

DERBYSHIRE COUNTY COUNCIL

MEETING OF CABINET MEMBER - HIGHWAYS, TRANSPORT AND INFRASTRUCTURE

12 September 2019

Report of the Executive Director – Economy, Transport and Environment

UPDATE ON SOUTH EAST MANCHESTER RAIL STUDY

(1) **Purpose of Report** To update the Cabinet Member on the results of the South East Manchester Rail Study.

(2) **Information and Analysis**

Background

At the meeting on 8 June 2017, the Cabinet Member gave approval for Derbyshire County Council to become involved in the South East Manchester Rail Study and to provide a financial contribution towards its cost (Minute No. 62/17 refers).

This study covered a number of rail routes which originate in the Greater Manchester area and then go on to serve communities in Derbyshire, including Glossop, Buxton and the Hope Valley. The study was commissioned and led by Transport for Greater Manchester (TfGM) as part of a series of similar projects it is undertaking of rail services in its area with Derbyshire County Council officers providing additional specialist support.

The purpose of the study was to produce a set of strategic options for meeting future demand growth on the rail network in the area up to 2040, grounded on a sound evidence base that could be taken forward by the rail industry and stakeholders. To achieve this, a detailed market review was undertaken drawing together evidence from previous studies and policies along with fresh analysis and consultation with industry bodies and user groups.

From this review, a set of service concepts were developed firstly for each rail corridor in isolation and then, subsequently, the results from the individual corridor analysis were used to inform the development of packages of proposals for the study area as a whole. Each concept was then developed into realistic operational timetables taking account of the demands for freight traffic where appropriate. Any infrastructure enhancements required to deliver the proposals were identified.

The concepts were then modelled to assess their impact on passenger demand, whilst the costs associated with any infrastructure enhancements and operating costs were identified at a high level. An evaluation framework was then produced to assess the relative merits of each concept, founded on the Transport for the North (TfN) Long Term Rail Strategy priorities of connectivity, capacity, cost effectiveness and environmental impacts. Using the framework, the better performing concepts were brought together into four packages covering all the different corridors with a range of approaches. Examples of these included focusing on short distance metro style frequencies or approaches which required minimal changes to the existing infrastructure. These packages were, in turn, assessed using the same evaluation framework and then ranked and a series of next steps identified.

The study concluded with a series of suggested next steps based on further development of the best options. In Derbyshire, the proposals were as follows:

Corridor	Suggested Development	Recommended Next Step	Key Stakeholder
Glossop	Increase frequency to 3 trains per hour and ultimately to 4 an hour.	Further refinement and analysis required along with active engagement with the current Network Rail study work in this area, particularly in relation to capacity at Manchester Piccadilly station.	TfGM
Hope Valley	Increase frequency to 3 fast trains an hour with the potential for 4 an hour later. Consider introduction of new direct stopping service linking the Hope Valley stations with Hazel Grove and Stockport.	Support ongoing industry process to secure 3 rd fast service an hour and further analysis into the case for 4 th fast service an hour.	TfGM Derbyshire TfN
Buxton	Maintain current 2 trains an hour from Manchester to Buxton and increase frequency on the inner part of the route to 4 trains an hour from Manchester ideally as far as New Mills Newtown.	Develop economic case and potential to become part of TfN journey time improvement initiative.	TfGM Derbyshire

	Improve journey times between Stockport, Hazel Grove and Buxton.		
Chapel-en-le-Frith Central station	Potential to improve accessibility to rail network by opening new station.	More detailed feasibility study that focuses on potential demand and feasibility.	Derbyshire

The further development of these proposals, to a point where they could potentially be considered for long term implementation, will require Derbyshire and TfGM to work with other partners in the rail industry, including Network Rail, the train operators and TfN to make the case for their inclusion in the future development plans for rail in the north. However, some of the proposals will benefit from investment decision which have already been agreed, such as the Hope Valley rail line upgrade which is due to be implemented by 2024 which will allow the number of fast trains on the route to be increase from the current 2 an hour to up to 4 an hour once the works are completed.

A copy of the summary report of the study is provided in provided in Appendix A.

(3) **Financial Considerations** Derbyshire County Council has provided a contribution of £6,480 towards the cost of the study.

The cost of implementing the proposals recommended in the study would be considerable. For example, on the Glossop line, the study estimates a cost of between £10m and £20m to implement the signalling upgrades required to accommodate the service improvements. It would require capital investment in additional rolling stock, as well as revenue funding to pay for the new services to operate. These costs would need be meet by the rail industry and regional organisation such as TfN, rather than Derbyshire County Council.

(4) **Social Value Considerations** Improvements to rail services in the area can help to improve access and connectivity for local residents and to reduce the impact of road transport on people and the environment.

Other Considerations

In preparing this report the relevance of the following factors has been considered: legal, prevention of crime and disorder, equality and diversity, environmental, health, human resources, property and transport considerations.

(5) **Key Decision** No.

- (6) **Call-In** Is it required that call-in be waived in respect of the decisions proposed in the report? No.
- (7) **Background Papers** Held on file within the Economy, Transport and Environment Department.
- (8) **OFFICER'S RECOMMENDATIONS** That the Cabinet Member:
- 8.1 Notes the results of the study and the potential for improvements to rail services in the High Peak and north Derbyshire Dales areas it has identified.
- 8.2 Agrees that officers from the County Council continue to work with Transport for Greater Manchester, Transport for the North and other stakeholders from the rail industry to further develop the next step proposals identified in the study.

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Executive Director – Economy, Transport and Environment

Developing a Strategic Plan for the South East Manchester Rail Study

Summary Report

Transport for Greater Manchester, Derbyshire County
Council

February 2019

Quality information

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3.2	27/02/2019	Update of Next Steps	27/02/2019	R Hibbert	Principal Consultant

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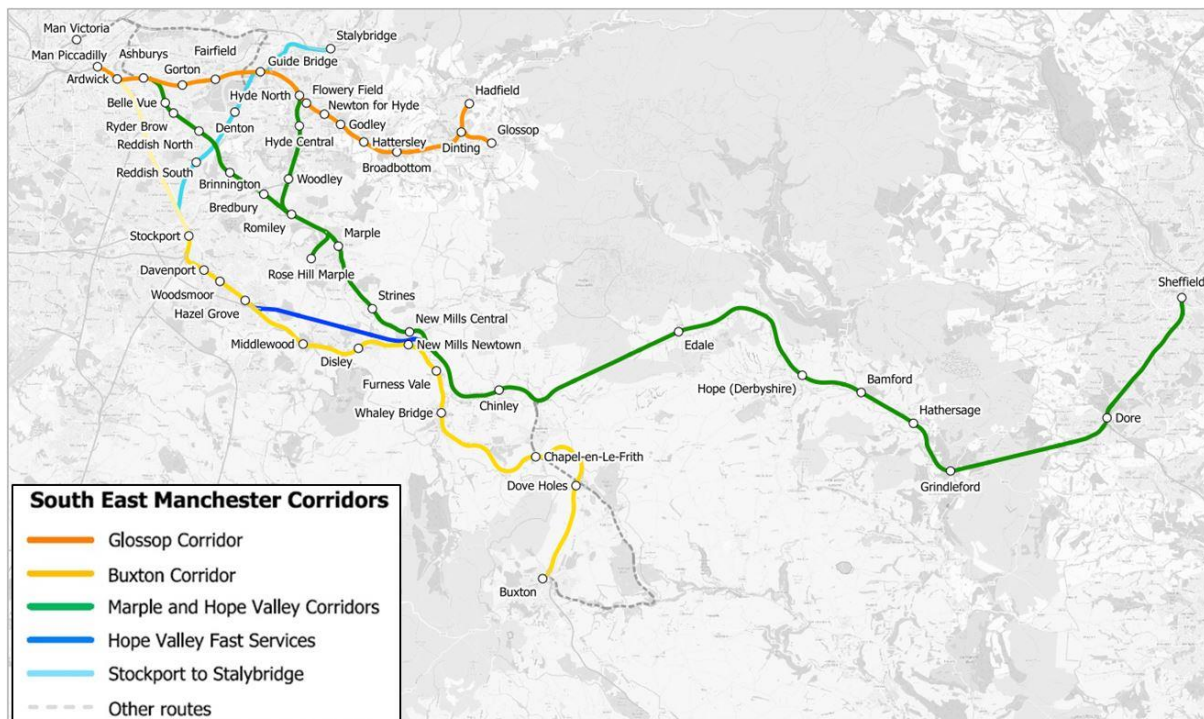
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1. Introduction

