

West Yorkshire Connectivity Plan

Leeds to Huddersfield: Case for Change

November 2020

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1 Introduction

1.1 The role of this Case for Change report

This Case for Change report for Leeds to Huddersfield 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 long-list 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, a 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 2040s.

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, sets 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.

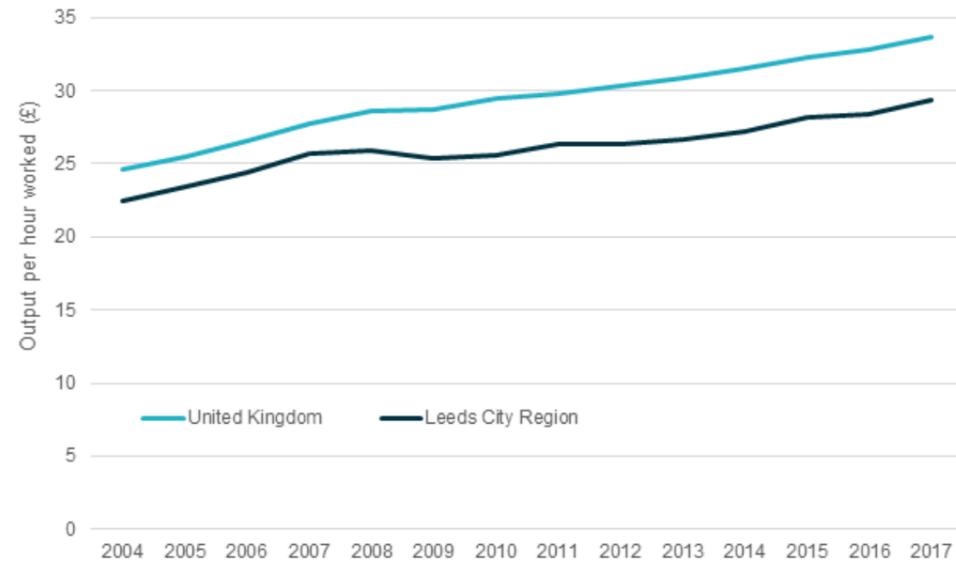
Twelve Case for Change reports have been produced with the input of the partner councils, which study corridors covering the geography of West Yorkshire and including parts of the wider City Region, to provide detailed evidence of connectivity needs. These Case for Change reports should be read in conjunction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



1.3 West Yorkshire’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 Combined Authority have stalled with a number of communities facing persistent poverty.

Figure 1: Illustration of productivity gap in West Yorkshire



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 41% of Leeds’ and 35% of Kirklees’ total CO₂ emissions¹. This needs immediate action as transport emissions are expected to grow, constraining the Combined Authority’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.

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

Table 1: West Yorkshire’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

1.4 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 will 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 Leeds to Huddersfield corridors highlighted in red.

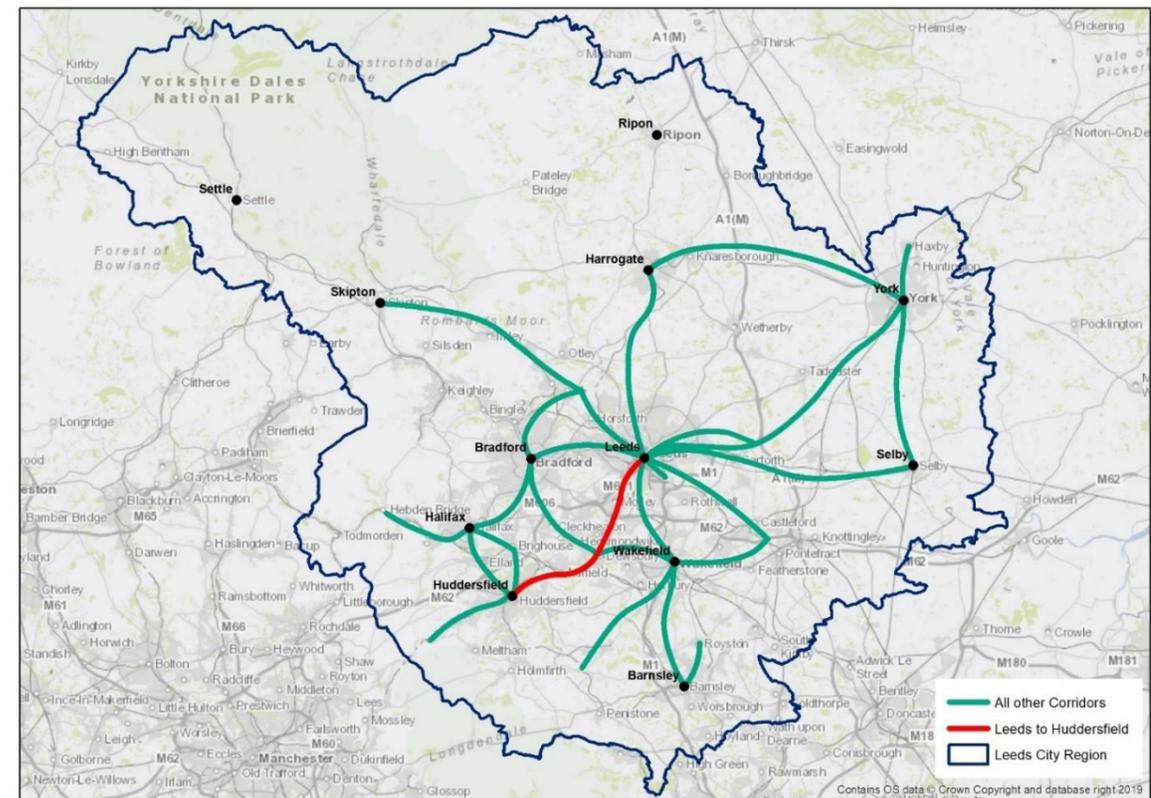
Table 2: Reporting Index

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

Figure 2: West Yorkshire Connectivity Plan: Corridor Outlines



Figure 3: West Yorkshire Connectivity Plan: Corridor Map



The corridor extends in a southwest direction from Leeds to Huddersfield, including Dewsbury. It covers an area characterised by high population densities and levels of existing employment.

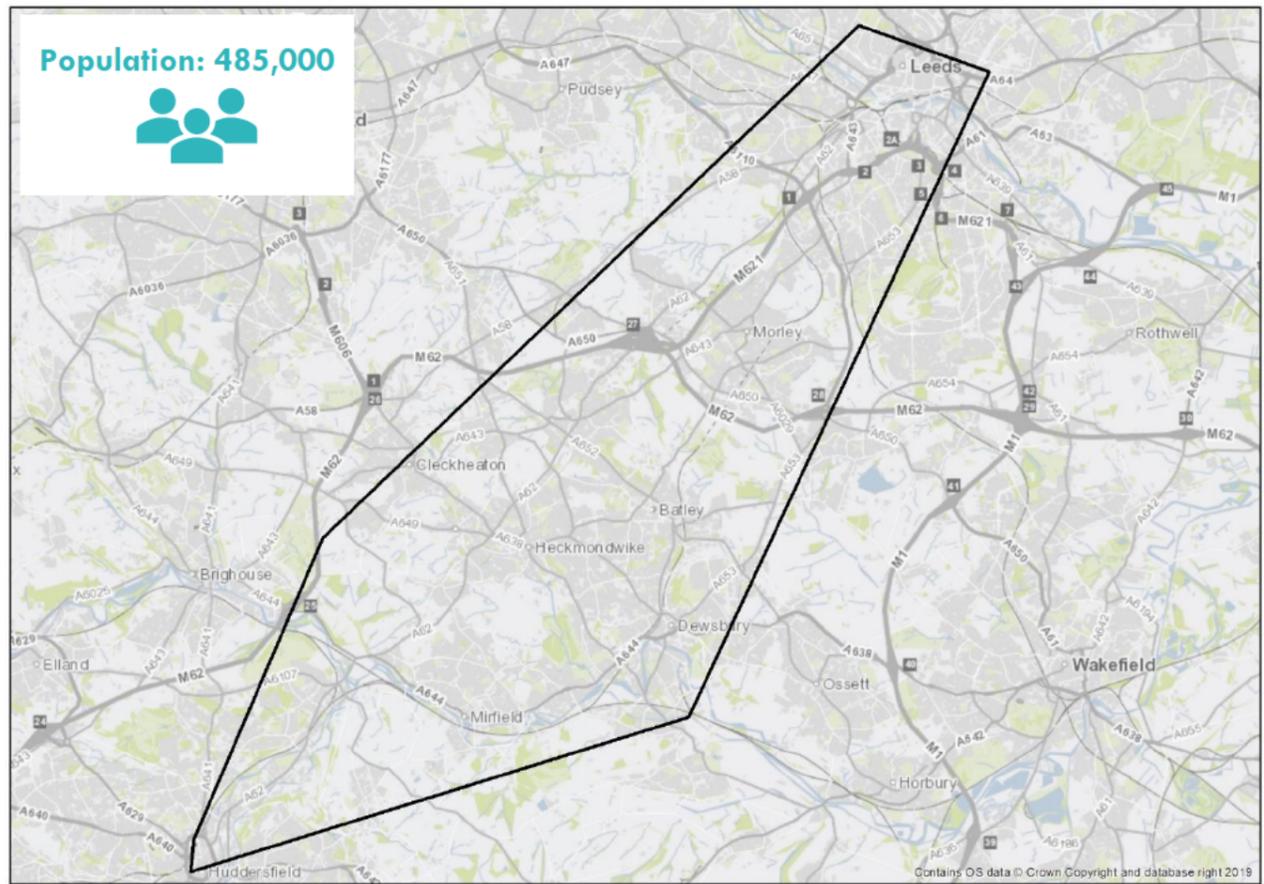
This route has already been considered in an earlier study (as part of the first phase of the West Yorkshire Connectivity Plan in Spring/Summer 2018). The findings from this earlier study have been taken and aligned with the second phase of the Connectivity Plan and are presented in this report.

1.5 Leeds to Huddersfield: at a glance

The following two pages provide some highlights for this study area – 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.

Leeds to Huddersfield: socio-economic profile

This corridor examines movements between Leeds and Huddersfield. It covers an area characterised by high population densities and levels of existing employment. However, these are largely low wage opportunities, highlighted by the average household income in the corridor being lower than both the national and regional averages. There are a high number of new employment and housing growth forecast throughout the corridor and connectivity to future growth sites is fundamental to enable inclusive growth throughout the Leeds City Region.



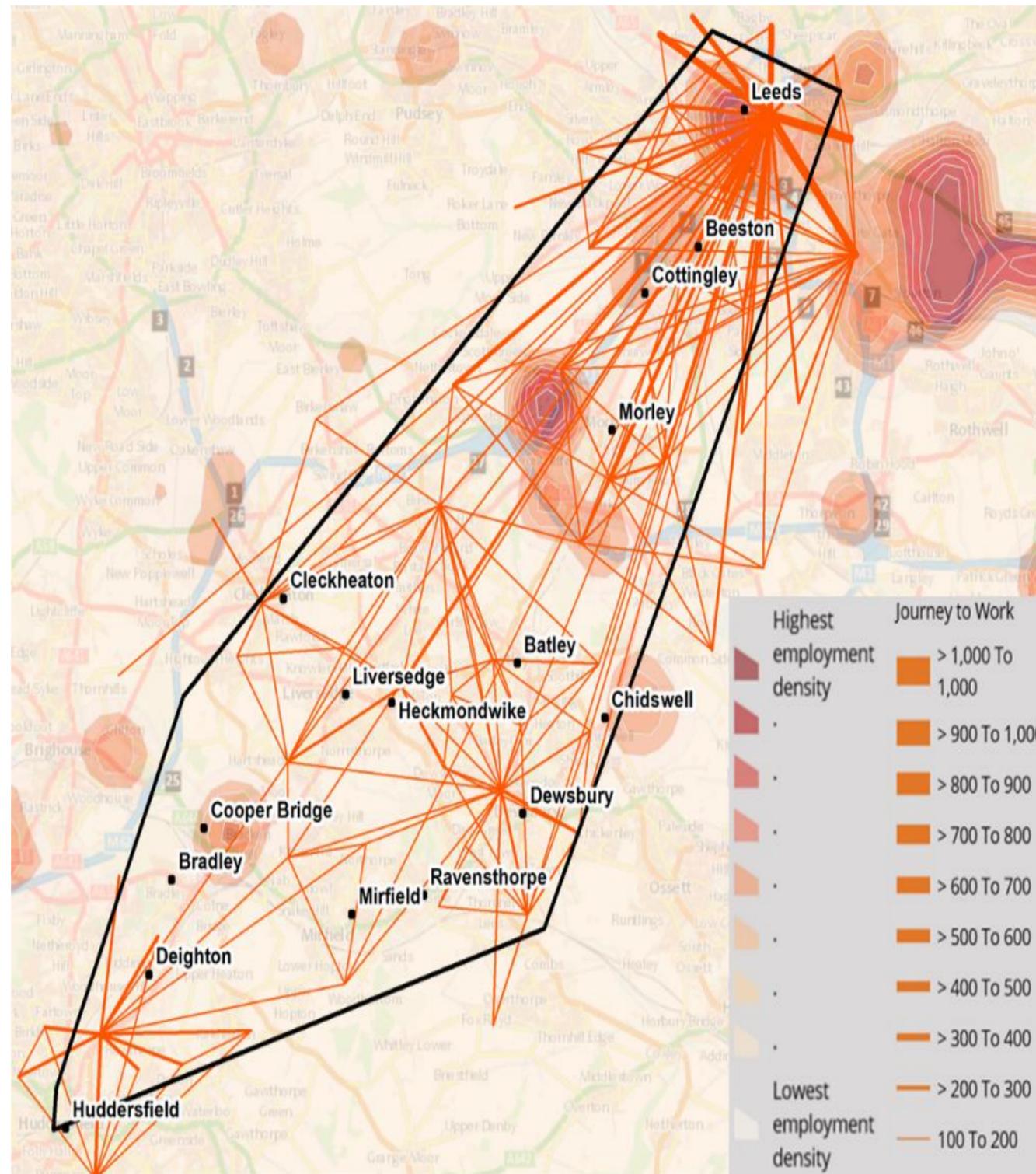
Places with challenges for:



Places with opportunities for:



Leeds to Huddersfield – connectivity highlights



There are spatial variations across this corridor. Some communities in Huddersfield, Dewsbury and Leeds are characterised by low travel horizons, and a range of deprivation characteristics, including low car ownership and narrow employment prospects. In a zero-carbon future, these communities need better local and strategic connectivity to ensure that they can overcome these issues and benefit from employment opportunities via sustainable modes.

There is also a lack of consistency in terms of the public transport options. The Transpennine route provides access to longer distance opportunities within and beyond the corridor. Other places, especially in North Kirklees, are characterised by poor public transport connectivity. Providing better connectivity by various modes of transport (not just the private car) is essential to achieving the inclusive growth potential of the area.

Key connectivity challenges:

- Existing employment opportunities are not well served by public transport and have working patterns that fall outside traditional public transport operating hours. Overcoming this would help to **boost productivity**
- Poor historic connections have resulted in communities being isolated and an under-utilised labour force. These need to be overcome to ensure **inclusive growth**
- Congested road network causing air quality issues, highlighted by air quality management areas (AQMAs). These must be addressed to **tackle the climate emergency**
- Accessibility gaps in areas of North Kirklees where there is no access to the rail network. End-to-end bus journey times are long with Huddersfield to Leeds taking almost two hours. This restricts the delivery of a **21st century transport system**

Investment is required to improve connectivity, both for local trips within North Kirklees and to opportunities in Leeds. 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.

