East Kirklees to Wakefield

West Yorkshire Connectivity Plan

East Kirklees to Wakefield: Case for Change

November 2020

West Yorkshire Connectivity Plan

East Kirklees to Wakefield: Case for Change

November 2020

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
■	■	■	■	■	■
■	■	■	■	■	■■■■■■
■	■	■	■	■	■■■■■■
■	■	■	■	■	■■■■■■

Document reference: 401619 | 05 | D

Information class: Standard

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Contents

Introduction

1.1 The role of this Case for Change

This Case for Change report for East Kirklees to Wakefield provides an important first step, and part of the evidence, for identifying a connectivity pipeline of future transport investments for this part of the region.

This report provides analysis of transport and socio-economic data, to identify an initial longlist of potential transport investments aimed at improving connectivity. The approach takes the view that transport should not be a barrier to people accessing jobs, to businesses choosing to invest here and to improving the health of our residents and visitors. Improvements in transport should be a catalyst for change across all these objectives.

This report's outputs will be integrated with other Case for Change reports, and other workstreams, including proposals to decarbonise transport, Urban Mass Transit market testing, Bus Network Reviews, Rail Capacity Study, Local Cycling and Walking Infrastructure Plans and a Future Mobility Strategy, to produce a connectivity plan and long term investment programme for the whole of West Yorkshire, to the 2040's.

1.2 Background to the report

The West Yorkshire Combined Authority has adopted a Transport Strategy to 2040. The strategy was a collaboration between the Combined Authority and the West Yorkshire partner councils of Bradford, Calderdale, Kirklees, Leeds and Wakefield and covers the geography of West Yorkshire but recognises the importance of the wider Leeds City Region, and that people and goods travel longer distances across administrative boundaries. The strategy provides a framework of high-level transport policies aimed at delivering a world-class, modern, integrated transport system, that will play a key role in transforming the region's economy and delivering inclusive, sustainable growth.

A daughter document, the Leeds City Region HS2 Growth Strategy, set out the strategic case for change for building on the once-in-a-generation opportunity provided by the arrival of High Speed 2 (HS2) and Northern Powerhouse Rail (NPR) in the region, to transform the City Region's economy. The benefits of HS2 and NPR cannot however drive inclusive growth alone; a range of factors are essential to create more and better jobs, with a highly skilled workforce to sustain them - and a lack of transport capacity and infrastructure at the City Region and local level will inhibit growth. The HS2 Growth Strategy identified corridors and communities which are in economic need of improved connectivity.

Significant investments in transport are planned through the West Yorkshire Transport Fund, Connecting Leeds and Transforming Cities Fund programmes, and by the rail industry, which will provide the early years of the connectivity pipeline. However, there remains insufficient capacity and resilience in our transport system, particularly to key employment centres, which will constrain business and labour market catchments, and the ability to train and develop the next generation, by restricting access to colleges and universities. The National Infrastructure Commission identified that this is affecting many places across the North of England and will increasingly inhibit economic development and living standards.

An important next step is to support the delivery of our strategies is to develop a plan and pipeline of longer-term investments, which address a full range of strategic and local connectivity needs.

Ten Case for Change reports have been produced with the input of the partner councils, which study corridors covering the geography of West Yorkshire and including parts of the wider City Region, to provide detailed evidence of connectivity needs. These Case for Change reports should be read in conjunction with the Connectivity Plan Appraisal Handbook for further detail on background and methodology.

1.3 Leeds City Region's priorities for growth

The emerging Industrial Strategy for West Yorkshire highlights a significant and widening productivity and innovation deficit, as shown in Figure 1. Living standards across the City Region have stalled with several communities facing persistent poverty.

Figure 1: Illustration of productivity gap in West Yorkshire

Productivity in Leeds City Region, 2004-17
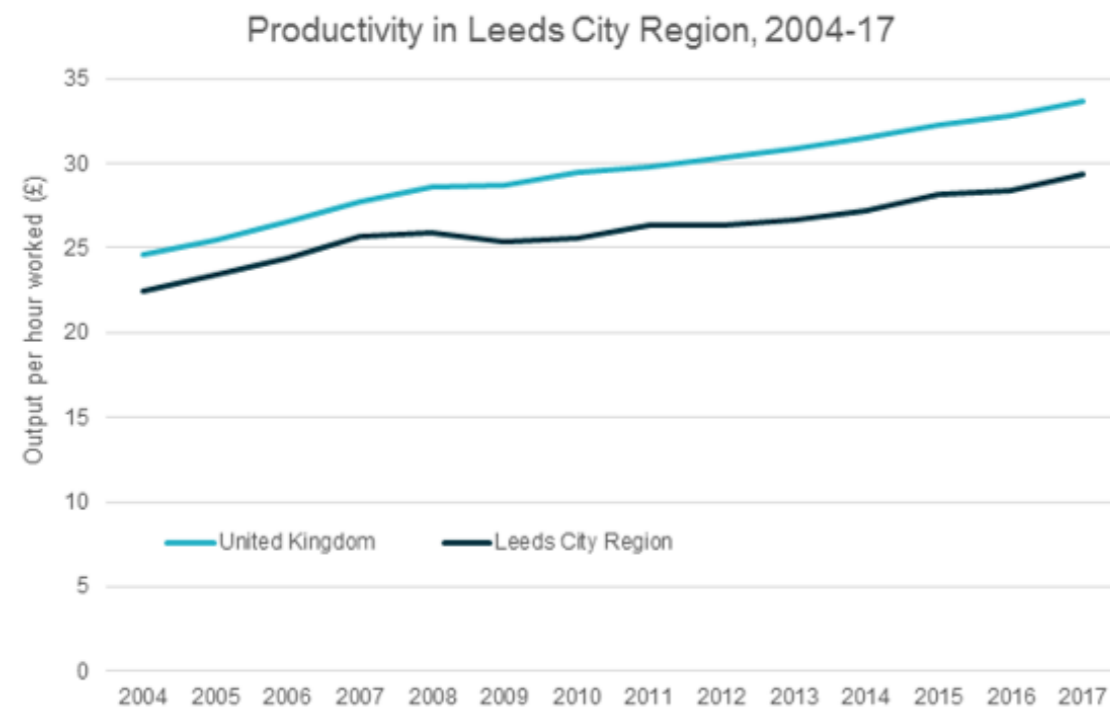
Source: Office for National Statistics, 2019

The West Yorkshire Transport Strategy recognises that our transport network currently constrains opportunities for growth and is a key factor in shaping experiences of poverty. Our network does not sufficiently support sustainable travel as the obvious choice for many. In the wake of the declaration of a "climate emergency" by all West Yorkshire districts, there is a growing need to de-carbonise our transport network; as the transport sector contributes 37% of Wakefield's and 35% of Kirklees's total CO_2 emissions[1]. This needs immediate action as transport emissions are expected to grow, constraining West Yorkshire's ability to meet overall emissions targets.

We have four priorities for the region aimed at addressing our key challenges. These are summarised in Table 1.

Table 1: Leeds City Region's four priorities for growth

Enabling Inclusive Growth – Ensuring that economic growth leads to opportunities for all who live and work in the region

Boosting Productivity – Helping businesses grow and bringing new investment into the region to drive economic growth and create jobs

Tackling the Climate Emergency - Growing our regional economy whilst cutting carbon dioxide emissions

Delivering 21st Century Transport - Creating efficient transport infrastructure that makes it easier to get to work, do business and connect with each other

Source: West Yorkshire Combined Authority

---

[1] UK local authority and regional carbon dioxide emissions national statistics: 2005-2016

1.4   Defining the scope and study area

This section explains the process undertaken to define the corridor from the original scope to an economic area in which to focus the evidence base, develop key connectivity concepts and interventions.

The Leeds City Region HS2 Growth Strategy identifies a network of communities and corridors that would benefit from inclusive growth. Table 2 shows a list of the corridors and the corresponding reports with their approximate extents illustrated in Figure 2. All the Case for Change corridors are shown in Figure 3 with the East Kirklees to Wakefield corridor highlighted in red.

Table 2: Reporting index

Ref.	Report Name	Original corridor name
1		Strengthening high value assets in the North West of Leeds, the University of Leeds, Kirkstall Forge and the airport
1	Airport, Airedale and Wharfedale: Case for Change	Skipton to Leeds
1		Stimulating development from the city centre into North Bradford towards Shipley, Saltaire and the airport
2	Calder Valley and Bradford: Case for Change	The Calder Valley and Bradford
3	West Kirklees to Calderdale: Case for Change	Huddersfield to Brighouse
3		South West Kirklees (including Slaithwaite) to Brighouse
3		Huddersfield – Halifax
3		Halifax to Brighouse
4	Leeds – Bradford: Case for Change	Leeds Bradford cross connectivity
4		South Bradford and North Kirklees – Bradford
5	Leeds – Huddersfield: Case for Change	Dewsbury / Huddersfield to the HS2 Hub
6	East Kirklees to Wakefield: Case for Change	Dewsbury to Wakefield
6		East Kirklees (including Denby Dale) to Wakefield
6		Five Towns to Wakefield
7	South and East Leeds: Case for Change	Extending the South Bank opportunity to the south of Leeds
7		Accelerating inclusive growth in the East of Leeds towards St James' Hospital and the East Leeds extension
8	North Yorkshire to Leeds: Case for Change	Harrogate to the HS2 Hub
8		York to Leeds
8		Se by to the HS2 Hub
9	Five Towns to Leeds: Case for Change	Five Towns to Leeds
10	Barnsley and Wakefield to Leeds: Case for Change	Barnsley and Wakefield to Leeds
10		North Barnsley to Barnsley

Source: Mott MacDonald

The corridor is a mixture of urban communities to the north of the area, comprising the towns of Huddersfield, Mirfield, Dewsbury, Batley and the City of Wakefield, with some smaller towns and suburbs and a large rural area in the south. Areas to the south and west are addressed in more detail as part of the West Kirklees to Calderdale corridor, and areas to the east in

Figure 2: West Yorkshire Connectivity Plan: Reporting Map

1 Airedale, Wharfedale & Airport
2 Calder Valley
3 West Kirklees to Calderdale
4 Leeds, Bradford, South Bradford & North Kirklees
5 Leeds to Huddersfield
6 East Kirklees to Wakefield
7 South Leeds & East Leeds
8 North Leeds to North Yorkshire
9 Five Towns to Leeds
10 Leeds to Wakefield & Barnsley

Figure 3: West Yorkshire Connectivity Plan: Corridor Map

Wakefield and Barnsley are covered as part of the Barnsley and Wakefield to Leeds corridor. .
The defined economic area is shown in the next chapter.

The corridor has been defined in consultation with officer representatives from Kirklees and
Wakefield districts (these will now be referred to as partners). An initial workshop helped to
identify and confirm the key "problems and opportunities" for the area. An example of the
outputs from this is shown in Figure 4.

The findings were then used to define both the extent of the corridor or economic area, the main
elements of the accompanying "story map" (which summarises the key issues and opportunities
in the spatial context, and sits behind the Case for Change as the data repository and analysis
tool) and to develop a set of corridor-specific aspirations.

1.5   East Kirklees to Wakefield corridor – at a glance

The following two pages provide some highlights for this corridor – these cover the key socio-
economic features of the geography as well as the connectivity challenges it faces and
conclude with prioritised investment proposals to meet these challenges. The 2-page summary
is designed as a double sided "lift out" of the key issues and conclusions. Further detail to
underpin these summary points is provided in subsequent Chapters.

**Figure 4: Example of issues identification and corridor definition from stakeholder
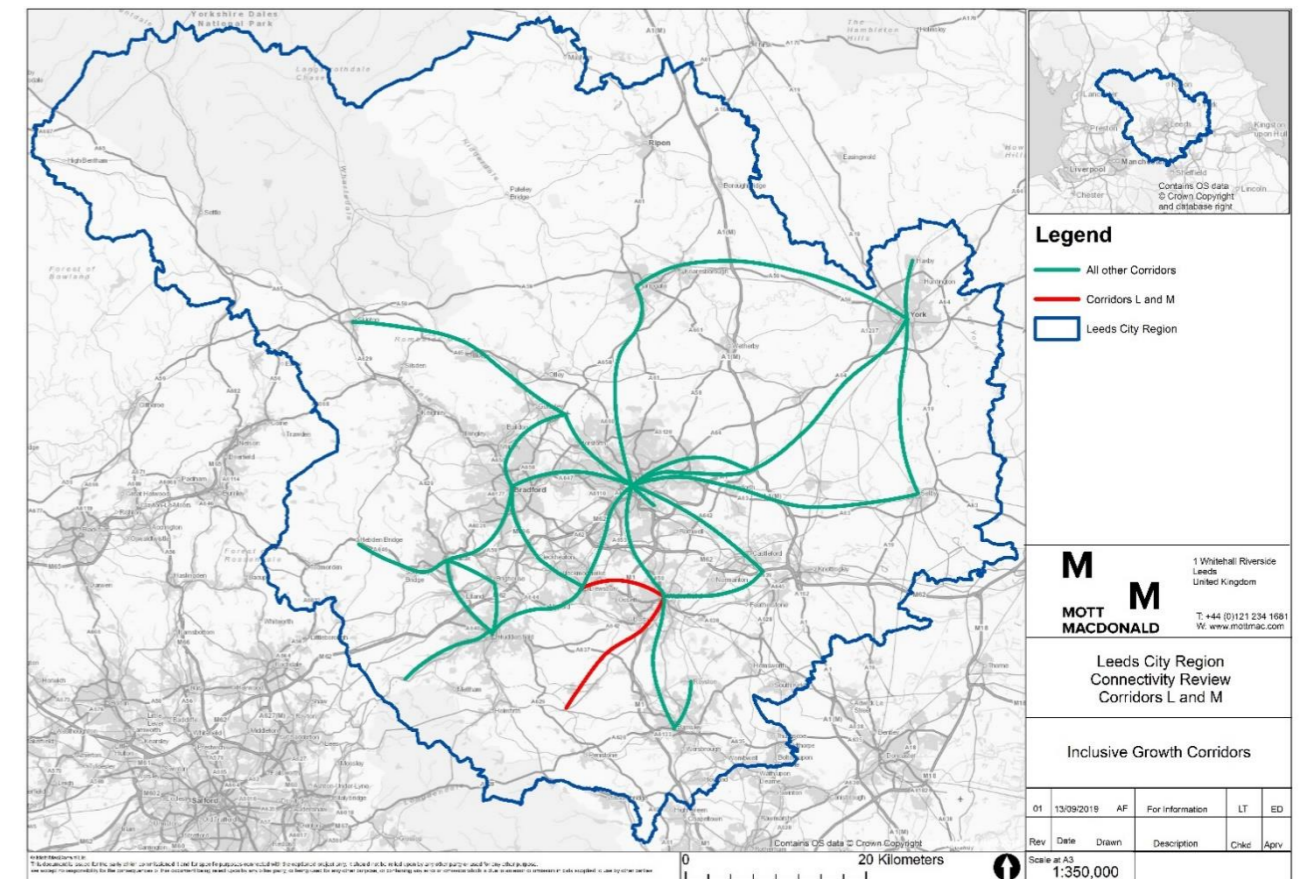workshop**

Source: Mott MacDonald

East Kirklees to Wakefield: socio-economic profile

This corridor is a mixture of urban communities to the north comprising the towns of Huddersfield, Mirfield, Dewsbury, Batley and the City of Wakefield, some smaller towns and suburbs and a large rural area in the south. Average household income in the corridor is lower than both the national and regional averages and the number of people in employment is just below the national average. There are several employment growth sites throughout the corridor as well as a considerable number of housing growth sites – connectivity to and between these future sites is fundamental to enable inclusive growth throughout the Leeds City Region.
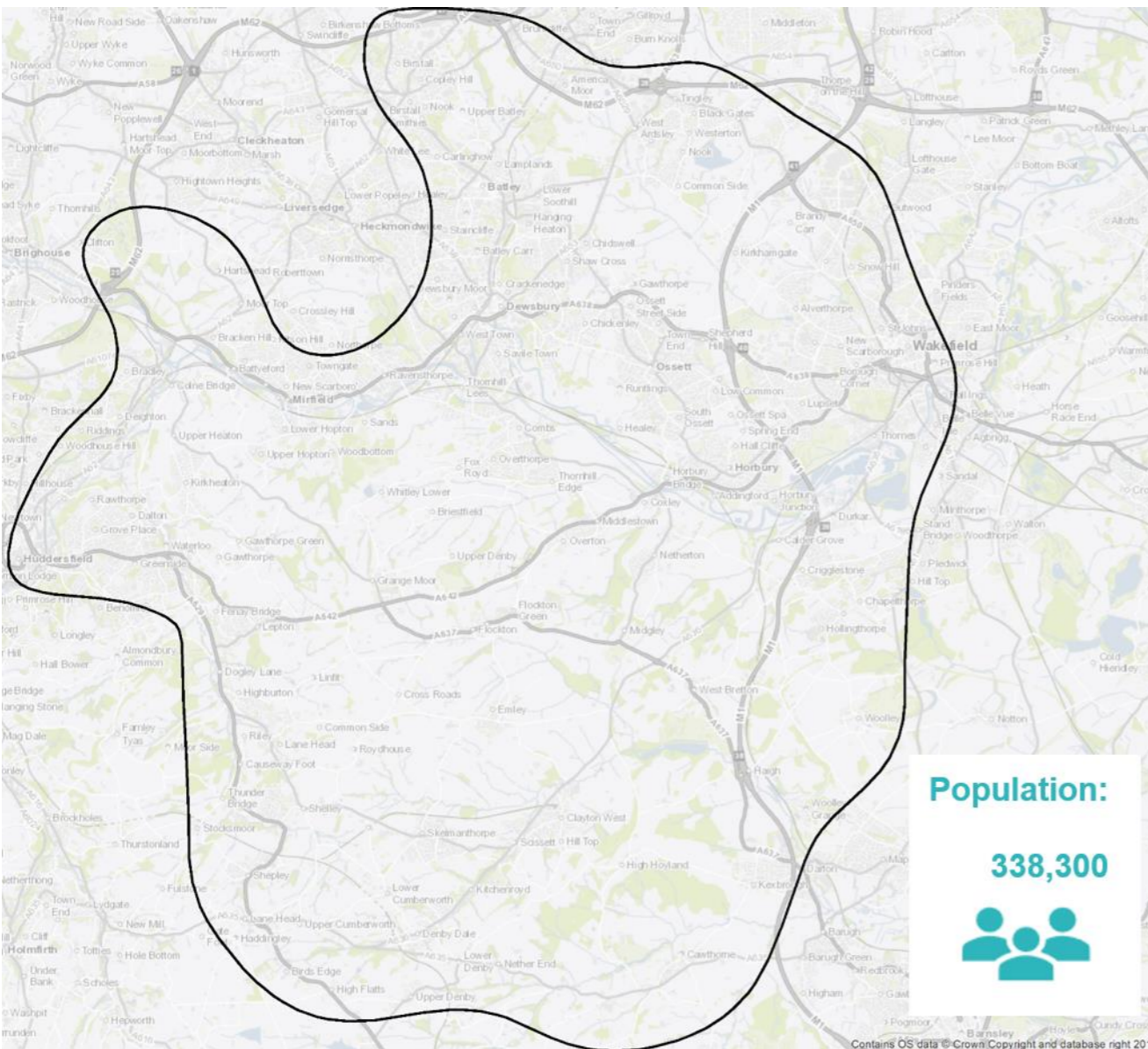
Population:

338,300

Total jobs in the corridor:
Over
157,950

Employment sites forecast in the corridor
48

Housing sites forecast in the corridor
26,214

Average household income:
£36,169

% in employment:
60%

Yorkshire and Humber	England and Wales
£36,526	£41,642

Yorkshire and Humber	England and Wales
60%	62%

Places with challenges for:

Income:
Batley

Employment:
Chidswell

Health:
Dewsbury

Places with opportunities for:
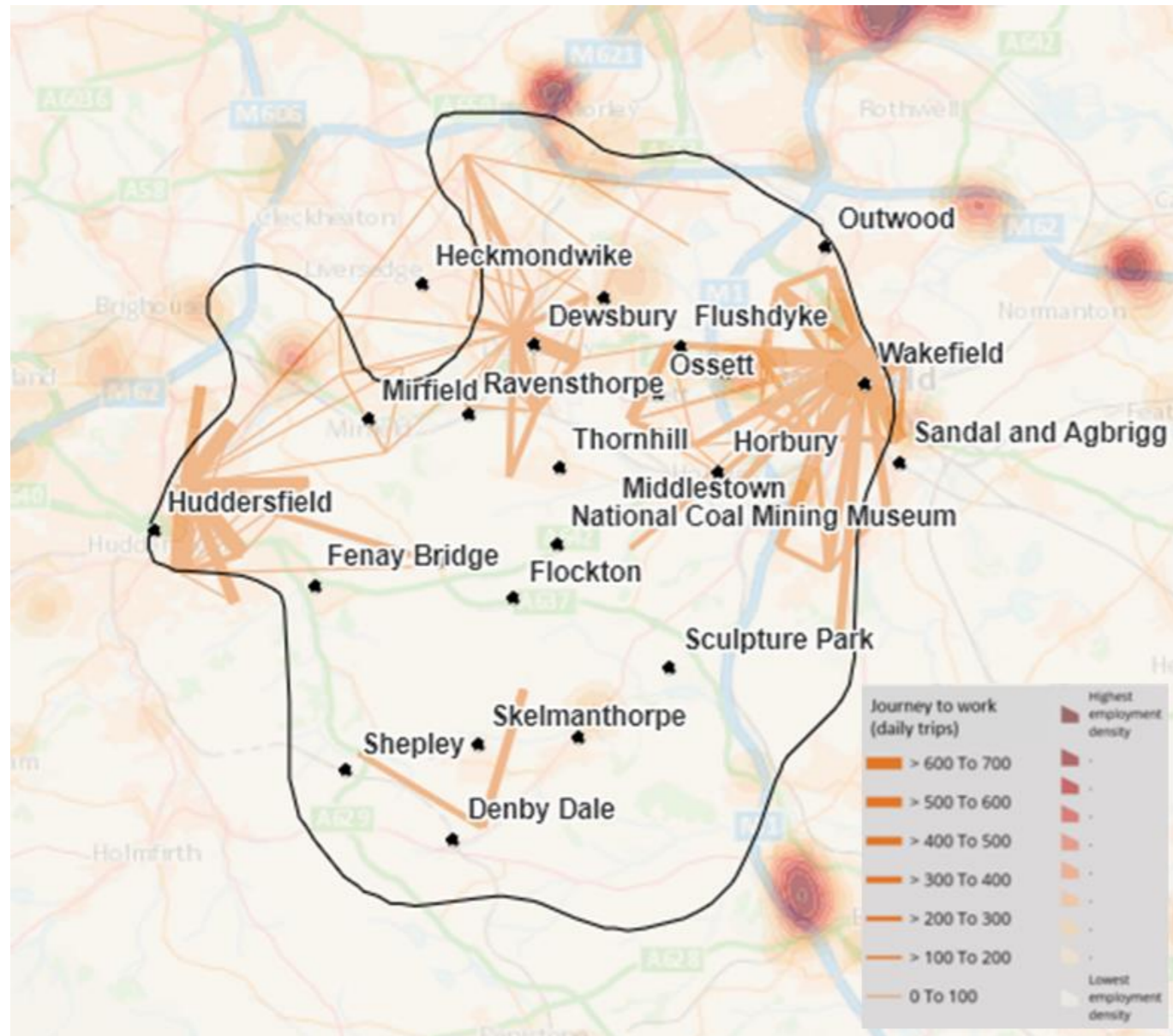
Connectivity:
Dewsbury

Employment:
Silkwood Park

Housing:
Chidswell

Contains OS data © Crown Copyright and database right 2019

East Kirklees to Wakefield – connectivity highlights

People in communities within the corridor, including in Batley, Dewsbury and Ravensthorpe experience low employment and skills prospects, low household income, and low car ownership, and are within the top 10% of most deprived communities in the UK.

Many job opportunities, often in wholesale and retail trade, rely on car access and are poorly served by other modes. To improve the prospects of these communities, and to boost productivity, they must be better connected to suitable employment opportunities by a range of transport options.

Key connectivity challenges:

- 75,800 people in the corridor live within an isolated community, approximately 22% of the population. Improving access to employment destinations will help to **boost productivity**
- 39% of residents in central Dewsbury and 45% in Ravensthorpe have no qualifications. Improving connectivity to education opportunities will ultimately help people to find better employment, helping to ensure **inclusive growth**
- 244,800 people (71%) within the West Yorkshire areas of the corridor have access to just one bus per hour or less outside of peak periods, this restricts the delivery of a **21st century transport system**
- High levels of peak-time traffic and associated congestion particularly on the M1 and M62 must be addressed to **tackle the climate emergency**

Investment is required in improved connectivity, particularly for trips to employment and education opportunities, including those at Chidswell, Silkwood Park, Calder Grove, and to Wakefield and Huddersfield centres. Schemes that will best address these connectivity challenges will be taken forward into a West Yorkshire pipeline of interventions to deliver inclusive and clean growth.

