

# West Yorkshire Connectivity Plan

South and East Leeds: Case for Change

November 2020

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# Contents

<b>1</b>	<b>Introduction</b>	<b>5</b>
1.1	The role of this Case for Change	5
1.2	Background to the report	5
1.3	West Yorkshire's priorities for growth	6
1.4	Defining the scope and study area	7
1.5	South and East Leeds: at a glance	8
	<b>South and East Leeds: socio-economic profile</b>	<b>9</b>
	<b>South and East Leeds – connectivity highlights</b>	<b>10</b>
<b>2</b>	<b>Spatial context</b>	<b>11</b>
2.1	Enabling Inclusive Growth	11
2.1.1	Deprivation	11
2.1.2	Isolated communities	11
2.1.3	Car ownership	12
2.2	Boosting Productivity	13
2.2.1	Employment characteristics	13
2.2.2	Household income	14
2.2.3	Growth areas	14
2.3	Tackling the Climate Emergency	15
2.3.1	Air quality and Carbon	15
2.4	Delivering 21 <sup>st</sup> Century Transport	16
2.4.1	Active modes	16
2.4.2	Bus	17
2.4.3	Rail	17
2.4.4	Road	18
2.4.5	Patterns in transport demand	19
2.5	Summary	21
<b>3</b>	<b>Corridor aspirations</b>	<b>22</b>
3.1	Defining objectives	22
3.2	Core objectives	22
3.3	Corridor-specific aspirations	22
3.4	Measuring objectives	23
3.4.1	The appraisal process	23
<b>4</b>	<b>Determining spatial priorities</b>	<b>25</b>
4.1	Places to connect	25
4.2	Existing connectivity improvements	27
4.3	Connectivity concepts	29
4.4	Appraisal outcomes	32
4.5	Demand	34
<b>5</b>	<b>Conclusion: The Need for Intervention in South and East Leeds</b>	<b>37</b>
5.1	Introduction	37
5.2	Connectivity Network	39
	<b>Appendices</b>	<b>43</b>
<b>A.</b>	<b>South and East Leeds: Investment Case</b>	<b>44</b>
A.1	Developing interventions	44
A.2	Interventions	46

# 1 Introduction

## 1.1 The role of this Case for Change

This Case for Change Report for South and East Leeds 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.

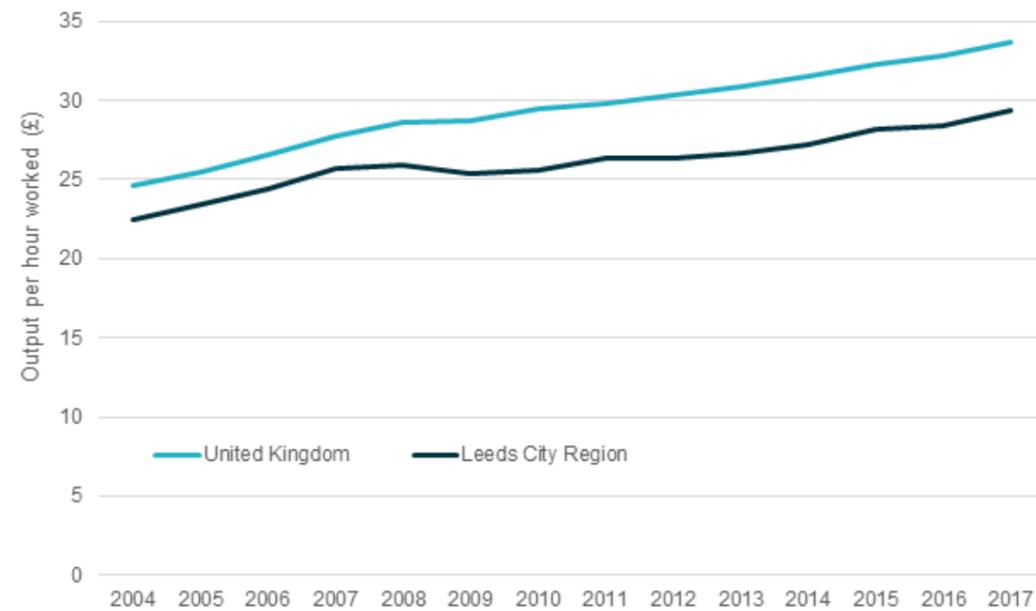
An important next step is to support the delivery of our strategies is to develop a plan and pipeline of long-term investments, which address a full range of strategic and local connectivity needs. Ten Case for Change reports have been produced with the input of the partner councils, which address corridors 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 West Yorkshire's priorities for growth

The emerging Industrial Strategy for West Yorkshire highlights a significant and widening productivity and innovation deficit, as show in Figure 1. Living standards across the City Region 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’s total CO<sub>2</sub> emissions<sup>1</sup>. 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 21<sup>st</sup> Century Transport** - Creating efficient transport infrastructure that makes it easier to get to work, do business and connect with each other

Source: West Yorkshire Local Industrial Strategy, West Yorkshire Combined Authority Policy Framework

<sup>1</sup> 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 will benefit from inclusive growth. Table 2 shows a list of the corridors and the corresponding reports with their appropriate extents illustrated in Figure 2. All the Case for Change corridors are shown in **Figure 3**, with the South and East Leeds corridor highlighted in red.

**Table 2: Reporting Index**

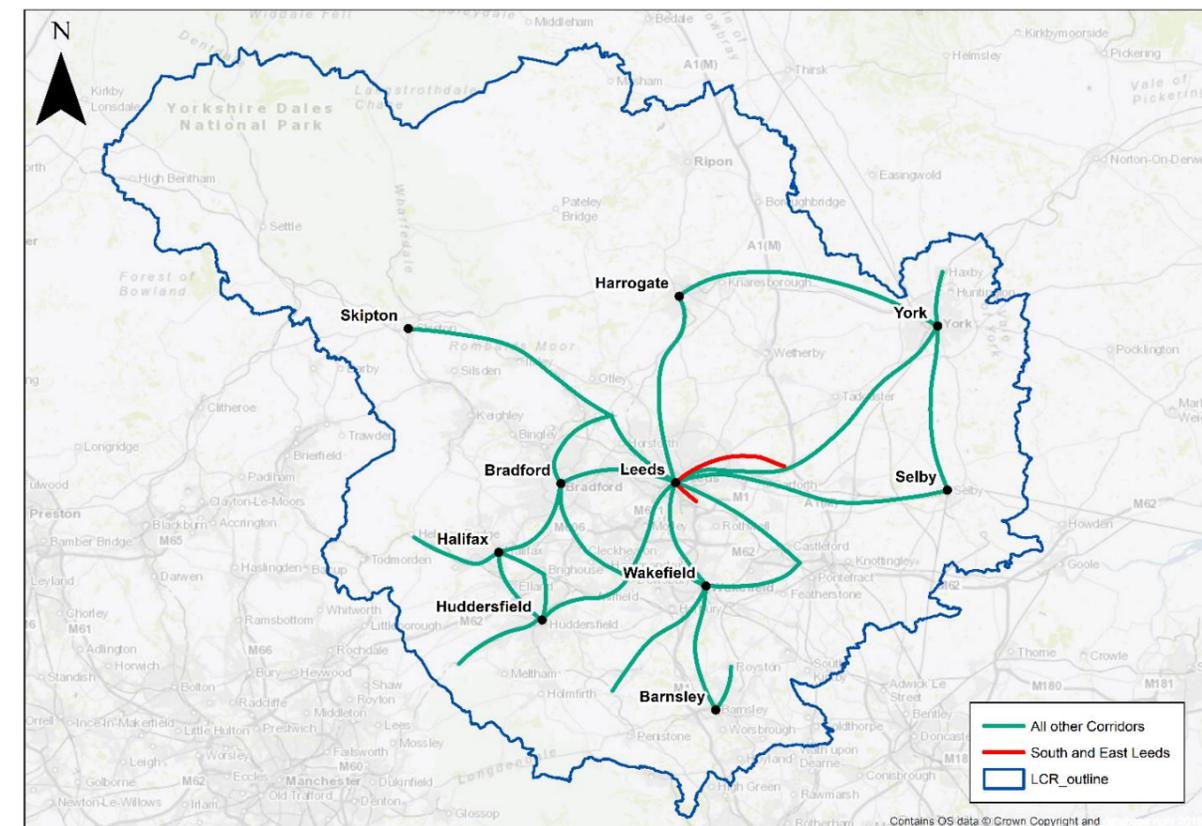
Ref.	Report Name	Original corridor name
1		Strengthening high value assets in the North West of Leeds, the University of Leeds, Kirkstall Forge and the airport
1	Airport, Airedale and Wharfedale: Case for Change	Skipton to Leeds
1		Stimulating development from the city centre into North Bradford towards 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

This corridor was 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 work have been compiled in accordance with the format of the second phase of Connectivity Plan development through 2019-20 and are presented in a consistent manner within this report.

**Figure 2: West Yorkshire Connectivity Plan Reporting Map**



**Figure 3: West Yorkshire Connectivity Plan: Corridor Map**



The South and East Leeds corridor extends eastwards from Leeds towards the East Leeds Extension and Thorpe Park, and includes St James's Hospital. To the south, the corridor extends from Leeds to the M62 Junction 28 and includes the South Bank, Holbeck, Hunslet, Belle Isle and Middleton. The corridor is characterised by densely populated urban areas, including Cross Green, Richmond Hill, Harehills, Seacroft, Hunslet and Belle Isle.

### 1.5 South and East Leeds: 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.

## South and East Leeds: socio-economic profile

This inclusive growth corridor examines movements across South and East Leeds. It is characterised by densely populated urban areas. Average household income in the corridor is lower than both national and regional averages and 70% of the population are employed. There is a considerable amount of 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.



Total jobs in the corridor:  
 Over  
**330,000**



Job growth forecast  
 in the corridor:  
**197,000**



Additional dwellings  
 forecast in the corridor:  
**30,000**



Average household income:  
**£32,500**



% in employment:  
**70%**

Yorkshire and Humber  
**£36,526**

England and Wales  
**£41,642**

Yorkshire and Humber  
**60%**

England and Wales  
**62%**

Places with challenges for:



Income:  
**Hunslet Carr**



Employment:  
**Beeston Hill**



Health:  
**Hunslet**

Places with opportunities for:



Connectivity:  
**Thorpe Park**

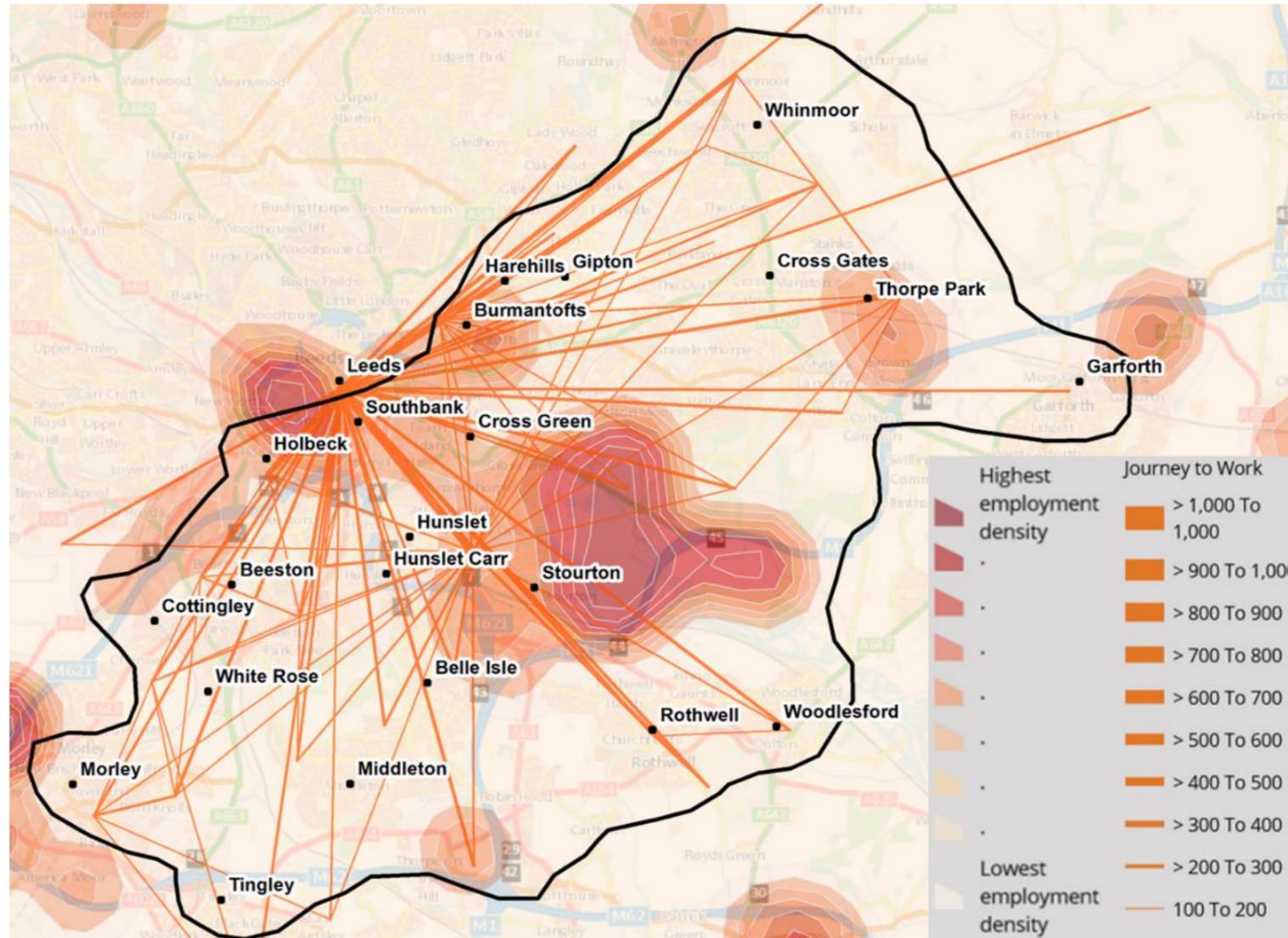


Employment:  
**Leeds South Bank  
 and A63 Leeds  
 Enterprise Zone**



Housing:  
**East Leeds  
 Extension**

## South and East Leeds – connectivity highlights



People in communities within the corridor, including in Burmantofts, Holbeck, Beeston and Hunslet Carr experience low employment and skills prospects, low household income, and low car ownership, with several areas being within the 10% of most deprived communities in the UK.

Many job opportunities, often in the wholesale and retail trade sector 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

### Key connectivity challenges:

- 49% of the population in the corridor are in the 10% most deprived in England. Improving access to employment and education destinations will help to **boost productivity** and ensure **inclusive growth**
- Addressing discrepancies in bus frequency in areas such as Belle Isle and Cross Green will help to **deliver a 21<sup>st</sup> century transport system**
- High levels of peak-time traffic, and associated congestion on the motorway network and junctions must be addressed to **tackle the climate emergency**

Investment is required in improved connectivity, both for strategic trips towards Leeds and the East of Leeds, and local trips to key housing and employment sites. 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

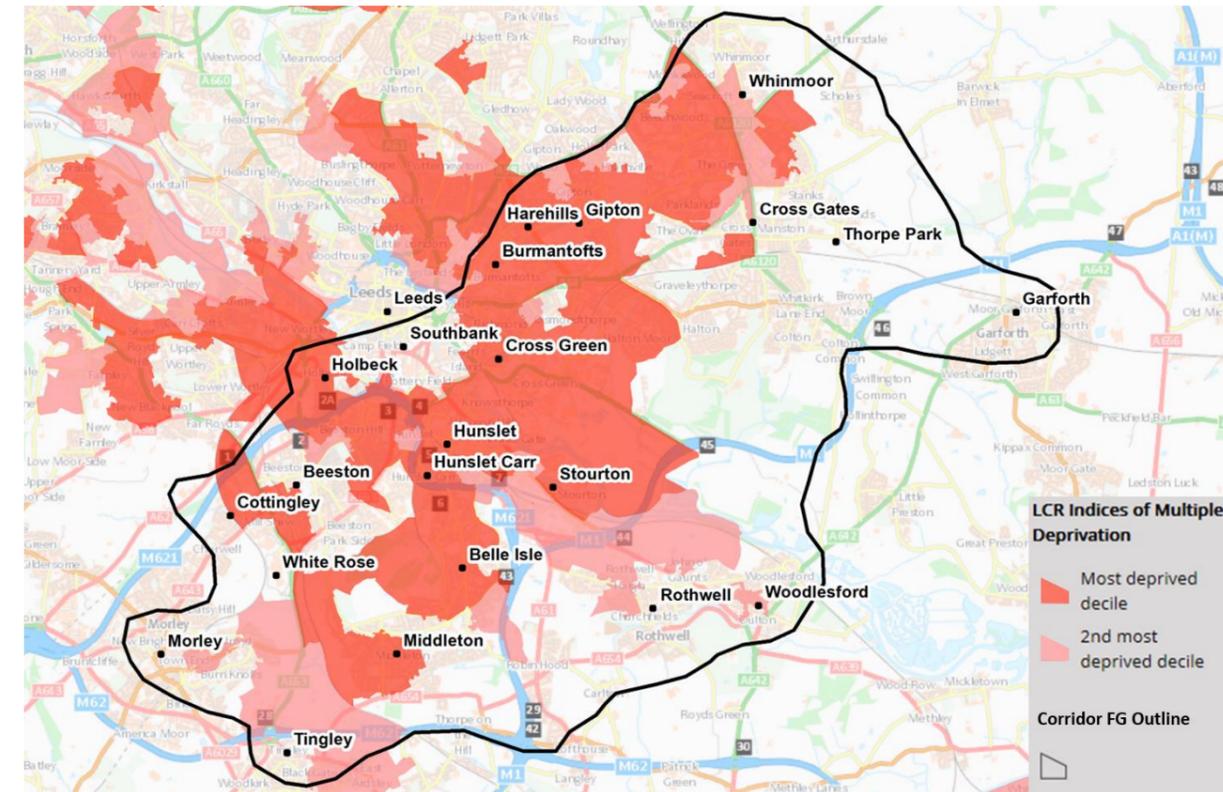
### 2.1 Enabling Inclusive Growth

#### 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 nationally<sup>2</sup>. The index of multiple deprivation is an overall relative measure of deprivation constructed by combining seven domains of deprivation according to their respective weights.<sup>3</sup> 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

Large areas of the South and East Leeds corridor have high levels of deprivation. The corridor has an average IMD score of 2.83, with 49% of the population falling within the 10% most deprived in England. The IMD score for the corridor is significantly lower than the Leeds City Region average of 5.06.

Burmantofts, Harehills, Richmond Hill, Cross Green, Seacroft, Hunslet, Hunslet Carr, Stourton, Middleton and Belle Isle are all within the 10% most deprived areas in England. There is very high density, low rise housing inside the Inner Ring Road, with high levels of social housing.