2 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 key 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 top 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

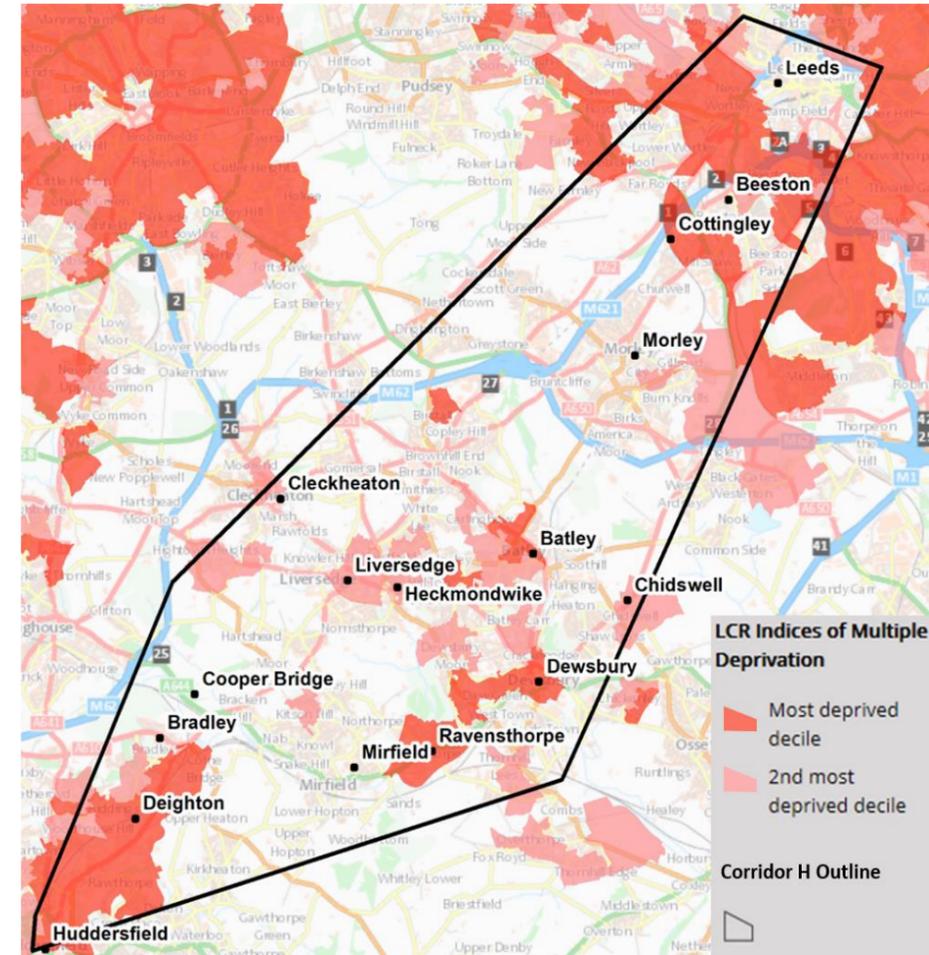
2.1 Enabling Inclusive Growth

2.1.1 Deprivation

Figure 4 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 nationally². The index of multiple deprivation is an overall relative measure of deprivation constructed by combining seven domains of deprivation according to their respective weights.³ 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 4: Areas of high deprivation



Source: Mott MacDonald

There are areas of deprivation across the corridor, including south west areas of Leeds such as Cottingley, as well as Batley and Dewsbury and areas to the north east of Huddersfield. These are associated with poor levels of health and economic activity.

Deighton, Dewsbury and Batley are in the top 10% deprived areas for education in England. **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 growth⁴.**

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

³ ibid

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>

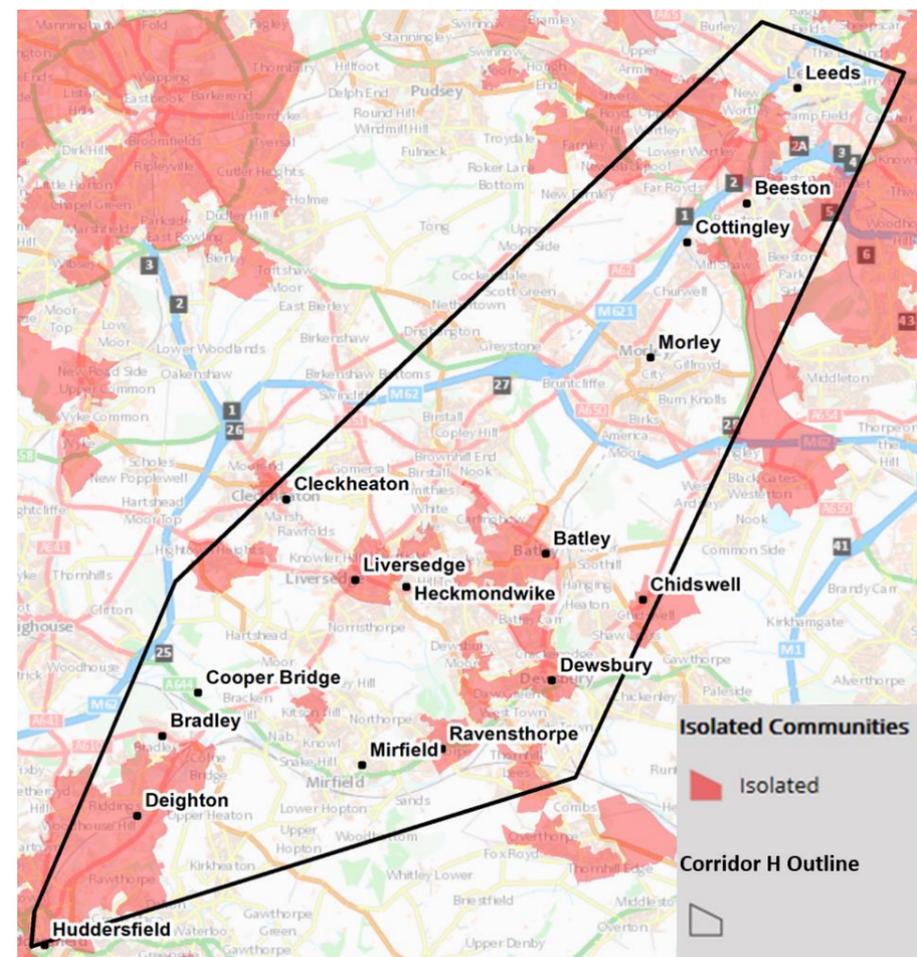
2.1.2 Isolated communities

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 affordability⁵.

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 to the north east of Huddersfield and south west of Leeds, as well as Dewsbury and Batley, that are defined as “isolated communities” (see Figure 5).

Figure 5: Isolated communities



Source: Mott MacDonald

Around 78,000 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 therefore fundamental to achieving inclusive growth⁶.

2.1.3 Car ownership

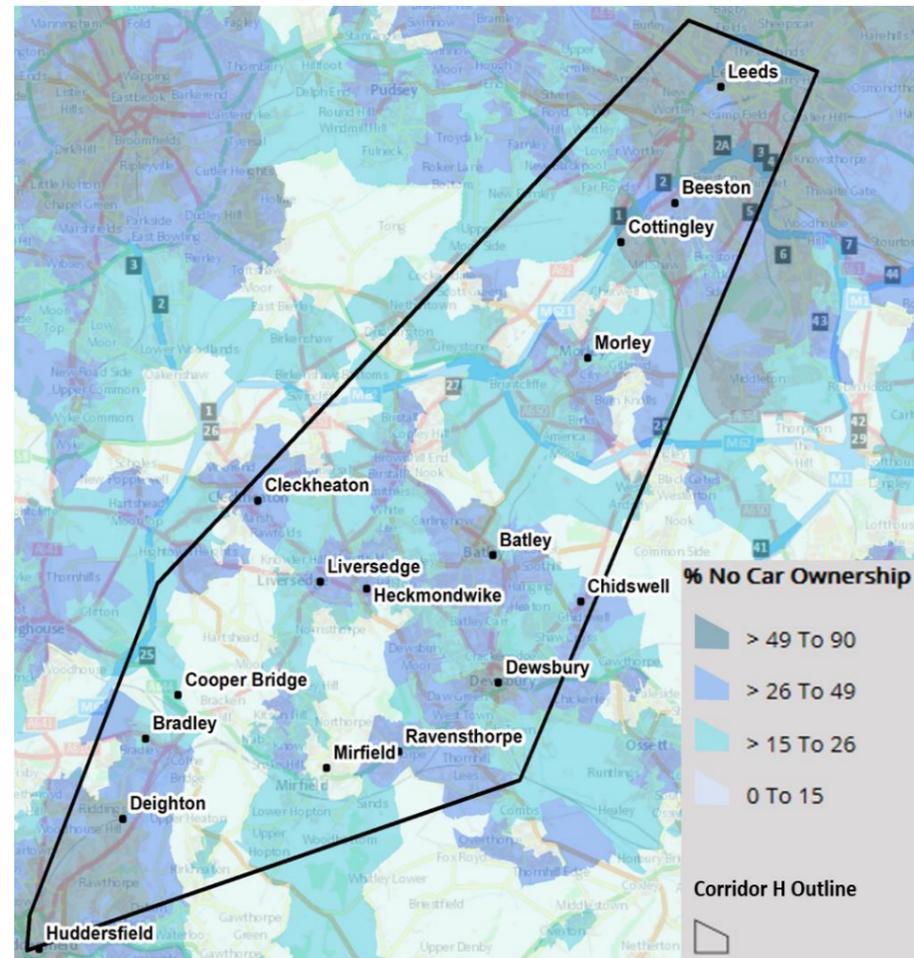
The motorway network ensures that some of these areas are reasonably well connected. **However, there are several areas in Huddersfield through to Bradley, Dewsbury and Cottingley which are characterised by low car ownership** (see Figure 6), meaning that not everyone can benefit from the connectivity opportunities this brings.

Ensuring that key employment areas are connected by good public transport links in both on 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.

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

⁶ Tackling transport-related barriers to employment in low-income neighbourhoods (2018) accessed via: <https://www.irf.org.uk/report/tackling-transport-related-barriers-employment-low-income-neighbourhoods>

Figure 6: % No car ownership



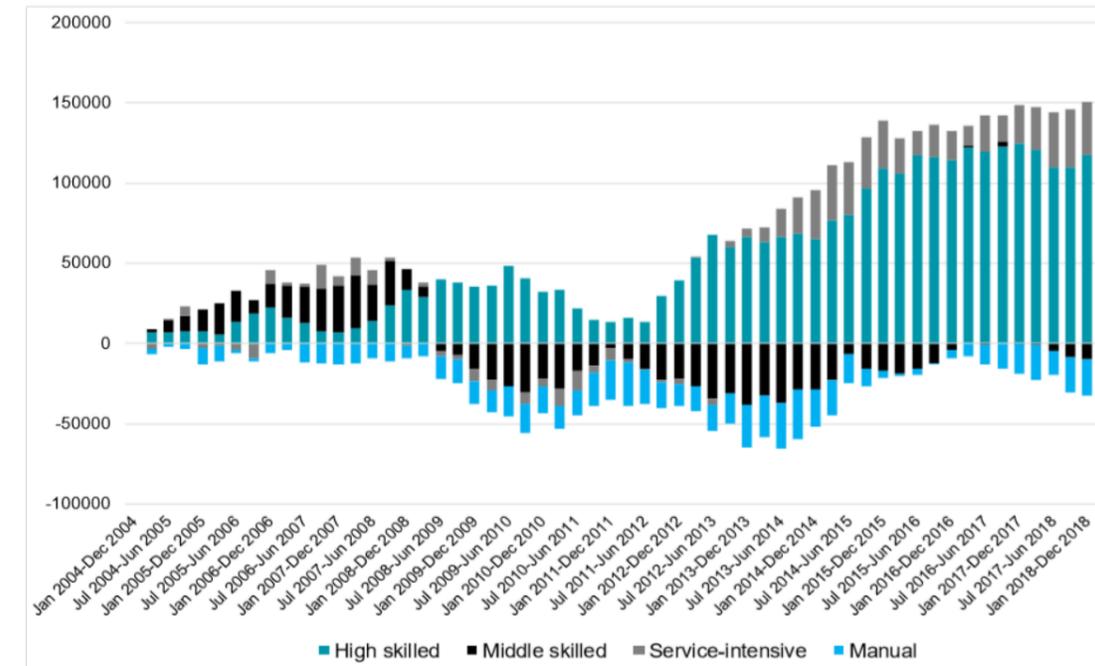
Source: Mott MacDonald

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 7). Within this corridor, this includes opportunities in the wholesale and retail sectors. This affects commuting flows as these workers often commute further and travel more. Having an effective and reliable transport system is therefore paramount to maximise productivity in the region.

Figure 7: Occupational contribution to cumulative employment growth



Source: Emerging West Yorkshire Industrial Strategy

The Leeds to Huddersfield corridor has some distinct employment characteristics and strengths.



Total jobs in the corridor:

Over
284,000



% in employment:

59%

Yorkshire and Humber
60%

England and Wales
62%

In terms of number of employees, the wholesale and retail, professional, scientific and technical and financial and insurance sectors have over *one and a half times the national average*⁷ in this corridor.

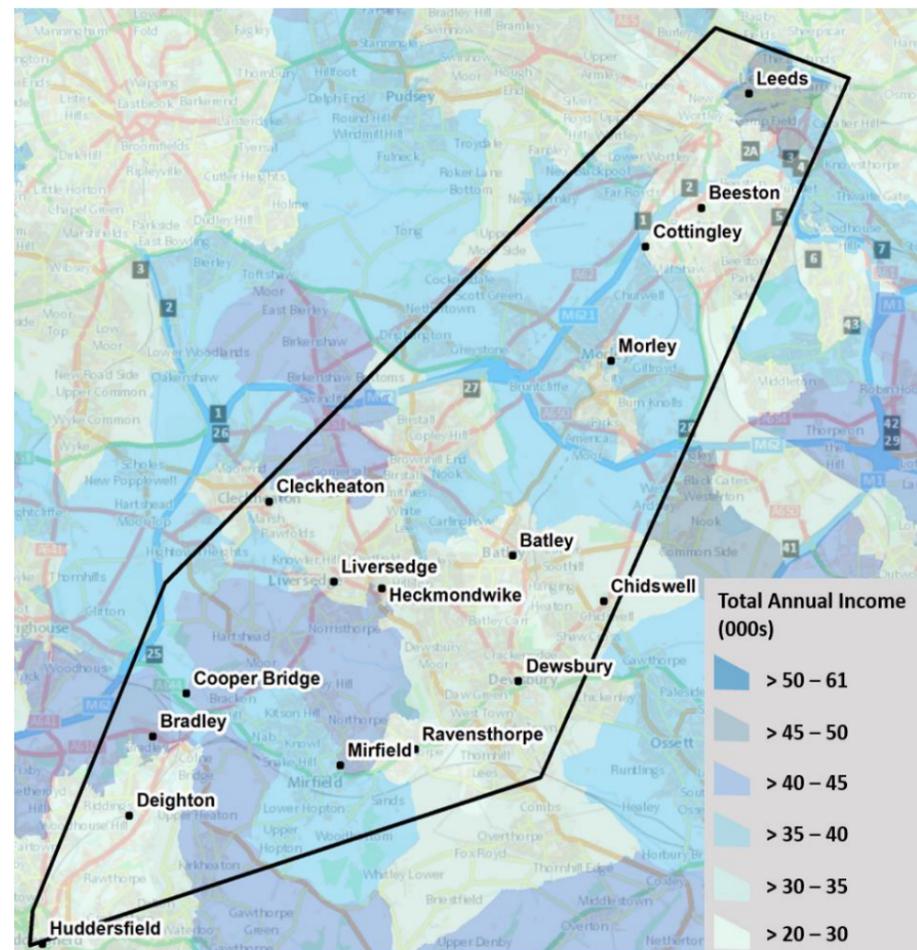
Elsewhere, manufacturing accounts for over 40% of jobs, such as around Batley and Ravensthorpe, highlighting the diversity of the jobs market in the corridor.

Connectivity to these specialisms is fundamental to boosting productivity.

2.2.2 Household income

Average total annual household income in the corridor (£34,000) is lower than the average for England and Wales (£41,642) and that for Yorkshire and Humber (£36,526). Household income is particularly low in Deighton, Ravensthorpe and Batley at less than £30,000 (shown in Figure 8). The emerging Industrial Strategy identifies that the gross value added per head (GVA) for Kirklees is 70% of the UK average and has seen an average growth rate of 2.9%. This general measure of prosperity shows the need for action to boost productivity, including better connections in the area to create opportunities to help enhance the economy.

Figure 8: Total annual household income



Source: Mott MacDonald

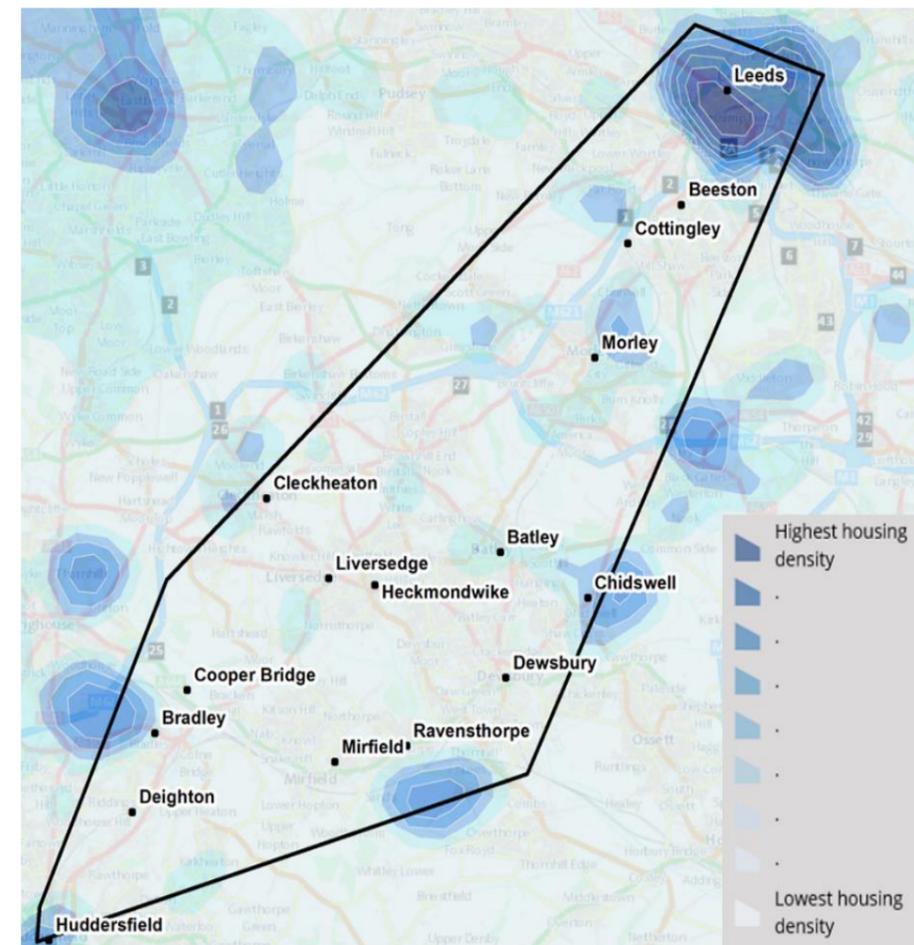
Connecting areas of deprivation and low annual household income is important to provide opportunities for people to access education and employment and in enabling inclusive growth throughout the corridor.

