

NIC Rail Needs Assessment for the Midlands and the North

**Response of the Greater Manchester Combined
Authority**

29th May 2020

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0. Introduction

- 0.1 This document sets out the Greater Manchester Combined Authority (GMCA)'s response to the National Infrastructure Commission (NIC)'s 'Rail Needs Assessment for the Midlands and the North' Call for Evidence. It summarises the considerations of the GM Local Authorities and Transport for Greater Manchester (TfGM). Manchester City Council (MCC), Trafford Council (TC), Wigan Council (WC), Stockport Council (SC) and Manchester Airport Group (MAG) will also submit individual responses as they are directly affected by High Speed 2 (HS2) and Northern Powerhouse Rail (NPR). This submission should be read in conjunction with these responses. In this response 'GM Partners' is a collective term to refer to GMCA, TfGM, MCC, TC, WC, SC and MAG.
- 0.2 The submission sets out a response per question that is supported by the Investment Table in Appendix 1 (A1). The table should be read in conjunction with this written response, as explained in Question 1, as it sets out details per scheme in relation to Questions 2,3, 4,6,7,8,10 and 11. Appendix 2 (A2) sets out a schedule of Supplementary Data, including referenced policies and strategies (R1.1, R1.2 etc), for which copies / links have been provided.
- 0.3 In preparing this response, GMCA understands that the NIC assessment would inform the Integrated Rail Plan (IRP) that the Government announced following the publication of the Independent Oakervee Review of HS2. GM Partners expect to play a full role in the development of the IRP alongside Northern Partners. As such, we expect that this response is viewed as the first stage in a collaborative process with the NIC and Government to produce and agree the IRP, in order to ensure that it can play its full part in levelling up the North.
- 0.4 GMCA fully supports the Government's intention to progress with HS2 Phase 2b. HS2 and NPR are core transformational infrastructure components in the Greater Manchester Growth Strategy and the wider agenda for economic rebalancing in the UK. GMCA has been a strong supporter of HS2 and NPR, whilst retaining a clear position on the need to ensure that they are delivered in a manner that fully complements the connectivity, place-making, local employment and sustainable growth objectives.
- 0.5 GM Partners strongly support the proposition of an Integrated Rail Plan for the North and Midlands. We believe it is essential that HS2 and NPR are recognised as being component parts of an integrated short, medium and long-term infrastructure investment programme to tackle capacity constraints and issues on rail systems across the North. The need for this investment and the capacity challenge the rail network in GM faces was clearly demonstrated on the national rail network by the disastrous May 2018 timetable change. The subsequent chaotic period of very unreliable services resulted in a loss of patronage and substantial loss of confidence in the rail network.
- 0.6 Furthermore, flows of trains on twelve of the seventeen rail routes serving the region are considered to be 'over capacity' for the network, and services on some routes exceed DfT crush capacity guidelines. Investment in the rail network is essential to provide additional capacity to meet present and anticipated future demand and to support the economic rebalancing agenda and sustainable growth. For example, it is estimated that by 2040 there will be 395,000 people working in Manchester city centre, an increase of over 150,000.
- 0.7 GMCA has responded pro-actively in terms of local policy to the opportunity presented by HS2 and NPR, the challenges on the wider national rail network in GM and the need to achieve sustainable economic growth. This includes the Greater Manchester Transport Strategy 2040 (GMTS 2040) (R1.1) - prepared by TfGM on behalf of the GMCA and Greater Manchester Local Enterprise Partnership (LEP). The Strategy focuses on creating an integrated, sustainable and well-co-ordinated transport system, setting out long-term proposals to create a cleaner, greener, more prosperous city region through better connections and simpler travel.
- 0.8 The practical actions planned to deliver this strategy are set out in the draft 5-year GMTS Delivery Plan (2020-2025) (R1.10). This has been published alongside the draft Greater Manchester Spatial Framework (GMSF) (R1.6) to ensure that development and transport are alongside each other to support sustainable

economic growth and contribute to the zero-carbon targets of the city and the region. GMSF includes GM's ambitious plans for major growth in employment leading to an increasing population and an urgent need to build over 11,000 homes a year up to 2035.

- 0.9 A central objective of the GMTS 2040 (R1.1) is the 'Right Mix Vision' for 2040 to reduce car use to no more than 50% of daily trips, with the remaining 50% made by public transport, walking and cycling. This will mean a million more trips each day using sustainable transport modes in Greater Manchester. Central to achieving this, as well as to generating nationally important agglomeration economies, is to accommodate a growth in trips to the Regional Centre of 35% from a 2017 base by public transport and active travel. Manchester City Council, Salford City Council and TfGM are producing an updated City Centre Transport Strategy which will set out an integrated package of measures to support more sustainable transport options when travelling to and from and within the city centre.
- 0.10 GM has set out how the rail network contributes to meeting the ambitious GMTS 2040 and our proposals to overcome some of the significant challenges on the network today in the GMCA Rail Prospectus (R1.2). This sets out the scale of growth in rail-based travel required to support the planned housing and employment growth in Greater Manchester in 2040, including;
- 100% increase in rail-based trips to the Regional Centre
 - 100% increase in national rail journeys to Manchester Airport
 - 200% increase in Metrolink trips across the region
 - 100% increase in people passing through GM stations and stops
 - 50% increase in passenger rail journeys between cities.
- 0.11 As the Prospectus makes clear this will require a step-change in the capacity of rail-based transport, together with significantly enhanced reliability and connectivity to those networks.
- 0.12 In March 2018, GMCA, Manchester City Council and Trafford Council also published a comprehensive growth strategy "The Stops Are Just The Start" (R1.5) for the stations at Manchester Airport and Piccadilly. This sets out the strategy for maximising the opportunity provided by HS2 and NPR through station planning, wider connectivity, full support for adjacent regeneration, and local skills and supply chain benefits. Growth strategies are also being developed for Wigan and Stockport.
- 0.13 These growth strategies sit alongside the GMSF proposals (R1.6) and several Strategic Regeneration Frameworks which set out the scale of regeneration and economic growth opportunities and the need for the right transport investment to achieve this potential. In particular, the Piccadilly SRF (R2.4) (which also links to Mayfield (R2.5), Portugal Street East and ID Manchester (R2.6)), the proposed GMSF Timperley Wedge and MediPark employment and residential development sites, the Greater Manchester Enterprise Zone (EZ) (generated by Manchester Airport, Airport City and the draft Wythenshawe Hospital Campus SRF) (R2.7), the Wigan Town Centre SRF (R4.2) and the Mayoral Development Corporation at Stockport (R6.2) all set out the scale of growth planned and the need for the transport investment to support this growth. For further details please refer to MCC, TC, WC and SC's responses.
- 0.14 In developing the Rail Assessment and IRP, GM believes it is essential that the integrated plan fully considers future economic growth and demand to ensure the rail-based transport network provides sufficient, future proofed capacity and connectivity. This needs to be a holistic view across the network including considering the role of Light Rail, Tram-Train and Metro style services to provide enhanced capacity and connectivity. Furthermore, the IRP needs to be developed in a manner that supports local policy to maximise sustainable economic growth. This includes effective placemaking, regeneration and wider connectivity to the enhanced rail network, as well as maximising opportunities such as employability and skills development.
- 0.15 The assessment also needs to consider addressing the barriers associated with the disjointed nature of the planning process for rail infrastructure. For example, major schemes such as Northern Hub, North West Electrification Project and TransPennine Route Upgrade are being delivered as separate projects and have little integration with Network Rail's Continuous Modular Strategic Planning process. A further

example relates to Manchester Piccadilly where the current proposals ‘bolt’ NPR on to the HS2 station, as opposed to taking a holistic view of developing the right solution for North-South and East-West connectivity and capacity. This is covered in more detail below and in the MCC response.

0.16 It should be noted that this response does not consider any impacts on travel patterns following the Covid-19 pandemic at this stage. However, GM firmly believes that investment in major transport schemes, such as those covered in this response, will form an essential component of the economic recovery needed both nationally, and specifically in the North of England, and will deliver benefits for decades to come.

1. What potential investments should be in scope of the Commission’s assessment of the rail needs of the Midlands and the North? In answering this question, please consider the terms of reference for the Integrated Rail Plan, particularly that HS2 Phases 1 and 2a are out of scope.

- 1.1 In response to this question we understand that the Commission is looking at a list of schemes to consider within the assessment. Whilst we have provided this from a GM perspective - see A1 and 1.12 below - GM Partners believe that the scope of the Commission’s assessment needs to define the long-term requirements for rail infrastructure in the North. This will enable assessments of specific interventions to be considered as part of a holistic framework for meeting local and national policy objectives. From discussion, we understand that the Commission is looking to publish its draft methodology for prioritising schemes in the summer, and we therefore welcome engagement with NIC on this.
- 1.2 The GM Rail Prospectus (R1.2) and GMTS Draft Delivery Plan (R1.10) set out GM’s vision and proposals for the rail-based network, including a comprehensive list of rail investments, (A1 and 1.12). Key areas that should also be considered as part of the scope of this assessment are set out below.

HS2 NPR

- 1.3 GM Partners have maintained that HS2 and NPR need to be delivered in an integrated manner that aligns with Local Policy. We therefore strongly recommend that the scope of the NIC’s assessment considers HS2 and NPR in the context of the Regional Growth Strategies. These strategies, initially funded by Government, set out the local view on how to maximise economic growth and effectively contribute to the levelling up agenda through the delivery of HS2 and NPR. The strategies are based on four pillars - Station Design, Wider Connectivity, Regeneration and Skills - and provide the framework for developing and integration of HS2 and NPR. Specific areas of consideration are included in Q2, 1.12 and A1.

Long Term – HS2 NPR and beyond

- 1.4 HS2 and NPR are major components of the IRP, but not the final pieces of the investment needed. GM believes that the IRP needs to look to the longer term to avoid replicating the challenges and capacity constraints on the network today. Two key areas for consideration are maximising the benefits both locally and across the region of released capacity from HS2 and NPR and providing further long-term capacity across the network (see Q2).

Rail freight

- 1.5 It is essential that freight requirements are considered in the planning process. Increasing concern over climate change and challenges facing the road haulage industry may lead to a major expansion in rail freight requirements. The allocation of limited rail capacity in Greater Manchester between freight and passenger traffic presents challenges, not least on the Castlefield Corridor and across the Pennines. Some lines, for which we have proposals for Tram-Train services, are also used by freight and therefore there is a need to understand whether both can be accommodated, and what capacity increases would be needed. GM Partners are keen to work with the rail industry and Government to explore how these challenges can be overcome, including considering potentially radical solutions, for example the possibility of re-routeing cross-Pennine rail freight away from the Regional Centre.

Ensuring integration, governance and appropriate delivery models

1.6 As noted above, one of the main barriers to development and delivery of rail infrastructure solutions is that the planning process is not sufficiently joined up. There are many different organisations involved in the process, but they are not necessarily aligned in delivering the solution and therefore there is not always ownership and commitment to the full process to ensure complete delivery and realisation of benefits. GM believes that the NIC should give this some consideration as part of the Rail Assessment, including working with Local Partners on their role in the process. This will be essential in ensuring that an integrated rail plan can be effectively delivered and some of the current barriers to delivery can be overcome.

Investments Table for inclusion in NIC Scope

1.7 A1 and 1.12 below, set out the investments GM Partners believe should be considered as part of the assessment. In preparing this list, GM has only included investments that meet our understanding of the NIC's terms of reference by achieving at least one of the following:

- Improving connectivity at more than a very local level.
- Providing additional infrastructure capacity at a capacity-critical section of the network.
- Providing a new link to an HS2 NPR station (integrating HS2 & NPR with the wider network).
- Accommodating rail demand when the operation of HS2 Phase 1 and 2a places additional pressure on the 'classic' rail network, before relief is provided by HS2 Phase 2b.

1.8 It should be noted that related interventions that meet the criteria have been grouped together as programmes. Well-defined and funded interventions expected to be delivered in the next 5 years (as noted in the Draft Delivery Plan (DDP) (R1.10) Map A, are however listed separately.

1.9 A1 and 1.12 below include schemes which fit the criteria above and therefore do not represent a full list of all investment GM believes is needed in the rail-based network. For example, broader investments, such as vehicles and GM proposals for new stations and stops, to provide improved local connectivity, are not included. Information is available in the DDP (R1.10) or upon request to TfGM on the following investments:

- New rail stations and Metrolink stops.
- Metrolink extensions.
- Mobility / Travel Hubs / Park & Ride upgrades.
- Rail station accessibility and customer facilities improvement programme.
- Renewal and enhancement of Metrolink infrastructure.

1.10 GM also has proposals for Bus Rapid Transit (BRT), two of which would be relevant to the NIC's terms of reference where they provide new links to the HS2 NPR network:

- BRT connecting Manchester Airport to housing developments to the east (DDP Ref.08.04 (R1.10)) and
- BRT connecting Manchester Airport / HS2 NPR to Altrincham, including National Rail and Metrolink networks, facilitating much-improved public transport access to Manchester Airport from locations such as Northwich and Knutsford (DDP Ref W.08.02 (R1.10)).

1.11 Further information about these proposals can be provided by TfGM upon request.

Investments Summary Schedule

1.12 The schedule below sets out a summary of the Investment Table. It lists the investments and indicates where the investment applies to the remaining questions asked by the Call for Evidence. The full Investments Table is provided in Appendix 1 (A1) and should be referred to and read in conjunction with the responses set out below. The responses below set out the key themes for GM whilst the detailed Investments Table provides detail against each scheme for the relevant questions. Columns shaded in turquoise indicate where there is further detail for individual schemes in the Investment Table for each question.