**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<sup>4</sup>.**

#### 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**

<sup>2</sup> English Indices of Deprivation 2015 – Department for Communities and Local Government

<sup>3</sup> ibid

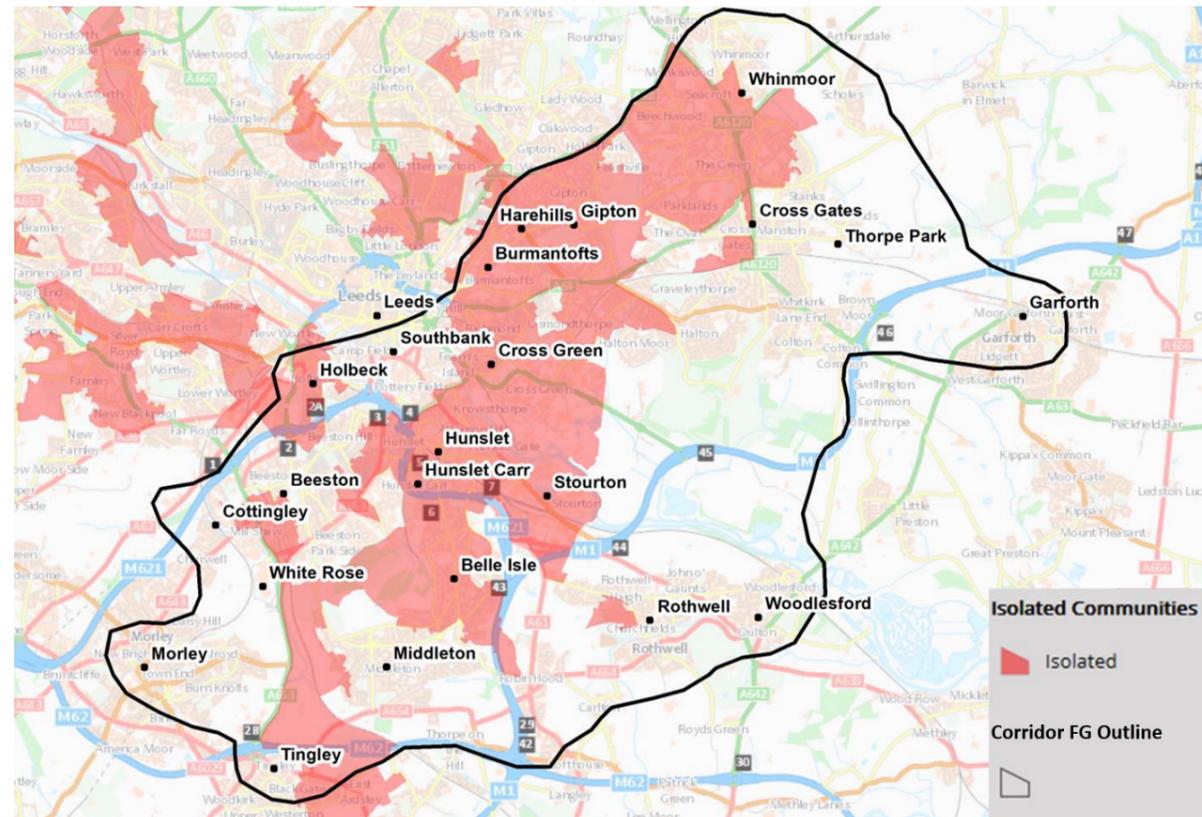
<sup>4</sup> Tackling transport-related barriers to employment in low-income neighbourhoods (2018) accessed via: <https://www.jrf.org.uk/report/tackling-transport-related-barriers-employment-low-income-neighbourhoods>

opportunities are difficult to access because of public transport journey times, reliability (perceived as well as actual) and affordability<sup>5</sup>.

This uses the approach adopted for the Joseph Rowntree Foundation for “*Tackling transport related barriers to employment in low-income neighbourhoods*” and 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 south and east of Leeds that are defined as “isolated communities” (see Figure 5:), notably in Burmantofts, Harehills, Gipton, Cross Green, Osmondthorpe, Hunslet, Holbeck and Stourton.

Figure 5: Isolated communities



Source: Mott MacDonald

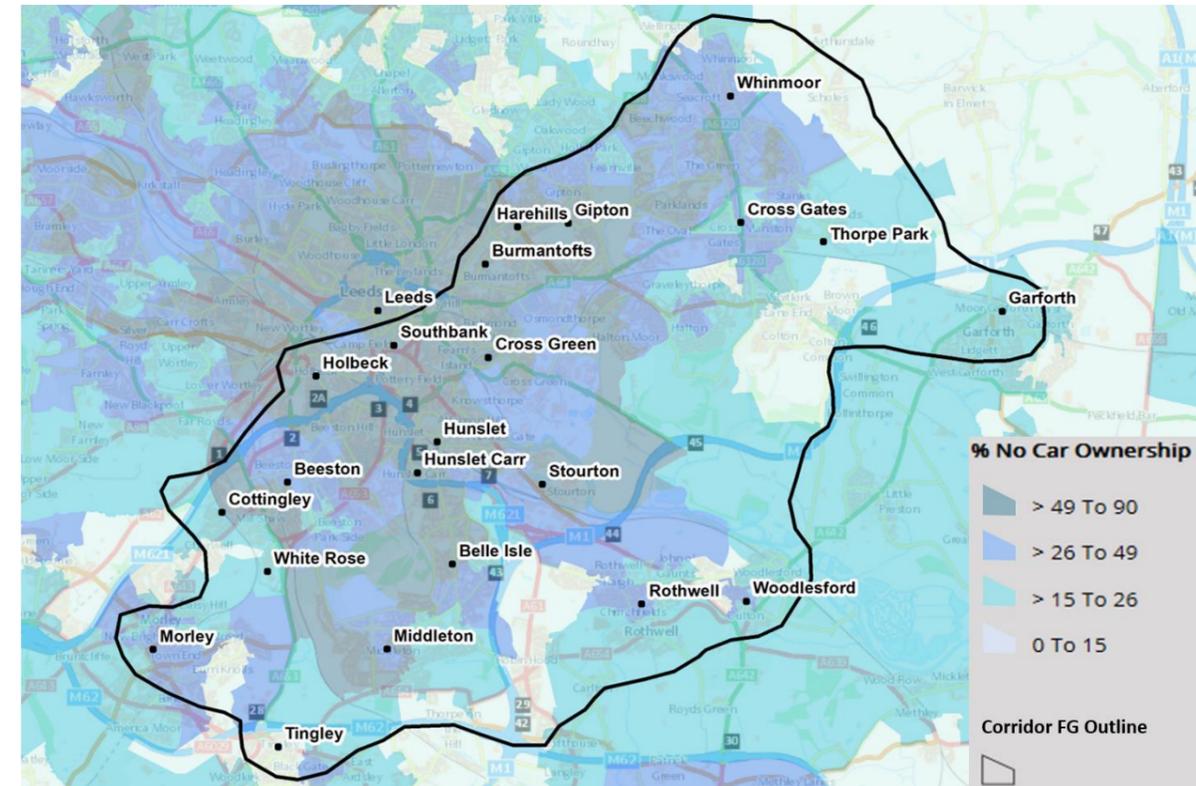
Improving connectivity in these areas is fundamental to enabling inclusive growth. People within these communities are unable to access many destinations for work, meaning many people have limited access to job opportunities. Many people in isolated communities also rely on affordable, convenient and 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 growth<sup>6</sup>.

### 2.1.3 Car ownership

The strategic road network in south and east Leeds ensures that some of these areas are reasonably well connected. **However, there are several areas in the corridor which are characterised by low car ownership** (see Figure 6:), meaning that not everyone can benefit from the connectivity opportunities this brings. Areas with particularly low car ownership levels include Stourton, Hunslet Carr, Holbeck, Beeston, Richmond Hill, Burmantofts and Gipton. In Beeston Hill, just over 70% of residents do not own a car.

**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.**

Figure 6: % No car ownership



Source: Mott MacDonald

<sup>5</sup> 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>

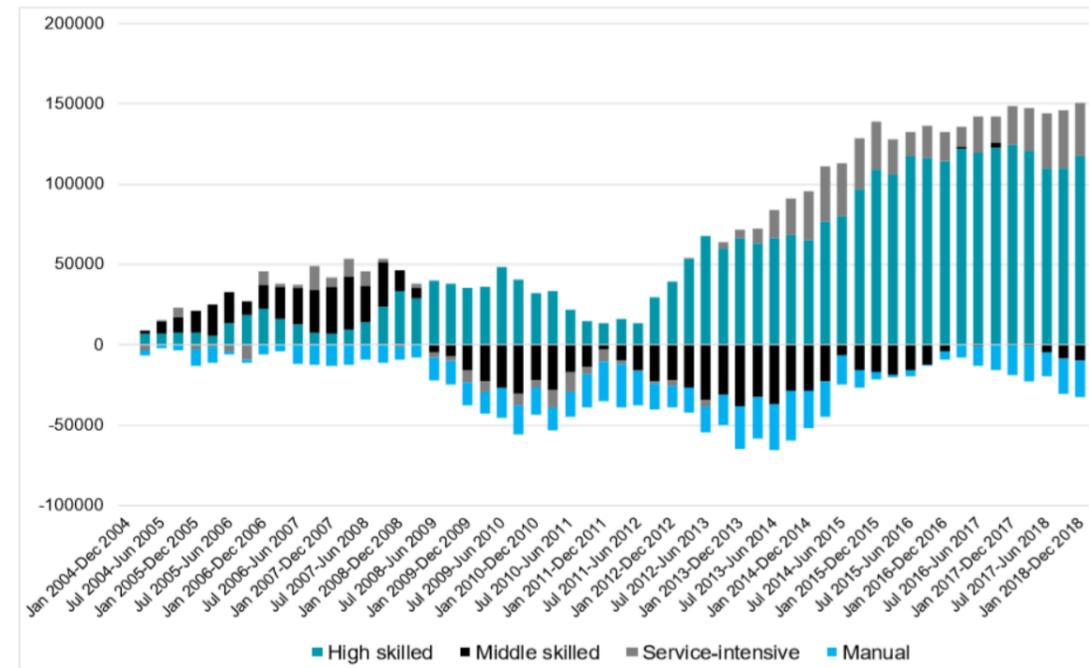
<sup>6</sup> Tackling transport-related barriers to employment in low-income neighbourhoods (2018) accessed via: <https://www.jrf.org.uk/report/tackling-transport-related-barriers-employment-low-income-neighbourhoods>

## 2.2 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). In this corridor, these employment opportunities include those in the finance and insurance sector. This has an impact on 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**



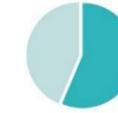
Source: LCR emerging Industrial Strategy



Total jobs in the corridor:

Over

**330,000**



% in employment:

**70%**

Yorkshire and Humber

**60%**

England and Wales

**62%**

The South and East Leeds corridor has some distinct employment characteristics and strengths.

In terms of number of employees, the financial and insurance sector has over *twice the national average*<sup>7</sup> in this corridor. The UK average industry percentage for the financial and insurance sector is 2.4%, whereas the industry percentage for the sector in the South and East Leeds corridor is 7.5%. Job accessibility will be enhanced by locating new employment opportunities near to both existing and new housing sites.

St James's Hospital is a key local employer and source of important health services within east Leeds. The largest employment sector around St James's Hospital in Burmantofts is human health and social work, with the industry percentage for this sector in the area at 83%. Thorpe Park and White Rose are both employment hubs. Job opportunities in these hubs centre around wholesale and retail trade. This sector operates shift patterns outside of the traditional timetables and schedules of current public transport routes.

**Connectivity to these specialisms is fundamental to boosting productivity.**

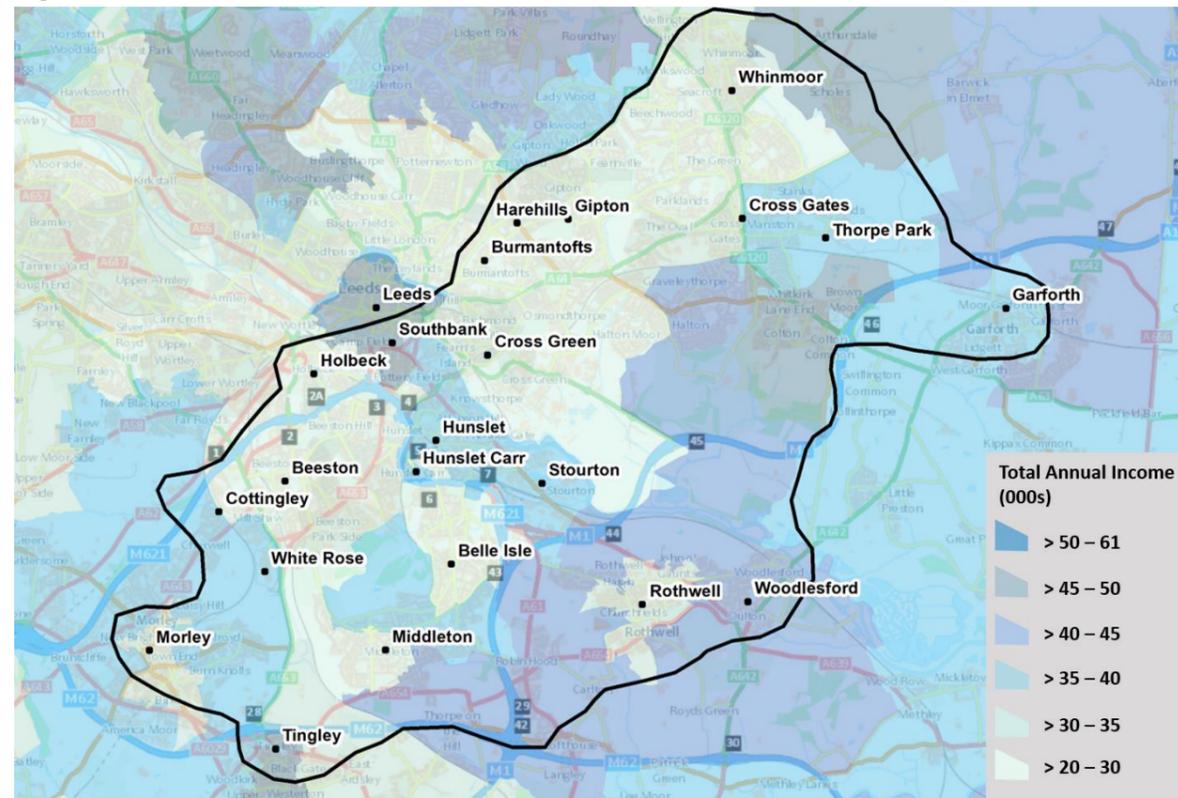
<sup>7</sup> Business Register and Employment Survey: open access (2017)

### 2.2.2 Household income

Average total annual household income in the corridor (£32,500) is lower than the average for England and Wales (£41,642) and that for Yorkshire and Humber (£36,526), and is particularly low in and surrounding Burmantofts (£23,600), Harehills (£25,800), Gipton (£25,800), Holbeck (£28,900), Hunslet Carr (£27,200) and Beeston (£28,400) (shown in Figure 8).

The gross value added per head (GVA) according to the West Yorkshire Combined Authority for Leeds is 8% higher than the UK average. This figure is based on Leeds as a whole, which is a large centre of economic activity within West Yorkshire. It is likely that areas and communities within this corridor have a lower GVA than this. This general measure of prosperity shows the need for better connections in the area to create opportunities to help enhance the economy and to help reduce the gap between some communities in the area and national income levels.

Figure 8: Total annual household income



Source: Mott MacDonald

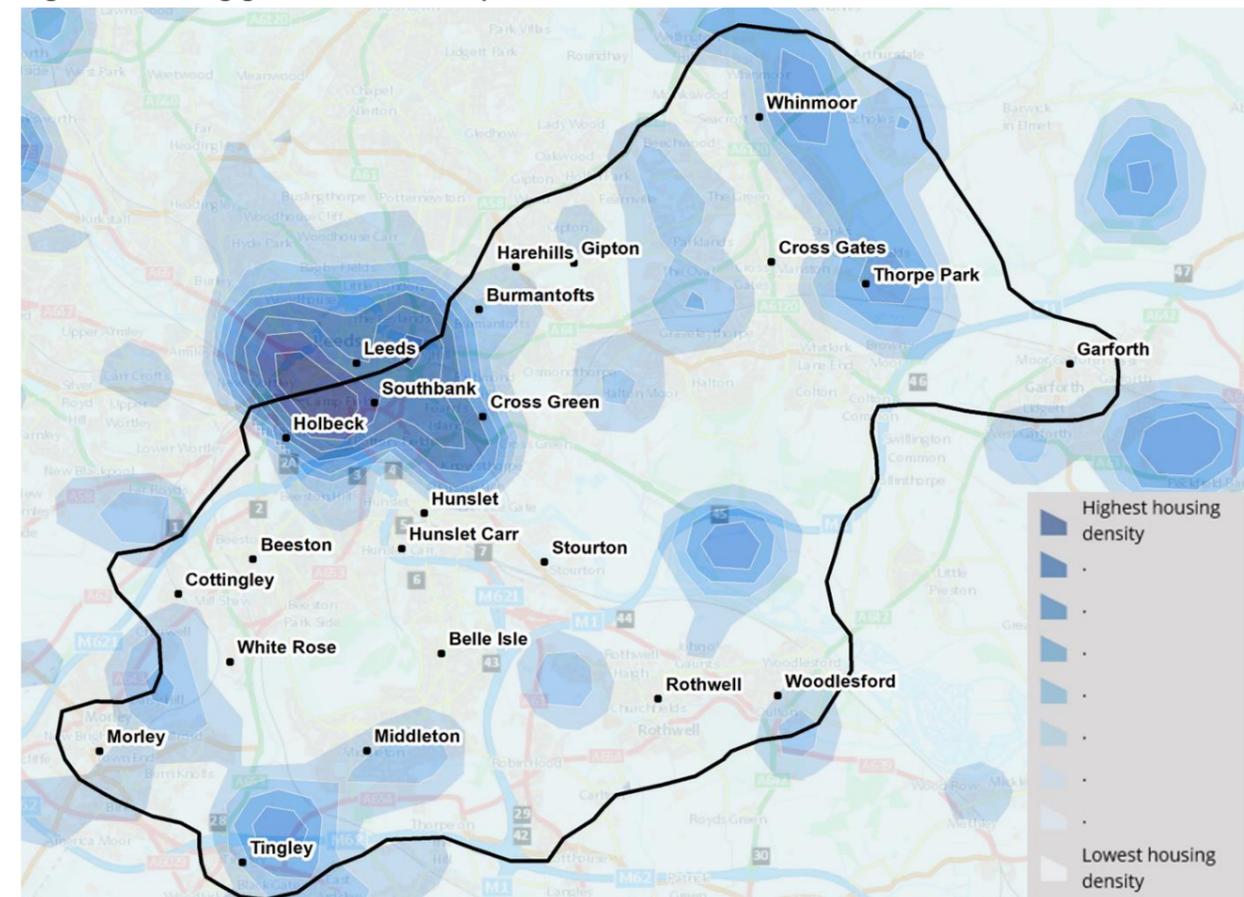
Connecting areas of deprivation and low annual household income is important to provide opportunities for people to access education and employment and in enabling inclusive growth throughout the corridor.

### 2.2.3 Growth areas

The South and East Leeds corridor is subject to considerable growth plans. 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 Leeds City Region's emerging Industrial Strategy identifies that over the past five years business base growth in Leeds (25%) has occurred faster than the UK (19%)<sup>8</sup>. This emphasises the need for efficient transport networks to support this growth and facilitate connections between businesses and potential employees and customers across the corridor.

Figure 9 shows a heatmap of housing growth sites in the South and East Leeds corridor. A total of 30,000 new homes are proposed across the corridor by the year 2035. Key housing development sites include Leeds South Bank (8,000 new homes) and the East Leeds Extension (5,000 new homes). Of the total number of proposed new homes in the corridor, 16,600 (55%) are planned for construction in the most deprived areas (top 10% in England).

