

REPORT N<sup>o</sup> 70018699-03

# CALDERDALE LOCAL PLAN EVIDENCE BASE

TECHNICAL NOTE 2: IMPLICATIONS OF  
SETTLEMENT GROWTH

JULY 2016

# CALDERDALE LOCAL PLAN EVIDENCE BASE

## IMPLICATIONS OF SETTLEMENT GROWTH

**Calderdale Metropolitan Borough Council**

Project no: 70018699

Date: July 2016

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# 1 INTRODUCTION

- 1.1.1 The Calderdale Local Plan will set out the levels of housing and employment development land that needs to be allocated. Assessments of quantified need for housing within the Local Plan have given rise to totals as follows:

**Table 1 - Local Plan Housing requirement**

		NUMBER	COMMENTS
A	Total Requirement 2012-2015	2,838	SHMA 2015
B	Net Completions 2012-2015	1,269	HLA Database
C	Difference 2012-2015	1,569	A-B
D	Requirement 2015-2032	16,082	SHMA 2015 (17 year plan period)
E	Total Requirement	<b>17,651</b>	D+C difference spread over plan period (+92pa)
	<b>Dwellings per annum</b>	<b>1,038</b>	E/17 (2015/16-2031/32)

- 1.1.2 The number of jobs, and subsequent land allocations, that are required over the period of the plan are still emerging from analysis of the Regional Econometric Model and Employment Land Review (ELR).
- 1.1.3 The purpose of this report is to develop evidence that can be used to inform the optimal distribution of these levels of development.
- 1.1.4 Set alongside parallel (non-transport) factors being considered by CMBC's Local Plan team, the findings will be used to inform a preferred distribution of growth across settlements within Calderdale based on the implications that stand to result from delivery.
- 1.1.5 The findings of this report will focus on the macro-level implications likely to result from development in each settlement rather than detailed analysis of specific local impacts.
- 1.1.6 The extent of development (housing and employment) that has been tested in each settlement is based on suitable scales and indicative locations for development identified by CMBC as broadly representative of the types of growth currently being considered.
- 1.1.7 The previous Stage 1 report of the Local Plan Transport Evidence Base set out the transport base line prior to the local plan, constraints, opportunities and possible future improvements. The findings from that report have been used to inform the analysis in this report.
- 1.1.8 The remainder of this report is structured as follows:
- Chapter 2 sets out the methodology used for analysis of future travel resulting from settlement growth

- Chapter 3 sets out the analysis of future travel in each settlement resulting from housing growth
- Chapter 4 sets out the analysis of future travel in each settlement resulting from employment growth
- Chapter 5 draws out the key conclusions from the analysis within the earlier chapters

# 2

## METHODOLOGY

### OVERVIEW

- 2.1.1 In order to establish an understanding of which settlements within Calderdale offer the most sustainable locations for new housing and employment, CMBC has provided details of sites within each settlement for several different uses including:
- Housing (all categories);
  - Employment category B1: Offices, premises for research and development or light industrial processes appropriate within a residential setting;
  - Employment category B2: General industrial use;
  - Employment category B8: Properties which are used for storage or as a distribution centre; and
  - Mixed use: Differing combinations of the above land uses.
- 2.1.2 The scale of development tested in this report is considered by CMBC to be broadly representative of the quantum of development that will eventually form part of the Calderdale Local Plan.
- 2.1.3 The findings of this report provide information to CMBC to be used when finalising the Calderdale Local Plan, specifically with regards the quanta of housing and employment development in each settlement.
- 2.1.4 The following narrative outlines the methodology used to estimate the volume, type and distribution of new commuting trips generated by housing and employment development in different settlements within Calderdale.
- 2.1.5 The assessment of future trip making has been looked at separately for housing and employment sites at this stage. In reality the two sets of movements are intertwined as some new trips from housing will inevitably go to new employment; therefore, to avoid double counting the two figures should not be aggregated. Later stages of the Local Plan evidence base work will assess the cumulative impact via more sophisticated transport modelling.

### 2011 CENSUS DATA

- 2.1.6 The latest Census of the UK population undertaken on the 27th of March 2011 provides a detailed snapshot of how people live their lives.
- 2.1.7 This report uses data from the 2011 Census in relation to where people live, where they work and how they commute. This data helps us to understand existing travel patterns and make predictions about how new trips, generated by new developments, may impact on the transport network.
- 2.1.8 Existing patterns of commuting in terms of destinations and mode of travel used are assumed to carry forward into the future and have been used to predict the future patterns related to new development. This is therefore a 'worst case' assumption in that future trip making propensity will mirror current observations. Scope exists to influence both the method and distribution of travel through transport policy and wider trends. The existing patterns do



however provide a steer as to how readily mode switch is likely to be achieved in different areas.

## 2.2 HOUSING

### SETTLEMENTS STUDIED

2.2.1 This report studies the impact that likely development of housing in certain settlements could have on the local and district wide transport network.

2.2.2 A single housing growth scenario has been examined in the following six settlements:

- Halifax,
- Brighouse (including Hipperholme),
- Elland (including Greetland),
- Sowerby Bridge (not including Sowerby village),
- The Upper Calder Valley (including Mytholmroyd, Hebden Bridge and Todmorden), and
- Northowram and Shelf.

2.2.3 Housing developments in areas outside the above, but still within Calderdale (Ripponden for example) were not considered as part of this work. Large scale development is not being considered by CMBC in these areas since remote, rural locations are unable to deliver sustainable development.

2.2.4 The impact on the transport network from indicative housing growth in each settlement has been studied in isolation in order to provide a steer on the suitability of each settlement for accommodating future growth potential. It is not intended to determine the cumulative effects of development (housing and employment) at this stage until greater clarity is known on the preferred spatial strategy.

### DESTINATION AREAS & MODES

2.2.5 Data from the 2011 Census at Mid-level Super Output Area (MSOA) geography was analysed to understand where, from each settlement, people are travelling to work during the AM peak period. In larger settlements, where a number of MSOAs make up the settlement, those selected were deemed representative of the types of new housing that would be introduced.

2.2.6 Analysis indicated that 90% of the journeys from each of the settlements studied are to the following destinations:

- The settlement in question (internal trips);
- Other settlements within Calderdale;
- Other districts in West Yorkshire;
- South Yorkshire;
- Greater Manchester ; and
- North Yorkshire.

2.2.7 The remaining 10% of journeys are spread across a wider geographical area with a small number of trips being made to each destination. The new trips to such destinations (less than 10 in total) created by new development are not considered as part of this study. This is because it is not considered that they will have a significant impact on the transport network.

- 2.2.8 The 2011 Census data also identified by which mode the above journeys are made. The following simplified categories were used:
- Public Transport (including bus, rail, minibus, coach and all modes of transport classified as 'other' in the 2011 Census);
  - Car (including car as passenger, taxi and motorcycles); and
  - Active Modes (including walking and cycling).

## TRIP GENERATION AND MODAL SHARE

- 2.2.9 CMBC provided suitable scales of development that are sufficiently representative of the options under consideration as part of the Calderdale Local Plan in each settlement location.
- 2.2.10 It is important to note that these figures are subject to change as part of the Calderdale Local Plan process and are merely considered as a 'starting point' in determining the optimal spatial strategy to be adopted, based on the findings of this analysis and other relevant assessments.
- 2.2.11 The Trip Rate Information Computer System (TRICS) is a database of observed trip rates produced by developments in the UK. Interrogation of the database is the industry-recognised approach for estimating the likely trip generation rates for new developments.
- 2.2.12 Using information from the TRICS database, trip rates for residential development in the following categories were sourced:
- Affordable Local Authority
  - Local Authority Flats
  - Mixed affordable
  - Mixed Private
  - Mixed private/affordable
  - Private Flats
  - Private Houses
- 2.2.13 The data was filtered by the removal of data from London, Wales, Scotland, Northern Ireland and Ireland. The mean of these trip rates was calculated, giving an AM peak hour trip rate of 0.681 person trips (by all modes) per dwelling for residential sites.
- 2.2.14 The approximate number of AM peak hour person trips estimated to result from the quanta of development being tested in each settlement is shown in Table 2, rounded to the nearest fifty trips.

**Table 2 - Distribution of housing growth used to undertake testing**

SETTLEMENT	NUMBER OF UNITS TESTED	DISTRIBUTION OF HOUSING ACROSS THE 6 SETTLEMENTS	APPROX. PERSON TRIPS GENERATED IN AM PEAK HOUR
Halifax	3300	28%	2250
Brighouse	4500	38%	3100

SETTLEMENT	NUMBER OF UNITS TESTED	DISTRIBUTION OF HOUSING ACROSS THE 6 SETTLEMENTS	APPROX. PERSON TRIPS GENERATED IN AM PEAK HOUR
Elland	2100	18%	1400
Sowerby Bridge	400	3%	300
Upper Calder Valley	1300	11%	850
Northowram & Shelf	300	3%	200
Total	11,900	100%	8100

- 2.2.15 The data collected on each of the settlements was analysed using Geographical Information Systems (GIS) to create the graphical outputs used in Section 3 of this document.

## OBSERVATIONS AND FURTHER ANALYSIS

- 2.2.16 As previously noted, the quanta of new housing in each settlement used to test the sustainability of each settlement is likely to change as the Calderdale Local Plan develops. The conclusions within this report will be used to inform the decision making process.
- 2.2.17 However, the report makes an informed judgement, based on the outcomes of the Stage 1 “Future Network Baseline” report, as to how the new trips expected to result from the developments could impact on particular junctions and levels of congestion along particular corridors.
- 2.2.18 The advantages and disadvantages of housing development on this scale in each settlement have been considered. Other observations, including which parts of each settlement may be most sustainable for development, have been made where possible.

## 2.3 EMPLOYMENT

### SETTLEMENTS STUDIED

- 2.3.1 Only settlements in which significant employment related development is being considered were studied. These settlements were
- Halifax,
  - Elland,
  - Brighouse, and
  - Sowerby Bridge.
- 2.3.2 As with housing, the impact that suitable scales of development could have on the transport network have been studied for each settlement in isolation. The cumulative impact of such

developments across several settlements will be studied at a later stage once CMBC have further progressed the Calderdale Local Plan.

## ORIGIN AREAS & MODES

- 2.3.3 The origin areas for commuter trips into settlements within Calderdale closely resemble the destination areas discussed at 2.2.6. Analysis indicated 80-90% of the journeys to work in each of the settlements studied are from these origin areas.
- 2.3.4 The remaining 10% of journeys are spread across a wider geographical area with a small number of trips being made from each origin area. The new trips from such origin areas (less than 10 in total) created by new development are not considered as part of this study. Again, this is because trips from these origin areas are unlikely to have a significant impact on the highway network.
- 2.3.5 The categories of modes used when studying the impact of new employment related developments were the same as for the housing study discussed at 2.2.8.

## TRIP GENERATION, NEW COMMUTING TRIPS AND MODAL SHARE

- 2.3.6 For employment sites the TRICS database was also examined, with the same filtering of site location, to give average rates for B1, B2 and B8. These can be seen in Table 3.

**Table 3 - Employment Trip Rates**

LAND USE	8-9 ARRIVAL (PER 100SQM)	NOTES
B1	2.289	Used for B1 and town centre sites.
B2	1.41	Average of Industrial units and Industrial Estates
B8	0.046	Warehousing

- 2.3.7 The suitable scales and types of employment development CMBC believe to be representative of the options under consideration in each settlement assume many town centre sites to be classified as mixed use. These have been designated as B1. This is a robust assumption as a mix of leisure/retail and office would be likely to have a lower trip rate.
- 2.3.8 Assumptions have been made by CMBC as to the developable area and likely floor areas of each site.
- 2.3.9 The census output areas used to represent the destinations of commuting trips to the settlements have been chosen to best represent the likely location of future employment development. The specific trips to each land use have been assigned to the output area deemed most representative of the future employment type. CMBC planning officers gave a steer as to the appropriate existing sites to be used. This means that new out of town employment sites have been assumed to follow the trip making patterns of similar existing land uses at peripheral locations.

- 2.3.10 The numbers of AM peak hour person trips estimated to result from the quanta of development being tested in each settlement are shown in Table 4.

**Table 4 - Distribution of employment growth used to undertake testing**

SETTLEMENT	B1 (HA)	% OF TOTAL B1	B2 (HA)	% OF TOTAL B2	B8 (HA)	% OF TOTAL B8	TOTAL NUMBER OF NEW TRIPS
Halifax	12	46%	29	35%	-	-	2250
Brighouse	3	13%	26	32%	3	100%	2950
Elland	4	14%	27	33%	-	-	2150
Sowerby Bridge	7	26%	-	-	-	-	700
Total	26	100%	82	100%	3	100%	8,050

- 2.3.11 In order to test where new commuter trips to new employment sites in different settlements are likely to originate and by which mode they are likely to be made, the census data was examined for journeys to work for the specific mix of output areas representative of the type and location of new employment..
- 2.3.12 The data collected on each of the settlements was analysed using Geographical Information Systems (GIS) to create the graphical outputs used in section 4 of this document.

## OBSERVATIONS AND FURTHER ANALYSIS

- 2.3.13 As previously noted, the quanta of new employment related development in each settlement used to test the sustainability of each settlement is likely to change as the Calderdale Local Plan develops and the outputs of this report are taken into account.
- 2.3.14 As with the housing related tests, reference has been made to the findings of the stage 1 “Future Network Baseline” report as to how the new trips expected to result from this development could impact on particular junctions and levels of congestion along particular corridors.
- 2.3.15 The advantages and disadvantages of employment development on this scale in each settlement have been considered. Other observations including where areas within each settlement may be most sustainable for development have been made where possible.

# 3

## ANALYSIS OF TRIPS GENERATED BY NEW HOUSING

3.1.1 The following chapter of this report looks to summarise the outputs of the work undertaken to assess the impact of new housing located in settlements across Calderdale. Each settlement is discussed in turn followed by summary graphs, infographics and an annotated map of the settlement.

3.1.2 As discussed in the methodology section of this document, the graphs and other outputs exclude trips to destinations with a total of trips numbering less than ten.

### 3.2 HALIFAX

3.2.1 Evidence suggests 3300 new units in Halifax would create approximately 2,250 new person trips during the AM peak period (new trips). The predicted distribution of these trips is shown in Figure 3.1.

3.2.2 The majority of the new trips generated from housing developments in Halifax (57%) will have a destination (place of work) within the settlement itself, giving Halifax the most self-contained labour market in Calderdale. Sustainable modes account for 25% of these trips which is a substantial minority. Although the majority of these internal trips are made via car as opposed to more sustainable means, having a more self-contained labour market offers the following benefits;

- Shorter journeys made by car are likely to impact on fewer junctions and contribute less to congestion than longer journeys would.
- Commuters making short journeys by car are more likely to consider switching to a more sustainable mode, particularly active modes for very short journeys.

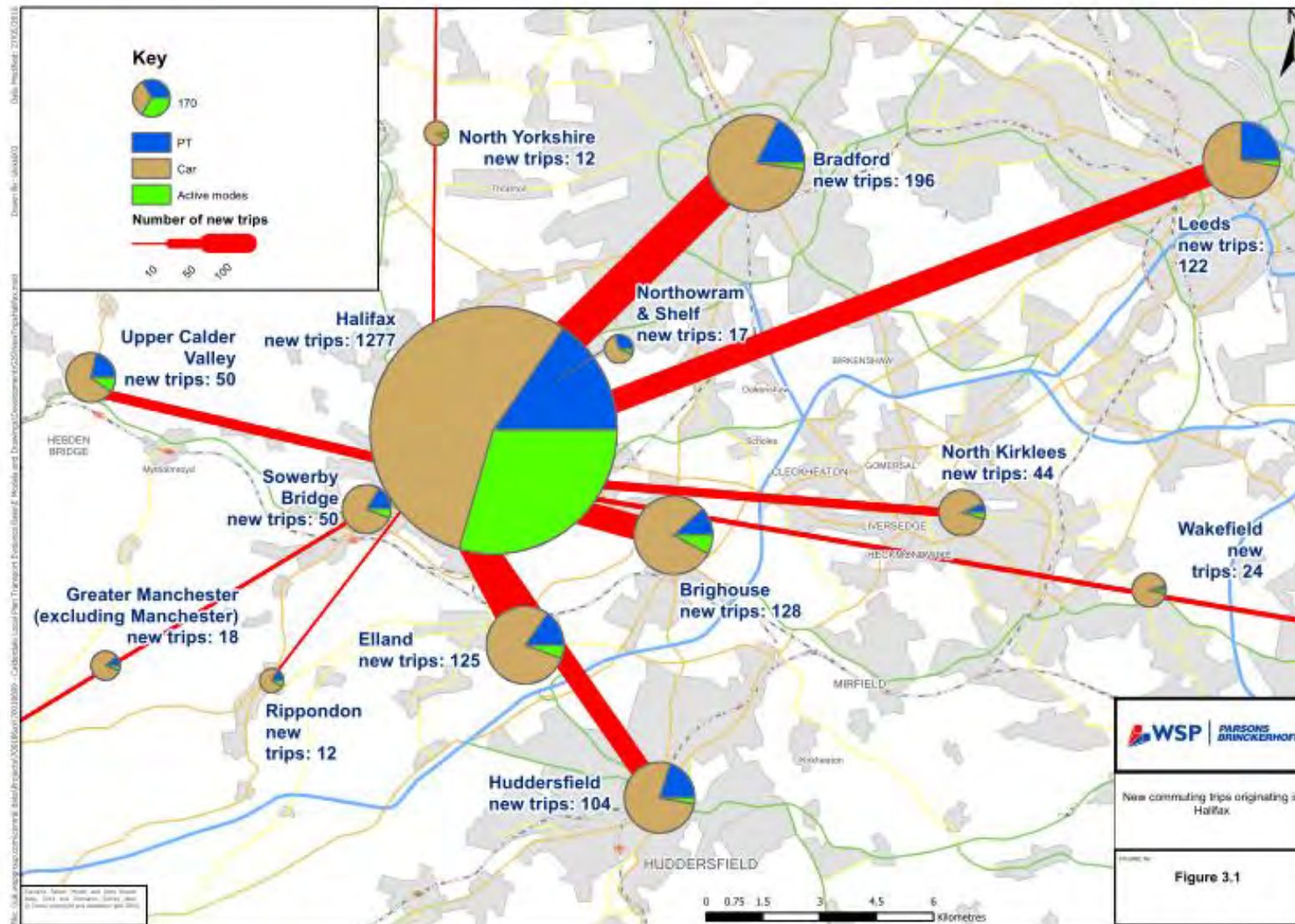
3.2.3 Highway improvements in Halifax town centre proposed under the WY+TF provide opportunities for growth in some vehicular trips to be accommodated. The scheme would also provide focused improvements to aid the movement of buses, cycle users and pedestrians, in Halifax Town Centre therefore increasing the likelihood of trips being made by sustainable means.

3.2.4 Almost 60% of the new trips have a destination within Halifax and are therefore covering short distances which could be travelled by sustainable modes. A further 9% of new trips are made by sustainable modes (public transport or active modes) to work outside Halifax.

3.2.5 Employment in Halifax is focused in and around the town centre. This, combined with the high proportion of internal commuter trips, means new housing in Halifax is likely to have a greater impact on the town centre than is the case in other settlements in Calderdale.



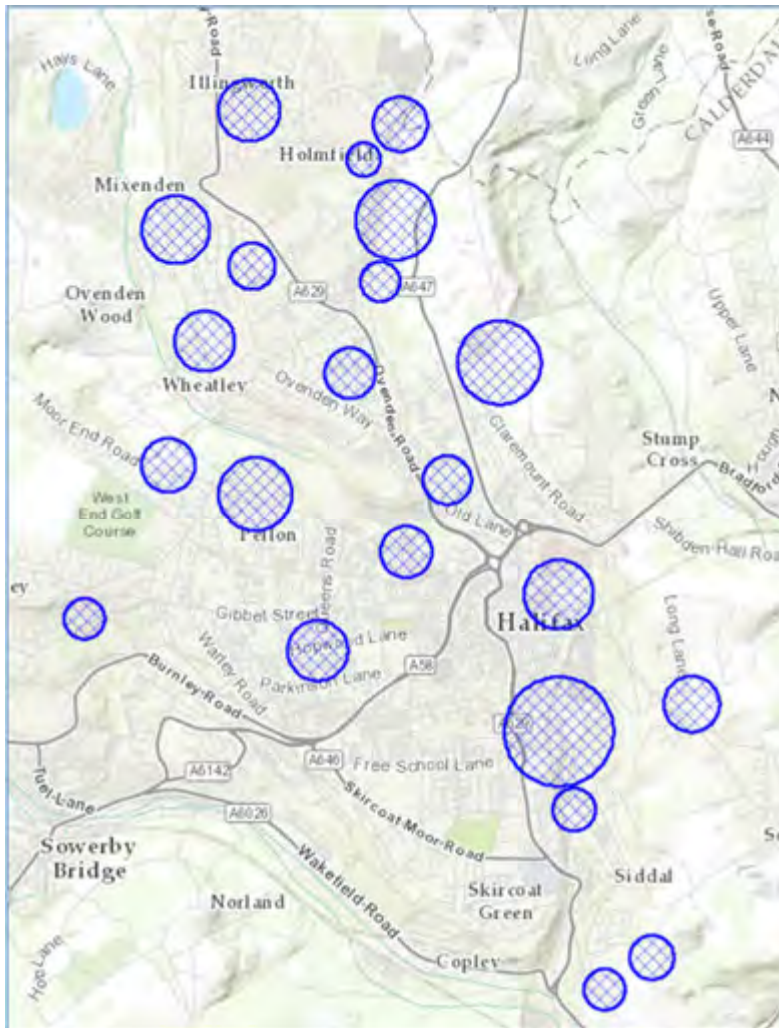
Figure 3.1 - Distribution of Halifax housing trips (AM peak hr)



- 3.2.6 Still, a significant proportion of new trips will be made to Elland and Brighouse. Few bus services operate between the residential areas to the west and north-west of Halifax (where greatest opportunity for new housing development exists) to these destinations. Those wishing to make this journey via public transport would need to change services in Halifax town centre, which lengthens the overall journey time and deters use of bus over other modes.
- 3.2.7 Only a small proportion of the new trips from Halifax would be to destinations to the west and south-west of Halifax such as the Upper Calder Valley, Sowerby Bridge and Greater Manchester, limiting the impact new housing in Halifax will have on the A646, the A58 and the A6026 in particular.
- 3.2.8 Some 72% of the new trips made to destinations outside of Halifax are to destinations along the Calder Valley Line. If the proposed Elland railway station were to be delivered, this figure would increase to 86%, given the number of trips likely to be destined within the Elland area. The planned investment in this rail line has the potential to make it more attractive as a choice of travel.
- 3.2.9 The majority of the potential sites for new housing development are towards the periphery of the town, see Figure 3.2 and are therefore beyond walking distance of Halifax railway station. Good public transport and cycling links to the station would be needed to make it possible for residents at these new sites to complete their whole journey via sustainable modes.



