Restoring the Valley-to-City Link

Rawtenstall-Bury-Rochdale-Manchester Rail Corridor:

Early Strategic Case for Investment

November 2018

Cebr

Contents

Key messages

Strategic case

The case for investing in rail in this corridor is based on:

- Significant commuting flows out of Rossendale (14,000 leave the borough daily for work, 9,000 of them into Greater Manchester) and within Greater Manchester (4,000 from Bury MBC to Rochdale MBC, 5,000 in the other direction; 12,000 and 9,000 respectively from these into Manchester).
- Poor (and worsening) traffic conditions in Rossendale and Greater Manchester making road-based options slow and unreliable;
- The success of rail in serving other commuting centres around Greater Manchester – for instance from High Peak 44% of those commuting into Manchester City Centre use rail.
- Wider environmental objectives that favour public transport improvements – both national CO_2 reduction targets and intensifying air quality issues in Manchester;
- The strength of the potential rail offer in serving city centre based employment and the strong residential offer in Bury and Rossendale for Manchester workers;
- The need to support existing and future businesses in Ramsbottom and Rawtenstall that are facing future constraints because of road congestion.

Previous studies over the last ten years have not been able to show a good business case. Cebr have however found that there are strong grounds to revisit as:

- There were some flawed assumptions – a realistic view of road conditions facing commuters was not factored in to demand in earlier studies;
- Northern Powerhouse provides a strong strategic rationale for improving commuter links from locations such as Rossendale to unlock housing options around growing cities like Manchester;
- There are some options for developing rail services that haven't been properly considered in earlier work that are less expensive and have lower impacts on the ELR's current heritage operation (and could benefit it through connection to the national rail network);

The case starts to look good when considered in terms of Rochdale BC, Bury MBC and Rossendale MBC together but depends on fresh thinking and a willingness to compromise by key stakeholders.

Emerging thinking

A promising option involves re-establishing a national rail link from Bury Bolton Street to the Calder Valley Line at Castleton and on to Manchester Victoria or Rochdale. A shuttle service between Rawtenstall and Bury could be operated in the morning and evening peaks. Key benefits:

- Our initial assessment indicates this would provide an attractive alternative to congested roads during peak periods despite interchange and some slow line speeds north of Bury.
- Heywood (population 30,000), one of only three towns in Greater Manchester with no rail connection, would be back on the national rail network;
- It would improve orbital links in northern Greater Manchester, between Bury and Rochdale;
- It provides an alternative to crowded trams to Manchester for Bury residents, improving resilience when Metrolink is unavailable or disrupted;
- Bury residents would have rail access to West Yorkshire without travelling via Manchester;
- A rail freight link to Heywood Distribution Park could boost industry and help to fund works;

Some investment is likely to be needed to upgrade the rail infrastructure east of Bury but would be modest in scale compared to most rail reopening schemes (e.g. low tens of millions of pounds). For this option to work the ELR would need to be on board as a cooperative partner.

What would this mean for the East Lancashire Railway?

The East Lancashire Railway would benefit from a new national rail connection bringing customers to their door, and the wider Bury / Rossendale visitor economy could benefit strongly.

ELR would be in a very strong position to operate a directly commissioned commuter shuttle service between Rawtenstall and Bury Bolton Street, providing a new revenue stream;

This option would not detract from the ELR's heritage character although there would likely be some impacts on operations and working practices:

- There would be some changes at Bury Bolton Street but these could be made without detracting from the ELR. An existing disused terminating platform at Bury Bolton Street (previously used for electric trains to Manchester Victoria pre 1992) could be brought back into use for the national rail service and low-key national rail station facilities provided (in keeping with the heritage character). We envisage second hand rolling stock operating the national rail service, e.g. ex London Underground 1970s District Line units fitted with either diesel or battery power – these are being converted for use in West Midlands and Wales at present;
- We envisage the section of the ELR east of Bury Bolton Street (i.e. towards Heywood) returning to Network Rail, with the ELR having access – timetabling of trains to Heywood would need to fit with rail service and there is likely to be a need for double tracking of this section.

Alternative solutions

The other options we have considered include the following:

Restoration of national rail services along the ELR:

- Gives Rossendale residents a quicker, direct rail connection into Manchester Victoria.
- Higher capital costs as the entire line would require work, with the ELR's heritage character and operations substantially compromised.

Shuttle along length of ELR into Castleton or Rochdale:

- Low capital costs and minimal impact on heritage character of ELR, allows ELR to fulfil aspiration of extending its services to Castleton.
- Longer journey times are likely to make this uncompetitive with road. Lower orbital connectivity benefits from a slower, peak-only service.

Extension of Bury Metrolink along ELR into Rawtenstall:

- Gives Rossendale residents a quicker, direct rail connection into Manchester Victoria.
- Existing crowding issues on Bury Metrolink would be intensified. Compatibility issues between light and heritage rail could seriously compromise ELR operations. No orbital connectivity benefits.

ELR shuttle to new Bury Metrolink interchange at Buckley Wells:

- Low capital costs and minimal impact on heritage character of ELR.
- Existing crowding issues on Bury Metrolink would be intensified. No orbital connectivity benefits.

Introduction

Aims of study

The aims of this study are to provide an early assessment of the strategic case for improving rail connections in the Rawtenstall to Rochdale/Manchester corridor. Transport for the North (TfN) is preparing a strategic transport plan for investment in the North of England's transport system over the next 30 years. A key objective for Rossendale and neighbouring boroughs is to ensure their current and future transport challenges are adequately addressed within this framework in order to ensure their economic potential is fully realised.

Context and background

Rossendale currently lacks a regular heavy or light rail service and roads are severely congested, particularly during peak periods. Rail connectivity is also limited in significant parts of neighbouring Bury MBC and Rochdale MBC, both part of Greater Manchester.

Figure 1 shows that Rossendale formerly had extensive rail connections to Greater Manchester and the rest of Lancashire. In the period following Richard Beeching's report *The Reshaping of British Railways*, services were gradually curtailed. Passenger services between Bury and Rawtenstall were withdrawn in 1972 and formal closure followed in 1982. Meanwhile, national rail between Manchester Victoria and Bury was replaced by a branch of the Manchester Metrolink tram service.

Figure 1: The extent of the rail network around Rossendale in the early 20th century (Lancashire and Yorkshire Railway map displayed in Manchester Victoria station)

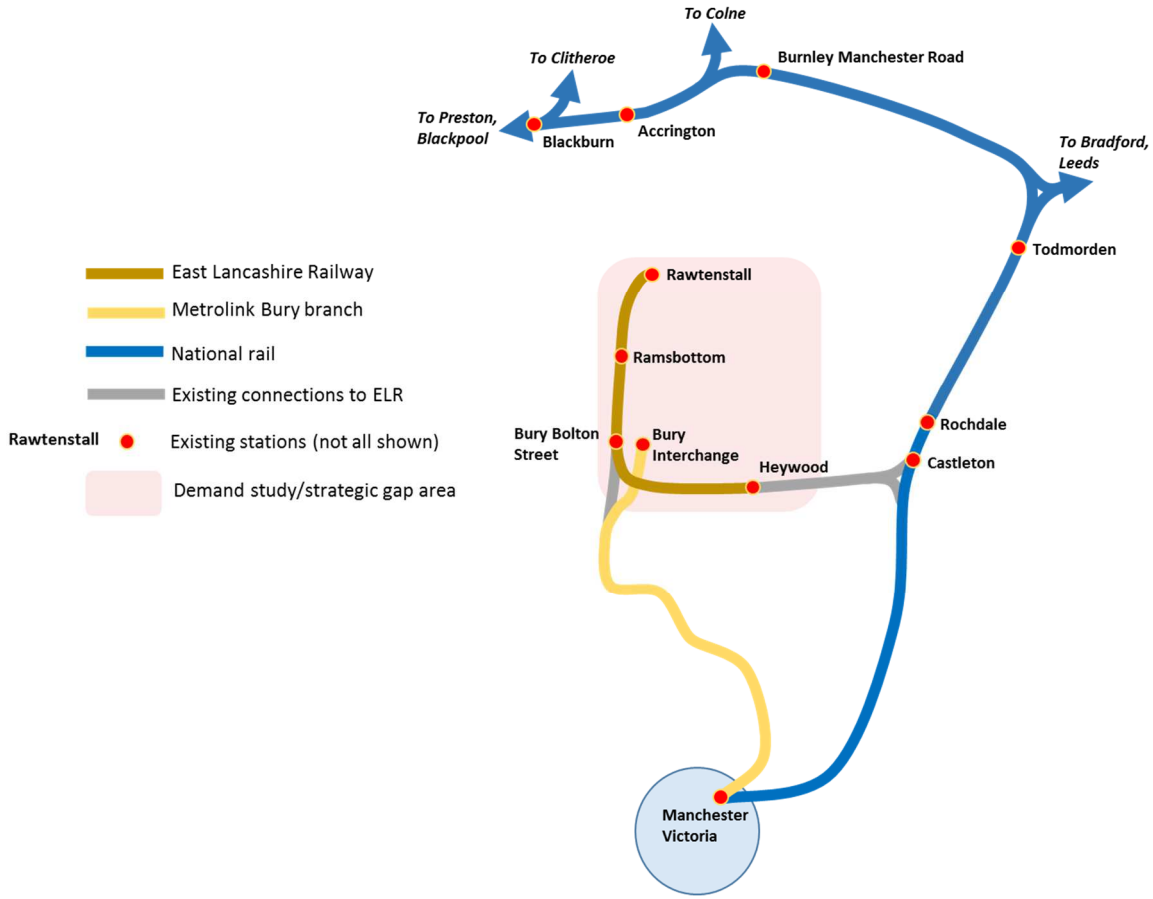
A substantial section of the East Lancashire Railway (ELR) does however remain operational as a heritage service, running weekend and inter-peak services throughout the year. Initially the four miles between Bury Bolton Street and Ramsbottom (Bury MBC) were reopened in 1987, with extensions to Rawtenstall (Rossendale BC) in 1991 and Heywood (Rochdale MBC) in 2003. This operation is important to the local

visitor economy – in 2016 it attracted over 200,000 visitors[1]. The ELR has connections to Bury Metrolink and the national rail network.

Study area

Existing rail infrastructure – national rail, Metrolink, and East Lancashire Railway – is illustrated in Figure 2. The study area consists of those parts of Rossendale, Bury, and Rochdale with transport connectivity problems. Where relevant, areas beyond the study area are considered – in particular key employment centres and other generators of travel demand of relevance to the three boroughs.

Figure 2: Existing rail infrastructure and identification of study area (not to scale)



Cebr map

The impacts of any transport intervention in this area would of course be wider – for instance productivity effects could arise in Manchester City Centre and other parts of Greater Manchester. It is beyond the scope of this work to model these but they will be important for future work fully assessing the funding case for transport investment.

This report will examine the current and future drivers of transport demand in the study area, outline options for investment, and at a high level evaluate these options.

[1]https://www.lancashiretelegraph.co.uk/news/15062650.Trains_bosses_celebrate_as_201_000_people_use_East_Lancs_stations_in_2016/

Baseline demand analysis

In this section we consider a number of factors informing present and future transport demand and supply in the study area:

Transport demand factors include:

- Projected population and housing;
- Employment growth;
- Commuting patterns;
- Freight opportunities.

Transport supply factors include:

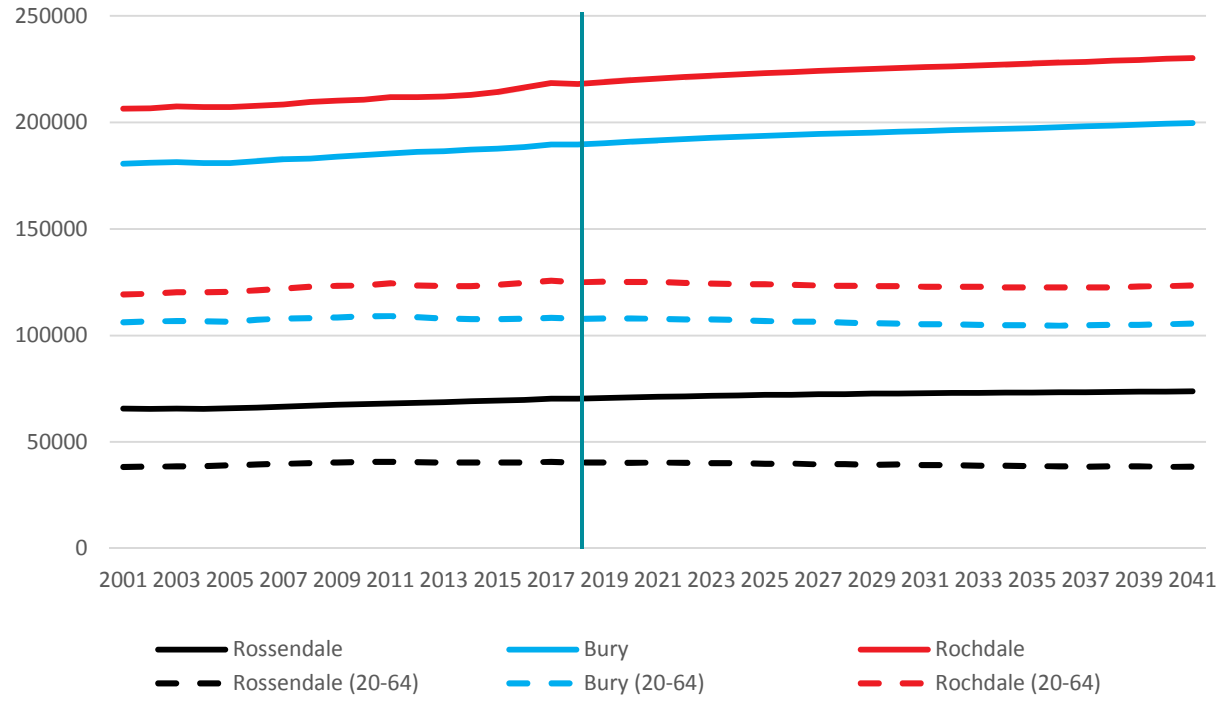
- Current and future road congestion;
- Present and planned infrastructure.

Transport demand factors

Population and housing

Bury and Rochdale are significantly more populous than Rossendale. All three boroughs are forecast to see slower population growth that Greater Manchester and England in the coming decades, and have also seen slower growth in recent years. Working age population is expected to grow more slowly than total population in all areas, however within the boroughs making up the study area the numbers of working age residents are expected to decline.

