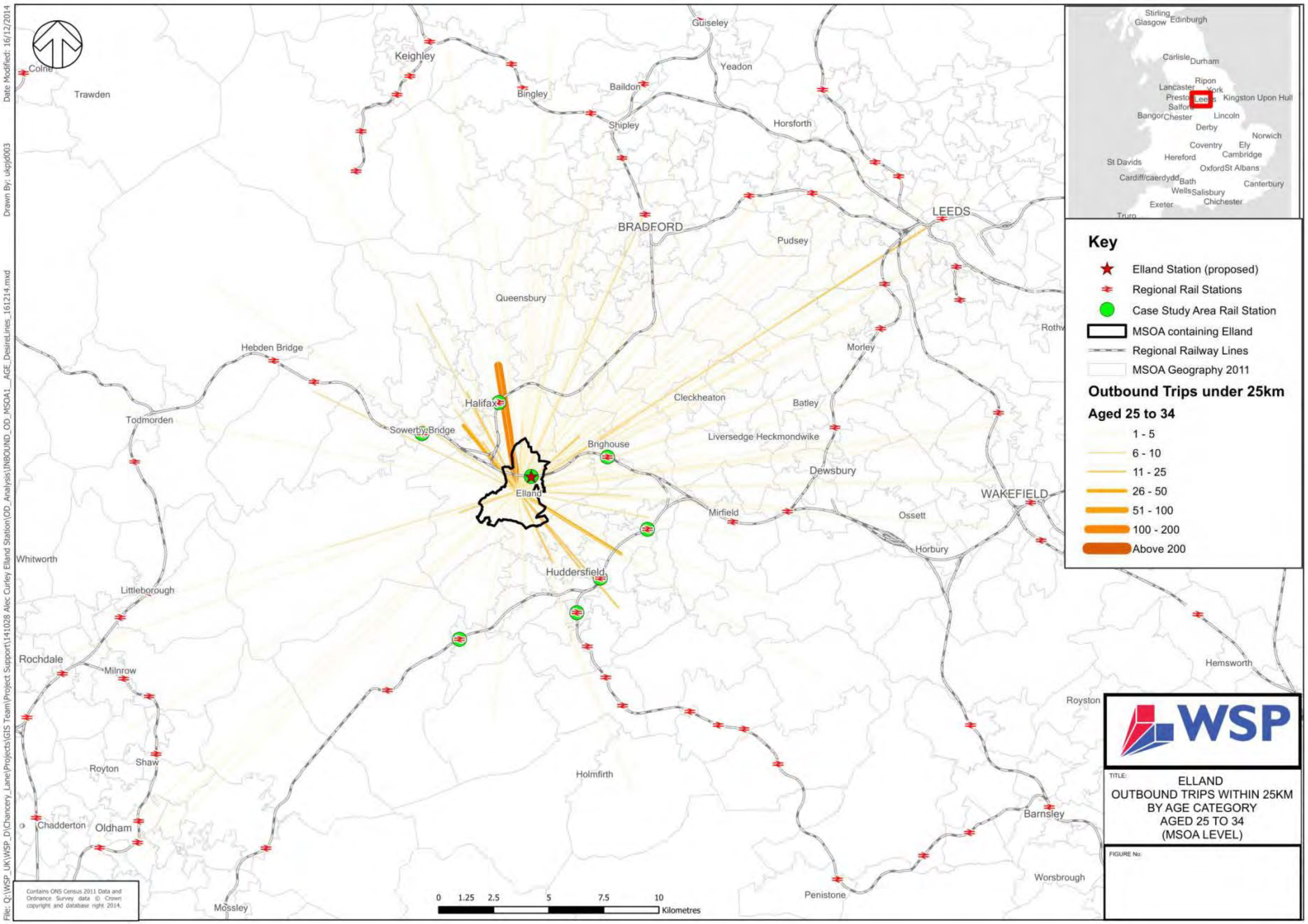


Figure 82: Elland Outbound Trips within 25km by Age Category Aged 35 to 49 years