Figure 3.2 - Locations of housing sites used in analysis



## KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 3.2.10 Assuming current trip making patterns are replicated, around 160 new vehicular trips would be made southbound along the A629 with over 100 vehicles continuing past Elland before joining or crossing the M62 at Junction 24.
- 3.2.11 Some 360 new vehicular trips would be made through the Stump Cross junction during the AM peak with 210 vehicles also continuing through the Hipperholme junction. This is a significant increase in traffic passing through an already congested area.
- 3.2.12 Around 130 vehicles can be expected to travel down the A644 towards Brighouse with 50 vehicles travelling beyond across the M62 at junction 25 towards North East Kirklees and Wakefield.
- 3.2.13 The currently planned A629 WY+TF scheme would give southbound capacity improvements that offer the potential to accommodate additional traffic movements. Comparison of the predicted flows to the current pinch points identified as part of the Stage 1 analysis shows that there would be a major intervention required at both Stump Cross and Hipperholme in order to accommodate the Halifax development trips. The scale of impact at junction 25 of the M62 could be accommodated by current spare capacity alongside more minor capacity improvements.

## IMPROVEMENTS TO BE CONSIDERED

- 3.2.14 In order for housing development in Halifax to be delivered in a sustainable manner, the following supporting interventions are likely to be needed:
- Introduction of cross-town bus services running from the west and north-west of Halifax through the town centre towards Brighouse and Elland.
  - Changes to town centre parking policy to manage long stay commuter parking and ensure parking space is used efficiently.
  - Significant investment in the Calder Valley Line aimed at improving journey times, service reliability, capacity and the overall passenger experience.
  - Direct bus services from residential areas in Halifax to the railway station to enable public transport users to transfer between modes more seamlessly.

## INNER SETTLEMENT SUSTAINABILITY

- 3.2.15 The central and inner areas of Halifax are more sustainable locations for housing growth:
- Although travelling between West and North West Halifax into Halifax town centre by sustainable means is easily achievable, travelling beyond other settlements and districts can require at least once change of service, and potentially mode within Halifax town centre. This makes development in this area of Halifax less sustainable than that in the centre and South.
  - New housing located within walking/cycling distance of Halifax town centre (including the rail and bus stations) will benefit from access both to the bulk of Halifax's employment sites and public transport services across the district and region.
  - New housing located within the walking distance of the A629 corridor will benefit from access to regular bus services between Halifax, Elland and Huddersfield.
  - All housing sites should ideally be within walking distance of bus stops with medium and high frequency services into Halifax and beyond.

## Positive



- ☐ Halifax is the most self-contained labour market in Calderdale.
- ☐ A relatively high proportion of new trips are by sustainable modes with potential for growth in active modes.
- ☐ Growth in Halifax capitalises on new infrastructure planned for delivery under the WY+TF

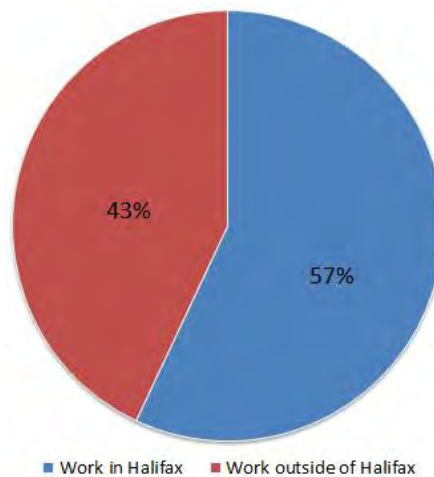
## Negative



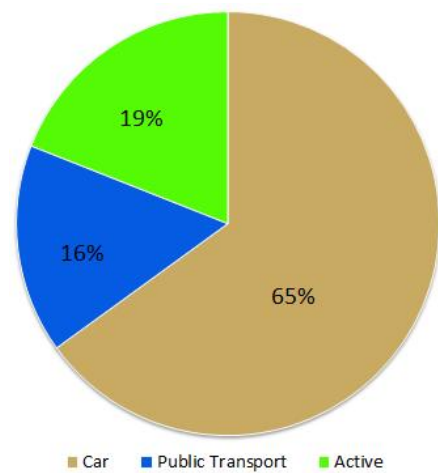
- ☐ The car is still the dominant mode for all movements
- ☐ New development would give rise to significant impacts at Stump Cross and Hipperholme where currently no improvement is planned
- ☐ Significant areas of developable land in the North and West are not within areas of good PT accessibility



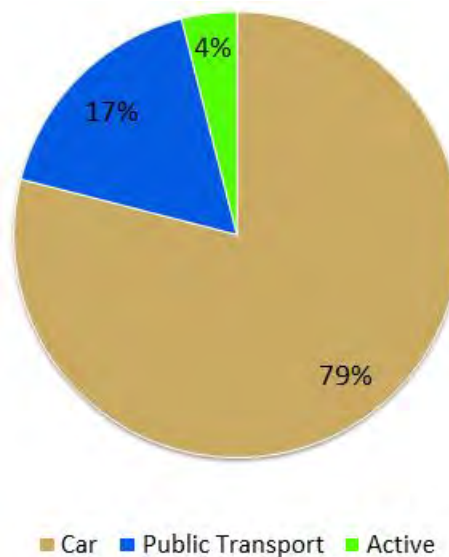
New trips destination split



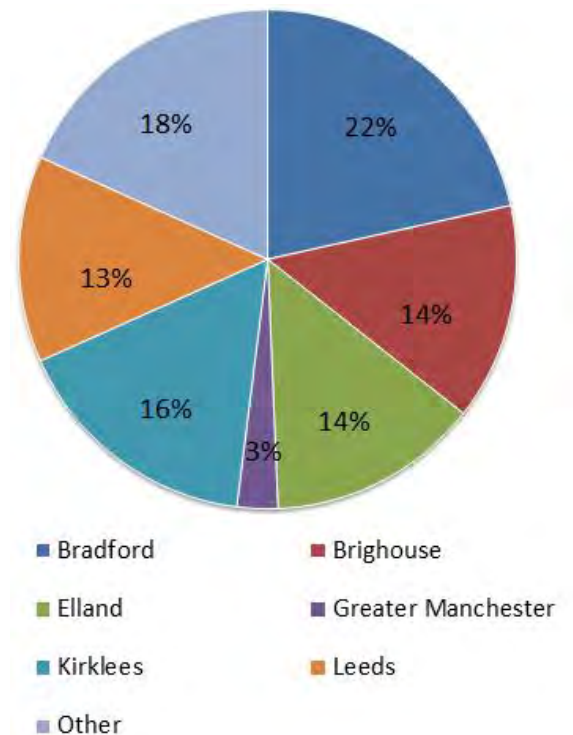
All new trips modal split



Modal split of new trips to destinations outside Halifax



Split of new trips to destinations outside Halifax



### 3.3 BRIGHOUSE

- 3.3.1 4500 new units in Brighouse will create 3100 new person trips during the AM peak period (new trips). The distribution and modal split of these trips is shown in Figure 3.3.
- 3.3.2 30% of the new trips generated from housing development in Brighouse will have a destination (place of work) within the settlement itself. Although this means the majority of employed persons living in Brighouse work elsewhere, it is still a significant proportion and potentially reduces the impact on the local highway network. The reasonably high level of local commuting offers the following advantages:
- Shorter journeys made by car are likely to impact on fewer junctions and contribute less to congestion than longer journeys would.
  - Commuters making short journeys by car are more likely to consider switching to a more sustainable mode, particularly active modes for very short journeys.
- 3.3.3 Although internal trips often cover shorter distances than external trips, if current patterns continue, 57% of the new trips in Brighouse will be made by car. There is however significant potential for many of these new trips to use more sustainable modes given that several corridors leading into and out of the town centre are well served by public transport and much of the settlement is within cycling distance.
- 3.3.4 A significant portion, around 40%, of the new trips will either have destinations within Brighouse, or be made by sustainable modes (public transport or active modes) to work in other settlements. The majority (60%) will be made by car.
- 3.3.5 82% of the new trips made to destinations outside of Brighouse will be made to settlements along the Calder Valley Line. The planned investment in this rail line has the potential to make it more attractive as a choice of travel.
- 3.3.6 Given its location along the eastern border of the district, on the Calder Valley Line and its proximity to the M62 it is not surprising a large proportion of the new trips generated will be made to destinations outside Calderdale (59% of new external trips).
- 3.3.7 With new housing being considered across Brighouse, see Figure 3.4, and trips being distributed to a range of destinations across the region, many of the new trips (by all modes) will be via Brighouse town centre which is already congested at peak times. The planned WY+TF scheme improvements on the A641 would assist in accommodating a portion of this traffic; however other radials are not planned for improvement.
- 3.3.8 Trips made to destinations outside Brighouse are more likely to be by car than trips made from Halifax.
- 3.3.9 Many of the trips made by car are to destinations outside Calderdale, which will increase the strain on cross-boundary connections.



Figure 3.3 - Distribution of Brighouse housing trips (AM peak hr)

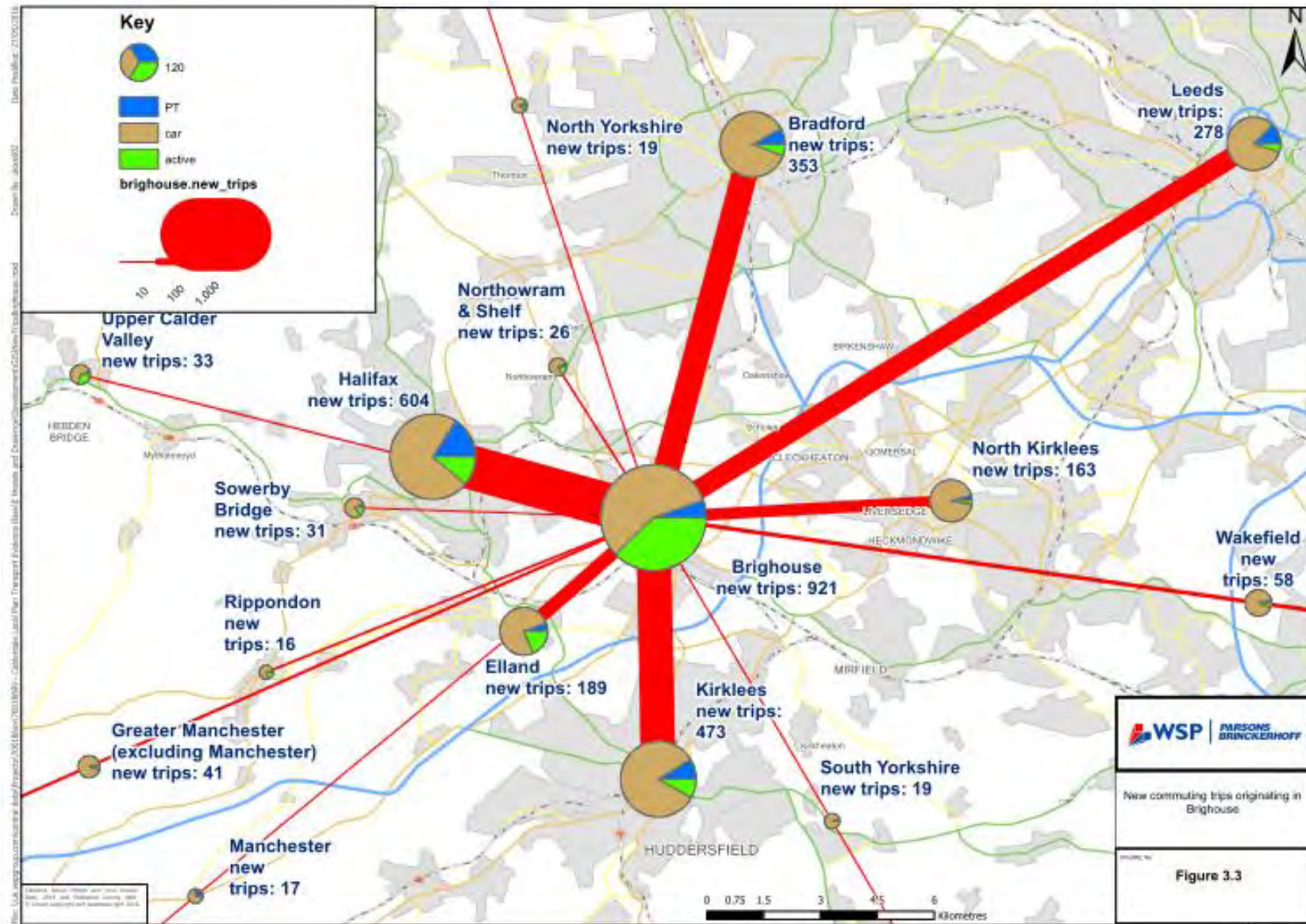
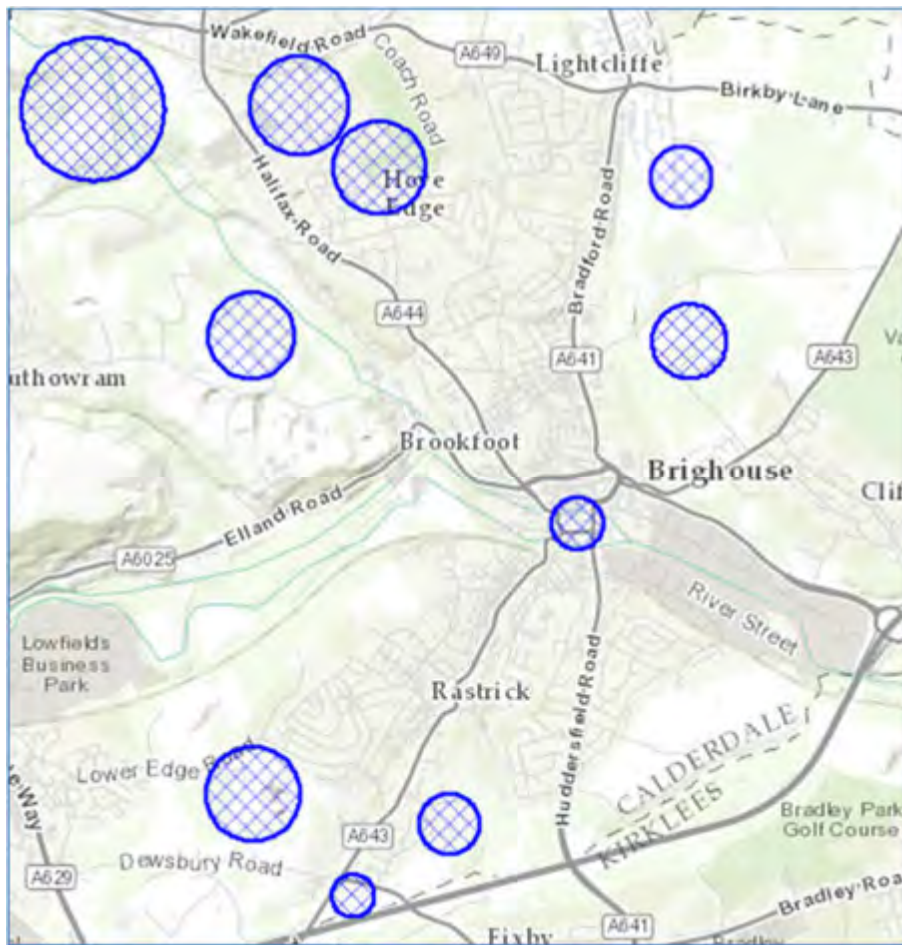


Figure 3.4 – Analysis of Brighouse housing sites



## KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 3.3.10 New trips by car between Brighouse and Bradford are likely to be split between the A641 and the M62/M606 depending on where housing is located in Brighouse and where in Bradford people are employed. If 50% of the new vehicular trips between the two locations are via the A641 this would mean in the region of 125 new vehicles along this route and could increase congestion at key junctions including those with the A58 and A6036. As mentioned above, investment in the A641 corridor is planned under the WY+TF and provides a possible increase in capacity that would cater for this additional traffic.
- 3.3.11 Elland Road not only links Brighouse and Elland but also forms part of the route between South Brighouse and Sowerby Bridge, Ripponden, the Upper Calder Valley and Halifax. Around 350 new vehicles can be expected to follow this route with 180 joining the A629 northbound towards Halifax. Around 50 new vehicular trips can be expected to then join the A6026 and be dispersed between the destinations of Sowerby Bridge and the Upper Valley. On Elland Road itself this is a significant increase in traffic and no investment is currently planned on this corridor. There is however an opportunity to increase the use of active modes via the planned City Connect 2 scheme which would link Brighouse, Elland and beyond.
- 3.3.12 Improvements being made to the A629 corridor via the WY+TF schemes will potentially provide enough new capacity to allow for this magnitude of new vehicular trips. Over 500 new vehicular trips can be expected to exit Brighouse along the A644 before reaching the M62 at junction 25. Signalisation and localised widening of Junction 25 is unlikely to be able to increase capacity to the point that all these new trips can be accommodated and therefore a

more significant intervention is likely to be required. The possible new motorway junction 24a is also a potential source of relief for junction 25.

- 3.3.13 The potential for improvements to the M62 via the continued role out of “smart” motorways and investment via the Highways England Growth and Housing fund are also possible sources of mitigation for the trips from Brighouse onto the strategic road network.
- 3.3.14 The A641 links Brighouse town centre and Huddersfield. Around 220 new vehicular trips can be expected to follow this route which is likely to cause increased congestion in and around Brighouse centre. The planned WY+TF scheme for the A641 provides the potential for capacity improvements that could accommodate much of this additional traffic.
- 3.3.15 If 50% of the new vehicular trips from Brighouse to Halifax can be expected to travel via the A644 and the A58 rather than the A629 over 200 new vehicles can be expected to pass through the Hipperholme junction and the Stump Cross junction with 185 continuing into Halifax town centre. Due to the nature and level of congestion at these locations, accommodating this level of additional traffic would require significant, currently unplanned, investment at both locations.

## MEASURES TO BE CONSIDERED

- 3.3.16 In order for housing development in Brighouse to be delivered in a sustainable manner, the following supporting interventions are likely to be needed:
- Focused improvements to aid the movement of road users through Brighouse town centre (in addition to the planned A641 WY+TF scheme).
  - Significant investment in the Calder Valley Line aimed at improving journey times, service reliability, capacity and the overall passenger experience.
  - Changes to town centre parking arrangements in Halifax alongside Huddersfield , Leeds and Bradford in order to reduce the preference for travel by car
  - Improved bus services between Brighouse, Elland, Sowerby Bridge and the Upper Calder Valley.



## SUSTAINABLE DEVELOPMENT LOCATIONS

- Sites within walking and cycling distance of Brighouse Town Centre including the bus/rail stations.
- Sites should ideally be within walking distance of a bus stop located on either the A644 or the A643 which offer high frequency bus services.

