Greater Manchester Transport Strategy 2040 and Delivery Plan 1 (2016/17 - 2021/22)

Integrated Assessment Report

Appendices

Transport for Greater Manchester

June 2016

Notice

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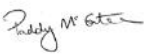
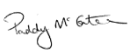
Rev 3.0	Final for consultation	P McEntee 	P McEntee 	C West 	C West 	29/06/16

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Appendix A. **Responses to the IA Key Sustainability Issues Technical Note**

Note: Tables 1, 2 and 3 in the Key Sustainability Issues Technical Note have become Tables 4, 5 and 7 in the IA Report

Respondent	Comments	Response	Action
Environment Agency	EA agree that all sustainability issues that lie within their remit have been identified. EA also agree with the wording of the IA, EqIA and HIA objectives. Suggest that in addition to protection / enhancement of protected sites, focus is placed on other habitats of local importance. EA support the use of Green Infrastructure to provide alternative transport modes to realise wider environmental benefits. Where possible the Transport Strategy should seek to improve the status of all water bodies to comply with the objectives of WFD. In addition to SuDS the assessment should consider further enhancement opportunities to improve the various waterbodies within GM. Opportunities should also be taken to reverse past industrial legacy and other reasons for failure in water quality – note the North West RBMP. Past industrial legacy should also be dealt with through use of Brownfield sites and Contaminated land remediation. Need to reword text relating to Flooding to make it clear that development should not increase flooding elsewhere or increase in flood risk, rather than just minimisation of impact. Note though that some options e.g. Footpaths. Cycleways etc can be 'water compatible' and can be in areas of flood risk. As well as the use of blue infrastructure there should also be an emphasis on the use of green infrastructure to reduce flooding impacts In relation to assessment prompt questions and the Objective of 'Conserve and Enhance the Water Environment', seeking to comply with the objectives of the WFD a further prompt should be included which considers whether or not there will be opportunities to improve water body status as part of the strategy.	Comments Noted. In particular it is noted that better emphasis should be placed on the WFD and how Green / Blue Infrastructure can help address its requirements as well as realise wider environmental benefits. Dealing with the past industrial legacy of GM is a major issue and should be addressed at all opportunities due to its ongoing environmental impact.	IA Team to ensure that as assessment develops, greater emphasis is placed on WFD objectives and need to address past industrial legacy. Continued focus will be placed on all sites of biodiversity / habitat importance – not just those protected sites. The IA will be amended to reflect this. In addition to SuDS, the IA will consider other potential opportunities to improve waterbodies across GM. The IA will make it clear that any proposed

Respondent	Comments	Response	Action
			development should not increase flood risk or flooding, though it will also recognise that some development is compatible with flood zones e.g. some green infrastructure. A further Assessment prompt question will be included as follows: Will the Transport Strategy provide opportunities to improve water body status?
Association of Greater Manchester Authorities (AGMA)	AGMA agree all Key Sustainability Issues have been identified and agree with the wording of the IA, EqIA and HIA objectives. AGMA encourage the use of Green Infrastructure to provide alternative modes of transport such as cycleways, footpaths etc. and this can realise wider environmental benefits. Where possible the Transport Strategy should seek to improve the status of the natural environment including water bodies. The assessment should consider further enhancement opportunities to improve the biodiversity. We would encourage the efficient use of brownfield sites and the	Comments Noted. In particular the encouragement for Green Infrastructure is noted as is the encouragement to utilise brownfield sites and to avoid	A further Assessment prompt question re. Green & Blue Infrastructure will be incorporated into the IA. This question will be as follows: Will

Respondent	Comments	Response	Action
	remediation of contaminated land through this process. Where possible the strategy should seek to avoid areas of highest flood risk to ensure future resilience to climate change. A further Assessment prompt question should be included which considers whether or not there will be opportunities to improve green and blue infrastructure as part of the strategy.	areas of highest flood risk.	the Transport Strategy provide opportunities to improve Green & Blue Infrastructure?
Greater Manchester Health Protection Team – Public Health England (M Brown)	As a general comment, we feel it is well written and covers well the sustainability issues and the HIA objectives. Technical Note needs to reflect and be clearer on the fact that some measures are already in place. The text should show what has been done so far, which measures are in place, how successful they were, and if GM should continue to apply these measures, as well as the discussion of additional measures looking forward. It would be relevant to know what contribution to targets individual measures could make – example given of CO2 target. Future Plans and targets are also referenced e.g. Defra's "Plans to improve air quality in the UK: Tackling nitrogen dioxide in our towns and cities. List of UK and National measures". Noted that although compliance with current standards is clearly a crucial objective, it is important to note that further population health benefits are to be expected if levels of some air pollutants are reduced even further. A further Assessment prompt question may be: does the strategy set out how TfGM will ensure that the best evidence and examples of good practice from around the world are considered when choices are being made for GM?	Comments Noted. In particular it is considered important that the IA is as up to date as possible. However, although consideration will be made of likely future targets and plans, it is not possible to fully consider these aspects until the relevant targets & plans have been published.	The IA will be amended to reflect that some measures are already in place and will provide details of these. Comment will also be made on how effective these are. Further Assessment Prompt question to be included. This is as follows: "Does the strategy set out how TfGM will ensure that the best evidence and examples of good practice from around the world are considered when choices are being made for

Respondent	Comments	Response	Action
			GM"?
Strategic Growth Services, **Trafford Council**	Supportive of the Strategy and satisfied with level of detail, though make the following comments: In relation to Key Sustainability Issues in Tables 1 and 2, for Air Quality, reference should be made to emissions from freight HGV's and LGV's a as these have a significant impact on nitrogen dioxide levels and PM10 levels. (although this is picked up in table 2). It is considered useful to make reference to other relevant strategies such as recent GM Climate Change Strategy (incorporating air quality). Also in relation to Air Quality, consideration should be given to PM 2.5 levels also. In relation to whether all relevant implications/opportunities for the Transport Strategy been identified in Tables 1 and 2, with regard to noise, reference should be made to government Noise Action Plans for roads, agglomerations under the Environmental Noise (England) Regulations 2006. The consultee agrees with the wording of the IA, EqIA and HIA objectives that have been identified in Tables 3, 4 and 5. It was noted that report mentions that poor air quality/noise affects learning ability in children-this statement should be suitably referenced. A range of adverse effects from poor air quality and noise are well documented and can be referenced accordingly and should be included if required. A further assessment prompt question should include reference to current draft AQAP and LEZ (not 100% sure about this) which was approved by Combined Authority and being consulted on (although there is reference to AQAP's generally in the second column of Table 1 and by the time this strategy is complete the AQAP will be finalised). In relation to the implications/opportunities for the Transport Strategy identified in Tables 1 and 2, it is suggested that maybe include some emphasis on the planning system/cumulative impacts of air quality (although this is included in the AQAP). It is also suggested that consideration should be given as to whether sufficient emphasis has been placed on the potential impact of traffic congestion on the economy, environment and quality of life.	Comments Noted. In particular the recent GM Climate Change Strategy will be reviewed in light of the aspirations of the Transport Strategy. In addition the IA will incorporate new work being undertaken by the Combined Authority on Air Quality Action Planning – this will also reference the potential for cumulative impacts.	A review of the IA will ensure that emphasis is placed upon the potential impact of congestion on the environment, economy etc and will fully explain the implications of this. Reference will be made to HGV / LGV emissions. Consideration will also be given to the most up to date air quality data available at the time of writing. A review of the recent GM Climate Change Strategy will be undertaken and the salient points noted within the IA. Reference will be made to the

Respondent	Comments	Response	Action
			potential impacts on the learning ability of children due to poor air quality (and relevant sources of information on this referenced). Reference will be made to government Noise Action Plans for roads, agglomerations under the Environmental Noise (England) Regulations 2006 An Assessment Prompt question will be added as follows: Will the Transport Strategy reflect and be in accordance with the proposed AQAP as approved by the Combined Authority?

Respondent	Comments	Response	Action
National Park Authority	Suggest that the wording on Page 7 – Table 1, Row 4, Landscape and Townscape is amended as follows: The first section states that "The Peak District encroaches on GM within Oldham". It would be more accurate to say that "part of Oldham Borough lies within the Peak District National Park boundary".	Comments Noted	Wording to be amended as appropriate.
Transport for Greater Manchester (M Percy)	The info in Table 1 (Air Quality) does not reflect the recent update to Defra's projections. They are now saying that GM will meet NO2 limits by 2020. However, we feel that even if this is the case, the projected levels of growth means that emissions will still be an issue.	Comments Noted. In particular it is considered important that the IA is as up to date as possible. It is also noted that it is considered that projected levels of growth mean that emissions will remain an issue.	IA to be updated to reflect the most recent data possible – in this case Defra's latest projections.
Natural England – Note this response was made in relation to the GMTS Vision	Natural England are generally in support of the Greater Manchester Transport Strategy 2040 - especially pleased to see that climate change resilience and low carbon transport are high on the agenda. Noted that it was important that GMTS and Spatial Strategy are linked to ensure that new development sites are well served with public and active transport infrastructure. Note how 'soft estate' of the transport network (verges, rail sides etc) can play a vital role in biodiversity and contribute to the delivery of other outcomes e.g. Defra's National Pollinators Strategy.	Note that these comments relate to the GM Transport Strategy Vision and not specifically to the IA. It is recognised that consideration of and linkages to	Ensure that all relevant Strategies are considered in the IA. Ensure consideration is made of Opportunities that

Respondent	Comments	Response	Action
	Note that there are management approaches that can deliver win-wins for the natural environment, people and the economy, by delivering biodiversity and ecosystem services benefits whilst also helping operators better manage risk and increase resilience of the network to the impacts of climate change. Wish for the consideration of solutions which deliver multiple ecosystem services and link into surrounding land use and management where possible e.g. use of SuDS. Similarly managing woods effectively can help Pollinators while reducing leaf fall – this can improve network resilience. Opportunity mapping can be used to identify where there is greatest potential to deliver significant environmental improvements at key 'hot spots' on the road and rail networks. This can provide a framework for the management of the soft estate to be better integrated and linked with adjacent land management and deliver wider benefits not limited to the transport estate, but which help better connect that estate to the wider landscape and deliver benefits at a landscape scale. Management of the soft estate can make an important contribution to the wider natural environment and we would encourage the adoption of similar approaches to the management of the transport soft estate Highways England's recent Biodiversity Plan sets out a vision and objectives for maximising the biodiversity potential of the strategic road network, with a commitment to no net loss in biodiversity by 2020 and net gain by 2040. Wherever possible, local transport authorities should look to set similar objectives in relation to their transport soft estate.	other relevant strategies is vital. It is recognised that Transport infrastructure management & maintenance can play a vital role in achieving many goals across a range of areas. Similarly new ways e.g. SuDS can still maintain traditional goals but meet other objectives. Other new approaches such as Opportunity Mapping can also enhance planning.	would provide benefits across a range of issues / objectives.

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Appendix B. **Policy documents reviewed for the IA**

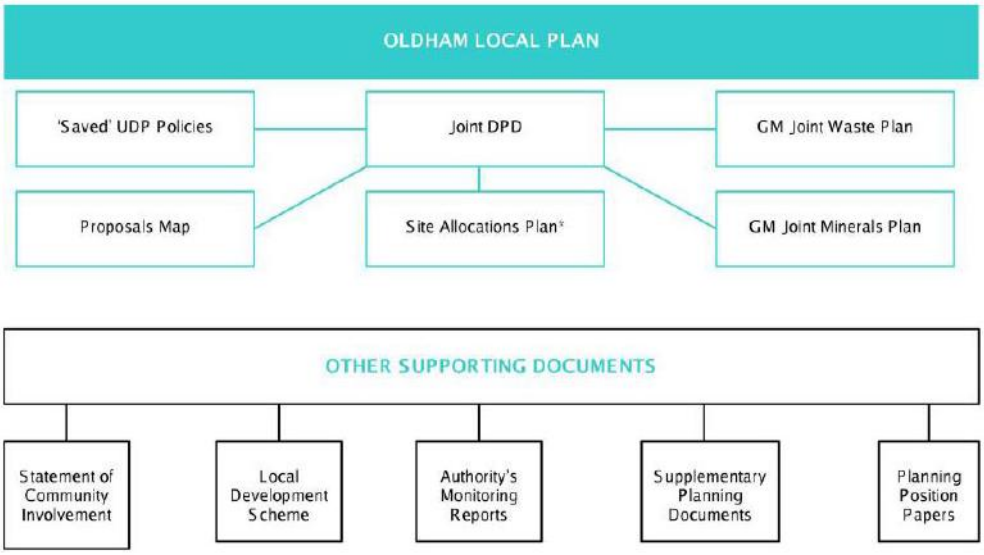
International and European
Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (1979)
Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (1979)
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) (1971)
EC A Sustainable Future for Transport – Towards an Integrated, Technology led and User Friendly System (2009)
EC Keep Europe Moving – Sustainable Mobility for our Continent: Mid-Term Review of White Paper (2006)
EU Action Plan on Urban Mobility (2009)
EU 2020 Biodiversity Strategy (2012)
EU 7th Environmental Action Programme (2013)
EU Air Quality Framework Directive (96/62/EC)
EU Biodiversity Action Plan (2006-2010)
EU Directive for the Promotion of Bio-fuels for Transport (2003/30/EC)
EU Directive on Ambient Air Quality and Management (1996/62/ EC)
EU Directive on Assessment and Management of Environmental Noise Directive (2002/29/EC) and associated Regulations (2006)
EU Directive on Assessment of the Effects of Certain Plans and Programmes on the Environment (2001/42/EC)
EU Directive on Environmental Impact Assessment (2014/52/EU) amending Directive (97/11/EC) amending Directive 85/337/EEC
EU Directive on the Conservation of Wild Birds (2009/147/EC)
EU Employment Equality Framework (2000)
EU Environmental Liability Directive (2004/35/EC)
EU Floods Directive (2007/60/EC)
EU Freshwater Fish Directive (78/659/EEC)
EU Groundwater Directive (GWD) (2006/118/EC)
EU Habitats Directive (92/43/EC)
EU National Emissions Ceiling Directive (2001/81/EC)
EU Race Equality Framework (2000/43/EU)
EU Rural Development Policy 2007-2013
EU Second European Climate Change Programme (2005)
EU Strategy on Adaptation to Climate Change (2013)
EU Sustainable Development Strategy (2006)
EU Sustainable Development Strategy (2006) and 2009 Review of EU SDS
EU Thematic Strategy on Air Quality, 2005
EU Waste Framework Directive (2006/12/EC)
EU Water Framework Directive (2000/60/EC)
European Convention on the Protection of the Archaeological Heritage
European Landscape Convention (91/676/EC)
European Spatial Development Perspective (1999)
European Transport Policy for 2010: A Time to Decide (2001)
UN Framework Convention on Climate Change (2008)
UN Johannesburg Declaration on Sustainable Development, 2002
UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) (1998)
UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)
UNFCCC Bali Road Map (2007)
UNFCCC Copenhagen Accord (2009)
UNFCCC Doha Climate Gateway (2012)

UNFCCC Kyoto Protocol on Climate Change (1997)
WHO Age Friendly Cities Guide (2007)
WHO Collaboration Between the Health and Transport Sectors in Promoting Physical Activity (2006)
WHO Guidelines for Community Noise (2000)
WHO Health Effects of Transport-Related Air Pollution (2005)
WHO Transport, Environment and Health (2000)
National
2010 to 2015 government policy: water quality (Updated 8 May 2015)
A Better Place to Play (Environment Agency, 2006)
A Safer Way: Consultation on Making Britain's Roads the Safest in the World (2009)
A Sure Start to Later Life: Ending Inequalities for Older People – A Social Exclusion Unit Final Report (2006)
Adapting to Climate Change in England (DEFRA, 2008)
Air Quality Regulations 2000 and The Air Quality (Amendment) Regulations 2002
Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007)
Ancient Monuments and Archaeological Areas Act 1979
Be Active Be Healthy: A Plan for Getting the Nation Moving (2009)
Beyond Copenhagen: The UK Government's International Climate Change Action Plan (2010)
Building a Greener Future Towards Zero Carbon Development – Consultation (Dec 2006)
Building a Low-Carbon Economy – The UK's Contribution to Tackling Climate Change. The First Report of the Committee on Climate Change (Committee on Climate Change, 2008)
Building a Society for all Ages (2009)
Building Sustainable Transport into New Developments (DfT, 2008)
Carbon Pathways Analysis: Informing Development of a Carbon Reduction Strategy for the Transport Sector, Department for Transport (2008)
Carbon Pathways: Informing Development of a Carbon Reduction Strategy for Transport (DfT, 2008)
Child Road Safety Strategy (DfT, 2007)
Clean Neighbourhoods and Environment Act 2005
Climate Change Act 2008
Conserving Biodiversity – The UK Approach (Defra on behalf of the UK Biodiversity Partnership 2007)
Countryside and Rights of Way Act 2000
Delivering a Sustainable Railway, Department for Transport (2007)
Delivering a Sustainable Transport System (DaSTS), Department for Transport (2008)
Delivering a Sustainable Transport System (DaSTS): Consultation on Planning for 2014 and Beyond, Department for Transport (2008)
DfT Sustainable Development Action Plan (2007 and 2008)
Disability Discrimination Act (2005)
Draft Heritage Protection Bill (2008)
Draft Plans to Improve Air Quality in the UK – Tackling Nitrogen Dioxide in our towns and cities (Defra 2015)
Enterprise and Regulatory Reform Act 2013
Environmental Noise (England) Regulations 2006 SI 2238
Equalities Review (2007)
Equality Act (2010)
Equality Framework for Local Government (2009)
Every Child Matters (2003)
Flood and Water Management Act (2010)
Future Water: Government's Water Strategy for England (2008)
Future water: The government's water strategy for England (2011)
Guidance on the Promotion and Creation of Physical Environments to Support Increased Levels of
Healthy Lives, Brighter Futures – the Strategy for Children and Young People's Health (2009)
Heritage Protection for the 21st Century: White Paper (DCMS, 2007)

Low Carbon Transport: A Greener Future, A Carbon Reduction Strategy for Transport, Department for Transport (2009)
Making the Connections: Final Report on Transport and Social Exclusion (2003)
Meeting the Energy Challenge: A White Paper on Energy (2007)
National Air Quality Strategy, Department for Environment, Food and Rural Affairs (2007)
National Cycling Strategy, DfT Review
National flood and coastal erosion risk management strategy for England (2011)
National Planning Policy Framework (2012)
National Waste Development Framework
Natural Environment and Rural Communities Act 2006
Noise Action Plans (DEFRA)
Older People: Their Transport Needs and Requirements (DfT, 2001)
Our Plan to Protect and Increase Biodiversity, Highways England (2015)
Physical Activity (NICE) (2008)
Planning (Listed Buildings and Conservation Areas) Act 1990
Planning for a Sustainable Future (2007)
Planning for a Sustainable Future, Department for Communities and Local Government (2007)
Planning for Economic Development (ODPM, 2004)
Powering Future Vehicles Strategy, Department for Transport (2002)
Protection of Badgers Act (1992)
PSA Delivery Agreement 27 Lead the Global Effort to Avoid Dangerous Climate Change (HM Government, 2007)
PSA Delivery Agreement 28 Secure a Healthy Natural Environment for Today and the Future (HM Government, 2007)
Public Sector Equality Duty (Equality Act 2010)
Race Relations (Amendment) Act (2000)
Road Safety Act 2006
Road Traffic Reduction (National Targets) Act 1998
Road Traffic Reduction Act 1997
Rural Strategy 2004
Securing the Future: The Government's Sustainable Development Strategy (2005)
Securing the Regions' Future (2006)
Stern Review of the Economics of Climate Change (Stern, 2007)
Sustainable Communities: Building for the Future (2003)
Sustainable Distribution: A Strategy (DfT, 1999)
Tackling Health Inequalities: A Programme for Action (2003)
The Conservation of Habitats and Species Regulations (2010)
The Countryside in and Around Towns: A Vision for Connecting Town and Country in the Pursuit of Sustainable Development (The Countryside Agency/Groundwork 2005)
The Future of Transport White Paper – A Network for 2030 (DfT, 2004)
The Government's Statement on the Historic Environment for England 2010
The Low Carbon Transition Plan and Low Carbon Transport 'A Greener Future' (2009)
The National Pollinators Strategy: for bees and other pollinators in England (Defra 2014)
The Public Health White Paper: Choosing Health – Making Healthy Choices (2004)
The UK Programme on Climate Change, Department for Environment, Food and Rural Affairs (2006)
Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon World (TaSTS), Department for Transport (2007)
UK Biodiversity Action Plan 1992-2012 (1994)
UK Climate Change Bill (2008)
UK Post-2010 Biodiversity Framework (July 2012)
Ultra-low Carbon Vehicles in the UK, HM Government (2009)
Walking and Cycling: An Action Plan (2009)
Waste Strategy for England (Defra, 2007)
Wildlife and Countryside Act (as amended) 1981
Working with the Grain of Nature: A Biodiversity Strategy for England 2002

World class places: the Government's strategy for improving quality of place (2009)
Regional
Draft Greater Manchester Air Quality Action Plan (October 2015)
Greater Manchester Climate Strategy 2011-2020
GM Cycling Strategy (2014)
Greater Manchester Local Transport Plan 3 (2011)
GM Climate Change and Low Emissions Strategies (draft, October 2015)
GM Moving (2015)
Greater Manchester Transport Strategy 2040 – Our Vision
GM Road Safety Plan (2013)
Integrated Assessment of the Greater Manchester Spatial Framework – IA Scoping Report
Rail North Long Term Rail Strategy (2014)
Greater Manchester Joint Waste Development Plan
Greater Manchester Joint Minerals Development Plan
TfGM Transport for Sustainable Communities: A guide for Developers
Unitary Development Plans for each of the relevant GM Authorities
Local*
Bolton Local Plan (2011) & Supplementary Planning Guidance on Accessibility, Transport and Safety
Bury Unitary Development Plan (1997) & Draft Local Plan
Manchester Local Plan (2012)
Oldham Local Development Framework Joint Core Strategy and Development Management Policies Development Plan Document (2011) and Infrastructure Study Update (2011).
Rochdale Unitary Development Plan and developing Core Strategy
Salford Unitary Development Plan (2006) and Developing Local Plan
Stockport Local Development Framework and aspects of Stockport Unitary Development Plan
Draft Tameside Local Development Framework and aspects of Unitary Development Plan
Trafford Local Plan (2012) and aspects of the Unitary Development Plan
Wigan Local Plan (2013)
Peak District Local Development Framework 2011 and aspects of the Local Plan 2001

*This Assessment made note of the relevant Local Development Frameworks / Local Plans for the 10 Local Authorities in Greater Manchester. At the local level, each of these Authorities develop their own Local Development Framework (LDF), now known as the Local Plan, which will gradually replace the previous Unitary Development Plans (UDPs). Note that not all of the Local Authorities have finalised their Local Plans – for example the Local Plan for Bury is still in development. The LDF, or Local Plan, is a portfolio of documents which typically primarily consist of Development Plan Documents (DPDs) and Supplementary Planning Documents (SPDs). Existing UDP policies will typically be saved until they are replaced within the LDF, or by any other over arching policy. A typical structure of a Local Plan is shown below (as developed by Oldham Council).



The Core Strategy (known as the Joint DPD in the above Oldham example) is the leading document of the LDF and sets a strategic framework for growth and development within the applicable Local Authority area. Core Strategies are made up of a range of key objectives including typically, of relevance to this Strategy, delivering sustainable transport.

The direction which the Core Strategy, and its constituent elements, takes will have significant impacts upon economic, social and environmental objectives. Its influence is mainly spatial, i.e. the future spatial distribution of development in the borough, but it can also influence the types of developments that take place and how they are designed / laid out / constructed.

From an economic perspective, the Plans can allocate areas for future economic growth and ensure that sufficient land is available, and can influence the distribution of jobs in the relevant borough. It can help to promote the relevant borough to attract inward investment and encourage a visitor economy. From a social perspective, it can protect community facilities and influence the location and type of housing that is built. Environmentally, the Plan can prioritise brownfield development, can require energy efficiency standards, safeguard biodiversity and require climate change adaptation measures. It can influence the amount of pollution in the borough and the transport options available. This Assessment therefore used the relevant parts of the Local Plan (or the current equivalent plan) for each GM Local Authority.

Appendix C. **Baseline data**

Introduction

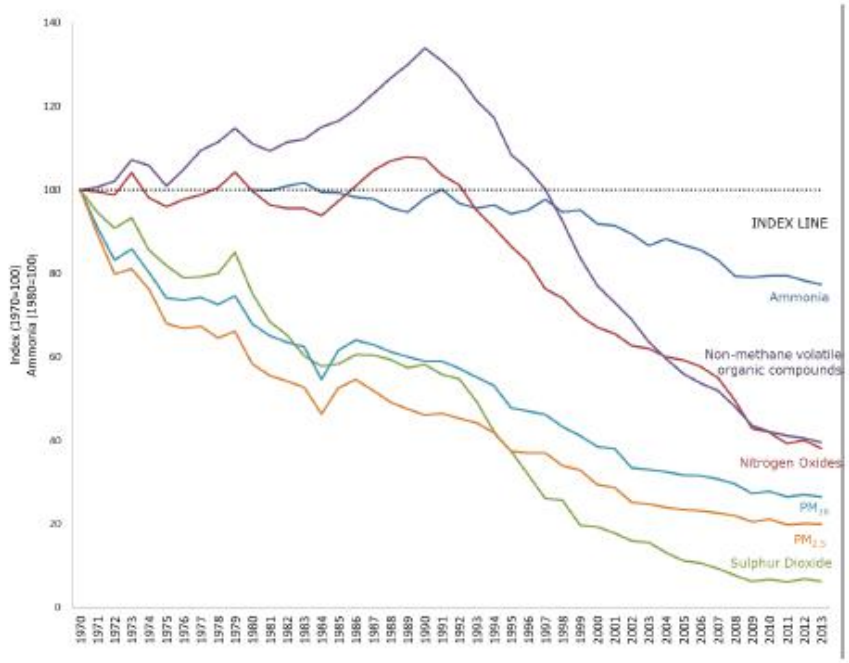
In this Appendix, we set out the information used to determine the baseline against which the effects of the IA have been assessed. In this context, the baseline is taken to mean the environmental, economic and social conditions that are prevalent in Greater Manchester at the time the assessment is being carried out, taking account (as far as is possible given the time and resources available) of how these may change during the life of the Transport Strategy (i.e. up to 2040).

Most of the information contained in this Appendix has been extracted from the Greater Manchester LTP3 IA Report and the Greater Manchester Spatial Framework IA Scoping Report with reviews and updates being made as necessary.

Environment

Air Quality

There have been significant improvements in air quality over the last five decades through the introduction of a range of measures in the UK. There have been significant falls in emissions across a range of pollutants as shown by Defra in the following chart showing trends in UK sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and particulate matter (PM10, PM2.5) emissions 1970 – 2013:



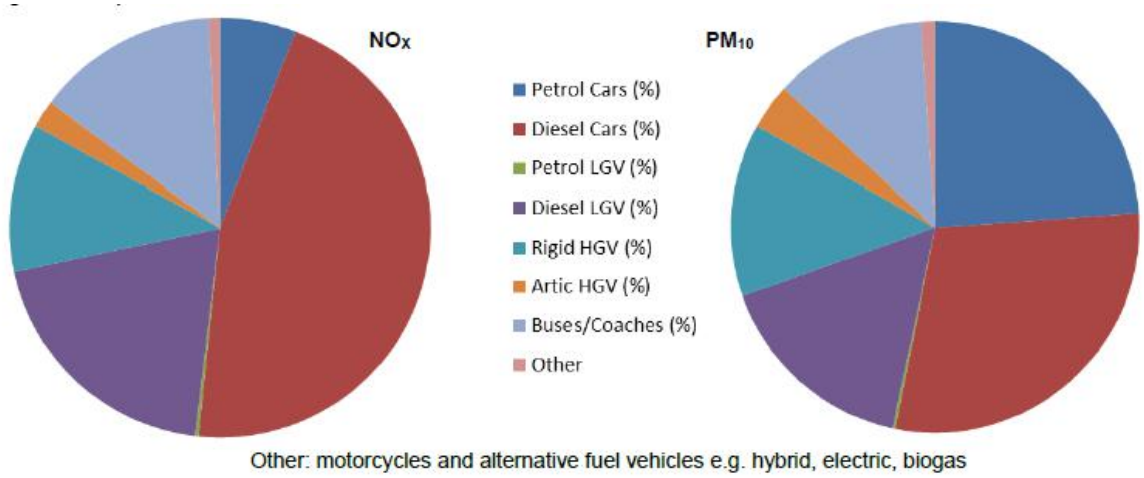
Nonetheless, Greater Manchester still contains a number of areas that are impacted by poor air quality – as would be expected in an urban area of this size and level of economic development. Poor air quality can have adverse consequences across many areas, but is most closely linked to health and biodiversity problems.

As with the situation across the United Kingdom, every local authority in GM is expected to monitor local air quality under the Environmental Act 1995. The objective of the monitoring is to determine if the National Air Quality Standards (AQSs) will be exceeded. The European Commission 1996 directive Council Directive 96/62/EC on Ambient Air Quality Assessment and Management also requires European member countries to implement appropriate measures to improve air quality. It refers to specific EU directives on limiting and monitoring ambient air pollutants.

In those cases where the AQSs are exceeded, local authorities are required to declare these areas as Air Quality Management Areas (AQMAs). Local Authorities are then required to produce an Air Quality Action Plan (AQAP). The AQAP will explain in more detail the current situation and put in place measures to improve conditions and work towards achieving the Government's objectives.

The largest proportion of air pollution in GM arises from road traffic. It has been demonstrated that particular air quality issues are reflective of the regions' motorway network, though negative impacts are experienced across the urban area and at particular 'hotspots' such as the airport and the Regional Centre

Nitrogen dioxide (NO2) emissions are of particular concern but PM10 emissions are also a major issue, with emissions from cars and motorcycles being identified as a significant source (with buses also contributing particularly on busier routes). Both HGVs and LGVs also play a significant role in the generation of these pollutants. The following chart as noted in the draft Air Quality Action Plan provides an indication of the sources and proportions of relevant pollutants from road traffic within the GM area.



Other: motorcycles and alternative fuel vehicles e.g. hybrid, electric, biogas

The Emissions Inventory for Greater Manchester (ENIGMA - 2010) provides further clarification as noted in the draft Low Emissions Strategy (road transport sources – tonnes / year):

Pollutant	Motorways	Other Major Roads	Minor Roads	Other*	Total
NOx	5,039	6,852	364	621	12,876
PM_{10}	558	788	54	66	1467

*includes extra emissions from starting up/cooling down engines and combustion of waste lubricants

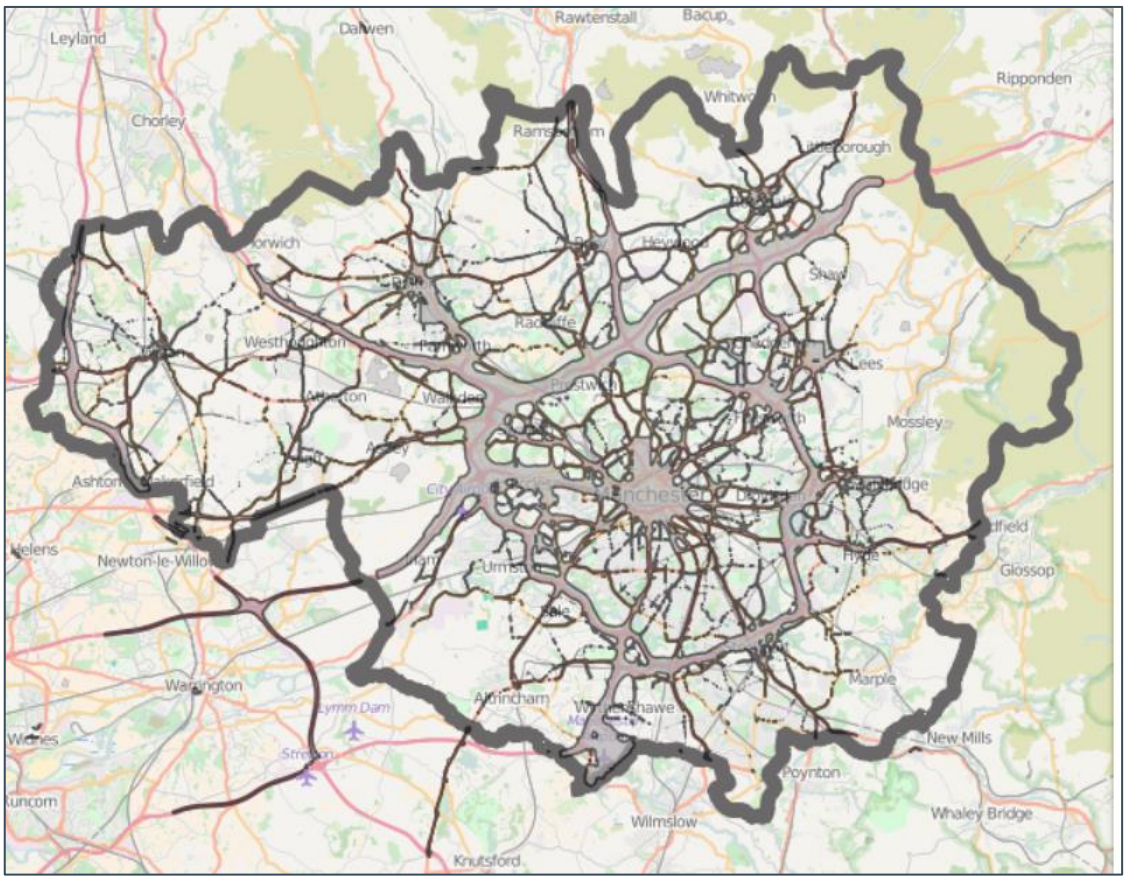
The above table (and as noted in the Low Emissions Strategy) demonstrates that major roads are the largest source of transport emissions in Greater Manchester, although motorways are also very significant. The following table (also noted in the Low Emission Strategy) shows how different road vehicles contribute to each type of emission:

Motorway Emissions				
Emission	**Cars**	**LGVs**	**OGVs**	**Buses**

Type								
	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic
NO_x	33	75	13	13	52	11	1	<1
PM_{10}	59		16		24		<1	
Carbon	49		13		37		<1	
Major Road Emissions								
	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic
NO_x	37	83	14	12	38	4	11	<1
PM_{10}	66		15		15		3	
Carbon	60		13		22		4	

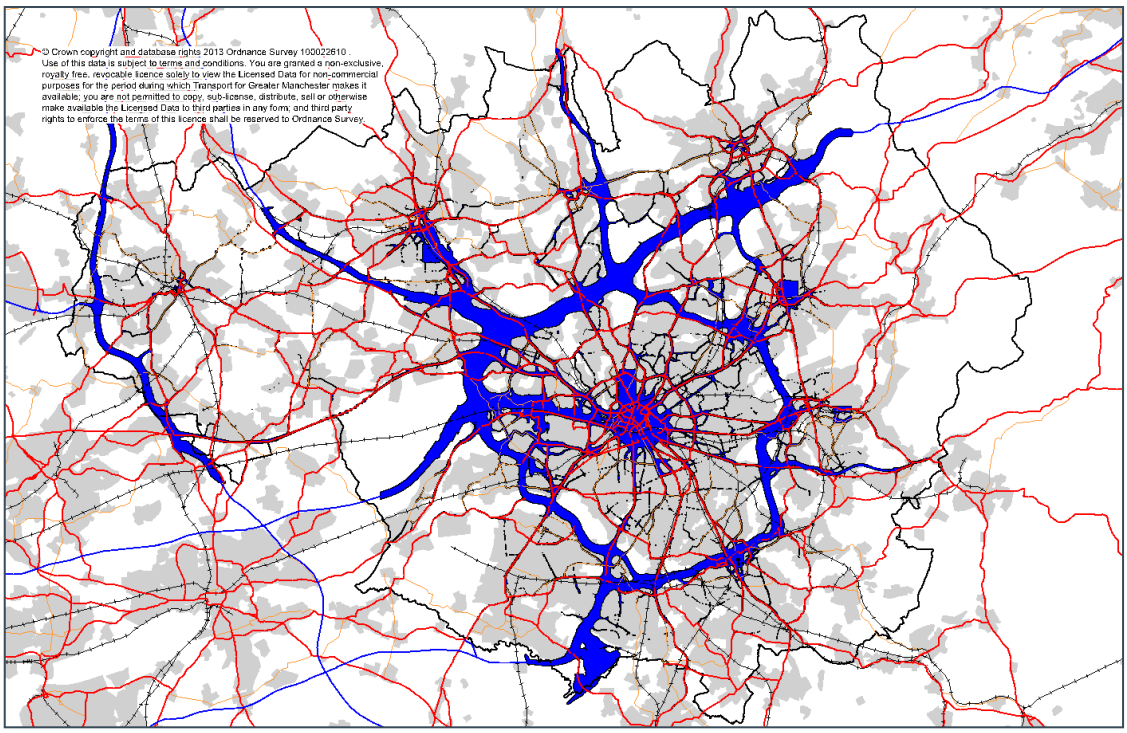
A major issue to be noted from the above table is the disproportionate impact of OGVs (all large goods vehicles) – in particular in relation to NOx emissions.

AQMA's have been established across all the GM authorities and their boundaries tend to reflect the motorway network. This is illustrated by AGMA as follows:



A series of GM Air Quality Action Plans have been developed to improve air quality in the AQMA, but so far has not achieved compliance with legal limits, despite downward trends.

The current AQMA where NO2 limits are exceeded is illustrated in the following drawing as noted in the draft Low Emissions Strategy:



Previously the Action Plans have been integrated with the GM Local Transport Plan as it was recognised that road traffic is a major contributor to pollution. A new draft Air Quality Action Plan for Greater Manchester is being developed and alongside this, GM has also developed a 'Low Emissions Strategy' (LES) which links the air quality and carbon reduction priorities of Greater Manchester. The key aims of the strategy are to:

- Support the UK Government in meeting all EU thresholds for key pollutants at the earliest date;
- Contribute to reducing Greater Manchester's carbon footprint, in line with the Greater Manchester Climate Change Strategy;
- Reduce air pollution as a contributor to ill-health in Greater Manchester.

The latest (2015) assessment from Defra shows that GM is expected to meet requirements of the European Air Quality Directive in terms of NO2 pollution by 2020 as shown in the table below. Note though that there are still issues relating to latest vehicle emissions and projected levels of growth and therefore this issue will remain under review

2013 Assessment					Projections for 2020		Compliance	
Area	Maximum annual mean limit value exceedance	Km of road exceeding limit value	Maximum annual mean ($\mu g/m^3$)	Hourly limit value exceedance	Km of road exceeding annual limit value	Maximum annual mean (µg/m3)	Compliance with NO2 limit values projected with no new measures	Compliance estimate based on this plan
Greater Manchester Urban Area	Y	170.3	61	N	0.0	38	2020	2020

Levels of particulates have fallen but have been stable over recent years. Although EU limits for particulates are currently being met, there is an ongoing significant health impact even at lower levels. To improve the health of the population, the EU has also set a target of a 20% reduction in urban background concentrations of PM 2.5 between 2010 and 2020. It should be noted that the direct emission of particulates from vehicle exhausts is not the only source. Significant contributions are also made by tyre and brake wear, road surface wear and the re-suspension of particles, factors which are not improved by vehicle efficiency.

There are habitats of ecological value, notably designated sites of nature conservation importance adjacent to key routes and AQMA.

Allied to air quality and of particular relevance to Transport are carbon emissions. In 2008 figures showed that emissions of CO2 in the Greater Manchester area amounted to c.17.5m tonnes – an average of 7.1 tonnes per person. It is likely that these figures have declined in recent years due to economic issues and increased energy efficiency, though there have been indications that emissions are rising again. Some estimates, e.g. as noted in the GM Spatial Framework put the carbon footprint of the average resident as high as 15.7 tonnes in 2011, though it is noted that this much higher figure is likely due to a change in counting methodology and includes embodied emissions not previously counted. Nonetheless, GM is committed to securing the transition to a low carbon economy with a target of reducing CO2 emissions by 48% by 2020 from a 1990 baseline. This commitment is manifested through the Greater Manchester Climate Strategy 2011-2020 and is being driven by the Low Carbon Hub run by a board of public, private, voluntary, university and government representatives.

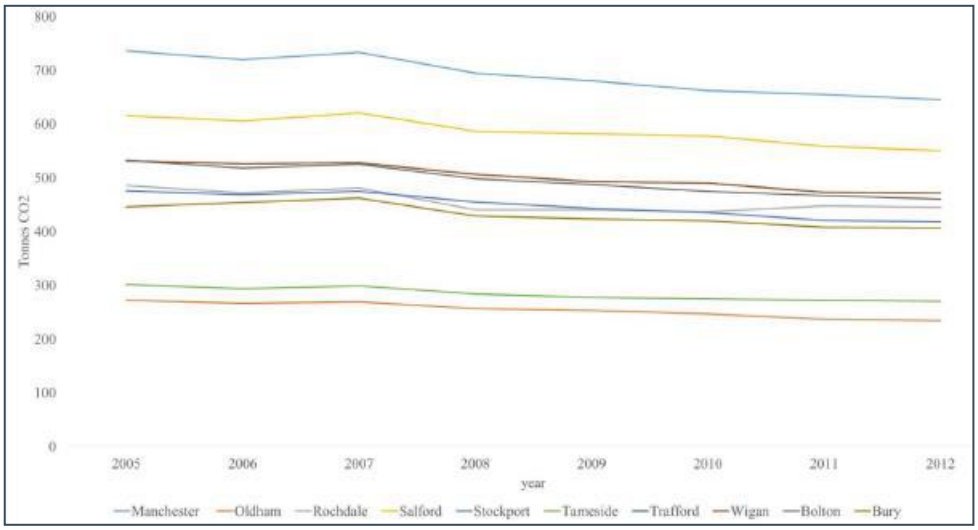
Transport results in a quarter of UK's carbon dioxide (CO2) emissions, with road transport being the majority source. In GM, this percentage is higher than the national average, with

road transport contributing 32% of CO2 emissions. The vast majority of carbon emissions from road transport are generated on the motorway and major road network.

Pollutant	Motorways	Other Major Roads	Minor Roads	Other*	Total
Carbon	385,231	574,877	35,083	21,843	1,017,034

*includes extra emissions from starting up/cooling down engines and combustion of waste lubricants

A business as usual scenario has predicted a 13% rise in CO2 from transport in the GM area by 2026. The percentage contribution from transport varies across the GM Local Authorities. Traffic congestion is a recognised factor in high emissions of CO2 – increased population and associated traffic growth could compound this issue. Transport emissions are highest in Manchester and Salford and lowest in Tameside and Oldham as noted in the following graph from the GM Spatial Framework:

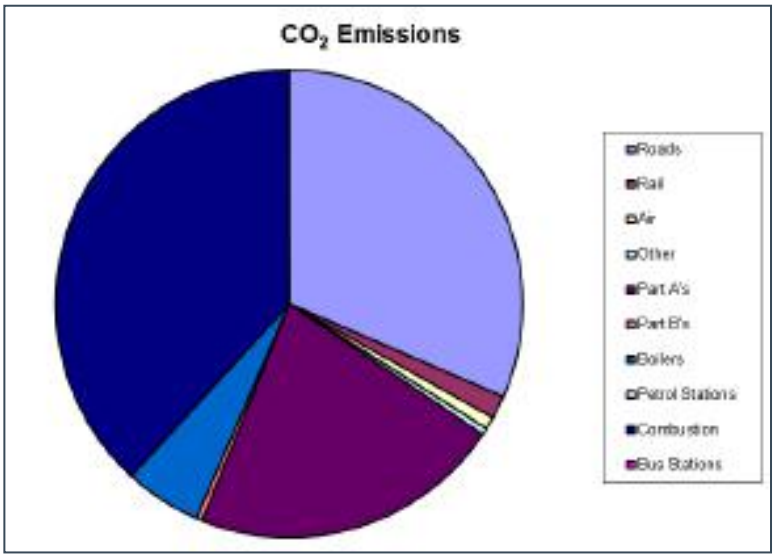


The following table (as noted in the draft Low Emissions Strategy) shows the contribution to carbon emissions from vehicle type.

Motorway Emissions								
Emission Type	**Cars**		**LGVs**		**OGVs**		**Buses**	
	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic
Carbon	49	75	13	13	37	11	<1	<1
Major Road Emissions								
	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic	% of total emissions	% of total traffic
Carbon	60	83	13	12	22	4	4	1

Cars are the main source of carbon emissions, with Good Vehicles also being significant, while buses make a relatively small contribution overall. Car engines have tended to become more efficient and although still a very small percentage, the relative contribution of bus emissions to total CO2 emissions is growing.

As noted in the Low Emissions Strategy, there are a range of sources of CO2 in the GM area. The relative proportions of these emissions are displayed as follows:



Carbon emissions have fallen and this is forecast to continue due to Euro engine standards and the use of biofuels.

Biodiversity, Flora and Fauna

As per the Ecological Framework for Greater Manchester, the GM area is classified as more than 50% urban; it has a population of more than 2.5 million people and is criss-crossed with major road and rail links. Notwithstanding the classification of GM as an urban area, there are a wide variety of habitats, species and designated sites across GM which warrant protection and enhancement. These habitats, species and designated sites are located in a wide variety of land use types and landscapes, examples of which are urban and urban fringe, river corridors, ancient woodlands, reservoirs and waterbodies left after coal mining subsidence such as the Wigan Flashes.

The list of protected and priority habitats and species found in Greater Manchester is long and impressive, and includes peregrine falcons, great crested newts, five species of bat, water voles, barn owls, kingfishers, little ringed plovers and badgers.

Sites are designated for nature conservation purposes at the International (European), National (UK) and Local level across the GM area and in neighbouring regions. Within the GM area there are 3 Special Areas of Conservation (SAC) and Special Protection Areas (SPA) - European designated sites, 21 Sites of Special Scientific Interest (SSSI), 535 Sites of Biological Importance and 57 Local Nature Reserves.

Natura 2000 Sites – SAC & SPA (3 No.)

- Rochdale Canal SAC
- Manchester Mosses SAC
- South Pennine Moors SAC & SPA

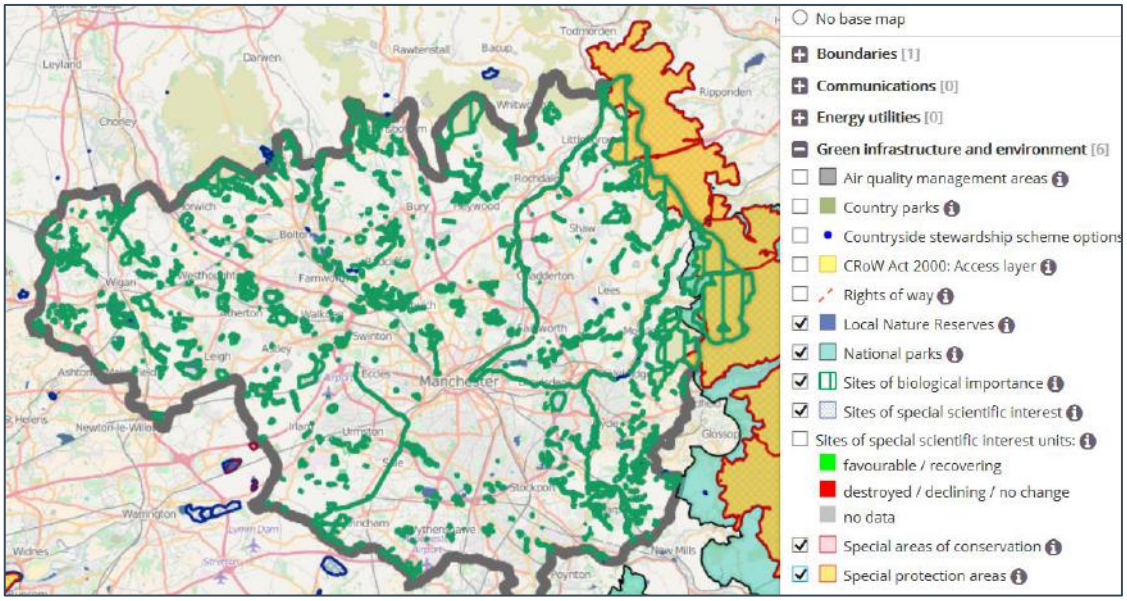
Sites of Special Scientific Interest (SSSI) (21 No.)

- Albram Flashes
- Ashclough
- Astley & Bedford Mosses
- Brookheys Covert
- Bryn Marsh & Ince Marsh
- Compstall Nature Reserve
- Cotteril Clough
- Dark Peak
- Dunham Park
- Gale Clough and Shooterslee Wood
- Highfield Moss
- Hollinwood Branch Canal
- Huddersfield Narrow Canal
- Ladcastle and Den Quarries
- Lowside Brickworks
- Ludworth Intake
- Nob End
- Red Moss
- Rochdale Canal
- South Pennine Moors
- Tonge River Section

Local Nature Reserves (LNR) (57 No.)

- Abney Hall
- Alkrington Woods
- Blackleach Country Park
- Blackley Forest
- Boggart Hole Clough
- Borsdane Wood
- Broad Ees Dole
- Carr Wood
- Castle Clough
- Chadkirk Country Estate
- Chesham Woods
- Chorlton Ess and Ivey Green
- Chorlton Water Park
- Clayton Vale
- Clifton Country Park
- Cowbury Dale
- Cunningham Clough
- Doffcocker Lodge
- Eastock Lodge
- Etherow Country Park
- Gately Carrs
- Goldwick Lows Nature Reserve
- Great Wood
- Greenslate Water Meadows
- Hall Lee Bank Park
- Happy Valley
- Haughton Dale
- Healey Dell
- Heaton Mersey Common
- Highfield Country Park
- Hollinwood Branch Canal
- Hopwood Woodlands
- Hulmes & Hardey Wood and Lower Haughton Meadows
- Hurst Clough
- Kersal Moor
- Knot Hill reservoir
- Low Hall Park
- Mersey Vale Nature Reserve
- Moses Gate
- Nob End
- Philips Park
- Poise Brook
- Rocher Vale
- Reddish Vale
- Seven Acres
- Stenner Woods & Milgate Fields
- The Cliff
- The Wigan Flashes
- Trafford Ecology Park
- Woodbank Park
- Worsley Woods

The distribution of ecological sites across GM is as noted on the following from AGMA:



The Greater Manchester Record Centre holds data on the habitats and species found in each of the GM Districts. An overview for each District is as follows:

Borough	Overview of Species and Habitats of Note
Bolton SAC & SPA = 0 SSSI = 4 LNR = 8	Despite large scale urbanisation, significant areas of priority habitat remain. This includes a number of SSSI, including Red Moss, Nob End and Shooterslee Wood. Species include Newt, Common Frog and Toad, Otter, Badger, Deer, Specialist moorland birds and a number of species of bat. Many species of rare plant, not recorded elsewhere in Greater Manchester, are found in Bolton, including Carline Thistle, Oak Fern, Vervain, Water-purslane and several species of Bog Moss.
Bury SAC & SPA = 0 SSSI = 1 LNR = 4	River valleys, as well as a high concentration of ponds and canals provide a good range of aquatic habitats. There are also important areas of moorland and some ancient woodland. Over 15% of the borough is semi-improved neutral grassland, with significant areas of unimproved acid and neutral grassland. Otters have taken advantage of the aquatic habitat available, along with a range of amphibians and numerous breeding and wintering wetland birds.
City of Manchester SAC & SPA = 0 SSSI = 0 LNR = 7	The range of habitats in this highly urbanised area include brownfield sites, river and canal corridors, ponds (especially in the Bolin Valley), areas of ancient woodland and wet woodland – including Cotteril Clough SSSI. There are also a range of formal parks such as Heaton Park. Despite the urban nature of the area, there is still a strong mix of different species, with bird life being of particular note.
Oldham SAC & SPA = 1	Oldham has large tracts of moorland containing heath and blanket bog – including areas in South Pennines Moor SPA and Peak District National Park. Other habitats include for example, reservoirs, rivers and canals. One canal stretch (Rochdale) is of particular ntoe as it has been designated

SSSI = 3 LNR = 1	SAC and SSSI. The Rochdale Canal supports the European Protected Species floating water plantain (Luronium natans). White-clawed crayfish and American pondweed (Potamogeton epihydrus), a red data book species, also occur. The UK Biodiversity Priority Species Grasswrack Pondweed is found in the Huddersfield Narrow canal SSSI.
Rochdale SAC & SPA = 1 SSSI = 2 LNR = 3	A large section of South Pennine Moors SPA lies within the district of Rochdale. Blanket bog, wet modified bog and acidic flush habitat is contained in Rochdale in significant amounts. The moorland also contains significant areas of bracken, the highest proportion of any GM district. Additionally, Ashworth Valley to the West of Rochdale is an important area of semi-natural broadleaved woodland. The River Roch is a main wildlife corridor through urban areas of this district as well as the Rochdale Canal SSSI and SAC. The wildlife consists of upland breeding birds, water voles, roe deer, damselfly, dragonfly and butterflies. There are extensive areas of heather, sphagnum, bog forming mosses. As well as this the Rochdale Canal supports the European Protected Species floating water plantain (Luronium natans), American Pond Weed and White-clawed Crayfish.
Salford SAC & SPA = 0 SSSI = 0 LNR = 5	Areas of lowland heath and lowland modified bog have survived at Chat Moss, Astley Moss and Twelve Yards Roads. An important wildlife corridor in Salford is the River Irwell which runs through some of the most built up areas in the county. Salford has the highest proportion of planted coniferous woodland in GM. Botany Bay Wood SBI is also noted as the largest single area of woodland in the county. Wildlife noted in Salford include herons (GMs largest group), Peregrine Falcons, Sparrowhawk, foxes, pochard, tufted duck, mute swans, great crested newt breeds, palmate newt, smooth newt, common frog and common toad. Brown hares inhabit the open arable land which also support the red-listed Corn Bunting. Dragonflies are present in large numbers on the mosslands providing prey to the migratory falcon, the Hobby.
Stockport SAC & SPA = 0 SSSI = 2 LNR = 12	Stockport has the highest proportion of semi-natural woodland, classified as ancient woodland. There are small areas of species rich neutral grassland and lowland heath occur in Stockport which is rare in GM. Flowing through Stockport are Rivers Etherow and Goyt. The River Tame and Goyt join and become the River Mersey a source within Stockport. Upland heath and blanket bog can be found in the east of the Stockport. Ludworth Moor SBI support the only bogs found in Stockport. Stockport is also noted as one of the few districts where ancient and/or rich hedgerows can be found. Within Stockport wildlife is made up of a significant population of farmland bird species, Red Deer and Fallow Deer. Ponds within Stockport support amphibians and reptiles (grass snake). Seven different types of bat species have been noted. Rough Chervil, Rough Hawksbeard and Greater Burnet Saxifrage are rare plant species only found in Stockport, in GM.
Tameside SAC & SPA = 2 SSSI = 3 LNR = 11	Oak, lowland broad-leaved woodlands, lowland dry acid grassland, springs and flushes have been UK BAP priority found in Tameside. Upland heath and blanket bog are situated on the high land on the east of the River Tame. Notably the River Tame, Etherow and Medlock flow through Tameside and are vital in acting as a wildlife corridor. Tamesides wildlife consists of The Brown Hare, the Mountain Hare, skylarks and in urban areas foxes. Additionally, speckled wood and various types of butterflies, dragonflies and damselflies are evident in Tameside. Floating Water Plantain (Luronium natans) and Grasswrack Pondweed can be found in Huddersfield Narrow Canal SSI, Peak Forest Canal SBI and Ashton Canal

	(EAST) SBI. Wintering wildfowl and the largest winter gull roost in GM was noted in Audenshaw Reservoirs. Hay Rattle still grows in the remaining lowland and meadows.
Trafford SAC & SPA = 0 SSSI = 4 LNR = 2	Dunham Massey in Trafford is one of England's most important ancient parklands. Trafford makes up approximately 20% of GMs arable habitat. Sinderland Brook corridor includes small woodlands such as Brookheys Covert SSSI which is a lowland broad-leaved woodland which also appears on the Ancient Woodland Inventory. Wildlife in Trafford is supported by important populations of farmland birds. Brown Hare and other mammals are dependent on the farmland in Trafford. Six types of bats feed along the River Merseys over the canals.
Wigan SAC & SPA = 1 SSSI = 4 LNR = 2	South of Wigan is important mossland remnants such as Astley Moss SSI which is part of the Manchester Mossess SAC. Wigan has the 2nd highest proportion of semi-natural broadleaved woodland of any district in GM. Other important habitats included in Wigan are; dense scrub, semi-natural grassland, heathland and swamp. UK Biodiversity Priority species included in Wigan are; great crested newts, brown hare, water voles, 8 species of bats and the reedbed specialist the Bittern. Farm birds such as barn owl, grey partridge skylark, tree sparrow and yellowhammer are also included. The wetland habitats include banded demoiselle, broad-bodied chaser and the magnificent Emperor the largest dragonfly.

A Biodiversity Action Plan has been developed for Greater Manchester. It is the aim that this will provide an overarching framework for biodiversity across all GM districts. The Greater Manchester audit identified those species and habitats that are of local conservation importance and require action in order to conserve and protect them.

Currently there are 13 action plans covering a range of habitats and species occurring in GM which require action to conserve them for the future. A further 5 action plans are in the process of being updated/created. These are as follows:

- Farmland
  - Hares
  - Hedgerows
  - Grasslands
  - Native Woodland
- Water & Wetlands
  - Ponds & Lodges
  - Lowland Mosslands
  - Water Voles
  - Great Crested Newt
  - Willow Tit
  - Reedbeds & Bittern
- Urban
  - Black Redstart
  - Native Black Poplar
- Uplands
  - Twite

It is also worth noting that there are a number of former quarry sites across GM which offer rich geodiversity and support important habitats and species with the main distribution of quarry sites throughout the GM region lying along the Pennine fringe. The Greater Manchester Biodiversity Project commissioned the Greater Manchester Ecology Unit (GMEU) and the Greater Manchester Geology Unit (GMGU) to undertake ecological and geological surveys on

eleven disused quarry sites within Greater Manchester and also involved the first ever systematic surveys of the Biodiversity Value of Quarry sites in Greater Manchester. This has provided an important evidence base to demonstrate the importance of quarry sites for the conservation of Biodiversity Priority Species and Habitats, an evidence base that can be used to support the future protection and management of important wildlife features on aggregate quarry sites in Greater Manchester.

Key threats have been identified from air pollution and climate change, which can change distribution of species and habitats.

New transport projects have the potential to impact on the sites of ecological or geological value and more generally on the network of linked multi-functional green spaces, comprising the local green infrastructure, through direct landtake for infrastructure (which may contribute to fragmentation) and construction and operational disturbance (noise, vibration, light pollution etc) and emissions / contamination (air, water & soil), though it may also provide opportunities for enhancement. Increased accessibility to designated sites also has the potential to adversely impact on them. Direct road kill can also impact on some species. On the other hand, transport infrastructure can provide opportunities for increased biodiversity, or to aid certain species such as the range of policies developed by Defra and the Highways Agency relating to Pollinators.

Landscape and Townscape

The landscape and townscape within GM varies greatly between districts including seven different regional landscape character areas and types including both urban and rural features. There is a mix of high density urban areas, suburbs, semi-rural and rural locations in GM, but overwhelmingly the land use is urban. The highest statutory protection is provided to National Parks (part of Oldham Borough lies within the Peak District National Park boundary – with Stockport and Tameside bordering), though there are also non-statutory designations such as Local Landscape designations. Note there are no Areas of Outstanding Natural Beauty (AONB) within the GM area.