Figure 9: Housing growth sites heatmap



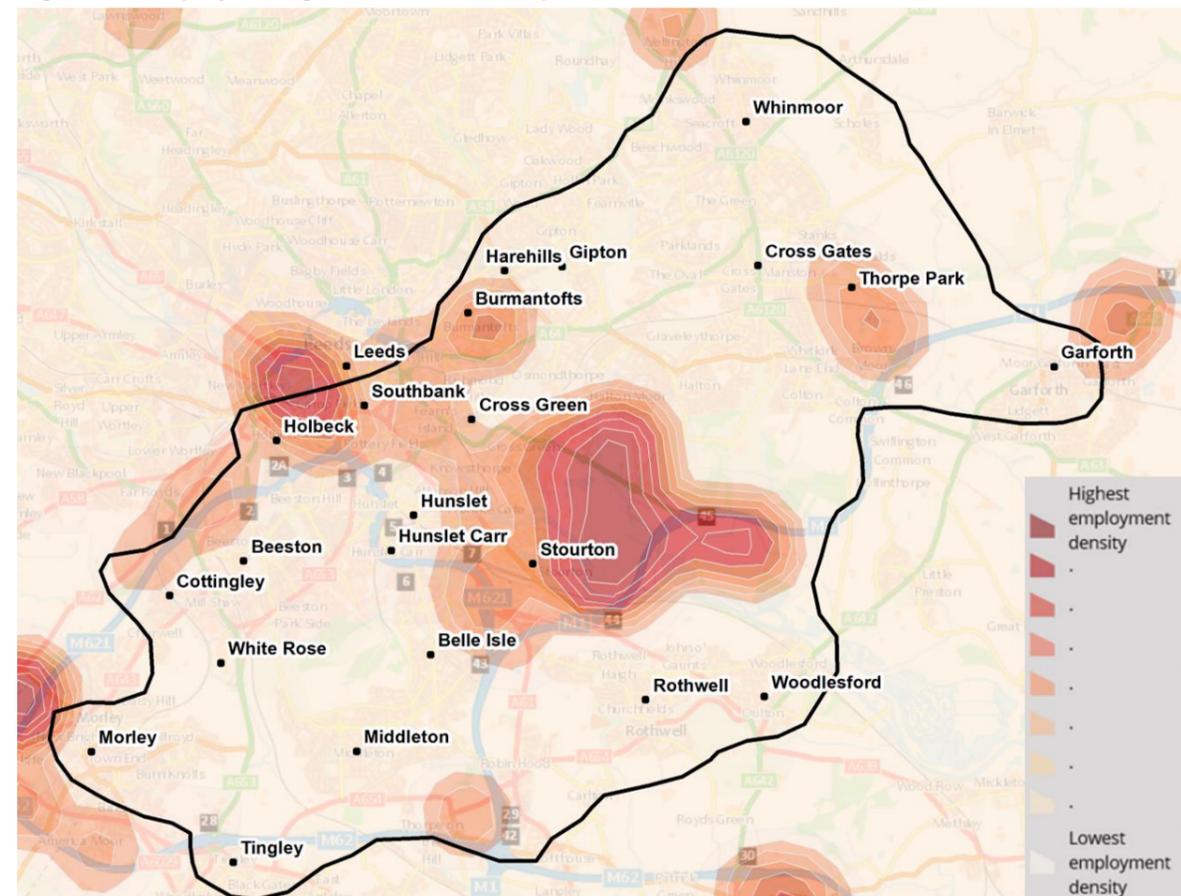
Source: Mott MacDonald

<sup>8</sup> ibid

**Housing and employment growth in the corridor emphasises the need to improve public transport connectivity to these areas and existing communities, to ensure services are not strained by additional residents and enable access to employment opportunities for everyone.**

Key employment growth sites include the Aire Valley Enterprise Zone, Thorpe Park Growth Area and Leeds South Bank (see Figure 10). The Aire Valley Enterprise Zone is a major employment zone with 142 hectares of planned development land situated at J45 of the M1. In Thorpe Park, a large site has been allocated for future mixed-use development. In addition to the 8,000 new homes associated with Leeds South Bank, 35,000 jobs are expected to be generated by the Leeds South Bank development.

**Figure 10: Employment growth sites heatmap**



Source: Mott MacDonald

## 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<sub>2</sub>e/year (millions of tonnes of carbon emissions per year). Transport sector emissions are dominated by emissions from road transport with 4.4 MtCO<sub>2</sub>e/year being from road transport<sup>9</sup>, representing roughly 40% of total CO<sub>2</sub> emissions in West Yorkshire (11.1 MtCO<sub>2</sub>e/year)<sup>10</sup>. 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)<sup>11</sup>.

The Combined Authority published, in July 2020, the findings of a Carbon Emissions Reduction Pathways (CERP) study<sup>12</sup>. 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<sub>2</sub>) and particulate matter (PM<sub>n</sub>) which

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

<sup>10</sup> ibid

<sup>11</sup> ibid

<sup>12</sup> ibid

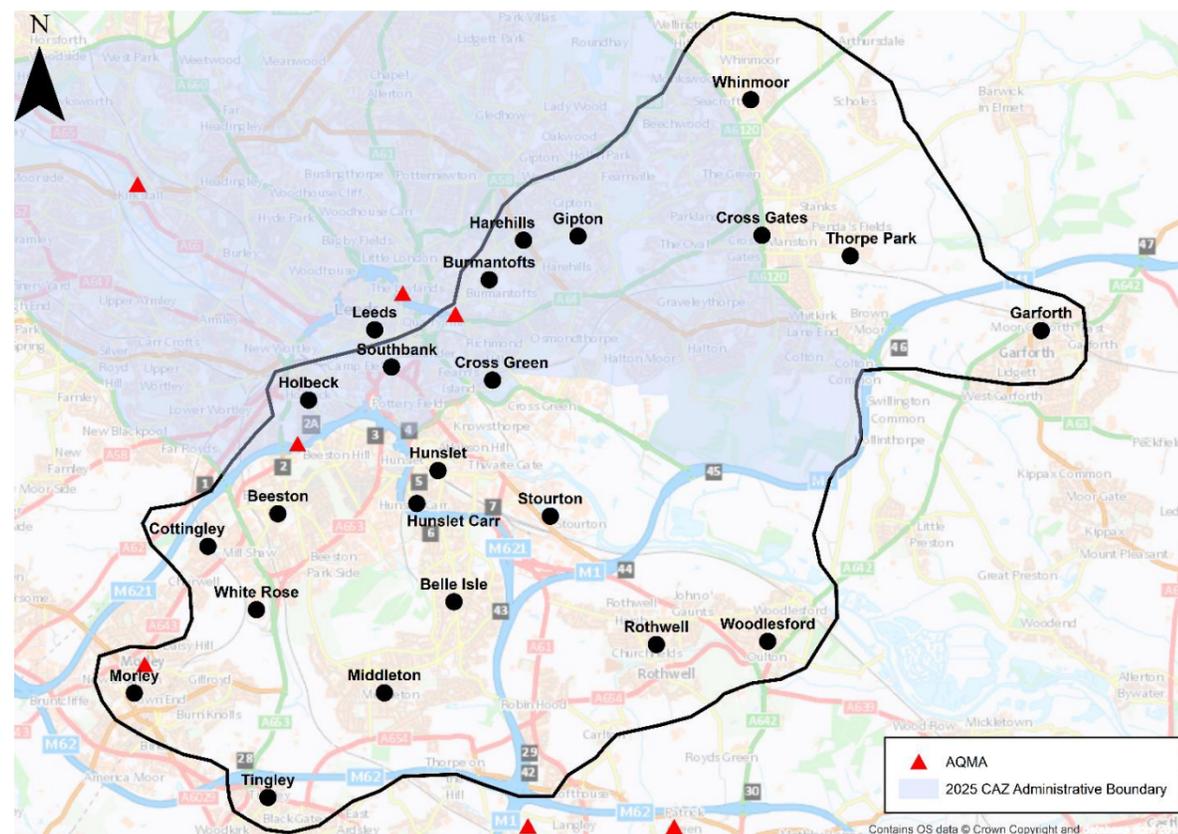
have an adverse impact on health and mainly result from emissions from traffic, particularly exhaust emissions from older diesel vehicles.

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<sup>13</sup>.

There are 3 small, localised air quality management areas in the corridor, as shown in Figure 11. Air quality has also been highlighted as an issue in Leeds with the proposed introduction of a Leeds Clean Air Zone (CAZ) covering the city centre and out to Cross Gates.

**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 (AQMA) and Future Clean Air Zone**



Source: Mott MacDonald

## 2.4 Delivering 21<sup>st</sup> Century Transport

### 2.4.1 Active modes

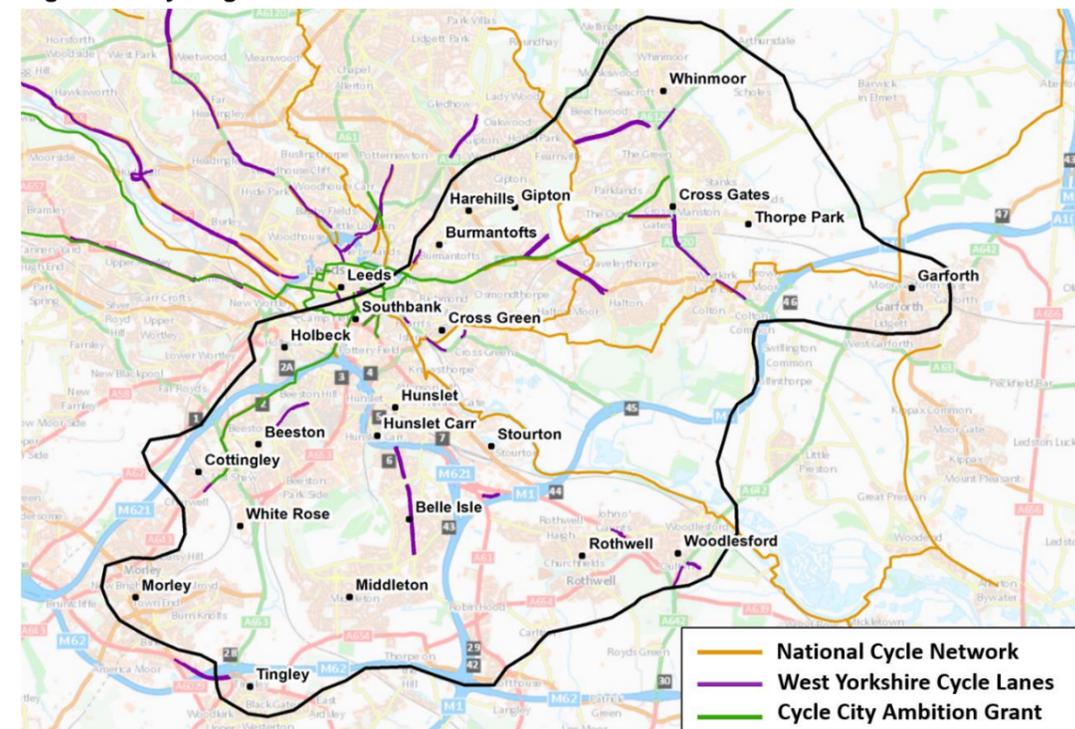
The ability for people to cycle and walk more safely, and more often, has a significant role to play in the wider strategic transport network in West Yorkshire and the wider Leeds City Region.

Figure 12 identifies the cycling network across the corridor, highlighting sections of the National Cycle Network (NCN). There are a number of National Cycle Routes (NCR) running within the eastern section of the corridor, such as NCR 66, NCR 67 and NCR 677.

The existing highway infrastructure in east Leeds causes severance which limits pedestrian and cycling access to the City Centre. The recent delivery of the City Connect Cycle Superhighway (CS2) along the A64 York Road has provided a boost to active travel in east Leeds. However, the A64 also creates a significant severance for communities and people wishing to travel by foot, with lack of crossing points and high speeds experienced by people.

**High quality infrastructure will be needed to see a significant increase in these journeys. Investment in infrastructure for walking and cycling will improve connectivity to current and future employment and education opportunities within the corridor, particularly in areas that are presently only accessible by private car.**

**Figure 12: Cycling network**



Source: Mott MacDonald

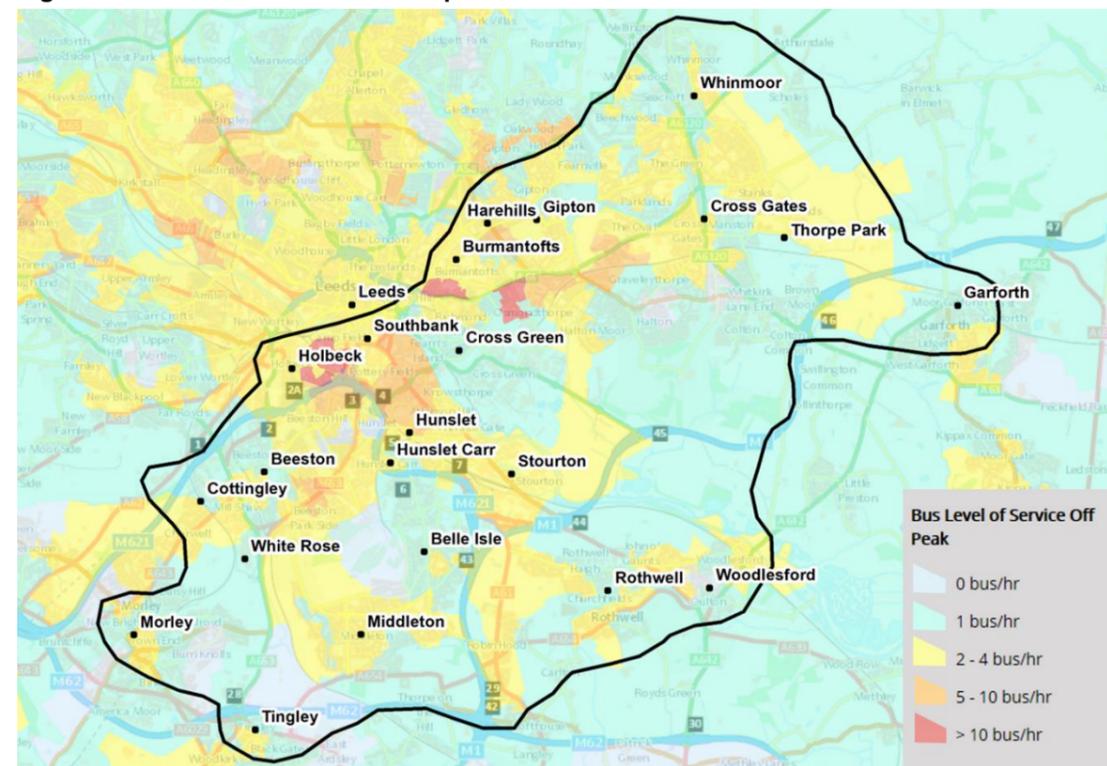
<sup>13</sup> Department for Environment Food & Rural Affairs at <https://uk-air.defra.gov.uk/aqma/> accessed in October 2020

### 2.4.2 Bus

Figure 13 shows bus levels of 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.

The lack of public transport priority in south Leeds is holding back innovative travel solutions. Bus services are particularly limited in areas such as Belle Isle and Cross Green. There is existing aging bus infrastructure along the A64 York Road, and long, unreliable public transport journey times along the A63 Pontefract Lane. There is an absence of orbital public transport options within the corridor, particularly between the M1 and the A63, which is adding to pressure on arterial routes. The lack of consistency in bus service throughout the corridor limits connectivity.

Figure 13: Bus level of service – off-peak



Source: Mott MacDonald

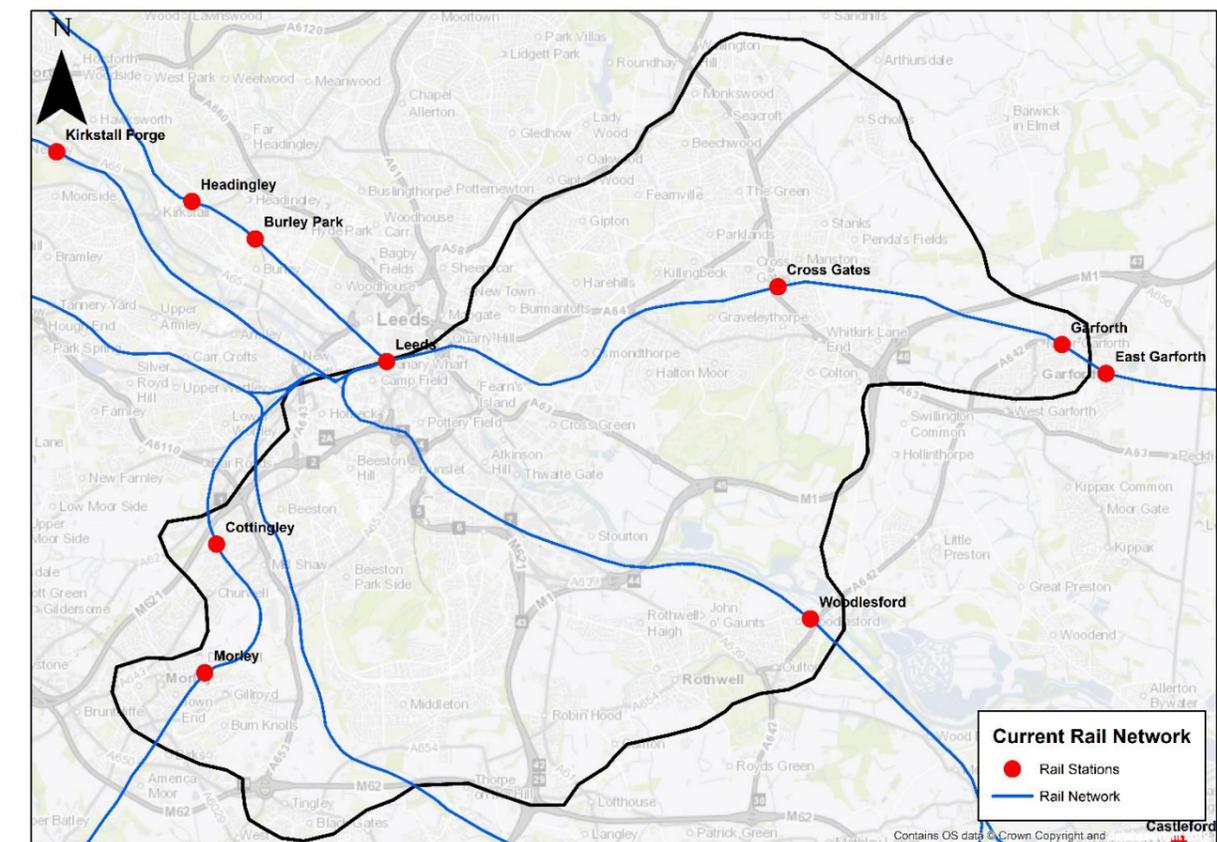
### 2.4.3 Rail

The current passenger rail network (see Figure 14) consists of:

- The East Coast Main Line: Leeds to Wakefield and Doncaster, providing wider connections to Peterborough and London King’s Cross.
- The Castleford line: via Woodlesford offering on average 1 train per hour.

<sup>14</sup> WYCA passenger counts and surveys

Figure 14: Current Rail Network



Source: Mott MacDonald

- The East Leeds line: with railway stations at Cross Gates, Garforth and East Garforth. This line extends eastwards to Selby, and additionally provides a connection to York.
- The Huddersfield (Diggle) trans-Pennine mainline: Leeds via Dewsbury to Huddersfield and Manchester. Services along this line stop at Cottingley and Morley within the South and East Leeds corridor.

Challenges for rail services within the study area include regular overcrowding of trains in and out of Leeds particularly at peak times<sup>14</sup> (which is anticipated to increase to higher levels in the future); frequencies that do not meet existing policy standards (WYCA’s policy is that all routes serving Leeds should have at least two trains per hour); poor reliability<sup>15</sup>; and an ageing and unattractive rolling stock provision.

There are connectivity gaps in the north east section of the corridor, in areas such as Harehills and Seacroft, and in the south, in areas such as Hunslet and Middleton.

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.

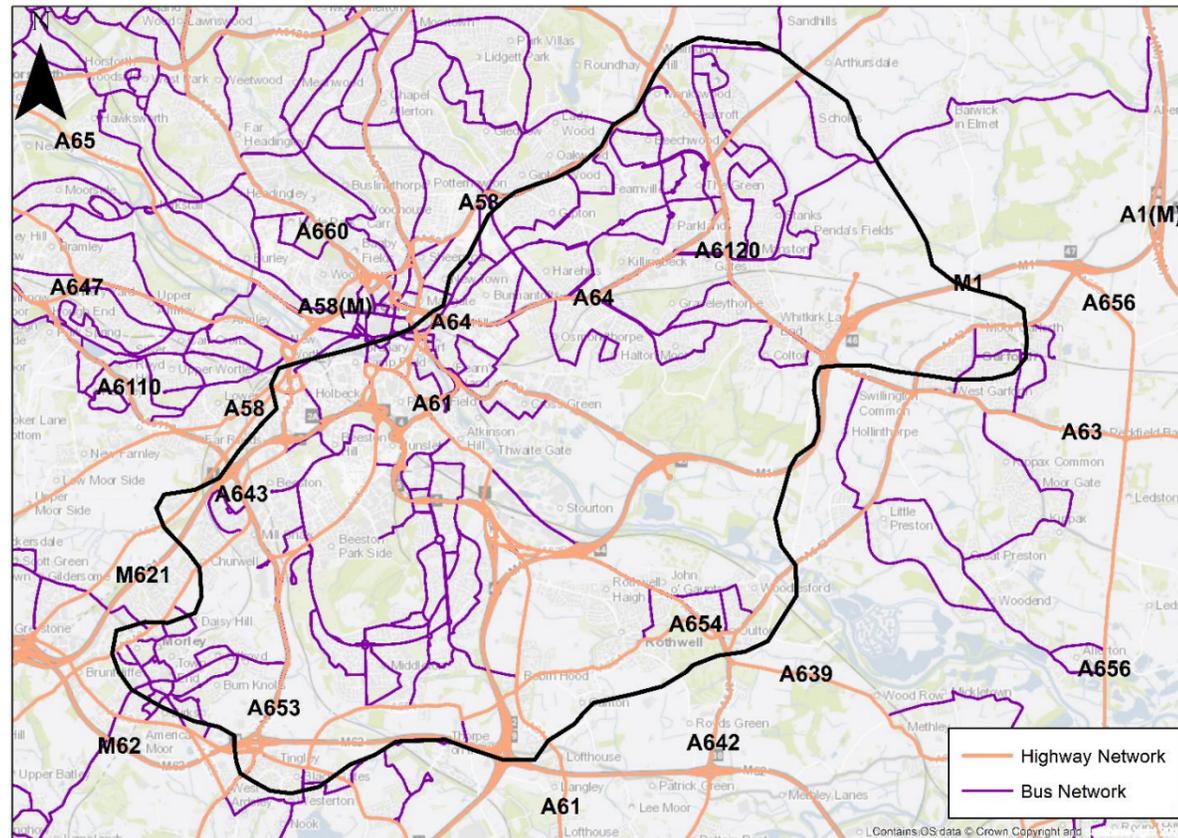
<sup>15</sup> Office of Rail and Road Passenger Rail Performance

### 2.4.4 Road

Figure 15 presents the road and bus networks throughout the corridor. The strategic road network includes the M62 to the south of the corridor and the M1 running through the south eastern part of the corridor.