### Positive

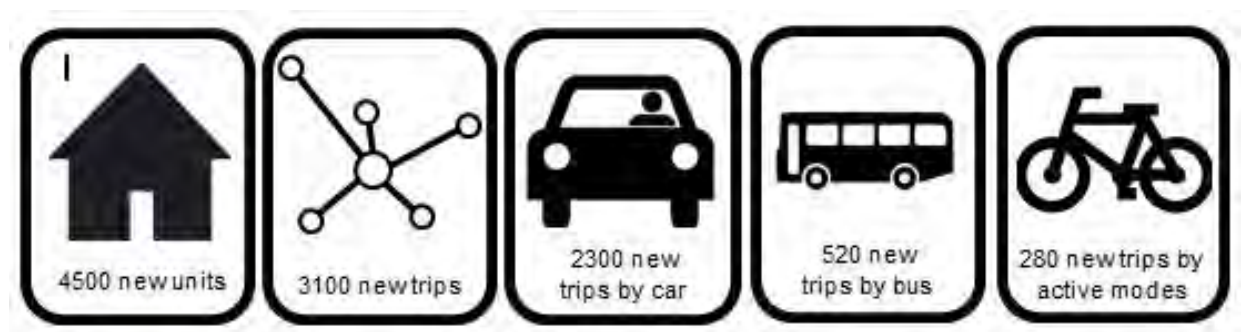


- ☐ 40% of the new trips will either have a destination within Brighouse or be made by sustainable modes.
- ☐ Growth can capitalise on the planned improvements to the A641 corridor through Brighouse town centre.
- ☐ Most external new commuting trips to destinations on the Calder Valley Line and could capitalise on planned improvements.
- ☐ Growth can capitalise on planned and possible investment on the M62

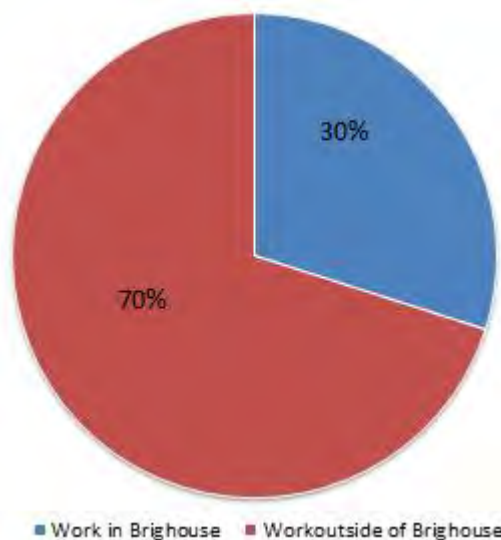
### Negative



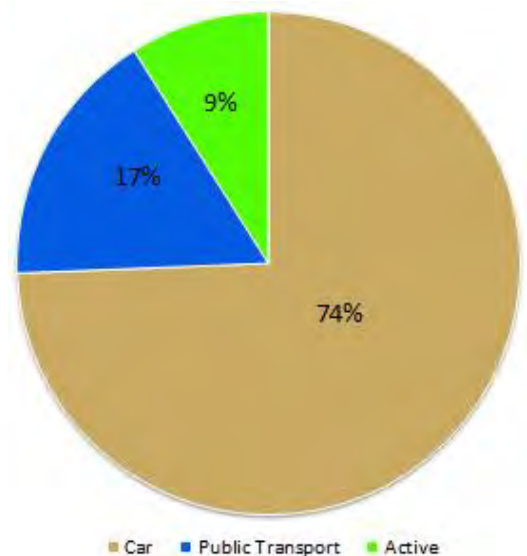
- ☐ Car is the dominant mode for all movements, so need to grow share of sustainable modes.
- ☐ Impact on the local highway network at Hipperholme, Stump Cross and M62 J25 are likely to require significant investment to mitigate. Improvements are not currently planned at these locations.
- ☐ For longer journeys to destinations outside the settlement, commuters beginning their journey in Brighouse are more car dependent than those starting in Halifax.



New trips destination split

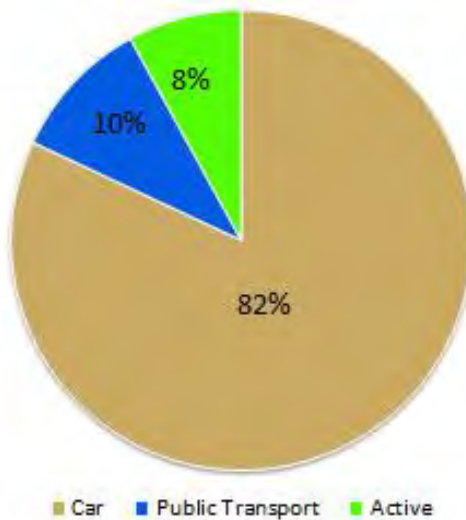


All new trips modal split

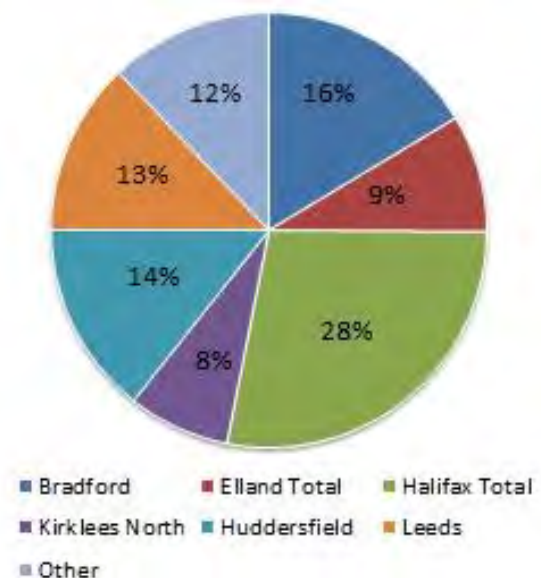




Modal split of new trips to destinations outside Brighouse



Split of new trips to destinations outside Brighouse



## 3.4 ELLAND

3.4.1 Evidence suggests 2100 new units in Elland will create 1400 new trips during the AM peak period. The distribution and modal split of these journeys are shown in Figure 3.5.

3.4.2 Around one quarter of the new trips generated by housing developments in Elland (26%) will have a destination (place of work) within the settlement itself giving Elland the fourth most self-contained labour market in Calderdale, though one that is considerably less self-contained than the most self-contained settlement (Halifax). A substantial number (40%) of these trips use sustainable modes. Although the majority of these internal trips are made via car as opposed to more sustainable means, having a relatively self-contained labour market offers the following benefits:

- Shorter journeys made by car are likely to impact on fewer junctions and make a smaller contribution to congestion than longer journeys.
- Commuters making short car journeys are more likely to consider switching to a sustainable mode, particularly active modes for very short journeys.

3.4.3 39% of the new trips will either cover a short distance (within Elland) by any mode or be made by a sustainable mode (public transport or active modes) to other settlements. These trips therefore have the potential to make less of an impact on the congested locations identified in the Stage 1 network baseline report.

3.4.4 Current employment in Elland is mainly focused to the north and east of the residential part of the town, along the A629 and Huddersfield Road corridors and in the Lowfields Business Park. This means that the new internal trips generated by new housing in Elland will mainly impact on junctions on this eastern edge of the town.

- 3.4.5 Halifax attracts more new trips from Elland than any other destination, including Elland itself: 400 new trips or 33% of the total new trips generated by housing development in the town. Some 77% of these new trips will be made by car if current patterns continue. This will increase the burden on the A629 corridor north of Elland and on Halifax Town Centre, where most employment in Halifax is located. Unless a new station is delivered in Elland these trips cannot be made by rail, so bus services offer the only public transport option for these movements.
- 3.4.6 Improvements planned for the A629 corridor via the WY+TF scheme would offer potential improvements to accommodate the anticipated growth in vehicular trips along the A629 as a result of the new housing development in Elland. There are also planned improvements in public transport as part of this scheme which would also increase the offer for this key movement.
- 3.4.7 A significant proportion of the new trips are to Kirklees, Bradford and Leeds: 210 or 17% of the total. The vast majority of these new trips are by car. This will place pressure on the A629 southbound and junction 24 of the M62, since most of the car trips from Elland to these destinations are likely to use these parts of the highway network. The Ainley Top junction is also planned for improvement as a part of the A629 scheme, offering potential improvements to accommodate these longer distance trips.
- 3.4.8 Only a small proportion of the new trips from Elland are to destinations to the West such as Sowerby Bridge, the Upper Calder Valley, Ripponden and Manchester. This means the impact of new housing in Elland will have minimal impact on the A646 and A58 west of Halifax.
- 3.4.9 Some 70% of the new trips are made to destinations which are served by the Calder Valley Line which is planned for future improvements. These settlements would be accessible from Elland by direct rail services if the proposed railway station in the town was delivered.

Figure 3.5 - Distribution of Elland housing trips (AM peak hr)

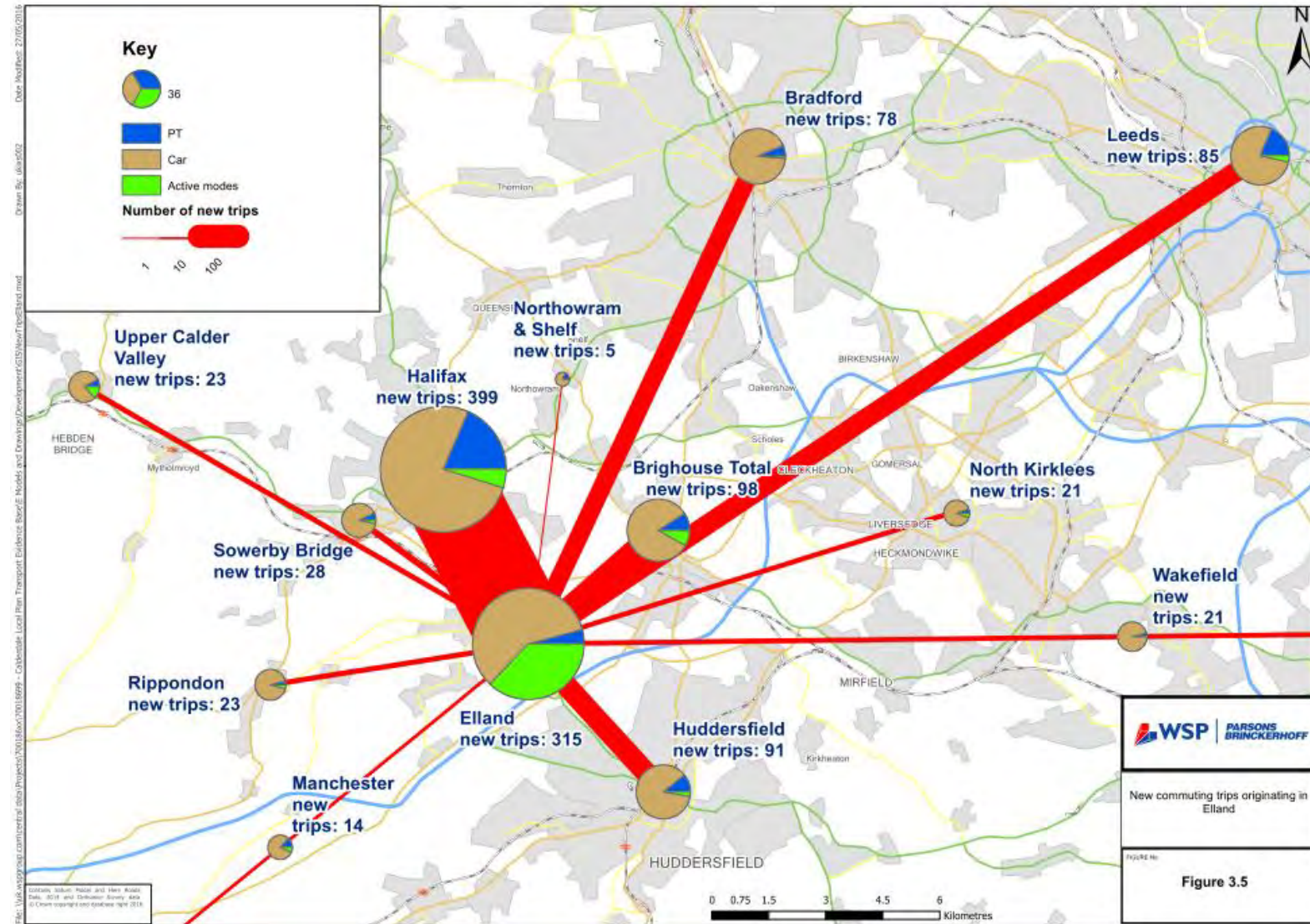
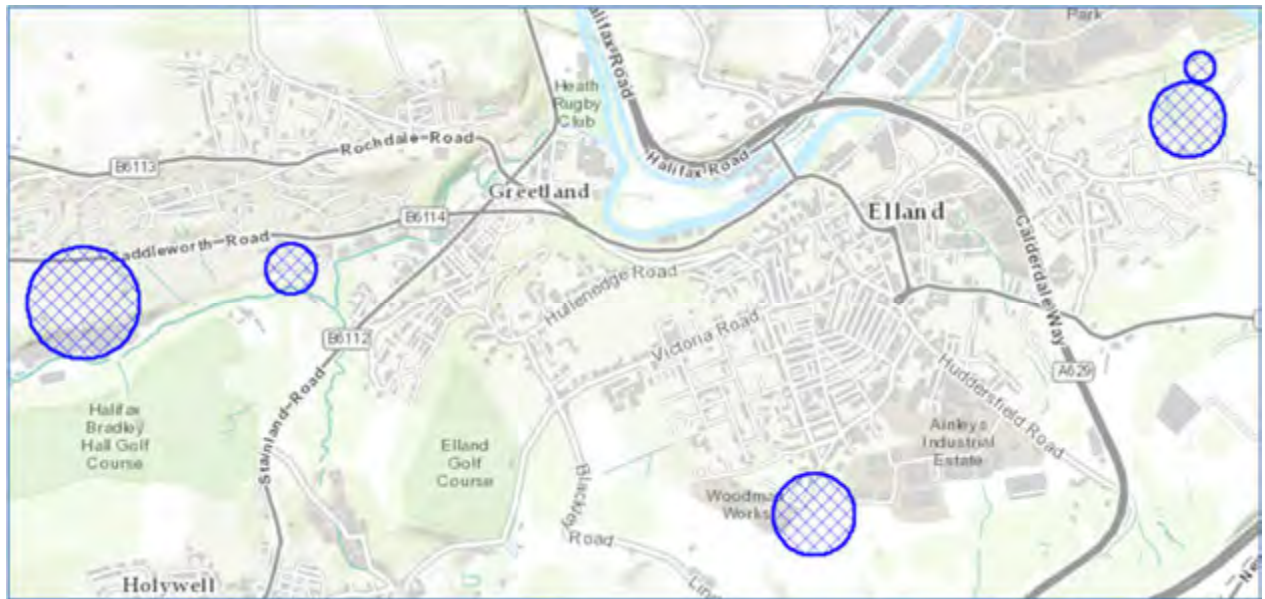


Figure 3.6 - Housing sites analysed in Elland



- 3.4.10 The location of the housing sites in Elland that were used in the analysis are shown in Figure 3.6.

## KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 3.4.11 Around 250 new vehicular trips will be made northbound on the A629 from Elland to Halifax in the AM peak. This increase will potentially be accommodated by the proposed highway improvements to the A629 via the WY+TF scheme. Modal shift from the car to more sustainable modes is also a possibility via the later stages of the A629 corridor scheme.
- 3.4.12 Around 180 new vehicular trips will be made southbound from Elland along the A629 to junction 24 of the M62. This level of additional traffic will require intervention at the Ainley Top junction envisaged as Phase 4 of the A629 corridor improvements. The possible new junction 24a could also play a role in relieving traffic from Ainley Top.
- 3.4.13 Around 150 new vehicular trips will be made on roads within Elland by trips starting in Elland and ending in Elland increasing pressure on several junctions which already experience congestion during peak periods. This level of increase spread over a wide area would be unlikely to cause a significant issue and the short distances mean that greater uptake of active modes could also mitigate the impact.
- 3.4.14 Around 70 new vehicular trips will be made eastbound from Elland to Brighouse on the B6114 and A643. This level of increase is unlikely to cause significant issues and the proposed City Connect 2 scheme also offers an alternative for increasing the use of active modes between Elland and Brighouse.

## IMPROVEMENTS TO BE CONSIDERED

- 3.4.15 In order for housing development in Elland to be delivered in a sustainable manner, the following supporting interventions are likely to be needed:
- Enhanced bus services on the A629 corridor between Elland and Halifax and between Elland and Huddersfield, including more services and improvements to the passenger experience.



- Highway interventions focused on improving routes for pedestrians and cycle users between the residential part of Elland and the employment areas on the northern and eastern side of the town.
- The delivery of a railway station on the Calder Valley line in Elland with services to Leeds, Bradford, Halifax, Manchester and Huddersfield as well as other smaller settlements *en route*.
- Significant investment in the Calder Valley line aimed at improving journey times, service, reliability, capacity and the overall passenger experience.
- The delivery of Junction 24A could help to ease the strain on Junction 24, Ainley Top and the A629 south of Elland.

## SUSTAINABLE DEVELOPMENT LOCATIONS

- Sites within Elland as opposed to the Greetland area due to better connection with the town centre, public transport and employment locations
- Within walking and cycling distance of the proposed Elland Rail Station and the town centre.

## Positive



- ☐ Growth in Elland will capitalise on the planned WY+TF schemes on the A629 towards Halifax and the M62.
- ☐ A high proportion of trips are to Halifax and Kirklees, along corridors which have a good public transport offer.
- ☐ Development growth lends support to the provision of a new station in Elland

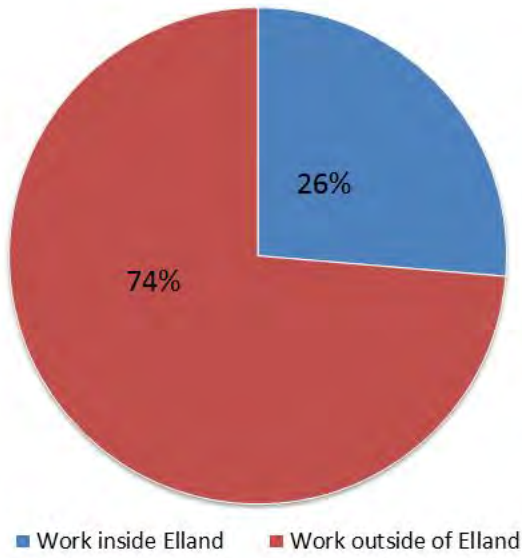
## Negative



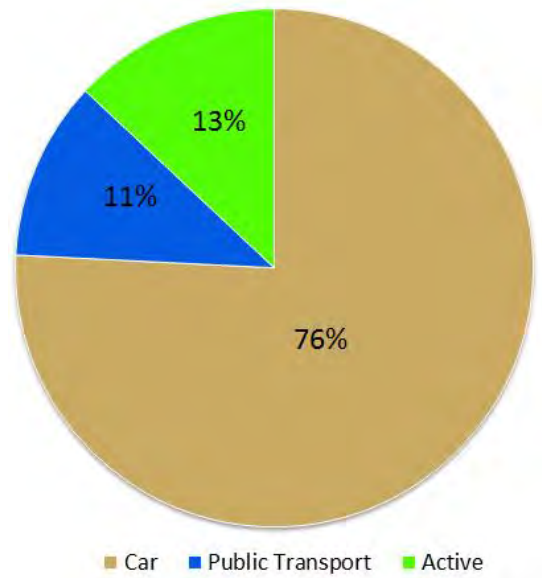
- ☐ New trips to Bradford, Leeds and Kirklees to increase congestion at the M62 Junction 24.
- ☐ New trips through the town centre could impact on congestion hotspots that currently have no planned investment



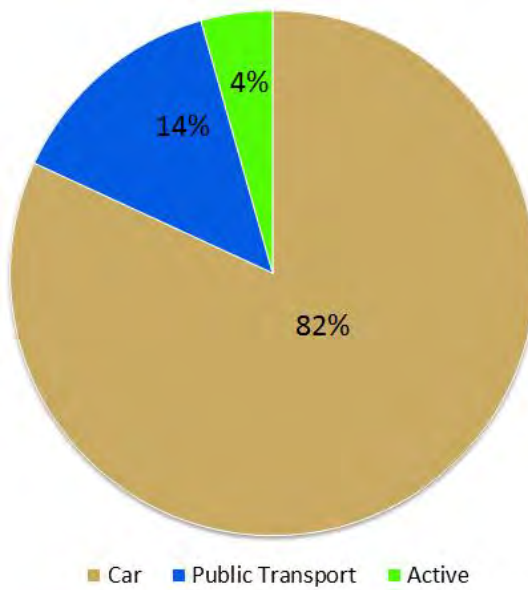
New trips destination split



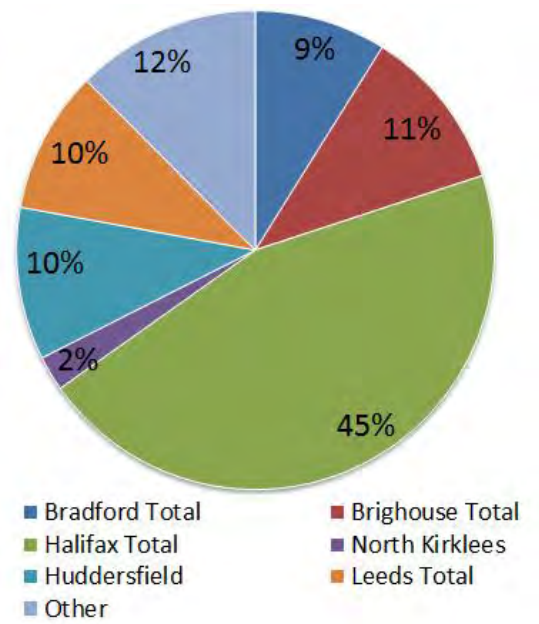
All new trips modal split



Modal split of new trips to destinations outside Elland



Split of new trips to destinations outside Elland



## 3.5 SOWERBY BRIDGE

- 3.5.1 400 new units in Sowerby Bridge will create 300 new trips during the AM peak period (new trips). The distribution and modal split is shown in Figure 3.7. The sites used in the analysis can be seen in Figure 3.8.
- 3.5.2 Around one sixth (14%) of the new trips will be to destinations within Sowerby Bridge (internal trips) meaning 84% are to destinations outside of the settlement (external trips).
- 3.5.3 Although only a small number of trips in absolute terms, almost half of the trips made within Sowerby Bridge will be made by active modes.
- 3.5.4 Around 38% of the new trips will either cover a short distance within Sowerby Bridge (all modes) or be made by sustainable modes (public transport or active modes) to work in other settlements. These have the potential to place less strain on the identified congestion hotspots in the wider network.
- 3.5.5 Some 43% of the new trips to destinations outside of Sowerby Bridge will be to one destination, Halifax. Given the proximity of Sowerby Bridge to Halifax, the districts largest employment centre, this figure is not surprising. More surprising is the fact 68% of these trips will be made by car, if current trends continue, even though the route between the two is only 5.5km and well served by both buses and rail.
- 3.5.6 New housing development in Sowerby Bridge will create 3 times as many trips to Halifax as it will to destinations within Sowerby Bridge.
- 3.5.7 17% of the new external trips will be made to the Upper Calder Valley, Brighouse or Elland although there are no bus services operating between these locations. The majority of bus services running through Sowerby Bridge are towards Halifax town centre.
- 3.5.8 Some 93% of the new external trips are to destinations along the Calder Valley Line, which is planned for improvement in the near future. This figure increases to almost 100% if Kirklees (requiring up to one change of service) and Elland (no station currently) are considered.
- 3.5.9 In comparison to several other settlements including Halifax, Brighouse and Elland, development in Sowerby Bridge will have a much lesser impact on the Hipperholme and Stump Cross junctions.

### KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 3.5.10 Around 85 new vehicular trips will be made from Sowerby Bridge along the A58 towards Halifax with a small number continuing beyond Halifax towards Bradford. This route was not considered as a key congestion hotspot during the Stage 1 baseline work and the level of trips envisaged is likely to be accommodated by current spare capacity.
- 3.5.11 A small number of new vehicular trips, around 40, will be made along the A6026 and the A629 towards Elland, Brighouse, Leeds and Kirklees. Again, this relatively small volume of trips is likely to be accommodated by current capacity as well as the A629 corridor improvements planned as part of the WY+TF. These trips could also benefit from the planned City Connect 2 scheme which would improve conditions for cycling from Sowerby Bridge along the Calder Valley.
- 3.5.12 Housing located to the west of Sowerby Bridge is likely to have a greater impact on traffic in Sowerby Bridge town centre as the majority of new trips are made eastbound along the A58. Minor improvements to junctions in the town are likely to be able to accommodate the level of additional traffic anticipated.

Figure 3.7 - Distribution of Sowerby Bridge housing trips (AM peak hour)

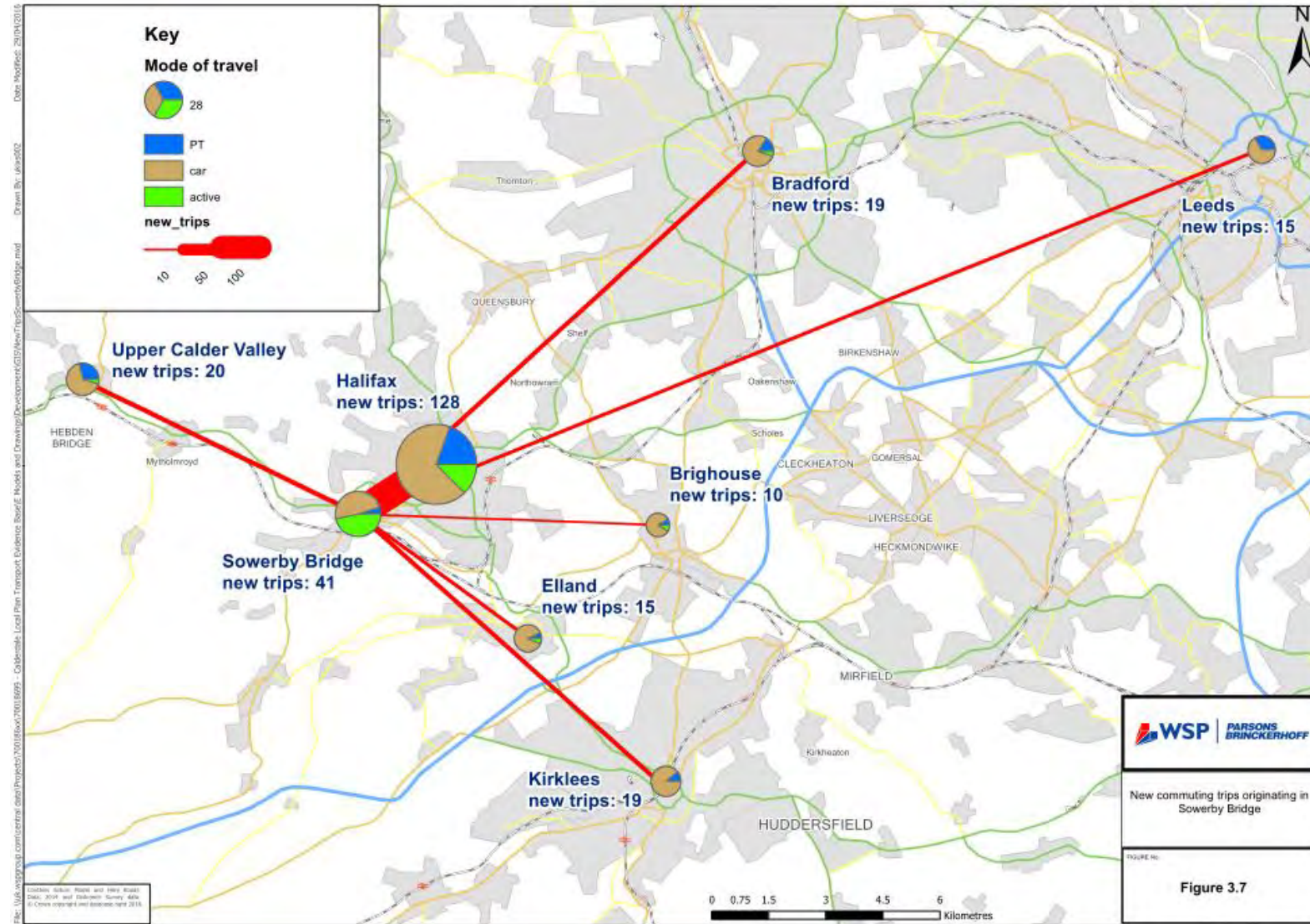
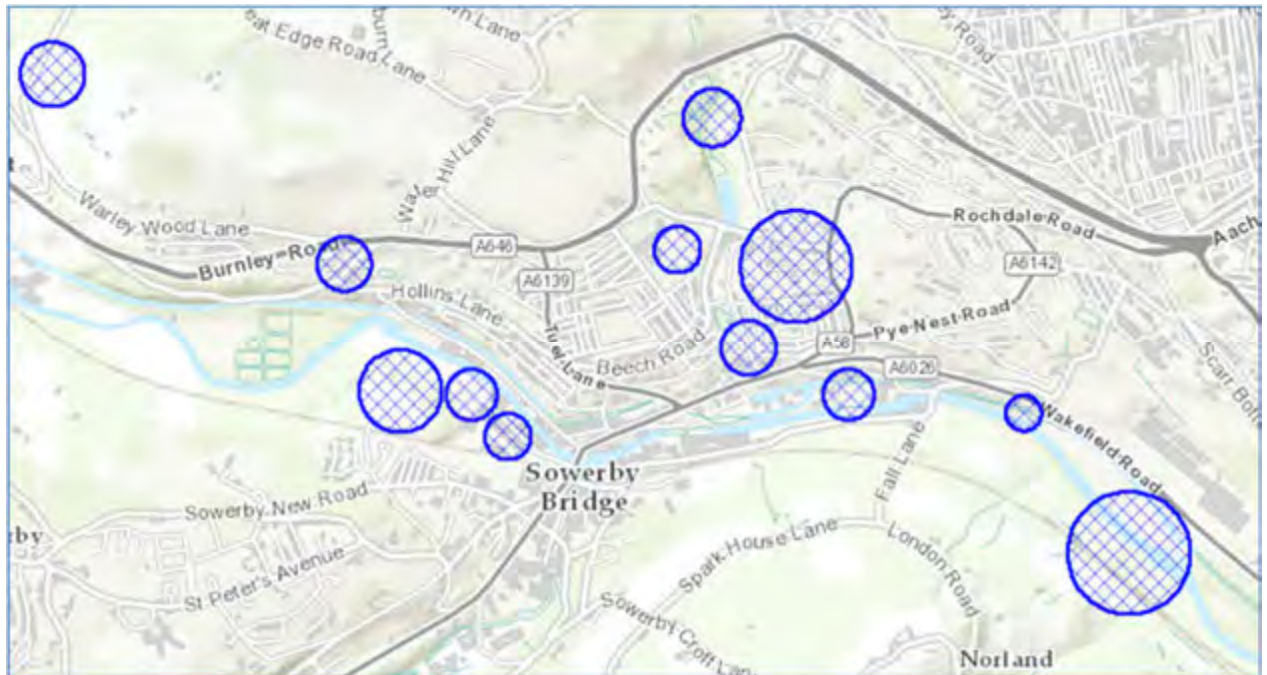




Figure 3.8 - Sowerby Bridge Housing sites analysed



## MEASURES TO BE CONSIDERED

3.5.13 In order for housing development in Sowerby Bridge to be delivered in a sustainable manner, the following supporting interventions are likely to be needed:

- Significant investment in the Calder Valley Line aimed at improving journey times, service reliability, capacity and the overall passenger experience.
- Increased park and ride capacity at Sowerby Bridge station and a new rail station at Elland.
- Changes to parking arrangements and costs in Halifax to deter long stay commuter parking.
- Bus routes linking the residential areas of Sowerby Bridge with employment centres in the Upper Calder Valley, Elland and Brighouse.

## SUSTAINABLE DEVELOPMENT LOCATIONS

- Within walking distance of Sowerby Bridge Rail Station and the high frequency bus services passing through the town centre towards Halifax (A58).
- Towards the east of the settlement limiting the impact new vehicular trips have on congestion in the town centre.

## Positive

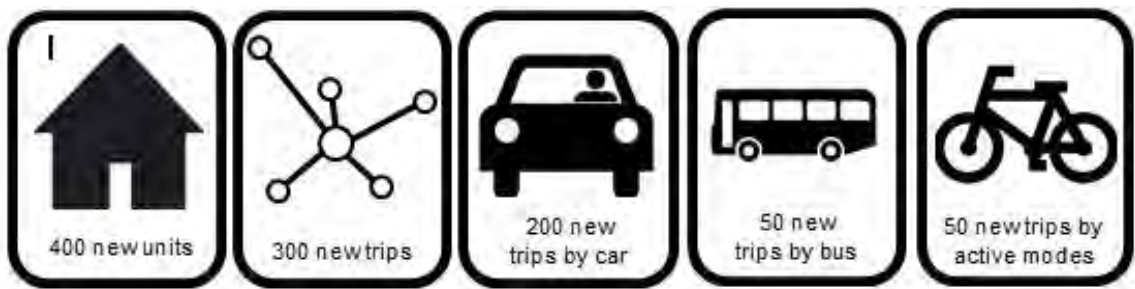


- ☐ The level of highway trips will be accommodated by current spare capacity
- ☐ Growth can capitalise on planned improvements on the Calder Valley Line, A629 corridor and City Connect 2

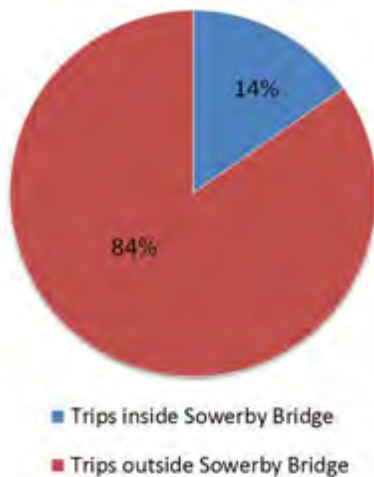
## Negative



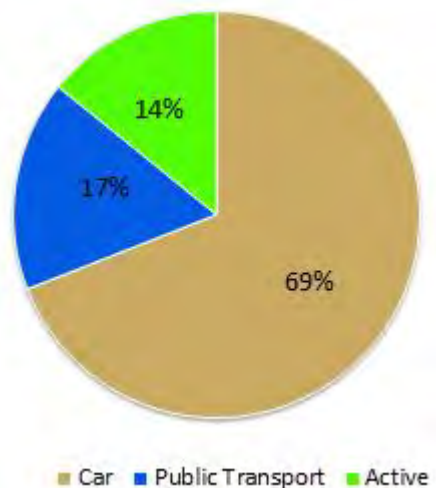
- ☐ Growth in trips via car to a range of destinations to the east place a small additional burden on Sowerby Bridge Town Centre, the A6026 and A629.
- ☐ An increase in trips by car to Halifax will place further strain on the A58.



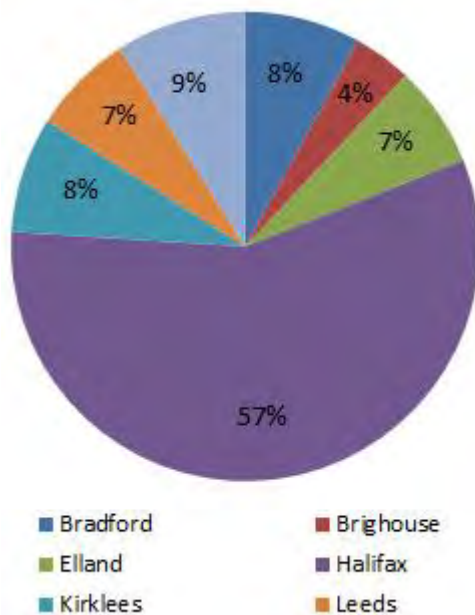
All new trips destination split



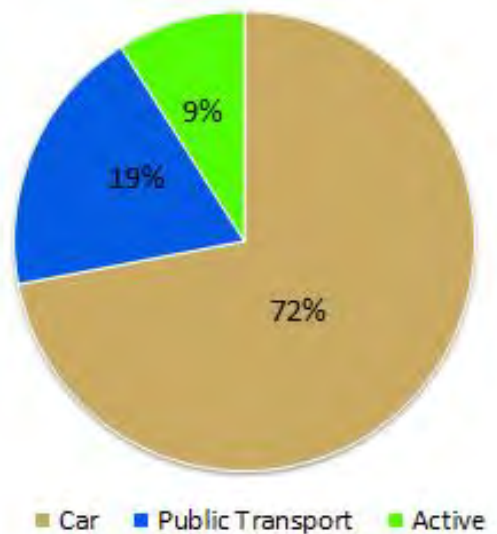
All new trips modal split



Split of new trips to destinations outside Sowerby Bridge



Modal split of new trips to destinations outside Sowerby Bridge



## UPPER CALDER VALLEY

- 3.5.14 1300 new units in the Upper Calder Valley will create 900 new trips during the AM peak period (new trips). The distribution of these trips is shown in Figure 3.9. The housing sites used in the analysis is shown in Figure 3.10.
- 3.5.15 50% of the new trips will be to destinations within the Upper Calder Valley (internal) meaning it has a relatively self-contained labour market in comparison to Sowerby Bridge, Brighouse, Elland and Northowram and Shelf. This may be due to the fact the Upper Calder Valley is a collection of several smaller settlements between which there may be many movements. Given its length, internal trips within the Upper Calder Valley are likely to cover a longer distance than those in settlements to the east.
- 3.5.16 In stark contrast to the other settlements studied, the majority of the new trips made to destinations outside of the Upper Calder Valley (external trips) are made to Greater Manchester (including Manchester). 82% of the new trips are either internal to the Upper Calder Valley, West towards Greater Manchester or made by sustainable modes to other destinations meaning development in the Upper Calder Valley has a proportionally lesser impact on the wider Calderdale highway network than the other settlements studied.
- 3.5.17 Over 50% of trips to Manchester and Leeds will be by public transport, largely rail, whereas over 50% of trips to Halifax, Brighouse and Bradford will by car although journey times to these destinations by rail are shorter.
- 3.5.18 Given one A road carries the majority of the traffic through the Upper Calder Valley (the A646) both internal and external new trips by car are likely to contribute towards congestion at peak times along its length. Where housing is located in the Upper Calder Valley it will have a significant impact on which junctions are affected.
- 3.5.19 Around 50% of the new external trips will be to destinations along the Calder Valley Line which is to be improved in the near future, potentially making it more attractive for commuting.

- 3.5.20 Only 20% of the new trips made to Greater Manchester are to central Manchester. The remaining 80% are spread across the other 9 districts. The majority of the new trips to these districts will be made by car if current trends continue.
- 3.5.21 Given the semi-rural nature of the Upper Calder Valley, and the fact so many new trips are to destinations along the Calder Valley Line, car parking facilities at each of the rail stations will continue to play a key role in reducing car traffic along the A646.

### KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 3.5.22 Around 100 new vehicular trips will be introduced along the A646, with this level of additional traffic potentially requiring improvements to particular junctions which are as yet unplanned. 80% of these trips will continue onto the A58 into Halifax with a small proportion continuing beyond Halifax towards Bradford and Leeds. 20% of the new vehicles traveling along the A646 will exit along the A6139 into Sowerby Bridge town centre which is already severely congested at peak times.
- 3.5.23 Improvements to rail station parking at Todmorden and Hebden Bridge, being delivered through the West Yorkshire Plus Transport Fund, will help to reduce these impacts by allowing a rail alternative for those who are outside walking distance to the station.
- 3.5.24 The level of additional traffic anticipated through Sowerby Bridge should be accommodated through relatively minor improvements, although these are as yet unplanned.
- 3.5.25 It is anticipated many of the new internal vehicular trips (165) will contribute towards congestion along the A646. More information on where the housing is to be located and the nature of the internal trips will be required to explore this further and determine the location and scale of intervention required.



Figure 3.9 - Distribution of Upper Calder Valley housing trips (AM peak hour)

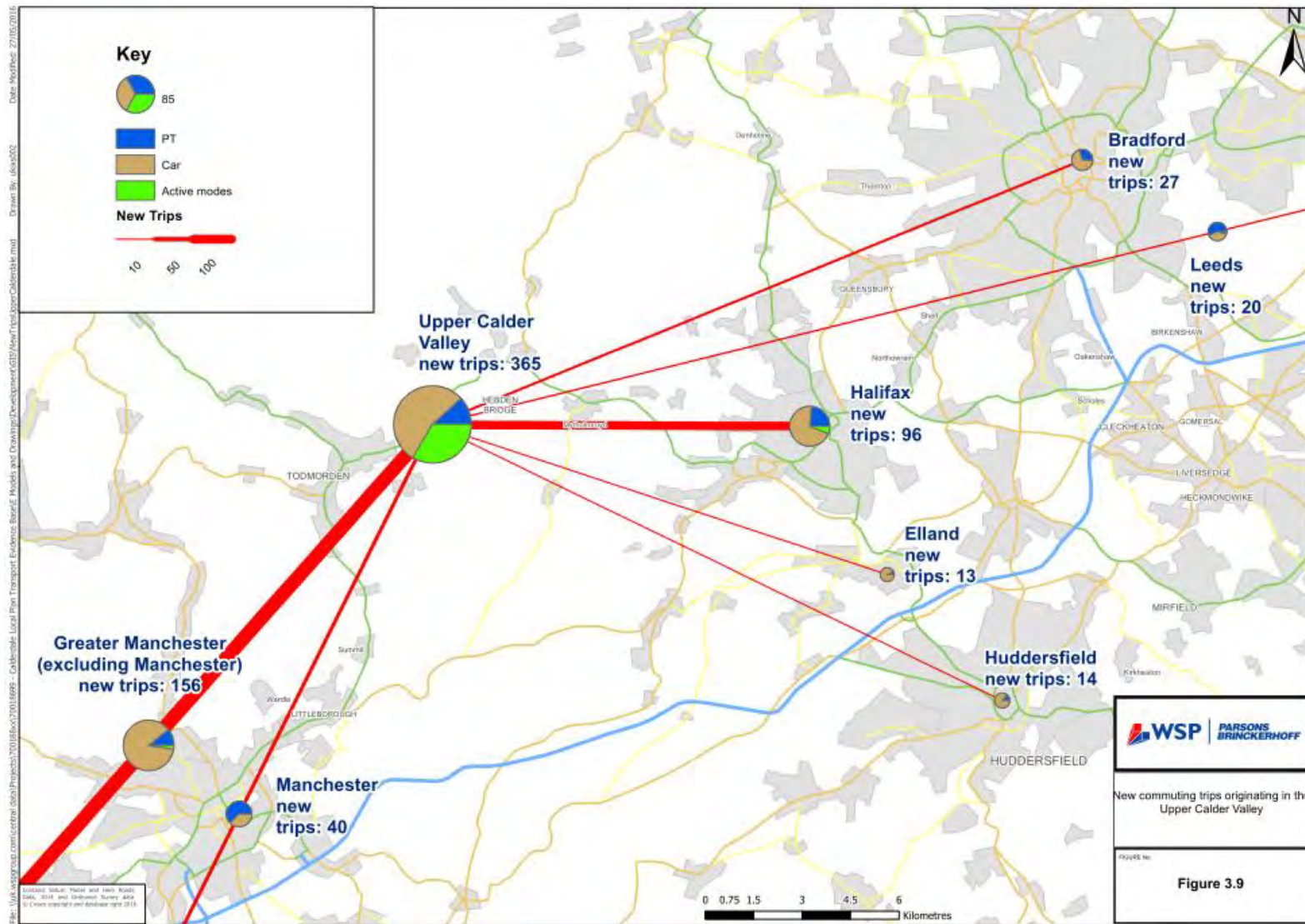
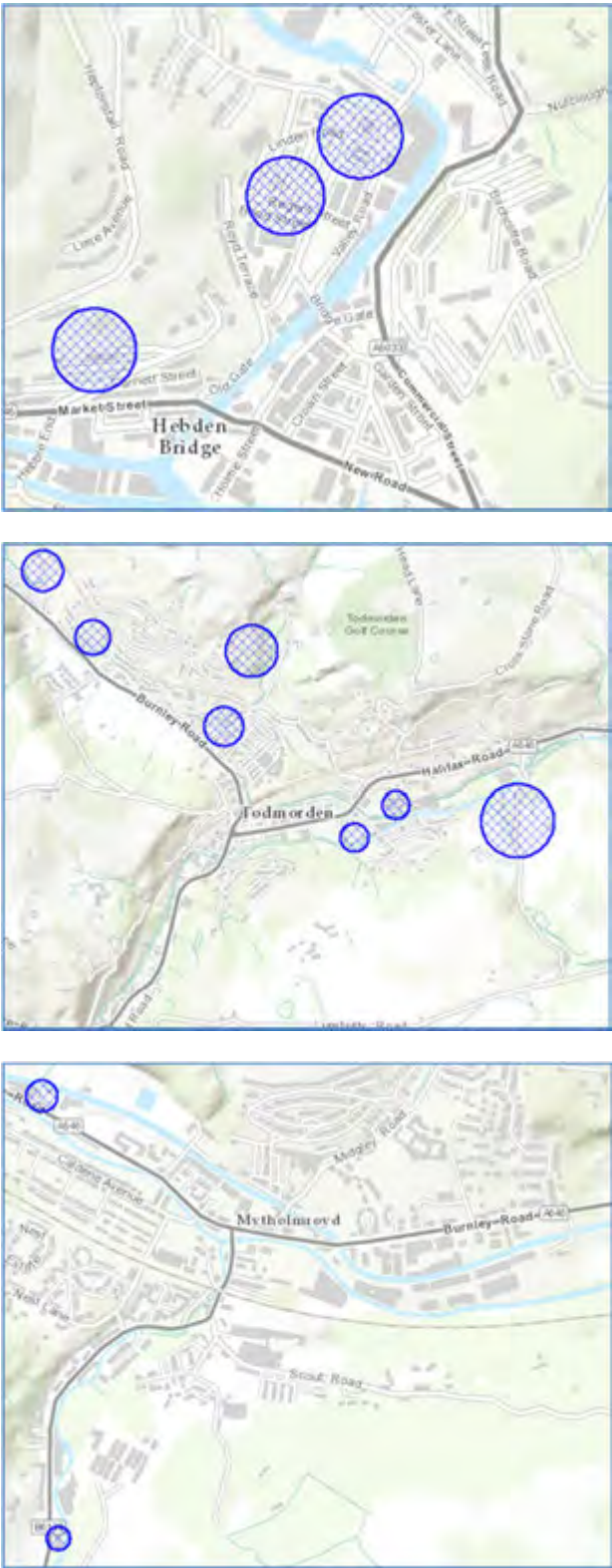


Figure 3.10 - Upper Calder Valley Housing Sites analysed



## MEASURES TO BE CONSIDERED

3.5.26

In order for housing development in the Upper Calder Valley to be delivered in a sustainable manner, the following supporting interventions are likely to be needed:

- Significant investment in the Calder Valley Line aimed at improving journey times, service reliability, capacity and the overall passenger experience.
- Changes to parking arrangements and costs in Halifax to deter long stay commuter parking.
- Improvements to traffic flow through Sowerby Bridge or measures to keep traffic on the A646 before joining the A629, bypassing Sowerby Bridge town centre.
- Improved bus services linking key residential site, employment sites and rail stations within the Upper Calder Valley

## SUSTAINABLE DEVELOPMENT LOCATIONS

- Sites within walking distance of rail stations along the Calder Valley Line and bus stops along the A646.
- Towards the West of the settlement as the majority of external trips are made towards Greater Manchester.