Spatial context

This chapter sets out the key spatial challenges for each of our four regional priorities in the corridor. It presents the key outputs from the "story map" for this corridor; this is a web-based Geographical Information System (GIS) data repository and analysis tool, which summarises the top issues and opportunities in the spatial context and sits behind the Case for Change. The story map was developed from a wide range of spatial datasets and the resulting narrative was shared with and shaped by feedback from key stakeholders on issues, opportunities and local priorities. These are presented alongside the major priorities for the City Region.

Please refer to Chapter 6 of the Appraisal Handbook for a summary of the datasets which form part of the evidence base for the "story map" that supports the development of the Case for Change.

2.1 Enabling Inclusive Growth

2.1.1 Deprivation

Figure 5 shows areas that are within the top two deciles of the indices of multiple deprivation. Deciles are calculated by ranking the 32,844 Lower Super Output Areas (LSOA) in England from most deprived to least deprived and dividing them into 10 equal groups. LSOAs in decile 1 fall within the 10% most deprived LSOAs nationally, whilst LSOAs in decile 10 fall within the 10% least deprived of LSOAs nationally[2].The index of multiple deprivation is an overall relative measure of deprivation constructed by combining seven domains of deprivation according to their respective weights.[2] These include:

- Income Deprivation
- Employment Deprivation
- Education, Skills and Training Deprivation
- Health Deprivation and Disability
- Crime
- Barriers to Housing and Services
- Living Environment Deprivation

Figure 5: Areas of high deprivation
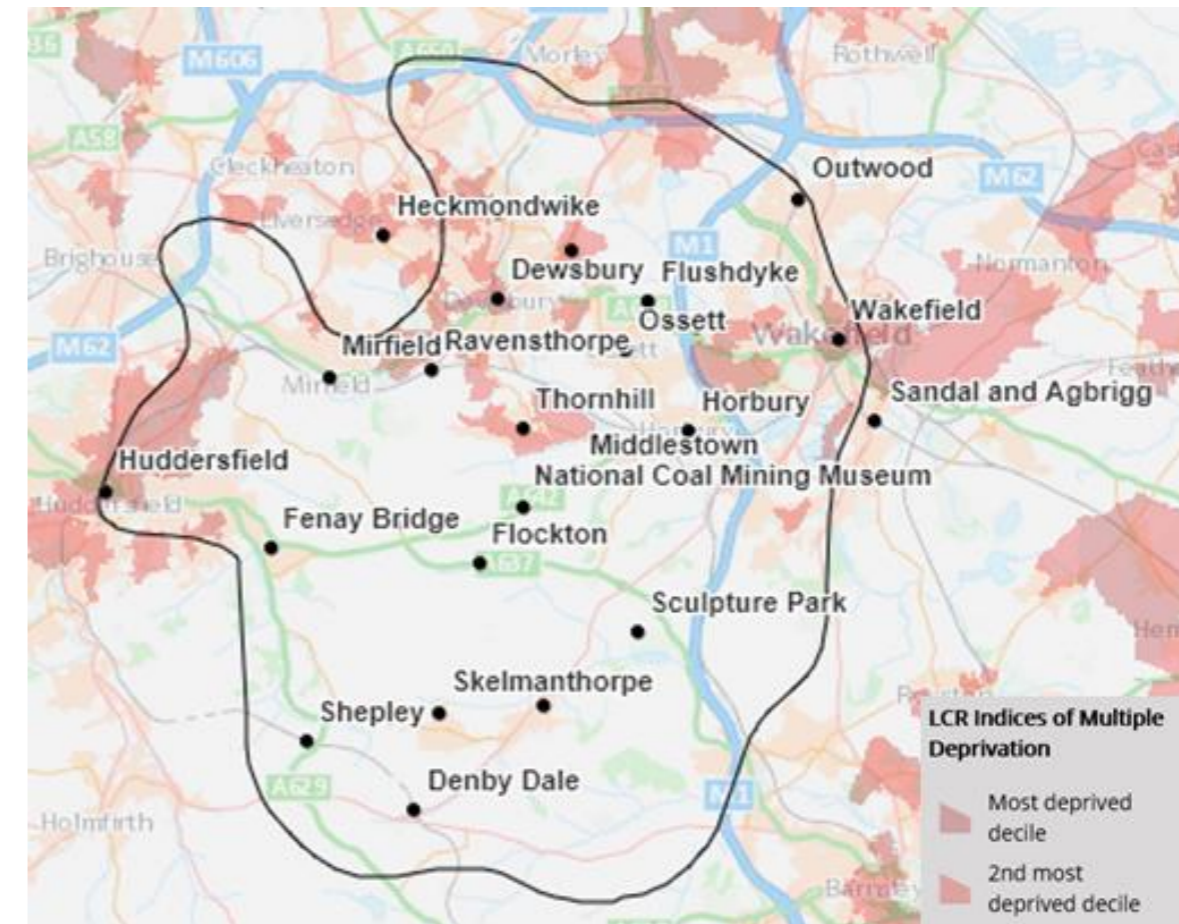
Source: Mott MacDonald

Deprivation is concentrated within the northern areas of the corridor including Huddersfield, Wakefield and Dewsbury. These are associated with poor levels of health and economic activity.

Central Dewsbury is in the top 10% most deprived in England with 39% of residents having no qualifications. Ravensthorpe is also within the top 10% most deprived in England with 45% of people having no qualifications. **People in these areas are more likely to suffer from poor connectivity and fewer opportunities to access jobs and education and many will rely on convenient and reliable transport; connecting these areas is vital to enabling inclusive growth[3].**

---

[2] English Indices of Deprivation 2015 – Department for Communities and Local Government

[3] Tackling transport-related barriers to employment in low-income neighbourhoods (2018) accessed via:
https://www.jrf.org.uk/report/tackling-transport-related-barriers-employment-low-income-neighbourhoods

2.1.2   Isolated communities

Isolated communities have high levels of deprivation (are within the top 20% most deprived in England) and can access a lower than average number of employment destinations. Residents find that job opportunities are difficult to access because of public transport journey times, reliability (perceived as well as actual) and affordability[4].

This uses the approach adopted for the Joseph Rowntree Foundation for *"Tackling transport related barriers to employment in low-income neighbourhoods"* – Census data (distance travelled to work, and the average number of destinations people can reach for journeys to work across the LCR).

There are several areas in the north of the corridor, including Batley, Dewsbury and the north east of Huddersfield, that are defined as "isolated communities" (see Figure 6).

Figure 6: Isolated communities
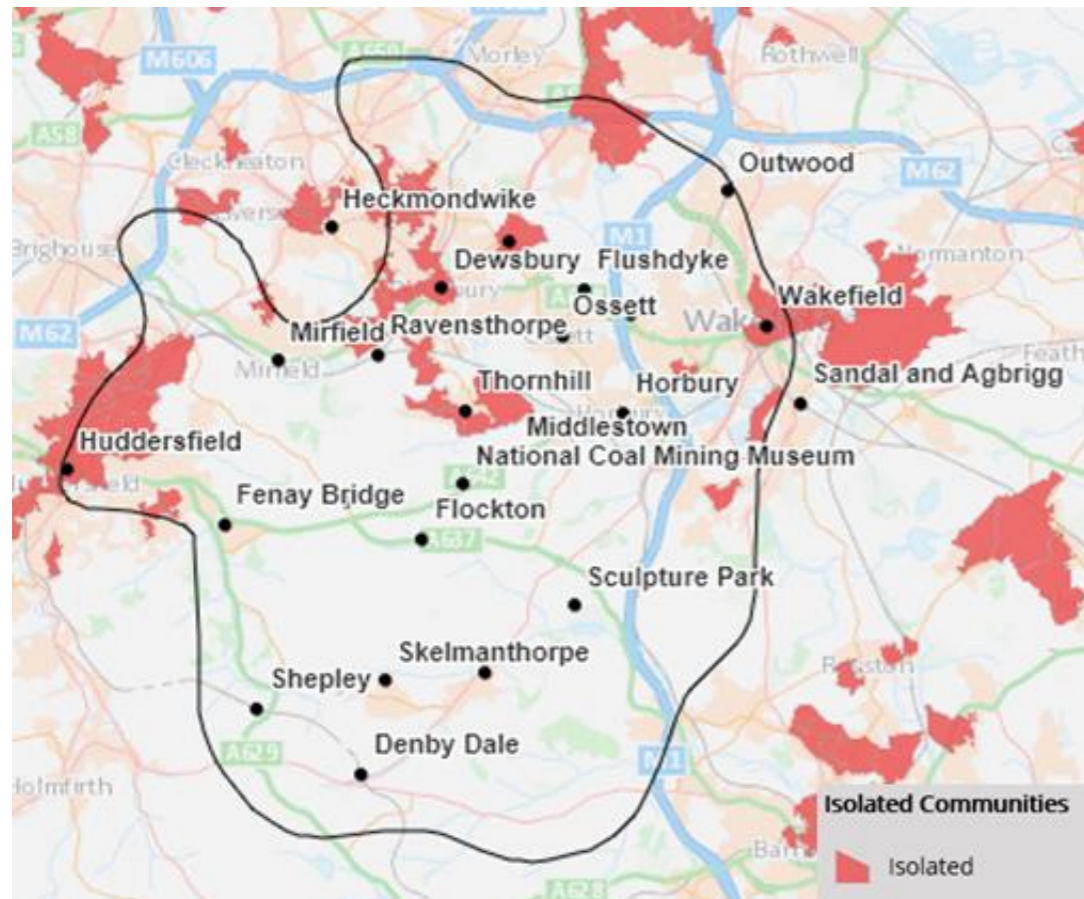
Source: Mott MacDonald

Around 75,800 people in the corridor live within an isolated community, approximately 22% of the corridor.

Improving connectivity in these areas is fundamental to enabling inclusive growth. People within these communities are unable to access many destinations for work, meaning many people have limited access to job opportunities. Many people in isolated communities also rely on affordable, convenient and reliable transport to access education and job opportunities. Ensuring that these areas are well connected by public transport to access employment and education is fundamental to achieving inclusive growth[5].

---

[4] Tackling transport-related barriers to employment in low-income neighbourhoods (2018) accessed via:
https://www.jrf.org.uk/report/tackling-transport-related-barriers-employment-low-income-neighbourhoods

[5] Tackling transport-related barriers to employment in low-income neighbourhoods (2018) accessed via:
https://www.jrf.org.uk/report/tackling-transport-related-barriers-employment-low-income-neighbourhoods

2.1.3 Car ownership

The motorway network ensures that some of these areas are reasonably well connected. However, there are several areas in Huddersfield, Wakefield and north east Kirklees including Dewsbury and Batley which are characterised by low car ownership (see Figure 7), meaning that not everyone can benefit from the connectivity opportunities this brings.

Figure 7: Car ownership
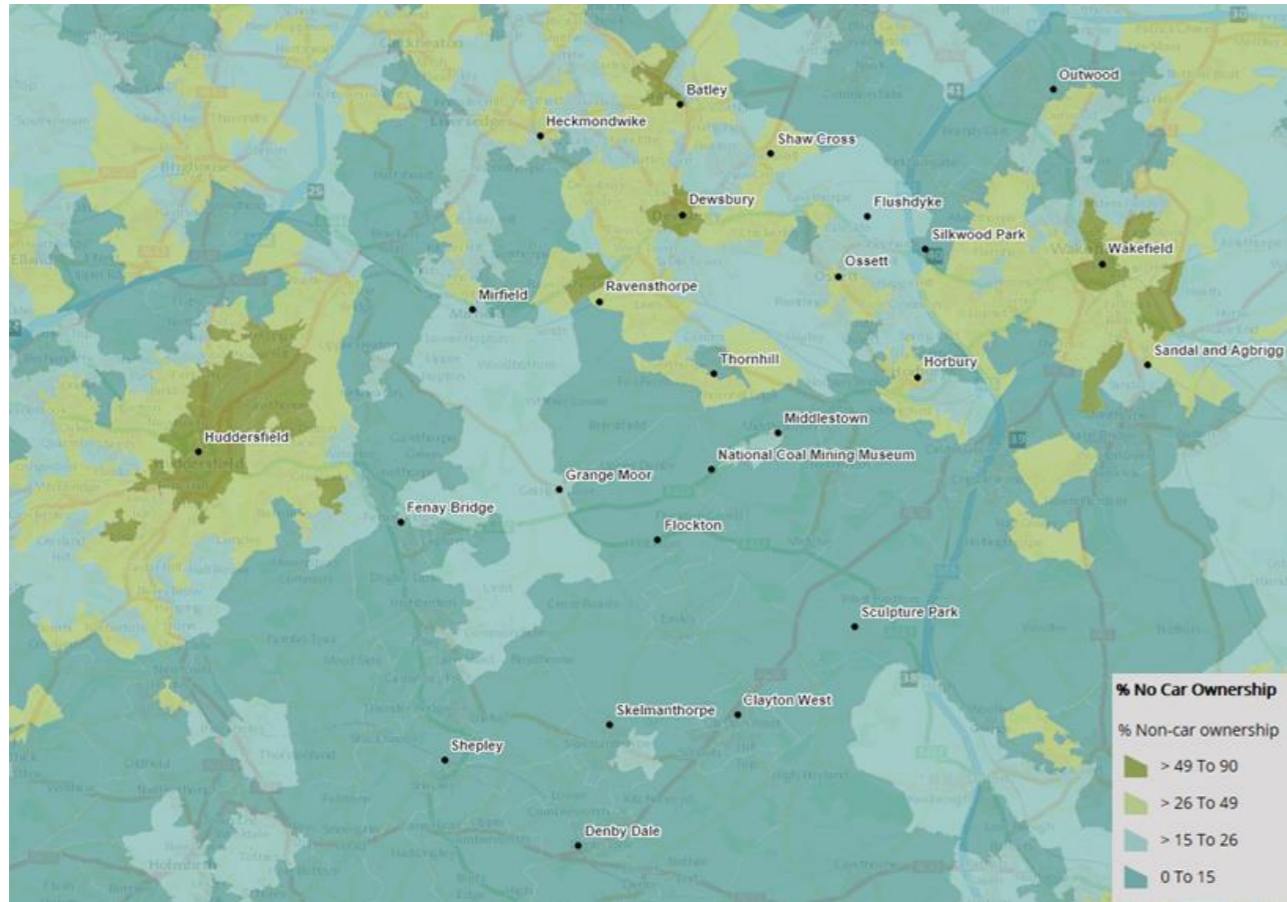

Source: Mott MacDonald

Ensuring that key employment areas are connected by good public transport links in both peak and off-peak time periods will enable people to access employment without owning a car. A high-quality integrated transport system will also encourage people to choose to travel by public transport rather than car which is key to meeting carbon reduction targets.

2.2 Boosting Productivity
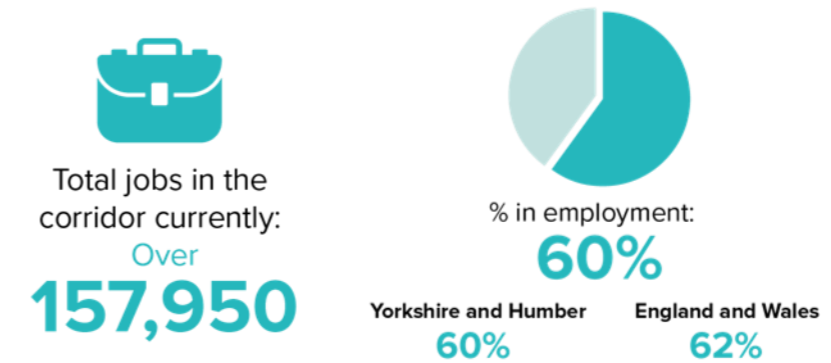
2.2.1 Employment characteristics

The emerging Industrial Strategy for West Yorkshire highlights an increase in highly skilled employment in the City Region (see Figure 8). Within this area, this includes opportunities for skilled trades in tourism and hospitality. Skills shortages impact upon commuting flows as skilled workers often commute further and travel more to access opportunities. Having an effective and reliable transport system is paramount to maximise productivity in the region.

Figure 8: Occupational contribution to cumulative employment growth
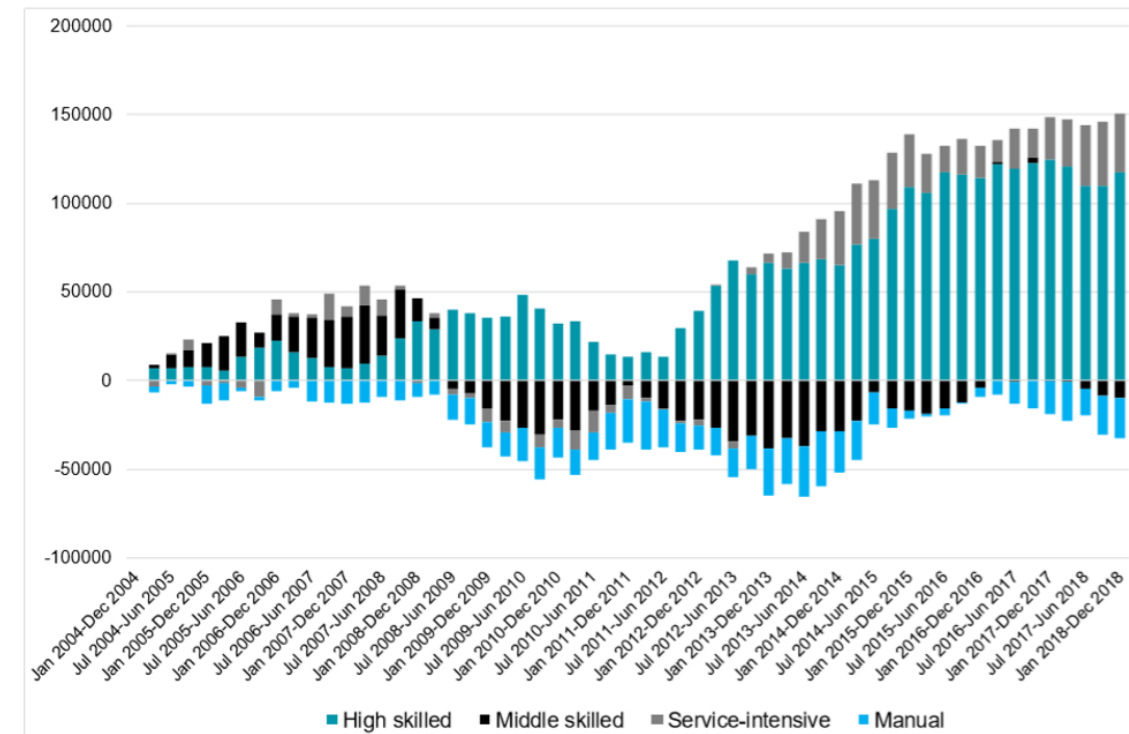
Source: Emerging West Yorkshire Industrial Strategy

The East Kirklees to Wakefield corridor has some distinct employment characteristics and strengths.

Total jobs in the corridor currently: Over **157,950**

% in employment: **60%**
Yorkshire and Humber **60%**
England and Wales **62%**

In terms of the number of employees, in the East Kirklees to Wakefield corridor the wholesale and retail trade sector is the largest employer, employing 35,178 people, which is 1.3 times the national average[6]. This sector operates shift patterns outside of the traditional timetables and schedules of current public transport routes. Both the construction and manufacturing sectors have over 1.6 times the national average, with 13,489 and 23,084 employees respectively.

The visitor economy plays a role in the south of the corridor, with the Yorkshire Sculpture Park at West Bretton attracting more than 480,000 visitors a year[7], the National Coal Mining Museum at Middlestown attracting more than 138,000 visitors per year[8] and the Kirklees Light Railway at Clayton West. The job opportunities that these sites bring favour populations with access to a car and encourage car ownership. Ensuring that these are regularly supported by public transport will help spread job opportunities further through the corridor.

Connectivity to these specialisms is fundamental to boosting productivity.

[6] Business Register and Employment Survey: open access (2017)
[7] Yorkshire Sculpture Park visitor numbers 2017/2018

[8] National Coal Mining Museum visitor numbers 2015-2016

2.2.2 Household income

Average total annual household income in the corridor (£36,169) is lower than the average for England and Wales (£41,642) and Yorkshire and Humber (£36,526) and is particularly low to the north east of Huddersfield, in Batley, Ravensthorpe and to the west of Wakefield (shown in Figure 9). The average total annual household income in Batley is £25,700 (38% below the national average). The gross value added per head (GVA) for Kirklees and Wakefield is 70% and 80% of the UK average respectively and has seen an average growth rate of 2.9% and 3.3%. This general measure of prosperity shows the need for better connections in the area to create opportunities to help enhance the economy and bring it up to national levels.

Figure 9: Total annual household income

Source: Mott MacDonald
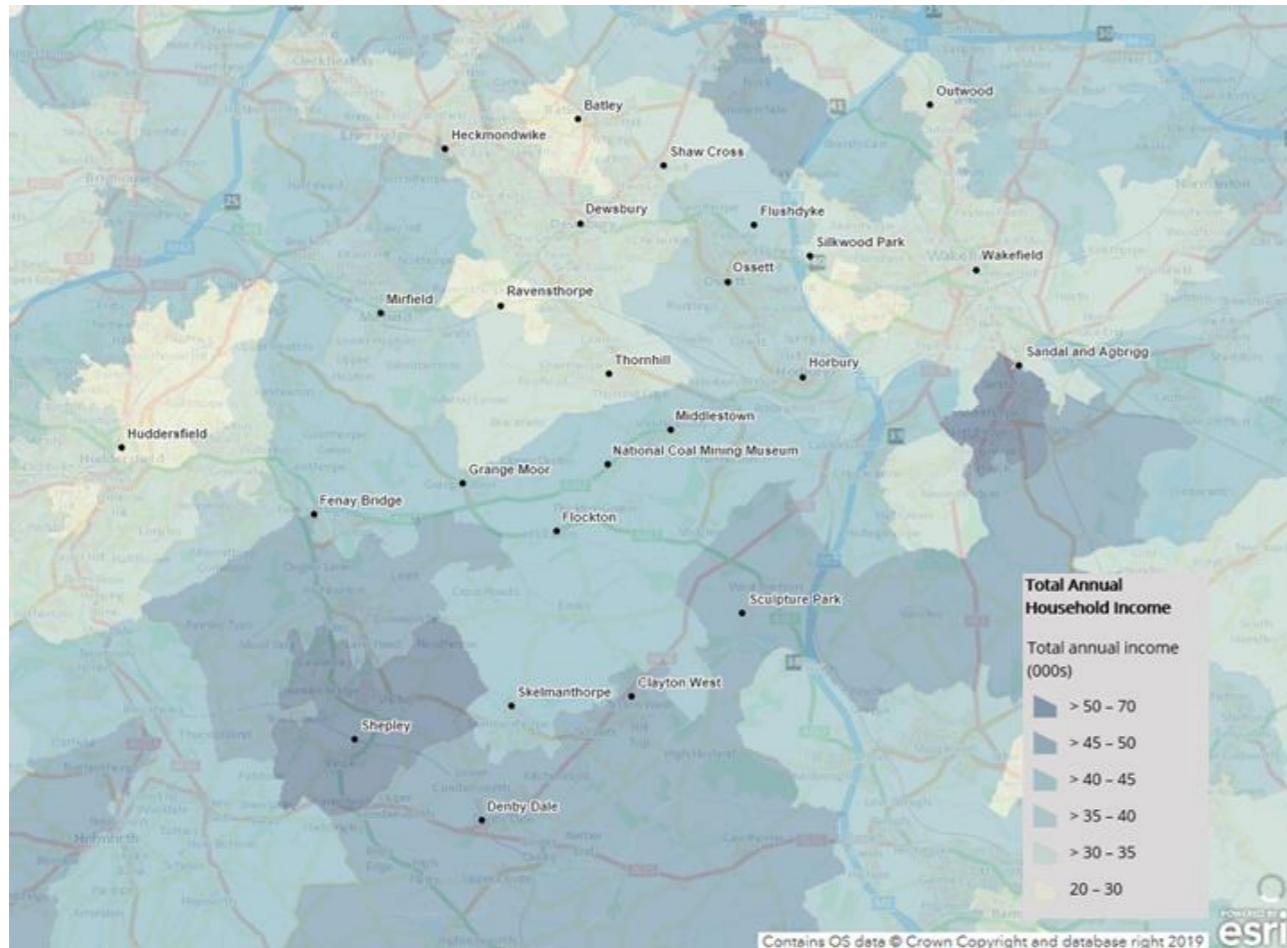
Connecting areas of deprivation and low annual household income is important to provide opportunities for people to access education and employment and in enabling inclusive growth throughout the corridor.
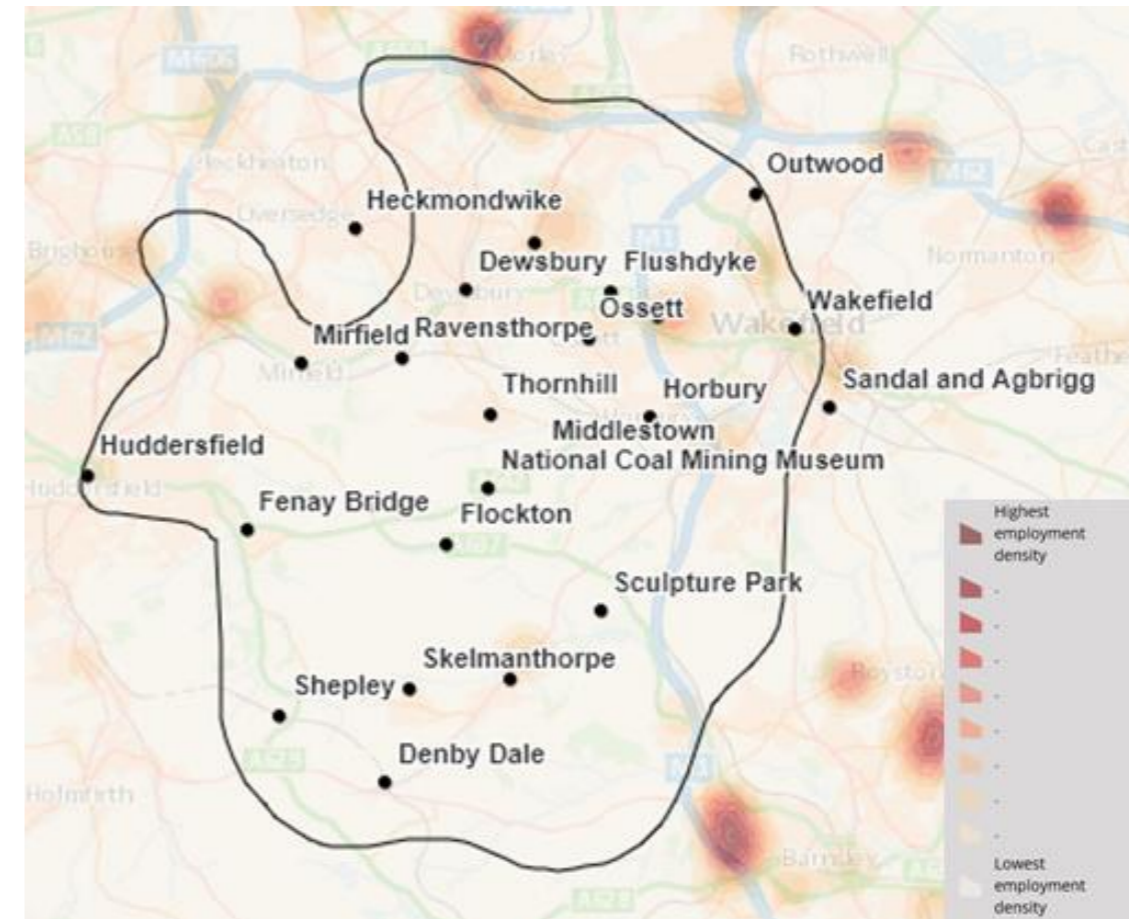
2.2.3 Growth areas

Figure 10 shows a heatmap of employment growth sites in the East Kirklees to Wakefield corridor. Key employment growth sites include Chidswell (60ha) [9], Silkwood Park (19ha) off the M1 and Calder Grove at Calder Park business park (24ha). There is also a large employment growth site (46ha) to the north west of Mirfield at Cooper Bridge, which overlaps with the West Kirklees to Calderdale corridor.