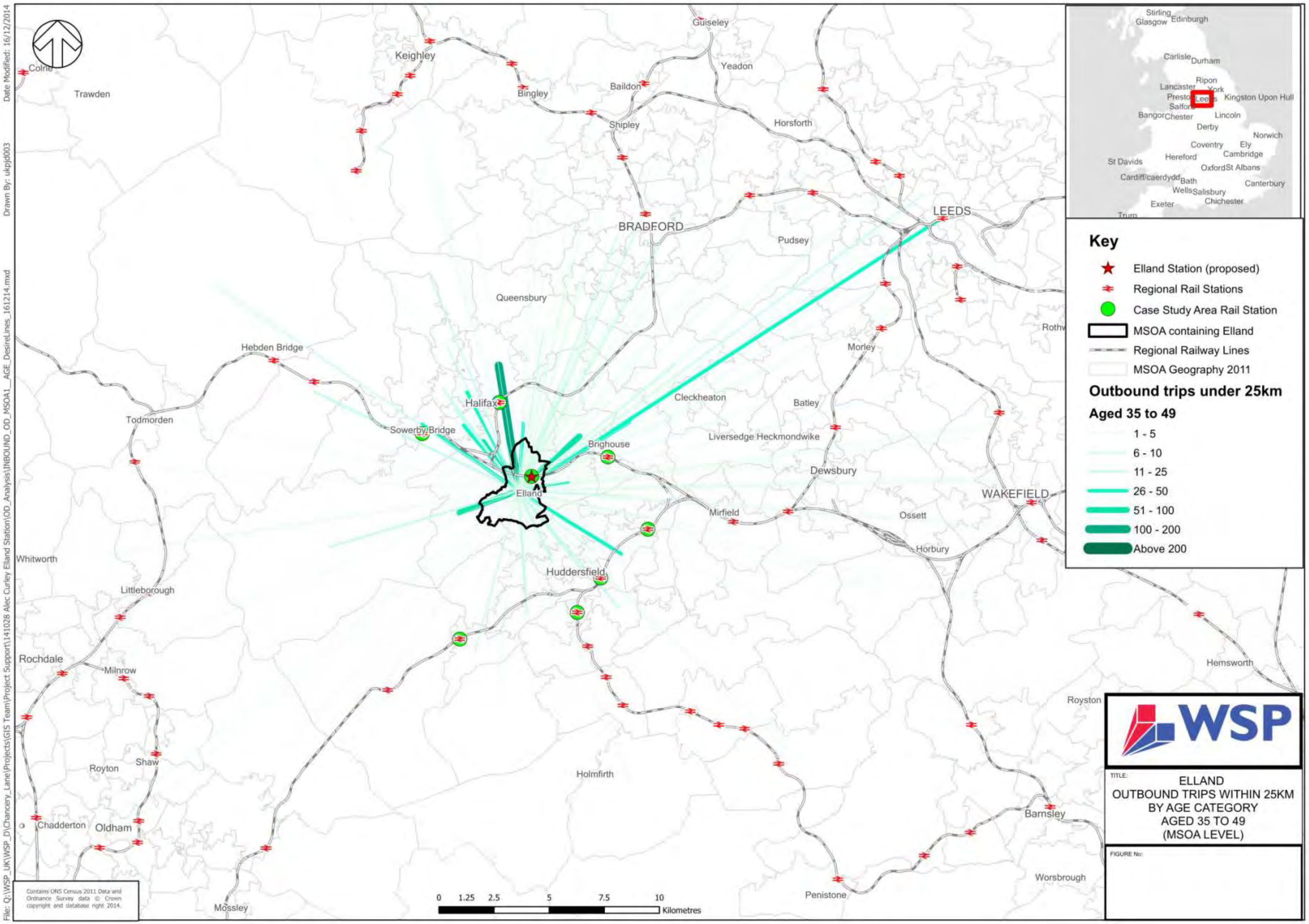


Figure 83: Elland Outbound Trips within 25km by Age Category Aged 50 to 64 years