Ref in GMTS 2040 DDP	Programme	Rail-based investments	Why Relevant?	Q2a)	Q2b)	Q2c)	Q3)	Q4)	Q6)	Q7) & Q8)	Q10)	Q11)
RC.07.01	HS2/NPR	Manchester Piccadilly HS2 and NPR Growth Strategy	Creation of an integrated station between HS2, NPR, 'classic' rail, and Metrolink (and potentially other metro services) at Manchester Piccadilly, maximising the opportunity to create a growth hub at this highly accessible location. Rail interventions to connect with a wider catchment are listed separately. Essential that the right solution at Piccadilly is taken forward that provides a properly integrated solution, which incorporates Metrolink and facilitates the SRF. See main response, particularly Q2, MCC response and appended report from Bechtel and well as GM HS2 NPR Growth Strategy									
G.01.02	HS2/NPR	Manchester Airport HS2 and NPR Growth Strategy	Ensuring HS2 and NPR connectivity to via the new station to Manchester Airport and developments in this area is essential. The Growth Strategy includes a range of improvements to integrate the new HS2/NPR station with its surrounding area. This includes integration of a Metrolink, highways improvements and other sustainable modes. Rail interventions to connect with a wider catchment are listed separately.									
C.06.03	HS2/NPR	Wigan HS2 Growth Strategy	Station development and wider connectivity improvements to enable the Wigan Stations to accommodate HS2 services, including 400m services, provide an appropriate Gateway to High Speed services and improve connectivity locally and across the region including Merseyside, Lancashire and the North, as well as locally and across Greater Manchester.									
None	HS2/NPR	HS2 Northern Chord	New link to facilitate trains running Manchester Piccadilly - Manchester Airport - Wigan - points north. Would provide a step-change in journey-time from Manchester Airport to Wigan and Scotland, and relieve capacity on the Manchester - Bolton - Preston and Manchester - Newton-le-Willows corridors, as well as in Manchester City Centre and Airport line.									
C.06.02	HS2/NPR	Stockport HS2 Growth Strategy	To address capacity constraints on West Coast Main Line in and near Stockport Station: these will become pressing when operation of HS2 Phase 2a begins, and before HS2 Phase 2b provides relief to this section of WCML. The investments will provide long-term benefits after completion of HS2 Phase 2b.									
W.13.09	HS2/NPR	South Manchester rail improvements (including HS2 readiness)	Improvements to accommodate rail demand on the Manchester to Stockport and Airport corridors, especially post-HS2 Phase 2a, but pre-HS2 Phase 2b, to achieve HS2 readiness.									
W.13.06	HS2/NPR	Stockport area rail infrastructure improvements	A range of improvements that are required in order to deliver HS2 Phase 2a, and would continue to be relevant after Manchester to London services are diverted to HS2 Phase 2b. Importantly, includes works at the life-expired Greek Street Bridge for investment in a better than like-for-like replacement (which would otherwise be Network Rail's asset renewal approach). A widened rail corridor at the Greek Street Bridge would resolve several linked issues within Stockport's surface transport network, and release a critical rail pinchpoint to facilitate a metro / tram-train service from Stockport to the Manchester Airport HS2/NPR station, Airport City and the Airport itself.									
C.02.01	Castlefield Corridor pinch-point	Castlefield Corridor - Deansgate - Oxford Road - Piccadilly capacity expansion	A critical bottleneck in accessing Greater Manchester's Regional Centre, and also to accessing HS2 and NPR. This constraint will not be substantially relieved - if at all - by NPR due to need to 'backfill' services for local traffic. Relevant for feeding HS2/NPR trips such as Bolton - London and Preston - Sheffield.									
RC.01.01	Castlefield Corridor pinch-point	Salford Central Station Upgrade	By permitting Liverpool-bound services to use this well-located city-centre station, rail access to Manchester City Centre will be improved, and some pressure taken off the Castlefield Corridor by improving access to Manchester City Centre by services operating via Victoria.									
RC.09.01	"Classic" Rail Network	Platform lengthening and increases in passenger capacity at stations in support of longer trains.	Facilitates longer trains to accommodate growth in rail travel, also avoiding access to HS2/NPR being compromised by inadequate capacity.									
W.13.04	"Classic" Rail Network	Hope Valley line improvements (part of Northern Hub - Manchester to Sheffield)	If NPR uses this line, it will need to continue to accommodate local passenger services and freight									
C.02.02	"Classic" Rail Network	Trans-Pennine Upgrade	Access to Greater Manchester's Regional Centre, and also to HS2 and NPR, for trips such as Huddersfield - Birmingham. Will facilitate long-term improvements to local services once NPR is in operation.									
W.13.08	"Classic" Rail Network	Cheshire Line Committee (CLC) improvements	A programme of improvements to the CLC line that could include investments such as electrification, passing loops, and re-signalling. Will improve capacity and connectivity, and access to HS2/NPR.									

Ref in GMTS 2040 DDP	Programme	Rail-based investments	Why Relevant?	Q2a)	Q2b)	Q2c)	Q3)	Q4)	Q6)	Q7) & Q8)	Q10)	Q11)
W.13.05, W.13.07, W.13.10 W13.11, and W.13.12	"Classic" Rail Network	Connectivity and capacity improvements on the National Rail network in Greater Manchester	A programme of improvements to improve capacity and connectivity, including access to HS2/NPR. Definition will be based on corridor studies.									
W.13.02	"Classic" Rail Network Electrification	Bolton - Wigan electrification	To improve capacity and connectivity, including access to HS2 at Wigan.									
W.13.03	"Classic" Rail Network Electrification	Manchester - Stalybridge electrification	To improve capacity and connectivity, including access to HS2/NPR at Manchester Piccadilly.									
G.06.01	Rail Freight	Port Salford rail freight link	To facilitate rail freight access to the proposed freight terminal at Port Salford, subject to any capacity constraints on the Chat Moss line.									
None	Airport	Manchester Airport classic station capacity increase	Allow longer/additional trains to use Manchester Airport, maintaining present rail connectivity: the longer trains are expected to be needed to accommodate demand growth to/from the Regional Centre of Greater Manchester.									
G.03.02	Airport	Extension of the Airport Metrolink line to Terminal 2	Provides a better connection to the newly expanded Terminal 2 for the existing rail passengers at Manchester Airport station, and for much of South Manchester (particularly those on the east side of Wythenshawe - a large 10% most deprived area). A key precursor to the extension of Metrolink to Manchester Airport HS2/NPR Station.									
W.08.22	Airport	Extension of the Airport Metrolink line from Roundthorn to Newall Green / Davenport Green	Better connects central Manchester with the residents on the west side of Wythenshawe and the key employment centres around Wythenshawe Hospital, and vice versa. A key precursor to the extension of Metrolink to Manchester Airport HS2/NPR Station.									
G.08.01	Airport	Completion of the Airport Metrolink line	The key intervention to facilitate high-frequency rail-based access between HS2/NPR and the Manchester Airport Terminals, Airport City and much of South Manchester. A precursor to combining with items W.08.33 and/or G.08.02 to provide further access to HS2/NPR, the Airport & Airport City from Stockport and/or the Altrincham line.									
W.08.33	Airport	Metro/tram-train from Stockport town centre to Manchester Airport	A rail-based link across South Manchester between Stockport and Manchester Airport HS2/NPR station, Manchester Airport Terminals and Airport City.									
G.08.02	Airport	Metro/tram-train from Cornbrook to Manchester Airport via Timperley	A rail-based link across South Manchester between Sale/Stretford and Manchester Airport HS2/NPR station, Manchester Airport Terminals and Airport City.									
None	Airport	Manchester Airport Western Link	New link from Manchester Airport to Mid-Cheshire line, improving rail access to Manchester Airport and the planned HS2/NPR station, and also speeding rail travel from Manchester to Chester and North Wales.									
RC.03.08	Salford Quays, MediaCity & Inner Salford	Metrolink connection from MediaCityUK to Salford Crescent	A rail-based connection from the major and growing trip-attractor of MediaCityUK to the rail network on the north side of Greater Manchester - facilitating access from locations including Bolton and Rochdale. Would link with or extend existing Metrolink services.									
RC.03.09	Salford Quays, MediaCity & Inner Salford	Metrolink connections to inner Salford	Rail-based connections from this rapidly developing and increasingly high-density part of Greater Manchester's Regional Centre. Could include a new link to Manchester City Centre, facilitating access from the wider rail network to the many jobs expected to be located here.									
W.08.19 to W.08.21 plus W.08.10	Metro / tram-train Network	tram-train Pathfinder Projects	Aims to overcome technological and institutional challenges to tram-train operation in Greater Manchester, including testing on-board energy storage to reduce track-side infrastructure. Tram-train can improve access to HS2 and NPR, especially at Manchester Piccadilly, and - by diverting services onto separate routes at the Northern Hub bottleneck - release capacity on the National Rail network for improvements to other rail services.									
W.08.29 to W.08.33	Metro / tram-train Network	Metro / tram-train services radiating from Manchester City Centre	High-frequency metro-type services, providing improved connectivity to support the growth of the Regional Centre in Greater Manchester plus improved access to HS2/NPR at Piccadilly. Options include lines to Glossop, Marple, Wigan via Atherton, Warrington and Stockport / Hazel Grove, typically replacing suburban services on the National Rail network.									

Ref in GMTS 2040 DDP	Programme	Rail-based investments	Why Relevant?	Q2a)	Q2b)	Q2c)	Q3)	Q4)	Q6)	Q7) & Q8)	Q10)	Q11)
RC.08.03	Metro / tram-train Network	Improved Metrolink capacity between Piccadilly and Victoria stations	Facilitates improved frequency and capacity north to south across Manchester City Centre between two major rail stations. Relevant for access to HS2/NPR for trips such as Oldham - London and Oldham - Sheffield.									
None	Metro / tram-train Network	Improved Metrolink capacity through Cornbrook	Increase in vehicle throughput capacity at a critical point on the Metrolink network near Greater Manchester's Regional Centre, to accommodate demand growth.									
RC.08.04	Metro / tram-train Network	City Centre Metro Tunnel	A step-change in metro capacity, facilitating the targeted growth of the Regional Centre, and providing capacity in Manchester City Centre to operate most or all of the metro services in W.08.29 to W.08.33. Metro conversion of suburban rail lines would release capacity on the National Rail network for improved services on other routes, including inter-urban services. Access to HS2/NPR at Manchester Piccadilly would be much-improved, and would not be impaired by the capacity constraints that are otherwise expected to adversely affect rail-based access to Manchester City Centre by 2040.									

Please note for Q6: For projects at concept stage the process of defining the geographic area of impact to be addressed by the intervention and the design of the proposed intervention have not been completed. Information on potential environmental effects of these investments is therefore unavailable. Information on potential environmental effects presented for identified investments have been collated from high level environmental assessments undertaken to identify key environmental sensitivities in defined intervention areas or extracted from documents such as environmental reports, press publications, leaflets etc. available for identified investments at later design stages.

2. Which set of rail investments do you believe would, together: a. best unlock capacity within the Midlands and the North? b. best improve connectivity within the Midlands and the North?

- 2.1 The contribution that each intervention both individually and jointly would make to improving capacity and / or connectivity is set out in 1.12 and A1. In Greater Manchester unlocking rail capacity is necessary to improve connectivity. This is because the critical constraint on improving connectivity, by running more trains, is typically at the bottleneck on the National Rail network in Manchester City Centre. This bottleneck impacts services across the North and North West, as well as locally within GM.
- 2.2 In advance of HS2 and NPR, there are several ways in which the Manchester capacity constraint needs to be unlocked to improve connectivity. There are existing commitments that would improve capacity and reliability in and around Greater Manchester. These include Castlefield Corridor (A1 - C.02.01) – the most pressing capacity constraint on the National Rail network in Greater Manchester; the re-opening of disused platforms at Salford Central station to improve connectivity by enabling Liverpool-bound services to use the station; and the TransPennine Route Upgrade which will provide additional capacity and capability for both freight and passenger services, through the provision of additional tracks, electrification and grade separation. These interventions need to be delivered in full as soon as possible (see Q3) as they address critical rail capacity constraints and shortfalls in rail connectivity. The uncertainty created by the delays to their implementation adds to the difficulty of long-term planning for the future of rail in Greater Manchester and the North.
- 2.3 A parallel way of increasing conurbation capacity is to convert selected suburban rail services on the National Rail network to metro operation, as with the highly successful conversions of the Bury, Altrincham, and Oldham/Rochdale lines to Metrolink. GM proposes to continue to extend the benefits of Metrolink, as well as utilising Tram-Train technology as set out in A1 and 1.12 (W.08.29 to W.08.33) and the DDP (R1.10). The introduction of new modes will release capacity on the National Rail network for improving services that are unsuitable for metro conversion, benefiting both Greater Manchester and the North of England. For example, Metro/Tram-Train to Wigan via Atherton (W.08.31 in A1) could release capacity at critical rail capacity constraints near Salford Crescent station, enabling more trains to run on the Manchester – Bolton – Preston corridor. As such, GM believes it is essential that the NIC Assessment includes Light Rail opportunities, such as Metrolink, Tram-Train and Metro services.
- 2.4 New Tram-Train / Metro services and the expansion of Greater Manchester’s highly successful Metrolink network will also play a crucial role in improving connectivity both locally and by providing improved connectivity to the suburban, interurban and, in the future, High Speed rail network. Several new conversions and extensions of the Metrolink network are proposed, especially where major population or employment centres (existing or planned) are located beyond walking-distance of the existing rail-based network, as set out in A1.
- 2.5 In the longer term HS2 and NPR provide a further step change in capacity and connectivity between the northern cities, the Midlands and London. This includes releasing capacity on the classic rail network. GMCA fully supports the HS2 NPR programme, however believes that the schemes as currently presented do not maximise the opportunities or potential value for money in terms of capacity, connectivity and supporting economic growth, both within GM and the wider Northern economy. To maximise these opportunities GM feels that there needs to be segregation of new NPR infrastructure in the form of new lines between Liverpool and Leeds via Bradford and Manchester, as opposed to lower capacity and extremely disruptive upgrades, and greater integration with local policy and place making. This includes fully considering multi modal connectivity to the High Speed network, both across the conurbation and regionally. Specific issues for consideration in the NIC’s Rail Assessment are noted below:

Stockport area rail infrastructure improvements

- 2.6 GMCA notes that the current indicative service patterns post HS2 Phase 2b do not include a High Speed service to operate through Stockport. Stockport is a critically important location for the National Rail

network but is currently operating at a very high level of capacity utilisation. This has resulted in operators not being able to meet franchise commitments in terms of service levels, as well as contributing to poor network reliability. This constraint will be further exacerbated when HS2 Phase 1 services initially use the “classic” network via Stockport to reach Manchester city centre. If this issue is not resolved prior to delivery of HS2 Phase 1, there is a risk that further, unacceptable compromises may have to be made to accommodate both existing and new demands for capacity. By resolving this issue beyond HS2 Phase 2b, this additional capacity can then be utilised to allow the HS2 service that is scheduled to serve Stoke-on-Trent and Macclesfield to run on to Stockport and into Manchester. The extension of this service is essential and will provide critical connectivity for Stockport. Furthermore the unused additional capacity that has been created will enable additional local and regional services to meet forecast demand growth. Stockport Council are developing a Vision for redeveloping Stockport station, Stockport Masterplan (R6.5), in a way that will unlock network capacity, provide improved passenger facilities and better integrate the station with the surrounding areas (See SC response).