Other key routes include the A63 Pontefract Lane connecting Cross Green with the M1, the A61, as well as the M621. The M621 circles a number of residential areas such as Morley, Beeston and Middleton and connects to the M62 at Gildersome and the M1 at Belle Isle.

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



Source: Mott MacDonald

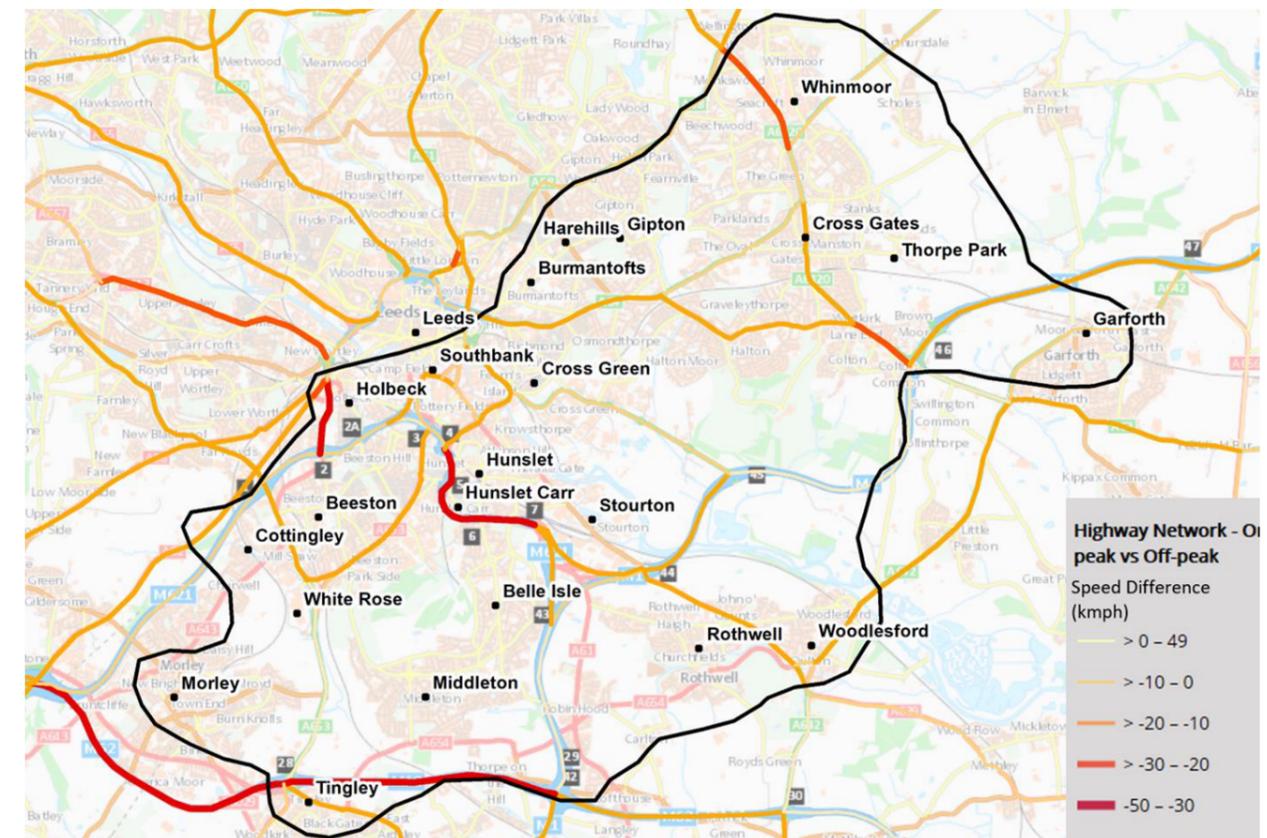
#### 2.4.4.1 Highway network performance

Figure 16 shows the speed difference (kmph) on the highway network between the peak and off-peak.

Capacity constraints on the motorway network and junctions limit access to employment opportunities and constrains further growth. There is a large reduction in peak speed along the A643 between the M621 and A58, along the M62 north of Tingley and along the M621 south of Hunslet Carr. Congestion has contributed to the declaration of AQMAs, including at 'The Tilburys' in Holbeck, east of the A643. Stakeholders have identified a lack of resilience on the highway network, which leads to rat-running during incidents, for instance on the M1.

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

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



Source: Trafficmaster

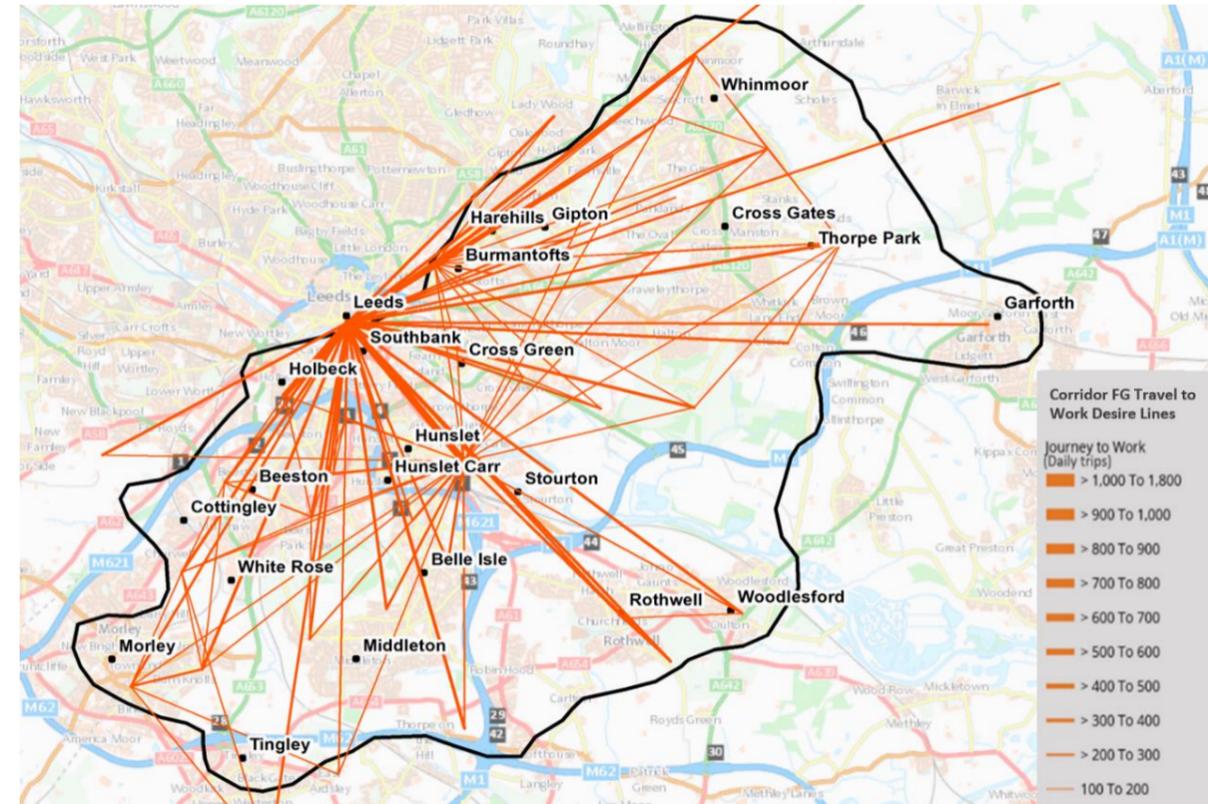
### 2.4.5 Patterns in transport demand

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). A considerable number of trips are made to and from Leeds City Centre from the key places to connect within the corridor. In terms of daily trip numbers beyond the corridor, there are currently 21,600 people travelling to work from Wakefield to Leeds and 12,700 from Leeds to Wakefield. Most of these people will use the south Leeds corridor to travel between the two destinations. There is a disparity in the direction of trips between Leeds and Wakefield, with 8,900 more workers travelling towards Leeds than Wakefield each day. There is similarly a disparity in travel towards/from York each day, as 4,000 travel to York and 10,400 workers travel towards Leeds, resulting in 6,400 more workers travelling towards Leeds each day than York.

Figure 18 and Figure 19 show where new housing and employment sites are located and the current travel to work patterns. Key housing growth sites include Thorpe Park (7,000 dwellings), East Leeds Extension (5,000 dwellings), Aire Valley (1,100 dwellings), South Bank (8,000 dwellings) and Tingley (1,500 dwellings). Key employment sites include Aire Valley (142ha) and South Bank (35,000 jobs). These growth points are likely to have a significant effect on travel patterns; it will consequently be crucial to connect these places with a range of travel choices to ensure inclusive growth.

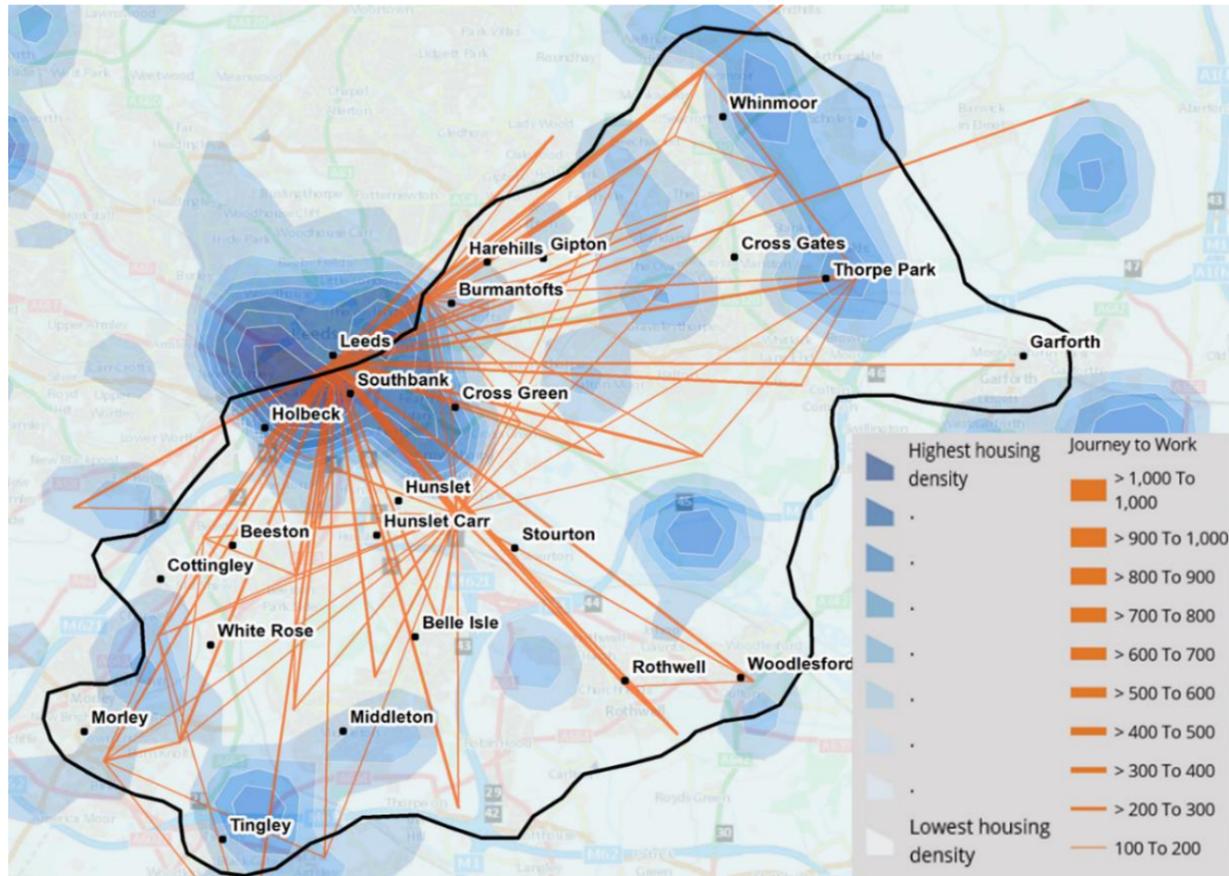
**These graphics indicate that there is value in improving connectivity in this area, to ensure the area's current and future residents and employees benefit from the growth opportunities that will become available. They also illustrate the potential for travel patterns to change, where demand is likely 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.

Figure 17: Journey to work desire lines



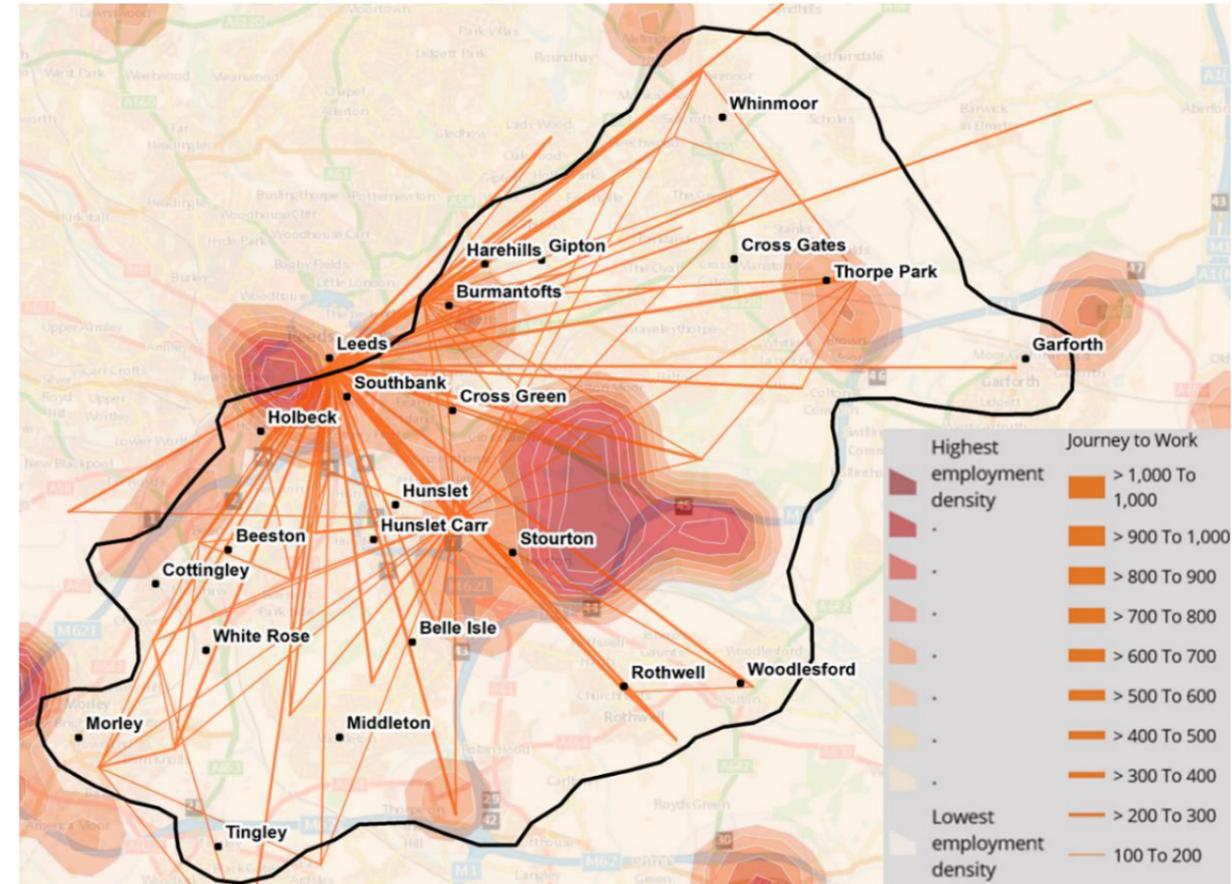
Source: Mott MacDonald. Note: the study area for this corridor only includes a selection of neighbourhoods within the Leeds urban area and thus not all commuter patterns have been captured

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 South and East Leeds, including in Burmantofts, Holbeck, Beeston and Hunslet Carr. These communities are characterised by low employment and skills prospects, low household income (up to 43% below national average) and low car ownership, and all are within the 10% most deprived communities in England.

Employment prospects in the area are focused on the financial and insurance sector, industrial sector and wholesale and retail trade. Many of these industrial and distribution opportunities rely heavily on car access, and yet, there are several communities that lie within the corridor which are characterised by low car ownership, including Beeston (where more than 70% 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.

Improving connectivity to education opportunities will 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.

To help **tackle the climate emergency** and achieve carbon emission targets, congestion and traffic levels on the strategic links in these areas 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.

Several areas within the corridor suffer from poor air quality and there are several AQMAs including Ebor Gardens in Burmantofts, 'The Tilburys' in Holbeck and Chapel Hill in Morley.

The Connectivity Plan for this area will focus upon **delivering 21<sup>st</sup> 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 opportunities in the East of Leeds such as the Thorpe Park development to the rest of the corridor
- Strategic trips from key transport and employment hubs towards opportunities in Leeds City Centre
- Local trips connecting surrounding areas to the opportunities at Leeds South Bank

### 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 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 stakeholder workshops. 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 and corridor-specific aspirations to ensure the best possible fit.

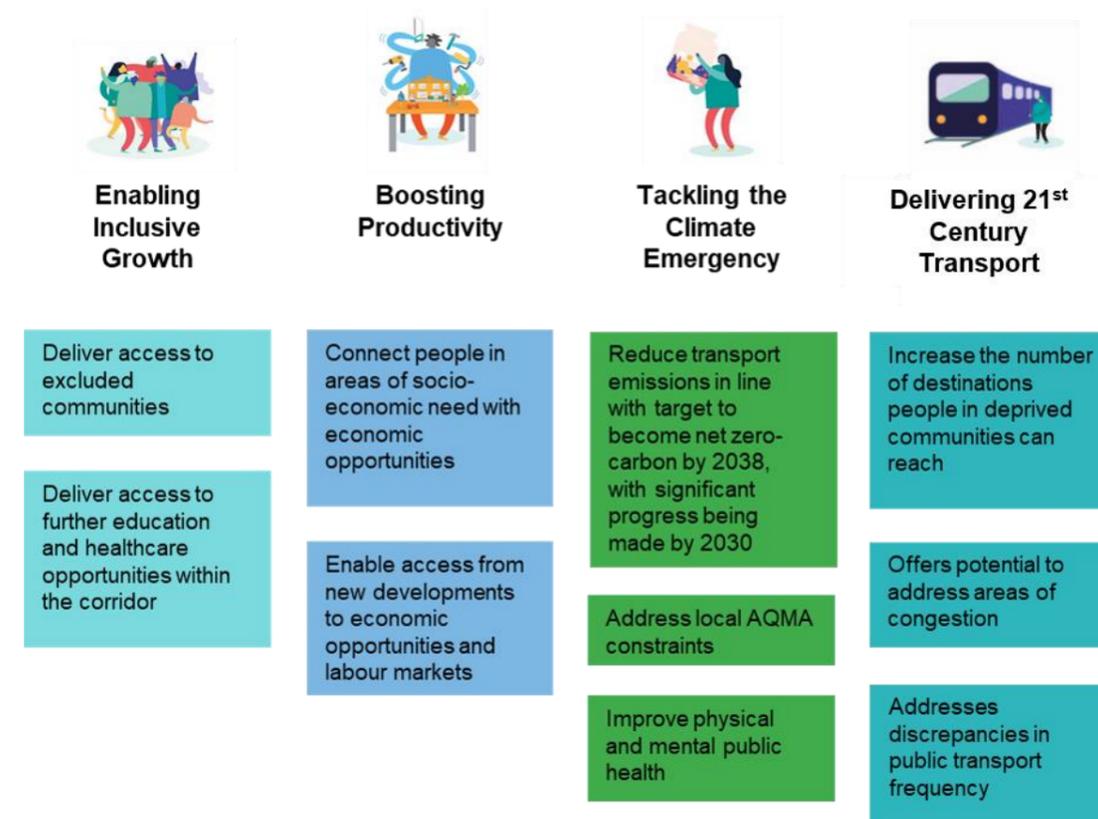
#### 3.2 Core objectives

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
- Address local AQMA constraints
- Improve physical and mental public health
- Reduce transport emissions in line with target to become net zero-carbon by 2038, with significant progress being made by 2030.