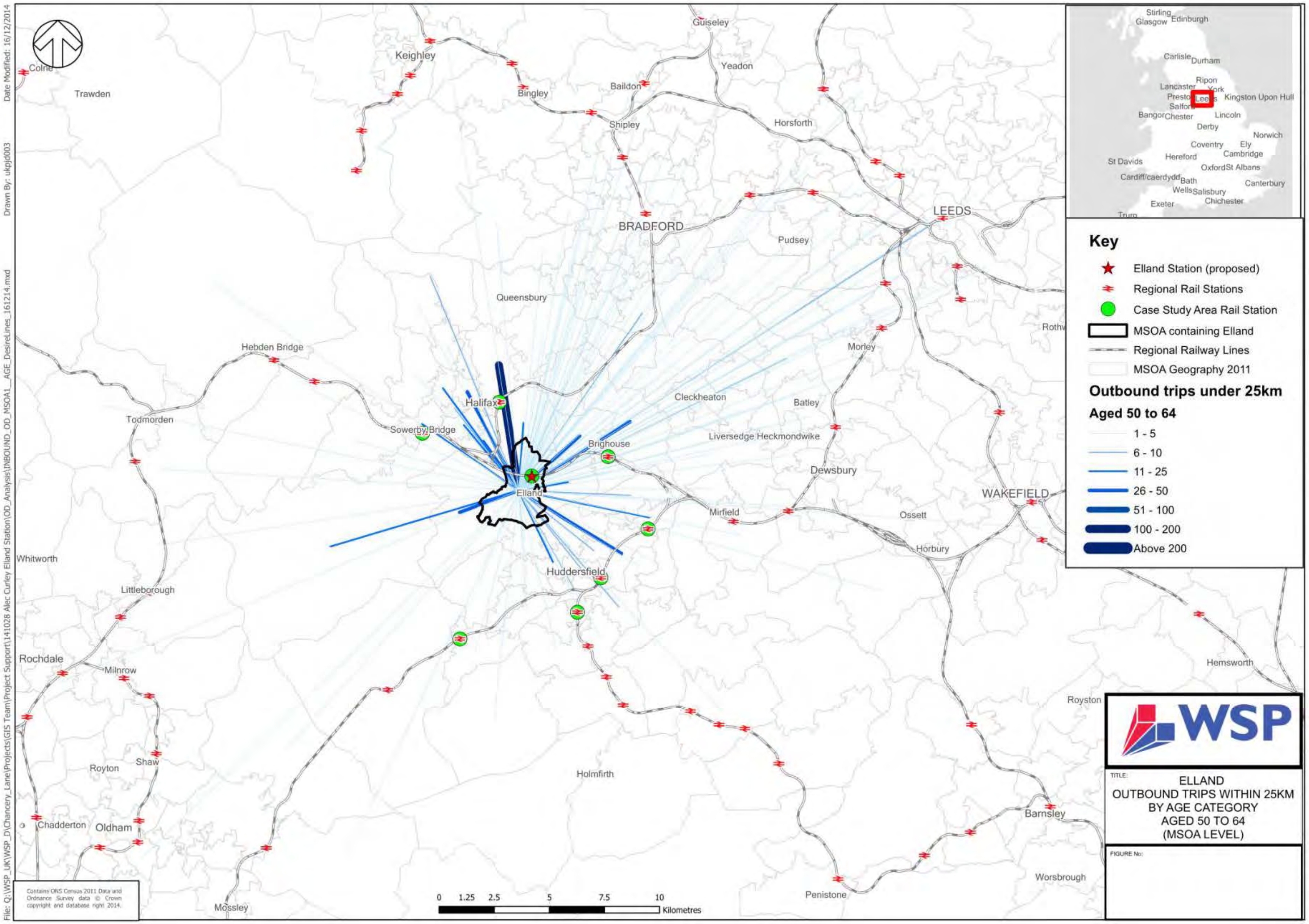


Figure 84: Elland Outbound Trips within 25km by Age Category Aged 65 years and above