- 2.7 In the short term, we need to ensure that Greek Street bridge on the approach to Stockport Station is reconstructed and that its cutting is widened to provide capacity for increased future rail services, as well as enabling Tram-Train services to link to Manchester Airport, East Didsbury and towards Ashton (see A1). Stockport is a strategic location on the network and therefore it is important to ensure its continued excellent rail connectivity once HS2 Phase 2b is operational. GM sees NPR as playing a key role in this by running Manchester to Sheffield services via Stockport station, providing links to the airport and ensuring continued provision of commuter capacity from the south to Manchester city centre.

Piccadilly

- 2.8 GM believes that the NIC should specifically consider Manchester Piccadilly in terms of the integration between HS2, NPR, the wider rail network and local policy. Piccadilly is central to the HS2 / NPR network in the North, and therefore it is essential to get the right solution to ensure there is capacity to meet long term demand, provide connectivity across the North and support economic growth.
- 2.9 GM does not believe that the current ‘surface turnback’ station will provide this, nor enable the level of reliability and resilience needed to effectively support the wider High Speed network. Furthermore, it will frustrate the place-making and economic growth agenda set out in the Piccadilly SRF (R2.4) and the GM HS2 NPR Growth Strategy (R1.5). The current HS2 proposals consider NPR as a ‘bolt on’ to the HS2 scheme, as opposed to providing a holistic view of how to best deliver an integrated HS2 and NPR solution that will provide long term capacity, reliability and connectivity (North / South and East / West).
- 2.10 This is demonstrated by the work commissioned by MCC and TfGM and carried out by Bechtel to review Piccadilly Station, Development of Piccadilly Station (R7.3). The report notes that whilst the HS2 alignment is appropriate for a HS2 only solution, it is not the optimal alignment in properly considering NPR and the need to provide both East-West and North-South Connectivity. It concludes that a fully underground and re-orientated through-station could address the main weaknesses of the existing options and offer much more flexibility for future train service provision.
- 2.11 The Bechtel report was also considered by the Richard George Independent Review of Piccadilly (R7.12), agreed by the TfN Board. Richard George notes that whilst the surface turnback solution is cost effective to meet defined objectives, the solution in terms of the best way forward for the long-term development of land use and transport infrastructure could be very different. Further detail on the improvements needed at Piccadilly, issues with the HS2 scheme and the findings of the Bechtel review is set out in MCC’s response. This is fully supported by the GM Partners.
- 2.12 It should be noted that in terms of wider connectivity, work is underway on the integration of Metrolink with the current surface HS2 proposals. This is essential for ensuring connectivity to the High Speed network. Any solution at Piccadilly will need to be fully integrated with Metrolink and the expansion of the Metrolink / Tram-Train network, and properly consider multi-modal connectivity.

Airport

- 2.13 GM regards connecting HS2 NPR to Manchester Airport essential to both ensure growth in the Airport area and to enhance connectivity for the Airport's key customer base across the North West. It is essential that development of the rail hub considers multi-modal connectivity from walking and cycling, bus and mass transit to both the Airport and wider development proposals. This includes integration with the Metrolink Western Leg extension which requires amendment to existing Powers, provision for which must be included in the HS2 Phase 2b Hybrid Bill. Connectivity for the Airport is covered in more detail in Q11, MAG's response, 1.12 and A1).

Northern Chord

- 2.14 GMCA considers the Northern Chord connection between the Manchester High Speed spur and the Golborne link to be vital to provide improved connectivity between the North West (including Wigan, Preston and Cumbria) and Scotland, with Manchester and Manchester Airport. In the 2016 consultation HS2 Ltd revised their proposal to relocate an HS2 depot to a site north of Crewe and removed the Northern Chord. GMCA reiterates its serious concerns over these revisions. In particular this means that High Speed services would not be able to run from the North West and Scotland to Manchester Airport or Piccadilly via the HS2 alignment.
- 2.15 Utilising the Northern Chord has the potential to avoid the already highly utilised lines between Euxton Junction and Manchester, and between Newton-le-Willows and Manchester, as well as reducing pressure on the Castlefield Corridor. This would provide additional capacity to support one of the busiest rail corridors into Manchester, from Preston via Wigan or Bolton. If the Northern Chord progresses, Trafford Council has consistently identified the need for HS2 Ltd to work closely with the GM Partners to develop engineering solutions that mitigate local impacts.

Golborne Link

- 2.16 The GM Partners believe that the HS2 Phase 2b proposals need to be delivered in full, including the Golborne Link which provides crucial additional capacity for services running between Scotland, Cumbria, Lancashire, Birmingham and London. The link provides the ability for High Speed services to bypass the Weaver Junction section, one of the busiest and most congested parts of the West Coast Mainline (WCML). This, in turn, frees up additional capacity on this section of the WCML for other passenger services and rail freight. Further investment is required on the WCML north of the Golborne Link in order to allow HS2 services to reach their full potential and free up capacity into Scotland. The Golborne Link also maximises High Speed running between London / Birmingham and Scotland, thereby minimising end-to-end journey times. For further detail, see the WC response.
- 2.17 As with the Northern Chord proposals, Trafford Council remains concerned about the impact of the Golborne Link on communities in Trafford and has consistently identified the need for HS2 Ltd to work closely with GM partners to develop engineering solutions that mitigate local impacts.

Wigan

- 2.18 Wigan was announced as an HS2 hub in July 2017. GM sees Wigan as an essential gateway to provide access to the High Speed network, providing the opportunity to connect into (and build on) existing rail connections with Merseyside, Lancashire and the North, as well as Greater Manchester. As such, work is currently underway to develop a Growth Strategy around the four 'pillars', in line with the NIC recommendations and consistent with the Manchester Piccadilly and Manchester Airport 'The Stops are Just the Start' (R1.5) Growth Strategies. A Wider Connectivity Study will look to enhance the town's strategic position, both on the rail network and proximity to the Strategic Road network, by broadening the catchment area of the Wigan stations to support connectivity to the rail network, including HS2. This work will consider multi modal connectivity including Tram-Train to maximise connectivity to the HS2 NPR network. It is vital that services utilising the Golborne link stop at Wigan, and therefore the

infrastructure at Wigan hub should be developed to accommodate the longer trains. For further detail, see the WC response.

Beyond HS2 and NPR – Metro Tunnel

- 2.19 Whilst HS2 and NPR are potentially transformational in terms of capacity release and economic growth, further investment is necessary to meet long term capacity and connectivity needs.
- 2.20 GM believes that if rail-based modes are to offer more convenient journeys and higher capacity in the long term, new approaches are needed to make the best use of the network. Many other cities - including Munich, Stuttgart, Milan, Liverpool and Newcastle - have linked pre-existing suburban railway lines with new tunnelled infrastructure to create high-capacity, high frequency metro systems offering excellent access to and through their city centres. Greater Manchester will need to follow the same path if it is to achieve our 'Right Mix' vision of 50% trips by sustainable modes by 2040. A Regional Centre metro tunnel (or tunnels) would enable rail-based travel in Greater Manchester to continue to grow into the 2040s and beyond through enabling a high-capacity and high-frequency metro service, without compromising city centre growth and development.

3. Within the set of investments you identified, which individual investment(s) should be the highest priority? Please explain your rationale for this and how this would affect the phasing and sequencing of the full set of investments you identified.

- 3.1 A1 identifies specific cases where phasing is important. It also endeavours to set out where schemes interface with other major schemes, for example schemes which provide connectivity with HS2 and NPR, to inform the development of the IRP. It should be noted that a number of schemes are in an early stage of development and therefore this should be seen as an initial assessment at this stage.

Prioritisation

- 3.2 GM does not consider it to be appropriate to pick out specific schemes as a priority in isolation from an overall strategy. Although it is expected that there will be some changes to the programme in the light of further study and development, the overall scale of the additional capacity provided, and the mix of improvements to connectivity represents what GM believes to be needed to achieve its 2040 Right Mix vision of zero net growth in motor vehicle kilometrage, based on the available evidence.
- 3.3 In the vision-led approach set out in the GMTS 2040 (R1.1), investments in transport are directed to achieving the vision of the kind of place that GM wants to be in 2040. A pathway to 2040, comprising a set of changes in patterns of travel and modal mix, has been defined to achieve that vision. The pathway will be reviewed through monitoring of progress.
- 3.4 The vision-led approach differs sharply from the 'incremental' approach that has in the past been followed in the UK. It requires a strategy and a programme of investments, whereas the incremental approach demands a pecking order in which investments are chosen according to which perform 'best', typically without proper consideration of complementary schemes and policies, or whether the individual investments can deliver all the objectives in isolation. The terms of reference set by the NIC for the IRP suggest a vision-led approach, which GM strongly supports.
- 3.5 It should be noted however that there are existing National Rail infrastructure commitments which urgently need to be progressed and delivered. For example, the Castlefield Corridor is a critical capacity constraint on the network, impacting both the resilience and reliability of services across GM and the North. A planned infrastructure upgrade (resignalling, remodelling and additional platforms at Oxford Road and Piccadilly) has already suffered an unacceptable long-term delay. Despite originally being planned for delivery by 2019 and having completed a Transport and Works Act Order application Public Inquiry in Autumn 2015, a final decision on the Order application is still awaited from the Secretary of State for Transport. Similarly, the TransPennine Route Upgrade (TRU) will provide enhanced capacity and capability on this critical east-west corridor, prompt delivery of which is essential to meet existing as well as future requirements.

- 3.6 Furthermore, these committed interventions underpin both the planning process for the IRP and assumptions made in preparing the business case for major schemes such as NPR. Failure to deliver these already committed schemes means that the baseline for these future major investments does not match the reality, leading to a risk that their forecasted benefits may not be realised, they become difficult to deliver at all, or the costs are increased as they have to address problems that should have already been resolved. All of these factors impact on their business cases and increase the risk that they are not approved for delivery.
- 3.7 This further demonstrates the need for the IRP to culminate in a long-term plan and commitment to deliver a full programme of investments to meet capacity and connectivity necessary across the region. This will also need a delivery model that supports an integrated, joined up approach across the industry and key partners, enabling lessons to be learned from delivering - or indeed failure to fully deliver - previous major rail infrastructure programmes, such as the Northern Hub.

Phasing and Sequencing

- 3.8 In developing the phasing and sequencing for the IRP, GM recognises that a number of considerations will apply, such as operational impacts; consenting requirements and timeframes; development and delivery timeframes; planning assumptions; interfaces with other schemes and Local Policy implications; impact on passengers to minimise disruption through delivery particularly over the long term; and Supply chain and industry resources.
- 3.9 In addition to the specific scheme information in 1.12 and A1, GM has set out our view on the overall delivery plan in the GM Rail Prospectus – see page 21 of R1.2. Appropriate consideration of interfaces between schemes and local policy is essential for sequencing rail investment in GM, in particular:
- The original HS2 programme (Phase 2b operational 2033) underpinned GMTS 2040 (R1.1). Therefore delays to the HS2 programme have a wider impact and will impact GM’s ability to both achieve its strategy and support sustainable growth. There remains significant uncertainty on the timetable for delivering HS2. GM is therefore pushing DfT and HS2 for clarity on this as soon as possible.
 - Prioritisation of the development and delivery of the HS2 programme is therefore essential, not just to realise the capacity benefits of HS2, but also to enable the delivery of wider schemes on both a local and regional level to progress.
 - In considering phasing and sequencing, it is essential that this takes into account the schemes, such as Metrolink and Tram-Train, that are essential in ensuring connectivity to the High Speed network. This also needs to consider the inclusion of appropriate legal powers within the consenting process, for example the HS2 Phase 2b Hybrid Bill.
 - The GM HS2 NPR Growth Strategy (R1.5) sets out the principle of ‘build it once, build it right’. It is essential that this principle underpins the delivery plan for the IRP, as well as HS2 NPR. In particular, the IRP needs to ensure that the delivery programme works with proposed regeneration and adjacent developments to both minimise blight and maximise long-term economic growth.
- 3.10 As noted above, it is essential that the IRP is supported by a delivery model that enables a co-ordinated approach to delivery. GM believes that local considerations in terms of phasing that are set out above demonstrate the importance of ensuring Local Partners are fully involved in developing the delivery model(s) for the IRP. GM looks forward to working with NIC and Government to address this.
- 4. What supporting policies need to be in place to deliver the benefits of the investments you identified? If there are any dependencies with other investments/policies, how confident are you that these supporting policies will be put in place?**
- 4.1 In Greater Manchester the opportunities provided by devolution and greater local determination of funding and delivery have, for many years, allowed us to take a bold and long-term view of our transport needs. We have developed a robust local policy framework and proposals for improving the transport

network and achieving our growth ambitions, in the medium and long term, including in relation to national rail interventions.