Figure 3: Rossendale, Bury, Rochdale historic and forecast population 2001-2041, including working age population



ONS 2001-17 population by age and local authority, 2016-based population projections; Cebr analysis

Figure 3 shows population figures for the boroughs making up the study area. Table 1 includes growth figures and comparisons with Greater Manchester and England.

Table 1: Population figures including comparisons with Greater Manchester and England, growth rates

All residents

	2001 pop.	2017 pop.	2041 pop.	2001-17 growth (%)	2017-41 growth (%)
Rossendale	65,647	70,365	73,800	7.2%	4.9%
Bury	180,655	189,628	199,800	5.0%	5.4%
Rochdale	206,440	218,459	230,300	5.8%	5.4%
Greater Manchester	2,516,096	2,798,799	3,064,900	11.2%	9.5%
England	49,449,746	55,619,430	61,952,100	12.5%	11.4%

Working age population (20-64)

	2001 pop.	2017 pop.	2041 pop.	2001-17 growth (%)	2017-41 growth (%)
Rossendale	38,401	40,772	38,500	6.2%	-5.6%
Bury	106,339	108,347	105,700	1.9%	-2.4%
Rochdale	119,390	125,771	123,600	5.3%	-1.7%
Greater Manchester	1,482,764	1,654,925	1,702,900	11.6%	2.9%
England	29,286,532	32,419,824	33,285,800	10.7%	2.7%

ONS 2001-17 population by age and local authority, 2016-based population projections; Cebr analysis

Labour market and quality of life factors are compared in Table 2. Standard of living across the study area as measured by GDHI per head is roughly in line with the wider region. Rochdale appears to be facing labour market challenges, with high unemployment and inactivity and a high percentage of workers with no qualifications. Rossendale performs relatively well on these.

Table 2: GDHI per head, labour market indicators in study area boroughs, wider area

	Rossendale	Bury	Rochdale	Greater Manchester	North West England	United Kingdom
GDHI per head (2016)	£15,285	£15,637	£15,255	£15,917	£16,761	£19,432
% unemployed (2017)	3.8	5.2	7.5	6.1	5.2	4.9
% economically inactive (2017)	25.1	25.1	30.4	24.8	24.3	22.2
% with no qualifications (2017)	7.6	8.4	11.9	9.6	9.0	8.0

ONS GDHI/head by local authority, mid-year population estimates; NOMIS annual population survey; Cebr analysis

Each of the boroughs has adopted targets for housebuilding in the coming years:

- Rossendale: 247 net additional dwellings per year, 2011-2026 (Local Plan adopted 2011)
- Bury: annual Local Housing Need (LHN) calculated as 378 (emerging Local Plan 2018)
- Rochdale: 460 net additional dwellings per year to 2028 (Core Strategy adopted 2016)

New housing in these areas, including any provided above and beyond these targets, could serve those commuting into Manchester – particularly with improved transport infrastructure. This housing provision in relatively affordable areas could therefore help to serve growing issues of inter-generational equality, as many young workers are currently unable to get onto the housing ladder.

Employment

Table 3 shows that across Greater Manchester and Lancashire, employment growth in recent years has been concentrated in Greater Manchester, and particularly in the City of Manchester – reflecting its growing importance as a major employment centre, hosting a greater concentration of knowledge-intensive business services. These high-productivity sectors benefit significantly from agglomeration economies, so it is to be expected that they will continue to grow in importance and density in city centres such as Manchester.

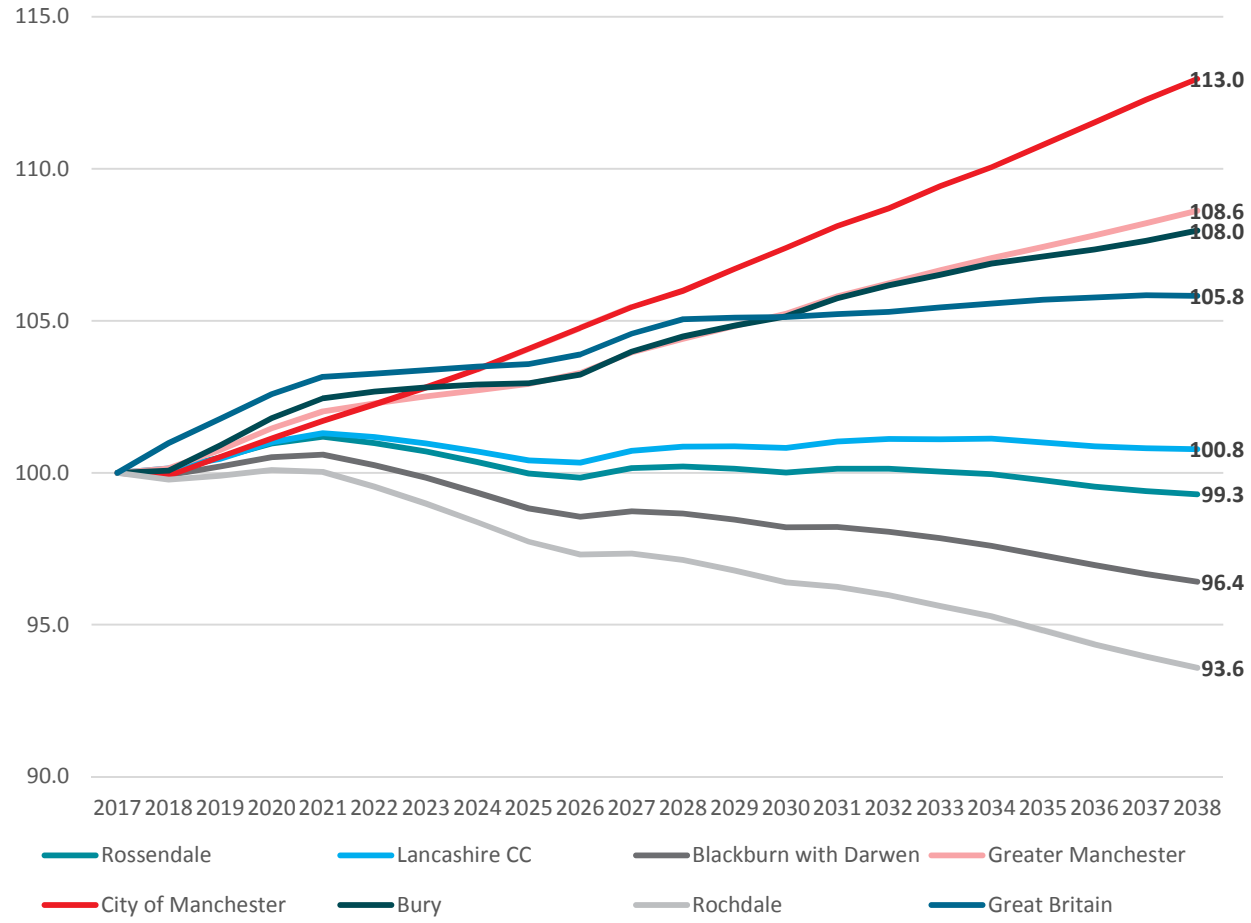
Table 3: Employment growth in and around study area

	2004-2006 (average)	2015-2017 (average)	Growth (%)
Rossendale	21,400	19,367	-9.5%
Bury	61,833	61,400	-0.7%
Rochdale	78,967	69,967	-11.4%
Lancashire CC	500,800	510,300	1.9%
Blackburn with Darwen	68,700	68,033	-1.0%
Greater Manchester	1,180,000	1,252,033	6.1%
City of Manchester	381,067	435,767	14.4%
Great Britain	27,135,267	29,289,233	7.9%

ONS 2001-17 population by age and local authority, 2016-based population projections; Cebr analysis

In future this pattern is broadly expected to continue, with rapid growth in Greater Manchester, led by the City of Manchester. The extensive plans for development of employment land in and around central Manchester – detailed in the *Policy and wider strategy review* section of this report – suggest that employment growth may be even higher than forecast.

Table 4: Cebr employment forecasts in and around study area, 2017-2038 (2017 = 100)



Cebr local authority-level employment forecasts

Commuting patterns

Travel to work data from the 2011 Census, summarised in Table 5, shows that there are substantial numbers of people commuting between the boroughs of the study area and from the study area into central Greater Manchester. For simplicity, flows into the cities of Manchester and Salford only are shown here as the bulk of commuting is into them, though of course other boroughs also see inflows. In total, 31,451 workers lived in the three boroughs containing the study area and worked in Manchester or Salford.

Commuting from the study area to other locations like West Yorkshire and 'reverse' commuting (e.g. from the City of Manchester into the study area) are all additional potential sources of demand to be explored in more detail.

Private motor is the dominant mode for all the commuting flows shown, with bus the most widely-used mode of public transport. Whilst those commuting from Rossendale into central Greater Manchester almost exclusive use private motor transport[2], the evidence suggests that where rail infrastructure is available it is reasonably well-used: the Bury (Metrolink) and Rochdale (national rail) connections into

[2] These figures are based on the dominant mode of transport used. Therefore the small metro/train shares for commuting from Rossendale into Manchester/Salford are likely to be the result of Rossendale residents driving to Bury or Rochdale and catching a tram or train.

Manchester have shares of 21% and 16% respectively, despite not all residents in those boroughs having easy access to them (e.g. Ramsbottom or Heywood residents as opposed to those in the city centres).

Table 5: Commuting flows and modes for study area boroughs

Origin	Destination	Commuters	Metro %	Train %	Bus %	Private motor %
Rossendale BC	Bury MBC	2176	0%	0%	4%	93%
Rossendale BC	Rochdale MBC	2587	0%	0%	8%	89%
Bury MBC	Rossendale BC	1281	0%	0%	4%	91%
Bury MBC	Rochdale MBC	4095	1%	0%	6%	87%
Rochdale MBC	Rossendale BC	892	0%	0%	7%	89%
Rochdale MBC	Bury MBC	4868	0%	0%	13%	83%
Rossendale BC	Manchester	1511	1%	3%	16%	79%
Rossendale BC	Salford	573	0%	1%	6%	91%
Bury MBC	Manchester	12130	19%	1%	10%	67%
Bury MBC	Salford	5689	4%	0%	6%	85%
Rochdale MBC	Manchester	9269	1%	9%	17%	70%
Rochdale MBC	Salford	2279	1%	5%	7%	86%
High Peak BC	Manchester	3314	0%	44%	1%	53%
High Peak BC	Salford	445	0%	23%	0%	73%

Census 2011 data; totals do not sum to 100% due to non-inclusion of active and other shares; Cebr analysis

High Peak in Derbyshire is a rural location which like Rossendale is immediately outside Greater Manchester. Unlike Rossendale, it enjoys a good rail connection to Greater Manchester. This connection is very well-used, with 44% of the 3,314 High Peak residents who worked in the City of Manchester travelling by train.

Given the strong employment growth in Greater Manchester and particularly the City of Manchester which is likely to continue in the coming years, we anticipate increased commuting flows into it from the study area.

Freight demand opportunities

A rail connection to the 200 acre Heywood Distribution Park – which is currently served by road only – could expand freight capacity, supporting regional manufacturing and logistics. An intermodal rail freight terminal could be provided in the land around the existing distribution park, with sidings at least 500m

long needed in order to accommodate modern freight trains. Conversion into a Strategic Rail Freight Interchange would remove significant numbers of HGVs from the congested strategic road network.

The distribution park is immediately adjacent to existing ELR line, as shown in Figure 4. Upgrades would almost certainly be needed to enable trains to reliably access the Calder Valley Line without causing an unacceptable risk of disruption to existing services – for example double-tracking of the ELR. Any such investment could also support the introduction of regular through passenger services on the section between Bury and locations served by the Calder Valley Line, and would provide a source of funding.

Figure 4: Aerial view of Heywood Distribution Park with ELR marked in red

Google Maps

Transport supply factors

Current and forecast road congestion

The National Infrastructure Commission's 'Traffic Congestion League', published in September 2018 based on comparison of peak and non-peak driving times, found that Manchester suffers the worst congestion of any British city outside London. The most congested non-city area is Accrington and Rossendale. As employment in central Manchester continues to grow, these issues are only likely to intensify; conversely, serious congestion will limit its employment catchment area and therefore growth.

The M66, which runs between Ramsbottom and Simister Island, north of Manchester, is particularly congested. This affects road journeys between central Manchester and Rossendale, most of Bury, and Heywood. Outside central Bury with its Metrolink connection there is no choice other than to use road for at least part of these journeys.

The Mayor of Greater Manchester's report *A Greater Manchester Congestion Deal* reinforces this view. Based on a survey of over 7,000 Greater Manchester residents, it identified the extent of congestion concerns throughout Greater Manchester and the personal impacts it has, including stress, anxiety, and potential health impacts from air pollution which deter people from using active transport. Lack of alternatives to the car was identified as one of five key causes of congestion.

Present and planned infrastructure

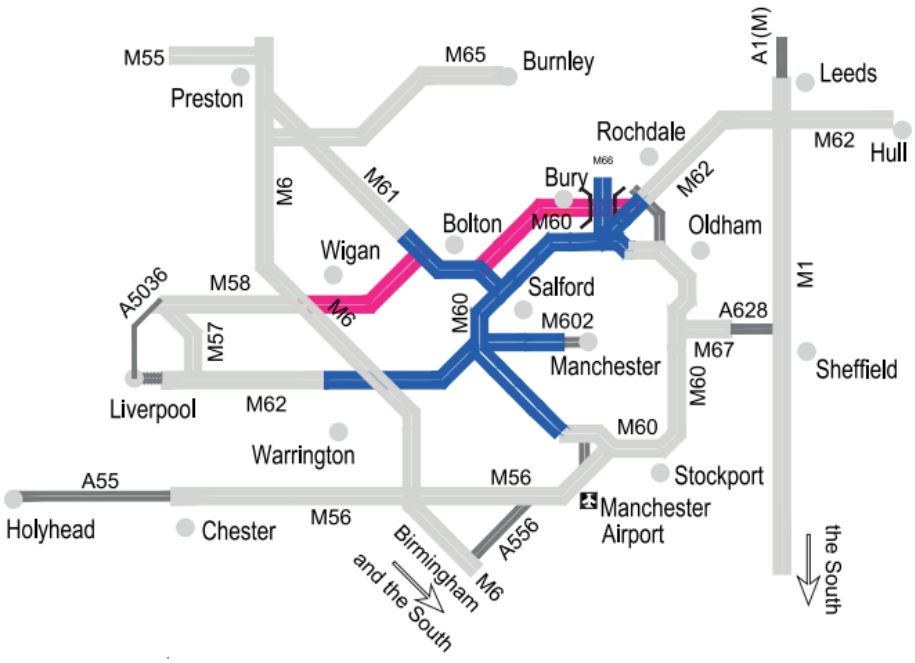
M60 North-West Quadrant strategic study

Potential improvements have been identified to the north-west part of the M60, along with parts of the M62, M602, M61, and M66, in one of the six strategic studies informing the development of RIS 2[3]:

- Northern Corridor: (highlighted in Figure 5) a new west-east route north of the M60 and M62. This would provide relief for the north-west quadrant by providing alternative routes for HGVs travelling between the Port of Liverpool and Yorkshire and other long-distance routes.
- Outer Orbital Corridor: a new orbital route outside and to the west of the M60, removing through traffic and freeing up capacity for increased public transport provision.
- PTMax: public transport improvements with greater opportunities for interchange between modes, including extra rail capacity to the north-west of Manchester towards Preston, Wigan, and Liverpool.
- In-Corridor Package: junction improvements and increased capacity within the existing M60 corridor, freeing up capacity for increased public transport provision.