2.2.3 Growth areas

The Leeds to Huddersfield corridor is subject to several growth plans. The emerging Industrial Strategy for the Leeds City Region highlights that over the past five years business base growth in Leeds has occurred faster than the UK. However, Kirklees' business growth has been slower, at around 17%. This emphasises the need for good transport options connecting Kirklees businesses to potential employees and custom.

Figure 9 shows a heatmap of housing growth sites in the Leeds to Huddersfield corridor. Additional housing is mainly proposed in Leeds city centre, including the development of the Leeds Southbank. This development will double the size of the city centre and includes the development of around 8,000 new homes. Dewsbury Riverside (adjacent to Ravensthorpe) is also a large housing site located in the corridor with plans for up to 4,000 dwellings, along with sites at Bradley (1,600 dwellings) and Chidswell (1,500 dwellings).

Figure 9: Housing growth sites heatmap



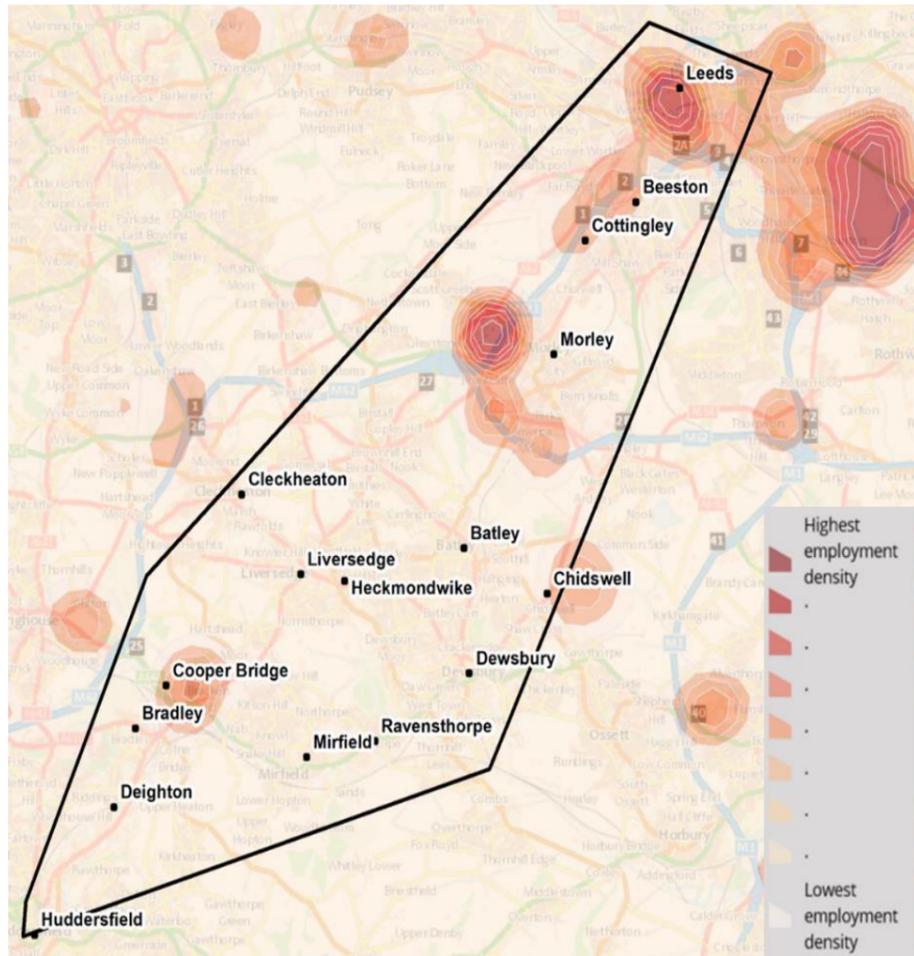
Source: Mott MacDonald

⁷ Business Register and Employment Survey: open access (2017)

Housing growth in the corridor emphasises the need to improve public transport connectivity to these areas and existing communities, to enable access to employment opportunities for everyone.

As well as housing growth, employment growth is being promoted in the area; particularly in Leeds city centre (see Figure 10). There are also large employment sites allocated at Morley (71ha), Cooper Bridge (46ha) and Chidswell (60ha) with the latter two sites included in the Leeds City Region Strategic Economic Plan⁸

Figure 10: Employment growth sites heatmap



Source: Mott MacDonald

⁸ The Leeds City Region Strategic Economic Plan 2016 - 2036

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 MtCO₂e/year (millions of tonnes of carbon emissions per year). Transport sector emissions are dominated by emissions from road transport with 4.4 MtCO₂e/year being from road transport⁹, representing roughly 40% of total CO₂ emissions in West Yorkshire (11.1 MtCO₂e/year)¹⁰. 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)¹¹.

The Combined Authority published, in July 2020, the findings of a Carbon Emissions Reduction Pathways (CERP) study¹². 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 (NO₂) and particulate matter (PM_n) which

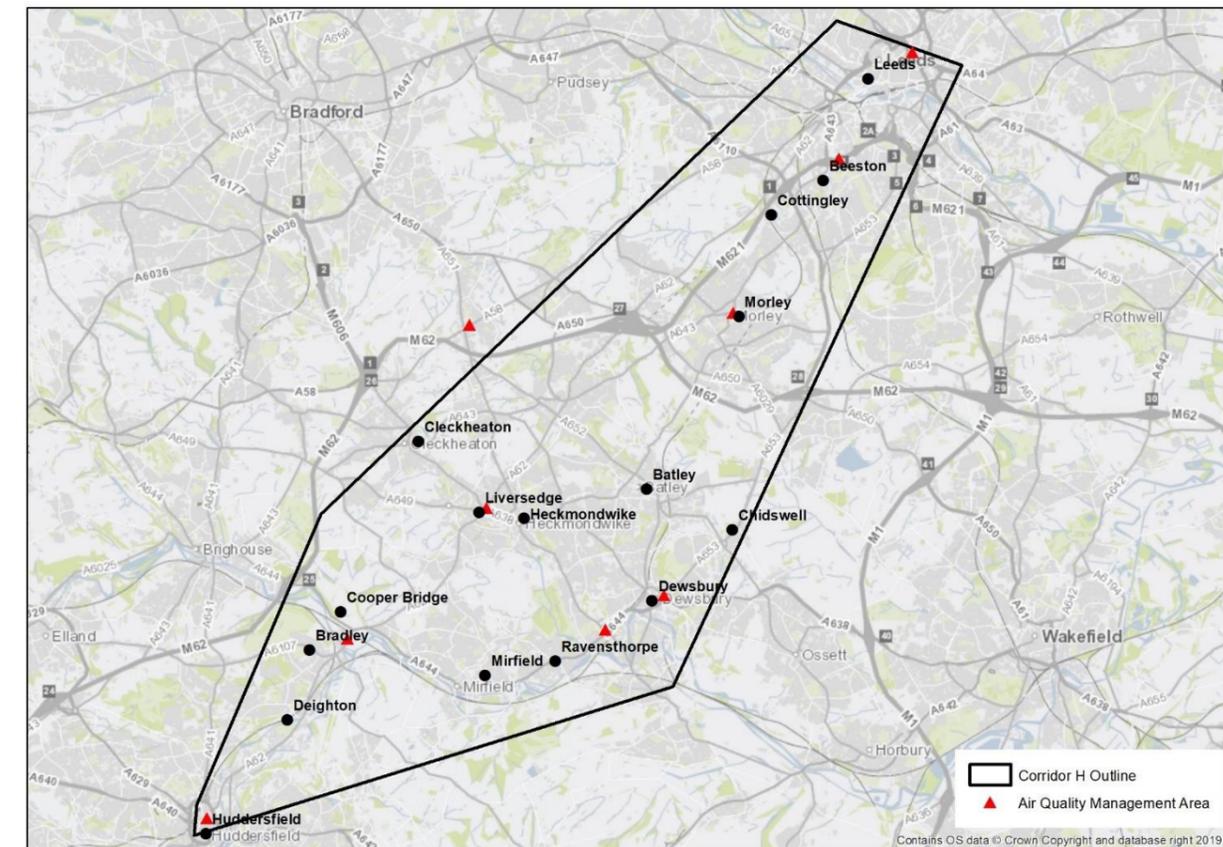
have an adverse impact on health and mainly result from emissions from traffic, particularly exhaust emissions from older diesel vehicles.

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 declared¹³.

There are 8 small, localised air quality management areas located along the corridor, as shown in Figure 11. Air quality has also been highlighted as an issue in Leeds with proposals being developed for a Leeds Clean Air Zone (CAZ). The Leeds CAZ will be introduced in 2021 at the earliest to help reduce air pollution and protect the health of everyone in Leeds. This includes Leeds city centre and in an arc to the north from west to and east; Farsley, Headingley, Roundhay, Harehills, Cross Gates and Temple Newsam.

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 11: Air Quality Management Areas (AQMAs)



Source: Mott MacDonald

⁹ West Yorkshire Combined Authority, 2020. West Yorkshire Carbon Emission Reduction Pathways Key Findings Report. Available at: <https://westyorkshire.moderngov.co.uk/documents/s16572/Item%2011%20-%20Appendix%201.pdf>

¹⁰ ibid

¹¹ ibid

¹² ibid

¹³ 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 cycle and walk more safely, and more often, has a significant role to play in the strategic transport network in West Yorkshire and the wider Leeds City Region.

Within this study area, the current provision of cycle and walking routes is through the National Cycle Network (NCN), which provides an off highway route from east to west. Sustrans, the national cycling and walking charity who manage 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'.

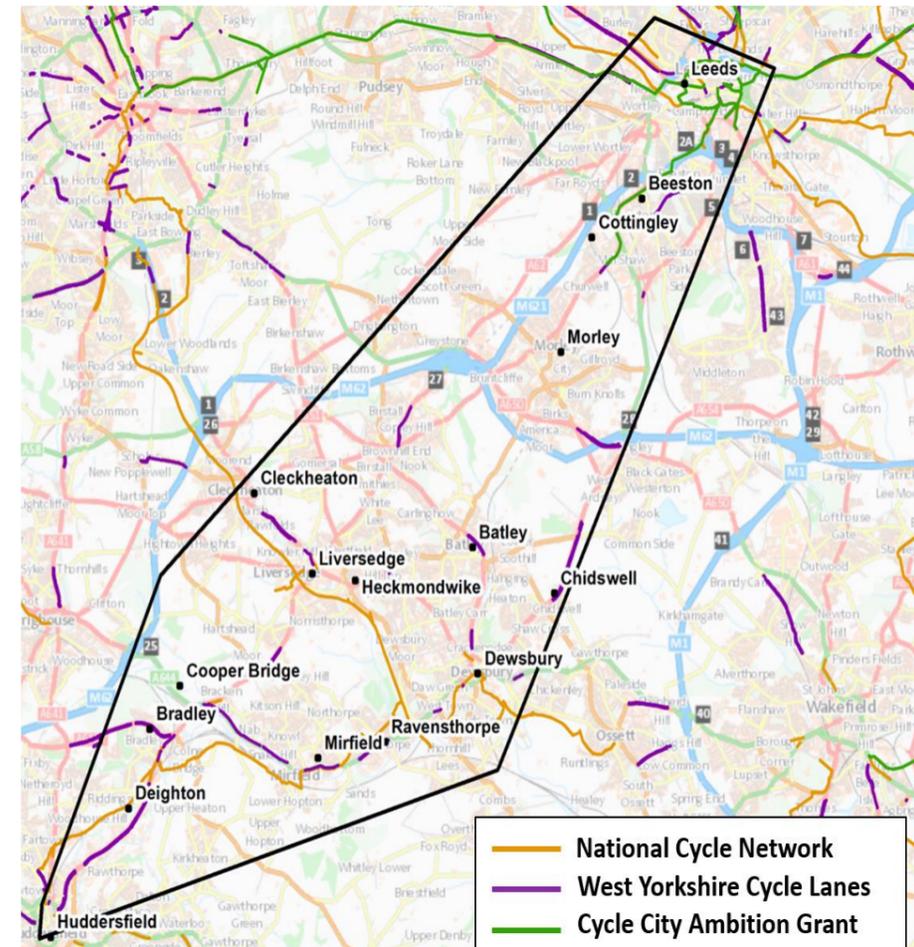
The Calder Valley Greenway towards Huddersfield and Brighouse provides a relatively good off-highway route, and links to the Bradley to Birkby greenway, whilst the Spen Valley Greenway provides a mainly traffic-free route between Dewsbury and South Bradford.

Figure 12 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 funded through the Cycle City Ambition Grant. 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 Dewsbury towards Leeds there is little or no provision of on or off-highway cycling infrastructure, and whilst there is a more challenging topography towards Tingley, high quality provision can provide people with the space and safe routes to overcome these challenges.

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 a lack 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.

Figure 12: Cycle network

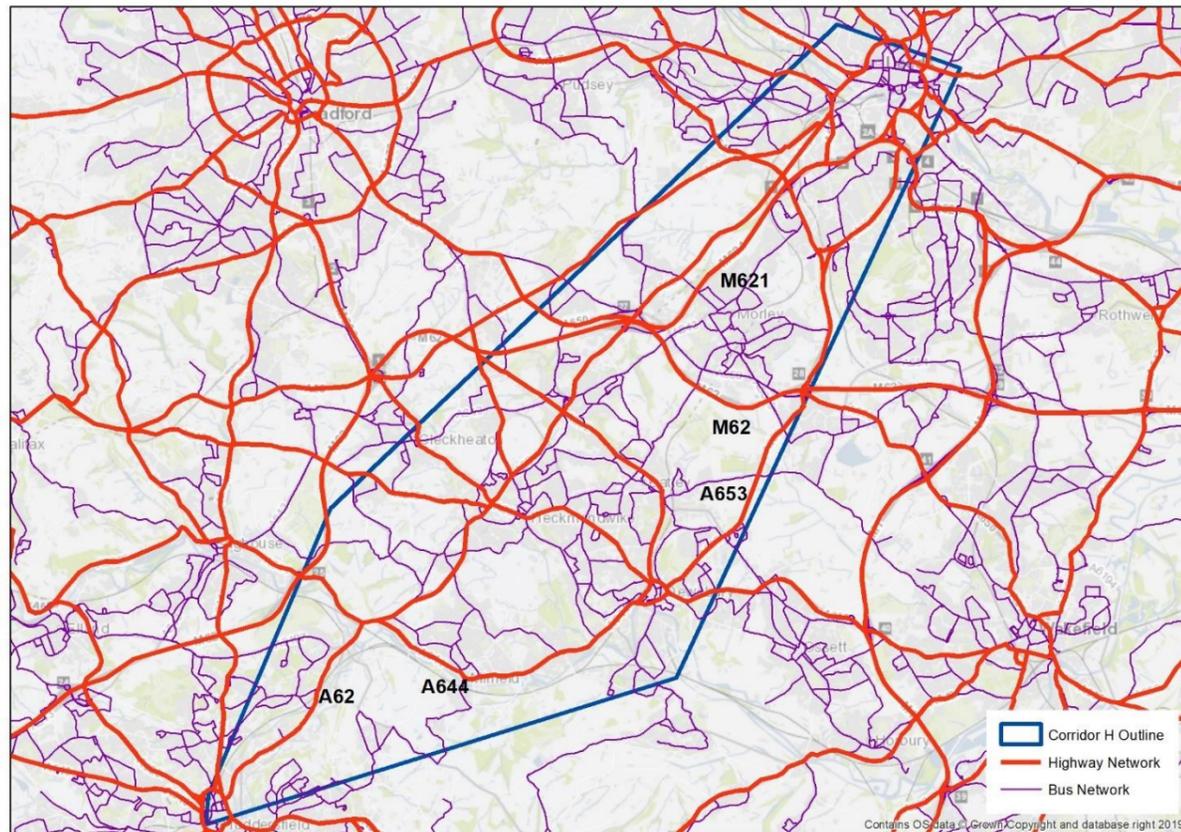


Source: Mott MacDonald

2.4.4 Road

Figure 15 presents the current road and bus networks throughout the corridor. The strategic road network includes the M62 which bisects the corridor and the M621 connecting North Kirklees to Leeds. Other key routes include the A62 and A653 connecting Huddersfield and Dewsbury to Leeds and the A644 which connects Huddersfield to Dewsbury.