AECOM was commissioned by Transport for Greater Manchester (TfGM) and Derbyshire County Council to develop network options for the South East Manchester (SEM) rail network considering a timescale for interventions of up to 2040. The study network includes the rail corridors South East of Manchester Piccadilly station, to Glossop / Hadfield; to Marple via Bredbury and through to Sheffield via the Hope Valley; to Marple via the Hyde Loop; and from Stockport to Buxton.

The SEM rail network serves a mix of inner-city markets, outer suburban commuter markets, regional towns and rural communities providing accessibility between those and central Manchester via Manchester Piccadilly station. Stations in the network are served by a mix of local (stopper) and regional express (semi-fast) rail services. Figure 1 shows the geographical location of the SEM rail stations within the scope of the study.

Figure 1: SEM rail corridors



The mix of regional passenger (TransPennine Express and East Midlands Trains), local stopping passenger (Northern) and freight trains and lack of passing facilities on the study routes creates some challenges for future service enhancements. The rail infrastructure within and adjoining the study area has seen substantial retraction since the 1960s, with routes having track and signal sections removed or being closed entirely, junctions reduced to single lead, etc. As a result, new challenges are now being experienced as the network struggles to accommodate the upturn in rail traffic seen in recent decades. Besides the growth that has already been experienced there is an aspiration to promote transfer of passengers and freight to sustainable modes which will increase the pressure on the capacity of the rail network even further.

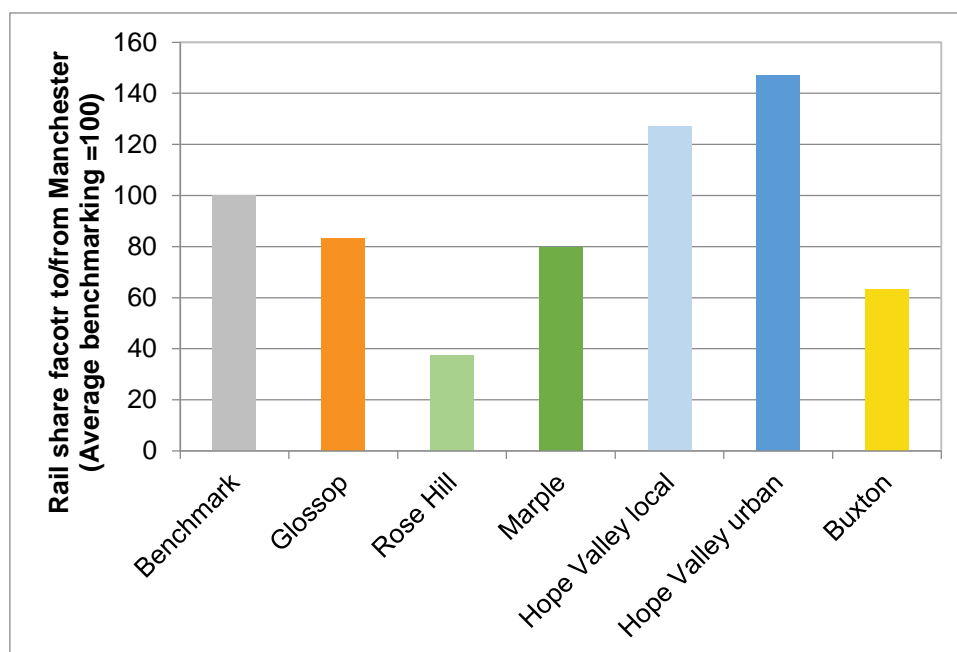
The purpose of this study was to produce a set of strategic recommendations for the rail network in the study area through to 2040, grounded on a sound evidence base that can be taken forward by rail industry stakeholders accordingly. The study explores how to make the best possible use of the existing infrastructure (initially for each corridor and then for the study area as a whole). Network upgrades are only considered when they provide a clear benefit to passengers in consonance with the likely level of infrastructure enhancements required.

The study remit did not require considering options for addressing rail network capacity constraints in Manchester City Centre which would affect the implementation of some of the proposed network concepts. Options for the city centre – which have been considered in other TfGM studies – include (i) a tram-train connection between Ashburys and Piccadilly Station and (ii) a city-centre metro tunnel.

Rail demand growth in the study area is sourced from the Manchester Rail Network Capacity Study (2017) and additional analysis to bring the forecasts to 2040, which are tied to economic prosperity. This approach ensures that the recommendations are future-proofed to cater for substantial passenger growth in the study area.

The 2040 analysis forecasts a significant increase in passenger demand into and through Manchester city centre. In the 2040 peak period the Glossop and Hope Valley corridors are expected to be significantly over capacity and the Marple and Buxton corridors close to capacity. Additionally, benchmarking of rail modal shares against other corridors in the north of England demonstrated that while the Hope Valley corridor had relatively high rail mode shares, the Glossop, Marple, Buxton and Hyde Loop corridors had slightly lower rail mode shares, see Figure 2. This may reflect the negligible bus mode share on the longer-distance Hope Valley corridor. Another possible interpretation could be that there is scope to increase the rail market share through service enhancements on the Glossop, Marple, Buxton and Hyde Loop corridors.

Figure 2: Rail market share comparison, flows to/from Manchester



Due to the strategic nature of the study, the report focusses primarily on the use of, and potential enhancements to the heavy rail infrastructure. However, this does not preclude the introduction of light rail vehicles on some corridors to improve rail penetration in Manchester city centre or alleviate congestion on the approaches to known rail capacity pinch-points such as Manchester Piccadilly. For instance, where the recommendations introduce a level of service that might be constrained by the available capacity on the approaches to Manchester, or available platform capacity at Manchester Piccadilly, the next stages in the future refinement and development of these concepts might be to consider alternative solutions such as links with Metrolink (tram-train) or a city-centre metro tunnel.