The GM area falls within the following National Character Areas (NCA) and their associated Landscape Character Areas (LCA):

NCA	NCA Overview*	Associated LCA(s)
NCA 54 Manchester Pennine Fringe	The Manchester Pennine Fringe occupies the transitional zone between the open moorlands of the Dark Peak and Southern Pennines, and the densely populated urban conurbation of Manchester. The area wraps around Manchester from Bolton in the north-west to the edge of Hazel Grove in the east, and includes the industrial towns of Bury, Bolton, Rochdale, Oldham, Dukinfield and Glossop. This transitional area runs along the edge of the Millstone Grit of the Pennine uplands, and is underlain by Carboniferous Millstone Grit and the Pennine Coal Measures, which broadly dip to the south-west. The area owes much of its character to its proximity to the adjacent Pennine moors, and the deeply incised, steep valleys that characterise the transition from moorland to urban area. The elevation of the area is generally between 100 m and 300 m, between the lower plains and higher Pennine moors.	**Dark Peak Western Fringe** This area is a transitional landscape between the Dark Peak and the more extensive urban areas of the Manchester Pennine Fringe. It comprises the settled sloping and lower lying landscapes of the Goyt, Etherow and Tame valleys. The distinctive pattern of stone wall enclosures and dispersed farmsteads and villages built of local gritstone are defining elements of this landscape. **Manchester Mill Towns & Pennine Fringe** This area forms a transition between the South Pennines/Dark Peak and Manchester conurbation. It comprises ridges and valleys supporting pastoral land use and containing notable settlements including Rochdale, Bury and Bolton. Often the landscape has an unkempt appearance and is used for recreational purposes. Evidence of past woollen and cotton industries and views across Manchester exert a strong sense of place.
NCA 55 Manchester Conurbation	A number of settlements have grown and come together to form the Manchester conurbation, including Manchester, Salford, Stockport, Sale, Ashton-under- Lyne, Swinton, Altrincham, Stretford, Prestwich, Cheadle Hulme, Denton and Droylsden. The area is characterised by dense urban and industrial development, commercial, financial, retail and administrative centres, commuter suburbs and housing, interspersed with a network of green infrastructure. The conurbation is centred on low hills, crossed by several river valleys that thread through the urban fabric. The geology is dominated by sandstones, overlain by thick deposits of glacial till. The underlying Permo-Triassic sandstones provide an extensive aquifer, contributing groundwater for a large number of industrial users as well as public water supply. River valleys form important corridors of semi-natural habitats and natural greenspace – with open grassland, woodland and wetland – linking urban	**Manchester Conurbation** An extensive area of urban development in Greater Manchester comprising discrete areas of townscape character including the regional commercial centre of Manchester and surrounding towns which have been subsumed over time. Countryside extends into the urban area along river valleys and transport corridors comprising a mixture of open spaces, woodland, scrub and relicts of an industrial past. From the urban areas there are memorable views to the Pennines which add to local sense of place.

	centres with open countryside. The industrial heritage now provides sites of wildlife interest in the urban environment. Canals that weave through the conurbation not only offer opportunities for access and recreation, but also form a network of wetland habitats. Sections of the Rochdale Canal, in particular, have been designated as being of international importance as a Special Area of Conservation (SAC). Woodland cover is generally low, but variable – and significant for such a heavily urban location. New areas of community woodland have been created in the Red Rose Forest and Pennine Edge Forest	
NCA 56 Lancashire Coal Measures	The Lancashire Coal Measures National Character Area (NCA) surrounds the towns of St Helens and Wigan, and extends from the Mersey Valley NCA in the south to the Lancashire and Amounderness Plain NCA in the north-west. Rocks from the Carboniferous Coal Measures underlie most of the area, giving rise to a varied topography of gentle hills and valleys, with patchy layers of glacial deposits. This fragmented landscape rises to 179 m at the summit of Billinge Hill on the western boundary, and then falls abruptly to the Lancashire and Amounderness Plain and Merseyside Conurbation to the west, and the Mersey Valley to the south. Views of the foothills of the southern Pennines can be seen to the east. The area is dominated by its industrial heritage, long associated with mining activity. The resulting landscape is a complex mosaic of farmland, scattered urban centres, industry, active mineral sites and derelict or reclaimed workings, giving this area a strong and distinctive identity.	**Lancashire Coal Measures** Past and present industrial activity and past coal mining activities give the landscape and towns in this character area a strong cultural identity. Topographically, it comprises a distinctive pattern of north west/south east orientated ridges. Farmland has a weak vegetation structure and much of the area has been settled and developed.
NCA 60 Mersey Valley	The Mersey Valley National Character Area (NCA) consists of a wide, low-lying river valley landscape focusing on the River Mersey, its estuary, associated tributaries and waterways. It is a varied landscape that extends from the mosslands near the Manchester Conurbation NCA in the east, to the Merseyside Conurbation NCA and the wide estuary with intertidal mudflats/sand flats and salt marsh in the west. The River Mersey is tidal from Howley Weir in Warrington. The area encompasses a complex mix of extensive industrial development and urban areas, with high-quality farmland in between. Farmland in the north of the Mersey Valley NCA is predominantly arable, while in the south there is a mix of arable and pasture. Field pattern is regular and large	**Mersey Valley** This area comprises the broad and distinctive river valley of the River Mersey and its tributaries. It includes open, flat, large scale farmland, some derived from improved/drained mossland, which supports mixed agriculture with little woodland cover. Major communications routes, prominent industrial infrastructure - chemical industries and the Fiddlers Ferry power station and the towns of Runcorn, Warrington, Halton and Widnes are defining elements.

	scale, often defined by degraded hedgerows with isolated hedgerow trees. In the east, open, flat farmland is found on the rich, dark peaty soils of the former mosses, with a complex network of drainage ditches. Urban and industrial developments line the banks of the River Mersey. Industrial infrastructure is often prominent, with large-scale, highly visible development including chemical works and oil refineries. The Manchester Ship Canal links the estuary to the heart of Manchester, perpetuating the industrial development of the area. There is a dense communication network of major roads, railways, canals and transmission lines. The urban and suburban areas provide housing for those working in neighbouring conurbations, as well as in the industries of the Mersey Valley	

*As noted by Natural England

**As noted in the North West Landscape Character Framework

Country Parks

There are a number of Country Parks spread across the GM area

Borough	Country Park(s)
Bolton	• Moses Gate Country Park • Smithills Hall Gardens & Country Park • Pennington Flash Country Park
Bury	• Burrs Low Country Park • Prestwich Country Park
Manchester City	• Burnage Country Park • Highfield Country Park
Oldham	• Tandle Hill Country Park • Daisy Nook Country Park
Rochdale	• Hollingworth Country Park
Salford	• Clifton Country Park • Blackleach Country Park
Stockport	• Etherow Country Park • Reddish Vale Country Park
Tameside	• Werneth Low Country Park • Stalybridge Country Park
Trafford	• N/A
Wigan	• Haigh Country Park • Three Sisters Recreation Area • Pennington Flash Country Park

Location of Country Parks as noted by AGMA

Green Belt

Each Borough within Greater Manchester designates its own Green Belt. Green Belt land performs the following five key functions:

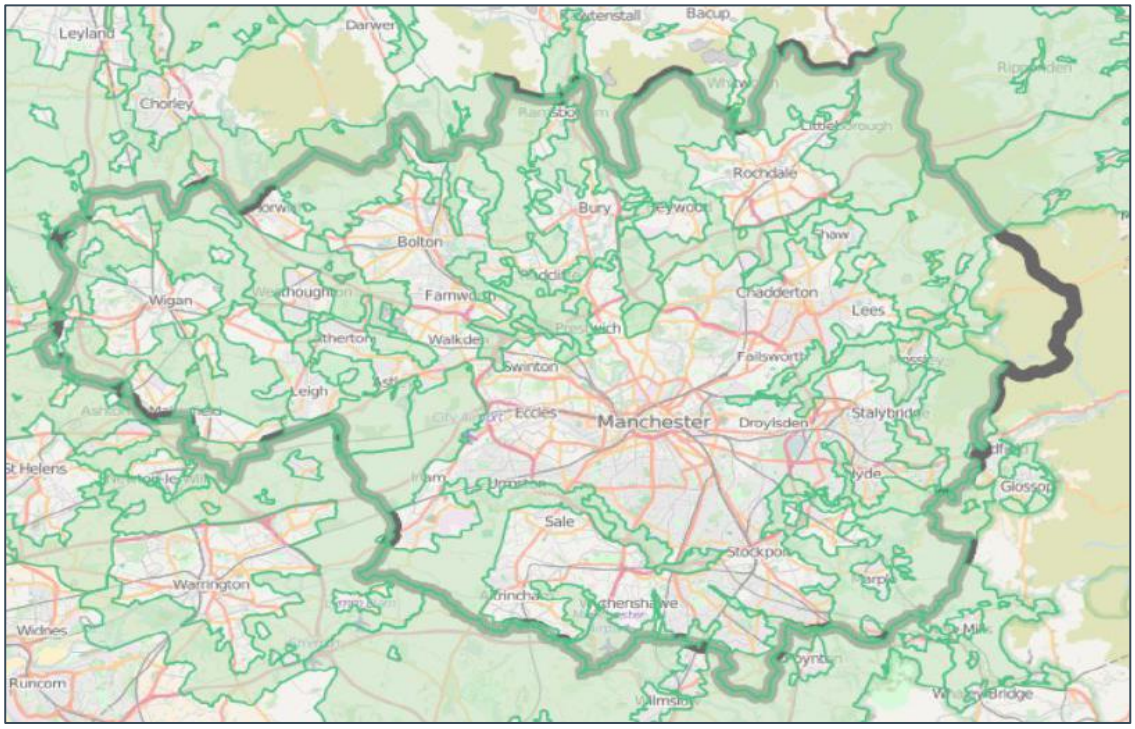
- to check the unrestricted sprawl of large built-up areas;
- to prevent neighbouring towns merging into one another;
- to assist in safeguarding the countryside from encroachment;
- to preserve the setting and special character of historic towns; and
- to assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

Across GM a total of 59,590 hectares of land is designated as Green Belt. Note that the area of Green Belt in the Manchester City Council area reduced by 25% between 2011/12 and 2012/13 to allow for the expansion of Manchester Airport as part of its growth strategy to 2030.

The table below shows the current areas of designated Green Belt within each GM authority.

Local Authority area	**Green Belt area (Hectares)**
Bolton District	7,280
Bury District	5,920
Manchester District	1,280
Oldham District	6,253
Rochdale District	9,923
Salford	3,372
Stockport District	5,857
Tameside District	5,061
Trafford District	3,982
Wigan District	10,642
Total GM	**59,590**

Areas of Green Belt are displayed on the following AGMA map:



Green Flag Awards for Parks

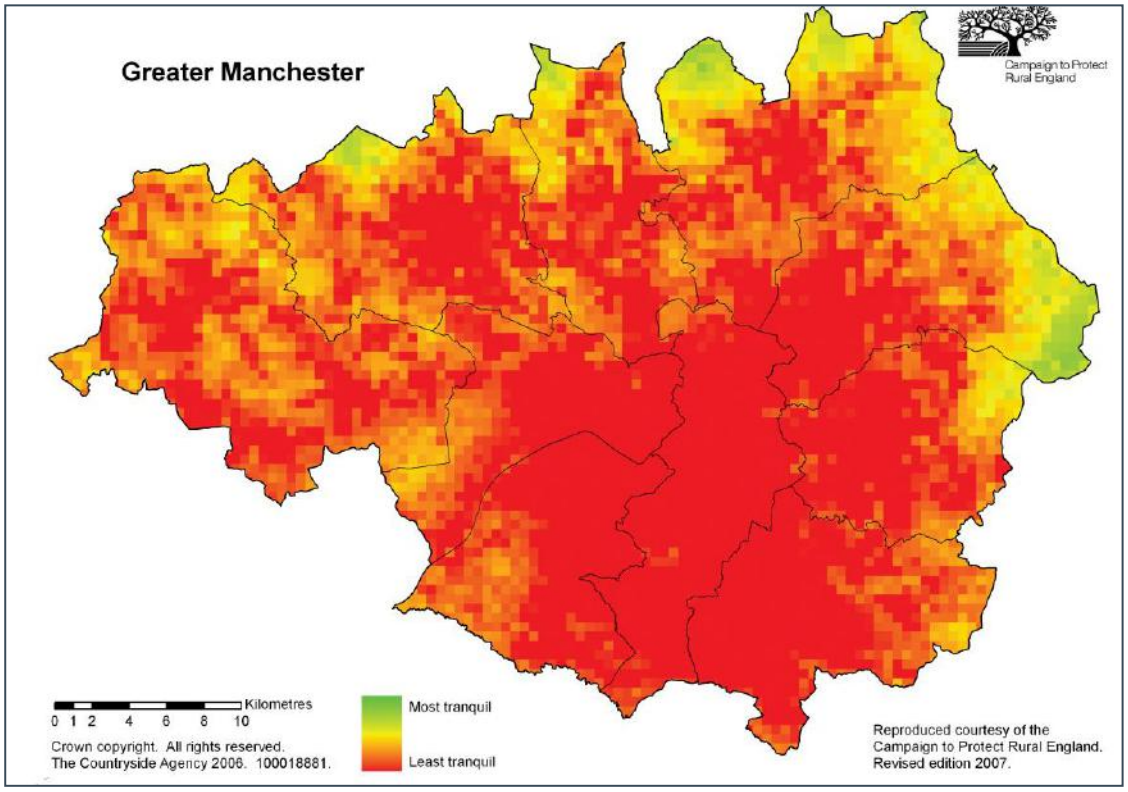
The North West Region of the UK, of which GM is part, is particularly strong in having Green Flag Awards for parks and gardens. In addition to an extensive list of Green Flags already awarded across GM, in 2015 -16 the following Green Flags were awarded:

Local Authority area	Green Flag
Bolton District	• N/A
Bury District	• Bolton Road Park • Burrs Country Park • Clarence Park • Close Park • Hoyles Park • Manchester Road Park • Nuttall Park • Openshaw Park • St Mary's Park • Town Meadow Park • Whitefield Park • Whitehead Park
Manchester City	• Alexandra Park (Manchester) • Blackley Cemetery & Crematorium • Gorton Cemetery • Heaton Park • Marie Louise Gardens • Philips Park Cemetery • Southern Cemetery • Gorton Park
Oldham District	• Alexandra Park

	• Dunwood Park
Rochdale District	• Hare Hill Park • Middleton Cemetery • Milnrow Memorial Park • Queen's Park Heywood • Rochdale Town Centre Parks • Truffet Park
Salford	• Blackleach Country Park • Clifton Country Park • Peel Green Cemetery • Victoria Park • Winton Park
Stockport District	• N/A
Tameside District	• Cedar Park • Cheetham Park • Dukinfield Park • Haughton Green Playing Fields • Hyde Park Hyde • Lymefield and Broad Mills • Oxford Park • Park Bridge • Ryecroft Hall Audenshaw • Stamford Park • Victoria Park • Werneth Low Country Park
Trafford District	• Denzell Gardens and The Devisdale • Victoria Park Trafford • Walkden Gardens • Worthington Park
Wigan District	• Pennington Hall Park • Alexandra Park • Mesnes Park • Jubilee Park

Loss of tranquillity

Loss of tranquillity is an issue within the GM area – a fact of the urban and industrial nature of large parts of this region. This was documented in a 1991 map (revised 2007) produced by the Campaign to Protect Rural England. It is anticipated that this map is still appropriate:



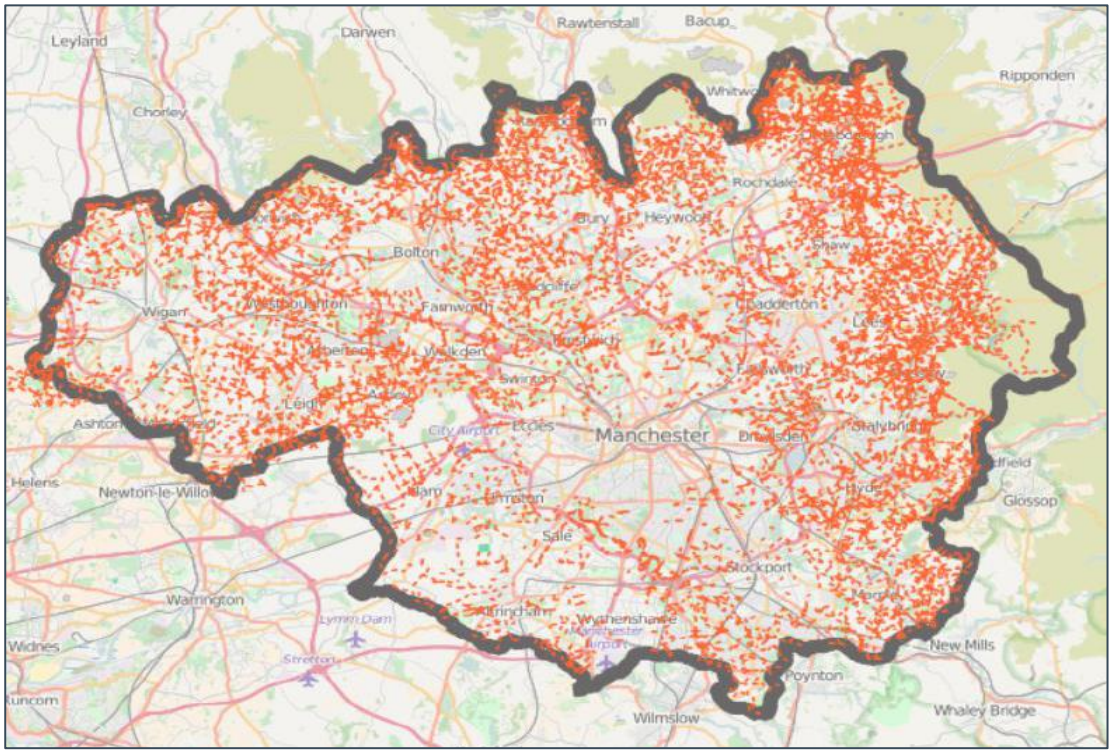
Public Rights of Way

As noted by Transport for Greater Manchester, GM's extensive network of Public Rights of Ways (PROW) in urban and rural areas, consisting of approximately 3000 km of route (56% is within the urban area and 44% in rural areas), is an extremely valuable resource. The network contributes to an integrated transport network, providing links between public transport services and providing a key component of the environmentally sustainable transport infrastructure, as well as providing opportunities for recreation and leisure pursuits

A Strategy has been developed to ensure that PROW are contributing to sustainable transport infrastructure in a way that will

- support economic growth,
- aid in the reduction of carbon emissions,
- promote equal opportunities,
- contribute to better safety, security, health,
- improve quality of life, and
- help to provide a healthy natural environment.

Rights of Way across the GM area are as noted by AGMA:



Landscape and built heritage across Greater Manchester

Parts of the urban landscape and townscape are closely linked to the historical development and cultural heritage of the conurbation, including potential archaeological assets. The majority of conurbation has been developed since these times, and whilst primarily residential in nature, includes many different housing types, together with supporting uses and infrastructure. The juxtaposition of development from different eras together with high quality public realm and building design in the Regional Centre and surrounding town centres, is a major part of the conurbation's identity and sense of place. Note that the GM Urban Historic Landscape Characterisation Project is underway at present – see http://www.gmau.manchester.ac.uk/projects/hlc.htm for further details.

The landscapes of GM are linked (either directly or indirectly) to the economy, and cultural identity of the area. For example, the tourist economy associated with the Peak District (and its outskirts) to the east depends heavily on the protection of that particular landscape. Similarly, the canals and important built heritage assets contribute significantly to local economies, as well as being part of the historic landscape. Rural landscapes support agricultural jobs and supply chains.

Green Infrastructure Corridors

GM has a wealth of green infrastructure assets. These assets deliver a whole series of provisioning (i.e. direct products such as agriculture or other natural resources); regulating (i.e. air quality regulation, pollination or flood risk reduction) or cultural (i.e. spiritual or tourism) benefits to GM and other parts of the UK. GM has also benefited (along with other regions of the country) with schemes such as the Coronation Meadow project which will establish a flagship meadow in all 105 counties across the UK (an example in GM being Chadkirk Wildflower Meadow in Stockport).

Historic and Cultural Heritage

GM contains a wide range of historic and cultural heritage features located across the region and which span the full range of human settlement – from the prehistoric to the present.

The Greater Manchester Archaeological Unit maintain over 18,000 records on their Historic Environment Record database and contains information relating to includes designations such as Scheduled Ancient Monuments, Listed Buildings, Conservations Areas, Parks and Gardens, buildings and features of local historic interest, historic landscapes, as well as archaeological sites. In particular, GM contains many cultural heritage assets as part of England's industrial heritage, such as the remaining canal network, warehouses, mills etc. It is important to note that the nature of cultural heritage features means that not all are known at present - in particular buried archaeological remains.

Historic waterways are an integral part of the history of the GM area and still play an important economic and recreational role today. Of particular note are the historic Manchester Ship Canal and the regenerated Salford Quays. Note that these historic canals also play a role in the economy and regeneration opportunities – in 2009 13.7million visits were linked to the GM canal network and this led to £39million in direct spending. The canal corridors support some 1300 leisure and tourism related jobs in GM.

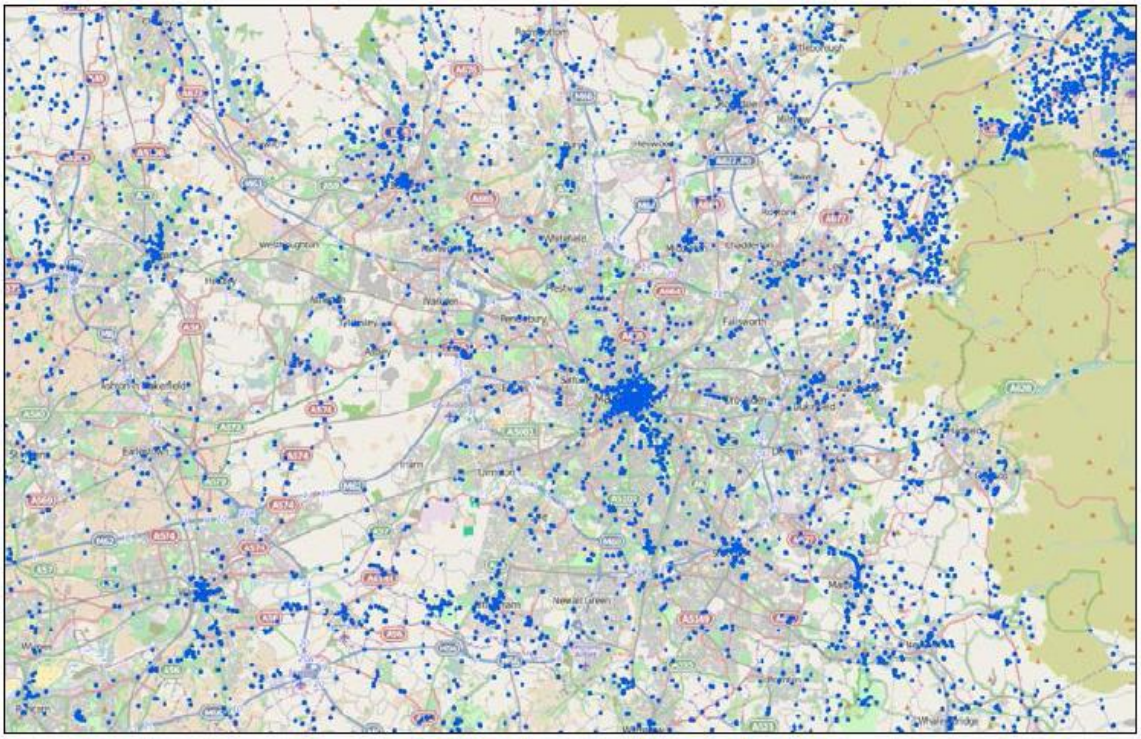
Cultural heritage assets within GM are distributed throughout the area. In some places, they sit in combination with certain historic landscapes to define an area's character. Specific examples include Scheduled Ancient Monuments which include archaeological remains which are of national importance are registered as Scheduled Ancient Monuments and have statutory protection under the Ancient Monuments and Archaeological Areas Act of 1979.The distribution of Scheduled Ancient Monuments is shown below:

Scheduled Ancient Monuments across Greater Manchester (Source: GM Spatial Framework IA Scoping)

Furthermore, there are important listed buildings across each of the authorities such as houses, churches/cathedrals, memorials, governmental/public buildings, country houses and bridges

The distribution of all listed buildings (i.e. grades I, II* and II) is presented below (as noted by AGMA):

There are also many Conservation Areas across GM which afford protection to the character and appearance of areas because of their particular architectural or historic interest.



Heritage at Risk across Greater Manchester (as noted by Historic England)

Local Authority area	Heritage at Risk
Bolton District	• Birley Street • Horwich Locomotive Works • Church of St. Catherine • Church of St Chad • Swan Lane Mill No.3
Bury District	• Ainsworth Conservation Area • Bury Town Centre • Rowlands / Brookbottoms Conservation Area • Walmersley Conservation Area • Church of St. Paul • Church of St. Hilda • Church of All Saints • Lower Chesham Hall
Manchester City	• Church of St. Helen • Church of Emmanuel • Brookfield UnitarianChurch • Church of St. Ann • Church of St. James • Police & Fire Station, London Rd • Baguley Hall • Former Welsh Baptist Chapel • Heaton Hall • Victoria Baths • Church of St. Nicholas • Church of All Saints • Synagogue of Withington Congregation of Spanish & Portuguese Jews • St. Aidan Reformed Church • Churhc of Holy Trinity • Christ Church • Church of St. Paul • Church of Holy Trinity
Oldham District	• Oldham Town Centre • Church of St. Mark with Christchurch • Church of St. Margaret • Church of Holy Trinity • Union St. United Reformed and Methodist Church • Church of St. Stephen and All Martyrs • Church of St. John • Foxdenton Hall • 1-5 Hollins Road • Church of St. James • St. Paul's Methodist Church
Rochdale District	• Castleton (South) • Rochdale Town Centre • Wardle • Church of Christ • Bamford United Reformed Church • St. Paul's Methodist Church • Church of St. Luke

	• Hopwood Hall • Crimble Mill • Birchinley Manor Farmhouse • Long St. Methodist Church • Tonge Hall • Long St. Methodist Sunday School Buildings
Salford	• Cliff, Higher Broughton • Crescent • Irlams o'th'Height • St. Augustine's • Church of St. Mary • Church of St. Peter • Church of St. John the Baptist • Church of St. Mark • Church of St. Paul • Church of St. Mary Magdalene • Higher Crumpsall Synagogue • Greek Church of the Annunciation • Church of the Ascension • Church of St. Clement • Former Public Baths, Collier St.
Stockport District	• Hillgate • Parish Church of St. Peter • Parish Church of St Thomas • St. Joesph's Church • Church of St.Paul • St. Mary's in the Marketplace • Oldknow's Limekilns • Houldsworth Mill Engine House • Moseley Old Hall • Woodbank Villa and Entrance Portico • Chuch of St. Mark • Christ Church • Church of St. Paul, Compstall Brow • Church of St. Chad • Wycliffe Congregational Chapel
Tameside District	• Ashton Town Centre • Stalybridge Town Centre • Church of St. Mary • Dukinfield Old Chapel • Church of St. John the Baptist • Holy Trinity Church • Church of St. John the Evangelist • Christ Church • Hugh Mason House • Old Hill Chapel • Church of St. John the Baptist (Mossley) • Apethorn Farmhouse • Hyde Hall
Trafford District	• Barton Upon Irwell Conservation Area • Empress Conservation Area • George Street Conservation Area • Church of St. Clement

Wigan District	• Leigh Conservation Area • Tyldesley Town Centre • Church of St. Elizabeth • Church of St. Catherine • Church of St. Paul • Haigh Hall Park Gateway and Lodges • Barn & Stable, Winstanley Hall • Winstanley Hall • Haigh Hall • Headgear at Astley Green Colliery • Leigh Spinners Mill

Historic Waterways

GM also has a number of historic waterways which are rooted in the history of the sub-region, connect to neighbouring areas and are significant contributors to the local economy. British Waterways (now the Canal and River Trust), in their document *Waterways: Contributing to the vision for a Greater Manchester*, state that waterways are a key driver in the fortunes and success of regional, sub-regional and local economies supporting the visitor and tourism economy and in many places they continue to contribute to the regeneration of deprived areas. It is estimated that around:

- 13.7 million tourism, recreation and functional visits were made to the canals in GM in 2009.
- Some £39 million gross direct expenditure was generated in the local economy through these visits, which rises to over £50 million if indirect and induced visitor spend is taken into account,
- The canal corridors support some 1,300 leisure and tourism related jobs in GM.
- GM seems to be underperforming in terms of use of the canal network compared with other cities in England.

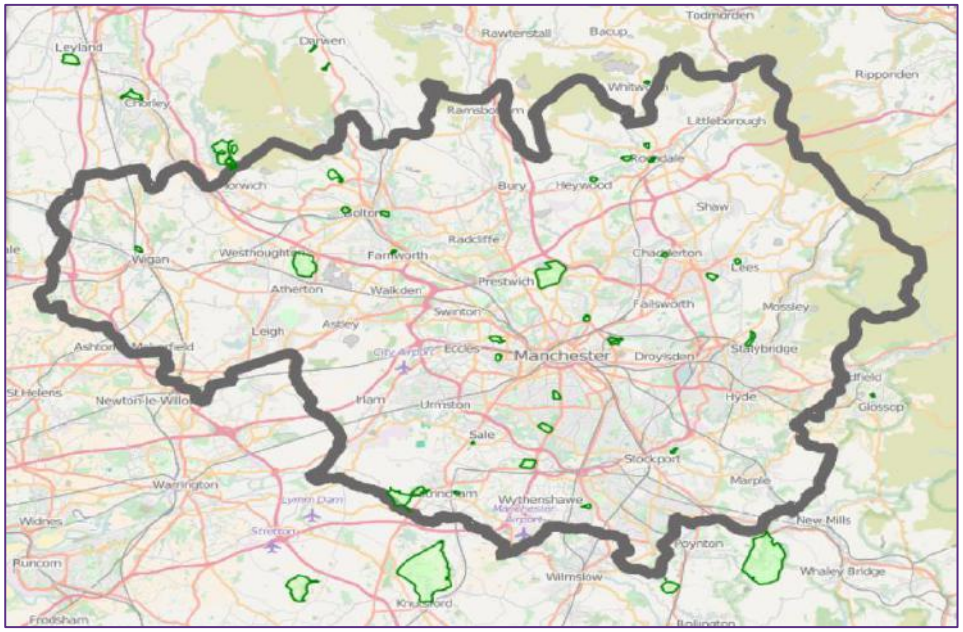
The above applies across the GM canal network, which includes canals owned, maintained and operated by the Canal and River Trust and Peel Holdings.

Canal Network in Greater Manchester as noted by AGMA

Parks and Gardens

In the urban areas, parks and gardens represent an important recreation resource and there are many throughout Greater Manchester.

Registered Parks and Gardens of special historic interest include planned open spaces that often started life as the grounds of private homes but also include important public parks and cemeteries. The figure below shows the distribution of GM's registered parks and gardens:



Registered Parks and Gardens across Greater Manchester (Source: AGMA)

Water Resources and Quality

GM has a wide range of water body types. Water bodies were frequently negatively impacted due to the industrial past of this region, but in recent decades there has been a marked and continuing improvement in water quality. There are still though water quality issues relating to the urbanised / industrialised nature of large parts of the region and the role of agriculture in other areas. Pollution can be both direct and indirect (point source or diffuse). As with the rest of the UK, the principles of the Water Framework Directive (WFD) are key to understanding the management of water bodies in the area – the GM area falls within the North West River Basin.

There are four main river catchments in the Greater Manchester area; these are:

- Irwell;
- Douglas;
- Upper Mersey and;
- Glaze Brook.

They are protected and managed according to the principles of the Water Framework Directive. The Irwell Catchment extends from the moors above Bacup (Rossendale) to the Manchester Ship Canal in the centre of Manchester. The Mersey catchment area extends from Bolton in the east, through Warrington and St Helens, and includes the Mersey Estuary at Liverpool.

The Irwell catchment makes up 42% of the Association of Greater Manchester Authorities (AGMA) area, whereas the Mersey catchment area equates to around 36%.

The above four river catchments fall within the following *North West River Basin District Catchments* as defined by the Water Framework Directive:

Irwell

The Irwell catchment drains the Southern Lancashire Pennines and has rural headwaters in the internationally protected South Pennine Moors. As the waters flow through the industrial towns of Bolton, Bury, Rochdale, Salford, Oldham and Manchester the river becomes predominantly walled and channelised.

There are, however, large semi-rural sections along significant stretches of the Irwell catchment, from Rawtenstall to Radcliffe, from Rochdale to Bury and Belmont to Astley.

Key statistics for Irwell catchment

River and lake water bodies	*2009*	*2015*
% at good ecological status or potential	13	13
% assessed at good or high biological status (24 water bodies assessed)	17	38
% assessed at good chemical status (5 water bodies assessed)	100	100
% at good status overall (chemical and ecological)	13	13
% improving for one or more element in rivers		50

Douglas

The River Douglas rises in the hills of South Lancashire and is fed by the Rivington reservoirs. The catchment also includes the River Lostock and River Yarrow. The Douglas and its tributaries flow through the historic industrial towns of Wigan, Chorley and Leyland before joining the Ribble Estuary. Urban pollution places significant pressures on the catchment at these locations.

Key statistics for Douglas catchment

River and lake water bodies	*2009*	*2015*
% at good ecological status or potential	8	12
% assessed at good or high biological status (17 water bodies assessed)	16	16
% assessed at good chemical status (8 water bodies assessed)	88	88
% at good status overall (chemical and ecological)	8	12
% improving for one or more element in rivers		15

Upper Mersey

Covering a significant part of urban Manchester and encompassing parts of the South Pennine Moors Special Protection Area and Special Area of Conservation, the Upper Mersey catchment is one of contrasts. The internationally protected conservation sites support rare and endangered habitats and bird species. Salmon are returning to the River Bollin following installation of two new fish passes and the River Goyt supports the Mersey's only known population of juvenile Atlantic salmon.

Key statistics for Upper Mersey catchment

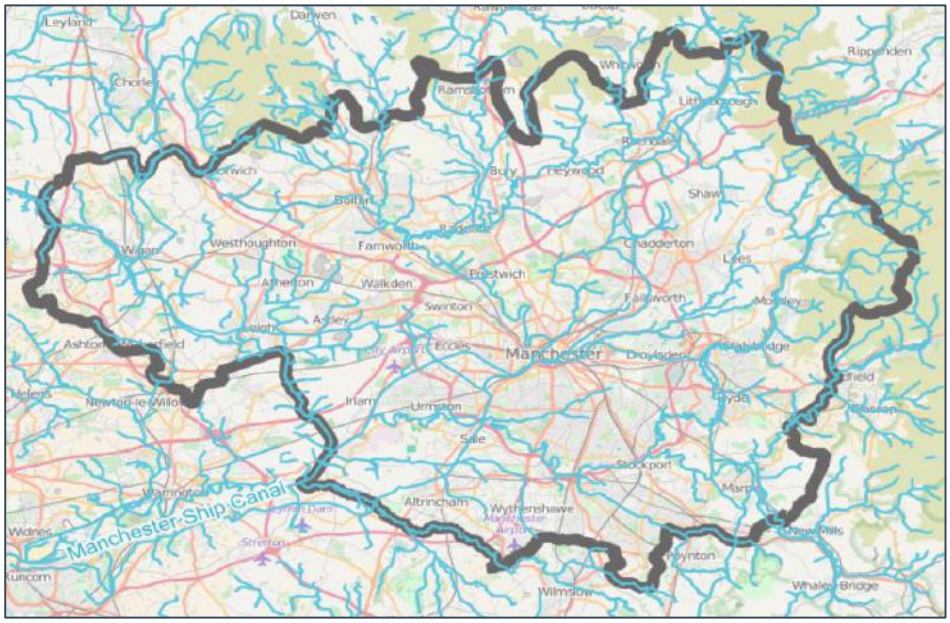
River and lake water bodies	*2009*	*2015*
% at good ecological status or potential	18	22
% assessed at good or high biological status (36 water bodies assessed)	24	32
% assessed at good chemical status (8 water bodies assessed)	63	75
% at good status overall (chemical and ecological)	18	22
% improving for one or more element in rivers		48

As noted and as with the rest of the UK, the principles of the Water Framework Directive (WFD) are key to understanding the management of water bodies in the area – this area falls within the North West River Basin.

The main rivers in the Greater Manchester region include:

- River Mersey
- River Irwell *(within the North West River Basin District Catchment- Irwell)*
- River Irk *(within the North West River Basin District Catchment- Irwell)*
- River Tame (within the Humber River Basin District Catchment- Tame and Mease)
- River Medlock (within the North West River Basin District Catchment- Irwell)
- River Goyt *(within the North West River Basin District Catchment- Upper Mersey)*
- River Etherow

There are also numerous canals – with the terminal basin for the various Manchester & Salford area being of particular note.



River network as noted by AGAM – note Manchester Ship Canal

Surface water

Rivers perform different roles and functions depending on a number of factors (such as location, access, and water quality). The rivers of GM are responsible for direct uses such as abstraction, leisure uses (fishing, boating, swimming) and transport. Rivers and their tributaries provide green links, which are important for recreation, including fishing, sailing and canoeing. Furthermore, there are many areas for cycling, horse riding and bird watching, including country and forest parks which are associated with rivers and waterways. The Irwell catchment includes designations of local and national importance. Nationally protected species that have been recorded in the catchment include great crested newts, water voles, floating water plantain and bats, which use rivers and streams as feeding areas. There are also indirect uses, such as a rivers contribution to a local landscape, cultural heritage as well as this they contribute positively socially, economically and environmentally. Across GM, there are also important areas of wetland including at Wigan Flashes, Chat Moss and Risley Moss to the west and southwest of Manchester. These areas provide important habitats and flood storage capacity.

Groundwater

Groundwater is a vital water body that is often overlooked. It is important to note that there are aquifers in the region utilised as a source for potable water. There are a number of Groundwater Source Protection Zones across the GM region. The main areas of Groundwater sensitivity are located in the south and west of the GM area, with an additional area to the north east of GM (between Oldham and Rochdale).

Groundwater Source Protection Zone (GSPZ) mapping for Greater Manchester is shown below. These zones help to monitor the risk of contamination from any activities that might cause pollution in the area.

Pressures on the water environment can come in a variety of ways however, a range of challenges remain, which will need to be addressed to secure the predicted improvements. These include:

- **Diffuse pollution from rural areas** – nutrients, sediments and pesticides in runoffs.
- **Point source pollution caused by discharges from sewerage systems**– an excess of organic matter which depletes the oxygen available for wildlife.
- **Diffuse pollution from roads and urban areas –** a range of pollutants related to urban areas and the transport network.
- **Physical modification of rivers and coastline** - changes to the structure of water bodies, such as for flood defence.
- **Point source pollution caused by discharges from industry** - a range of pollutants and chemicals related to various industries that may affect the physiology, growth, development and reproduction of aquatic organisms.
- **Abstraction and other artificial flow regulation** – problems related to taking water from rivers, reservoirs, lakes and groundwater.

Overall, it is important to acknowledge that water resources come from many different assets. Given forecast population and economic growth, expected climate change, managing and reducing demand for water resources will continue to be important measures to ensure that the water supply to Greater Manchester can continue to be managed sustainably. The main areas of groundwater sensitivity are located within the south and west of Greater Manchester as well as an area towards the north east of Greater Manchester between Oldham and Rochdale. Rivers and other watercourses could be polluted by contaminated land and as a result of development however, maintaining and improving surface and groundwater quality is vital to secure a continued water resource in Greater Manchester.

Land Use, Soil & Agriculture

GM is a highly urbanised / industrialised area. There is a mix of land use types e.g. heavily urbanised, suburban, urban fringe and rural locations but overwhelmingly the land use is urban. There is continuing pressure on areas of open space for development. This continuing pressure is also partly driven by transport / infrastructure needs.

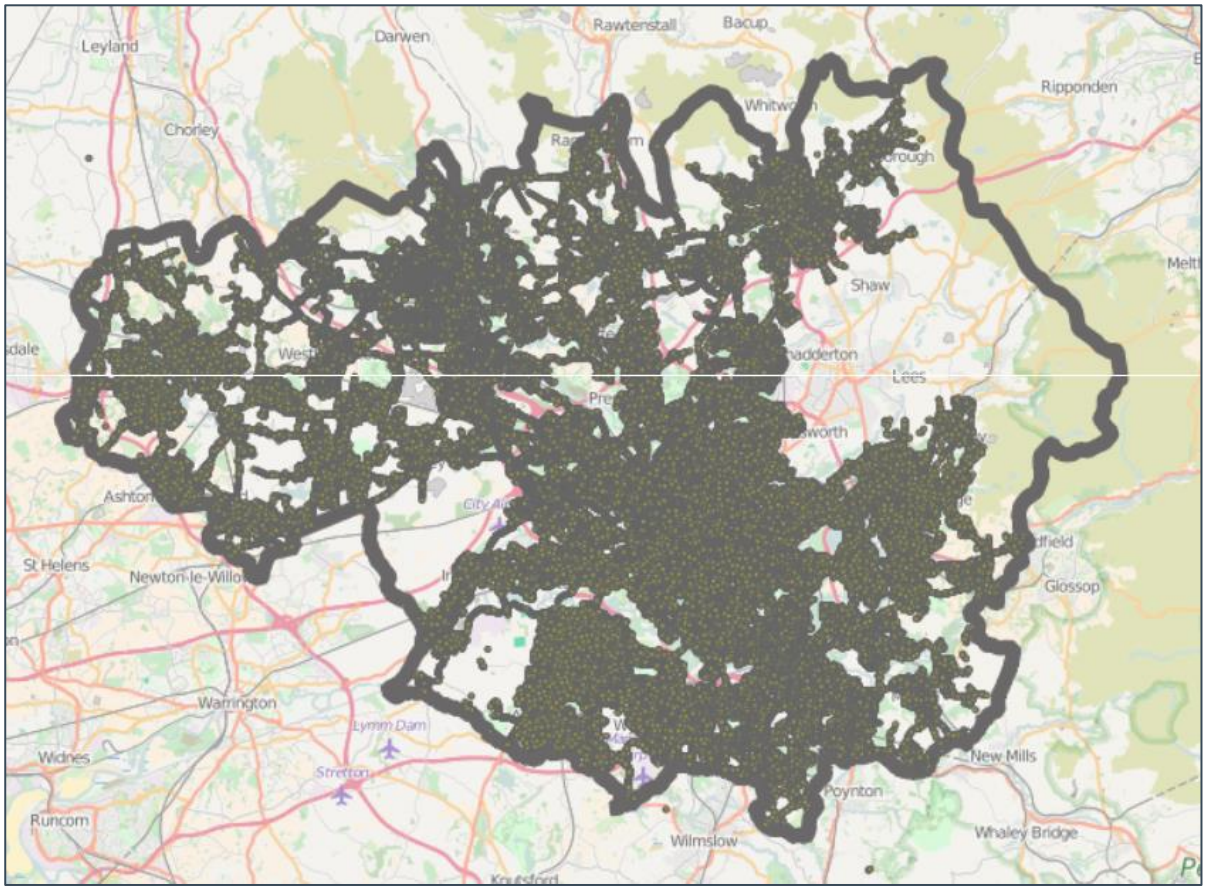
Soil is a finite resource that fulfils many important functions and services (ecosystem services) for society; for instance as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution.

There are areas already impacted by urbanisation that could accommodate new (brownfield) development though it is to be noted that contamination could be encountered in these areas due to the legacy of heavy industrialisation in the region.

Development pressure will also be felt on existing rural areas, with the need for new transport infrastructure contributing to this pressure. This could have a wide range implications for the land use / soil / agricultural resource e.g. through direct loss, potential for pollution or contamination incidents, severance of farm holdings etc.

Density of built up areas

GM is a mix of built up and undeveloped areas – an indication of built up areas can be seen on this map produced by AGMA which depicts street light locations:



Contamination

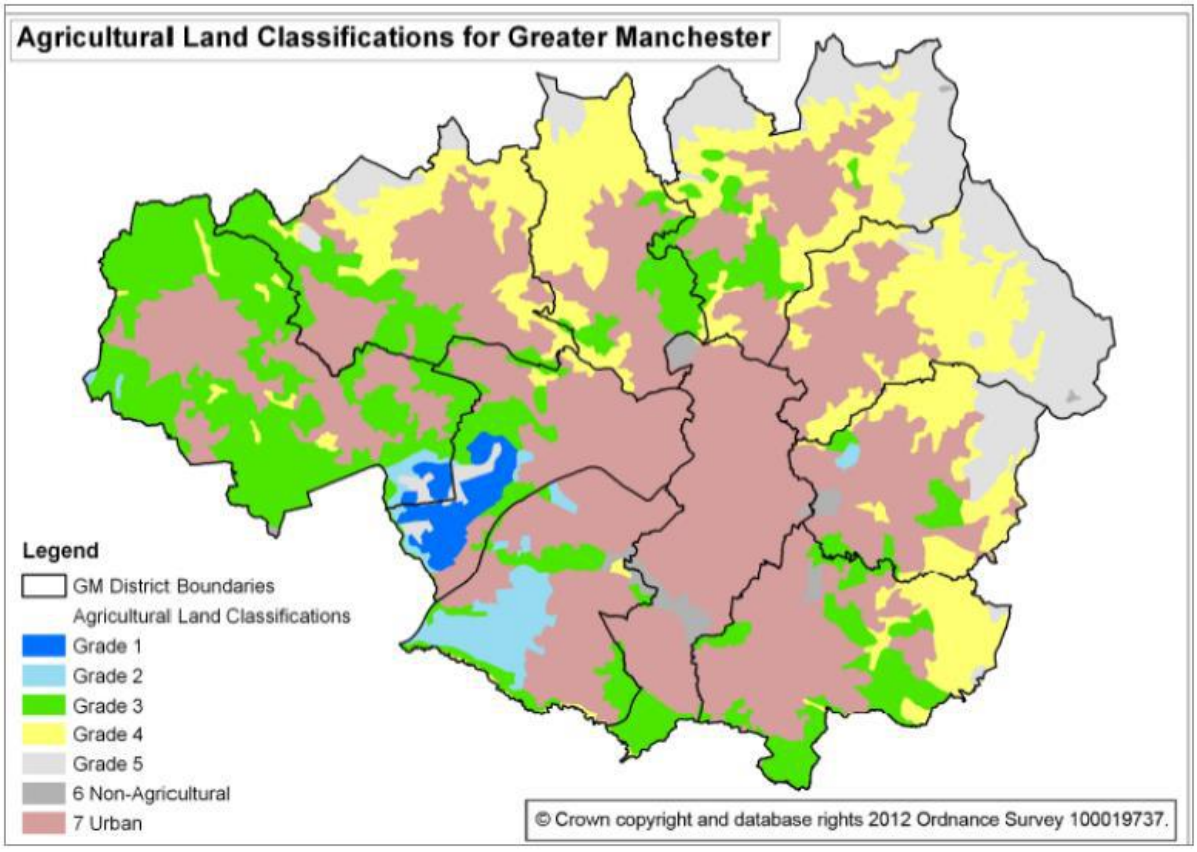
As noted in the GM Spatial Framework, GM was central to the Industrial Revolution and this resulted in intense industrial activity in many places from the 19th century to the present day. Industrial activity had a significant impact on the local environment. In particular it has left a legacy of potentially contaminated land at former industrial sites and at infilled mineral excavations. In some cases significant risks from this contamination now have to be addressed to protect the health of all those who live and work in these areas and to prevent damage to the environment.

As well as often being a significant undertaking to remediate, former industrial land provides great opportunities for certain areas in terms of being a potential underused resource which could be used to meet housing targets and produce new economically productive sites. Issues around contaminated land and industrial legacy are dealt with on a local authority level through implemented contaminated land strategies and polices within Core Strategies.

Agricultural land

Agricultural land is prevalent across parts of GM and, where it is in use, it is fundamentally linked to local economies and communities. Despite the heavy urbanisation, there are areas within GM that are classified within the top grades of the Agricultural Land Classification system.

The Agricultural Land Classification (ALC) classifies agricultural land according to three grades, where grade 1-3a is considered the best and most versatile. These grades are protected from development. The best and most versatile land is generally in the western part of the region – away from the upland Pennine areas. The figure below shows the ALC classification across GM.



Agricultural Land Classification for Greater Manchester (Source: Manchester City Council)

Flooding

Due to the highly urban nature of GM, many rivers and other water bodies, along with ground surface types have been modified from their natural condition. This has resulted in limitations to the carrying capacity of the drainage network.

The existing flood risk within GM has been recognised at both a regional and local level – for example each of the 10 local authorities are producing Local Flood Risk Management Strategies. It is also recognised that there are different flooding types due to natural differences in topography, geology, rainfall patterns, vegetation etc as well as manmade conditions such as urbanisation and drainage infrastructure.

As such, flood risk varies widely across the region and each local authority has a number of issues. For example, even though flood risk areas within Bolton are fairly narrow, there are still significant Flood Zone 2 and some large Flood Zone 3 areas.

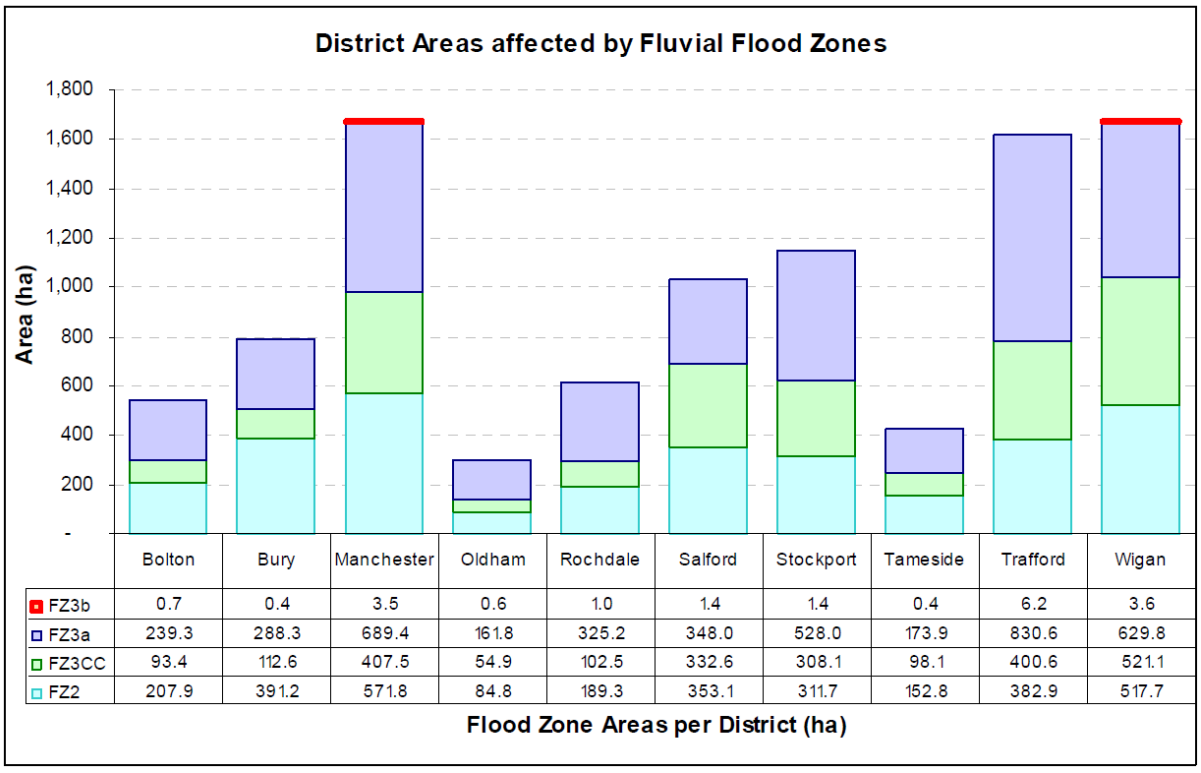
The Greater Manchester area consists of a complex hydrological network that interlinks all of the councils and areas beyond the boundaries of GM. The hydrology of the area is affected not only by natural features such as topography, watercourses and geology, but also by artificial influences such as canals, reservoirs and the built environment. As a result, GM has a complex mix of varying and interlinked flood sources and associated risks.

The Irwell and Mersey catchments dominate the study area, accounting for 78% of the total catchment area. Glaze Brook, the River Bollin, Sinderland Brook and the River Douglas make up the remainder of the fluvial catchments. The upper regions of the catchments tend to be steeper and have less permeable geology and are therefore more susceptible to flooding from watercourses and direct runoff as a result of high intensity rainfall events. The lower areas of the catchments consist of a more shallow topography, and have more permeable geology and tend to be dominated by fluvial flooding as a result of widespread and persistent rainfall events. All catchments within the AGMA area, apart from the River Douglas, drain into the Manchester Ship Canal.

Six main flood types have been identified in the Strategic Flood Risk Assessment for the Greater Manchester area and these are summarised below.

1. **Flooding from Rivers:**

The principal source of flood risk to GM is from fluvial flooding. A significant amount of information exists for the main watercourses and their tributaries across the four main catchments (Irwell, Mersey, Douglas and Glaze Brook). Manchester, Trafford, Salford, Stockport and Wigan have the largest areas of fluvial flood risk in the Greater Manchester Sub-Region.



	Bolton	Bury	Manchester	Oldham	Rochdale	Salford	Stockport	Tameside	Trafford	Wigan
FZ3b	0.7	0.4	3.5	0.6	1.0	1.4	1.4	0.4	6.2	3.6
FZ3a	239.3	288.3	689.4	161.8	325.2	348.0	528.0	173.9	830.6	629.8
FZ3CC	93.4	112.6	407.5	54.9	102.5	332.6	308.1	98.1	400.6	521.1
FZ2	207.9	391.2	571.8	84.8	189.3	353.1	311.7	152.8	382.9	517.7

As urbanisation in the region has developed and grown, some watercourses were culverted, diverted, or even infilled to accommodate the amount of development associated with the industrial revolution, however there are many that remain unknown or ‘forgotten’ and continue to flow through old culverts and tunnels. The condition, standard of service and exact route of these culverts and tunnels is often unknown but they still

present a potential flood risk to local areas in the sub-region. Culverts carry an inherent and often unknown risk of flooding as a result of debris blockage, siltation (and hence loss of capacity) and collapse.

2. Flooding from the Land:

During periods of prolonged rainfall events and sudden intense downpours, overland flow from higher ground may 'pond' in low-lying areas of land without draining into watercourses, surface water drainage systems or the ground. Pluvial and surface water flooding is most likely to occur in areas of poor permeability and limited drainage and on steeper slopes; however, there is widespread potential for occurrences across GM. In some areas, pluvial flooding may present a more significant risk than other sources of flooding, including fluvial.

Historically, Manchester, Bolton, Bury, Rochdale, Stockport, Salford, Tameside and Trafford have records showing that pluvial flooding has occurred.

3. Flooding from sewers:

Sewer and drainage flooding are another flood risk throughout GM, particularly during severe rainfall events, where the design capacity of the sewer network is insufficient to cope with the high volumes of water. During periods of high river flow, there is the potential for such drainage systems to become unable to discharge to watercourses, or to surcharge due to a lack of capacity, resulting in the system backing up and flooding roads and properties.

As with pluvial flooding, sewer flooding has the potential to occur anywhere within GM especially as a result of the high urban density.

4. Manmade/ Artificial Flooding

There are few recorded instances of flooding from the canal networks as they tend to be heavily regulated and controlled. Nonetheless, flood risk from canals and navigable waterways still exists where canals could overtop or breach. As the Ship Canal is privately run and operated, it falls outside of the remit of existing flood risk legislation and, consequently, the programme of flood risk modelling and mapping projects undertaken by the EA and local authorities.

This has led to a 'critical gap' in the flood risk information available for GM. Similarly, the flood risk associated with canals are also difficult to quantify.

Similarly, there are approximately 80 reservoirs falling under the Reservoirs Act within GM, with up to an additional 45 contributing to them from outside this area. There are few recorded incidents of flooding as a result of reservoirs, though the residual risk of breaching and overtopping remains, along with the risk associated with emergency discharges.

The Districts most at risk are those in the upper catchment areas, where the majority of reservoirs exist. These include Bolton, Bury, Oldham, Rochdale, Tameside and Stockport

5. Flooding from Groundwater

Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to last longer than fluvial, pluvial or sewer flooding and mostly affects below surface infrastructure and buildings (for example, tunnels, basements and car parks).

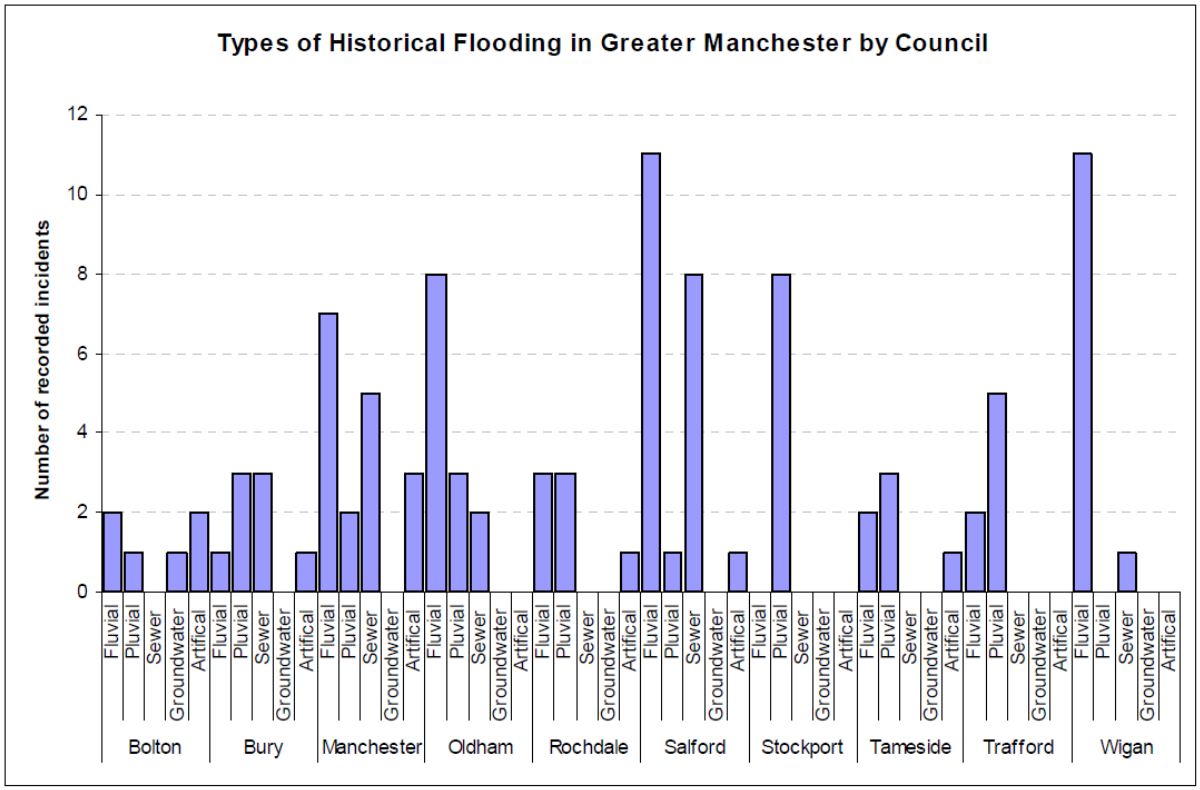
Parts of the Upper Douglas catchment immediately adjacent to Wigan District are known to have suffered from groundwater flooding in the past. It is thought that flooding from groundwater may become more of an issue due to the cessation of dewatering mines.

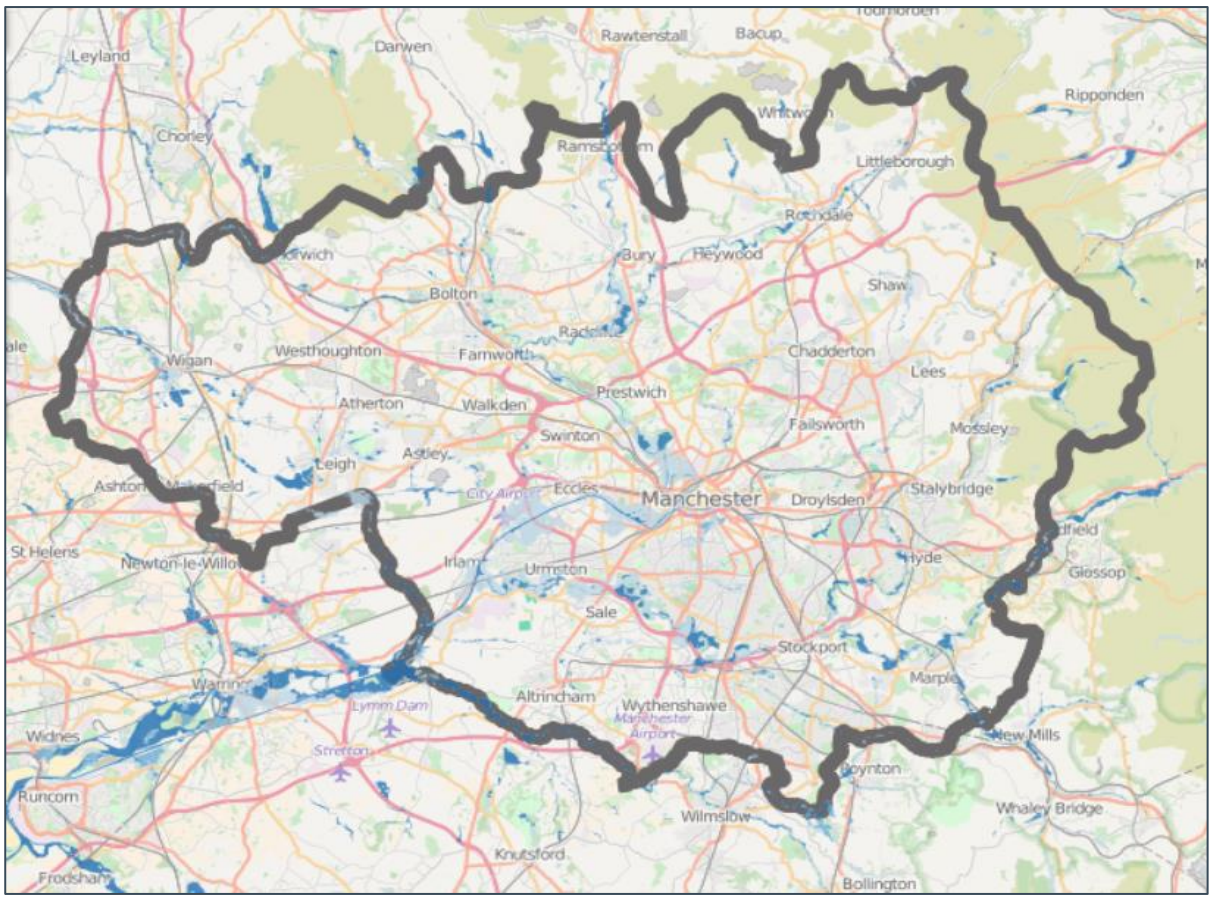
Risk from Groundwater may increase as new drainage techniques such as SuDS increase groundwater recharge and therefore groundwater levels. This level of risk has not been quantified.

6. Historical Flooding

Numerous flooding events have occurred in GM over the years and it has been shown that most occurred during July and August with a large proportion of these floods being pluvial, sewer or combined (i.e. records show that fluvial flooding occurred as well as sewer and surface water flooding).

Salford is shown to have significant historical flooding, in particular fluvial and sewer flooding. Many of the recorded incidents are as a result of flooding from the River Irwell. Wigan has a similar number of recorded fluvial flood events as do Manchester and Trafford.





Risk of River Flooding as noted by AGMA – darker blue shading denotes a higher risk

Waste & Resources

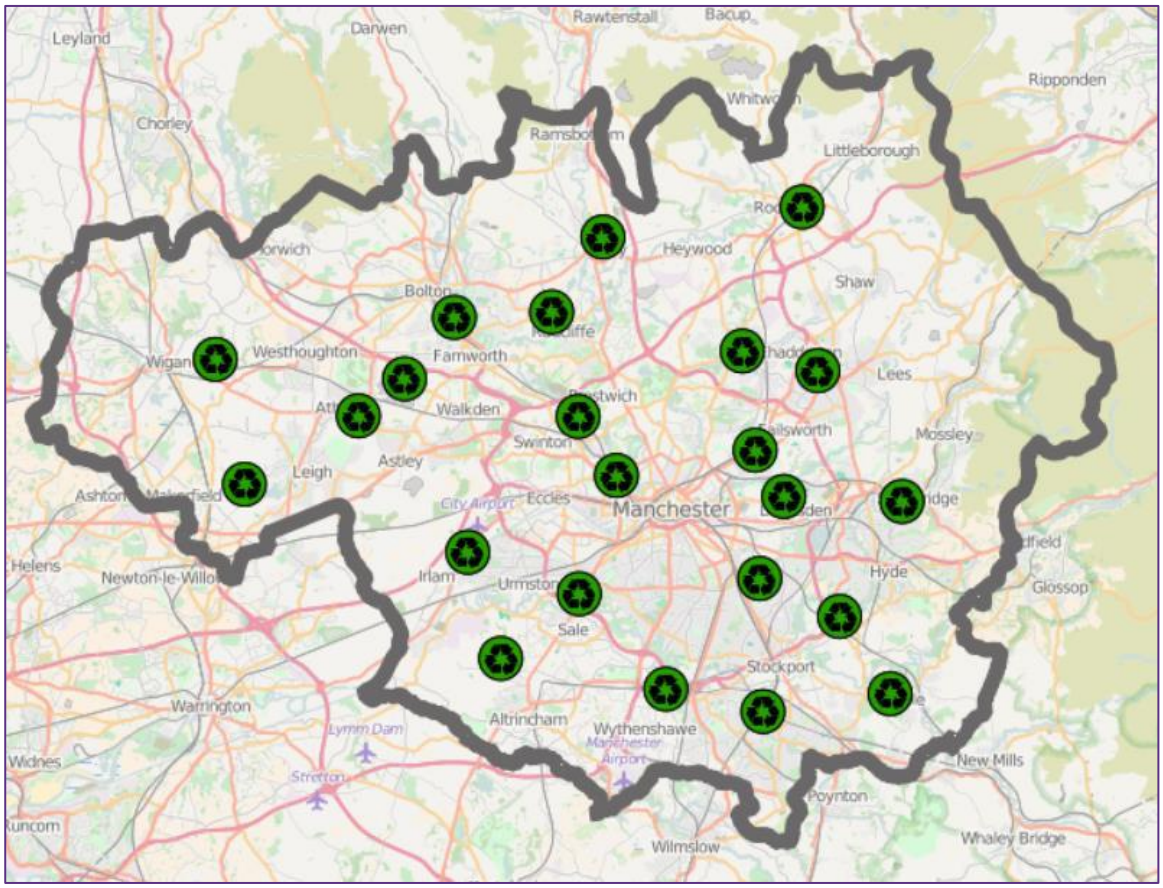
Planning for waste is achieved at a strategic level with the Greater Manchester Joint Waste Plan, adopted in 2012. This plan highlights the relative proportions of principal waste streams in Greater Manchester as follows:

- Commercial Waste = 33%
- Industrial Waste = 17%
- Municipal Waste = 24%
- Construction, demolition and excavation waste = 21%
- Agricultural and other waste = 5%

Waste across the Greater Manchester area is managed by the Greater Manchester Waste Disposal Authority.