To maximise the economic benefit and potential that these bring, their connectivity requirements must be considered carefully, and in the context of the existing socio-economic issues. The emerging Industrial Strategy for West Yorkshire highlights that over the past five years business base growth in Kirklees has been slower, at around 17% compared to the national average. Wakefield has seen growth in line with UK levels around 19%. This emphasises the need for good transport options connecting Kirklees and Wakefield businesses to potential employees and custom.

Figure 10: Employment growth sites heatmap

Source: Mott MacDonald

---

[9] Figures subject to change since adoption of Kirklees Local Plan February 2020

The East Kirklees to Wakefield corridor is subject to considerable housing growth plans. Figure 11 shows there is substantial housing development proposed in the northern parts of the corridor including Chidswell (1570 dwellings), Dewsbury Riverside (2500 dwellings) and Batley (3500 dwellings).

Figure 11: Housing growth sites heatmap
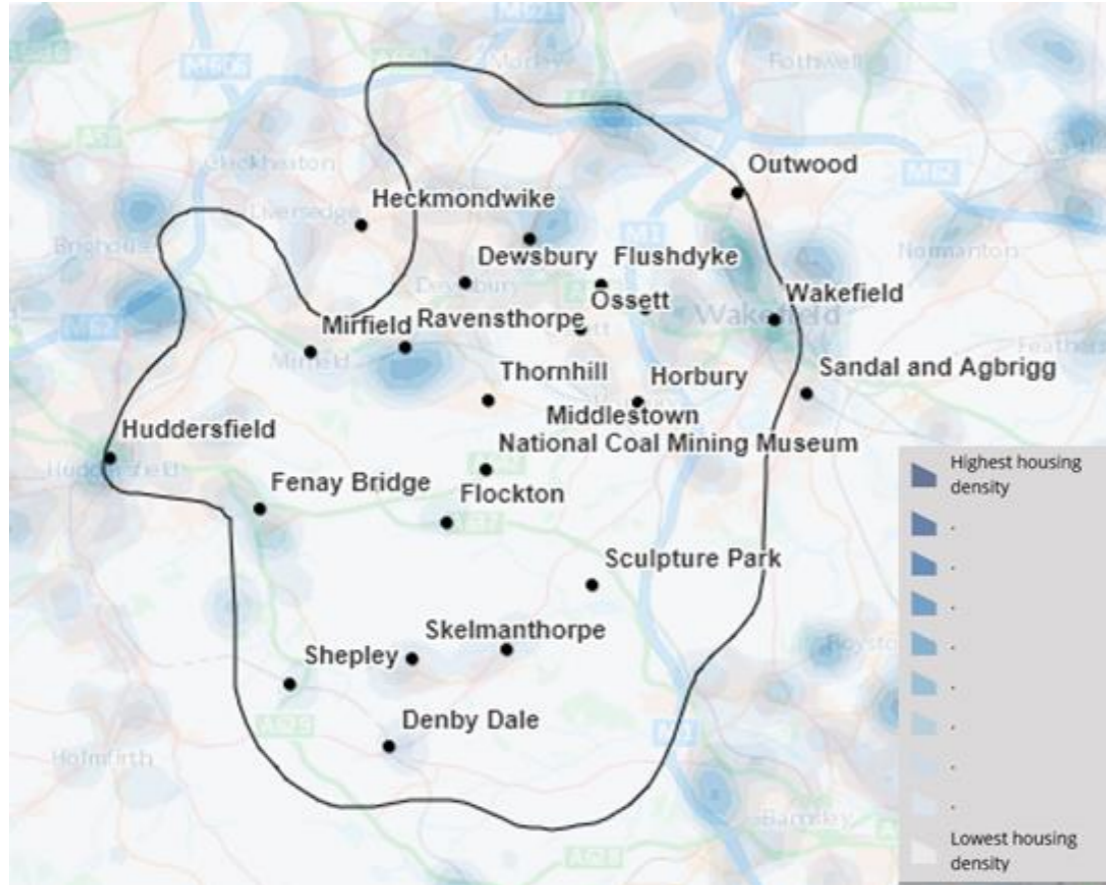
Source: Mott MacDonald

Further employment growth emphasises the need to improve public transport connectivity to these areas, both from existing communities and new housing growth sites, to enable access to employment opportunities for everyone.

2.3 Tackling the Climate Emergency

2.3.1 Carbon emissions

The West Yorkshire Transport Strategy recognises that our transport network currently constrains opportunities for growth and is a key factor in shaping experiences of poverty, but also that our networks do not sufficiently support sustainable travel as the obvious choice for many.

This is reflected in the evidence that the transport sector is the largest emitter of damaging carbon dioxide in the region, with transport contributing 4.9 MtCO$_2$e/year (millions of tonnes of carbon emissions per year). Transport sector emissions are dominated by emissions from road transport with 4.4 MtCO$_2$e/year being from road transport[10], representing roughly 40% of total CO$_2$ emissions in West Yorkshire (11.1 MtCO$_2$e/year)[11]. Road transport emissions are dominated by emissions from private cars, vans and lorries - with conventional petrol and diesel internal combustion engines the dominant technology across all vehicle types.

In June 2019 the Combined Authority, in line with all the West Yorkshire partner councils and most Leeds City Region local authorities, formally declared a Climate Emergency. This declaration signals the Combined Authority and partner councils' ambition for the region to become net zero-carbon by 2038, with significant progress being made by 2030. The 2038 target was determined following work by the Tyndall Centre for Climate Change Research, which was commissioned to create a science-based carbon budget for the Leeds City Region that is consistent with the objectives of the UN Paris Agreement on Climate Change (Paris Agreement) and the Intergovernmental Panel on Climate Change (IPCC)[12].

The Combined Authority published, in July 2020, the findings of a Carbon Emissions Reduction Pathways (CERP) study[13]. This report, produced for the Leeds City Region and York and North Yorkshire local enterprise partnerships, is the first step in identifying the actions needed to create a net zero carbon economy.

While three pathways have been identified through the CERP work, there are several common actions identified in all the pathways, including a series of measures on transport. These modelled pathways all recognise the need for further modal shift to achieve the scale of reduction in carbon emissions from transport required to meet the ambitious net zero target and timeline.

Transport is therefore a critical sector for carbon emissions reduction across West Yorkshire requiring ambitious action that goes beyond current national policy and targets. The CERP asserts that this will require a significant shift in behaviour change and the fast adoption of low carbon technology.

At the time of publication, no further specific evidence on carbon emissions was available (pending release of West Yorkshire Combined Authority Emissions Reduction Pathway study and other work on carbon emissions), however **these influences, once understood, will be critical in understanding and prioritising connectivity requirements in future**.

2.3.2 Air quality

Partners across West Yorkshire, including the Combined Authority, the five district councils, and Public Health England, have developed the West Yorkshire Low Emissions Strategy (2016). The focus of the strategy is "tackling transport emissions as pollution from transport causes most local air quality problems".

The strategy highlights that health effects associated with exposure to air pollution are significant; more deaths are caused by air pollution than preventable liver or respiratory disease. In West Yorkshire in 2013, 5.1% of all deaths (1 in 20 deaths) were caused by exposure to particulate air pollution with up to 6% in some local authority areas. Traffic in our urban centres and on busy roads results in levels of air pollution which have a significant impact on the health of the population, with those having underlying health conditions being most at risk. There are two pollutants of greatest concern: nitrogen dioxide (NO$_2$) and particulate matter (PM$_n$) which have an adverse impact on health and mainly result from emissions from traffic, particularly exhaust emissions from older diesel vehicles.

Nitrogen dioxide and particulate matter, together with other air pollutants, have been set an upper air quality limit value that the general population should not be exposed to that is legally binding in UK law. Since 1997 each local authority has been carrying out review and assessment of air quality in its area, and where it is found likely that national air quality objectives will not be achieved, an air quality management area must be declared[14].

There is a large air quality management area that runs through the north east of the corridor, including most of the urban area of the City of Wakefield and another that includes the urban area of Huddersfield, as shown in Figure 12. **Facilitating sustainable modes of transport will reduce car use, enabling a consequent reduction in traffic congestion and the associated emissions that cause air pollution and poor air quality.**

Figure 12: Air Quality Management Areas
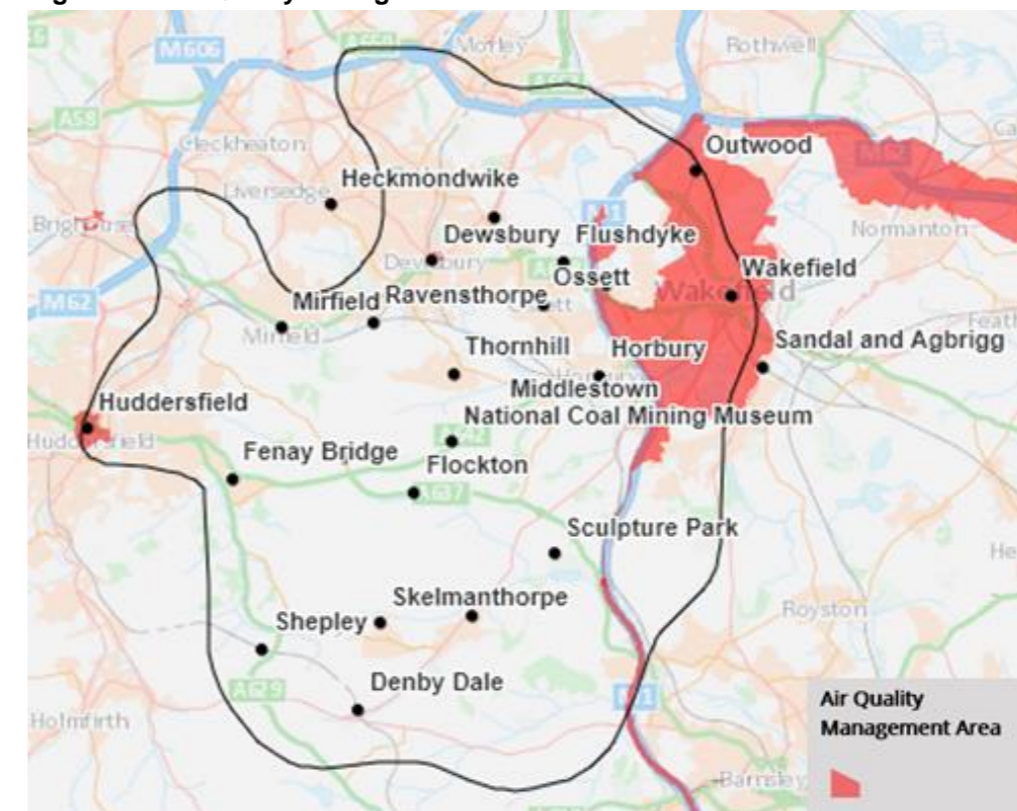
Source: Mott MacDonald

---

[10] West Yorkshire Combined Authority, 2020. West Yorkshire Carbon Emission Reduc ion Pathways Key Findings Report. Available at:
https://westyorkshire.moderngov.co.uk/documents/s16572/Item%2011%20-%20Appendix%201.pdf
[11] ibid

[12] ibid
[13] ibid
[14] Department for Environment Food & Rural Affairs at https://uk-air.defra.gov.uk/aqma/ accessed in October 2020

2.4 Delivering 21st century transport

2.4.1 Active modes

The ability for people to frequently and safely cycle and walk has been identified in policy as having a significant role to play in the strategic transport network in West Yorkshire.

Within this corridor, the current provision of cycle and walking routes is enhanced by the National Cycle Network (NCN), which provides an off-highway route from east to west. Sustrans, the national cycling and walking charity which manages the NCN, is currently reviewing the network as part of its 'Better Paths for Everyone' programme. Provision through Mirfield, to link to the Calder Valley Greenway has been highlighted as poor and requiring intervention in 'Better Paths for Everyone'.

The Calder Valley Greenway towards Huddersfield and Brighouse provides a relatively good off-highway route, and links to the Bradley to Birkby greenway.

Figure 13 identifies there are significant gaps in the network, particularly around Cooper Bridge. Links into Huddersfield town centre are not of a high standard. The creation of a Bradley to Brighouse Greenway is under development through the CityConnect programme, and the A62 into Huddersfield, which has some cycle lanes, is the subject of a West Yorkshire Transport Fund project to deliver a smart corridor, which will see some segregated provision, although junctions and vehicle capacity along the route remain a barrier.

From Huddersfield towards Wakefield there is little or no provision on or off-highway, and whilst there is a more challenging topography, high quality provision can provide people with the space and safe routes to overcome these challenges.

The route from Fenay Bridge into Huddersfield is the focus of the Kirklees Local Cycling and Walking Infrastructure Plan (LCWIP) and has been highlighted as a corridor to provide connectivity for cycling.

For people wishing to travel by foot and to access the public transport network, the road network creates a significant barrier in this corridor, with an absence of provision for crossing points, particularly around the ring roads in Huddersfield and Dewsbury, which create severance for communities to make local journeys by foot.

There is reduced safety for people making journeys by bike and on foot in more rural areas, such as Penistone Road between Kirkburton and Denby Dale.

Investment in better infrastructure, particularly the provision of crossing points, will improve connectivity to current and future employment and education opportunities within the corridor. Facilitating active travel modes will reduce car use which will help to achieve the City Region's carbon emission targets.

Figure 13: Cycle network

2.4.2   Bus

Figure 14 shows levels of bus service during the off-peak period in the corridor. This uses information about service frequencies across all routes at individual bus stops and calculates an average level of service across census output areas. This helps to characterise areas by their level of accessibility alongside comparable socio-economic characteristics outlined in earlier sections.

For the purposes of this study, bus service data was not collected for the South Yorkshire area. However, this could be revisited in a more area-specific study. Almost all areas are served by one bus per hour or less, as shown in orange and red. These include Flockton and Denby Dale, both of which are housing growth sites. This leaves people without access to a car limited opportunities to travel, often to a restricted number of locations. The National Coal Mining Museum is served by only one bus service per hour during off-peak times, which limits accessibility for tourism.

Excluding people outside of West Yorkshire, around 58,600 people in the corridor (17%) have no access to a bus service outside of peak periods, and 244,800 people (71%) have access to just one bus per hour or less.

Partners commented that bus travel in the Dewsbury area is 'entrenched' with poor bus-rail integration. Improving this would help deprived areas access more employment opportunities.

Figure 14: Bus level of service – off-peak
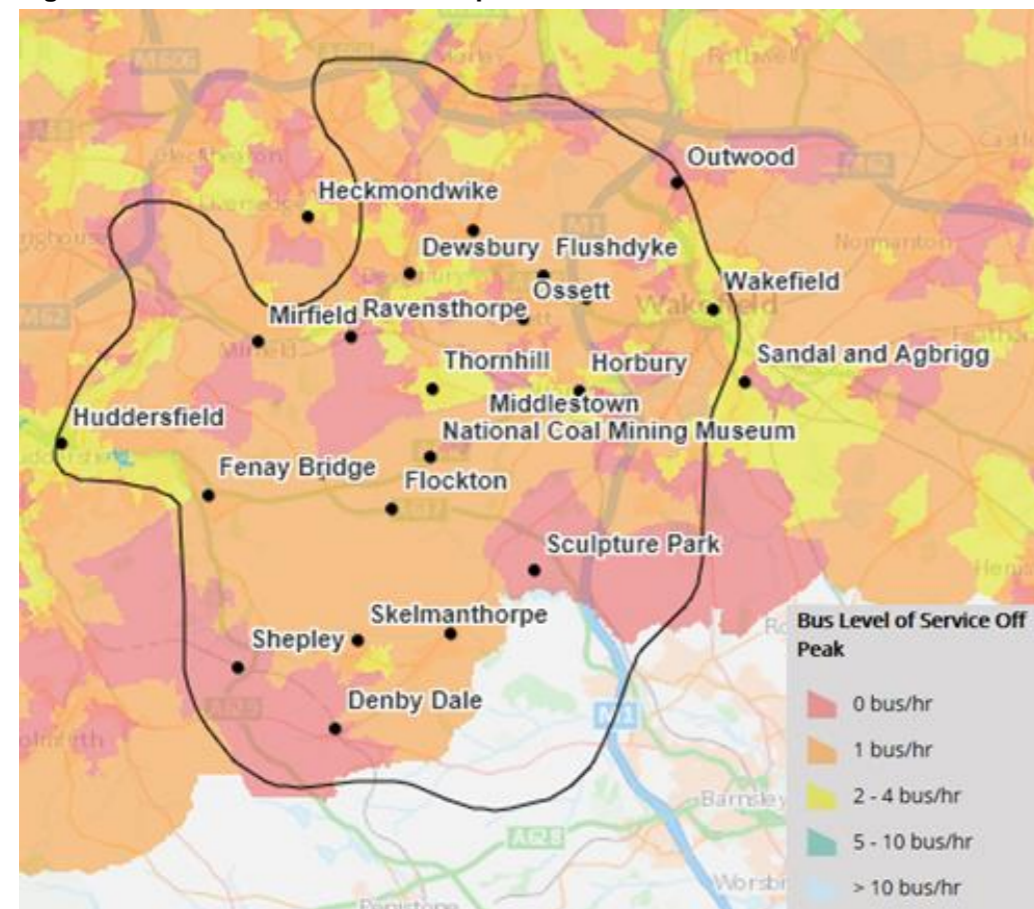
Source: Mott MacDonald

2.4.3   Rail

The current passenger rail network (see Figure 15) consists of:

- The Huddersfield (Diggle) trans-Pennine main line: Leeds via Dewsbury to Huddersfield and Manchester
- A connection from Dewsbury and from Huddersfield to Brighouse and Elland, and on to Halifax or the upper Calder Valley line, with current services operating from Leeds via Dewsbury and Brighouse to the Upper Calder, plus from Huddersfield via Brighouse to Halifax and Bradford
- Limited services linking Bradford and Halifax via Mirfield to Wakefield and on to London; also a local Huddersfield – Wakefield Kirkgate – Castleford service
- The Penistone line, linking Huddersfield via Denby Dale, Penistone and Barnsley to Meadowhall and Sheffield
- In addition, sections of the Hallam line (Leeds – Wakefield Kirkgate – Darton – Barnsley – Sheffield) and Wakefield West Riding line (Leeds – Wakefield Westgate – Doncaster / Sheffield) operate on the peripheries of the corridor

Service levels are variable, with some stations on the main Diggle line receiving up to 6 trains per hour (for example, Huddersfield to Leeds), but several stations (such as Brighouse, Darton, Deighton and Ravensthorpe) see only hourly services. In general, fast services operate at high frequencies (with links through to the wider intercity network), with local services being less satisfactory. On Sundays the difference between intercity and local service levels is particularly marked, with no trains at all on the Leeds – Dewsbury – Brighouse – Calder Valley – Manchester route or between Huddersfield and Wakefield / Castleford.

The main freight flows in the study area at present operate to/from Manchester via the Calder Valley and Wakefield. Partners have highlighted that a lack of network capacity for additional freight across the Pennines is preventing more freight from operating by rail, which could otherwise reduce hauliers' reliance on the M62 motorway.

Certain gaps in the network have been highlighted by partners, including the Spen Valley (Bradford towards Dewsbury and Wakefield via Low Moor, Cleckheaton, Liversedge and Heckmondwike); and the former "Crigglestone curve" which allowed trains from the direction of Huddersfield, Halifax and Bradford to travel directly towards Barnsley and Sheffield. In addition, partners have flagged the possibility of new stations on the existing network, such as at Bradley, Thornhill, and Horbury/Ossett.

Other challenges for rail services in the study area at present include severe overcrowding of trains on many routes[15]; poor journey times on the Penistone line; poor performance (reliability and punctuality) [16]; severe network capacity constraints; ageing and unattractive trains on local services; a total reliance on diesel traction in the absence of electrification; variable station facilities and accessibility[17]; in some cases poor access between stations and the communities they serve; and limited integration both between rail services and with buses[18]. There is strong support amongst partners for the proposed upgrade of the Trans-Pennine route, with a view that this must include full electrification, journey-time improvements, line capacity improvements, longer trains and provision for regular freight trains.

While this report makes recommendations that are directly or indirectly relevant to rail, most rail content will be picked up separately in WYCA's Rail Strategy work. That Rail Strategy sits alongside these Case for Change reports, informed by them and informing them, and this report should be read in conjunction with the WYCA Rail Strategy.

Figure 15: Current Rail Network
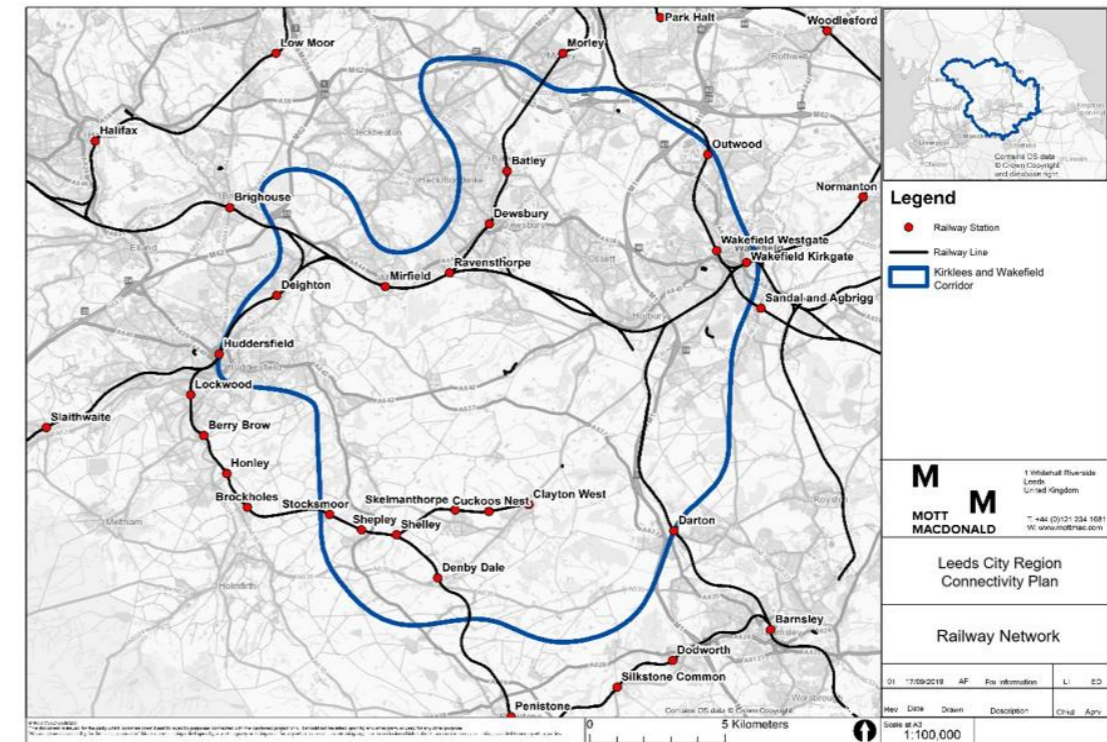
Source: Mott MacDonald

---

[15] WYCA passenger counts and surveys

[16] Office of Rail and Road Passenger Rail Performance

[17] National Rail Passenger Service ratings, partner (plus stakeholder, user and political) feedback.

