Greater Manchester’s South East Rail Corridor Study 2020

Continuous Modular Strategic Planning

January 2020
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A train driver and guard swap ends at Hadfield station
01 Executive Summary

Study scope
- A rail corridor located to the south east of Manchester with electrified services running between Manchester Piccadilly and Hadfield/Glossop, and diesel services to Rose Hill and Marple
- A key commuter corridor for Greater Manchester and Derbyshire with passenger services provided by the Northern Rail franchise
- Some freight services operating along the route, mainly involving aggregates and waste

Study approach
- A Continuous Modular Strategic Planning (CMSP) module, part of Network Rail’s Long-Term Planning Process (LTPP)¹
- One of four current CMSP modules in the Greater Manchester region

Strategic interventions: 2024 and 2033 forecast growth
- Platform lengthening at Godley, Bredbury, New Mills Central and Rose Hill Marple to support train lengthening
- Increase in peak service frequency from 10 to 11 trains per hour (tph) based on the Network Rail System Operator growth scenario

Strategic advice: 2043 forecast growth
- Future further review of capacity requirements and potential interventions required to meet them following the completion of the four Manchester CMSP Studies (due in 2021)

Study aims
The South East Manchester Corridor Study seeks to address the Strategic Question “What interventions are required to meet future growth forecasts on the Hadfield/Glossop corridor by 2024, 2033 and 2043?”. The available capacity has been analysed in light of the future forecast demand scenarios, and a series of potential interventions have been identified which together will enable funders to make decisions about planning the network in years to come.

The bigger picture
In the next 20 years, Greater Manchester is forecast to continue its rapid economic and population growth. This is expected to lead to an increase of 600,000 trips taken per day on the region’s transport network by 2035². The railway and its key corridors (including the Hadfield/Glossop line) are expected to play a crucial role in accommodating these additional journeys as Transport for Greater Manchester strives to achieve the forecast growth in transport with no increase in car traffic.

Study format
A Continuous Modular Strategic Planning (CMSP) approach has been adopted for this Study. This is the method through which Network Rail meets its Licence Obligations with regard to Long Term Planning, and by which it plans the future capability of the Rail Network in the UK. The Study has employed both Government-endorsed and local aspirational growth forecasts to identify the potential intervention options required to meet future forecast demand.

¹ Network Rail’s Long Term Planning Process
² Transport for Greater Manchester’s “Greater Manchester Transport Strategy 2040 Executive Summary”
**Stakeholder engagement**
Collaboration of industry stakeholders has been key to the development of the Study and its outputs. All involved have contributed significant amounts of local knowledge and expertise that have proved invaluable throughout the process.

**Key assumptions**
The Study has assumed Northern Rail services and the full delivery of its current franchise commitments as the baseline position. The Study area has been limited to the rail corridor between Ardwick and Hadfield/Glossop and its feeder corridors.

**Summary of outcomes:**
- With 4-car services in operation and a slightly revised timetable, growth can be accommodated on the corridor until 2033
- To accommodate 4-car services, some platforms will need to be lengthened
- To meet 2043 forecast growth, larger scale infrastructural interventions become necessary in order to increase passenger capacity. This requirement is contingent on the impact and outputs of major programmes such as NPR
- The Study recommends a further review of the potential interventions required to meet forecast 2043 demand. This should be completed in conjunction with the outputs from both the other CMSP modules (due in 2021) and the planned transformational schemes (NPR) that will impact the Greater Manchester area

**Updated recommendations**
The introduction of 4-car services with a slightly revised timetable has been shown to meet the forecast growth until at least 2033. The Study concludes that no further action is required in this period once the franchise commitments that would deliver this additional capacity are met. However, since the start of the Study, it has become apparent that 4-car Class 331s cannot be introduced until the stabling capacity for trains is increased in Manchester.

In the meantime, the Study recommends reviewing the need for an increase in service frequency utilising the current 3-car Class 323 trains.

**Further study**
The Study recommends further development of intervention options to be explored in conjunction with the outputs of other CMSP modules impacting the Greater Manchester area in order to meet demand for the railway beyond 2033. Potential intervention options should also seek to align with the outputs of the NPR Programme which may also impact the Study area.

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**Dinting Station**

Greater Manchester’s South East Rail Corridor Study 2020

January 2020
02  Context: Greater Manchester’s South East Rail Corridor

Introduction to the network

- A section of electrified suburban railway running south east of Manchester
- Rail predominantly delivers services for commuter and local markets
- Passenger services are operated by Northern Rail with low levels of freight on the line

Figure 1- South East Rail Corridor location
Location
The South East Corridor forms a part of Greater Manchester and Derbyshire’s heavy railway network. The corridor runs directly between Ardwick station and Hadfield/Glossop and is approximately 15 miles long. Its feeder corridors run from Ardwick to New Mills Central via Belle Vue, and from Ardwick to Rose Hill Marple via Hyde North. Figure 1 shows the Corridor in the context of the wider network around Greater Manchester. (Note that the feeder corridor that runs through New Mills Central continues across the Hope Valley to Sheffield).

In the context of this report, a “feeder corridor” relates to a heavy rail line that interfaces with the main route under investigation and whose performance will therefore directly impact that of the main corridor.

Figure 3 shows the route itself and how this fits into the wider Greater Manchester network. The main corridor and both feeder corridors connect into Manchester Piccadilly via Ardwick.

The line that runs between Ardwick and Hadfield/Glossop was originally electrified in the early 1950s when it formed a section of the Woodhead Line towards Sheffield. Since then, the railway that stretched east of Hadfield has been closed and the Ardwick - Hadfield/Glossop section had its line electrification converted to overhead 25kV AC. In contrast, both feeder corridors remain non-electrified.

The South East Corridor is largely a double-track railway, the exception is a short section that splits at Dinting West Junction and forms two separate single line sections, one that leads to Hadfield and the other to Glossop. The two single line sections are linked by a single line chord between Dinting East and Dinting South junctions1, thus the route forms a single-track triangle around Dinting station. Apart from a short stretch of track between Romiley and Rose Hill Marple, both feeder corridors are otherwise double-track for the full route.