2. Approach

Firstly a detailed market review was undertaken, drawing together an evidence base that was used to inform the development and assessment of service concepts. Evidence was brought together from previous studies and policies, consultation with rail users and industry bodies, as well as from fresh analysis.

Informed by the evidence base, a set of service concepts¹ were developed firstly for each study corridor in isolation and subsequently the results from the individual corridor analysis was used to inform the development of concept packages for the study area as a whole. Each concept was then developed into realistic operational timetables², taking account of the demands for freight traffic where appropriate, then any infrastructure enhancements required to deliver the concept were identified.

¹ Details of the individual corridor concepts can be found in Chapter 2 of the Part 2 – Network Plan Report, September 2018.

² Details of the operational assessment and timetables can be found in the Concept Booklet, September 2018.

The concepts were then modelled to assess their impact on passenger demand, whilst the costs associated with any infrastructure enhancements and operating costs were identified at a high level.

An evaluation framework was produced to assess the relative merits of each concept, founded on Transport for the North Long Term Rail Strategy (2015) priorities around connectivity, capacity, coherence, cost-effectiveness and environmental impacts, where a number of specific indicators were developed around these priorities. Then, on a corridor by corridor basis, each concept was evaluated against the other concepts for that corridor.

The better performing concepts from the corridor level analysis were then brought into four concept packages that considered all the corridors in the study area together. In some cases there were clearly synergies in combining individual corridor-based concepts at a wider network level. The concept packages were then assessed using the same evaluation criteria leading to a set of options that may be considered for more detailed development. While the ranking indicates the relative potential of the packages compared to each other, packages that score lower may have other advantages such as less infrastructure costs and therefore the potential for earlier delivery, which may prove attractive.

It should be noted that the study brief specifically excluded taking into account likely service plans for Northern Powerhouse Rail (NPR); and as such the concepts do not provide for the use of the classic rail network to meet NPR Conditional Outputs, given the lack of definition of the final solution during the timescale of the study.

3. Evaluation of Service Concept Packages

Following the completion of the corridor concept evaluation the outputs were used to inform the construction of concept packages for further analysis. The development of packages was considered an essential step in the process given the anticipated synergies (in terms of potential train service patterns, sharing of potential infrastructure investment, demand interactions, etc.) that were emerging from the initial corridor analysis.

It was agreed that the concept packages would be based on the following criteria:

- **Package 1 - Core Concept:** The 'Core Concept Package' was defined as being the combination of the best performing corridor concepts from each corridor.
- **Package 2 - Maximum Benefits Concept:** This concept package aims to maximise the user time savings as a proxy of the scheme's potential benefits. Higher user time savings would have the potential to generate a stronger business case (all other things remaining equal) that may support the greatest levels of investment across the study area.
- **Package 3 - Inner Metro Concept:** The focus of this concept package was the introduction of high frequency services, 4 trains per hour (tph), serving the inner Manchester suburban areas, namely Guide Bridge/Stalybridge, Marple/Rose Hill and Hazel Grove. Whilst 4 tph is a reasonable proxy for a high frequency heavy rail service, further frequency improvements would be moving more towards a Metro frequency. The limitations of capacity on the approach to or at Manchester Piccadilly might also indicate that a tram-train or tunnel solution becomes more viable to manage large increases in service frequencies.
- **Package 4 - Optimal Deliverability Concept:** This concept package aims to deliver the maximum possible benefits/trains for the least amount of additional infrastructure. The intention being to identify a package that might be the easiest to deliver from a capital funding perspective, and could be more attractive for short term delivery.

It should be noted that some detailed variations have not been considered or modelled because of the high level nature of the assessment. For example in Package 2 (Maximum Benefits Concept), it was not possible to assess which group of services through Romiley should divert to Manchester Victoria, however the earlier corridor analysis demonstrated the importance of having all services in a corridor serving a single destination rather than serving different destinations.

The potential for a new Chapel-en-le-Frith Central station has also been considered. This station would be located on an existing freight-only line in close proximity to the town centre. In Packages 1 and 2, Chapel-en-le-Frith Central station could be served by an extension of the terminating Chinley path (reversing at Chinley North Junction). In principle it could also be linked to a terminating New Mills Central service in Packages 3 and 4; however this would not align with the “themes” of these packages. The modelling tool used to analyse the main concepts and packages is only suitable to forecast demand changes on existing flows and therefore is unable to forecast demand at Chapel-en-le-Frith Central station. An alternative approach was devised to forecast demand at this station but this was not sophisticated enough to generate different forecasts for the range of interventions proposed in Packages 1 and 2, which is why the analysis was separated from the concept packages. Further details and the outputs from this analysis are discussed in Section 4.3.

The baseline timetable is shown in Figure 3 for reference and the final concept packages are presented in Figure 4 to Figure 7. The following principles have been used when testing the concepts and packages:

- The figures show off-peak standard service patterns
- Each line represents 1 train per hour
- Through services show indicative end destinations, but the operation and interaction of these services have not been modelled outside the study area
- The potential extension of services to a new Chapel-en-le-Frith Central station is also shown in the Package 1 and 2 diagrams.