[18] National Rail Passenger Service ratings, partner (plus stakeholder, user and poli ical) feedback.

2.4.4   Road

Figure 16 presents the road and bus networks throughout the corridor. The M1 provides north to south connectivity, to the eastern edge of the corridor. Similarly, the M62 provides east-west connectivity to the very northern parts of the corridor. The A629, A635, A636 and A642 provide connectivity in the central/southern sections of the corridor.

Figure 16: Current bus and highway network (A roads and motorway network)
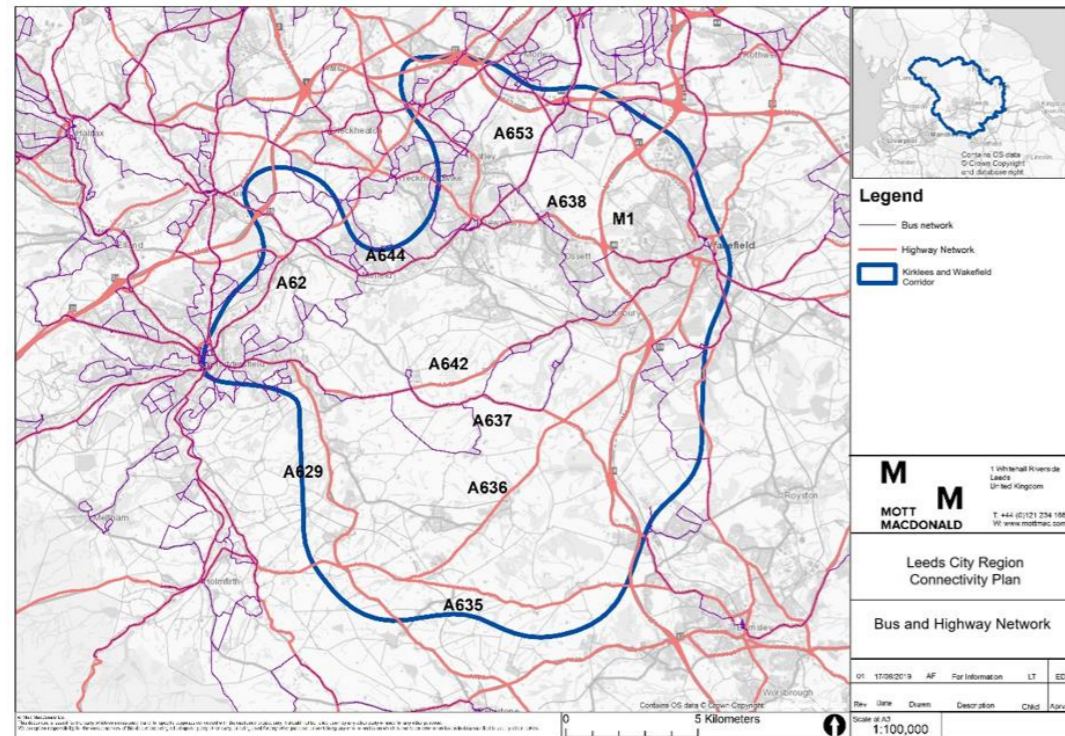
Source: Mott MacDonald

Figure 17 shows the speed difference (kph) on the highway network between the peak and off-peak.

Capacity constraints on the motorway network and junctions limit access to employment opportunities. There is a large peak-time reduction in speed along the M1 (junction 40 to junction 41) and M62 (junction 27 to junction 29) as well as reductions on the A636, A638 and A644. All main roads into Huddersfield experience peak-time reductions in speed, slowing connections in and out of Huddersfield and impacting on the AQMA.

Introducing more opportunities to travel to these areas via public transport will help to reduce capacity constraints on the road network, reduce air pollution and enable inclusive growth.

Figure 17: Highway network peak vs off-peak speed difference
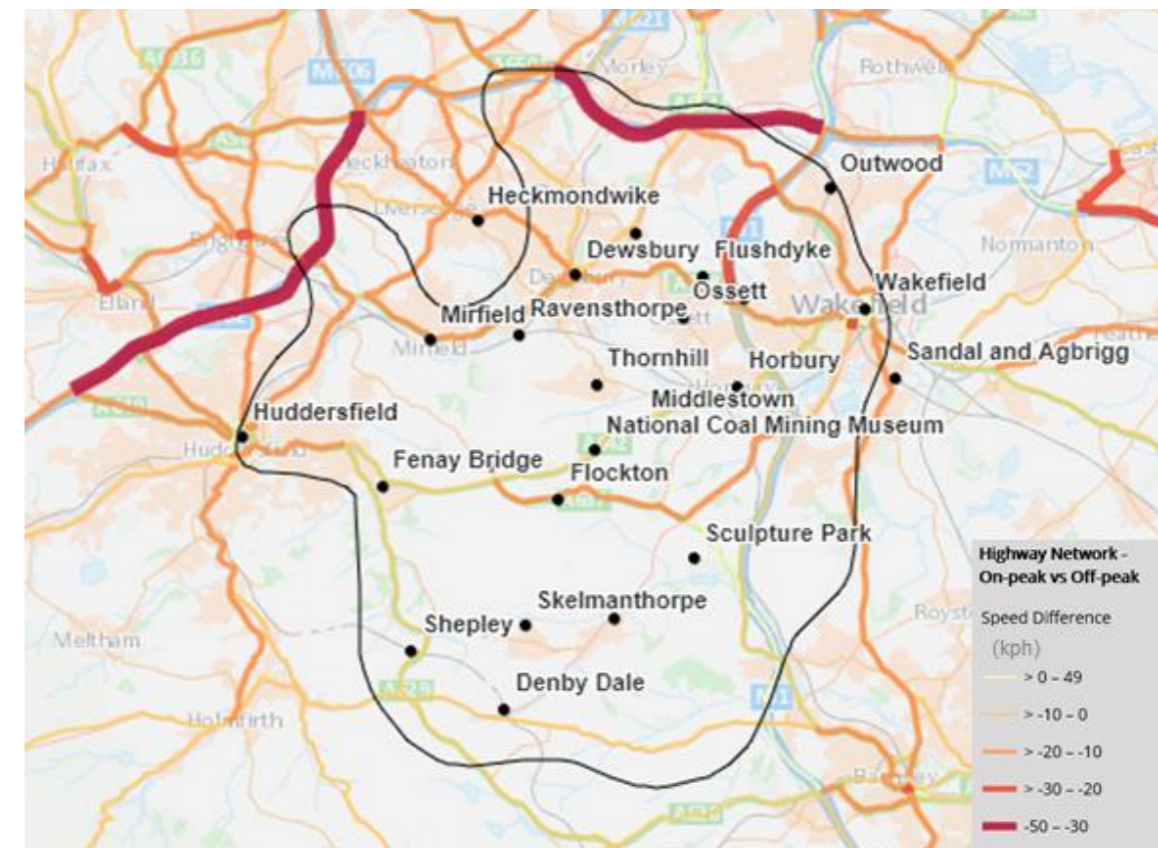
Source: Trafficmaster

2.4.5 Patterns in transport demand

Figure 18 shows that key economic movements in the area (in the form of journey to work desire lines – person daily trips to work, Census 2011) are towards Dewsbury, Huddersfield and Wakefield. The concentration of desire lines shows the importance of local connectivity to urban centres.
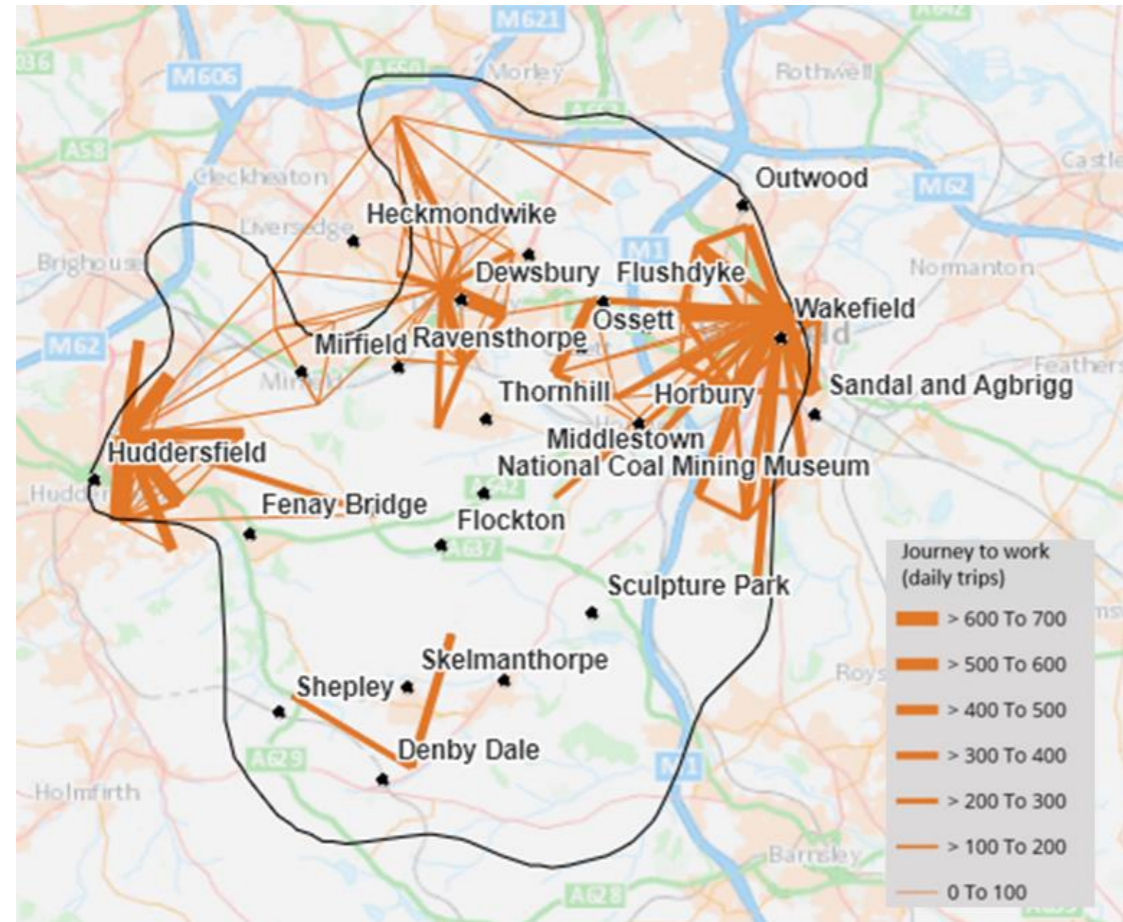
Figure 18: Journey to work desire lines

Source: Mott MacDonald

Figure 19 and Figure 20 show where new housing and employment sites are located and the current travel to work patterns. The travel to work patterns show that travel horizons in the corridor are low with few people commuting between Huddersfield and Wakefield.

The emerging Industrial Strategy for West Yorkshire notes that Kirklees (20.4%) has a younger population aged 0-15 than is seen nationally (19.1%). Areas in Dewsbury, Huddersfield and Wakefield are defined as "isolated communities". People within these communities have limited access to destinations for work and are reliant on public transport to access job opportunities. This means there is likely to be a future reliance on public transport in the corridor highlighting the need for good public transport options to ensure inclusive growth for all.

Housing growth is focused on areas which have poor bus service provision (see section 2.4.2) and low car ownership such as Batley (3500 dwellings). These sites are likely to have the most significant effect on travel patterns; it is crucial to connect these places with a range of travel choices to ensure inclusive growth

Figure 19: Future housing growth and current travel to work desire lines
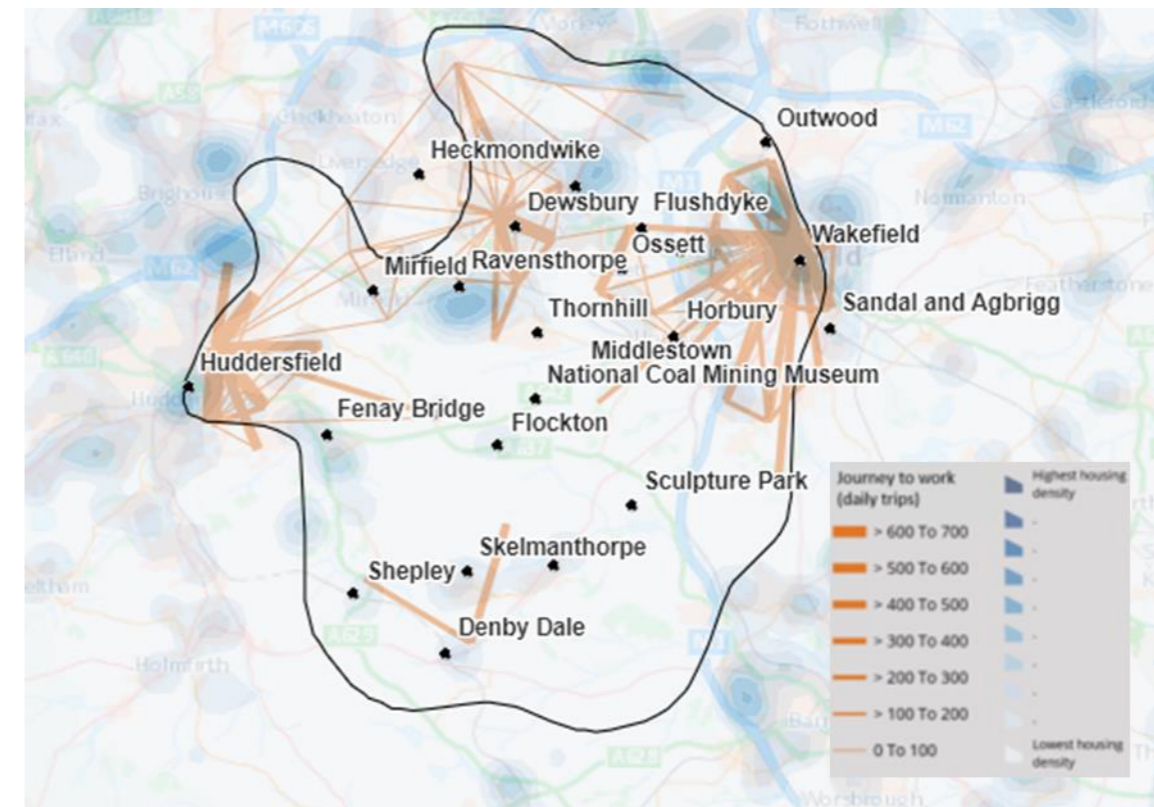
Source: Mott MacDonald

Figure 20: Future employment growth and current travel to work desire lines
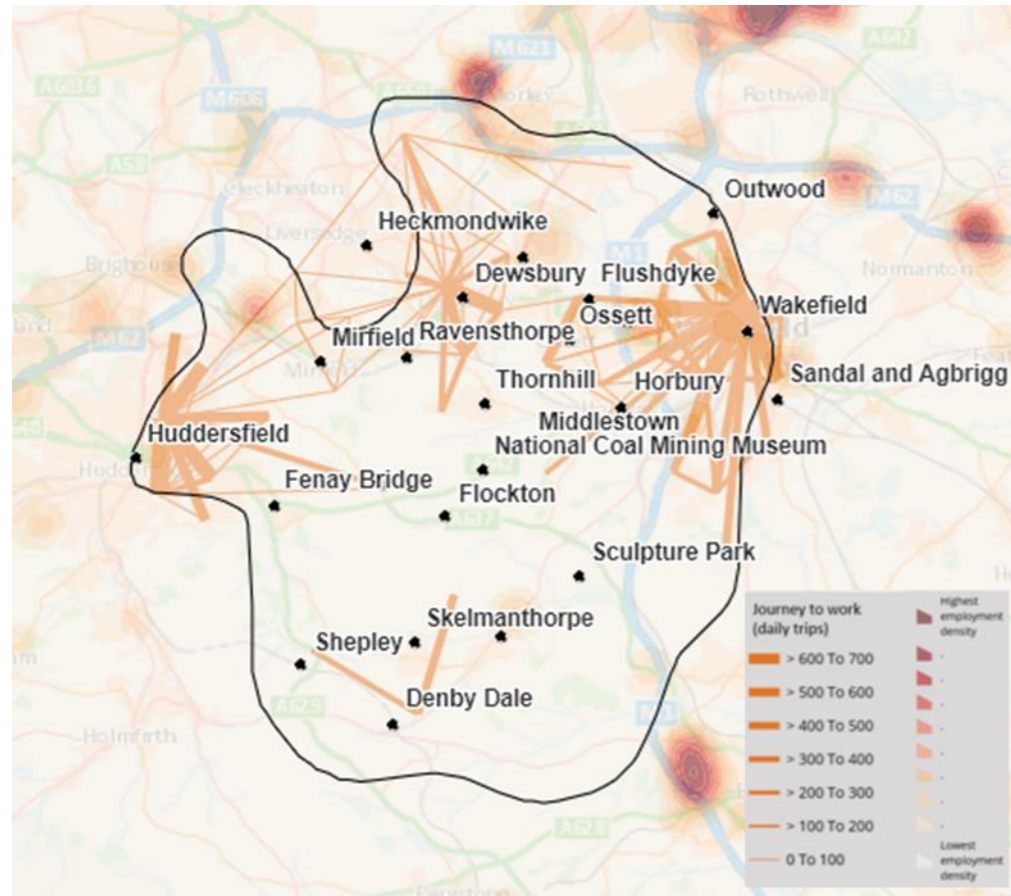
Source: Mott MacDonald

As well as housing growth, employment growth is being promoted in the area; key employment sites include Calder Grove (24ha), Chidswell (60ha) and Silkwood Park (19ha). Outside of the study area, several large employment prospects are proposed in Barnsley and the Dearne Valley which could draw from the Kirklees labour market.

These graphics indicate that there is value in improving connectivity in this area, in order to broaden these limited travel horizons and ensure its current and future residents and employees benefit from the growth opportunities that will become available. They also illustrate the potential for travel patterns to change, and where demand is likely to increase, and where investment needs to be made in order to connect people to these new growth sites. This is explained in further detail in Chapter 4.

2.5   Summary

To enable **inclusive growth**, improved connectivity is needed to provide better access to work for people in communities within the corridor, including in Batley, Dewsbury and Ravensthorpe. These communities are characterised by low employment and skills prospects, low household income (13-38% below national average) and low car ownership, with several areas being within the 10% of most deprived communities in the UK.

Employment prospects in the area are focused on the wholesale and retail trade and manufacturing sectors. The visitor economy also plays an important role. Many of these prospects rely heavily on car access, and yet, there are several communities that lie within the corridor including Dewsbury, Huddersfield and Wakefield which are characterised by low car ownership (more than 50% of households do not own a car).

There is therefore a disconnect between jobs located in places that have poor access for people without a car and communities with low car ownership. To improve the prospects of these communities, and to **boost productivity**, employment opportunities must be better connected to communities of the greatest economic need.

There is also a skills gap. 39% of residents in central Dewsbury and 45% in Ravensthorpe have no qualifications. Improving connectivity to education opportunities will help close this skills gap and help people to find better employment, contributing to opportunities for everyone in the area. Improving productivity through better connectivity to employment and skills will also help improve broader economic indicators.

Several areas suffer from poor air quality particularly adjacent to the M1 and in the urban areas of Wakefield and Huddersfield. To help **tackle the climate emergency** and achieve carbon emission targets, congestion and traffic levels on the M1 and on the strategic links into these centres must be addressed. Options for travel that have lower carbon emissions must be improved, both through cleaner public transport options and an expanded active travel network.

The Connectivity Plan for this area will focus upon **delivering 21st century transport** that connects the places of greatest economic need to employment and skills opportunities through greener modes of transport. Ensuring cleaner, greener modes are used will contribute to achieving a zero-carbon economy in the City Region.

The focus should be on:

- Strategic trips connecting employment and education opportunities to the rest of the corridor
- Strategic trips from key transport and employment hubs towards opportunities in Leeds
- Local trips connecting surrounding areas to the opportunities in Huddersfield and Wakefield

Four summary maps have been created to summarise the spatial context highlights for each of the regional priorities. These are show in **Appendix A**.

Corridor aspirations

This section outlines the processes through which the corridor aspirations have been defined, and how they link to the evidence base and local policy.

Please refer to Chapters 4 and 8 of the Appraisal Handbook for details of how the West Yorkshire Connectivity Plan core objectives have been derived from key policy drivers and how they and corridor-specific aspirations are used in the development of the Case for Change.

3.1 Defining objectives

The core objectives have been derived from strategic visions and ambitions from policy and have been agreed with the West Yorkshire Combined Authority. They ensure that the West Yorkshire Connectivity Plan supports the delivery of the long-term vision for the Leeds City Region – as identified in the LCR HS2 Growth Strategy – as well as the priorities and ambitions outlined in the Strategic Economic Plan (SEP), the LCR HS2 Connectivity Strategy, and the West Yorkshire Transport Strategy 2040. These objectives are applicable to all inclusive growth corridors.

Corridor-specific aspirations have been developed from the key issues, opportunities and priorities identified in the workshop with local officer representatives. These objectives ensure that the interventions developed align with the priorities of West Yorkshire and its districts. Each intervention is assessed against both the core objectives and corridor-specific aspirations to ensure the best possible fit.

3.2 Core objectives

The West Yorkshire Connectivity Plan core objectives are aligned to the City Region's core priorities, as illustrated below:

The West Yorkshire Connectivity Plan Core Objectives are to:

- Connect people in areas of socio-economic need with economic opportunities
- Enable access from new developments to economic opportunities and labour markets
- Deliver access to further education and healthcare opportunities within the corridor
- Deliver access to excluded communities
- Increase the number of destinations people in deprived communities can reach
- Offer potential to address areas of congestion
- Address discrepancies in public transport frequency
- Reduce transport emissions in line with target to become net zero-carbon by 2038, with significant progress being made by 2030
- Address local AQMA constraints
- Improve physical and mental public health

Figure 21: Alignment of the West Yorkshire Connectivity Plan core objectives to The City Region's core priorities
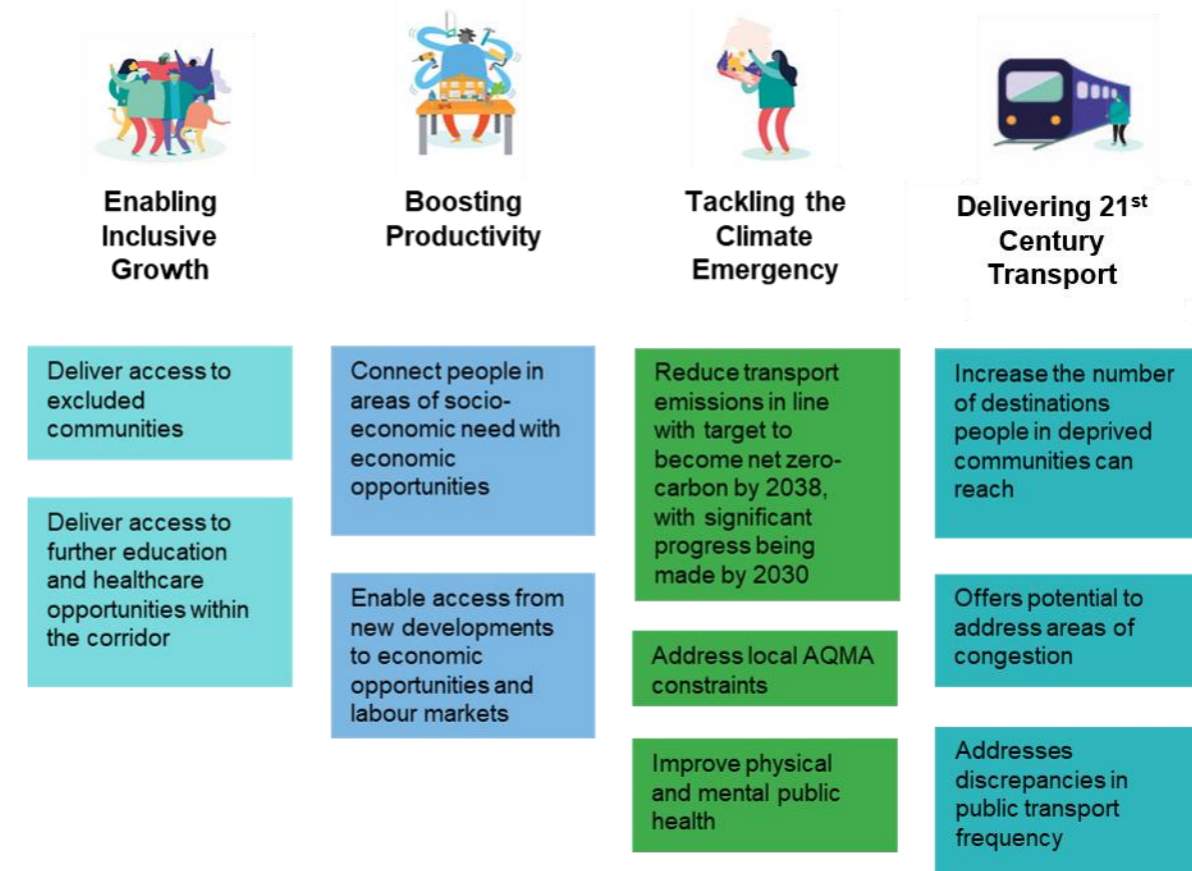
3.3 Corridor-specific aspirations

Drawing on the key issues and opportunities identified from the evidence base, corridor-specific aspirations have been agreed for East Kirklees to Wakefield, in consultation with stakeholders from Wakefield and Kirklees districts.