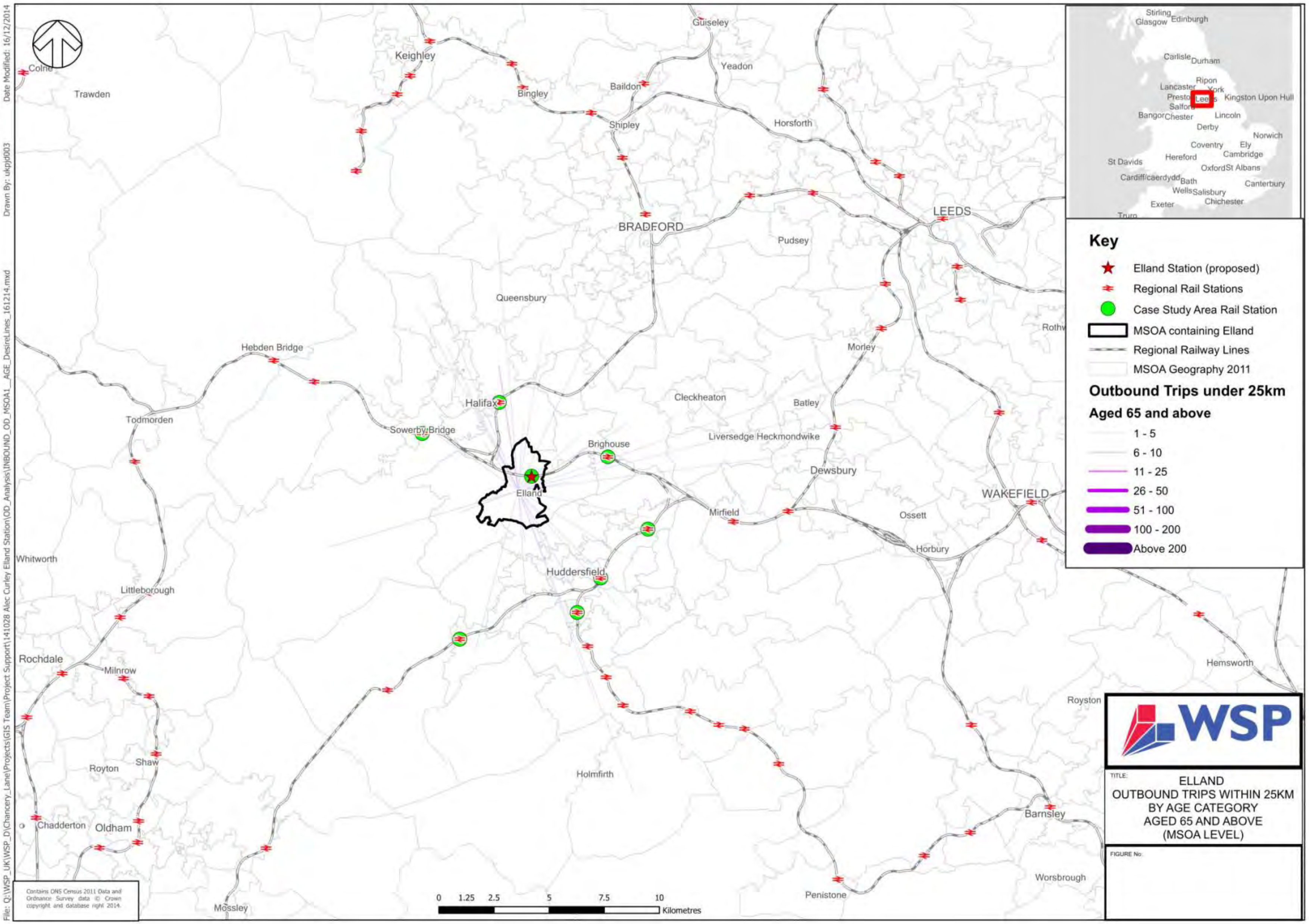


Figure 85: Pie chart showing total outbound trips to Elland by Age Category