**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 South and East Leeds, in consultation with stakeholders.

**The South and East Leeds aspirations are:**

- Contribute to the development of homes and employment
- Ensure people are connected to employment opportunities by high quality transport
- Provide public transport journeys that are quicker and cheaper than owning and running a car
- Provide capacity to meet future travel demand
- Run at an adequate frequency to deliver a 'turn-up-and-go' level of service on the core network
- Deliver high quality, reliable public transport services
- Reduce harmful emissions
- Greater journey choice and flexibility supported by demand responsive transport and Park & Ride

These all align to current local policy documentation such as 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"> <li>Deliver access to further education and healthcare opportunities within the corridor</li> <li>Deliver access to excluded communities</li> </ul>	<p><b>Enabling Inclusive Growth</b></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"> <li>Connect people in areas of socio-economic need with economic opportunities</li> <li>Enable access from new developments to economic opportunities and labour markets</li> </ul>	<p><b>Boosting Productivity</b></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"> <li>Become net zero-carbon by 2038, with significant progress being made by 2030</li> <li>Address local AQMA constraints</li> <li>Improve physical and mental public health</li> </ul>	<p><b>Tackling the Climate Emergency</b></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™<sup>16</sup> principles (again, an influence on positive mode shift to cleaner modes).</p>
<ul style="list-style-type: none"> <li>Increase the number of destinations people in deprived communities can reach</li> <li>Offers potential to address areas of congestion</li> <li>Addresses discrepancies in public transport frequency</li> </ul>	<p><b>Delivering 21st Century Transport</b></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 initial sift takes the pros and cons identified for each concept and assessing each one against three high level criteria using readily available spatial data in GIS. The criteria related to current housing and employment catchments, future development sites and a journey time comparison against the car.

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

<sup>16</sup> 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.

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 second 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.

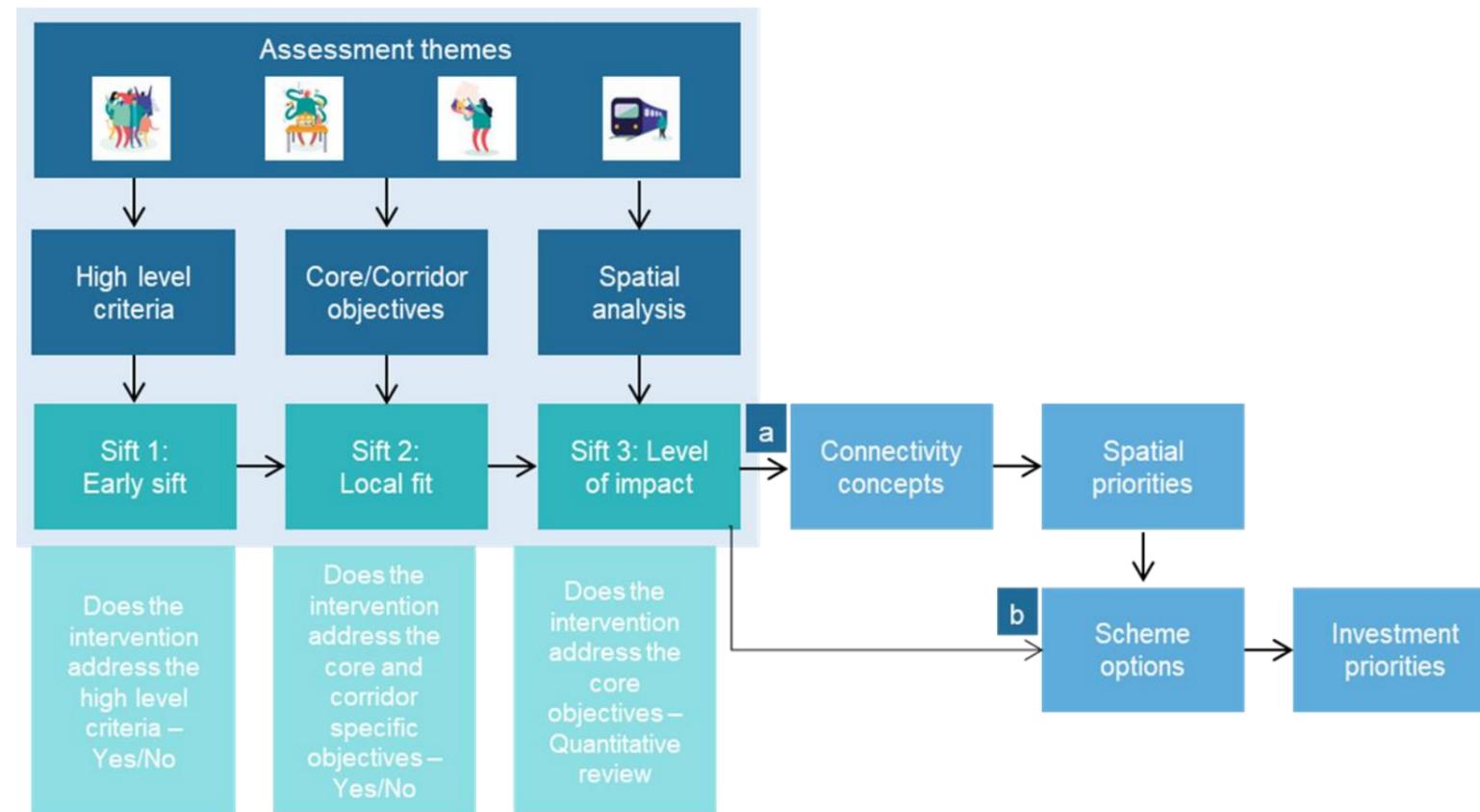
The key outcomes from the appraisal are two-fold – (a) a set of spatial priorities determined from several “connectivity concepts” (mode agnostic connections between key places – described further in Chapter 4), and (b) investment priorities determined from several interventions.

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 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 21: Appraisal process**



Source: Mott MacDonald

**The core appraisal adopted for South and East Leeds 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 spatial priorities, the evidence base enables 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 2.2.1: 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 2.3.1: Air Quality and Carbon
- Section 2.4.3: Rail

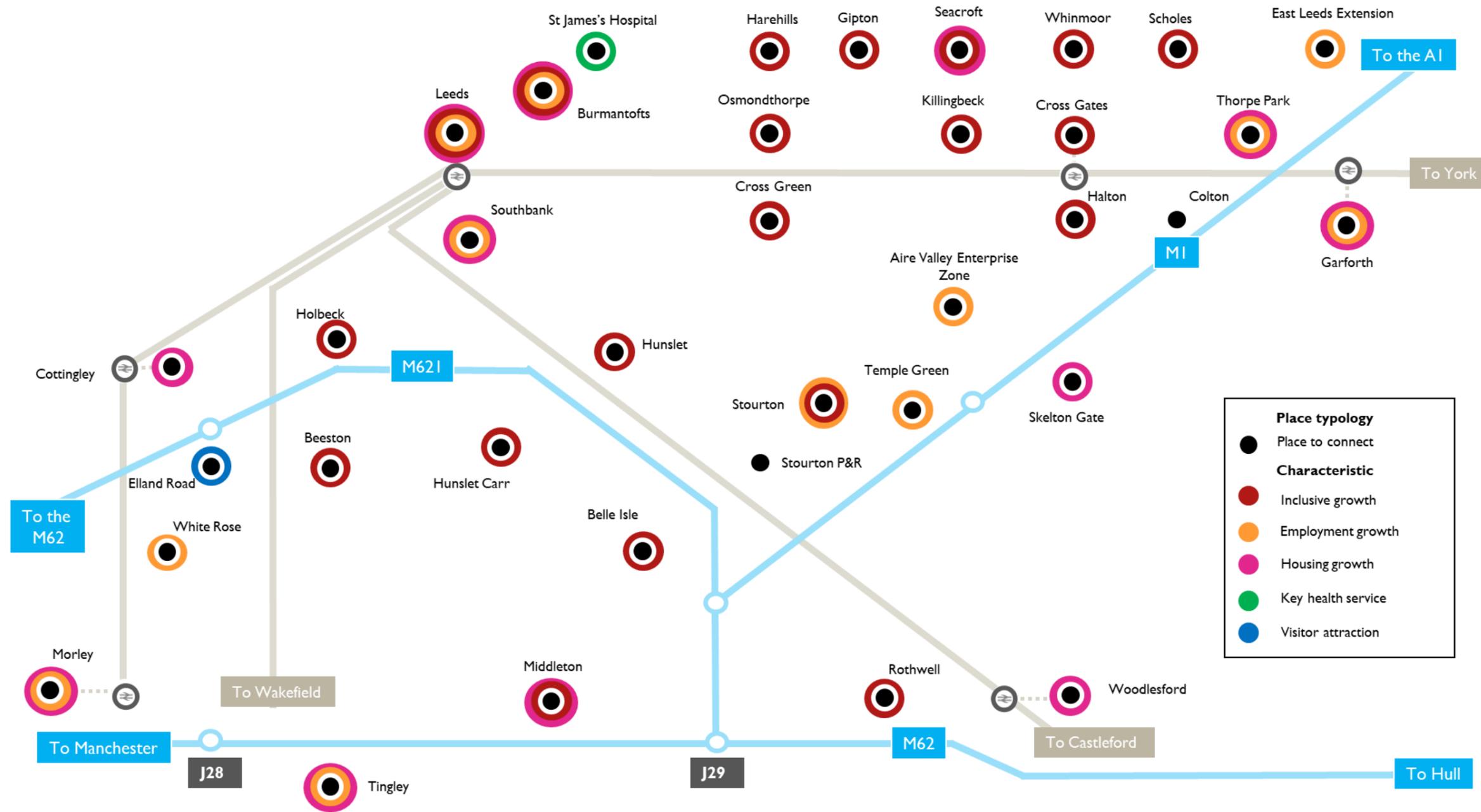
The principal characteristics influencing the selection of each place to connect is also shown. Places include key settlements, transport hubs, housing and employment growth zones. These were identified in the "story map" for the South and East Leeds corridor, and are shown in Figure 22. This illustrates the places to connect in the context of the wider rail network (shaded grey lines) and motorway network (shaded blue lines). Improving connectivity to these areas is important for growth. There are already high levels of demand from East and South Leeds towards central Leeds, which results in high levels of road congestion and rail crowding. With further housing and employment development proposed in East and South Leeds, it will be important to address the connectivity issues.

**Table 4: Key places to connect**

Key place	Characteristic	Scale / justification
Aire Valley Enterprise Zone	Large Housing and Employment Growth	Approximately 100ha of new employment land allocated.
Beeston	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
Belle Isle	Inclusive growth	Among the 10% most deprived neighbourhoods in England Area has typically low qualifications and sits within the Green Belt.
Burmantofts	Inclusive growth with Employment and Housing Growth	Deprived area with poor public transport accessibility. Typically, low income and low house prices in the area. Housing growth / Employment growth is planned north of the A64.
Colton	Bus network	Key suburb on Leeds bus network.
Cottingley	Housing Growth	Key existing rail station serving South Leeds. Planned housing growth.
Cross Gates	Inclusive growth	IMD Among the 10% most deprived neighbourhoods in England. Also, rail station in the East Leeds area.
Cross Green	Inclusive growth	Among the 10% most deprived neighbourhoods in England.

East Leeds Extension	Large Housing Growth	5,000 new homes will be created by 2028 on 233 hectares of undeveloped land and a new major road will be constructed (the East Leeds Orbital Road).
Elland Road	Visitor attraction	Visitor attraction and Park & Ride hub.
Garforth	Housing and Employment Growth	Large commuter town with two rail stations with housing and employment zones.
Gipton	Inclusive growth	Deprived area with typically low income, low house prices and low qualifications.
Halton	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
Harehills	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
Ho beck	Inclusive growth	Within the top 20% most deprived neighbourhoods in England.
Hunslet	Inclusive growth	Total annual household income of £22,800 within MSOA and within the top 10% most deprived in England.
Hunslet Carr	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
Killingbeck	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
Leeds	Housing and Employment Growth and Inclusive growth	A key hub for HS2 and a core city in the region. Substantial housing and employment development sites, including South Bank. Areas of deprivation.
Middleton	Inclusive growth with Housing Growth	Around 10,000 people within the top 10% most deprived in England and over 100 new dwellings.
Morley	Housing and Employment Growth	Approximately 27ha of employment land and 960 dwellings allocated.
Osmondthorpe	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
Rothwell	Inclusive growth	Large settlement. Part of Rothwell has an IMD score in the bottom 10%. Rothwell sits within the Green Belt.
Scholes	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
Seacroft	Inclusive growth with Housing Growth	Neighbourhood in eastern Leeds which is classed as isolated and within top decile for deprivation in England. Also includes hospital and some housing growth.
Skelton Gate	Large Housing and Employment Growth	Approximately 1800 dwellings at the Skelton Gate site.
South Bank	Large Housing and Employment Growth	35,000 new jobs and 8,000 new homes will be created. Leeds South Bank will be integrated with the HS2 Station.
St James's Hospital	Hospital	Key economic and social asset in Leeds and key health service within the corridor. It is a major trip attractor with poor connectivity to the city centre and other major hospital sites in Leeds.
Stourton	Inclusive growth with Employment Growth	Around 3000 people within top decile for deprivation in England and 35ha of new employment land.
Temple Green	Employment Growth	Site with Park and Ride for people travelling into Leeds from the east and nearby visitor attraction (Temple Newsam House). Employment growth zone approximately 70ha.
Thorpe Park Development	Housing and Employment Growth	A large mixed-use development with committed and future housing and employment growth. Also plans for a new rail station and potential for multi-modal interchange and Park and Ride.
Tingley	Housing and Employment Growth	Approximately 32ha of employment land allocated and 1500 new dwellings located close to the M62 Junction 28junction (formerly M62J28).
Whinmoor	Inclusive growth	Among the 10% most deprived neighbourhoods in England.
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.
Woodlesford	Housing Growth	Approximately 120 dwellings allocated. Key settlement with train station catering for a large population to the south and east, currently over capacity.

Figure 22: 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 active travel corridors and interventions as part of the Leeds Public Transport Investment Programme, West Yorkshire Plus Transport Fund (WYPTF), Connecting Leeds, the Leeds Transport Strategy, and the Network Rail Great North Rail Project. 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 the White Rose Rail Station. A selection of West Yorkshire's Transforming Cities Fund (TCF) schemes are also planned in the area. Table 5 provides a description of investment programmes currently scheduled to provide connectivity improvements throughout the corridor.

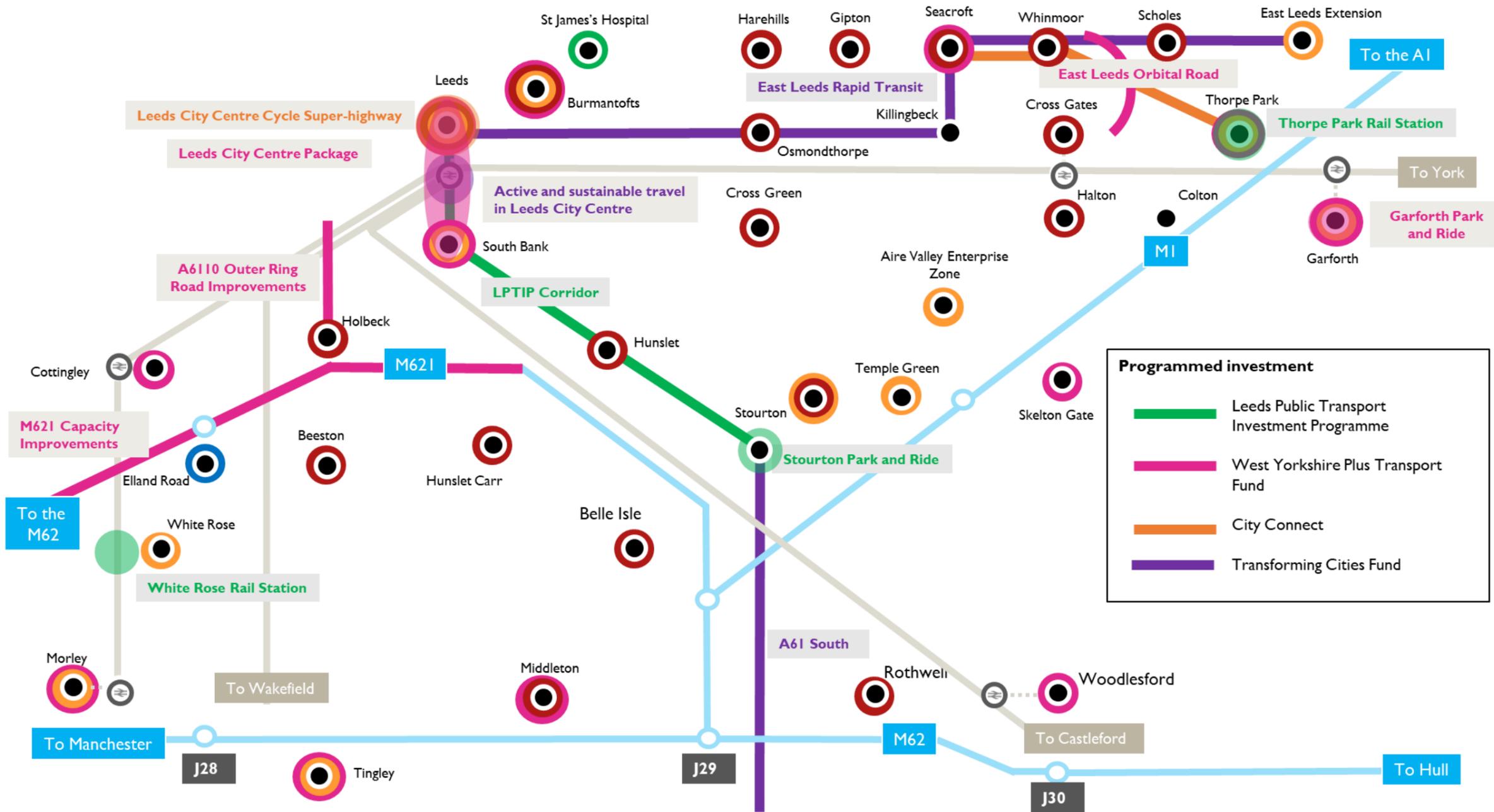
Despite these already planned investments, there are further opportunities to better connect areas within the corridor to housing and employment growth opportunities. There are also opportunities to develop initiatives to encourage walking and cycling within the corridor.