The East Kirklees to Wakefield Aspirations are to:

- Improve perception of access and increase travel horizons
- Improve access to both current and future employment sites
- Improve access to education sites
- Enable better access to interchanges
- Improve public transport connectivity
- Address first/last mile connectivity

These all align to current local policy encapsulated in plans such as the Wakefield District Transport Strategy (2011-2025) and the Kirklees Local Plan (2019).

3.4 Measuring objectives

3.4.1 The appraisal process

The core objectives and corridor-specific aspirations provide the foundation of the West Yorkshire Connectivity Plan options appraisal process, alongside spatial analysis. Interventions are assessed against a set of criteria aligned with the objectives, and the spatial evidence base in a Geographical Information System (GIS) – such as whether the intervention connects to areas of deprivation and employment, housing and education sites. A description of the data that underpins this is detailed in Chapter 7 of the Appraisal Handbook.

The outputs are then fed into the Mott MacDonald's Investment Sifting & Evaluation Tool or "INSET" – this is a WebTAG-compliant decision support process, based on multi-criteria analysis. It enables interventions to be assessed and "sifted" against specially defined and flexible parameters which determine how well the interventions meet the objectives and corridor-specific aspirations.

INSET is like the Department for Transport (DfT) Early Assessment and Sifting Tool (EAST) but has been built to surpass its capabilities – such as the ability to assess interventions across a full range of themes, including economic, social and environmental indicators, depending on local circumstances, and to reflect on multiple future scenarios.

The appraisal is classified into four assessment themes, all linked to the core policy priorities. These are used to classify the core objectives and have specific scoring criteria – as shown in Table 3. The assessment themes also enable policy makers and scheme promoters to sift interventions that will meet specific policy drivers (e.g. economic growth, social, transport, environmental) enabling them to quickly respond to different funding opportunities as they come forward. Interventions can be assessed individually relative to other Business Case factors such as deliverability.

Table 3: Key themes for multi-criteria assessment

Core objective	Assessment theme	Scoring notes
● Deliver access to further education and healthcare opportunities within the corridor ● Deliver access to excluded communities	**Enabling Inclusive Growth**	Based on the number of Equality, Diversity and Inclusion hotspots the intervention connects to as well as health and education sites. This theme helps to address the need to connect people including those in excluded communities to education and health facilities which links to the key objectives in the HS2 Connectivity Strategy.
● Connect people in areas of socio-economic need with economic opportunities ● Enable access from new developments to economic opportunities and labour markets	**Boosting Productivity**	Based on the number of housing and employment growth sites the intervention connects to, as well as the affected population for deprivation, low car ownership and the total number of jobs. This helps to identify interventions that best help to improve inclusive growth by connecting people to jobs who are living in areas of deprivation and low car ownership.
● Reduce transport emissions in line with target to become net zero-carbon by 2038, with significant progress being made by 2030 ● Address local AQMA constraints ● Improve physical and mental public health	**Tackling the Climate Emergency**	At the time of assessment, no quantifiable evidence on carbon emissions was available (pending release of West Yorkshire Combined Authority Emissions Reduction Pathway study and other work on carbon emissions) – therefore, based on the broad understanding that significant modal shift alongside fast adoption of low carbon technology will be required, it is assumed that all schemes would inherently contribute to the decarbonisation agenda, unless they are road schemes. As a proxy, scoring was influenced by how many Air Quality Management Areas (where it can be reasonably assumed there will be action to tackle emissions from transport) and touchpoints with the National Cycle Network (which may positively influence mode shift to cleaner modes) the intervention connects to, as well as their performance against the Healthy Streets™[19] principles (again, an influence on positive mode shift to cleaner modes).
● Increase the number of destinations people in deprived communities can reach ● Offers potential to address areas of congestion ● Addresses discrepancies in public transport frequency	**Delivering 21st century transport**	Based on how well the intervention connects areas with low levels of existing travel identified as isolated communities as well as areas with a large speed difference between on-peak and off-peak periods on the highway network and those with poor levels of bus service. As these are transportation schemes, a high number of interventions scored well for this theme.

Source: Mott MacDonald

The multi-criteria analysis is done in three "sifts". These are summarised below and the sub-criteria and scoring approach for each is available in Chapter 8 of the Appraisal Handbook.

Sift 1: Early sift. This is based on the potential for the intervention to address the Core Objectives – it is simply scored using a Yes / No outcome against a series of sub-criteria, linked to the spatial data in GIS. On its own, the early sift can be used to rule out interventions at a very high-level; i.e. if it does not address one or more of the four themes or policy priorities or does not meet a criterion or combination of criteria.

Sift 2: Local fit. This is based on the potential for the intervention to address the corridor-specific aspirations – again, it is simply scored using a Yes / No assessment by determining whether an intervention meets a certain

criterion (or combination of criterion) and/or whether it is above or below a certain threshold for a given objective.

Sift 3: Level of impact. Like the first sift, this is based on the potential for the intervention to address the Core Objectives identified; however, the third sift has a *quantitative* element, drawing on the spatial evidence from the datasets in GIS. It also introduces a degree of standardisation to mitigate against the scale of intervention, and ensure schemes are tested fairly in terms of their level of impact relative to their size and spatial scale.

The key outcomes from the appraisal is two-fold – (a) a set of spatial priorities determined from several "connectivity concepts" (mode agnostic connections between key places – described further in Chapter 4), and (b) investment priorities determined from several interventions.

The diagram below summarises the appraisal process:

enable interventions to be filtered for their suitability for future funding streams – such as how they score against specific policy levers, and their readiness or timescales for delivery (e.g. Transforming Cities). Corridor specific objectives can also be "switched-off" to enable a more Leeds City Region focused list of priorities. The appraisal process can also be used to better understand the relative strength or weakness of different interventions and can highlight opportunities to "repackage" schemes for future funding streams.

Please refer to Chapters 8, 9 and 10 of the Appraisal Handbook for the detailed workings of option appraisal process and its outcomes.

Figure 22: Appraisal process
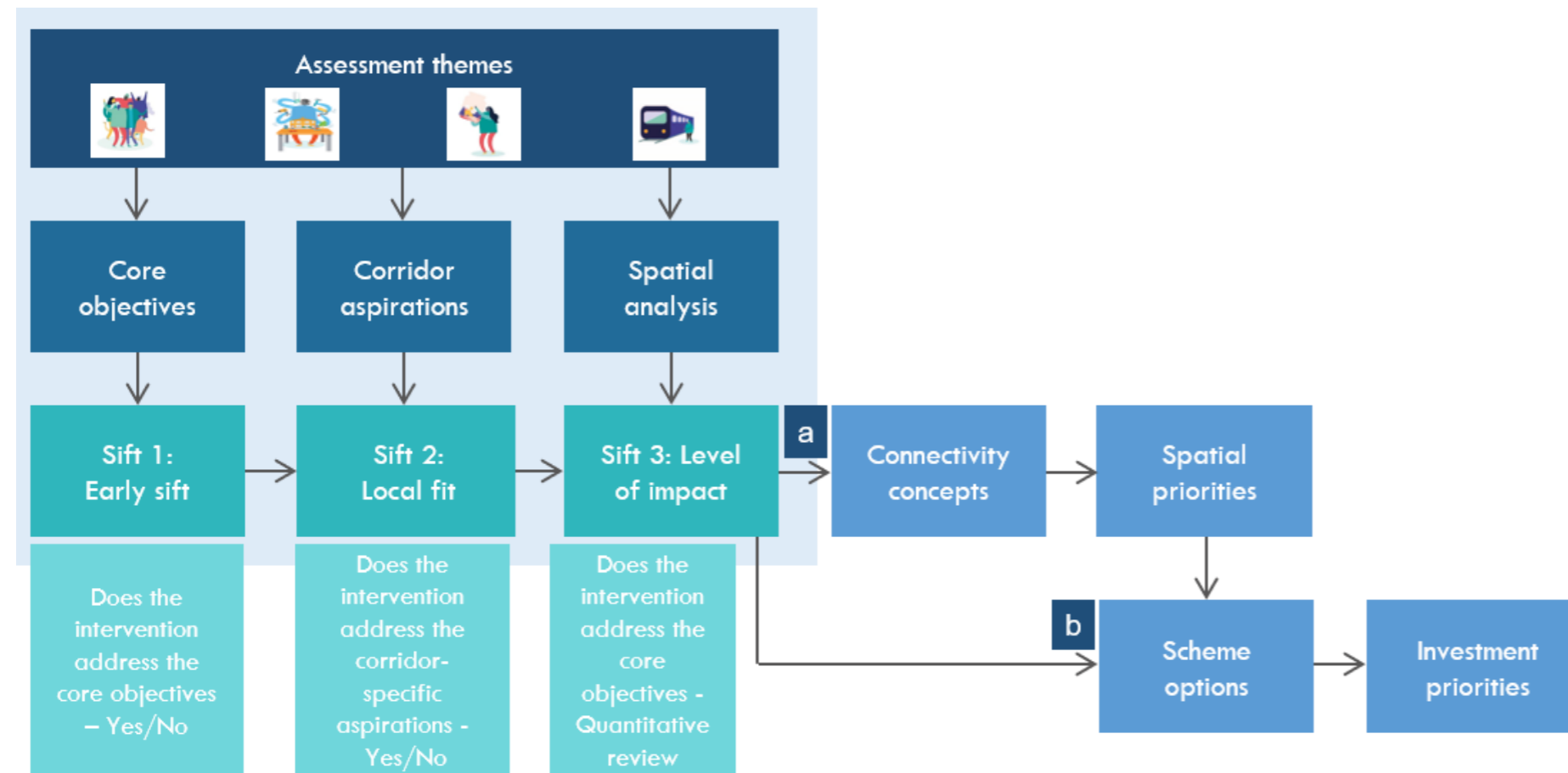
Source: Mott MacDonald

The core appraisal adopted for East Kirklees to Wakefield corridor assumes that all assessment themes have equal weighting / importance. However, the application of the appraisal process is very flexible and can be used to adapt to different requirements (e.g. a change in funding or policy environment). Different weightings can be applied to the four assessment themes. For example, the user can "switch-off", "switch-on" or change the weighting that is applied for the assessment themes and criteria to perform sensitivity tests or to simply

Determining spatial priorities

In determining spatial priorities, the evidence base and stakeholder workshops enable identification of key **places to connect** and resulting connectivity requirements for the corridor's economic area. From this, **"connectivity concepts"** are defined. At this stage, connectivity concepts do not relate to a specific transport mode or a specific route alignment. However, they do enable a strategic appraisal of whether there is merit in connecting people and places, as well as helping to define spatial priorities within the area. Connectivity concepts will allow further exploration of alignments, transport modes and specific interventions should they meet a series of key objectives.

4.1   Places to connect

Table 4 shows the key places to connect that have been identified, reflecting the inputs of partners and supported by the evidence base. Key sections of the evidence base that have informed the identification of these places are listed below:

- Section 2.1.1 Deprivation
- Section 2.1.2 Isolated communities
- Section 2.2.1 Employment characteristics
- Section 2.2.2 Household income
- Section 2.2.3 Growth areas
- Section 2.4.3 Rail

The principal characteristic influencing the selection of each place to connect is also shown. Places include key settlements, housing and employment growth zones. These were identified on the "story map" for East Kirklees to Wakefield and are shown in Figure 23. There are low travel horizons within East Kirklees, improving connectivity between these places is fundamental to improving travel horizons throughout the corridor.

Table 4: Key places to connect

Key place	Characteristic	Scale / justification
Alverthorpe	Bus network	Key place on bus network
Athersley	Inclusive growth	54% of people in parts of Athersley have no qualifications and it is in the top decile for deprivation in England
Barnsley	Employment growth/housing growth/Inclusive growth	Principal town with a rail station and around 6,800 people within the top 20% most deprived in England
Batley	Inclusive growth and housing growth	Key settlement with a rail station. Areas in the top 10% most deprived in England with total annual household income of £25,700 within MSOA. Approximately 3500 new dwellings allocated.
Birstall	Bus network	Key settlement on bus network
Calder Grove	Employment growth	24ha of new employment land allocated at the existing Calder Park business park
Carr Gate	Employment growth	Currently a key employment area within the corridor
Chidswell	Housing and employment growth	Approximately 60ha of mixed-use land allocation, including around 1570 new dwellings allocated
Clayton West	Housing and employment growth	Approximately 10 to 25ha of new employment land and 2000 new dwellings allocated
Cleckheaton	Inclusive growth and housing growth	Within the top 20% most deprived in England with over 100 dwellings allocated for development
Dalton	Bus network	Key settlement on bus network
Darton	Housing growth	Rail station and over 100 dwellings allocated for development

Key place	Characteristic	Scale / justification
Denby Dale	Housing growth	Settlement has a rail station. Approximately 280 new dwellings proposed
Deighton	Inclusive growth	Areas in the top 10% most deprived in England
Dewsbury	Housing growth , Inclusive growth	Key settlement with a rail station. Areas in the top 10% most deprived in England with 39% of residents having no qualifications. Approximately 730 new dwellings allocated.
Dewsbury Riverside	Housing growth	Approximately 2500 new dwellings allocated, with further development including services and employment land
Dodworth	Train station	Key settlement with a rail station
Durkar	Employment growth	Approximately 24ha new employment land allocated at the existing Calder Grove business park.
Fartown	Inclusive growth	Within the top 20% most deprived neighbourhoods in England
Fenay Bridge	Housing growth	Approximately 860 new dwellings allocated
Flockton	Housing growth	Approximately 170 new dwellings allocated
Flushdyke	Bus network	Key settlement on bus network
Grange Moor	Settlement	Settlement identified by partners
Hall Green	Inclusive growth	Next to an area of deprivation in Kettlethorpe
Heckmondw ke	Inclusive growth	Within the top 20% most deprived neighbourhoods in England
Horbury	Settlement	Settlement identified by partners through local plans
Huddersfield	Housing and employment growth , Inclusive growth	Key settlement with rail station. Approximately 1500 new dwellings and 4ha of employment land allocated within the town centre and within the top 20% deprived areas in England
Kettlethorpe	Inclusive growth	1740 people living within the top 20% most deprived in England
Kirkheaton	Bus network	Key settlement on bus network
Liversedge	Inclusive growth	Areas in the top 10% most deprived in England
Mapplewell	Housing growth	Approximately 300 new dwellings
Middlestown	Key settlement	Key settlement identified by partners
Mirfield	Housing and employment growth	Key settlement with a rail station. Approximately 720 new dwellings. Large employment area with 46ha of growth allocated at Cooper Bridge.
National Coal Mining Museum	Visitor attraction	Attraction brings in significant tourist numbers, with over 138,000 visitors in 2015/16
Ossett	Housing growth	Approximately 430 new dwellings allocated throughout Ossett
Outwood	Train station	Key settlement with a rail station
Penistone	Train station	Key settlement with a rail station
Ravensthorpe	Inclusive growth	Key settlement with a rail station. Within the top 10% most deprived in England with 45% of people having no qualifications
Sandal & Agbrigg	Housing growth	Settlement has a rail station. Approximately 260 new dwellings allocated
Sculpture Park	Visitor attraction	This attraction brings in a significant number of tourists into the area, with over 480,000 visitors in 2017/18
Shepley	Housing growth	Settlement has a rail station. Approximately 190 new dwellings allocated
Si kstone Common	Train station	Key settlement with a rail station
Si kwood Park	Employment growth	Additional 19ha of employment land allocated
Skelmanthorpe	Housing growth	Approximately 440 new dwellings allocated
Stocksmoor	Train station	Key settlement with a rail station
Thornhill	Housing growth	Approximately 430 new dwellings allocated in and around Thornhill
Wakefield	Housing growth, Inclusive growth	Slower than average growth emphasises the need for good transport options connecting Wakefield businesses to potential employees and custom. Within top 10% most deprived in England and 170 dwellings planned

Figure 23: Places to connect – key attributes
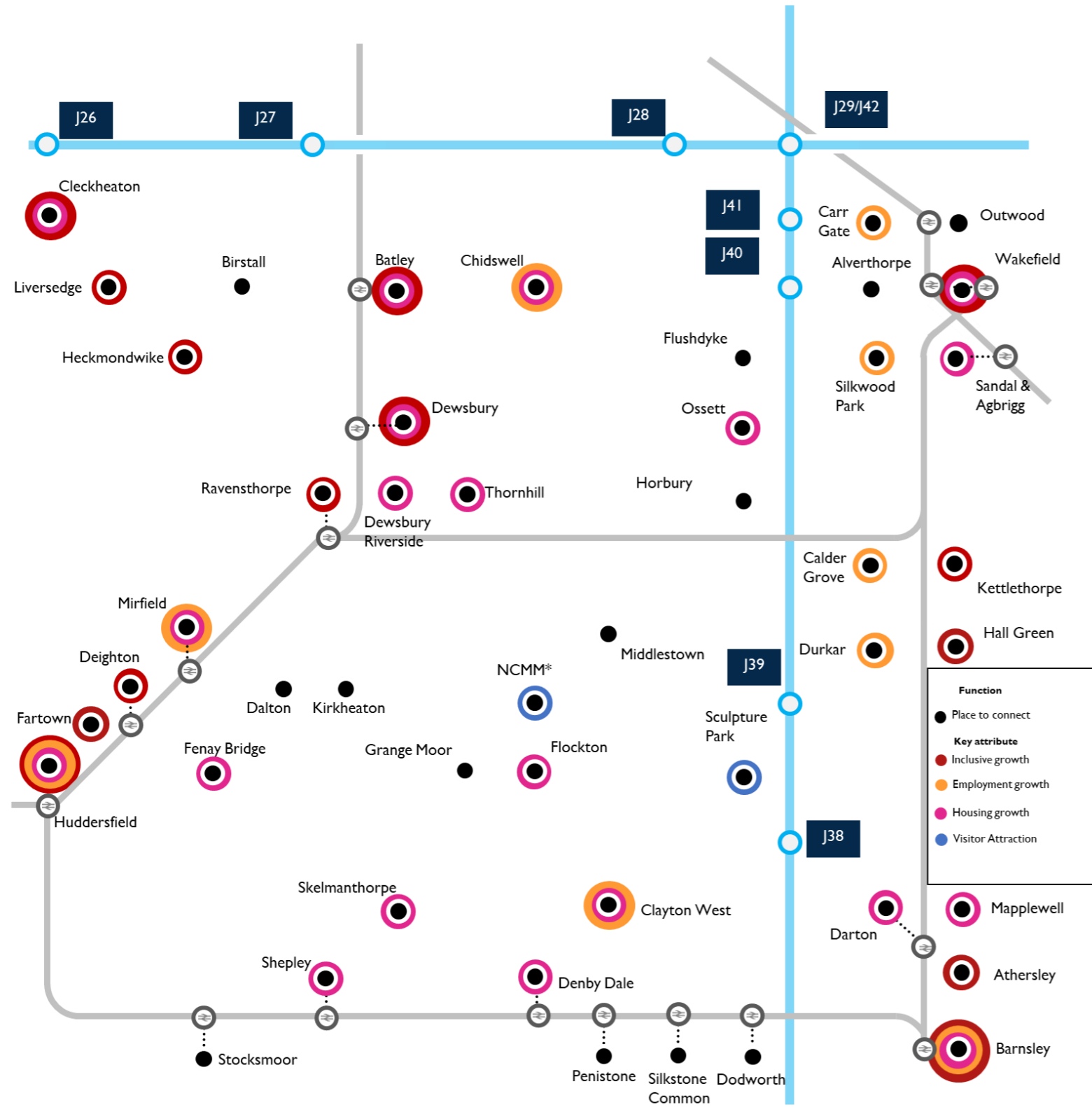
4.2   Existing connectivity improvements

There are several existing proposals scheduled for implementation within the corridor. Figure 24 presents a conceptual map showing the planned highway interventions as part of the West Yorkshire Plus Transport Fund (WYPTF). These include several transport projects to improve connectivity on key routes.

Table 5 provides a description of each programme currently providing connectivity improvements throughout the corridor.
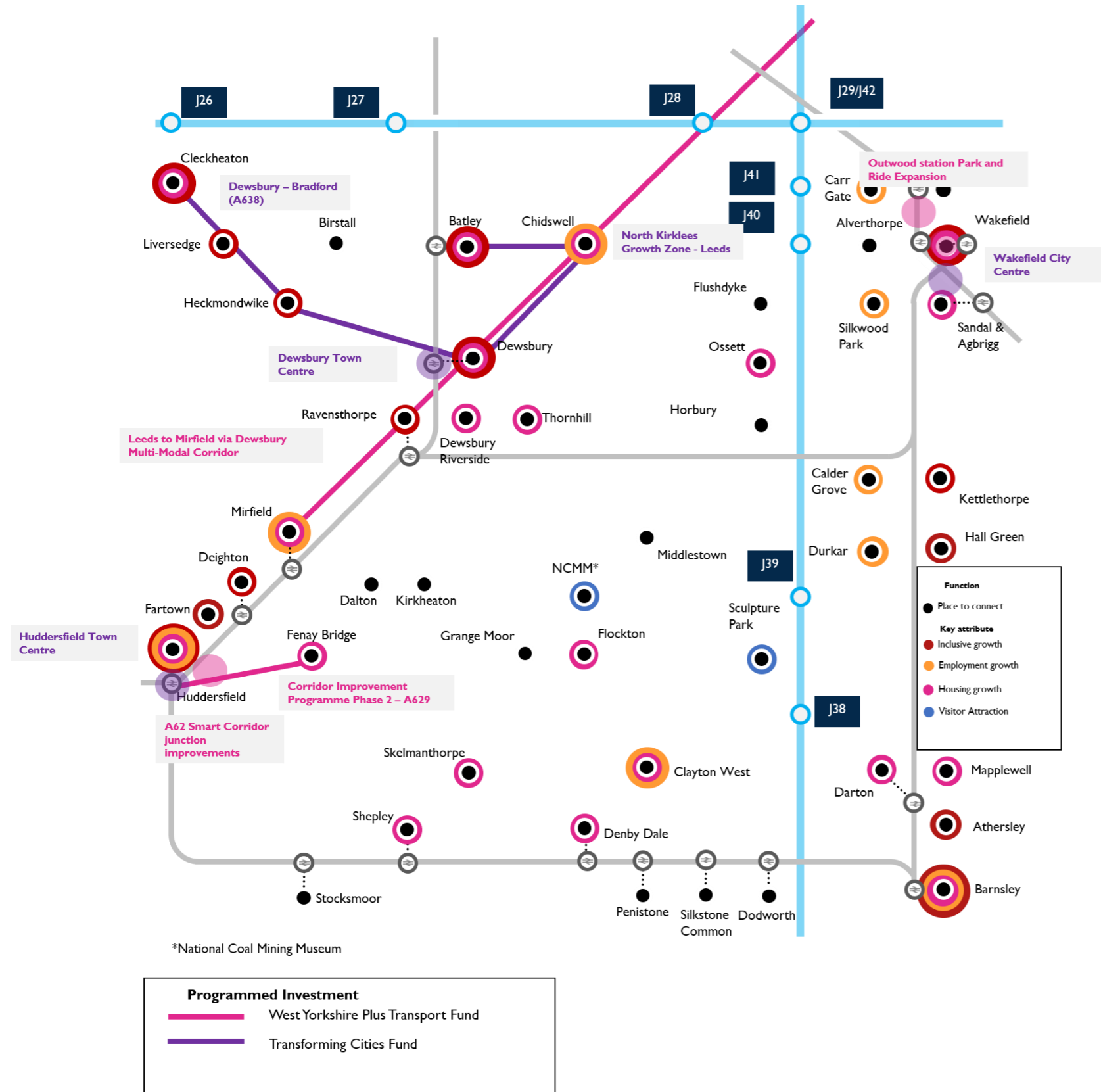
Despite these already planned investments, there are further opportunities to better connect areas in East Kirklees (such as Dewsbury and Middlestown) to employment opportunities in Wakefield and Huddersfield, ensuring that a wide range of prospects are available to these neighbourhoods, and in the surrounding areas.

Similarly, there are opportunities to better connect communities in East Kirklees and Wakefield to local employment opportunities, as well as enhancing connectivity towards Leeds.