If selected and realised as part of RIS 2, these projects would ease congestion in the quadrant and therefore benefit the study area.

Figure 5: M60 north-west quadrant (blue) with proposed Northern Corridor (pink)



Stage 3 report on improving the north-west part of the M60, Department for Transport

[3] https://www.gov.uk/government/publications/manchester-north-west-quadrant-strategic-study-stage-3-report

Policy and wider strategy review

National policy objectives

National Infrastructure Assessment

In July 2018, the National Infrastructure Commission released its first set of recommendations on how to address the UK's infrastructure needs. Entitled *Congestion, Capacity, Carbon: Priorities for national infrastructure*, it makes proposals on topics including digital infrastructure, flood resilience, recycling, and renewable energy. On transportation, its key recommendation is that the UK needs to prepare for 100% electric vehicle sales by 2030, and lay the foundations for the emergence of connected, autonomous vehicles as well. Whilst this primarily concerns road investment, the report is clear that this is not a complete solution, particularly where city regions are concerned:

"For all their benefits, neither electric nor connected and autonomous vehicles will solve the problems of urban transport; rather they are likely to increase the number of drivers on the roads. Government and cities need to act now to ensure that space in cities is used effectively, with room allocated for fast, frequent public transport systems, well-connected and affordable housing, and pleasant public spaces."

The report argues that *"the priorities for transport investment should be growing and congested urban areas and their catchments, the key interurban corridors, and the key international gateways"*, and that *"infrastructure to support public transport in growing and congested cities offers some of the highest returns for transport investment"*. Therefore investment to support public transport into and around a growing city region with congestion issues – such as Greater Manchester – would be highly compatible with the NIC's recommendations.

Industrial Strategy

The emerging Industrial Strategy has identified four 'Grand Challenges' for future growth to put the UK at the forefront of future industries. These are AI & Data Economy, Clean Growth, Future of Mobility, and Ageing Society. The second and third of these are particularly relevant to future transport infrastructure investment decisions.

The Industrial Strategy's infrastructure recommendations dovetail well with and are partly driven by the NIC's assessments. There is a similar emphasis on encouraging a shift towards electric vehicles, with a £100m fund to incentivise their purchase and £200m of public investment in charging infrastructure. £1.7bn of funding will be available under the Transforming Cities Fund for projects to improve connectivity in and around city regions to transform productivity by linking towns around cities to city centres and to each other. The TCF's remit does not directly include heavy rail, for which other funding streams are available, but could include light rail or station upgrades. In any case, improvements to connectivity between the study area and Manchester would be highly compatible with national infrastructure objectives.

Regional policy objectives

The Northern Powerhouse vision

Relatively poor connectivity within the North of England is a legacy of land use focused on achieving strong single industry localisation economies, with little need for interaction between settlements. This has been exacerbated by extensive 20th-century rail closures and severe traffic congestion on the region's strategic road network.

The result of this poor connectivity is a lack of economic integration between the North's cities, and between these cities and the smaller settlements around them, resulting in failure to realise the significant opportunities for agglomeration in the North. Widening and deepening of labour markets improves job matching and business-to-business linkages generate knowledge spillovers, enhancing productivity. Therefore whilst city regions – notably Manchester – have succeeded in creating dynamic, knowledge-based economies, their comparative economic performance lags that of London and peer regions on the continent.

The plans for Northern Powerhouse Rail and road improvements across the Pennines will strengthen connectivity between major cities, but the full realisation of the transport vision also relies on growing the employment catchment areas around major cities, for example better connecting Manchester to places such as Rossendale, and improving orbital connectivity within major conurbations.

Greater Manchester Spatial Framework

The Greater Manchester Spatial Framework, published in 2016 and being updated for 2018, sets out ambitious plans for growth and development in the city based on their forecast of 200,000 new jobs in Greater Manchester over the next 20 years. Plans include development in the city centre, around the airport, and at various other points around the city with the most significant at the Northern Gateway, Eastern Gateway, and Western Gateway. These will all include substantial housing and employment space:

- Western Gateway: 1,400,000m^2 industrial and warehousing floorspace; over 20,000 homes.
- Northern Gateway: 2,726,000m^2 business, industrial, and warehousing floorspace; 9,500 homes.
- Eastern Gateway: 200,000m^2 business and industrial floorspace; over 4,000 homes.

Residents and businesses in these developments will generate additional travel-to-work journeys. Though transport infrastructure will be improved alongside these developments, any further investment which provides viable public transport options to ease congestion would no doubt be welcome.

Greater Manchester Transport Strategy and Congestion Deal

Transport for Greater Manchester sums up its 2040 vision as, *"World class connections that support long-term, sustainable economic growth and access to opportunity for all."* If growth is to be sustainable and inclusive, public transport will clearly need to play a greater role in what is presently a car-dependent region; TfGM identifies integrated public transport with high capacity for both passengers and freight as a priority, and this would fit well with rail investment in the Rawtenstall-Manchester corridor.

A Greater Manchester Congestion Deal specifies 7 distinct aspects of policy that will be pursued by the Greater Manchester Combined Authority (GMCA) to tackle congestion issues:

1. **A smoother journey:** junction and traffic signal upgrades to improve the flow of road traffic.
2. **More reliable journeys:** tighter control of roadworks and improved information to network users to improve reliability and minimise the impact of disruption.
3. **Safer travel for all:** tackling crime on the transport network, steps to improve cycle safety and reduce dangerous driving.
4. **A healthier you:** increasing public and active transport use through campaigns, engagement, and cycle infrastructure, with a view to reducing air pollution.
5. **A genuine alternative to the car:** bus priority schemes, simplified 'tap on/tap off' ticket payment schemes, improvements to the rail network.
6. **Organisations taking a lead:** working with employers to encourage flexible working hours and season ticket loans, reducing pressure on the network at peak hours.

7. **Planning for the future:** extensions to Metrolink, ensuring accessibility by public and active transport to new residential and employment developments.

Naturally, some of these concern improvements to car travel, which will always be an important aspect of travel in and around major cities. Rail investment is very well-aligned, however, with 'A genuine alternative to the car' and 'A healthier you'. Expanding rail coverage as well as electrifying or improving capacity on the existing network provides more people with alternatives to driving into work, and as cars are taken off the road air quality will improve and make cycling or walking more desirable.

Transport for the North Draft Strategic Transport Plan

The 2020-50 strategy currently being produced by Transport for the North will allocate £27 billion for strategic transport projects in the North of England, with the aim of supporting transformational economic growth, following the vision set out in the *Northern Powerhouse Independent Economic Review*. Once TfN becomes a Sub-National Transport Body the plan will become a statutory document.

Goals of this investment identified by TfN in their report include:

- Providing easier access to high quality jobs for more communities;
- Tackling overcrowding and congestion;
- Improving connectivity across the North's transport network;
- Making areas of the North accessible for housing, commercial, and industrial developments;
- Delivering a sustainable transport network that supports quality of life.

Transport investment within the study area could support all of these goals by connecting communities to employment centres. The desire to tackle congestion and deliver sustainable transport are a better fit with investment in rail rather than road.

Local policy objectives

Rossendale's emerging economic development priorities include:

- Boosting its visitor economy and its town centres as shopping destinations;
- Increasing inward investment and attracting quality employment;
- Supporting businesses within the borough, both new and established.

An Employment Land Review undertaken as part of Rossendale's 2011 Local Plan identified a gross requirement of 20.84 ha of employment land for classes B1, B2, and B8 (light industry, general industry, and warehousing), a requirement of 2.14 ha over the 2011-2026 period. An emphasis on small, affordable units aims to support business start-ups.

All of the above objectives would be helped by improved connectivity. Greater economic integration with the surrounding area will boost the productivity of Rossendale's businesses and its desirability as a location for investment. The visitor economy would also benefit from quality, accessible transport. The East Lancashire Railway is a major attraction and a means of delivering visitors into the county, so solutions which support or at least do not compromise its operation would help Rossendale's attractiveness as tourist destination.

Initial investment aims

Based on Cebr's economic research, policy and wider strategy review, and consultations with stakeholders, we have arrived at a set of initial investment aims which are set out in Table 6. These fit into the themes of **Transport capacity and connectivity**, **Local economy**, and **Quality of life**.

Table 6: Initial investment aims for transport investment in the Rawtenstall-Manchester corridor

Strategic Aim	Objective
Transport capacity and connectivity	Improve journey times and resilience in travel to work markets between Rossendale and key employment centres
	Relieve capacity constraints on key commuter road corridors serving the study area
	Improve connectivity between the study area and key destinations across the North of England
	Increase the labour market catchment of Greater Manchester's employment centres
	Improve orbital connectivity within Greater Manchester
Local economy	Protect the heritage character of the East Lancashire Railway as a major tourist attraction
	Improve access to the visitor economy in Rossendale
	Improve attractiveness of study area to investors in manufacturing and distribution activities
Quality of life	Improve journey experience for transport users beginning and/or ending their trips in the study area
	Improve residents' access to employment, cultural, and leisure opportunities within and beyond Greater Manchester, particularly for relatively deprived areas
	Maintain or enhance environmental quality, supporting national climate change and local air quality objectives

Transport capacity and connectivity

Given the current issues faced by Rossendale residents in travelling to work in Greater Manchester, reducing journey times and improving resilience must be a key priority of any investment.

The realisation of the Northern Powerhouse vision is fundamentally reliant on improved transport connectivity within the North's city regions and beyond them to open up new sources of labour and housing for workers. Investment should therefore improve Greater Manchester's labour market catchment area, and ideally improve connections between the study area and other Northern locations such as West Yorkshire. Greater orbital connectivity – i.e. between Bury and Rochdale – would increase the labour market catchment areas of these centres and stimulate growth in their employment, not just that of the Cities of Manchester and Salford.

Local economy

The existence of the heritage operation along the East Lancashire Railway has both preserved a valuable railway alignment which might otherwise have been torn up and built over – thus making restoration of commuter services a greater possibility than would otherwise have been the case – and created an

incredibly valuable asset for the local visitor economy. Investment along the rail corridor should therefore aim to maintain and if possible enhance the heritage operation rather than compromise it.

Rossendale has aspirations to grow its visitor economy, including the development of its town centres as shopping destinations. Improved connectivity could and should aim to deliver this. Given that the East Lancashire Railway is a big part of Rossendale's visitor economy, this emphasises the importance of maintaining that heritage operation.

Transport investment can make the study area more attractive for investment, perhaps building on existing manufacturing in Rossendale and distribution activities in Heywood, by reducing journey times and improving reliability on the roads, and possibly providing freight activities with access to rail.

Quality of life

Congested roads are stressful for commuters, harming their quality of life. Transport investment which reduces road congestion and/or provides a reliable train service as an alternative will avoid this. Achieving this goal will go hand-in-hand with reducing commuting times out of the study area and improving their resilience.

Greater access to employment, cultural, and leisure opportunities will result from improved connectivity to Greater Manchester. It is particularly important that deprived areas see these benefits, as their residents are relatively less likely to own cars and therefore to have other means of accessing these opportunities.

Environmental objectives follow from the UK's international obligations to reduce carbon dioxide emissions and from local air quality issues. Rail is associated with lower carbon dioxide emissions per passenger than road, so a rail alternative will help the UK meet its commitments on climate change. City centres such as Manchester are associated with large numbers of idling car engines – these produce pollutants such as nitrogen oxides and particulates (in addition to carbon dioxide), damaging local air quality with potential adverse health impacts on others. Greater Manchester has serious air quality issues, comparable to those experienced by London. A report by IPPR North found that Central Manchester has the highest rate of emergency hospital admissions for asthma in England, with North Manchester in second place.[4]

[4] https://www.theguardian.com/uk-news/2018/jun/14/people-in-manchester-exposed-to-dangerous-levels-of-air-pollution

Development of alternatives

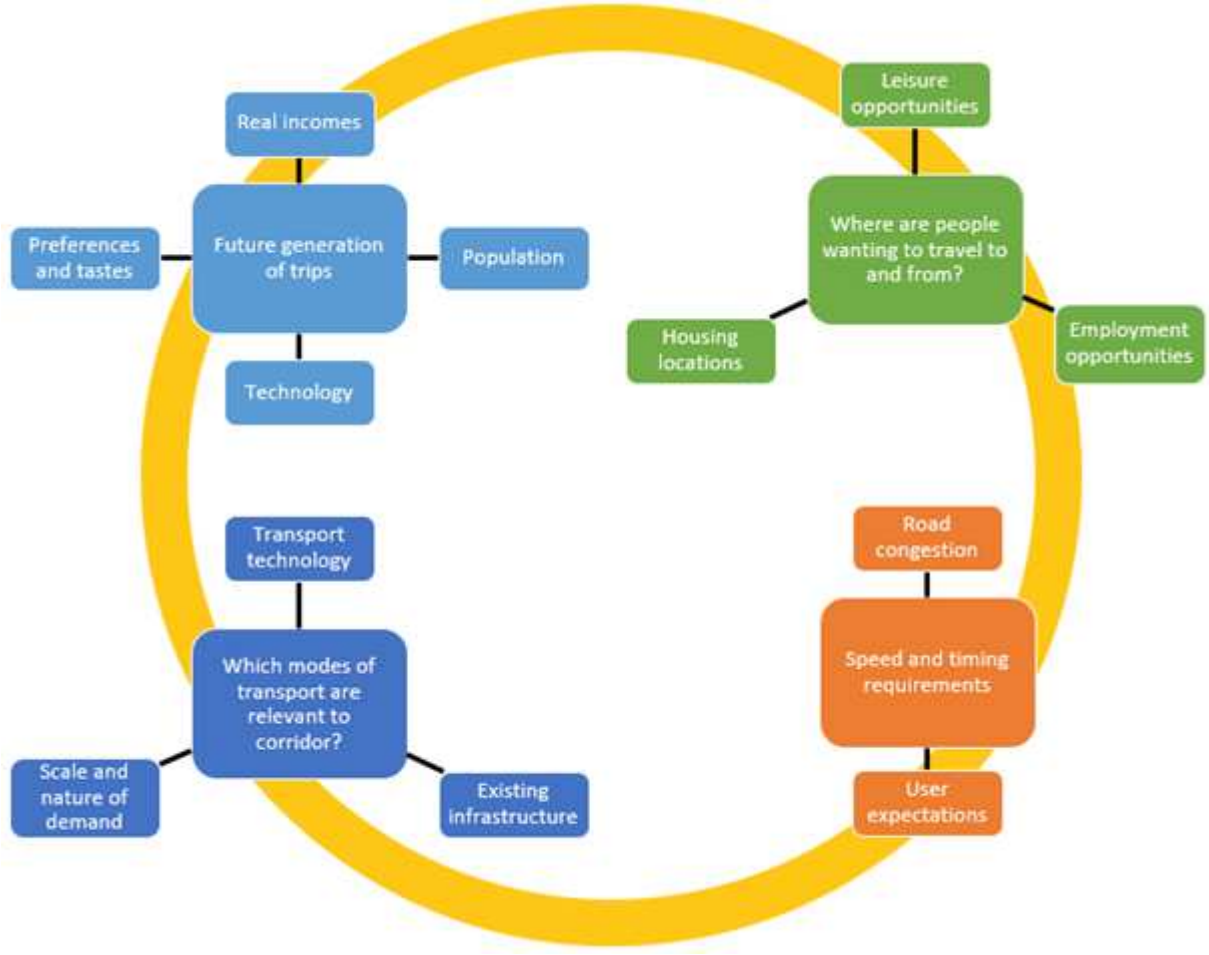
It is vital that a broad range of alternatives are considered at this early stage of the business case cycle, including heavy rail, light rail, and road-based solutions. The unique circumstances of the study area suggest that rail-based solutions could well be viable.