The role of the railway
The core rail corridor betweenHadfield/Glossop and Ardwick passes through a diverse series of settlements despite its relatively short length. Travelling between two counties (Derbyshire and Greater Manchester) and through three different local authorities, the role that the railway plays in each of the local communities varies.

What is consistent along the corridor though is the importance of the service in connecting people with jobs in and around Greater Manchester. In fact, the “travel to work” flow from High Peak into the city is one of the most significant flows of people for the whole of Greater Manchester2. The map in Appendix B illustrates the proportion of people who travel to work by heavy rail across Greater Manchester. The south east corridors have amongst the highest rates, with up to around 70% of the local populations travelling to work in Central Manchester via the heavy rail network. This is in part attributable to the established rail service and the relatively slow journey times between Hadfield/Glossop and the centre of Manchester by road.

Connectivity is a key function of this railway. A mixture of markets covering rural, regional, suburban and urban demographics are all connected by the rail corridor to Central Manchester via Manchester Piccadilly. Through Manchester Piccadilly, passengers connect to numerous other locations, including Manchester International Airport and London. This is important particularly for the more rural communities where other modes of public transport may provide more limited connectivity to Greater Manchester.

Passenger services
The passenger services running along the South East Corridor are operated as part of the Northern franchise, which was awarded to Arriva Rail North and is planned to continue until 2025.

Currently Northern operates 3-car Class 323s to Hadfield and Glossop with a mixture of Class 142 and 150 units serving Rose Hill Marple and Marple, though the Class 142 units are in the process of being withdrawn.

Along the Hadfield/Glossop corridor, Northern Rail’s services currently link a predominantly local or commuter market with Manchester Piccadilly by operating three trains per hour in the peak, and two per hour off peak. Between Ardwick and Guide Bridge several other markets are catered for, including Inter-Regional and Freight markets.

The feeder corridors are currently served by two trains per hour originating from New Mills Central, one from Sheffield and a further two from Rose Hill Marple, all of which terminate at Manchester Piccadilly and are also operated by Northern Rail.

There are thirteen stations in total along the main corridor (including Ardwick, Hadfield and Glossop). In terms of passenger usage, Glossop is by far the busiest, followed by Hadfield and Guide Bridge1. Ardwick receives a very limited service of between 1 and 3 services per day whilst Fairfield receives roughly an hourly service throughout the day.

In the last five to ten years there has been a steady increase in the numbers of passengers using the South

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1 Network Rail “Route Specifications 2017, London North Western”
2 new economy “Travel to work patterns in Greater Manchester”, 2014
3 Office of Rail and Road, Estimates of station usage, using data from 2018/2019
East Corridor. Statistics from the ORR show a 23% increase in the total number of station entries and exits for stations along the line between 2010/11 and 2017/18. The greatest growth in the number of passenger entries and exits has been at Glossop and Guide Bridge, though Hattersley and Dinting have seen significant percentage increases too.

Connections to the rest of the network are made at Manchester Piccadilly (out of scope for this work), beyond Ardwick. From here, passengers can access routes to a wide selection of locations nationwide including services to Manchester Airport and to the south of England via Stockport. These connections are key to supporting the commuter and local markets along the route.

Guide Bridge and Ashburys are the stations on the main corridor that provide opportunity for interchange onto other lines. At these points other rail corridors intersect the main South East corridor.

Freight services
Whilst no freight services run the full length of the South East Corridor from Hadfield/Glossop through Ardwick and onwards, trains do run via Guide Bridge. This is mainly “through freight” traffic from the Stockport area travelling towards Stalybridge and then across the Pennines (and vice versa) and includes regular aggregates, biomass and waste traffic.

With the onset of HS2, future aggregates freight traffic out of the Peak District quarries is set to increase through the Guide Bridge area.

Ongoing challenges
Key challenges faced by the South East Corridor include (but are not limited to) the following:

- Slow line speeds
- Single line sections
- Slow journey times driven by all trains calling at intermediate stations
- Interface with Manchester Piccadilly
- Long signalling sections

The feeder corridors face additional challenges as a result of their interfaces with other lines (in particular the Hope Valley line), non-electrification and the early generation diesel rolling stock employed (although some older units are planned to be withdrawn, these are typically poorly performing in terms of acceleration).

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4 Office of Rail and Road, Estimates of station usage
Figure 3- The South East Rail Corridor as part of the wider heavy rail network

South East Manchester CMSP Study Area
Based upon a map designed by Andrew Smithers © 2019 www.projectmapping.co.uk and reproduced with permission

Core Corridor
Feeder Corridors

Aerial view of Guide Bridge Station
03 Methodology: Study Development

Summary of conditional outputs
• A Continuous Modular Strategic Planning (CMSP) Study
• A part of Network Rail’s Long-Term Planning Process (LTPP)
• Answering key Strategic Questions
• Utilising agreed baseline assumptions
• Collaboration between multiple industry stakeholders
• Identification of potential network intervention options

Study purpose and scope
This Study explores the current capacity of Greater Manchester’s South East Rail Corridor that covers the geographic area between Hadfield/Glossop and Ardwick stations, as well as its feeder corridors from New Mills Central and Rose Hill Marple stations. Crucially, the Study reviews the corridors’ abilities to support anticipated future growth in demand for the lines.

Scenarios are reviewed for the years 2024, 2033 and 2043. For each year reviewed, the service level requirements along the corridor are identified based on forecast growth rates and baseline assumptions. Potential railway investment packages have been identified where the current infrastructure is unable to support the required future service level in a safe and reliable manner. Strategic advice is offered where specific infrastructural investment options are difficult to outline.

Study approach
The South East Manchester Corridor Study is a CMSP module that has been developed in line with Network Rail’s LTPP (Long-term Planning Process). The LTPP is a part of Network Rail’s Licence Obligations to plan the future capability of the heavy rail network in the UK.