GM Policy

- 4.2 Greater Manchester's main transport policy document is the Greater Manchester Transport Strategy 2040 (GMTS 2040) (R1.1) - the City Region's current statutory Local Transport Plan - which supports the overarching Greater Manchester Strategy, 'Our People, Our Place' (R1.3), and sets out our approach to planning the City Region's transport network in a way that supports jobs, housing, skills, public health and the environment. GMTS 2040 (R1.1) supports a number of strategic documents and plans, including the draft Greater Manchester Plan for Homes, Jobs, and the Environment (the Greater Manchester Spatial Framework (GMSF) (R1.6)) - and the Local Industrial Strategy - as sustainable growth will both need and be driven by improved connectivity. The emerging plan aims to focus new activity in places which are well served by the public transport network and will both support and be supported by plans to strengthen the role of the Greater Manchester and wider North's rail network. This is true on both a local and pan-northern level, as Greater Manchester has a fundamental role to play as part of the Government's 'levelling up' agenda.
- 4.3 In terms of other relevant local policy documents and proposals, the Greater Manchester Rail Prospectus (R1.2) outlines a step-change in the role of rail to support the City Region's planned growth, and the City Centre Transport Strategy - which is currently being developed – will take into account the city centre's continuing economic and population growth and Manchester's ambition to become a zero-carbon city by 2038. The strategy has the central aim for 90% of trips to the city centre to be made by public transport, foot or cycle by 2040. A Clean Air Plan for Greater Manchester (R1.4) is also under development. GMTS 2040 is supported by the draft 5-year Delivery Plan (R1.10), which lists rail-based interventions. A refreshed version of the draft Delivery Plan will be published this year. These documents will be further supported by sub-strategies, including a Rapid Transit Strategy which covers suburban rail, Metrolink and other metro services, and bus rapid transit. The sub-strategies are presently being drafted with a view to finalisation in summer 2020.
- 4.4 As shown in A1 the Manchester Piccadilly HS2 and NPR Growth Strategy requires the Piccadilly Strategic Regeneration Framework to proceed (see the MCC response). The Airport HS2 and NPR Growth Strategy links to the wider plans for the area, including the proposed GMSF development sites at Timperley Wedge and MediPark, Wythenshawe Hospital Campus SRF and Airport City. GMSF employment and residential development proposals for example at Timperley Wedge and MediPark would also be served by the Metrolink Western Leg (see TC & MAG responses).

Delivery Approach

- 4.5 Cultural change and a more integrated approach - across Network Rail and wider Government – is required to deliver the benefits of the investments identified, and to ensure that future rail strategy is aligned with Greater Manchester's place-based agenda. When it comes to National Rail services in Greater Manchester, there is plenty of opportunity to better meet the needs of the people and places served as part of an integrated travel offer. In our Greater Manchester Rail Prospectus (R1.2) published in 2019 for example, we proposed the agreement of a joint programme of study and development work relating to the National Rail and Metrolink network as a mechanism to achieve this. This may include the development of Tram-Train schemes, or light rail conversion schemes, which could provide an early test of how Greater Manchester and the rail industry can work together to deliver key local priorities.
- 4.6 The right infrastructure, services and governance mechanisms all need to be in place to address the challenges we face. Some of this is within our own hands, but we need Government and transport industry partners to work with us to deliver the scale of transformation required. Further significant investment from Government is required to provide more rail capacity and connectivity, to accommodate future demand, and to support a shift toward a more sustainable transport mix.

Funding

- 4.7 Underpinned by GMTS 2040, GM’s HS2 and NPR growth strategies (for Manchester Piccadilly and Manchester Airport, details of which are set out in ‘The Stops Are Just the Start’ (R1.5)) aim to maximise the benefits from HS2 and NPR by ensuring full integration with the existing and future transport network. GM received funding to produce the strategies, and was previously working collaboratively with Government to ensure a funding strategy for taking this forward but – as raised at Places Group (MHCLG organised session with DfT, HS2 and the cities impacted by HS2) there is now no budget or funding mechanism for progressing the growth strategies. This needs to be addressed as a matter of priority.

Summary

- 4.8 Greater Manchester recommends that a ‘place based’ approach should be taken whilst considering any investment to ensure full integration across the region, as well as full Local Partner involvement into the development of delivery models, policy and funding mechanisms to ensure investment is maximised. As is stated in GM’s policy and strategy documents, it is crucial that a collaborative approach on skills and the supply chain is taken to maximise local benefit.
- 4.9 The relevant specific policies for the GM Partners are listed in A2. Please also refer to the submissions from MCC, TC, WC, SC and MAG. Further information is available upon request. As recommended in the Oakervee Review, national rail interventions should take account of these local policies in order to deliver the best outcomes for areas.

5. What impact would the investments you identified have on greenhouse gas emissions? In particular, how would they affect the UK’s ability to meet its domestic and international targets, including the Paris Agreement and net-zero? In answering this question, it would be helpful if you could consider the expected decarbonisation of road transport, as set out in the Commission’s National Infrastructure Assessment and Freight Study.

- 5.1 In 2016 transportation became the largest emitting sector of greenhouse gases (GHG) in the UK and in 2018 accounted for 31% of carbon dioxide emissions in the Greater Manchester city region. Decarbonisation of the transport sector will play a significant role in the UK meeting its domestic and international targets and the schemes presented here will contribute towards that.
- 5.2 Improving air quality and reducing GHG emissions including carbon dioxide is a key priority for Greater Manchester and its ten local authorities. In 2019 Greater Manchester published its 5 Year Environment Plan (5YEP) (R7.6), with a commitment to become carbon neutral by 2038. This is a science-based target and the Plan sets out the actions needed for GM to make its fair contribution towards the Paris Agreement.
- 5.3 Both the National Infrastructure Assessment (NIA) (R7.9) & Decarbonising Transport (R7.8) identify that rail is more carbon efficient than other forms of road transport and that over 56% of GHG emissions originate from cars. The schemes presented will increase the attractiveness of rail travel, increase capacity on the network and help accelerate modal shift to public transport. The electrification of railway lines and the expansion of Metrolink, which uses 100% green electricity, will contribute significantly to the GM target to have 100% rail electrification by 2040 and removing 0.19MtCO_{2e}.
- 5.4 Rail is one of the most efficient ways of moving goods over long distances. A further priority within the 5YEP (R7.6) is to decarbonise freight transport, shifting to rail and water. The Port Salford freight link will contribute towards this modal shift, saving tonnes of carbon, reducing congestion and improving air quality. A continued programme of railway electrification at a national level will support rail freight operators to adopt electric traction, further enhancing rail freight’s environmental credentials.
- 5.5 At the national level, the Oakervee Review highlights that whilst there are likely to be additional carbon emissions in the short-term from the construction of HS2, the project is likely to be less carbon intensive than other non-rail alternative transport schemes that would deliver similar transport outcomes. More

crucially, High Speed Rail can encourage a modal shift away from car use, especially where it creates capacity on the conventional railway, to encourage more shorter-distance trips by rail. An example of this may be between Wigan and Manchester via Eccles.

- 5.6 In addition, HS2's improvements to rail capacity will enable more freight to be transported using rail, reducing the number of journeys by road, and have the potential to reduce demand for domestic flights. The integration of HS2 and NPR and investment in new rail infrastructure also provides opportunities for decarbonisation of rail across the North and opportunities to utilise heat recovery initiatives from HS2's tunnels in local zero carbon heating schemes.

6. In addition to greenhouse gas emissions, what are the potential environmental effects (positive and negative) of the investments you identified?

- 6.1 The identified investments are at different stages of development, ranging from concept/output definition to detailed design/consented, therefore the information in 1.12 and A1 is in many cases indicative only.
- 6.2 Progressing the identified investments is expected to reduce the use of motor vehicles, leading to positive air quality effects. Other potential positive environmental effects include reduction in traffic noise and reduction in the degradation of designated sites of ecological conservation importance that are sensitive to poor air quality. Beneficial biodiversity effects are expected from the identified investments in line with the priorities set in Greater Manchester's 5-year Environmental Plan (R7.6) which requires new developments to achieve a net gain in biodiversity.
- 6.3 A1 presents the potential local environmental effects associated with the identified investments, where this (indicative) information is available. Local environmental effects of rail investments are typically adverse, particularly during construction, whereas the environmental benefits of rail investment are typically widely distributed and tend to be similar in nature for different types of rail investment.
- 6.4 Where investments are restricted to the existing rail corridor or within an urban context, e.g. HS2/NPR Growth Strategy Work, Salford Central Station Upgrade, Tram-Train Pathfinder, adverse environmental effects are not expected beyond the construction phase. Typical construction-phase environmental effects associated with these investments include deterioration in local air quality, increase in noise and vibration, change to the setting of heritage assets and disruption to public rights of ways which are expected to be negative, indirect, short-term and temporary. With appropriate, standard industry, best practice environmental mitigation measures these potential negative environmental effects are not expected to be significant. Use of a rail head in an appropriate location, to move material by rail, would significantly reduce construction traffic and emissions.
- 6.5 Greater Manchester recognises that transport investments generally have environmental effects and as a result are committed to ensuring that any significant adverse environmental effects are identified and avoided through redesign where possible. Where avoidance is not possible, appropriate mitigation measures will be investigated and implemented where possible, working with the relevant delivery and environmental bodies, with proportionate monitoring measures. As part of the design and assessment process of investments, maximisation of beneficial environmental effects is a key design consideration which is also integral to the cumulative environmental impact assessment. This approach is required by law and will be undertaken to ensure any adverse environmental effects of investments are minimised and beneficial environmental effects maximised.

7. Aside from those delivered by improved connectivity and greater capacity, what broader impacts on people's quality of life could the investments you identified have?

- 7.1 A wide range of additional benefits affecting quality of life can result from rail investment. The information in A1 focuses on two types of additional benefit:

- Other policies facilitated that would either not be possible, or would only be achievable on a more limited scale, and
 - Improvements to the opportunities available to residents of deprived areas.
- 7.2 We are assuming that important so-called ‘secondary’ economic benefits such as agglomeration in urban centres are included within the definition of the impacts delivered by improved connectivity and greater capacity.
- 7.3 The Greater Manchester Growth Strategy – ‘The Stops Are Just The Start’ (R1.5) - details how HS2 and NPR, combined with other investment, will deliver new jobs, new homes, growth and local regeneration with Greater Manchester at the heart of the Northern Powerhouse. The Strategy aims to unlock the untapped economic growth potential within the North of England to which quality of life is an underpinning asset, providing an attractive place for people to live, work, invest and visit. The local regeneration facilitated by HS2 and NPR provides a good example of how rail investment can facilitate policies that would not otherwise be possible or would only be achievable on a more limited scale.
- 7.4 If GM’s preferred option of a tunnelled high-speed facility at Manchester Piccadilly is adopted the area around the re-developed station is expected to provide 40,000 new and sustainable jobs, 13,000 new homes and close to a million square metres of commercial development. Manchester City Council has developed Strategic Regeneration Frameworks for Piccadilly (R2.4) and neighbouring Mayfield (R2.5) using its considerable experience to set out a vision for delivering jobs, homes and place-making.
- 7.5 The arrival of HS2 and NPR at Manchester Airport also offers the opportunity to create a brand new station that both respects the natural setting and is part of a new diverse neighbourhood at Timperley Wedge with homes, offices and hotels, as well as the potential for 20,000 new jobs over the next ten years. Trafford Council and Manchester City Council are already progressing development plans for the wider area in the GMSF.
- 7.6 High Speed Rail and improved north-south and east-west connectivity is a fundamental building block to improving quality of life and promoting the North as a place in which to work, study, live and invest.
- 7.7 Rail investment at Manchester Piccadilly and the Airport will act as a catalyst for redevelopment, attracting investment. Improved connectivity will make the job, training and leisure opportunities created more accessible to residents across GM and the North.
- 7.8 The economic growth in these redevelopment areas, including the increased jobs and homes, are critical to achieving GMSF targets and will deliver a major contribution to the ‘Levelling up Agenda’.
- 7.9 Rail investment will enhance Greater Manchester’s Local Industrial Strategy (R2.2), which sets out growth in frontier sectors which will all require science, technology, engineering and maths (STEM) skills at scale including digital and creative, health innovation, advanced manufacturing and materials and green growth. Developing skills for our HS2 and NPR ambitions offers the opportunity to upskill our residents with the STEM skills not only required to deliver HS2 and NPR successfully, but also to continue to contribute to creating a world-class competitive economy beyond the scope of the investment.
- 7.10 GMCA has already developed a STEM Framework (R1.7) to ensure that the correct skills infrastructure is in place to mobilise skills providers, employers, residents of all ages, and STEM facilitating organisations to increase STEM engagement and maximise the benefits of these investments for local residents.
- 7.11 Rail investments directly serving areas of social deprivation are identified 1.12 and A1. Besides the resulting connectivity benefits, these investments are expected to add to a sense of pride and wellbeing for local residents in their communities. Increased confidence that communities are important and are benefiting from investment can be linked to reduced crime and NEET (Not in Education, Employment or Training) rates.

8. How would the costs and benefits of the investments you identified be distributed economically, socially and geographically?

8.1 The investments identified by GM will result in costs and benefits throughout the North of England and beyond. GM has carried out some analysis of distributional effects within Greater Manchester and can confirm that the ten Greater Manchester Districts will all benefit directly from the investments. We are not able to provide an analysis of the overall distribution of costs and benefits at a UK level. Benefits to deprived areas are identified in the response to Q7.

9. Which set of investments would best improve rail connectivity with Scotland? If these are different to the investments you identified above, please explain why.

9.1 Of the investments identified, GM would see those set out below as making a substantive improvement to rail connectivity with Scotland:

9.2 The Golborne Link provides crucial additional capacity for services running between Scotland, Cumbria, Lancashire, Birmingham and London by enabling High Speed services to bypass the Weaver Junction section, one of the busiest and most congested parts on the WCML. The Link also maximises High Speed running between London / Birmingham and Scotland thus minimising end-to-end journey times.

9.3 Provision of the Northern Chord would allow services from Scotland to utilise HS2 and NPR infrastructure to access both the Airport and Central Manchester, without the need to travel via the congested routes via Bolton / Chat Moss and the Castlefield corridor. This may provide additional capacity to run trains to Scotland at improved frequencies (subject to improvements elsewhere), with the potential for reduced journey times (especially to / from Manchester Airport).

9.4 Upgrade of West Coast Mainline (WCML) north to Scotland - Whilst provision of a new build High Speed route from the North West to Scotland remains a long term ambition, enhancements to the existing "classic" WCML north to Scotland would open up opportunities for reducing journey times, providing higher frequencies, and improving performance. Whilst benefits would be maximised when allied with provision of the Golborne Link / Northern Chord, a standalone scheme would also provide notable benefits for trains accessing Greater Manchester via existing routes.

9.5 Upgrades to the Transpennine route / East Coast Mainline north to Scotland - Whilst less direct than routing via the WCML, hourly services operate between Greater Manchester and Scotland via the Transpennine route and East Coast mainline. Any upgrade schemes for these routes could provide benefits in terms of capacity, reliability and journey time.

9.6 Longer trains - Lengthening services on Greater Manchester to Scotland routes beyond their current 5-car length would improve passenger capacity and overall journey quality. Operation of services with multiple trainsets able to split and join en route would also open up the possibility of enhancing frequencies to existing destinations (currently only served every two hours) or providing new direct services to other destinations currently requiring a change of train. However, any splitting and joining of services would have to be considered in light of extended journey time requirements and performance risks relating to this operation.