The rail alignment is of course intact, and is being operated by the East Lancashire Railway. Shared use of this infrastructure could avoid the very high initial fixed costs of establishing a new railway alignment whilst preserving the heritage operation. Investment to upgrade the lines, e.g. double-tracking parts of it, may well be needed, but it would not be necessary to acquire land and property to make way for an entirely new line.

The geography of Rossendale in particular suggests that rail solutions could be effective. Other areas with linear settlements strung along steep sided valleys such as the South Wales Valleys are effectively served in this way, enabling residents to commute to a variety of employment opportunities in Cardiff. Rail in the study area could offer a fast, high quality mode of transport to Manchester and other employment centres.

Figure 6 illustrates the broad factors we will take into account when defining and considering options.

Figure 6: Key factors informing high level option development



Technical constraints to rail investment

Though the preservation of the East Lancashire Railway's alignment does make investment in rail an easier option than would be the case if starting from scratch, there are nevertheless technical issues relating to the existing line and heritage operation which must be fully taken into account in future development work. No significant independent work on technical constraints has been undertaken by Cebr, however we summarise issues, drawing on earlier work such as Faber Maunsell's 2008 report[5], below.

Track and alignment limitations

Speed limitations

Currently ELR services travel no faster than 25mph and the East Lancashire Light Railway Order 1986 limits speeds. Line speeds north of Bury are also very limited by infrastructure constraints, while the line speeds between Bury and Heywood are higher. However these could only be exploited with suitable investment in rolling stock, e.g. in trains with central locking doors. Changing the permitted speed may involve, inter alia, testing of heritage vehicles were they to start travelling more quickly and the segregation of heritage and commuter services due to limited crashworthiness of heritage rolling stock; this segregation would almost certainly be necessary in any case to avoid the imposition of significant regulatory burdens on the heritage operation.[6]

Track crossings

A number of vehicle and footpath crossings exist along the length of the East Lancashire Railway. Presently these are volunteer operated and designed with relatively low speeds and traffic volumes in mind. For example to the east of Heywood station is a manually-operated open crossing, used only occasionally by through trains between the ELR and national rail network. A heavy rail option which saw regular (albeit slow-moving due to the proximity of the station) traffic through this crossing would require that it be upgraded.

Crossing loops

Constraints such as narrow bridges mean that two-tracking of the entire line will not be possible without very high costs. Therefore use of passing places where double-tracking is not possible or affordable will be necessary. Signal-controlled crossing loops are already in place at Ramsbottom and Bury Bolton Street, and there is a run-round loop at Heywood. More of these may be needed to facilitate smooth running of a higher frequency of services.

Check rails

Check rails are designed to prevent the diversion of wheel flanges onto the wrong route at points, thus preventing derailment. Raised check rails are required for Metrolink trains, but these are thought to be incompatible with many steam locomotives, particularly those with no flanges on some of their driving wheels. This issue would have to be resolved to make any extension of Metrolink onto the ELR feasible. Potential technical solutions could be visually obtrusive, compromising the heritage character of the line.

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[5] *TIF Feasibility Study: Improvement to public transport services from Bury, Ramsbottom, Heywood and surrounding areas, Final Report on capital and revenue costs for rail based schemes*, Faber Maunsell, July 2008

[6] For instance the ELR's heritage stock is not required to fit a TPWS (Train Protection & Warning System) due to slow speeds and low frequencies – mixing heritage and through/commuter services would compromise this.

Station construction and refurbishment

The major stations along the East Lancashire Railway – Heywood, Bury Bolton Street, Ramsbottom, and Rawtenstall – would all require upgrades to be used as part of any new commuter service, as would Summerseat, Irwell Vale, and Burrs Country Park[7]. Options for further park and ride stations are Stubbins (reinstatement) and Broadfield, Heap Bridge, and Ewood Bridge (new builds).

Works required may include installation of CCTV, disabled-friendly access, car parking provision, and possibly ticket machines – and all of these would need to be implemented in a manner compatible with existing heritage characteristics. The ELR requires a platform length of 200m (compared to 100m for conventional heavy rail and just 60m for Metrolink). This means that if the ELR were to use any new stations, they would need to comply with this standard.

Signalling

Faber Maunsell identify a few areas where extensive signalling work may be required, depending on the nature of rail investment:

- Heavy rail options would require remodelling of Castleton South Junction and new signals around Heywood.
- Light rail options including development of an interchange at the Buckley Wells site in Bury are likely to require installation of new signals.
- Options involving use of Rawtenstall's second platform would necessitate installation of new signals between there and Ramsbottom.
- Any new crossing loops would require signalling.

Power supply

Metrolink trains are powered via overhead wires. Installation of these along the East Lancashire Railway would be unacceptably damaging to its heritage character. Battery operation, though not yet widely used elsewhere, is therefore the most feasible option for a light rail solution; battery operated tram-trains are planned for South Wales Valleys services by Transport for Wales – see the *Case studies* section.

High-level option development

Building on the initial investment aims and our present understanding of the technical constraints, we have developed five high-level options for rail investment in the corridor together with three high-level road-based options. These are:

- Light rail option: extend Bury branch Metrolink services to Rawtenstall;
- Light/heavy rail option: peak-only shuttle to new interchange at Buckley Wells;
- Heavy rail option (a): national rail through service: Rawtenstall – Castleton/Manchester;
- Heavy rail option (b): national rail to Bury, peak-only shuttle Rawtenstall – Bury;
- Heavy rail option (c): peak-only shuttle Rawtenstall – Rochdale;
- Road-based options: Intensification of bus services, bus priority schemes, road widening.

Key features of these options are described in the following sections.

[7] Faber Maunsell, which refers to the station as 'Burr's Halt', predates the re-opening of the station by the ELR in 2016.

(i) Light rail option: extend Bury branch Metrolink services to Rawtenstall

Cebr map

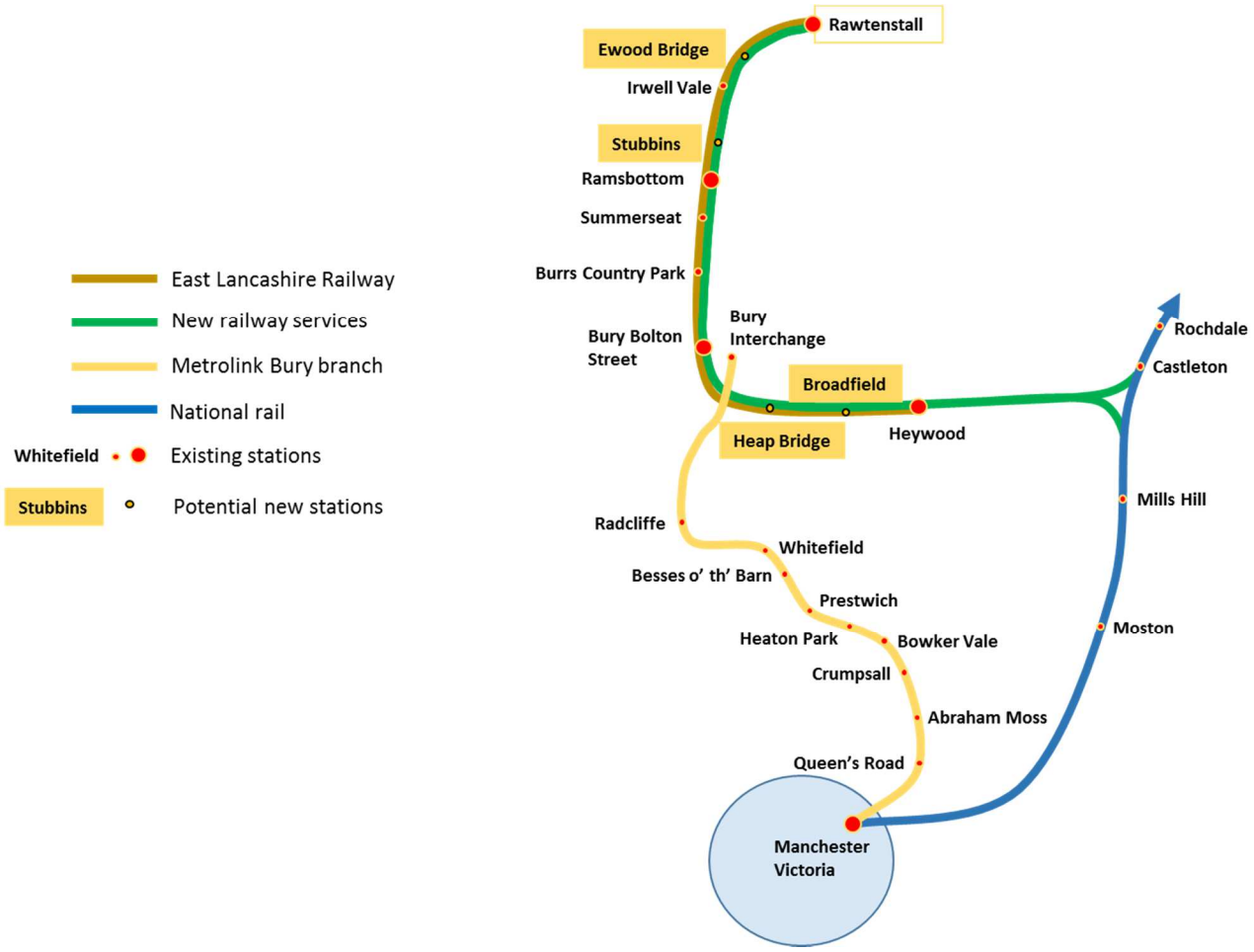
- Extend Metrolink (possibly with battery operation) by developing existing connection at Buckley Wells to enable services to Bury Bolton Street, Ramsbottom, and Rawtenstall possibly with one or two additional park and ride stops.
- Achieved either through diversion of some Bury Interchange services or additional services to be fitted into existing timetable; scope for new interchange at Buckley Wells.
- Maximum service frequency determined by Metrolink capacity constraints in central Manchester.

(ii) Light/heavy rail option: peak-only shuttle to new interchange at Buckley Wells

Cebr map

- Development of new interchange at Buckley Wells, existing ELR connection to Bury Metrolink.
- Peak only shuttle service between Rawtenstall and Buckley Wells with limited stops to ensure competitive journey times, although could include one or two new park and ride stops. Possible operation through ELR concession.

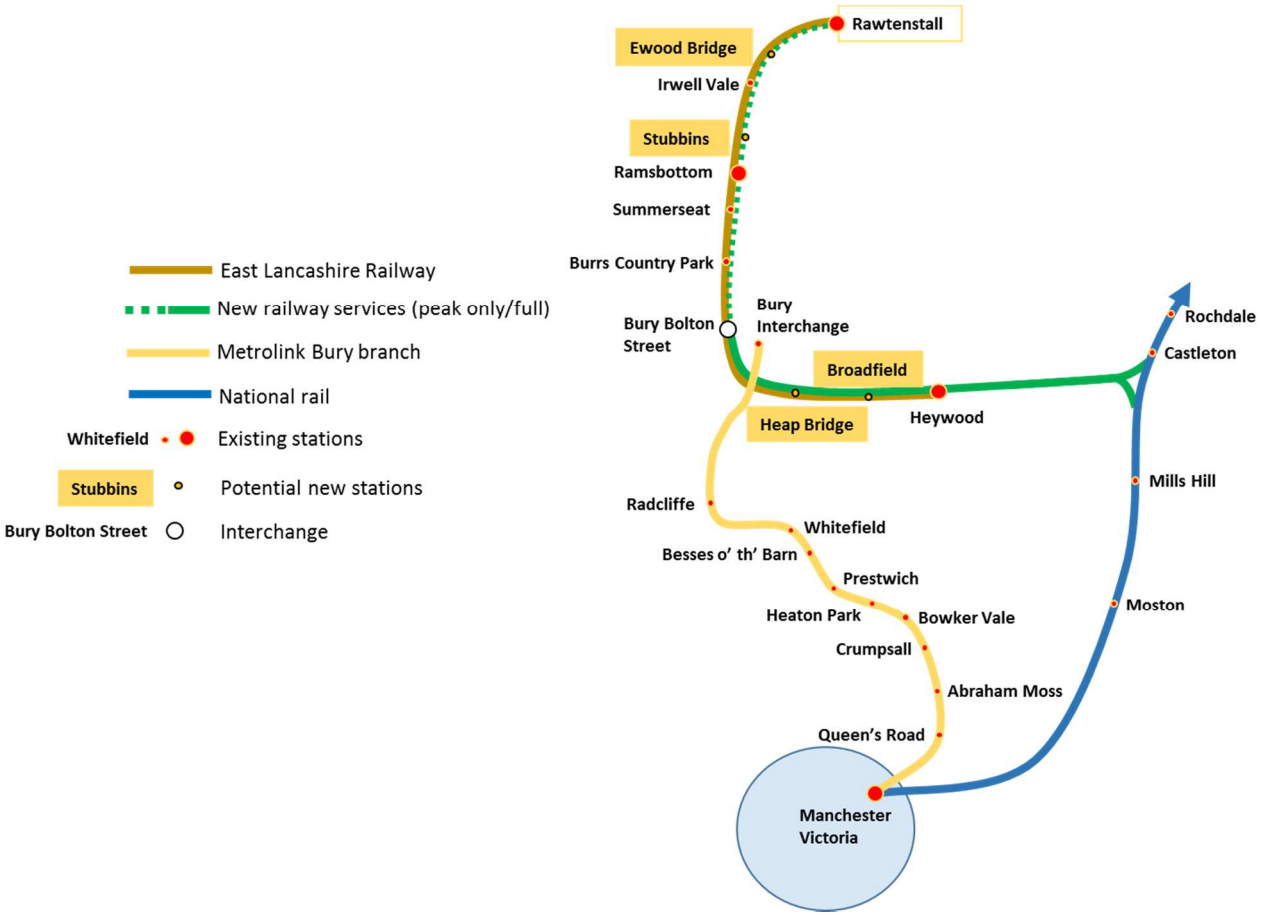
(iii) Heavy rail option (a): national rail through service: Rawtenstall – Castleton/Manchester



Cebr map

- Incorporation of ELR infrastructure into national rail system, utilising existing connections south of Castleton.
- Introduction of regular through services between Rawtenstall and Manchester with option for services from Rawtenstall to West Yorkshire via Rochdale.
- Limited stop service to ensure competitive journey times, although could include one or two new park and ride stops.
- Achieved through extensive capital investment on ELR, but maximum frequency constrained by availability of Network Rail paths.