Figure 15: Current bus and highway network (A roads and motorway networks)



Source: Mott MacDonald

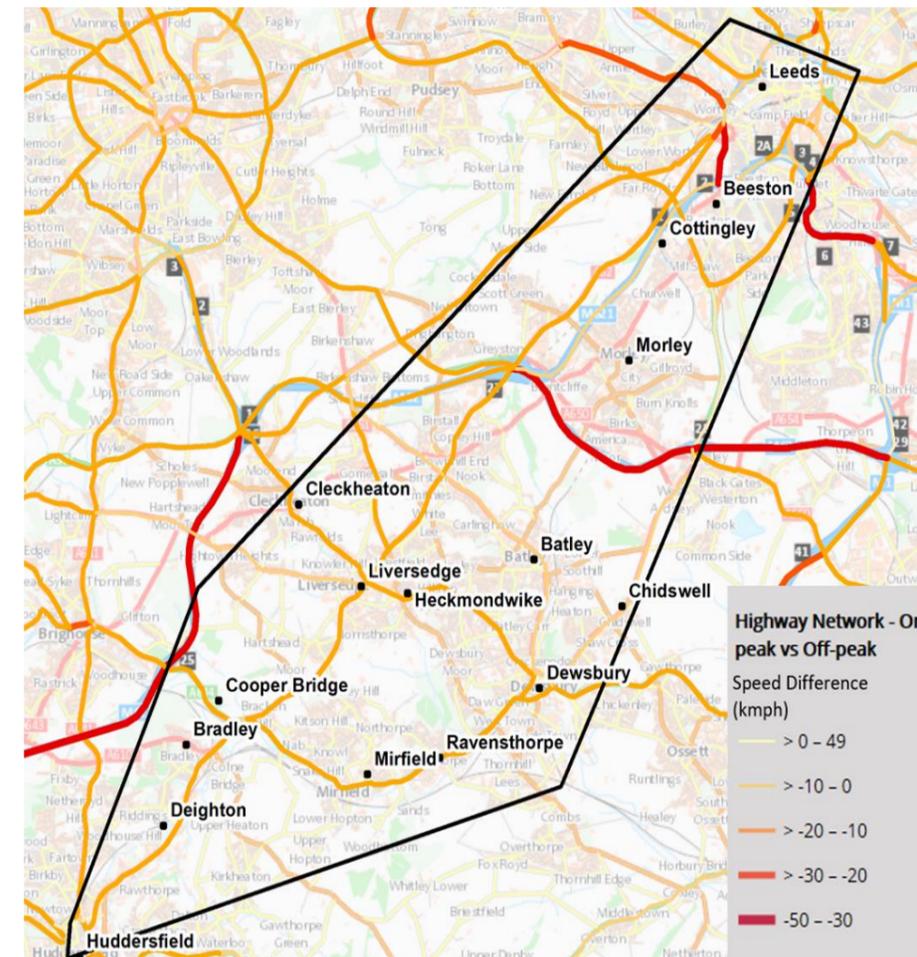
2.4.4.1 Highway network performance

Figure 16 shows the speed difference (kmph) on the highway network between the on-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 M62 as well as some delay on the A62 from Huddersfield and Leeds and A644 towards Dewsbury. Such congestion not only inhibits the connectivity of the area but has also contributed towards the declaration of several AQMAs at these points.

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

Figure 16: Highway network on-peak vs off-peak speed difference



Source: Trafficmaster

2.4.5 Patterns in transport demand

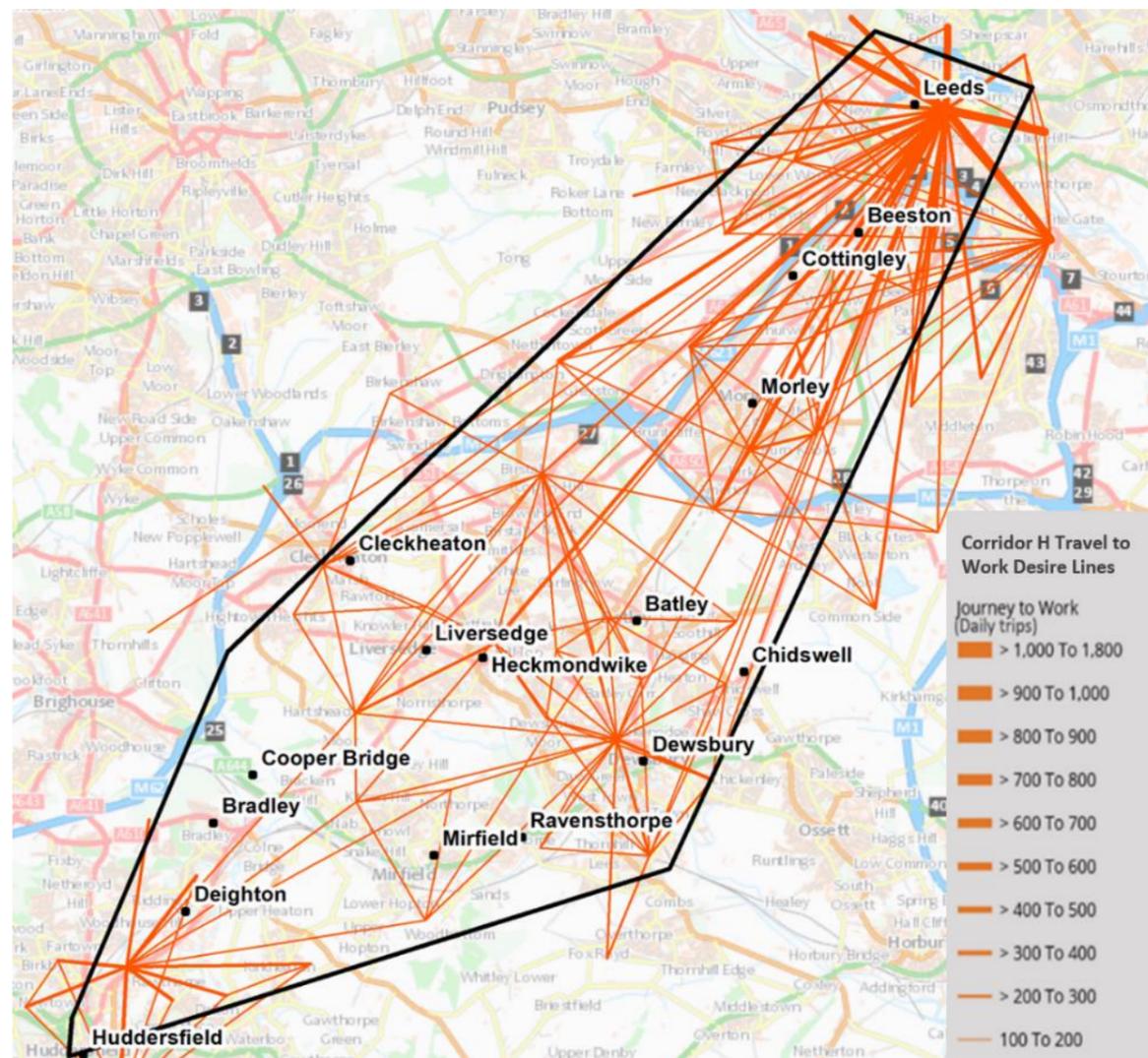
Figure 17 shows the key movements in the area (in the form of journey to work desire lines – person daily trips to work, Census 2011).

There is a large attraction towards Leeds city centre from north of the M62 with Huddersfield and Dewsbury also shown as notable trip attractors. The latter two attract mainly localised trips, similar to the rest of the North Kirklees area in the corridor. Areas in Heckmondwike, Batley and to the north east of Huddersfield 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.

Figure 18 and Figure 19 show where new housing and employment sites are located and the current travel to work patterns.

These graphics indicate that there is value in improving connectivity in this area, in order to broaden travel horizons and ensure the area’s current and future residents and employees benefit from the growth opportunities that will become available. They also illustrate the potential for travel patterns to

Figure 17: Journey to work desire lines

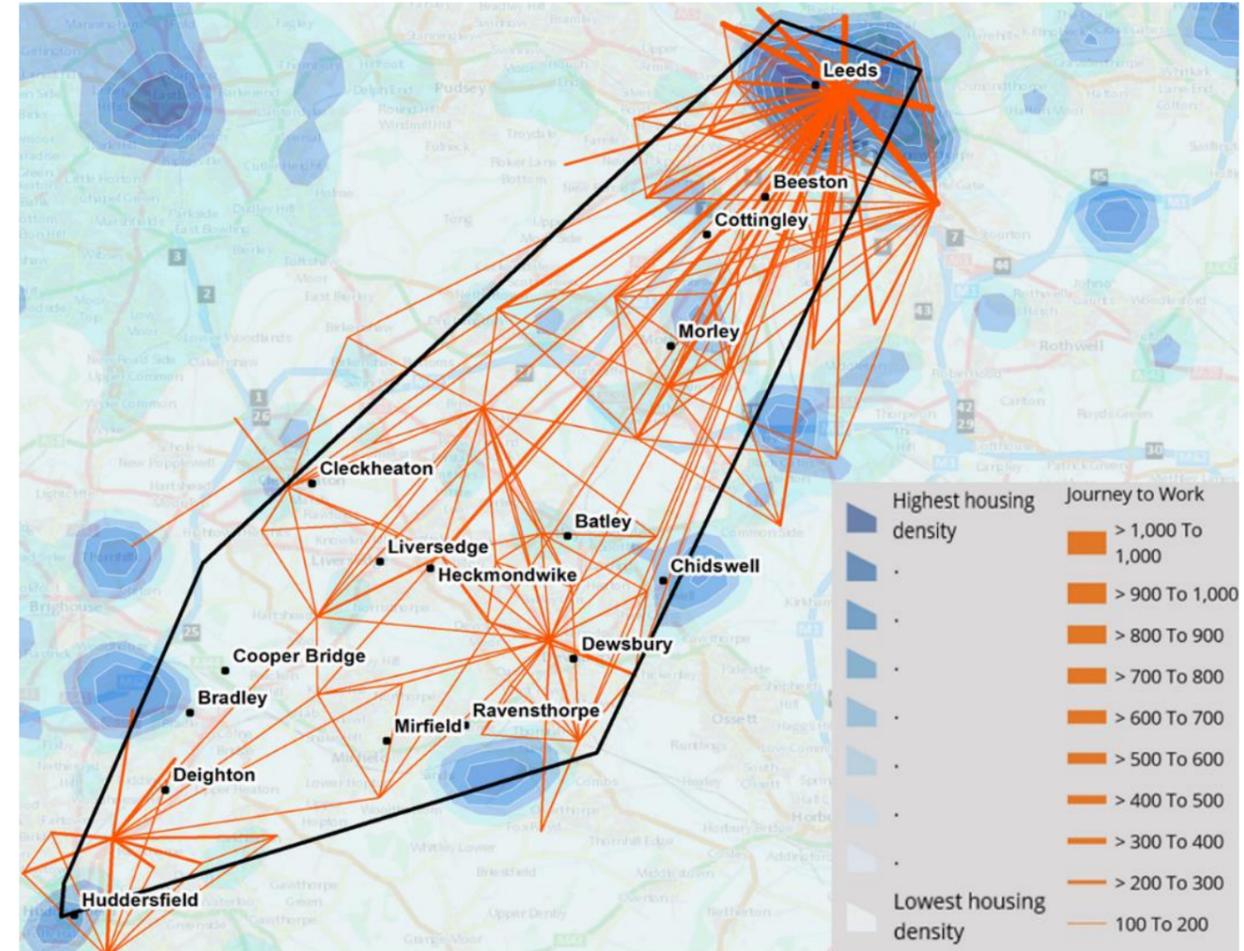


Source: Mott MacDonald

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.

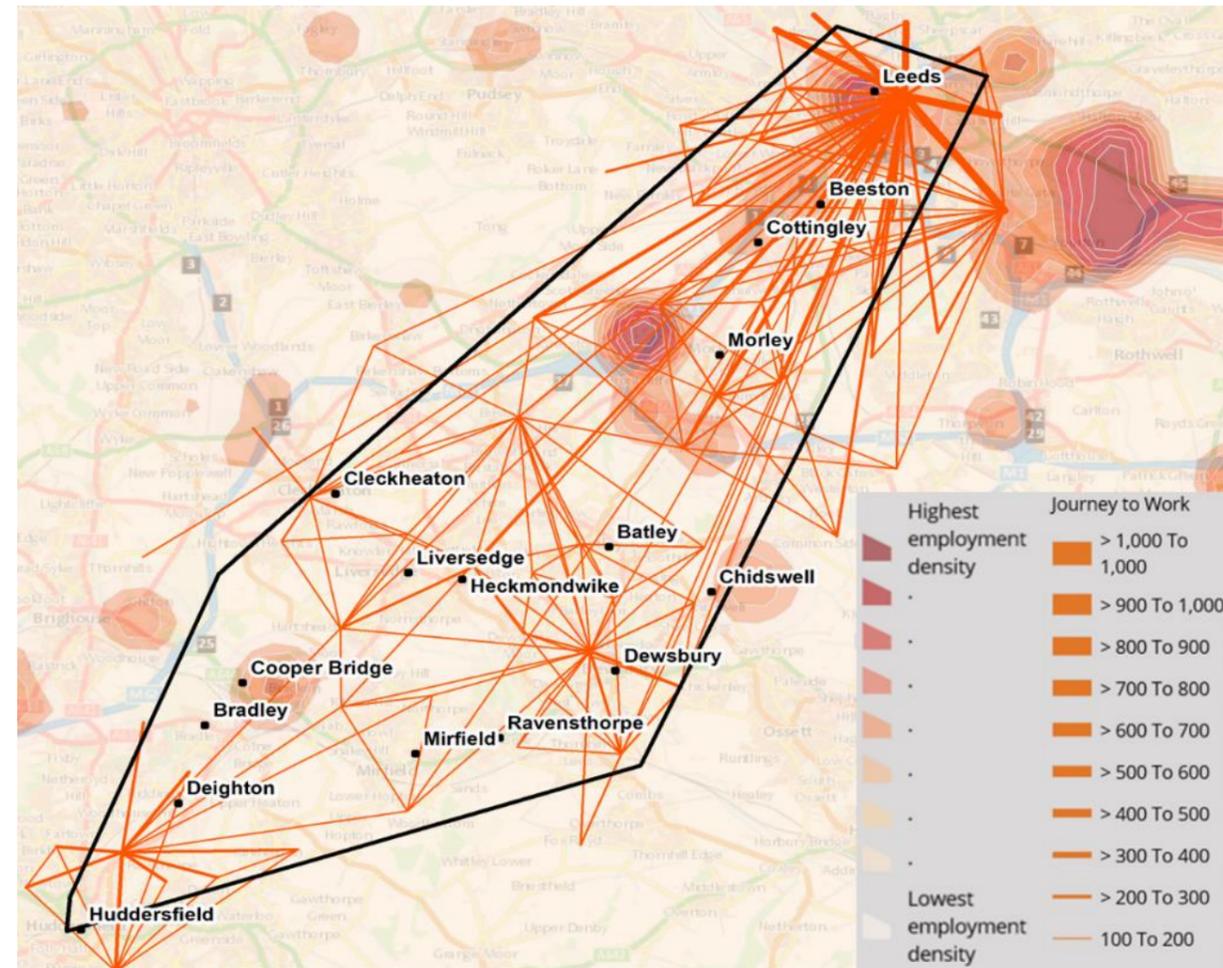
Change in employment site locations is likely to have the most significant effect on travel patterns; therefore, it is crucial to connect these places with a range of travel choices to ensure inclusive growth.

Figure 18: Future housing growth and current travel to work desire lines



Source: Mott MacDonald

Figure 19: Future employment growth and current travel to work desire lines



Source: Mott MacDonald

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 Deighton, Batley and Dewsbury. These communities are characterised by low employment and skills prospects, low household income and car ownership, with several areas being within the 10% of most deprived communities in England.

Employment prospects in the corridor are diverse. There is a concentration of professional service opportunities in Leeds city centre with places such as Batley and Ravensthorpe acting as employment centres for manufacturing. The latter job opportunities operate under irregular shift patterns and are thus poorly served by public transport in off-peak periods, meaning that car access is the only viable means of accessing these opportunities. However, there are communities within the corridor including those to the north east of Huddersfield and in Dewsbury and Batley that are characterised by low car ownership (with over 50% of households without access to a car), thus limiting travel choices to access employment and other services.

There is 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. Cottingley, Batley and Dewsbury are in the top 10% most deprived areas for education in England. 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. This not only affects populations living in these areas, but also affects a high number of commuters travelling through the AQMAs. To help **tackle the climate emergency** and achieve carbon emission targets, congestion and traffic levels in the corridor must be addressed. Options for travel that has 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:

- Local trips connecting surrounding areas to the opportunities in Dewsbury and Huddersfield
- Strategic trips connecting opportunities areas to the opportunities in Leeds city centre

3 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 aspirations ensure that the interventions developed align with the priorities of Leeds City Region and its districts. Each intervention is assessed against both the core objectives and corridor-specific aspirations to ensure the best possible fit.