10. What would be the impact of the investments you identified on connectivity between the Midlands and the North, and other parts of the UK? Please explain where and how impacts would occur.

10.1 1.12 and A1 list the core schemes which directly support national connectivity and demonstrates that improving connectivity across the UK will be achieved in a number of ways. For example, investment in the Castlefield Corridor will directly improve connectivity between areas to the west and north of Greater Manchester, Manchester Piccadilly and the rest of the UK. Local schemes have an equally important role to play, for example Metrolink and Tram-Train has the potential to provide high quality connections to longer-distance services to the rest of the country, including HS2 and NPR.

- 10.2 HS2 is vital to increasing the capacity and connectivity of Britain’s rail network. HS2 Phase 2b will improve the poor links that currently exist between Manchester and the Midlands, both directly and through releasing capacity for other services. NPR, the east-west rail network across the North, is also vital to boost our city-region’s economy and make Manchester Airport one of the best connected city airports in Europe. NPR will significantly improve capacity, frequency, speed and services between the North’s six main cities and Manchester Airport.
- 10.3 The fundamental aim of our Growth Strategy is to realise, and indeed maximise, the economic potential of rail investment at Manchester Piccadilly and Manchester Airport, across the city region, and nationally. Critical to this is the integration of investment at the Greater Manchester level, regional level (via Northern Powerhouse Rail, the Northern Hub, and other schemes identified in 1.12 and A1), national level (via HS2), and globally (at Manchester Airport), in order to provide the step change in connectivity and capacity needed to realise maximum economic growth.
- 10.4 For the country to reach its full economic potential, all our cities and regions need to perform at the highest level. This means that action needs to be taken locally and centrally to significantly narrow the North-South productivity gap and deliver more balanced growth across the UK. Connectivity plays a vital role in driving productivity and growth by:
- improving businesses’ access to a wider and deeper pool of labour with the right skills, which is made possible by fast, frequent and reliable transport links for commuters. At the same time this provides residents with access to a wider range of employment opportunities.
 - improving business-to-business markets, enabling businesses to serve existing markets at lower cost and new markets further afield. This is a major feature of international connectivity and underlines the importance of Manchester Airport.
 - improving businesses’ access to their customers and providing customers with more choice and the ability to source products of higher quality and/or lower cost, which in turn will drive the competitiveness of the businesses that serve them.
 - Supporting improved productivity of key cities in the North; and
 - acting as a multiplier on all other local and national investment and initiatives, by reducing barriers to competition between the North and other parts of the country by improving access to markets - especially producer and consumer service sectors - and lowering transport costs.
- 10.5 National Rail and Metrolink have played a key role in supporting economic growth, due to more people choosing to commute by rail-based modes over any other form of transport. This has been fundamental in ensuring that economic growth is not just dependent on more cars getting into the Regional Centre, causing more congestion and pollution.

11. What would be the impact of the investments you identified on international connectivity across the Midlands and the North? Please consider the impact on both ports and airports.

- 11.1 The investments set out in 1.12 and A1 include many which improve international connectivity from the Midlands and the North, including access to airports and ports. The majority of these are as a result of improved connectivity to Manchester Airport, which is the largest airport in the UK outside South East England in terms of passenger numbers, and a key international gateway.
- 11.2 They will significantly reduce journey times by public transport to the Airport from locations across the North and Midlands, as well as improving capacity, frequency of services, journey time reliability, and journey quality. A number of the interventions set out will also enable improved opportunities to connect to heavy or light rail services to the Airport.
- 11.3 Improving access to Manchester Airport – both from Greater Manchester and from the Airport’s wider hinterland – is an important part of the GMTS 2040 (R1.1). Manchester Airport plays a pivotal role in providing access to international markets from Greater Manchester and across the North of England and is therefore central to delivering a Northern Powerhouse economy. The Airport employs 25,000 people

on site and contributes c.£4.5bn each year to the UK economy. As the third busiest airport in the UK, and with c.12 million people living within 50 miles, and over 18 million within 75 miles, Manchester Airport is also a major asset for the whole of the UK.

- 11.4 The Airport already provides access to a range of international destinations, with over 70 airlines operating to around 200 destinations worldwide. Direct flights are operating, or planned, to important growth economies around the world: North America, the Emirates, Singapore, Hong Kong and China. It also offers highly flexible, affordable short-haul access to European cities and attracts passengers from across the North, the Midlands, and North Wales. The Airport plays an important freight role, handling around 100,000 tonnes of cargo each year, much of which is high value or time sensitive.
- 11.5 MAG has ambitious plans to grow its passenger market from 24 million trips per annum in 2016 to 45 million by the early 2030s, delivering over £15.5bn annually to the UK Economy and supporting 88,000 jobs in the north west. Unlike major UK airports in the south east, Manchester Airport has spare runway capacity and therefore has enormous potential to rapidly expand its role, without the need for major investment in potentially contentious new runway capacity. MAG is delivering a transformational £1bn investment plan into its Airport facilities, to maintain and enhance its world-class position and secure further new airlines and routes into Manchester.
- 11.6 In addition to their primary role as transport hubs, airport locations are also in themselves increasingly acting as drivers for employment and growth. Airport City (R5.3) in Manchester for example is intending to deliver 5 million square feet of offices over the next 10-15 years, making it a significant attractor of trips in and of itself.
- 11.7 However, the full potential of Manchester Airport will only be realised if surface access to the gateway matches the quality of the transformed Airport facilities and services. While there has already been significant investment in connectivity improvements to the Airport in recent years, such as the Metrolink extension, much more will need to be done.
- 11.8 The Independent International Connectivity Commission Report (February 2017) (R7.11) has highlighted the value of international connectivity to the North's economy and found that improving surface access to its international gateways can deliver improved global connectivity (by increasing demand for more services to a wider range of destinations) in a relatively short timeframe, and thus provide a material contribution to narrowing north-south gap in the UK's economic performance. The study also found that businesses and visitors to / from the North require the same quality of direct connectivity as those in the South, and in many cases (for airports and ports) the capacity exists to deliver this growth.
- 11.9 We will need to improve transport connectivity by public transport to enable both passengers and employees to travel easily and seamlessly to the Airport without a car, coupled with carefully designed demand management measures, to ensure that congestion does not undermine the Airport's long-term growth potential. Connectivity improvements and demand management measures will also support sustainable economic growth at the Greater Manchester Enterprise Zone (GMEZ), and at Davenport Green (which is identified as a strategic site for office and residential development), both adjacent to the Airport.
- 11.10 As well as spreading the economic and social benefits of international connectivity more widely, enhanced rail services also reduces environmental impacts and land use in comparison to other modes. High Speed Rail also provides the opportunity to reduce short haul aviation, reducing emissions or freeing up airport capacity for alternative uses.
- 11.11 Greater Manchester's ambition for the Airport, as set out in GMTS 2040 (R1.1), is to support growth at the Airport and adjacent Enterprise Zone by bringing many more passengers across the North within a one hour and two hour rail journey time, and by ensuring that public transport services better meet the needs of airport passengers and employees.

HS2 & NPR

- 11.12 HS2 will provide a new interchange and track going into and out of the airport. High Speed trains will allow travellers to reach Birmingham in just over 30 minutes, and London in just over an hour, and the new infrastructure will open capacity on existing lines. NPR will, in tandem with HS2, allow for faster and more frequent services in and out of Manchester Airport with goals of 8 minutes to Piccadilly, and 30 minutes to both Liverpool and Sheffield. This dramatically improved connectivity is fundamental to realising the North of England's untapped potential and rebalancing the national economy.
- 11.13 New High Speed Rail services to Manchester Airport will significantly increase the airport's catchment area, bringing more people and businesses within an attractive rail journey time of the airport. This will, in turn, increase the airport's ability to attract new inter-continental routes and further increase the North of England's ability to trade internationally and to develop new global leisure markets.
- 11.14 It is therefore essential that an HS2 NPR station remains part of the High Speed proposals. Furthermore, as set out previously, in order to maximise the benefits of HS2 and NPR it is essential that wider connectivity measures are included as part of the proposals. In particular, the current proposals sever existing Metrolink powers for the Metrolink Western Leg, without provision to fully accommodate these powers in the Hybrid Bill. This is not acceptable. These powers must be re-provided in the Hybrid Bill and the Metrolink proposals considered as part of the HS2 NPR scheme, to ensure vital public transport connectivity is provided to the HS2 NPR Stations from both Manchester Airport and the wider region.
- 11.15 As detailed in Q2, GMCA considers the Northern Chord connection to be vital to provide improved connectivity between the North West (including Wigan, Preston and Cumbria) and Scotland with Manchester and Manchester Airport.

Freight and Ports

- 11.16 Provision of adequate capacity for freight services to and from rail served ports is of significant importance to the regional economy. Rail currently carries a high proportion of intermodal traffic to and from the region for import and export, via deep sea ports in the south, such as Southampton and Felixstowe. However the ability to move freight by rail is hindered by a lack of paths, particularly at key bottlenecks such as the Castlefield Corridor through Central Manchester.
- 11.17 Emerging evidence suggests that intermodal flows by rail are becoming increasingly competitive over shorter distances, meaning that there are opportunities for more relatively local services such as from the Ports of Liverpool, Humber, and Tees to the North West, particularly given current expansion at the Port of Liverpool. These provide the opportunity for modal shift and a reduction in dependency on southern ports, but bring with them requirements for further capacity on the network. In addition to intermodal traffic, rail in the region also conveys imported materials such as biomass and exports such as scrap steel and automotive products to and from port locations. The development and retention of these flows is dependent upon sufficient capacity being available to allow their continued operation. The interventions set out in 1.12 and A1 will greatly support current and future demand for rail freight from Greater Manchester to international ports.