The Greater Manchester Waste Disposal Authority are responsible for dealing with the 1.1 million tonnes of waste produced each year, from the 1,017,000 households and resident population of over 2.42 million (AGMA 2015) in Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside and Trafford.

This waste comes from council household waste collections and 20 Household Waste Recycling Centres (HWRCs) provided and serviced by the Authority. They handle around 4% of England's Municipal waste. (Sourced: http://www.gmwda.gov.uk/about-us)



Waste and recycling centres – source AGMA

For GM, the Greater Manchester Joint Waste Plan was adopted in April 2012. The purpose of the plan is to set out a waste planning strategy to 2027 which enables the adequate provision of waste management facilities in appropriate locations for municipal, commercial and industrial, construction and demolition and hazardous wastes. Relative proportions of principal waste streams in GM are as follows (AGMA 2012):

Waste Type	**Percentage**
Municipal Waste	24%

Construction, Demolition and Excavation Waste	21%
Commercial Waste	33%
Industrial Waste	17%
Agricultural and other waste	5%

The table below indicates the forecast Local Authority collected waste arisings within the Greater Manchester Waste Disposal Authority area, at five year intervals throughout the Plan period, illustrating the predicted arrest in growth in waste arisings in line with the targets above.

GM Waste Disposal Authority: Local Authority collected waste arisings (tonnes per annum) 2009-2027 As noted in GM Joint Waste Development Plan

Waste Arisings 2009	Forecasted Waste Arisings 2012	Forecasted Waste Arisigns 2017	Forecasted waste Arisings 2022	Forecasted waste Arisings 2027
1,111,271	1,115,480	1,114,077	1,114,077	1,114,077

The Plan states the following about future waste capacity requirements in GM:

- Energy Recovery Between 2012 and 2027: a total of 5.2 million tonnes of energy recovery capacity will be required; this will be accommodated at a maximum of five energy recovery facilities.
- Non-hazardous waste disposal between 2012 and 2027: a total of 7.8 million tonnes of waste disposal capacity will be required; this will be accommodated at two landfill facilities.
- Hazardous waste disposal between 2012 and 2027: a total of 272,000 tonnes of hazardous waste disposal capacity will be required; this will be accommodated at a specially engineered cell within one of the landfill facilities above.
- Other capacity requirements: The evidence indicates that there is sufficient recycling, composting and treatment capacity for all other waste streams throughout the Plan period. Therefore no additional facilities have been allocated for this purpose.

The following graphs shown below indicate the different types of waste and capacity for waste in GM and whether there will be sufficient capacity to deal with the accumulated waste over this period of 19years.
(Graphs sourced: Greater Manchester Joint Waste Development Plan Document)

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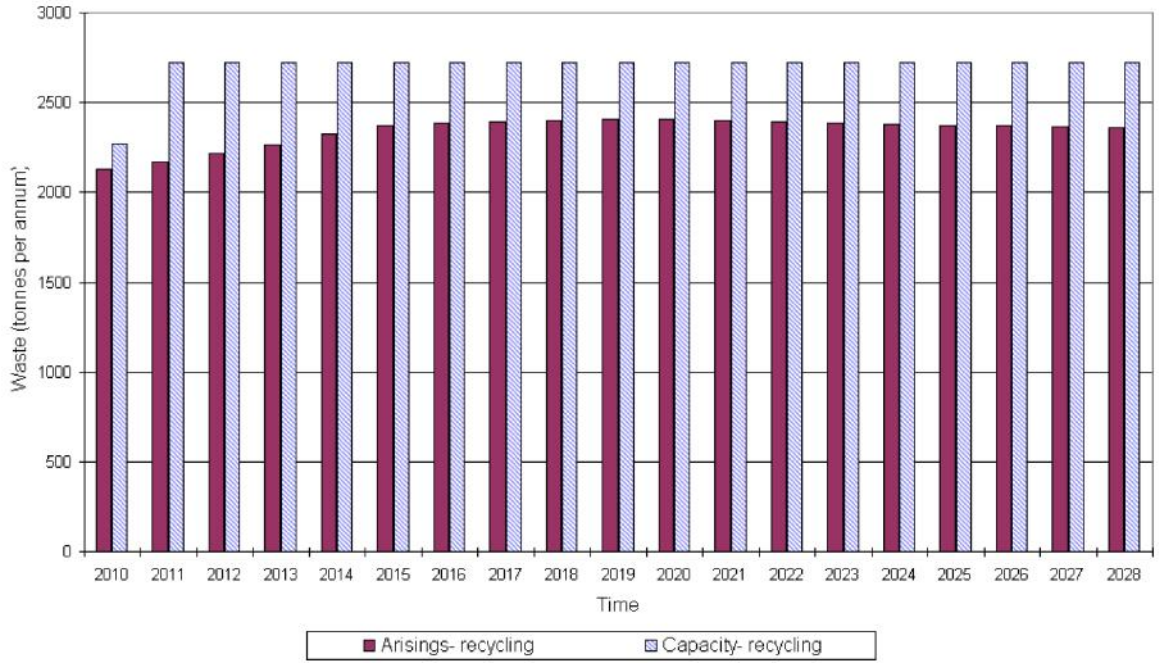
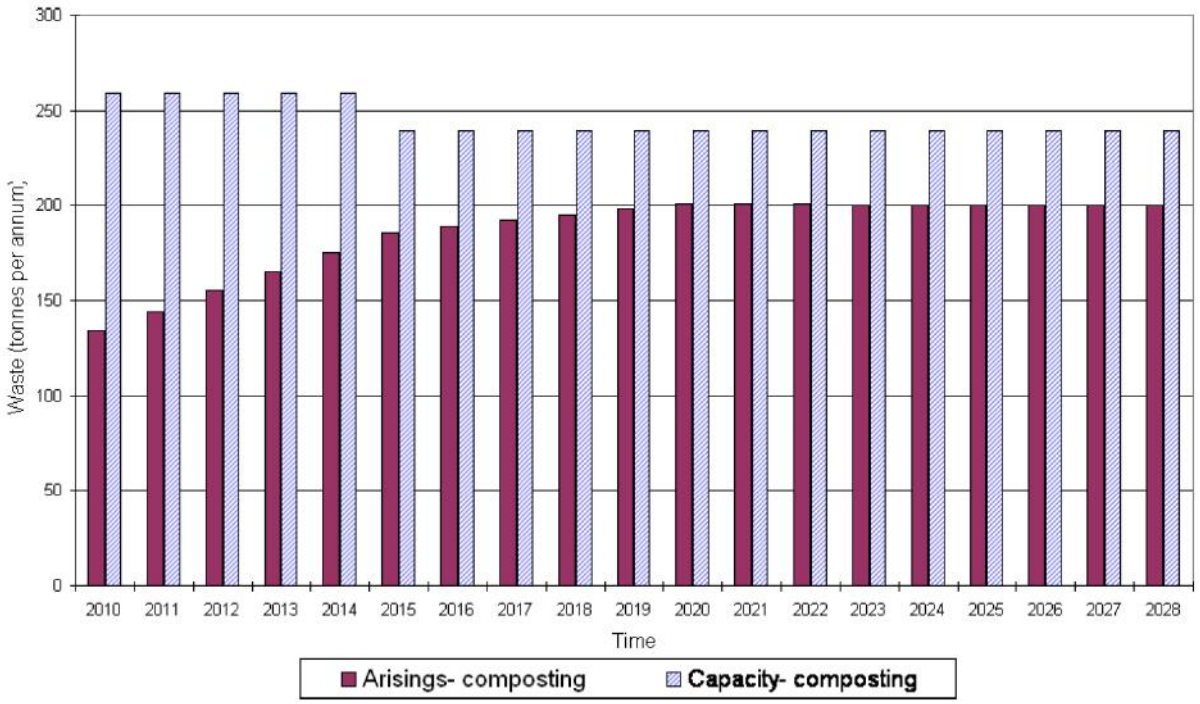
Commercial and Industrial Waste: Recycling Capacity illustrated by arisings and current and planned capacity from 2010-2028



Commercial and Industrial Waste: Composting capacity illustrated by arisings and capacity data 2010-2028



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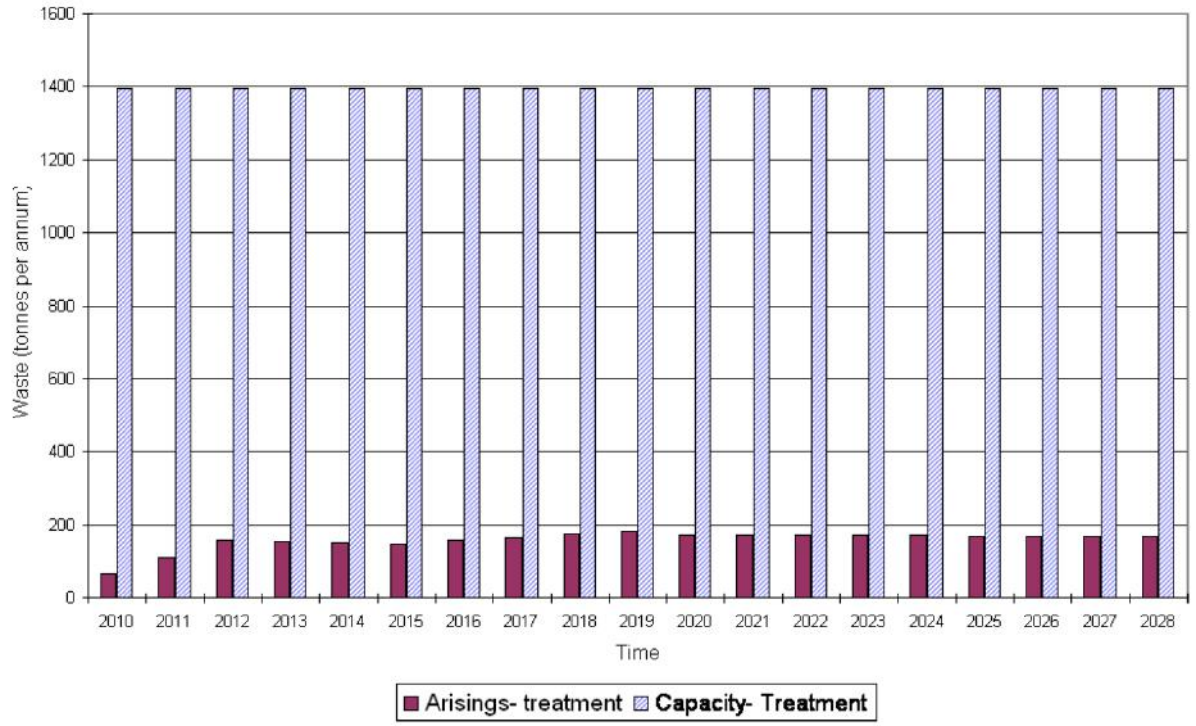
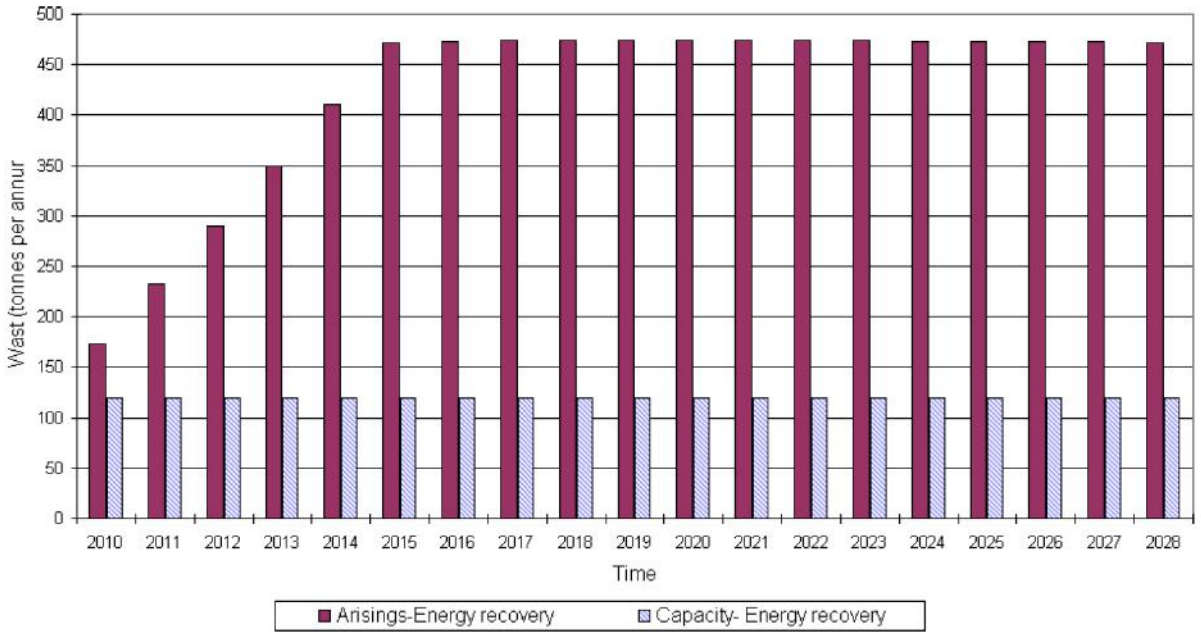
Commercial and Industrial Waste: Treatment capacity illustrated by arisings and capacity data 2010-2028



Commercial and Industrial Waste: Energy Recovery capacity illustrated by arisings and capacity data 2010-2028



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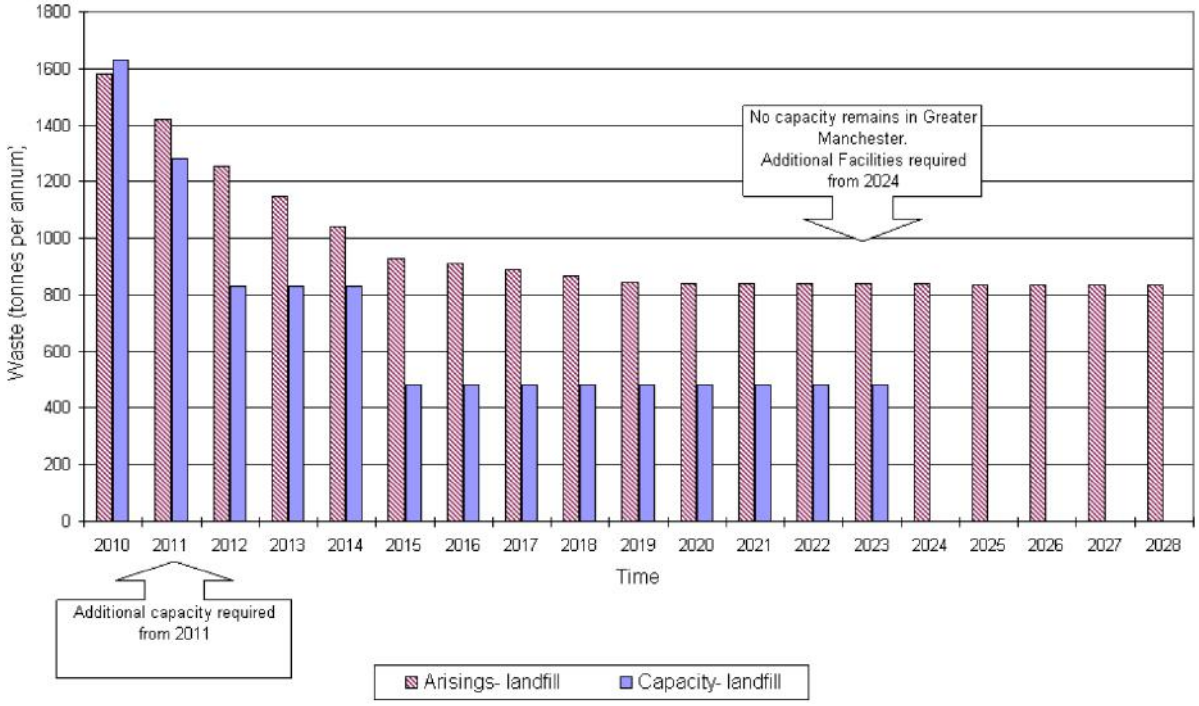
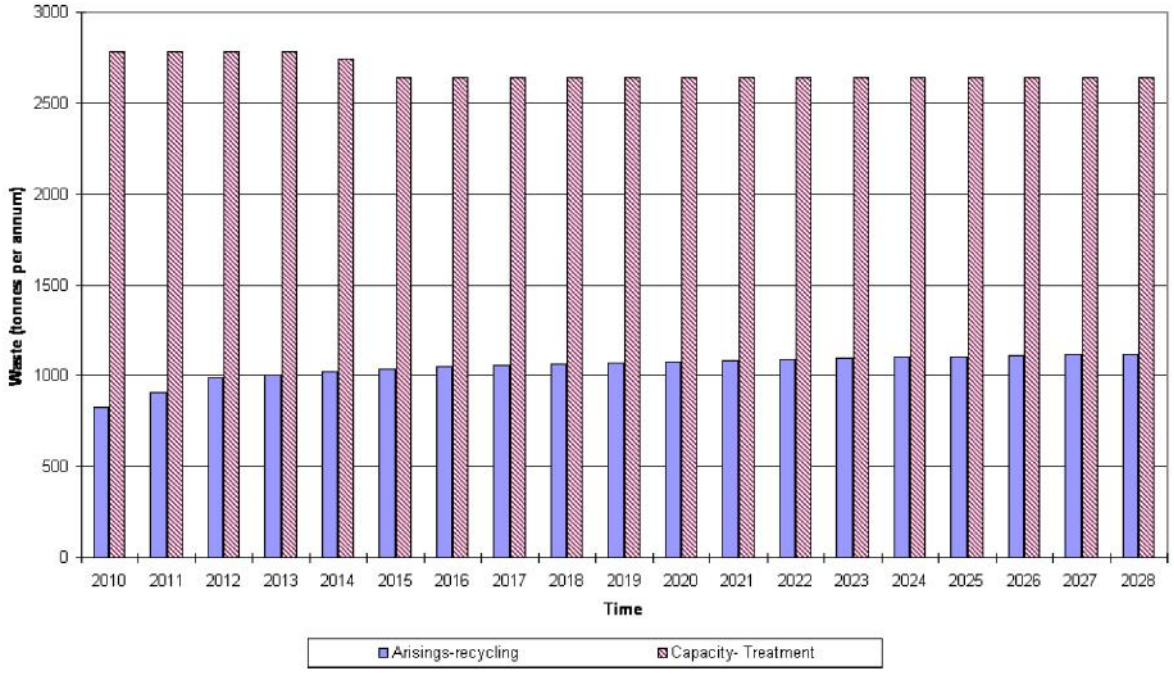
Non-hazardous Waste: Disposal Capacity illustrated by arisings and current and planned capacity from 2010-2028



Construction, Demolition and Excavation Waste: Recycling capacity illustrated by arisings and current and planned capacity form 2010-2028



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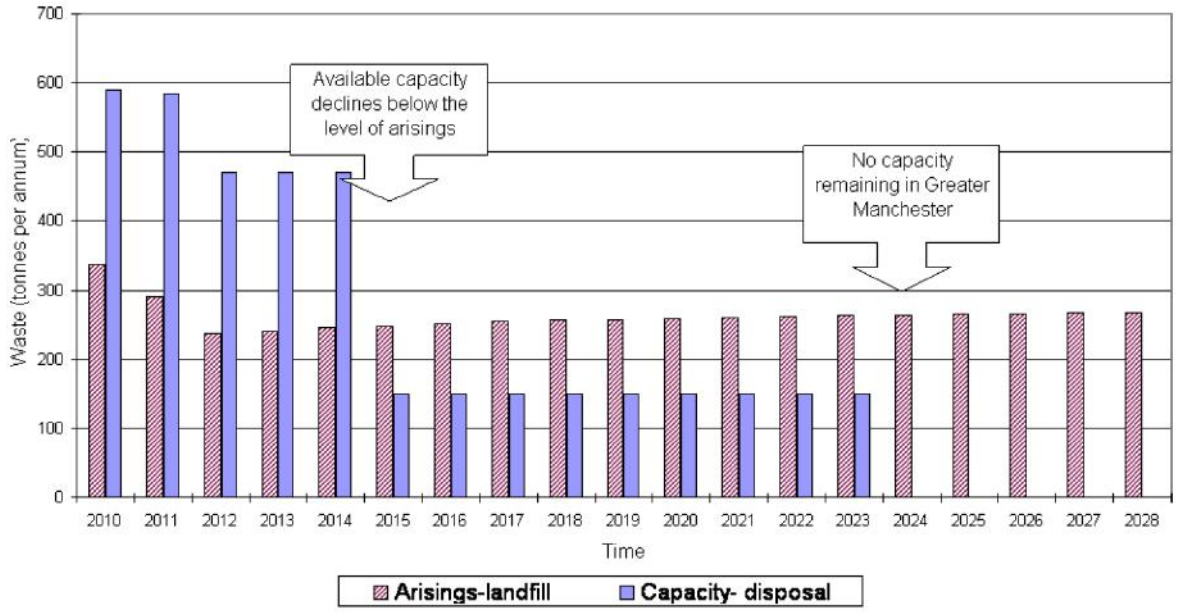
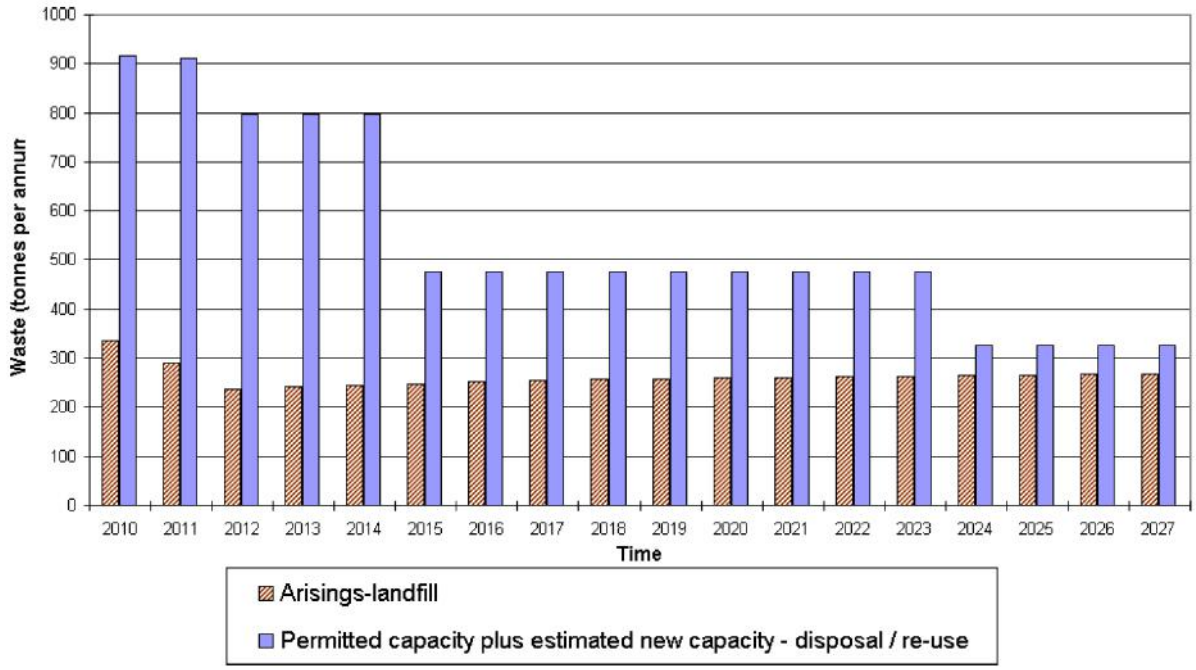
Construction, Demolition and Excavation Waste: Disposal capacity illustrated by arisings and current and planned capacity from 2010-2028



Inert Waste Arisings against Estimated Future Disposal and Re-use Capacity



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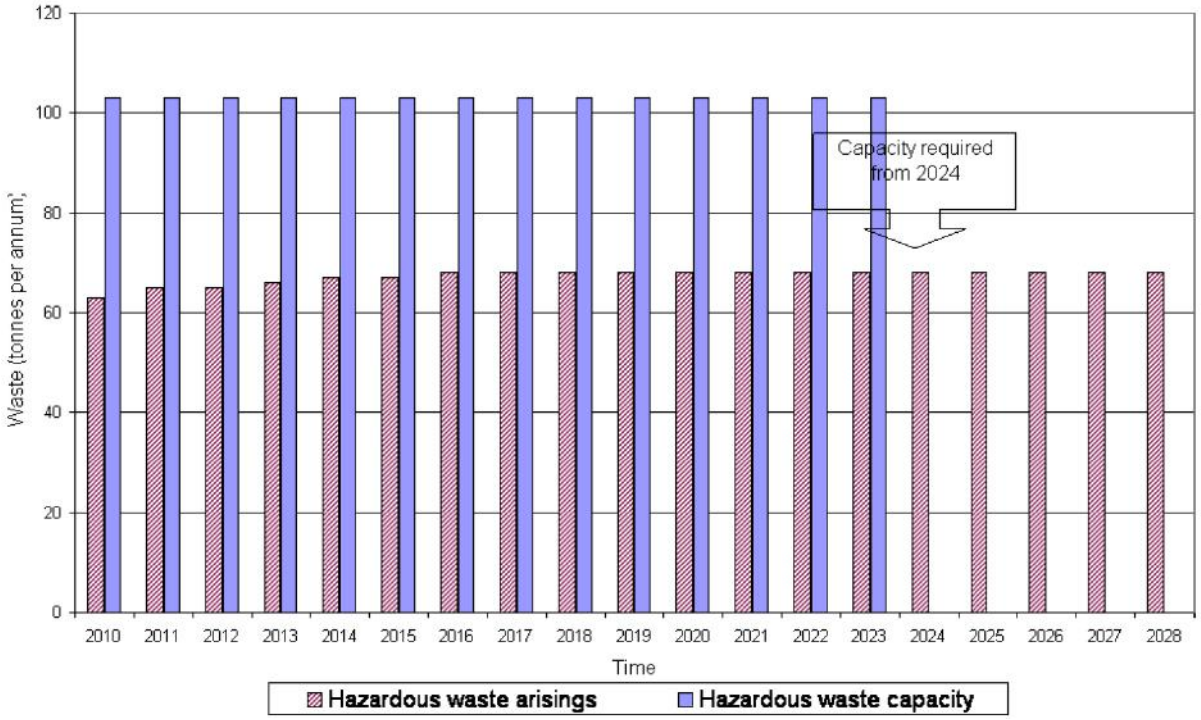
Hazardous Waste- Stable, non-reactive: Disposal capacity illustrated by arisings and current and planned capacity from 2010-2028

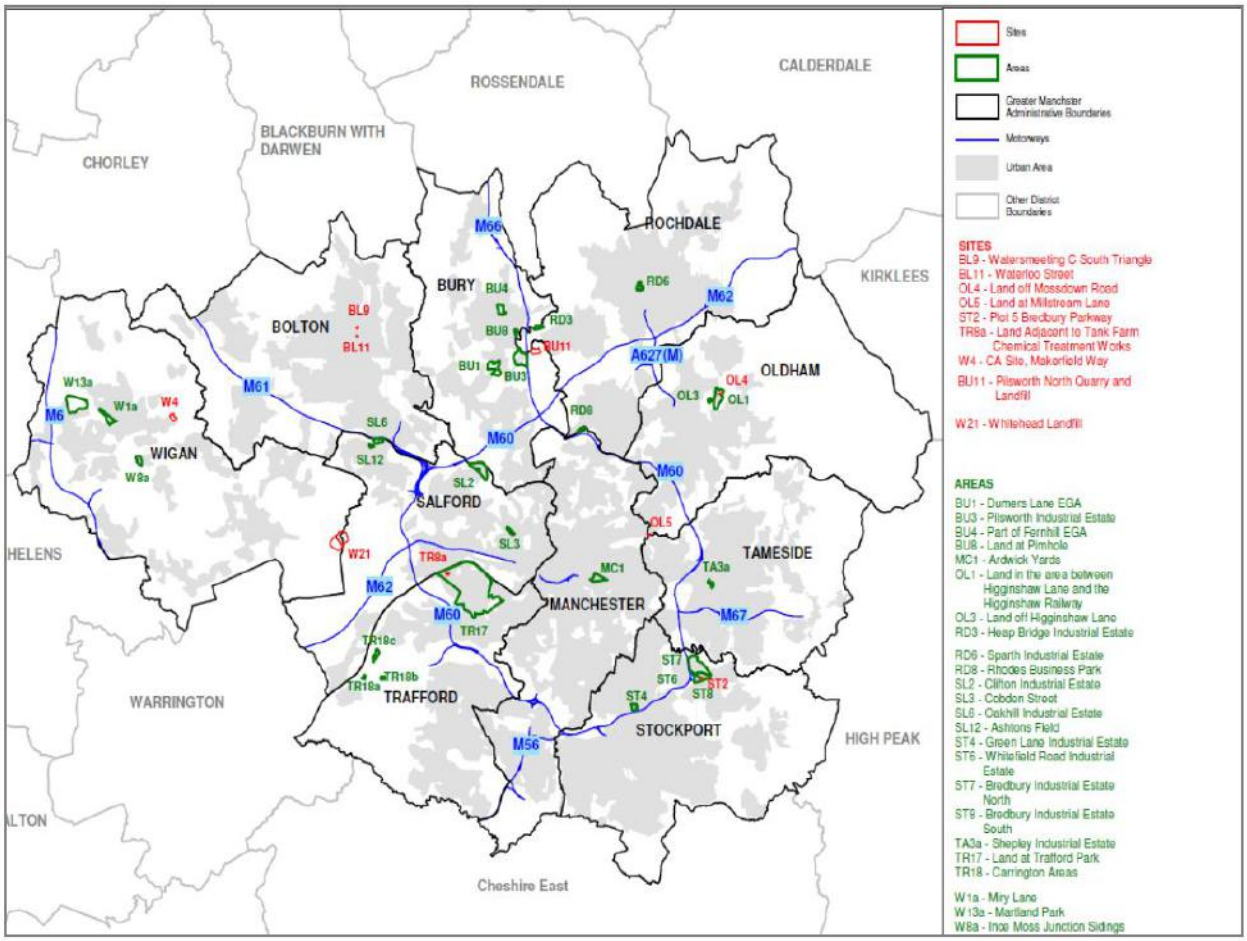


These graphs which represent the future waste management requirements suggest, as a majority that, the following areas will not have a capacity to withhold the estimated expenditure of specific waste requirements necessary during the stipulated time period:

- Commercial and Industrial Waste: Energy Recovery capacity illustrated by arisings and capacity data 2010-2028
- Non-hazardous Waste: Disposal Capacity illustrated by arisings and current and planned capacity from 2010-2028
- Construction, Demolition and Excavation Waste: Recycling capacity illustrated by arisings and current and planned capacity form 2010-2028
- Construction, Demolition and Excavation Waste: Disposal capacity illustrated by arisings and current and planned capacity from 2010-2028

As a result within Greater Manchester managing waste could be considered through the following measures: *(GM Spatial Framework IA Scoping)*

- The construction of new homes and employment sites will generate waste as part of the construction process and once completed will also generate waste that will require treatment or disposal.
- This future development will require the measures set out in the Greater Manchester Joint Waste Plan to be implemented so that the waste generated can be diverted from landfill and beneficially re-used, recycled, recovered and only as a last resort disposed of.
- Consideration as to whether further waste management facilities will be required to meet the planned scale and distribution of development over the longer timescale of the GMSF will be needed.
- Greenhouse gas emissions from waste management should also be considered.
- Opportunities to implement the circular economy and improve resource efficiency through spatial planning should be considered.
- Waste facilities of all kinds (landfill to recycling) should be well managed to avoid environmental and health impacts from day to day use (i.e. odour or noise).



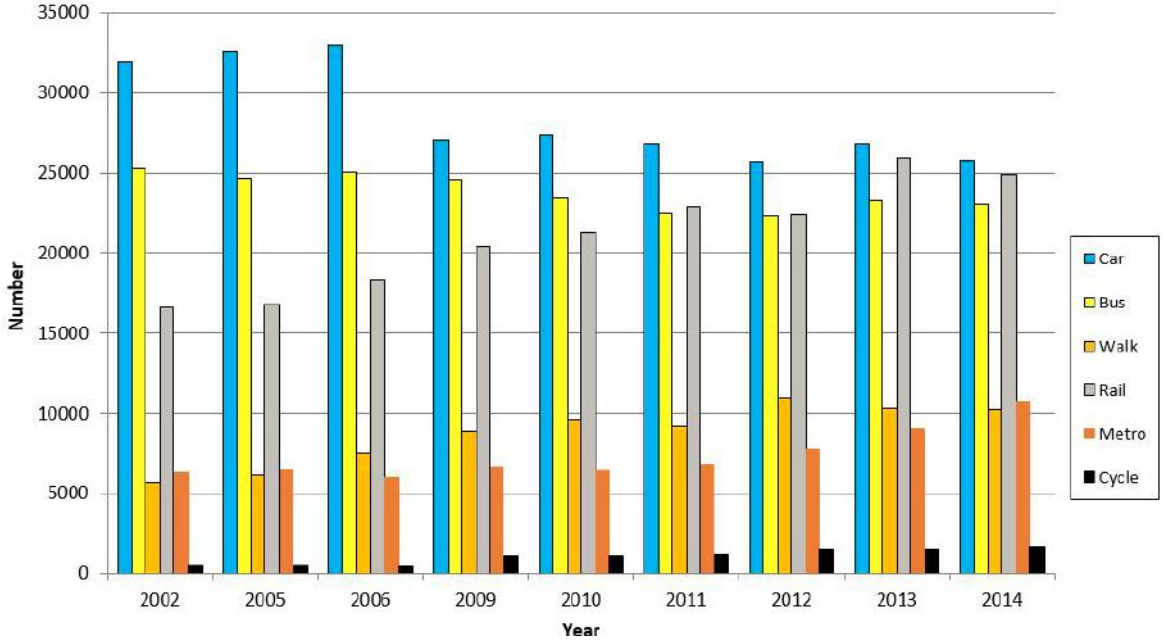
Location of future waste management facilities across GM, to 2027 (Source: AGMA 2010)

Transport

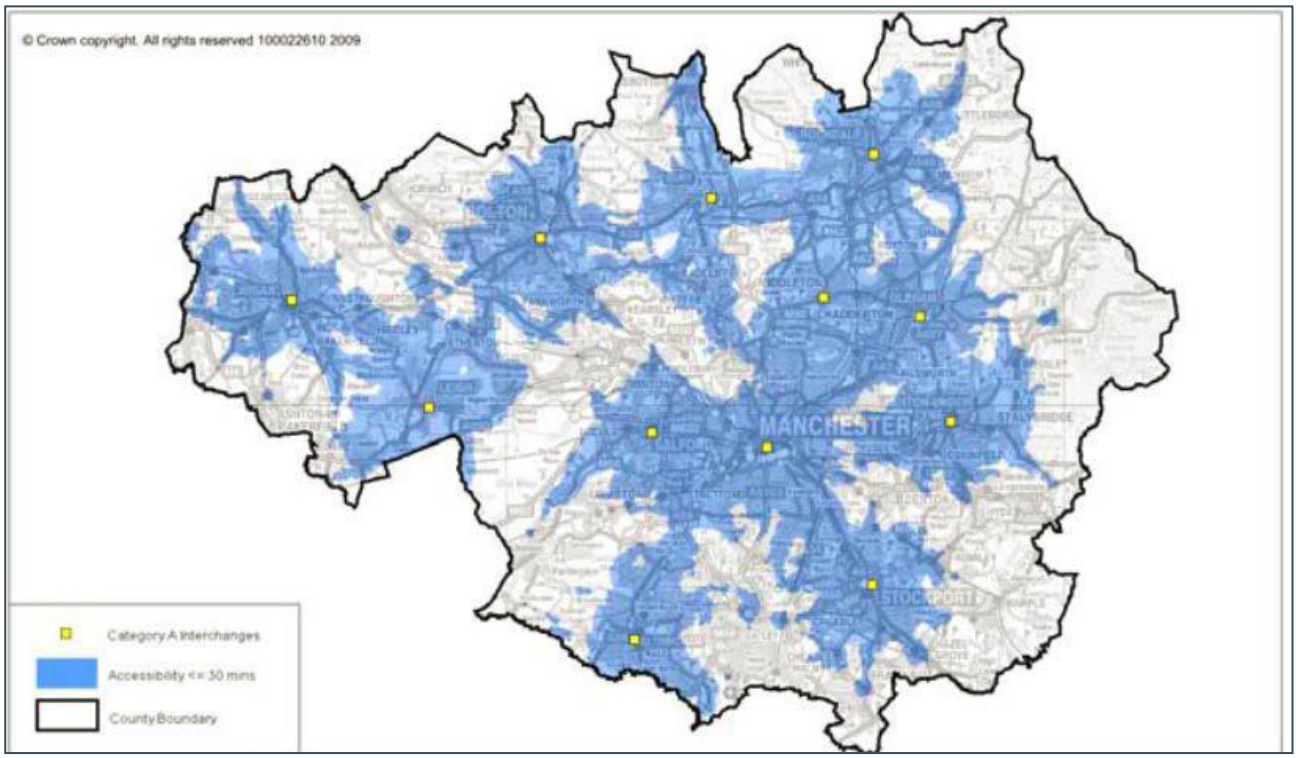
As with the country as a whole, GM has seen a general increase in both population and economic activity over the last number of decades, with an increasing burden on the Transport network. This has increased the need for an effective transport system. Journeys are made within the GM area and into/from GM to neighbouring regions.

Modes of transport

Across GM the dominant mode of transport for commuting is the private car, followed by bus use and then walking. In addition to population increase, car ownership has also increased – these trends have led to an overall increase in road travel, although these trends vary significantly in different parts of Greater Manchester. The varying levels of transport choice are illustrated in the following graph as detailed in the GM Spatial Framework and which shows trips into Manchester City Centre during the two hour morning peak (07:30 to 09:30).



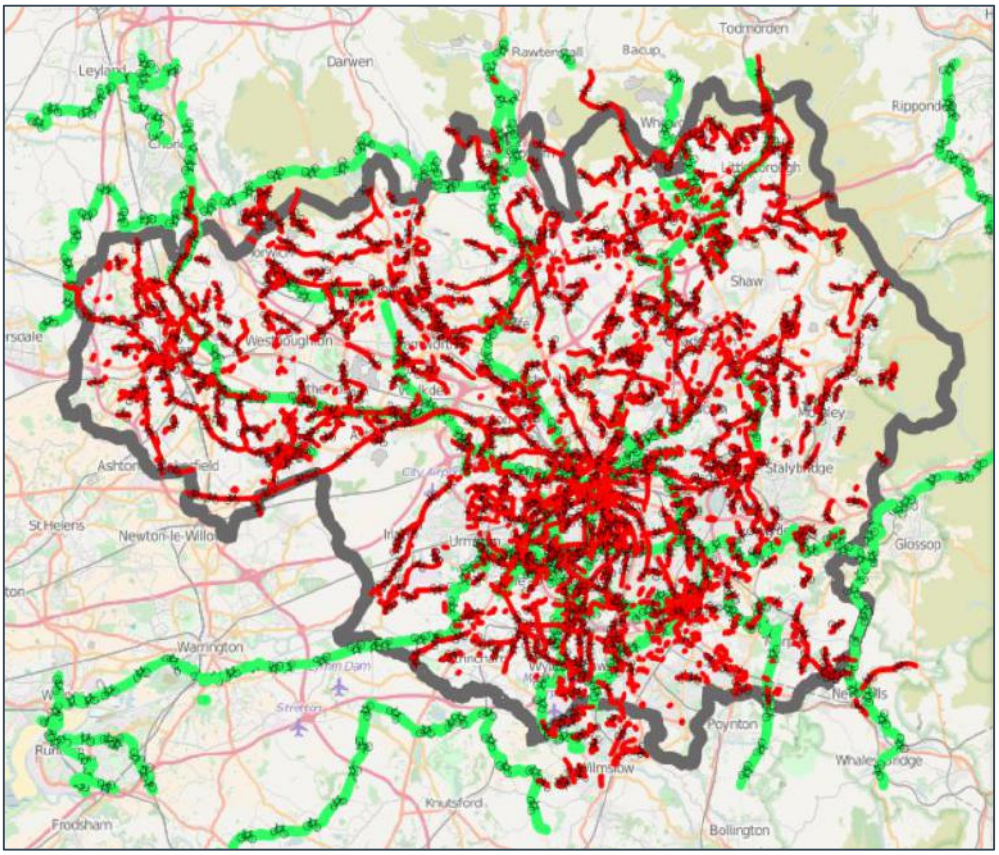
While GM as a whole benefits from having an extensive public transport network, there are still some areas with limited connectivity to key locations. This is of particular note in the rural parts of the region such as the Pennine fringe to the east, but is also of note in cross boundary areas such as between Wigan and Warrington. Accessibility is illustrated in the following as detailed in the GM Spatial Framework and which shows accessibility within 30 minutes to Category A Interchanges by public transport:



Bus travel has levelled out in recent years following a steady decline during the1980's and 1990's, though it is estimated that by 2020, 30,000 passengers will use bus to access the city centre in the morning rush. GM's Metrolink network is one of the most successful light rail systems in the UK, carrying around 27.5 million passengers every year.

Bus Routes in GM as noted by AGMA

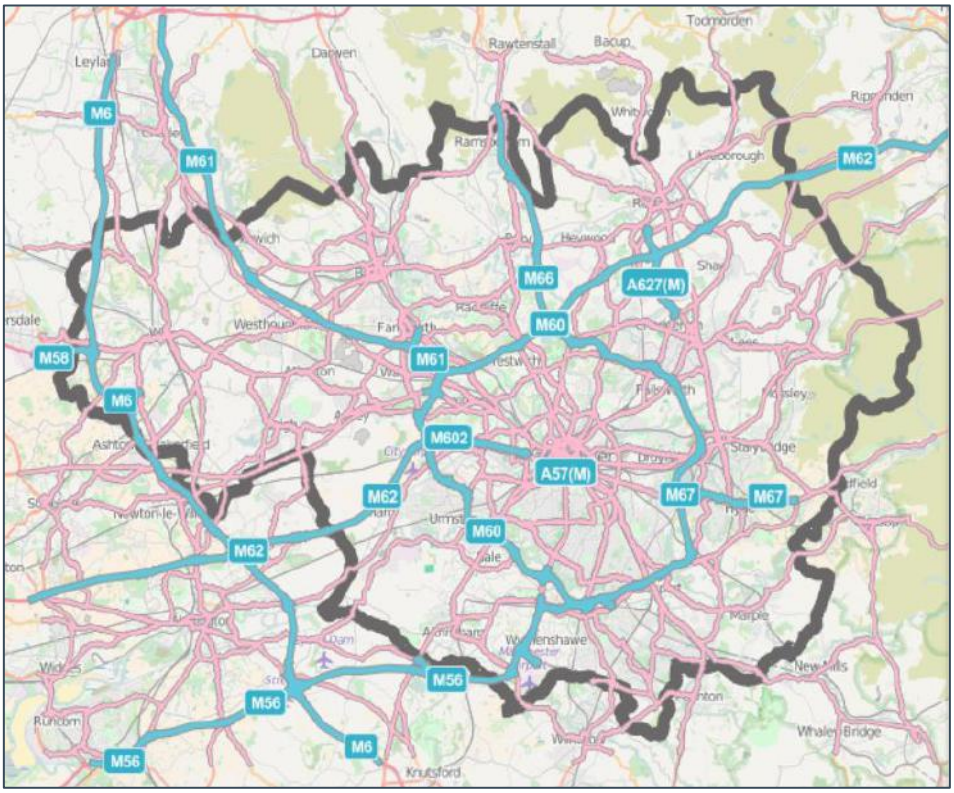
Walking has increased, particularly into the City Centre. In addition, the significant investment in cycling infrastructure is reflected in the increase in cycle trips. It is recognised though that the levels of walking and cycling could increase further.



Cycle routes across GM (Red = TfGM, Green = Sustrans)

Freight

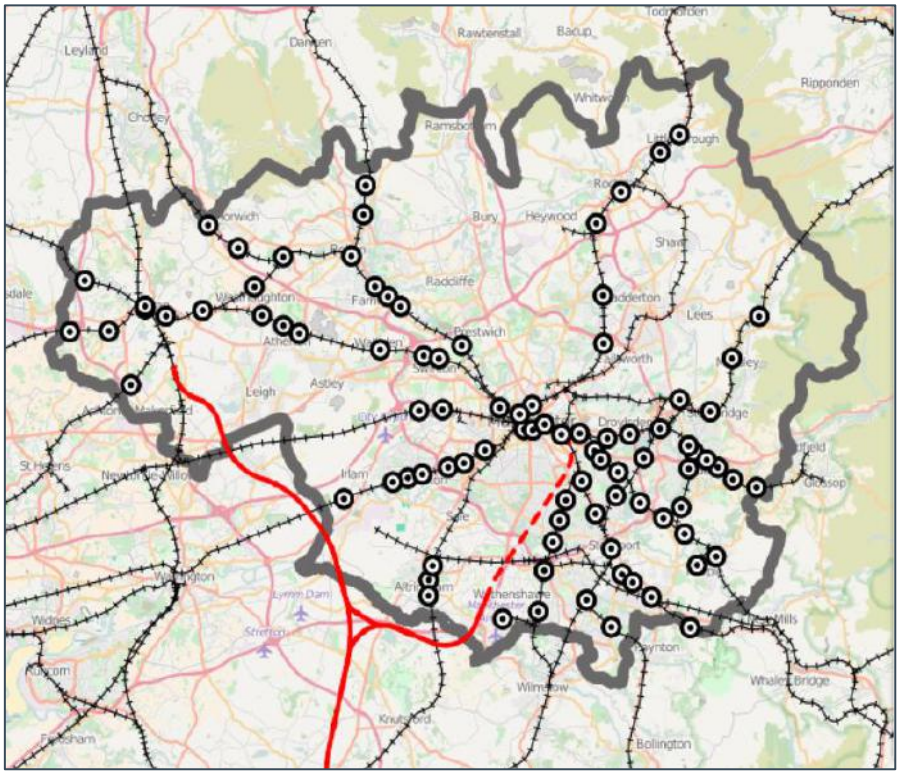
The highway network is utilised to transport the majority of freight into and around GM, with relatively small volumes moved by rail and on waterways. Congestion on the strategic highway is an issue – a reflection of the large car use and movement of freight on the road network. Sections of the Motorway network, particularly on the north west side of the M60 and near junctions are identified as particular congestion 'hot spots'.



GM Motorway and Main Road network

Rail Network

GM also benefits from an extensive rail network, though not all areas are served. Rail travel has increased in recent years, though overcrowding has been identified as an issue, as is the capacity of the local rail network. Local rail travel increased from 17million journeys in 2001/2 to 22.7million by 2010. Connections to beyond the region will be enhanced significantly by the development of the planned HS2 rail connection.



Rail network and stations across GM (Red = Proposed HS2 Route)

Manchester Airport

Manchester Airport is the third busiest in the UK and serves a large part of the north of England and beyond. It is forecast that growth at this airport will grow over the coming years and there are plans to expand terminals capacity and improve access to air travel.

Air passenger numbers through Manchester Airport are as follows (numbers in thousands)

Year	Passenger No.s ('000)	Year	Passenger No.s ('000)
2000	17,467	2008	20,729
2001	17,958	2009	18,308
2002	18,342	2010	17,408
2003	18,643	2011	18,674
2004	20,129	2012	19,737
2005	20,624	2013	20,697
2006	21,824	2014	22,055
2007	21,581	2015	23,116

Economy

GM is the largest functional economic area in the UK outside London – with an annual economic output of £54billion.

It is an ambition that GM will develop toward a low carbon economy – with a target to reduce CO_2 emissions by 48% by 2020 (from 1990 baseline). This aim is aided by a growth in the financial and services sector – this sector represented 40% of employment growth over the last decade. The creative, digital and education sectors are also key areas.

The dominant sector is thus the Services sector with GM having a slightly higher percentage of people in the services sector than the North west of England, or England as a whole. As with other indicators though, there are variations within the GM area – with Tameside and Rochdale having a lower percentage in services but a higher percentage employed in the manufacturing sector.

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It is considered that GM will lead economic recovery across the region with GVA anticipated to rise from £54billion in 2014 to £89billion by 2034. Note that the GVA values vary across sectors and geographic areas within GM.

GM has seen a slight increase in numbers of economically active residents (0.8%) which is slightly lower than the national rate (1.2%). The rate varies across the GM area with some areas such as Salford significantly higher rates of increase (7.3%) while other areas have had a decline e.g. Oldham (-2.9%). Similar trends are noted for numbers of economic inactivity – e.g. Oldham had a 2.9% rise, while Salford had a 3.7% decline.

Employment type also varies across the region with Stockport and Trafford showing notably high levels of professional occupations compared to other local authority areas.

The ten districts of GM demonstrate a functional economic geography with a single labour market and interdependent businesses, towns and cities. There is high connectivity between each of the districts. Specific opportunities for GM come from increasing growth and investment and increasing private and public sector productivity. Greater Manchester's major sectors are noted below (as noted in the GM Spatial Framework):

Industry Type	**Percentage of Employment**
Primary Services (Agriculture & Mining)	0.1
Energy and water	1.4
Manufacturing	8.8
Construction	4.3
Services	85.4
Services can be sub-divided into the following categories (with their percentage of employment within the Services category)	
Wholesale & Retail	16.2
Transport & Storage	5.1
Accommodation & Food Services	5.9
Information & Communication	3
Financial & Business Services	24.5
Public Administration, Education & Health	26.9
Other Services	3.9

GM is the largest functional economic area in the UK outside London. In recent years, GM has experienced a large-scale expansion of the service sector, specifically the financial and professional services and as the above table demonstrates, this is the dominant sector of the GM economy. Further to this, GM's creative and digital industry sector is expected to increase over the next ten years. Education, including GM's universities, colleges and providers mean education is another key service area.

The Greater Manchester economy generates £56 billion of gross value added (GVA) on an annual basis (e.g. £56 billion of real value produced in the economy, like national GDP), higher than the GVA of the North East (£45 billion), West Yorkshire (£46 billion), Merseyside (£27 billion), and accounting for nearly 40% of GVA in the North West.

There are 1.4 million people working in Greater Manchester in around 105,000 businesses. These businesses can be broken down by employee base as follows:

- Micro, 0-9 employees: 86,100 businesses
- Small, 10-49 employees: 15,300 businesses
- Medium, 50-249 employees: 3,400 businesses
- Large, 250+ employees: 600 businesses

Around 110,000 additional jobs are forecast within Greater Manchester for the period 2014–24 by the Greater Manchester Economic Forecasting Model (GMFM).

As noted in the GM Spatial Framework, the number of economically active / inactive people and percentage unemployed across the ten GM Boroughs in 2014 was as follows:

Year: 2014				
Local Authority area	**No. of Economically Active persons**	**No. of Economically Inactive persons**	**Percentage Unemployed**	**NEET**
Bolton	132,600	48,500	7.3	5.3
Bury	93,400	25,900	6.4	5.9
Manchester City	254,100	115,100	9.5	6.3
Oldham	103,300	41,400	6.6	4.7
Rochdale	95,600	39,900	8.4	4.8
Salford	122,400	36,300	7.3	8.1
Stockport	147,200	32,400	5.5	5.4
Tameside	107,700	36,100	6.9	4.4
Trafford	120,500	28,000	5.5	3.9
Wigan	166,000	39,000	6.7	5.9
GM as a whole	1,342,700	442,700	7.8	5.5

GVA is forecast by GMFM to rise by 2.8% per year between 2014 and 2024 – in line with the UK figure and above the North West annual rise of 2.6% – increasing to more than £72 billion by the end of this period. (Sourced: http://neweconomymanchester.com/media/1474/ne-key-facts-dec-15-web.pdf)

GM is committed to securing the transition to a low carbon economy; this is expected through the demand for core low carbon goods and a shift towards a low carbon approach to all economic activity. GM has a target to reduce CO2 emissions by 48% by 2020 from a 1990 baseline.

Gross Value Added (GVA) across Greater Manchester

GVA for GM in 2014 was approximately £54 billion; this has increased from £34.9 billion in 1991. GVA for GM is divided into two main areas:

1. Greater Manchester North, which includes Wigan, Bolton, Bury, Rochdale and Oldham, and

2. Greater Manchester South, which includes Salford, Trafford, Manchester, Stockport and Tameside.

In terms of GVA per capita alone, Greater Manchester South consistently performs much better than Greater Manchester North, and North West and UK averages, whereas GM as a whole outperforms the NW but does not outperform the UK. Taken as a whole, forecasts produced by Oxford Economics estimate that GM would lead economic recovery in the region over the next decade and by 2034, GM GVA would be £89 billion.

In general there has been an increase in GVA for the service sector, where GM had a 3.26% increase in GVA from this sector compared to the North West increase of 3.02%, and a national level increase of 2.93%. There is a general decline in the Energy and Water sector in addition to the Manufacturing sector.

Forecast change in Gross Value Added

The picture is varied across sectors and geographic areas for the Forecast percentage change in GVA from 2014–2034. There is forecast to be a slight (-0.02 to -0.09) general decline in GVA across all *primary service* sectors (defined as the agricultural and mining sectors). The only exception being Bury, for which this sector's GVA is forecast to grow. This trends is also observed, with the same exception in Bury, across the *manufacturing* (ranging from -0.9 to -2.94 percentage points) and the *Public Admin, Education and Health* sectors, where the downward trends are much more pronounced.

At a national and regional level there is forecast to be an increase in GVA for the *service* sector but GM is forecast to experience a decline of 0.58%. The majority of the local authority areas are forecast to see growth in this area but declines in service sector outputs are forecast in Oldham (-0.25%) and Stockport (-2.89%).

GVA in the *information and communication* sector is forecast to increase across all areas, as is the *financial and other business services* sector (expect in Bury). The sectors which have increasing GVA also have increasing levels of job creation.

Overall, how the economy is made-up, how it works and how it is invested in can greatly affect:

- the environmental performance of an area, through the types of business which are located within the area, their local (e.g. air quality, water effects on biodiversity) and global environmental impacts)
- the health of the population (e.g. through environmental impact, or the types of employment on offer)
- equal opportunities for given populations (e.g. through access to employment and a regular wage)
- the wellbeing and deprivation of a given population (e.g. by determining access to housing, public services, and healthy environments)
- the transport and utilities networks (e.g. through evidence based strategic investment).

Urban Development

Strategic economic sites

GM includes a number of key strategic sites which are drivers of economic growth. The key strategic area is the *regional centre* which extends from the city centre of Manchester into Salford; into the adjacent development of Salford Quays/Trafford Wharfside including MediaCityUK; along Oxford Road, where the Corridor Manchester comprises Europe's largest concentration of knowledge assets, including Universities, hospitals and Manchester Science Park, and into east Manchester. The regional centre remains the focus for economic growth and employment in GM.

There are other key strategic sites across GM which will generate significant employment and economic growth in the future, together with further large sites which will deliver more locally significant economic restructuring and growth.

Social

General Health & Health inequalities

Although health inequalities are not uniform across the region, GM as a whole has health indicators lower than the UK average - with Manchester local authority considered the most deprived area in relation to health and disability in England. Manchester is also the most deprived local authority in the region in terms of the 'Living Environment' which is a measurement that is partly made up with issues relating to transportation e.g. air quality indicators and road traffic accidents.

Around 19% of GM residents are currently living with long term conditions (LTCs) such as diabetes, asthma and heart disease, and 25% of over 60s have two or more LTCs.

GM is typically worse than the national average across a range of health indicators, although with some variation within the area. Key points include:

- The 2014 rate of primary school children in year 6 classed as obese or morbidly obese in some authorities in GM is higher than national and regional levels (19%). Highest levels of childhood obesity were seen in Manchester (25%), Salford (21%) and Bolton (21%).
- Adult obesity levels are higher than national levels within some authorities in GM. The highest levels of obesity are seen in Rochdale (30% of adult population), compared to 23% nationally. In contrast, Trafford has low levels of adult obesity, with only 16% of adults classed as obese.
- Every day 18 people die from cancer in GM – around 6,500 a year – making the death toll around 10 per cent higher than the UK average. These high numbers are due to a higher number of people in GM getting diagnosed with cancer, in part due to high levels of smoking in the area.
- Life expectancy at birth for both males and females was lower than national levels in the majority of districts, and two districts (Manchester and Salford) are in the top ten for lowest life expectancy at birth in England and Wales for both males and females (Tameside is also in the top ten for males).

In public health nationally significant inequalities exist as a result of failures, including information, social context, market failures, etc.

The level of deprivation varies considerably between and within the districts within GM. This is likely to give rise to potential inequalities in terms of health as deprived or lower socio-economic groups are more likely to experience health inequalities due to:

- inadequate level of health literacy;
- fewer resources to devote to healthy goods and services.

Research relating to the links between transport and health inequalities shows that:

- people without access to a car can experience health problems as a result of lack of access to essential services and amenities and increased level of social exclusion.
- disadvantaged groups are more likely to be involved in a road accident.
- deprived communities tend to experience poorer air quality as a result of transport related air pollution, and therefore they are more likely to experience the resulting health impacts;
- the pedestrian death rate for children from families in social class V is higher than for children of social class I.

Population growth and make up of local population

GM is a generally densely populated urban area with a diversity in ethnicity and economic terms of its population. The population is growing across the GM region with Manchester experiencing the greatest growth. It is forecast that the GM area will have a population rise from 2.7million in 2013 to over 3 million by 2037. This population is housed in over 1 million homes as of 2011.

Manchester local authority area has the highest population (514,417 in 2013) with Bury being the lowest (186,527 in 2013).

Deprivation

Deprivation varies considerably between and within the ten districts in GM area, with three of the authorities (Manchester, Salford and Rochdale) being in the top 20 most deprived in England. Manchester in particular has a very high level, with 41% of Lower Super Output Areas (LSOAs) being in the 10% most deprived in England (IMD 2015).

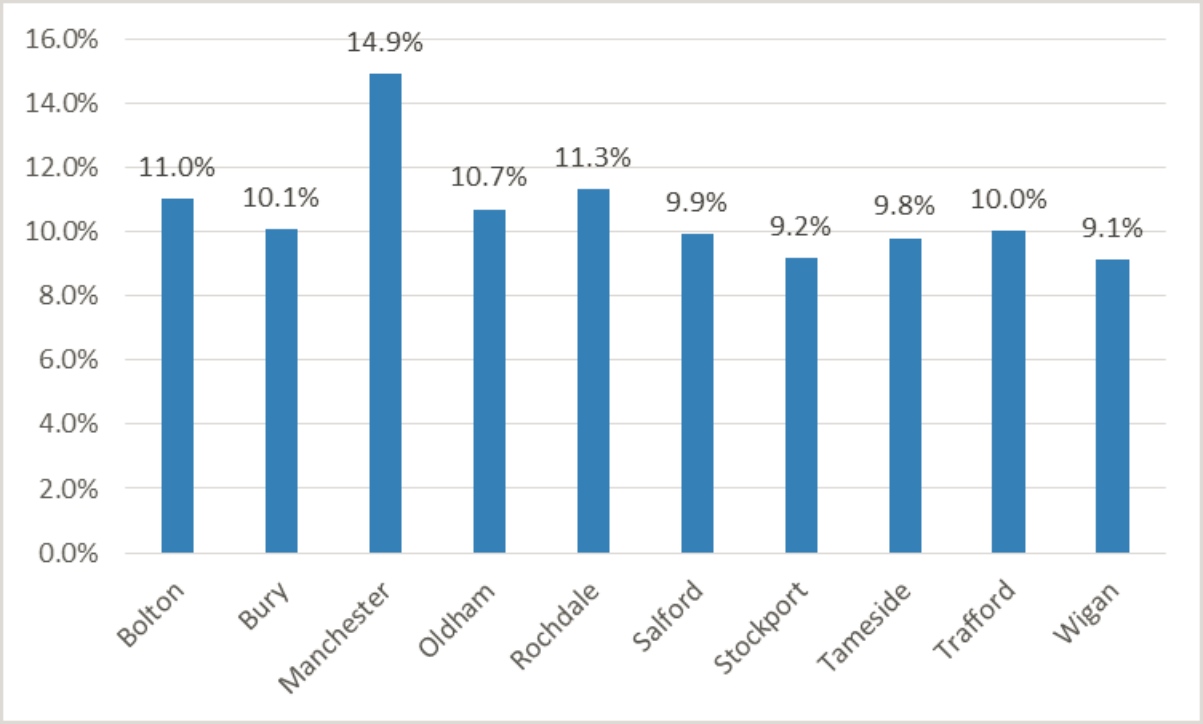
Another indicator of deprivation is the proportion of the population unemployed. In the GM area, approximately 1.1% of the population were collecting job seekers allowance (JSA) in September 2015, which is in line with national levels (1.1%). Levels of unemployment have decreased over recent years.

There are many contributory elements to deprivation (including income, employment, health and education) and it often correlates with levels of crime and disorder. It is measured in both relative and absolute terms. The Indices of Multiple Deprivation are a widely-used benchmark of relative deprivation across England. Examples of absolute measures of deprivation include statistics on child poverty and fuel poverty.

Out of the 326 local authorities in England covered by the Index of Multiple Deprivation (IMD) Manchester has the fourth highest amount of deprivation, followed in GM by Salford (26th), Rochdale (29th) and Tameside (34th).

One example measurement of Deprivation is fuel poverty – defined as spending more than 10% of household income to maintain a satisfactory level of heating. As a whole, fuel poverty is higher across GM

than the English average, though there are widespread variations within GM itself, as shown in the following graph (for the year 2015) from the GM Spatial Framework:



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Equality Groups

Gender

The gender balance in GM is 49% males and 51% female, which mirrors the national balance in England.

People with Disabilities

9.8% of GM residents have a long term limiting illness which limits their life a little and 9.6% have a long term limiting illness which limits their life a lot. There are higher levels of illnesses which 'limit their lives a lot' in Wigan, Tameside and Rochdale; and higher levels of illnesses which 'limit their lives a little' in Salford, Wigan and Rochdale.

Black & Minority Ethnic Groups

The majority of the GM population is white (83.7% in 2011), though there are significant populations of other ethnicities – most notably those classified as Asian (total in 2011 of 12.5% across all Asian sub groups).Ethnicity is not uniform across GM – for example both Manchester and Oldham have relatively high populations of ethnic groups other than white (33.4% of Manchester city residents belong to BME groups,

and 22.5% of Oldham residents). Areas of Manchester such as Moss Side have a particularly high population of black residents, and there are high proportions of Asian residents in the south of Manchester also.