### Positive



The high proportion of local trips – and local trips made by sustainable modes – mitigates the potential impact of development trips on the highway network across the borough



The high share for public transport among long distance trips reduces the strain on the highway network.



The preference for trips to Greater Manchester means that car trips do not impact on key pinch points within Calderdale

### Negative



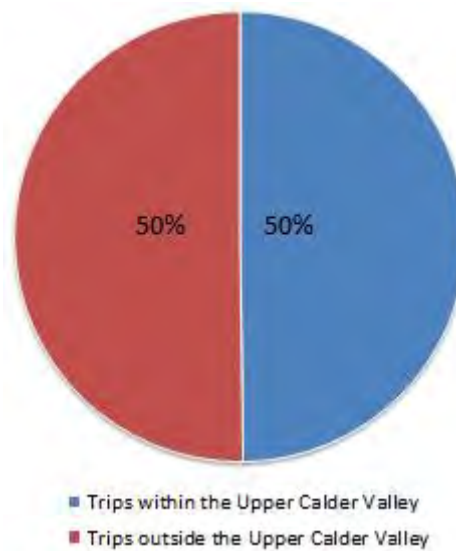
Upper Calderdale settlements are spread over a wide area. Over half of the new internal trips are to be made by car contributing to localised congestion between settlements.



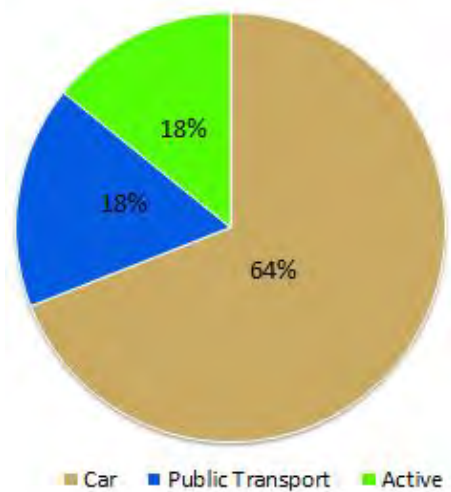
Journeys made via car to destinations in eastern Calderdale will contribute to congestion at several pinchpoints, along the A646, the A58 and the A629.



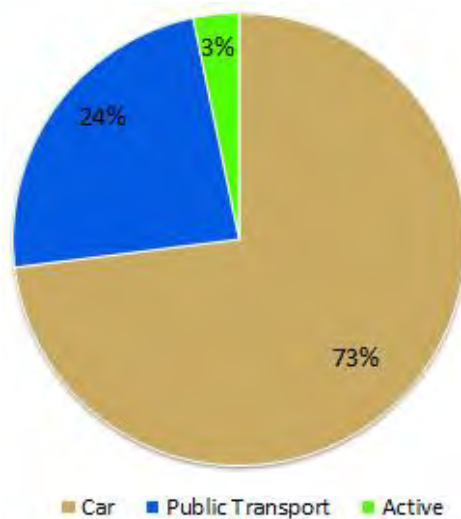
New trips destination split



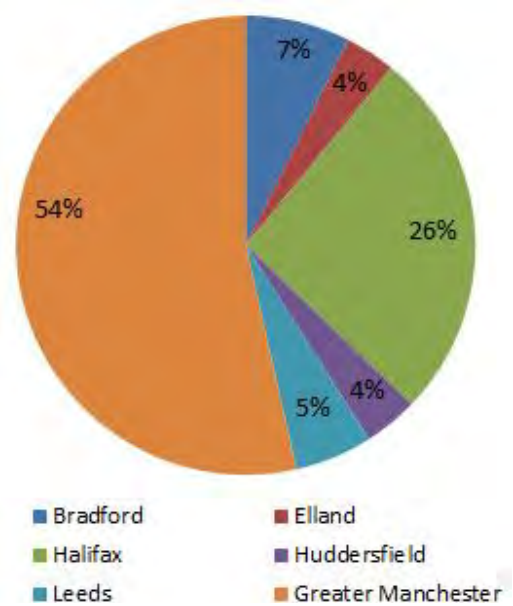
All new trips modal split



Modal split of new trips to destinations outside the Upper Calder Valley



Split of new trips to destinations outside the Upper Calder Valley





## 3.6 NORTHOWRAM AND SHELF

- 3.6.1 Evidence suggests 300 new units in Northowram and Shelf will create 200 new person trips during the AM peak (new trips). The distribution of new trips is shown in Figure 3.11 and the sites analysed are shown in 3.12.
- 3.6.2 The majority (93%) of new trips originating in Northowram and Shelf have destinations outside the settlement (external trips). This makes Northowram and Shelf the least self-contained labour market in Calderdale. The majority of these new external trips are made by car, which has the following disadvantages:
- Longer journeys made by car are likely to impact on more junctions and make a larger contribution to congestion than shorter local journeys.
  - Commuters making longer car journeys are less likely to consider switching to a sustainable mode, particularly active modes for very short journeys.
- 3.6.3 Only 7% of the new trips cover a short distance (within Northowram and Shelf). A further 10% are made by a sustainable mode (public transport or active modes) to other settlements. This means that a majority of new trips will have an impact on the wider highway network.
- 3.6.4 The majority of new trips originating in Northowram and Shelf are made to Halifax (33% of all new trips) and Bradford (37% of all new trips). Around 85% of these trips are made by car. This will increase the burden on the A6036, both eastbound and westbound. The westbound movements will add to congestion at the Stump Cross junction and in Halifax town centre. The former location having no planned improvement scheme.
- 3.6.5 Some 25 new trips originating in Northowram and Shelf, the overwhelming majority of which are made by car, have a destination in Brighouse and Kirklees. These journeys, heading directly south from the villages, will increase the pressure somewhat on the Hipperholme Crossroads which has no planned investment and Brighouse Town Centre which will see some improvement in capacity as a result of the A641 corridor WY+TF scheme.
- 3.6.6 Both Stump Cross and Hipperholme junctions are operating at or close to capacity. Although a small amount of new housing in Northowram and Shelf is unlikely to significantly impact the operation of either junction the new trips will contribute towards increased delays but would also be of a magnitude where even minor improvements would be unfeasible because of cost.
- 3.6.7 New trips originating in Northowram and Shelf are unlikely to make a significant contribution to congestion on the A629 and A646 because there are very few new trips from the villages to Sowerby Bridge, Elland, Upper Calderdale and Manchester.
- 3.6.8 There is no scope for providing a rail link to Northowram and Shelf, so these car trips cannot be transferred to rail. However, there is potential to bring about modal shift from car to bus among commuters resident in Northowram and Shelf although this would be a significant change from the current situation.

### KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 3.6.9 Around 90 new vehicular trips would travel from Northowram and Shelf on the A6036 in both directions with 50 to Bradford and 40 to Halifax. New vehicular trips to Halifax will contribute to congestion around the Stump Cross junction although these developments alone will not be enough to necessitate the significant investment that would be required to improve the junction.
- 3.6.10 Around 20 new vehicular trips travelling south from Northowram and Shelf will pass through the Hipperholme Crossroads and enter Brighouse Town Centre (where about 50% of them will

terminate). This number is also not enough to necessitate significant investment in the Hipperholme junction but would worsen the situation at this key congestion hotspot.

**Figure 3.11 - Distribution of Northowram and Shelf housing trips (AM peak hr)**

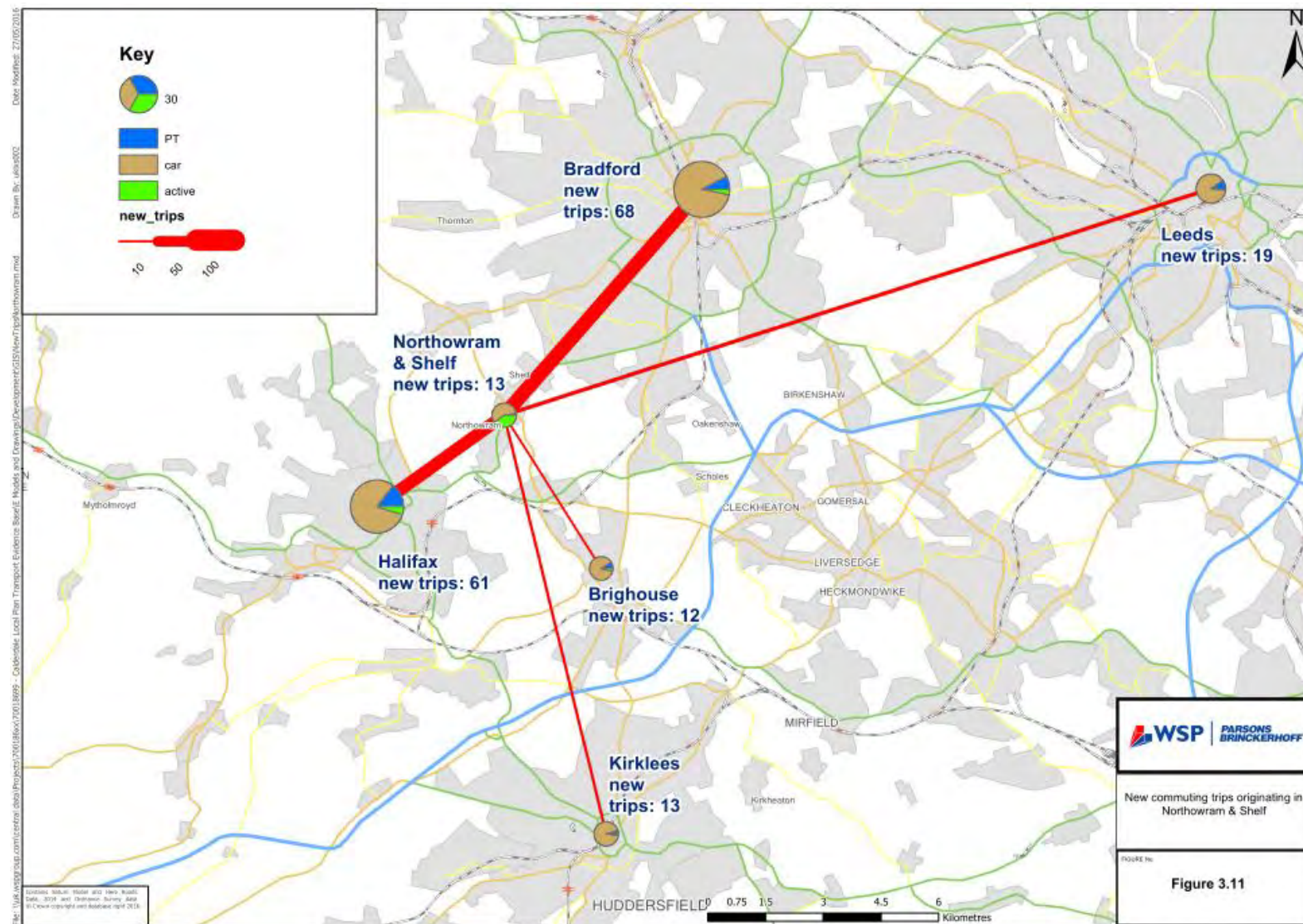
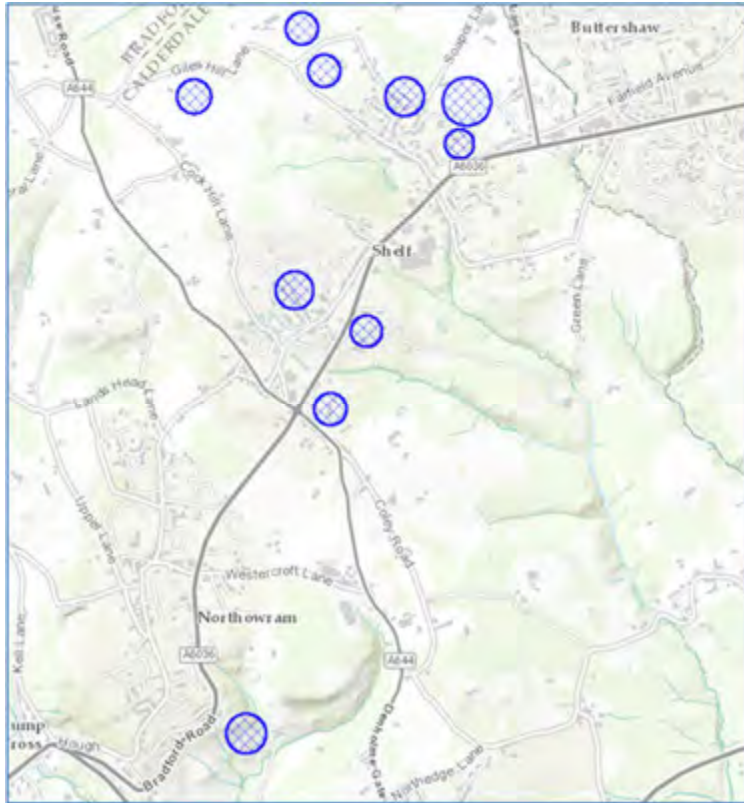


Figure 3.12 - Northowram and Shelf Housing Sites analysed



## IMPROVEMENTS TO BE CONSIDERED

- 3.6.11 In order for housing development in Northowram and Shelf to be delivered in a sustainable manner, the following supporting interventions are likely to be needed:
- Highway interventions to benefit car users, bus services and cycle users at Hipperholme Crossroads and Stump Cross junction.
  - Enhanced bus services on the A6036 corridor between Bradford and Halifax via Northowram and Shelf, with more frequent services, increased capacity and an improved passenger experience.

## SUSTAINABLE DEVELOPMENT LOCATIONS

- Sites within walking distance of the bus stops on the A6036 and medium/high frequency bus services.

## Positive



- ☐ The vast majority of trips out of the settlement are to Halifax and Bradford both of which are easily reachable by public transport.

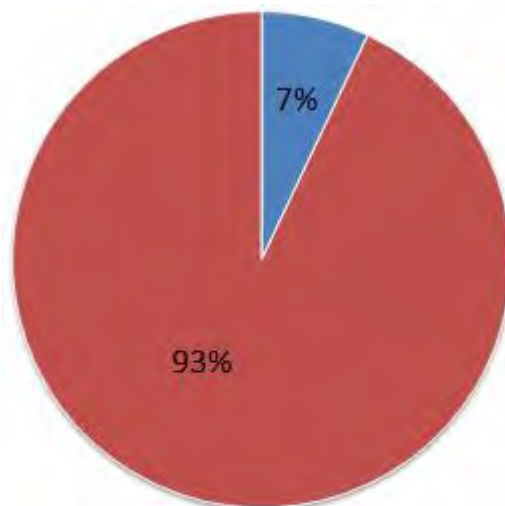
## Negative



- ☐ The majority of new trips from the settlement will impact on the local and regional highway network including key pinchpoints which have no planned investment

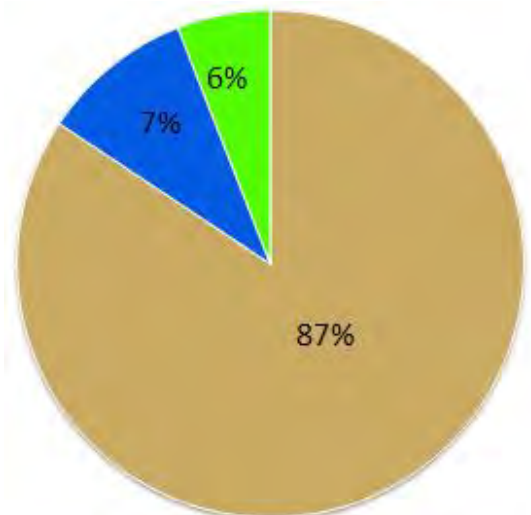


New trips destination split



- Trips within Northowram and Shelf
- Trips outside Northowram and Shelf

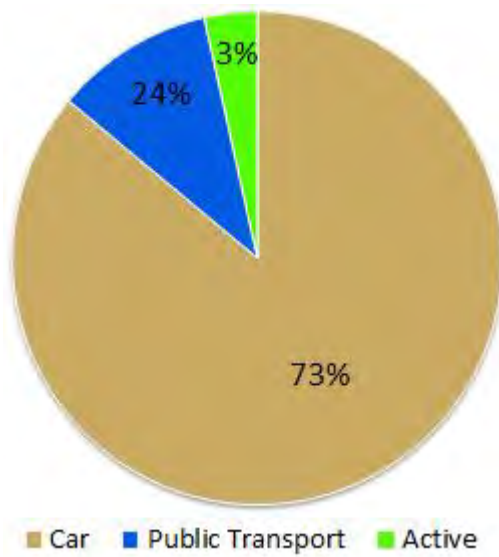
All new trips modal split



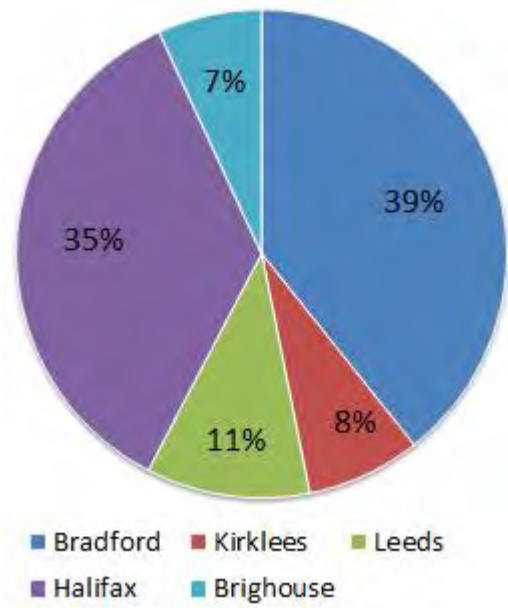
- Car
- Public Transport
- Active



Modal split of new trips to destinations outside Northowram and Shelf



Split of new trips to destinations outside Northowram and Shelf





# 4

## ANALYSIS OF NEW COMMUTING TRIPS FORECAST – EMPLOYMENT

- 4.1.1 The following chapter of this report looks to summarise the outputs of the work undertaken to assess the impact of new employment located in settlements across Calderdale. Each settlement is discussed in turn using graphs, infographics and an annotated map of the settlement.
- 4.1.2 As noted in the methodology, the assessment of future trip making has been analysed separately for housing and employment sites at this stage. In reality the two sets of movements are intertwined as some new trips from housing will inevitably go to new employment. To avoid double counting the two sets of figures should not be aggregated. Later stages of the Local Plan evidence base work will assess the cumulative impact of housing and employment trips, using more sophisticated transport modelling.
- 4.1.3 As also discussed in the methodology, the graphs and other outputs exclude trips to destinations with a total of trips numbering less than ten.