Appendix 1 Investment Table

Ref in GMTS 2040 Draft Delivery Plan	Programme	Rail-based investments relevant for integrating HS2 Phase 2b and wider transport plans in the North and the Midlands	Why Relevant?	Q2a) Capacity	Q2b) Connectivity	Q2c) How would they combine together with other investments?	Q3) Phasing/Sequencing	Q4) Supporting Policies	Q6) Other Environmental	Q7) Other QoL & Q8) Distributional	Q10) Connectivity to elsewhere in UK	Q11) International connectivity
RC.07.01	HS2/NPR	Manchester Piccadilly HS2 and NPR Growth Strategy	Creation of an integrated station between HS2, NPR, 'classic' rail, and Metrolink (and potentially other metro services) at Manchester Piccadilly, maximising the opportunity to create a growth hub at this highly accessible location. Rail interventions to connect with a wider catchment are listed separately. Essential that the right solution at Piccadilly is taken forward that provides a properly integrated solution, which incorporates Metrolink and facilitates the SRF. See main response, particularly Q2, MCC response and appended report from Bechtel and well as GM HS2 NPR Growth Strategy	Increases capacity of Piccadilly Station to accommodate growth in travel demand. Holistic approach needed to ensure solution provides sufficient capacity for long term demand	Facilitates North / South and East / West connectivity through HS2 and NPR. Provision of expanded and relocated Metrolink services are essential for providing wider connectivity to the HS2 network and connectivity to the SRF development. In addition to Metrolink, Station solution needs to facilitate wider connectivity through the incorporation of the Multi Modal Interchange and through a design solution that facilitates the SRF, local policy and placemaking agenda including active modes to ensure connectivity within the city region.	Integral part of HS2 and NPR - central to realising the full benefits of these transformational schemes both within GM and the North.	HS2 Programme, interfacing with NPR Programme. HS2 Programme awaited. Wider Connectivity, including Metrolink expansion and relocation to be delivered as part of an integrated programme with the HS2 works. Urgent engagement on the HS2 programme is needed as this impacts the delivery of the wider GMTS 2040.	Solution essential to being able to full delivery Piccadilly Strategic Regeneration Framework. Initial Growth Strategy work funded by Government - however Government needs to address funding mechanism for regional growth strategy implementation and work with Local Partners to develop Delivery Model	Currently at concept stage. Full identification of potential environmental effects to be provided in the HS2 Final Environmental Statement	Creates an improved quality of place in the vicinity. Essential component of realising the benefits of HS2 and NPR across the North. Skills and employability programme.	Highly relevant - this intervention will enable connectivity between local and long-distance services, facilitating journeys from locations in Greater Manchester (and its hinterland) and the rest of the UK, in particular London and the South East. Delivery in line with Growth Strategy will maximise wider connectivity to the High Speed network	Supports international connectivity as an integral component of the HS2 NPR programme
G.01.02	HS2/NPR	Manchester Airport HS2 and NPR Growth Strategy	Ensuring HS2 and NPR connectivity to via the new station to Manchester Airport and developments in this area is essential. The Growth Strategy includes a range of improvements to integrate the new HS2/NPR station with its surrounding area. This includes integration of a metrolink, highways improvements and other sustainable modes. Rail interventions to connect with a wider catchment are listed separately.	Capacity and released capacity provided as an integral part of the HS2 NPR. The proposed wider connectivity measures will also increase capacity on the PT network as a whole.	HS2 and NPR and the new station will significantly increase the airport's catchment area, bringing more people and businesses within an attractive rail journey time of the airport and the wider developments in this area including the proposed GMSF Timperley Wedge and MediPark employment and residential development sites, the Greater Manchester Enterprise Zone (EZ) (generated by Manchester Airport, Airport City and the draft Wythenshawe Hospital Campus SRF. Metrolink will also provide essential PT connectivity between the HS2 NPR station, local communities, the proposed developments and the Airport and therefore it is essential that the scheme reproduces existing Metrolink powers that are needed to adjust the Metrolink Western Leg extension to provide connectivity to the HS2 NPR station.	Integral part of HS2 and NPR - central to realising the full benefits of these transformational schemes both within GM and the North.	HS2 Programme, interfacing with NPR Programme. HS2 Programme awaited. Wider Connectivity, including Metrolink expansion and relocation to be delivered as part of an integrated programme with the HS2 works. Urgent engagement on the HS2 programme is needed as this impacts the delivery of the wider GMTS 2040. Currently delaying the delivery of the Metrolink Western Leg extension in order to ensure connectivity to HS2 can be provided.	The Growth Strategy supports existing local plans and policies: proposed GMSF sites at Timperley Wedge & MediPark; Wythenshawe Hospital SRF, and the Airport City Enterprise Zone.	Currently at concept stage. Full identification of potential environmental effects to be provided in the HS2 Final Environmental Statement	Access and connectivity across the North to the Airport and employment opportunities at the airport and surrounding developments. Skills and employability programme	There is a significant quantity of strategic development planned around the Manchester Airport HS2 site; this intervention will significantly increase its connectivity to the rest of the country (in particular London and the south east of England).	Highly relevant - enhanced surface access connectivity is necessary to support the sustainable growth of aviation from Manchester Airport
C.06.03	HS2/NPR	Wigan HS2 Growth Strategy	Station development and wider connectivity improvements to enable the Wigan Stations to accommodate HS2 services, including 400m services, provide an appropriate Gateway to High Speed services and improve connectivity locally and across the region including Merseyside, Lancashire and the North, as well as locally and across Greater Manchester.	Through effective delivery of the Wigan Station Gateway, will enable 400m trains to stop at Wigan	Providing enhanced connectivity, both locally and across the wider Greater Manchester region, Merseyside, Lancashire and the North to High Speed services and support economic growth opportunity	Maximises the impact of HS2 and NPR in terms of connectivity and as catalysts for economic growth.	To be developed as part of the ongoing Growth Strategy work. Will interface with HS2 programme - both Phase 1, 2a and Phase 2b.	Government needs to address funding mechanism for regional growth strategy implementation and work with Local Partners to develop Delivery Model	Currently at concept stage. Final investment design / locations / routes not identified. Identification of potential environmental effects not currently possible.	Creates an improved quality of place in the vicinity. Significant advantage to 10% most deprived areas adjoining Wigan town centre.	Highly relevant - interventions to Wigan stations will be necessary to ensure that HS2 services are able to call at Wigan, facilitating connectivity to the rest of the UK from Wigan. A wider programme of interventions in the Wigan area (including better connecting the two stations) is envisaged in order to maximise the benefits of HS2 in connecting Wigan to the rest of the country.	With the inclusion of Northern Chord, enhances connectivity across the region to Manchester Airport
None	HS2/NPR	HS2 Northern Chord	New link to facilitate trains running Manchester Piccadilly - Manchester Airport - Wigan - points north. Would provide a step-change in journey-time from Manchester Airport to Wigan and Scotland, and relieve capacity on the Manchester - Bolton - Preston and Manchester - Newton-le-Willows corridors, as well as in Manchester City Centre and Airport line.	Releases capacity on Preston - Bolton - Manchester, Chat Moss (Newton-le-Willows - Manchester), Castlefield Corridor, and Airport lines	Step-change in rail journey-time from Manchester Airport to Wigan and beyond	Complements other rail-based investments to support growth in Greater Manchester's Regional Centre and Manchester Airport.	To be delivered as part of the HS2 programme, which would need to include capacity increases on WCML between Golborne Junction and Euxton Junction.	No additional supporting policies required.	As documented by HS2. Further environmental mitigation design required if this investment is progressed.	Broader benefits through the implementation of the Growth Strategy Skills and Employability Pillar of the Growth Strategies	Possibly relevant - the HS2 northern chord would free up capacity in the north west of Greater Manchester which might be used by services connecting the north to the rest of the country.	Highly relevant - the HS2 Northern Chord would enable more, and faster connections from Wigan, Lancashire and Cumbria to Manchester Airport.
C.06.02	HS2/NPR	Stockport HS2 Growth Strategy	To address capacity constraints on West Coast Main Line in and near Stockport Station: these will become pressing when operation of HS2 Phase 2a begins, and before HS2 Phase 2b provides relief to this section of WCML. The investments will provide long-term benefits after completion of HS2 Phase 2b.	Increases capacity of Stockport Station and nearby sections of WCML to accommodate growth in travel demand. Stockport is a critically important location for the National Rail network but is currently operating at a very high level of capacity utilisation. This has resulted in operators not being able to meet franchise commitments in terms of service levels, as well as contributing to poor network reliability. This constraint will be further exacerbated when HS2 Phase 1 services initially use the "classic" network via Stockport to reach Manchester city centre. If this issue is not resolved prior to delivery of HS2 Phase 1, there is a risk that further, unacceptable compromises may have to be made to accommodate both existing and new demands for capacity	By resolving this issue, beyond HS2 Phase 2b, this additional capacity can then be utilised to allow the HS2 service that is scheduled to serve Stoke on Trent and Macclesfield to run on to Stockport and into Manchester. The extension of this service is essential and will provide critical connectivity for Stockport. Furthermore the unused additional capacity that has been created will enable additional local and regional services to meet forecast demand growth. Stockport Council are developing a Vision for redeveloping Stockport station in way that will unlock network capacity, provide improved passenger facilities and better integrate the station with the surrounding areas (See SC response).	Essential capacity and connectivity requirements to support the HS2 and NPR, and W.13.06.	Prior to HS2 Phase 2a, to achieve HS2 readiness.	No additional supporting policies required.	Currently at concept stage. Final investment locations / routes not identified. Identification of potential environmental effects not currently possible.	Broader benefits through the implementation of the Growth Strategy Skills and Employability Pillar of the Growth Strategies and supporting Stockport Wider regeneration aspirations	Highly relevant - this intervention is needed to address a major track capacity bottleneck and thereby allow connectivity between Greater Manchester and the south east when operation of HS2 Phase 2a begins; without this intervention, it will not be possible to provide the envisaged levels of service as well as existing franchise commitments. It is also expected that NPR services between Manchester and Sheffield will place further demands on capacity here. Therefore, this intervention is necessary for connectivity from Stockport and Manchester to the south of England (as well as those locations accessed by changes of trains in Manchester and Stockport). Once HS2 Phase 2b is operational, it is expected that the released capacity at Stockport can be utilised to further improve frequency on lines in Southern Greater Manchester and Cheshire, thereby further improving connectivity between locations in the north and the rest of the country. This intervention is also relevant for improving the availability of freight paths from Greater Manchester to the West Coast Main Line at Crewe, and therefore for freight connectivity between the north and the rest of the UK.	Interventions at Stockport station will facilitate paths for tram-train services between Stockport and Manchester Airport, thereby improving access to international gateways from locations in the north. This intervention is also relevant for improving the availability of freight paths from Greater Manchester to the West Coast Main Line at Crewe, and therefore for freight connectivity between the north and international ports.
W.13.09	HS2/NPR	South Manchester rail improvements (including HS2 readiness)	Improvements to accommodate rail demand on the Manchester to Stockport and Airport corridors, especially post-HS2 Phase 2a, but pre-HS2 Phase 2b, to achieve HS2 readiness.	Aims to increase capacity.	Initially maintain existing connectivity by increasing capacity to accommodate additional trains (including "WCML backfill" services) under HS2 Phase 2a. Opportunity to enhance connectivity post HS2 Phase 2b by utilising freed capacity on classic network.	Complements HS2 Phases 2a and 2b.	As soon as possible, to deliver on existing franchise commitments - but certainly prior to HS2 Phase 2a in order to achieve HS2 readiness.	No additional supporting policies required.	Currently at concept stage. Specific investment locations / routes not identified. Identification of potential environmental effects not currently possible.	No specific additional quality of life impacts identified.	Highly relevant - this intervention will improve frequency, quality and reliability of services in Southern Greater Manchester, Cheshire, and High Peak, thereby improving access from stations in this area to the rest of the UK via connections to HS2/NPR and other long distance services at Manchester Piccadilly, Stockport, Crewe and Stoke-on-Trent. This intervention is also relevant for ensuring current paths for local services are not compromised by demand for paths for HS2 and NPR services, though this is better covered in the Stockport HS2 Growth Strategy intervention. This intervention is also relevant for improving the availability of freight paths from Greater Manchester to the West Coast Main Line at Crewe, and therefore for freight connectivity between the north and the rest of the UK.	Highly relevant - this intervention will improve frequency, quality and reliability of services to Manchester Airport, and also of services in Southern Greater Manchester, Cheshire and High Peak with onward connections to Manchester Airport, thereby improving access from locations in the north to international gateways. This intervention is also relevant for improving the availability of freight paths from Greater Manchester to the West Coast Main Line at Crewe, and therefore for freight connectivity between the north and the rest of the UK.
W.13.06	HS2/NPR	Stockport area rail infrastructure improvements	A range of improvements that are required in order to deliver HS2 Phase 2a, and would continue to be relevant after Manchester to London services are diverted to HS2 Phase 2b. Importantly, includes works at the life-expired Greek Street Bridge for investment in a better than like-for-like replacement (which would otherwise be Network Rail's asset renewal approach). A widened rail corridor at the Greek Street Bridge would resolve several linked issues within Stockport's surface transport network, and release a critical rail pinchpoint to facilitate a metro / tram-train service from Stockport to the Manchester Airport HS2/NPR station, Airport City and the Airport itself.	Significant uplift in capacity and operational flexibility for heavy rail services	Facilitates future connectivity improvements from W.08.33 (Stockport - Airport metro / tram-train service). Opportunities to enhance heavy rail connectivity post HS2 phase 2b through utilising freed capacity.	Complements HS2 Phases 2a and 2b and facilitates W.08.33 (Stockport - Airport metro / tram-train service).	Prior to HS2 Phase 2b. Precursor to W.08.33 (Stockport - Airport metro / tram-train service).	No additional supporting policies required.	Currently at concept stage. Specific investment locations / routes not identified, with the exception of the Greek Street Bridge area. Mainly temporary construction related adverse environmental effects as noted in response to Q6 expected including temporary adverse effect on nearby Listed Buildings. Identification of further potential environmental effects not currently possible.	Significant advantage to 10% and 20% most deprived areas around Stockport opening up new journey options for employment, education and leisure - supported by TfGM's concessionary fares policies.	Highly relevant - Stockport station cannot at present accommodate existing franchise commitments, together with the additional paths demanded by HS2 and NPR. In addition, GM has ambitions (as set out in the rail prospectus) to increase significantly the frequency of suburban rail, which would place significant extra demands on capacity at Stockport station (with four suburban lines passing through it). Improvements to capacity at Stockport station will allow significant improvements both to long-distance rail connectivity, with more paths available to destinations in London, the South East, the East, the South West and Wales, and will also allow higher frequencies of suburban services to connect to longer distance services at Stockport, Manchester and Manchester Airport HS2/NPR station. It should also be noted that an important freight route passes through Stockport and that the provision of more paths at Stockport will facilitate freight movement between the north and south of England.	Relevant - metro / tram-train between Stockport and Manchester Airport will improve connectivity to a significant international gateway. Increasing the number of paths through Stockport will also allow freight routes to access international ports such as Felixstowe.
C.02.01	Castlefield Corridor pinch-point	Castlefield Corridor - Deansgate - Oxford Road - Piccadilly capacity expansion	A critical bottleneck in accessing Greater Manchester's Regional Centre, and also to accessing HS2 and NPR. This constraint will not be substantially relieved - if at all - by NPR due to need to 'backfill' services for local traffic. Relevant for feeding HS2/NPR trips such as Bolton - London and Preston - Sheffield.	Relieves critical rail bottleneck in north of England	Required to maintain existing connectivity at reasonable levels of performance as well as providing some enhanced connectivity in future.	Combines with RC.09.01 to accommodate rail demand growth to, from, and through Manchester.	As soon as possible to (i) meet existing demands on network in terms of capacity, performance and connectivity and (ii) support and enable many of the "Classic" Rail Network schemes below. It is important to deliver on politically committed schemes such as this (which has been through Public Inquiry) in order to provide a strong basis for future planning.	No additional supporting policies required.	Potential beneficial effects include positive air quality and biodiversity effects as noted in text response to Q6. These apply below where marked (*) Adverse direct effects to two designated heritage assets. Potential adverse effect on buried archaeological remains. Moderate adverse visual effects on nearby residential properties. Adverse noise and vibration effects on nearby residential properties. Potential adverse hydrological effects on the water environment.	No specific additional quality of life impacts identified.	Relevant - investment in the Castlefield Corridor will improve access to Piccadilly station from the west and north of Manchester, and therefore contribute to connectivity between these areas and the rest of the country. The Castlefield Corridor is also an important freight route, and this investment will facilitate freight movements between the North (particularly Trafford Park) and the rest of the country.	Highly relevant - investment in the Castlefield Corridor will allow more services from north and west of Manchester to pass through to Manchester Airport, which is currently heavily constrained, and therefore contribute to international connectivity. The Castlefield Corridor is also an important freight route, and this investment will facilitate freight movements between the North (particularly Trafford Park) and international ports (e.g. Felixstowe).