Continuous Modular Strategic Planning (CMSP) forms a key part of the LTPP. It was introduced in response to the Shaw Review’s (2016) recommendation that Network Rail better incorporate the needs of passengers and freight end-users into the railway planning process.

This Study is one of a number that are being developed across the national rail network that will, in turn, shape the planning process for Control Period 6 and beyond.

Integral to these Studies is the intention to plan a network that will deliver the following:
• A safer railway for passengers and for the people who work on the railway;
• A reliable timetable and acceptable performance for passengers; and
• The ability to adapt to technology that provides good value for money for current and future users and for funders.

Figure 4 outlines the end to end CMSP process. Industry stakeholder input is integrated at all key stages in the CMSP lifecycle.

Figure 4- The CMSP process
The Strategic Question and priorities

The CMSP process begins with the identification of a series of “strategic questions” by nominated members of the Industry. These questions are then prioritised through a sifting process. In exploring answers to these questions, Network Rail is able to identify where changes in the use of capacity or enhancements to the current network may be required in order to operate to meet the forecast future demand.

This Study is looking to answer the Strategic Question: “What interventions are required to meet future growth forecasts on the Hadfield/Glossop corridor by 2024, 2033 and 2043?”. The question was identified by the governance groups as part of a series of four Strategic Questions that focussed on rail corridors feeding into Greater Manchester. In this instance, it was decided that the question should focus on the capacity of the corridor as a priority instead of other factors, such as journey times or connectivity.

Underpinning the Study are the Network Rail Strategic Priorities, outlined in Figure 5. These themes have been highlighted in Network Rail’s Strategic Business Plan for Control Period 6 (2019-2024) to ensure continuity across all operational, maintenance and renewals strategies.

Baseline timetable assumptions

Once the strategic question has been established, in order to assess the need for potential future railway interventions, it is essential to establish a baseline scenario against which forecast demand growth rates can be applied. In this instance, the baseline has been set as a one-way flow of traffic into Manchester on a weekday morning high peak hour (with trains arriving at Manchester Piccadilly between 08:00-08:59).

The Study also assumes the May 2018 timetable as its baseline position as the timetable analysis was completed in this period. It should also be noted that the Study assumes that all current franchise commitments are met. Together, these assumptions enable the assessment of the interventions required to support demand in the busiest period of the day.

Infrastructure assumptions

All modelling required as part of the Study and its assessment of the South East Corridor’s rail capacity assumes current infrastructure (May 2018 for the capacity modelling).

Only those schemes impacting the area in question that have had funding committed are assumed to also be in place when reviewing capacity in future years. In the case of the South East Corridor, this involves the CP6 (Control Period 6) platform extensions required to meet train lengthening outputs at Flowery Field, Brinnington and Bredbury stations.

Other schemes progressing through the Rail Network Enhancement Pipeline (RNEP) process but that have not reached the “Decision to Deliver” have not been assumed.

Other key assumptions

Growth Forecasts

Future demand for the railway will dictate capacity requirements. The demand forecasts are generated based on expected growth in a region, considering factors such as population change, GDP per capita and employment levels.

In this Study, demand is calculated using the Department for Transport generated and approved Transport Analysis Guidance (TAG) forecast growth. To review more localised growth forecasts, a Network Rail System Operator view as well as a Transport for Greater Manchester (TfGM) view is also considered. These forecast growth rates are detailed in Figure 6, the TfGM forecasts shown were provided by themselves.

High Speed 2 (HS2)

In 2009 the government began assessing the case for a second high speed rail line in the UK. The intention of the project was to improve capacity and connectivity between the main economic centres in the north and south of the country in order to support economic growth.

A Y-shaped route from London to Manchester and Leeds via Birmingham was proposed. The programme has been broken down into multiple phases with Phase 2b planned to extend the route north from Crewe to Manchester. This phase will also include the construction of the eastern leg from the West Midlands to Leeds.

Figure 5 - Network Rail’s Strategic Priorities

- **Safe**: Railway investment packages will support Network Rail’s continued pursuit of safety, including that of reducing level crossing risk, driving down track accident risk and protecting workforce safety.
- **Reliable**: Progressing railway investment packages in an integrated manner with a view to reducing performance impacts on passengers.
- **Efficient**: Railway investment packages which make best use of new technology and offer more efficient ways of working contributing to an industry that is more lean and innovative.
- **Growing**: Railway investment packages which deliver new capacity to support economic growth.
As part of this CMSP module, the impact of the proposed HS2 network has been considered in the demand analysis on the South East Corridor. Greater Manchester plays a crucial role in connecting the North West with the rest of the country. Between 2017 and 2018, 56% of journeys between the North West and other regions began or terminated in Greater Manchester. Whilst the direct impact of HS2 on the corridor may be limited, the corridor’s role in connecting passengers to the HS2 hub at Manchester Piccadilly, and therefore other regions of the country, will become even more important in the future.

**Northern Powerhouse Rail (NPR)**

The Northern Powerhouse Rail (NPR) Programme is making the case for major investment in the rail network for the North. It aims to transform rail journeys between the city centres of the six main Northern Powerhouse cities (Liverpool, Manchester, Sheffield, Leeds, Hull and Newcastle and also Manchester Airport) by 2043. The programme is part of the Northern Transport Strategy: a multi-modal strategy aimed at enabling the Northern Powerhouse vision.

The Programme aims to achieve significant reductions in journey times, coupled with increases in frequency and capacity for passenger services. The NPR network aims to also offer much improved connectivity for Other Significant Economic Centres (OSECs) and possibly enable released capacity on the existing network for freight or other local services.

Whilst the expected impacts of NPR have been considered throughout the Study, this has not explicitly been built into any analysis.

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1 Office of Rail and Road, Regional Rail Usage 2017-18

**Geographic Scope**

This Study does not consider capacity requirements beyond the lines highlighted in green in Figure 3. The geographic scope therefore does not include Manchester Piccadilly or the Hope Valley line, both of which are subject to other ongoing reviews currently (including the Cross Manchester workstream which partially interfaces Manchester Piccadilly).