### 4.2 HALIFAX

- 4.2.1 Evidence suggests that the 41 hectares of new employment development assumed in this analysis (consisting of 12 hectares of B1 and 29 hectares of B2) would produce 2300 new trips during the AM peak period. The distribution of these trips is shown in Figure 4.1.
- 4.2.2 The majority of sites suitable for potential employment uses are located in the centre of the town. As such, trips to new employment (71% of which are made by car) will contribute to congestion in Halifax Town Centre.
- 4.2.3 Almost half of the new trips generated by employment development in Halifax (41%) originate within the settlement itself. Although current trip making patterns suggest the majority of these internal trips will be made via car (60%) as opposed to more sustainable means, having a relatively self-contained labour market offers the following benefits:
- Shorter journeys made by car are likely to impact on fewer junctions and make a smaller contribution to congestion than longer journeys.
  - Commuters making short car journeys are more likely to consider switching to a sustainable mode, particularly active modes for very short journeys.
- 4.2.4 Highway improvements in Halifax town centre proposed under the WY+TF provide opportunities for growth in some vehicular trips to be accommodated. These interventions are also focused on improving routes for pedestrians and cycle users in Halifax Town Centre which will also assist the potential use of active travel and public transport for journeys to work.
- 4.2.5 41% of the new trips cover a short distance (within Halifax) and are therefore potentially achievable using sustainable modes. A further 12% are made by a sustainable mode (public transport or active modes) from other settlements.
- 4.2.6 Most of the potential employment sites in Halifax are located in the town centre, but there are important clusters of employment in the south and north of the town, see Figure 4.2. In order

to make public transport attractive for journeys to these more peripheral sites, they will need to be directly served by buses.

Figure 4.1 - New commuting trips arriving in Halifax

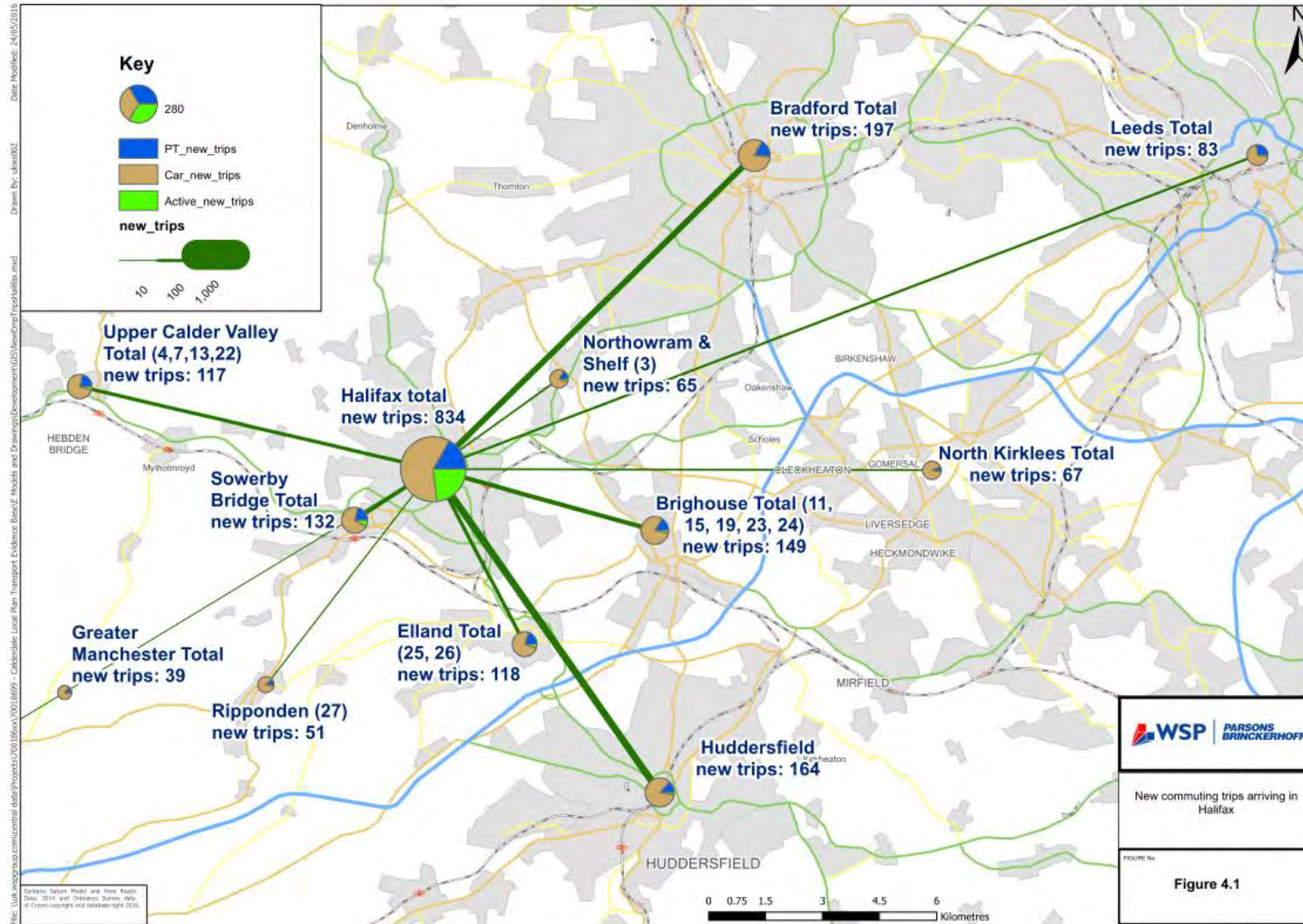
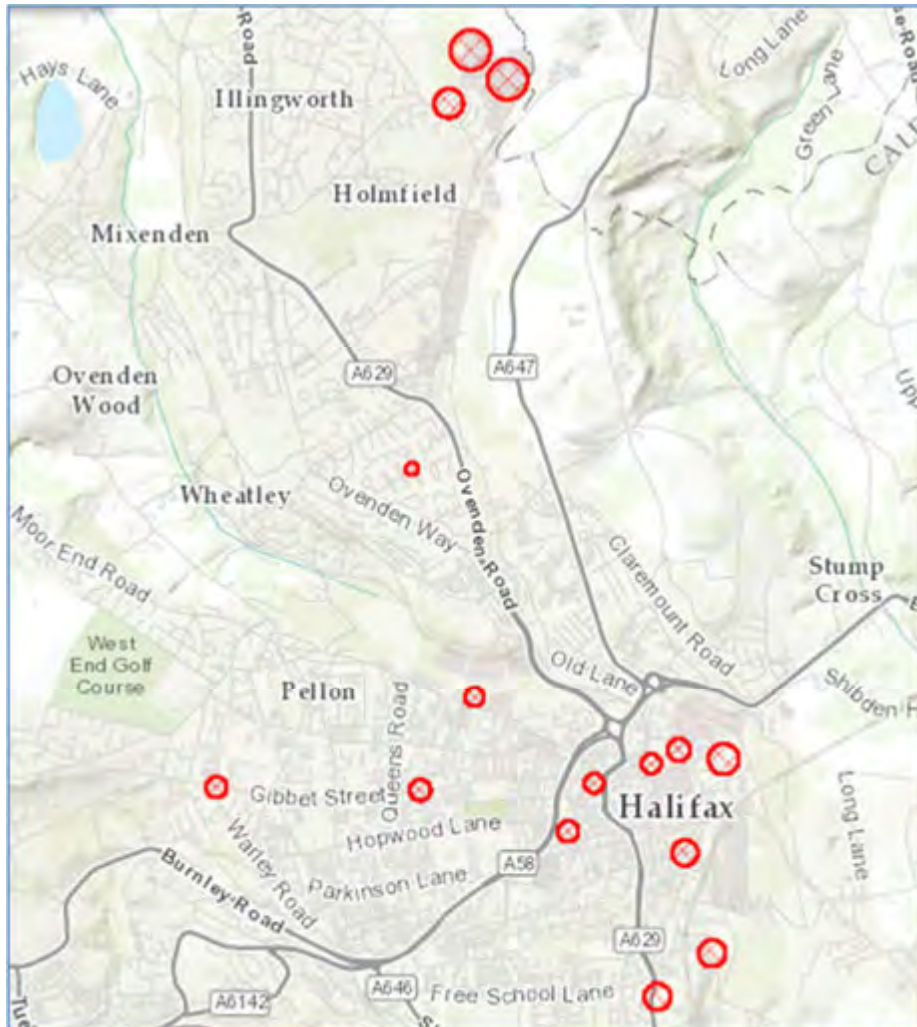


Figure 4.2 – Halifax employment sites used in analysis



- 4.2.7 The vast majority of new trips originating from settlements outside Halifax are fairly evenly split between Bradford, Brighouse, Elland, Kirklees, Sowerby Bridge and the Upper Calder Valley. The vast majority of these new trips are made by car (79%). This will have an impact on the highway network in several locations identified as capacity constrained within the Stage 1 report. The trips which would impact on Halifax Town Centre and the A629 Corridor have greater potential to be accommodated due to the planned WY+TF scheme. Impacts elsewhere at Sowerby Bridge centre, Brighouse Town Centre, junction 24 of the M62, Hipperholme Crossroads and Stump Cross junction are less easily accommodated as these junctions do not have any currently planned improvements.
- 4.2.8 Only a small minority of new trips originate in Greater Manchester, Northowram and Shelf and Ripponden (7% of the total for all three settlements combined). This minimises the likely impact of employment development in Halifax on the A6036 north of Stump Cross, the A646 west of Halifax and the A672.
- 4.2.9 Some 47% of the new trips originate from settlements which are served by the Calder Valley line. If Elland railway station is delivered, this would increase to 53%. This indicates that there is the potential to bring about modal shift from car to rail for many of these new trips to Halifax.

There is also the potential for this station to function as a park and ride facility for Halifax-bound commuters originating in Kirklees who do not live close to a station.

## KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 4.2.10 An increased strain would be placed on Halifax Town Centre as a result of vehicular traffic accessing employment sites.
- 4.2.11 Over 250 new vehicular trips northbound on the A629 between Elland and Halifax Town Centre. The planned A629 corridor improvements from the WY+TF scheme provide a potential opportunity to accommodate these increases.
- 4.2.12 Over 280 new vehicular trips passing through the Stump Cross junction and over 150 new vehicular trips passing through Hipperholme junction. This level of additional traffic would require major improvements to be made at both junctions which are currently not planned to be improved.
- 4.2.13 Around 225 new vehicular trips entering Halifax from the west, distributed between the A58 and the A646. These locations were not highlighted in the previous Stage 1 report and therefore have greater potential spare capacity to accommodate additional trips.
- 4.2.14 Around 50 new vehicular trips will be introduced to the M62 junction 26, around 50 to junction 25 and around 150 to junction 24. In isolation, these impacts could be absorbed by current capacity and minor improvements.

## IMPROVEMENTS TO BE CONSIDERED

- 4.2.15 In order to assist the sustainability of the employment development in Halifax, the following are considered desirable:
  - Enhanced bus services on the A629 corridor between Elland and Halifax.
  - Provision of cross-town bus services in Halifax.
  - Significant investment in the Calder Valley line aimed at improving journey times, service, reliability, capacity and the overall passenger experience.
  - The delivery of a railway station at Elland.

## SUSTAINABLE DEVELOPMENT LOCATIONS

- Extensions to existing employment sites.
- Sites should ideally be within walking distance of bus stops with medium and high frequency services.
- In and around Halifax Town Centre



## Positive



- ☐ The Halifax labour market is relatively self-contained, with a high proportion of trips originating in the settlement.
- ☐ Growth of employment in Halifax would capitalise on the new infrastructure planned to be delivered in the town centre and A629 corridor as part of the WY+TF schemes

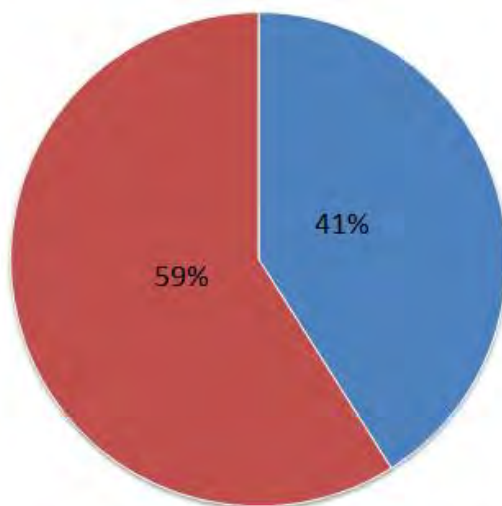
## Negative



- ☐ Employment in Halifax would give rise to commuting trips that would place pressure on Stump Cross and Hipperholme junctions which are not currently proposed for investment

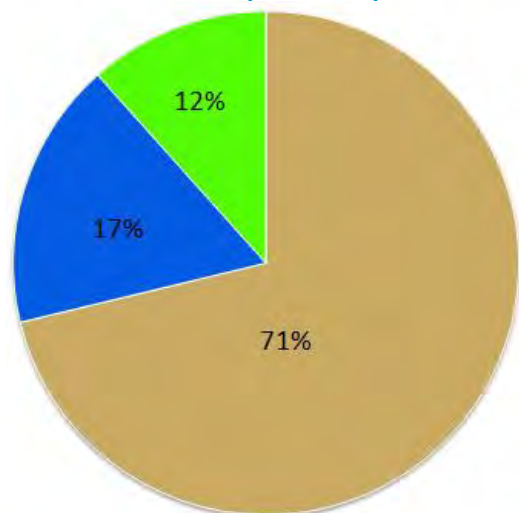


New trips destination split



■ Live In Halifax ■ Live outside of Halifax

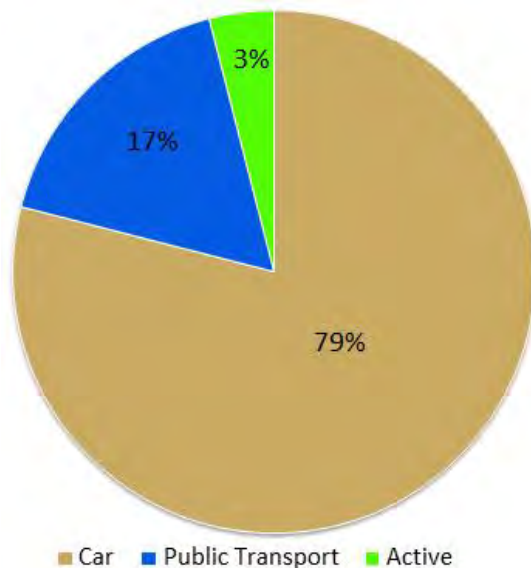
All new trips modal split



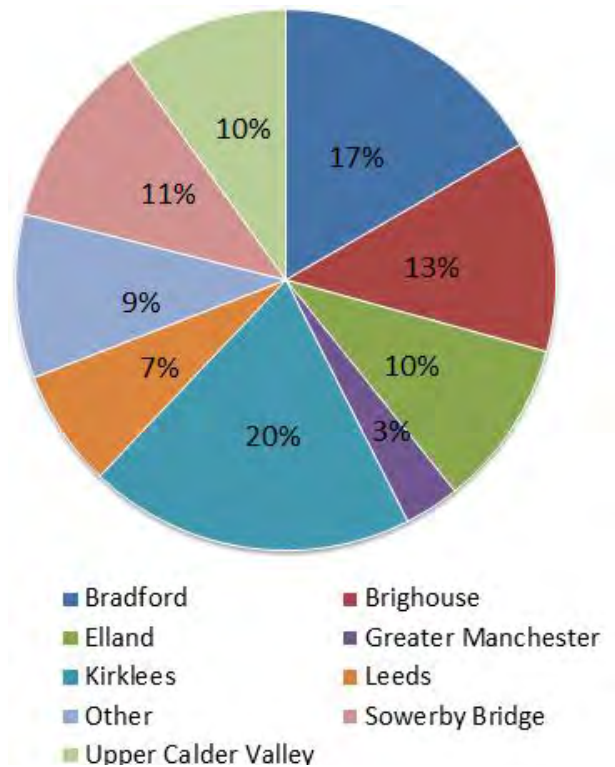
■ Car ■ Public Transport ■ Active



Modal split of new trips from origins outside Halifax



Split of new trips from origins outside Halifax



## 4.3 BRIGHOUSE

- 4.3.1 Evidence suggests that 31 hectares of new employment development (consisting of 3 hectares of B1, 26 hectares of B2 and 3 hectares of B8) will produce 2900 new trips during the AM peak period. The distribution and modal split of these trips is shown in Figure 4.3.
- 4.3.2 Around one third of the new trips generated by employment development in Brighouse originate within the settlement itself (34% of the total new trips). Although the majority of these internal trips are made via car (59%) as opposed to more sustainable means, having a relatively self-contained labour market offers the following benefits:
- Shorter journeys made by car are likely to impact on fewer junctions and make a smaller contribution to congestion than longer journeys.
  - Commuters making short car journeys are more likely to consider switching to a sustainable mode, particularly active modes for very short journeys.
- 4.3.3 In addition to the trips that cover a short distance (within Brighouse) by any mode, a further 9% are made by a sustainable mode (public transport or active modes) to other settlements. Thus around 40% of trips have the potential to be carried out without causing an impact on the wider highway network.
- 4.3.4 New sites for employment in Brighouse are located in the town centre and to the east of the town on the A644 corridor, as shown in Figure 4.4. In order to make public transport attractive for journeys to these more peripheral sites, they will need to be directly served by buses. In order to make active modes attractive they will need safe and direct cycling and pedestrian links.

- 4.3.5 The vast majority of new trips originating from settlements outside Brighouse originate in Bradford, Elland, Halifax, Huddersfield and North Kirklees. The majority of these new trips are made by car (84%). Impacts on Brighouse Town Centre the A641 corridor and the A629 Corridor (mainly between Elland and Ainley Top) would be more easily accommodated by planned improvements as part of the WY+TF schemes., Whereas impacts on Junction 25 of the M62, the A644, Hipperholme Crossroads and Stump Cross junction do not have planned improvements.
- 4.3.6 Only a small minority of new trips originate in Greater Manchester, Sowerby Bridge, the Upper Calder Valley, Northowram and Shelf and Ripponden. This mitigates the impact of employment development in Brighouse on the A646 west of Halifax, Sowerby Bridge Town Centre and the A672.
- 4.3.7 Some 54% of the new trips originate from settlements which are served by the Calder Valley line, which is due for improvement. If Elland railway station is delivered, this would increase to 57%. This indicates that there is the potential to bring about modal shift from car to rail for many of these new trips to Brighouse.

Figure 4.3 - New commuting trips arriving in Brighouse

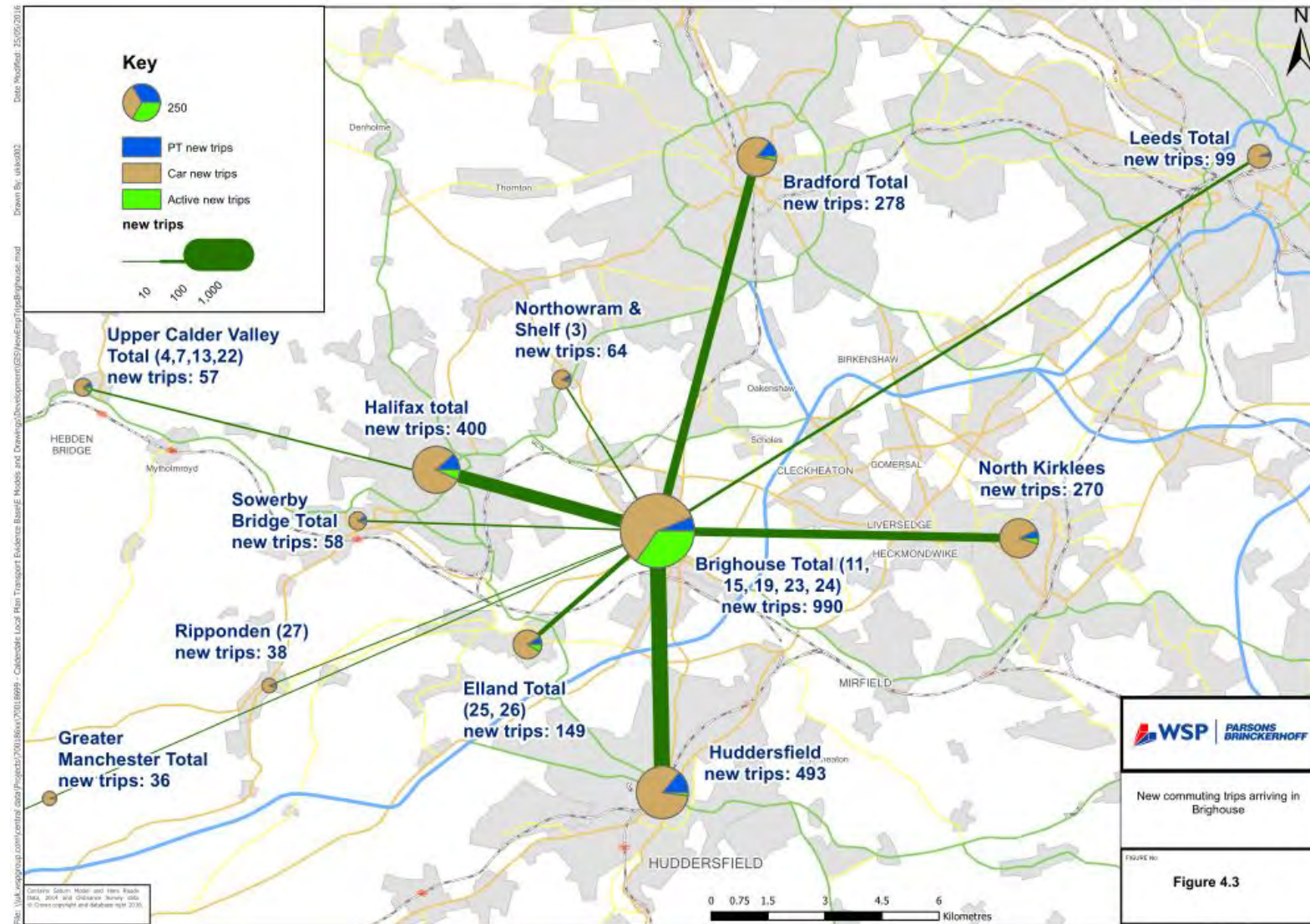
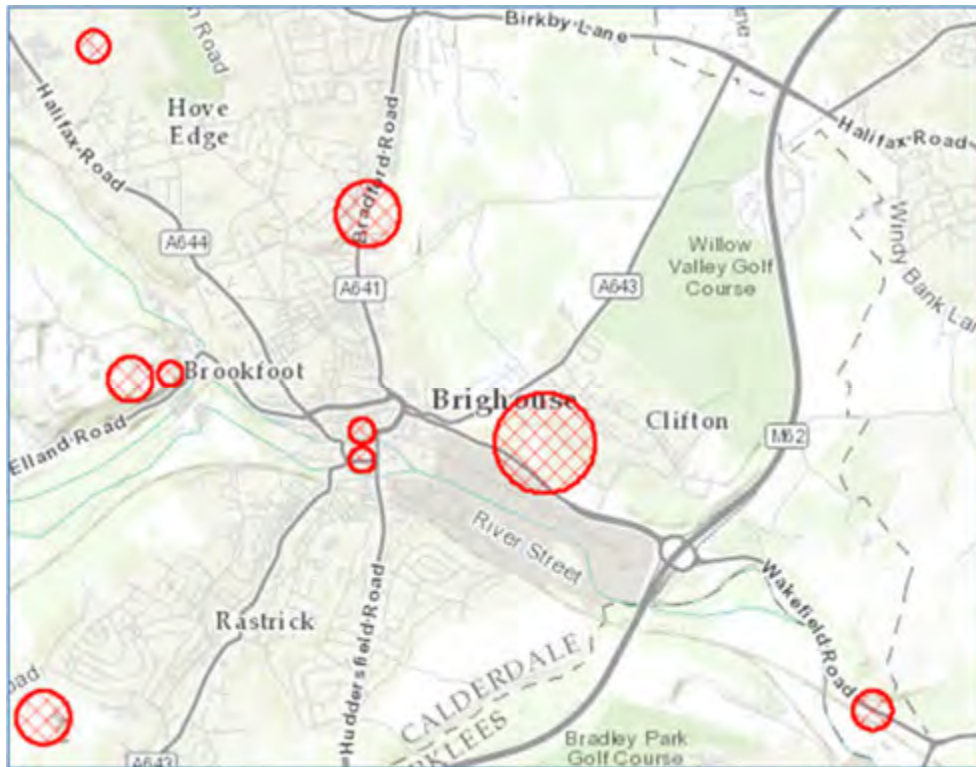