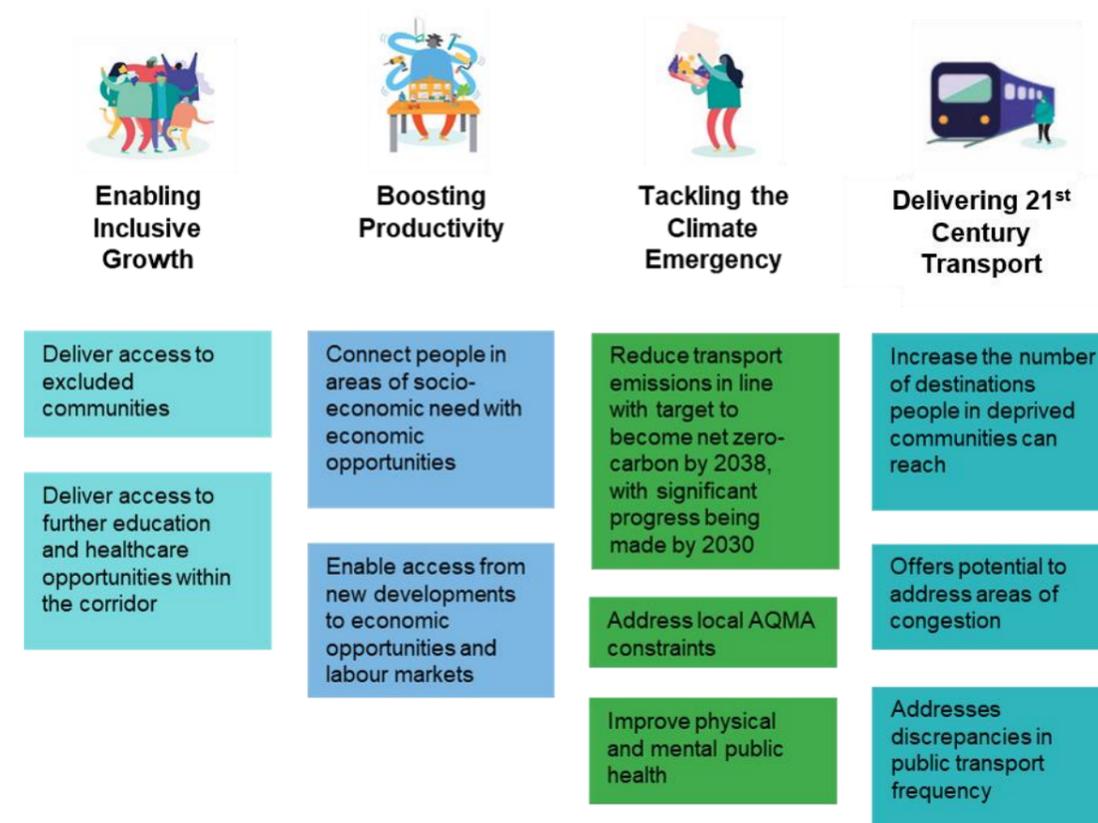
3.2 Core objectives

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 20: 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 Leeds to Huddersfield, in consultation with stakeholders from Leeds and Kirklees districts.

The Leeds to Huddersfield Aspirations are to:

- Contribute to the development of homes and employment
- Allow more people to access jobs and opportunities
- Deliver public transport journeys that are quicker and cheaper than owning and running a car
- Provide capacity to meet future travel demand
- Provide a 'turn-up and go' frequency
- Provide a high quality service you can rely on
- Ensure a reduction in harmful emissions
- Provide more choice and more flexible options

These all align to current local policy documentation such as the Kirklees Local Plan (2013-2031) and the Interim Leeds Transport Strategy (2016).

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 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 objectives.

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
<ul style="list-style-type: none"> Deliver access to further education and healthcare opportunities within the corridor Deliver access to excluded communities 	<p>Enabling Inclusive Growth</p> 	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.
<ul style="list-style-type: none"> Connect people in areas of socio-economic need with economic opportunities Enable access from new developments to economic opportunities and labour markets 	<p>Boosting Productivity</p> 	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.
<ul style="list-style-type: none"> Become net zero-carbon by 2038, with significant progress being made by 2030 Address local AQMA constraints Improve physical and mental public health 	<p>Tackling the Climate Emergency</p> 	<p>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.</p> <p>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^{TM14} principles (again, an influence on positive mode shift to cleaner modes).</p>
<ul style="list-style-type: none"> Increase the number of destinations people in deprived communities can reach Offers potential to address areas of congestion Addresses discrepancies in public transport frequency 	<p>Delivering 21st Century Transport</p> 	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 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.

¹⁴ Pedestrians from all walks of life; Easy to cross; Shade and shelter; Places to stop and rest; Not too noisy; People choose to walk, Cycle and use public transport; People feel safe; Things to see and do; People feel relaxed; Clean air.

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

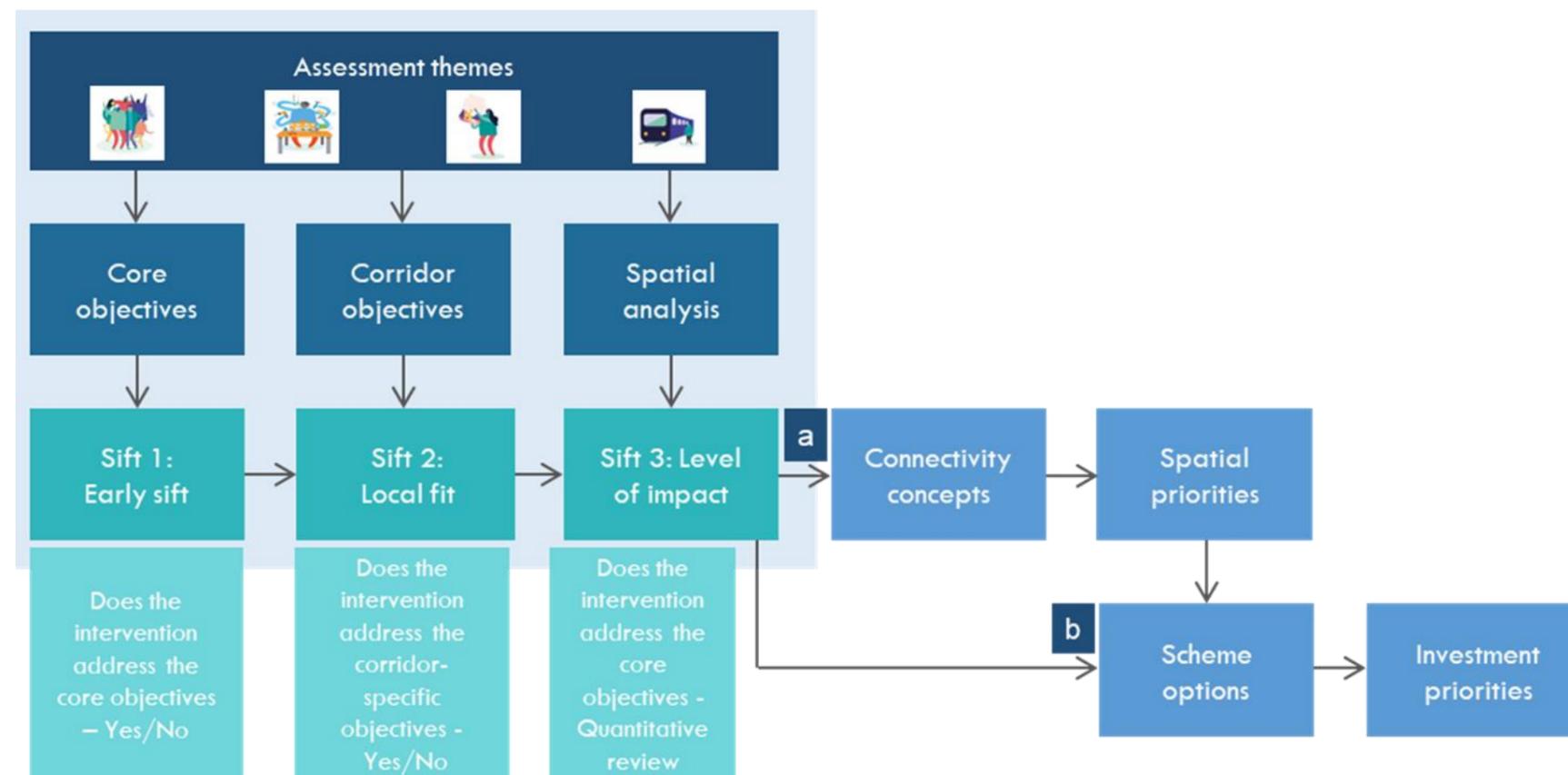
The key outcomes from the appraisal are two-fold – (a) a set of spatial priorities determined from several “connectivity concepts” (mode agnostic connections between key places – described further in Chapter 4), and (b) investment priorities determined from several interventions.

The diagram below summarises the appraisal process:

weighting that is applied for the assessment themes and criteria to perform sensitivity tests or to simply 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 aspirations 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 21: Appraisal process



Source: Mott MacDonald

The core appraisal adopted for Leeds to Huddersfield assumes that all assessment themes have equal weighting or 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

4 Determining spatial priorities

In determining 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 improve connections to and within 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 2.2.3: Growth Areas
- Section 2.4.3: Rail

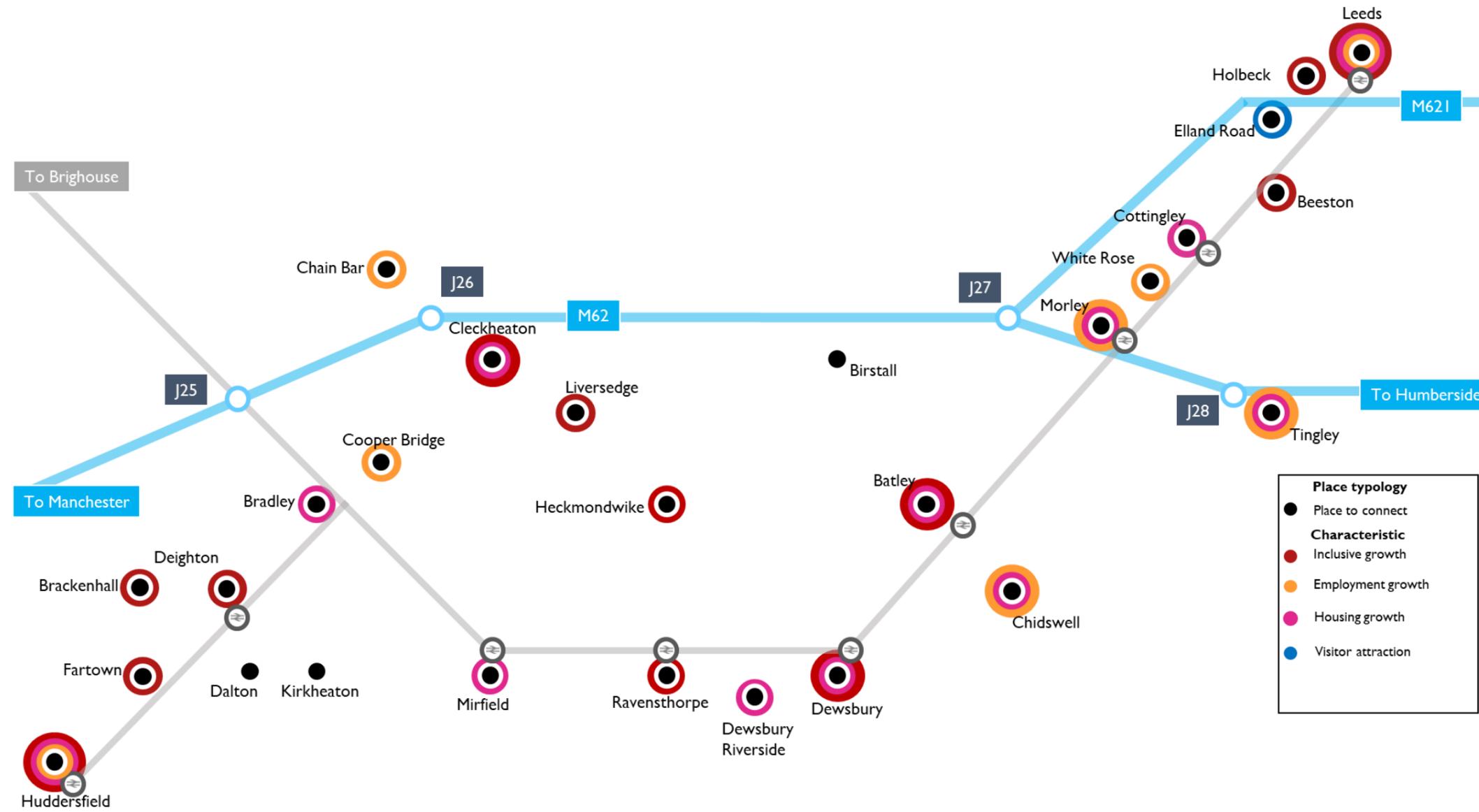
The principal characteristic influencing the selection of each place to connect is also shown. Places include key settlements, transport hubs, housing and employment growth zones. These shown in Figure 22. This illustrates the places to connect in the context of the wider rail network (shaded grey lines) and motorway network (shaded blue lines).

Table 4: Key places to connect

Key place	Characteristic	Scale / justification
Batley	Inclusive Growth and housing growth	Key settlement with a rail station. Areas in the top 10% most deprived neighbourhoods in England with total annual household income of £25,700 within MSOA. Approximately 3500 new dwellings allocated
Beeston	Inclusive Growth	Within the top 10% most deprived neighbourhoods in England
Birstall	Bus network	Key place on bus network
Brackenhall	Inclusive Growth	Within the top 20% most deprived neighbourhoods in England
Bradley	Housing growth	1,900 dwellings proposed at Bradley Golf Course as well as a further 50 dwellings throughout the settlement
Chain Bar	Employment growth	Approximately 40ha of employment land allocated
Chidswell	Employment and housing growth	Approximately 60ha of employment land and over 1500 dwellings allocated
Cleckheaton	Inclusive Growth and housing growth	Within the top 20% most deprived neighbourhoods in England. Over 100 dwellings allocated for development
Cooper Bridge	Employment growth	Approximately 46ha of employment land allocated
Cottingley	Housing growth	Key existing rail station serving south Leeds. Planned housing growth
Dalton	Bus network	Key place on bus network
Deighton	Inclusive Growth	Key settlement with a rail station. Within the top 10% most deprived neighbourhoods in England
Dewsbury	Housing growth/ Inclusive Growth	Key settlement with a rail station. Areas in the top 10% most deprived neighbourhoods in England with 39% of residents having no qualifications. Approximately 730 new dwellings allocated
Dewsbury Riverside	Large housing growth	Approximately 2500 new dwellings allocated
Elland Road	Visitor attraction	Visitor attraction and bus based Park & Ride to the south west of Leeds City Centre providing a high frequency service to the city centre
Fartown	Key area of deprivation	Within the top 10% most deprived neighbourhoods in England and 44% of people are economically inactive in one area of Fartown
Heckmondw ke	Key area of deprivation	Within the top 20% most deprived neighbourhoods in England
Ho beck	Inclusive Growth	Within the top 20% most deprived neighbourhoods in England
Huddersfield	Housing growth / 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
Kirkheaton	Bus network	Key place on bus network
Liversedge	Inclusive Growth	Within the top 20% most deprived neighbourhoods In England
Leeds	Inclusive Growth	A key hub for HS2 and a core city in the region. Substantial housing and employment development sites, including Southbank. Areas of deprivation
Mirfield	Housing growth	Key settlement with a rail station. Approximately 720 new dwellings
Morley	Employment and housing growth	Approximately 27ha of employment land and 960 dwellings allocated
Ravensthorpe	Inclusive Growth	Key settlement with a rail station. Within the top 10% most deprived neighbourhoods with 45% of people having no qualifications in one area of Ravensthorpe
Tingley	Employment and housing growth	Approximately 32ha of employment land and 1500 new dwellings allocated
White Rose	Employment growth	Visitor attractor and employment asset. Major capacity challenge, with a new rail station proposed. Housing and employment growth is expected around White Rose, which is currently a large employment area.

Figure 22: Places to connect – key attributes

Places to connect – key attributes



Source: Mott MacDonald

4.2 Existing connectivity improvements

There are several existing schemes scheduled for implementation within the corridor. Figure 23 presents a conceptual map showing the planned highway and rail interventions as part of the West Yorkshire Plus Transport Fund (WYPTF). These include several transport projects to improve connectivity on key routes as well as several proposals to enhance the appeal and access to rail, such as Huddersfield Station Gateway.

Figure 23 also shows the initial areas being included in the work to develop the Local Cycling and Walking Infrastructure Plan (LCWIP). LCWIP is a planning process and delivery is currently unfunded. A selection of West Yorkshire's Transforming Cities Fund (TCF) schemes are also planned in the area.