**The Safety Baseline**

A crucial consideration that is built into CMSP study development is the Safety Baseline. Each module should look to identify and address any known safety issues along the rail corridor in question. This may include any level crossing or highway interfaces or known issues with weather resilience for example. Throughout the course of the CMSP module, safety standards across the area in question should look to be maintained as a minimum but improved where possible.

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**Figure 6- Growth Forecasts for Manchester**

<table>
<thead>
<tr>
<th>Manchester Background Growth</th>
<th>2026</th>
<th>2033</th>
<th>2039</th>
<th>2043</th>
</tr>
</thead>
<tbody>
<tr>
<td>DfT - TAG</td>
<td>15.0%</td>
<td>26.0%</td>
<td>36.2%</td>
<td>43.5%</td>
</tr>
<tr>
<td>Network Rail - System Operator</td>
<td>28.7%</td>
<td>41.8%</td>
<td>54.1%</td>
<td>62.9%</td>
</tr>
<tr>
<td>TfGM - South East</td>
<td>22.3%</td>
<td>22.7%</td>
<td>44.3%</td>
<td></td>
</tr>
</tbody>
</table>

*Base year: 2016
**TfGM growth reflects South East Manchester Corridors weighted average
In the case of the South East Corridor, the main safety issues highlighted are as follows:

- Gorton as a current high risk route crime hotspot (22 incidents of trespass in the past 13 months prior to November 2019)
- Guide Bridge at medium-high risk (7 incidents of trespass in the same period)
- Dinting as a medium risk following 6 incidents in the past 13 months from November 2019 (4 trespass and 2 vandalism).

The impacts of proposed interventions on this Safety Baseline will be explored later in this report.

Analyzing Requirements
Once the Study assumptions have been confirmed, and the baseline position established, Network Rail completes a series of analyses that investigate the strategic question. Together these analyses enable the identification of potential railway investment packages.

The representatives from each of the following functions combined with the Strategic Question Lead form the Technical Working Group for the Study.

Economic Analysis
Economic Analysis use the future forecast growth rates and apply them to the baseline capacity assumptions in order to highlight capacity constraints for passenger services along a route. The demand mapping generated can also serve to illustrate the key movements of passengers within the geographical scope.

Later in the Study development process, the Economic Analysis team is responsible for the production of a high-level business case. This assesses the “value for money” case (based on a benefit/cost ratio) for each of the proposed interventions.

Capacity Analysis
Capacity Analysis create a concept train plan for the rail corridor in question to assess whether the proposed future timetable can operate in accordance with the Timetable Planning Rules (TPRs). Throughout this assessment, the CA team also generates proposals for interventions that would support the Study in meeting the objective of the strategic question.

The TPRs are assumed to remain unchanged for the purposes of analysis throughout the Study.

Development of potential intervention options
Once a series of proposed interventions has been identified, the Development team create concept designs and cost plans for each. This work feeds into the High-Level Business Case.

Governance
In order to support the development of the CMSP module throughout the course of the Study, the following governance arrangements are in place:

**Governance Group (Industry Planning Advisory Group, IPAG):** Network Rail, Department for Transport, Transport for the North, Rail North, Transport for Greater Manchester, Rail Delivery Group, Arriva Rail North, TransPennine Express and freight representation.

**Working Group:** Strategic Question Lead, Network Rail, Department for Transport, Transport for the North, Rail North, Train Operating Companies, Freight Operating Companies, Local Transport Authorities and Combined Authorities.

**Technical Working Group:** Strategic Question Lead, Network Rail.

The Governance structure and how it feeds into the wider Network Rail organisation is shown in Figure 7.

*Figure 7: The CMSP Governance Structure*
04 Results: Identification of Railway Investment Packages

Summary of conditional outputs

- Forecast demand in 2024 and 2033 can be accommodated along the South East Corridor
- This will require the addition of new services and a series of platform lengthening schemes to enable the introduction of 4-car services on the route
- 2043 demand cannot be accommodated by current infrastructure, but the Study recommends reviewing interventions again in conjunction with the outputs from the other CMSP modules based in Greater Manchester (due in 2021)

This section of the Study summarises the outputs of the analysis outlined earlier in the report. It will, in turn, set out the package of investments required to answer the Strategic Question: “What interventions are required to meet future growth forecasts on the Hadfield/Glossop corridor by 2024, 2033 and 2043?”.

When exploring potential intervention options, the Study looks to consider the best use of existing infrastructure before any further infrastructure solutions. As such, where Economic Analysis highlights the need for an intervention, considerations have been made in the following order:

- A review of the quantum of services
- A review of the frequency and length of services
- A review of the current services with alternative stopping patterns
- A review of freight paths
- A review of route signalling

Further infrastructure interventions are then pursued where train lengthening, increased frequencies (and so on) are proven to be insufficient to meet the forecast demand along the corridor.

The recommendations or “conditional outputs” of the Study are offered to the rail industry and funders as outcomes they may wish to pursue, conditional on there being an efficient and affordable way of delivering them.

The “Do Minimum” Scenario

To identify where potential future interventions may be required, it is necessary to review the current capacity of the network infrastructure compared with forecast future demand for the services. The “Do Minimum” scenario also accounts for committed schemes, including any franchise agreements in place.

Demand Mapping Process

The demand maps created as part of this Study give an indication of the average number of passengers travelling into Manchester on each service during the high peak AM hour. The colours on the diagrams show how busy the service becomes throughout the course of the route. When the lines are a shade of green, all passengers on an average service within the peak hour have access to a seat. From yellow through to black, progressively more passengers are being forced to stand.

The Department for Transport (DfT)’s peak crowding guidelines stipulate that passengers travelling for 20 minutes or longer should have the opportunity to be seated on the journey, and that standing passenger densities should not routinely exceed more than 2.2 passengers per square metre for trains along the South East Corridor. These guidelines have been factored into the development of proposed interventions.