Figure 4.4 – Analysis of Brighouse employment sites



## KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 4.3.8 An increased pressure on the junctions within Brighouse Town Centre. Some limited improvements are planned as part of the A641 corridor WY+TF scheme which would accommodate a portion of this traffic
- 4.3.9 Around 525 new vehicular trips westbound on the A644 from Junction 25 of the M62 to Brighouse town centre which will contribute to delays at both ends. Signalisation and widening of the M62 junction is unlikely to create enough capacity to cope with such an increase in traffic meaning further, as yet unplanned, improvements may be required.
- 4.3.10 The potential for improvements to the M62 via the continued role out of “smart” motorways and investment via the Highways England Growth and Housing fund are also possible sources of mitigation for the trips from Brighouse onto the strategic road network.
- 4.3.11 200 new vehicular trips southbound along the A641 will contribute towards congestion at the junction of the A641 and the A58 as well as in Brighouse town centre. The planned WY+TF scheme for this corridor will improve capacity to potentially accommodate this traffic.
- 4.3.12 Around 350 new vehicular trips northbound on the A641 into Brighouse from Huddersfield will increase congestion around Brighouse town centre. The planned WY+TF scheme for this corridor will improve capacity to potentially accommodate this traffic.
- 4.3.13 Over 180 new vehicular trips can be expected through the Stump Cross and Hipperholme junctions onto the A644 southbound into Brighouse town centre. In order to accommodate such an increase in traffic significant investment would be required to improve capacity at both these junctions, which already experience significant delays during peak times. These potential investments are as yet unplanned.



- 4.3.14 Around 350 new vehicular trips can be expected eastbound on the A6025 (Elland Road) into Brighouse. This will increase pressure on the A6025's junction with the A629 and in Brighouse town centre, both of which are not planned for improvement. Close to 300 of these trips will have originated in Halifax, Sowerby Bridge, Ripponden or the Upper Calder Valley and will increase pressure on the A629 southbound. The planned improvements for the A629 will potentially provide sufficient capacity to cope with an increase of this scale at this location. The planned City Connect 2 improvements between Brighouse and Elland and further up the Calder Valley will also assist in providing an alternative for these trips.
- 4.3.15 Over 100 new vehicular trips from the Upper Calder Valley, Ripponden and Sowerby Bridge may have an impact on junctions in Sowerby Bridge town centre and along the A6026.

## IMPROVEMENTS TO BE CONSIDERED

In order to assist the sustainability of the employment development in Brighouse, the following are considered desirable:

- Enhanced bus services between Brighouse and Halifax, Brighouse and Bradford, and Brighouse and Huddersfield.
- Highway interventions focused on improving routes for pedestrians and cycle users in Brighouse Town Centre.
- Significant investment in the Calder Valley line aimed at improving journey times, service, reliability, capacity and the overall passenger experience.
- The delivery of a railway station at Elland.

## SUSTAINABLE DEVELOPMENT LOCATIONS

- Extensions to existing employment sites including around the Clifton area.
- Within walking distance of bus stops with medium and high frequency services particularly along the A643.
- In and around Brighouse Town Centre

## Positive

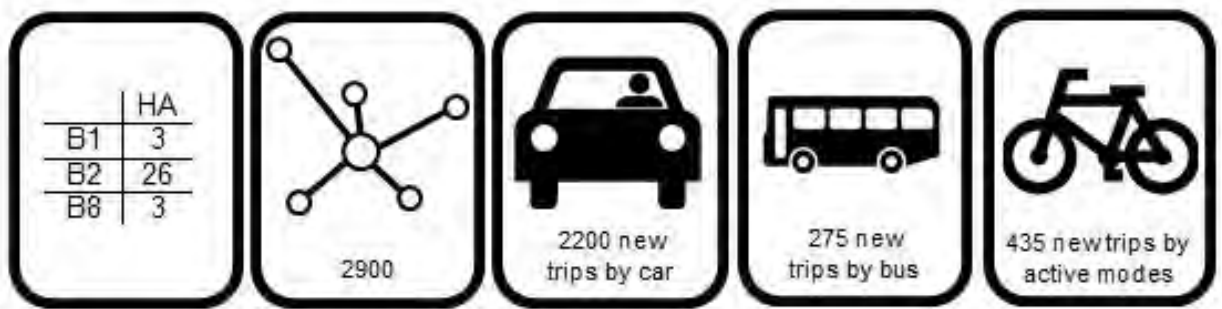


- ☐ A significant proportion of the new trips to work in Brighouse originate in Brighouse limiting the impact they have on the wider road network
- ☐ Growth can capitalise on the WY+TF schemes on the A641 and A629 corridors as well as City Connect 2
- ☐ Growth can capitalise on planned and possible investment on the M62

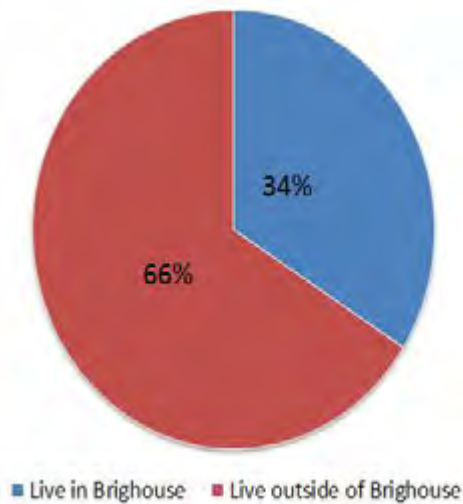
## Negative



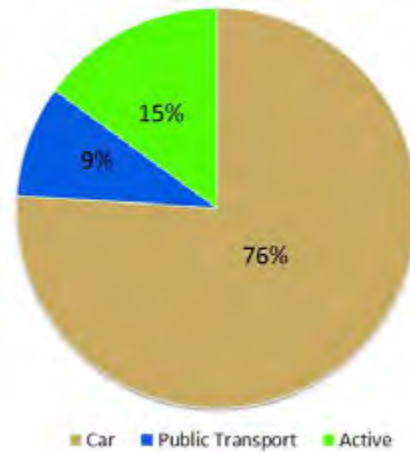
- ☐ The high proportion of new trips by car from Kirklees, Elland and Halifax will increase the burden on the A629, A641 and A6025
- ☐ There will be additional pressure put on to Brighouse Town Centre and the M62 junctions 24 and 25 which do not have planned improvements



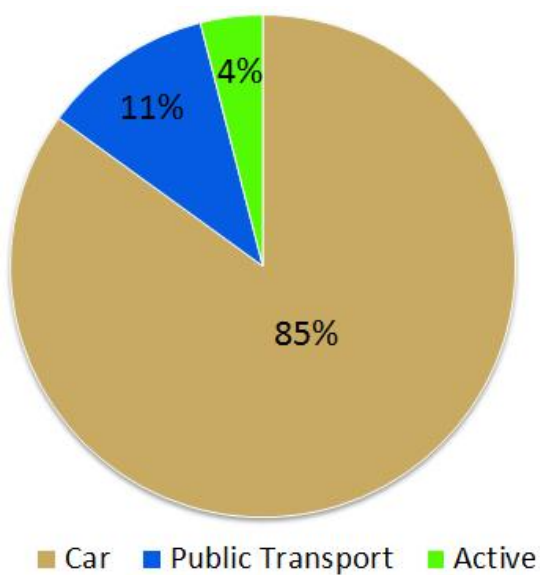
New trips destination split



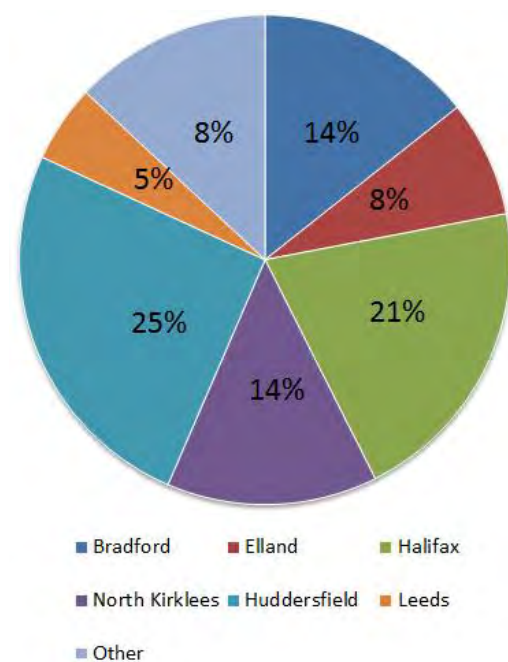
All new trips modal split



Modal split of new trips from origins outside Brighouse



Split of new trips from origins outside Brighouse





## 4.4 ELLAND

- 4.4.1 Evidence suggests that 32 hectares of new employment development (consisting of 4 hectares of B1 and 27 hectares of B2) will produce 2100 new trips during the AM peak period. The distribution and modal split of these trips is shown in Figure 4.5. The employment sites analysed are shown in Figure 4.6.
- 4.4.2 Only 19% of the new trips generated by employment development in Elland originate within the settlement itself and a majority of these internal trips are made via car (56%) as opposed to more sustainable means. The high proportion of trips for jobs based in Elland originating outside Elland has two disadvantages.
- Longer journeys made by car are likely to impact on more junctions and make a larger contribution to congestion than longer journeys.
  - Commuters making long car journeys are less likely to consider switching to a sustainable mode, particularly active modes for very short journeys.
- 4.4.3 Around a third of the new trips will either cover a short distance (within Elland) or be made by a sustainable mode (public transport or active modes) from other settlements.
- 4.4.4 Future employment sites in Elland are located in the town centre and to the north and east of the town on the A629 and Huddersfield Road corridors. In order to make public transport attractive for journeys to the more peripheral employment sites they will need to be directly served by buses. In order to make active modes attractive they will need safe and direct cycling and pedestrian links.
- 4.4.5 The vast majority of new trips originating from settlements outside Elland originate in Halifax, Huddersfield, Brighouse, North Kirklees, Bradford and Leeds. The vast majority of these trips are made by car and will have an impact on the highway network in several locations. On the A629 Corridor north and south of Elland, Halifax Town Centre and the A641 corridor the WY+TF schemes have the potential to accommodate additional traffic., Whereas there are no planned interventions for the A6025 west of Brighouse and other parts of Brighouse Town Centre not affected by the A641 scheme.
- 4.4.6 Only a small minority of new trips originate in Sowerby Bridge, Northowram and Shelf, Ripponden and the Upper Calder Valley (13% combined for all five settlements). This mitigates the impact of employment development in Brighouse on the A646 west of Halifax, Sowerby Bridge Town Centre and the A672.
- 4.4.7 Some 77% of the new trips to Elland originate from settlements which are served by the Calder Valley line which is due to be improved. If Elland railway station is delivered, many of these trips could be made by direct rail services.

### KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 4.4.8 Potential additional pressure on Elland Town Centre junctions, though a portion journeys will not cross, or terminate in, the town centre because their destination is located in the suburbs or on the edge of the town. At present the improvement of junctions within the town centre is not planned.
- 4.4.9 Some 150 new vehicular trips on the A6025 westbound into Elland, a high proportion of which will have passed through Brighouse Town Centre. There are currently no highway improvements planned here; however the proposed City Connect 2 scheme would provide an alternative for active trips between Brighouse and Elland.

- 4.4.10      Some 300 new vehicular trips southbound on the A629 into Elland. The planned WY+TF schemes for the A629 corridor give the potential to accommodate this additional traffic and later stages would also encourage modal shift to public transport and active modes.
- 4.4.11      Some 400 new vehicular trips northbound on the A629 northbound into Elland. Again the planned improvements to the southern portion of the A629 corridor would provide potential additional capacity for this traffic.

Figure 4.5 - New commuting trips arriving in Elland

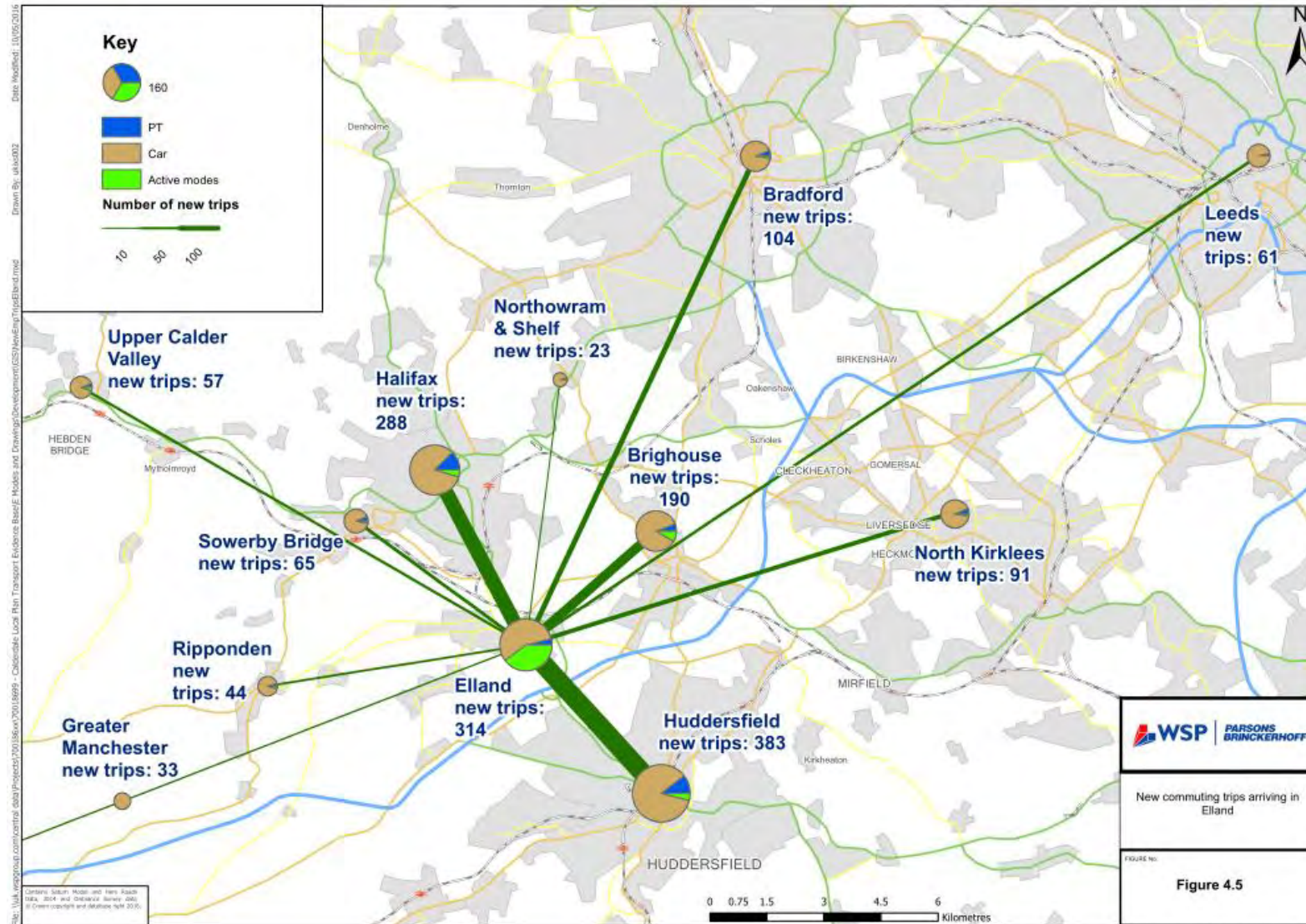
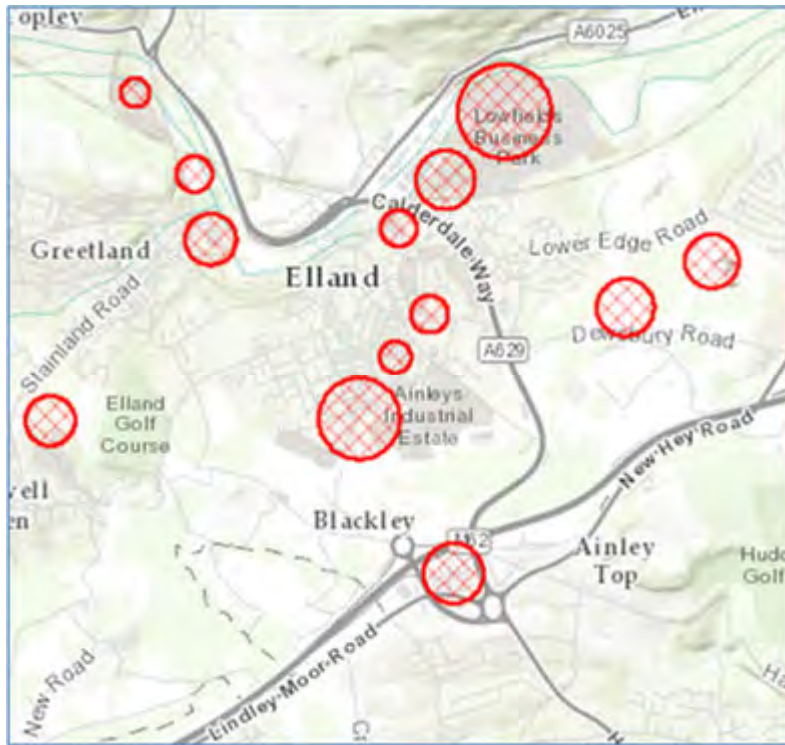


Figure 4.6 – Analysis of Elland employment sites



## IMPROVEMENTS TO BE CONSIDERED

4.4.12 In order to assist the sustainability of the employment development in Elland, the following are considered desirable:

- Enhanced bus services between Brighouse and Halifax, Brighouse and Bradford, and Brighouse and Huddersfield.
- The delivery of a railway station at Elland.
- Significant investment in the Calder Valley line aimed at improving journey times, service, reliability, capacity and the overall passenger experience.

## SUSTAINABLE DEVELOPMENT LOCATIONS

- Extensions to existing employment sites including the Lowfields Business Park.
- Within walking and cycling distance of Elland Town Centre and the proposed new Elland Rail Station.
- Within walking distance of bus stops with medium and high frequency bus services including the A629.