Appendix 1 Investment Table

Ref in GMTS 2040 Draft Delivery Plan	Programme	Rail-based investments relevant for integrating HS2 Phase 2b and wider transport plans in the North and the Midlands	Why Relevant?	Q2a) Capacity	Q2b) Connectivity	Q2c) How would they combine together with other investments?	Q3) Phasing/Sequencing	Q4) Supporting Policies	Q6) Other Environmental	Q7) Other QoL & Q8) Distributional	Q10) Connectivity to elsewhere in UK	Q11) International connectivity
RC.01.01	Castlefield Corridor pinch-point	Salford Central Station Upgrade	By permitting Liverpool-bound services to use this well-located city centre station, rail access to Manchester City Centre will be improved, and some pressure taken off the Castlefield Corridor by improving access to Manchester City Centre by services operating via Victoria.	Primarily Connectivity focussed. May alleviate some demand for additional capacity on services via Castlefield corridor	Improves east-west rail access to Manchester City Centre.	Could combine with C.02.01 to better serve Manchester City Centre by rail.	As soon as is possible to (i) meet existing demands on network in terms of capacity, performance and connectivity and (ii) support and enable many of the "Classic" Rail Network schemes below.	No additional supporting policies required.	* - Potential beneficial effects as above. Within an existing rail corridor and urban context, therefore temporary construction related adverse environmental effects expected. No significant adverse environmental effects expected during operation.	No specific additional quality of life impacts identified.	-	-
RC.09.01	"Classic" Rail Network	Platform lengthening and increases in passenger capacity at stations in support of longer trains.	Facilitates longer trains to accommodate growth in rail travel, also avoiding access to HS2/NPR being compromised by inadequate capacity.	Increases passenger capacity by facilitating longer trains which may reduce pressure for increase in frequency, protecting network capacity.	Not main focus.	Complements other rail investments to support growth in Greater Manchester's Regional Centre.	Longer trains, supported by appropriate infrastructure measures, are the most immediate way to meet existing demands on the network in terms of capacity.	No additional supporting policies required.	Currently at concept stage. Final investment locations/routes not identified. Identification of potential environmental effects not currently possible.	No specific additional quality of life impacts identified.	This intervention will enable longer trains, thereby increasing capacity. This is relevant for both long distance trains (NPR/HS2) for access to the rest of the UK, and for those suburban services which will interchange with them.	Relevant - Manchester Airport station is under consideration for platform lengthening, allowing additional services to the airport
W.13.04	"Classic" Rail Network	Hope Valley line improvements (part of Northern Hub - Manchester to Sheffield)	If NPR uses this line, it will need to continue to accommodate local passenger services and freight	Adds capacity so that line can continue to carry mixed traffic	Improved reliability	Complements NPR if routed from Manchester to Sheffield via this route.	As soon as is possible to meet existing demands on network in terms of capacity, performance and connectivity. It is important to deliver politically committed schemes such as this to provide a firm foundation for planning future schemes. This scheme already has planning/powers in place.	No additional supporting policies required.	* - Potential beneficial effects as above. Adverse negligible residual direct effects to identified historic assets. Beneficial ecology effects from proposed enhancement measures. Adverse visual and noise effects.	No specific additional quality of life impacts identified.	Relevant - Investments on the Hope Valley Line are relevant for supporting movements of freight between the North and Midlands (particularly stone from Derbyshire quarries) and the rest of the country. Additionally, these investments will support movements from the communities in the Hope Valley through onward connections to HS2 or NPR or other services to the rest of the country in Sheffield or Manchester.	Relevant - Investments on the Hope Valley Line are relevant for supporting movements of freight between the North and Midlands and international ports. Additionally, these investments will support movements from the communities in the Hope Valley to international gateways such as Manchester Airport.
C.02.02	"Classic" Rail Network	Trans-Pennine Upgrade	Access to Greater Manchester's Regional Centre, and also to HS2 and NPR, for trips such as Huddersfield - Birmingham. Will facilitate long-term improvements to local services once NPR is in operation.	Transpennine Route upgrade will result in additional capacity on network for freight/passenger services	Faster journey-times and potential for more frequent local services.	Provides improvements in advance of NPR.	As soon as is possible to meet existing demands on network in terms of capacity, performance and connectivity. It is important to deliver politically committed schemes such as this to provide a firm foundation for planning future schemes.	No additional supporting policies required.	* - Potential beneficial effects as above. Adverse direct and indirect effects to listed buildings, permanent adverse visual effects, potential adverse effects on flood zones, vegetation clearance and localised displacement of protected species to be offset by compensatory planting and habitat creation. Potential effects will be fully assessed upon detailed design completion and mitigated where required.	No specific additional quality of life impacts identified.	This intervention will allow improvements to local services on the Huddersfield-Manchester route, thereby improving connectivity from locations along the route to major stations in Manchester and Leeds (including HS2/NPR stations), and thereby improving access to the rest of the UK.	This intervention will allow improvements to local services on the Huddersfield-Manchester route, thereby allowing the potential for improved connectivity to international gateways such as Manchester Airport. The intervention also allows the possibility of gauge cleared freight services, improving accessibility of freight to international gateways such as Liverpool and the Humber Ports.
W.13.08	"Classic" Rail Network	Cheshire Line Committee (CLC) improvements	A programme of improvements to the CLC line that could include investments such as electrification, passing loops, and resignalling. Will improve capacity and connectivity, and access to HS2/NPR.	Provides increased capacity to facilitate more station stops on local services	Improvements in speed and reliability.	Provides early benefits that would also be useful under a longer-term tram-train/metro future for the line - see W.08.29 to W.08.33.	As soon as is possible to meet existing demands on network in terms of capacity, performance and connectivity. An outline scheme exists, supported by partners including Network Rail.	No additional supporting policies required.	* - Potential beneficial effects as above. Within an existing rail corridor therefore mainly temporary construction related adverse environmental effects as noted in response to Q6 expected. Some adverse visual effects associated with electrification equipment expected.	No specific additional quality of life impacts identified.	This intervention will improve quality, frequency and reliability of services in South Western Greater Manchester and Warrington, thereby improving access from stations in this area to the rest of the UK via connections to HS2/NPR and other long distance services at Manchester Piccadilly.	-
W.13.05, W.13.07, W.13.10 W.13.11, and W.13.12	"Classic" Rail Network	Connectivity and capacity improvements on the National Rail network in Greater Manchester	A programme of improvements to improve capacity and connectivity, including access to HS2/NPR. Definition will be based on corridor studies.	Aims to improve capacity and connectivity.	Aims to improve capacity and connectivity.	Aims to complement other rail investments - e.g. C.02.01.	To be determined as part of wider rail industry planning processes, taking into account the network as a whole.	No additional supporting policies required.	Currently at concept stage. Final investment locations/routes not identified. Identification of potential environmental effects not currently possible.	No specific additional quality of life impacts identified.	This intervention will improve connectivity and capacity on services throughout Greater Manchester, thereby improving access from stations in Greater Manchester to the rest of the UK via connections to HS2/NPR and other long distance services.	This intervention will improve connectivity from stations in Greater Manchester to the international gateway of Manchester Airport by increasing the number of services and the potential for connections.
W.13.02	"Classic" Rail Network Electrification	Bolton - Wigan electrification	To improve capacity and connectivity, including access to HS2 at Wigan.	Not main focus	Improve journey times	Complements other electrification investments.	As soon as is possible. It is important to deliver politically committed schemes such as this to provide a firm foundation for planning future schemes. For electrification, a rolling national programme improves delivery efficiency.	No additional supporting policies are required. However, policy in favour of a rolling national electrification programme would be welcome.	* - Potential beneficial effects as above. Within an existing rail corridor therefore mainly temporary construction related adverse environmental effects expected. Some adverse visual effects associated with electrification equipment expected.	No specific additional quality of life impacts identified.	This intervention will enable improved frequency and reliability between Wigan and Bolton (and onwards to Manchester), in turn improving access to Wigan, allowing connections to the rest of the UK (ultimately by means of HS2).	-
W.13.03	"Classic" Rail Network Electrification	Manchester - Stalybridge electrification	To improve capacity and connectivity, including access to HS2/NPR at Manchester Piccadilly.	Not main focus	Improve journey times	Complements other electrification investments.	As soon as is possible. It is important to deliver politically committed schemes such as this to provide a firm foundation for planning future schemes. For electrification, a rolling national programme improves delivery efficiency.	No additional supporting policies are required. However, policy in favour of a rolling national electrification programme would be welcome.	* - Potential beneficial effects as above. Within an existing rail corridor therefore mainly temporary construction related adverse environmental effects expected. Some adverse visual effects associated with electrification equipment expected.	No specific additional quality of life impacts identified.	This intervention will enable improved frequency and reliability of services from eastern Greater Manchester to Manchester Piccadilly, providing improved connectivity to the rest of the UK.	-
G.06.01	Rail Freight	Port Salford rail freight link	To facilitate rail freight access to the proposed freight terminal at Port Salford, subject to any capacity constraints on the Chat Moss line.	Not main focus	Provides connectivity to facilitate rail freight access to Port Salford.	More work needed to understand how rail freight investments could combine into a coherent strategy.	To be determined as part of wider rail industry planning processes, taking into account the network as a whole.	No additional supporting policies required.	TBC	No specific additional quality of life impacts identified.	Could provide links for freight from the rest of the UK to intermodal rail freight terminal	Could provide rail freight access to port, therefore improving connectivity to freight to international gateways.
None	Airport	Manchester Airport classic station capacity increase	Allow longer/additional trains to use Manchester Airport, maintaining present rail connectivity; the longer trains are expected to be needed to accommodate demand growth to/from the Regional Centre of Greater Manchester.	Increases capacity on key link to Manchester Airport.	Maintains rail connectivity to Manchester Airport (otherwise, introducing longer trains without the intervention would result in a trade-off of capacity vs. connectivity).	Complements RC.09.01 and G.03.02.	As soon as is possible to meet existing demands on network in terms of capacity, performance and connectivity. Existing franchise commitments cannot be met without this scheme.	No additional supporting policies required.	Currently at concept stage. Final investment locations/routes not identified. Identification of potential environmental effects not currently possible.	No specific additional quality of life impacts identified.	Relevant - this intervention will enable the number of services which can access Manchester Airport to be maintained.	Relevant - this intervention will enable the number of services which can access Manchester Airport to be maintained.
G.03.02	Airport	Extension of the Airport Metrolink line to Terminal 2	Provides a better connection to the newly expanded Terminal 2 for the existing rail passengers at Manchester Airport station, and for much of South Manchester (particularly those on the east side of Wythenshawe - a large 10% most deprived area). A key precursor to the extension of Metrolink to Manchester Airport HS2/NPR Station.	Connectivity rather than capacity is the main focus.	Better connects existing rail passengers and much of South Manchester (particularly those on the east side of Wythenshawe) to the newly expanded Terminal 2.	Combines with all other items in this category - particularly with G.08.01 to connect with HS2/NPR Manchester Airport Station, and W.08.22, W.08.33 & G.08.02 to connect with much of South Manchester.	Well in advance of HS2/NPR to improve connectivity in the existing situation.	This scheme supports existing local plans and policies, particularly the Airport City Enterprise Zone.	* - Potential beneficial effects as above. Extension is wholly within the Airport estate therefore mainly temporary construction related adverse environmental effects expected. Potential adverse impact on a listed Building, adverse visual effects on nearby receptors and adverse biodiversity effects associated with vegetation removal.	No specific additional quality of life impacts identified.	Relevant - improves connectivity between existing rail services from elsewhere in the UK to Manchester Airport Terminal 2, and as part of the broader completion of the Metrolink Airport line it will improve connectivity between the South of Greater Manchester, the existing Manchester Airport rail station and the future Manchester Airport HS2/NPR station.	Relevant - improves connectivity to Manchester Airport and therefore to international gateways.