1 Department for Transport’s “Rail passenger numbers and crowding statistics: notes and definitions”
Demand maps for the Study have been created using System Operator (Network Rail) forecast growth rates, although a map made using TAG growth rates is shown in Appendix C for further context. The variance in growth rates will impact the timescales for Study recommendations, with higher rates accelerating the timescales for potential required interventions. In this instance, the System Operator growth forecasts were the highest for the Corridor (as shown in Figure 6).

**Demand Mapping Outputs**

The demand maps for the years in question (2024, 2033 and 2043) are shown labelled as Figures 8 to 10 on the following pages. A few key messages can be inferred:

1. Forecast growth in 2024 can be accommodated by the baseline scenario in the busiest period of the day with a minimal number of passengers being required to stand.

2. Forecast growth in 2033 can be accommodated by the baseline scenario in the busiest period of the day although services now require some passengers to stand from Fairfield and Bredbury.

3. Forecast growth in 2043 becomes more challenging, with passengers now expected to have to stand from Flowery Field to Ardwick on the main corridor, and an increase in the density of standing passengers from Bredbury to Ardwick along the feeder corridor. The journey times for these standing passengers is not likely to exceed the 20 minute limit as per the DfT’s peak crowding guidelines.

The implications of the outputs from the “Do Minimum” scenario are examined further in the following sections of the Study. Some potential interventions are explored that would enable the accommodation of forecast future growth along the corridor.

**SE Manchester 2024 capacity**

*Suburban rail services arriving into central Manchester during the high peak hour 0800 to 0859*

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Based upon a map designed by Andrew Smithers ©2017 www.projectmapping.co.uk and reproduced with permission

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*Figure 8- The “Do Minimum” Scenario. System Operator growth forecast demand for 2024.*
**SE Manchester 2033 capacity**
Suburban rail services arriving into central Manchester during the high peak hour 0800 to 0859

**SE Manchester 2043 capacity**
Suburban rail services arriving into central Manchester during the high peak hour 0800 to 0859

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**Figure 9-** The “Do Minimum” Scenario. System Operator growth forecast demand for 2033.

**Figure 10-** The “Do Minimum” Scenario. System Operator growth forecast demand for 2043.
Underpinning the Study has been the key assumption that all franchise commitments held by Northern Rail along the South East Manchester Corridor will have been met as planned. One such commitment is for an increase in the service capacity along the corridor. To deliver this, Northern is investigating a number of potential scenarios, one being the replacement of 3-car Class 323s with 4-car Class 331s (thus increasing the standing passenger capacity of the trains). Other options include potentially increasing the service frequency on the line, whilst continuing to utilise the Class 323s. For the purposes of the Study though, it was assumed that the 4-Car Class 331s would have been successfully introduced. Note that this assumption creates a risk to the accuracy of the baseline scenario.

**Railway investment package for years 2024 and 2033**

Utilising the outputs from the demand maps, a series of Indicative Train Service Specifications (ITSSs) have been identified to represent potential future service patterns along the corridor (those required to support the Network Rail System Operator forecast future growth). These have then been analysed to assess whether they can be accommodated on the network without any timetable or infrastructure interventions being required. Details of these ITSSs can be found in Appendix D.

**Capacity Analysis Outputs**

The capacity analyses performed for the years 2024 and 2033 demonstrate that both proposed ITSSs can be compliantly accommodated without the need for any infrastructure or timetable interventions.

Table 1 illustrates the number services that would need to operate through Ashburys station as a result of the implementation of the new ITSS. Despite increasing the number of passenger trains per hour in 2024 by 1 train, the analysis has shown that this can continue to be timetabled similarly to the “Current” situation (May 18) without any infrastructure interventions being required.

There is a caveat here though: for these services to meet the future forecast demand identified, the trains in operation from Hadfield/Glossop through to Ardwick need to all be 4 cars long (as discussed previously). In order for this to be possible, and the franchise commitment met, a number of platforms along the route will need to be lengthened, and/or a system of selective door opening (SDO) will have to be implemented.

The Study scope also does not include Manchester Piccadilly station. To assess the viability of introducing these additional services in reality, the capacity at Manchester Piccadilly would need to be investigated.

**Railway Interventions**

The suggested interventions required to accommodate the Network Rail System Operator future forecast growth along the South East Corridor in 2024 and 2033 are as follows:

- An increase in service frequency from Sheffield (detailed in Table 1)
- A review of platform lengthening or SDO implementation at the following stations to enable 4-car trains to operate: Flowery Field, Godley, Ryder Brow, Brinnington, Bredbury, New Mills Central, Woodley and Rose Hill Marple. Table 2 provides more details about these interventions (The outputs displayed in the table are indicative only and will need detailed development and surveys to progress further)

Several of the platforms that were initially identified as requiring lengthening are already being covered by the CP6 Platform Lengthening Scheme under the North of England Programmes.

In terms of accomplishing the Safety Baseline aspirations, the implications of introducing SDO along the route should be explored prior to implementation. In managing the risk at Dinting, various Anti-Trespass measures were installed at the station in March 2019 and incidents elsewhere on the route continue to be closely monitored and required interventions appraised.