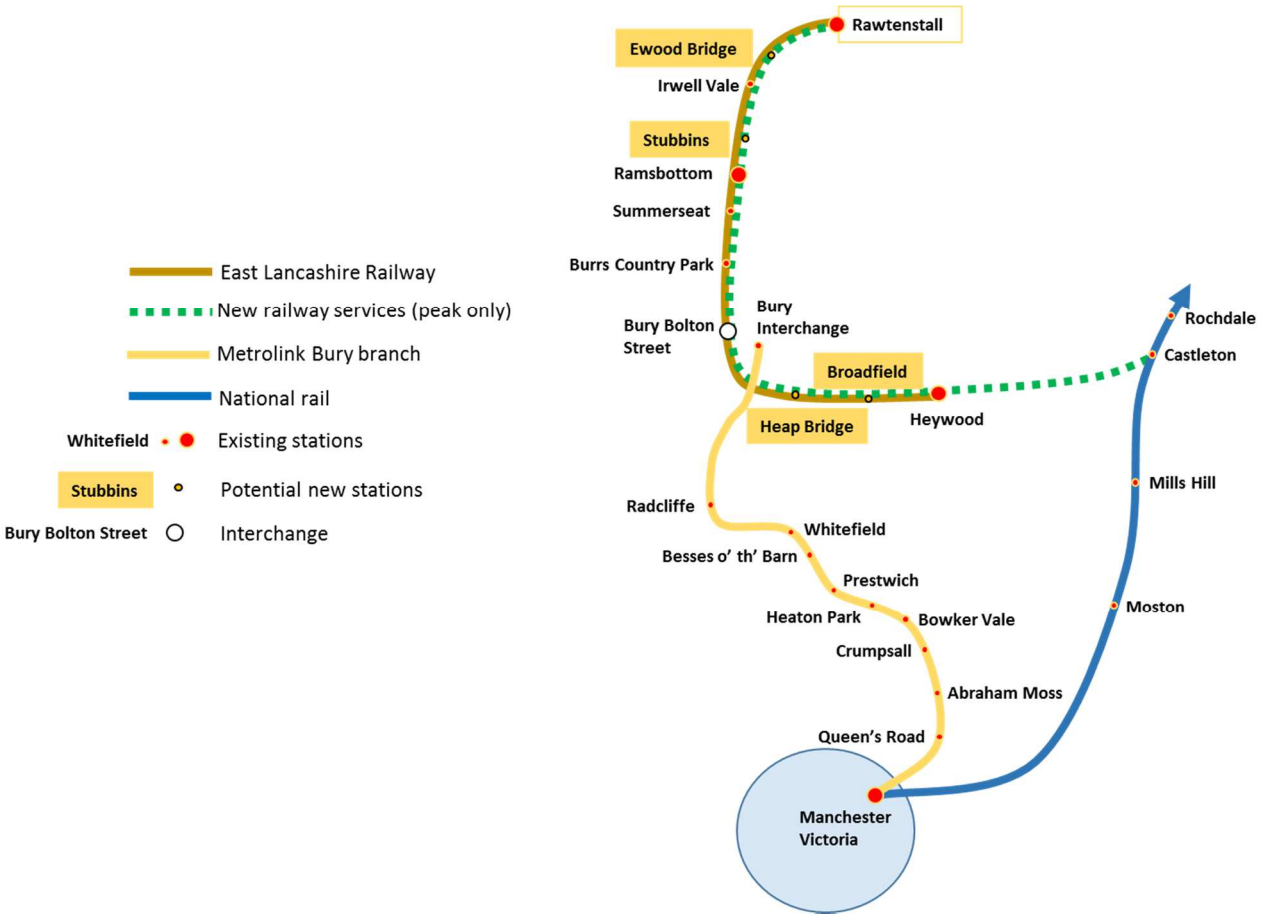
(iv) Heavy rail option (b): national rail to Bury, peak-only shuttle Rawtenstall – Bury



Cebr map

- Reincorporation of ELR south of Bury into national rail system, utilising existing connections south of Castleton.
- Introduction of regular through services between Bury and Manchester with option for through services towards West Yorkshire via Rochdale.
- Peak only shuttle service between Rawtenstall and Bury with limited stops to ensure competitive journey times, although could include one or two new park and ride stops. Possible operation through ELR concession.
- Maximum frequency determined by availability of Network Rail paths and by ELR capacity for shuttle.

(v) Heavy rail option (c): peak-only shuttle Rawtenstall – Rochdale



Cebr map

- Peak only shuttle service between Rawtenstall and Rochdale on ELR infrastructure and existing national rail connection with limited stops to ensure competitive journey times, although could include one or two new park and ride stops. Possible operation through ELR concession.
- Interchange onto national rail trains to Manchester and West Yorkshire at Rochdale.
- Maximum frequency determined by ELR capacity for shuttle.

Road-based options

We have considered potential road based solutions, but were not able to identify viable options that address the full range of proposed investment aims:

a) Intensification of bus services to increase frequency and locations served:

- Limited scope to intensify at peak periods, where frequency is high already;
- Subject to existing road congestion issues, so journey times would still be uncompetitive and unreliable.

b) Introduction of a priority bus lane on the A56 – M66:

- Some journey time and reliability benefits, but still subject to congestion on approach to Manchester City centre;
- Severe congestion impacts for other road users restricted to one lane, intensifying existing issues.

c) Widening of the A56 – M66:

- Significant capital costs and potential planning issues;
- Incompatible with national climate change objectives;
- Still subject to congestion on approach to Manchester City centre, which would be intensified by increased traffic generation.

There may be future investment in the strategic roads around Manchester, for example if proposed solutions in the M60 North-West Quadrant strategic study go ahead under RIS 2. These combined with A56 – M66 widening could reduce driving times from Rawtenstall into Manchester, but would fail to achieve other objectives – a purely road-based solution is less compatible with environmental and inclusivity goals and ultimately growing employment in Greater Manchester could lead to the newly-upgraded roads becoming acutely congested once again.

Evaluation of alternatives

Early Assessment Sifting Tool (EAST)

The EAST is a decision support tool developed by the Department for Transport which sets out criteria to help inform early views of transport intervention options, based on the following criteria:

- Scale of impact in solving the identified problem;
- Fit with wider transport and government objectives;
- Degree of consensus over outcomes;
- Economic growth (connectivity, reliability, wider impacts, resilience, housing);
- Carbon emissions;
- Other economic impacts (socio-distributional and the regions, local environment, well-being);
- Managerial (implementation timetable, public acceptability, practical feasibility);
- Financial and commercial (capital cost, revenue costs, source of funding).

High-level demand estimates

We've taken into account the findings of previous studies, but it should be noted that circumstances have moved on considerably since these were undertaken. We've also conducted significant new analysis based on 2011 Census Travel to Work data.

A key factor that has changed significantly is the level of severity of congestion faced by people in the study area, which is now much higher – as confirmed by the findings of the National Infrastructure Commission. In our view, current circumstances suggest that the conclusion drawn by Halcrow (2009)[8], that the overall generalised cost of rail would be higher than that of bus or car travel, no longer holds.

Driving times used in the Halcrow analysis did not account for current levels of peak hour congestion. Bus timetables advertise a journey time of 45 minutes between Rawtenstall and Manchester, however our discussions with numerous local stakeholders suggest that in reality they may take 60-90 minutes, with car and bus users facing long and unreliable journey times. In light of this, we consider it likely that a rail service between locations not currently served within Rossendale, Bury, and Rochdale boroughs and central Manchester could be competitive with private and public motor transport, if it provided a reliable journey time between Rawtenstall and Manchester Victoria of an hour or so.

Based on further analysis of 2011 Census Travel to Work data, including at the MSOA level, we estimate that if the heavy rail options via Castleton Junction captured a 10% share of commuting traffic in their affected markets, morning peak traffic would be roughly **1,700** in the Rawtenstall-Heywood direction and **1,100** in the Heywood-Rawtenstall direction.

[8] *Greater Manchester Passenger Transport Executive: GMPTE: TIF Bury – Rawtenstall Option Appraisal Final Report*, Halcrow Group Limited, March 2009

On similar assumptions, we estimate approximately **900** commuters heading in the Rawtenstall-Bury direction and **200** in the Bury-Rawtenstall direction under the options based on the Bury Metrolink corridor (extension to Rawtenstall or heavy rail shuttle to interchange at Buckley Wells).

Table 7: Peak-time commuter flows for options based on the two existing rail corridors, by % of 2011 commuter flows captured

Castleton corridor	Share of 2011 commuter flows	Rawtenstall-Heywood	Heywood-Rawtenstall
	5%	847	539
	10%	1,694	1,078
	15%	2,541	1,617
	20%	3,388	2,156
	25%	4,235	2,695

Bury Metrolink corridor	Share of 2011 commuter flows	Rawtenstall-Bury	Bury-Rawtenstall
	5%	442	102
	10%	884	204
	15%	1,325	306
	20%	1,767	408
	25%	2,209	510

Cebr analysis

Table 7 summarises commuter flows for the two alternative rail corridors depending on percentage of 2011 commuter flows using the new rail services.

The numbers under these scenarios are reasonably cautious for the following reasons:

- They are based on data from the 2011 Census, since which employment in the Cities of Manchester and Salford have grown significantly (from 376,000 and 92,000 respectively in 2011 to 461,000 and 103,000 in 2017[9]). UK rail demand has also grown strongly in recent years – from 359m passenger journeys in 2012-13 Q1 to 429m in 2018-19 Q1[10]. Transport for the North anticipate a 400% increase in rail travel across the North by 2050 – though of course this is based on significant increases in employment and rail infrastructure[11].
- Dynamic effects may arise – rail could make Rossendale a more attractive commuting location and stimulate business growth; Bury and Rochdale could become more integrated with each other.
- Leisure traffic has not been accounted for yet – just commuter demand.
- Whilst any non-national rail shuttle service would only operate at peak hours, new national rail or Metrolink services could pick up inter-peak and weekend demand.

[9] ONS data

[10] Office of Rail and Road: http://orr.gov.uk/statistics/popular-statistics/how-many-people-use-the-railway

[11] TfN Position Statement: https://www.transportforthenorth.com/wp-content/uploads/TfN-Position-Statement.pdf

There are also some respects in which these may be somewhat generous:

- Rail services may capture a lower share in the 'reverse' than 'forward' directions. As more people commute into than out of Manchester, road congestion conditions are likely to be less severe in this direction, so other things being equal commuters will be more likely to drive.

- Workers will not commute to work every working day – on any given day some of them will be on annual leave or may do some of their work from home.

Taking the figures from Table 7 as Average Annual Weekday Traffic (AAWT), Table 8 estimates peak-time trips taken on an annual basis. These figures are based simply on multiplying daily trips by 506: there are 253 working days in a typical year and 2 trips per commuter per day.

Table 8: Peak-time commuter trips for options based on the two existing rail corridors, by % of 2011 commuter flows captured, annualised

Castleton corridor	Share of 2011 commuter flows	Rawtenstall-Heywood	Heywood-Rawtenstall
	5%	428,531	272,683
	10%	857,063	545,367
	15%	1,285,594	818,050
	20%	1,714,126	1,090,734
	25%	2,142,657	1,363,417

Bury Metrolink corridor	Share of 2011 commuter flows	Rawtenstall-Bury	Bury-Rawtenstall
	5%	223,551	51,612
	10%	447,102	103,224
	15%	670,652	154,836
	20%	894,203	206,448
	25%	1,117,754	258,060

Cebr analysis

Our full methodology for the daily estimates is detailed in the technical appendix. Common-sense assumptions made here about which commuters would and would not use the new rail links are covered.

The faster, more direct, and more frequent the rail option, the greater the market share it is likely to capture – i.e. the Metrolink extension or national rail through service should, other things being equal, attract more passengers than the shuttle options as passengers from Rawtenstall and Ramsbottom will not need to change at Bury.

Options based on the Bury Metrolink will offer convenient onward travel (i.e. without interchange) to a range of locations in central Manchester, making rail more attractive to those working near these stations. The Ordsall Curve provides a heavy rail connection between Manchester Victoria and Manchester Piccadilly via Salford Central, Deansgate, and Manchester Oxford Road[12] – were trains under Castleton

[12] Beyond Manchester Piccadilly, continuing towards Stockport or Manchester Airport may also be possible, dependent on rail capacity.

corridor-based options to continue along this line (capacity permitting), study area residents working near those stations would find it more attractive.

There are criteria other than market share attracted to consider however, and these are detailed in *Summaries of key impacts*, below.