There were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015, with the majority of immigrants in Manchester city (14,000) and significant numbers on Salford also (4000). The majority of immigrants are from Europe (68.1%, with just over half of those coming from newer EU member states) and there is also significant immigration from South Asia (11.0% of immigrants in the region). The following provides a breakdown of different ethnic groups in each Borough, as well as GM as a whole (as noted in the GM Spatial Framework):

	Greater Manchester Local Authority										
Ethnicity	**Bolton**	**Bury**	**Manchester City**	**Oldham**	**Rochdale**	**Salford**	**Stockport**	**Tamesside**	**Trafford**	**Wigan**	**GM as a whole**
White	81.8	89.1	66.5	77.5	81.6	90.1	92.1	90.9	85.5	97.2	83.7
Gypsy / Traveller	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Mixed / Multiple Ethnicity	1.8	1.8	4.6	1.8	1.7	2.0	1.8	1.4	2.7	0.9	2.3
Asian / Asian British / Indian	7.8	0.7	2.3	0.7	0.5	1.1	1.0	1.7	2.8	0.3	2.0
Asian / Asian British / Pakistani	4.3	4.9	8.5	10.1	10.5	0.8	2.4	2.2	3.1	0.2	4.8
Asian / Asian British / Bangladeshi	0.2	0.2	1.3	7.3	2.1	0.3	0.2	2.0	0.2	0.0	1.3
Asian / Asian British / Chinese	0.5	0.6	2.7	0.3	0.4	1.1	0.6	0.4	1.0	0.3	1.0
Asian / Asian British / Other	1.1	0.9	2.3	0.8	1.4	0.8	0.7	0.3	0.9	0.3	1.1
Black / African / Caribbean / Black British	1.7	1.0	8.6	1.2	1.3	2.8	0.7	0.8	2.9	0.5	2.8
Other ethnicity	0.7	0.7	3.1	0.2	0.4	1.1	0.6	0.2	1.0	0.2	1.0

Sexuality or gender identity

Manchester is generally considered a gay-friendly city, with a variety of facilities and services aimed at LGBT people. 0.22% of people in GM are in a registered same-sex civil partnership, which is in line with national levels, although in Manchester city, this number rises to 0.34%, well above the national average.

Age Profile

GM has a marginally younger population than for England as a whole. Around 20% of the population are children, compared to 19% nationally. The district of Oldham has the highest proportion of children, where just over 22% of the population are aged under 16.

The highest proportion of older people within the GM area is found within Stockport where around 18% of the population are aged over 65.

Faith Groups

The majority of people in GM identify as Christian (61.8% in 2011) with a significant percentage (8.7%) identifying as Muslim. There is an even spread of other religions and 26.9% of the population having no or not stated religion.

	Religion and Percentage of the Population								
GM Local Authority	**Christian**	**Buddhist**	**Hindu**	**Jewish**	**Muslim**	**Sikh**	**Other**	**No religion**	**Not stated**
Bolton	62.7	0.2	2.2	0.1	11.7	0.0	0.3	17.2	5.7
Bury	62.7	0.2	0.4	5.6	6.1	0.2	0.2	18.6	6.0
Manchester City	48.7	0.8	1.1	0.5	15.8	0.5	0.4	25.3	6.9
Oldham	59.7	0.2	0.5	0.0	17.7	0.0	0.2	16.1	5.6
Rochdale	60.6	0.2	0.3	0.1	13.9	0.0	0.2	18.9	5.8
Salford	64.2	0.4	0.6	3.3	2.6	0.1	0.3	22.3	6.2
Stockport	63.2	0.3	0.6	0.5	3.3	0.1	0.3	25.1	6.5
Tameside	64.0	0.2	1.5	0.0	4.4	0.0	0.3	23.6	5.9
Trafford	63.4	0.3	1.0	1.1	5.7	0.7	0.2	21.2	6.3
Wigan	77.8	0.2	0.2	0.0	0.7	0.0	0.2	15.3	5.5
GM as a whole	61.8	0.4	0.9	0.9	8.7	0.2	0.3	20.8	6.1

Appendix D. **Assessment of Alternatives**

Description of Strategic Scenarios

Theme	Alternative 1 (Business as Usual)	Alternative 2 (Balanced Approach)
Geographical Focus	Priorities identified for each mode and a number of cross-cutting themes Interventions focus on economic growth areas and improving access to them Approach to cross boundary issues based on work with national agencies, such as: the Highways Agency (now Highways England) Department for Transport, and Network Rail to develop shared solutions	Business as Usual approach to growth areas continues, but interventions identified across all spatial themes. Business as Usual approach to cross boundary issues, plus proactive identification of opportunities and issues for GM. Integrated (multi-modal) approach to identifying priorities for different types of travel, as defined by 'spatial themes': • Global Connectivity • City-to-City links • Travel to and within the Regional Centre • Travel Across the Wider City Region • Connected Neighbourhoods
Integrated Approach	LTP supports the overarching Greater Manchester Strategy (multi-disciplinary) Joint working with planning authorities to ensure new development is supported by transport infrastructure and that the impact is mitigated Joint approach with Health sector to promoting active travel Work with neighbouring authorities to identify cross-boundary issues Co-ordinated approach with emergency services re safety and security	As Business as Usual plus • A co-ordinated and integrated approach to improving connectivity, particularly by sustainable modes, to key growth areas such as Manchester Airport Enterprise Zone, and the Atlantic Gateway area around Port Salford, enables long-term sustainable economic growth at these key locations and encourages further international investment in GM. • Much closer partnership working across the north of England through Transport for the North and Rail North to support delivery of significantly improved city-to-city links, particularly by rail, which are well integrated into GM transport networks and support delivery of a Northern Powerhouse economy. • A co-ordinated approach to managing the Key Route Network of highways and Strategic Route Network • Joint working to develop the GM Spatial Framework with transport a key consideration in identifying sites for development
Active Travel	Focus on incremental plugging of network gaps, plus exploiting active travel funding opportunities as they arise via national bidding exercises and public/private partnership	As Business as Usual plus Seek to mainstream long-term investment in active travel to ensure continuous

	working. Focus on delivering strategic cycle networks and key walking routes into the Regional Centre, to town centres and off-road routes along waterways, through parks and on disused rail corridors. Raise awareness of walking benefits through partnership working with the Health Sector	improvements in facilities for walking and cycling. Mainstreaming walking and cycling with the aim of making them the modes of choice for short trips and delivering a 10% cycling mode share by 2020 with a more integrated funding approach than awaiting funding bids.
Public Transport	Improved quality of bus services, achieved through Statutory Quality Partnerships (linked to bus priority investment) and Voluntary Partnership Agreements (e.g. Code of Conduct). Quality Contracts to be considered if the SQP/VPA approach does not bring the desired improvements. Work with operators and DfT to improve fares structure. Smart ticketing through partnership working with operators Development of new interchanges in town centres Improving rail services and capacity through coordinated working with rail industry. Support for HS2. Small scale station improvements to improve safety, security and information to supplement rail industry programmes Completion of LTP3 Metrolink network extensions as funding allows and subject to successful business cases and legal powers being in place. Network is radial, focussed on Regional Centre	Aim of improved quality continues, but greater emphasis moving to a single unified bus brand with a simple integrated ticket range and simple fares structure, integration with other modes and a specified bus network. Forthcoming legislation (Buses Bill) to be used to achieve this. Continuation of town centre interchanges programme, plus improved operation of a network of interchanges (based on categorisation of function) to make interchange a more attractive option and so increase the reach of the public transport network. Longer term approach to investment in rail stations, through local management, to drive improved standards of passenger facility Delivery of an expanded rapid transit network through a three-stage approach, including orbital rapid transit Devolution and reform agenda focuses on delivering a more integrated, customer-focused and viable public transport network tailored to the needs of specific markets; providing both mass transit options for travel to major centres, and more local access to health, education, retail and employment opportunities.
Highways	Making best use of existing network, building new capacity only where this will support growth Improving efficiency and reliability of key routes through joint working between GM authorities and Highways agency. Encouraging the use of strategic routes for the movement of high volumes of people and goods by all modes of transport Safeguarding the priority of pedestrians and cyclists in quieter residential streets.	Continuation of approach to making best use/new capacity A change in approach, to secure a more strategic approach to managing our key route network, working in close partnership with stakeholders such as Highways England, GM District Councils and neighbouring authorities allows our network to managed more effectively to maximise the efficient movement of people and goods. Continuing to work towards reducing road casualties for vulnerable road users as per the Business as Usual, but with the ambition of near zero fatalities.

Goods and Servicing	Encourage mode shift to rail/water, cleaner freight fleets in Greater Manchester and routing of vehicles away from sensitive and residential areas whilst maintaining access for deliveries. Support expansion of future business and freight sites areas through Metrolink extensions	A continuation of the Business as Usual plus • a balanced GM-side approach to goods and servicing, recognising the vital role that this plays to our GM economy. A focus on reducing the impact on peak hour capacity of our transport network • Opportunities explored for freight consolidation in local centres, clean air zones, and vehicle improvements to improve safety and reduce emissions
Environmental Responsibility	Public transport-centred strategy to achieve mode shift, plus improved flow on highway network to smooth traffic flow Working through existing Travel Choices networks and partnerships to support modal shift and access to opportunity objectives. Taking funding opportunities to introduce cleaner buses and charging points for electric vehicles. Expansion of the electrically powered Metrolink network Air Quality Action Plan embedded in LTP Adoption of ambitious GM target for carbon reduction Energy reduction focussed on TfGM estate and vehicles Biodiversity, natural and urban environments protected through project management procedures	This contains all elements of Alternative 1, though our approach to Electric Vehicles has moved to develop an approach to EV vehicles that is not reliant on funding bids. Furthermore, • A strong focus on travel choices and customer experience, enabling more rapid uptake of ultra-low-emission vehicles (ULEVs), with a particular focus on goods vehicles and buses, and developing ULEV car clubs; alongside a major focus on increasing active travel particularly for short trips to secure modal shift. • A long-term balanced strategic approach to managing, maintaining and renewing our transport networks means that GM is in a strong position to respond to more extreme weather conditions and other major disruptions to our transport networks.
Health & Wellbeing	Delivering travel behaviour change programmes, working in partnership with health sector, to increase levels of active travel, targeted at groups identified in LSTF/CCAG bids. Minimising the risk of road casualties, especially for vulnerable road users Increasing personal security for public transport users Air Quality Action Plan embedded in LTP Taking the opportunities offered by regeneration schemes,	Much closer working with health sector to significantly increase levels of walking and cycling both for leisure and utility purposes. Health and transport devolution encourage greater collaboration to support delivery. Continuation of BAU for safety and security, plus support for 20mph in local neighbourhoods Continuation of BAU plus Feasibility study for a Clean air Zone

	both in town and city centres and in other areas to create good quality public realm.	Continuation of BAU
Accessibility	Partnership working with operators regarding network coverage Support for non-commercial bus services and provision of door-to-door services to fill gaps in the network .Integrating door-to-door services through a one-stop call centre. Expansion of (fully accessible) Metrolink network, serving regeneration areas Access improvements at rail stations subject to rail industry funding Access from residential areas - particularly those prioritised for housing growth - to key education and employment areas in support of Greater Manchester's skills and worklessness objectives. See also public transport re fares	Continuation of BAU plus Continuation of Door-to-door transport: achieve more consistency of taxis across GM, support the community transport sector, and improve accessibility of demand responsive transport. Integrate door-to-door services through a one-stop call centre to continue. Longer term approach to rail station investment (see above) will increase the likelihood of access improvements

Assessment of Alternatives

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ -	Combination of moderate beneficial and slight adverse effects	Significant

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
1. Improve air quality	**+/-**	Reductions in emissions of local air pollutant emissions would likely continue to occur generally as a result of the continuation of LTP3 type of interventions. Examples of how this would be achieved are noted in the following relevant themes: Integrated Approach: Promotion of active travel will reduce emissions Active Travel: Focus on delivering strategic cycle networks and key walking routes into the Regional Centre, to town centres and off-road routes along waterways, through parks and on disused rail corridors; raise awareness of walking would all help reduce emissions Public Transport: Improving rail services and their supporting	**++ -**	This Alternative Strategy contains many of the benefits of the 'Business as Usual' approach, but with a greater focus on an integrated approach and set targets. This Strategy will lead to improvements in air quality across GM. Examples of how this would be achieved are noted in the following relevant themes: Geographical Focus: Reductions in pollutant emissions will be experienced across GM due to the focus on spatial themes. Active Travel: Benefits of Business as Usual but with additional long term focus on investment in active travel to ensure continuous improvement in walking / cycling facilities. Target of 10% cycling mode share by 2020. Public Transport: Aim to develop a more integrated, customer-focused and viable public transport network. Aim of improved quality and greater reach of public transport network. Delivery of expanded rapid transit network.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach		
	SE	**Comments/ explanation**	**SE**		**Comments/ explanation**
		infrastructure, as well as increasing the Metrolink network Goods and Servicing: Encouraging a shift to rail / water and cleaner freight fleets, as well as expansion of Metrolink, should result in improved air quality Environmental Responsibility: Public transport centred strategy, cleaner buses, electric vehicle facilities, energy reduction of TfGM estate & fleet. An Air Quality Action Plan is embedded in the LTP. Health & Wellbeing: Increase in active travel & Air quality action plan embedded in LTP Accessibility: Expansion of (fully accessible) Metrolink network This Business as Usual approach though, does leave a potential for air quality not to improve as much as possible. For example the following theme would encourage car use: Highways: Building new capacity and Encouraging the use of strategic routes for the movement of high volumes of people and goods by all modes of transport Geographical Focus: This theme also perhaps shows that LTP3 was focused on economic growth areas and benefits in air quality would not be felt equally across GM.			Longer term and staged approaches identified. Goods and Services: Benefits of Business as Usual but with additional focus on vehicle improvements to reduce emissions and clean air zones. Environmental Responsibility: Benefits of Business as Usual (including the embedded Air Quality Action Plan) but with new focus, more likely to be achieved, on electric vehicles, encouraging more rapid uptake of ultra-low-emission vehicles (ULEVs), with a particular focus on goods vehicles and buses, and developing ULEV car clubs; alongside a major focus on increasing active travel particularly for short trips. Health & Wellbeing: Benefits of Business as Usual (such as the embedded Air Quality Action Plan) but with studies relating to a Clean Air Zone and ambition to significantly increase levels of walking / cycling. Accessibility: Continuation of Business as Usual but better investment to allow more people to use rail network. This Alternative Strategy though still has some themes which give a potential for air quality not to improve as much as possible: Highways: Continuation of 'Business as Usual' approach leaves a potential for traffic growth and therefore air quality negative effects.
2. Reduce carbon dioxide (CO2) emissions from transport overall, with particular emphasis on	**+/-**	As with emissions to Air as a whole, there are likely to deliver a reduction in carbon emissions as a result of the continuation of LTP3 type of interventions. Examples of how contributions to a reduction in the rate of increase of carbon dioxide emissions by moving away from the private car as the main means of transport are noted in the following relevant themes: Integrated Approach: Promotion of active travel will reduce	**++**	**-**	This Alternative Strategy contains many of the benefits of the 'Business as Usual' approach, but with a greater focus on an integrated approach and set targets. This Strategy will lead to a reduction in carbon emissions across GM. Examples of how this reduction would be achieved are noted in the following relevant themes: Geographical Focus: Reductions in carbon emissions will be experienced across GM due to the focus on spatial themes.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
road transport		emissions of carbon Active Travel: Focus on delivering strategic cycle networks and key walking routes into the Regional Centre, to town centres and off-road routes along waterways, through parks and on disused rail corridors; raise awareness of walking would all help reduce emissions Public Transport: Improving rail services and their supporting infrastructure, as well as increasing the Metrolink network Goods and Servicing: Encouraging a shift to rail / water and cleaner freight fleets, as well as expansion of Metrolink, should result in improved air quality Environmental Responsibility: Public transport centred strategy, cleaner buses, electric vehicle facilities, energy reduction of TfGM estate & fleet. Adoption of an ambitious GM target for carbon reduction. Health & Wellbeing: Increase in active travel and Air quality action plan embedded in LTP should reduce carbon Accessibility: Expansion of (fully accessible) Metrolink network While the above measures apply to transport as a whole and would reduce carbon emissions, they are not focused on roads. This Business as Usual approach also has other aspects which leave a potential for carbon emissions not to decrease as much as possible. For example the following theme would encourage car use: Highways: Building new capacity and encouraging the use of strategic routes for the movement of high volumes of people and goods by all modes of transport Geographical Focus: This theme also perhaps shows that		Active Travel: Benefits of Business as Usual but with additional long term focus on investment in active travel to ensure continuous improvement in walking / cycling facilities. Target of 10% cycling mode share by 2020. Public Transport: Aim to develop a more integrated, customer-focused and viable public transport network. Aim of improved quality and greater reach of public transport network. Delivery of expanded rapid transit network. Longer term and staged approaches identified. Goods and Services: Benefits of Business as Usual but with additional focus on vehicle improvements to reduce emissions (which would include carbon) and clean air zones. Environmental Responsibility: Benefits of Business as Usual (including the ambitious target for Carbon reduction) but with new focus, more likely to be achieved, on electric vehicles, encouraging more rapid uptake of ultra-low-emission (which would include carbon) vehicles (ULEVs), with a particular focus on goods vehicles and buses, and developing ULEV car clubs; alongside a major focus on increasing active travel particularly for short trips. Health & Wellbeing: Benefits of Business as Usual (including embedded Air Quality Action Plan) but with studies relating to a Clean Air Zone and ambition to significantly increase levels of walking / cycling. Accessibility: Continuation of Business as Usual but better investment to allow more people to use rail network. There is still though an emphasis on roads. In the theme of 'Highways' there is a continuation of the 'Business as Usual' approach which leaves a potential for traffic growth and therefore carbon reductions may not be achieved as much as possible.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		LTP3 was focused on economic growth areas and benefits in air quality would not be felt equally across GM.		
3. Conserve and enhance biodiversity, green infrastructure and geodiversity assets	**+/-**	The Business as Usual (LTP) approach would have positive effects (or provide the opportunity for positive effects) on biodiversity, green infrastructure and geodiversity assets. Examples of how this can occur are seen in aspects of the following themes: Active Travel: The focus on delivering strategic cycle networks and key walking routes into the Regional Centre, to town centres and off-road routes along waterways, through parks and on disused rail corridors would likely effect biodiversity, or provide an opportunity for enhancement. Goods and Servicing: Encouragement of a mode shift to water could effect the biodiversity of these waterbodies (canals / rivers). Environmental Responsibility: Biodiversity, natural and urban environments protected through project management procedures. Health & Wellbeing: Efforts for good quality public realm offer opportunity for biodiversity enhancement. The building of new capacity on the Highway network as outlined in the Highways theme would likely have a negative effect on biodiversity etc., though it could, in certain circumstances, also provide an opportunity for enhancement.	**+/-**	While there are a range of interventions contained within the LTP3 Strategy that would likely have a positive effect on biodiversity etc., these interventions are not developed further in terms of the themes in the new proposed Strategy. The aspiration to continue the approach noted in the Highways theme for new capacity suggests that there would remain a likely negative effect on biodiversity from this aspect.
4. Conserve and enhance the European sites (HRA specific	**?**	No specific reference to European sites is noted in relation to any theme associated with LTP3. There is a potential for interventions identified under the strategy to impact on European sites (for example through the development of additional highway capacity noted in the Highways theme), though it is noted that LTP3 supports the overarching	**?**	As with the Business as Usual approach, no specific reference is made to the potential effect on European sites (though note is made of sites of European level importance). There is a potential for interventions identified under this new proposed Strategy (such as the continued Highway development under the Highways theme) to impact on European sites – particularly as the spatial themes of the Balanced Approach apply across

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
objective)		Greater Manchester Strategy (multi-disciplinary), along with joint working with planning authorities and working with neighbouring authorities to identify cross boundary issues – this approach should allow identification of potential effects on European sites, but this cannot be said for certain.		the whole of GM. Nonetheless, this Balanced Approach builds upon the communication / liaison / co-ordination approach developed for LTP3 – for example this includes joint working to develop the GM Spatial Framework. This approach would give a greater opportunity to identify potential effects (including enhancement opportunities) on European sites and allow the avoidance of negative effects.
5. Conserve and enhance the character and quality of GM's landscapes and townscapes	**+/-**	In a general sense, the type of interventions that could arise out of a continuation of LTP3 would likely give rise to effects on the quality of landscape and townscape, as the interventions would be located in built up and rural areas – though it is noted that interventions focus on economic growth areas. More specifically, in relation to each individual theme, effects on townscape / landscape are likely through the following: Active Travel: The focus on delivering strategic cycle networks and key walking routes into the Regional Centre, to town centres and off-road routes along waterways, through parks and on disused rail corridors would offer an opportunity to enhance some areas. Public Transport: Development of new interchanges in city centres and further development of Metrolink would offer the opportunity to enhance townscape. Goods and Services: Encouraging a shift to rail / water could impact on landscape & townscape e.g. by reusing the canal system, though supporting the expansion of freight sites would likely negatively impact landscape / townscape. Environmental Responsibility: The embedding of an Air Quality Action Plan in the Strategy could improve townscape by reducing unsightly deposition of emissions (particulates) on buildings in the urban areas. In addition the proposed protection of the natural and urban environment through project management procedures would be a beneficial	**+/-**	As with the Business as Usual approach (from which many elements of the Balanced Approach are drawn), this approach will give rise to effects on the landscape / townscape. In this instance, due to the spatial themes of the Balanced Approach (for example City-to-City links, Travel to and within the Regional Centre, Travel across the wider city region), effects could be experienced across the whole of the GM region – in both urban and rural areas. Specifically, in addition to the effects caused by the Business as Usual approach carried across to the Balanced Approach, in relation to each individual theme, additional effects on townscape & landscape are likely through the following: Public Transport: The proposed longer term investment in rail stations would likely involve an improvement to townscape. Goods and Servicing: The exploration of opportunities for freight consolidation in local centres could have a positive or negative effect depending on where these are located, or if it means that the overall number of such centres is reduced. As with the Business as Usual approach, the continuation of a policy of new highway capacity as outlined in the Highways theme would likely effect landscape in a negative way.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		effect. Health & Wellbeing: Embedding of Air Quality Action Plan would benefit townscape due to reduction in particulate deposition as outlined above. Townscape would also benefit from the noted aim of taking the opportunities offered by regeneration schemes, both in town and city centres and in other areas to create good quality public realm. However, some aspects of the LTP3 Strategy are likely to have negative effects. For example: Highways: The proposed building of new capacity would likely impact on landscape negatively.		
6. Conserve and enhance the quality and distinctiveness of historic and cultural heritage	**+/-**	The type of interventions that could arise out of a continuation of LTP3 would potentially give rise to effects on historic assets. In relation to each theme effects on cultural heritage / historic assets are likely through: Active Travel: The focus on delivering strategic cycle networks and key walking routes into the Regional Centre, to town centres and off-road routes along waterways, through parks and on disused rail corridors could offer the potential to enhance some historic assets like canal paths, railway lines etc. Public Transport: The noted small scale station improvements may offer an opportunity to highlight key aspects of some historic railway stations e.g. Manchester Piccadilly. Goods and Servicing: The use of historic canals as part of a transport mode shift could provide the opportunity to highlight the canals heritage. Potential routeing of vehicles away from sensitive areas could include heritage assets such as listed buildings, scheduled monuments etc.	**+/-**	As with the interventions and their effects brought over from the Business as Usual approach, the Balanced Approach could potentially give rise to effects on historic and cultural heritage. In this instance, due to the spatial themes of the Balanced Approach (for example City-to-City links, Travel to and within the Regional Centre, Travel across the wider city region), effects could be experienced across the whole of the GM region – in both urban and rural areas. The full range of historic assets within GM could therefore potentially be affected, positively or negatively. Building new highway capacity as noted in the Highways theme could effect negatively unknown archaeological artefacts, though would also provide an opportunity to learn more about these lost features.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		Environmental Responsibility: The embedded Air Quality Action Plan could have a positive effect on heritage assets by reducing particulate deposition. Health & Wellbeing: As with the environmental responsibility theme, the embedded Air Quality Action Plan could have a positive effect on heritage assets by reducing particulate deposition. In addition, the development of good quality public realm could afford the opportunity to enhance historic assets. Building new highway capacity as noted in the Highways theme could effect negatively unknown archaeological artefacts though would also provide an opportunity to learn more about these lost features.		
7. Conserve and enhance the water environment	**-**	The type of interventions that could arise out of a continuation of LTP3 would potentially give rise to effects on the water environment – most likely negative. These could be caused by pollution incidents relating to the construction and operation of the full range of infrastructure interventions. In relation to each theme effects on the water environment are particularly likely through: Active Travel: The construction and use of off-road routes along waterways could lead to direct effects e.g. from pollution incidents. Highways: Building new capacity could cause pollution during both construction and operation. Goods and Servicing: A modal shift to using waterways for transport could lead to direct effects.	**-**	The Balanced Approach would continue to utilise the interventions proposed in the Business as Usual approach in many aspects – with the consequent likely negative effect on the water environment. There are though additional themes leading to interventions in the Balanced Approach which could have an effect on the water environment as follows: Integrated Approach: One area where key interventions will be made relates to the Atlantic Gateway area of Port Salford. This will potentially lead to waterways (e.g. Ship Canal) being utilised for transport – in particular freight. Negative effects could be experienced through pollution incidents.
8. Conserve soil and agricultural resources and	**+/-**	The continuation of LTP3 has a range of interventions that could impact on both soil and agricultural resources, though it is noted that interventions focus on economic growth areas. The interventions would also likely provide the	**+/-**	The Balanced Approach spatial themes (for example City-to-City links, Travel to and within the Regional Centre, Travel across the wider city region), mean that effects could be experienced across the whole of the GM region – in both urban and rural areas. This therefore would likely

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
seek to remediate / avoid land contamination		opportunity to remediate contaminated land. In relation to each theme effects on soils, agriculture and contaminated land are particularly likely through: Active Travel: Use of disused rail corridors provides a positive opportunity to remediate potentially contaminated land. Public Transport: Development of new interchanges in town centres and extension of the Metrolink network may provide a positive opportunity to remediate contaminated land. Highways: Development of new capacity may involve the direct loss of soil resources and agricultural areas and could potentially result in contamination of these resources. It may though, in certain circumstances, provide an opportunity for remediation of contaminated land. Goods and Servicing: Expansion of Metrolink and freight sites may provide a positive opportunity to remediate contaminated land, though it may also result in the loss of soil resources depending on location. Health & Wellbeing: Regeneration schemes, both in town and city centres and in other areas to create good quality public realm would provide a clear opportunity to remediate any contamination present. Accessibility: Expansion of (fully accessible) Metrolink network, serving regeneration areas would provide a clear opportunity to remediate any contamination present.		involve effects on soil and agriculture in rural areas, but also areas of contamination in both urban & rural areas. In addition to the effects outlined for the Business as Usual approach, the following themes in the Balanced Approach could also have effects on soil, agriculture and contaminated land: Public Transport: Development of an extended rapid transit network, including orbital rapid transit could effect soil, agriculture and contaminated land. Goods and Servicing: Consolidation of freight in local centres could effect soil, agriculture and contaminated land depending upon location chosen.
9. Reduce risk of flooding and increase resilience to the effects of a changing	**-**	The range of interventions proposed under continuation of LTP3 could be vulnerable to flooding or could contribute to flood risk depending upon location and the nature of the intervention. Climate change could also have long term implications for interventions which are not at risk, or pose a risk at present. The following themes have been identified as	***+/-***	Interventions are proposed across all Spatial Themes and thereby across all of GM. It is inevitable that some will be in areas prone to flooding (or which will become prone due to a changing climate) and depending upon the nature of the intervention, some could potentially increase the risk of flooding e.g. by increasing areas of hard standing.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
climate		being particularly relevant to flooding: Active Travel: Any delivered strategic cycle networks and key walking routes utilising off-road routes along waterways could be at risk to flooding depending upon location. This risk could increase with a changing climate. Highways: New routes could increase runoff and thereby contribute to flooding, or could be vulnerable to flooding if they are located in a flood plain. Goods and Servicing: A modal shift to using watercourses for transport could be at risk due to flood conditions. This risk could increase with a changing climate.		As noted though in the Environmental responsibility theme, there will be a long-term balanced strategic approach to managing, maintaining and renewing our transport networks means that GM is in a strong position to respond to more extreme weather conditions and other major disruptions to our transport networks.
10. Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	+	There are a range of interventions proposed in continuation of LTP3 that could have an effect on the use of natural resources, waste production and recycling. For the most part the interventions are aimed at reducing vehicle travel (cars and HGV's). This would reduce fuel consumption and can therefore represent a prudent use of natural resources, as well as reduce the production of waste. Themes of particular note in this regard are: Integrated Approach: Promotion of active travel will reduce car use and therefore reduce fuel consumption – thereby a prudent use of natural resources Active Travel: Delivering strategic cycle networks and key walking routes would help reduce fuel consumption and thereby help prudent use of natural resources Public Transport: Improving rail services and their supporting infrastructure, as well as increasing the Metrolink network would likely reduce car travel and fuel consumption Goods and Servicing: Encouraging cleaner freight fleets, as well as expansion of Metrolink, should result in reduced fuel	++	Interventions are identified across a range of spatial themes and these could have an effect on the use of natural resources, waste production and recycling. As with LTP3, for the most part the interventions are aimed at reducing vehicle travel (cars and HGV's).This would reduce fuel consumption and can therefore represent a prudent use of natural resources, as well as reduce the production of waste. Themes of particular note (which are in addition to those carried over from LTP3) in this regard are: Active Travel: Seeking to ensure continuous improvement in walking & cycling facilities and delivering a 10% cycling mode share by 2020 would result in more prudent use of natural resources such as fuel. Public Transport: Delivery of an expanded rapid transit network Goods and Services: Benefits of Business as Usual but with additional focus on vehicle improvements to reduce emissions (and hence more prudent use of natural resources) Environmental Responsibility: Benefits of Business as Usual but with new focus, more likely to be achieved, on electric vehicles, encouraging more rapid uptake of ultra-low-emission vehicles (ULEVs), with a particular focus on goods vehicles and buses, and developing ULEV car clubs; alongside a

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		consumption Environmental Responsibility: Public transport centred strategy, cleaner buses, electric vehicle facilities, energy reduction of TfGM estate and fleet. Health & Wellbeing: Increase in active travel should reduce fuel consumption Accessibility: Expansion of (fully accessible) Metrolink network should reduce fuel consumption etc. None of the themes noted in regard to the LTP3 Strategy are applicable to recycling.		major focus on increasing active travel particularly for short trips. This will represent prudent use of resources. Health & Wellbeing: Benefits of Business as Usual but with ambition to significantly increase levels of walking / cycling and thereby reduce fuel use. Accessibility: Continuation of Business as Usual but better investment to allow more people to use rail network and thereby reduce fuel use. The themes relevant to this Strategy do not make specific reference to the need for recycling
11. Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	**+/-**	There are a range of interventions proposed in LTP3 that for the most part are aimed at reducing car travel and the movement of goods via HGV's. Particular themes which are relevant to this goal have been identified as: Active Travel: Delivering strategic cycle networks and key walking routes; raising awareness of walking benefits. Public Transport: Improved quality of bus services, smart ticketing, improved fares, new interchanges, improved rail services and stations, extended Metrolink etc will all act to reduce the need to travel by car. Note though that the Metrolink is radial and focused on regional centre – therefore limited in coverage. Goods and Servicing: Expansion of future business and freight sites areas through Metrolink extensions. Environmental responsibility: Public transport centred strategy to achieve mode shift would help but note that improved flow on highway network to smooth traffic flow would not discourage the need to travel by car.	**++**	The Geographical focus (through the Spatial themes) of the Balanced Approach means that interventions proposed to reduce the need to travel by car etc would be more widespread across GM and thereby open up more areas to alternative modes of transport. This aspect will be enhanced by interventions such as that noted in Integrated Approach for improving connectivity to key growth areas and improved city to city links etc. Further enhancements in addition to those carried over from the Business as Usual approach can be seen in the following themes: Active Travel: Further long term investment in active travel, with the aim of 10% cycling mode by 2020 Public Transport: Further improvements in bus services etc. Continuation of town centre interchanges programme, longer term investment in rail stations etc. delivery of expanded rapid transit network – including orbital. More integrated, customer-focused and viable public transport network tailored to the needs of specific markets; providing both mass transit options for travel to major centres, and more local access to health, education, retail and employment opportunities would all help to reduce significantly the need to travel by car etc. and promote sustainable modes. Health & Wellbeing: Much closer working with health sector to significantly increase levels of walking and cycling both for leisure and utility purposes

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		Health & Wellbeing: Promotion of active travel and increasing personal security on public transport would reduce car use. Accessibility: Support for non-commercial bus services and provision of door-to-door services to fill gaps in the network and expansion of Metrolink, as well as general access improvements (including from / to key areas) would reduce the need for car use. Note though that interventions promoted by this alternative are focused on economic growth areas (as outlined in the Geographical focus theme) and as such may have limited effect across the full area of GM to reduce the need to travel by car etc. Another area which would not reduce the need to travel by car etc is outlined in the Highways theme where it is noted that extra capacity could be built and efficiency and reliability of routes will be improved – this would not reduce the need to travel by car etc.		would reduce the need for car journeys. Accessibility: Longer term investment in rail stations will allow their use by a greater range of people. The Highways theme though recognises the continued need for car journeys and reflects this in new capacity and a more strategic approach to managing our key route network to maximise the efficient movement of people and goods.
12. Promote economic growth and job creation across the sub-region, and improve access to jobs for all	+	Interventions within LTP3 focus on economic growth areas and improving access to these. This may mean that benefits are not experienced across the whole of GM and not by all its citizens. Other effects on economic growth and job creation through the identified themes are as follows: Public Transport: Partnership contracts with bus operators. Goods and Services: Routing of vehicles away from sensitive and residential areas whilst maintaining access for deliveries. Support expansion of future business and freight sites areas through Metrolink extensions. Health & Wellbeing: Delivering good quality public realm can make it easier to attract businesses to an area. Accessibility: Partnership working with operators offers contract opportunities and access from residential areas -	++	As noted in the Geographical focus theme, as well as the Business as Usual approach to growth areas continuing, the Balanced Approach has interventions identified across all Spatial Themes – this would provide better coverage to the whole of GM and a wider range of citizens. The focus on growth areas would also be enhanced as noted in the Integrated Approach theme with a co-ordinated and integrated approach to improving connectivity, particularly by sustainable modes, to key growth areas such as Manchester Airport Enterprise Zone, and the Atlantic Gateway area around Port Salford, enables long-term sustainable economic growth at these key locations and encourages further international investment in GM. It is also the case that the Balanced Approach aims for much closer partnership working across the north of England through Transport for the North and Rail North to support delivery of significantly improved city-to-city links, particularly by rail, which are well integrated into GM transport networks and support delivery of a Northern Powerhouse economy. In addition to continuing aspects of the Business as Usual approach, the Balanced Approach takes new approaches to issues such as funding over

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		particularly those prioritised for housing growth - to key education and employment areas in support of Greater Manchester's skills and worklessness objectives. Throughout LTP3, the development of the proposed interventions would frequently entail construction (or other) contract opportunities and this would help generate / maintain employment in the construction industry etc.		the long term. As noted in the Highways theme, efforts will be made to make transport networks (such as Highways) as efficient as possible – this would have economic benefits. Similar approaches are shown in the Goods and Services theme which recommends a balanced GM-side approach to goods and servicing, recognising the vital role that this plays to our GM economy. As with LTP3, the development of the proposed interventions in the new Strategy would frequently entail construction (or other) contract opportunities and this would help generate / maintain employment in the construction industry etc.
13. Coordinate land use and transport planning across GM	+	LTP3 promotes an approach to cross boundary issues based on work with national agencies, such as noted in the Geographical focus and Integrated Approach themes: the Highways Agency (now Highways England) Department for Transport, and Network Rail to develop shared solutions. LTP3 also supports the overarching Greater Manchester Strategy (multi-disciplinary) and joint working with planning authorities to ensure new development is supported by transport infrastructure and that the impact is mitigated. LTP3 also involves working with neighbouring authorities to identify cross-boundary issues and takes a co-ordinated approach to working with emergency services and the health sector. These approaches would be vital in order to realise the benefit of Interventions such as that noted in Health & Wellbeing regarding taking the opportunities offered by regeneration schemes, both in town and city centres and in other areas to create good quality public realm. Similarly this would be the case (as noted in Accessibility) for access from residential areas - particularly those prioritised for housing growth - to key education and employment areas in support	++	As noted in the Geographical focus theme, as well as the Business as Usual approach to growth areas continuing, the Balanced Approach has interventions identified across all Spatial Themes – this would provide better coverage to the whole of GM and a wider range of citizens. Also in addition to raking the Business as Usual approach to cross boundary issues, the Balanced Approach would have proactive identification of opportunities and issues for GM and as noted in the Integrated Approach theme would take a co-ordinated and integrated approach with a range of authorities and key stakeholders. Importantly, the Balanced Approach would also involve joint working to develop the GM Spatial Framework with transport a key consideration in identifying sites for development. Further integration and co-ordination is shown in the Highways theme which will involve a change in approach, to secure a more strategic approach to managing our key route network, working in close partnership with stakeholders such as Highways England, GM District Councils and neighbouring authorities allows our network to managed more effectively to maximise the efficient movement of people and goods.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		of Greater Manchester's skills and worklessness objectives. However, as noted in the Geographical focus theme LTP3 also promotes interventions which focus on economic growth areas and improving access to them which suggests that it will not be experienced fully across GM.		
14. Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)	+	There are a range of Interventions in LTP3 which would promote greater equality of opportunity for all citizens. Some of these interventions require co-ordination with key stakeholders and authorities such as the health sector. Other key aspects noted in the identified themes are: Public Transport: Work with operators and DfT to improve fares structures – this will ideally open up public transport to a greater range of income groups. Highways: Safeguarding the priority of pedestrians and cyclists in quieter residential streets Environmental responsibility: Working through existing Travel Choices networks and partnerships to support modal shift and access to opportunity objectives. Health & Wellbeing: Targeted at groups identified in LSTF/CCAG bids Health & Wellbeing: Increasing personal security for public transport users will make it more attractive to vulnerable travellers. Accessibility: Partnership working with operators regarding network coverage and support for non-commercial bus services and provision of door-to-door services to fill gaps in the network will help provide access to previously 'missed' areas. Access improvements at rail stations subject to rail industry funding, will help those members of society who may have mobility or other health issues utilise the rail	++	As noted in the Geographical focus theme, as well as the Business as Usual approach to growth areas continuing, the new Strategy has interventions identified across all Spatial Themes – this would provide better coverage to the whole of GM and a wider range of citizens, thereby providing greater equality of opportunity etc. Further positive effects of the Balanced Approach (in addition to those carried over from the Business as Usual approach) are indentified in the following themes: Public Transport: Simple integrated ticket range and simple fares structure, integration with other modes and a specified bus network should further open up public transport to a greater range of income groups. Increasing the reach of the public transport network, as well as more local access to health, education, retail and employment opportunities would also be a key to greater equality of opportunity. Accessibility: Working to achieve more consistency of taxis across GM, support the community transport sector, and improve accessibility of demand responsive transport will give more citizens the chance to partake of opportunity. In addition longer term approach to rail station investment will increase the likelihood of access improvements and thereby further help those members of society who may have mobility or other health issues utilise the rail service.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		service. Another key aspect of accessibility is the proposed access from residential areas - particularly those prioritised for housing growth - to key education and employment areas in support of Greater Manchester's skills and worklessness objectives.		
15. Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)	+	There are a range of Interventions in LTP3 which would help to improve health and well-being of all citizens and reduce inequalities in health. As noted in the Integrated Approach theme there is a joint approach with the Health sector to promote active travel. In addition there is a co-ordinated approach with emergency services regarding safety and security. The Interventions proposed under Active Travel such as the focus on delivering strategic cycle networks and key walking routes will also bring positive effects. Awareness of the benefits of walking will be raised through partnership working with the Health Sector. Further benefits re. health can be seen through the following themes: Public Transport: Small scale station improvements to improve safety and security will improve well being for all citizens. Highways: Safeguarding the priority of pedestrians and cyclists in quieter residential streets. Goods and Servicing: Routing of vehicles away from sensitive and residential areas Health & Wellbeing: This theme is of particular note, with interventions being derived to deliver travel behaviour change programmes, working in partnership with health sector, to increase levels of active travel, targeted at groups identified in LSTF/CCAG bids. In addition there will be interventions to minimise the risk of road casualties, especially for vulnerable road users and increase personal security for public transport users.	++	In addition to interventions brought over from LTP3, the following themes have relevant aspects relating to improving the health and well being of all citizens and reducing inequalities in health: Active Travel: Mainstreaming walking and cycling with the aim of making them the modes of choice for short trips and delivering a 10% cycling mode share by 2020 Public Transport: More local access to health opportunities Highways: Continuing to work towards reducing road casualties for vulnerable road users as per the Business as Usual, but with the ambition of near zero fatalities. Goods and Servicing: Vehicle improvements to improve safety Health and Wellbeing: In addition to the range of interventions brought over from LTP3, there will be much closer working with the health sector to significantly increase levels of walking and cycling both for leisure and utility purposes. Health and transport devolution encourage greater collaboration to support delivery. In addition to support for 20mph in local neighbourhoods. In addition to the above, a range of themes and derived interventions will lead to improvements in air quality across Greater Manchester which will lead to improvements in health and well being for all citizens.

IA Objectives	*Alternative 1* Business As Usual		*Alternative 2* Balanced Approach	
	SE	**Comments/ explanation**	**SE**	**Comments/ explanation**
		In addition to the above, a range of themes and derived interventions will lead to improvements in air quality. This may be of greatest benefit to those areas such as economic growth areas upon which interventions will be focused. This may restrict the number of citizens who would benefit.		

Appendix E. **Assessment of Draft Transport Strategy**

Network Principles: Integration at the heart of our 2040 Transport Strategy

Part 2 - Network Principles	**Integration at the heart of our 2040 Transport Strategy**
Summary of principle (for full text refer to Transport Strategy document)	*Our Ambition by 2040: A fully integrated sustainable transport system which enables customers to move seamlessly between services and modes of transport, supported by sophisticated travel choices campaigns and programmes; personalized journey planning and wayfinding tools; and paid for via a single cashless personal travel account. We must also have a fully integrated approach to land use planning and transport that can support delivery of transformational levels of housing and employment growth without significant increases in traffic levels and congestion.* Over the coming years, we will focus on significantly improving people's travel experience in Greater Manchester. Individual customers should be able to customise their journeys using multiple modes of transport, in a seamless manner, through innovative new ways of planning and paying for travel. We must also facilitate customer access to real-time information on planned and unexpected disruption on the network, enabling them to make informed choices about alternative travel options. Technology developments open up a range of new opportunities for delivering this integrated and customer-focused transport system. TfGM's role will also gradually shift away from being a transport authority and delivery body, towards a focus on enabling mobility and improving connectivity for all our customers no matter how they choose to travel. <u>Expanding the Transport Offer in Greater Manchester</u> …we want to see a more comprehensive low-emission car club offer in Greater Manchester, as well as developing options for cycle hire or sharing schemes. Such approaches, based on the growth in popularity of the "sharing economy" concept, enable people to more easily access a car or a bike for occasional trips, even if they don't own one as an individual. We will continue to work with a range of different commercial and community transport operators to ensure that these supporting modes of transport are fully embedded into our transport strategy and are seen as an integral part of a fully integrated, accessible transport system in Greater Manchester. <u>A Fully Integrated Network</u> Over the period to 2040, we will stop viewing different modes of transport as separate networks, with individual asset management, service planning, and fares and ticketing regimes, and instead plan our transport system as a single, highly-connected entity that all customers can move through seamlessly. <u>Travel choices</u> Greater Manchester already has a comprehensive Travel Choices programme focussed on the journey to work, working with businesses to encourage their staff to travel sustainably; helping jobseekers travel to interviews and during the initial period of employment; and encouraging individuals to use new public transport, cycling or walking infrastructure in their area. A continuing programme of Travel Choices will be important in complementing the programmes and measures described in Chapter 7. We will seek partnership funding, including from developer contributions, to maintain a GM-wide programme of travel choices interventions focussing on: • Making best use of the existing transport network; • Maximising the benefit of new, integrated transport infrastructure and services; • Delivering public health benefits through active travel; • Supporting town and city centres; and • Improving access to key services and job opportunities. <u>Integration with land use planning</u>

	We will work with planning authorities and developers to better integrate transport and new development in accordance with the principles: • Reducing the need to travel by car, and the distance travelled • Maximising accessibility by sustainable modes • Making the best use of existing infrastructure • Maximising the opportunity to provide public transport • Designing to encourage active travel This will involve providing advice on Development Plan Documents and significant planning applications, with the aim of reducing the need to travel by car and maximising travel by sustainable modes. This advice will include the need for developer contributions to improve transport provision, where appropriate.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives	Description of effect[1]	Scale / significance of effect	Recommendations for mitigation or enhancement

[1] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

1.	Improve air quality	Working to encourage a better integrated public transport network and expanding the transport offer in GM positively impacts on this principle with a positive effect on improving air quality by reducing the amount of travel by private car. The Principle specifically comments on the provision of a low-emission car club offer in Greater Manchester as well as cycle hire schemes. Throughout the document there is a recognition of a preference towards walking and cycling and thus seeking to support improvements to air quality.	++		The 'supporting' modes of transport – taxis, ring and ride, demand responsive bus services are emphasised. There may be opportunity to ensure these future services are provided by cleaner vehicles – less air polluting vehicles - (which could be a commitment through the procurement process.)
2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This principle outlines policy and measures that should have a positive effect on reducing GHG emissions (including CO2) by reducing the amount of travel by private car. The Principle specifically comments on the provision of a low-emission car club offer in Greater Manchester as well as cycle hire schemes. Throughout the document there is a recognition of a preference towards walking and cycling and thus seeking to support reduced GHG emissions (including CO2)	++		The 'supporting' modes of transport – taxis, ring and ride, demand responsive bus services are considered. There may be opportunity to ensure these future services are provided by electric or hybrid – emitting less CO2 - (which could be a commitment through the procurement process).
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	Elements of this Principle encourage the use of existing and development of new infrastructure which could potentially have positive effects on the conservation and enhancement of biodiversity e.g. by reducing the need for new infrastructure, or negative effects eg. by creating of new road infrastructure taking up biodiversity rich land, though there is no detail on what would be entailed. As such, the effects could be either positive or negative. In addition, no note is made of Green Infrastructure or other similar assets. This Principle also notes that advice would be provided on 'Significant Planning Applications' and the 'need for developer contributions to improve transport provision', but it does not encourage the protection of biodiversity etc. Without any advice / encouragement, these significant planning applications and new transport provision could impact on biodiversity etc. This could be over a permanent time frame.	++	--	None of the Network Principles proposed cover biodiversity, green infrastructure and geodiversity. It is recommended that a new Principle is developed to ensure that any transport interventions and any advice provided in relation to 'Significant Planning Applications' is informed by the need to conserve and enhance biodiversity, provide green infrastructure, avoid severance of habitats, provide wildlife corridors etc. This would likely reduce the potential for and significance of any negative effects.
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle encourages the use of sustainable transport methods and cites improvements to existing infrastructure, which could have positive effects in reducing air pollution impacts on European sites. However, the Principle also makes reference to providing additional public transport and the development of new infrastructure, which could cause negative effects by direct land take, increasing emissions, and promoting accessibility to European sites, thereby contributing to recreational pressure. As such, the effects could be either positive or negative. This Principle also notes that advice would be provided on 'Significant	++	--	None of the Network Principles proposed cover potential effects upon European sites. It is recommended that the protection of European sites is cited under a new Principle. This will ensure that the transport interventions and any advice provided in relation to infrastructure schemes is informed by the need to protect European sites. It should be ensured that any proposals are assessed for their potential to have likely significant effects on an

		Planning Applications' and the 'need for developer contributions to improve transport provision', but it does not encourage the protection of European sites. Without any advice / encouragement, these significant planning applications and new transport provisions could impact on European sites. This could be over a permanent time frame.			European site through the HRA process in order to avoid, mitigate or compensate for any adverse effects. This would likely reduce the potential for, and significance of, any negative effects.
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	Elements of this Principle encourage the use of existing and the development of new transport infrastructure which could potentially have a positive effect on the character and quality of GM's landscapes and townscapes e.g. by reducing the need for new infrastructure, but equally could have a negative effect through the construction of new road infrastructure, though there is no detail on what would be entailed. As such, the effects could be positive or negative. In addition, no note is made of Green Infrastructure or other similar assets which contribute to landscape and townscape character. This Principle also notes that advice would be provided on 'Significant Planning Applications' and the 'need for developer contributions to improve transport provision', but it does not encourage the conservation and enhancement of the character and quality of GM's landscapes and townscapes. Without any advice / encouragement, these significant planning applications and new transport provision could impact negatively on landscapes etc. This could be over a permanent timeframe.	++	--	None of the Network Principles proposed cover landscape and townscape. It is recommended that a new Principle is developed to ensure that any transport interventions and any advice provided in relation to 'Significant Planning Applications' is informed by the need to conserve and enhance the quality of landscapes / townscapes. For example, the Principle while encouraging the use of existing infrastructure could make it clear that the repair and maintenance of infrastructure should respect and enhance the landscape etc. Similarly it could require the exploration of opportunities for landscape / streetscape enhancement by removing signage etc. This would likely reduce the potential for and significance of any negative effects.
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	Elements of this Principle encourage the use of existing and the development of new transport infrastructure which could potentially have a positive impact on the historic and cultural heritage e.g. by reducing the need for new infrastructure, or by reducing traffic congestion in historic town centres or near to important sites. However, there is no detail on what would be entailed and as such, effects could be positive or negative. This Principle also notes that advice would be provided on 'Significant Planning Applications' and the 'need for developer contributions to improve transport provision', but it does not encourage the conservation and enhancement of the historic and cultural heritage. Without any advice / encouragement, these significant planning applications and transport provision could impact negatively on historic and cultural heritage etc. This could be over a permanent timeframe.	++	--	None of the Network Principles proposed cover heritage. It is recommended that a new Principle is developed to ensure that any transport interventions and any advice provided in relation to 'Significant Planning Applications' includes the need to enhance access to the regions cultural and designated / non-designated historic assets. It should also reflect the need to enhance and maintain the integrity and settings of these assets. This approach would likely reduce the potential for and significance of any negative effects.

7.	Conserve and enhance the water environment	This Principle does not consider the water environment and any new infrastructure e.g. under the Travel Choices programme may lead to schemes that have a negative effect. In fact, this principle does not aim to protect the water environment from either existing or proposed infrastructure. This Principle notes that advice would be provided on 'Significant Planning Applications' and the 'need for developer contributions to improve transport provision'. No consideration of potential effects on the water environment is made in relation to the proposed advice to be provided. Impacts on the water environment from transport interventions derived from this Principle would likely be experienced from the short through to the long term	--		None of the Network Principles proposed cover the water environment. It is recommended that a new Principle is developed to ensure that any advice to be provided relating to the development of any new transport scheme notes a requirement to protect and enhance where possible the water environment. Reference should also be made of requirements under the Water Framework Directive (WFD). This approach would likely reduce the potential and for and significance of any negative effects.
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	While this Principle could potentially help conserve soil and agricultural resources through a reduction in the need for new infrastructure, it does not seek to remediate / avoid land contamination – this could still occur from pollution incidents taking place on existing infrastructure, or negative impacts could occur from any new infrastructure developed, for example, under the Travel Choices programme. Impacts on soil would be experienced from the short through to the long term and in the absence of remediation could be considered to be permanent.	++	--	None of the Network Principles proposed cover soil and contamination. It is recommended that a new Principle is developed to ensure that any new transport infrastructure promoted by TfGM and any advice provided in relation to new infrastructure notes a requirement to conserve soil and agricultural resources and avoid land contamination. It should also be encouraged for opportunities to be taken in relation to remediation of land. This approach would likely reduce the potential for and significance of any negative effects.
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	While this Principle notes the need to 'maximise the best use of existing infrastructure', it does not provide detail on how this infrastructure can be protected / improve resilience – particularly in the light of a changing climate. It is noted that a separate principle covers Resilient Network issues and that these aspects in relation to TfgM's networks are covered there. This Principle does not consider the need to reduce the risk of flooding and any new infrastructure e.g. under the Travel Choices programme may lead to schemes that have a negative effect. In fact, this principle does not aim to reduce the risk of flooding from either existing or	--		None of the Network Principles proposed cover flooding but Principle Resilient Networks deals with resilience to the effects of a changing climate. It is recommended that a new Principle is developed to ensure that any new transport infrastructure and advice provided in relation to new infrastructure notes a requirement to consider flood risk.

		proposed infrastructure. Advice is to be provided under this Principle in relation to 'Significant Planning Applications' and the 'need for developer contributions to improve transport provision'. No consideration is made of the need to ensure that the risk of flooding or other extreme events associated with climate change is addressed. In the absence of adequate advice, negative effects from a changing climate such as increased flooding could be considered to be permanent.		This approach would likely reduce the potential for and the significance of any negative effects.
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	This Principle could reduce the use of natural resources and minimise waste by reducing the need for new infrastructure – thereby leading to less construction etc. as well as reducing use of the car (thereby reducing fuel use) by promoting a shift to more sustainable forms of transport. It could equally lead to negative effects on this objective through the need to construct and run new transport infrastructure. However, the Principle does not address the requirement to ensure recycling etc. It also notes the potential for new infrastructure, for example, under the Travel Choices programme. No note is made of the need for prudent use of natural resources, minimising the production of waste etc.	+/-	None of the Network Principles proposed cover the use of natural resources and waste production. It is recommended that a new Principle is developed to increase the alignment of the Strategy with the IA Objective by ensuring that recycling is encouraged where possible e.g. during maintenance of existing infrastructure and that the need for waste reduction etc during the development of new infrastructure is noted.
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	The integration between services and networks according to the principle set under the Fully Integrated Network is in full alignment with this IA objective. The commitment to an expanding transport offer, offering a greater range and travel choices, and the full integration of services to increase accessibility to the transport system will significantly contribute towards the principle of reducing the need to travel by car and supporting the uptake of sustainable modes of transport including walking, cycling and public transport.	+++	None
12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	A better integrated network will improve access to jobs and potentially increase travel horizons of those in employment and the unemployed. This could significantly boost employment and economic growth. This principle supports the development of technology and job creation through application development for the provision of more online information, and staff involved in travel choices programmes. There are opportunities to enhance the existing transport system through the provision of new technological services, and the transport offering such as the fitting of real time passenger information systems and the creation of cycle hire and car sharing companies.	++	The links to the potential benefits to the economy through the development of new transport systems, information provision and application development is not recognised in this principle and could be enhanced.

		The travel choices agenda is targeted at getting people into work eg jobseekers to interviews. The flexible ticketing options will make it easier for people to travel and therefore should facilitate job creation and economic growth. There may be some reduction in employment from the increase in automation and the potential reduction in ticketing and enforcement staff. The principle specifically references the sharing economy and the concept of car sharing schemes – this may depend on people having access to the internet, and as such may disadvantage the elderly or those without access.		
13.	Coordinate land use and transport planning across GM	Working with planning authorities and developers to better integrate transport and new development according to the principles set is in full alignment with this IA objective. The provision of timely advice on Development Plan Documents and significant planning applications (including the need for developer contributions to improve transport provision, where appropriate) will support development which is compact and mixed use, served by public transport and supportive of active travel.	+++	None
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle will improve access to facilities and services across the region, in particular for those without access to a car. It will improve walking and cycling connectivity and reduce severance, as well as reducing accidents for pedestrians and cyclists with improved, safer infrastructure. The integration of fares across different modes and operators should reduce the cost of travel as it will reduce the need to buy multiple tickets. The encouragement of sustainable modes of travel should lead to mode shift, which will reduce air, noise and light pollution, and low-emissions car sharing clubs will help to minimise the impacts of some car trips.	++	Travel information should be made available in other languages, and in formats accessible for people with disabilities (especially people with visual impairments and learning difficulties). Transport services and interchanges should also be made accessible for people with disabilities – mobility impairments and also visual impairments in particular. The new fare pricing structure should be designed to be as affordable as possible.
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle will improve access to healthcare facilities and services across the region, in particular for those without access to a car. It will improve walking and cycling connectivity and reduce severance, as well as reducing accidents for pedestrians and cyclists with improved, safer infrastructure. Higher levels of active travel in the area will be beneficial for health, and help to reduce obesity levels. The encouragement of sustainable modes of travel should lead to mode shift, which will reduce air, noise and light pollution, and low-emissions car sharing clubs will help to minimise the impacts of some car trips. This reduction in air pollution will be of particular benefit to those with long term conditions such as asthma, but will also improve health	++	It will be important when considering the integration of transport services that the needs of people accessing healthcare are considered – services need to be regular and offer as direct access as possible. It will also be important to ensure that services are accessible for people with disabilities.

		overall.		

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	+++	+++	++	++	++	++	+++	This principle makes improvements to accessing key services (including healthcare) in a number of ways: • Treating the transport network as a whole, and designing infrastructure and services to make interchange easier; • Using land use planning to ensure that future development is located close to public transport services and that as many services as possible are provided locally so that people can easily walk/cycle; • Identifying the potential for technology to help facilitate journeys away from the regular transport network – for example improved booking and coordination with demand responsive transport (this will be of particular benefit to older people and people with disabilities, who are more likely to be dependent on these); • Improving the information available on travel choices so that people are able to take advantage of all existing infrastructure and services; • Introducing sharing schemes (cycling and cars) which will benefit people without access to a vehicle at their home. All of these measures will help to improve access for people without access to a car (who often experience health problems as a result of poor access to essential healthcare services), which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (9.8%), as well

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). Recommendations In order to maximise the beneficial impact, it will be important to target the travel information so that people are able to find the best routes for them, and it will also be important to make sure that the information is accessible, including making it available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015) and making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed materials).
2	Improve affordability of transport	+	+	+	++	+	+	+	+	This principle aims to produce a consistent pricing and payment system, with one account/card used for all public transport and transport sharing schemes. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport. This will be particularly beneficial for low-income groups – there are high levels of deprived people in Manchester, Salford and Rochdale in particular, which are all in the top 20 most deprived authorities in England.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and community safety, but the improvements to interchange and associated reduction in waiting time

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										may improve the perception in safety slightly. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	++	+	+	++	++	++	+	++	This principle includes improved design to encourage active travel, which is to include reducing traffic speeds, making clear priority for pedestrians and cyclists, and introducing segregated routes where necessary. This will improve safety and reduce the number of accidents involving pedestrians and cyclists. If the principle succeeds in reducing car trips, the reduction in vehicle km would potentially be associated with a reduction in accidents involving cars. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.
5	Reduce severance	++	+	++	+	++	++	+	++	This principle includes improved design to encourage active travel, which is to include reducing traffic speeds, making clear priority for pedestrians and cyclists, and introducing segregated routes where necessary. The introduction of new routes will help improve connectivity for pedestrians and cyclists, and the reduction in traffic speeds (along with any reduction in congestion/car trips due to mode shift to more sustainable modes) would reduce severance on impacted corridors. There is also to be consideration of the impact of highways on shaping local places, which will include any perception of severance created by them. Encouraging active travel will help people to increase their activity levels, which will be beneficial to

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
										their health. Levels of childhood obesity in the GM area are higher than the national average (19%, with up to 25% in some authorities) as are levels of adult obesity (up to 30% in some authorities), and facilitating active travel as a part of daily life will help to reduce these levels.
6	Reduce air, noise and light pollution from transport	++	+	++	++	+	++	+	++	This principle aims to reduce car trips and traffic speed, which will have a positive impact on air, noise and light pollution. People will be encouraged to use more sustainable modes such as public transport and active travel to move around Manchester. There will a low emission car club, which will mean that some necessary car trips will be able to be made with less of a negative impact on air, noise and light pollution. Development is to be planned so that none is allowed in places that are already congested without mitigation to reduce car trips – this will mean that impacts on any existing AQMAs/noise hotspots is likely to be minimised. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	+++	++	+++	+++	++	++	++	++	+++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Treating the transport network as a whole, and designing infrastructure and services to make interchange easier; • Using land use planning to ensure that future development is located close to public transport services and that as many services as possible are provided locally so that people can easily walk/cycle; • Identifying the potential for technology to help facilitate journeys away from the regular transport network – for example improved booking and coordination with demand responsive transport (this will be of particular benefit to older people and people with disabilities, who are more likely to be dependent on these); • Improving the information available on travel choices so that people are able to take advantage of all existing infrastructure and services; • Introducing sharing schemes (cycling and cars) which will benefit people without access to a vehicle at their home. All of these measures will help to improve access for people without access to a car, which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (19% have limiting long term conditions, with 9.6% more

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											serious), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). Recommendations In order to maximise the beneficial impact, it will be important to target the travel information so that people are able to find the best routes for them, and it will also be important to make sure that the information is accessible, including making it available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015) and making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed materials).
2	Improve affordability of transport	++	++	++	++	++	++	++	++	++	This principle aims to produce a consistent pricing and payment system, with one account/card used for all public transport and transport sharing schemes. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport.
3	Reduce crime and fear of crime and promote community safety	0	+	0	+	+	+	0	0	+	This principle would have very little impact on crime and community safety, but the improvements to interchange and associated reduction in waiting time may improve the perception in safety slightly. This is likely to have a

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											greater impact for women, BME people, some religious groups, and LGBT people, as they are more likely to feel vulnerable to crime. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	++	++	++	++	++	++	This principle includes improved design to encourage active travel, which is to include reducing traffic speeds, making clear priority for pedestrians and cyclists, and introducing segregated routes where necessary. This will improve safety and reduce the number of accidents involving pedestrians and cyclists. If the principle succeeds in reducing car trips, the reduction in vehicle km would potentially be associated with a reduction in accidents involving cars.
5	Reduce severance	++	++	++	++	++	++	++	++	++	This principle includes improved design to encourage active travel, which is to include reducing traffic speeds, making clear priority for pedestrians and cyclists, and introducing segregated routes where necessary. The introduction of new routes will help improve connectivity for pedestrians and cyclists, and the reduction in traffic speeds (along with any reduction in congestion/car trips due to mode shift to more sustainable modes) would reduce severance on impacted corridors. There is also to be consideration of the impact of highways on shaping local places, which will include any perception of severance created by them.
6	Reduce air, noise and light pollution from transport	++	+	++	+	+	+	+	+	++	This principle aims to reduce car trips and traffic speed, which will have a positive impact on air, noise and light pollution. People will be encouraged to use more

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											sustainable modes such as public transport and active travel to move around Manchester. There will a low emission car club, which will mean that some necessary car trips will be able to be made with less of a negative impact on air, noise and light pollution. Development is to be planned so that none is allowed in places that are already congested without mitigation to reduce car trips – this will mean that impacts on any existing AQMAs/noise hotspots is likely to be minimised. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Network Principles: An accessible and inclusive Network

Part 2 - Network Principles	An Accessible and Inclusive Network
Summary of principles	*Our Ambition for 2040: A fully inclusive and affordable sustainable transport system for all* To meet the scale of ambition set out in our Greater Manchester Strategy, we must ensure that everyone in Greater Manchester is able to access a range of employment, training, health and leisure opportunities to enable them to lead productive, healthy and fulfilling lives. Therefore we must make sure that our transport network is as inclusive and accessible as possible. An accessible transport network will become even more critical as the proportion of our population that is over the age of 60 continues to grow over the coming decades.