Table 5: Programmed investment

Programme	Scheme	Description
West Yorkshire Plus Transport Fund	A653 Leeds to Dewsbury Corridor	Highway improvements on the corridor between Dewsbury and Leeds. Capacity enhancement measures to reduce congestion at junctions along with public transport improvements, such as the introduction of a limited stop bus service from Dewsbury to Leeds.
West Yorkshire Plus Transport Fund	A62 and A644 Corridors	Highway improvements and junction upgrades to relieve congestion in the Cooper Bridge area and additional capacity to unlock future housing and employment growth.
West Yorkshire Plus Transport Fund	A641 Bradford to Huddersfield Corridor	Improve efficiency and connectivity for all modes travelling along the corridor between Bradford, Brighouse and Huddersfield; enhancing accessibility to key growth sites, and facilitating economic development across Calderdale, Kirklees and Bradford.
West Yorkshire Plus Transport Fund	Corridor Improvement Programme	The Corridor Improvement Programme (CIP) is a three phased approach to delivering low to medium cost interventions on highway corridors on the key route network across West Yorkshire, to reduce congestion, improve journey times and unlock economic growth. Identified CIP locations in the corridor (Phase 1) include: - Wakefield A650 Newton Bar - Kirklees A62 Smart Corridor
West Yorkshire Plus Transport Fund	Outwood Rail Park & Ride	Provision of up to 167 additional car parking spaces at Outwood rail station (130 existing spaces), to help improve connectivity across West Yorkshire. Work has been ongoing since 2014.
West Yorkshire Transport Fund	Huddersfield Station Gateway	Regeneration of the rail station and its environs with works including additional eastern entrances to provide better passenger access, improvements to the existing highway and the creation of a taxi hub off St George's Square, allowing public realm enhancements in the space vacated.
West Yorkshire Transport Fund	Corridor Improvement Programme (CIP) Phase 2 – A629	Improvement along the A629 corridor from Fenay Lane/Waterloo to Huddersfield
Transforming Cities Fund	Dewsbury and Bradford (A638)	A package of schemes to deliver enhanced walking, cycling and bus infrastructure between the urban centres of Dewsbury and Bradford.
Transforming Cities Fund	Connecting employment and skills centres in Dewsbury	A package of schemes to transform the public transport offer for Dewsbury Town Centre including a new bus interchange facility and high-quality walking and cycling routes to the town centre and colleges.
Transforming Cities Fund	North Kirklees to Leeds	A package of measures to deliver enhanced bus infrastructure from the North Kirklees Growth Zone (Dewsbury-Batley-Tingley corridor) towards Leeds.
Transforming Cities Fund	Huddersfield Town Centre	Package of improvements schemes to Huddersfield bus and train stations
Transforming Cities Fund	Wakefield City Centre	Package of improvements schemes to Wakefield bus and train stations

Figure 24: Programmed Investment

J26

J27

J28

J29/J42

J41

J40

J39

J38

Cleckheaton

Dewsbury – Bradford (A638)

Birstall

Batley

Chidswell

North Kirklees Growth Zone - Leeds

Carr Gate

Outwood station Park and Ride Expansion

Alverthorpe

Wakefield

Wakefield City Centre

Liversedge

Heckmondwike

Flushdyke

Silkwood Park

Sandal & Agbrigg

Dewsbury

Dewsbury Town Centre

Ossett

Ravensthorpe

Leeds to Mirfield via Dewsbury Multi-Modal Corridor

Thornhill

Horbury

Dewsbury Riverside

Calder Grove

Kettlethorpe

Mirfield

Durkar

Hall Green

Deighton

Middlestown

Dalton   Kirkheaton

NCMM*

Sculpture Park

Fartown

Huddersfield Town Centre

Fenay Bridge

Grange Moor

Flockton

Corridor Improvement Programme Phase 2 – A629

Huddersfield

A62 Smart Corridor junction improvements

Skelmanthorpe

Clayton West

Darton

Mapplewell

Shepley

Denby Dale

Athersley

Stocksmoor

Penistone   Silkstone Common   Dodworth

Barnsley

Function

● Place to connect

Key attribute

● Inclusive growth
● Employment growth
● Housing growth
● Visitor Attraction

*National Coal Mining Museum

Programmed Investment

— West Yorkshire Plus Transport Fund

— Transforming Cities Fund

4.3   Connectivity concepts

Based on the feedback from partners and the spatial analysis (which together provide an assessment of the current transport network and issues, future development plans and investment programmes), several "connectivity concepts" have been defined across the economic area, to demonstrate the need for improved connectivity between key places. At this stage, connectivity concepts do not relate to a specific transport mode or a specific route alignment. However, they do enable a strategic appraisal of whether there is merit in connecting people and places, as well as helping to define spatial priorities within the area. Seven connectivity concepts have been defined for the East Kirklees to Wakefield corridor. Some places not connected through the connectivity concept framework have been addressed in other strands of work such as the West Yorkshire Bus Network Review. These concepts are shown in Figure 25, with the navy line illustrating a connectivity concept identified as part of the work undertaken for the Leeds to Huddersfield corridor, and the orange line showing a connectivity concept identified as part of the Leeds to Bradford, South Bradford and North Kirklees corridor. Connectivity concepts not included in this assessment include those covered by the West Kirklees to Calderdale corridor (encompassing parts of the Penistone line) and the Leeds Wakefield and Barnsley corridor (encompassing links to the east of the M1. A brief narrative for each concept is given below:

Figure 25: Connectivity concepts East Kirklees to Wakefield

Source: Mott MacDonald

1 - The Red Concept (Huddersfield to Wakefield via Horbury)

Concept function	Provides *strategic* connectivity
Summary	This concept provides a strategic connection between Huddersfield and Wakefield. It draws on the existing road network and using sustainable modes will help to alleviate air quality issues along these congested routes.

Enabling **Inclusive Growth**	Boosting **Productivity**	Tackling the **Climate Emergency**	Delivering **21st Century Transport**
• Provides new connections to rural parts of East Kirklees • Improves accessibility to educational sites in Huddersfield and Wakefield	• Connects housing growth sites at Fenay Bridge, Huddersfield and Wakefield	• Intersects with 43% of the corridor's AQMAs	• Provides a strategic connection between Wakefield and Huddersfield, via Horbury

Indicative mode	Bus Rapid Transit / Bus

2 - The Purple Concept (Denby Dale to Wakefield via Kettlethorpe)

Concept function	Provides *strategic* connectivity
Summary	This concept provides a connection from current and growing communities in South Kirklees to the employment growth at Clayton West and Calder Grove and the opportunities present within Wakefield.

Enabling **Inclusive Growth**	Boosting **Productivity**	Tackling the **Climate Emergency**	Delivering **21st Century Transport**
• Improves connectivity to both Wakefield, Sandal & Agbrigg and Denby Dale rail stations	• Connects to existing and future employment sites at Calder Grove and Clayton West • Connects housing growth sites at Denby Dale and Clayton West	• Intervention accords with Healthy Street principles	• Provides a strategic connection to the Sculpture Park • Improves connectivity to Denby Dale rail station and between both Wakefield stations

Indicative mode	Bus Rapid Transit / Bus

3 - The Yellow Concept (Middlestown Loop via Dewsbury)

Concept function	Provides *local* connectivity
Summary	This concept provides a local connection between isolated and deprived communities in Dewsbury to the current and future employment opportunities in Dewsbury and North Ossett.

Enabling **Inclusive Growth**	Boosting **Productivity**	Tackling the **Climate Emergency**	Delivering **21st Century Transport**
• Connects deprived communities in Dewsbury	• Connects existing employment sites to the north of Ossett and future growth at Chidswell	• Intervention accords with Healthy Street principles	• Improves connectivity to Dewsbury rail station.

Indicative mode	Bus / Active Travel

4 - The Light Green Concept (Huddersfield to Wakefield via Dewsbury)

Concept function	Provides *strategic* connectivity
Summary	This concept provides a strategic connection between Huddersfield and Wakefield. It connects deprived communities such as Dewsbury and Batley to the economic opportunities in Huddersfield and Wakefield along with connecting housing growth sites at Dewsbury Riverside and Chidswell.

Enabling **Inclusive Growth**	Boosting **Productivity**	Tackling the **Climate Emergency**	Delivering **21st Century Transport**
• Connects deprived communities in Dewsbury and Batley	• Connects key areas of future growth around Dewsbury at Chidswell and Dewsbury Riverside	• Has 10 touchpoints with the National Cycle Network • Intersects with 71% of the corridor's AQMAs	• Provides a strategic connection between Huddersfield and Wakefield, via Dewsbury • Improves accessibility to educational sites in Huddersfield and Dewsbury

Indicative mode	Mass Rapid Transit / Bus Rapid Transit

5 - The Light Brown Concept (Huddersfield to Barnsley via Flockton)

Concept function	Provides *strategic* connectivity
Summary	This concept provides a strategic connection between Barnsley and Huddersfield. It connects areas of housing growth such as Darton and Fenay Bridge to the employment and education opportunities in Barnsley and Huddersfield. It draws on the existing road network and using sustainable modes will help to alleviate air quality issues along these congested routes.

Enabling **Inclusive Growth**	Boosting **Productivity**	Tackling the **Climate Emergency**	Delivering **21st Century Transport**
• Improves connectivity to Huddersfield, Barnsley and Darton rail stations	• Connects to existing and future employment sites at Huddersfield, Barnsley and Mapplewell • Connects housing growth sites at Fenay Bridge, Flockton and Darton	• Connects to 6 touchpoints of the National Cycle Network	• Provides a strategic connection to the Sculpture Park • Improves connectivity to Darton rail station

Indicative mode	Bus Rapid Transit / Bus

6 - The Green Concept (Dewsbury Figure of Eight)

Concept function	Provides *local* connectivity
Summary	This concept provides a local connection between the deprived communities of Dewsbury and Batley and the housing and employment growth at Dewsbury Riverside and Chidswell.

Enabling **Inclusive Growth**	Boosting **Productivity**	Tackling the **Climate Emergency**	Delivering **21st Century Transport**
• Connects deprived communities in Dewsbury and Batley	• Connects future housing and employment growth at Dewsbury Riverside and Chidswell	• Intersects with 29% of the corridor's AQMAs	• Improves east-west connectivity

Indicative mode	Active Travel

7 - The Brown Concept (Wakefield to Shepley via Middlestown)

Concept function	Provides *strategic* connectivity
Summary	This concept provides a strategic connection between Wakefield and Shepley. It connects key settlements such as Middlestown and housing growth sites at Shepley and Skelmanthorpe to the economic opportunities in Horbury, Ossett and Flushdyke.

Enabling **Inclusive Growth**	Boosting **Productivity**	Tackling the **Climate Emergency**	Delivering **21st Century Transport**
• Improves access bility to educational sites in Wakefield • Improves connectivity to Middlestown	• Connects to existing employment sites at Horbury, Ossett and Flushdyke • Connects housing growth sites at Shepley, Skelmanthorpe and Flockton	• Has 6 touchpoints with the National Cycle Network	• Draws on the connectivity provided by the existing rail network by improving connectivity to Shepley rail station

Indicative mode	Bus Rapid Transit / Bus

4.4 Appraisal outcomes

Our appraisal process (summarised in 3.4.1) has been applied to the 7 connectivity concepts to define spatial priorities in the East Kirklees to Wakefield corridor.

Each of the four assessment theme scores are averaged to provide an overall INSET score of between 0 and 1, where 1 represents a perfect correlation and anything else represents a degree of deviation from that perfect score. Typically, the total scheme scores lie somewhere between the two numbers with the following categories assigned:

Table 6: Scoring ranges

Scores	Ranges
Excellent	0.99 – 1.00
Good	0.75 – 0.99
Average	0.50 – 0.75
Fair	0.25 – 0.50
Low	<0.25

Source: Mott MacDonald

The outcome of the prioritisation for the connectivity concepts is summarised in Figure 26.

Figure 26: Appraisal outcomes for connectivity concepts – ranked

Rank	#	Connectivity concept	Sift 1: Early sift				Sift 1: Early sift Score	Sift 2: Local fit	Sift 3: Level of impact				Sift 3: Level of impact	Overall score
			Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21st Century Transport			Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21st Century Transport		
1	4	Light Green: Huddersfield to Wakefield via Dewsbury	Excellent	Excellent	Good	Excellent	Good	Excellent	Good	Fair	Good	Average	Average	Good
2	7	Brown Route: Wakefield to Shepley via Middlestown	Excellent	Excellent	Good	Excellent	Good	Excellent	Fair	Fair	Average	Average	Fair	Good
3	1	Red Route: Huddersfield to Wakefield via Middlestown	Excellent	Average	Good	Excellent	Good	Excellent	Good	Low	Good	Fair	Average	Good
4	5	Light Brown: Huddersfield to Barnsley via Flockton	Excellent	Average	Good	Excellent	Good	Excellent	Average	Low	Average	Average	Average	Good
5	6	Green Route: Dewsbury Figure of Eight	Excellent	Average	Good	Excellent	Good	Excellent	Good	Low	Good	Fair	Fair	Good
6	2	Purple Route: Denbvy Dale to Wakefield via Kettlethorpe	Excellent	Average	Good	Excellent	Good	Excellent	Fair	Low	Good	Fair	Fair	Average
7	3	Yellow Route: Middlestown Loop via Dewsbury	Excellent	Average	Good	Excellent	Good	Excellent	Fair	Low	Average	Fair	Fair	Average

Although many concepts were classified as "Good" overall, there is differentiation within the defined scoring range. Figure 26 highlights that the Light Green, Brown and Red concepts demonstrated the best level of fit across all themes and sifts and therefore have the potential to produce the greatest benefit for interventions. The orange and navy routes in Figure 25 have also been prioritised as part of the conclusions of the Case for Change Reports for Leeds to Bradford, South Bradford and North Kirklees and for Leeds to Huddersfield.

Overall, the Light Green, Brown and Red connectivity concepts have been identified as the spatial priorities as they are the highest scoring concepts that address the connectivity requirements to and from East Kirklees to Wakefield. These are shown in Figure 27. Delivering improved connectivity along these connectivity concepts will help to increase travel horizons within the corridor and beyond, which have historically been low.

Figure 27: Prioritised connectivity concepts

Source: Mott MacDonald

4.5 Demand

An assessment has been undertaken using the Combined Authority's Urban Dynamic Model (UDM) to estimate the total peak hour trip demand along each of the prioritised connectivity concepts. This presents 2033 forecasts of demand using established assumptions of the development landscape.

A mode technology framework developed by the Combined Authority has then been used to identify what mode of transport might be appropriate based on having a suitable capacity per hour (see Table 7).

Please refer to Section 9.2.2 of the Appraisal Handbook for the detailed workings of demand estimation.

Table 7: Mode technology framework

| Mode	Capacity per service	Typical capacity per hour	Potential role
Walking and Cycling	1		Greatest potential for shorter distance journeys, particularly across congested city centre/urban environments.
Demand Responsive Transport	5 - 12	800 -1,500 passengers	Most suited to low demand areas or periods where a scheduled service would be inefficient with regard to cost and use.
Standard Double Decker Bus	70 – 80	Less than 1,000 passengers	Flexible services which meet local access bility needs – with very high-density shopping patterns.
Bus Rapid Transit	70 – 80	500 – 2,000 passengers	Limited stops outside of urban centres. Moves large volumes of people relatively short distances within an urban / city centre environment.
Light Rail / Tram / Mass Transit	100 – 200	2,000 – 4,000 passengers	BRT is often typically implemented where there is less demand or as a precursor to Mass Transit.
Suburban Heavy Rail	500 – 700	2,000 – 6,000 passengers	Move large volumes of people over longer distances (eg:10-30 miles) with limited stops.
Inter Urban / National Heavy Rail	500 - 1000	Up to 27,000 passengers	Centre to centre fast and direct services.

Source: West Yorkshire Combined Authority

The demand analysis provides indicative evidence towards what the highest capacity mode could be along the connectivity concepts. Other lower capacity modes also could be considered elsewhere in the hierarchy to provide a range of integrated transport services that could address these forecast levels of demand. The figures presented here illustrate

- Unconstrained demand that focuses on the potential of movement between places
- Aggregate flows between each place to connect within the connectivity concept
- Two-way flows to illustrate key attractors on the network
- Variations in demand between places to connect to demonstrate the range of services that could potentially be provided within each connectivity concept.

Figure 28 shows demand in 2033 along the highest scoring connectivity concept; Light Green. This provides a strategic connection between Wakefield and Huddersfield, via Dewsbury and indicates that the demand is high enough to suggest the potential for heavy rail or mass transit on this corridor between Silkwood Park and Wakefield. Elsewhere on the route, such as between Ravensthorpe and Batley, the level of demand suggests potential for modes such as Bus Rapid Transit (BRT) or Mass Rapid Transit (MRT).

Figure 28: Light Green concept - Demand 2033
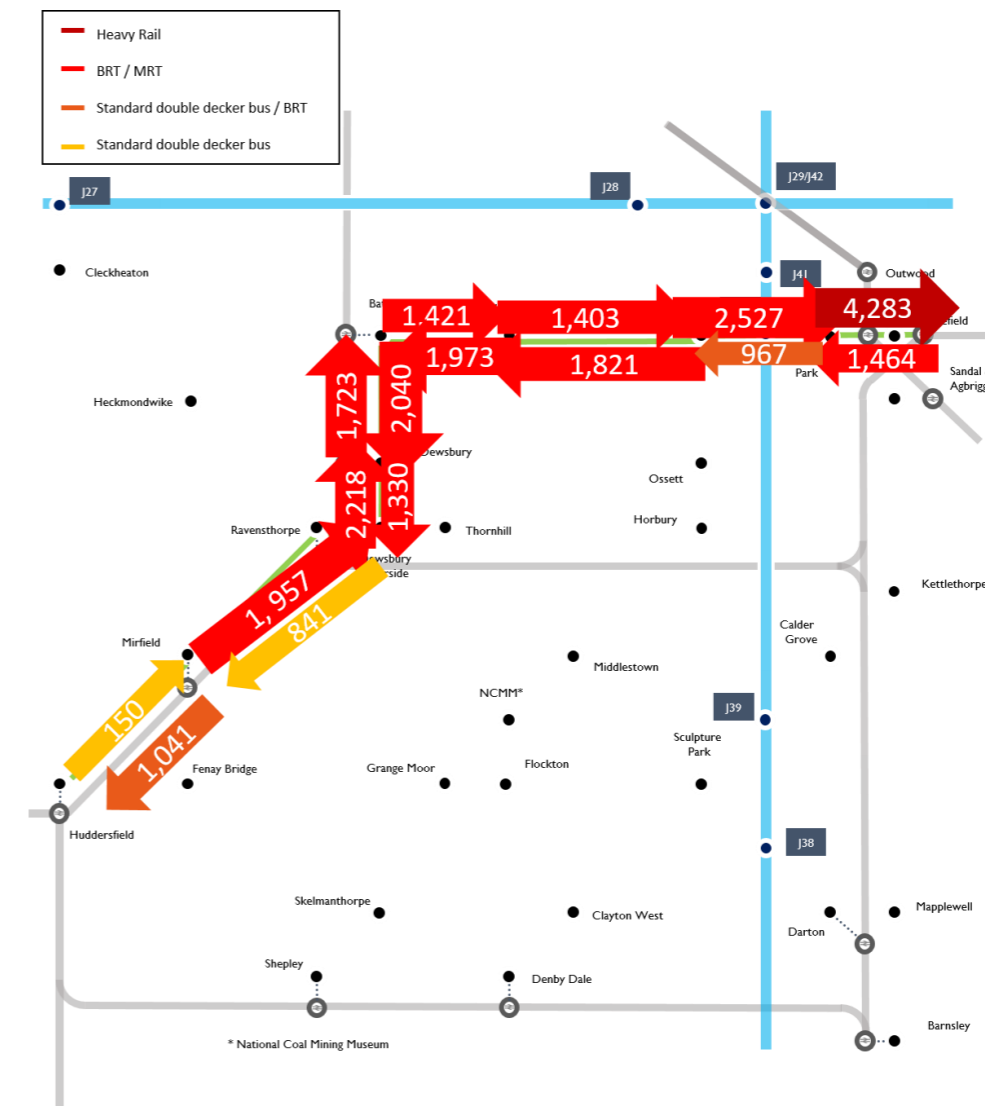
Source: Urban Dynamic Model

Figure 30 shows demand between Wakefield and Huddersfield, through Horbury, Middlestown, Flockton and Grange Moor in 2033. Demand is lower on this route, with greatest demand from Grange Moor and Huddersfield indicating the potential for BRT or MRT. Elsewhere along the route, options may be more suited for a standard double decker bus service, even with the spike in demand from Horbury to Wakefield.

Figure 30: Red concept – Demand 2033

Source: Urban Dynamic Model
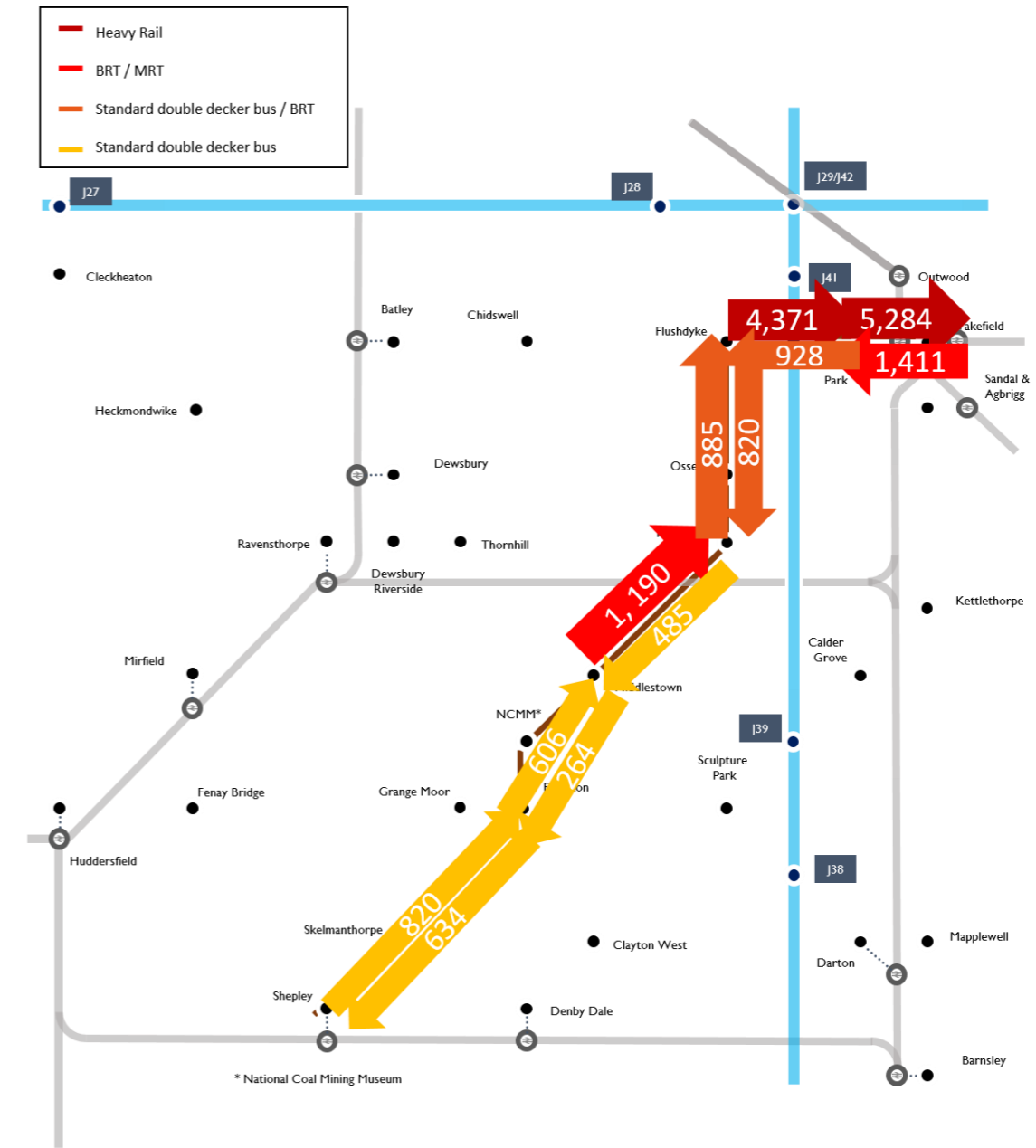
Figure 29: Brown concept – Demand 2033
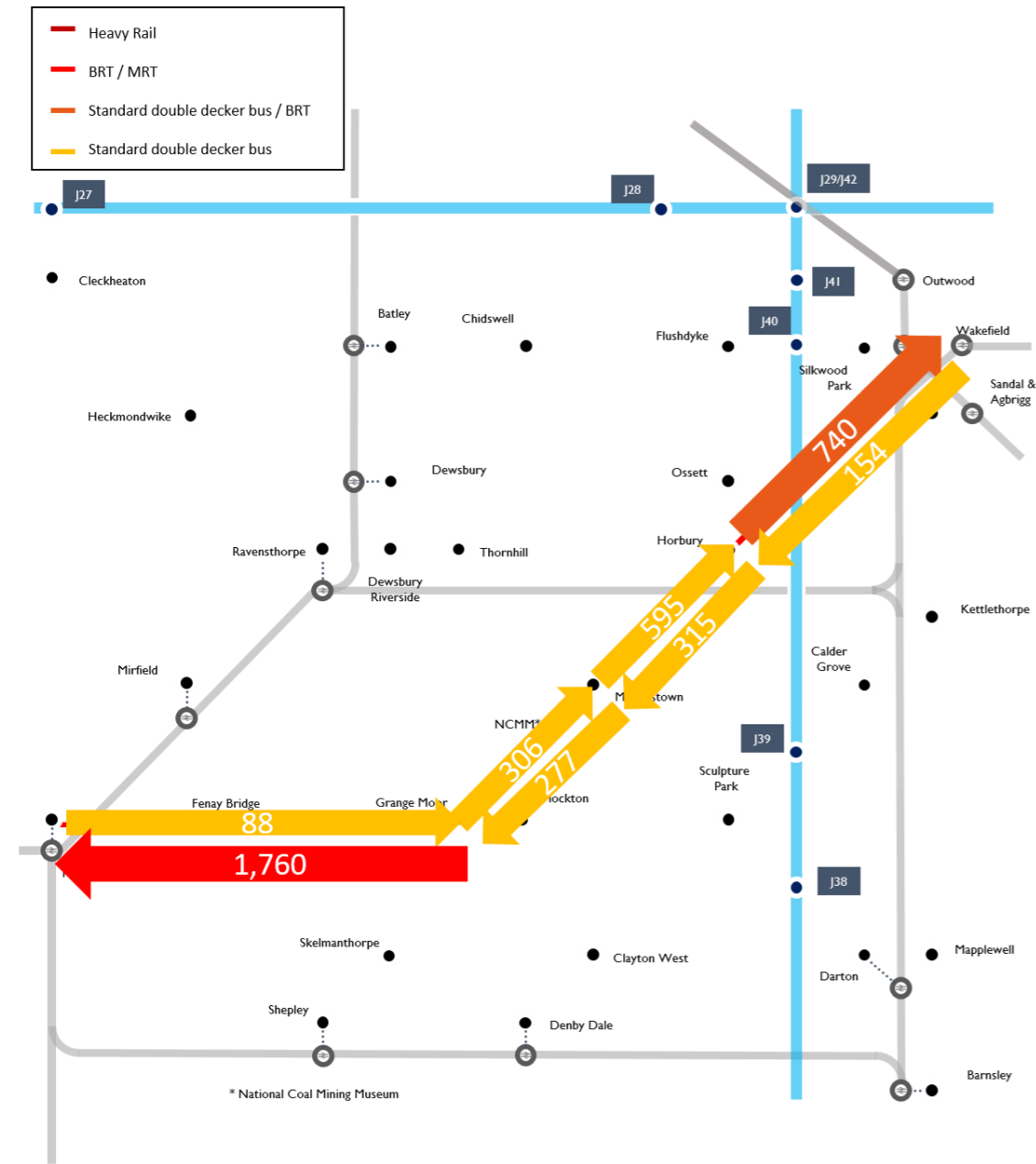
Source: Urban Dynamic Model

Figure 29 shows demand between Shepley and Wakefield is high enough to suggest the potential for heavy rail between Flushdyke and Wakefield. There is potential therefore to examine alternative mass transit options to increase capacity along this concept, such as BRT or MRT. The potential for BRT or MRT is also suggested from Wakefield to Silkwood Park and from Middlestown to Horbury. Demand is lower as the route moves southwards between Middlestown and Shepley, indicating a standard double decker bus service maybe an effective modal choice.