Figure 3: Baseline timetable

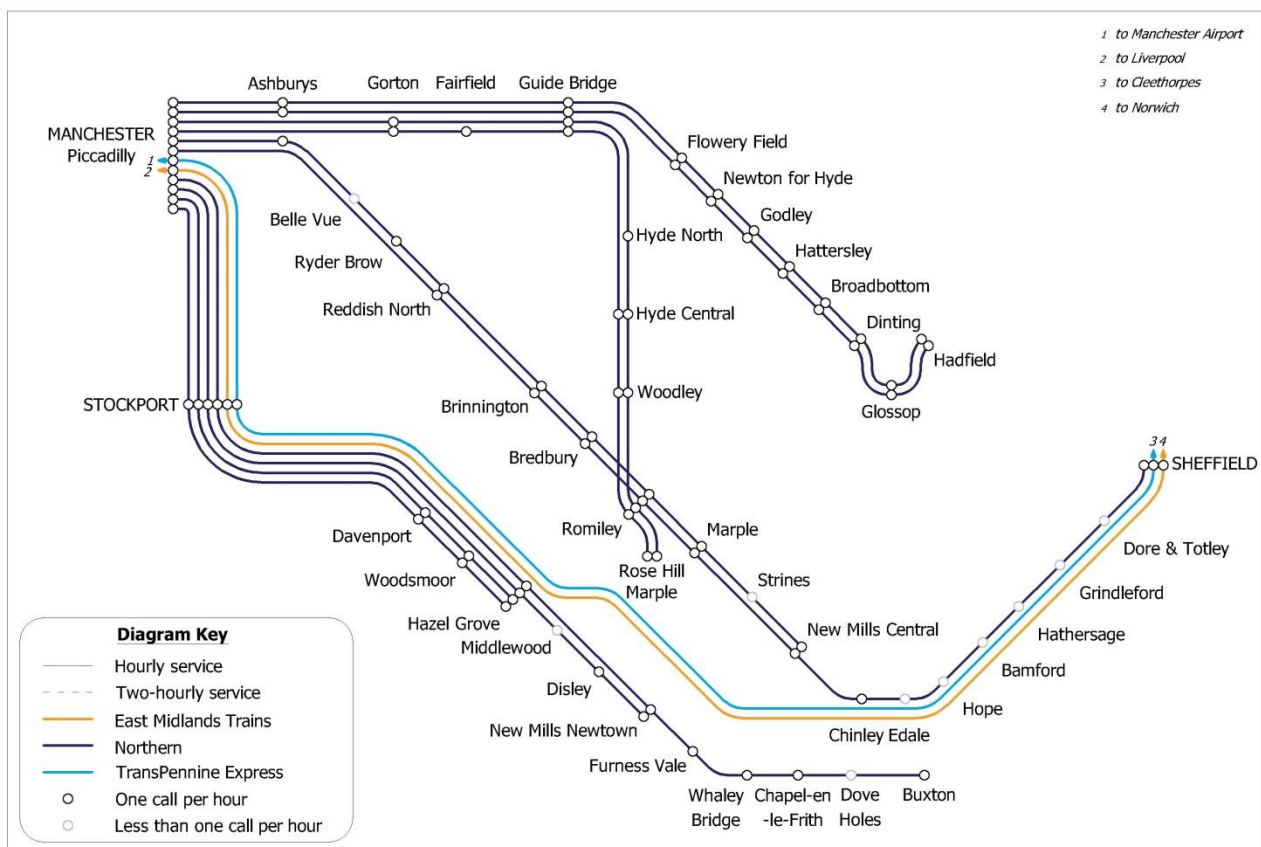
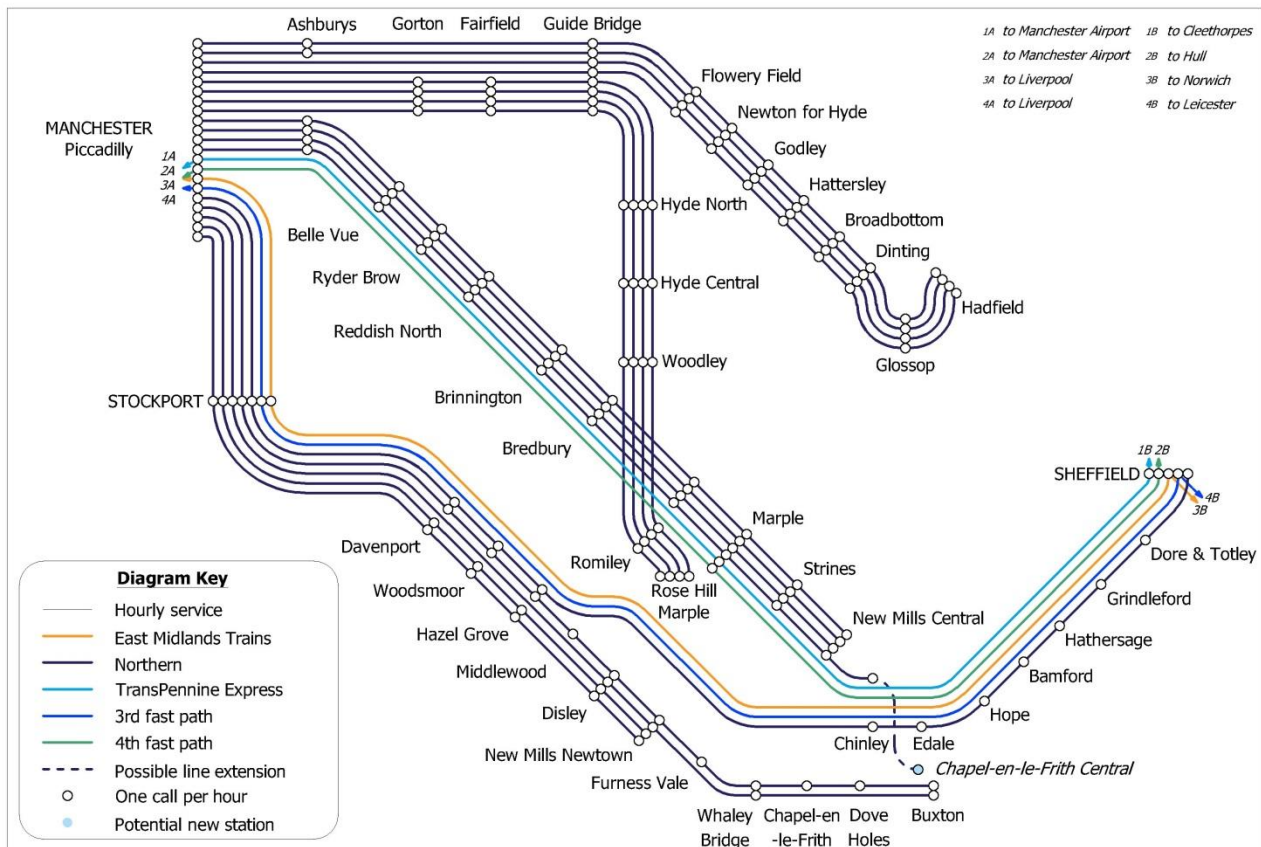


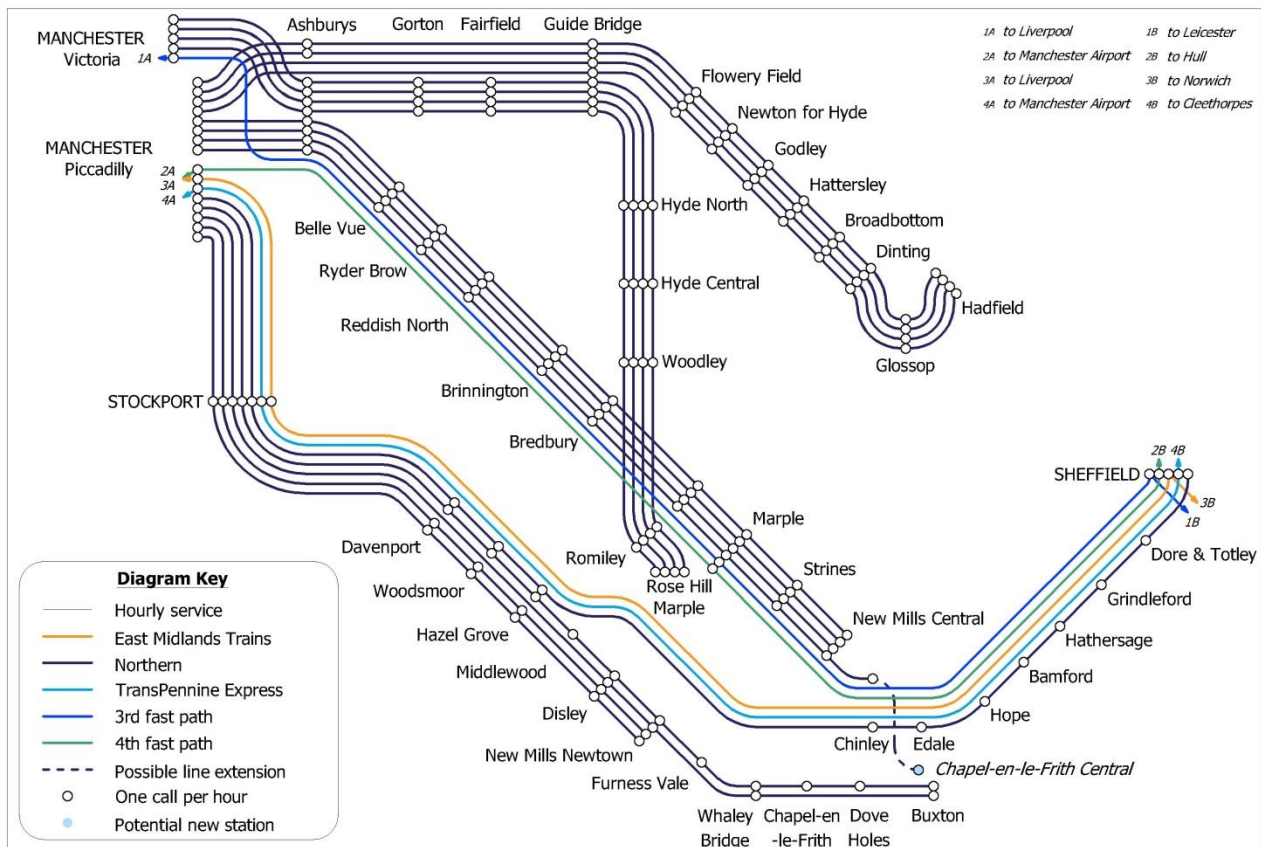
Figure 4: Package 1 diagram (Core Concept)