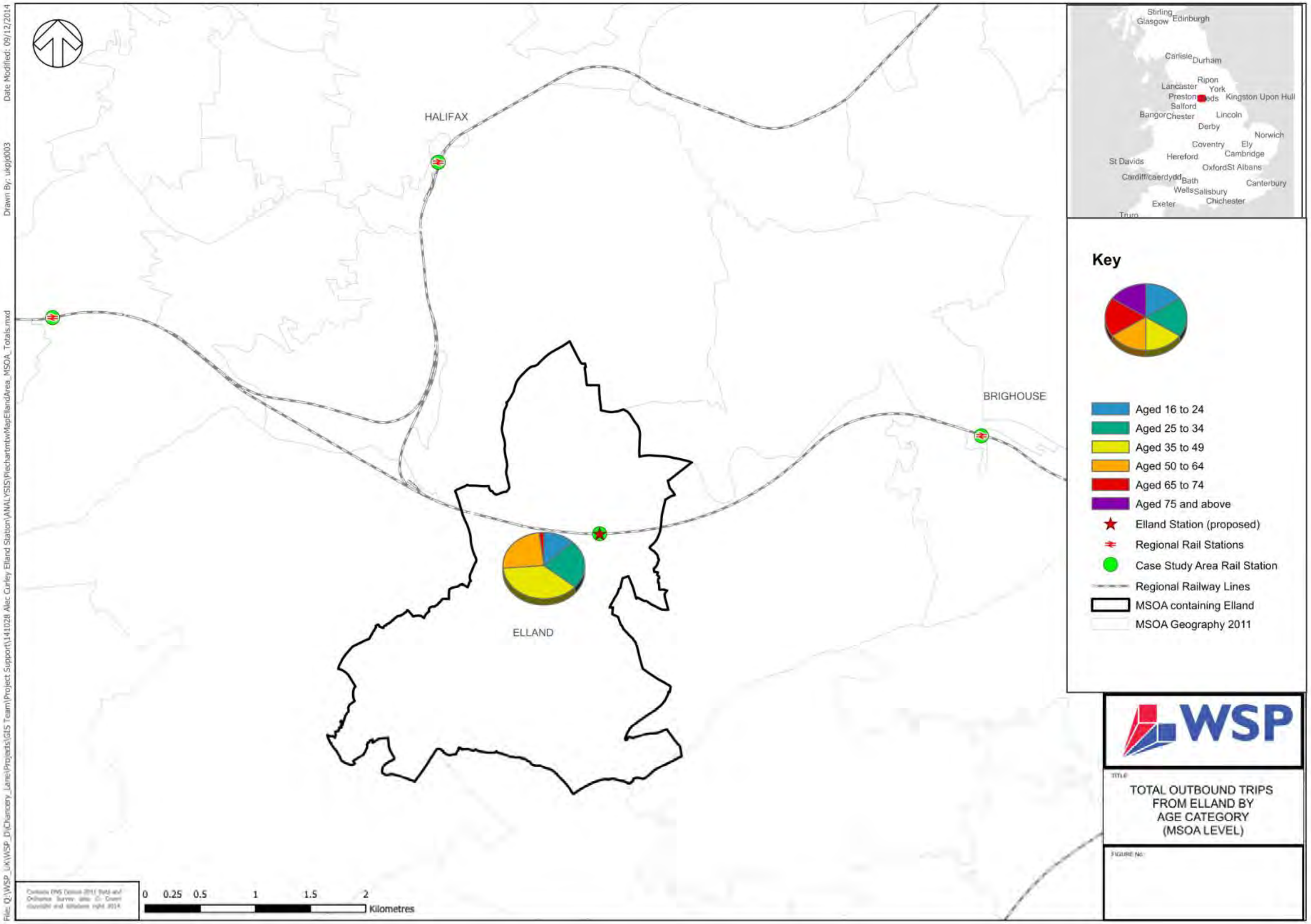
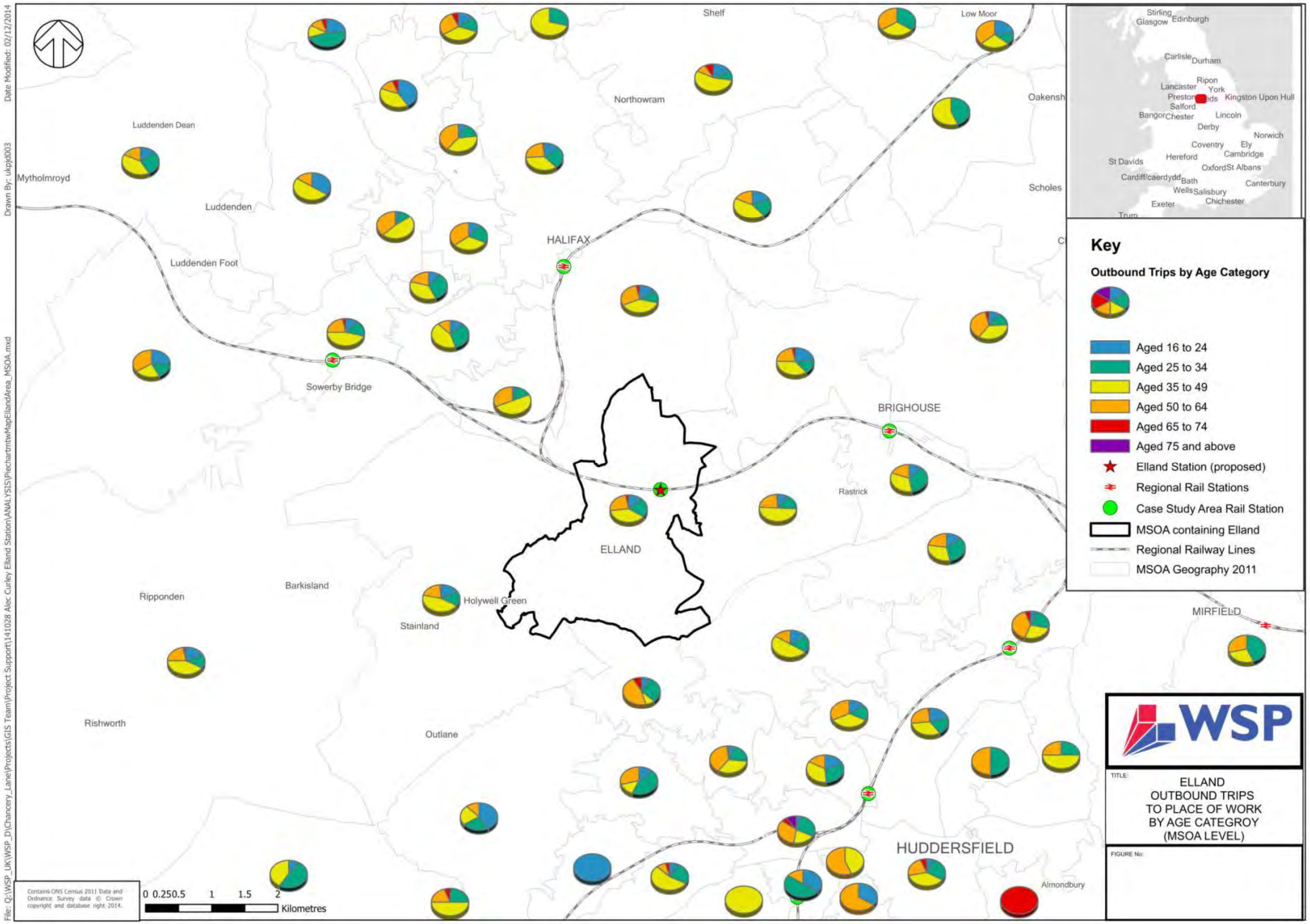


Figure 86: Pie chart showing total outbound trips to Elland by Age Category from each MSOA in the Elland catchment area



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