Further work will be required to produce detailed estimates of likely demand for the different investment options. The *Northern Powerhouse Independent Economic Review* suggests that there are reasons to be optimistic about the demand new rail infrastructure could attract:

"…the slow journey times offered by rail services in the North are correlated with low levels of longer-distance commuting. Moreover, it has been seen that ***when new direct rail services are introduced that offer a material reduction in rail journey times, there can be a substantial growth in demand which is much greater than conventional demand modelling would suggest*** *– a good example of this is the direct links between Manchester and north Lancashire, Cumbria and Scotland introduced by Trans Pennine Express. It is not just for commuting that poor rail connectivity across the North suppresses demand."*[13]

Focus on city centre commuting

The above analysis has focused on commuting flows along the entirety of the rail corridors in both directions. Here we focus on flows from newly-connected areas (Rossendale and Ramsbottom, plus Heywood in scenarios using the Castleton Junction corridor) into central Greater Manchester (in this case we consider the cities of Manchester and Salford).

A higher range of potential demand shares are included. These reflect that particularly intense congestion conditions in central Greater Manchester may help to make rail an especially attractive option for these travellers – the data from High Peak backs this up; its rail shares into Manchester and Salford are 44% and 23% (of 3,314 and 445 commuters) respectively, according to Census 2011 data.

The results of this exercise are summarised below: Manchester in Table 9, Salford in Table 10, and the two together in Table 11. Commuting numbers from Rossendale[14], Ramsbottom, and Heywood are shown as per the 2011 Census, along with numbers of rail users implied under Bury Metrolink corridor and Castleton Junction corridor options for usage levels ranging from 25% to 50%.

Comparing the numbers for a 25% share of commuters from Table 11 and Table 7 provides some further insight. For Bury Metrolink options, if a uniform share is captured across all markets, commuters into Manchester and Salford make up 32% (701 of 2,209 for a 25% share) of all commuters in the Rawtenstall-Bury direction. For Castleton Junction options, these commuters make up 25% (1,043 of 4,235) of all commuters in the Rawtenstall-Heywood direction.

The share is lower under the Castleton Junction options because although those commuting from Heywood to Manchester/Salford are now included in demand, so are those commuting from Bury/Heywood to Rochdale and West Yorkshire and from Rossendale/Ramsbottom to Heywood/Rochdale.

For the reasons discussed above, rail may capture a particularly high share of commuting flows into central Greater Manchester, so in reality these may well make up a much greater share of total demand.

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[13] *The Northern Powerhouse Independent Economic Review: Workstream 4 Scenarios for Future Growth in the North – Final Report*, June 2016

[14] Not all parts of Rossendale are included – as discussed in the technical appendix we conservatively assume that eastern parts of the borough are less likely to use the new rail connection. This affects our results only slightly.

Table 9: Commuters into Manchester from affected parts of study area, passenger numbers by rail usage share and rail corridor used

	N Rossendale	Haslingden	Rawtenstall	Helmshore	S Rossendale	Ramsbottom	Bury Metro. Corridor	Heywood	Castleton Corridor
Commuters	*246*	*189*	*192*	*134*	*217*	*1,069*	***2,047***	*1,017*	***3,064***
25%	62	47	48	34	54	267	**512**	254	**766**
30%	74	57	58	40	65	321	**614**	305	**919**
40%	98	76	77	54	87	428	**819**	407	**1,226**
45%	111	85	86	60	98	481	**921**	458	**1,379**
50%	123	95	96	67	109	535	**1,024**	509	**1,532**

Table 10: Commuters into Salford from affected parts of study area, passenger numbers by rail usage share and rail corridor used

	N Rossendale	Haslingden	Rawtenstall	Helmshore	S Rossendale	Ramsbottom	Bury Metro. Corridor	Heywood	Castleton Corridor
Commuters	*87*	*70*	*61*	*57*	*71*	*409*	***755***	*352*	***1,107***
25%	22	18	15	14	18	102	**189**	88	**277**
30%	26	21	18	17	21	123	**227**	106	**332**
40%	35	28	24	23	28	164	**302**	141	**443**
45%	39	32	27	26	32	184	**340**	158	**498**
50%	44	35	31	29	36	205	**378**	176	**554**

Table 11: Commuters into Manchester and Salford from affected parts of study area, passenger numbers by rail usage share and rail corridor used

	N Rossendale	Haslingden	Rawtenstall	Helmshore	S Rossendale	Ramsbottom	Bury Metro. Corridor	Heywood	Castleton Corridor
Commuters	*333*	*259*	*253*	*191*	*288*	*1,478*	***2,802***	*1,369*	***4,171***
25%	83	65	63	48	72	370	**701**	342	**1,043**
30%	100	78	76	57	86	443	**841**	411	**1,251**
40%	133	104	101	76	115	591	**1,121**	548	**1,668**
45%	150	117	114	86	130	665	**1,261**	616	**1,877**
50%	167	130	127	96	144	739	**1,401**	685	**2,086**

Summaries of key impacts

(i) Light rail option: extend Bury branch Metrolink services to Rawtenstall

- Would offer competitive rail journey times for new users north of Bury but some stations are remote from residential areas so likely to be dependent on access by other modes, including park and ride;
- Would require major intervention along length of ELR corridor (new loops or double tracking, signalling, stations etc.) with significant impacts on heritage character of ELR and potential damage

to ELR local economic function as visitor attraction; compatibility issues with other aspects of ELR operation, e.g. volunteer led maintenance;

- Some unresolved technical issues, including compatibility of check rails with heritage steam operations and reliance on battery technology with no proven track record in commercial service;
- Additional services could provide crowding relief at stations south of Bury;
- Additional pressure on already congested Metrolink system, either diverting some services from Bury Interchange or requiring additional services to be fitted into timetable. May be subject to capacity constraints in central Manchester;
- Demand may be too thin to justify a frequent service, particularly during inter-peak periods, making scale of capital costs required difficult to justify;
- Does not offer orbital connectivity benefits and provides few additional connectivity benefits to residents in Bury and Rochdale MBCs, e.g. no benefits to Heywood or link from Bury to Rochdale or West Yorkshire;
- Offers minimal rail / Metrolink network resilience benefits other than an alternative for Bury Interchange e.g. during maintenance and upgrade possessions.

(ii) Light/heavy rail option: peak-only shuttle to new interchange at Buckley Wells

- Would offer competitive rail journey times for new users north of Bury (slightly longer than Metrolink extension due to interchange) but some stations are remote from residential areas so likely to be dependent on access by other modes, including park and ride;
- Very limited impacts on heritage character of ELR; some adaption of ELR working practices; ELR could be commissioned to operate peak only shuttle services;
- Improved access to visitor economy in Rossendale at peak times only;
- Additional services could provide crowding relief at stations south of Bury;
- Additional pressure on already congested Metrolink system, requiring additional services to be fitted into timetable. May be subject to capacity constraints in central Manchester;
- Does not offer orbital connectivity benefits and provides few additional connectivity benefits to residents in Bury and Rochdale MBCs, e.g. no benefits to Heywood or link from Bury to Rochdale or West Yorkshire;
- Offers minimal rail / Metrolink network resilience benefits other than an alternative for Bury Interchange e.g. during maintenance and upgrade possessions.

(iii) Heavy rail option (a): national rail through service: Rawtenstall – Castleton/Manchester

- Provides an alternative to congested roads in peak periods, Rawtenstall-Manchester Victoria journey time could be reliable and competitive with road despite slow line speeds by operating with limited stops. Potential to include one or two park and ride stations;

- Requires major intervention in ELR corridor (new loops or double tracking, signalling, stations etc.); significant impacts on heritage character of ELR; compatibility issues with other aspects of ELR operation, e.g. volunteer led maintenance;
- Potential damage to ELR as visitor attraction could be partially offset by improved rail access from east; potential benefits to wider Rossendale visitor economy; future potential to link to Manchester Airport;
- Subject to availability of Network Rail paths, particularly in central Manchester but platform lengths would allow 4 car+ operation so significant capacity could be provided through a 2 tph service (i.e. efficient use of paths);
- Bury and parts of Rochdale would once again be on the national rail network, with following benefits:
    - reintroduces regular passenger services to Manchester / Rochdale and beyond for residents of Heywood;
    - an alternative to trams (often crowded) between Bury and Manchester, easing capacity and improving resilience, e.g. during weekend possessions or service perturbations; potentially enables some Metrolink services to be diverted at Crumpsall onto a new branch serving Middleton;
    - improving orbital connectivity in Greater Manchester, serving commuting flows between Bury and Rochdale;
    - access to / from West Yorkshire without travelling via Manchester.
- Opportunity to provide an intermodal terminal at Heywood Distribution Park could help fund infrastructure works.

(iv) Heavy rail option (b): national rail to Bury, peak-only shuttle Rawtenstall – Bury

- Provides an alternative to congested roads in peak periods, Rawtenstall-Manchester Victoria journey time could be reliable and competitive with road despite slow line speeds and interchange by operating with limited stops. Potential to include one or two park and ride stations;
- Requires some intervention in ELR corridor south of Bury (new loops or double tracking, signalling, new stations etc.) but very limited impacts north of Bury; very low impact on heritage character of ELR (could use disused south facing bay platform at Bury); some adaption of ELR working practices; ELR could be commissioned to operate peak only shuttle services;
- Significant boost to ELR as visitor attraction by providing improved rail access from east; potential benefits to wider Rossendale visitor economy; future potential to link to Manchester Airport;
- Subject to availability of Network Rail paths, particularly in central Manchester but platform lengths would allow 4 car+ operation so significant capacity could be provided through a 2 tph service (i.e. efficient use of paths);
- Bury and parts of Rochdale would once again be on the national rail network, with following benefits:

		Light rail	Light/heavy rail	Heavy rail			
		(i) Metrolink extension to Rawtenstall	(ii) Peak-time shuttle, interchange at Buckley Wells	(iii) Through services from Rawtenstall	(iv) Through services from Bury, peak-time shuttle from Rawtenstall	(v) Peak-time shuttle from Rawtenstall to Rochdale	Notes
Scale of impact	Improve journey times and resilience in travel to work markets between Rossendale and key employment centres						(i) and (iii) give direct access to Manchester from north of Bury, while (ii), (iv), and (v) require interchange.
	Relieve capacity constraints on key commuter road corridors serving the study area						All options benefit M66 corridor and north Greater Manchester. (iii) delivers greatest journey time benefits across study area.
	Improve connectivity between the study area and key destinations across the North of England						(iii), (iv), and (v) provide orbital connectivity benefits in Greater Manchester and improve links to West Yorkshire.
	Increase the labour market catchment of Greater Manchester's employment centres						(iii) and (iv) provide broader range of benefits to established employment centres.
	Improve orbital connectivity within the Manchester City Region						(iii), (iv), and (v) provide orbital connectivity benefits in Greater Manchester by connecting Bury and Rochdale.
	Impact on the heritage character of the East Lancashire Railway as a major tourist attraction						(i) and (iii) generate serious negative impacts. With suitable mitigation, other options should have minimal impacts.
	Improve access to the visitor economy in Rossendale						(iii, (iv), and (v) could help establish a rail-based visitor corridor between Rossendale and West Yorkshire.
	Improve attractiveness of study area to investors in manufacturing and distribution activities						(iii) and (iv) provide national rail connection to Heywood, with possible benefit to distribution park.
	Improve journey experience for transport users beginning and/or ending their trips in the study area						(i) and (ii) could result in more crowding on existing Bury Metrolink. (iii) does not involve interchange.
	Improve access to employment, cultural, leisure opportunities, particularly for relatively deprived areas						All options improve access to opportunities across Greater Manchester.
	Maintain or enhance environmental quality, supporting climate change and air quality objectives						All options should provide environmental benefits through incentivising mode shift from road to rail.
Wider policy fit	Local						Damage to ELR under (i) and (iii) detracts from other benefits common to all options.
	Regional						All options provide regional benefits, with (iii) and (iv) broader in their impacts.
	National						All options support regional economic rebalancing (Northern Powerhouse).
Degree of consensus							Support exists for rail investment in corridor, provided ELR is protected. Direct services from Rossendale conflict with ELR.
Economic growth	Local						Connectivity benefits offset by damage to ELR in (i) and (iii). Maximum connectivity with the least damage to ELR in (iv).
	Regional						(iii) and (iv) provide maximum connectivity benefits through orbital connectivity in Greater Manchester and beyond.
Financial and commercial	Expected total cost						(i) and (iii) significantly more costly due to required upgrade of ELR north of Bury.
	Potential for additional funding contributions						(iii) and (iv) could attract additional funding to enable rail freight link to Heywood Distribution Park.

Strongly negative	Slightly negative	Broadly neutral	Slightly positive	Strongly positive

- reintroduces regular passenger services to Manchester / Rochdale and beyond for residents of Heywood;
- an alternative to trams (often crowded) into Manchester, easing capacity and improving resilience, e.g. during weekend possessions or service perturbations; potentially enables some Metrolink services to be diverted at Crumpsall onto a new branch serving Middleton;
- improving orbital connectivity in Greater Manchester, serving commuting flows between Bury and Rochdale;
- access to / from West Yorkshire without travelling via Manchester.

- Opportunity to provide an intermodal terminal at Heywood Distribution Park could help fund infrastructure works.

(v) Heavy rail option (c): peak-only shuttle Rawtenstall – Rochdale

- Provides an alternative to congested roads in peak periods, Rawtenstall-Manchester Victoria journey time could be reliable and competitive with road despite slow line speeds and interchange by operating with limited stops. Potential to include one or two park and ride stations;
- Very low impact on heritage character of ELR; some adaption of ELR working practices; ELR could be commissioned to operate peak only shuttle services;
- Peak-time boost to ELR as visitor attraction by providing improved rail access from east; some potential benefits to wider Rossendale visitor economy, albeit at peak times only; future potential to link to Manchester Airport; ELR could fulfil aspiration to extend heritage services to Castleton;
- Interchange onto existing national rail services could cause crowding issues, subject to availability of Network Rail paths additional services could be added;
- Bury and parts of Rochdale would benefit from a new peak-time train service, with following benefits:
  - reintroduces regular passenger services to Manchester / Rochdale and beyond for residents of Heywood;
  - an alternative to trams (often crowded) into Manchester, easing capacity and improving peak-time resilience, e.g. service perturbations; potentially enables some Metrolink services to be diverted at Crumpsall onto a new branch serving Middleton;
  - improving orbital connectivity in Greater Manchester, serving commuting flows between Bury and Rochdale;
  - access to / from West Yorkshire without travelling via Manchester.

Investment aims: performance of the five options

An evaluation spreadsheet comparing performance of the five options is included overleaf.