<table>
<thead>
<tr>
<th>Origin/Destination</th>
<th>“Current” May 2018 (tph)</th>
<th>ITSS 2024 and 2033 (tph)</th>
<th>ITSS 2043 (tph)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hadfield</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>New Mills Central</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Rose Hill Marple</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Leeds</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sheffield</td>
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<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Chinley</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>11</td>
<td>14</td>
</tr>
</tbody>
</table>
Table 2: A summary of recommended platform interventions to review to enable 4-car trains to operate along the South East Corridor (subject to full development and design)

<table>
<thead>
<tr>
<th>Origin/Destination</th>
<th>“Current”: May 2018 (tph)</th>
<th>ITSS 2024 and 2033 (tph)</th>
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<tr>
<td>Flowery Field</td>
<td>Up Main</td>
<td>Included in CP6 Platform Lengthening Scheme</td>
</tr>
<tr>
<td></td>
<td>Down Main</td>
<td>Included in CP6 Platform Lengthening Scheme</td>
</tr>
<tr>
<td>Godley</td>
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</tr>
<tr>
<td></td>
<td>Down Main</td>
<td>Platform length review required</td>
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<tr>
<td>Ryder Brow</td>
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<td></td>
<td>Down Reddish Branch</td>
<td>Platform length review required</td>
</tr>
<tr>
<td>Brinnington</td>
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<td></td>
<td>Down Reddish Branch</td>
<td>Included in CP6 Platform Lengthening Scheme</td>
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<tr>
<td>Bredbury</td>
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<tr>
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<td>Down Reddish Branch</td>
<td>Implement SDO</td>
</tr>
<tr>
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<td>Up Romiley</td>
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<td>Up Romiley</td>
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<tr>
<td></td>
<td>Down Romiley</td>
<td>Implement SDO</td>
</tr>
<tr>
<td>Rose Hill Marple</td>
<td>Up and down Rose Hill</td>
<td>Platform length review required</td>
</tr>
</tbody>
</table>

Railway investment package for year 2043

To review the potential interventions required to meet 2043 demand on the route, the ITSS has been revised further. The main revisions considered have included increasing the number of services in operation and lengthening all services from 4 to 6-car.

Capacity Analysis Outputs

Table 1 illustrates the increased services required to meet the forecast growth, 14 tph compared with 11 in 2033. This has generated a number of constraints at different points along the main corridor and its feeder corridors:

1. The service levels specified in the ITSS cannot be accommodated between Hyde Junction and Dinting
2. There is insufficient pathing time available between Ardwick and New Mills Central for the 2 Sheffield services
3. A conflict exists between the service terminating at Chinley and one of the Sheffield services
4. The increased number of services that would be required to terminate at Rose Hill Marple station cannot be accommodated
5. The assumption that trains become 6-car is currently impossible to accommodate with a number of stations not having long enough platforms

In short, the 2043 ITSS (and therefore the Network Rail System Operator future forecast growth) cannot be compliantly accommodated on the current infrastructure.

Proposed Interventions

A number of potential interventions have been identified for both the main corridor and the feeder corridors that could help to alleviate these constraints:

1. Upgraded signalling between Hyde Junction and Dinting that would allow trains to run closer together
2. Changes to the stopping patterns of the Hadfield services
3. Redesigning New Mills Central station to incorporate a through line in the “Up” direction (that is, the line travelling towards Sheffield)
4. Platform lengthening at all stations that otherwise would be unable to accommodate 6-car trains

Early development concepts have been prepared for interventions 3 and 4. The interventions are complex with potentially significant expense associated largely as a result of the local geography. The Study Working Group has expressed a view that a high-level business case is unlikely to generate anything better than a “poor” outcome if developed now, based on current assumptions and an assessment of benefits that could be realised. A recommendation is therefore made to not pursue further development and cost planning for the 2043 interventions listed as part of this Study at this stage.

Instead, a report refresh should take place once further developments in large scale projects such as HS2 and NPR have taken place. A further appraisal should consider the outputs of the CMSP modules based in the Greater Manchester region simultaneously.
This will enable the Study to have much better visibility of actual demand and therefore of the benefits that infrastructural interventions will bring (which will in turn support a stronger business case).

**Other Considerations**

**Digital Railway**

The future intervention options outlined must consider the provision of more advanced technologies such as digital signalling. The Digital Railway Delivery Strategy could enable more frequent train services to operate on existing tracks through improved headways, performance and reliability. The aim of the strategy is to see digital solutions as “business as usual” by around 2027 onwards.

**Decarbonisation Strategy**

In line with the government’s national commitment to Net Zero Carbon emissions by 2050, the electrification of the Study feeder corridors must also be investigated. The Study recommends that this is considered as part of a wider review in conjunction with the outputs from the other Manchester based CMSP modules.

**Northern Powerhouse Rail**

The Northern Powerhouse Rail (NPR) is a programme that’s being designed to deliver a transformed rail network in the North of England and as a result may impact on the study area. Work to progress Northern Powerhouse Rail is moving at pace and over the next 12 months Transport for the North will be carrying out detailed work to make progress towards a single preferred concept on each route. Further work may therefore be needed to understand the complementary investment options available, and the recommendations from this study may therefore need revisiting.

**Summary of required interventions**

In order to accommodate the Network Rail System Operator forecast demand for the years 2024 and 2033, the number of passenger services in operation would need to increase from 10 to 11 in the peak hour. Capacity analysis has confirmed that this service increase can be accommodated within the current infrastructure. Services will have to operate as 4-car trains, rather than 3-car, which will require a series of platforms along the routes to be lengthened, or to have SDO implemented.

As part of this Study it was decided not to develop cost plans for the interventions required to meet 2043 forecast demand. Instead, the strategic recommendation is to revisit this study with a more accurate view of demand and the expected outputs of large-scale projects like HS2 and NPR, as well as the outputs of the other local CMSP modules. As part of revisiting this Study, it’s advised that any potential interventions that could be employed at the high-risk stations (Gorton and Guide Bridge) to reduce trespass incidents should be investigated following the requirements of the Safety Baseline.

It is worth reiterating that the Study only covers a limited geographical scope. The integration of the increased number of services required along the South East Corridor into the wider network should be a consideration for future study, especially at Manchester Piccadilly station.

---

*A freight train passes through Guide Bridge Station*
What happens next?