(for full text refer to Transport Strategy document)	We will continue to ensure that all new transport infrastructure and vehicles are designed to be as accessible as possible to all our customers, regardless of their levels of mobility. We will also continue to deliver accessibility improvements to our existing transport networks, targeted those parts of our transport system which most require improvement and cause most disadvantage to those with a mobility impairment. Further detail on our priorities for accessible public transport is provided in section xx below. Affordability is also an important issue for people on limited incomes. Season tickets can offer good value to people who need to travel five days or more a week, but these do not benefit part-time workers, who have to pay higher daily fares. Over the period to 2040, we will see increasing numbers of people working or studying on a part-time, flexible or short-term contract basis and so flexible ticketing options will become even more important to support our rapidly changing economy.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives	Description of effect[2]	Scale / significance of effect	Recommendations for mitigation or enhancement

[2] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

1.	Improve air quality	Elements of this Principle supports greater use of public transport through enhanced integration and accessibility of the transport network vehicles. Whilst not the primary aim of this Principle, potential mode shift from private car to use of public transport generated through greater accessibility and integration of public transport systems may be slightly beneficial to this Principle.	+	None
2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	Elements of this Principle supports greater use of public transport through increased accessibility and integration of the bus and tram network. Whilst not the primary aim of this Principle, potential mode shift from private car to use of public transport generated through increased access to public transport systems may be slightly beneficial to this Principle.	+	None
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle does not relate to this IA Objective.	0	None
4.	Conserve and enhance the European sites *(HRA specific objective)*	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle does not relate to this IA Objective.	0	None
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle does not relate to this IA Objective.	0	None
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle does not relate to this IA Objective.	0	None
7.	Conserve and enhance the water environment	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle does not relate to this IA Objective.	0	None
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle does not relate to this IA Objective.	0	None
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle does not relate to this IA Objective.	0	None
10.	Promote the prudent use of natural resources, minimise the production of	Although this Principle notes the need for 'new transport infrastructure', this is in the context of making it accessible and as such this Principle	0	None

	waste and support re-use and recycling	does not relate to this IA Objective.		
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	The improved access to the transport system according to the principle set under the Accessible and Inclusive Network is in full alignment with this IA objective. The principle supports accessibility for all to the transport network regardless of mobility level. This generates the potential for those with mobility impairments currently utilising the car to have access to the full range of public transport services offered. This allows all users access to more sustainable modes of transport.	++	None
12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	This principle supports potential job creation (although not necessarily within the sub-region) through the design, deployment and procurement of new transport system vehicles. Increasing numbers of public transport services will create more jobs for drivers. The flexible ticketing options will make it easier for people to travel and therefore should facilitate job creation and economic growth. There may be some reduction in employment from the increase in automation and the potential reduction in ticketing and enforcement staff. . The integration may overall reduce income from fares. And reduction in car travel will reduce income from fuel sales for public accounts, yet potentially keep more transport revenue within Greater Manchester. This principle recognises the importance of PT to young people exploring work opportunities and jobseekers. Increasing youth employment will, in particular, look to grow the national economy.	+/-	The links to the potential benefits to the economy through the procurement and driving of new vehicles is not recognised in this principle and could be enhanced.
13.	Coordinate land use and transport planning across GM	This principle does not contribute to the achievement of this objective as it is not concerned with land use planning.	0	None
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle will improve accessibility and inclusivity for everyone in Greater Manchester, particularly to employment, training, health and leisure opportunities. Ensuring all new infrastructure and vehicles are accessible will be of particular benefit to people with mobility restrictions (older people and those with a disability). The increase in flexible ticketing options will be of greatest benefit to those in part time employment or work, job seekers and part-time or flexible workers. This will not only encourage people to use public transport over using a car, but will provide additional transport opportunities for people on lower incomes or with mobility restrictions.	++	It is recommended that information on the infrastructure and vehicle improvements should be publicised widely, particularly using a method suitable for people with visual impairments and learning difficulties. Furthermore, it is recommended that information on new ticketing options should also be widely publicised, and easy to understand and use.

15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle will improve access, in particular to education, employment and healthcare facilities. The improvements will be experienced most by people with no access to a car (likely to be on lower incomes), younger people in part time education, people in part time employment, and people suffering from mobility restrictions (older people and disabled people). This principle is likely to instigate some people changing travel mode from cars to public transport. As a consequence this would reduce the level of air pollution, which would particularly benefit those with long term conditions such as asthma, but will also improve health overall. A reduction in noise pollution would benefit children the most, as high noise levels have an adverse impact on children's' cognitive ability.	++	To ensure the principle is as inclusive as possible, the future infrastructure and vehicle improvements will have to be widely and clearly advertised, in order to ensure people who were previously unable to use the services due to mobility restrictions, are now aware of the changes and options available to them. Similarly, changes to the availability of flexible ticketing options should be publicised extensively, ensuring they are available in a number of languages.

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	+++	+++	+++	++	++	++	+++	This principle ensures an accessible and integrated network, which will enhance access to employment, training, health and leisure opportunities). All new transport infrastructure and vehicles will be designed to be as accessible as possible to all customers, regardless of mobility levels. This measure will help to improve access for those with mobility issues, including older people (who make up, up to 18% of the GM population) and people with disabilities (19% of the GM population, but 9.6% of the GM population limiting a lot). In order to maximise the beneficial impact, it is recommended to target the travel information to make sure that the information is accessible. This should include making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										materials). Additionally the information should be made available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015).
2	Improve affordability of transport	+++	+++	+++	+++	+++	++	++	+++	This principle aims to ensure accessibility is not affected by affordability for those people on low incomes. It will do this by: • Increasing the number of flexible ticketing options. This will help those on part-time, flexible or short-term working contracts or those studying part time. • Recognising the need for a flexible ticketing system for young job seekers, who currently are likely not to benefit from the concessions available to those in full time employment. • Continuing to review the additional local provision of free bus travel for those who have reached female state pension age (after 9:30am) and disabled concessions. These are likely to increase and it is important that these are kept under review. This principle will help people without access to a car, which will include children (20% of people in Greater Manchester area), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). It will also help those on low incomes who cannot afford and those who do not find it cost effective, to use public transport. <u>Recommendations</u> It is recommended that in order to ensure this principle fully achieves its aims, it is important to continually monitor and regularly review the number of

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										concessionary tickets being made available, to ensure it can continue to be offered. Furthermore, information on flexible ticketing should be publicised effectively, through educational facilities, job centres and places of employment.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and community safety. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	++	++	+	+	++	Any reduction in vehicle km due to mode shift from making public transport more accessible will help to reduce levels of accidents on the roads. Research shows children, young males, disabled and older people are particularly vulnerable groups in terms of accidents, and also that a higher proportion of accidents occur in deprived areas – of which there are a comparatively large amount in the GM area.
5	Reduce severance	0	0	0	0	0	0	0	0	This principle would have very little impact on severance. There is little potential to increase the impact on this sub-objective.
6	Reduce air, noise and light pollution from transport	++	+	++	++	+	++	+	++	This principle aims to provide additional opportunities for people to use public transport. This will mean that some car trips can be replaced by public transport journeys, and consequently reduce the negative impact on air and noise pollution. All ten of the GM authorities have declared Air Quality Management Areas (AQMAs), largely for NO2 and PM10. Road transport is the most significant source of pollution across GM for both NOx and PM10,

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
										contributing 60% and 61% of total emissions in 2006 respectively. A reduction in air and noise pollution will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	**Gender**	**Disability**	**Ethnicity**	**Faith**	**Sexual Orientation and Gender Reassignment**	**Pregnancy and Maternity**	**Marriage and Civil Partnerships**	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	+++	++	+++	++	++	++	++	++	+++	This principle ensures an accessible and integrated network, which will enhance access to employment, training, health and leisure opportunities). All new transport infrastructure and vehicles will be designed to be as accessible as possible to all customers, regardless of mobility levels. This measure will help to improve access for those with mobility issues, including older people (who make up, up to 18% of the GM population) and people with disabilities

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											(19% of the GM population, but 9.6% of the GM population limiting a lot). In order to maximise the beneficial impact, it is recommended to target the travel information to make sure that the information is accessible. This should include making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed materials). Additionally the information should be made available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015).
2	Improve affordability of transport	+++	++	+++	+++	++	++	++	++	+++	This principle aims to ensure accessibility is not affected by affordability for those people on low incomes. It will do this by: • Increasing the number of flexible ticketing options. This will help those on part-time, flexible or short-term working contracts or those studying part time. • Recognising the need for a flexible ticketing system for young job seekers, who currently are likely not to benefit from the concessions available to those in full time employment. • Continue to review the additional local provision of free bus travel for those who have reached female state pension age (after 9:30am) and disabled concessions. These are likely to increase and it is important that these are kept under review.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											This principle will help people without access to a car, which will include children (20% of people in Greater Manchester area), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). It is recommended that in order to ensure this principle fully achieves its aims, it is important to continually monitor and regularly review the number of concessionary tickets being made available, to ensure it can continue to be offered. Furthermore, information on flexible ticketing should be publicised effectively, through educational facilities, job centres and places of employment.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and community safety. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	+	+	+	+	+	+	+	+	+	Any reduction in vehicle km due to mode shift from making public transport more accessible will help to reduce levels of accidents on the roads.
5	Reduce severance	0	0	0	0	0	0	0	0	0	This principle would have very little impact on severance. There is little potential to increase the impact on this sub-objective.
6	Reduce air, noise and light pollution from transport	++	+	++	+	+	+	+	+	+	This principle aims to provide additional opportunities for people to use public transport. This will mean that some car trips can be replaced by public transport journeys, and consequently reduce the negative impact on air,

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											noise and light pollution. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Network Principles: A resilient Network

Part 2 - Network Principles	A Resilient Network
Summary of principles (for full text refer to Transport Strategy document)	*Our Ambition for 2040: A transport network that is well-maintained and managed across Greater Manchester, and much better able to withstand unexpected events and severe weather conditions.* Our networks need to continue to provide a service even when things go wrong or there is a sudden increase in demand. When rail or Metrolink services are unavailable due to a fault or engineering works, we need to provide replacement bus services, when roads are closed we need to set up diversionary routes and when there are major visitor events we need to manage the whole network to cope with much greater demand. In the winter, key roads have to be gritted and cleared of snow and rail and tram route de-iced. However as the climate changes, we will also need to adapt to different weather, likely to mean more instances of flooding, or damage to structures due to soil drying out during dry weather.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[3]	Scale / significance of effect	Recommendations for mitigation or enhancement
1.	Improve air quality	This Principle notes the move towards increased electrification of the network. This could have a positive benefit on local air quality. There could be national / global issues with air quality depending on the national energy strategy and choice of fuel. It is noted that the national energy strategy is seeking to make energy greener but this is out of the control of GM and could therefore have a positive or negative benefit. There is acknowledgement that replacement bus services may be required when rail or Metrolink services are unavailable but there is no outline of the likely measures to enhance the resilience of the network and the types of vehicles that would be deployed. There are no clear commitments to air quality in this principle and there could be positive or negative impacts to air quality depending on the measures and	+/-	Clearer commitments to the types of measures and vehicles that would be procured for backstopping measures may enhance this principle in relation to this specific IA objective.

[3] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

		interventions deployed.		
2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This Principle notes the need to encourage modal shift and increase electrification of the network. There is acknowledgement that replacement bus services may be required when rail or Metrolink services are unavailable but there is no commitment to the types of vehicles that would be deployed. There are no clear commitments to emission reduction in this principle and there could be positive or negative impacts depending on the measures and interventions deployed.	+/-	Clearer commitments to the types of vehicles that would be procured for backstopping measures may enhance this principle in relation to this specific IA objective.
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	This Principle relates to management and maintenance of transport networks and is not relevant to this IA Objective.	0	None
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle relates to management and maintenance of transport networks and is not relevant to this IA Objective.	0	None
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	This Principle relates to management and maintenance of transport networks and is not relevant to this IA Objective.	0	None
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	This Principle relates to management and maintenance of transport networks and is not relevant to this IA Objective.	0	None
7.	Conserve and enhance the water environment	This Principle relates to management and maintenance of transport networks and notes the requirement for key roads to be gritted and rail and tram routes to be de-iced. These activities are likely to have a negative impact on the water environment, though this is likely to be of short term duration and only during particular weather conditions.	-	It is recommended that the Principle is amended to reflect the need to protect the water environment (while maintaining public safety).
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	This Principle relates to management and maintenance of transport networks and is not relevant to this IA Objective.	0	None
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	This Principle notes the need to adapt to a changing climate e.g. from more extreme weather and flooding events. However, no further information is provided as to how this adaptation would be accomplished. This adaptation may have an impact (positive or negative).	+/-	It is recommended that the Principle is amended to provide more information of proposals for adaptation to a changing climate.
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and	This Principle relates to management and maintenance of transport networks and is not relevant to this IA Objective.	0	None

	recycling			
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	This Principle relates to management and maintenance of transport networks and is not relevant to this IA Objective.	0	None
12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	This Principle relates to management and maintenance of transport networks and no specific reference is made to the potential job creation this could deliver. There is some potential for job creation through monitoring and evaluation of measures.	0	There is no recognition of the economic benefit of providing a more resilient network (e.g. where services are not cancelled/delayed or need re-building meaning a network can continue to function as normal.) There is huge potential to demonstrate the links between providing this resilience and the economic savings caused from maintaining a regular system and timetable operation.
13.	Coordinate land use and transport planning across GM	This principle does not contribute to the achievement of this objective as it is not concerned with land use planning.	0	None
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle will ensure access to facilities and services across the region are sustained during times when the transport network is under stress. This will be particularly beneficial to those who do not have a car, and therefore are less able to vary their route. It will also benefit those who require access to schools, employment and health facilities. The encouragement of sustainable modes of travel should lead to mode shift, which will reduce air, noise and light pollution, and low-emissions car sharing clubs will help to minimise the impacts of some car trips.	++	It is recommended that up to date communication methods are used to relay messages when there are travel disruptions. Additionally people should be made aware of alternative methods of travel and how to obtain more information on them. This information should be made available in other languages, and in formats accessible for people with disabilities (especially people with visual impairments and learning difficulties). Transport services and interchanges should also be made accessible for people with disabilities – mobility impairments and also visual impairments in particular. The new fare pricing structure should be designed to be as affordable as possible.
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle will maintain access to healthcare facilities and services across the region, in particular for those without access to a car. Higher levels of sustainable travel in the area will lead to more active travel and be beneficial for health, and help to reduce obesity levels. The encouragement of sustainable modes of travel should lead to mode shift, which will reduce air and noise pollution. This reduction in air pollution will be of particular benefit to those with long term conditions such as asthma, but will also improve health overall. The	++	It is recommended that up to date communication methods are used to relay messages when there are travel disruptions. Additionally people should be made aware of alternative methods of travel and how to obtain more information on them. When implementing replacement methods

		reduction in noise will be of benefit to children in particular, who can be adversely affected by noisy environments.		of travel, all users should be taken into account. For example alternative routes and vehicles should be suited for use by people with all levels of mobility, including older people and disabled people.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	++	++	++	++	++	++	++	++	This principle aims to provide a transport network that is well-maintained and managed across Greater Manchester, and much better able to withstand unexpected events and severe weather conditions. This includes: • Providing replacement bus services when Metrolink or rail services are unavailable due to a fault or engineering works. • Setting up diversionary routes when roads are closed. • Manage the whole network when major visitor attractions increase demand. • Ensure in winter that key roads are gritted and cleared of snow, and that rail and tram routes are de-iced. • Adapt to a changing climate, for example coping with more instances of flooding, or damage to structures due to soil drying out during dry weather. This principle ensures that plans are in place for keeping Greater Manchester moving when there are constraints put on the road and public transport

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										network. This will be of benefit in particular for children and young people in reaching educational facilities, commuters travelling to work and for the elderly and disabled people to access healthcare.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	This principle would have very little impact on the affordability of transport. There is little potential to increase the impact on this sub-objective.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and fear of crime. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	++	+	+	++	++	++	+	++	Through encouraging people to travel more using sustainable modes, there will be fewer cars on the roads and less congestion. This should result in a decrease of accidents. Furthermore, ensuring the roads and public transport network is open and safe to use during winter will reduce the risk of accidents caused by adverse weather conditions. Accident rates have been decreasing in Manchester over recent years and it is hoped that this principle can support its reduction further. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
5	Reduce severance	0	0	0	0	+	0	0	0	This principle will have little impact on severance, although gritting and snow clearing key roads in winter will be of benefit to cyclists who use these routes.
6	Reduce air, noise and light pollution from transport	++	+	++	+	+	++	+	++	Future population and traffic growth, with associated congestion are likely to result in an increase in existing levels of noise. In improving the resilience of the network, it will ensure that capacity is maintained and that incidents do not result in extra congestion that would contribute to air and noise pollution. Noise pollution can be a major nuisance and is widely recognised as a disbenefit affecting daily life. General annoyance and sleep disturbance are the most widespread effects of environmental noise. Symptoms such as depression, irritability and headaches have also been reported. Stress has been suggested as a possible mechanism through which noise may affect mental and physical health. Around 19% of GM residents are currently living with long term conditions (LTCs) such as diabetes, asthma and heart disease, and 25% of over 60s have two or more LTCs.

	Scale of Effect	

EqIA sub-objective		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	Description of effect/Recommendations for mitigation or enhancement
1	Improve accessibility to services, facilities and amenities for all	++	+	++	+	+	+	+	+	++	This principle aims to provide a transport network that is well-maintained and managed across Greater Manchester, and much better able to withstand unexpected events and severe weather conditions. This includes: • Providing replacement bus services when Metrolink or rail services are unavailable due to a fault or engineering works. • Setting up diversionary routes when roads are closed. • Manage the whole network when major visitor attractions increase demand. • Ensure in winter that key roads are gritted and cleared of snow, and that rail and tram routes are de-iced. • Adapt to a changing climate, for example coping with more instances of flooding, or damage to structures due to soil drying out during dry weather. This principle ensures that plans are in place for keeping Greater Manchester moving when there are constraints put on the road and public transport network. This will be of benefit in particular for children and young people in reaching educational facilities, commuters travelling to work and for the elderly and disabled people to access healthcare.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	0	This principle would have very little impact on the affordability of transport. There is little potential to increase the impact on this sub-objective.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and fear of crime. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	++	++	++	++	++	++	Through encouraging people to travel more using sustainable modes, there will be fewer cars on the roads and less congestion. This should result in a decrease of accidents. Furthermore, ensuring the roads and public transport network is open and safe to use during winter will reduce the risk of accidents caused by adverse weather conditions. Accident rates have been decreasing in Manchester over recent years and it is hoped that this principle can support its reduction further. Recommendations It is recommended that accident and casualty rates are monitored continuously to ensure this principle is being effective. Additionally, during winter months, the weather and key road conditions should be followed to ensure action is taken as soon as possible to avoid dangerous driving conditions.
5	Reduce severance	0	0	0	0	0	0	0	0	0	This principle will have little impact on severance, although gritting and snow clearing key roads in winter will be of benefit to cyclists who use these routes.
6	Reduce air, noise and light pollution from transport	++	+	++	+	+	+	+	+	++	In improving the resilience of the network, it will ensure that capacity is maintained and that incidents do not result in extra congestion that would contribute to air and noise pollution. Noise pollution can be a major nuisance

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											and is widely recognised as a disbenefit affecting daily life, particularly to children, whose concentration levels can decrease. A reduction in air pollution caused by vehicle emissions will also be of a benefit, particularly to children, the elderly and people with associated health primeless (e.g. respiratory conditions such as asthma).

Network Principles: A safe and secure Transport System

Part 2 - Network Principles	A Safe and Secure Transport System
Summary of principles (for full text refer to Transport Strategy document)	*Our Ambition to 2040: To eradicate deaths on our roads. Poor perceptions of personal security will no longer be a significant barrier to people using public transport.* We have adopted a co-ordinated approach to road safety, through the GM Casualty Reduction Partnership, which brings together the Emergency Services and Highways England, as well as the GM District Councils and TfGM to deliver joint road safety projects. These cover development of educational resources and high profile campaigns to raise awareness and create safer road user behaviour and delivery of 'Drivesafe' training courses to re-educate offending motorists as well as targeted enforcement and physical measures to improve safety. Our approach to preventing and tackling crime and antisocial behaviour on Greater Manchester's bus and tram network is based on partnership working. In 2015 the pilot 'Travelsafe' Partnership was launched, providing a dedicated team of police constables, police community support officers, special constables and security personnel to provide regular patrols. Led by TfGM and Greater Manchester Police, the scheme uses data on crime and antisocial behaviour provided by contributing operators – Metrolink RATP Dev Ltd, First Bus and Stagecoach – to target patrols in hotspot areas at key times and support front line staff. Where appropriate, legal powers are used to ban offenders from public transport and deliver restorative justice schemes following or as an alternative to prosecution. There is also a focus on preventative measures and youth education as to the dangers, impacts and consequences of crime, antisocial behaviour and fare evasion on public transport. Personal security is also an important element in the design of public transport vehicles and infrastructure. We will continue with programmes to upgrade interchanges through measures such

	as removal of 'blind spots', improved lighting, CCTV and customer help points, developing consistent standards across all our public transport networks.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[4]	Scale / significance of effect	Recommendations for mitigation or enhancement
1.	Improve air quality	Elements of this Principle support the greater use of public transport through improved safety and security measures on the bus and tram network. Whilst not the primary aim of this Principle, potential mode shift from private car to use of public transport generated through positive perceptions of public transport; and the perception of safer roads for cyclists increasing the uptake of sustainable modes may be slightly beneficial to air quality in GM.	+	None

[4] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	Reducing CO2 is not the primary aim of this Principle. However this Principle has the potential to generate mode shift from private car to use of public transport generated through positive perceptions of public transport; and the perception of safer roads for cyclists increasing the uptake of sustainable modes. There could be a slight benefit to reducing CO2.	+	None
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
7.	Conserve and enhance the water environment	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	This Principle relates to safety and security and does not contribute to the achievement of this IA Objective.	0	None
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	Whilst not the primary aim of this Principle, potential mode shift from private car to use of public transport generated through positive perceptions of public transport; and the perception of safer roads for cyclists increasing the uptake of sustainable modes may be slightly beneficial to meeting this objective.	+	None
12.	Promote economic growth and job creation across the sub-region, and	Improving the safety and security, and the perception of crime on GM's streets will seek to enhance the visitor and night time economy. This	+	The links to the potential benefits to the visitor and night time

	improve access to jobs for all	could increase visitor numbers and residents visiting different parts of GM boosting employment, in particular in the leisure industry.		economy/entertainment are not recognised in the text and could be enhanced.
13.	Coordinate land use and transport planning across GM	This principle does not contribute to the achievement of this objective as it is not concerned with land use planning.	0	None
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	The principle will contribute to the achievement of national and local targets for road safety, with a long term ambition is to eradicate road deaths in Greater Manchester by 2040. Additionally it will tackle crime and antisocial behaviour on Greater Manchester's bus and tram network. This will achieve these through both making the road network safer and ensuring a reduction in crime on public transport. The principle will promote community safety and reduce the number of accidents and other incidents.	++	Education and awareness courses need to be targeted at the right demographics and behaviour types in order to be most effective. Furthermore it is imperative that the co-ordinated approach to road safety is continued and monitored, to effectively deliver joint road safety projects. Customer perception should also be monitored for people using public transport, in order to ascertain the extent of the improvements on fear of crime. The upgrading of public transport interchanges to make them safe also needs to be closely monitored, in order to ensure lighting, CCTV and customer help points are all working and have not been tampered with.
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	The principle will improve personal security on public transport and at its facilities to improve accessibility to key facilities. It will also promote training for drivers to promote safe driving, promote road safety awareness with children and young people and it aims to reduce casualty numbers, particularly for vulnerable groups.	++	To ensure the principle is as inclusive as possible, the road safety awareness and driver training will have to be widely and clearly available, ensuring as many people are reached as possible, particularly children and young drivers. Customer perception should also be monitored for people using public transport, in order to ascertain the extent of the improvements on fear of crime. The upgrading of public transport interchanges to make them safe also needs to be closely monitored, in order to ensure lighting, CCTV and customer help points are all working and have not been tampered with.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	0	0	0	0	0	0	0	0	This principle would have very little impact on the accessibility of transport. There is little potential to increase the impact on this sub-objective.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	This principle would have very little impact on the affordability of transport. There is little potential to increase the impact on this sub-objective.
3	Reduce crime and fear of crime and promote community safety	++	+++	++	++	+	++	+	++	This principle aims to reduce crime and the fear of crime through: • Targeting patrols in crime hot spot areas; • Providing dedicated support from police constables, community support officers, special constables and security officers, in order to carry out regular patrols; • To remove 'blind sports'; • Improve lighting, CCTV and customer help points; • To ban offenders from public transport; and • Focus on preventative measures and youth education as to the dangers, impacts and consequences of crime, antisocial behaviour and fare evasion on public transport. Fear of crime can have a large impact on whether someone feels safe enough to use public transport. Although a large number of people were satisfied with personal safety at the bus stop (78%) and with personal security on the bus (82%), around 7% of bus passengers in Greater Manchester felt that other passengers' behaviour gave them cause to worry or feel uncomfortable on their bus journey. Therefore, improving people's perceptions of being a

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										victim of crime whilst using public transport, is crucial to sustain demand for the services being provided. The people most vulnerable to crime include older people, women and disabled people. There is also a risk of hate crimes which could be targeted at ethnicity and sexual orientation and gender reassignment. This principle will improve access of opportunity for all and create more welcoming environments for travel, and contribute to improvements of public realm and levels of natural surveillance to create a more welcoming environment for travel, physical activity, and accessing key facilities.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	+	++	++	+	+	++	This principle aims to improve road safety through the following measures for road safety • Developing educational resources and high-profile campaigns to raise awareness and create safer road user behaviour and delivery of 'Drivesafe' training courses to re-educate offending motorists; and • Targeted enforcement and physical traffic calming. Reducing road traffic accidents will particularly benefit disadvantaged groups, who are more likely to be involved in a road accident, including older people and pedestrians. Vulnerable road users, currently make up 51% of all casualties in Greater Manchester. Children and young males will also benefit from the education and awareness campaigns.
5	Reduce severance	0	0	0	0	0	0	0	0	This principle would have very little impact on the severance. There is little potential to increase the

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										impact on this sub-objective.
6	Reduce air, noise and light pollution from transport	0	0	0	0	0	0	0	0	This principle would have very little impact on the air, noise and light pollution. There is little potential to increase the impact on this sub-objective.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	0	0	0	0	0	0	0	0	0	This principle would have very little impact on the accessibility of transport. There is little potential to increase the impact on this sub-objective.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	0	This principle would have very little impact on the affordability of transport. There is little potential to increase the impact on this sub-objective.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
3	Reduce crime and fear of crime and promote community safety	++	+++	++	+++	+++	+++	+++	+++	+++	This principle aims to reduce crime and the fear of crime through: • Targeting patrols in crime hot spot areas; • Providing dedicated support from police constables, community support officers, special constables and security officers, in order to carry out regular patrols; • To remove 'blind sports'; • Improve lighting, CCTV and customer help points; • To ban offenders from public transport; and • Focus on preventative measures and youth education as to the dangers, impacts and consequences of crime, antisocial behaviour and fare evasion on public transport. Fear of crime can have a large impact on whether someone feels safe enough to use public transport. Although a large number of people were satisfied with personal safety at the bus stop (78%) and with personal security on the bus (82%), around 7% of bus passengers in Greater Manchester felt that other passengers' behaviour gave them cause to worry or feel uncomfortable on their bus journey. Therefore, improving people's perceptions of being a victim of crime whilst using public transport, is crucial to sustain demand for the services being provided. This is likely to have a greater impact for women, BME people, some religious groups, and LGBT people, as they are more likely to feel vulnerable to crime.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
4	Improve road safety and reduce the number of accidents and other incidents	+++	++	++	++	++	++	++	++	++	This principle aims to improve road safety through the following measures for road safety • Developing educational resources and high-profile campaigns to raise awareness and create safer road user behaviour and delivery of 'Drivesafe' training courses to re-educate offending motorists; and • Targeted enforcement and physical traffic calming. Reducing road traffic accidents will particularly benefit disadvantaged groups, who are more likely to be involved in a road accident, older people, pedestrians, children and young males.
5	Reduce severance	0	0	0	0	0	0	0	0	0	This principle would have very little impact on the severance. There is little potential to increase the impact on this sub-objective.
6	Reduce air, noise and light pollution from transport	0	0	0	0	0	0	0	0	0	This principle would have very little impact on the air, noise and light pollution. There is little potential to increase the impact on this sub-objective.

Network Principles: Moving towards Zero Emissions

Part 2 - Network Principles	Moving Towards Zero Emissions
Summary of principles (for full text refer to Transport Strategy document)	*Our Ambition for 2040: Greater Manchester will be an established world leader in zero emission transport technologies and techniques. We will have reduced tailpipe emissions from transport to zero. Air quality problems will be a thing of the past.* We have developed a 'Low Emissions Strategy' to identify the types of measure that will have the greatest impact: changing travel behaviour to reduce car use; reducing emissions from HGVs (which make a disproportionate contribution to NO2 emissions); stimulating the uptake of ultra low-emission vehicles and reducing emissions from buses on key urban corridors. This has informed the detailed actions in our Climate Change Implementation Plan and statutory Air Quality Action Plan. The latter includes a commitment to carry out a feasibility study into whether access restrictions can be introduced for the most polluting vehicles, to minimise harmful emissions, without having a disproportionate impact on businesses. Any such measures will be incorporated into our transport investment programmes.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[5]	Scale / significance of effect	Recommendations for mitigation or enhancement
1.	Improve air quality	This Principle is concerned with reducing emissions including NO2 and PM10 and there is recognition of the need to address current levels and achieve the AQMA targets and ensuring 'air quality problems will be a thing of the past'. The strategy makes reference to the statutory Air Quality Action Plan including a commitment to carry out a feasibility study into solutions that can be implemented without impacting business however there are no clear commitments to what the air quality targets are and how these will be achieved in the strategy.	++	The strategy makes no specific commitments to the levels of impact that are hoped to be achieved for the levels of NOx and PM10 reduction, nor the solutions that will be implemented to achieve reduction. More clearly defined objectives (as from the Air Quality Action Plan or elsewhere) are required within the strategy document. See comment below – on making clear the strategy for tackling air quality.
2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This Principle is concerned with reducing CO2 emissions and there is recognition of the need to address current levels and move towards meeting the EU targets. The strategy makes bold claims to be a world leader in zero emission transport technologies and techniques and references a 'Low Emissions Strategy' and 'Climate Change Implementation Plan' that identifies the measures for the reduction of emissions. As such there are no clear commitments to how 'zero tailpipe emissions from transport' will be achieved. There is potentially some confusion in terminology between air quality and carbon dioxide plans and which emissions each strategy will address.	++	The strategy makes no specific reference to the solutions that will be implemented to achieve the zero emission target. More clearly defined objectives (as from the Low Emissions Strategy, the 'Climate Change Implementation Plan' or elsewhere) are required within the strategy document. Document to more clearly articulate the principles for: 1. Tackling CO2 emissions; and 2. Tackling air quality pollutants eg NO2 and PM10
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	While the Principle is about reducing emissions, it is unclear without reference to other strategies as to how this will be accomplished. Methods used could potentially result in positive effects on Biodiversity e.g. by removing harmful emissions on biodiversity.	+	It is recommended that the Principle is amended to provide more information on the solutions that will be implemented to achieve reduced emissions.
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle addresses the ambition to reduce emissions, which is a sensitivity of some European sites within Greater Manchester. However, it is unclear though without reference to other strategies as	+	It is recommended that the Principle is amended to provide more information on the methods to be implemented for reducing emissions and thus potential impacts to

[5] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

		to how this could be accomplished.		European sites.
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	This Principle is concerned with reducing emissions and if implemented could lead to positive effects on townscape e.g. by reducing particulate deposition on buildings. It is unclear though without reference to other strategies as to how this could be accomplished.	+	It is recommended that the Principle is amended to provide more information on the solutions that will be implemented to achieve reduced emissions.
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	This Principle is concerned with reducing emissions and if implemented could lead to positive effects on cultural heritage e.g. by reducing particulate deposition on historic buildings. It is unclear though without reference to other strategies as to how this could be accomplished.	+	It is recommended that the Principle is amended to provide more information on the solutions that will be implemented to achieve reduced emissions.
7.	Conserve and enhance the water environment	This Principle does not contribute to the achievement of this objective as it is not concerned with the water environment.	0	None
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	This Principle does not contribute to the achievement of this objective as it is not concerned with soil and agricultural resources or land contamination.	0	None
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	This Principle relates to reducing emissions and while this may potentially help to reduce the overall rate of climate change, it will not reduce the risk of flooding or increase resilience to the consequences of a changing climate that are already inevitable.	0	None
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	This Principle is concerned with reducing emissions and would include a reduction in car use – this will lead to a reduction in fuel (natural resource) consumption. No note is made though of the need to minimise waste production or the need for recycling. It is also unclear without reference to other strategies as to how this could be accomplished.	+	It is recommended that the Principle is amended to provide more information on the solutions that will be implemented to achieve reduced emissions.
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	The principle hints at changing travel behaviour to reduce car use to achieve zero emission targets. However, it is not explicit in the measures that will be implemented to achieve this. It is unclear without reference to other strategies as to how this could be accomplished.	+	It is recommended that the Principle is amended to provide more information on the methods to be implemented for reducing emissions and how this links into this IA objective.
12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	This Principle does not currently contribute to the achievement of this objective as economic growth is not discussed. There is the potential to create jobs dependent upon the measures identified (not clearly stated) e.g. by establishing GM as a "world leader in zero emission	+	The links to the potential benefits to the economy need to be clearly defined dependent upon the measures proposed. This objective could be further enhanced.

		transport technologies and techniques".		
13.	Coordinate land use and transport planning across GM	This principle does not contribute to the achievement of this objective as it is not concerned with land use planning.	0	None
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle will have a beneficial impact on reducing air and noise pollution, which will be particularly beneficial for children (impacted more by noise) and people with long term health conditions such as asthma. Any reduction in vehicle km due to mode shift would also reduce accidents and severance.	++	No mitigation/enhancement recommended.
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle will have a beneficial impact on reducing air and noise pollution, which will be particularly beneficial for children (impacted more by noise) and people with long term health conditions such as asthma. There is also likely to be a particular benefit for low income people, as they are more likely to suffer the ill effects of pollution related to transport. Any reduction in vehicle km due to mode shift would also reduce accidents and severance.	++	No mitigation/enhancement recommended.

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
4	Improve road safety and reduce the number of accidents and other incidents	+	+	+	++	+	+	+	+	This principle aims to reduce car trips through mode shift, and the reduction in vehicle km would potentially be associated with a reduction in accidents involving cars. The pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should be beneficial for people in deprived communities.
5	Reduce severance	+	+	+	+	+	+	+	+	This principle aims to reduce car trips through mode shift, and the traffic on roads will reduce severance on impacted corridors. Any reduction in severance may encourage active travel, which will have a beneficial impact on health.
6	Reduce air, noise and light pollution from transport	+++	++	+++	+++	++	++	++	+++	This principle aims to reduce car trips through mode shift, and to reduce HGV trips into urban areas. It also considers reducing access to the centre for the most polluting vehicles. Use of low emission vehicles is recommended where use of a car or HGV cannot be avoided, and the principle also aims to reduce emissions from buses on key urban corridors. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
4	Improve road safety and reduce the number of accidents and other incidents	+	+	+	+	+	+	+	+	+	This principle aims to reduce car trips through mode shift, and the reduction in vehicle km would potentially be associated with a reduction in accidents involving cars.
5	Reduce severance	+	+	+	+	+	+	+	+	+	This principle aims to reduce car trips through mode shift, and the traffic on roads will reduce severance on impacted corridors.
6	Reduce air, noise and light pollution from transport	+++	++	+++	++	++	++	++	++	++	This principle aims to reduce car trips through mode shift, and to reduce HGV trips into urban areas. It also considers reducing access to the centre for the most polluting vehicles. Use of low emission vehicles is recommended where use of a car or HGV cannot be avoided, and the principle also aims to reduce emissions from buses on key urban corridors. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Modal Principles

Modal Principle: Highways – The Arteries of our City Region

Part 2 – Modal	Highways: The Arteries of our City Region

Principles	
Summary of principle (for full text refer to Transport Strategy document)	*Our Ambition: A consistent and co-ordinated approach to highways management which delivers a reliable and resilient network which focuses on the efficient and effective movement of people and goods to, from and across Greater Manchester.* A Key Route Network (KRN) has been identified and will be managed in an integrated and co-ordinated manner. <u>Future Role of the Car</u> We must therefore design our urban areas around the needs of people and not traffic and we must think differently about the long-term role of our critical highways networks. New ways of thinking and doing things provide a great opportunity to develop more integrated and flexible transport system – e.g. car clubs, companies such as Uber etc can provide transport on demand without responsibility of ownership. New technology such as driverless cars though could also lead to higher car ownership and make modal shift more challenging. These aspects will require partnership between public and private sectors to realise GM's wider objectives. These partnerships could also lead to better use of data to better manage demand and plan future needs, but need to ensure this new tech is fully integrated into the transport system and not undermine multi-modal objectives. <u>Priorities for Highway Investment</u> Future investment in highways across Greater Manchester will reflect the vital role that the KRN plays in the economy and will ensure that that interventions required to maintain the reliability and safety of the network for all users – motorised and non-motorised - are brought to the fore. We will continue to explore the role of, and benefits of investment in, next generation technological capabilities in signalling and predictive traffic management, supported by real time operational intelligence across the network, and prepare for advances in vehicle-to-vehicle and vehicle-to infrastructure communications (e.g. autonomous vehicles). We will also seek to invest in implementation of innovative junctions which support different modes e.g. pedestrian count-down and pedestrian and cycle Scoot . We will work closely with Highways England and Transport for the North to identify future investment needs across the Strategic Road Network (SRN) and ensure that the opportunities for shared investment in infrastructure that improve access to the SRN and between and across the northern City Regions are fully realised. <u>Demand Management</u> We will increasingly need to apply travel demand management measures to make better use of the highways capacity - focus will be on measures that encourage people and freight operators to travel at a different time, on a different part of the network, or to change to a different mode, to make more efficient use of available capacity. Future demand management will include measures to encourage modal shift (smart ticketing, bus priority measures, reallocating road space for pedestrian and cycling infrastructure, car share schemes, real-time travel information and signing, constraints on long-stay parking in our key centres); and reduce demands from the road freight sector (e.g. freight consolidation, delivery and servicing plans, freight routing strategies). We will work with partners in urban planning to ensure that new residential and employment development in Greater Manchester can be served effectively by sustainable modes to minimise the impact on our highways network. We will continue to work with Highways England to research appropriate demand management measures. <u>Providing for Sustainable modes on our Highways</u> To encourage sustainable travel such as walking & cycling we will take steps to provide additional priority where appropriate, in the form of enhanced crossing facilities and reallocation of road space to provide bus priority, cycle lanes and wider footways. We will introduce 20mph speed limits in residential and other built up areas where there is local support. Severance created by road traffic will also be reduced and the environment for local residents, businesses and their customers significantly improved. <u>Highways & the Bus</u>

	Bus priority and infrastructure will continue to be a key focus. We will complete the delivery of the current programme of bus priority measures and we will continue to explore ways in which appropriate interventions such as bus priority, adjustments to traffic signals, and changes to waiting and loading restrictions can help to free buses from congestion and to help improve their attractiveness to existing and new customers. We will work with partners to complete development of a long-term bus priority and infrastructure plan which will identify how we can best protect the existing bus network, develop the bus market by increasing patronage to key destinations, and help support our future growth aspirations. We must also continue to improve our bus stop facilities. Powered Two Wheel Vehicles We will continue to seek to improve the safety of PTW users through education initiatives and we will seek to provide adequate and secure parking for PTW in key locations and PTW will benefit from our focus on maintenance and improving resilience. Maintenance and Renewal We will work to improve and maintain the condition of our road network drawing on best practice set out within the Highways Maintenance Efficiency Programme (HMEP). We will also continue to pursue a policy of Invest to Save to renew highway infrastructure in order to overcome maintenance backlogs, arrest decline and bring the condition of the asset up to a high standard. We will also continue to explore opportunities to improve the efficiency of delivery in highways maintenance operations through, for example, shared services. Resilience of the Highway Network We will keep the vulnerability of our highway structures and road surfaces under constant review and ensure that new infrastructure is designed with in-built resilience. In recognising that climate change will have an increasing impact over the period to 2040, we will work with partners to determine the key infrastructure assets (including roads) that might be at significant risk, identify and implement appropriate mitigation measures and agree service levels for various tiers of road infrastructure. To ensure our customers are kept informed on the usability of our road network and the availability of alternatives, we will continue to develop our ATOM and OPTIS network management and travel information systems and provide real time 'open data' to support development of travel planning Systems will be supported by a growing network of Variable Message Signs, passive detectors, traffic counters and CCTV cameras, monitored and controlled through our Traffic Control Centre.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[6]	Scale / significance of effect	Recommendations for mitigation or enhancement
1.	Improve air quality	This objective is clearly related to this Principle, however the connections are not clearly acknowledged, and there is limited commitment to reducing overall car use and therefore improving air quality.	-	The Principle could make further acknowledgement of changing vehicle fleet, in the advent of Euro 6 and the move towards electric/hybrid or alternative-fuelled vehicles. A stronger commitment to reducing the need to travel by car should be stated in the 'future role of the car' or 'demand management' sections for this objective to be enhanced.

[6] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This objective is clearly related to this Principle, however the connections are not clearly acknowledged, and there is limited commitment to reducing overall car use and therefore reducing CO2 emissions.	-	The Principle could make further acknowledgement of changing vehicle fleet, in the advent of Euro 6 and the move towards electric/hybrid or alternative-fuelled vehicles. A stronger commitment to reducing the need to travel by car should be stated in the 'future role of the car' or 'demand management' sections for this objective to be enhanced.
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network, but it does also highlight the need for Highway Investment etc – this could result in 'hard' interventions which may potentially have a negative effect on biodiversity, which could be considered permanent.	--	It is recommended that the Principle is reworded to note the requirement to protect or enhance biodiversity when possible. For example this could include planting of wildflowers or native species of plants etc at new road verges. This approach would likely reduce the significance of negative effects.
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network, but it does also highlight the need for Highway Investment etc – this could result in 'hard' interventions which may potentially have a negative effect on European sites, which could be considered permanent.	--	It is recommended that the Principle is amended to note the requirement to protect European Sites and appropriately assess any schemes that are likely to have significant effects on European sites through the HRA process. Mitigation measures will need to be implemented to avoid, reduce or compensate for any adverse effects.
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network, but it does also highlight the need for Highway Investment etc – this could result in 'hard' interventions which may potentially have a negative effect on the character and quality of GMs landscapes / townscapes, which could be considered permanent.	--	It is recommended that the Principle is reworded to note the requirement to protect or enhance the character and quality of GM's landscapes and townscapes when possible from any new infrastructure development. An example of how this could be done would be through native species of

					screening planting. This approach would likely reduce the significance of any negative effects.
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network. While this Principle is likely to result in hard interventions that could have negative effects, part of the aims of the Principle involve effective maintenance which would potentially enhance the historic and cultural heritage settings by arresting decline and bringing the condition of assets up to a high standard. Therefore it is considered that this Principle could have positive and negative effects.	++	--	It is recommended that the Principle is reworded to note the requirement to protect or enhance the quality and distinctiveness of GMs historic and cultural heritage when possible during both construction of new infrastructure and maintenance to existing infrastructure. This approach would likely reduce negative effects, while also benefiting positive effects.
7.	Conserve and enhance the water environment	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network, but it does also highlight the need for Highway Investment etc – this could result in 'hard' interventions which may potentially have a negative effect on the water environment, which could be considered permanent.	--		It is recommended that the Principle is reworded to note the requirement to protect the water environment during the construction and operation of any new infrastructure. This could be accomplished by the use of SuDS and this approach would likely reduce the negative effects.
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network, but it does also highlight the need for Highway Investment etc – this could result in 'hard' interventions which may potentially have a negative effect on soil and agricultural resources. There could though be a potential opportunity in certain circumstances to remediate areas of land contamination. As such effects could be positive or negative and could be considered to be permanent.	++	--	It is recommended that the Principle is reworded to note the requirement to protect soil and agricultural resources when possible and to take opportunities for land remediation as appropriate.
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network. This Principle also recognises the need for new infrastructure to be designed with built in resilience and recognises the increasing impact of a changing climate over the period to 2040. As part of this recognition, appropriate mitigation measures will be identified and implemented. However, this Principle does not clearly consider the need to reduce	++	--	It is recommended that the Principle is amended to provide more information of proposals for adaptation to a changing climate and on how reduction of risk of flooding will be achieved.

		the risk of flooding and any new infrastructure may lead to schemes that have a negative effect. In fact, this principle does not aim to reduce the risk of flooding from either existing or proposed infrastructure.		
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	This Principle relates for the most part to Demand Management and future scenarios to deliver a reliable and resilient network but does not make note of the prudent use of natural resources, minimising waste or supporting recycling. All of these issues are likely to be relevant due to the requirement in the Principle for highway investment that could result in new infrastructure. New infrastructure is likely to result in a negative effect on these issues. These issues are also relevant to any maintenance carried out.	-	It is recommended that the Principle is reworded to ensure that in the design of any new infrastructure, prudent use of natural resources, waste minimisation and recycling are considered during both construction of new infrastructure and maintenance to existing infrastructure.
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	This Principle relates to the promotion of a reliable highway network generating efficient and effective movements (by car). Improving the efficiency and effectiveness of the existing road network supports further use of the car, which will not achieve the stated objective. There is recognition of the need for demand management and the encouragement of people to use other modes, however there is no firm commitment that sets out how people will be discouraged from using the car – particularly if the highway network will be more efficient in the future.	--	This Principle would benefit from some clearer commitments to how car use will be actively discouraged. There is only a commitment to encouraging mode shift, but the effectiveness of this may be invalid if in parallel the road network becomes more efficient.
12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	This objective is relevant to this Principle, however the connections are not clearly acknowledged, and there is limited commitment to promoting economic growth. The potential to improve the efficiency of the network, thus improving journey time reliability, will generate economic benefits through the reduction of congestion, however this may be counter-productive as more people choose to utilise the more efficient road network and contribute to further delay.	+/-	It is recommended that the Principle is amended to provide more information of proposals for supporting economic growth.
13.	Coordinate land use and transport planning across GM	This Principle may impact negatively on this IA objective as through promoting a reliable highway network which generates efficient and effective movements (by car) and improves the efficiency and effectiveness of the existing road network supporting further use of the car may send the wrong signals in terms of achieving compact land use served by sustainable modes of transport.	-	This Principle would benefit from some clearer commitments to how car use will be actively discouraged.
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle aims to greater priority for bus services across the Greater Manchester area, which will be particularly beneficial for those without access to a car. It aims to reallocate road space to make better provision for pedestrians and cyclists, and also to introduce 20mph zones n some residential areas to improve safety. There are	++	None.

		also plans for safety awareness campaigns for powered two wheel vehicles to reduce accidents. The principle aims to reduce congestion, which will reduce air, noise and light pollution.		
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle aims to greater priority for bus services across the Greater Manchester area, which will be particularly beneficial for those without access to a car. It aims to reallocate road space to make better provision for pedestrians and cyclists, which will encourage active travel and so improve health in the area. It also to introduce 20mph zones n some residential areas to improve safety and there are plans for safety awareness campaigns for powered two wheel vehicles to reduce accidents. The principle aims to reduce congestion, which will reduce air, noise and light pollution.	++	None.

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	++	++	++	++	++	++	++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Improving bus priority throughout the area, so that bus journeys are faster and more reliable; • Improving access in areas without public transport for those who do not own a vehicle, including integrating car clubs, Uber and car sharing with the public transport network; • Providing real time information on public transport services, which will enable people to better plan their journeys; • Reallocating road space for pedestrians and cyclists, improving connectivity by these modes; • Working with urban planners to ensure that new residential areas and employment are served effectively by public transport. All of these measures will help to improve access for

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										people without access to a car, which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (19% have limiting long term conditions, with 9.6% more serious), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels).
2	Improve affordability of transport	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	This principle includes smart integrated ticketing to encourage mode shift. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport. This principle also includes "appropriate demand management schemes", to be discussed with Highways England. Any change in affordability will have a particular impact on low-income groups – there are high levels of deprived people in Manchester, Salford and Rochdale in particular, which are all in the top 20 most deprived authorities in England. Recommendations It is recommended that any changes in affordability need to ensure that incomes are not disproportionately impacted on by them, for example reinvesting money raised by the schemes in providing better low cost public transport to deprived areas.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle does not include anything that is likely to have an impact on crime or community safety.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
4	Improve road safety and reduce the number of accidents and other incidents	+++	++	++	+++	+++	+++	++	+++	This principle includes investment in highway infrastructure maintenance, improving the road surface and ensuring that routes are safe. It proposes 20mph zones in some residential areas, which will make it safer for pedestrians and cyclists, and reduce the severity of incidents that occur. Education initiatives are proposed for powered two wheel vehicles, which are designed to improve their safety levels on the road. The principle also includes a potential freight routing strategy – this could be used to ensure that larger vehicles do not use unsuitable roads, reducing their potential for conflict with other vehicles and improving road safety, especially for cyclists. . In addition to being beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.
5	Reduce severance	+++	++	++	+++	+++	+++	++	+++	This principle includes proposals to reallocate road space for pedestrians and cyclists, to include cycle lanes and wider footways, which will improve connectivity and reduce the perception of severance. Urban areas are to be planned around people rather than traffic, and some 20mph residential zones are suggested, which will also reduce the perception of severance. Innovative junctions will be introduced on the network that support different modes, to include improvements to crossings. This principle will help to encourage active travel and help people to increase their activity levels, which will be beneficial to their health. Levels of childhood obesity in the GM area are higher than the national average (19%, with up to 25% in some authorities) as are levels of adult obesity (up to

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										30% in some authorities), and facilitating active travel as a part of daily life will help to reduce these levels.
6	Reduce air, noise and light pollution from transport	+++	++	+++	+++	++	++	++	++	This principle includes predictive traffic management, which aims to reduce queuing and congestion, which will have a beneficial impact on air, noise and light pollution. It proposes ways to encourage mode shift, such as smart ticketing and bus priority, and also includes demand management, which should reduce overall car trips as well as congestion, and so reduce air, noise and light pollution. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

	Scale of Effect	

EqIA sub-objective		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	Description of effect/Recommendations for mitigation or enhancement
1	Improve accessibility to services, facilities and amenities for all	+++	++	+++	+++	++	++	++	++	++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Improving bus priority throughout the area, so that bus journeys are faster and more reliable; • Improving access in areas without public transport for those who do not own a vehicle, including integrating car clubs, Uber and car sharing with the public transport network; • Providing real time information on public transport services, which will enable people to better plan their journeys; • Reallocating road space for pedestrians and cyclists, improving connectivity by these modes; • Working with urban planners to ensure that new residential areas and employment are served effectively by public transport. All of these measures will help to improve access for people without access to a car, which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (19% have limiting long term conditions, with 9.6% more serious), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels).
2	Improve affordability of transport	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	This principle includes smart integrated ticketing to encourage mode shift. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport. This principle also includes “appropriate demand management schemes”,

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											to be discussed with Highways England. The exact nature of the schemes is not detailed, but there is the potential for certain demand management schemes to have a negative impact on the affordability of transport. Recommendations When considering demand management schemes, thought is given to ensuring that people on lower incomes are not disproportionately impacted on by them, for example reinvesting money raised by the schemes in providing better low cost public transport to deprived areas.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	0	This principle does not include anything that is likely to have an impact on crime or community safety.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	++	++	++	++	++	++	This principle includes investment in highway infrastructure maintenance, improving the road surface and ensuring that routes are safe. It proposes 20mph zones in some residential areas, which will make it safer for pedestrians and cyclists, and reduce the severity of incidents that occur. Education initiatives are proposed for powered two wheel vehicles, which are designed to improve their safety levels on the road. The principle also includes a potential freight routing strategy – this could be used to ensure that larger vehicles do not use unsuitable roads, reducing their potential for conflict with other vehicles and improving road safety, especially for

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											cyclists.
5	Reduce severance	++	++	++	++	++	++	++	++	++	This principle includes proposals to reallocate road space for pedestrians and cyclists, to include cycle lanes and wider footways, which will improve connectivity and reduce the perception of severance. Urban areas are to be planned around people rather than traffic, and some 20mph residential zones are suggested, which will also reduce the perception of severance. Innovative junctions will be introduced on the network that support different modes, to include improvements to crossings.
6	Reduce air, noise and light pollution from transport	++	++	++	++	++	++	++	++	++	This principle includes predictive traffic management, which aims to reduce queuing and congestion, which will have a beneficial impact on air, noise and light pollution. It proposes ways to encourage mode shift, such as smart ticketing and bus priority, and also includes demand management, which should reduce overall car trips as well as congestion, and so reduce air, noise and light pollution. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Modal Principle: Developing a Comprehensive Walking and Cycling Network

Part 2 – Modal Principles	**Developing a Comprehensive Walking and Cycling Network**
Summary of principle (for full text refer to Transport Strategy document)	*Our Ambition: A comprehensive network of on and off-road walking and cycling routes that make it easier and safer for people to walk and cycle to key local destinations, such as local centres, jobs, healthcare and education and for leisure purposes.* Despite significant investment in walking and cycling infrastructure over recent years, we know that there is much more to do to create an environment which is truly pedestrian and cycle friendly. We will prepare updated walking and cycling strategies and investment plans to set out in more detail our aspirations for improving the walking and cycling environment. Major focus will be on improving pedestrian and cycle links to local centres and transport interchanges; and to key employment, health, education and shopping destinations. We have put significant investment into improving walking and cycling links alongside our extensive waterway network, disused railway lines, and through parks and green spaces, to enable people to be more active in their day-to-day lives. We will continue to identify opportunities for further off-road improvements over the coming years across the city region.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[7]	Scale / significance of effect	Recommendations for mitigation or enhancement
1.	Improve air quality	This Principle relates to the provision of high quality walking and cycling infrastructure enabling people to travel on foot or bicycle. There is likely to be significant benefits to air quality where active travellers have shifted from other modes, particularly use of the car. The positive association to this objective is not explicit in the text however there are clear benefits within this Principle.	++	Greater acknowledgement of the impact of this Principle to this objective could be clearly stated.
2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This Principle relates to the provision of high quality walking and cycling infrastructure enabling people to travel on foot or bicycle. There is likely to be significant benefits to CO2 reductions where active travellers have shifted from other modes, particularly use of the car. The positive association to this objective is not explicit in the text however there are clear benefits within this Principle.	++	Greater acknowledgement of the impact of this Principle to this objective could be clearly stated.
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	This Principle relates for the most part to future strategies and investment plans but does also note the need for the identification of future opportunities for further off road improvements. These off road opportunities could include green infrastructure and this could have consequent positive effects on biodiversity.	+	Amend the Principle to make it clearer that any future opportunities being taken for the development of new Greenways should also include an aspiration to enhance biodiversity.
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle relates to the provision of high quality walking and cycling infrastructure enabling people to travel on foot or bicycle. Encouragement of non-emissions transport may contribute a positive impact upon European sites that are sensitive to air pollution. However, the potential benefits may be limited unless the off-road network is improved in close proximity to such sites.	+	Amend the Principle to make it clearer that any future opportunities being taken for the development of new Greenways should also include an aspiration to conserve and enhance European sites.
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	This Principle relates for the most part to future strategies and investment plans but does also note the need for the identification of future opportunities for further off road improvements. These off road opportunities could include green infrastructure and this could have consequent positive effects on the landscape of GM.	+	Amend the Principle to make it clearer that any future opportunities being taken for the development of new Greenways should also include an aspiration to enhance the landscape etc.
6.	Conserve and enhance the quality and distinctiveness of historic and cultural	This Principle relates for the most part to future strategies and investment plans but does also note the need for the identification of	+	Amend the Principle to make it clearer that any future opportunities being taken for the

[7] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

	heritage	future opportunities for further off road improvements. These off road opportunities could include green infrastructure and this could have consequent positive effects on the cultural heritage setting of GM.		development of new Greenways should also include an aspiration to enhance the setting of any historic or cultural heritage features.
7.	Conserve and enhance the water environment	This Principle does not relate to the water environment and is therefore not relevant to this IA Objective.	0	None
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	This Principle relates for the most part to future strategies and investment plans but does also note the need for the identification of future opportunities for further off road improvements. These off road opportunities could include green infrastructure and this could have consequent positive effects by offering an opportunity for land remediation.	+	Amend the Principle to make it clearer that any future opportunities being taken for the development of new Greenways should also include an aspiration to remediate land or reuse brownfield sites as appropriate.
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	This Principle does not relate to flooding or climate change and is therefore not relevant to this IA Objective.	0	None
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	This Principle does not relate to the use of resources, waste or recycling and is therefore not relevant to this IA Objective.	0	None
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	This Principle has direct links to this IA Objective. Improving the provision of walking and cycling networks and infrastructure will aim to ensure people travel by these modes rather than by private car – particularly for short distance journeys.	++	None
12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	This Principle does not have any clear impact to this IA Objective, however it is likely that an active mode revolution could create economic opportunities across the region. For example, the provision of cycle hire schemes, opening of leisure facilities, design and implementation of cycle routes, and café's or retail businesses close to cycle connections. Improved cycle connections linked in with Manchester's commitment to provide bicycles to those seeking job opportunities (although not specifically referenced here) provides a clear positive benefit for those without a car to access employment opportunities.	+	The Principle could better develop the connections of the active mode revolution created with the development of a comprehensive walking and cycling network to potential economic growth scenarios and accessibility to employment.
13.	Coordinate land use and transport planning across GM	This Principle has direct links to this IA Objective. Improving the provision of walking and cycling networks and infrastructure will send the right signals to ensure new planned development makes provision for people travel by these modes rather than by private car	+	None

14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle will help to improve access to facilities and services for those without access to a car, and will also improve the connectivity of pedestrian and cycle networks. The networks will be designed to improve safety for pedestrians and cyclists, and any reduction in vehicle km due to mode shift will also reduce accidents, as well as reducing severance, noise, air and light pollution.	++	It is recommended that if pedestrian and cycle routes are developed in more isolated areas (e.g. along waterways, disused railway lines), they should be well lit and have good visibility to minimise the risk of crime.
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle will help to improve access to facilities (including healthcare) for those without access to a car, and will also improve the connectivity of pedestrian and cycle networks. The networks will be designed to improve safety for pedestrians and cyclists, and any reduction in vehicle km due to mode shift will also reduce accidents, as well as reducing severance, noise, air and light pollution. These improved networks will help to promote active travel, and so improve health in the area.	+++	It is recommended that if pedestrian and cycle routes are developed in more isolated areas (e.g. along waterways, disused railway lines), they should be well lit and have good visibility to minimise the risk of crime.

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	+	+	++	+++	++	++	++	This principle makes improvements to accessing key services (including healthcare) in a number of ways: • Implementing a comprehensive network of on and off road walking and cycling routes that connect people to key local destinations, including healthcare; • Ensuring that the network of walking and cycling routes connects into the public transport network, especially at interchanges, allowing people to make longer journeys by sustainable means.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										All of these measures will help to improve access for people without access to a car (especially those who depend on walking and cycling), which will include children (20% of people in Greater Manchester area), and potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). The improvements will potentially benefit older people and people with disabilities, although those with mobility impairments may not be able to take full advantage of the new networks.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	-	0	-	0	This principle includes investing in walking and cycling routes along the waterway network and disused railway lines, as well as through parks and green spaces – while these routes are primarily intended to be used as leisure routes, they will most likely also be used by commuters who will be more likely to use the route in the dark and at times when there will be less natural surveillance. . Recommendations It will be important to ensure that the routes are well lit and have good visibility so that people are able to see any potential dangers. It will also be important to ensure that appropriate equivalent routes in busier areas are also available so that commuters are not dependant on travelling through isolated areas.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	+++	+++	++	++	++	This principle aims to make it easier and safer to walk and cycle to key destinations in the Greater Manchester area, through providing a better walking and cycling network, to include off road routes with reduced potential for conflict with other vehicles. Any reduction in car trips due to mode shift will also likely mean a reduction in accidents. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.
5	Reduce severance	+++	++	++	++	+++	++	++	++	The comprehensive walking and cycling network will improve connectivity for pedestrians and cyclists and so reduce severance. Any reduction in car trips due to mode shift will also reduce severance. This principle will encourage active travel and help people to increase their activity levels, which will be beneficial to their health. Levels of childhood obesity in the GM area are higher than the national average (19%, with up to 25% in some authorities) as are levels of adult obesity (up to 30% in some authorities), and facilitating active travel as a part of daily life will help to reduce these levels.
6	Reduce air, noise and light pollution from transport	+++	++	+++	+++	++	++	++	++	This principle aims to encourage people to replace short car trips with walking and cycling trips, which will reduce air, noise and light pollution. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution). People in deprived communities tend to

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
										experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

EqIA sub-objective	Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
	Age	**Gender**	**Disability**	**Ethnicity**	**Faith**	**Sexual Orientation and Gender Reassignment**	**Pregnancy and Maternity**	**Marriage and Civil Partnerships**	**Assessment summary**	

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	++	++	+	+++	++	++	++	++	++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Implementing a comprehensive network of on and off road walking and cycling routes that connect people to key local destinations, including local centres, jobs, healthcare and education; • Ensuring that the network of walking and cycling routes connects into the public transport network, especially at interchanges, allowing people to make longer journeys by sustainable means. All of these measures will help to improve access for people without access to a car (especially those who depend on walking and cycling), which will include children (20% of people in Greater Manchester area), and potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). The improvements will potentially benefit older people and people with disabilities, although those with mobility impairments may not be able to take full advantage of the new networks.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
3	Reduce crime and fear of crime and promote community safety	0	-	0	-	-	-	0	0	0	This principle includes investing in walking and cycling routes along the waterway network and disused railway lines, as well as through parks and green spaces – while these routes are primarily intended to be used as leisure routes, they will most likely also be used by commuters

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											who will be more likely to use the route in the dark and at times when there will be less natural surveillance. This is likely to have a greater impact for women, BME people, some religious groups, and LGBT people, as they are more likely to feel vulnerable to crime. <u>Recommendations</u> It will be important to ensure that the routes are well lit and have good visibility so that people are able to see any potential dangers. It will also be important to ensure that appropriate equivalent routes in busier areas are also available so that people are not dependant on travelling through isolated areas.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	++	++	++	++	++	++	This principle aims to make it easier and safer to walk and cycle to key destinations in the Greater Manchester area, through providing a better walking and cycling network, to include off road routes with reduced potential for conflict with other vehicles. Any reduction in car trips due to mode shift will also likely mean a reduction in accidents.
5	Reduce severance	++	++	++	++	++	++	++	++	++	The comprehensive walking and cycling network will improve connectivity for pedestrians and cyclists and so reduce severance. Any reduction in car trips due to mode shift will also reduce severance.
6	Reduce air, noise and light pollution from transport	+++	++	+++	++	++	++	++	++	++	This principle aims to encourage people to replace short car trips with walking and cycling trips, which will reduce air, noise and light pollution. This will be of particular

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Modal Principle: Public Transport – Keeping GM Moving in 2040

Part 2 - Modal Principles	Public Transport: Keeping GM Moving in 2040
Summary of principle (for full text refer to Transport Strategy document)	*Our Ambition: A fully integrated, customer-focused, low-emission public transport network that provides an attractive and accessible alternative to travelling by car to key Greater Manchester destinations.* An attractive, efficient and well-integrated public transport network is an essential element within the city region's infrastructure. Together with Active Travel, it can provide the significantly enhanced connectivity that our city region requires for success. Crucially, however, our approach also opens the way for a future where car ownership is not perceived as indispensable, and residents can choose from a range of sustainable and efficient travel options. We have invested heavily to date and we will focus on delivering further transformational change in the quality, coverage, accessibility and integration of our public transport networks to ensure we have a system fit for a modern, world-class city region. <u>Our Interchange Strategy</u> We have identified 5 types of Interchange – Global Gateway, National Hubs, GM Hubs, Local Hubs and Neighbourhood Gateways. We need to ensure that access and interchange facilities are of a consistent standard across our entire public transport network, with criteria developed for different types of interchange to ensure that appropriate provision is made for: walking and cycling access (including wayfinding); parking provision; passenger facilities; safety and security; information; and access for those

with mobility impairments. Our approach will be tailored to specific local requirements, but will seek to provide a much more consistent and high quality customer experience across Greater Manchester.