Package 1 combines the best performing scenarios from each corridor, translating into a considerable increase in the number of paths per hour terminating at Manchester Piccadilly. Proposed 'turn-up-and-go' service frequencies on the Glossop, Marple and Rose Hill corridors would result in the need for an additional 9 train paths per hour into and out of Manchester Piccadilly, potentially building the case for establishing linkages with Manchester Metrolink (tram-train). On the Hope Valley corridor, this package adds two further fast services per hour and diverts the stopping service (1 tph) to operate via Stockport. Linkages between the Hope Valley stations and the Marple corridor are maintained by extending one Marple service through to Chinley (which could be extended further to serve a new station at Chapel-en-le-Frith). On the Buxton line the higher frequency service is extended out from Hazel Grove to New Mills Newtown (potentially involving extension of electrification) and there are 2 tph to/from Buxton, one of which is semi-fast.

The proposed fast service from Manchester to Sheffield via Marple would need to be reviewed in the possible future context of a higher-frequency local service on the Marple corridor, achieved – for example – through tram-train operation. In that scenario, a direct fast service to Sheffield via Marple could prove to be infeasible.

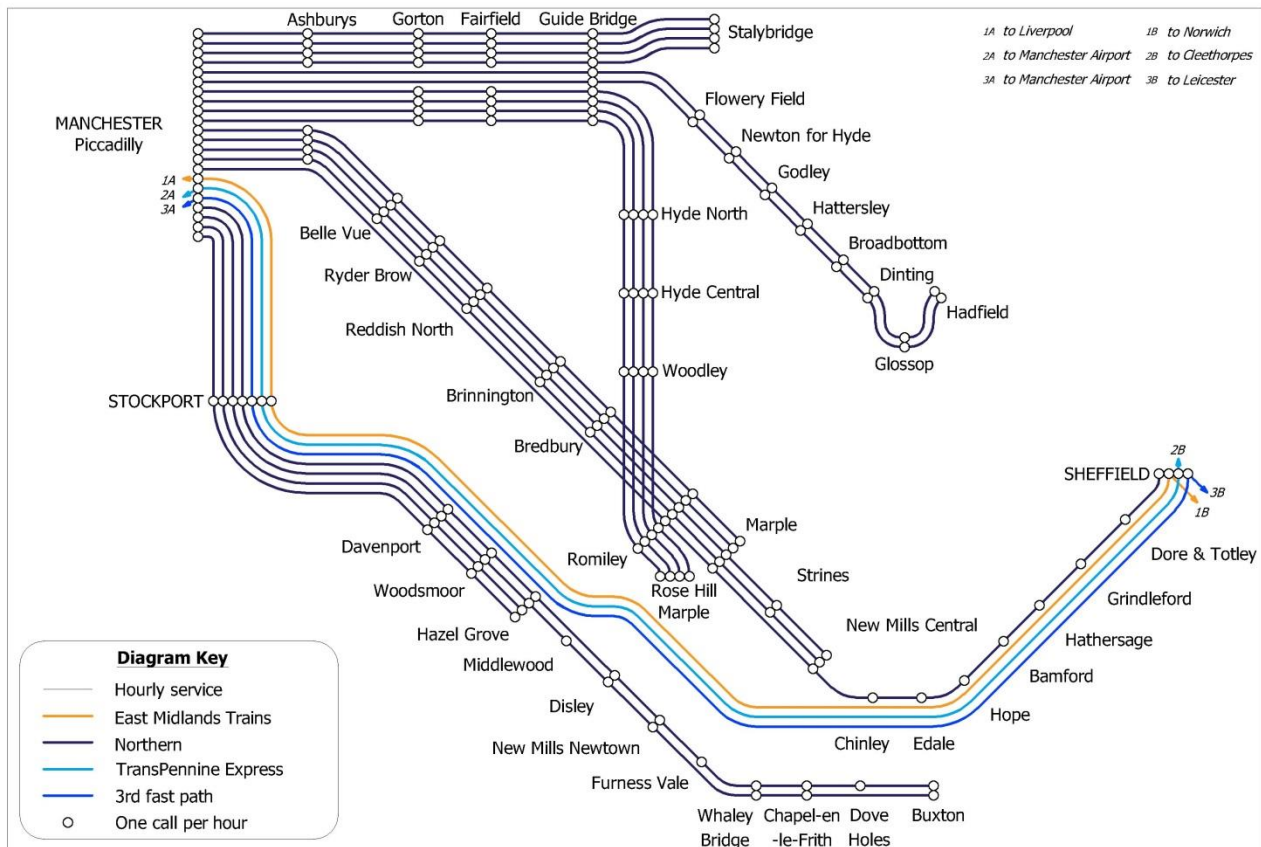
Figure 5: Package 2 diagram (Maximum Benefits Concept)



Package 2 combines the individual corridor concepts delivering maximum benefits, and therefore largely mirrors Package 1 with one key difference. In this package the Hyde Loop services (4 tph) and a fast Manchester to Sheffield path are diverted to Manchester Victoria instead, thereby enhancing the Manchester city centre accessibility, whilst reducing pressure at Manchester Piccadilly (4 additional train paths required rather than 9). Same platform interchanges at Guide Bridge enable easy access to Manchester Victoria and Manchester Piccadilly to passengers travelling from stations on the Glossop and Hyde Loop corridors. For the high level assessment the service pattern shown in Figure 5 was used, but it would be possible to swap the end destinations of either of the service groups through Romiley to best meet passenger requirements. However, the earlier corridor analysis demonstrated greater benefits of having consistent service patterns within a corridor (i.e. all trains serving the same destination rather than alternative trains serving different destinations). The high frequency improves the ease of interchange and provides more travel opportunities per hour than would be the case with a more complex service pattern.