## Positive



- ☐ A significant proportion of trips arriving in the town are short, local trips made by active modes.
- ☐ Employment growth in Elland can capitalise on the planned investment in the A629 corridor and City Connect 2
- ☐ Employment development at Elland is unlikely to increase the burden on the highway network in Sowerby Bridge, Stump Cross, Junction 25, Hipperholme Crossroads and Halifax Town Centre.
- ☐ The growth and location of employment sites lends weight to the need for a new station at Elland

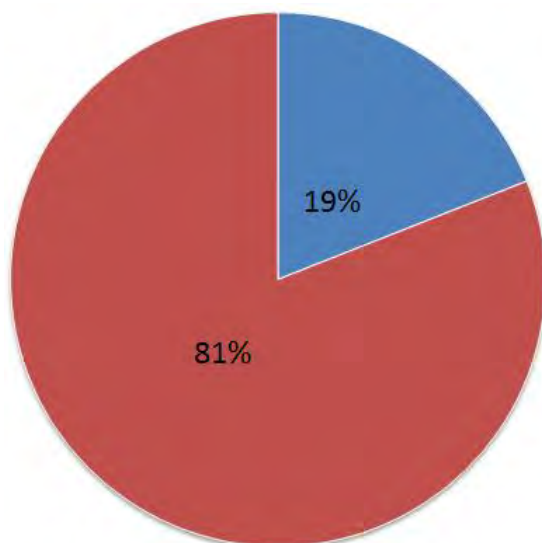
## Negative



- ☐ Additional pressure on the highway network within the town centre. Junctions which are not planned for investment
- ☐ The high number of new trips from the east to Elland will place pressure on the A6025 which is not currently planned for improvement.

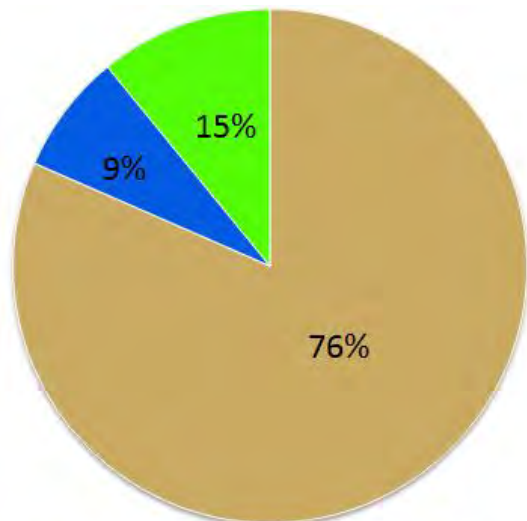


New trips origin split



■ Live in Elland ■ Live outside of Elland

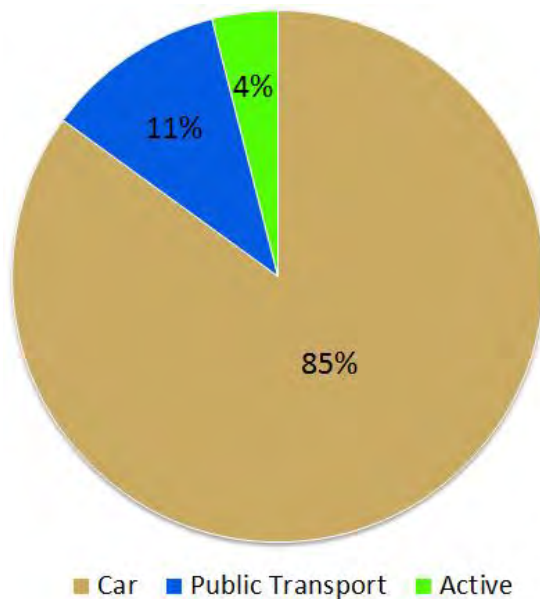
All new trips modal split



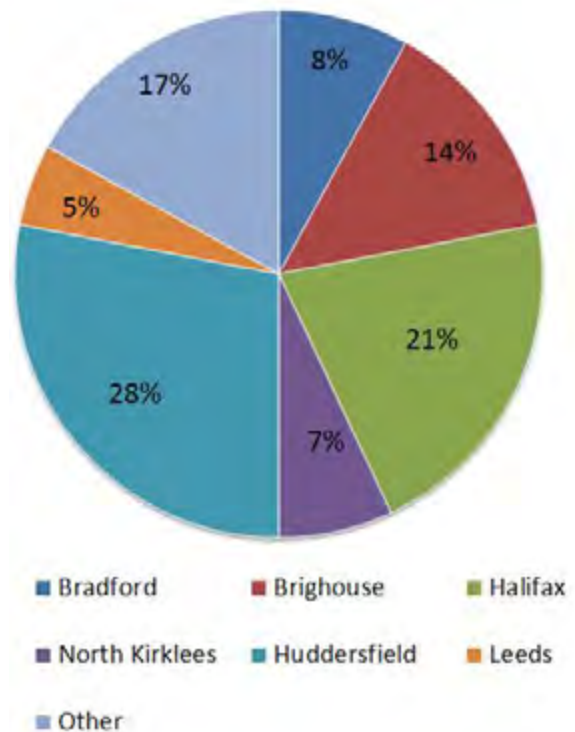
■ Car ■ Public Transport ■ Active



Modal split of new trips from origins outside Elland



Split of new trips from origins outside Elland



## 4.5 SOWERBY BRIDGE

- 4.5.1 7 hectares of new employment development (B1) will produce 700 new trips during the AM peak period. The distribution of this development is shown in Figure 4.7 and 4.8 shows the sites analysed.
- 4.5.2 Of these new trips only 10% originate within the settlement (internal trips) and 90% originate outside the settlement. Having a high proportion of trips for jobs based in Sowerby Bridge originating outside Sowerby Bridge has two disadvantages.
- Longer journeys made by car are likely to impact on more junctions and make a larger contribution to congestion than longer journeys.
  - Commuters making long car journeys are less likely to consider switching to a sustainable mode, particularly active modes for very short journeys.
- 4.5.3 Around 30% of the new trips either originate in Sowerby Bridge or are made by sustainable means from other settlements/districts. The remaining 70% will have an impact on the highway network inside and outside of Sowerby Bridge.
- 4.5.4 The new employment in Sowerby Bridge is likely to be located to the east of the settlement close to the border with the settlement of Halifax along the A6026. Sites in this area are almost beyond walking distance of Sowerby Bridge rail station meaning bus services, particularly those which link in with the link rail network will be key to delivering any kind of modal shift.
- 4.5.5 The above mentioned area is however close to the Rochdale Canal which is being updated as part of the Cycle City Ambition Grant programme. Once upgrades works are complete the

Rochdale Canal and the off road cycle routes it links in with will run between the Upper Calder Valley, Sowerby Bridge, Elland and Brighouse.

- 4.5.6 Almost half of the new trips into Sowerby Bridge will be from Halifax (43%). Of these trips the vast majority will be via car based on current trends. Given Halifax town centre is only 5.5km from Sowerby Bridge town centre, along a corridor well served by public transport, efforts could be made to encourage more people to switch from car to more sustainable modes, including cycling.
- 4.5.7 Over two thirds of the new trips are from origin settlements along the Calder Valley Line (direct services) which is due for improvements in the near future. If journeys which involve a single change of service and journeys from Elland, which could have a station on the Calder Valley Line, are considered this figure increases to 90%.
- 4.5.8 13% of trips are from either Elland or Brighouse. Although Brighouse has a rail station on the Calder Valley Line, there are currently no bus services which link the residential areas of these settlements with the eastern side of Sowerby Bridge, where new employment development is being considered.
- 4.5.9 Around 10% of the trips will be from Huddersfield. Although also located on the Calder Valley Line, being such a large settlement means many residential areas, from which people are beginning their journey, are not within walking distance of Huddersfield rail station. Furthermore traveling between Sowerby Bridge and Huddersfield by rail requires a change of service at Brighouse.

Figure 4.7 - New commuting trips arriving in Sowerby Bridge

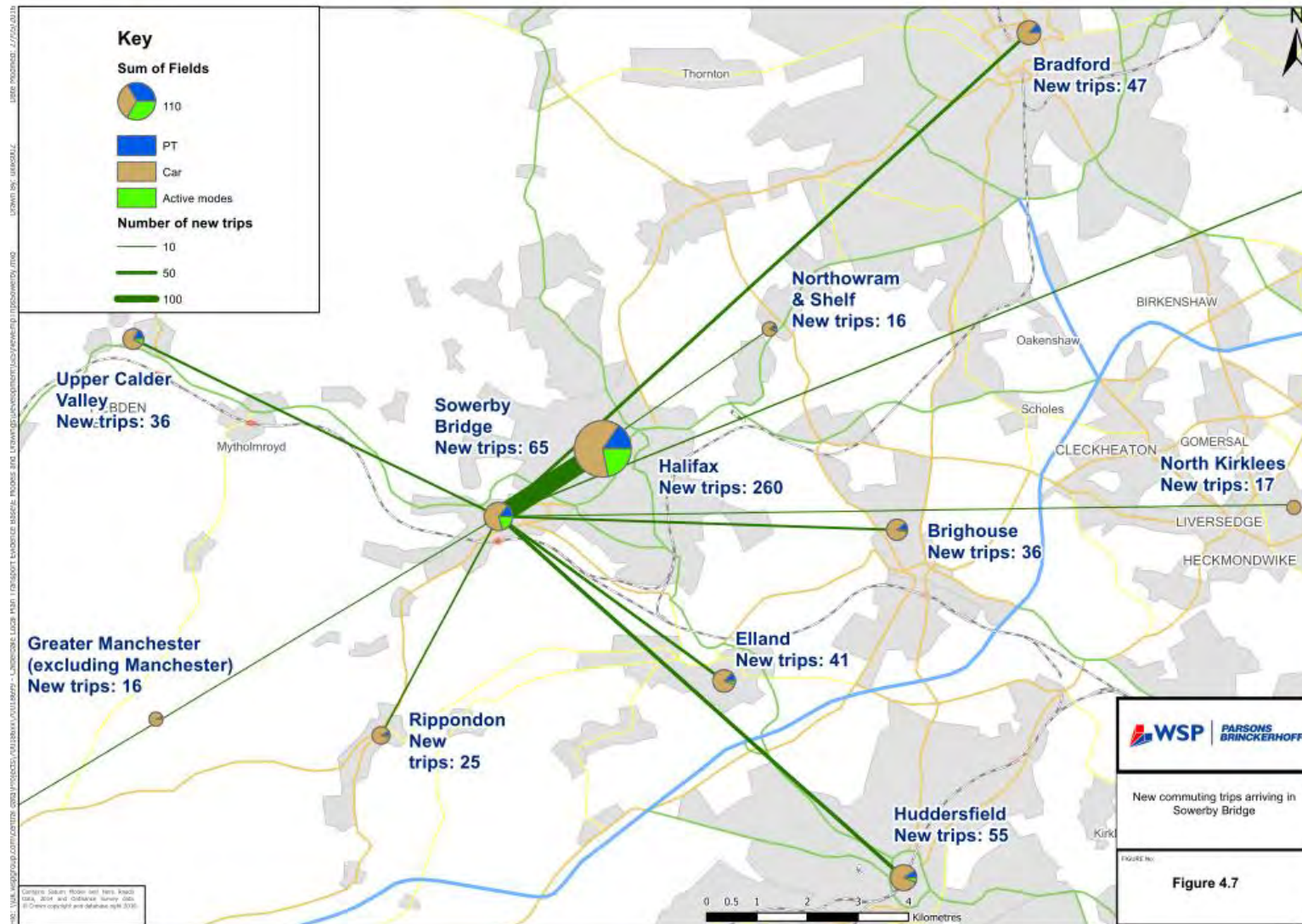
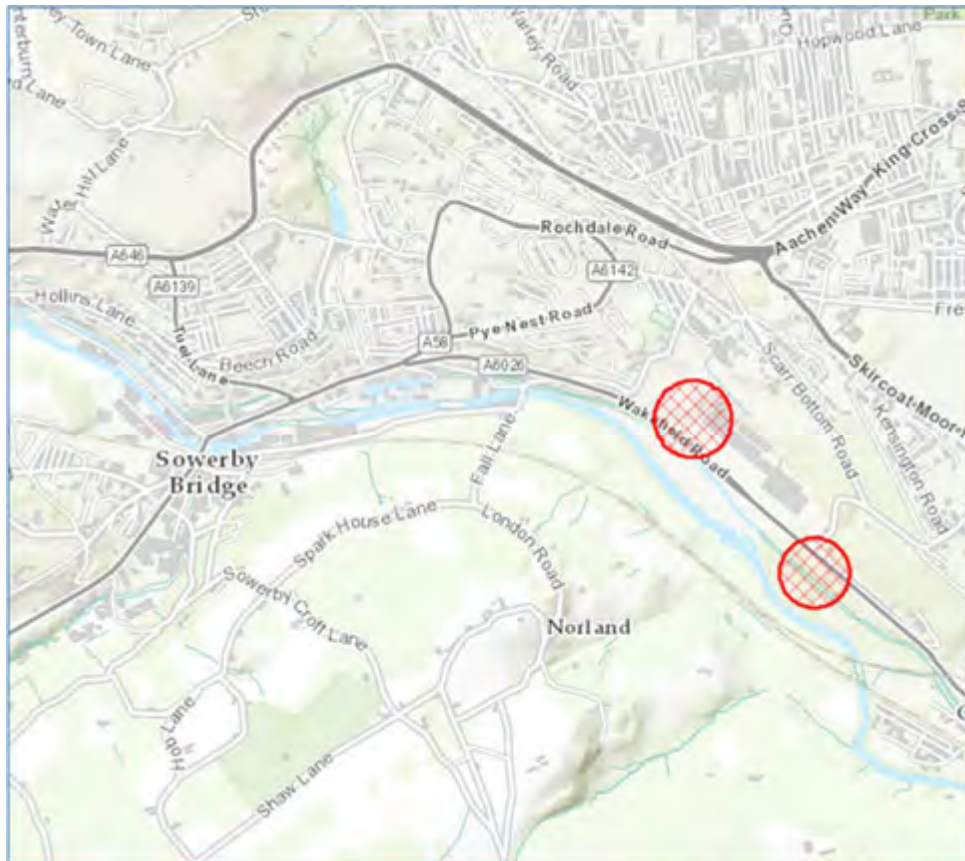


Figure 4.8 - Sowerby Bridge employment sites analysed



## KEY IMPACTS ON JUNCTIONS AND CORRIDORS

- 4.5.10 Up to 180 vehicular trips from Halifax, Bradford and Leeds will enter Sowerby Bridge from the North East along the A58. This is likely to increase pressure on several junctions along the A58 but most significantly that with the A6026. There are currently no planned improvements for the junctions within Sowerby Bridge.
- 4.5.11 Over 100 new vehicular trips can be expected northbound along the A629 through several key junctions before joining the A6026, a junction which experiences extended delays during both peak periods. Improvements being made to the A629 through the WY+TF scheme will potentially create capacity to accommodate this increase in demand.

## IMPROVEMENTS TO BE CONSIDERED

- 4.5.12 In order to assist the sustainability of the employment development in Elland, the following are considered desirable:
- Significant investment in the Calder Valley line aimed at improving journey times, service, reliability, capacity and the overall passenger experience.
  - Enhanced bus services between key employment sites in Sowerby Bridge and the residential areas within Halifax, Brighouse and Elland.
  - Continued development of a high quality network of on road and off road cycle routes connecting the districts key settlements.



## SUSTAINABLE DEVELOPMENT LOCATIONS

- Within walking and cycling distance of Sowerby Bridge Rail Station.
- Within a short cycling distance of the Calder and Hebble Navigation.

### Positive



- ☐ There is potential to convert the high number of new trips by car from Halifax to more sustainable modes.
- ☐ Growth in employment can capitalise on the planned improvements to both the A629 corridor and City Connect 2.

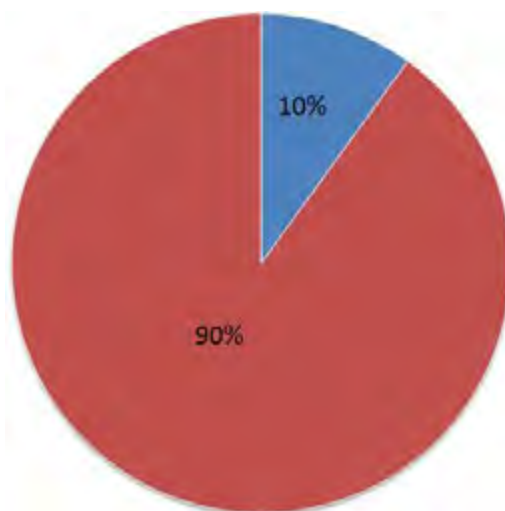
### Negative



- ☐ There will be an impact on the junctions within Sowerby Bridge which are not currently planned for improvement.

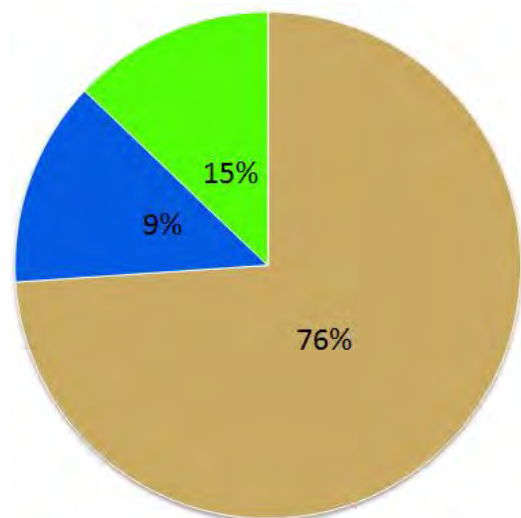


New trips origin split



■ Live in Sowerby Bridge ■ Live outside of Sowerby Bridge

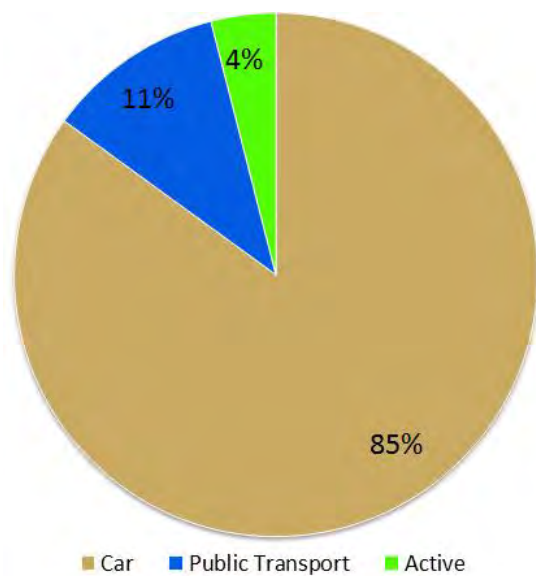
All new trips modal split



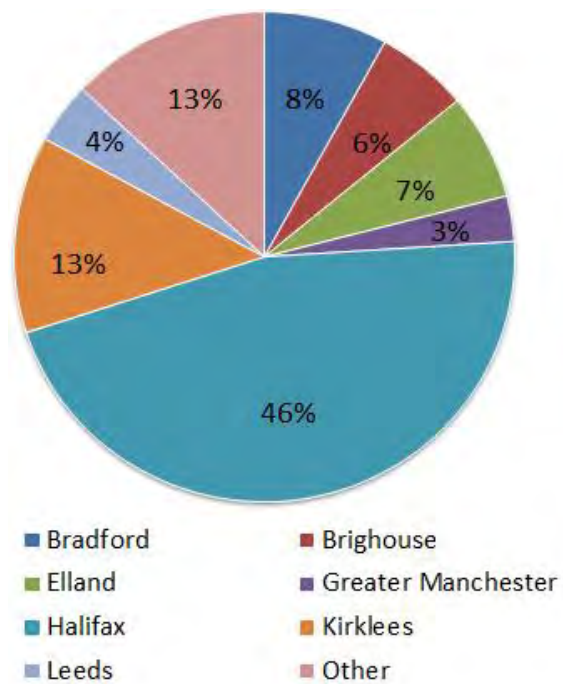
■ Car ■ Public Transport ■ Active



Modal split of new trips from origins outside of Sowerby Bridge



Split of new trips from origins outside Sowerby Bridge



# 5

## CONCLUSIONS

### 5.1 HOUSING & EMPLOYMENT

#### 5.1.1

This report has detailed the predicted impacts that would occur from a likely level of growth in each of the main settlements in Calderdale. Current baseline conditions have been examined alongside analysis of census journey to work data for the specific areas of Calderdale where growth is expected. The conclusions from the previous sections are shown below.

- Halifax, Brighouse and Elland show the greatest potential for sustainable travel due to higher levels of local employment. Halifax shows the greatest potential for sustainable travel with Brighouse and Elland showing lower potential
- Sowerby Bridge shows a similar level of potential for sustainable travel as Brighouse and Elland. A key movement for travel is shown to be with Halifax.
- The Upper Valley also shows high levels of local trip making, although these would still have local impacts on the road networks. Public transport use is also higher here.
- Northowram and Shelf shows the greatest level of commuting out of the settlement, making it least suitable for intensive development. The impacts from development here would be felt at both Hipperholme and Stump Cross junctions which have no current plan for improvement.
- The North and North West area of Halifax is less preferential for development than areas to the South due to public transport accessibility and the potential impacts on junctions on the A58
- Through the planned WY+TF A629 corridor improvements growth is supported in Halifax and Elland and to a lesser extent Brighouse. Growth in Brighouse is supported by the WY+TF A641 corridor improvements.
- Growth in Sowerby Bridge and particularly Elland and Brighouse is supported by the planned City Connect 2 scheme which will provide an improved option for use of active modes.
- There are a lack of planned interventions which would support major development in Sowerby Bridge and the Upper Calder Valley.
- Development in either of the key settlements of Halifax and Brighouse would give rise to a need for as yet unplanned major interventions at the Stump Cross and Hipperholme junctions
- The potential level of development at Brighouse, particularly employment, is likely to mean there is a need for major interventions to improve capacity at M62 Junction 25 or abstraction of traffic via the possible junction 24a
- The level of both housing and employment development in Elland and interactions with other areas lends significant support to the provision of a new rail station which would help mitigate the traffic impacts on the A629 corridor
- All settlements show high levels of reliance on the private car, greater than 70%. Therefore it is desirable to promote a policy of modal shift and in particular support the improvement of bus services between settlements so that direct services are available without the need for interchange in Halifax