As we seek to improve the physical aspects of interchange at our local and strategic interchange points, we will develop more detailed principles for each category of interchange, based on the following key elements:

- Excellent customer experience (easy & stress free, focus on design and ease of movement)
- Reinforcing a sense of place (well connected and related to the surrounding area, with high quality cycle routes, parking and signage)
- Inclusive and accessible (enabling everyone to use public transport equally, confidently and independently)
- Minimising differentiation between modes (physically and mentally through branding, integrated ticketing etc)
- Simplicity (easy to use info, easy to navigate design)
- Tailored (to the needs of customers and the local area)
- Attractive (ensure customers feel safe & secure, with a pleasant atmosphere)

Our Vision for Bus

Our Ambition: A modern zero-emission accessible bus system fully integrated with our Greater Manchester transport network. Everyone will be happy to travel by bus no matter what their background or mobility level.

We have invested heavily in bus infrastructure and services, in particular since 2000. Modern, high quality interchanges have been built or are under construction in our main town centres, and this programme of renewal is almost complete. We have also introduced extensive bus priority, through a network of Quality Bus Corridors and provided a network of socially necessary services. However, patronage is static. The bus network lacks a consistent identity and cannot be marketed as a recognised commuter brand. Other factors re. poor bus use are Lack of Understanding, Lack of Confidence and Slowness. To achieve bus potential we need:

- introduce a single, simple, integrated ticket range with an easy-to-understand fares structure;
- better integrate timetables and fares with other modes to broaden the catchment area of public transport for access to jobs and to minimise journey times.
- offer and promote a single, unified, safe and modern bus brand, with consistent vehicle quality and environmental standards, to the public to encourage more travel by bus;
- incentivise reliability and punctuality;
- specify the network coverage, avoiding the current practice of over-bussing on certain core routes, and enabling timetables to be better integrated with one another and for frequencies to be increased on some routes and at some times of day to better meet people's needs, particularly for access to work and training;
- provide appropriate bus priority measures to improve the reliability and attractiveness of buses, with a particular focus on improving bus connectivity to key GM growth areas, such as the Regional Centre and Manchester Airport, as well as improving access to key Greater Manchester interchanges where congestion causes significant bus delays; and
- deliver high quality, accessible and appropriately located passenger waiting facilities at our bus stops and interchanges.

Rapid Transit Strategy

Over the period to 2040, we will be taking a much broader view of rapid transit, focusing on delivering the most appropriate, integrated public transport network to meet the needs of different parts of the city region. We use the term "rapid transit" to mean any public transport service that offers a significant journey-time advantage over stopping bus services for middle-distance trips (defined as journeys in the 6 to 50km range).

Heavy Rail

We will continue to work with DfT, Network Rail, train operators and with other local authorities across the north of England to implement the Rail North Long Term Rail Strategy (2014) in order to secure our strategic priorities.

	Coaches and Taxis Scheduled coaches provide a lower cost alternative for longer distance journeys and have traditionally been popular with students and retired people. We believe, however, that there is scope for this role to grow in importance as we deliver our Vision for Bus. We will therefore explore the feasibility and scope for coaches or express buses to provide some of the medium to long distance journeys, to places like the Airport or the Regional Centre, on corridors where rail or Metrolink would not be feasible or affordable. Our long-term aim is to achieve more consistency across the conurbation, in order to provide a better, more integrated service to the customer and to ensure that taxis entering the Regional Centre and main town centres meet the highest environmental standards. We will therefore work with the ten Greater Manchester local authorities and the industry to bring this about, building on best practice from elsewhere. We will work with the private sector to identify the role that water taxis can play as part of the overall transport offer, for leisure and commuting trips.

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives	Description of effect[8]	Scale / significance of effect	Recommendations for mitigation or enhancement

[8] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

1.	Improve air quality	This Principle relates to the provision of an attractive, efficient and well integrated public transport network that aims to increase the numbers of people travelling by bus, rail and Metrolink. This would have the potential to improve air quality, however this is not directly acknowledged.	+	The Principle could be enhanced with further recognition of the potential beneficial impacts from improved air quality.
2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This Principle relates to the provision of an attractive, efficient and well integrated public transport network that aims to increase the numbers of people travelling by bus, rail and Metrolink. This would have the potential to reduce CO2 emissions, however this is not directly acknowledged.	+	The Principle could be enhanced with further recognition of the potential beneficial impacts from reduced CO2 emissions.
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the provision of new rapid transit routes, using either Metrolink/tram-train or bus, or improvements to existing bus journey times through bus priority or major corridors. This is unlikely to involve major new infrastructure and therefore effects are predicted to be minor negative.	-	None
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the development of new infrastructure. This would have the potential to have a negative effect on European sites, which could be considered permanent.	--	It is recommended that the Principle is reworded to note the requirement to protect European sites and appropriately assess any schemes that are likely to have significant effects on European sites through the HRA process. Mitigation measures will need to be implemented to avoid, reduce or compensate for any adverse effects.
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the provision of new rapid transit routes, using either Metrolink/tram-train or bus, or improvements to existing bus journey times through bus priority o major corridors. This is unlikely to involve major new infrastructure and therefore effects are predicted to be minor negative.	-	None
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the provision of new rapid transit routes, using either Metrolink/tram-train or bus, or improvements to existing bus journey times through bus priority o major corridors. This is unlikely to involve major new infrastructure and therefore effects are predicted to be minor negative.	-	None

7.	Conserve and enhance the water environment	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the provision of new rapid transit routes, using either Metrolink/tram-train or bus, or improvements to existing bus journey times through bus priority o major corridors. This is unlikely to involve major new infrastructure and therefore effects are predicted to be minor negative.	-	None
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the provision of new rapid transit routes, using either Metrolink/tram-train or bus, or improvements to existing bus journey times through bus priority o major corridors. This is unlikely to involve major new infrastructure and therefore effects are predicted to be minor. There could though be a potential opportunity in certain circumstances to remediate areas of land contamination. As such effects could be positive or negative.	+/-	None
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the provision of new rapid transit routes, using either Metrolink/tram-train or bus, or improvements to existing bus journey times through bus priority o major corridors. This is unlikely to involve major new infrastructure and therefore effects are predicted to be minor negative.	-	None
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	This Principle relates to the provision of an attractive, efficient and well integrated network and is likely to result in the provision of new rapid transit routes, using either Metrolink/tram-train or bus, or improvements to existing bus journey times through bus priority o major corridors. This is unlikely to involve major new infrastructure and therefore effects are predicted to be minor negative.	-	None
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	This principle links directly to this IA objective, and the provision of a fully integrated, customer focused, low-emission public transport network that provides an attractive and accessible alternative to travelling by car.	+++	None
12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	This principle references use of the canal network and the development of the coach and taxi offering. Each of these would allow for the development of an improved tourist and leisure economy that requires much enhancement in the city. There would be many potential spin off opportunities following better transport provisions for tourists, and potential development of the tourist economy. These benefits are not recognised in this Principle. The principle recognises the benefits from TfGM operating stations, including longer-term development plans (including retail offering and	++	This Principle could be enhanced through the recognition of the role transport has to play in developing and promoting the tourist and leisure economy. Particularly where transport is geared towards the needs of visitors, and the associated benefits that come with this. The Principle could benefit from stronger connections to the role of transport and the

		secondary activities at stations). There is strong potential to enhance the transport hubs, generating economic activity at interchange hubs, and linking into the creation of jobs at these key sites. The principle also recognises the economic stimulus in Manchester that will follow from the arrival of HS2 and local electrification schemes. Whilst this may have a push-effect for movements away from Manchester, there is likely more potential for Manchester to create a pull-effect, shifting the economic balance from the south of England towards the north. The economic benefits from this, including the relocation of business and knowledge to the North has the potential to provide significant agglomeration impacts that are not specifically recognised in this principle.		development of economies, particularly with the development of large scale infrastructure and investment including HS2.
13.	Coordinate land use and transport planning across GM	This principle has a link to this IA objective in that the provision of a fully integrated, customer focused, low-emission public transport network that provides an attractive and accessible alternative to travelling by car will send the right signals in terms of planning for compact land use served by sustainable transport modes.	+	None
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle aims to provide better public transport connections to facilities and services across the Greater Manchester area, which will be particularly beneficial for those without access to a car. It aims to provide more consistent pricing, and to improve the security of transport interchanges. This principle should lead to a reduction in vehicle km, which will help to reduce severance and also reduce air, noise and light pollution.	+++	It will be important when considering the integration of transport services that the needs of people accessing healthcare are considered – services need to be regular and offer as direct access as possible. It will also be important to ensure that services are accessible for people with disabilities. It will also be important to mitigate any potential safety impacts of running tram-train into the city centre.
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle aims to provide better public transport connections to facilities (including healthcare) across the Greater Manchester area, which will be particularly beneficial for those without access to a car. It aims to provide more consistent pricing, and to improve the security of transport interchanges. This principle should lead to a reduction in vehicle km, which will help to reduce severance and also reduce air, noise and light pollution. The improved walking and cycling access to transport interchanges will help to encourage active travel as part of longer journeys, and so be beneficial for health.	+++	It will be important when considering the integration of transport services that the needs of people accessing healthcare are considered – services need to be regular and offer as direct access as possible. It will also be important to ensure that services are accessible for people with disabilities. It will also be important to mitigate any potential safety impacts of running tram-train into the city centre.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	+++	+++	+++	+++	+++	+++	+++	+++	This principle makes improvements to accessing key services (including healthcare) in a number of ways: • Treating the transport network as a whole, and designing infrastructure and services to make interchange easier; • Specifying the network coverage to better meet the needs of passengers and facilitate journeys to important facilities; • Improving journey times and reliability of the public transport network so that people are able to rely on public transport to make time-critical trips; • Ensuring that interchanges and the transport network are accessible for people with mobility impairments and other disabilities; • Improving the information available on travel choices so that people are able to take advantage of all existing infrastructure and services; • Improving inter-peak, weekend and evening services on the rail network to allow for better access to services and facilities outside of standard commuting hours. All of these measures will help to improve access for people without access to a car, which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (19% have limiting long term conditions, with 9.6% more serious), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). <u>Recommendations</u> In order to maximise the beneficial impact, it will be

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										important to target the travel information so that people are able to find the best routes for them, and it will also be important to make sure that the information is accessible, including making it available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015) and making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed materials).
2	Improve affordability of transport	++	++	++	+++	++	++	++	++	This principle aims to produce a consistent pricing system that is easy to understand, with one account/card used for all public transport and transport sharing schemes. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport. This will be particularly beneficial for low-income groups – there are high levels of deprived people in Manchester, Salford and Rochdale in particular, which are all in the top 20 most deprived authorities in England.
3	Reduce crime and fear of crime and promote community safety	++	++	++	++	++	++	++	++	This principle involves building higher quality interchange facilities, with improved safety and security, which should reduce both actual crime and fear of crime. The improvement to connections between services, reducing waiting times, will also help to improve the perception of safety.
4	Improve road safety and reduce the number of accidents and other	+	+	+	++	+/-	+	+	+	Any reduction in vehicle kilometres due to mode shift will also likely lead to an associated reduction in accidents. In addition to being particularly beneficial

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
	incidents									for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities. The potential use of tram-train to achieve greater penetration in the city centre could lead to greater potential for conflicts between road users, in particular if there are more trams in pedestrianised areas. There is also some danger from any tram-train tracks, as it is possible to get bicycle wheels caught in them, which would cause accidents for cyclists. <u>Recommendations</u> It will be important to ensure that any tram-train is implemented in such a way that conflicts with other road users are minimised – their interaction with cars need to be clear, and if they are to be used in pedestrianised areas then it needs to be clear for pedestrians and cyclists when it is safe to cross the tracks. There should also be warnings discouraging cyclists from going too close to the tracks.
5	Reduce severance	++	++	++	++	++	++	++	++	This principle includes improving walking and cycling access to transport interchanges, including high quality cycle routes. The introduction of new routes and improvements to existing will help improve connectivity for pedestrians and cyclists, and the reduction in traffic congestion due to mode shift to more sustainable modes) would reduce severance on impacted

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										corridors. Improving pedestrian and cycle links to transport hubs would encourage more people to use active travel to complete the first stage of their journey, which would increase activity levels, which will be beneficial to people's health. Levels of childhood obesity in the GM area are higher than the national average (19%, with up to 25% in some authorities) as are levels of adult obesity (up to 30% in some authorities), and facilitating active travel as a part of daily life will help to reduce these levels.
6	Reduce air, noise and light pollution from transport	+++	++	+++	+++	++	++	++	++	This principle aims to reduce car trips, which will have a positive impact on air, noise and light pollution. People will be encouraged to use public transport to move around Manchester, which is more sustainable and causes less air, noise and light pollution that cars in the wider area. It aims to provide Greater Manchester with a low-emission public transport network, with consistent vehicle quality and environmental standard. It also aims to set environmental standards for taxis as a vital part of the network. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	+++	++	+++	+++	++	++	++	++	+++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Treating the transport network as a whole, and designing infrastructure and services to make interchange easier; • Specifying the network coverage to better meet the needs of passengers and facilitate journeys to important facilities, especially for training and employment purposes; • Improving journey times and reliability of the public transport network so that people are able to rely on public transport to make time-critical trips; • Ensuring that interchanges and the transport network are accessible for people with mobility impairments and other disabilities; • Improving the information available on travel choices so that people are able to take advantage of all existing infrastructure and services; • Improving inter-peak, weekend and evening services on the rail network to allow for better access to services and facilities outside of standard commuting hours; • Potentially creating community space in transport interchanges, meaning that they will be more easily accessible. All of these measures will help to improve access for people without access to a car, which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											(19% have limiting long term conditions, with 9.6% more serious), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). <u>Recommendations</u> In order to maximise the beneficial impact, it will be important to target the travel information so that people are able to find the best routes for them, and it will also be important to make sure that the information is accessible, including making it available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015) and making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed materials).
2	Improve affordability of transport	++	++	++	++	++	++	++	++	++	This principle aims to produce a consistent pricing system that is easy to understand, with one account/card used for all public transport and transport sharing schemes. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport.
3	Reduce crime and fear of crime and promote community	+	++	+	++	++	++	+	+	+	This principle involves building higher quality interchange facilities, with improved safety and security, which should reduce both actual crime and fear of crime. The

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
	safety										improvement to connections between services, reducing waiting times, will also help to improve the perception of safety. This is likely to have a greater impact for women, BME people, some religious groups, and LGBT people, as they are more likely to feel vulnerable to crime.
4	Improve road safety and reduce the number of accidents and other incidents	+	+	+	+	+	+	+	+	+	Any reduction in vehicle kilometres due to mode shift will also likely lead to an associated reduction in accidents. The potential use of tram-train to achieve greater penetration in the city centre could lead to greater potential for conflicts between road users. There is also some danger from any tram-train tracks, as it is possible to get bicycle wheels caught in them, which would cause accidents for cyclists. <u>Recommendations</u> It will be important to ensure that any tram-train is implemented in such a way that conflicts with other road users are minimised – their interaction with cars need to be clear, and if they are to be used in pedestrianised areas then it needs to be clear for pedestrians and cyclists when it is safe to cross the tracks. There should also be warnings discouraging cyclists from going too close to the tracks.
5	Reduce severance	++	++	++	++	++	++	++	++	++	This principle includes improving walking and cycling access to transport interchanges, including high quality cycle routes. The introduction of new routes and improvements to existing will help improve connectivity for pedestrians and cyclists, and the reduction in traffic

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											congestion due to mode shift to more sustainable modes) would reduce severance on impacted corridors.
6	Reduce air, noise and light pollution from transport	+++	++	+++	++	++	++	++	++	++	This principle aims to reduce car trips, which will have a positive impact on air, noise and light pollution. People will be encouraged to use public transport to move around Manchester, which is more sustainable and causes less air, noise and light pollution that cars in the wider area. It aims to provide Greater Manchester with a low-emission public transport network, with consistent vehicle quality and environmental standard. It also aims to set environmental standards for taxis as a vital part of the network. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Modal Principle: Goods and Servicing

Part 2 - Modal	Goods and Servicing

Principles	
Summary of principle (for full text refer to Transport Strategy document)	*Our Ambition: Our Ambition for 2040: All goods will be in Greater Manchester moved by zero emission vehicles. The negative impact of freight vehicles on our local communities will be minimised.* Our emerging 2040 Freight and Logistics Transport Strategy aims to maximise freight's contribution to economic growth and competitiveness. This will involve: improving journey times and reliability; keeping costs as low as possible; ensuring that infrastructure is capable of meeting future growth and demand; increasing integration between modes and distribution centres and increasing GM's share of the logistics market.

Assessment Scale	**Assessment Category**	**Significance of Effect**
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives	**Description of effect[9]**	**Scale / significance**	**Recommendations for mitigation or enhancement**

[9] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

			of effect	
1.	Improve air quality	This objective has a specific focus for considering the role of Freight and its movements in GM. There is recognition of the impact of freight on air quality and there are proposed measures to address this, including the pursuit of Clean Air Zones (not referenced in the network principles) in key urban centres, and the use of consolidation centres to minimise goods movements – notably last mile logistics. Implementation of a Clean Air Zone will have a clear positive impact on areas that have the biggest concerns with air quality	++	The Principle could make further acknowledgement of changing vehicle fleet, in the advent of Euro 6 and the move towards electric/hybrid or alternative-fuelled vehicles.
2.	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This Principle relates to the role of Freight within GM. There is recognition of the growth in freight movements, however the mitigations include better linkages with land use planning, and the GM Spatial Framework, identifying sites with multi-modal capability and maximising where possible the movement of freight by rail and waterways. The Northern Hub rail enhancements may have the potential to provide additional rail freight capacity, however it is likely that much of this capacity is taken by increasing passenger trains. This may lead to a business as usual situation where freight continues to be moved on the highway therefore having positive or negative impacts to this objective.	+/-	The Principle could make further acknowledgement of changing vehicle fleet, in the advent of Euro 6 and the move towards electric/hybrid or alternative-fuelled vehicles.
3.	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	This Principle relates to the role of Freight and its movements in the economy of GM and notes that there is a requirement to ensure that infrastructure is capable of meeting future growth and demand. These requirements are likely to result in 'hard' interventions such as road widening which are likely to result in significant adverse effects on biodiversity etc. It is recognised, however, that most interventions will be of a 'softer' nature through signalling, Smart Motorway and modal shift reducing the significance of effects.	--	It is recommended that the Principle is reworded to note the requirement to protect or enhance biodiversity when possible. For example this could include planting of wildflowers or native species of plants etc at new road verges. This approach would likely reduce the significance of negative effects.
4.	Conserve and enhance the European sites *(HRA specific objective)*	This Principle relates to the role of freight and its movements in the economy of Greater Manchester and notes that there is a requirement to ensure that infrastructure is capable of meeting future growth and demand. These requirements are likely to result in 'hard' interventions such as road widening which have potential to cause significant impacts upon European sites. However, the ambition to move to zero emission vehicles may be beneficial for European sites that are sensitive to such pollutants. As such, positive and negative impacts are	+/-	It is recommended that the Principle is reworded to note the requirement to protect European sites and appropriately assess any schemes that are likely to have significant effects on European sites through the HRA process. Mitigation measures will need to be

		expected as a result of the Principle.		implemented to avoid, reduce or compensate for any adverse effects. The Principle could make further acknowledgement of changing vehicle fleet to reduce heavy load emissions and improve air quality in the region.
5.	Conserve and enhance the character and quality of GM's landscapes and townscapes	This Principle relates to the role of Freight and its movements in the economy of GM and notes that there is a requirement to ensure that infrastructure is capable of meeting future growth and demand. These requirements are likely to result in 'hard' interventions such as road widening which are likely to result in significant adverse effects on the quality of landscapes and townscapes. It is recognised, however, that most interventions will be of a 'softer' nature through signalling, Smart Motorway and modal shift reducing the significance of effects.	-	It is recommended that the Principle is reworded to note the requirement to protect or enhance the character and quality of GM's landscapes and townscapes when possible from any new infrastructure development. An example of how this could be done would be through native species of screening planting. This approach would likely reduce the significance of any negative effects.
6.	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	This Principle relates to the role of Freight and its movements in the economy of GM and notes that there is a requirement to ensure that infrastructure is capable of meeting future growth and demand. These requirements could potentially result in 'hard' interventions such as road widening which would likely result in significant adverse effects to cultural and historic heritage if these take place in the vicinity of these assets. It is recognised, however, that most interventions will be of a 'softer' nature through signalling, Smart Motorway and modal shift reducing the significance of effects.	-	It is recommended that the Principle is reworded to note the requirement to protect or enhance the quality and distinctiveness of GMs historic and cultural heritage when possible. This could be accomplished for example by careful screening (ideally using native species) of the historic asset from any new infrastructure and this approach would likely reduce the significance of any negative effects.
7.	Conserve and enhance the water environment	This Principle relates to the role of Freight and its movements in the economy of GM and notes that there is a requirement to ensure that infrastructure is capable of meeting future growth and demand. These requirements could potentially result in 'hard' interventions such as road widening which would likely result in significant adverse effects on the water environment – both during construction and operation. It is recognised, however, that most interventions will be of a 'softer' nature through signalling, Smart Motorway and modal shift reducing the significance of effects.	-	It is recommended that the Principle is reworded to note the requirement to protect the water environment during the construction and operation of any new infrastructure. This could be accomplished by the use of SuDS and this approach would likely reduce

				the negative effects.
8.	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	This Principle relates to the role of Freight and its movements in the economy of GM and notes that there is a requirement to ensure that infrastructure is capable of meeting future growth and demand. These requirements could potentially result in 'hard' interventions such as road widening which would likely result in significant adverse effects on soil and agricultural resources. There could though be a potential opportunity in certain circumstances to remediate areas of land contamination. As such effects could be positive or negative and could be considered to be permanent. It is recognised, however, that most interventions will be of a 'softer' nature through signalling, Smart Motorway and modal shift reducing the significance of effects.	+/-	It is recommended that the Principle is reworded to note the requirement to protect soil and agricultural resources when possible and to take opportunities for land remediation as appropriate.
9.	Reduce risk of flooding and increase resilience to the effects of a changing climate	This Principle relates to the role of Freight and its movements in the economy of GM and notes that there is a requirement to ensure that infrastructure is capable of meeting future growth and demand. No note is made of a changing climate or the potential risk of flooding. Any new infrastructure could be subject to these pressures and likely suffer a negative (and permanent) effect. It is recognised, however, that most interventions will be of a 'softer' nature through signalling, Smart Motorway and modal shift reducing the significance of effects.	-	It is recommended that the Principle is reworded to recognise the threat of flooding and a changing climate in the design of any new infrastructure. This would likely reduce any negative effects.
10.	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	This Principle relates to the role of Freight and its movements in the economy of GM but does not make note of the prudent use of natural resources, minimising waste or supporting recycling. All of these issues are likely to be relevant due to the requirement in the Principle for ensuring that infrastructure is capable of meeting future growth and demand. New infrastructure is likely to result in a negative effect on these issues. It is recognised, however, that most interventions will be of a 'softer' nature through signalling, Smart Motorway and modal shift reducing the significance of effects.	-	It is recommended that the Principle is reworded to ensure that in the design of any new infrastructure, prudent use of natural resources, waste minimisation and recycling are considered.
11.	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	This Principle relates to the role of Freight within GM. There is recognition of the growth in freight movements, however the mitigation includes better linkages with land use planning, and the GM Spatial Framework, identifying sites with multi-modal capability and maximising where possible the movement of freight by rail and waterways. The Northern Hub rail enhancements may have the potential to provide additional rail freight capacity, however it is likely that much of this capacity is taken by increasing passenger trains. This may lead to a business as usual situation where freight continues to be moved on the highway therefore having positive or negative impacts to this objective.	+/-	This Principle would benefit from some clearer commitments to modal shift, and how this will be supported by TfGM.

12.	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	There is little recognition of the importance of freight movements for this objective. Whilst freight and logistics is largely dominated by private sector businesses who will benefit directly from increasing numbers of goods movements through the region (due to the growth of the Port of Liverpool and Manchester Airport) there will be secondary impacts for the region including job creation, economic growth and prosperity. The growth of freight movements may however contribute to existing congestion concerns, notably on the key route network and in the urban centres for 'last mile' logistics. There are opportunities to stimulate a diversified offering for the last leg of movements, with a shift towards cycle logistics – stimulating new business opportunities.	++	This Principle would benefit from recognition of the roles of growth at both the Port of Liverpool (Liverpool 2 Superport) and Manchester Airport (Airport City). Both of these investments will generate significant economic growth in the freight and logistics sector, including the potential relocation of companies and warehouses to Manchester, and the increasing numbers of goods that flow through the region. Both of these will have significant economic benefits and create vast numbers of employment opportunities.
13.	Coordinate land use and transport planning across GM	This principle does not contribute to the achievement of this objective as it is not concerned with land use planning.	0	None
14.	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle aims to remove freight carrying HGVs from urban areas where possible, and to reduce their negative impact on other road users. It aims to reduce emissions from HGVs by using low emission vehicles or switching to rail/waterways where possible. There are also plans for an educational campaign to ensure that logistics companies minimise their impact on the environment, and this will also include driver training aimed at improving safety on the roads.	++	No mitigation/enhancement recommended.
15.	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle aims to remove freight carrying HGVs from urban areas where possible, and to reduce their negative impact on other road users, which will mean lower accident rates and less of an impact on the health of residents. It aims to reduce emissions from HGVs by using low emission vehicles or switching to rail/waterways where possible. There are also plans for an educational campaign to ensure that logistics companies minimise their impact on the environment, and this will also include driver training aimed at improving safety on the roads.	++	No mitigation/enhancement recommended.

	Scale of Effect	

HIA sub-objective		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	Description of effect/Recommendations for mitigation or enhancement
1	Improve accessibility to services, facilities and amenities for all	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	+	+++	+++	++	++	++	This principle includes proposals for awareness campaigns for logistics companies, to include driver training and raising awareness of issues such as cycle safety around HGVs. It also suggests freight consolidation, with fixed sites for HGV delivery, and the use of smaller vehicles to enter urban areas – this would reduce the potential for conflicts between HGVs and vulnerable users such as pedestrians and cyclists. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.
5	Reduce severance	++	++	++	++	++	++	++	++	This principle suggests freight consolidation, with fixed sites for HGV delivery, and the use of smaller vehicles to enter urban areas. It also suggests locating logistics sites to enable water/rail transport where possible to reduce the amount carried on the road network. The removal of HGV traffic through urban areas would reduce the perception of severance and help to

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
										contribute towards a greater sense of place. Any reduction in severance may encourage active travel, which will have a beneficial impact on health.
6	Reduce air, noise and light pollution from transport	+++	++	+++	+++	++	++	++	++	This principle includes the use of zero-emissions freight vehicles where possible, and suggests freight consolidation, with fixed sites for HGV delivery, and the use of smaller, cleaner vehicles to enter urban areas, which would reduce air, noise and light pollution overall and also ensure that any impacts caused by them would have less of an effect on people. It also suggests locating logistics sites to enable water/rail transport where possible to reduce the amount carried on the road network, which would reduce emissions. The principle includes sustainable distribution practice awareness campaigns, to make logistics companies and individual drivers more aware of ways that they can reduce their impacts on the environment. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	++	++	++	++	++	++	This principle includes proposals for awareness campaigns for logistics companies, to include driver training and raising awareness of issues such as cycle safety around HGVs. It also suggests freight consolidation, with fixed sites for HGV delivery, and the use of smaller vehicles to enter urban areas – this would reduce the potential for conflicts between HGVs and vulnerable users such as pedestrians and cyclists.
5	Reduce severance	++	++	++	++	++	++	++	++	++	This principle suggests freight consolidation, with fixed sites for HGV delivery, and the use of smaller vehicles to enter urban areas. It also suggests locating logistics sites to enable water/rail transport where possible to reduce the amount carried on the road network. The removal of HGV traffic through urban areas would reduce the perception of severance and help to contribute towards a greater sense of place.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
6	Reduce air, noise and light pollution from transport	+++	++	+++	++	++	++	++	++	++	This principle includes the use of zero-emissions freight vehicles where possible, and suggests freight consolidation, with fixed sites for HGV delivery, and the use of smaller, cleaner vehicles to enter urban areas, which would reduce air, noise and light pollution overall and also ensure that any impacts caused by them would have less of an effect on people. It also suggests locating logistics sites to enable water/rail transport where possible to reduce the amount carried on the road network, which would reduce emissions. The principle includes sustainable distribution practice awareness campaigns, to make logistics companies and individual drivers more aware of ways that they can reduce their impacts on the environment. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Spatial Themes: Global Connectivity

Part 3 – Spatial Themes	Global Connectivity

Summary of challenges and interventions (for full text refer to Transport Strategy document dated 01/02/16)	Manchester Airport and Enterprise Zone *Our ambition is to support growth at the Airport and the adjacent Enterprise Zone by: bringing many more passengers within a 1hr and 2hr rail journey time; improving the reliability of the highway network; and ensuring that public transport services better meet the needs of airport passengers and employees. Fewer people will drive to work at the Airport, with transformed sustainable transport connectivity to the Airport from across Greater Manchester and beyond.* … 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 line extension to the Airport; major highways investment in schemes such as the A6 Manchester Airport Relief Route and A556 Knutsford to Bowdon link road; and the Airport City Enterprise Cycleway, much more will need to be done. In particular, we will need to 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), which is adjacent to the Airport. Any new rail connections must be carefully planned to ensure that they integrate well with existing rail and road networks. GMCA and Manchester Airports Group (MAG) have already given an "in principle"commitment to make a local funding contribution towards the costs of the new HS2 station. Committed electrification and infrastructure schemes in the North West will offer enhanced linkages to Liverpool, St Helens, Blackpool, Preston, Bolton, Wigan, Huddersfield, Leeds and York using faster and longer trains, whilst the Ordsall Chord and associated Northern Hub capacity improvements will permit better cross Manchester rail links to the airport, a new direct Bradford-Halifax-Rochdale to Airport service and enhanced train frequencies to Liverpool. More direct service links to the Airport are expected to be forthcoming via the new Trans-Pennine and Northern franchises, including a direct Liverpool, Warrington Central to Airport "Northern Connect" service. Supporting infrastructure improvements, such as platform lengthening at key rail stations in the North, will be necessary to maximize the benefits of these transformational rail improvements. TfGM, Transport for the North and other key transport agencies, such as Highways England and Network Rail, will also need to work closely with MAG to identify opportunities to improve the quality of the entire, door-to-door passenger travel experience, from providing excellent information on how to travel to the Airport; through to seamless, integrated smart ticketing products. We must make it as easy as possible for people to plan their whole journey in advance and to encourage the use of more sustainable travel options wherever possible. The strategic road network also plays a crucial role in accessing the airport. Reliability of journey times to the airport is particularly important. We will need to work closely with Highways England to develop strategic priorities for improving airport access, better managing demand for travel by car, and dealing with existing and potential bottlenecks on our motorway network. Atlantic Gateway and Port Salford *Our Ambition: Atlantic Gateway corridor developed to maximise the sustainable movement of goods by water and rail. Port Salford area developed as a tri-modal (rail, water and road) logistics park and development zone to improve access to global markets via Port of Liverpool.* Greater Manchester partners will continue to work closely with Highways England, to develop a comprehensive programme of strategic interventions to improve access to and improve the performance of our highway network in the Atlantic Gateway area, and particularly the interface between our Greater Manchester Key Route Network and the Strategic Road Network. Improvements to the performance and resilience of our highways network will not be achieved simply through infrastructure enhancements. Appropriate demand

	management tools and techniques will also be needed to manage traffic flows on our highways network, particularly during peak periods. We will also need to ensure that workers can access the new job opportunities at Port Salford and in the Atlantic Gateway corridor without having to travel by car. Public transport access to the area via the City Centre and other key interchange points, such as Trafford Centre and Eccles, will be critical. We are exploring the potential to extend the Trafford Park Metrolink line into the Atlantic Gateway area to support this objective. We will also identify opportunities to cater for increased demand for rail services from local rail stations, such as Irlam and Patricroft. We must also improve orbital connectivity to the Atlantic Gateway from across Greater Manchester. This will require investment in highway and public transport, to deliver the most effective and attractive overall package of measures, facilitating access from a variety of destinations. Providing improved walking and cycling connections from surrounding areas (such as Peel Green, Patricroft and Irlam) will also be a high priority to ensure good access from more deprived areas to job opportunities in the Port Salford and the Atlantic Gateway area. SUMMARY OF INTERVENTIONS • A western Metrolink 'loop' to the Airport • HS2 and Northern Powerhouse Rail services direct to the Airport • Better rail services to Manchester Airport from the south • Better public transport links to the Airport area from across GM, including better orbital connections • An improved Airport Interchange as part of the Terminal 2 redevelopment • Tackling motorway congestion around the Airport and the north western part of the M60 • A new Metrolink line to the Trafford Centre, and potentially on to Port Salford • A Ship Canal wharf, rail and road links at Port Salford • Improving local pedestrian and cycle links to the Airport, • Enterprise Zone and Port Salford • Targeted travel choices interventions to reduce levels of car use by workers at Airport and Port Salford

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[10]	Scale / significance of effect	Recommendations for mitigation or enhancement
1	Improve air quality	The expansion of Manchester Airport through an increase in passenger numbers and service destinations, along with the growth at the Enterprise Zones are likely to have an adverse effect on local air quality. However, managing and improving the surface access to the Airport will limit the localised impact, particularly reducing the proportion of workers who travel to the Airport by car and the wider integration of rail connectivity to the Airport. This approach will also benefit the Atlantic Gateway / Port Salford area.	-	The spatial theme could articulate further the importance of tacking air quality particularly in the AQMAs in this area of GM.
2	Reduce carbon dioxide (CO_2) emissions from transport overall,	The expansion of Manchester Airport through an increase in passenger numbers and service destinations, along with the growth at	-	This spatial theme could further outline the relationship between reducing carbon

[10] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

	with particular emphasis on road transport	the Enterprise Zones are likely to have an adverse effect on carbon dioxide emissions. However, managing and improving the surface access to the Airport will limit the impact on carbon emissions, particularly reducing the proportion of workers who travel to the Airport by car and the wider integration of rail connectivity to the Airport. This approach will also benefit the Atlantic Gateway / Port Salford area.		emissions and the proposed transport strategy.
3	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	There will be a number of infrastructure developments including new rail links to the airport, cycle-and pedestrian links and in some instances new roads / road improvements, as well as a new wharf on the Ship Canal. These Infrastructure interventions could have a negative effect on biodiversity e.g. through direct landtake or severance of habitat, but also provide an opportunity for biodiversity enhancement, for example through designing in biodiversity such as wildflower verges to provide opportunities for pollinators or planting suitable native species of trees and hedgerows. It should also be noted that this Spatial Theme also includes a range of interventions which will result in a reduced need for new infrastructure e.g. targeted travel choice interventions, car club / sharing etc. These interventions will therefore have a positive (though likely indirect) effect on biodiversity.	++ --	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance biodiversity during construction and critically during the operational phase through planned maintenance schemes that recognise the importance of protecting biodiversity e.g. by controlling invasive species. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment or Environmental Impact Assessment (level of assessment to be appropriate to the nature of the scheme). These assessments should provide greater clarity on how biodiversity will be protected (through mitigation) and /or enhanced during the development of any new transformational infrastructure.
4	Conserve and enhance the European sites *(HRA specific objective)*	*See HRA Stage 1 Screening Report that accompanies Transport Strategy*	N/A	N/A
5	Conserve and enhance the character and quality of GM's landscapes and townscapes	Development of new infrastructure could have an effect on landscape / townscape – both positive for example by reducing congestion in some areas of townscape, or negative e.g. by introducing new 'hard' features into the landscape. The standard of design will dictate the effect this will have on these assets, with a good design, taking into account local factors likely providing an enhancement. It should also be noted that this Spatial Theme also includes a range of	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance the landscape / townscape. This could include appropriate natural screening (which will also enhance

		interventions which will result in a reduced need for new infrastructure – a number of these are based on good management e.g. managing demand for travel by car to reduce bottlenecks on the motorway network. Making better use of existing infrastructure will impact on positively on townscapes by reducing congestion etc.		biodiversity), as well as the enhancement of public spaces such as station forecourt, or the decluttering of streetscapes. Good design is a key component of this new Principle. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment. These assessments should make it clearer that careful design of new infrastructure is critical to ensure that effects on landscape / townscape are a positive enhancement.
6	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	Development of new infrastructure could impact negatively on cultural / historic heritage assets, for example, by impacting on the setting of these features. Conversely it also offers the opportunity to enhance assets directly or through their settings by good design. In this Spatial Theme, interventions relating to the Ship Canal, for example, will directly impact on an historic feature – not least in that it will herald a new lease of life for this asset and provide the opportunity to highlight many of its features and the role it played in the history of the region.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance these assets. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment. These assessments should encourage sympathetic design in relation to cultural / historical assets with a view to positive enhancement of these and their settings.
7	Conserve and enhance the water environment	All new development could impact on the water environment. Of particular note in this instance is the proposed wharf on the Ship Canal. Negative effects are most likely during construction but could also occur during operation e.g. through accidental spills. This Spatial Theme though, through a number of interventions, does reduce the need for new infrastructure, as well as the potential for accidental spillages. For example, reducing demand for travel by car, will reduce the need for new roads, but also reduce the potential for accidents – these interventions will therefore have both a direct and indirect positive effect on the water environment.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy addressing the potential risk to the water environment from transport schemes . In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment and the mitigation developed from this assessment should ensure that the water environment is protected during construction

				and operation of any transport scheme.
8	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	Development of new rail links and other infrastructure such as new roads, will have an effect on soil and agricultural resources in that some areas may be permanently lost. Development of this infrastructure does though also represent an opportunity to remediate areas of contaminated land – a widespread problem in a formerly heavily industrialised area like Manchester. Therefore the Transport Strategy could have positive and negative effects on this IA Objective. This Spatial Theme though, also encourages the use of existing infrastructure where possible – this includes the Ship Canal and related assets within the Port Salford area. This will lead to a reduction in road freight and along with other measures to reduce car use, will avoid the need for new infrastructure like roads / road widening.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy addressing the need to protect very good agricultural land and to protect soil (if it is not possible to avoid impacts altogether). This Principle also encourages transport projects to remediate land and make use of opportunities for regeneration. The assessment undertaken of any scheme derived from the Transport Strategy should also encourage this approach as appropriate.
9	Reduce risk of flooding and increase resilience to the effects of a changing climate	No consideration is made of the potential for flooding on any of the new potential infrastructure being proposed and there are likely significant negative effects. Likewise, no consideration is made of the effects of a changing climate on any of the new Infrastructure.	--	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy addressing a changing climate and increased risk of flooding and requiring all transport projects to consider these issues – for both the construction and operational phases. These issues would also be considered during any environmental assessment carried out.
10	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	No direct consideration is made of the prudent use of natural resources, or minimising the production of waste though schemes to increase capacity of existing infrastructure will help reduce effects of both these issues. No consideration is made of re-use or recycling.	-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy to consider Life Cycle Management during the design of any Transport Scheme. This will therefore ensure the prudent use of natural resources, minimise the production of waste and support recycling. These issues will also be addressed in any environmental assessment.

11	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	The HS2 and Norther Powerhouse rail proposals provide the potential to significantly improve connectivity to Manchester Airport from key city regions by sustainable modes and reduce the need to access the Airport by car. This directly aligns with the IA objective. The acknowledgement that 24hr a day public transport services to the Airport on key services, particularly to the Regional Centre, are required will assist employees in accessing their workplace sustainably, along with parking management strategies to encourage car sharing. Rail access improvements to the Atlantic Gateway Corridor will provide the opportunity to move more freight by rail, thereby reducing the movement of good by road which also directly aligns with the objective.	+++	The Strategy states that 'fewer people will drive to work at the Airport' – it suggested that a clarification is added as with the planned expansion/ increase in jobs more people will drive, although the proportion of those driving may reduce overall.
12	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	Expanding Manchester Airport and the associated Airport Enterprise Zones directly align with the promotion of economic growth and job creation elements of this IA objective. With the potential to create over 75,000 jobs, the improved public transport, walking and cycling links ensure that 'access for all' is promoted, particularly from surrounding local areas that currently suffer from deprivation. Promoting the use of sustainable travel choices to access jobs along the Atlantic Gateway, including Port Salford, will assist in ensuring the job opportunities created along with corridor are open to all.	+++	None
13	Coordinate land use and transport planning across GM	Through this spatial theme there is a clear focus on targeting transport improvements where significant new developments are planned. This has a slight benefit for this objective.	+	None
14	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle is to support improved global connectivity for freight and passengers via Manchester Airport and via Manchester Ship Canal for international freight movements. In order to accomplish this, a number of improvements to both the highway network and public transport network are proposed. These will include infrastructure improvements in particular to the rail and highway networks, which will provide more opportunities for people travelling to employment, education and healthcare. Furthermore, new key rail hubs will strengthen connections to other major city regions across the network, and will be vital in supporting the movement of freight (by rail), skills and information. If Greater Manchester is to benefit fully from access to global trade, the area must be accessible from across the city region. Therefore, this will require improvements to both orbital and radial public transport	++	It should be noted that 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, much more will need to be done. In particular, they will need good 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

		connectivity, supported by appropriate ticketing products and fare structures.		Airport's long-term growth potential. It was also proposed that other potential travel options would be considered, such as express bus and coach services, new models of car club operation and car sharing and taxi provision to provide a range of alternatives for international travellers. It is recommended that all travel options must be carefully designed and marketed to make them as easy to use as possible, particularly for those unfamiliar with Greater Manchester. Furthermore, it is recommended that research is undertaken in deciding which ticketing products to offer, ensuring they can be used over a variety of modes. Having flexible ticketing options will be beneficial to those on lower incomes and people in part time education or employment.
15	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle aims to expand the Airport's passenger numbers dramatically, which will also mean a large number of jobs will be created. In order for this to be successful, the Airport will need a good road and rail network supporting it. People travelling to the airport must be able to plan their journey easily, including having access to good sustainable transport links with flexible ticketing options, along frequent public transport services or on un-congested roads. Additionally, an increase in rail travel for both passengers and freight would decrease the level of air, light and noise pollution, and improvements to walking and cycling opportunities will increase the levels of active travel and the health of the area.	++	It is recommended that information on improved airport facilities and transport links to them are easy to understand and widely advertised, particularly using a method suitable for people with visual impairments and learning difficulties. Similarly, changes to the availability of flexible ticketing options should be publicised extensively, ensuring they are available in a number of languages.

	Scale of Effect	

HIA sub-objective		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	Description of effect/Recommendations for mitigation or enhancement
1	Improve accessibility to services, facilities and amenities for all	++	++	++	++	++	+	+	++	This principle will support growth at the Airport and the adjacent Enterprise Zone though: • Bringing many more passengers within a 1hr and 2hr rail journey time; and • Ensuring that public transport services better meet the needs of airport passengers and employees. Sustainable transport connectivity will be transformed and as a consequence fewer people will drive to work at the airport. Additionally, there will be a number of access improvements to the Airport to help support its growth through enabling a greater number of people to reach it, this will be achieved though the following improvements: • A Metrolink service; • A direct rail service to the Airport, from HS2, the Northern Powerhouse cities and the south of Manchester; • Better public transport links to the Airport from the whole of Greater Manchester; and • Airport interchange improvements as part of the Terminal 2 development. Furthermore, the airport currently has significant runway capacity and therefore potential to rapidly expand without the need for major investment or the possibility of a contentious additional runway. The developments to public transport connectivity is important particularly for people who do not have access to a car, older people, children and those with a disability. Approximately 19% of the Greater Manchester population have a long term limiting illness that either limits their life a little or a lot. Up to 18% of

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										the population are over 65 years old and 20% are under 16 years old. Less congestion on the motorways and more direct rail links will benefit commuters, who will have shorter journey times as a result. <u>Recommendations</u> It is recommended that any new rail connections are carefully planned to ensure that they integrate well with existing rail and road networks. The strategic road network also needs to be developed in order to ensure the reliability of journey times to the airport. This is particularly important to improve airport access, better management of demand for travel by car, and dealing with existing and potential bottlenecks on the motorway network. In order to accomplish this it is recommended that strategic priorities are developed.
2	Improve affordability of transport	++	++	++	+++	++	+	++	++	Manchester Airport currently offers highly flexible, affordable short-haul access to European cities and attracts passengers from across the North, North Wales and parts of the Midlands. As the airport has significant runway capacity, it has enormous potential to rapidly expand. This is likely to increase the choices of destinations further. Opportunities will also be identified to improve the entire door-to-door passenger travel experience (both road and public transport). This will be through a number of ways including providing information on how to travel to the Airport to seamless, integrated smart

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										ticketing products. Recommendations It is recommended that public transport services should be tailored to integrate with flight times and with worker shift patterns as much as possible, which will require 24-hour a day operations on key services. If Greater Manchester is to benefit fully from access to global trade, the area must be accessible from across the city region. Therefore, this will require improvements to both orbital and radial public transport connectivity, supported by appropriate ticketing products and fare structures. It is recommended that research is undertaken in deciding which ticketing products to offer, ensuring they can be used over a variety of modes. Having flexible ticketing options will be especially beneficial to those on lower incomes and people in part time education or employment.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and community safety. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	0	0	0	0	0	0	0	0	This principle would have very little impact on road safety and reducing the number of accidents and other incidents. Although it is likely that there will be indirect impacts that could improve road safety, such as better public transport links that could reduce the number of cars on the highway network, there is little potential to

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										increase the impact on this sub-objective.
5	Reduce severance	++	++	++	++	+++	++	+	++	This principle also recognises the importance of good local connections from surrounding areas to ensure good access from more deprived areas to job opportunities at the Airport. It aims to improve local pedestrian and cycle links to the Airport, Enterprise Zone and Port Salford, through exploring walking and cycling opportunities. Improvements to walking and cycling routes will help to reduce severance, particularly for people with no access to a car, older people, children and those with a disability.
6	Reduce air, noise and light pollution from transport	+++	++	+++	++	++	+	+	++	In order to improve the entire door-to-door passenger travel experience it must be as easy as possible for people to plan their whole journey in advance and to encourage the use of more sustainable travel options wherever possible. The increase in sustainable travel will result in more people using public transport and fewer people driving cars, and consequently a reduction in air, noise and light pollution as an outcome. As road transport is the most significant source of pollution across Greater Manchester for both NOx and PM10 (contributing 60% and 61% of total emissions in 2006 respectively). A reduction in air and noise pollution will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	**Gender**	**Disability**	**Ethnicity**	**Faith**	**Sexual Orientation and Gender Reassignment**	**Pregnancy and Maternity**	**Marriage and Civil Partnerships**	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	+	++	+	+	+	+	+	++	This principle will support growth at the Airport and the adjacent Enterprise Zone though: • Bringing many more passengers within a 1hr and 2hr rail journey time; and • Ensuring that public transport services better meet the needs of airport passengers and employees. Sustainable transport connectivity will be transformed and as a consequence fewer people will drive to work at the airport. Additionally, there will be a number of access improvements to the Airport to help support its growth through enabling a greater number of people to reach it, this will be achieved though the following improvements: • A Metrolink service;

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											• A direct rail service to the Airport, from HS2, the Northern Powerhouse cities and the south of Manchester; • Better public transport links to the Airport from the whole of Greater Manchester; and • Airport interchange improvements as part of the Terminal 2 development. Furthermore, the airport currently has significant runway capacity and therefore potential to rapidly expand without the need for major investment or the possibility of a contentious additional runway. The developments to public transport connectivity is important particularly for people who do not have access to a car, older people, children and those with a disability. Approximately 19% of the Greater Manchester population have a long term limiting illness that either limits their life a little or a lot. Up to 18% of the population are over 65 years old and 20% are under 16 years old. Less congestion on the motorways and more direct rail links will benefit commuters, who will have shorter journey times as a result. <u>Recommendations</u> It is recommended that any new rail connections are carefully planned to ensure that they integrate well with

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											existing rail and road networks. The strategic road network also needs to be developed in order to ensure the reliability of journey times to the airport. This is particularly important to improve airport access, better management of demand for travel by car, and dealing with existing and potential bottlenecks on the motorway network. In order to accomplish this it is recommended that strategic priorities are developed.
2	Improve affordability of transport	++	+	+	+	+	+	+	+	++	Manchester Airport currently offers highly flexible, affordable short-haul access to European cities and attracts passengers from across the North, North Wales and parts of the Midlands. As the airport has significant runway capacity, it has enormous potential to rapidly expand. This is likely to increase the choices of destinations further. Opportunities will also be identified to improve the entire door-to-door passenger travel experience (both road and public transport). This will be through a number of ways including providing excellent information on how to travel to the Airport to seamless, integrated smart ticketing products. <u>Recommendations</u> It is recommended that public transport services should be tailored to integrate with flight times and with worker shift patterns as much as possible, which will require 24-

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											hour a day operations on key services. If Greater Manchester is to benefit fully from access to global trade, the area must be accessible from across the city region. Therefore, this will require improvements to both orbital and radial public transport connectivity, supported by appropriate ticketing products and fare structures. It is recommended that research is undertaken in deciding which ticketing products to offer, ensuring they can be used over a variety of modes. Having flexible ticketing options will be beneficial to those on lower incomes and people in part time education or employment.
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and community safety. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	0	0	0	0	0	0	0	0	0	This principle would have very little impact on road safety and reducing the number of accidents and other incidents. Although it is likely that there will be indirect impacts that could improve road safety, such as better public transport links that could reduce the number of cars on the highway network, there is little potential to increase the impact on this sub-objective.
5	Reduce severance	++	+	++	+	+	+	+	+	++	This principle also recognises the importance of good local connections from surrounding areas to ensure good access from more deprived areas to job opportunities at the Airport. It aims to improve local pedestrian and cycle

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											links to the Airport, Enterprise Zone and Port Salford, through exploring walking and cycling opportunities. Improvements to walking and cycling routes will help to reduce severance, particularly for people with no access to a car, older people, children and those with a disability.
6	Reduce air, noise and light pollution from transport	+++	+	+++	+	+	+	+	+	++	In order to improve the entire door-to-door passenger travel experience it must be as easy as possible for people to plan their whole journey in advance and to encourage the use of more sustainable travel options wherever possible. The increase in sustainable travel will result in more people using public transport and fewer people driving cars, and consequently a reduction in air, noise and light pollution as an outcome. As road transport is the most significant source of pollution across Greater Manchester for both NOx and PM10 (contributing 60% and 61% of total emissions in 2006 respectively). A reduction in air and noise pollution will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution) and people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Spatial Themes: Delivering Better City-to-City Links

Part 3 – Spatial Themes	Delivering Better City-to-City Links
Summary of challenges and interventions (for full text refer to Transport Strategy document dated 01/02/16)	*Our Ambition is to see GM at the heart of a successful Northern Powerhouse Economy, with transformed connectivity between the major cities of the North of England, and to the Midlands, London and Scotland. The will be a step-change in quality, speed and reliability of our city-to-city rail links, allowing travel to Liverpool, Leeds and Sheffield in 30 minutes or less and to London in just over an hour. The strategic highway network will reliably allow 'mile a minute' journey times. More freight will be moved by rail or water. Transformed infrastructure and smart ticketing and customer information will encourage more trans-northern journeys to be made by public transport.* Improving Connectivity to Deliver a Northern Powerhouse Economy **HS2** We will push for the delivery of the full HS2 'Y' network as soon as possible to ensure that the people and businesses of Greater Manchester and the wider North have rapid access to the rest of the UK economy, including London, the Midlands, and Scotland. From Manchester, journey times to London are anticipated to be as low as 68 minutes, with 3 trains per hour to London and 2 trains per hour to Birmingham. We wish to see the benefits of HS2 realised as soon as possible, starting with extension of the line to Crewe by 2026. In the intervening years, however, we will continue to work hard to deliver improved north-south rail connectivity in and out of Greater Manchester, including identifying potential improvements to services on the existing WCML through future franchise specifications; and ensuring that Greater Manchester key stations are served by HS2 classic compatible services that can run on both HS2 lines and the WCML following delivery of Phase 1 of HS2 from London to the West Midlands. **M6 Motorway** The link into central Manchester and Manchester Airport, via the M56, is currently being upgraded through the A556 Knutsford to Bowdon Improvement scheme. In the west, the M6 has four connecting junctions in Wigan District, but two of these provide access in one direction only. Two committed schemes will improve Wigan's strategic highways connections: the M58 link road providing a direct link from the M58/M6 J26 to the A571; and the A49 link road providing a more direct route from the M6 J25 to the town centre. However J25 currently has southbound access and northbound egress, and we aspire to making this an all movements junction, allowing the closure of J24, which would relieve congestion in Ashton-under-Lyne town centre. Northern Powerhouse Rail (NPR) Network We are working with partners to achieve the Northern Powerhouse Rail target of achieving the following levels of service: • Manchester – Leeds: 30mins, 6 trains per hour; • Manchester –Liverpool: 20mins, 6 trains per hour; • Manchester-Newcastle: 90mins, 3 trains per hour; and • Manchester-Sheffield: 30mins, 6 trains per hour. To deliver these ambitious journey time and frequency aspirations, options are also being explored to deliver new lines or major rail bypasses as well as making use of proposed HS2 infrastructure. It is anticipated that significant sections of new line would be needed on routes between Manchester and Leeds and Manchester and

	Sheffield, for example. Existing rail infrastructure would then be freed up on our current rail networks to provide express, semi-fast, local and freight services. Delivery of a seamless, public transport network across the North of England, is also to be supported a smart Northern ticketing system that makes it simple and easy to travel across the North by any mode of public transport. This will be enhanced by real-time travel information and a simplified fare structure. We will ensure that this emerging Northern smart ticketing system is compatible with our future Greater Manchester smart ticketing and fares system. Future Development of our National Rail Hubs In Part 2, we set out our approach to improving interchange on our public transport system, highlighting different categories of interchange which are needed to support a seamless Greater Manchester transport network. Our Global Gateway at Manchester Airport, and Greater Manchester National Hubs and are critical in terms of supporting excellent city-to-city links and we will develop proposals to improve interchange facilities at all of these locations to ensure that national rail services are well integrated into our city region transport network. With the introduction of HS2 and Northern Powerhouse Rail services, Manchester Piccadilly will become the most intensive strategic transport interchange in the North. An integrated strategy is needed to ensure that these connectivity benefits are spread across the city region and, critically, that the immediate area around the station delivers on its potential. We want to see the station environment and the surrounding area transformed in time for the start of HS2 Phase 1 operations in 2026, so as to maximise early city-to-city connectivity benefits and accelerate regeneration of the area. The adjacent Piccadilly and Mayfield areas have the potential for commercial development that could secure up to 30,000 additional jobs, alongside scope for greater housing opportunities and regeneration of the surrounding area. There are a number of other interchanges in Greater Manchester that are vital for the successful implementation of improved city-to-city rail links, including Manchester Airport, Wigan, Stockport and Bolton. Investment in high quality access and interchange facilities at these key hubs will be critical to ensure that travellers from across Greater Manchester have excellent access to city-to-city rail services, that are well integrated into our City Region transport system. Transforming City-to-City Highways Connectivity Significant investment is already planned in Greater Manchester's strategic road network over the coming years, primarily through the Government's "Road Investment Strategy". In the period to 2020, a number of improvements will be made to the strategic road network to improve its performance and reliability through the Highways England first Road Investment Strategy. These focus on rolling out Smart Motorways on key sections of the M60, M62, M6 and M56; improving Junction 18 of the M60 (Simister Island); and delivery of the Mottram Moor Link Road which will improve connectivity to Sheffield City Region, including a bypass of Mottram. We will work with our key partners to help develop the Government's current investment plans over the longer-term future, including through work on major strategic studies of the Northwest Quadrant of the M60 and a Trans-Pennine Tunnel study. City to City Freight Movement Transport for Greater Manchester, alongside partners, will continue to cooperate on development and delivery of the Northern multi-modal Freight Strategy which looks at all aspects of this complex sector and will seek to deliver any interventions identified to improve connections between our city regions for the sustainable movement of goods. SUMMARY OF INTERVENTIONS - Early delivery of HS2 and Northern Powerhouse rail to Manchester city centre, well connected to GM rail network

	- Faster rail journeys to Liverpool, Leeds and Sheffield - Electrification of GM rail network - Improvements to key rail stations for city to city links (Piccadilly, Victoria, Stockport, Bolton and Wigan) - Tackling congestion on the motorway network - A reliable all-weather trans-Pennine highway link - A bypass for Mottram and Tintwistle - A study into a A6-M60 bypass - Improved links to the M6 - A pan-northern multi-modal ticketing system

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[11]	Scale / significance of effect	Recommendations for mitigation or enhancement
1	Improve air quality	The overall Strategy of improving city-to-city connectivity by public transport will contribute to a mode shift away from the private car	+	A balance needs to be struck between highway improvements that reduce

[11] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

		towards more sustainable modes. Rail electrification and localised improvements on motorways and other strategic road links will reduce congestion. An indirect impact of all of these will be a slightly beneficial improvement in air quality in GM.		congestion and generate associated air quality improvements and highway interventions that generate significant additional new traffic that could worsen air quality.
2	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	The overall Strategy of improving city-to-city connectivity by public transport will contribute to a mode shift away from the private car towards more sustainable modes. Rail electrification and localised improvements on motorways and other strategic road links will reduce congestion. An indirect impact of all of these will be a slightly beneficial reduction in carbon dioxide emissions.	+	A balance needs to be struck between highway improvements that reduce congestion and generate associated air quality improvements and highway interventions that generate significant additional new traffic that could increase carbon emissions.
3	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	There will be a number of Infrastructure developments including in some instances new roads / road improvements such as for example the bypass for Mottram and Tintwistle, but also significant rail links such as between Manchester and Leeds. These Infrastructure interventions could have a negative effect on biodiversity e.g. through direct landtake or severance of habitat, but also provide an opportunity for biodiversity enhancement, for example through designing in biodiversity such as wildflower verges to provide opportunities for pollinators or planting suitable native species of trees and hedgerows. This Spatial Theme though also encourages the use of existing infrastructure where possible e.g. the rolling out of the Smart Motorways initiative which will allow greater capacity to the network. This will reduce the need for new infrastructure that could affect biodiversity.	++ --	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance biodiversity during construction and critically during the operational phase through planned maintenance schemes that recognise the importance of protecting biodiversity e.g. by controlling invasive species. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment or Environmental Impact Assessment (level of assessment to be appropriate to the nature of the scheme). These assessments should provide greater clarity on how biodiversity will be protected (through mitigation) and /or enhanced during the development of any new infrastructure. This is particularly relevant to the development of new proposed roads and rail links.
4	Conserve and enhance the European sites *(HRA specific objective)*	*See HRA Stage 1 Screening Report that accompanies Transport Strategy*	N/A	N/A

5	Conserve and enhance the character and quality of GM's landscapes and townscapes	Development of new infrastructure could have an effect on landscape / townscape – both positive for example by reducing congestion in some areas of townscape, or negative e.g. by introducing new 'hard' features into the landscape. The standard of design will dictate the effect this will have on these assets, with a good design, taking into account local factors likely providing an enhancement. Improvements to existing infrastructure will also be made through for example interventions at Piccadilly, Victoria, Stockport, Bolton and Wigan stations. This will have a positive effect in the townscape of these areas.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance the landscape / townscape. This could include appropriate natural screening (which will also enhance biodiversity), as well as the enhancement of public spaces such as station forecourt, or the decluttering of streetscapes. Good design is a key component of this new Principle. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment. These assessments should make it clearer that careful design of new infrastructure is critical to ensure that effects on landscape / townscape are a positive enhancement.
6	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	Development of new infrastructure could impact negatively on cultural / historic heritage assets, for example, by impacting on the setting of these features. Conversely it also offers the opportunity to enhance assets directly or through their settings by good design. Of particular note in this instance is the focus on Manchester Piccadilly rail station – this station was opened in 1842 and is of significant historic interest.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance these assets. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment. These assessments should encourage sympathetic design in relation to cultural / historical assets with a view to positive enhancement of these and their settings. Particular note should be made of the potential to highlight the historic interest of Manchester Piccadilly station.
7	Conserve and enhance the water	No note is made of the water environment but development of transformational infrastructure could have a negative effect on the	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle

	environment	water environment. Negative effects are most likely during construction but could also occur during operation e.g. through accidental spills. It is noted that the Spatial Theme aims to reduce freight movements by road and onto rail. This could potentially reduce the number of accidents and therefore the risk of accidental fuel spills to watercourses and therefore indirectly benefit the water environment.		relating to the Built and Natural Environment to be included in the Transport Strategy addressing the potential risk to the water environment from transport schemes. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment and the mitigation developed from this assessment should ensure that the water environment is protected during construction and operation of any transport scheme.
8	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	Development of new Rail links and new roads / road improvements will have an effect on soil and agricultural resources in that some areas may be permanently lost. Development of this infrastructure does though also represent an opportunity to remediate areas of contaminated land – a widespread problem in a formerly heavily industrialised area like Manchester. Therefore the Transport Strategy could have positive and negative effects on this IA Objective. This Spatial Theme though also encourages the use of existing infrastructure where possible e.g. the rolling out of the Smart Motorways initiative which will allow greater capacity to the network. This will reduce the need for new infrastructure that could affect areas of soil etc.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy addressing the need to protect very good agricultural land and to protect soil (if it is not possible to avoid impacts altogether). This Principle also encourages transport projects to remediate land and make use of opportunities for regeneration. The assessment undertaken of any scheme derived from the Transport Strategy should also encourage this approach as appropriate.
9	Reduce risk of flooding and increase resilience to the effects of a changing climate	No consideration is made of the potential for flooding on any of the new potential infrastructure proposed. Likewise, no consideration is made of the effects of a changing climate on any of the new Transformational Infrastructure.	--	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy addressing a changing climate and increased risk of flooding and requiring all transport projects to consider these issues – for both the construction and operational phases. These issues would also be considered during any environmental assessment carried out.