As noted above, the proposed fast service from Manchester to Sheffield via Marple would need to be reviewed in the possible future context of a higher-frequency local service on the Marple corridor, achieved – for example – through tram-train operation. In that scenario, a direct fast service to Sheffield via Marple would be unlikely could prove to be infeasible.

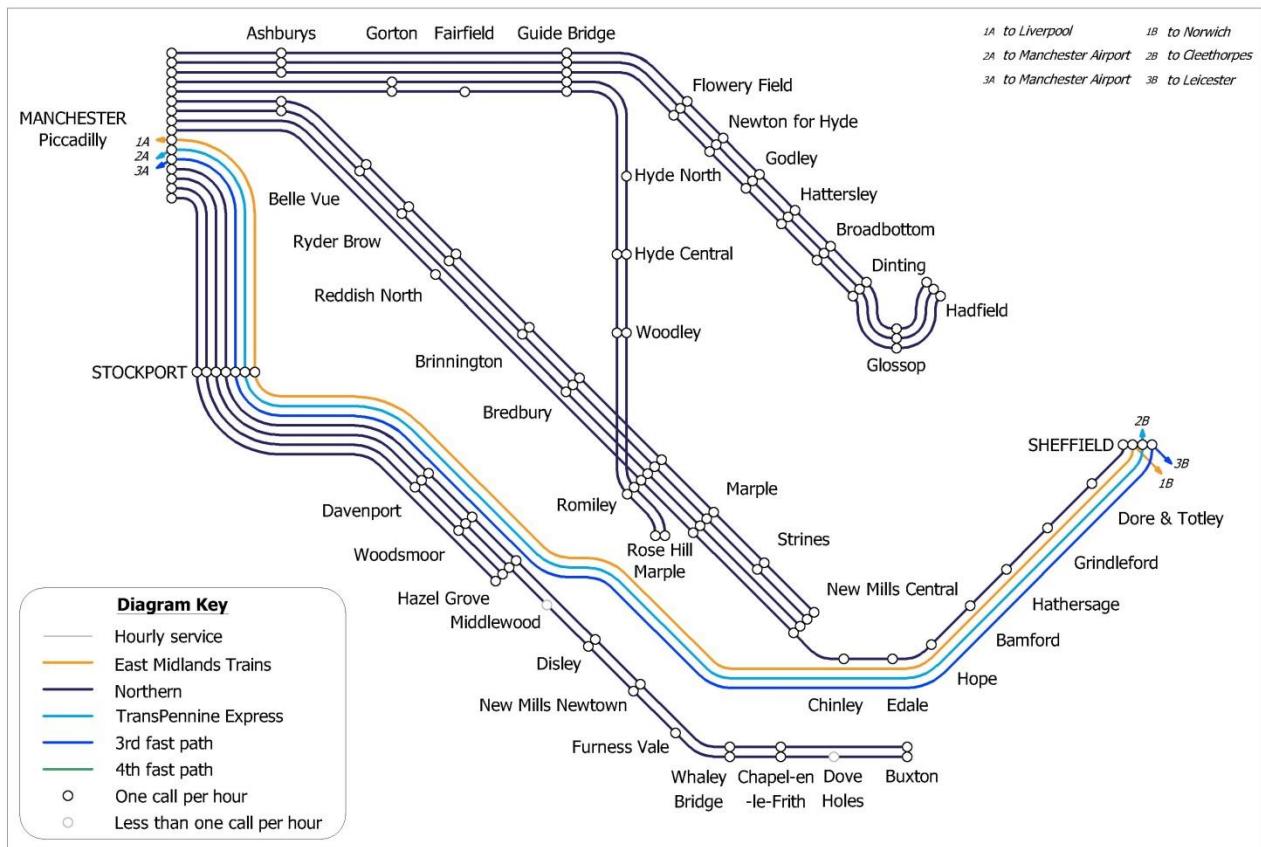
Figure 6: Package 3 diagram (Inner Metro Concept)



Package 3 brings together the corridor concepts to provide an ‘inner-metro’ service across the Greater Manchester region, with minimal changes to longer distance services. High frequency suburban services (4 tph) are provided along all corridors as far as Guide Bridge/Stalybridge, Marple, Rose Hill and Hazel Grove. The focus, therefore, with this package is to stimulate suburban travel within Greater Manchester. There is, however, an additional third fast service on the Hope Valley line in line with stakeholder aspirations and the committed Northern Hub package of improvements. This package requires an additional 10 train paths into Manchester and is therefore, arguably more aligned to future conversion to Metro operation on the Glossop, Hyde and Marple corridors, with the services diverted into the city centre or a Metro tunnel, potentially relieving the train path demands placed on Manchester Piccadilly. With this package there is a less obvious solution to bringing a new station at Chapel-en-le-Frith into the rail network.

The proposed limited-stop Hope Valley service via Marple would need to be reviewed in the possible future context of a higher-frequency local service on the Marple corridor, achieved – for example – through tram-train operation. In that scenario, a direct fast service to Sheffield via Marple could prove to be infeasible.

Figure 7: Package 4 diagram (Optimal Deliverability Concept)



Package 4 sets out to maximise the benefits afforded by the proposed corridor service enhancements without the requirement to enhance the existing infrastructure. Unsurprisingly, this objective constrains the ability to significantly enhance service frequencies, and therefore improvements are restricted to extending the current peak pattern on the Glossop corridor (3 tph) to the inter-peak period and adding one further fast service over the Hope Valley in line with current stakeholder aspirations and the committed Northern Hub package of improvements. In the Marple corridor, however, it is possible to introduce a more significant service enhancement to 4 tph to/from New Mills Central, albeit with a skip-stopping service pattern. This package therefore reduces the number of additional services into Manchester Piccadilly to 4 tph

As noted above, the proposed fast service from Manchester to Sheffield via Marple would need to be reviewed in the possible future context of a higher-frequency local service on the Marple corridor, achieved – for example – through tram-train operation. In that scenario, a direct fast service to Sheffield via Marple could prove to be infeasible.

4. Study Outputs

4.1 Corridor Level Concepts

Before considering the final recommended packages, the study findings at the corridor level are discussed below.

Glossop Corridor:

- There are clear benefits to passengers from increasing the service frequency to 4 tph and therefore lowering wait times considerably to provide a “turn up and go” service, which is demonstrated by an increase in passengers forecast in the higher frequency concepts.
- There is also a benefit from focusing on serving Glossop commuter flows in the peak because of the greater number of people who travel to the regional centre for work from this area. However, there is also a significant flow between Glossop, Hadfield and Dinting and there are options to possibly better serve the local market in the inter-peak;
- Investment would be required in terms of additional rolling stock and a signalling upgrade east of Guide Bridge to provide the enhancements outlined above.

Marple Corridor:

- Metro-style operation on both the Bredbury and Hyde corridors (4 tph calling at all stations) and retention of 1 tph fast in the Bredbury corridor from Sheffield delivers the largest increase in forecast passenger numbers. This form of service pattern also has the potential to facilitate possible conversion to tram-train operation at some point in the future thus enhancing city centre accessibility. However, the feasibility of a 1tph fast service in the Bredbury corridor would need particularly close attention in a future scenario with a high-frequency service that tram-train operation might permit.
- Metro operation would require signalling headway improvements along most of the corridor south of Ashburys and south of Guide Bridge. Terminating services at New Mills Central is preferable to Marple as there is no need to install a new crossover, which otherwise would be required; Diverting the Hyde Loop services to Manchester Victoria via the existing freight only line via Phillips Park Junction scored strongly in the analysis and is worth further consideration;
- Additional rolling stock would be required to deliver a metro frequency in the corridor.