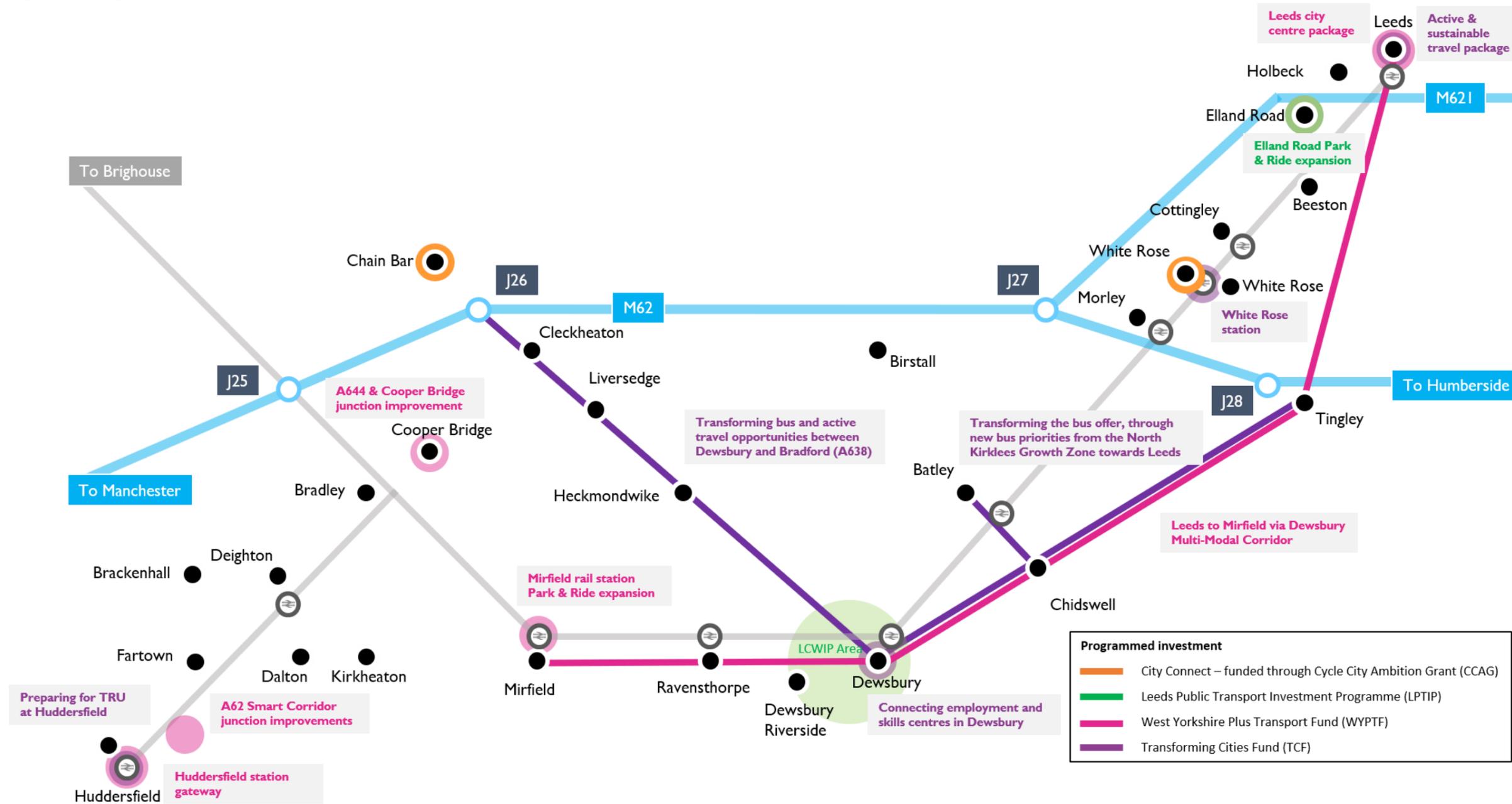
Table 5 provides a description of each programme currently providing connectivity improvements throughout the corridor.

Table 5: Programmed investment

Programme	Scheme	Description
West Yorkshire Plus Transport Fund	A644 & Cooper Bridge	Transport interventions at locations along the A644 and A62 will contribute to the main West Yorkshire-plus Transport Fund strategic objectives of increasing employment accessibility.
West Yorkshire Transport Fund	Huddersfield Station Gateway	The Huddersfield Station Gateway project is intended to make improvements for rail customers accessing Huddersfield Station. This is of primary benefit to rail customers who currently use St Georges Warehouse car park or access the station from the west
West Yorkshire Plus Transport Fund	Leeds City Centre Network and Interchange Package	A package of schemes to improve access around Leeds City centre and to enable City Square to have traffic reduction. This will improve pedestrian access from the station to the city centre and the flow of traffic around the South of Leeds.
West Yorkshire Plus Transport Fund	Mirfield Rail Station Park & Ride	Provision of 119 additional car parking spaces at Mirfield rail station (35 existing spaces), to help improve connectivity across West Yorkshire
West Yorkshire Plus Transport Fund	Mirfield to Dewsbury to Leeds	The main interventions are as follows; 1. A653 junction and corridor improvements in Kirklees and Leeds; 2. The introduction of an Express (limited stopping) Bus Service from Dewsbury to Leeds
Transforming Cities Fund	Active and Sustainable Travel within Leeds City Centre	A package of schemes centred on Leeds Rail Station to deliver enhanced walking and cycling infrastructure to enhance access to the station both within the immediate city centre and to communities on the periphery of the city centre
Transforming Cities Fund	Bus Passenger Facilities	Providing 21 st century bus shelter facilities across the Combined Authority
Transforming Cities Fund	Connecting employment and skills centres in Dewsbury	Improvements to walking and cycling to enhance connectivity in the town centre and reduce the severance presented by the Ring Road. A major overhaul of the Bus Station and its accesses is also proposed.
Transforming Cities Fund	Transforming bus and active travel opportunities between Dewsbury and Bradford (A638)	Improved bus offer through an upgraded bus hub at Heckmondwike and bus priority treatments along the corridor. The scheme also involves a set of on-street cycling upgrades and new local links to the Spen Valley Greenway.
Transforming Cities Fund	Transforming the bus offer through new bus priorities from the North Kirklees Growth Zone towards Leeds	A series of bus, cycle and footway improvements to provide better access to Batley and Dewsbury and encourage modal shift.
Transforming Cities Fund	White Rose railway station	New rail station proposed in South Leeds on the Leeds to Dewsbury section of the TransPennine route. The station would serve business, employment and education sites and also provide access to the rail network for communities in Cottingley, Churwell and Millshaw

Source: West Yorkshire Combined Authority

Figure 23: Programmed investment

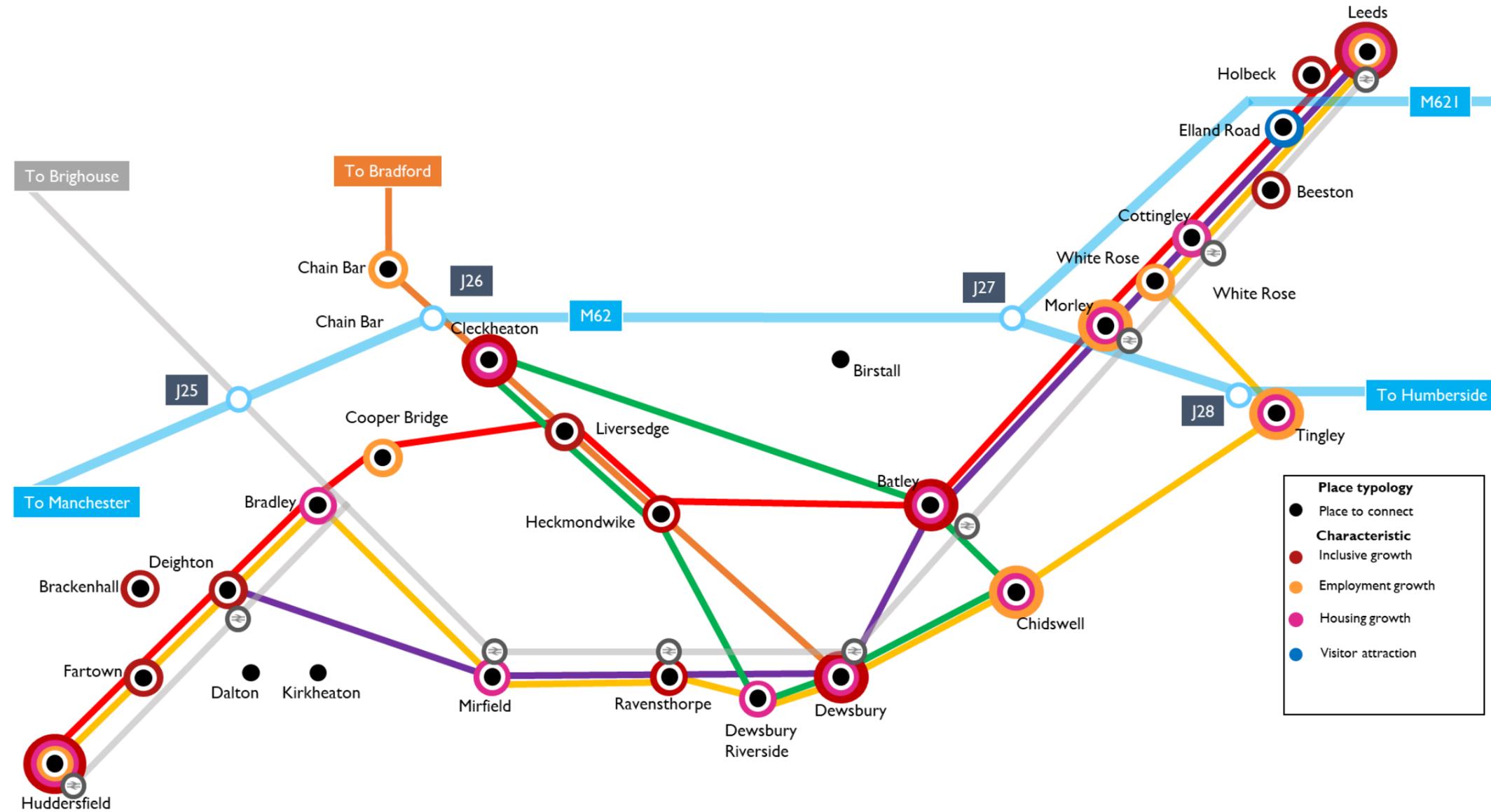


Source: Mott MacDonald

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. Four connectivity concepts have been defined for the Leeds to Huddersfield corridor; labelled red, yellow, green and purple. A fifth concept, highlighted in orange, has been included to demonstrate linkages with other parts of the network. Further details of this concept can be found in the Leeds to Bradford, South Bradford and North Kirklees Case for Change Report. 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. The connectivity concepts identified are shown in Figure 24 with a brief narrative for each concept provided below.

Figure 24: Connectivity Concepts Leeds to Huddersfield



Source: Mott MacDonald

1 – The Purple Concept (Huddersfield to Leeds via Batley)

Concept function	Provides <i>strategic</i> connectivity		
Summary	This concept provides a strategic connection between Huddersfield and Leeds. It draws on the existing rail network, building on the improvements as a result of the Transpennine route upgrade.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21st Century Transport
<ul style="list-style-type: none"> Connects deprived communities in Deighton and Dewsbury 	<ul style="list-style-type: none"> Improves connectivity to employment centres of Huddersfield and Leeds 	<ul style="list-style-type: none"> Provides alternative to car use for travel to Leeds where a CAZ is proposed 	<ul style="list-style-type: none"> Opportunity to reduce journey times and enhance journey quality by rail
Indicative mode	Heavy Rail		

2 – The Red Concept (Huddersfield to Leeds via Heckmondwike)

Concept function	Provides <i>strategic</i> connectivity		
Summary	This concept provides a connection between Leeds and Huddersfield, drawing on the existing highway network (A62 and A643), enabling expanded connectivity to communities outside of the rail network, such as Heckmondwike.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21st Century Transport
<ul style="list-style-type: none"> Connects deprived communities in Deighton and Heckmondwike 	<ul style="list-style-type: none"> Improves connectivity to employment centres of Huddersfield and Leeds Connects to housing growth around Bradley 	<ul style="list-style-type: none"> Concepts goes through 5 AQMAs 	<ul style="list-style-type: none"> Improves connection to communities in North Kirklees not currently served by the rail network
Indicative mode	Bus Rapid Transit / Bus		

3 – The Yellow Concept (Huddersfield to Leeds via Chidswell)

Concept function	Provides <i>strategic</i> connectivity		
Summary	This concept provides a connection between Leeds and Huddersfield, drawing on the existing highway network (A653) and connects to several strategic growth sites outside of the rail network such as Chidswell and Dewsbury Riverside.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21st Century Transport
<ul style="list-style-type: none"> Connects deprived communities in Deighton, Ravensthorpe and Dewsbury 	<ul style="list-style-type: none"> Connects strategic development sites at Chidswell and Dewsbury Riverside 	<ul style="list-style-type: none"> Concept goes through 4 AQMAs 	<ul style="list-style-type: none"> Improves access bility to educational sites in Huddersfield, Leeds and Dewsbury
Indicative mode	MRT / Bus Rapid Transit		

4 – The Green Concept (Dewsbury and North Kirklees circular)

Concept function	Provides <i>local</i> connectivity		
Summary	A circular concept, connecting communities in North Kirklees to the opportunities and onward connections in Dewsbury		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21st Century Transport
<ul style="list-style-type: none"> Connects deprived communities in Batley, Heckmondwike and Dewsbury 	<ul style="list-style-type: none"> Connects to strategic development sites of Chidswell and Dewsbury Riverside 	<ul style="list-style-type: none"> Concept goes through 2 AQMAs 	<ul style="list-style-type: none"> Improves connection to the rail network at Dewsbury and Batley for communities not currently served by rail
Indicative mode	Bus / Active Travel		

4.4 Appraisal outcomes

Our appraisal process (summarised in 3.4.1) has been applied to the 4 connectivity concepts to define spatial priorities in the Leeds to Huddersfield 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 25.

Although all concepts were classified as “Good” overall, there is differentiation within the defined scoring range. The **Yellow**, **Red** and **Purple** concepts (Figure 25) demonstrated the greatest benefit for interventions. Therefore, further analysis will focus on these three routes where additional infrastructure could be considered. Additional analysis of the orange route can be found in the Leeds to Bradford, South Bradford and North Kirklees Case for Change Report.

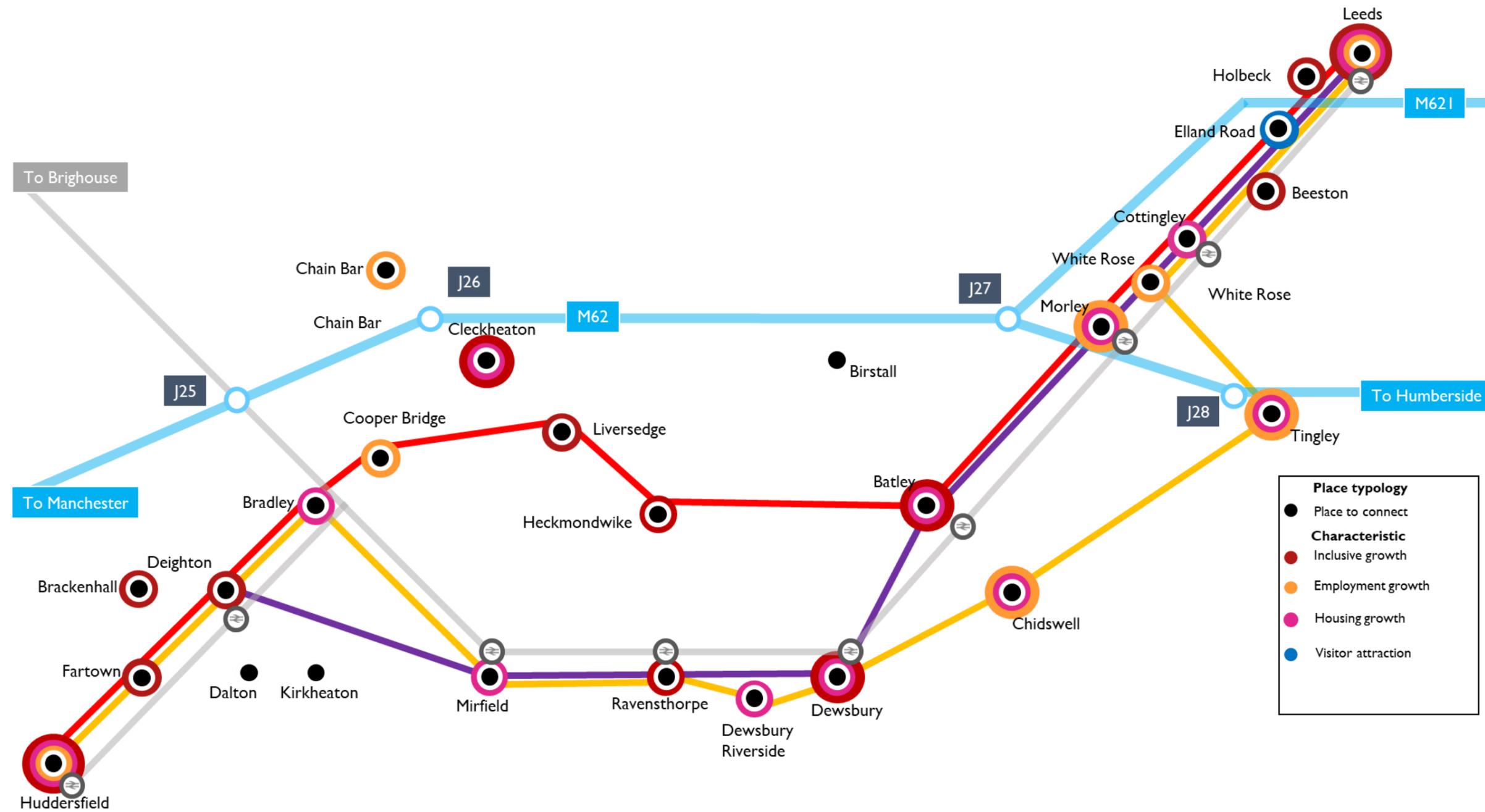
Figure 25: Appraisal outcomes for connectivity concepts – ranked

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 21 st Century Transport			Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 st Century Transport		
1	3	Yellow Route – Huddersfield to Leeds via Chidswell	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Good	Average	Average	Good
2	2	Red Route – Huddersfield to Leeds via Heckmondwike	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Good	Average	Average	Good
3	1	Purple Route – Huddersfield to Leeds via Batley	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Good	Average	Average	Good
4	4	Green Route – Dewsbury and North Kirklees Circular	Excellent	Fair	Excellent	Excellent	Good	Excellent	Average	Low	Good	Average	Average	Good

Source: Mott MacDonald

Overall, the Yellow, Red and Purple connectivity concepts have been identified as the spatial priorities as they are the highest scoring concepts that address *connectivity requirements to and within the corridor*. These are shown in Figure 26. Delivering improved connectivity along these connectivity concepts will help to increase travel horizons which have previously been limited and help achieve inclusive growth across the Leeds City Region.