10	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	No direct consideration is made of the prudent use of natural resources, or minimising the production of waste though schemes to increase capacity of existing infrastructure will help reduce effects of both these issues. No consideration is made of re-use or recycling.	-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy to consider Life Cycle Management during the design of any Transport Scheme. This will therefore ensure the prudent use of natural resources, minimise the production of waste and support recycling. These issues will also be addressed in any environmental assessment.
11	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	The step change in the quality, speed and reliability of city-to-city rail links, along with the associated interchange facilities directly aligns with this objective, and will reduce the need to travel by car between these key city destinations. Furthermore, it provides the opportunity to transport more freight by rail and not road.	+++	None
12	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	The transformation change in the city-to-city rail links and the associated interchange facilities will facilitate an increase in productivity and promotion of economic growth via the improved movements of goods, skill and information. Labour catchment areas will effectively be expanded, creating more accessible job opportunities. This directly aligns with the IA objective. The interventions will provide the opportunity for the growing logistics industry to expand, creating more jobs and further contributing to economic growth.	+++	None
13	Coordinate land use and transport planning across GM	This principle does not contribute to the achievement of this objective as it is not concerned with new land use planning.	0	None
14	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle will improve accessibility and inclusivity for everyone in Greater Manchester up to 2040 and beyond. There will be infrastructure improvements in particular to the rail network and highway network, which will provide more opportunities for people travelling to employment, education and healthcare. Along with new key rail hubs, this will strengthen connections to other major city regions across the network, and will be vital in supporting the movement of freight (by rail), skills and information. Further research into being more prepared for adverse weather and the need to increase capacity will result in fewer delays, congestion, accidents and noise and air pollution. The increase in flexible ticketing options will be of greatest benefit to those in part time employment or	++	It is recommended that improved train services and ticketing systems are easy to understand and widely advertised, particularly using a method suitable for people with visual impairments and learning difficulties. Additionally, there is a need for all of the partners to work together well over the coming years in order to deliver the transformational improvements to the city-to-city links needed to achieve the 2040 Transport Vision and to play a key role in

		work, job seekers and part-time or flexible workers.		delivering a Northern Powerhouse economy.
15	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle will improve accessibility and inclusivity for everyone in Greater Manchester up to 2040 and beyond. There will be infrastructure improvements in particular to the rail network and highway network, which will provide more opportunities for people travelling to employment, education and healthcare. Along with new key rail hubs, this will strengthen connections to other major city regions across the network, and will be vital in supporting the movement of freight (by rail), skills and information. Further research into being more prepared for adverse weather and the need to increase capacity will result in fewer delays, congestion, accidents and noise and air pollution. The increase in flexible ticketing options will be of greatest benefit to those in part time employment or work, job seekers and part-time or flexible workers. An increase in rail travel for passengers and freight would decrease the level of air, light and noise pollution. This would particularly benefit those with long term conditions such as asthma, and would also improve health overall. A reduction in noise pollution would benefit children the most, as high noise levels have an adverse impact on children's' cognitive ability.	++	It is recommended that information on improved train services are easy to understand and widely advertised (in particular shorter journey times and more frequent services), particularly using a method suitable for people with visual impairments and learning difficulties. Similarly, changes to the availability of flexible ticketing options should be publicised extensively, ensuring they are available in a number of languages.

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	++	++	++	++	+	+	++	This principle will improve accessibility to services, facilities and amenities for all, through early delivery of HS2, and the Northern powerhouse to Manchester City Centre. This will ensure strong connections to major city regions across the North, Birmingham, London, Glasgow and Edinburgh, in supporting the critical flow

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										of goods, skills and information. Having good accessibility to services is particularly important for people who do not have access to a car, older people, children and those with a disability. Approximately 19% of the Greater Manchester population have a long term limiting illness that either limits their life a little or a lot. Up to 18% of the population are over 65 years old and 20% are under 16 years old.
2	Improve affordability of transport	++	++	++	+++	++	+	++	++	This principle aims to improve affordability of transport through transforming infrastructure and smart ticketing and customer information, with the aim of encouraging more trans-northern journeys to be made by public transport. This will be supported by a smart 'Northern ticketing system' that makes it simple and easy to travel across the North by any mode of public transport. This will be enhanced by real-time travel information and a simplified fare structure. The emerging Northern smart ticketing system will be compatible with the future Greater Manchester smart ticketing and fares system. Further responsibilities will include ensuring fair ticketing for concessionary travel, multi-modal ticketing schemes and the use of 'smart' transactions. Although Greater Manchester unemployment is in line with national figures, the level of deprivation varies area by area. It is important to ensure the whole population have equal opportunities in accessing transport to enable them to reach key facilities and amenities (such

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										as employment, education and health care).
3	Reduce crime and fear of crime and promote community safety	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and community safety. There is little potential to increase the impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	+++	+++	+++	+++	+++	+	+	+++	The roll out of SMART Motorways in the area will help to reduce accidents though increasing capacity on the motorway network by using variable speed limits and hard shoulder running at busy times. These changes will promote smoother traffic flows, more reliable journey times and provide more information to drivers, which will all support a reduction in accidents. Pedestrians, cyclists and motorcyclists are vulnerable user groups in terms of accidents, and while accident rates amongst these groups are generally in line with the national average in the GM area, it will still be important to consider the impacts on them. Research also shows that children, young males, disabled and older people are other particularly vulnerable groups in terms of accidents, and also that a higher proportion of accidents occur in deprived areas – of which there are a comparatively large amount in the GM area.
5	Reduce severance	+	++	+	+	++	+	+	++	This principle includes the future development of Greater Manchester's rail hubs. This involves investment in high quality access and interchange facilities at the key hubs, which will be critical to ensure that travellers from across Greater Manchester have excellent access to city-to-city rail services, that are well integrated into the City Region transport system. This would result in it being easier for pedestrians and cyclists to access the rail hubs and other key transport

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										interchanges.
6	Reduce air, noise and light pollution from transport	+++	++	++	+	+	++	+	++	The development and implementation of Smart Motorways will encourage smoother traffic flows, which will mean a reduction in vehicle noise and emissions. Furthermore, improvement to the city to city rail connectivity will support the movement of people, and also help transport more freight by rail rather than road, which will reduce the number of lorries on the road network. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution). Noise pollution can be a major nuisance and is widely recognised as a disbenefit affecting daily life. General annoyance and sleep disturbance are the most widespread effects of environmental noise. Stress has been suggested as a possible mechanism through which noise may affect mental and physical health. Additionally, air pollution can affect people living with long term conditions such as asthma (who will be particularly affected by air pollution). This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution). Noise pollution can be a major nuisance and is widely recognised as a disbenefit affecting daily life. General annoyance and sleep disturbance are the most widespread effects of environmental noise. Stress has been suggested as a possible mechanism through which noise may affect mental and physical health. Additionally, air pollution can affect people living with long term conditions such as asthma (who will be particularly affected by air

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
										pollution).

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	**Gender**	**Disability**	**Ethnicity**	**Faith**	**Sexual Orientation and Gender Reassignment**	**Pregnancy and Maternity**	**Marriage and Civil Partnerships**	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	+	++	+	+	+	+	+	++	This principle will improve accessibility to services, facilities and amenities for all, through early delivery of HS2, and the Northern powerhouse to Manchester City Centre. This will ensure strong connections to major city regions across the North, Birmingham, London, Glasgow and Edinburgh, in supporting the critical flow of goods, skills and information. Having good accessibility to services is particularly important for people who do not have access to a car, older people, children and those with a disability. Approximately 19% of the Greater Manchester population have a long term limiting illness that either limits their life a little or a lot. Up to 18% of the population

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											are over 65 years old and 20% are under 16 years old.
2	Improve affordability of transport	+++	+	++	+	+	+	+	+	++	This principle aims to improve affordability of transport through transforming infrastructure and smart ticketing and customer information, with the aim of encouraging more trans-northern journeys to be made by public transport. This will be supported by a smart 'Northern ticketing system' that makes it simple and easy to travel across the North by any mode of public transport. This will be enhanced by real-time travel information and a simplified fare structure. The emerging Northern smart ticketing system will be compatible with the future Greater Manchester smart ticketing and fares system. Further responsibilities will include ensuring fair ticketing for concessionary travel, multi-modal ticketing schemes and the use of 'smart' transactions. Although Greater Manchester unemployment is in line with national figures, the level of deprivation varies area by area. It is important to ensure the whole population have equal opportunities in accessing transport to enable them to reach key facilities and amenities (such as employment, education and health care).
3	Reduce crime and fear of crime and promote community	0	0	0	0	0	0	0	0	0	This principle would have very little impact on crime and community safety. There is little potential to increase the

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
	safety										impact on this sub-objective.
4	Improve road safety and reduce the number of accidents and other incidents	+++	+	++	+	+	+	+	+	++	The roll out of SMART Motorways in the area will help to reduce accidents though increasing capacity on the motorway network by using variable speed limits and hard shoulder running at busy times. These changes will promote smoother traffic flows, more reliable journey times and provide more information to drivers, which will all support a reduction in accidents. The principle also includes the development and implementation of Smart Motorways, and a reduction in bottle necks on the highway network. These promote the smooth running of traffic flows, which in turn can reduce accidents. In particular, children, young males, disabled and older people are vulnerable in terms of accidents.
5	Reduce severance	++	+	++	+	+	+	+	+	++	This principle concerns the future development of Greater Manchester's rail hubs. This includes investment in high quality access and interchange facilities at the key hubs, which will be critical to ensure that travellers from across Greater Manchester have excellent access to city-to-city rail services, that are well integrated into the City Region transport system. This would result in it being easier for pedestrians and cyclists to access the rail hubs and other key transport interchanges.
6	Reduce air, noise and light	+++	+	++	+	+	+	+	+	+++	The development and implementation of SMART Motorways will encourage smoother traffic flows, which

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
	pollution from transport										will mean a reduction in vehicle noise and emissions. Furthermore, improvement to the city to city rail connectivity will support the movement of people, and also help transport more freight by rail rather than road, which will reduce the number of lories on the road network. This will be of particular benefit for children (who are more likely to be susceptible to the negative effects of noise pollution). Noise pollution can be a major nuisance and is widely recognised as a disbenefit affecting daily life. General annoyance and sleep disturbance are the most widespread effects of environmental noise. Stress has been suggested as a possible mechanism through which noise may affect mental and physical health. Additionally, air pollution can affect people living with long term conditions such as asthma (who will be particularly affected by air pollution).

Spatial Themes: Travel To and Within Our Regional Centre

Part 3 – Spatial	Travel To and Within Our Regional Centre

Themes	
Summary of challenges and interventions (for full text refer to Transport Strategy document dated 01/02/16)	*Our ambition is for fully integrated transport networks that support rapid growth in the economy: with HS2 and Northern Powerhouse Rail services serving the heart of the city centre; traffic levels held at or below 2016 volumes (with fewer trips by goods vehicles during the peak); and with at least 70% of peak hour trips by public transport and 15% on foot or by bike. There will be much better public transport, pedestrian and cycle connections between the City Centre and the outer parts of the Regional Centre and key destinations will be accessible by public transport 24/7. The pedestrian and cycle network will be safe and secure at all times and the negative impacts of traffic on residents will be minimised.* <u>Supporting a Northern Powerhouse Economy</u> The arrival of High Speed 2 (HS2) and Northern Powerhouse Rail services into the Piccadilly Hub will support transformational growth of our Greater Manchester economy and further boost the attractiveness of our Regional Centre as a focus for investment. Improved city-to-city connectivity, particularly by rail, will help to support rapid growth of the Regional Centre's knowledge-based economy enabling more rapid exchange of knowledge and ideas, improved access to skills and labour, and supporting greater levels of productivity and innovation in our great Northern towns and city regions. We are already planning how we can fully integrate these transformational infrastructure improvements with our wider local and regional transport networks to maximise the benefits for Greater Manchester. Our city centre transport hubs will need to expand their role as key gateways to our city region, providing the crucial first impression of Greater Manchester for visitors arriving in the Regional Centre and bringing in workers to support our growing economy. These hubs must be designed to meet rapidly evolving passenger expectations in terms of customer service and experience, and to optimise the expanded role of they will play as highly accessible locations for people to connect and collaborate. Our transport hubs will also be carefully designed to allow seamless interchange between transport services and to improve their connectivity and integration with surrounding areas (particularly through local pedestrian and cycling connections). Piccadilly, Victoria and Salford Central stations will all be important Regional Centre gateways, providing access to national, regional and local transport services, and will be important economic growth and regeneration areas in their own right over the period to 2040. The sheer growth in passenger numbers flowing into, through and out of the interchanges will require a step-change improvement in capacity, quality and legibility of provision for pedestrians in particular. <u>Accommodating Growth in Peak Hour Travel</u> Our transport systems will therefore need to accommodate a dramatic increase in peak hour trips into and across the Regional Centre. We must plan now for this long-term growth to avoid the Regional Centre becoming more congested with traffic. Our focus is therefore on improving the quality and capacity of our public transport, walking and cycling networks to encourage as many people as possible to travel to the Regional Centre by non-car modes. Our aim is to deliver the desired economic growth in the city centre, without any further growth in peak period traffic levels. We recognise that this is a major challenge and estimate that there will be a 76% increase in morning peak period (07.30-09.30) trips into the city centre alone (c.68,000 trips) if we achieve our full growth aspirations by 2040. If we are able to hold peak period traffic levels steady, all of these additional trips will need to be made by public transport, by bicycle or on foot. We will also need to ensure that our Regional Centre walking and cycling networks can cope with the huge increase in public transport passengers who will be walking or cycling from public transport interchanges to their final destination within the city centre. In a constrained City Centre environment, there is only limited opportunity to provide significant additional transport capacity on our road and rail networks. Hence, much of the additional capacity will need to be achieved by making more efficient use of the transport networks we already have by delivering improvements that focus on maximising the efficient movement of people rather than vehicles into and across the city centre. Buses will also need to play a much bigger role in accommodating the growth in trips into and across the regional centre (particularly for trips of 10km or less). We need to transform buses into a mode of transport that all travellers in Greater Manchester are happy to use (as is the case in London), through provision of high quality, reliable services and clean, comfortable vehicles (equipped with wi-fi and any other digital infrastructure which enables people to make productive use of their travel

	time). Our bus reform agenda will focus on delivering bus services that are much better integrated into the rest of our transport network, with simple, integrated, affordable and smart ticketing products that attract a new generation of bus users travelling into and across the Regional Centre. We will review bus termination points within the city centre, to ensure that we have the right balance of cross-city bus services and more buses which turn around at key locations on the edges of the city centre but with improved pedestrian/cycle/Metrolink connectivity to final destinations within the city centre core, supported by simple, low-cost fares for travel within the City Centre. This will help to minimise the negative impacts on pedestrian and cycle movements and air quality and safety of very high numbers of buses travelling through the heart of the City Centre. Walking and cycling are both critical to the success of our Regional Centre. Investment in quality provision for pedestrians and cycling is relatively cheap, enables the movement of high volumes of people in a constrained urban environment, and will help us to create a healthier and cleaner city region. We will continue to invest in high-capacity and high-quality pedestrian and cycle routes into and across the city centre to enable higher proportions of trips to be made by active travel modes. We will also need to carefully manage demand for travel, to encourage people to think about how and when they travel into the Regional Centre. Smart, tailored customer information on travel choices will be a crucial part of this, as will the availability and cost of car parking in the regional centre. We will also have to make difficult decisions on how we allocate roadspace within the regional centre to maximise the efficiency of our transport networks. Without carefully targeted demand management measures, we will simply not achieve the levels of growth that we aspire to, and the Regional Centre will become choked by traffic congestion and pollution. We are also developing detailed plans to determine when and how freight and servicing vehicles access the regional centre, to minimise negative impacts on congestion and quality of life within the regional centre. <u>Supporting a 24/7 Economy</u> We must ensure that our transport network is carefully designed to support this economy, focusing on the needs of different markets at different times of the day and the week, and ensuring that our transport offer is as integrated and easy to understand as possible, particularly for visitors that are less familiar with the Regional Centre. As well as providing public transport services that operate for all or much of the night, both during the week and at weekends, we need to ensure that travel by all modes of transport is safe and secure, and that we make the right provision for crucial supporting transport services, such as chartered coaches and taxis which play a really important role in supporting our leisure economy. A carefully designed car parking management strategy is also critical to the success of our economy. <u>Embracing Innovation</u> We want Manchester to be recognised as a world leader in transport innovation, and the scale and nature of the Regional Centre provides an ideal testbed for trialling transport innovations and embracing new thinking in a thoughtful but proactive way, with a particular focus on maximising the capacity, efficiency, resilience and safety of our Regional Centre transport networks. An improved customer experience will be a particular focus of our efforts, and we will deliver transformational change to the customer experience through technology-supported improvements to information provision, ticketing and payment systems, and wayfinding. We want to ensure that the use of digital communication is widely adopted and that we utilise live information and data to monitor and respond to periods of peak demand and feedback on network performance and reliability. Our users will be able to access real-time information about their journeys so they can make informed choices on their travel options into and within the city centre. <u>Connectivity within a rapidly growing regional centre</u> There are regeneration frameworks already in place for many of these sites, containing ambitious plans for a variety of mixed-use developments, including significant volumes of new housing. As more peripheral Regional Centre sites are developed, we must ensure that they are carefully stitched into the fabric of the surrounding urban area and, in particular, ensure excellent connectivity to our major city centre transport interchanges. We must also fully embed sustainable travel into new developments by providing excellent walking and cycling facilities (including adequate cycle parking provision); developing tailored parking and servicing management strategies; engaging with occupiers to encourage sustainable travel behaviour from the outset; and providing other supporting interventions, such as car clubs, to give occupiers access to a car when needed without the burden and cost of owning and operating a private vehicle.

	We will also focus on improving connectivity between the City Centre and other areas of the Regional Centre. The relatively short distances involved provide an excellent opportunity to promote higher levels of walking and cycling, through ongoing investment in pedestrian and cycle networks, including exploiting the potential of our waterways by providing better facilities along the River Irwell and our extensive canal network. This investment will be supported by comprehensive and consistent on-street and digital wayfinding infrastructure. We are also developing potential improvements to rapid transit connections from our major city centre interchanges to key destinations across the regional centre, including Salford Quays, Media City and Old Trafford; and the Etihad Campus and Manchester Life areas of East Manchester. These will be further bolstered by increased bus coverage within the regional centre, which we will target towards areas with increasing residential populations such as the areas around Salford Central and Greengate. The rapidly expanding city centre will quickly extend beyond the confines of our existing major transport infrastructure, and particularly the Manchester and Salford Inner Relief Route (MSIRR), which comprises the Mancunian Way, Great Ancoats Street and Trinity Way and which creates a significant barrier to movement between the city centre and regional centre. As this expansion occurs, we will continue to review the role and function of major highways, such as the MSIRR, and will seek to minimise the severance effects of such barriers for people moving into and out of the city centre. <u>A liveable city centre</u> A Regional Centre which offers a high quality of life will enable us to attract and retain the skills and talent that our city region needs to fulfil its longterm potential. It will also help to build on Greater Manchester's existing role as a major visitor attraction, by creating a strong, positive first impression to those visiting the city for business or leisure purposes. As well as an attractive built environment, we must provide the right supporting green and blue infrastructure and open spaces, which enable the city to breathe and provide a welcome escape from the hustle and bustle of urban living. Such infrastructure will also provide active travel opportunities, enabling people to move easily and directly through the city on direct and traffic free corridors. This urban environment must be as inclusive as possible, to enable those of all ages and with a range of mobility impairments to enjoy the opportunities and facilities offered within our regional centre. All transport improvements must therefore be designed with inclusivity and accessibility in mind. Our Vision is for a Regional Centre with a city centre core that is focused primarily on the needs of people and not traffic, and where the numbers of motorised vehicles accessing the core is kept to a minimum. We are developing more detailed traffic routing and wayfinding proposals, which balance the need to maintain access for essential servicing vehicles, with the ambition to make the city centre core a truly pedestrian and cycle-focused environment. Over time, we want all vehicles entering the city centre core to be ultra-low emission vehicles (ULEVs). We envisage that all new development will be designed to support active travel modes, minimise car use, and encourage ULEV uptake. The Regional Centre will offer a transport network which has a greatly reduced environmental impact. Sustainable transport will be the natural choice for regional centre residents and visitors, and Greater Manchester will become recognised globally as a Green City Region where air quality problems are a thing of the past, and our carbon emission reduction targets are met. <u>SUMMARY OF INTERVENTIONS</u> - Re-development of Piccadilly station to integrate HS2, Northern Powerhouse Rail, local rail and Metrolink - Increased capacity at Victoria, Salford Central and Oxford Road stations - Reduced highway congestion at the western approach (A57/M602). - Improvements to traffic routing and signing.

	- Additional Ship Canal crossing points to improve regional centre connectivity. - Improved connections into and across the Regional Centre for pedestrians and cyclists. - Increased parking provision for bikes and motorcycles. - Review of bus routing and interchange facilities within the regional centre. - Review of public transport access for the night-time economy - Updated car parking strategy to manage demand for peak hour car travel. - Better sustainable transport links between Manchester city centre, Salford Quays and the Etihad Campus. - Improved coach layover and taxi rank facilities. - Increased capacity for rapid transit in Manchester city centre, including exploring feasibility of new city centre tunnels. - Reducing the number of large goods vehicles at peak times. - Work with businesses to reduce peak hour demand for travel

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives	Description of effect[12]	Scale / significance of effect	Recommendations for mitigation or enhancement

[12] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

1	Improve air quality	The principle outlined for this theme that 85% of peak hour trips into the Regional Centre will be undertaken by sustainable modes aligns with the IA objective as the mode shift will indirectly improve air quality. Furthermore accommodating a 24/7 economy across the Regional Centre via appropriate sustainable transport provision, will indirectly support this objective.	+	The spatial theme could articulate further the importance of tacking air quality in the AQMAs in the regional centre.
2	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	This spatial theme outlines the intention to create a transport network that has a greatly reduced environmental impact. By encouraging as many people as possible to travel to the Regional Centre by non-car mode, such that growth can be accommodated without increasing the levels of traffic congestion within the Regional Centre. The aim to keep peak period traffic levels at 2016 volumes, with at least 70% of peak hour trips to the Regional Centre made by public transport and a further 15% by bicycle/ on foot indirectly aligns with the IA objective of reducing carbon dioxide emissions, particularly from road transport.	+	This spatial theme could state further the positive benefits on carbon emission reductions.
3	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	Proposals such as city centre transport hubs expansion, improving capacity of public transport and cycling networks, improving the rapid transit network are likely to result in slight negative effects on biodiversity given the city centre type of environment, though there could also provide opportunities for biodiversity enhancement. Infrastructure will also include 'Green & Blue' types that will also provide active travel opportunities in traffic free corridors (sometimes through areas of Open Space). Development of this green and blue infrastructure and use of areas of Open Space could have both positive and negative effects on biodiversity. Moves to make more transport networks 24hours could potentially have a negative effect on light sensitive species such as bats, while more extensive use of the River Irwell and canal network may have a negative effect on some water based species. It is also recognised within the Spatial Theme that more efficient use of the transport network will have to be made to provide greater capacity. This will reduce the need for new infrastructure and therefore will likely have an indirect positive effect on biodiversity.	+/-	None
4	Conserve and enhance the European sites *(HRA specific objective)*	*See HRA Stage 1 Screening Report that accompanies Transport Strategy*	N/A	N/A
5	Conserve and enhance the character and quality of GM's landscapes and townscapes	It is recognised that sustainable travel has to be 'stitched into' new developments and therefore focus will be on careful design – this will likely have a positive effect on townscapes.	+	None

		Development of 'Green & Blue' Infrastructure will offer the opportunity for further landscape / townscape enhancement through careful design of screening etc. Increasing capacity via better use of existing assets will reduce the need for new infrastructure in the landscape and improve townscape by reducing traffic congestion.		
6	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	Making better use of the historic canal network will provide an opportunity to highlight these industrial heritage assets. Additional Ship Canal crossing points may offer the opportunity to highlight and access this unique feature. Use of low emission vehicles will help protect historic buildings in the City core from deposition of particulate matter. Use of transport hubs such as Piccadilly station will provide the opportunity to highlight this historic station and its role in the transport of Manchester over the years.	+	None
7	Conserve and enhance the water environment	Proposals such as city centre transport hubs expansion, improving capacity of public transport and cycling networks, improving the rapid transit network are likely to result in slight negative effects in the water environment given the urban context. Development of Green and Blue infrastructure could provide the opportunity to enhance the water environment, though negative effects could also be experienced. Direct effects (positive or negative) could be experienced on the River Irwell, the canal network and the Ship Canal. These assets should be protected during construction and operation.	+/-	None
8	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	Proposals such as city centre transport hubs expansion, improving capacity of public transport and cycling networks, improving the rapid transit network are likely to result in slight negative effects on soil and agricultural resources given the urban context. Development of this infrastructure does though also represent an opportunity to remediate areas of contaminated land – a widespread problem in a formerly heavily industrialised area like Manchester. Therefore the Transport Strategy could have positive and negative effects on this IA Objective.	+/-	None

		Increasing capacity via better use of existing assets will reduce the need for new infrastructure in the landscape and improve townscape by reducing traffic congestion.		
9	Reduce risk of flooding and increase resilience to the effects of a changing climate	Proposals such as city centre transport hubs expansion, improving capacity of public transport and cycling networks, improving the rapid transit network are likely to result in slight negative on flooding given the urban context.	-	None
10	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	No direct consideration is made of the prudent use of natural resources, or minimising the production of waste though schemes to increase capacity of existing infrastructure will help reduce effects of both these issues. No consideration is made of re-use or recycling.	-	None
11	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	The provision of fully integrated transport system, focussing on 24/7 public transport provision to key destinations and an improved and expanded cycling/ pedestrian facilities aligns with this IA objective. The spatial theme outlines an approach to establishing a transport network for the regional centre that enables users access to more sustainable modes of transport, reducing the reliance on the private car.	++	None
12	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	The principle will contribute to achieving this objective. A fully integrated transport system, with a focus on sustainable modes will support the economic growth of the regional centre via an effectively expanded labour market/ improved access to jobs – in particular those in more deprived communities/ without access to a private car. The support of the 24/7 economy with appropriate sustainable transport provision is especially important as it will increase the level of job opportunities to those without access to a private car. The transport proposals will support the growth and expansion of the regional centre, contributing to economic growth.	++	None
13	Coordinate land use and transport planning across GM	Through this spatial theme there is a clear focus on targeting transport improvements where significant new developments are planned. This has a positive benefit for this objective.	++	None
14	Promote greater equality of opportunity for all citizens, with the	This principle aims to improve interchange between different modes and so facilitate multi-stage journeys for people without access to a	++	It will be important to ensure that all interchanges are suitable for people with

	desired outcome of achieving a fairer society (*EqIA specific objective*)	car. It aims to ensure that travel by all modes is safe and secure, so that vulnerable groups are not discouraged from using available services, and aims to remove freight vehicles from the city centre as much as possible. It aims to reduce the levels of motorised vehicles in the city centre to create a pedestrian and cyclist focussed environment.		disabilities, and that extra crossings over the canal are suitable for both pedestrians and cyclists. Any Metrolink extensions above ground should consider the potential for conflict with other modes.
15	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle aims to improve interchange between different modes and so facilitate multi-stage journeys for people without access to a car. It aims to ensure that travel by all modes is safe and secure, so that vulnerable groups are not discouraged from using available services, and aims to remove freight vehicles from the city centre as much as possible, which will reduce accident rates and also improve air and noise pollution levels, which will be beneficial to health. It aims to reduce the levels of motorised vehicles in the city centre to create a pedestrian and cyclist focussed environment, and where car journeys are necessary, it will promote ULEVs, so that the levels of pollution are minimised.	++	It will be important to ensure that all interchanges are suitable for people with disabilities, and that extra crossings over the canal are suitable for both pedestrians and cyclists. Any Metrolink extensions above ground should consider the potential for conflict with other modes.

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	++	?	++	++	+	++	++	This principle makes improvements to accessing key services (including healthcare) in a number of ways: • Improved access to interchanges, including better local walking and cycling connections; • Improved quality and capacity for public transport, as well as walking and cycling networks; • A review of the bus network, ensuring that it is integrated properly with other modes and is reliable; • Investment in pedestrian and cycle links both through and across the city centre; • More night services on buses, which will be of particular benefit to shift workers, including those at hospitals;

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										• Ensuring the new housing has excellent connectivity to the city centre, public transport interchanges, and walking and cycling facilities; All of these measures will help to improve access for people without access to a car (who often experience health problems as a result of poor access to essential healthcare services), which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (9.8%), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). The principle also suggests potentially having fewer buses enter the city centre, and having the final stage of a journey completed by walking, cycling or Metrolink, which could have a particular impact on mobility impaired people, including older people. <u>Recommendations</u> It will be important to ensure that any extra interchange is accessible to people with mobility impairments, and that they are not forced to walk further distances than they are comfortable with.
2	Improve affordability of transport	+	+	+	++	+	+	+	+	This principle aims to introduce affordable smart ticketing, and make sure that there are low cost fares for travel in the city centre. This will be particularly beneficial for low-income groups – there are high levels of deprived people in Manchester, Salford and Rochdale in particular, which are all in the top 20 most deprived authorities in England.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
3	Reduce crime and fear of crime and promote community safety	+	+	+	+	?	+	+	+	This principle aims to improve interchanges, and also to ensure that travel by all modes is safe and secure. It suggests clean and comfortable buses, which will improve the perception of community safety whilst travelling on them. It also includes investing in walking and cycling routes along the waterway network and disused railway lines, as well as through parks and green spaces – while these routes are primarily intended to be used as leisure routes, they will most likely also be used by commuters who will be more likely to use the route in the dark and at times when there will be less natural surveillance. . <u>Recommendations</u> It will be important to ensure that the routes are well lit and have good visibility so that people are able to see any potential dangers. It will also be important to ensure that appropriate equivalent routes in busier areas are also available so that commuters are not dependant on travelling through isolated areas.
4	Improve road safety and reduce the number of accidents and other incidents	+	+	+	++	++	+	+	++	This principle aims to make travel by all modes safe and secure. It proposes management of when and how freight enters the centre in order to reduce conflicts with other vehicles. It also suggests reducing buses entering the centre, and having the final leg of the journey completed by walking, cycling and Metrolink in an attempt to reduce the potential for conflicts. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities. Recommendations If any additional Metrolink is constructed to further penetrate the centre, it will be important to consider the potential for conflicts with other road users.
5	Reduce severance	++	++	++	++	+++	++	++	++	This principle aims to invest in high quality walking and cycling routes into and across the city centre, and to improve wayfinding so that people can make full use of them. It aims to reduce the number of motorised vehicles entering the city centre to produce a pedestrian and cyclist focussed environment. It aims to increase the number of crossing points over canals, and also suggests the possibility of building future city centre rapid transit links underground to minimise the impact they would have on severance. Encouraging active travel will help people to increase their activity levels, which will be beneficial to their health. Levels of childhood obesity in the GM area are higher than the national average (19%, with up to 25% in some authorities) as are levels of adult obesity (up to 30% in some authorities), and facilitating active travel as a part of daily life will help to reduce these levels. Recommendations It will be important to ensure that the new crossing points are wide enough to allow for both pedestrians

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
										and cyclists to use them safely.
6	Reduce air, noise and light pollution from transport	+++	++	+++	+++	++	++	++	++	This principle aims to reduce car trips through demand management, which will have a positive impact on air, noise and light pollution. It aims to promote ULEVs so that any necessary vehicle use will have lower negative impacts. People will be encouraged to use more sustainable modes such as public transport and active travel to move around Manchester. There is to be management of when and how freight enters the centre, which will attempt to reduce the negative impacts of freight vehicles on local communities. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

	Scale of Effect	

EqIA sub-objective		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	Description of effect/Recommendations for mitigation or enhancement
1	Improve accessibility to services, facilities and amenities for all	++	+	++	++	++	+	+	+	++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Improved access to interchanges, including better local walking and cycling connections; • Improved quality and capacity for public transport, as well as walking and cycling networks; • A review of the bus network, ensuring that it is integrated properly with other modes and is reliable; • Investment in pedestrian and cycle links both through and across the city centre; • More night services on buses, which will be of particular benefit to shift workers, including those at hospitals; • Ensuring the new housing has excellent connectivity to the city centre, public transport interchanges, and walking and cycling facilities; All of these measures will help to improve access for people without access to a car (who often experience health problems as a result of poor access to essential healthcare services), which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (9.8%), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). The principle also suggests potentially having fewer buses enter the city centre, and having the final stage of a journey completed by walking, cycling or Metrolink, which could have a particular impact on mobility impaired people, including older people.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											Recommendations It will be important to ensure that any extra interchange is accessible to people with mobility impairments, and that they are not forced to walk further distances than they are comfortable with.
2	Improve affordability of transport	0	0	0	0	0	0	0	0	0	This principle aims to introduce affordable smart ticketing, and make sure that there are low cost fares for travel in the city centre.
3	Reduce crime and fear of crime and promote community safety	+	++	+	++	++	++	+	+	++	This principle aims to improve interchanges, and also to ensure that travel by all modes is safe and secure. It suggests clean and comfortable buses, which will improve the perception of community safety whilst travelling on them. It also includes investing in walking and cycling routes along the waterway network and disused railway lines, as well as through parks and green spaces – while these routes are primarily intended to be used as leisure routes, they will most likely also be used by commuters who will be more likely to use the route in the dark and at times when there will be less natural surveillance. . This is likely to have a greater impact for women, BME people, some religious groups, and LGBT people, as they are more likely to feel vulnerable to crime. Recommendations It will be important to ensure that the routes are well lit

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											and have good visibility so that people are able to see any potential dangers. It will also be important to ensure that appropriate equivalent routes in busier areas are also available so that commuters are not dependant on travelling through isolated areas.
4	Improve road safety and reduce the number of accidents and other incidents	+	+	+	+	+	+	+	+	+	This principle aims to make travel by all modes safe and secure. It proposes management of when and how freight enters the centre in order to reduce conflicts with other vehicles. It also suggests reducing buses entering the centre, and having the final leg of the journey completed by walking, cycling and Metrolink in an attempt to reduce the potential for conflicts. <u>Recommendations</u> If any additional Metrolink is constructed to further penetrate the centre, it will be important to consider the potential for conflicts with other road users.
5	Reduce severance	++	++	++	++	++	++	++	++	++	This principle aims to invest in high quality walking and cycling routes into and across the city centre, and to improve wayfinding so that people can make full use of them. It aims to reduce the number of motorised vehicles entering the city centre to produce a pedestrian and cyclist focussed environment. It aims to increase the number of crossing points over canals, and also suggests the possibility of building future city centre rapid transit links underground to minimise the impact they would have on severance.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											Recommendations It will be important to ensure that the new crossing points are wide enough to allow for both pedestrians and cyclists to use them safely.
6	Reduce air, noise and light pollution from transport	++	++	++	++	++	++	++	++	++	This principle aims to reduce car trips through demand management, which will have a positive impact on air, noise and light pollution. It aims to promote ULEVs so that any necessary vehicle use will have lower negative impacts. People will be encouraged to use more sustainable modes such as public transport and active travel to move around Manchester. There is to be management of when and how freight enters the centre, which will attempt to reduce the negative impacts of freight vehicles on local communities. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

Spatial Themes: Travel Across the Wider City-region

Part 3 – Spatial Themes	**Travel Across the Wider City-region**
Summary of challenges and interventions (for full text refer to Transport Strategy document dated 01/02/16)	*Our ambition is that our regenerated town centres easy to get to, particularly by sustainable modes, and pleasant to walk around and spend time in. Journeys across the area, between centres or to other major destinations will be made easier through better and faster orbital links, reduced congestion, more reliable buses, more effective interchange and better-connected cycle routes. Road accidents will fall, year on year, moving towards our goal of zero deaths and serious injuries. The significant new development expected in GM will be accessible by public transport, so that the impact of the extra trips on the road network is mitigated.* Supporting vital and vibrant town centres All the centres have regeneration strategies aimed at widening their appeal through a better quality 'offer', broadening the range of uses by including housing and community facilities and so increasing footfall to the retail areas. Transport has an important role to play in supporting this regeneration through provision of good quality public transport infrastructure and services, safe cycle and pedestrian routes, secure and convenient car parking, and access for servicing and deliveries. In addition, a more pleasant environment can be created for visitors by reducing the dominance of the car in key areas and improving pedestrian linkages across the centre. Access to employment, services and leisure Although Greater Manchester has an extensive public transport network, there are many locations that are not well served. Major out-of-town employment areas are often difficult to serve by bus, due to shift working or 24/7 operation, which makes the demand too dispersed for viable services. There is a need to improve access by public transport, active travel links and measures such as car club /cycle hire as well as Travel Choices interventions to make people aware of their travel options. Delivering a more reliable highways network The pressure to move increasing volumes of road traffic efficiently across the city region as the population and economy grows must be balanced with protecting local communities and maintaining the viability and accessibility of local centres along key routes, ensuring that they are places for people and not just for traffic. Our priority is to make the best use of the existing road network through a combination of using technology to better manage traffic flows and using Travel Choices interventions to encourage people to travel at different times, on different routes or to switch to public transport, cycling or walking for some of their journeys. Wherever feasible, the highway network should prioritise the movement of people, moving capacity through the most congested locations to ensure that a fast and consistent journey time is achievable. However in some cases highway improvements will be needed to relieve congestion hotspots, to reduce congestion or improve safety on key freight routes, to facilitate new development or to mitigate the impact of traffic on local communities (cross ref to Global and city-city). We will need to ensure that environmental issues arising from new or improved highways are mitigated, particularly in terms of air quality.The growth in logistics will potentially add to congestion on the network. We will work with businesses to develop re-timing strategies to support freight movements outside of peak hours and also consider pilots for different types of Urban Distribution Centre. Both of these measures will reduce congestion and improve air quality in town centres. Providing attractive alternatives to car travel Greater Manchester's public transport network is effective in linking people with the main town and city centres, and has been enhanced by recent investment in

	Metrolink. However this is not the case for many of the more orbital movements: between centres, or to out-of-town locations. Bus services may not exist, due to low demand, or may be unattractive: because congestion results in journey times that are long or unreliable; or because the lack of integration between public transport services and modes makes people unwilling to interchange. Cross-border journeys can also be a problem because of differing ticketing products and fares structures. There is no single solution to the problem, and we will need to identify the best way to improve orbital journeys on a case by case basis. Where there is a high demand and a fast route can be identified linking to a very major trip attractor (i.e. Manchester city centre or, in the future, Manchester Airport) it may be possible to develop new rapid transit routes, using either Metrolink/tram-train (see xx above) or bus. Where demand would not support rapid transit, it may be possible to improve existing bus journey times through bus priority, which already exists on a number of major corridors. We now need to support our ambitious growth plans by creating the right network that enables services to operate with a reliability that will be attractive to customers. We therefore need to make sure that bus priority and other bus infrastructure is in place to support existing and future jobs in the town centres and key employment areas, retail activity and to give easier access to interchanges for onward travel. In some places it may be possible to introduce short sections of segregated route to bypass congestion. We will also need to work with the rail industry to improve rail services for local journeys, bearing in mind the fact that limited capacity often means that a choice has to be made between improving local stopping services and long distance ones. In the future, additional capacity will be released following the arrival of HS2 and through the Northern Transport Strategy (cross ref). Improvements to rail services have the potential to relieve the road network for medium and long distance journeys both within Greater Manchester and to neighbouring areas. Interchanges in the major town centres function as City Region Hubs, facilitating travel across the conurbation and we will continue to make sure that these provide a high level of passenger facilities. We will also identify locations such as local towns and large employment or service sites (e.g. major hospitals) that can increase their role as Local Hubs, making interchange easier for a range of day to day journeys. Cycling can provide a healthy, low cost, alternative to car travel and could offer an alternative for short journeys. However cycle routes are often fragmented and whilst a number of strategic routes have been developed inside the M60, investment elsewhere has been more piecemeal. Lack of funding has meant that sections of cycle route are often improved as opportunities arise, e.g. as part of other highway works, or using developer funding. To encourage cycling we need to ensure that residential areas are linked to key destinations by continuous routes that of a good standard throughout. Travel choices interventions will be needed, particularly to persuade people that journeys involving interchange have become easier. Our programmes will include: working with businesses and their employees to encourage them to use sustainable modes; informing jobseekers about how they could travel to employment opportunities, and providing support; promoting the use of new transport infrastructure and services; working with key healthcare and education sites and tourism venues to promote sustainable travel; and promoting sustainable transport to major new developments. <u>Supporting new development</u> While some additional highway improvements will inevitably be required to serve very large scale developments, particularly on brownfield or greenfield sites (such as the Carrington area or Davenport Green), improvements to the performance and resilience of our highways network will not be achieved simply through infrastructure enhancements. Appropriate demand management tools and techniques will also be needed to manage traffic flows on our highways network, particularly during peak periods. The provision of attractive public transport and active travel alternatives, supported by Travel Choices promotional measures, to reduce the need to travel by car, will be crucial if we are to fulfill Greater Manchester's growth potential in a way that makes the conurbation a highly desirable place to live. In the case of employment development, it will also be vital to provide non-car access for workers, in order to spread the benefits of economic growth throughout the conurbation. While some communities can be served by new, direct public transport links, such as the potential extension of Metrolink from the Trafford Centre into the Barton area, or the Metrolink 'Western Loop', connecting the Medipark area and Davenport Green, the key to improved connectivity will be to improve access via interchange points, not only in the Regional Centre but increasingly through a network of GM Hubs (see XX above), served by better integrated services, including orbital.

	SUMMARY OF INTERVENTIONS - Faster rail journeys and increased capacity for local services - Develop the 'next generation' of rapid transit routes (tramtrain and bus rapid transit), including orbital links, serving key centres and the Airport - Improve the flow of traffic on the most significant local roads - Reduced congestion in the south-east of the conurbation - Better east-west road links in Wigan - Improved maintenance of highways - Improved public transport to major employment and residential areas within and immediately outside GM - Improvements to Interchanges, including in Bury town centres - Better pedestrian and cycle links across town centres, including reduced severance by major roads - Reduced impact of goods vehicles in centres, with better loading/unloading facilities - More parking in centres for cycles and motorcycles - Pedestrian and cycle route improvements to key destinations, particularly using 'green' corridors - Improved road safety at accident blackspots - GM-wide low emission car clubs and cycle hire - Provide infrastructure to serve new development areas, identified through GMSF

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ / --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[13]	Scale / significance of effect		Recommendations for mitigation or enhancement
1	Improve air quality	This spatial theme articulates the support for greater use of public transport and active modes through an enhanced. The potential mode shift from private car to use more sustainable modes may be slightly beneficial to this objective. Furthermore, by aiming to deliver a more efficient and reliable highway network, addressing localised congestion and liaising with businesses to develop freight/ delivery re-timing strategies to ensure these do not add to peak congestion problems will all indirectly contribute to improved air quality.	+		The spatial theme could articulate further the importance of tacking air quality in the AQMAs in this area of GM.
2	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	Supporting greater use of public transport and active modes through an enhanced offering within this spatial area will look to create mode shift from private car to use more sustainable mode. This may be slightly beneficial to this objective. Furthermore, by aiming to deliver a more reliable highway network, addressing localised congestion and liaising with businesses to develop freight/ delivery re-timing strategies to ensure these do not add to peak congestion problems will all indirectly contribute to reducing carbon emissions.	+		None
3	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	There will be a number of infrastructure developments including for example new rail, cycle-ways, rapid transit, pedestrian links and in some instances new roads. These Infrastructure interventions could have a negative effect on biodiversity e. through direct landtake, but also provide an opportunity for biodiversity enhancement – for example through the development / utilisation of 'green corridors'. The Spatial Theme notes though that the priority is to make better use of existing infrastructure e.g. roads and this will reduce the need for new infrastructure.	++	--	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance biodiversity during construction and critically during the operational phase through planned maintenance schemes that recognise the importance of protecting biodiversity e.g. by controlling invasive species. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment or Environmental Impact Assessment (level of assessment to be appropriate to the nature

[13] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

				of the scheme). These assessments should provide greater clarity on how biodiversity will be protected (through mitigation) and /or enhanced during the development of any new infrastructure. This is particularly relevant to the development of new proposed roads and rail links.
4	Conserve and enhance the European sites *(HRA specific objective)*	*See HRA Stage 1 Screening Report that accompanies Transport Strategy*	N/A	N/A
5	Conserve and enhance the character and quality of GM's landscapes and townscapes	Development of new infrastructure could have an effect on landscape / townscape – both positive for example by reducing congestion in some areas of townscape, or negative e.g. by introducing new 'hard' features into the landscape. The standard of design will dictate the effect this will have on these assets, with a good design, taking into account local factors likely providing an enhancement. The reduction of traffic / reducing the dominance of the car, will have a positive impact on townscapes, as will the improved maintenance proposed.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy as it will encourage a range of approaches to protect and enhance the landscape / townscape. This could include appropriate natural screening (which will also enhance biodiversity), as well as the enhancement of public spaces such as station forecourts, or the decluttering of streetscapes. Good design is a key component of this new Principle. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment or Environmental Impact Assessment (level of assessment to be appropriate to the nature of the scheme).. These assessments should make it clearer that careful design of new infrastructure is critical to ensure that effects on landscape / townscape are a positive enhancement.
6	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	Reducing the dominance of the car may provide the opportunity to enhance positively the setting of cultural heritage assets, or the historic centres of towns. Conversely new infrastructure also has the potential to impact negatively on some areas of cultural or historic heritage for example by	+/-	Many features of the transport network are in themselves important historic and cultural heritage assets e.g. railway bridges and stations etc. The new Principle included within the Transport Strategy relating to the Built and Natural Environment will encourage a range of approaches to protect

		impacting on the setting.		and enhance these assets. Also any scheme derived from The Transport Strategy will be subject to environmental assessment. These assessments should encourage sympathetic design in relation to cultural / historical assets with a view to positive enhancement of these and their settings.
7	Conserve and enhance the water environment	No note is made of the water environment but development of transformational infrastructure could have a negative effect on the water environment. Negative effects are most likely during construction but could also occur during operation e.g. through accidental spills. It is noted that interventions are proposed to reduce congestion and improve flows – this will potentially reduce the number of accidents and therefore the risk of accidental fuel spills to watercourses and therefore indirectly benefit the water environment.	-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy addressing the potential risk to the water environment from transport schemes. In addition, it should be made clear in the Strategy document that any scheme to be derived from the Transport Strategy will be subject to environmental assessment and the mitigation developed from this assessment should ensure that the water environment is protected during construction and operation of any transport scheme.
8	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	Development of High Speed Rail links and associated transformational infrastructure will have an effect on soil and agricultural resources in that some areas may be permanently lost. Development of this infrastructure does though also represent an opportunity to remediate areas of contaminated land – a widespread problem in a formerly heavily industrialised area like Manchester. Therefore the Transport Strategy could have positive and negative effects on this IA Objective. The Spatial Theme notes though that the priority is to make better use of existing infrastructure e.g. roads and this will reduce the need for new infrastructure.	+/-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy addressing the need to protect very good agricultural land and to protect soil (if it is not possible to avoid impacts altogether). This Principle also encourages transport projects to remediate land and make use of opportunities for regeneration. The assessment undertaken of any scheme derived from the Transport Strategy should also encourage this approach as appropriate.
9	Reduce risk of flooding and increase resilience to the effects	No consideration is made of the potential for flooding on any of the new potential infrastructure.	++ --	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment

	of a changing climate	Likewise, no consideration is made of the effects of a changing climate on any of the new Transformational Infrastructure.		to be included in the Transport Strategy addressing a changing climate and increased risk of flooding and requiring all transport projects to consider these issues – for both the construction and operational phases. These issues would also be considered during any environmental assessment carried out.
10	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	No direct consideration is made of the prudent use of natural resources, or minimising the production of waste though schemes to increase capacity of existing infrastructure will help reduce effects of both these issues. No consideration is made of re-use or recycling.	-	The proposals within this Spatial Theme reinforce the need for the new Principle relating to the Built and Natural Environment to be included in the Transport Strategy to consider Life Cycle Management during the design of any Transport Scheme. This will therefore ensure the prudent use of natural resources, minimise the production of waste and support recycling. These issues will also be addressed in any environmental assessment.
11	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	By ensuring that the significant new developments will be accessible by public transport and supported by Travel Choices promotional measures improves will reduce the need to access these developments by the private car. This Principle directly aligns with the IA objective. Furthermore, the provision of more attractive alternatives to car travel - including orbital public transport connections all effectively reduce the need to travel by car thereby supporting this objective. The strategy states the need to balance highway improvements with demand management measures.	++	Given the complex travel patterns, particularly associated with orbital movements, reference could be made to multi-modal journeys eg bike-bus/ tram/ train. In particular, to promote using multiple sustainable travel modes.
12	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	Supporting the regeneration strategies of the eight main town centres by improving their accessibility aligns with this objective of promoting economic growth. Improved accessibility by sustainable modes increases access to jobs for all. Furthermore a more reliable highway network will increase the attractiveness of GM's town centres, both promoting economic growth and potentially boosting footfall in their central areas.	++	None
13	Coordinate land use and	The provision of attractive public transport and active travel alternatives for residents and workers in new large scale development,	++	None

	transport planning across GM	supported by Travel Choices promotional measures, to reduce the need to travel by car will contribute positively to this objective.		
14	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle aims to improve interchanges and public transport services so that more people are able to easily make journeys without access to a car. It aims to reduce the impact of freight on vulnerable road users and people with health issues, and plans to encourage mode shift so that the impact of motorised vehicles can be minimised.	++	Travel information should be made available in other languages, and in formats accessible for people with disabilities (especially people with visual impairments and learning difficulties). Transport services and interchanges should also be made accessible for people with disabilities – mobility impairments and also visual impairments in particular. The new fare pricing structure should be designed to be as affordable as possible.
15	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle aims to improve interchanges and public transport services so that more people are able to easily make journeys without access to a car, including promoting sustainable access to hospitals. It aims to reduce the impact of freight on vulnerable road users and people with health issues, and plans to encourage mode shift so that the negative heath impact of motorised vehicles can be minimised.	++	It will be important when considering the integration of transport services that the needs of people accessing healthcare are considered – services need to be regular and offer as direct access as possible. It will also be important to ensure that services are accessible for people with disabilities.

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	++	++	++	++	++	++	++	++	This principle makes improvements to accessing key services (including healthcare) in a number of ways: • Improving orbital connections, to be provided either by rapid transit or priority for existing buses depending on feasibility; • New transport interchanges to enable multi-stage journeys, including City Region Hubs in major town centres and Local Hubs in local towns, large employment sites, or service sites (e.g. hospitals);

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										• Further Metrolink extensions so that more people are served; • Where possible, increasing rail capacity and speed; • Linking residential areas to key destinations by continuous cycle routes of good standard; • Promoting travel choices, including working with healthcare sites to promote sustainable access. All of these measures will help to improve access for people without access to a car (who often experience health problems as a result of poor access to essential healthcare services), which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (9.8%), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). <u>Recommendations</u> In order to maximise the beneficial impact, it will be important to target the travel choices information so that people are able to find the best routes for them, and it will also be important to make sure that the information is accessible, including making it available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015) and making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed materials).
2	Improve affordability of transport	+	+	+	++	+	+	+	+	This principle aims to produce a consistent pricing and payment system, with one account/card used for all

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										public transport and transport sharing schemes. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport. This will be particularly beneficial for low-income groups – there are high levels of deprived people in Manchester, Salford and Rochdale in particular, which are all in the top 20 most deprived authorities in England.
3	Reduce crime and fear of crime and promote community safety	+	+	+	+	+	+	+	+	This principle aims to improve interchanges and waiting facilities, including at railway stations and Metrolink stops, which will improve the perception of security.
4	Improve road safety and reduce the number of accidents and other incidents	+	+	+	++	++	+	+	++	This principle aims to make improvements to improve the safety on key HGV routes, and also considers retiming freight journeys and using urban distribution centres, which would reduce the potential for conflicts with other road users. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.
5	Reduce severance	+	+	+	+	++	+	+	+	This principle considers retiming freight journeys and using urban distribution centres, which would reduce the perception of severance on key freight routes. Any increase in active travel will help people to increase

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										their activity levels, which will be beneficial to their health. Levels of childhood obesity in the GM area are higher than the national average (19%, with up to 25% in some authorities) as are levels of adult obesity (up to 30% in some authorities), and facilitating active travel as a part of daily life will help to reduce these levels.
6	Reduce air, noise and light pollution from transport	++	+	+++	++	+	++	+	++	This principle aims to mitigate environmental impacts of transport, especially air quality. It considers retiming freight journeys and using urban distribution centres, which would reduce the negative impact HGVs have on air quality in urban areas. It also suggests demand management and using new technology to reduce and smooth traffic flows to reduce emissions due to congestion, as well as implementing highway improvements to tackle congestions. It aims to encourage mode shift, by promoting travel choices, especially targeting businesses and jobseekers. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

	Scale of Effect	

EqIA sub-objective		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	Description of effect/Recommendations for mitigation or enhancement
1	Improve accessibility to services, facilities and amenities for all	++	+	++	++	+	+	+	+	++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Improving orbital connections, to be provided either by rapid transit or priority for existing buses depending on feasibility; • New transport interchanges to enable multi-stage journeys, including City Region Hubs in major town centres and Local Hubs in local towns, large employment sites, or service sites (e.g. hospitals); • Further Metrolink extensions so that more people are served; • Where possible, increasing rail capacity and speed; • Linking residential areas to key destinations by continuous cycle routes of good standard; • Promoting travel choices, including working with healthcare and education sites to promote sustainable access, and targeting jobseekers to inform them of how they could travel to employment opportunities. All of these measures will help to improve access for people without access to a car (who often experience health problems as a result of poor access to essential healthcare services), which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (9.8%), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels). <u>Recommendations</u> In order to maximise the beneficial impact, it will be

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		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											important to target the travel choices information so that people are able to find the best routes for them, and it will also be important to make sure that the information is accessible, including making it available in other languages (there were around 29,000 National Insurance number registrations to overseas adults in the GM area in the year to March 2015) and making it available to people with disabilities (especially those with visual impairments and learning difficulties who may struggle with traditional printed materials).
2	Improve affordability of transport	++	++	++	++	++	++	++	++	++	This principle aims to produce a consistent pricing and payment system, with one account/card used for all public transport and transport sharing schemes. The affordability of this will depend on the exact pricing structure, but as a scheme like this would reduce the need to buy multiple tickets for different operators and modes, it is likely that it would improve the affordability of transport.
3	Reduce crime and fear of crime and promote community safety	+	++	+	++	++	++	+	+	+	This principle aims to improve interchanges and waiting facilities, including at railway stations and Metrolink stops, which will improve the perception of security. This is likely to have a greater impact for women, BME people, some religious groups, and LGBT people, as they are more likely to feel vulnerable to crime.
4	Improve road safety and reduce the number of	+	+	+	+	+	+	+	+	+	This principle aims to make improvements to improve the safety on key HGV routes, and also considers retiming freight journeys and using urban distribution centres,

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	accidents and other incidents										which would reduce the potential for conflicts with other road users.
5	Reduce severance	+	+	+	+	+	+	+	+	+	This principle considers retiming freight journeys and using urban distribution centres, which would reduce the perception of severance caused by high HGV levels on key freight routes.
6	Reduce air, noise and light pollution from transport	+++	++	+++	++	++	++	++	++	++	This principle aims to mitigate environmental impacts of transport, especially air quality. It considers retiming freight journeys and using urban distribution centres, which would reduce the negative impact HGVs have on air quality in urban areas. It also suggests demand management and using new technology to reduce and smooth traffic flows to reduce emissions due to congestion, as well as implementing highway improvements to tackle congestions. It aims to encourage mode shift, by promoting travel choices, especially targeting businesses and jobseekers. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy

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											environment.

Spatial Themes: Connected Neighbourhoods

Part 3 – Spatial Themes	Connected Neighbourhoods
Summary of challenges and interventions (for full text refer to Transport Strategy document dated 01/02/16)	*Our ambition is for local neighbourhoods to be safer and more pleasant to walk and cycle around, with the impact of traffic on local roads reduced and a year-on-year reduction in accidents. Active travel will be the natural choice for many short journeys, 10% of which will be made by bike. Easier access to interchanges and to local centres will increase the proportion of journeys made by public transport and ensure that local facilities are supported.* <u>Pedestrian and cycle-friendly neighbourhoods</u> Areas that are easy for people to walk and cycle around also tend to be good places to live, with low traffic speeds, safe links to places like shopping centres, schools, parks, countryside and with interesting public spaces. Neighbourhoods that encourage pedestrian and cycle activity provide more opportunities for social interaction and can improve a sense of security through the presence of other people. <u>Environmental Quality</u> In addition to safety concerns, the pollution and noise from motorised traffic can impact on the quality of life in residential areas and deter people from walking and cycling. Defra has identified areas in all the major cities where noise is a problem, and while electric vehicles will reduce this problem in the medium term, we need to take opportunities to reduce noise through design (including the use of noise-reducing surfacing) or traffic management (smoothing traffic flow) where possible.

	'Green infrastructure' such as parks and roadside trees not only help to create much more pleasant places to live, but bring important environmental benefits through reducing temperatures, noise and pollution as well as absorbing run-off. 'Blue infrastructure' also contributes to our quality of life, and our canals and rivers can provide attractive, traffic-free routes for walking and cycling. <u>Access to local facilities</u> While for many people the daily commute is the journey they are most concerned about, the majority of journeys in Greater Manchester are not to work but for shopping, education, leisure, or to local services like healthcare. Everyone needs easy access to these facilities to meet their day to day needs. Our aim is to achieve centres that are walkable, with pedestrian-friendly spaces, which accommodate access by bike and by public transport but are still accessible by car and are viable for business. The school journey can have a significant impact on local traffic and transporting children to school by car also contributes to reduced levels of fitness and increasing obesity. For journeys to primary school, a switch to more walking or cycling would both reduce traffic in residential areas and improve the health of our young people. Journeys to secondary school are generally longer, but many could still be made on foot or by bike if safer routes and cycle parking were provided. To encourage more school pupils to walk or cycle to school we need to: work with the Health sector to promote active travel to schools, including the development of school travel plans; continue to provide 'Bikeability' training to primary school pupils, as funding allows; and work with secondary schools that are located close to local cycle networks to encourage cycling, including the provision of secure cycle parking. Many secondary school journeys are made by public transport, particularly bus. Local authorities have a statutory obligation to provide free school transport for journeys over a certain length but in addition, fare-paying, dedicated school services are also provided to some schools by TfGM. In view of the rising cost of this provision, these journeys should be integrated as much as possible into the general local bus network, with shorter journeys made by cycling or walking where possible. The location of services can affect peoples' ability to reach them without a car. The reorganisation of healthcare under the 'Healthier Together' programme will lead to more services being provided at the local level, rather than in hospitals, but this will be in a reduced number of 'super surgeries', rather than at the current GP surgeries. Good access is vital, as missed appointments can lead to poorer health outcomes, and for the rising proportion of people in their eighties, regular check-ups may prevent the need for a hospital stay. <u>Access to public transport</u> Most people in Greater Manchester are within walking distance of public transport. However, in an ageing society, an increasing number of people may have difficulty in walking to a station or stop. The quality and safety of the route and the waiting environment also affect people's willingness to use the services on offer. Many local stations are therefore not used to their full potential. We need to make them more appealing as waiting environments, with a consistent standard of facilities and information provision, including signing from the highway and locations such as town centres. In addition, making them more effective as interchanges, through provision of cycle parking, bus links and, where appropriate, car parking will increase usage. The development of station travel plans can maximise access by sustainable modes and raise awareness of the station locally. Park and ride facilities need to be carefully located, as they can lead to people driving further before they start their public transport journey. Our policies for the bus network are described in Chapter 6. Given financial constraints, we have to recognise that it will never be possible to provide all the services that people need and will need to maximise the potential of local self-help and innovative solutions.