Appendix 1 Investment Table

Ref in GMTS 2040 Draft Delivery Plan	Programme	Rail-based investments relevant for integrating HS2 Phase 2b and wider transport plans in the North and the Midlands	Why Relevant?	Q2a) Capacity	Q2b) Connectivity	Q2c) How would they combine together with other investments?	Q3) Phasing/Sequencing	Q4) Supporting Policies	Q6) Other Environmental	Q7) Other QoL & Q8) Distributional	Q10) Connectivity to elsewhere in UK	Q11) International connectivity
W.08.22	Airport	Extension of the Airport Metrolink line from Roundthorn to Newall Green / Davenport Green	Better connects central Manchester with the residents on the west side of Wythenshawe and the key employment centres around Wythenshawe Hospital, and vice versa. A key precursor to the extension of Metrolink to Manchester Airport HS2/NPR Station.	Connectivity rather than capacity is the main focus.	Better connects central Manchester with the residents on the west side of Wythenshawe and the key employment centres around Wythenshawe Hospital, and vice versa.	Combines with all other items in this category - particularly with G.03.02 to connect with Terminal 2, with G.08.01 to connect with HS2/NPR Manchester Airport Station, and with W.08.33 and G.08.02 to connect with much of South Manchester.	Well in advance of HS2/NPR to improve connectivity in the existing situation.	This scheme supports existing local plans and policies: proposed GMSF sites at Timperley Wedge & MediPark; and Wythenshawe Hospital SRF.	* - Potential beneficial effects as above. Potential adverse noise and vibration effects on nearby residential properties, potential adverse effect on Listed Buildings and flood risk areas. Sections of this line are within an undisturbed corridor therefore potential exists for adverse effect on buried archaeological remains and biodiversity including a Local Nature Reserve during construction. Sensitivity in design / construction method is required to avoid / minimise impacts on watercourses.	Significant advantage to a 10% most deprived area (western Wythenshawe) opening up new journey options for employment, education and leisure - supported by TIGM's concessionary fares policies.	Not relevant on its own - but as part of the broader completion of the Metrolink Airport line it will improve connectivity between the South of Greater Manchester, the existing Manchester Airport rail station and the future Manchester Airport HS2/NPR station.	Not relevant on its own - but as part of the broader completion of the Metrolink Airport line it will improve connectivity to Manchester Airport and therefore to international gateways.
G.08.01	Airport	Completion of the Airport Metrolink line	The key intervention to facilitate high-frequency rail-based access between HS2/NPR and the Manchester Airport Terminals, Airport City and much of South Manchester. A precursor to combining with items W.08.33 and/or G.08.02 to provide further access to HS2/NPR, the Airport & Airport City from Stockport and/or the Altrincham line.	Connectivity rather than capacity is the main focus.	This is the jigsaw piece that connects many other interventions in the Airport category.	Combines with all other items in this category - particularly with G.03.02 to connect with Terminal 2 and W.08.22, W.08.33 & G.08.02 to connect with much of South Manchester.	Coordinated with HS2/NPR.	This scheme supports existing local plans and policies: proposed GMSF sites at Timperley Wedge & MediPark; and the Airport City Enterprise Zone.	* - Potential beneficial effects as above. Potential adverse noise and vibration effects on nearby residential properties, potential adverse effect on Listed Buildings and flood risk areas. Sections of this line are within an undisturbed corridor therefore potential exists for adverse effect on buried archaeological remain and biodiversity including an ancient woodland and Local Nature Reserve during construction. Sensitivity in design/construction methods is required to avoid/minimise impacts on Ancient Woodland near HS2/NPR stn.	Significant advantage to a 10% most deprived area (western Wythenshawe) opening up new journey options for employment, education and leisure - supported by TIGM's concessionary fares policies.	Relevant - completion of the Metrolink Airport line will include a stop at the HS2/NPR station, providing high quality onward connections for many locations in South Manchester to the wider UK.	Relevant - completion of the airport loop provides improved connectivity to Manchester Airport, including significantly reduced journey times from locations in South Manchester to the airport, and improving connectivity to international gateways.
W.08.33	Airport	Metro/tram-train from Stockport town centre to Manchester Airport	A rail-based link across South Manchester between Stockport and Manchester Airport HS2/NPR station, Manchester Airport Terminals and Airport City.	Connectivity rather than capacity is the main focus.	Connects much of South Manchester and Stockport with Manchester Airport	Combines with all other items in this category - particularly with W.08.22 & G.08.01 to connect with HS2/NPR Manchester Airport Station and G.03.02 to connect with Terminal 2.	Following W.08.22 & G.08.01, and linked to other investments around Stockport.	No additional supporting policies required.	* - Potential beneficial effects as above. Predominantly within an existing rail corridor therefore mainly temporary construction related adverse environmental effects as noted in response to Q6 expected. Potential increased adverse noise and vibration effects on nearby residential properties during operation. Sensitivity in design needed at new junction/chord locations.	Significant advantage to 10% and 20% most deprived areas in Adswold and Cheadle, opening up new journey options for employment, education and leisure - supported by TIGM's concessionary fares policies.	Relevant - this will improve access to the HS2 Phase 2a station at Stockport and the HS2 Phase 2b station at Manchester Airport, thereby improving connectivity from Stockport and locations along the route to the rest of the country.	Relevant - this will improve access to from Stockport and its considerable rail hinterland to the international gateway of Manchester Airport station.
G.08.02	Airport	Metro/tram-train from Cornbrook to Manchester Airport via Timperley	A rail-based link across South Manchester between Sale/Stretford and Manchester Airport HS2/NPR station, Manchester Airport Terminals and Airport City.	The service would provide extra capacity on the Altrincham line - the busiest on the Metrolink system.	Provides new direct Metrolink connection from Manchester Airport to Sale and Stretford.	Combines with all other items in this category - particularly with W.08.22 & G.08.01 to connect with HS2/NPR Manchester Airport Station, and G.03.02 to connect with Terminal 2.	Following W.08.22 & G.08.01.	No additional supporting policies required.	* - Potential beneficial effects as above. Predominantly within an existing rail corridor therefore mainly temporary construction related adverse environmental effects as noted in response to Q6 expected. Potential increased adverse noise and vibration effects on nearby residential properties during operation. Sensitivity in design needed at new junction/chord locations.	No specific additional quality of life impacts identified.	Relevant - this intervention will improve connectivity from Trafford to the rest of the UK via interchange at Manchester Airport HS2.	Relevant - this intervention will improve connectivity from Trafford to the international gateway at Manchester Airport.
None	Airport	Manchester Airport Western Link	New link from Manchester Airport to Mid-Cheshire line, improving rail access to Manchester Airport and the planned HS2/NPR station, and also speeding rail travel from Manchester to Chester and North Wales.	Releases capacity by reducing need to terminate at Airport (classic) Station.	Addresses weak rail connectivity from Airport to the west and south-west.	Complements Airport classic station capacity increase.	To be determined as part of wider rail industry planning processes.	No additional supporting policies required.	* - Potential beneficial effects as above. Investment on undisturbed land, potential therefore exists for impact on buried archaeology. Currently at concept stage. Final investment locations / routes not identified. Identification of further potential environmental effects not currently possible.	No specific additional quality of life impacts identified.	Relevant - this link could improve connectivity between the north and Wales, both by creating a new route and by relieving the congested Manchester-Stockport-Crewe route. Relieving Manchester-Stockport-Crewe would also have a beneficial effect in enabling more paths between the north and the south of England.	Relevant - this link could create better connectivity to Manchester Airport from North Wales, Chester and Mid-Cheshire, thereby enabling more paths from elsewhere in the north.
RC.03.08	Salford Quays, MediaCity & Inner Salford	Metrolink connection from MediaCityUK to Salford Crescent	A rail-based connection from the major and growing trip-attractor of MediaCityUK to the rail network on the north side of Greater Manchester - facilitating access from locations including Bolton and Rochdale. Would link with or extend existing Metrolink services.	Adds public transport capacity to a rapidly-developing area.	Connects Greater Manchester's 'north-side' rail network with MediaCityUK efficiently & effectively.	Complements RC.03.09 in connecting inner Salford with the rail-based network.	As soon as possible. Complements RC.03.09 below, so could be packaged together - but could be separated if RC.03.09 proves more complex.	No additional supporting policies required.	* - Potential beneficial effects as above. Potential adverse effects to the setting of a Listed Building. Potential adverse noise and vibration effects on nearby residential receptors.	Significant advantage to 10% and 20% most deprived areas nearby, opening up new journey options for employment, education and leisure - supported by TIGM's concessionary fares policies.	Less relevant than the item immediately below.	Less relevant than the item immediately below.
RC.03.09	Salford Quays, MediaCity & Inner Salford	Metrolink connections to inner Salford	Rail-based connections from this rapidly developing and increasingly high-density part of Greater Manchester's Regional Centre. Could include a new link to Manchester City Centre, facilitating access from the wider rail network to the many jobs expected to be located here.	Adds public transport capacity to a rapidly-developing area.	Connects rapidly developing parts of inner Salford with the rest of Greater Manchester and the UK.	Complements RC.03.08 in connecting inner Salford with the rail-based network.	As soon as possible. Complements RC.03.08 above, so could be packaged together - but could be separated if RC.03.09 proves more complex.	No additional supporting policies required.	* - Potential beneficial effects as above. Potential adverse effects to the setting of a Listed Building. Potential adverse noise and vibration effects on nearby residential receptors. No significant adverse environmental effects expected.	Significant advantage to 10% and 20% most deprived areas nearby, opening up new journey options for employment, education and leisure - supported by TIGM's concessionary fares policies.	Possibly relevant - intervention could increase connectivity between inner Salford and the rest of the UK through better connections to stations with longer-distance services.	Possibly relevant - the intervention could increase connectivity between inner Salford and Manchester Airport, through better connections to nodes serving Manchester Airport.
W.08.19 to W.08.21 plus W.08.10	Metro / tram-train Network	tram-train Pathfinder Projects	Aims to overcome technological and institutional challenges to tram-train operation in Greater Manchester, including testing on-board energy storage to reduce track-side infrastructure. Tram-train can improve access to HS2 and NPR, especially at Manchester Piccadilly, and - by diverting services onto separate routes at the Northern Hub bottleneck - release capacity on the National Rail network for improvements to other rail services.	Facilitates further investments that release capacity on the Northern Hub of the National Rail network.	Facilitates further investments that provide high-frequency metro-type services, including improved access to HS2/NPR.	Combines with W.08.29 to W.08.33.	As soon as possible.	No additional supporting policies required.	* - Potential beneficial effects as above. Largely within current and former rail corridors. Potential adverse noise and vibration effects expected to sensitive noise receptors in proximity of the disused railway on the Pathfinder North route between Castleton and Heywood. Significant adverse environmental effects not expected.	Significant advantage to 10% and 20% most deprived areas on the Pathfinder North route via Heywood, opening up new journey options for employment, education and leisure - supported by TIGM's concessionary fares policies.	Relevant - tram-train has the potential to provide high quality connections to longer-distance services to the rest of the country. However, in order to derive any of the envisaged benefits, it will be necessary to successfully roll out the Pathfinder projects to prove the technology.	Relevant - tram-train has significant potential for connections to Manchester Airport. However, in order to derive any of the envisaged benefits, it will be necessary to successfully roll out the pathfinder projects to prove the technology.
W.08.29 to W.08.33	Metro / tram-train Network	Metro / tram-train services radiating from Manchester City Centre	High-frequency metro-type services, providing improved connectivity to support the growth of the Regional Centre in Greater Manchester plus improved access to HS2/NPR at Piccadilly. Options include lines to Glossop, Marple, Wigan via Atherton, Warrington and Stockport / Hazel Grove, typically replacing suburban services on the National Rail network.	Some of these investments release capacity on the Northern Hub of the National Rail network - e.g. Wigan via Atherton releases capacity between Bolton and Manchester.	Provide high-frequency metro-type services, including improved access to HS2/NPR from communities throughout Greater Manchester.	Combines with tram-train Pathfinder projects: W.08.19 to W.08.21.	As soon as possible following one of the Pathfinder schemes. Some lines (but not all) can be implemented without complementary investment in city-centre metro capacity.	No additional supporting policies required.	* - Potential beneficial effects as above. Potential noise and vibration effects, visual effect on nearby receptors and historic assets along new twin track between Ashburys and Manchester Piccadilly outside of current rail corridor but alongside proposed HS2/NPR lines. Significant adverse environmental effects not expected - typically replace suburban services on the existing National Rail network.	Significant advantage to a large number of 10% and 20% most deprived areas across all these routes, opening up new journey options for employment, education and leisure - supported by TIGM's concessionary fares policies.	Relevant - this improvement will improve accessibility from Manchester's rail hinterland to key long-distance nodes (in particular the HS2 stations at Manchester, Manchester Airport and Wigan), and thereby improve accessibility from locations in Greater Manchester to the rest of the UK.	Relevant - this improvement will, through improved frequency and better interchange possibilities, improve accessibility from Manchester's rail hinterland to Manchester Airport, and thereby improve accessibility from locations in Greater Manchester to international gateways.

Appendix 1 Investment Table

Ref in GMTS 2040 Draft Delivery Plan	Programme	Rail-based investments relevant for integrating HS2 Phase 2b and wider transport plans in the North and the Midlands	Why Relevant?	Q2a) Capacity	Q2b) Connectivity	Q2c) How would they combine together with other investments?	Q3) Phasing/Sequencing	Q4) Supporting Policies	Q6) Other Environmental	Q7) Other QoL & Q8) Distributional	Q10) Connectivity to elsewhere in UK	Q11) International connectivity
RC.08.03	Metro / tram-train Network	Improved Metrolink capacity between Piccadilly and Victoria stations	Facilitates improved frequency and capacity north to south across Manchester City Centre between two major rail stations. Relevant for access to HS2/NPR for trips such as Oldham - London and Oldham - Sheffield.	Facilitates a more frequent service - and hence increased capacity - at a critical bottleneck on the Metrolink network.	Facilitates improved Metrolink services from the north of Greater Manchester to the rail network at Piccadilly Station.	Complements HS2 and NPR.	Prior to HS2/NPR, so that the benefits to communities such as Rochdale and Oldham are maximised. Ideally in place before the new Metro / tram-train services described above place additional strain on the existing Metrolink network.	No additional supporting policies required.	* - Potential beneficial effects as above. Within an existing rail corridor therefore mainly temporary construction related adverse environmental effects as noted in response to Q6 expected. Significant adverse effects not expected - track, signalling & power works etc. on existing Metrolink alignment to improve junction capacity.	Significant advantage to a large 10% most deprived area (Oldham) by providing a direct link to HS2/NPR opening up new journey options for employment, education and leisure - supported by TfGM's concessionary fares policies.	Relevant - this intervention will enable connectivity between local and long-distance services, facilitating journeys from locations in Greater Manchester (and its hinterland) and the rest of the UK, in particular London and the South East.	Less relevant than the items immediately above and below.
None	Metro / tram-train Network	Improved Metrolink capacity through Cornbrook	Increase in vehicle throughput capacity at a critical point on the Metrolink network near Greater Manchester's Regional Centre, to accommodate demand growth.	Targeted at increasing capacity on the critical section of Metrolink network.	Facilitates further investments that provide high-frequency metro-type services, including improved access to HS2/NPR.	Complements other rail-based investments to support growth in Greater Manchester's Regional Centre.	Required before significant development in the surrounding area impedes construction and increases station footfall. Ideally in place before the new Metro / tram-train services described above place additional strain on the existing Metrolink network.	No additional supporting policies required.	* - Potential beneficial effects as above. Potential adverse effect to the setting of a Listed Building and flood risk areas. Significant adverse environmental effects not expected. This scheme would require a 10m-20m expansion strip next to the existing station, currently a breaker's yard.	No direct/specific additional quality of life impacts identified - but facilitates other schemes that do have these.	Relevant - potential to improve services from Trafford and Salford Quays to long distance HS2/NPR stations at Manchester Piccadilly and Manchester Airport.	Relevant - potential to improve Metrolink services to Manchester Airport.
RC.08.04	Metro / tram-train Network	City Centre Metro Tunnel	A step-change in metro capacity, facilitating the targeted growth of the Regional Centre, and providing capacity in Manchester City Centre to operate most or all of the metro services in W.08.29 to W.08.33. Metro conversion of suburban rail lines would release capacity on the National Rail network for improved services on other routes, including inter-urban services. Access to HS2/NPR at Manchester Piccadilly would be much-improved, and would not be impaired by the capacity constraints that are otherwise expected to adversely affect rail-based access to Manchester City Centre by 2040.	Facilitates the growth of Greater Manchester's Regional Centre by providing a step-change in metro capacity, and releases capacity on the National Rail network in Greater Manchester.	Facilitates high-frequency metro-type services on lines presently served by National Rail suburban services.	Facilitates most/all of the investments in W.08.29 to W.08.33. Complements other rail-based investments to support growth in Greater Manchester's Regional Centre.	Likely to be needed in the late 2030s / early 2040s, after increases in capacity at Cornbrook and interventions to facilitate a higher service-frequency between Piccadilly and Victoria.	No additional supporting policies required.	* - Potential beneficial effects as above, but as a megaproject this is likely to require large site areas (particularly for the tunnel drive sites - 30,000m ² to 45,000m ² is typical) and there is potential for adverse effects. Final investment locations / routes not identified - identification of potential environmental effects not currently possible.	No direct/specific additional quality of life impacts identified - but facilitates other schemes that do have these.	Relevant - this intervention will facilitate much higher levels of frequency and capacity on Greater Manchester's suburban rail and Metrolink networks, and thereby allow much greater connectivity from Greater Manchester and its hinterland to Manchester Piccadilly and other nodes for long distance rail travel, and onwards to the rest of the UK (notably via connection to HS2/NPR).	Relevant - this intervention will improve connectivity and frequency throughout Greater Manchester, enabling better levels of connectivity either directly or via interchange to services to Manchester Airport.

Please note for Q6: For projects at concept stage the process of defining the geographic area of impact to be addressed by the intervention and the design of the proposed intervention have not been completed. Information on potential environmental effects of these investments is therefore unavailable. Information on potential environment effects presented for identified investments have been collated from high level environmental assessments undertaken to identify key environmental sensitivities in defined intervention areas or extracted from documents such as environmental reports, press publications, leaflets etc. available for