**Table 5: Programmed investment**

Programme	Scheme	Description
West Yorkshire Plus Transport Fund	Garforth rail station Park & Ride	Provision of 83 additional car parking spaces (approximately 140 existing), LED lighting, improvements to drainage and cycle parking. Completed in late December 2019.
West Yorkshire Plus Transport Fund	Leeds City Centre Package	Redevelopment of City Square gateway to the city, public realm improvements, reconfiguring Armley Gyratory, capacity improvements between Junctions 1-4 and 7 of the M621 (to be completed by 2022), and increasing travel to the city centre by sustainable modes by improving bus and cycle infrastructure.
West Yorkshire Plus Transport Fund	Leeds Station Gateway Yorkshire Hub	Masterplan to integrate Leeds Station improvements with the new HS2 station and regeneration of Leeds South Bank. Currently in Outline Business Case stage.
West Yorkshire Plus Transport Fund	A6110 Outer Ring Road Improvements	Improvements to several junctions along the A6110.
West Yorkshire Plus Transport Fund	Rail Park & Ride Programme Phase 1	Work is underway to add an additional 80 parking spaces at Garforth rail station Park and Ride to meet increased demand.
West Yorkshire Plus Transport Fund	East Leeds Extension Orbital Road	New orbital road including feeder cycle routes as part of the East Leeds Extension which will link the Outer Ring Road at Red Hall and Thorpe Park, ELOR is to support the development of the East Leeds Extension and to reduce congestion along the Outer Ring Road.
Leeds Transport Strategy	Stourton P&R	Provision of a new Park & Ride facility at Stourton, along with associated bus corridor and highway improvements on the A639 Low Road / A61 Hunslet Road.
Leeds Transport Strategy	Bus Priority Measures	Improving bus journey times and reliability along the A61 / A639.
Connecting Leeds	Leeds City Centre Cycle Superhighway	Segregated cycle routes through the centre of Leeds linking the existing Cycle City Connect routes 1 and 2.
Network Rail Great North Rail Project	Transpennine Route Upgrade	Upgrade to the Transpennine route to improve journey time and frequency to the east of Leeds.
Leeds Public Transport Investment Programme / Transforming Cities Fund	White Rose Rail Station	New station at White Rose Shopping Centre on the Leeds to Dewsbury section of the main Transpennine rail route.
Leeds Public Transport Investment Programme	Thorpe Park Station	New rail station at Thorpe Park serving the East Leeds Extension.
Leeds Public Transport Investment Programme	A61/A639 bus priority	Bus priority along the A61/A639 connecting to the new Stourton Park Ride.
Transforming Cities Fund	A64 East Leeds	A bus rapid transit and Park & Ride solution from the East Leeds housing and employment growth zones to Leeds City Centre.
Transforming Cities Fund	A61 south	Extending the positive impact of 'Connecting Leeds' from South Leeds through Wakefield (A61).
Transforming Cities Fund	Leeds City Centre Active & Sustainable Travel	Active travel access bility improvements in and around Leeds Train Station.

Source: West Yorkshire Combined Authority

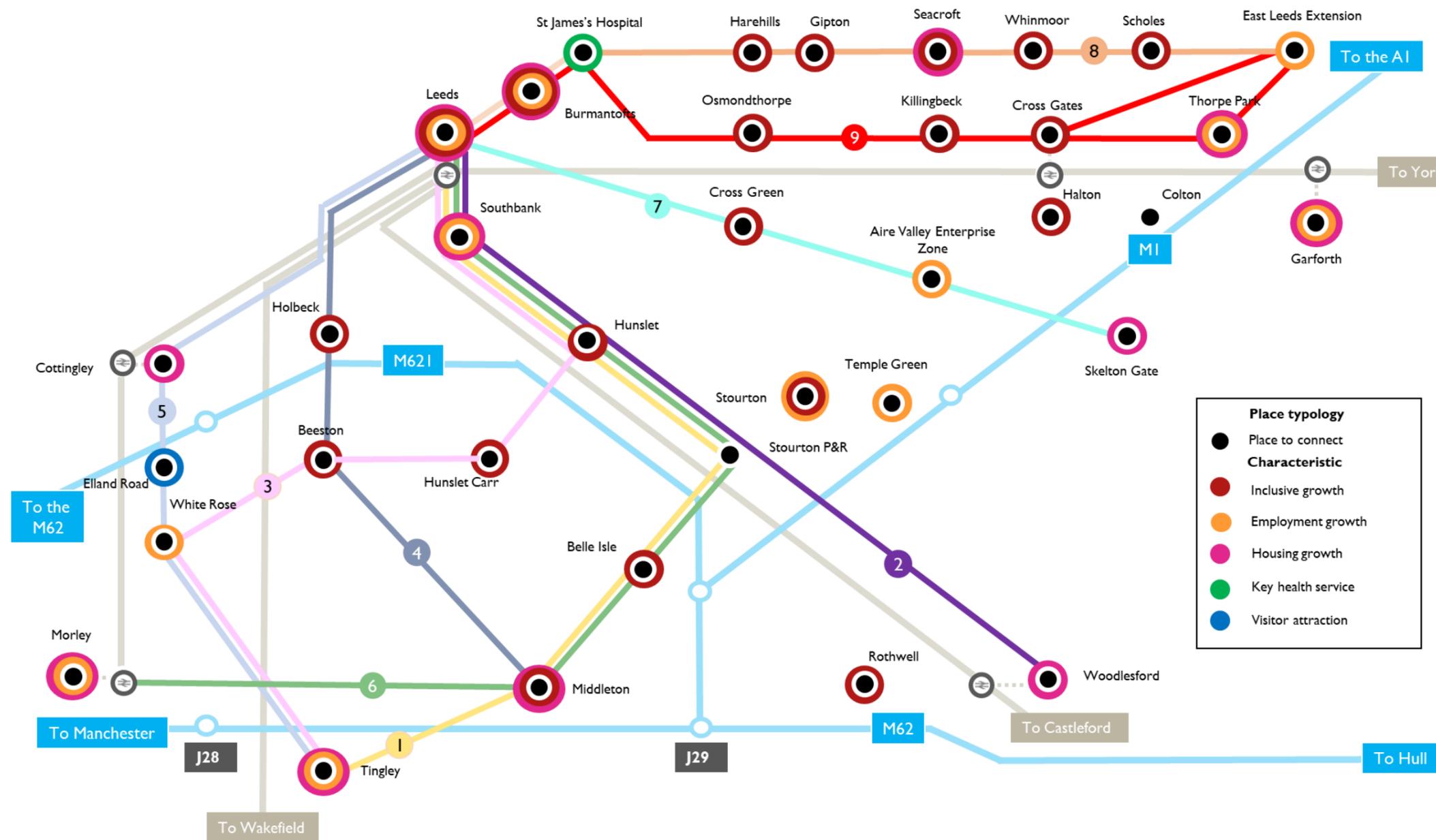
Figure 23: Programmed investment



### 4.3 Connectivity concepts

Based on the outcomes from early stage work for the Connectivity Plan and subsequent 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. 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. Nine connectivity concepts have been defined for the South and East Leeds corridor. These are shown in Figure 24. A brief narrative for each concept is given below.

**Figure 24: Connectivity Concepts South and East Leeds**



1 – The Yellow Concept (Leeds – Tingley via Belle Isle)			
<b>Concept function</b>	Provides <i>strategic and local</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and Tingley. It connects deprived communities such as Belle Isle, Hunslet and Middleton to the economic opportunities in Leeds and Leeds South Bank. It draws on the existing rail network (Pontefract Line) and using sustainable modes will help to alleviate air quality issues along these congested areas.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects deprived communities such as Belle Isle, Hunslet and Middleton</li> </ul>	<ul style="list-style-type: none"> <li>Improves connectivity to key employment and housing sites such as Leeds South Bank</li> </ul>	<ul style="list-style-type: none"> <li>Intersects with the proposed Clean Air Zone (CAZ)</li> <li>Encourages active travel by intersecting with NCR 66 and NCR 67</li> </ul>	<ul style="list-style-type: none"> <li>Enables better connectivity by providing improved access to the new Stourton P&amp;R site</li> <li>Connects to potential new P&amp;R site at Tingley</li> </ul>
<b>Indicative mode</b>	Rapid Transit / Bus		

2 – The Purple Concept (Leeds – Woodlesford via Hunslet)			
<b>Concept function</b>	Provides <i>strategic and local</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and Woodlesford. It provides connections to the economic opportunities and growth areas in Leeds and Leeds South Bank. It draws on the existing and future rail network helping to alleviate air quality issues along congested highway corridors.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects deprived communities to the south east of Leeds to Leeds and the South Bank area.</li> </ul>	<ul style="list-style-type: none"> <li>Improves connectivity to key employment sites and housing growth sites at South Bank</li> </ul>	<ul style="list-style-type: none"> <li>Encourages active travel by intersecting with NCR 66 and NCR 67</li> <li>Intersects with the proposed Clean Air Zone (CAZ)</li> </ul>	<ul style="list-style-type: none"> <li>Enables better connectivity by providing improved access to the new Stourton P&amp;R site.</li> <li>Builds on the connectivity provided by the existing rail network</li> </ul>
<b>Indicative mode</b>	Rapid Transit / Bus		

4 – The Blue Concept (Leeds – Middleton via Holbeck and Beeston)			
<b>Concept function</b>	Provides <i>strategic</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and Middleton. It connects deprived communities such as Holbeck, Beeston and Middleton with economic opportunities in Leeds. It draws on the existing rail network (East Coast Main Line) which offers alternatives to the private car to alleviate air quality issues along these congested areas.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Improves connections to deprived communities south of Leeds</li> </ul>	<ul style="list-style-type: none"> <li>Connects areas of employment with communities with low levels of car ownership such as Holbeck</li> </ul>	<ul style="list-style-type: none"> <li>Intersects with the proposed Clean Air Zone (CAZ)</li> <li>Encourages active travel by intersecting with NCR 66</li> </ul>	<ul style="list-style-type: none"> <li>Optimisation of existing rail infrastructure</li> </ul>
<b>Indicative mode</b>	Rail / Rapid Transit / Bus		

3 – The Pink Concept (Leeds - The White Rose Centre via Hunslet Carr)			
<b>Concept function</b>	Provides <i>strategic and local</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and the White Rose, extending to Tingley. It connects deprived communities to the south of Leeds such as Hunslet and Hunslet Carr to economic opportunities at White Rose, Leeds City Centre and Leeds South Bank. It draws on the existing road network and using sustainable modes will help to alleviate air quality issues in these congested areas.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects deprived communities such as Hunslet and Hunslet Carr</li> </ul>	<ul style="list-style-type: none"> <li>Connects employment and housing growth sites at White Rose and Leeds South Bank</li> </ul>	<ul style="list-style-type: none"> <li>Intersects with the proposed Clean Air Zone (CAZ)</li> <li>Encourages active travel by intersecting with NCR 66</li> </ul>	<ul style="list-style-type: none"> <li>Improves connectivity to a potential new rail station at White Rose</li> <li>Connects to potential new P&amp;R site at Tingley</li> </ul>
<b>Indicative mode</b>	Rapid Transit / High quality bus service		

5 – The Light Blue Concept (Leeds to Morley via Holbeck and White Rose)			
<b>Concept function</b>	Provides <i>strategic</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and Morley, connecting deprived communities such as Holbeck with economic activities in Leeds and at White Rose. It offers alternatives to the private car.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects deprived communities such as Holbeck</li> </ul>	<ul style="list-style-type: none"> <li>Provides a connection to strategic development sites at White Rose</li> </ul>	<ul style="list-style-type: none"> <li>Intersects with an AQMA and provides an alternative to car use</li> <li>Intersects with the proposed Clean Air Zone (CAZ)</li> <li>Encourages active travel by intersecting with NCR 66</li> </ul>	<ul style="list-style-type: none"> <li>Improves connectivity to a potential new rail station at White Rose</li> <li>Connects to potential new P&amp;R site at Tingley</li> </ul>
<b>Indicative mode</b>	Bus / Active travel / Rapid Transit		

6 – The Green Concept (Leeds to Morley via South Bank, Hunslet and Middleton)			
<b>Concept function</b>	Provides <i>strategic and local</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection, between Leeds and Morley. It connects deprived communities such as Belle Isle, Hunslet and Middleton to the economic opportunities in Leeds and Leeds South Bank.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects deprived communities such as Belle Isle, Hunslet and Middleton</li> </ul>	<ul style="list-style-type: none"> <li>Connects communities to employment sites and growth sites such as Leeds South Bank</li> </ul>	<ul style="list-style-type: none"> <li>Intersects with the proposed Clean Air Zone (CAZ)</li> <li>Encourages active travel by intersecting with NCR 66 and NCR 67</li> </ul>	<ul style="list-style-type: none"> <li>Enables better connectivity by providing improved access to the new Stourton P&amp;R site</li> </ul>
<b>Indicative mode</b>	Bus / Active travel / Rapid Transit		

7 – The Cyan Concept (Leeds to Leeds Enterprise Zone via Cross Green)			
<b>Concept function</b>	Provides <i>strategic</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and the Aire Valley Enterprise Zone. It will connect the Skelton Gate housing development at M1 J45 with the economic opportunities and employment growth around the Aire Valley Enterprise Zone and Leeds.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects the deprived community of Cross Green</li> </ul>	<ul style="list-style-type: none"> <li>Connects strategic development sites surrounding the Aire Valley Enterprise Zone.</li> </ul>	<ul style="list-style-type: none"> <li>Encourages active travel by intersecting with NCR 67</li> <li>Intersects with the proposed Clean Air Zone (CAZ)</li> </ul>	<ul style="list-style-type: none"> <li>Provides connectivity to the Temple Green P&amp;R site</li> </ul>
<b>Indicative mode</b>	Rapid Transit / Bus		

8 – The Peach Concept (Leeds to the East Leeds Extension via St James’s Hospital, Harehills and Seacroft)			
<b>Concept function</b>	Provides <i>strategic</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and the East Leeds Extension development. It connects deprived communities such as Harehills and Seacroft to the economic opportunities and employment growth around Leeds.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects deprived communities such as Harehills and Seacroft</li> </ul>	<ul style="list-style-type: none"> <li>Connects strategic development sites at East Leeds Extension</li> </ul>	<ul style="list-style-type: none"> <li>Intersects areas with an AQMA and provides alternative to car use</li> <li>Intersects with the proposed Clean Air Zone (CAZ) in Leeds</li> <li>Encourages active travel by intersecting with NCR 66, NCR 668, NCR 67 and NCR 677</li> </ul>	<ul style="list-style-type: none"> <li>Helps to reduce severance caused by the existing highway network and River Aire</li> <li>Provides connections to communities not currently supported by the rail network</li> </ul>
<b>Indicative mode</b>	Bus Rapid Transit / Bus		

9 – The Red Concept (Leeds to Thorpe Park via St James’s Hospital and Cross Gates)			
<b>Concept function</b>	Provides <i>strategic</i> connectivity		
<b>Summary</b>	This concept provides a strategic connection between Leeds and Thorpe Park. It connects deprived communities to the economic opportunities and employment growth around Thorpe Park and the East Leeds Extension.		
Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport
<ul style="list-style-type: none"> <li>Connects deprived communities such as Cross Gates and the local labour markets with two major development zones</li> </ul>	<ul style="list-style-type: none"> <li>Connects strategic development sites surrounding Thorpe Park</li> </ul>	<ul style="list-style-type: none"> <li>Intersects with the A64 Cycle Superhighway</li> <li>Intersects areas with an AQMA and provides alternative to car use</li> <li>Encourages active travel by intersecting with NCR 66, NCR 668 and NCR 677</li> </ul>	<ul style="list-style-type: none"> <li>Helps to reduce severance caused by the existing highway network and River Aire</li> <li>Provides connectivity to the new potential Thorpe Park Rail Station</li> <li>Provides connections to communities such as Osmondthorpe and Killingbeck that aren't supported by the rail network</li> </ul>
<b>Indicative mode</b>	Rapid Transit / Bus / Active Modes		

#### 4.4 Appraisal outcomes

Our appraisal process (summarised in 3.4.1) has been applied to the 9 connectivity concepts to define spatial priorities in the South and East Leeds 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. Figure 26 highlights that the Peach, Blue, Pink, Yellow and Red concepts demonstrate the best level of fit across all themes and sifts and therefore have the potential to produce the greatest benefit for interventions. The Purple route features as a prioritised concept in the Five Towns to Leeds Case for Change report.

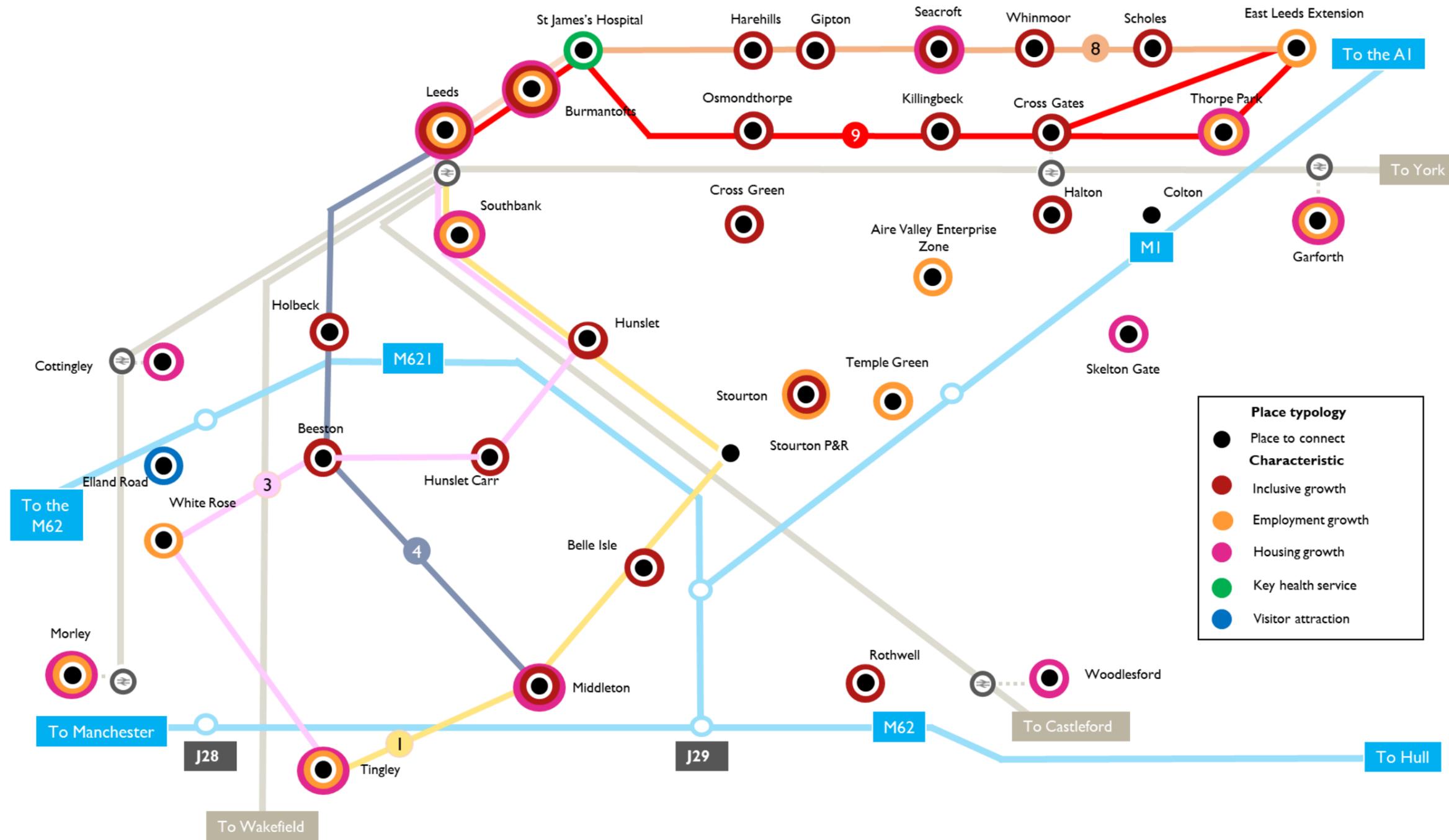
**Figure 25: Appraisal outcomes for connectivity concepts – ranked**

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 <sup>st</sup> Century Transport			Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport		
1	8	Peach Connectivity Concept – Leeds to East Leeds Extension	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Fair	Good	Good	Average	Good
2	4	Blue Connectivity Concept – Leeds to Middleton	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Fair	Good	Average	Average	Good
3	3	Pink Connectivity Concept – Leeds to White Rose Centre	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Fair	Good	Average	Average	Good
4	1	Yellow Connectivity Concept – Leeds to Tingley	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Good	Average	Average	Good
5	9	Red Connectivity Concept – Leeds to Thorpe Park	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Good	Good	Average	Good
6	6	Green Connectivity Concept – Leeds to Morley	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Good	Average	Average	Good
7	2	Purple Connectivity Concept – Leeds to Woodlesford	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Good	Average	Average	Good
8	7	Cyan Connectivity Concept – Leeds to Leeds Enterprise Zone	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Fair	Average	Good	Average	Good
9	5	Light Blue Connectivity Concept – Leeds to Morley via Holbeck	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Average	Fair	Average	Average	Average	Good

Source: Mott MacDonald

**Overall, the Peach, Blue, Pink, Yellow and Red 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	1,000 – 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 in identifying the potential for future modes along the connectivity concepts. Lower capacity modes could also 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 between Leeds and Middleton, via Beeston (the prioritised Blue concept) in 2033. This shows a high number of people travelling from Middleton towards Leeds, implying Mass Rapid Transit (MRT) or heavy rail may be needed to match demand. With no suburban rail options on offer to these places, a rapid transit solution could be considered.