	Inclusive Neighbourhoods Designing new infrastructure and services to improve accessibility for people with mobility problems will have the additional benefit of futureproofing the transport network to meet the needs of an ageing society. Our specific policies on improving accessibility are set out in Chapter 6, however we also need to make sure that other schemes do not disadvantage people with mobility problems and that they make the most of opportunities to improve accessibility. TfGM already works with the Disability Design Reference Group to do this in relation to public transport infrastructure. Measures that need to be considered as part of transport schemes include the provision of tactile paving and raised bus stop kerbs, extended crossing times at signals, provision of seating (including informal seating opportunities such as low walls), toilets and dementia-friendly design such as clear signage and provision of distinctive landmarks to aid navigation. Where 'shared space' schemes are introduced to give greater pedestrian priority in centres, these must be made safe for visually impaired people to navigate safely, by including or retaining tactile features. People living in rural areas also experience specific transport problems. They generally have to travel further to reach key services and therefore may have less potential to walk or cycle. Public transport provision is limited due to the low demand, which means that these areas are more car-dependent. At the same time, their importance as locations for recreation or their position on strategic routes can lead to high traffic volumes on unsuitable roads. Roads in the Pennine fringe areas have particular maintenance problems due to the topography and the weather, with structures such as drystone walls and gullies essential to keeping key arteries open. To improve access in rural areas we need to: improve interchange between rail and bus at rural stations; maintain Rights of Way and Bridleways as funding allows; support proposals for speed reduction, including 'quiet lanes' where this will provide safer walking and cycling links to local facilities such as schools and stations; and infill gaps in long distance walking and cycling routes that improve access to the countryside. Changing travel behaviour Our policies for achieving better connected neighbourhoods will make it easier for people to travel by sustainable modes, particularly walking and cycling. However improvements in infrastructure and services need to be complemented by Travel Choices promotions to influence travel decisions at the local level. These need to focus on promoting active travel for short journeys, including journeys to school, encouraging the use of local stations, promoting sustainable travel in new developments and promoting the use of new transport infrastructure. SUMMARY OF INTERVENTIONS - Improved facilities at local stations - More accessible 'public realm', including bus stops - Better pedestrian and cycle links to stations and stops, as well as to local facilities - Road safety measures where there is a high risk to vulnerable road users - 20mph zones or limits in prioritised locations - Reduced noise levels in identified 'hotspot' areas

Assessment Scale	Assessment Category	Significance of Effect
+++	Large beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Strong adverse	
?	Effect uncertain	
+/-	Combination of slight beneficial and adverse effects	Not significant
++ --	Combination of moderate beneficial and adverse effects	Significant

IA Objectives		Description of effect[14]	Scale / significance of effect	Recommendations for mitigation or enhancement
1	Improve air quality	This supports the greater use of active travel modes through improved safety and more attractive local areas, along with easier access to interchanges promoting the use of public transport. Whilst not the primary aim of this intervention, the potential mode shift from private car to the use of active travel and/ or public transport generated through a safer, more attractive local area may be slightly beneficial to air quality within the local neighbourhoods of GM. Promoting the support of local facilities seeks to enhance this mode shift by reducing trip lengths and/ or supporting the use of sustainable travel modes. The environmental quality principles will also be of a slight benefit to	+	None

[14] This includes the effects' magnitude, geographical scale, time period over which they occur, whether they are permanent or temporary, positive or negative, probable or improbable, reversible or irreversible, frequent or rare

		improving air quality.		
2	Reduce carbon dioxide (CO_2) emissions from transport overall, with particular emphasis on road transport	Reducing CO2 is not the primary aim of this intervention. However the aspirations seek to generate a mode shift from the private car to active modes and/ or public transport - generated by providing safer, more attractive local areas to promote cycling and walking and through improved access to interchanges. Promoting the support of local facilities seeks to enhance this mode shift by reducing trip lengths and/ or supporting the use of sustainable travel modes. There could be a slight benefit with the reduction of CO2 associated with this mode shift and/ or reduction in trip length. The environmental quality principles will also be of a slight benefit to reducing carbon emissions.	+	None
3	Conserve and enhance biodiversity, green infrastructure and geodiversity assets	This theme refers vaguely to the benefits of both 'Green' & 'Blue' infrastructure under Environmental Quality but no concrete approaches or interventions are proposed in this regard. The creation of such type of infrastructure has the potential to enhance positively biodiversity.	+	It is recommended that a better explanation is provided in the Strategy of the approaches and interventions regarding 'Green' & 'Blue' infrastructure and that this explanation is provided under its own heading rather than under Environmental Quality. In addition, the proposed new 'Environmentally-Responsible' principle covers this aspect and many other Environmental Quality aspects and applies across the Spatial themes. The current text under Environmental Quality under this theme is too generic and missing in many key aspects. It is recommended that the topic of Environmental Quality is removed from this Spatial theme, apart possibly from providing further explanation about 'Green' and 'Blue' infrastructure proposals as mentioned above, if indeed this is important from a Connected Neighbourhoods perspective only. Otherwise, it is suggested that better explanation are provided with regards to other relevant spatial themes.
4	Conserve and enhance the European sites *(HRA specific objective)*	*See HRA Stage 1 Screening Report that accompanies Transport Strategy*	N/A	N/A

5	Conserve and enhance the character and quality of GM's landscapes and townscapes	Development of 'Green & Blue' Infrastructure will offer the opportunity for further landscape / townscape enhancement through careful design of screening etc. Proposals are however unclear in this regard.	+	See recommendation for IA Objective 3.
6	Conserve and enhance the quality and distinctiveness of historic and cultural heritage	Making better use of the canal network by the development of 'Blue' infrastructure will provide the opportunity to highlight these industrial heritage assets. Proposals are however unclear in this regard.	+	See recommendation for IA Objective 3.
7	Conserve and enhance the water environment	Development of Blue infrastructure could provide the opportunity to enhance the water environment, though negative effects could also be experienced. Proposals are however unclear in this regard.	+/-	See recommendation for IA Objective 3.
8	Conserve soil and agricultural resources and seek to remediate / avoid land contamination	The development of 'Green' Infrastructure could provide the opportunity to protect and enhance soil resources, as well as remediate areas of contamination – a widespread problem in a formerly heavily industrialised area like Greater Manchester. Proposals are however unclear in this regard.	+	See recommendation for IA Objective 3.
9	Reduce risk of flooding and increase resilience to the effects of a changing climate	Developing 'Green' and 'Blue' Infrastructure and utilising the river and canal network may assist in reducing the risk of flooding but it may also exacerbate the potential for flooding along these assets to occur. Proposals are however unclear in this regard.	+/-	See recommendation for IA Objective 3.
10	Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling	No consideration is made of the prudent use of natural resources, minimising the production of waste and supporting recycling. These are all issues relevant to the development of any new infrastructure – no matter how small the piece of infrastructure e.g. this concept applies to the installation of a bus stop as well as much larger schemes.	-	See recommendation for IA Objective 3.
11	Reduce the need to travel by car or move goods by road and promote sustainable modes of transport	By encouraging and supporting both active travel modes and public transport trips, the intervention aligns with this IA objective. The desire to promote the use of local facilities aims to further reduce the need/ distance to travel.	++	The Strategy states it aims for '10% of shorter journeys will be made by bicycle'. It is recommended that a definition is provided of what a 'shorter journey' is.
12	Promote economic growth and job creation across the sub-region, and improve access to jobs for all	Supporting the greater use of active travel modes through improved safety and more attractive local areas, along with easier access to interchanges promoting the use of public transport effectively improves the access to employment opportunities. Promoting an attractive local living environment both contributes to retaining the local labour market needed to support economic growth	+	None

		and may encourage the promotion of local economic growth as local facilities are supported.		
13	Coordinate land use and transport planning across GM	This theme seeks to outline principles that will integrate land use and transport planning at the local level.	+	None
14	Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (*EqIA specific objective*)	This principle aims to improve connections and integration of transport services for people who do not have access to a car. It aims to reduce speed limits, which will make roads more suitable for walking and cycling, and will also reduce the perception of severance. Infrastructure and services is to be designed to ensure that people with mobility and visual impairments are able to make full use of facilities.	+++	None
15	Improve health and well-being for all citizens and reduce inequalities in health (*HIA specific objective*)	This principle aims to improve connections and integration of transport services for people who do not have access to a car. It aims to reduce speed limits, which will make roads more suitable for walking and cycling, and will also reduce the perception of severance and so help to promote active travel, which will increase activity levels. Infrastructure and services is to be designed to ensure that people with mobility and visual impairments are able to make full use of facilities. Active travel will be promoted in schools, which will help to instil healthy habits in children from a young age.	+++	None

HIA sub-objective		**Scale of Effect**								**Description of effect/Recommendations for mitigation or enhancement**
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	**Assessment summary**	
1	Improve accessibility to services, facilities and amenities for all	+++	+++	+++	+++	+++	+++	++	+++	This principle makes improvements to accessing key services (including healthcare) in a number of ways: • Improved access to interchanges, including better local walking and cycling connections, with the possibility of developing station travel plans; • "Healthier Together", an initiative that proposes relocating many medical services to "super GPs" so that more healthcare is available at a local level, reducing the need to travel to hospitals for more

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										basic care; • Designing infrastructure and services to improve access for people with mobility impairments; • Improving the interchange between rail and bus at rural stations so that sustainable travel for the whole journey is possible; • Maintaining Public Rights of Way and bridleways; • Creating "quiet lanes", roads with speed reduction to make them more suitable for walking and cycling; • Filling in gaps in existing walking a cycling routes; • Improving accessibility in the public realm, ensuring that design is suitable for people with mobility impairments and visual impairments; • Using emerging technology to improve demand responsive community services. All of these measures will help to improve access for people without access to a car (who often experience health problems as a result of poor access to essential healthcare services), which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (9.8%), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels).
2	Improve affordability of transport	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.
3	Reduce crime and fear of crime and promote community safety	+	+	+	+	+	+	+	+	This principle aims to improve interchanges and waiting facilities, which will improve the perception of security. It aims to promote areas with high levels of walking and cycling so that there is natural surveillance, which will

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										also improve the perception of security.
4	Improve road safety and reduce the number of accidents and other incidents	++	++	++	+++	+++	+++	++	+++	This principle aims improve road safety, especially where there is high risk for vulnerable users. It proposes 20mph zones in some residential areas, which will reduce the severity of any accidents that occur, and also suggests that where main roads pass through residential areas, there are “trixi-mirrors” at key junctions, allowing for improved visibility of cyclists. These routes would also potentially have improved crossings and segregated cycle lanes. Pedestrian and cycle routes would be maintained to ensure that they are safe to use, and Bikeability training would be offered to residents so that they know how to cycle safely. Where “shared space” is used in the public realm, it will be made safe for visually impaired people through the use of tactile features for them to navigate by. In addition to being particularly beneficial for pedestrians and cyclists, the pedestrian death rate for children from more deprived families is higher than the average and disadvantaged groups are more likely to be involved in a road accident, so a reduction in accidents should also be beneficial for people in deprived communities.

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
5	Reduce severance	++	++	++	++	+++	++	++	++	This principle aims to promote active travel, improve long distance cycle routes, and to maintain existing Public Rights of Way and bridleways. It will promote "quiet lanes", roads where speed is reduced to allow safe walling and cycling routes, and also 20mph zones in residential areas which will decrease the perception of severance. It will aim to develop local cycle networks, walkable town centres, and pedestrian friendly spaces where possible, as well as giving greater priority to pedestrians and cyclists on busier through streets. Encouraging active travel will help people to increase their activity levels, which will be beneficial to their health. Levels of childhood obesity in the GM area are higher than the national average (19%, with up to 25% in some authorities) as are levels of adult obesity (up to 30% in some authorities), and facilitating active travel as a part of daily life will help to reduce these levels.
6	Reduce air, noise and light pollution from transport	+++	++	+++	+++	++	++	++	+++	This principle aims to reduce noise levels in identified hotspot areas, using both design (e.g. noise reducing surfaces) and traffic management (smoothing traffic flow). It aims to change travel behaviour and promote mode shift, including encouraging active travel to school, which will reduce car trips and so have a positive impact on air, noise and light pollution levels. It suggests that any Park and Ride sites to be implemented will need to be considered carefully, to ensure that they do not increase distances driven or exacerbate any local air and noise quality issues. People in deprived communities tend to experience poorer air quality as a result of transport related air

HIA sub-objective		Scale of Effect								Description of effect/Recommendations for mitigation or enhancement
		Children and adolescents	Older people	Disabled/ other health problems	Low-income groups	Cyclists, pedestrians, commuters	Residents	Employees	Assessment summary	
										pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
1	Improve accessibility to services, facilities and amenities for all	+++	++	+++	+++	++	++	++	++	+++	This principle makes improvements to accessing key services and job opportunities in a number of ways: • Improved access to interchanges, including better local walking and cycling connections, with the possibility of developing station travel plans; • "Healthier Together", an initiative that proposes relocating many medical services to "super GPs" so that more healthcare is available at a local level,

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											reducing the need to travel to hospitals for more basic care; • Designing infrastructure and services to improve access for people with mobility impairments; • Improving the interchange between rail and bus at rural stations so that sustainable travel for the whole journey is possible; • Maintaining Public Rights of Way and bridleways; • Creating "quiet lanes", roads with speed reduction to make them more suitable for walking and cycling; • Filling in gaps in existing walking a cycling routes; • Improving accessibility in the public realm, ensuring that design is suitable for people with mobility impairments and visual impairments; • Using emerging technology to improve demand responsive community services. All of these measures will help to improve access for people without access to a car (who often experience health problems as a result of poor access to essential healthcare services), which will include children (20% of people in Greater Manchester area), older people (up to 18%) and people with disabilities (9.8%), as well as potentially higher levels of Black and Minority Ethnic (BME) people (16.4%, with pockets of much higher levels).
2	Improve affordability of transport	0	0	0	0	0	0	0	0	0	This principle would have very little impact on this sub-objective, and there is little potential to increase the impact.

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
3	Reduce crime and fear of crime and promote community safety	+	++	+	++	++	++	+	+	++	This principle aims to improve interchanges and waiting facilities, which will improve the perception of security. It aims to promote areas with high levels of walking and cycling so that there is natural surveillance, which will also improve the perception of security. This is likely to have a greater impact for women, BME people, some religious groups, and LGBT people, as they are more likely to feel vulnerable to crime.
4	Improve road safety and reduce the number of accidents and other incidents	+++	+++	+++	+++	+++	+++	+++	+++	+++	This principle aims improve road safety, especially where there is high risk for vulnerable users. It proposes 20mph zones in some residential areas, which will reduce the severity of any accidents that occur, and also suggests that where main roads pass through residential areas, there are “trixi-mirrors” at key junctions, allowing for improved visibility of cyclists. These routes would also potentially have improved crossings and segregated cycle lanes. Pedestrian and cycle routes would be maintained to ensure that they are safe to use, and Bikeability training would be offered to residents so that they know how to cycle safely. Where “shared space” is used in the public realm, t will be made safe for visually impaired people through the use of tactile features for them to navigate by.
5	Reduce severance	+++	+++	+++	+++	+++	+++	+++	+++	+++	This principle aims to promote active travel, improve long distance cycle routes, and to maintain existing Public Rights of Way and bridleways. It will promote “quiet lanes”, roads where speed is reduced to allow safe walling and cycling routes, and also 20mph zones in

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											residential areas which will decrease the perception of severance. It will aim to develop local cycle networks, walkable town centres, and pedestrian friendly spaces where possible, as well as giving greater priority to pedestrians and cyclists on busier through streets. <u>Recommendations</u> It will be important to ensure that 20mph speed limits are enforced, so that the benefits can be felt.
6	Reduce air, noise and light pollution from transport	+++	+++	+++	+++	+++	+++	+++	+++	+++	This principle aims to reduce noise levels in identified hotspot areas, using both design (e.g. noise reducing surfaces) and traffic management (smoothing traffic flow). It aims to change travel behaviour and promote mode shift, including encouraging active travel to school, which will reduce car trips and so have a positive impact on air, noise and light pollution levels. It suggests that any Park and Ride sites to be implemented will need to be considered carefully, to ensure that they do not increase distances driven or exacerbate any local air and noise quality issues. People in deprived communities tend to experience poorer air quality as a result of transport related air pollution and to suffer the health impacts of it, so any improvements would benefit them particularly. Around 19% of GM residents are currently living with long term conditions, which includes conditions such as asthma – people suffering with breathing difficulties will benefit from a reduction in air pollution. Children in particular

EqIA sub-objective		Scale of Effect									Description of effect/Recommendations for mitigation or enhancement
		Age	Gender	Disability	Ethnicity	Faith	Sexual Orientation and Gender Reassignment	Pregnancy and Maternity	Marriage and Civil Partnerships	Assessment summary	
											will benefit from a reduction in noise pollution, as they are most likely to suffer the negative effects of a noisy environment.

Appendix F. **Assessment of Delivery Plan 1**

IA Objective 1 – Improve Air Quality

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on Air Quality	
Highways	**New Highway Links**	New highway links would provide new road infrastructure and potentially increase vehicle-kilometres, as well as having emissions during construction. Without mitigation, these schemes would lead to an increase in pollution emissions in the local area, though may reduce levels of emissions in other areas that experience reduced congestion or a change in traffic patterns.	• Effective Design • Management of Vehicle speed • High Occupancy Lanes and Cycle Lanes • Increase distances between traffic and sensitive receptors • Encourage use of Low Emission Vehicles	Moderate adverse --	Moderate beneficial ++
	Highway Infrastructure Improvements	Highway Infrastructure improvements can lead to reduced congestion or a change in traffic patterns, through removal of pinch points, junction improvements etc. This would lead to a decrease in emissions, though this can be offset by an increase in vehicle kilometres as a greater volume of traffic may be attracted to the improved route.	• Effective Design • Management of Vehicle speed • High Occupancy Lanes and Cycle Lanes • Increase distances between traffic and sensitive receptors • Encourage use of Low Emission Vehicles	Moderate adverse --	Moderate beneficial ++
Railways	**Rail Links**	These type of schemes would typically result in beneficial effects as a result of mode shift to rail though new rail lines would entail emissions during construction as well as introducing new emissions to areas not previously effected by train emissions.	• Newer technology trains • Increased electrification of the rail network	Moderate beneficial ++	
	Rail Infrastructure Improvements	These type of schemes would typically result in beneficial effects as a result of mode shift to rail. There may be some adverse effects associated with train frequency leading to increased air pollution, though this would be ameliorated in some areas through electrification of the network (e.g. Bolton – Wigan) and it is therefore considered overall	• Newer technology trains • Increased electrification of the rail network	Moderate beneficial ++	

		beneficial.		
	Station Upgrade	Station upgrades would encourage a mode shift to rail and therefore reduce emissions from cars. There may be some adverse effects associated with an increase in train frequency leading to increased air pollution though this would be ameliorated in some areas through electrification of the network (e.g. Bolton – Wigan) and it is therefore considered overall beneficial.	• Newer technology trains • Increased electrification of the rail network	Moderate beneficial ++
Public Transport (excl. Rail)	**Metrolink & Bus**	Increasing and improving the Metrolink and Bus network, alongside improvement in their facilities and capacity will promote a modal shift away from car use to these types of transport. Investment in bus fleets with lower emissions will also encourage an improvement in air quality – particularly in areas adjacent to bus routes. Some emissions will still occur but it is considered that overall there will be moderate benefit.	• Encourage further investment in low emission bus vehicles	Moderate beneficial ++
	Minor Works	The range of schemes proposed will likely result in increased use of sustainable transport options (and support a modal shift to these options), including walking and cycling and will lead to a reduction in vehicle emissions.	• None identified	Strong beneficial +++
	Station & Interchange Works	Improvements to existing stations and facilities, alongside increasing access to adjacent key destinations, will encourage a modal shift to bus and rail and thereby reduce vehicle emissions.	• None identified	Strong beneficial +++
Various	**EV Facilitating**	Expansion of the EV charging point network will include more than 200 fast charging bays across GM. This will make ownership and use of EV cars more convenient across the region and lead to a reduction in vehicle	• None identified	Strong beneficial +++

		emissions.		
Waterways	**Sustainable Freight Infrastructure**	The proposed scheme for a wharf at Port Salford on the Manchester Ship Canal will allow the diversion of freight from the road & rail networks. This will result in overall reduced pollution emissions (some will still be emitted by the shipping required and during the construction process) and an overall improvement in air quality.	• None identified	Moderate beneficial ++

Overview of Recommended Mitigation for Air Quality: It will be important to reduce emissions and protect air quality as much as possible. Mitigation measures may affect the project design, layout, construction, operation and/or may comprise measures to improve air quality in pollution hotspots beyond the immediate locality of the scheme. Measures could include, but are not limited to, changes to the route of the new scheme, changes to the proximity of vehicles to local receptors in the existing route, physical means including barriers to trap or better disperse emissions, and speed control. The implementation of mitigation measures may require working with partners to support their delivery.

IA Objective 2 – Reduce carbon dioxide (CO2) emissions from transport overall, with a particular emphasis on road transport

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on Carbon dioxide emissions	
Highways	**New Highway Links**	New highway links would provide new road infrastructure and potentially increase vehicle-kilometres, as well as causing carbon emissions during construction.	• Effective Design • Management of Vehicle speed • High Occupancy Lanes and Cycle Lanes • Increase distances between traffic and sensitive receptors • Encourage use of Low Emission Vehicles • Methods to reduce Carbon Footprint during construction e.g. use by contractor of carbon calculator	Moderate adverse --	Moderate beneficial ++

	Highway Infrastructure Improvements	Highway Infrastructure improvements can lead to reduced congestion or a change in traffic patterns, through removal of pinch points, junction improvements etc. This would lead to a decrease in carbon emissions, though this gain can be offset by an increase in vehicle kilometres as a greater volume of traffic may be attracted to the improved route.	• Effective Design • Management of Vehicle speed • High Occupancy Lanes and Cycle Lanes • Encourage use of Low Emission Vehicles • Methods to reduce Carbon Footprint during construction e.g. use by contractor of carbon calculator	Moderate adverse --	Moderate beneficial ++
Railways	**Rail Links**	These type of schemes would typically result in beneficial effects as a result of mode shift to rail though new rail lines would entail emissions during construction as well as introducing new emissions to areas not previously effected by train emissions. Increased rail travel should lead to an overall reduction in carbon dioxide emissions – particularly if electric powered trains are used. There would still be carbon dioxide emissions from the use of non-electric trains and their frequency under these schemes would increase. Overall though it is considered to be beneficial.	• Newer technology trains • Increased electrification of the rail network • Newer technology trains • Further Electrification of network • Methods to reduce Carbon Footprint during construction e.g. use by contractor of carbon calculator	Moderate beneficial ++	
	Rail Infrastructure Improvements	These type of schemes would typically result in beneficial effects as a result of mode shift to rail. There may be some adverse effects associated with train frequency leading to increased carbon emissions, though this would be ameliorated in some areas through electrification of the network (e.g. Bolton – Wigan) and it is therefore considered overall beneficial.	• Newer technology trains • Increased electrification of the rail network • Further Electrification of network • Methods to reduce Carbon Footprint during construction e.g. use by contractor of carbon calculator	Moderate beneficial ++	
	Station Upgrade	Station upgrades would encourage a mode shift to rail and thereby reduce carbon emissions from road traffic. There may be some adverse effects associated with an	• Newer technology trains • Increased electrification of the rail network • Further Electrification of network	Moderate beneficial ++	

		increase in train frequency leading to increased carbon emissions though this would be ameliorated in some areas through electrification of the network (e.g. Bolton – Wigan) and it is therefore considered overall beneficial.	• Methods to reduce Carbon Footprint during construction e.g. use by contractor of carbon calculator	
Public Transport (excl. Rail)	**Metrolink & Bus**	Increasing and improving the Metrolink and Bus network, alongside improvement in their facilities and capacity will promote a modal shift away from car use to these types of transport. Investment in bus fleets with lower emissions will also include a reduction in carbon emissions. Some carbon emissions will still occur but it is considered that overall there will be moderate benefit.	• Encourage further investment in low emission bus vehicles	Moderate beneficial ++
	Minor Works	The range of schemes proposed will likely result in increased use of sustainable transport options (and support a modal shift to these options), including walking and cycling and will lead to a reduction in vehicle carbon emissions.	• None identified	Strong beneficial +++
	Station & Interchange Works	Improvements to existing stations and facilities, alongside increasing access to adjacent key destinations, will encourage a modal shift to bus and rail and thereby reduce vehicle emissions.	• None identified	Strong beneficial +++
Various	**EV Facilitating**	Expansion of the EV charging point network will include more than 200 fast charging bays across GM. This will make ownership and use of EV cars more convenient across the region and lead to a reduction in vehicle emissions.	• None identified	Strong beneficial +++
Waterways	**Sustainable Freight Infrastructure**	The proposed scheme for a wharf at Port Salford on the Manchester Ship Canal will allow the diversion of freight from the road & rail networks. This will result in overall	• Methods to reduce Carbon Footprint during construction e.g. use by contractor of carbon calculator	Moderate beneficial ++

		reduced emissions of carbon (some will still be emitted by the shipping required) and an overall improvement in air quality. Note that the construction of the wharf will result in carbon emissions.		

Overview of Recommended Mitigation for Carbon: Due to the potential threats posed by a changing climate and in order to meet Government commitments to reducing carbon emissions, measures should be taken to reduce the amount of carbon from our transport system. Reductions would mainly be from vehicles and can be found in many of the measures suggested to reduce air pollution emissions, but further reductions to the carbon footprint can be found in the construction and operation of transport network assets – for example by using more energy efficient lights. The carbon footprint can be readily measured at construction and operation by use of an appropriate carbon calculator.

IA Objective 3 – Conserve and enhance biodiversity, green infrastructure and geodiversity assets & IA Objective 4 - Conserve and enhance the European sites (HRA specific objective)

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on Biodiversity
Highways	**New Highway Links**	New road infrastructure can lead to direct loss of or encroachment onto habitat or the severance / fragmentation of green infrastructure. Fauna can also be directly lost through road kill etc. Indirect effects can also be experienced via noise, pollutant deposition etc.	• Compensatory green infrastructure – including development of 'Green Streets' • Scheme realignment – particularly if designated areas may be effected • Screening with native species • Development of wildflower meadows along route alignment or at junction islands etc. • Animal under / over passes • Installation of bird / bat boxes	Moderate adverse --

	Highway Infrastructure Improvements	Improvements to road infrastructure such as removing pinch points could lead to the encroachment onto or fragmentation of existing green infrastructure corridors, or lead to direct loss of habitat, some of which could be priority habitat.	• Compensatory green infrastructure – including development of 'Green Streets' • Screening with native species • Development of wildflower meadows along route alignment • Planting of junction islands etc with wildflowers	Moderate adverse --
Railways	**Rail Links**	New rail links would lead to direct loss of or encroachment onto habitat or the severance / fragmentation of green infrastructure. Fauna could also be lost through train strike. Indirect effects can also be experienced via noise and vibration – though this would be intermittent as trains pass.	• Protect green corridors • Planting of appropriate native species • Animal over / under passes • Consideration of installation of bird / bat boxes • Consideration of planting of trees	Moderate adverse --
	Rail Infrastructure Improvements	An adverse effect could be expected on biodiversity along rail infrastructure corridors as a result of potential land required for track capacity and at a later stage potential electrification. Loss of trees and other planting due to requirement for embankment safety is another issue. Direct loss of fauna can be experienced through strikes by train.	• Protect green corridors • Planting of appropriate native species • Animal over / under passes • Consideration of installation of bird / bat boxes • Consideration of planting of trees	Moderate adverse --
	Station Upgrade	Effects on biodiversity are anticipated to be limited as stations are already existing and within urban areas for the most part.	• Consideration of installation of bird / bat boxes • Consideration of planting of trees	Neutral 0
Public Transport (excl. Rail)	**Metrolink & Bus**	The proposed schemes are for the most part in previously developed areas and direct loss or encroachment onto habitat is likely to be limited. These areas are also likely to be already subject to noise / vibration and other disturbance.	• Consideration of installation of bird / bat boxes • Consideration of planting of trees	Neutral 0
	Minor Works	The proposed schemes are for the most part in previously developed areas (such as town	• Consideration of installation of bird / bat boxes	Neutral

		centres) and direct loss or encroachment onto habitat is likely to be limited. These areas are also likely to be already subject to noise / vibration and other disturbance.	• Consideration of planting of trees	0
	Station & Interchange Works	The proposed schemes are at existing stations & interchanges in previously developed areas (such as town centres) and direct loss or encroachment onto habitat is likely to be limited. These areas are also likely to be already subject to noise / vibration and other disturbance.	• Consideration of installation of bird / bat boxes • Consideration of planting of trees	Neutral 0
Various	**EV Facilitating**	Expansion of the EV charging point network will include more than 200 fast charging bays across GM. About one quarter of these will be in fleet depots and private car parks with the remainder in public car parks and on-street parking bays. As such, effects on biodiversity are not anticipated.	• None identified	Neutral 0
Waterways	**Sustainable Freight Infrastructure**	Construction of the wharf will require a large area of hard standing and direct loss of terrestrial ecology is expected to occur. This scheme also has the potential to have an effect on aquatic ecology e.g. through direct loss of habitat or via a construction related pollution incident. The site though is close to existing major infrastructure such as the motorway and other proposed development sites. Note this site is not a designated site and no effect on a designated site is anticipated at this stage – therefore in relation to European sites it is anticipated this scheme will be Neutral.	• Appropriate mitigation anticipated to be incorporated into scheme design • Confirm and ensure scheme will not affect European designated sites.	Moderate adverse --

Overview of Recommended Mitigation for Biodiversity: Opportunities to enhance biodiversity and green infrastructure exist, through designing in biodiversity into schemes. These opportunities include for example, the development of wildflower meadows along linear features such as roads and railway lines, which will look attractive and also provide opportunities for pollinators, or could include simple measures such as bird / bat boxes. More complex measures such as animal over or under passes can be considered. Similarly, biodiversity can be enhanced by the planting of suitable / native species of trees and hedgerows. Properly planned maintenance schemes can also enhance biodiversity, for example from the active control of invasive species.

Particular consideration needs to be made to protection measures in relation to any scheme which may impact directly, or indirectly, on any site designated for nature conservation purposes – particularly those designated as SSSI or Natura 2000.

IA Objective 5 – Conserve and enhance the character and quality of GM's landscapes and townscapes

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on landscapes and townscapes	
Highways	**New Highway Links**	New road infrastructure (particularly new roads) can have a detrimental effect if located in designated areas, or areas of open space such as rural areas. Effects would be reduced in already developed, more urban areas, though here roads can encroach on areas identified as open space / recreation. Though in some circumstances there may be an opportunity for enhancement – for example if a new road is across a derelict area.	• Careful route selection, especially in rural areas – particular protection to nationally designated areas required, with avoidance if possible • Consideration during Planning / Design to landscaping & screening, with care taken in choice of materials and species used	Moderate adverse --	
	Highway Infrastructure Improvements	Such schemes would have the potential to adversely impact adjacent areas identified as open space and recreation. Junction improvements, removal of pinch points etc provide an opportunity for improvement – particularly in relation to townscape.	• Consideration during Planning / Design to landscaping & screening, with care taken in choice of materials and species used • Opportunities to improve townscape e.g. through decluttering of signage to be considered during design	Moderate adverse --	Moderate beneficial ++
Railways	**Rail Links**	New rail links can have a detrimental effect if located in designated areas, or areas of	• Careful route selection, especially in rural areas – particular protection	Moderate adverse	

		open space such as rural areas. Effects would be reduced in already developed, more urban areas, though in these areas they would potentially require encroachment onto areas identified as open / recreational space.	to nationally designated areas required, with avoidance if possible • Consideration during Planning / Design to landscaping & screening, with care taken in choice of materials and species used	--
	Rail Infrastructure Improvements	There may be detrimental effects on landscape / townscape due to widening of corridors, increase in infrastructure height e.g. through electrification. Opportunities for additional screening may also be presented however.	• Consideration during Planning / Design to landscaping & screening, with care taken in choice of materials and species used	Combination of slight beneficial and adverse effects +/-
	Station Upgrade	Station upgrades could enhance the landscape and townscape by enhancing the public realm, therefore creating better quality and more tranquil areas.	• Consideration during Planning / Design to choice of materials used	Slight beneficial +
Public Transport (excl. Rail)	**Metrolink & Bus**	The proposed schemes are for the most part in previously developed areas and would represent an opportunity to improve the townscape in these locations.	• Consideration during Planning / Design to landscaping & screening, with care taken in choice of materials and species used	Slight beneficial +
	Minor Works	The proposed schemes are for the most part in previously developed urban areas (town centres etc.) and would represent an opportunity to improve the townscape in these locations.	• Consideration during Planning / Design to landscaping & screening, with care taken in choice of materials and species used	Slight beneficial +
	Station & Interchange Works	The proposed schemes are at existing stations & interchanges in previously developed areas (such as town centres) and would represent an opportunity to improve the townscape in these locations.	• Consideration during Planning / Design to landscaping & screening, with care taken in choice of materials and species used	Slight beneficial +
Various	**EV Facilitating**	The expanded EV network would represent a series of new features within the townscape, though these are small and stand alone and would be considered part of	• Consideration during Planning / Design to precise location of the EV charging point with care taken in	Neutral 0

		the street furniture. These features are also in keeping with other street furniture to be found in parking areas e.g. ticketing machines etc.	choice of materials	
Waterways	**Sustainable Freight Infrastructure**	The proposed wharf will represent a major new facility in the landscape. While this area is an industrial area and is already heavily impacted by other dominant features such as the motorway and rail networks, its nature of cranes and a large area of hardstanding could make it difficult to screen / landscape and therefore represents a strong adverse effect. This will be a private sector led initiative, with the GMCA working with partners on transport links.	• Consideration during Planning / Design to landscaping & screening. Note this could also include off site screening from particularly sensitive viewpoints.	Strong adverse ---

Overview of Recommended Mitigation for Landscape & Townscape: Projects need to be designed carefully, taking account of the potential impact on the landscape. Reducing the scale of a project or making changes to its operation can help to avoid or mitigate the visual and landscape effects of a proposed project. Consideration during planning should also be given to appropriate siting, design of the scheme (including choice of materials) and landscaping schemes. Note that ideally native species should be used in any planting. Subject to appropriate planning, screening can also take place 'off site' e.g. by planting out gaps in tree lines / hedgerows. Particular consideration is to be given to conserving landscape and scenic beauty in any nationally designated areas, with encouragement given to avoiding these areas if possible. Opportunities for landscape enhancement should be taken when possible.

IA Objective 6 – Conserve and enhance the quality and distinctiveness of historic and cultural heritage

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on historic and cultural heritage

Highways	**New Highway Links**	New road infrastructure may have a detrimental effect on the character and setting of heritage assets and therefore impact on their quality and distinctiveness. Construction of infrastructure also has the potential for previously unknown heritage features to be disturbed or damaged.	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected heritage discovery during construction • Potential need for archaeological watching brief during construction – particularly in areas not previously developed	Moderate adverse --	
	Highway Infrastructure Improvements	Such schemes may have a detrimental effect on the character and setting of heritage assets and therefore impact on their quality and distinctiveness. However, junction improvements, removal of pinch points etc may also provide an opportunity for improvement – particularly in relation to heritage features located in the townscape, where congestion may be reduced.	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected heritage discovery during construction • Potential need for archaeological watching brief during construction – particularly in areas not previously developed	Moderate adverse --	Moderate beneficial ++
Railways	**Rail Links**	There is a potential that the proposed schemes could have a detrimental effect on the quality and distinctiveness of heritage assets e.g. through the construction of new infrastructure. Construction could also lead to the damage or disturbance of previously unknown features.	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected heritage discovery during construction • Potential need for archaeological watching brief during construction – particularly in areas not previously developed	Moderate adverse --	
	Rail Infrastructure Improvements	There is a potential that the proposed schemes could have a detrimental effect on the quality and distinctiveness of heritage assets e.g. through the construction of new infrastructure such as overhead electrification. However, Infrastructure	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected	Moderate adverse --	Moderate beneficial ++

		improvements may also provide opportunities for enhancement e.g. to railway heritage features. There is always a potential for unknown heritage features to be discovered or damaged during construction.	heritage discovery during construction • Potential need for archaeological watching brief during construction – particularly in areas not previously developed	
	Station Upgrade	Station upgrades could provide the opportunity for the enhancement of railway heritage features e.g. at the historic Piccadilly station.	• Consideration of character, setting, level of protection and potential need for conservation during planning and design	Slight beneficial +
Public Transport (excl. Rail)	**Metrolink & Bus**	The proposed schemes are for the most part in previously developed areas and cultural heritage features would therefore have likely previously been disturbed – though with any construction scheme there is always the potential that unknown features will be uncovered. The schemes may provide an opportunity to enhance any known features previously affected.	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected heritage discovery during construction	Combination of slight beneficial and adverse effects +/-
	Minor Works	The proposed schemes are for the most part in previously developed urban areas (town centres etc.) and cultural heritage features would therefore have likely previously been disturbed – though with any construction scheme there is always the potential that unknown features will be uncovered. The schemes may provide an opportunity to enhance any known features previously affected.	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected heritage discovery during construction	Combination of slight beneficial and adverse effects +/-
	Station & Interchange Works	The proposed schemes are at existing stations & interchanges in previously developed areas (such as town centres) and cultural heritage features would therefore have likely previously been disturbed – though with any construction scheme there is always the potential that unknown features	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected heritage discovery during construction	Combination of slight beneficial and adverse effects +/-

		will be uncovered. The schemes may provide an opportunity to enhance any known features previously affected.		
Various	**EV Facilitating**	The expanded EV network would represent a series of new features within the townscape. Their locations though, in fleet depots and private car parks with the remainder in public car parks and on-street parking bays, suggest that these will not affect any features or buildings of cultural heritage interest.	• As part of planning, ensure that the EV charging points do not affect any listed / historic building etc. e.g. by being incongruous with the historic building façade. Move the location if this is a potential.	Neutral 0
Waterways	**Sustainable Freight Infrastructure**	The Manchester Ship Canal is an historic industrial feature in its own right and this wharf will be constructed on the banks of this canal. However, its purpose is in keeping with the original purpose of the canal – i.e. to ship freight to the wider GM area and beyond and would therefore represent the rejuvenation of this historic asset which had fallen into disrepair in recent decades. As with any construction scheme there is always the potential that unknown features will be uncovered.	• Consideration of character, setting, level of protection and potential need for conservation during planning and design • Precautions for unexpected heritage discovery during construction	Moderate beneficial ++

Overview of Recommended Mitigation for Heritage: The historic environment includes all aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora. Heritage assets may be buildings, monuments, sites, places, areas or landscapes. Consideration should be made of the character and setting of the heritage asset, its significance (and level of protection afforded to it), the potential for loss or harm and need for conservation. Opportunities should be taken when possible for the enhancement of heritage assets. It should also be noted that due to its nature, not all heritage features may be apparent at the planning / design stage and precautions for unexpected discovery should be taken – perhaps through an archaeological watching brief.

IA Objective 7 – Conserve and enhance the water environment

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on the water environment	
Highways	**New Highway Links**	New road links would result in an increase in impermeable areas, potentially leading to increased contaminated surface water runoff. Pollution incidents may also occur both during construction and as a result of accidents when operational.	• Use of SuDS • Pollution Control Measures & Plan during construction • Use of pollution interceptors when operational	Moderate adverse --	
	Highway Infrastructure Improvements	These types of scheme could result in an increase in impermeable areas, potentially leading to an increase in contaminated surface water runoff. However, opportunities may be afforded for the introduction of new pollution control measures e.g. SuDS and the improved road infrastructure may reduce the potential for accidents that could lead to pollution.	• Use of SuDS • Pollution Control Measures & Plan during construction • Use of pollution interceptors when operational	Moderate adverse --	Moderate beneficial ++
Railways	**Rail Links**	New rail links may lead to additional polluted runoff though areas of impermeable surfacing likely to be relatively minor in the overall scheme context. Potential for pollution incidents during construction e.g. likely to be works required over or adjacent to watercourses.	• Use of SuDS • Pollution Control Measures & Plan during construction	Moderate adverse --	
	Rail Infrastructure Improvements	Increased infrastructure capacity may lead to addition polluted runoff. Area of impermeable surfacing likely to remain constant.	• Use of SuDS • Pollution Control Measures & Plan during construction	Moderate adverse --	
	Station	The schemes are for the most part located within urbanised lands and therefore there is	• Use of SuDS • Pollution Control Measures & Plan	Neutral	

	Upgrade	not likely to be increases in impermeable area (or marginal increases in worst case) – potential opportunity for installation of some SuDS features e.g. green rooves, water butts, permeable paving etc. which can control runoff and help address pollution.	during construction	0
Public Transport (excl. Rail)	**Metrolink & Bus**	The schemes are for the most part located within urbanised lands and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case) – potential opportunity for installation of some SuDS features e.g. green rooves, water butts, permeable paving etc. which can control runoff and help address pollution.	• Use of SuDS • Pollution Control Measures & Plan during construction	Neutral 0
	Minor Works	The schemes are for the most part located within urbanised lands e.g. town centres and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case) – potential opportunity for installation of some SuDS features e.g. permeable paving etc. which can control runoff and help address pollution.	• Use of SuDS • Pollution Control Measures & Plan during construction	Neutral 0
	Station & Interchange Works	The schemes are for the most part located within urbanised lands and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case) – potential opportunity for installation of some SuDS features e.g. green rooves, water butts, permeable paving etc. which can control runoff and help address pollution.	• Use of SuDS • Pollution Control Measures & Plan during construction	Neutral 0
Various	**EV Facilitating**	It is considered that the expansion of the EV charging network will not have any interaction with the water environment	• None identified	Neutral 0
Waterways	**Sustainable Freight**	The proposed Wharf on the Manchester Ship Canal will clearly involve works directly within and adjacent to the water	• Pollution Control Measures & Plan during Construction and Operation	Moderate adverse

	Infrastructure	environment. As such there is a strong potential for a pollution incident to occur both during construction and operation. Operational effects could include runoff from the large area of hard standing, though it is anticipated this would be directed via adequate pollution control measures.		--

Overview of Recommended Mitigation for Water: Impact on local water resources can be addressed through planning and design for the efficient use of water, including water recycling. Consideration should be given to the use of SuDS (including permeable paving), but it is also recognised that conventional drainage will play an important role. Protection and good pollution control measures are to be utilised during both construction and operation of transport schemes.

IA Objective 8– Conserve soil and agricultural resources and seek to remediate / avoid land contamination

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on soil & agricultural resources etc.
Highways	**New Highway Links**	New road links could potentially be located within moderate to good agricultural lands, or greenfields, hence leading to a decrease in quality soils. There is also a potential that new areas could become contaminated e.g. following accidental pollution / road runoff etc. Other schemes may provide an opportunity to remediate contaminated land – including removal / treatment of invasive species such as Japanese Knotweed.	• Careful route selection – avoid areas of better quality soils if possible and target previously used land • Remediation of contaminated land • Removal of invasive species • Care of topsoil for future reuse	Strong adverse ---
	Highway Infrastructure Improvements	Some schemes could affect good quality soils / agricultural areas e.g. through encroachment into these areas, though for the most part it is considered that these schemes will be in urban areas or within existing route corridors. There are likely to be potential opportunities for remediation of contaminated land / removal of invasive species.	• Careful scheme design – avoid areas of better quality soils if possible and target previously used land • Remediation of contaminated land • Removal of invasive species • Care of topsoil for future reuse	Slight adverse -

Railways	**Rail Links**	New rail lines could potentially be located within moderate to good agricultural lands, or greenfields, hence leading to a decrease in quality soils. Some schemes may provide an opportunity to remediate contaminated land – including removal / treatment of invasive species such as Japanese Knotweed.	• Careful scheme design – avoid areas of better quality soils if possible and target previously used land • Remediation of contaminated land • Removal of invasive species • Care of topsoil for future reuse	Strong adverse ---
	Rail Infrastructure Improvements	As these improvements will be to already existing railway lines, effects will be limited e.g. by slight encroachment on agricultural lands. Opportunities may be provided for remediation of contaminated land / removal of invasive species.	• Careful scheme design – avoid areas of better quality soils if possible and target previously used land • Remediation of contaminated land • Removal of invasive species • Care of topsoil for future reuse	Slight adverse -
	Station Upgrade	These schemes are unlikely to have a tangible effect in soil / agricultural resources, but may provide an opportunity for remediation of contaminated land / removal of invasive species.	• Remediation of contaminated land • Removal of invasive species	Slight beneficial +
Public Transport (excl. Rail)	**Metrolink & Bus**	These schemes are for the most part located in urban areas and will therefore have negligible effect on soil / agricultural resources. The schemes may provide an opportunity for remediation of contaminated land / removal of invasive species.	• Remediation of contaminated land • Removal of invasive species	Slight beneficial +
	Minor Works	These schemes are for the most part located in urban areas (town centres etc) and will therefore have negligible effect on soil / agricultural resources. The schemes may provide an opportunity for remediation of contaminated land / removal of invasive species.	• Remediation of contaminated land • Removal of invasive species	Slight beneficial +
	Station & Interchange	These schemes are for the most part within existing facilities and will therefore have	• Remediation of contaminated land • Removal of invasive species	Slight beneficial

	Works	negligible effect on soil / agricultural resources. The schemes may provide an opportunity for remediation of contaminated land / removal of invasive species.		+
Various	**EV Facilitating**	It is considered that the expansion of the EV charging network will not have any interaction with soil or agricultural resources. There may be a small opportunity to remove / remediate contaminated land / invasive species, but overall this is likely to be negligible.	• Remediation of contaminated land • Removal of invasive species	Neutral 0
Waterways	**Sustainable Freight Infrastructure**	This new wharf will require large scale earth movements, with a consequent effect on soil and agricultural resources. There may be opportunities to remediate contaminated land / remove invasive species if these are present at the site.	• Careful scheme design – avoid areas of better quality soils if possible and target previously used land • Remediation of contaminated land • Removal of invasive species • Care of topsoil for future reuse	Strong adverse ---

Overview of Recommended Mitigation for Soil resources, agriculture and contaminated land: Protection of soil resources, particularly those of higher quality / areas of better agricultural lands should always be considered – this could be done during scheme planning by careful route selection. If areas of good quality soil cannot be avoided, care should be taken during construction to store topsoil for later reuse – either on site as landscaping or further afield. Opportunities should also be taken to utilise areas of previously developed land and to remediate contaminated land when possible. This could include the removal / appropriate treatment of any invasive species such as Japanese Knotweed.

IA Objective 9 – Reduce risk of flooding and increase resilience to the effects of a changing climate

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on flooding and effects of a changing climate

Highways	**New Highway Links**	New highway links would lead to an increase in impermeable area and therefore may contribute to increased flood risk by increasing runoff to nearby watercourses. The route of the schemes may also be located within flood zones and therefore would be liable to flooding.	• Careful route selection – avoid flood areas if possible • Design to consider flood protection measures, flow routes and flood storage capacity • Use of SuDS	Strong adverse ---
	Highway Infrastructure Improvements	These schemes could increase the area of impermeable surface and thereby contribute to an increase in runoff. There may though be an opportunity to install SuDS features in some areas.	• Design to consider flood protection measures, flow routes and flood storage capacity • Use of SuDS	Moderate adverse --
Railways	**Rail Links**	While new rail links would not increase the area of impermeable surfacing by a large amount (relative to the size of the scheme), there may be changes to flow conditions, or the route may effect flood zones.	• Careful route selection – avoid flood areas if possible • Design to consider flood protection measures, flow routes and flood storage capacity • Use of SuDS	Moderate adverse --
	Rail Infrastructure Improvements	Rail infrastructure improvements are not anticipated to lead to a large increase in impermeable surfacing. Opportunities could be taken in relation to providing flood protection measures or floodplain alleviation.	• Design to consider flood protection measures, flow routes and flood storage capacity • Use of SuDS	Slight adverse -
	Station Upgrade	The schemes are for the most part located within urbanised lands and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case) – potential opportunity for installation of some SuDS features e.g. green rooves, water butts, permeable paving etc. which would help to control the rate of runoff.	• Explore opportunities for use of SuDS	Slight beneficial +
Public Transport (excl. Rail)	**Metrolink & Bus**	The schemes are for the most part located within urbanised lands and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case) –	• Use of SuDS (sized to allow for a changing climate) • Consideration of potential for flooding in design	Neutral 0

		potential opportunity for installation of some SuDS features e.g. green rooves, water butts, permeable paving etc. which would help control runoff rate and thereby reduce the risk of flooding elsewhere.		
	Minor Works	The schemes are for the most part located within urbanised lands (town centres etc) and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case) – potential opportunity for installation of some SuDS features e.g. permeable paving etc. which would help control runoff rate and thereby reduce the risk of flooding elsewhere.	• Use of SuDS (sized to allow for a changing climate) • Consideration of potential for flooding in design	Neutral 0
	Station & Interchange Works	The schemes are for the most part located within urbanised lands and therefore there is not likely to be increases in impermeable area (or marginal increases in worst case) – potential opportunity for installation of some SuDS features e.g. green rooves, water butts, permeable paving etc. which would help control runoff rate and thereby reduce the risk of flooding elsewhere.	• Use of SuDS (sized to allow for a changing climate) • Consideration of potential for flooding in design	Neutral 0
Various	**EV Facilitating**	Expansion of the EV charging network will not have any implications for flooding in itself i.e. there will be no increased hardstanding and the charging points will not cause a barrier to water movement. Nevertheless a greater use of EV's will reduce carbon emissions and thereby help reduce the rate of climate change.	• None identified	Neutral 0
Waterways	**Sustainable Freight Infrastructure**	This scheme will be located on the banks of the Manchester Ship Canal. The large area of hardstanding may contribute to increased runoff to the canal and thereby contribute to an increased flood risk.	• Consider flow attenuation during design	Moderate adverse --

Overview of Recommended Mitigation for Flood Risk: Flooding poses a particular risk to the transport network and this situation is likely to get worse with a changing climate. However, new infrastructure developments or improvements to existing infrastructure can also contribute to an additional flood risk elsewhere. Opportunities can be taken to lower flood risk by considering flood protection measures, improving flow routes, flood storage capacity and using Sustainable Drainage Systems (SuDS). The appropriate use of SuDS will be critical and it should be the intention that site layout and surface water drainage systems should cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without adverse impacts. Infrastructure should only be located in flood zones when there is no other option.

IA Objective 10 – Promote the prudent use of natural resources, minimise the production of waste and support re-use and recycling

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on use of natural resources etc.
Highways	**New Highway Links**	Construction of these schemes would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Strong adverse --
	Highway Infrastructure Improvements	Construction of these schemes would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Moderate adverse --
Railways	**Rail Links**	Construction of these schemes would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Moderate adverse --
	Rail Infrastructure	Construction of these schemes would result in a requirement for additional resources and	• Sustainable design measures • Consideration of waste hierarchy	Moderate adverse

	Improvements	increased waste production. There may be opportunities for the use of recycled materials in construction.	• Use of recycled or re-used materials	--
	Station Upgrade	Construction of these schemes would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Slight adverse -
Public Transport (excl. Rail)	**Metrolink & Bus**	Construction of these schemes would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Slight adverse -
	Minor Works	Construction of these schemes would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Slight adverse -
	Station & Interchange Works	Construction of these schemes would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Slight adverse -
Various	**EV Facilitating**	Installation of the expanded EV charging network would entail minimal use of additional resources. Opportunities for recycling etc would also be limited.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Slight adverse -
Waterways	**Sustainable Freight Infrastructure**	Construction of this wharf scheme would result in a requirement for additional resources and increased waste production. There may be opportunities for the use of recycled materials in construction.	• Sustainable design measures • Consideration of waste hierarchy • Use of recycled or re-used materials	Moderate adverse --

Overview of Recommended Mitigation for use of Natural Resources, reducing waste and encouraging reuse and recycling: Consideration during design and construction of transport schemes should be given to the waste hierarchy of prevention, reuse, recycling and disposal. All waste should be handled in accordance to applicable waste management legislation and the emphasis should be to minimise the volume of waste produced and the volume sent for disposal, unless it can be demonstrated that this is the best environmental outcome. Consideration should be given to the use of Recycled materials in construction.

IA Objective 11 – Reduce the need to travel by car or move goods by road and promote sustainable modes of transport

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on reducing the need to travel by car etc.
Highways	**New Highway Links**	Although it is appreciated that link roads would often be accessing logistics and other employment sites, new roads would encourage increased car use and therefore would not reduce the need to travel by car or move goods by road, or promote sustainable modes of transport	• Bus priority measures, the provision of high-occupancy lanes • Cycle lanes (if highway type appropriate) • Ensure adequate footpaths (if highway type appropriate)	Strong adverse ---
	Highway Infrastructure Improvements	Highway infrastructure improvements are likely to encourage car use and the movement of goods by road as they will provide greater capacity and likely make journey times quicker / more reliable.	• Bus priority measures, the provision of high-occupancy lanes • Cycle lanes (if highway type appropriate) • Ensure adequate footpaths (if highway type appropriate)	Strong adverse ---
Railways	**Rail Links**	New rail links would reduce the requirement to travel by car as new routes would be possible and would be considered a more sustainable mode of transport. This would also reduce the need to move goods by road.	• None identified	Strong beneficial +++
	Rail Infrastructure Improvements	These improvements would encourage a mode shift to this more sustainable transport option. Improvements to the network would also help facilitate the movement of goods by this method.	• None identified	Strong beneficial +++

	Station Upgrade	Station upgrades would encourage a mode shift to this more sustainable transport option. These upgrades would only have a limited role in encouraging the movement of goods by rail.	• None identified	Moderate beneficial ++
Public Transport (excl. Rail)	**Metrolink & Bus**	Improvements in these areas such as network improvements would encourage a mode shift to the use of Metrolink and Bus. This would reduce the need to travel by car, though would have limited applicability in terms of moving goods.	• None identified	Moderate beneficial ++
	Minor Works	These packages would result in better access by sustainable modes to key areas etc and therefore reduce the need to travel by road	• None identified	Moderate beneficial ++
	Station & Interchange Works	These schemes would increase public transport appeal resulting from improvements to passenger facilities, therefore potentially encouraging a shift away from travel by road.	• None identified	Moderate beneficial ++
Various	**EV Facilitating**	Expansion of the EV network would not encourage a mode shift away from the need to travel by road and while it would reduce emissions etc, it would not lead to a reduction in congestion.	• None identified	Moderate adverse --
Waterways	**Sustainable Freight Infrastructure**	The main driver behind this scheme is to re-utilise the Manchester Ship Canal for the movement of goods. This would result in a significant reduction in the movement of goods by road.	• Ensure the new wharf is fully integrated with rail network	Strong beneficial +++

Overview of Recommended Mitigation to Reduce the need to travel by car or move goods by road and promote sustainable modes of transport: Congestion can be reduced in numerous ways. Examples include new junctions and highway improvements, though these measures often only provide short term fixes. Therefore it is important that aspects such as Smart Infrastructure and Managed Highways and importantly, the development of more sustainable and active modes (such as cycling and walking) are taken. Improved communities, with better streetscapes and people friendly streets may also encourage people to leave their cars, thereby reducing road traffic / congestion. A further key component will be the full integration of bus and rail services to increase accessibility to the transport system.

IA Objective 12 – Promote economic growth and job creation across the sub-region, and improve access to jobs for all

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on economic growth etc.
Highways	**New Highway Links**	New roads will require staff to construct and therefore maintain / improve employment in the construction industry – though this would be limited to the construction phase. The new roads may also improve accessibility to existing employment areas as well as accessibility to development land widening the range of potentially accessible employment opportunities.	• Provide employment opportunities to unskilled / apprentices at construction stage	Strong beneficial +++
	Highway Infrastructure Improvements	These schemes could provide employment opportunities during construction (though this would be limited to the construction phase). Access to employment centres may be improved by a reduction in congestion / journey times.	• Provide employment opportunities to unskilled / apprentices at construction stage	Strong beneficial +++
Railways	**Rail Links**	New rail links will require staff to construct and therefore maintain / improve employment in the construction industry – though this would be limited to the construction phase. The new rail links would also increase access to employment centres / opportunities.	• Provide employment opportunities to unskilled / apprentices at construction stage	Strong beneficial +++
	Rail Infrastructure Improvements	These schemes would lead to increased and improved access to jobs and employment opportunities by providing high frequency, fast, high quality rail connectivity.	• None identified	Strong beneficial +++

	Station Upgrade	These schemes may provide an opportunity to develop commercial opportunities	• Explore potential commercial opportunities at planning stage	Slight beneficial +
Public Transport (excl. Rail)	**Metrolink & Bus**	An expanded network could improve access to jobs and open up new employment opportunities. Improvements to journey time and reliability will make accessing employment easier.	• None identified	Strong beneficial +++
	Minor Works	Improved access to key employment, education and training locations across the region is a key element of these packages.	• None identified	Strong beneficial +++
	Station & Interchange Works	These schemes will make journeys more comfortable and will increase accessibility.	• None identified	Slight beneficial +
Various	**EV Facilitating**	The expansion of the EV charging network will include more than 200 fast charging bays across GM. The location of about one quarter of these in fleet depots and private car parks will help some in employment with access to this type of transport, though will not aid the access to employment opportunities per se.	• None identified	Neutral 0
Waterways	**Sustainable Freight Infrastructure**	This proposed wharf scheme will lead to employment opportunities during construction and operation. This scheme will revitalise a traditional economic opportunity of the Manchester Ship Canal.	• None identified	Moderate beneficial ++

Overview of Recommended Mitigation for the Promotion of economic growth and job creation across the sub-region, and improvement of access to jobs for all: It is vital that the transport network provides and where possible improves, the access to employment opportunities and effectively connects business areas with residential areas. Connectivity between business and residential centres and key infrastructure such as Airports is a major consideration to be made, as is connectivity between urban centres across the region. Issues such as the attractiveness of the region as a better place to live and work can also influence and enhance inward investment or tourism and thereby increase employment opportunities across the region.

IA Objective 13 – Coordinate land use and transport planning across GM

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on land use
Highways	**New Highway Links**	New roads would potentially allow the 'opening up' of development lands as well as increase access to new growth hubs.	• Consideration of route in relation to land use plans	Slight beneficial +
	Highway Infrastructure Improvements	A key element of the package of measures contained within these improvements are access to development sites, in support of key growth points and to address localised issues of traffic congestion that undermine their productivity potential.	• Consideration in design of land use planning requirements	Moderate beneficial ++
Railways	**Rail Links**	These seek to improve existing assets such as Manchester Airport and Port Salford. This required effective land use and transport planning coordination.	• Consideration in design of land use planning requirements	Slight beneficial +
	Rail Infrastructure Improvements	These improvements are for the most part within existing rail infrastructure and do not require extensive co-ordination with land use planning.	• None identified	Neutral 0
	Station Upgrade	These improvements are for the most part within existing rail infrastructure and do not require extensive co-ordination with land use planning.	• None identified	Neutral 0

Public Transport (excl. Rail)	**Metrolink & Bus**	These seek to improve existing assets such as Manchester Airport, Trafford Centre and the Enterprise Zone and would require effective land use and transport planning coordination	• None identified	Slight beneficial +
	Minor Works	A key element of the package of measures contained within these support effective integration between principal public transport gateways and the city centre, reduce severance by major roads, reduce congestion and promote enhanced permeability. This would require effective landuse and transport planning coordination.	• Consideration in design of land use planning requirements	Moderate beneficial ++
	Station & Interchange Works	These improvements are for the most part within existing infrastructure and do not require extensive co-ordination with land use planning.	• None identified	Neutral 0
Various	**EV Facilitating**	The expansion of the EV charging network to 200 fast charging bays across GM, one quarter of which will be in existing fleet depots and private car parks with the remainder in public car parks and on-street parking bays demonstrates effective co-ordination of land use and transport planning.	• None identified	Slight beneficial +
Waterways	**Sustainable Freight Infrastructure**	The development of the wharf will result in a tri-modal transport hub. This is the outcome of effective co-ordination of land use and transport planning that will utilise existing assets such as the Manchester Ship Canal and nearby assets such as the motorway and rail networks.	• None identified	Moderate beneficial ++

Overview of Recommended Mitigation for Co-ordination of Land Use and Transport Planning: All of the proposed schemes will require adherence to the relevant planning requirements for any development in Greater Manchester. As such consideration of these requirements will be made at the design stage of all relevant schemes.

IA Objective 14 – Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (EqIA specific objective)

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on equality of opportunity
Highways	**New Highway Links**	New road schemes will primarily benefit those in ownership of cars, though some benefit will likely be experienced by bus passengers and users of taxi's. Access may also be increased to employment opportunities and public services / recreational facilities, as well as unlocking land development potential. Depending on the nature of the highway there may be opportunity for enhancing pedestrian / cycle links through footpaths & cycle lanes.	• Introduction of footpaths & cycle lanes (if nature of carriageway allows) • Consider potential for severance from key public services – or opportunities to improve access • See suggested mitigation for reduction in emissions	Combination of slight beneficial and adverse effects +/-
	Highway Infrastructure Improvements	Highway infrastructure improvements will primarily benefit those in ownership of cars, though some benefit will likely be experienced by bus passengers and users of taxi's. Access may also be increased to employment opportunities and public services / recreational facilities. Depending on the nature of the highway there may be opportunity for enhancing pedestrian / cycle links through footpaths & cycle lanes.	• Introduction of footpaths & cycle lanes (if nature of carriageway allows) • Consider potential for severance from key public services – or opportunities to improve access • See suggested mitigation for reduction in emissions	Combination of slight beneficial and adverse effects +/-
Railways	**Rail Links**	While new rail links will be available to all to avail of, ticket cost will be a key consideration. These schemes though will increase accessibility to employment and recreational opportunities, as well as public services.	• Regular reviews of ticket pricing / consideration of affordability • Consider potential for severance from key public services – or opportunities to improve access	Slight beneficial +

	Rail Infrastructure Improvements	These schemes will increase accessibility to employment and recreational opportunities, as well as public services.	• Regular reviews of ticket pricing / consideration of affordability	
	Station Upgrade	These schemes are considered not likely to have any significant impact on promoting citizens' greater equality of opportunity.	• None identified	Neutral 0
Public Transport (excl. Rail)	**Metrolink & Bus**	These schemes would typically promote greater equality of opportunity for all citizens, as they would provide better, more comfortable facilities with increased reliability and better journey times	• Consider potential for severance from key public services – or opportunities to improve access • See suggested mitigation for reduction in emissions	Slight beneficial +
	Minor Works	These schemes would typically promote greater equality of opportunity for all citizens, as they would provide better, more comfortable facilities with increased reliability and better journey times . Access to urban centres would improve as well as access to key employment, education and training locations across the wider city region.	• Consider potential for severance from key public services – or opportunities to improve access • See suggested mitigation for reduction in emissions	Moderate beneficial ++
	Station & Interchange Works	These schemes would typically promote greater equality of opportunity for all citizens, as they would provide better access to urban centre facilities, alongside more comfortable stations.	• Consider potential for severance from key public services – or opportunities to improve access • See suggested mitigation for reduction in emissions	Slight beneficial +
Various	**EV Facilitating**	This scheme is considered not likely to have any significant impact on promoting citizens' greater equality of opportunity.	• None identified	Neutral 0
Waterways	**Sustainable Freight Infrastructure**	This scheme is considered not likely to have any significant impact on promoting citizens' greater equality of opportunity.	• None identified	Neutral 0

Recommended Mitigation for promoting greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society: During the Planning and Design stages of any transport scheme, it is vital that consideration is given to the need for access to key public services such as health, education community and leisure facilities by all members of society. Access should be considered in relation to all modes, with an emphasis on more active and sustainable types. Affordability should also be a key consideration, with a particular emphasis placed on effects on lower income groups. It should also be a priority to enhance access to key services for vulnerable groups.

IA Objective 15 – Improve health and well-being for all citizens and reduce inequalities in health (HIA specific objective)

Sector	Type of Scheme	Likely Effects	Typical specific Mitigation for type of scheme	Overall Likely Effect on health etc.
Highways	**New Highway Links**	With most schemes of this type there is a potential for accidents to occur (during construction and operation), as well as an increase in pollutant levels and the potential for disturbance through noise & vibration. Issues such as light pollution and community severance can also impact on health. However, access to services may improve.	• Ensure scheme is designed to latest H&S standards • See mitigation suggested for reduction in emissions • Consideration to reducing noise & vibration impacts through design e.g. use of noise barriers or low noise road surfacing – in particular near to sensitive receptors • Consideration during design to be given to issue of community severance	Combination of slight beneficial and adverse effects +/-
	Highway Infrastructure Improvements	These schemes would typically lead to beneficial effects on the health and wellbeing of citizens due to improvements in the overall environment (e.g. reduction in pollutants) and improved accessibility to a range of vital services including healthcare facilities. Highway improvements may lead to less accidents and reduce driver stress.	• Ensure scheme is designed to latest H&S standards • Consideration to reducing noise & vibration impacts through design e.g. use of noise barriers or low noise road surfacing – in particular near to sensitive receptors	Combination of slight beneficial and adverse effects +/-
Railways	**Rail Links**	With most schemes of this type there is a potential for accidents to occur (during construction and operation), as well as an increase in pollutant levels and the potential for disturbance through noise & vibration. However, access to services (including health) may improve	• Ensure scheme is designed to latest H&S standards • Consideration to reducing noise & vibration impacts through design e.g. use of noise barriers	Combination of slight beneficial and adverse effects +/-

	Rail Infrastructure Improvements	With most schemes of this type there is a potential for accidents to occur (during construction and operation). These schemes may improve accessibility to services (including health).	• Ensure scheme is designed to latest H&S standards • Consideration to reducing noise & vibration impacts through design e.g. use of noise barriers	Combination of slight beneficial and adverse effects +/-
	Station Upgrade	These schemes will encourage the use of more sustainable modes of transport which will reduce car use and therefore reduce emissions. This will help to reduce vehicle emissions and should lead to a reduction in effects on people's health – particularly those with respiratory illness.	• None identified	Slight beneficial +
Public Transport (excl. Rail)	**Metrolink & Bus**	These schemes will encourage the use of more sustainable modes of transport which will reduce car use and therefore reduce emissions. This will help to reduce vehicle emissions and should lead to a reduction in effects on people's health – particularly those with respiratory illness.	• None identified	Slight beneficial +
	Minor Works	These schemes would likely make significant improvements to the health and wellbeing of citizens through means of improved accessibility covering bus, walking and cycling modes. Access to key public services will be enhanced.	• None identified	Moderate beneficial ++
	Station & Interchange Works	These schemes will encourage the use of more sustainable modes of transport which will reduce car use and therefore reduce emissions. This will help to reduce vehicle emissions and should lead to a reduction in effects on people's health – particularly those with respiratory illness.	• None identified	Slight beneficial +
Various	**EV Facilitating**	The extension of the EV charging network will help to reduce vehicle emissions and this	• None identified	Slight beneficial

		should lead to a reduction in effects on people's health – particularly those with respiratory illness.		+
Sustainable freight infrastructure	**Sustainable freight infrastructure**	The reduction in road freight due to this scheme will help to reduce HGV emissions and this should lead to a reduction in effects on people's health – particularly those with respiratory illness.	• None identified	Slight beneficial +

Recommended Mitigation for improving the health & well-being for all citizens and reducing inequalities in health: The consideration of health & safety (including security / crime) is critical as part of scheme planning and design and should include the introduction of the most modern and effective safety measures where proportionate**.** Safety considerations should apply to the construction phase, as well as when the transport infrastructure is operational. It should always be the consideration to minimise the risk of deaths or injury arising from the scheme and contribute to an overall improvement in societal safety levels. Consideration during scheme planning and design also has to be given to reducing emissions and other aspects such as noise, vibration dust, light pollution and severance which potentially effect health and well-being. Access to public services (health, education, community facilities etc.) is also another key consideration.