- **Review of service frequency in light of changing baseline assumptions**
- **Required review of platform lengthening ahead of introduction of 4-car trains**
- **Review of future requirements following progression of large-scale projects likely to have a significant impact on the Corridor’s demand**

**Summary of outputs**

The Greater Manchester area is expected to experience a significant amount of economic growth in the next 20 years. Forecast growth in population and employment combined with a drive to reduce car use in the Greater Manchester area from 61% to 50% by 2040\(^1\) will inevitably lead to growth in the demand for the rail network. The South East Corridor provides important access to the city centre for a large commuter population. For this reason, the capability of the network to accommodate this demand has been a focus for the Industry, with various local stakeholders holding aspirations for growth and investment along the line.

Despite the rapid growth that’s forecast for the area and the limitations imposed by the baseline infrastructure, the Study has shown that the network along the South East Corridor is in a good position to cater for the increase in demand up until the early 2030s. The required interventions in this period include a series of platform lengthening projects to enable 4-car trains to operate and a slight increase in the number of services being operated.

Beyond this date though, the requirements were found to become significantly more complex as the increase in services required to accommodate the forecast future growth could no longer fit onto the current infrastructure.

It should be noted that should actual growth rates exceed those employed by the Study as forecasts, interventions may become necessary before the early 2030s as the Study has forecast. Other assumptions, such as the introduction of HS2 and NPR projects may also change the shape of demand drastically, in a way that has not been accounted for in this report.

**Autumn 2019 update**

Since the completion of the analysis performed for the Study, Northern Rail has highlighted that there is a lack of capacity to stable Class 331 units in the Manchester area. The operation of 4-car services (assumed in the baseline of the Study) in the short term therefore becomes impossible along the South East Corridor.

The Study Demand Mapping has since been reviewed to reflect the continued use of 3-car Class 323 trains along the Hadfield/Glossop Corridor, and the implications this has for overcrowding have been assessed. In short, replacing the assumed 4-car services with 3-car services yielded the following results:

- In 2024, capacity is still found to be sufficient to meet the Network Rail System Operator future forecast demand.
- In 2033, the number of standing passengers increases slightly and conditions become more crowded on the approach to Manchester Piccadilly.

The rolling stock configuration of the Class 323s is such that the difference in seating capacity between continuing to run 3-car trains versus the planned 4-car Class 331s is marginal. Though passengers will experience a reduction in standing capacity, this does not change the outputs or recommendations of the Study.

\(^1\) Transport for Greater Manchester’s “Greater Manchester Transport Strategy 2040: Delivery Plan (2020-2025)”
Recommendations for next steps

Final Recommendations

The change in baseline rolling stock assumptions reinforce the requirement for a further review of the corridor to take place. For the Study outputs to be successfully applied, the integration of the proposed increase in services into the wider network must also be explored, in particular at Manchester Piccadilly.

The Study should continue to be developed with potential interventions explored that can operate in conjunction with the outputs from other CMSP modules impacting the Greater Manchester area (due to be completed in 2021). These outputs must also seek to align with the Northern Powerhouse Rail aspirations for the region. Note that these other Manchester based Studies may require more immediate interventions to ensure that capacity in the area is sufficient to meet long term forecast demand.

Compatibility with the proposed plans for the Hope Valley line will also need to be further investigated.

The recommendation of the Study is to also look to consider other business strategies, especially the Safety Baseline, Digital Railway and Decarbonisation, when further developing potential interventions for the corridor.

Other Considerations

Throughout the course of Study development, a locally held ambition for potential new stations along the route has been discussed. Should these proposals progress further, the Study recommends incorporating the impact on demand along the route in any further capacity review.

An investigation into the improvement of journey times along the route would be a good extension of the Study, in order to maintain the rail corridor’s competitive advantage over road travel in the area. Similarly, if a longer time period were investigated this would provide a clearer view of the connectivity requirements for passengers along the route, for example the peak hour could be extended to reflect a 3-hour peak instead.

Acknowledgements

Network Rail would like to take this opportunity to thank all individuals and organisations involved for the collaborative approach taken in the creation of this Study.
## Appendix A Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
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<tr>
<td>CMSP</td>
<td>Continuous Modular Strategic Planning, part of the Long-Term Planning Process, is Network Rail's response to the Shaw Review's (2016) recommendation noting the requirement to better plan the railway based on customer, passenger and freight needs.</td>
</tr>
<tr>
<td>Concept Train Plan</td>
<td>A development timetable that shows how the capacity of a section of infrastructure could be used. It does not necessarily take into consideration current operational requirements or prejudice any future commercial aspirations of industry stakeholders.</td>
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<tr>
<td>Conditional Output</td>
<td>Statement of aspirations for the level of service provided.</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Opportunity to travel between two locations and associated journey time.</td>
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<tr>
<td>Control Period 6 (CP6)</td>
<td>Network Rail is funded in five-year periods. Control Period 6 is the funding period from April 2019 to March 2024.</td>
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<tr>
<td>Digital Railway</td>
<td>The Digital Railway is a rail industry-wide programme designed to benefit Britain's economy by accelerating the use of modern technology in several key rail areas.</td>
</tr>
<tr>
<td>HS2</td>
<td>Proposed High Speed link between London, Birmingham, and beyond to Manchester and Leeds.</td>
</tr>
<tr>
<td>HS2 Phase 1</td>
<td>First phase of High Speed 2 to provide a high-speed line between London and Birmingham.</td>
</tr>
<tr>
<td>HS2 Phase 2</td>
<td>Extension of High Speed 2 Phase 1 network which includes a high-speed line from Birmingham to Manchester and from Birmingham to the East Midlands, Sheffield and Leeds.</td>
</tr>
<tr>
<td>Intervention</td>
<td>Planned works to deliver the desired infrastructure or operational enhancement to the railway.</td>
</tr>
<tr>
<td>ITSS</td>
<td>Indicative Train Service Specification. This reflects one possible way in which the Conditional Outputs from the Market Studies could be met, and it is used to test the current network to determine if it can accommodate these outputs.</td>
</tr>
<tr>
<td>LTPP</td>
<td>Long Term Planning Process.</td>
</tr>
<tr>
<td>NPR</td>
<td>Northern Powerhouse Rail: a transformational scheme looking to drive improved connectivity between the key economic centres in the North of England.</td>
</tr>
<tr>
<td>ORR</td>
<td>Office of Rail and Road. The safety and economic regulator for the rail industry in Great Britain.</td>
</tr>
<tr>
<td>Route Study</td>
<td>An evidence base for the rail industry and its funders to inform investment choices over the next 10 years, as well as proposals to meet forecast passenger demand growth through to 2043.</td>
</tr>
<tr>
<td>RUMS</td>
<td>Regional Urban Market Study. One of four Market Studies produced as part of the Long-Term Planning Process. Produced in 2013, its sets out how passenger demands for the regional urban market are expected to change in Britain over the next 30 years.</td>
</tr>
<tr>
<td>RUS</td>
<td>Route Utilisation Strategy. A report that considers the future development of the railway in a particular area (Geographic RUS), or one aspect of its development (Network RUS). Geographic RUSs are being superseded by Market Studies and Route Studies in the Long-Term Planning Process.</td>
</tr>
<tr>
<td>TPH</td>
<td>Number of Trains per Hour.</td>
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Appendix B  Manchester: Travel to Work by Rail