Evidence from other workstreams will inform how a multi-modal transport offer could be provided in these corridors, alongside the indicative high-capacity modes identified above.

Conclusion: The need for intervention for East Kirklees to Wakefield

5.1 Introduction

This Case for Change presents the evidence and strategic narrative for investing in improved connectivity in the East Kirklees to Wakefield corridor.

Through evidence review, and engagement from district partners, key places to connect have been identified, and a complementary series of connectivity concepts have been developed to show where there is greatest need to improve connections between people and places in the corridor. These places to connect have been used to support evidence gathering in other workstreams and are shown in Figure 31.

An appraisal of each of the concepts provides evidence to demonstrate which connectivity concepts have the greatest potential to enable inclusive growth, boost productivity, tackle the climate emergency, and deliver a 21st century transport system. The connectivity concepts prioritised through this process focus on making connections between communities to the north of the corridor, including Batley, Dewsbury and Ravensthorpe with emerging economic opportunities in the north east such as Chidswell and Silkwood Park. The prioritised concepts also connect local communities to economic and educational opportunities in Huddersfield and Wakefield. A high-level demand analysis has also been undertaken on these concepts to illustrate the potential for higher capacity modes of transport that might support improved connectivity between the key places to connect.

The Case for Change is one of several complementary sources that together, form a complex evidence base. Other evidence sources include:

- West Yorkshire Bus Network Review
- Leeds City Region Rail Vision and Capacity Study
- Leeds City Region Emissions Reduction Pathway
- West Yorkshire Walking and Cycling Strategy
- West Yorkshire Future Mobility Strategy
- West Yorkshire Urban Transit Study
- Ongoing engagement with district partners

Figure 31: Places to Connect
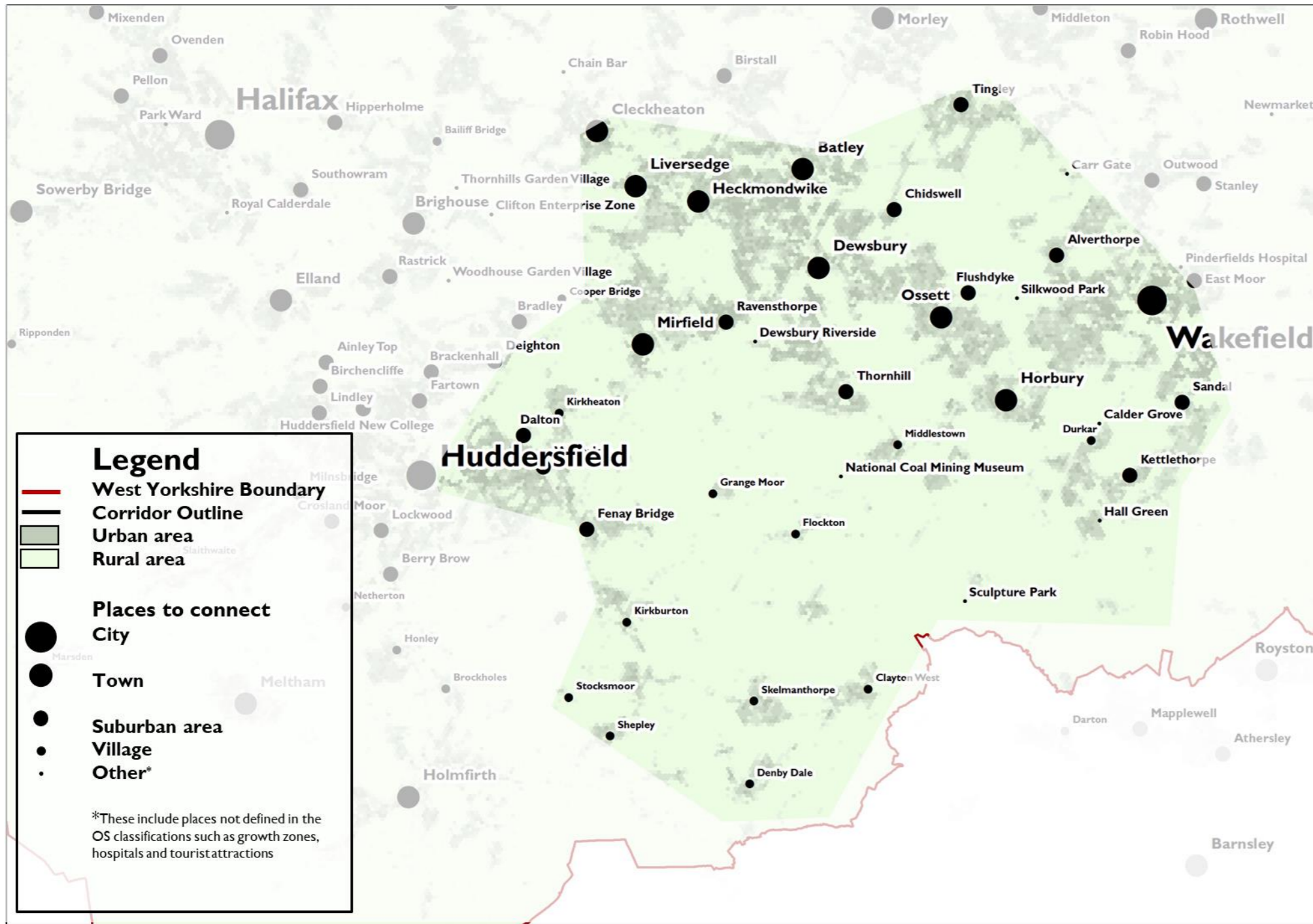
5.2 Connectivity Network

This Case for Change report therefore brings together several strands of evidence that have been evaluated and will ultimately inform the development of a package of interventions across several modes.

The emerging multi-modal network on which future interventions will focus provides a framework to address the key connectivity issues and opportunities that have been highlighted through this study and other strands of evidence. This network for East Kirklees to Wakefield is illustrated in Figure 32. This will link with networks developed in other Case for Change reports within the Connectivity Plan to provide a full multi-modal network for West Yorkshire.

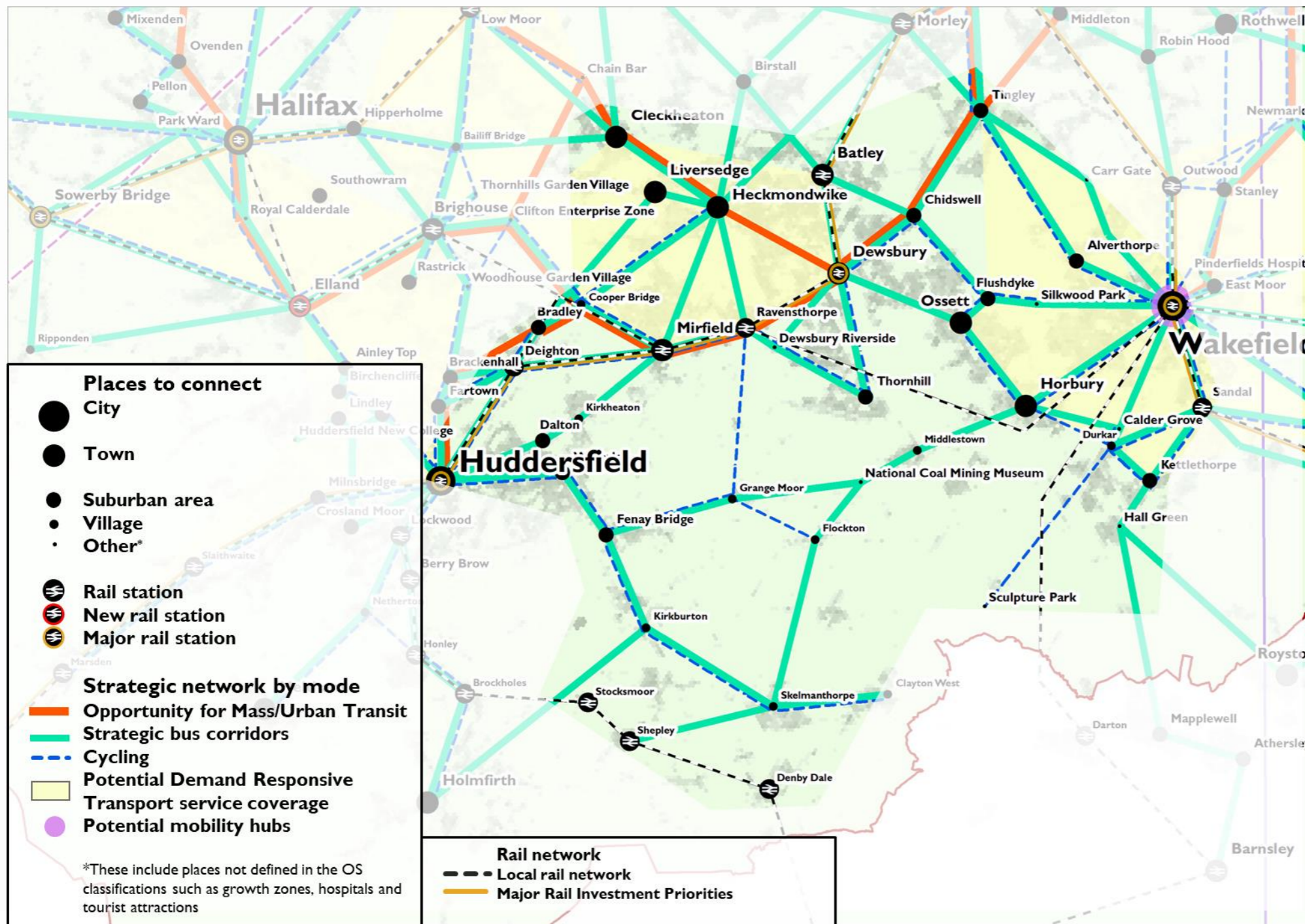**Figure 32: East Kirklees to Wakefield Connectivity Network**

Figure 33 illustrates spatially how the various strands of evidence, including the prioritised connectivity concepts and subsequent demand analysis, provide a rationale for network interventions in East Kirklees and Wakefield. These strands of evidence are summarised alongside West Yorkshire's four strategic priorities in Table 8.

Table 8: Evidence rationale for network interventions

Network Area	Description	Rationale				Evidence Base
		Enabling Inclusive Growth	**Boosting Productivity**	**Tackling the Climate Emergency**	**Delivering 21st Century Transport**	
1	Light Green Connectivity Concept	Connects deprived communities such as Dewsbury and Batley	Connects key areas of future growth around Dewsbury at Chidswell and Dewsbury Riverside. Provides access to the economic centres of Huddersfield and Wakefield	Improves connectivity on routes where congestion is an issue on the approaches to Huddersfield and Wakefield	Potential mass transit links between Heckmondwke and Dewsbury and Mirfield and Chidswell. Bus based interventions along existing corridors between Huddersfield and Wakefield	East Kirklees to Wakefield Case for Change Report West Yorkshire Bus Network Review Urban Transit Study
2	Brown Connectivity Concept	Improves accessibility to educational sites in Wakefield and improves connectivity to key settlements such as Middlestown	Enhances connections to existing employment sites at Horbury, Ossett and Flushdyke and housing growth sites at Shepley, Skelmanthorpe and Flockton	Intersects with the large AQMA surrounding Wakefield. High car dependency in the south, based on car ownership figures, demonstrating a need to provide wider travel choices in order to encourage mode shift	Predominantly bus based interventions along existing corridors between Shepley and Wakefield including local connections to Stocksmoor railway station and Kirkburton	East Kirklees to Wakefield Case for Change Report West Yorkshire Bus Network Review
3	Red Connectivity Concept	Provides linkages to rural communities in East Kirklees. Improves accessibility to educational sites in Huddersfield and Wakefield	Connects housing growth sites at Fenay Bridge, Huddersfield and Wakefield	Intersects with 43% of the corridor's AQMAs and improves connectivity on routes in and out of Huddersfield where congestion is an issue	Predominantly bus based interventions along existing corridors between Wakefield and Huddersfield, via Horbury. Planned improvements to the cycling route from Fenay Bridge into Huddersfield	East Kirklees to Wakefield Case for Change Report West Yorkshire Bus Network Review
4	North West Kirklees	Connects deprived communities in Deighton and Heckmondwike	Provides onward connections to the employment centres of Huddersfield and Leeds	Intersects with several AQMAs. Tackles connections across the motorway network which currently contrbute towards poor air quality	Predominantly bus based interventions along existing corridor with rail enhancements. Potential mass transit corridor providing strategic between Kirklees and Bradford	Leeds to Bradford, South Bradford and North Kirklees Case for Change West Kirklees to Calderdale Case for Change Report West Yorkshire Bus Network Review Urban Transit Study
5	Purple connectivity concept	Connects deprived communities in Kettlethorpe and Wakefield	Enhances connections to employment growth sites at Calder Grove and Clayton West	High car dependency based on car ownership figures, demonstrating a need to provide wider travel choices in order to encourage mode shift	Predominantly bus based interventions along existing corridors between Wakefield and Barnsley	East Kirklees to Wakefield Case for Change Report West Yorkshire Bus Network Review
6	North West Wakefield	Connects deprived communities in Batley	Connects to strategic development site at Chidswell. Provides onward connections to the employment centre of Leeds	Improves connectivity on routes where congestion is an issue on the approaches to Wakefield	The route between Chidswell and Tingley could be served by mass transit, providing a strategic link to Leeds, Dewsbury and Huddersfield	East Kirklees to Wakefield Case for Change Report Leeds to Huddersfield Case for Change Urban Transit Study
7	North Kirklees	Connects deprived communities in Dewsbury and Ravensthorpe	Provides connections to strategic development sites such as Dewsbury Riverside	A package of schemes to deliver enhanced walking cycling and bus infrastructure as part of West Yorkshire's Transforming Cities Fund package	Part of programmed interventions to enhance bus offer and waking and cycling infrastructure between Dewsbury and Bradford and within Dewsbury Town Centre	East Kirklees to Wakefield Case for Change Report West Kirklees to Calderdale Case for Change Report Leeds to Huddersfield Case for Change

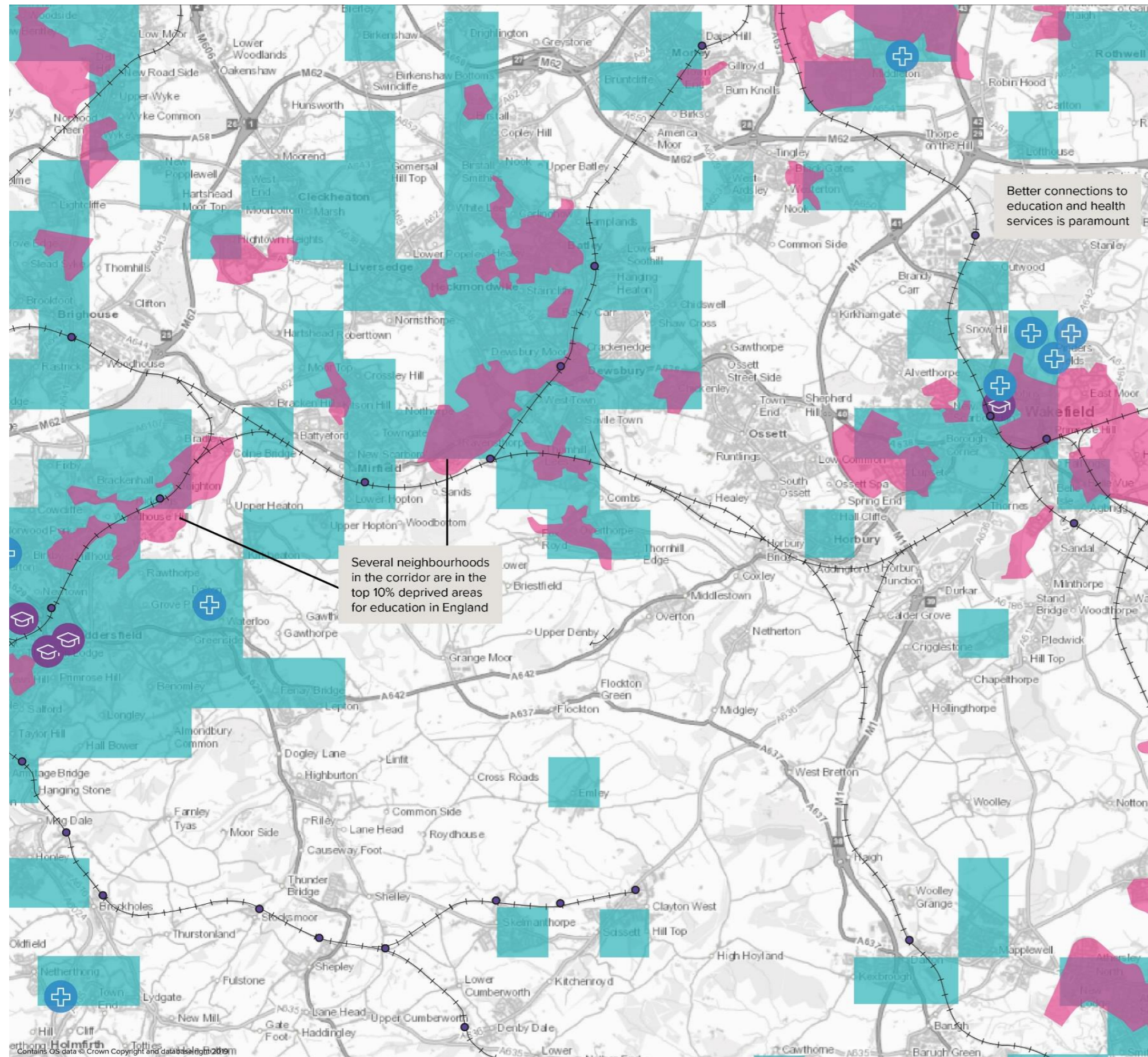**Figure 33: Evidence map for network interventions**
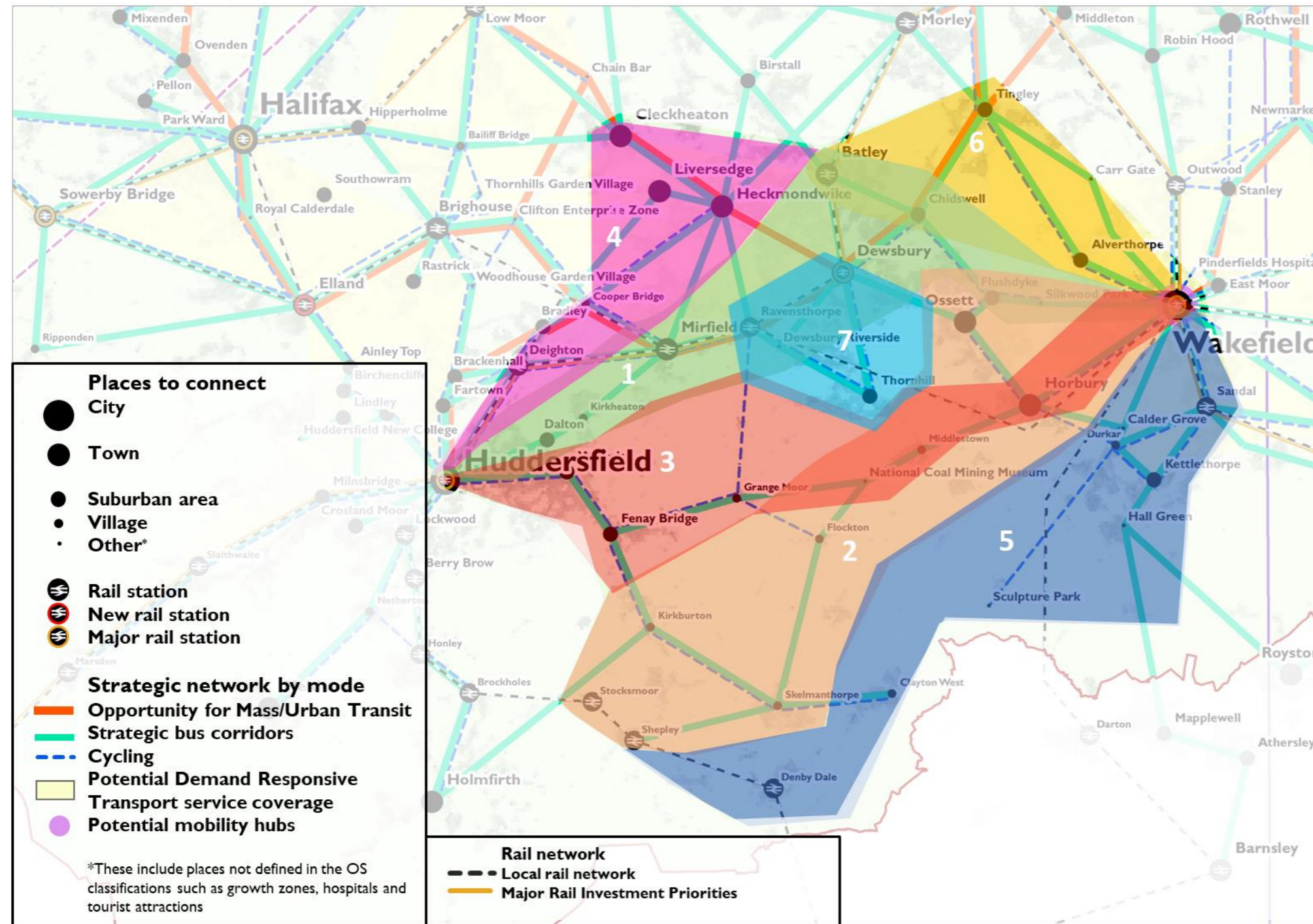
Appendices

A. Spatial context highlights across the regional priorities

Enabling inclusive growth

+++ Rail line

● Rail station

⊕ Hospitals

⊖ Higher education services

⬛ Top 10% deprived areas for education in England

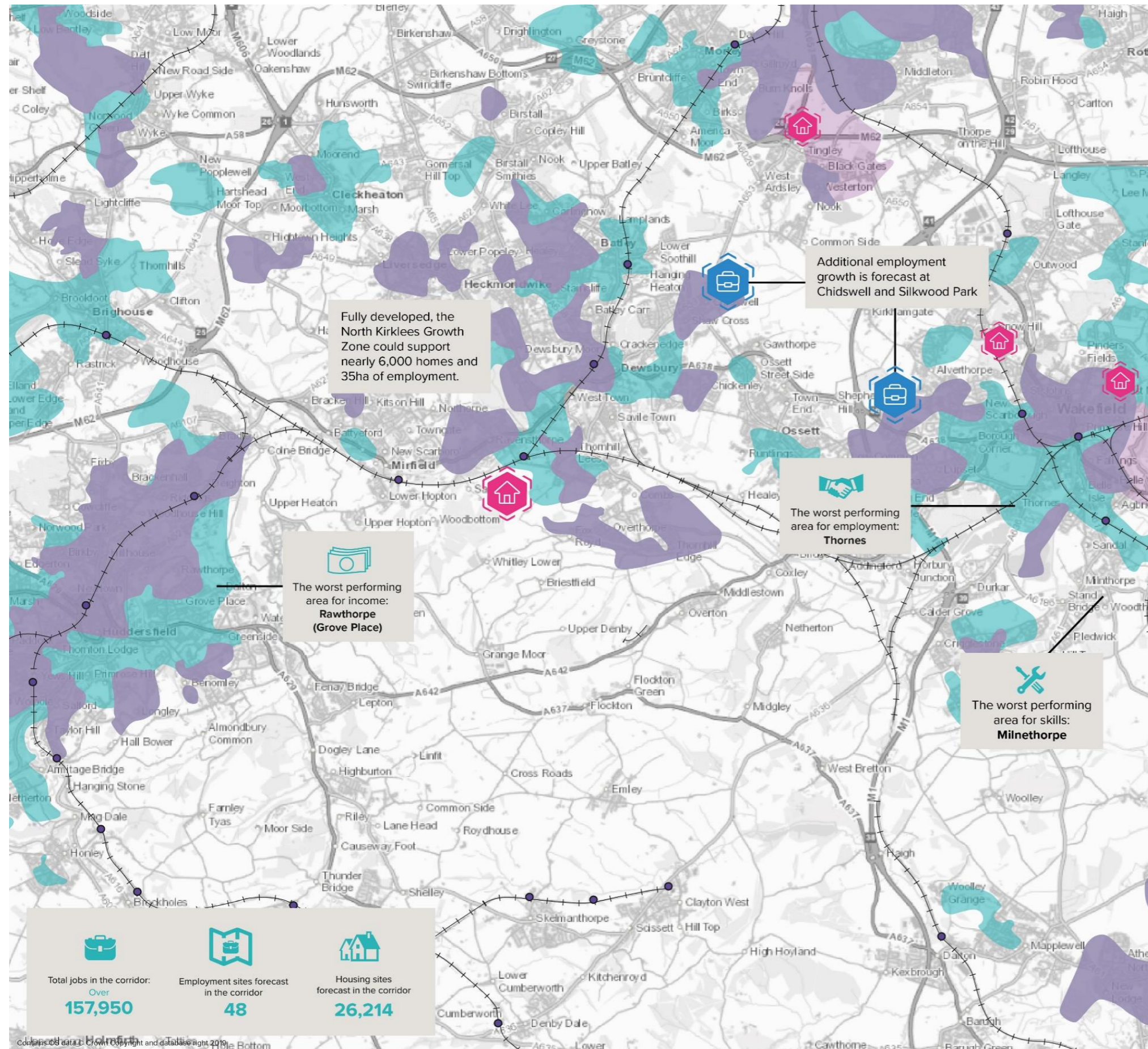⬛ Equality, Diversity and Inclusion (EDI) hotspots

These areas show high concentrations of population, people from "protected characteristic groups" (as defined by the Equality Act 2010, including age, disability, gender reassignment, marriage or civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation), and trip attractor destinations such as schools, hospitals, religious buildings and care homes.