Hope Valley Corridor:

- Increasing the service frequency of the fast trains between Manchester and Sheffield from 2 tph to 4 tph is preferred over going to 3 tph, as it delivers improved connectivity between East Midlands/South Yorkshire and the North West as well as growing the Sheffield to Manchester market substantially. Timetables with four trains per hour generally have more memorable departure times and provide a service headway closer to a “turn up and go” service level which proves attractive to passengers.
- The committed capacity upgrades at Bamford and Dore & Totley are necessary to facilitate this level of service increase. In addition a new crossover to serve Earles Sidings would be required in order to reduce the time required to access the freight terminals and therefore free up capacity on the line;
- A clockface timetable for the fast services would be desirable as it generates an improvement in Generalised Journey Time for passengers, by having regular intervals between trains, which leads to additional forecast demand using the service. This would, however, require further infrastructure in the Bamford area in order to enable fast trains to overtake the slower stopping service.
- The optimal way to serve the local stations in the Hope Valley is via a dedicated hourly stopping service. The evidence suggests it is beneficial to re-route this service via Stockport, which would provide Hope Valley communities with access to their nearest essential facilities

(e.g. Stepping Hill Hospital) as well as opportunities to interchange at Stockport Station to access trains travelling south without the need to travel all the way into Manchester.

- At least one of the fast services should operate via the Marple corridor (taking up the path of the diverted stopping service). This is suggested because of the limited train paths between Stockport and Manchester Piccadilly, and there is a preference for the stopping service to route via Stockport to increase service frequency at Chinley (growing demand at the station by up to 10%) as well as unlocking a fast path via Marple that could be used by another service. In addition there are connectivity benefits from providing one direct fast service to Sheffield which calls at Marple. The case for sending a second fast service via the Marple corridor is marginal with the operational benefits of removing a train path between Stockport and Manchester offset by operational constraints at Manchester Piccadilly. These conclusions would need to be reviewed in the possible future context of a higher-frequency service on the Marple corridor, achieved – for example – through tram-train operation. In that scenario, direct fast services to Sheffield via Marple would be unlikely to be feasible.
- There is a weaker case for routing a fast service via Manchester Victoria (via the Marple corridor) because the additional journey time not only impacts on some passengers travelling to Manchester (in practice some will benefit and some will have a dis-benefit depending on their ultimate destination), but it will also impact passengers routing through Manchester on to places such as Warrington or Liverpool who will only dis-benefit from the increase in journey time. However, because of the capacity challenges at Piccadilly and the impact of a service from Marple to west of Manchester having to cross the entire throat, means that routing a service via Victoria may need further consideration if more optimal solutions are not possible.

Buxton Corridor:

- The analysis indicated that Buxton should be served by 2 tph, with one of these operating as a 'semi-fast' service, only calling at Stockport between Manchester and Disley. It should be noted that since this work was completed the latest timetable (May 2018) has introduced 2 tph to Buxton, although the 2nd train calls at more intermediate stations than the preferred output in this study;
- The 'inner section' of this corridor (Stockport – Hazel Grove) would benefit from being served by a 'Metro-style' frequency with 4 tph calling at all stations to provide a "turn up and go" service. In addition, these services could be further enhanced by extending to Disley and New Mills Newtown. This would require a new turnback facility at New Mills Newtown;
- A new direct link between Chinley and Hazel Grove/Woodsmoor (for Stepping Hill hospital)/Davenport/Stockport appears to be beneficial as it provides links from Hope Valley communities to their nearest essential facilities (e.g. Stepping Hill Hospital) as well as opportunities to interchange at Stockport Station to access trains travelling south without the need to travel into Manchester. It also has the added benefit of providing a direct service from stations between Stockport and Hazel Grove to the Hope Valley for leisure trips.
- In line with stakeholder aspirations, journey time improvements should be developed between Stockport, Hazel Grove and Buxton. This could be facilitated via line speed improvements and/or electrification.
- Since this analysis was undertaken, service frequency at Chapel-en-le-Frith has increased from 1 tph to 2 tph. Therefore, it should be noted that the concept packages that present only 1 tph at Chapel-en-le-Frith is a function of the baseline used and is not a study recommendation.

4.2 Concept Packages

Those packages that are based on the best performing corridor concepts tend to score the best in the resulting evaluation framework for the packages. The best performing packages all have high frequency 'metro-style' services as far as New Mills, Glossop and Hazel Grove, whereas when the metro frequency is focused closer to the regional centre as in Package 3 it does not score as well in the evaluation. This suggests that frequency and connectivity outweigh journey time for the short and medium distance suburban markets. However, this is supplemented by the provision of a 'fast train option' at key suburban stations

such as Marple, Hazel Grove and Guide Bridge. This, along with the benefits seen from journey time improvements for the longer distance movements (Buxton, Hope Valley), suggests that there is an optimum balance to aim for across the study area's local short/medium distance movements and the longer distance markets.

All the package concepts require an additional single path between Stockport and Manchester Piccadilly. Therefore, if any of these packages are developed further then the linkages with other corridors in South Manchester will need to be taken into account. Assessment of the capacity between Stockport and Manchester Piccadilly is outside the scope of this study and is being covered by another TfGM commissioned study.³

Packages 1, 2 and 3 which add a number of additional paths between Guide Bridge and Ashburys would require this section of line to be upgraded to a four track railway. This intervention is needed to accommodate increased traffic on the corridor, which is further constrained by the higher number of trains also operating on the route via Bredbury that interact with the Ashburys to Guide Bridge corridor at Ashburys Junction. The operational analysis of these concepts suggests that four-tracking is likely to be needed between Ashburys and Guide Bridge, including both stations. From Ashburys to Gorton this could be achieved by upgrading the existing freight infrastructure to allow running of passenger services. In contrast, the section between Gorton and Guide Bridge will require rebuilding of the dismantled tracks which have been preserved as a path running parallel to the railway. Four-tracking the Ashburys to Guide Bridge section will also provide additional capacity for freight services; therefore this intervention is likely to remove the need for freight loops in the Guide Bridge area.

Packaged Concepts 1 and 2 include the same number of paths per hour between Ashburys and Guide Bridge as in Glossop Concept 5. The combined concepts are however further constrained by the additional number of trains operating on the single track sections of the Glossop and Hyde Loop lines which restricts the flexibility of the timetables in these concepts, and the increased number of conflicts at Ashburys. This means that the Ashburys to Guide Bridge section requires additional capacity to accommodate Packaged Concepts 1 and 2. Package 4, however could be delivered with minimal additional infrastructure throughout the SEM rail network including minor signalling enhancements and a crossover to access Earles Sidings from the eastbound direction to improve performance.