Figure 28 shows demand between Leeds and Tingley via Belle Isle (the prioritised yellow concept). Demand from Tingley towards Leeds is high enough to support heavy rail service but could also be served by mass transit if rail connections are not feasible. Localised demand from Belle Isle towards Leeds is particularly high.

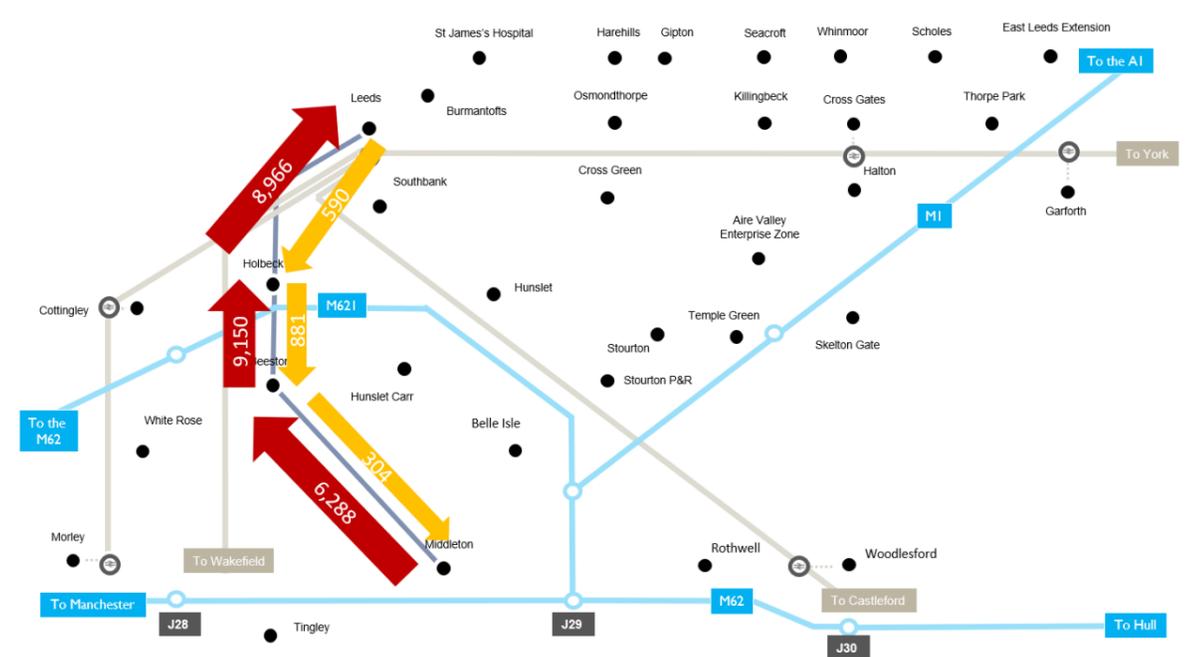
Figure 29 shows demand along the pink connectivity concept between Leeds and Tingley via Hunslet Carr and White Rose. The assessment of part of this concept, from Tingley to Leeds, indicates demand high enough to support heavy rail. However, the absence of rail infrastructure along much of this concept suggests a rapid transit option could be a viable alternative to increase capacity. The demand increases significantly from White Rose travelling towards Leeds, which could partially be addressed by the provision of a new station. Demand from Leeds to White Rose is high enough to suggest the potential for Bus Rapid Transit (BRT) or Mass Rapid Transit (MRT).

Figure 30 shows demand in 2033 along the highest scoring connectivity concept: Peach. This provides a strategic connection from Leeds to East Leeds Extension through Seacroft. Future demand may be high enough between Seacroft and Leeds to support Mass Rapid Transit (MRT) or heavy rail. However, Seacroft does not have an open rail station and so alternative means such as BRT / MRT would help to increase capacity along this concept. Similarly, the demand from East Leeds Extension to Seacroft suggests that a BRT or MRT link could be provided.

Figure 31 shows demand between Leeds and East Leeds Extension via Cross Gates. The highest level of demand along this concept is from Cross Gates to Leeds where the level of demand is currently served by a heavy rail connection. Future demand from East Leeds Extension to Cross Gates and St James's Hospital to Thorpe Park is high enough to suggest the potential for Bus Rapid Transit (BRT) or Mass Rapid Transit (MRT).

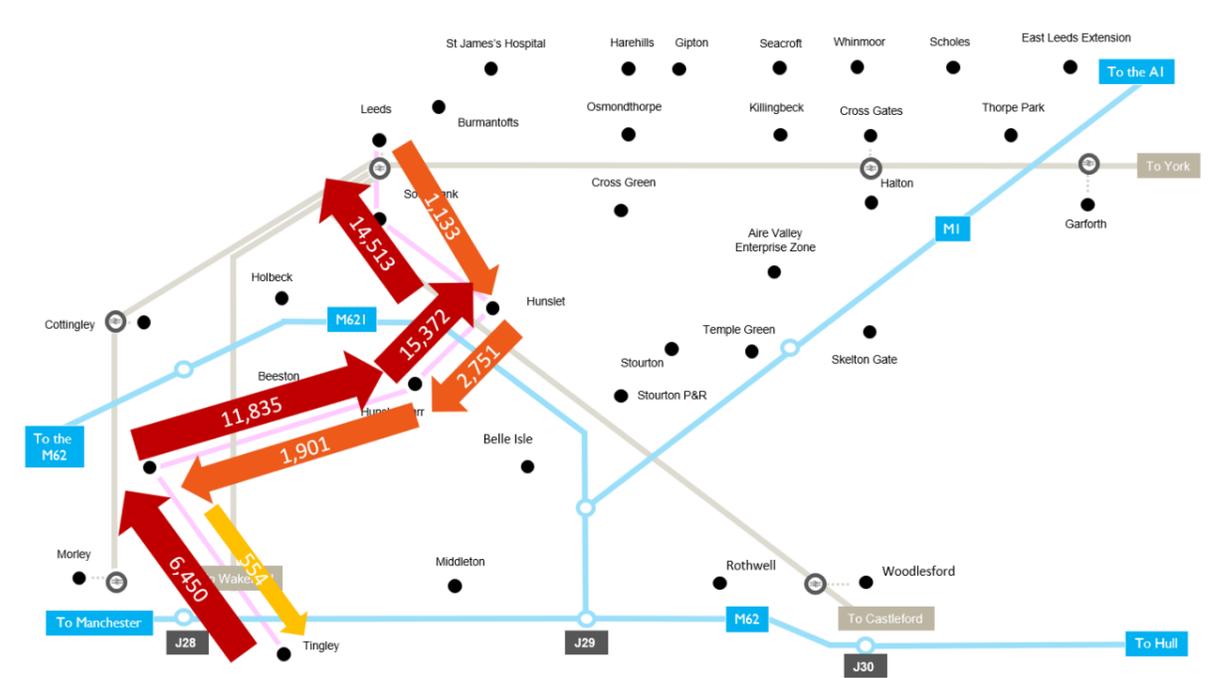
Evidence from other workstreams will inform how a multi-modal transport offer could be provided in these corridors, alongside the indicative high-capacity modes identified above.

Figure 27 : Blue Concept – Demand 2033



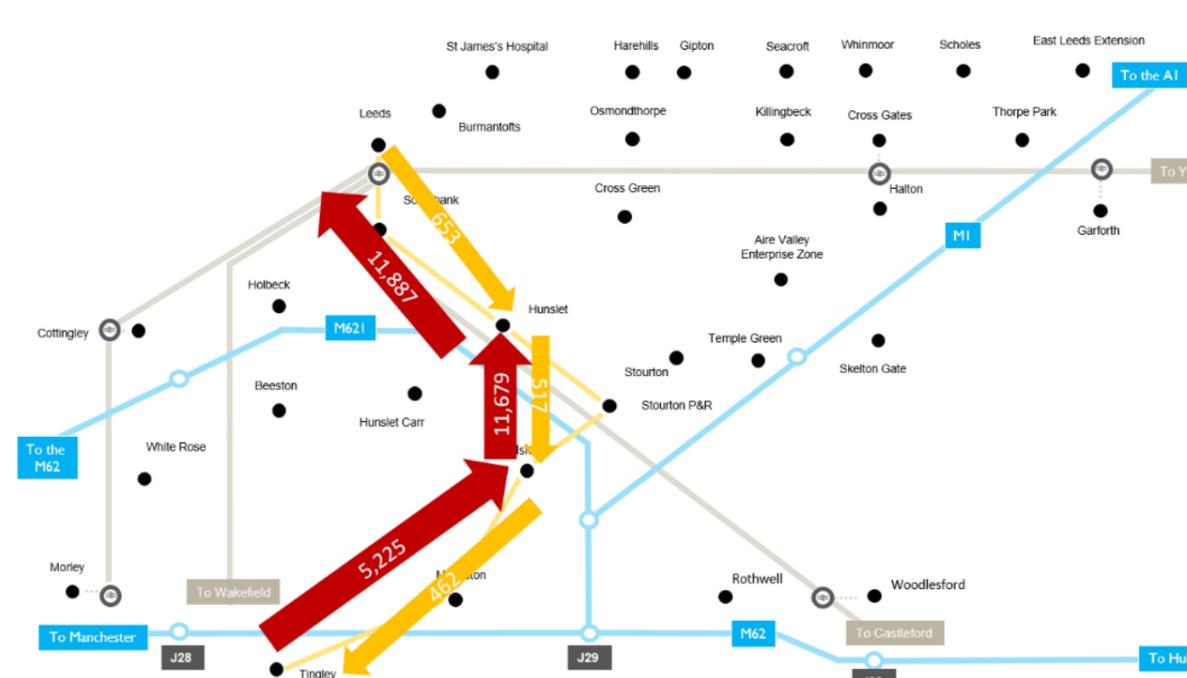
Source: Urban Dynamic Model (UDM)

Figure 29 : Pink Concept – Demand 2033



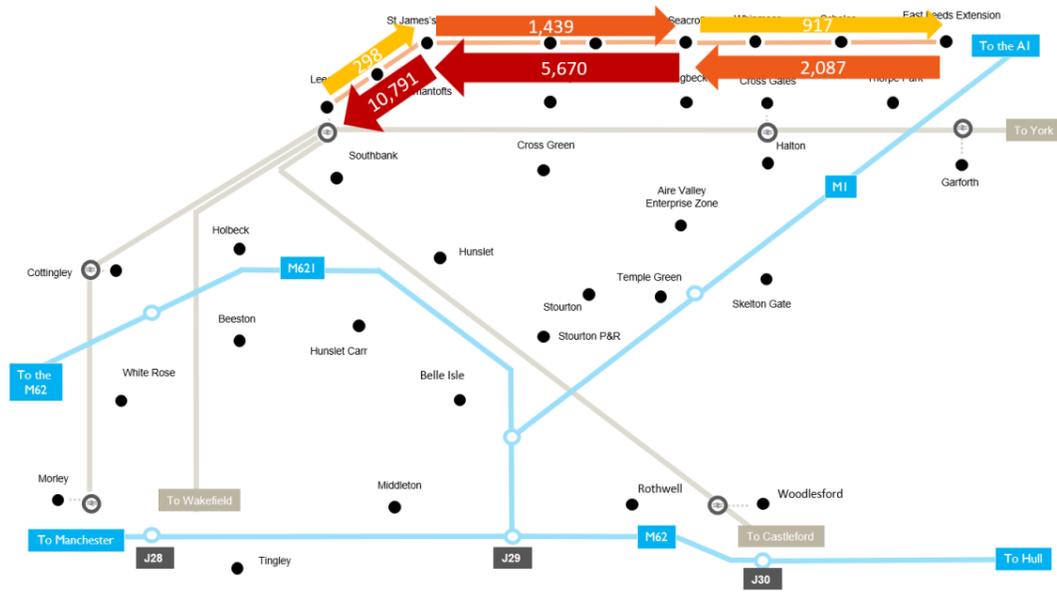
Source: Urban Dynamic Model (UDM)

Figure 28: Yellow Concept – Demand 2033



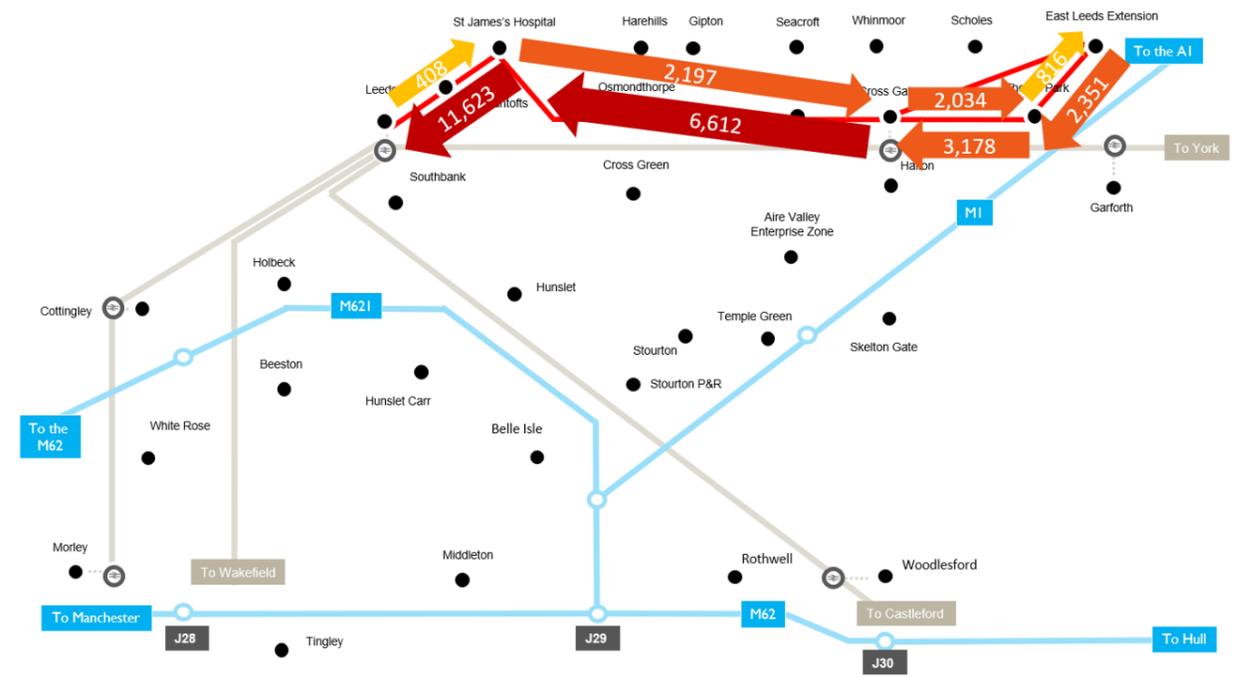
Source: Urban Dynamic Model (UDM)

Figure 30: Peach Concept – Demand 2033



Source: Urban Dynamic Model (UDM)

Figure 31: Red Concept – Demand 2033



Source: Urban Dynamic Model (UDM)

## 5 Conclusion: The Need for Intervention in South and East Leeds

### 5.1 Introduction

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

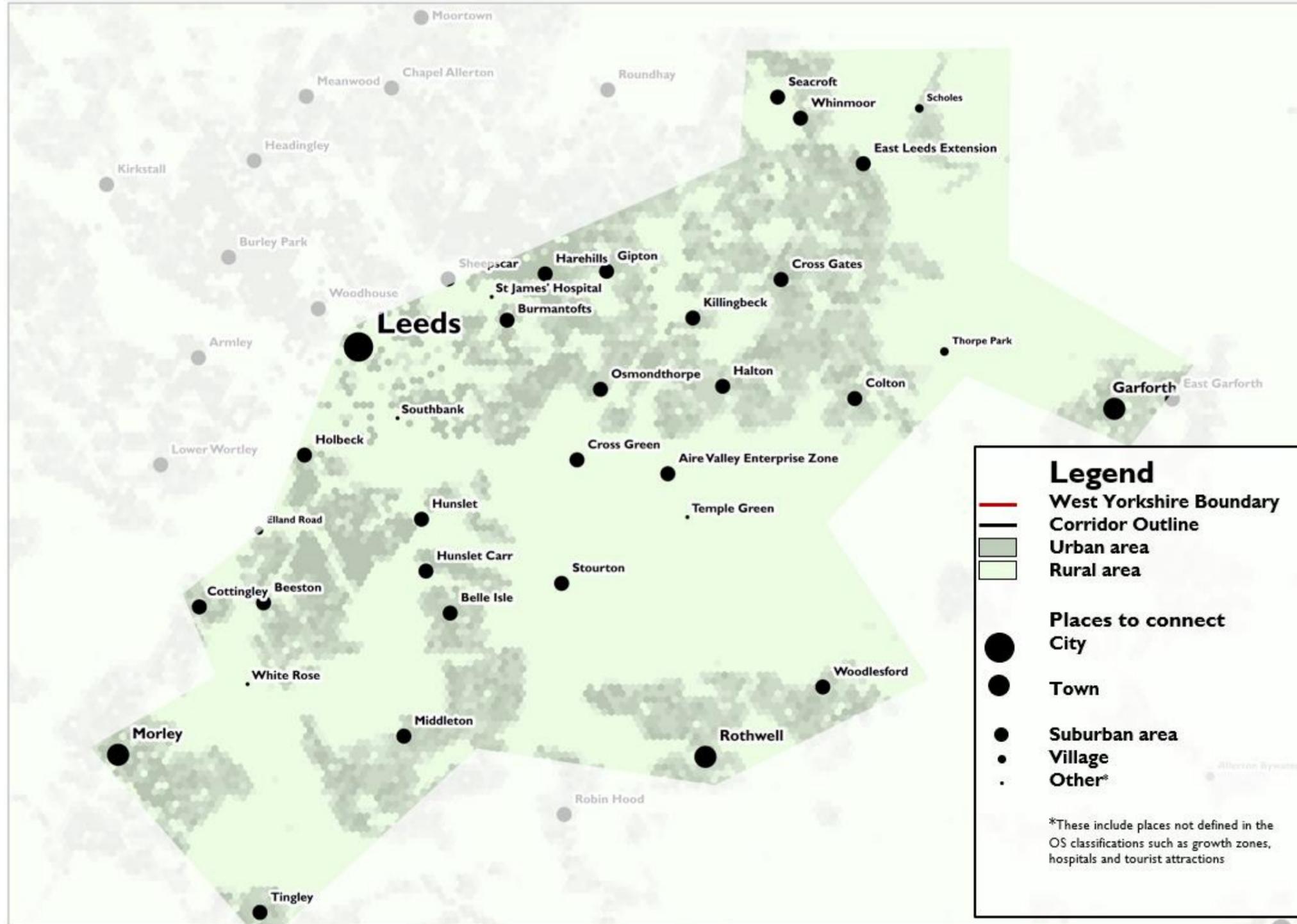
Through evidence review and spatial analysis key places to connect have been identified, and a complementary series of connectivity concepts have been developed to show where there is greatest need to improve connections between people and places in the corridor. These places to connect have been used to support evidence gathering in other workstreams and are shown in Figure 32.

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 deprived communities such as Holbeck, Beeston and Burmantofts and the opportunities in Leeds City Centre. This includes local trips connecting communities such as Hunslet, Hunslet Carr and Belle Isle with the emerging opportunities at Leeds South Bank. The prioritised concepts also connect the east Leeds communities to the East Leeds Extension and Thorpe Park, and therefore provide connectivity to the economic opportunities that are emerging on the eastern fringes of Leeds.