Manchester - Travel to work by Rail

Data Source: Network Rail RINM, 2011 Census
Appendix C  The “Do Minimum” Scenario. WebTAG growth forecast demand for 2043.

SE Manchester 2043 capacity
Suburban rail services arriving into central Manchester during the high peak hour 0800 to 0859

Based upon a map designed by Andrew Smithers ©2017 www.projectmapping.co.uk and reproduced with permission
## Appendix D  Indicative Train Service Specifications (ITSSs)

### Greater Manchester South East Corridor ITSS 2024

<table>
<thead>
<tr>
<th>Service Type</th>
<th>From</th>
<th>To</th>
<th>Route</th>
<th>High Peak Hour -08:00-08:59</th>
<th>Service Frequency</th>
<th>Calling Pattern</th>
<th>Rolling Stock</th>
<th>Length</th>
<th>Notes</th>
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<td>Slow</td>
<td>Manchester Piccadilly</td>
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<tr>
<td>Slow</td>
<td>Manchester Piccadilly</td>
<td>New Mills Central</td>
<td>via Marple</td>
<td>Peak</td>
<td>Ashburys, Belle Vue, Ryder Brow, Reddish North, Brinnington, Bredbury, Romiley, Marple, Strines</td>
<td>Class 150 or 156</td>
<td>4-car</td>
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<tr>
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## Greater Manchester South East Corridor ITSS 2033

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<th>Calling Pattern</th>
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## Appendix D  Indicative Train Service Specifications (ITSSs)

### Greater Manchester South East Corridor ITSS 2043

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<th>From</th>
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<th>Route</th>
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<th>Service Frequency</th>
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<td>New Mills Central via Marple</td>
<td>Peak</td>
<td>Ashburys, Belle Vue, Ryder Brow, Reddish North, Brinnington, Bredbury, Romiley, Marple, Strines</td>
<td>Class 170</td>
<td>6-car</td>
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</tr>
<tr>
<td>Slow</td>
<td>Manchester Piccadilly</td>
<td>New Mills Central via Marple</td>
<td>Peak</td>
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<td>New Mills Central via Marple</td>
<td>Peak</td>
<td>Ashburys, Belle Vue, Ryder Brow, Reddish North, Brinnington, Bredbury, Romiley, Marple, Strines</td>
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<td>Chinley via Marple</td>
<td>Peak</td>
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<td>Slow</td>
<td>Manchester Piccadilly</td>
<td>Sheffield via Marple</td>
<td>Peak</td>
<td>Ashburys, Belle Vue, Ryder Brow, Reddish North, Brinnington, Bredbury, Romiley, Marple, Strines, New Mills Central, Chinley, Edale, Hope, Bamford, Hathersage, Grindleford, Dore&amp;Totley</td>
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<td>6-car</td>
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<td>Assumed to run via an alternative route</td>
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<td>Rose Hill Marple via Marple</td>
<td>Peak</td>
<td>Gorton, Fairfield, Guide Bridge, Hyde North, Hyde Central, Woodley, Romiley</td>
<td>Class 170</td>
<td>6-car</td>
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<tr>
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<td>Rose Hill Marple via Marple</td>
<td>Peak</td>
<td>Gorton, Fairfield, Guide Bridge, Hyde North, Hyde Central, Woodley, Romiley</td>
<td>Class 170</td>
<td>6-car</td>
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</tr>
<tr>
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<td>Sheffield</td>
<td>Peak</td>
<td>Marple</td>
<td>Class 195</td>
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<tr>
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<td>Sheffield</td>
<td>Peak</td>
<td>Marple</td>
<td>Class 195</td>
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<tr>
<td>Semi-fast</td>
<td>Manchester Piccadilly</td>
<td>Leeds via Stalybridge</td>
<td>Peak</td>
<td>Stalybridge</td>
<td>Class 195</td>
<td>6-car</td>
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<td>Included for modelling only</td>
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<tr>
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<td>Leeds via Stalybridge</td>
<td>Peak</td>
<td>Stalybridge</td>
<td>Class 195</td>
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</table>
Appendix E  Reference Material

Derbyshire County Council – Developing a Strategic Plan for the South East Manchester Rail Study Summary Report, September 2019


Network Rail – Long Term Planning Process: http://www.networkrail.co.uk/long-term-planning-process/


• SRS H.29 Guide Bridge – Glossop/Hadfield pgs 37-39
• SRS H.26 North Transpennine: Manchester Piccadilly- Guide Bridge pgs 28-30
• SRS H.28 Ashburys/Hyde North – New Mills Central/Rose Hill pgs 34-36

new economy – Travel to work patterns in Greater Manchester, August 2014


Transport for Greater Manchester – Greater Manchester Transport Strategy 2040: Delivery Plan (2020-2025)

Transport for Greater Manchester – Greater Manchester Transport Strategy 2040 Executive Summary


Broadbottom Station