Figure 26: 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 accessibility 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.

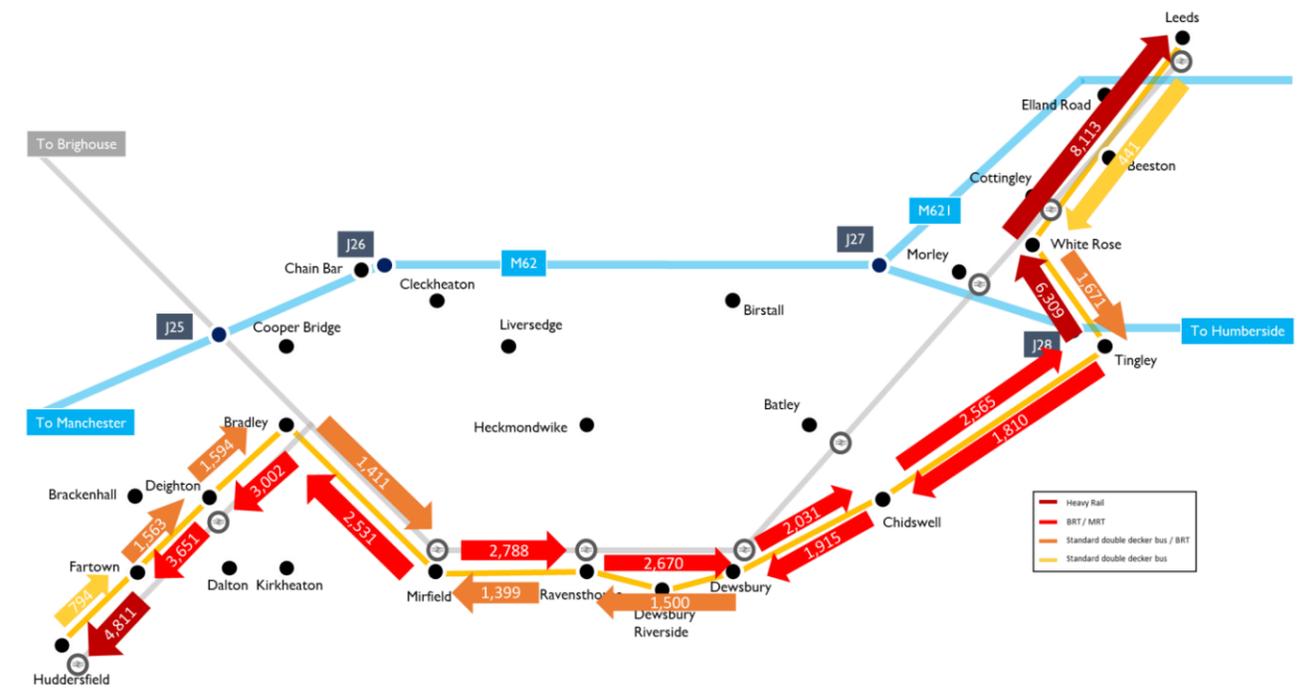
Source: West Yorkshire Combined Authority

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 27 shows demand in 2033 along the highest scoring connectivity concept: Yellow. This provides a strategic connection from Huddersfield to Leeds through Chidswell. Demand is high enough from Fartown to Huddersfield and Tingley to Leeds to warrant Heavy Rail. However, whilst a new rail station is proposed at White Rose, neither Tingley nor Fartown have open rail stations and so alternative means such as Bus Rapid Transit (BRT) or Mass Rapid Transit (MRT) would help to increase capacity along this route. Demand is also high enough between Mirfield and Fartown, Mirfield and Tingley and Tingley to Dewsbury to suggest the need for BRT / MRT. Demand from Leeds to White Rose and from Huddersfield to Fartown are the lowest in the corridor indicating the need for a standard double decker bus service between these areas.

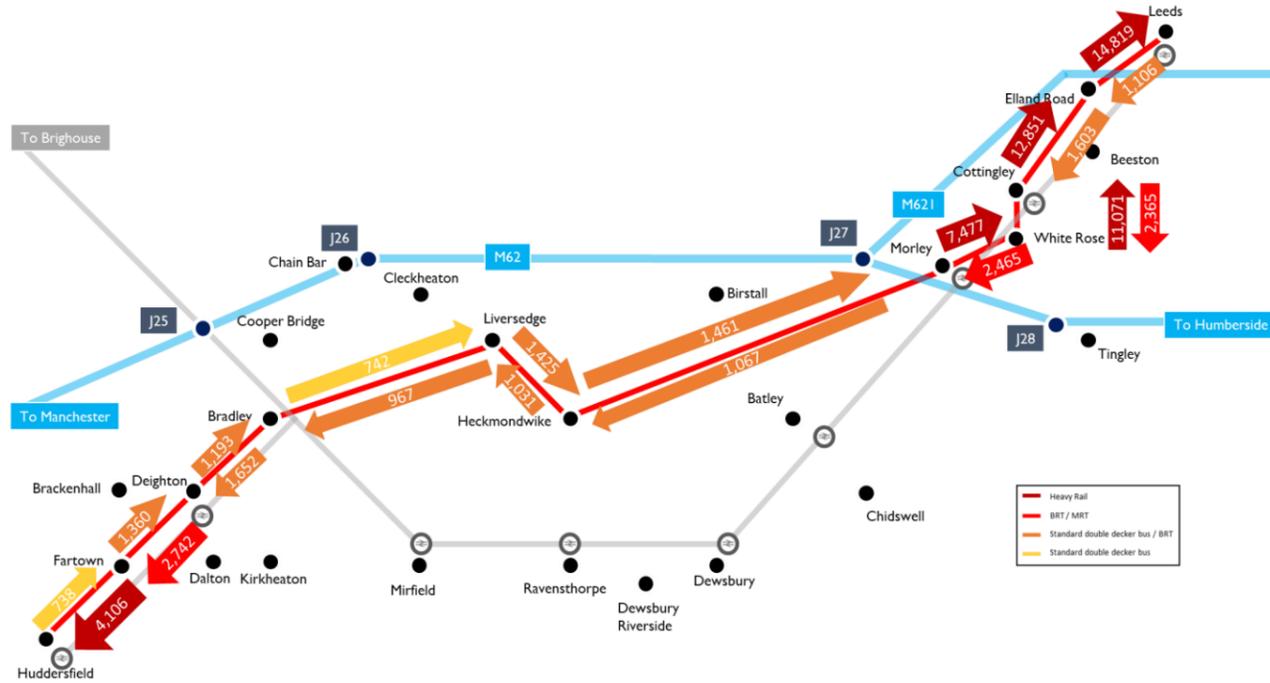
Figure 27: Yellow Route – Demand 2033



Source: Urban Dynamic Model (UDM)

Figure 28 shows demand between Huddersfield and Leeds, via Heckmondwike (the Red concept) in 2033. This shows a high number of people travelling from Morley and Leeds and from Fartown to Huddersfield to require heavy rail infrastructure. Rail infrastructure already exists here so potentially measures could be taken to increase capacity or develop new stations. In most other locations along the route, demand is lower, indicating that BRT or a standard double decker bus would be enough.

Figure 28: Red Route – Demand 2033

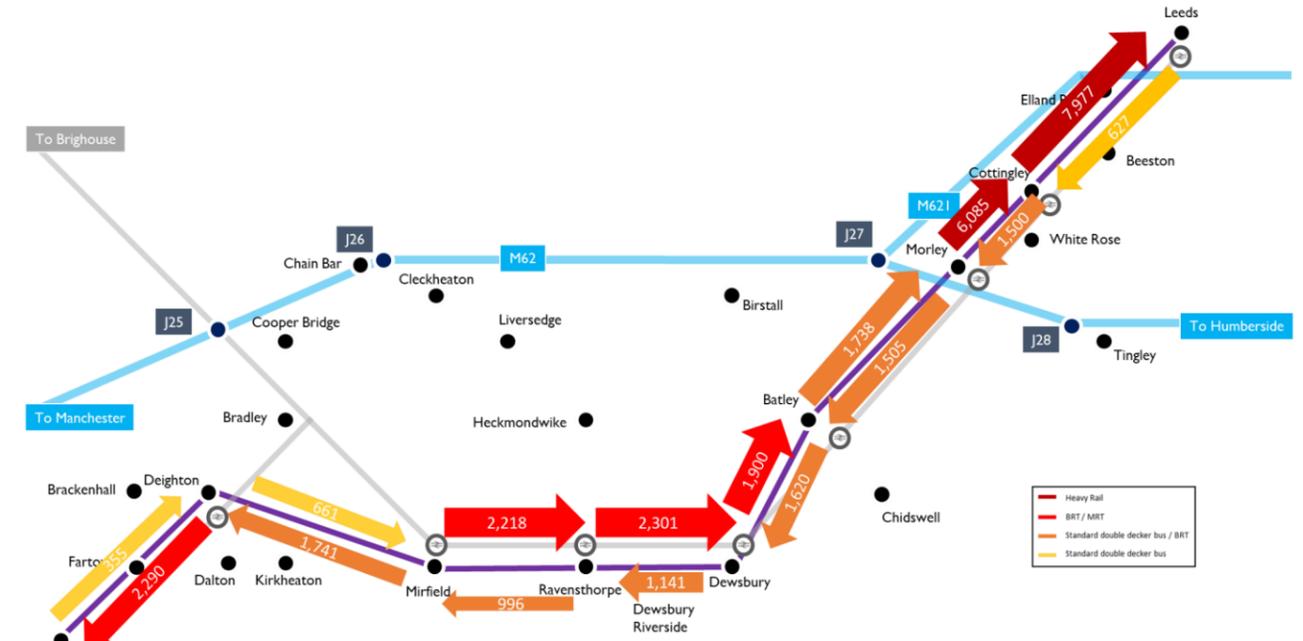


Source: Urban Dynamic Model (UDM)

Figure 29 shows demand for the Purple concept between Huddersfield and Leeds via Batley. This concept covers the existing rail line between Huddersfield and Leeds. The demand analysis suggests that demand is high enough between Morley and Leeds to require heavy rail. Demand along the rest of the route is lower with demand from Mirfield to Huddersfield and from White Rose to Dewsbury and Mirfield to Morley indicating the need for BRT / MRT. Demand from Huddersfield to Mirfield and from Leeds to White Rose suggests this could be accommodated by a standard double decker bus.

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.

Figure 29: Purple Route - Demand 2033



Source: Urban Dynamic Model (UDM)

5 Conclusion: The Need for Intervention in Leeds to Huddersfield

5.1 Introduction

This Case for Change presents the evidence and strategic narrative for investing in improved connectivity in the Leeds to Huddersfield corridor.

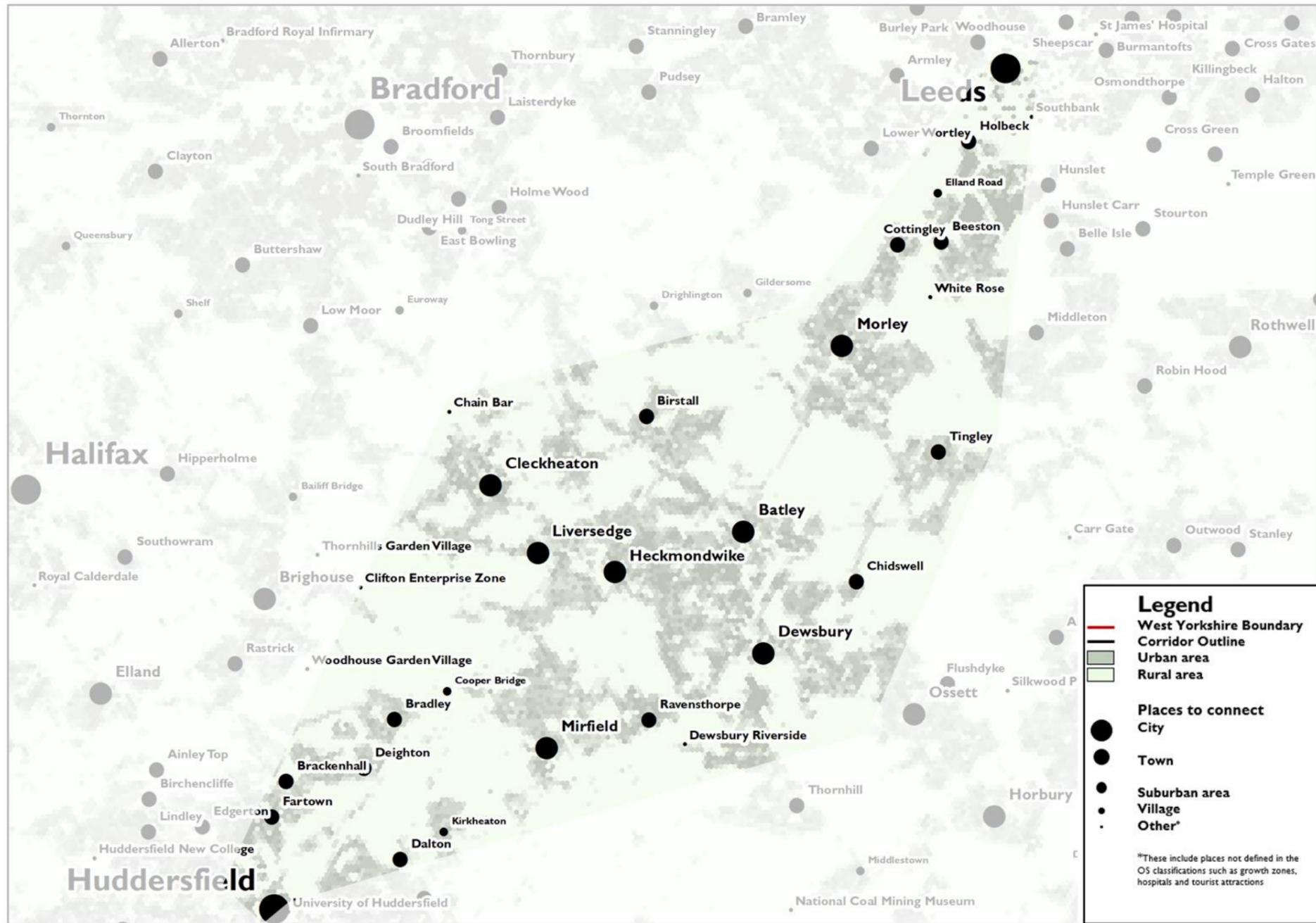
Through evidence review, and engagement from district partners, key places to connect have been identified, and a complementary series of connectivity concepts have been developed to show where there is greatest need to improve connections across people and places in the corridor. These places to connect have been used to support evidence gathering in other workstreams and are shown in Figure 30.