Platform capacity at the low-numbered platforms of Manchester Piccadilly could restrict the scope to deliver some of the packages because of the additional number of services (particularly Packages 1 and 3). These platforms serve trains from the Marple and Glossop corridors, for which a substantial frequency increase has been proposed. In order to address these platform capacity issues, some of the services from the Glossop and/or Marple corridor could be diverted towards Manchester Victoria via the existing freight only line to Phillips Park Junction or to the Manchester Metrolink network via a new link east of the station if a tram-train solution is adopted. Alternatively, a solution that may be required to realise these packages would be significant infrastructure to increase capacity through / across Manchester via a tunnel or to provide additional capacity at Manchester Piccadilly (possibly as part of the HS2 / Northern Powerhouse Rail proposals), however, further work would be needed to investigate the extent of the enhancements required and how these could be integrated into the station development. The change in the number services into Manchester Piccadilly is presented in Table 1.

Table 1: Net impact on extra train services per hour into Manchester Piccadilly

Net extra services per hour to Piccadilly through:	Package 1 Core	Package 2 Maximum Benefits	Package 3 Inner Metro	Package 4 Optimal Deliverability
Stockport	+ 1	+ 1	+ 1	+ 1
Ashburys	+ 8	+ 3	+ 9	+ 3

4.3 Other Considerations

The study was also asked to consider the reintroduction of a regular service on the Reddish South / Denton corridor and the potential for a new station closer to the centre of Chapel-en-le-Frith by making use of an existing freight-only line. The existing Chapel-en-le-Frith station is poorly located some distance from the

³ South Manchester Rail Network Assessment & HS2 Preparedness, Steer

town centre and the evidence gathering stage identified stakeholder aspirations for a new more centrally located station that would better serve the needs of the population.

Reddish South / Denton Corridor: The analysis undertaken suggests that an hourly service linking Stockport and Manchester Victoria would attract a usage of circa 220,000 rail journeys per annum at Reddish South and Denton, which is substantial enough to suggest the scheme is worth further consideration to see if it is financially and economically viable. In addition, an estimated 12,000 new journeys would be generated across existing rail flows. Routing this service to Manchester Victoria (rather than Stalybridge) generates more demand, provides greater choice to central Manchester destinations and provides opportunities to improve operational efficiency at Manchester Victoria by removing a terminating service. Circa 70,000 (or 32%) of these passengers are forecast to be abstracted from other stations (Reddish North, Heaton Chapel and Guide Bridge). It must be noted, however, that the capacity to access Stockport station has not been considered in this study. The TfGM Manchester Rail Network Capacity Study identified that Heaton Norris Junction and Stockport station are key capacity constraints and it is therefore unlikely the service could be accommodated on the network until Stockport area capacity is addressed. Further study would be required to prove this issue.

Chapel-en-le-Frith Central station: Circa 100,000 entries/exits per annum are forecast to use this new station located on the existing freight line to Peak Forest (which is roughly double the number of passengers currently using the existing Chapel-en-le-Frith station). Circa 34% of Chapel-en-le-Frith Central demand would be abstracted from either Chinley or Chapel-en-le-Frith, with demand at these stations estimated to fall by 18,000 and 16,000 passengers per annum respectively. One benefit of this will be an associated reduction in car traffic that is currently used to access these stations. To put Chapel-en-le-Frith Central demand estimates into context, other stations in the high peak that have a similar number of entries and exits in 2016-17 are Whaley Bridge (circa 130,000), Chinley (circa 120,000) and Edale (circa 90,000). In the modelling exercise the existing Chapel-en-le-Frith station was assumed to remain open with an hourly service frequency. The proposed station could be served by an extension of a New Mills Central or Chinley terminating service, without the need for additional infrastructure (other than a new station), although detailed signalling requirements would need to be confirmed and interactions with freight considered in more detail. The analysis suggests that this new station significantly improves rail access for the town, has the potential to generate circa 65,000 new rail journeys. Operationally it appears Chapel-en-le-Frith Central can be added to the network relatively straightforwardly as an extension to existing or proposed services terminating at New Mills Central or Chinley (taking them off the main Hope Valley route).

4.4 Next Steps

The table below sets out some recommendations for possible next steps relating to the progression of potential schemes identified as outputs in this study. These are presented for the consideration of TfGM and Derbyshire County Council alongside other relevant stakeholders.

Table 2: Possible next steps to progress potential schemes for each study corridor

Corridor	Study Headline	Recommended Next Steps	Key Stakeholder
Glossop Corridor	Increase service frequency to 3tph (potential quick win?) and ultimately 4tph	Further refinement and more detailed analysis including operational and economic assessment of concepts.	TfGM
Marple Corridor	Introduction of an increased service frequency and Metro-style frequency via the Bredbury and/or the Hyde Loop corridor	Active participation in Network Rail's CMSP (Continuous Modular Strategic Planning) Strategic Question covering these corridors.	TfGM/NR
	Consider diverting Hyde Loop services to Manchester Victoria	Determine the extent to which demands on train capacity at Manchester Piccadilly might constrain the ability to deliver these aspirations Link to possible development of tram-train/Metrolink proposals in these corridors	TfGM

Corridor	Study Headline	Recommended Next Steps	Key Stakeholder
Hope Valley	<p>Progress an increase to 3tph fast services over this route in line with recently committed infrastructure enhancements. Further consideration of 4tph fast services over route taking into account ability to path at regular intervals, alternative routings to enhance East Midlands-North West services (eg: via Stoke) and freight requirements.</p> <p>Consider the introduction of new direct service between Hope Valley stations and Hazel Grove/Woodsmoor (for Stepping Hill hospital)/Davenport/Stockport.</p>	<p>Support ongoing industry processes to procure third fast service.</p> <p>Study into what is the emerging case for a fourth fast path on the Hope Valley line. Will, for example, TfN's Strategic Development Corridor (South Pennines) work cover this?</p>	TfN TfGM Derbyshire CC
Buxton Corridor	Ensure high frequency service (4 tph) to at least Hazel Grove and ideally as far as New Mills Newtown.	Further refinement and more detailed analysis including operational and economic assessment of concepts.	TfGM Derbyshire CC
	Journey time improvements should be developed between Stockport, Hazel Grove and Buxton. This could be facilitated via line speed improvements and/or electrification.	<p>Development of economic case for journey time improvements. Is this a potential case study for TfN's journey time improvements initiative (Better Ways of Working)?</p> <p>Consider study outputs in conjunction with South Manchester Strategic Rail Study to understand wider demand for train capacity between Stockport and Manchester Piccadilly.</p>	TfGM Derbyshire CC
Reddish South/Denton Corridor	Introducing rail services linking Stockport to Manchester Victoria has the potential to generate additional rail demand through enhanced connectivity, provide greater choice to central Manchester destinations and provides opportunities to improve operational efficiency at the east end of Manchester Victoria.	Further analysis needs to be undertaken within the TfGM New Stations Study to assess heavy rail network capacity constraints at the Stockport end of route.	TfGM
Chapel-en-le-Frith Central Station	Potential to significantly improve accessibility to the rail network for the local catchment population. Potential to generate station usage to similar levels as that currently experienced at other local stations.	More detailed feasibility study that focusses on potential demand impacts and operational feasibility.	Derbyshire CC