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 32: 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. The network for South and East Leeds is illustrated in Figure 33. 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 33: South and East Leeds Connectivity Network

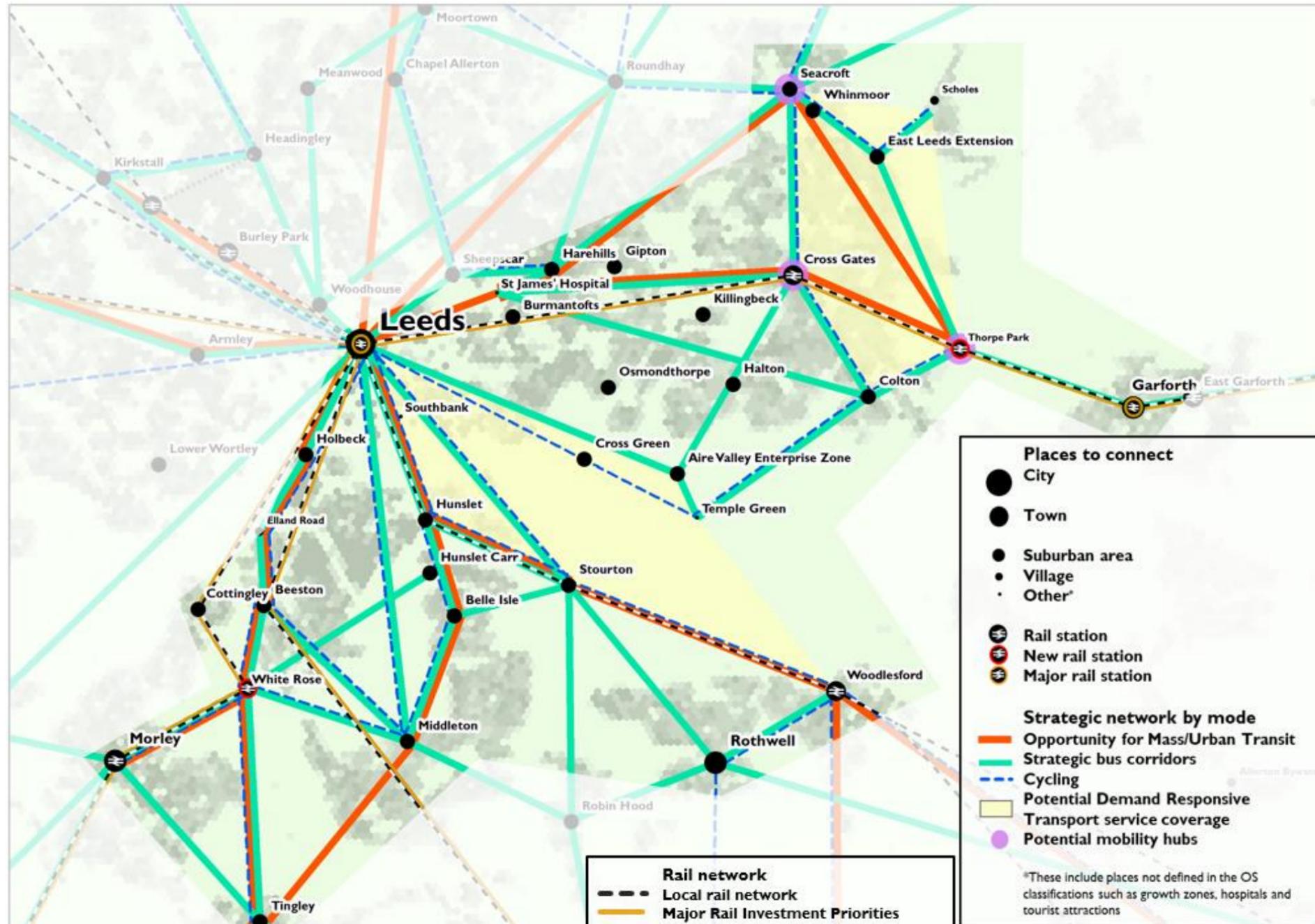


Figure 34 illustrates spatially how the various strands of evidence, including the prioritised connectivity concepts and subsequent demand analysis, provide a rationale for network interventions in South and East Leeds. These strands of evidence are summarised in Table 8.

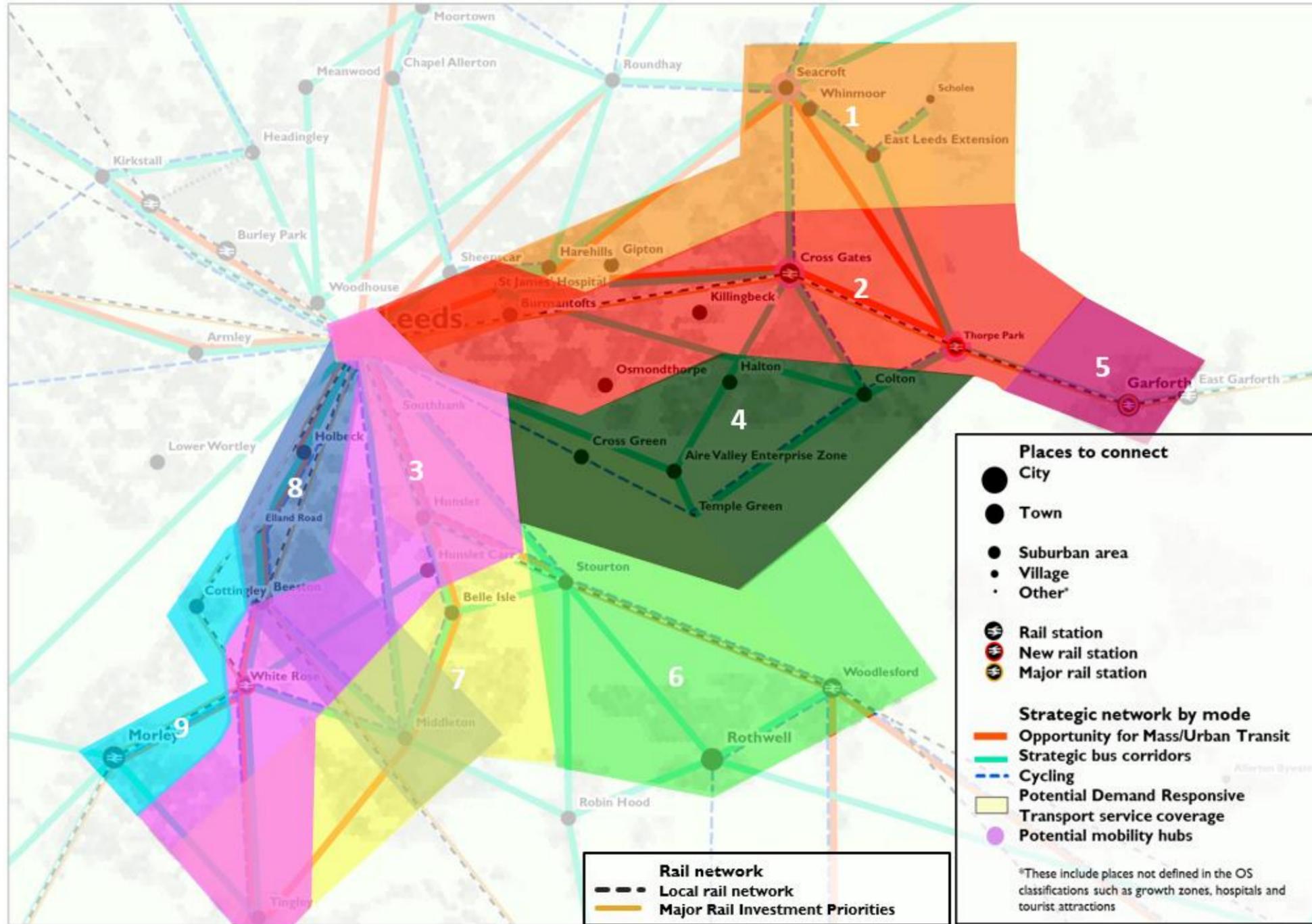
**Table 8: Rationale Narrative**

Network Area	Description	Rationale				Evidence Base
		Enabling Inclusive Growth	Boosting Productivity	Tackling the Climate Emergency	Delivering 21 <sup>st</sup> Century Transport	
						
1	Peach Connectivity Concept	Connects deprived communities such as Harehills and Seacroft to employment opportunities in Leeds Helps to reduce severance caused by the existing highway network and River Aire	Connects strategic development sites at East Leeds Extension	Intersects areas with an AQMA and provides alternative to car use Intersects with the proposed Clean Air Zone (CAZ)	Demand suggests that this concept could be served by BRT / MRT from the East Leeds Extension and would provide a connection to communities that are not supported by the rail network, such as Seacroft. This supports the TCF East Leeds Rapid Transit scheme.	South and East Leeds Case for Change Report
2	Red Connectivity Concept	Connects deprived communities such as Cross Gates and the local labour markets with two major development zones at Thorpe Park and the East Leeds Extension Helps to reduce severance caused by the existing highway network and River Aire Provides connectivity to the new potential Thorpe Park Rail Station	Connects strategic development sites surrounding Thorpe Park	Intersects with the A64 Cycle Superhighway Intersects areas with an AQMA and provides alternative to car use	Demand analysis suggests that the current heavy rail connection between Cross Gates and Leeds could potentially be supported by BRT / MRT between the East Leeds Extension to Cross gates and also between St James' Hospital to Thorpe Park. This provides connections to communities such as Osmondthorpe and Killingbeck that aren't supported by the rail network.	South and East Leeds Case for Change Report
3	Pink Connectivity Concept	Connects deprived communities such as Hunslet and Hunslet Carr to economic opportunities at White Rose, Leeds City Centre and Leeds South Bank	Connects employment and housing growth sites at White Rose and Leeds South Bank Improves connectivity to a potential new rail station at White Rose Connects to potential new P&R site at Tingley	Intersects with the proposed Clean Air Zone (CAZ)	Demand analysis suggest that demand is great enough along this concept to require heavy rail infrastructure. However, the absence of rail infrastructure along much of this concept suggests a rapid transit option could be a viable alternative to increase capacity. Significant increase in demand from White Rose to Leeds could be addressed by the provision of the new station.	South and East Leeds Case for Change Report
4	Aire Valley Enterprise Zone	Provides connections between deprived communities such as Holton to job employment opportunities in the Aire Valley. Also provides connections for isolated communities.	This strategic growth corridor provides connections between the enterprise zone and outer Leeds communities, including the Temple Green Park & Ride site.	Covers part of the proposed Leeds Clean Air Zone (CAZ) and there are several opportunities to enhance the cycling network in the area to local neighbourhoods such as South Bank and to other transport hubs such as Cross Gates and Thorpe Park.	Key area for bus connectivity to connect prospective employees. With some infrastructure already in place to support the Park & Ride site, further bus measures could be considered as the site grows to make bus travel more reliable.	West Yorkshire Bus Network Review South and East Leeds Case for Change Report
5	East Leeds	Connects deprived communities in eastern Leeds and Selby	Provides onward connections to employment opportunities in regional centres of Se by and Leeds for the commuter town of Garforth. Further evidence provided in the Case for Change report for North Yorkshire to Leeds.	Will provide alternative transport options to the car for communities	The demand analysis in the North Yorkshire to Leeds Case for Change suggests that demand from Garforth into Leeds could require Bus Rapid Transit (BRT) / Mass Rapid Transit (MRT). A rail link also connects Leeds and Garforth, so enhanced rail capacity could help support this identified demand.	North Yorkshire to Leeds Case for Change Report
6	South East Leeds	Connects deprived communities such as Stourton and Rothwell to connections to opportunities further afield in Wakefield and Leeds	Provides onward connections to regional centres of Leeds and Wakefield and improves connectivity to key areas of employment opportunities at Stourton, Newmarket and Wakefield. Further evidence provided in Case for Change report for Five Towns to Leeds.	Improves connectivity on routes where congestion is an issue, such as the M1	This area provides onward connections to regional centres of Leeds and Wakefield through bus interventions between places such as Rothwell and Woodlesford.	Five Towns to Leeds Case for Change Report West Yorkshire Bus Network Review

7	Yellow Connectivity Concept	Connects deprived communities such as Belle Isle, Hunslet and Middleton	Improves connectivity to key employment and housing sites such as Leeds South Bank	Intersects with the proposed Clean Air Zone (CAZ) Encourages active travel by intersecting with NCR 66 and NCR 67	The demand analysis suggests that demand from Tingley to Leeds is high enough to warrant mass transit investment in the absence of heavy rail infrastructure. Demand continues to be high enough for mass transit as the concept moves through Middleton, Belle Isle and Hunslet. Bus connectivity will also play an important role in this area, with Middleton forming the hub of an expanded bus network in South Leeds.	South and East Leeds Case for Change Report
8	Blue Connectivity Concept	Improves connections to deprived communities south of Leeds	Provides a strategic connection between Leeds and Middleton. It connects deprived communities such as Holbeck, Beeston and Middleton with economic opportunities in Leeds City Centre.	Intersects with the proposed Clear Air Zone (CAZ) Encourages active travel by intersecting with NCR 66	The demand analysis suggests that the level of demand from Middleton through White Rose and Beeston towards Leeds is high enough to warrant a rapid transit connection. This could be provided by infrastructure proposed as part of the Pink and Yellow connectivity concepts. Rail infrastructure already exists here so potentially measures could be taken to increase capacity alongside the proposed station at White Rose.	South and East Leeds Case for Change Report
9	Morley and Cottingley	Connects deprived communities in Deighton, Ravensthorpe and Dewsbury	Provides onward connections to regional centres of Leeds and Huddersfield. Further evidence provided in the Case for Change report for Leeds to Huddersfield.	Concept goes through Air Quality Management Areas	Demand analysis as part of the Leeds to Huddersfield Case for Change suggests there are high number of people travelling from Morley to Leeds which may require additional capacity on the heavy rail network, or additional travel choices such as mass transit connections that link to the wider network.	Leeds to Huddersfield Case for Change Report

These interventions will link with networks developed in other Case for Change reports across West Yorkshire to provide a full multi-modal network across the city region which will be set out in the wider Connectivity Plan.

Figure 34: Network Areas



# Appendices

A.	South and East Leeds: Investment Case	44
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## A. South and East Leeds: Investment Case

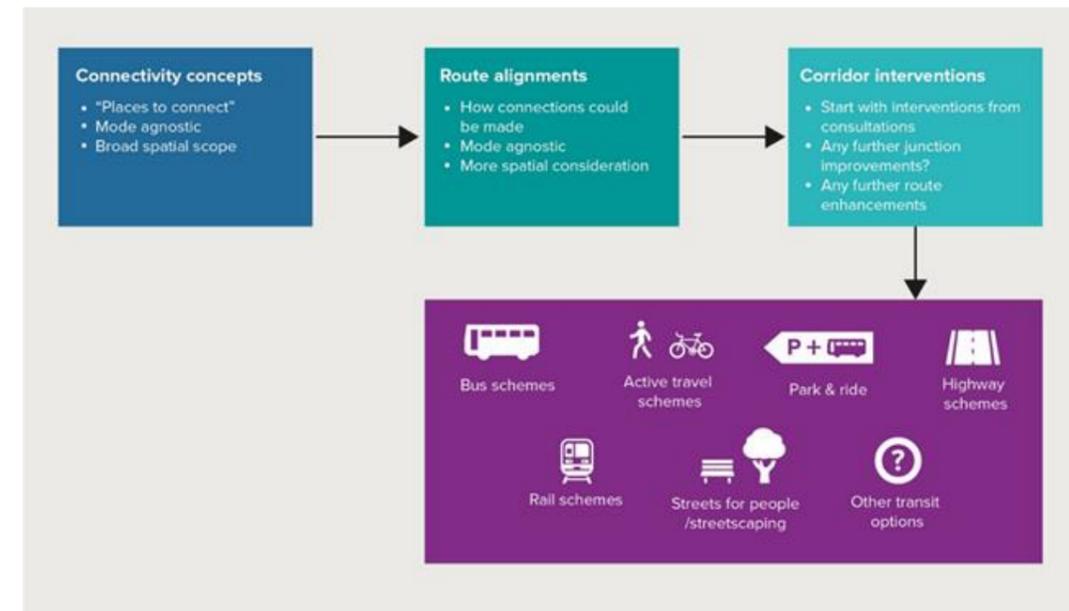
The highest scoring “connectivity concepts” represent the corridor’s spatial priorities. For this corridor these are the Yellow, Purple, Pink, Blue, Peach and Red concepts as these were the best performing concepts for connectivity *to and within* the corridor. These connectivity concepts are used as 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 through 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 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”, Park & Ride, rail, highways, transit concepts (e.g. BRT, tram-train etc.).

The following diagram summarises the process for developing interventions.

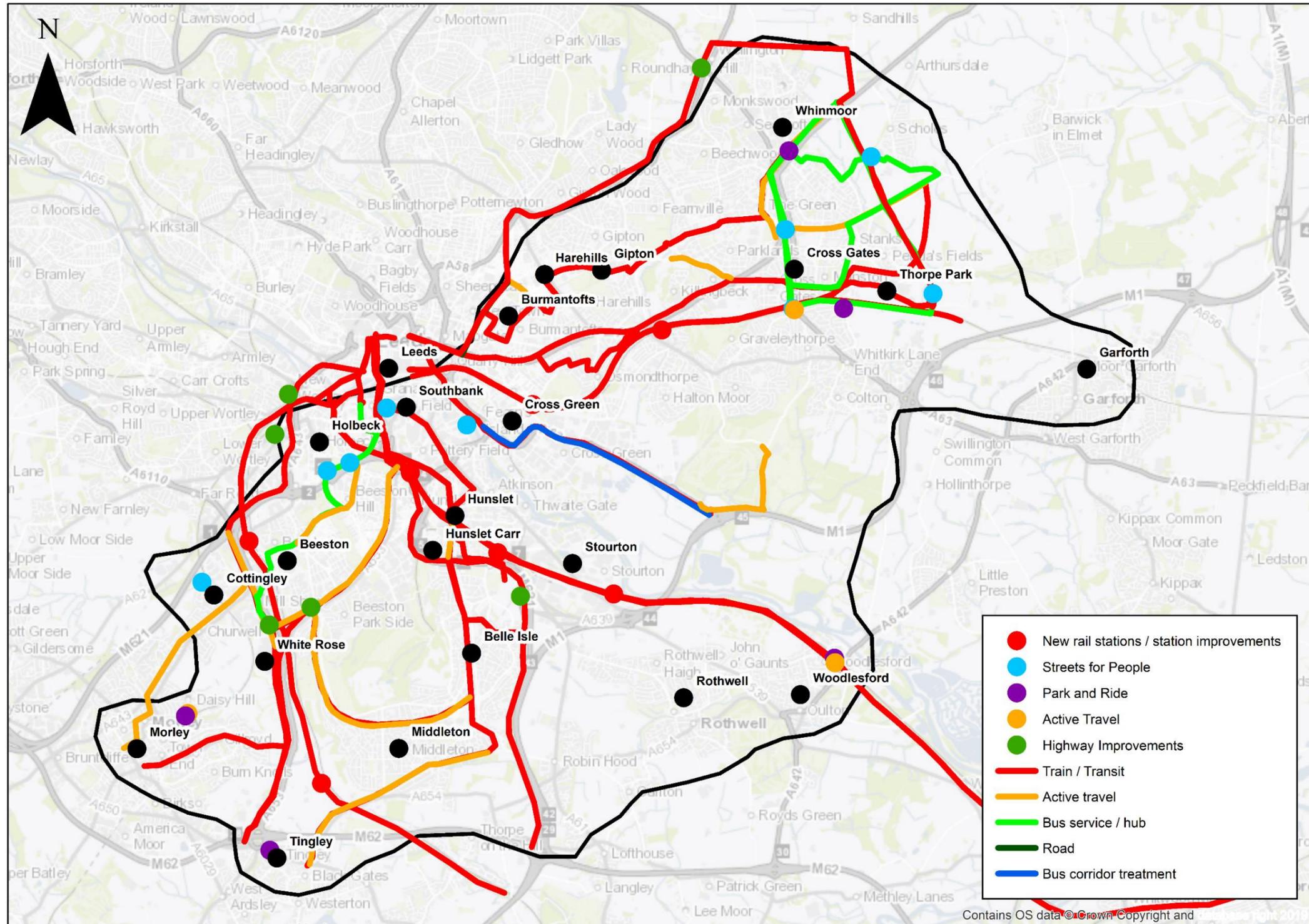


All interventions have been assigned a scheme type, a high-level deliverability and timescale attribute, as follows:

- 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 longlist of 68 interventions for the South and East Leeds corridor. The alignments for these are mapped in Figure 35.

Figure 35: South and East Leeds 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.