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 Huddersfield and communities in North Kirklees – such as Batley, Heckmondwike and Ravensthorpe, to the economic opportunities in Leeds. A high-level demand analysis has been undertaken on these concepts to illustrate the highest capacity mode of transport it would be feasible to introduce between 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 30: Places to Connect Map



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 Leeds to Huddersfield is illustrated in Figure 31. 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 31: Leeds to Huddersfield Connectivity Network

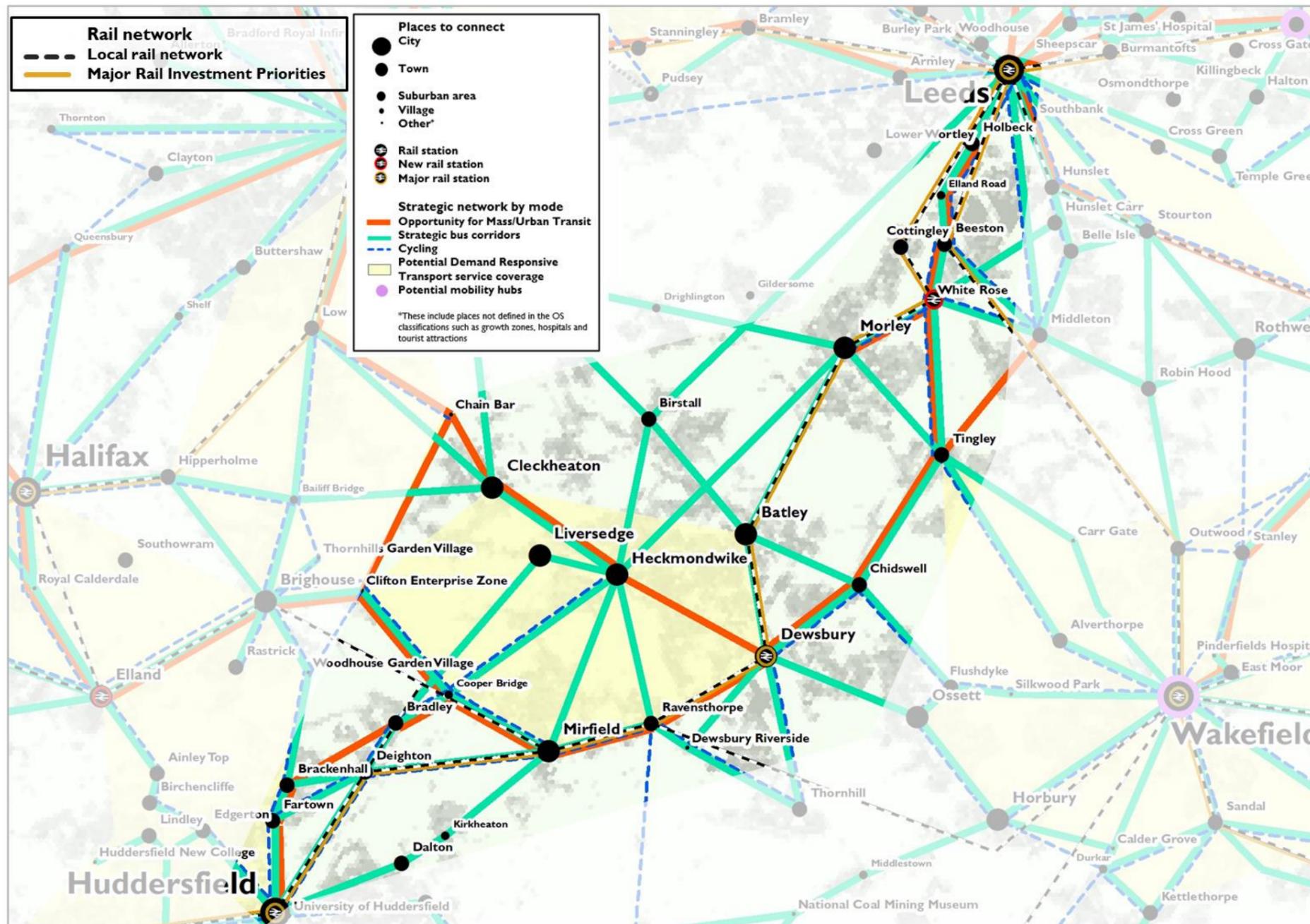
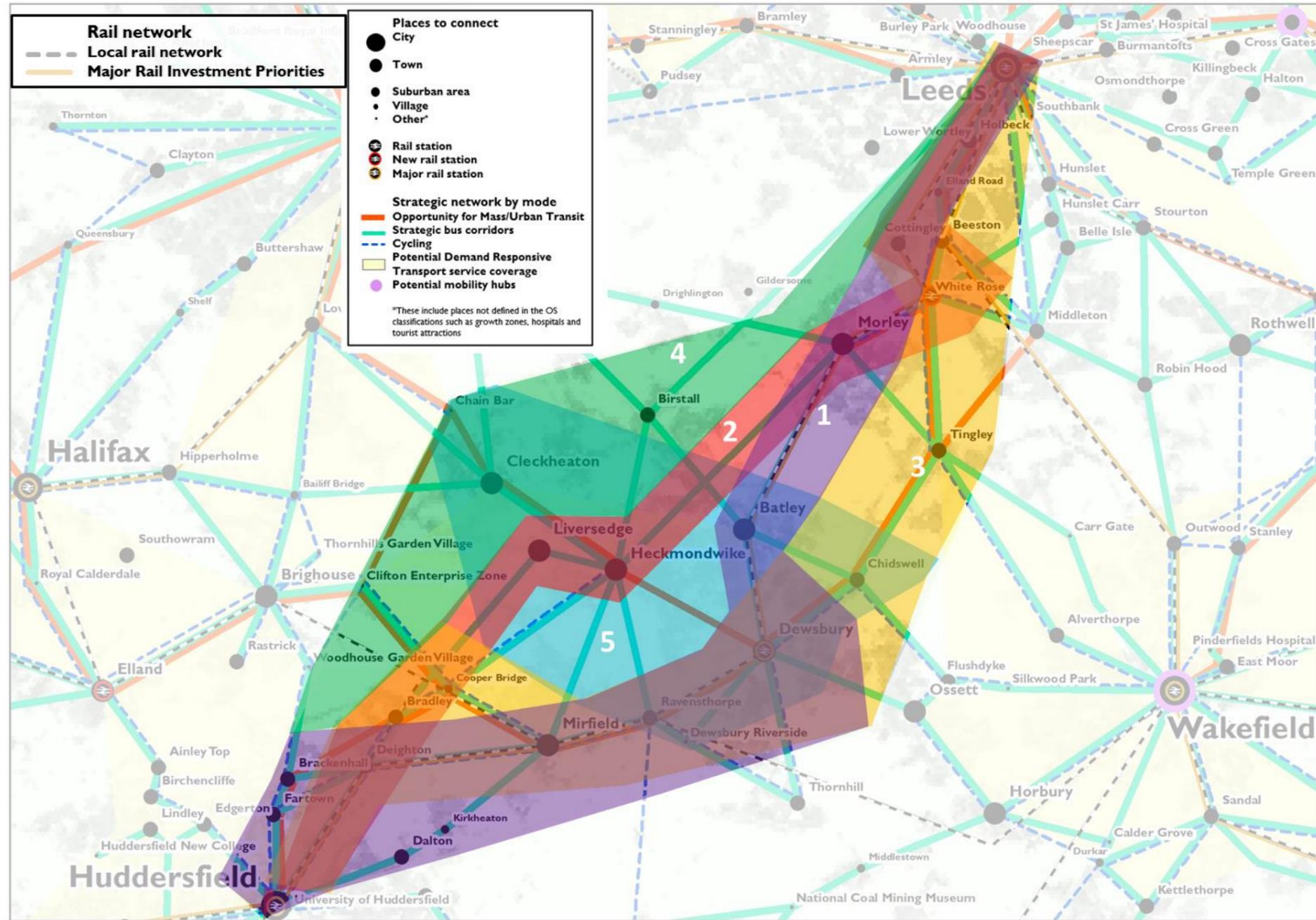


Figure 32 illustrates spatially how the various strands of evidence, including the prioritised connectivity concepts and subsequent demand analysis, provide a rationale for network interventions in the Leeds to Huddersfield corridor. These strands of evidence are summarised in Table 8.

Table 8: Evidence rationale for network interventions

Network Area	Description	Rationale				Evidence Base
		Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 st Century Transport	
						
1	Purple Connectivity Concept	Connects deprived communities in Deighton and Dewsbury to economic opportunities in Leeds and Huddersfield	Enhances connectivity to employment centres of Huddersfield and Leeds	Intersects with proposed Clean Air Zone in Leeds and several congested routes into Leeds and Huddersfield.	A programme of rail improvements have been identified as part of the Transpennine Route Upgrade to reduce journey times and enhance journey quality by rail	Leeds to Huddersfield Case for Change West Yorkshire Rail Strategy
2	Red Connectivity Concept	Connects deprived communities in Deighton and Heckmondwike to economic opportunities in Leeds and Huddersfield	Improves connectivity to employment centres of Huddersfield and Leeds	Intersects with several Air Quality Management Areas (AQMAs) Intersects with proposed Clean Air Zone in Leeds	Predominantly bus based interventions along existing corridor with rail enhancements in the form of a new station at White Rose	Leeds to Huddersfield Case for Change West Yorkshire Bus Network Review
3	Yellow Connectivity Concept	Connects deprived communities in Deighton, Ravensthorpe and Dewsbury to economic opportunities in Leeds and Huddersfield	Provides connections to strategic development sites such as Chidswell and Dewsbury Riverside	Intersects with several AQMAs Intersects with proposed Clean Air Zone in Leeds	Demand analysis suggests much of this route could be served by mass transit, providing a strategic link between Huddersfield and Leeds, with strategic connections offered towards Brighouse and Bradford	West Kirklees to Calderdale Case for Change East Kirklees to Wakefield Case for Change Urban Transit Study
4	South West Leeds	Provides linkages to communities such as Birstall, Batley and Cleckheaton that will benefit from inclusive growth.	Provides access to the economic centre of Leeds	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 corridor between Huddersfield and Leeds via Birstall	Leeds to Bradford, South Bradford and Kirklees Case for Change West Yorkshire Bus Network Review
5	North Kirklees	Encompasses communities such as Batley, Heckmondwike and Dewsbury which are among the most deprived in England	Provides connections to strategic development sites such as Chidswell and Dewsbury Riverside	Intersects with several AQMAs	Part of programmed intervention to enhance bus offer and cycling infrastructure between Dewsbury and Bradford. The Spenn Valley Greenway also forms part of the National Cycle Network. MRT link provided through Cleckheaton and Heckmondwike based on indicative flows from demand analysis	Leeds to Huddersfield Case for Change Leeds to Bradford, South Bradford and Kirklees Case for Change Urban Transit Study

Figure 32: Evidence map for network interventions



Appendices

A.	Leeds to Huddersfield: Investment Case	42
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A. Leeds to Huddersfield: Investment Case

The highest scoring “connectivity concepts” represent the corridor’s spatial priorities. For this corridor these are the Yellow, Red and Purple concepts as these were the best performing concepts for connectivity *to and within* the corridor. 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.

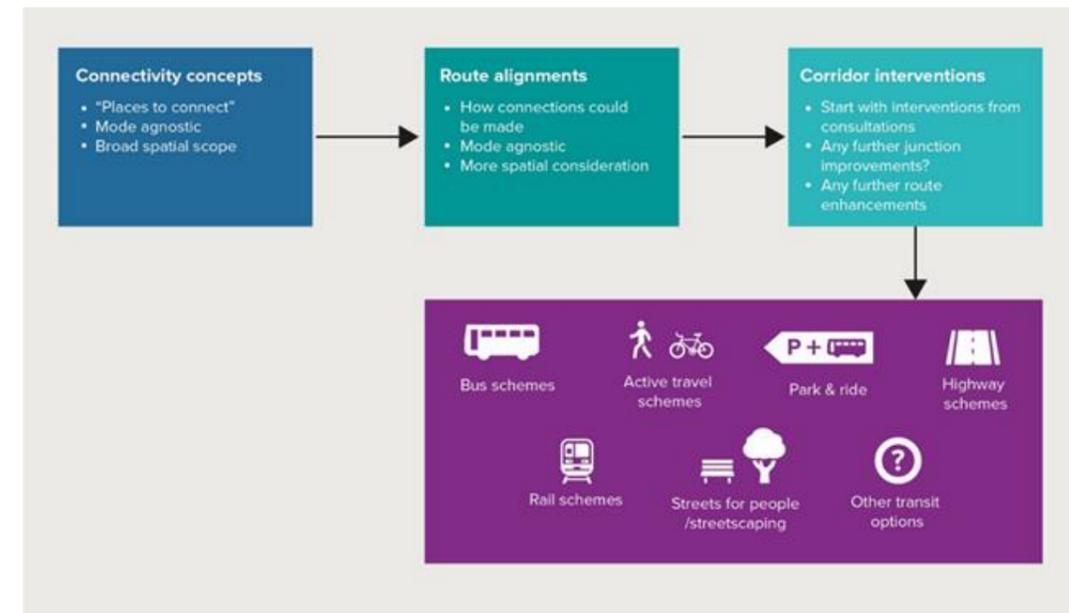
A.1 Developing interventions

Potential route alignments are identified as ways to provide the connections identified 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 corridor¹⁵ to identify new interventions that will provide the required 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”¹⁶, Park & Ride, rail, highways, transit concepts (e.g. BRT, tram-train etc.).

The longlist excludes schemes that have been developed as part of other workstreams, although it is possible there will be some overlap if options have been identified independently in both this report and other specific studies (e.g. LCWIP). Several interventions in the Cleckheaton-Heckmondwike-Dewsbury corridor have also been developed as part of the Leeds – Bradford, South Bradford and North Kirklees Case for Change reports. Some of these schemes have also been accelerated as part of West Yorkshire’s Transforming Cities Fund programme.

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:

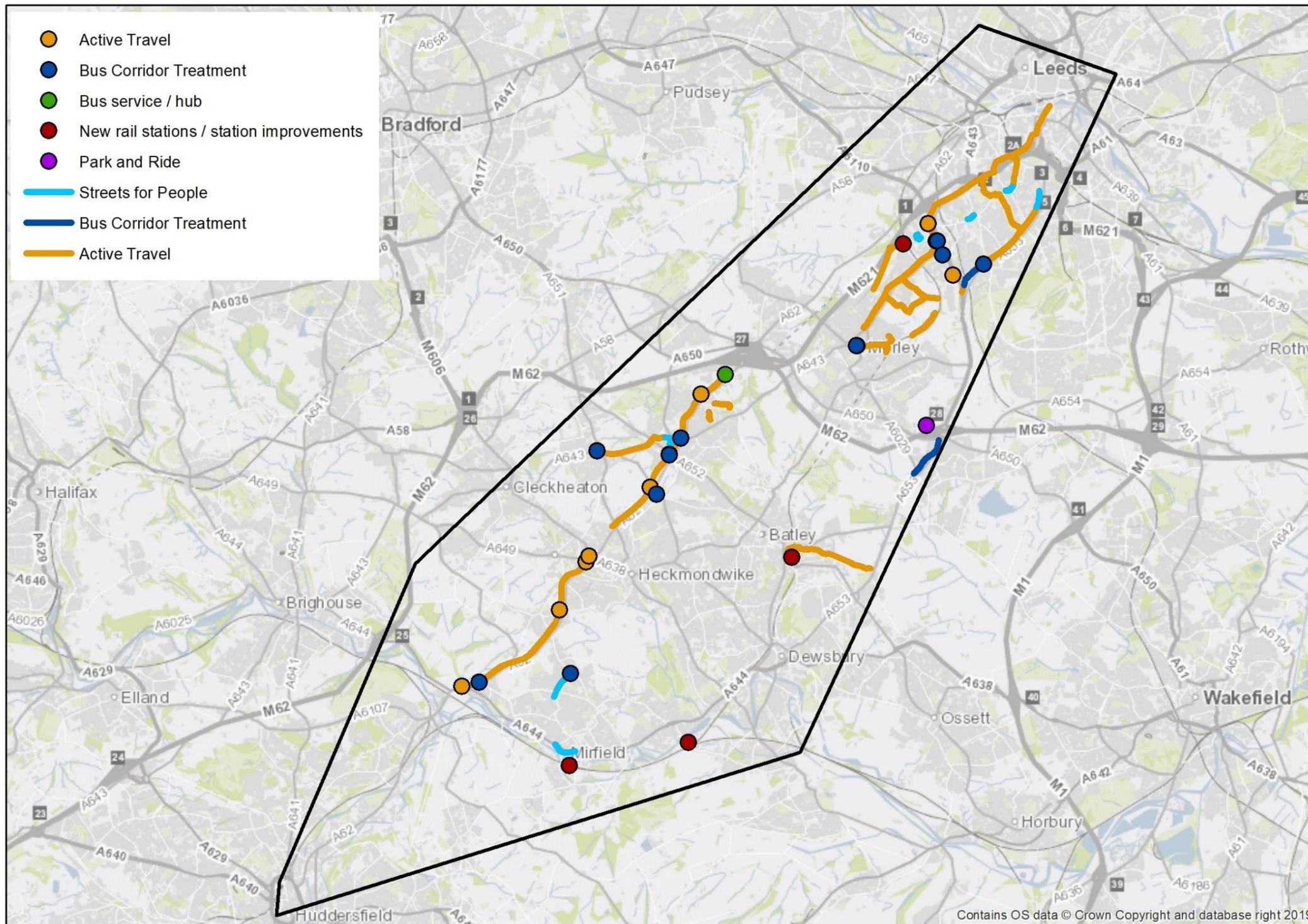
- Scheme types
 - Active travel (on and off-road walking and cycling)
 - Bus corridor treatment (bus priority measures and/or road space reallocation)
 - Bus service
 - Masterplanning / Streets for People - Improved urban realm and accessibility for pedestrians and cyclists
 - Park & Ride
 - Rail
 - 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 53 interventions for the Leeds to Huddersfield corridor. The alignments for these are mapped in Figure 33.

¹⁵ 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

¹⁶ Streets for People is a West Yorkshire-led series of design principles that focuses on creating safe and healthy places that take into consideration a number of factors, including traffic management, reducing air pollution, creating places which help people to interact and encouraging sustainable methods of transport such as cycling, walking and public transportation.

Figure 33: Leeds to Huddersfield corridor - all interventions



Source: Mott MacDonald

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.