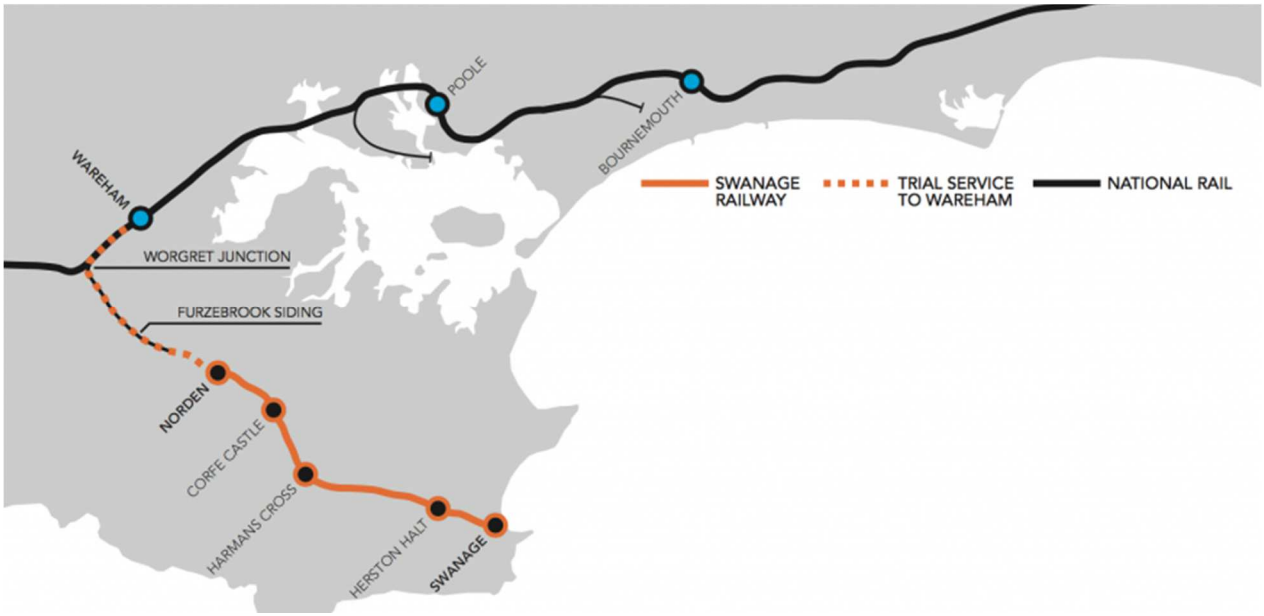
Case studies

Various projects situated elsewhere in the country are worthy of consideration, and may be instructive in considering the pros and cons of rail investment options in the Rawtenstall-Manchester corridor.

Swanage Railway

This heritage line in Dorset operates a steam service along the 8.8km line from Swanage to Norden, a successful tourist attraction which has been running since the 1990s. At the busiest times, during summer, two trains are used to run a service in each direction every 40 minutes. A long-standing objective of The Swanage Railway is the reinstatement of passenger services between Swanage and Wareham, and following the recent restoration of the line between Norden and Wareham a trial 'community rail service' was operated for 60 days in 2017, as shown in Figure 7. Four services a day, five days a week were provided, running at two-hourly intervals with careful planning in place to allow community and heritage services to cross each other at Corfe Castle or Harmans Cross.

Figure 7: Swanage Railway, extent of community rail service trial, interaction with national rail



Rail Engineer

The section of line between Wareham and Worgret Junction is shared between National Rail and the proposed community rail service. The Swanage Railway intends to use two of its own DMUs (diesel multiple units) to operate the service – however, as these had not been adapted to main line certification standards, rolling stock hired from West Coast Railways was used instead for the 2017 trial, with no trial taking place in 2018. The second trial is now expected to commence in early 2019. A Swanage Railway ticket office has been set up at Wareham station and its services are displayed on platform indicators, so it is well integrated with national rail operations.

The Swanage Railway intends to form its own TOC (train operating company), allowing it to operate any new community service 'on its own terms', in a way which does not compromise or abstract demand from heritage services, and with the potential to earn additional revenues. In the longer term, the reinstated track may allow The Swanage Railway to operate heritage services beyond Norden – even as far as Wareham, though this would entail getting locomotives and coaches certified for main line usage.

This demonstrates that heritage and commuter operations are not incompatible – indeed, in this case, the heritage operator itself has pioneered the introduction of new services linking to national rail. By operating a shuttle service itself, the East Lancashire Railway could ensure that new commuter services do not damage its existing operations, and could realise benefits through increased revenues and connectivity with national rail.

The West Somerset Railway

This heritage line runs for 33km between Minehead and Bishops Lydeard and Norton Fitzwarren, near Taunton. The West Somerset Railway is currently seeking to run a shuttle train service to Taunton, on the national rail network, during peak days in the summer period. Such a service was briefly in operation during 2007, with trains catering to holidaymakers running as far as Bristol Temple Meads, with further occasional running on the national network since. This further demonstrates the possibility of heritage and national rail services sharing space.

Borders Railway

This recently-constructed line between Edinburgh and Tweedbank on the Scottish Borders has been credited with providing significant employment and tourism benefits, despite being single-track in most places and non-electrified, with two trains per hour running in each direction during weekday peak times.

What is now known as the Borders Railway is a partial reconstruction of the former Waverley Route running from Edinburgh to Carlisle, which was closed in 1969. Following the construction of 30 miles of new railway and 7 stations, the line opened in 2015, and passenger numbers have increased year-on-year since, comfortably exceeding the forecasts made to inform the business case – from 1.3m in the first year of operation to 1.37m in the second and 1.5m in the third.

Though newly-constructed and fully part of the national rail network – rather than a solution built around an existing heritage operation – there are important parallels between the Borders Railway and potential investments along the East Lancashire Railway. Both connect a hinterland (the Scottish Borders, Rossendale) with an urban centre (Edinburgh, Manchester). Positive impacts along the Borders Railway suggest that investment in passenger services along the ELR could deliver major benefits:

- Increases in housebuilding along the line even before it was completed, for instance a doubling of new houses in Midlothian in 2012, many of them close to the new stations. This demonstrates the potential for rail to unlock housing development, supporting city centre growth and increasing housing supply.
- Visitor numbers at Borders and Midlothian attractions have increased since the opening of the line, suggesting that improved transport connectivity can support the visitor economy.
- The robust passenger numbers include people switching from road-based modes to the train – according to the *Borders Railway Year 2 Evaluation Survey of users and non-users*[15] 35,800 single car trips and 14,100 single bus trips were saved in Year 2 of the line's operation.
- In the *Borders Railway Year 2 Evaluation Survey of users and non-users*, 58% of those in the catchment area who had moved house and 52% of those who had moved employment stated that the re-opening of the line was a factor in their decision. This suggests the potential for rail to increase labour market catchments by making non-urban locations more appealing to live.

[15] Scottish Government, February 2018

Sheffield-Rotherham tram-trains

As part of Sheffield's 'Supertram' light rail system, tram-train operations were introduced in October 2018. These run on the national rail network between Rotherham Parkgate and Rotherham Central, then join the tram network and run to Sheffield City Centre. This works in a similar manner to systems in Karlsruhe, Kassel, and Saarbrücken in Germany and Mulhouse in France.

Though light rail options along the East Lancashire Railway would face other issues – for instance compatibility with rails designed for heritage stock and the likely need to use battery power rather than installing overhead wires – this shows that combined light and heavy rail operation is in principle possible.

South Wales Metro

This light rail system proposed for Cardiff and its hinterland will bring several new innovations to transport in and around the Welsh capital. Trams and tram-trains used on the network will include 'tri-mode' vehicles capable of running on diesel, overhead wires, and from battery power. If light rail is to be used across both the East Lancashire Railway and existing Bury Metrolink system, using battery or diesel power north of Bury rather than installing overhead wires will avoid serious damage to the ELR's heritage character – however issues surrounding compatibility of check rails with heritage and light rail services will still be an issue.

Rolling stock

We do not anticipate that procurement of appropriate rolling stock would be an issue. For instance, British Rail Class 230s, units from the District Line of the London Underground converted to diesel electric or battery traction, as shown in Figure 8, are being made available. These could be used for ELR heavy rail shuttle services as well as or instead of its existing heritage stock, and for national rail services into Manchester Victoria. Light rail options are considered in *Case studies*.

These trains are being commissioned by Transport for Wales and Transport for the West Midlands to provide enhanced commuter services.

Figure 8: Vivarail Class 230 battery electric train, converted from London Underground stock

Wikimedia Commons

Recommendations

This report has outlined the key transport demand and supply factors within the study area, options for rail investment, and the arguments for and against each of them. Overall, we believe this work indicates that feasible options exist for investment which could deliver significant economic benefits, reduce congestion, and meet environmental targets in a way which will not harm the valuable operations of the East Lancashire Railway, and may even be to their benefit.

Of course, this is an early strategic case for investment only, and further work will be needed to identify the best choice for any future investment. In particular, we recommend:

- Assembly of a comprehensive evidence base on car and bus journey times and journey time reliability within the study area and from the study area towards central Manchester, with particular attention to the morning and evening peaks.

- Investigation of other heritage services which interact with national rail and how lessons from them may be applied to investments along the East Lancashire Railway.

- Completion of a full Strategic Outline Business Case building on the issues raised in this study. In particular, demand estimates for rail investment options are required, and these should take into account the long, unreliable journey times faced by car and bus users in the Rawtenstall-Manchester corridor.

- In order to secure support and funding for this project and the further work required, pressing for its inclusion in Transport for the North's *Strategic Transport Plan* should be a priority.

Technical appendix: estimation of rail demand from 2011 Census data

In order to make these estimates we extracted 2011 Census Journey to Work data at the MSOA (middle super output area) level. Working at a lower level than would be possible with local authority-level data allowed us to include all relevant commuter flows and exclude irrelevant flows. For example an individual who lives in Ramsbottom and works in Bury is not captured as a commuter in the local authority data, as both settlements are within Bury MBC. Nevertheless, all five of the investment options would provide a rail link between Ramsbottom and Bury which this individual might well opt to use. In contrast, a Whitworth, Rossendale resident who works in the centre of Rochdale does commute from one borough to another, but it is highly unlikely they would use a new train service – driving to a station in Rawtenstall or Ramsbottom in order to catch a train would take longer than simply driving into Rochdale.

Data extracted was on place of work and usual residence for local authorities in Lancashire (including Blackburn and Blackpool unitaries), Greater Manchester, West Yorkshire, and High Peak. Data for Rossendale, Bury, Rochdale, and High Peak was extracted at the MSOA level. Data on mode of travel was also included.

MSOAs within Bury MBC and Rochdale MBC were grouped for analysis purposes. MSOAs within Rossendale BC were not grouped – its lower population density means that each area is geographically larger, so combining them would not be appropriate. For analysis purposes each MSOA or group thereof was named as per Table 12:

Table 12: Names of MSOAs, groups thereof in Cebr analysis

Local authority	MSOA nos.	Name
Rossendale	Rossendale 001	N Rossendale
	Rossendale 002	Haslingden
	Rossendale 003	Bacup
	Rossendale 004	Rawtenstall
	Rossendale 007	Helmshore
	Rossendale 008	S Rossendale
	Rossendale 009	Whitworth
	Rossendale 010	Waterfoot
Bury	Bury 001-003	Ramsbottom
	Bury 004-011	Bury (Centre)
	Bury 012-016, 018	Radcliffe
	Bury 017, 019-021	Whitefield
	Bury 022-026	Prestwich
Rochdale	Rochdale 001-003	Littleborough
	Rochdale 004-016	Rochdale (Centre)
	Rochdale 017	Castleton
	Rochdale 018-020	Heywood
	Rochdale 021-025	Middleton

Once total commuting flows for all routes of potential relevance had been extracted, we made some common-sense about commuter behaviour in deciding which ones to include and exclude, namely that:

- Residents of Bacup, Whitworth, and Waterfoot do not make use of the new rail service as they are already closer to Rochdale and can drive in and catch a train from here if they so wish. Rail commuting shares into the City of Manchester from these locations are already 7.0%, 15.7%, and 3.2% respectively, suggesting that this is what some commuters choose to do.
- Rawtenstall and North Rossendale residents commuting into Ramsbottom may use rail, others will not due to it being easier to drive straight to Ramsbottom.
- Rossendale residents commuting into West Yorkshire will not use the new rail services in the heavy rail scenario due to the circuitous route it would entail relative to catching a train at e.g. Walsden or driving all the way. Once again the existing rail shares back this up – between 2.7% and 9.4% of those living in Rossendale MSOAs and working in West Yorkshire currently take the train for most of their journey. Bury and Rochdale residents may use the new rail services to head into West Yorkshire however.
- Residents of Bury MBC (other than Ramsbottom) may use new rail to travel to Rochdale MBC but will continue to use the Metrolink to head into other parts of Greater Manchester.
- Within Bury MBC, residents of Whitefield or Prestwich working in Heywood or Oldham will not use new heavy rail services – respectively, driving all the way or taking the Metrolink into Manchester Victoria then out towards Oldham are assumed to be quicker.
- Commuting flows to the following Greater Manchester boroughs (other than the two in the study area) are included: Manchester, Salford, Trafford, Tameside, Stockport, and Oldham. Wigan and Bolton, due to their location in the northwest of Greater Manchester, are unlikely to be of relevance in generating demand for new rail services – driving is likely to remain a more attractive option for study area residents working in these boroughs.

Table 13 shows all potential commuting flows: origin, destination, whether or not they are included in our heavy rail estimates (the 'Y/N' column), total commuting numbers from the 2011 Census, and the number and percentage of these using the train. Certain commuting flows in the 'reverse' direction were considered at the whole-borough level due to data limitations.