This map shows the inclusivity indicators within the corridor, including education and health services and the spread of Equality, Diversion and Inclusion (EDI) hotspots.

The corridor's health and education centres are focussed in Wakefield and Huddersfield. Having reliable connections to the facilities, as well as employment and growth areas will be an important consideration in enabling inclusive growth.

EDI hotspots are concentrated in the more urban areas of the corridor to the north, such as Huddersfield, Dewsbury and Wakefield where there are many communities with protected characteristics and specific needs. Considerations of these must be made when improving transport services to ensure growth is felt by all, and does not discriminate or divide access between groups of people.

Better connections to education and health services is paramount

Several neighbourhoods in the corridor are in the top 10% deprived areas for education in England
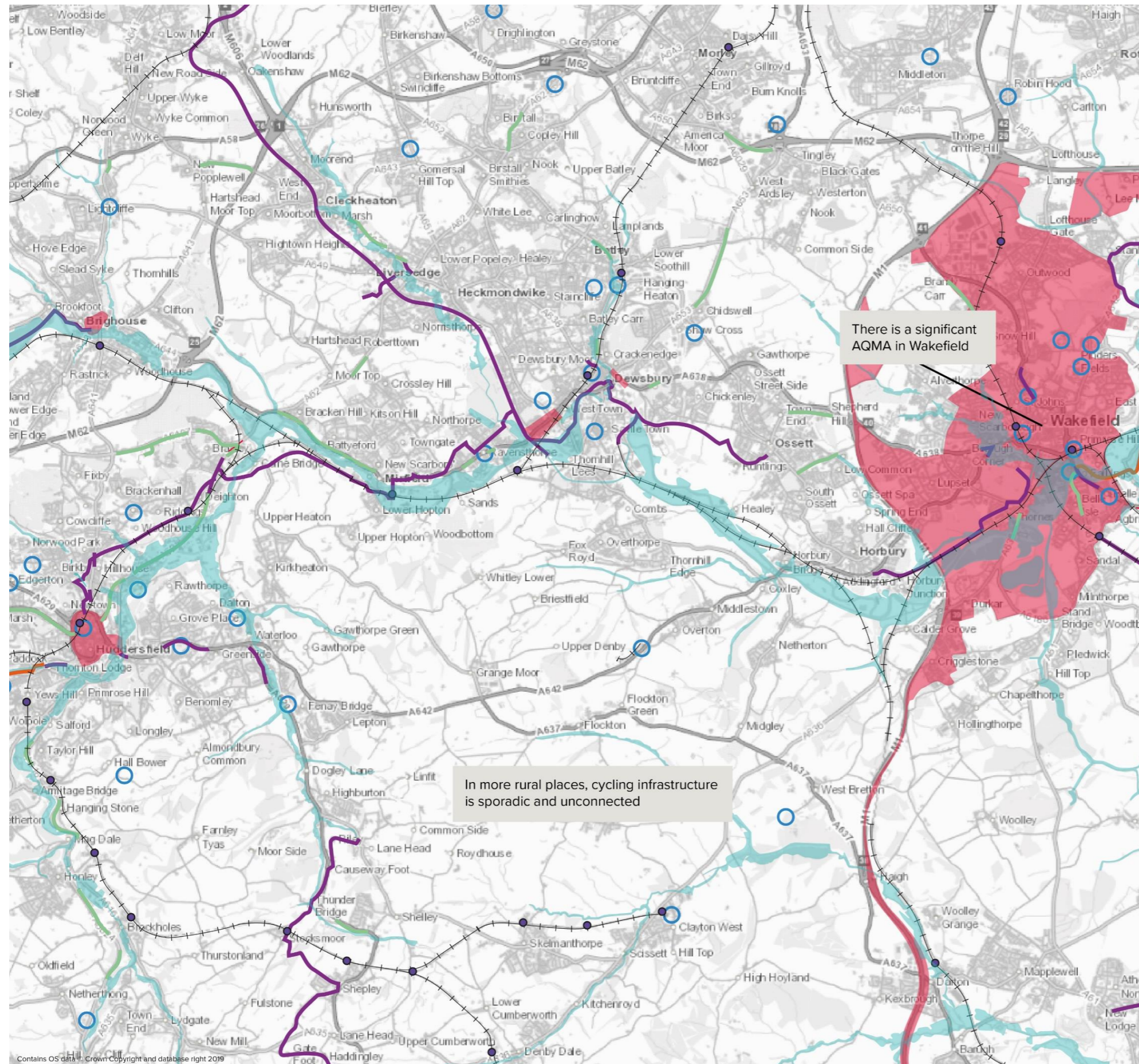
Boosting productivity

Future Growth Sites

⬡ Housing

⬡ Employment

┼┼ Rail line

● Rail station

● Top 20% most deprived in England

● >26% no car ownership

● Top 20% most deprived in England
and >26% no car ownership

This map shows employment and housing growth opportunities and other economic characteristics to understand the corridor's productivity gap.

The North Kirklees Growth Zone is set to add considerable employment opportunities to the corridor, located to the north east of Dewsbury. A large housing site also forms part of the growth zone's aspirations, and substantial housing developments are also proposed around Wakefield and Tingley. Additional employment growth is also forecast at Chidswell and Silkwood Park to the west of Wakefield. Providing access to such sites by public transport and active modes of travel outside of peak hours will help to improve employment opportunities for those in deprived areas.

High levels of deprivation are prevalent in the corridor and cover large areas to the north of the corridor, including Dewsbury, Batley and north east Huddersfield. These areas also have high levels of no car ownership. Therefore, ensuring these communities are connected to growth opportunities will be an important consideration in boosting productivity.

Additional employment growth is forecast at Chidswell and Silkwood Park

Fully developed, the North Kirklees Growth Zone could support nearly 6,000 homes and 35ha of employment.

The worst performing area for employment:
Thornes

The worst performing area for income:
**Rawthorpe
(Grove Place)**

The worst performing area for skills:
Milnethorpe

Total jobs in the corridor:
Over
157,950

Employment sites forecast in the corridor
48

Housing sites forecast in the corridor
26,214

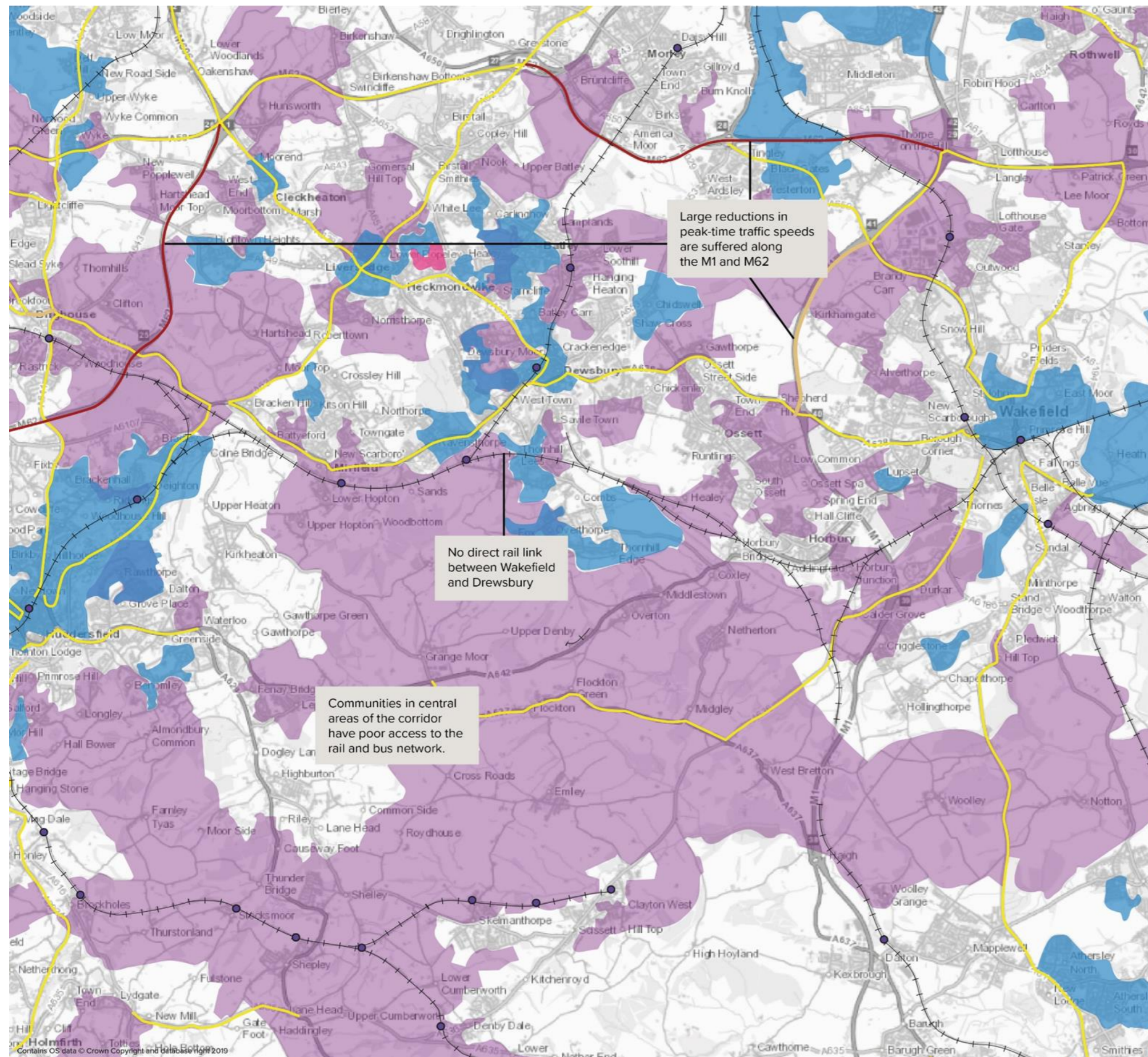**MOTT
MACDONALD**

Tackling the climate emergency

┼┼ Rail line

● Rail station

—— National Cycle Network

—— Cycle City Ambition Grant

—— West Yorkshire National Cycle Lanes

○ Points of interest

● Air Quality Management Area

● Flood Zone 3

These areas are assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), as set out in the National Planning Policy Guidance.

This map shows how the corridor currently stands in relation to delivering clean growth, particularly looking at the active travel network and the air quality management areas (AQMAs). The geography of the corridor means that some areas are of high flood vulnerability, which any interventions will need to take into consideration.

AQMAs in this corridor are concentrated to Huddersfield Town Centre and most of the urban area of Wakefield, with these communities suffering directly from air pollution.

The active travel network varies considerably throughout the corridor with a lack of infrastructure in central and southern areas, presenting a barrier to active travel in these communities. On the other hand, the national cycle network provides east-west connectivity from Huddersfield to Ossett, though this highlights the need to extend the connection to Wakefield to further promote active travel in the corridor.

There is a significant AQMA in Wakefield

In more rural places, cycling infrastructure is sporadic and unconnected

Contains OS data © Crown Copyright and database right 2019

MOTT MACDONALD

Delivering 21st century transport

┼┼┼ Rail line

● Rail station

● Isolated communities

These are areas where the distance travelled to work and the average number of destinations people can reach for journeys to work across the Leeds City Region, are lower than the national average. This is based on the approach adopted for the Joseph Rowntree Foundation for "Tackling transport related barriers to employment in low-income neighbourhoods".

Bus service provision (in the morning peak)

● Poor (1 bus per hour)

● Non-existent (0 buses per hour)

Congestion: Speed reduction due to peak-time congestion

━━ Over 30 kmph

━━ Between 20 – 29 kmph

━━ Between 10 – 19 kmph

This map shows the existing transport network including rail lines and stations, highway congestion performance and the bus service provision.

There is congestion on sections of the M1 and M62 hindering north-south and east-west connectivity. Key A-Roads, such as the A638 and A637 also experience peak time delays, slowing connections to and within the corridor.

There are good rail links along the Trans Pennine Line between Batley through to Huddersfield. However, there is no direct rail link from Wakefield to Dewsbury and rural communities in central and the southern areas of the corridor have poor accessibility to the rail network.

The disparity in travel horizons within the corridor is also highlighted by the bus level of service; large areas of Huddersfield, Dewsbury and Wakefield are served by 3-4 buses per hour, whereas communities such as Flockton, Denby Dale and Middlestown are served by one bus per hour.

Callouts on map:
- Large reductions in peak-time traffic speeds are suffered along the M1 and M62
- No direct rail link between Wakefield and Drewsbury
- Communities in central areas of the corridor have poor access to the rail and bus network.

MOTT MACDONALD

B. East Kirklees to Wakefield: Investment Case

The highest scoring "connectivity concepts" represent the corridor's spatial priorities. For this corridor these are the Light Green, Brown and Red concepts, the best performing concepts for connectivity *to and from* East Kirklees to Wakefield. These connectivity concepts are used as the framework for developing interventions that will address the Leeds City Region's future connectivity requirements and improve travel horizons throughout the corridor.

B.1 Developing interventions

Potential route alignments are identified as ways to provide the connections within the "connectivity concepts". For example, potential route alignments could be road corridors, disused railway lines, canal towpaths, watercourses or public rights of way. The route alignments remain conceptual and mode agnostic, but as they are considered in further detail, can become more mode-specific as interventions.

Interventions are identified from stakeholder feedback, consideration of previous feasibility studies, and a detailed desktop gap analysis. The latter looks at existing (current and disused) transport provision and networks, and the current pipeline of works in the corridor[20] to identify new interventions that will provide improved connectivity opportunities for the future, by giving greater breadth and opportunity to travel, and increasing travel horizons. Scheme types include: active travel – walking and cycling (both on and off road), bus corridor treatment (bus priority measures and/or road space reallocation), bus service, masterplanning and "Streets for People", Park & Ride, rail, highways and transit concepts (e.g. BRT, tram train etc).

Additional emphasis was put on identifying short to medium term interventions to support the development of the emerging programme for the West Yorkshire Transforming Cities Fund (TCF) bid.

The following diagram summarises the process for developing interventions.
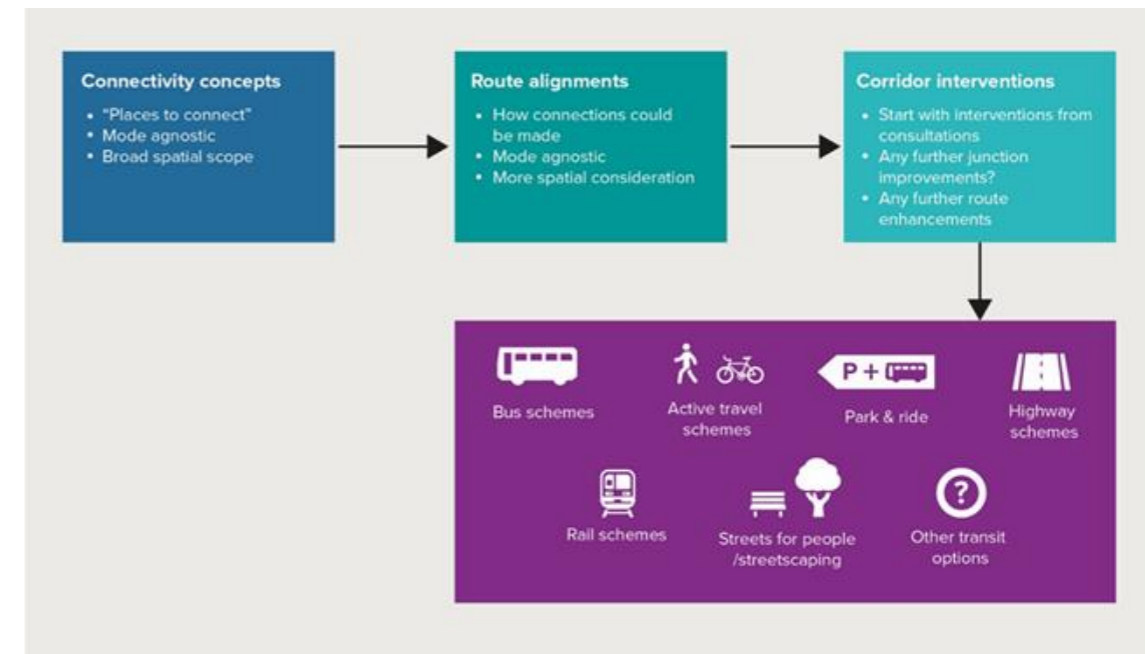

All interventions have been assigned a scheme type, a high-level deliverability and timescale attribute, as follows:

- Scheme types
  - Active travel scheme (on and off-road walking and cycling)
  - Bus corridor treatment (bus priority measures and/or road space reallocation)
  - Bus service
  - Masterplanning / Streets for People - Improved urban realm and accessibility for pedestrians and cyclists
  - Park & Ride
  - Rail
  - Highways
  - Transit concepts (e.g. BRT, tram train etc).
- Delivery timescales: short, medium, long term.
- Technical complexity: low, medium, high.
- Connectivity concept: identifies the connectivity concept each scheme aligns to

The result of the process above is a long list of 168 interventions for the East Kirklees to Wakefield corridor. The alignments for these are mapped in Figure 34.

---

[20] e.g. West Yorkshire Transport Fund, Cycle City Ambition Grant, Leeds Public Transport Investment Programme and the West Yorkshire Local Cycling and Walking Investment Plan

Figure 34: East Kirklees to Wakefield Corridor – alignments for all interventions in the long list
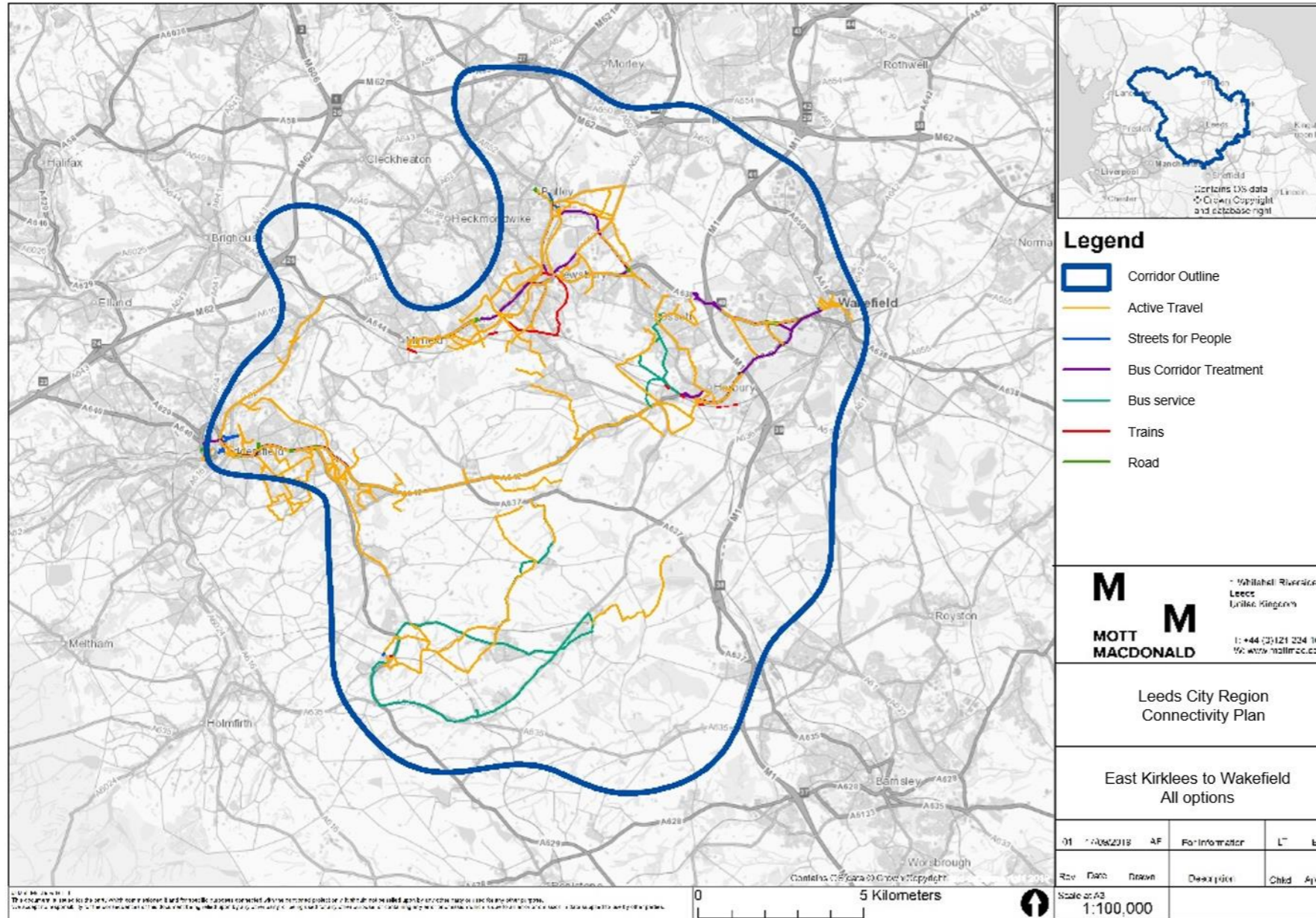
B.2 Interventions

The initial long-list of options for transport connectivity improvements has been produced by Mott MacDonald consultants. These proposals have been identified through high-level assessment of the evidence. Feasibility work will be required to develop deliverable schemes that best provide the connectivity required. The list has been collated with the long-list outputs of other Case for Change reports and the outputs of aligned workstreams such as the Leeds City Region Rail Vision and Capacity study and the Leeds City Region Emissions Reduction Pathway study to inform the West Yorkshire Connectivity Investment Plan and pipeline. The consolidated initial long-list can be found in Appendix 2 to the WY Connectivity Plan. Programme C - Options for delivery between 2026 – 2040.

mottmac.com