Table 13: Commuting data and assumptions used in demand scenarios

From	To	Y/N	2011	2011 Train		From	To	Y/N	2011	2011 Train	
N Rossendale	Ramsbottom	1	43	0	0.0%	Ramsbottom	N Rossendale	1	26	0	0.0%
Haslingden	Ramsbottom	0	62	0	0.0%	Ramsbottom	Haslingden	0	98	0	0.0%
Bacup	Ramsbottom	0	38	0	0.0%	Ramsbottom	Bacup	0	14	0	0.0%
Rawtenstall	Ramsbottom	1	47	0	0.0%	Ramsbottom	Rawtenstall	1	86	1	1.2%
Helmshore	Ramsbottom	0	57	0	0.0%	Ramsbottom	Helmshore	0	30	0	0.0%
S Rossendale	Ramsbottom	0	140	0	0.0%	Ramsbottom	S Rossendale	0	237	0	0.0%
Whitworth	Ramsbottom	0	11	0	0.0%	Ramsbottom	Whitworth	0	8	0	0.0%
Waterfoot	Ramsbottom	0	65	0	0.0%	Ramsbottom	Waterfoot	0	56	0	0.0%
N Rossendale	Bury (Centre)	1	155	0	0.0%	Bury (Centre)	N Rossendale	1	9	0	0.0%
Haslingden	Bury (Centre)	1	160	0	0.0%	Bury (Centre)	Haslingden	1	83	0	0.0%
Bacup	Bury (Centre)	0	82	0	0.0%	Bury (Centre)	Bacup	0	18	0	0.0%
Rawtenstall	Bury (Centre)	1	152	0	0.0%	Bury (Centre)	Rawtenstall	1	67	0	0.0%
Helmshore	Bury (Centre)	1	163	0	0.0%	Bury (Centre)	Helmshore	1	26	0	0.0%
S Rossendale	Bury (Centre)	1	252	0	0.0%	Bury (Centre)	S Rossendale	1	137	0	0.0%
Whitworth	Bury (Centre)	0	82	0	0.0%	Bury (Centre)	Whitworth	0	17	0	0.0%
Waterfoot	Bury (Centre)	0	154	0	0.0%	Bury (Centre)	Waterfoot	0	60	0	0.0%
Ramsbottom	Bury (Centre)	1	2036	0	0.0%	Bury (Centre)	Ramsbottom	1	1004	2	0.2%
N Rossendale	Heywood	1	32	0	0.0%	Heywood	N Rossendale	1	1	0	0.0%
Haslingden	Heywood	1	40	0	0.0%	Heywood	Haslingden	1	43	0	0.0%

Bacup	Heywood	0	48	0	0.0%	Heywood	Bacup	0	4	0	0.0%		
Rawtenstall	Heywood	1	41	0	0.0%	Heywood	Rawtenstall	1	9	0	0.0%		
Helmshore	Heywood	1	27	0	0.0%	Heywood	Helmshore	1	7	0	0.0%		
S Rossendale	Heywood	1	43	0	0.0%	Heywood	S Rossendale	1	18	0	0.0%		
Whitworth	Heywood	0	107	0	0.0%	Heywood	Whitworth	0	24	0	0.0%		
Waterfoot	Heywood	0	56	0	0.0%	Heywood	Waterfoot	0	8	0	0.0%		
Ramsbottom	Heywood	1	203	1	0.5%	Heywood	Ramsbottom	1	57	0	0.0%		
Bury (Centre)	Heywood	1	855	4	0.5%	Heywood	Bury (Centre)	1	1080	0	0.0%		
Radcliffe	Heywood	1	441	0	0.0%	Heywood	Radcliffe	1	420	0	0.0%		
Whitefield	Heywood	0	202	1	0.5%	Heywood	Whitefield	0	60	0	0.0%		
Prestwich	Heywood	0	170	0	0.0%	Heywood	Prestwich	0	64	0	0.0%		
N Rossendale	Castleton	1	9	0	0.0%	Castleton	N Rossendale	1	2	0	0.0%		
Haslingden	Castleton	1	8	0	0.0%	Castleton	Haslingden	1	4	0	0.0%		
Bacup	Castleton	0	25	0	0.0%	Castleton	Bacup	0	6	0	0.0%		
Rawtenstall	Castleton	1	7	0	0.0%	Castleton	Rawtenstall	1	6	0	0.0%		
Helmshore	Castleton	1	2	0	0.0%	Castleton	Helmshore	1	0	0	N/A		
S Rossendale	Castleton	1	9	0	0.0%	Castleton	S Rossendale	1	5	0	0.0%		
Whitworth	Castleton	0	71	0	0.0%	Castleton	Whitworth	0	12	0	0.0%		
Waterfoot	Castleton	0	13	0	0.0%	Castleton	Waterfoot	0	4	0	0.0%		
Ramsbottom	Castleton	1	23	0	0.0%	Castleton	Ramsbottom	1	14	0	0.0%		
Bury (Centre)	Castleton	1	65	0	0.0%	Castleton	Bury (Centre)	1	109	1	0.9%		
Radcliffe	Castleton	1	33	0	0.0%	Castleton	Radcliffe	1	48	0	0.0%		
Whitefield	Castleton	1	18	0	0.0%	Castleton	Whitefield	1	9	0	0.0%		
Prestwich	Castleton	1	19	0	0.0%	Castleton	Prestwich	1	11	1	9.1%		
Heywood	Castleton	1	227	0	0.0%	Castleton	Heywood	1	279	0	0.0%		
N Rossendale	Manchester	1	246	0	0.0%	Manchester	Rossendale		130	2	1.5%		
Haslingden	Manchester	1	189	0	0.0%	1							
Bacup	Manchester	0	172	12	7.0%								
Rawtenstall	Manchester	1	192	0	0.0%								
Helmshore	Manchester	1	134	0	0.0%								
S Rossendale	Manchester	1	217	1	0.5%								
Whitworth	Manchester	0	172	27	15.7%								
Waterfoot	Manchester	0	189	6	3.2%								
Ramsbottom	Manchester	1	1069	8	0.7%	Manchester	Bury		2490	34	1.4%		
Bury (Centre)	Manchester	0	2406	27	1.1%	0							
Radcliffe	Manchester	0	2137	33	1.5%								
Whitefield	Manchester	0	2506	19	0.8%								
Prestwich	Manchester	0	4012	16	0.4%								
Heywood	Manchester	1	1017	22	2.2%								
N Rossendale	Salford	1	87	1	1.1%	Salford	Rossendale		93	0	0.0%		
Haslingden	Salford	1	70	0	0.0%	1							
Bacup	Salford	0	71	0	0.0%								
Rawtenstall	Salford	1	61	0	0.0%								
Helmshore	Salford	1	57	0	0.0%								
S Rossendale	Salford	1	71	1	1.4%								
Whitworth	Salford	0	63	4	6.3%								
Waterfoot	Salford	0	93	0	0.0%								
Ramsbottom	Salford	1	409	1	0.2%	Salford	Bury		2154	2	0.1%		
Bury (Centre)	Salford	0	987	2	0.2%	0							
Radcliffe	Salford	0	1138	5	0.4%								
Whitefield	Salford	0	1123	0	0.0%								
Prestwich	Salford	0	2032	5	0.2%								
Heywood	Salford	1	352	1	0.3%								
N Rossendale	Trafford	1	59	0	0.0%	Trafford	Rossendale		53	0	0.0%		
Haslingden	Trafford	1	54	0	0.0%	1							
Bacup	Trafford	0	48	1	2.1%								
Rawtenstall	Trafford	1	60	0	0.0%								
Helmshore	Trafford	1	51	0	0.0%								

S Rossendale	Trafford	1	72	0	0.0%						
Whitworth	Trafford	0	52	0	0.0%						
Waterfoot	Trafford	0	53	0	0.0%						
Ramsbottom	Trafford	1	288	0	0.0%	Trafford	Bury		644	1	0.2%
Bury (Centre)	Trafford	0	630	3	0.5%	0					
Radcliffe	Trafford	0	552	7	1.3%						
Whitefield	Trafford	0	507	2	0.4%						
Prestwich	Trafford	0	675	6	0.9%						
Heywood	Trafford	1	279	1	0.4%						
N Rossendale	Tameside	1	27	0	0.0%	Tameside	Rossendale		98	0	0.0%
Haslingden	Tameside	1	24	0	0.0%	1					
Bacup	Tameside	0	18	0	0.0%						
Rawtenstall	Tameside	1	19	0	0.0%						
Helmshore	Tameside	1	13	0	0.0%						
S Rossendale	Tameside	1	37	0	0.0%						
Whitworth	Tameside	0	25	0	0.0%						
Waterfoot	Tameside	0	27	0	0.0%						
Ramsbottom	Tameside	1	123	0	0.0%	Tameside	Bury		568	15	2.6%
Bury (Centre)	Tameside	0	206	1	0.5%	0					
Radcliffe	Tameside	0	150	1	0.7%						
Whitefield	Tameside	0	157	2	1.3%						
Prestwich	Tameside	0	179	1	0.6%						
Heywood	Tameside	1	97	1	1.0%						
N Rossendale	Stockport	1	22	0	0.0%	Stockport	Rossendale		67	1	1.5%
Haslingden	Stockport	1	23	0	0.0%	1					
Bacup	Stockport	0	17	0	0.0%						
Rawtenstall	Stockport	1	24	0	0.0%						
Helmshore	Stockport	1	24	0	0.0%						
S Rossendale	Stockport	1	24	0	0.0%						
Whitworth	Stockport	0	25	0	0.0%						
Waterfoot	Stockport	0	21	0	0.0%						
Ramsbottom	Stockport	1	126	0	0.0%	Stockport	Bury		558	12	2.2%
Bury (Centre)	Stockport	0	248	2	0.8%	0					
Radcliffe	Stockport	0	181	3	1.7%						
Whitefield	Stockport	0	180	2	1.1%						
Prestwich	Stockport	0	226	4	1.8%						
Heywood	Stockport	1	126	0	0.0%						
N Rossendale	Oldham	1	69	0	0.0%	Oldham	Rossendale		161	0	0.0%
Haslingden	Oldham	1	42	0	0.0%	1					
Bacup	Oldham	0	94	0	0.0%						
Rawtenstall	Oldham	1	47	0	0.0%						
Helmshore	Oldham	1	52	0	0.0%						
S Rossendale	Oldham	1	48	0	0.0%						
Whitworth	Oldham	0	183	1	0.5%						
Waterfoot	Oldham	0	70	0	0.0%						
Ramsbottom	Oldham	1	269	0	0.0%	Oldham	Bury		1220	3	0.2%
Bury (Centre)	Oldham	1	540	1	0.2%	1					
Radcliffe	Oldham	1	378	2	0.5%						
Whitefield	Oldham	0	298	0	0.0%						
Prestwich	Oldham	0	426	1	0.2%						
Heywood	Oldham	1	602	0	0.0%						
N Rossendale	Rochdale (Centre)	1	92	0	0.0%	Rochdale (Centre)	N Rossendale	1	13	1	7.7%
Haslingden	Rochdale (Centre)	1	75	0	0.0%	Rochdale (Centre)	Haslingden	1	84	0	0.0%
Bacup	Rochdale (Centre)	0	337	0	0.0%	Rochdale (Centre)	Bacup	0	46	0	0.0%
Rawtenstall	Rochdale (Centre)	1	83	0	0.0%	Rochdale (Centre)	Rawtenstall	1	53	0	0.0%
Helmshore	Rochdale (Centre)	1	43	0	0.0%	Rochdale (Centre)	Helmshore	1	13	0	0.0%
S Rossendale	Rochdale (Centre)	1	82	0	0.0%	Rochdale (Centre)	S Rossendale	1	51	0	0.0%
Whitworth	Rochdale (Centre)	0	821	1	0.1%	Rochdale (Centre)	Whitworth	0	231	0	0.0%

Waterfoot	Rochdale (Centre)	0	174	0	0.0%	Rochdale (Centre)	Waterfoot	0	66	0	0.0%
Ramsbottom	Rochdale (Centre)	1	231	0	0.0%	Rochdale (Centre)	Ramsbottom	1	90	0	0.0%
Bury (Centre)	Rochdale (Centre)	1	527	2	0.4%	Rochdale (Centre)	Bury (Centre)	1	1203	6	0.5%
Radcliffe	Rochdale (Centre)	1	224	0	0.0%	Rochdale (Centre)	Radcliffe	1	344	1	0.3%
Whitefield	Rochdale (Centre)	1	156	0	0.0%	Rochdale (Centre)	Whitefield	1	83	0	0.0%
Prestwich	Rochdale (Centre)	1	167	1	0.6%	Rochdale (Centre)	Prestwich	1	148	2	1.4%
Heywood	Rochdale (Centre)	1	1400	2	0.1%	Rochdale (Centre)	Heywood	1	2030	6	0.3%
N Rossendale	Littleborough	1	6	0	0.0%	Littleborough	N Rossendale	1	1	0	0.0%
Haslingden	Littleborough	1	4	0	0.0%	Littleborough	Haslingden	1	10	0	0.0%
Bacup	Littleborough	0	26	0	0.0%	Littleborough	Bacup	0	9	0	0.0%
Rawtenstall	Littleborough	1	9	0	0.0%	Littleborough	Rawtenstall	1	1	0	0.0%
Helmshore	Littleborough	1	7	0	0.0%	Littleborough	Helmshore	1	3	0	0.0%
S Rossendale	Littleborough	1	6	0	0.0%	Littleborough	S Rossendale	1	11	0	0.0%
Whitworth	Littleborough	0	55	0	0.0%	Littleborough	Whitworth	0	47	0	0.0%
Waterfoot	Littleborough	0	10	0	0.0%	Littleborough	Waterfoot	0	10	0	0.0%
Ramsbottom	Littleborough	1	12	0	0.0%	Littleborough	Ramsbottom	1	20	0	0.0%
Bury (Centre)	Littleborough	1	44	0	0.0%	Littleborough	Bury (Centre)	1	188	1	0.5%
Radcliffe	Littleborough	1	11	0	0.0%	Littleborough	Radcliffe	1	53	1	1.9%
Whitefield	Littleborough	1	16	0	0.0%	Littleborough	Whitefield	1	16	0	0.0%
Prestwich	Littleborough	1	8	0	0.0%	Littleborough	Prestwich	1	22	1	4.5%
Heywood	Littleborough	1	97	0	0.0%	Littleborough	Heywood	1	313	4	1.3%
N Rossendale	West Yorkshire	0	69	4	5.8%	West Yorkshire	Rossendale		291	0	0.0%
Haslingden	West Yorkshire	0	42	2	4.8%	0					
Bacup	West Yorkshire	0	126	4	3.2%						
Rawtenstall	West Yorkshire	0	46	2	4.3%						
Helmshore	West Yorkshire	0	32	3	9.4%						
S Rossendale	West Yorkshire	0	36	1	2.8%						
Whitworth	West Yorkshire	0	74	2	2.7%						
Waterfoot	West Yorkshire	0	114	7	6.1%						
Ramsbottom	West Yorkshire	1	117	1	0.9%	West Yorkshire	Bury		646	23	3.6%
Bury (Centre)	West Yorkshire	1	219	8	3.7%	1					
Radcliffe	West Yorkshire	1	137	5	3.6%						
Whitefield	West Yorkshire	1	120	2	1.7%						
Prestwich	West Yorkshire	0	160	11	6.9%						
Heywood	West Yorkshire	1	145	3	2.1%						

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