Transport for Development

Assessing the Transport Impacts of the Local Development Framework

Report for Greater Manchester LDF Modelling Steering Group

In Association With David Simmonds Consultancy and Greater Manchester Transportation Unit

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Summary

1. This Report provides a summary of the issues being raised by the study into the potential transport impacts of the Local Development Frameworks (LDF). The objective of the study was to investigate the potential impacts on transport networks of the LDF core spatial strategies for each of the districts in Greater Manchester. The outputs from this study will be used to inform the further development of the LDF strategies by showing how the resulting travel demand changes impose stresses on the transport network. These outputs will consider the impacts both locally and in neighbouring areas, and highlight where investment in the transport network is required to achieve the core strategy or a revision to that strategy.

2. The model forecasts show that without the LDFs and transport schemes, that traffic levels are expected to increase, with a reduction in public transport demand. This is as a result of increasing levels of population, employment, income and car ownership over time, together with declining relative affordability of public transport compared with car. However, the inclusion of the LDF developments and the transport schemes results in a forecast increase in car trips of 15% but with public transport demand remaining constant between 2011 and 2026. The combination of the LDF developments and the transport schemes has arrested the decline in public transport patronage that would otherwise be expected. However, traffic levels are continuing to increase and the overall public transport mode share is forecast to continue decreasing.

3. The concentration of residential and employment development in the Regional Centre, as well as the improvements to the transport network, have contributed to forecast increases in public transport demand to the Regional Centre. This results in a forecast increase in public transport commuting journeys of 2% between 2011 and 2026. However, this increase in public transport commuting is confined to Manchester and Salford districts, where development is concentrated on the Regional Centre. Elsewhere in Greater Manchester, the dispersed distribution of development results forecast decreases in public transport patronage and the increased dominance of the private car.

4. Rail trips are forecasts to increase throughout the day between 2011 and 2026, and the expansion of the Metrolink network means that tram trips are forecast to increase significantly over the period. However, with increasing traffic levels the cost of using the bus relative to other modes increases, resulting in forecasts of bus patronage reductions over time. The capacity of rail services in the peak periods is going to need to be addressed in order that the network is able to cater for the forecast additional demand.

5. Fuel efficiency is expected to improve over time and improvements in engine standards for emissions are also expected to continue. The net result is that despite the forecast growth in vehicle traffic, NOx emissions are expected to fall by about 20% between 2011 and 2026. However, PM10 and CO2 emissions are expected to increase, with CO2 output from traffic forecast to grow by 15%.

6. The trend of increasing traffic growth on the motorways which has been seen over recent years is forecast to continue when the the LDF developments and the transport schemes are included, with increased congestion resulting in journey times on the M60 increasing by up to 50% between 2011 and 2026. The section of the M60 anti-clockwise between the M66 and

the M62 in the morning peak seeing the largest increase, with the M62 and the M67 being the worst hit of the other motorways in Greater Manchester.

7. Traffic levels are also forecast to increase on the remainder of the highway network, the resulting decrease in average speeds in the peak hours across all non-motorway roads being 17%. In particular the concentration of developments in the Regional Centre is expecte to place increased stress on the radial routes, with rising congestion hitting bus levels of service as well as private car travel times. The A56 (Bury), A635 (Stalybridge), A57 (Hyde), M602/A57 (Irlam), A580 (Boothstown) and A666 (Bolton) have all seen journey time increases in excess of 30%.

1 Introduction

1.1 Purpose of this Report

1.1.1 The purpose of this Report is to provide the Local Transport Plan (LTP) Steering Group, Planning Officer's Group (POG) and the Highways Agency (HA) a summary of the issues being raised by the study into the potential transport impacts of the Local Development Frameworks (LDF). This study has been undertaken by consultants and was managed via a steering group led by the Joint Transport Team.

1.1.2 The Report outlines the background to the study, the approach that has been taken to modelling and analysis, consideration of the suitability of the models used for policy appraisal and then sets out the transport and land use findings for consideration as part of the LDF evidence base.

1.2 Background

1.2.1 MVA Consultancy and David Simmonds Consultancy (DSC) have been commissioned by the Greater Manchester Planning Authorities and the Highways Agency to undertake a study of the potential transport impacts of the Local Development Framework (LDF) Core Strategies for the ten districts in Greater Manchester.

1.2.2 Each local authority is required to prepare a folder of local development documents that outline the spatial planning strategy for the local area, this folder of documents being known as the Local Development Framework. Each Authority's LDF should contain Development Plan Documents which must include a core strategy and a proposals map. Each of the ten districts of Greater Manchester is required to compile an LDF.

1.2.3 Each LDF must undergo an independent examination, with one element of this examination being a test of the soundness of the LDF. This test of soundness includes demonstrating that the transport impacts of land use proposals are fully understood both in terms of the local impacts and also in terms of the demand for travel across boundaries and on other authorities' roads.

1.3 Study Objectives

1.3.1 The objective of the study was to investigate the potential impacts of the levels of development set out in the LDF core spatial strategies for each of the districts in Greater Manchester on the transport networks.

1.3.2 The outputs from this study will be used to inform the further development of the LDF strategies by showing how the resulting travel demand changes impose stresses on the transport network. These outputs consider the impacts both locally and in neighbouring areas, and highlight where investment in the transport network is required to achieve the core strategy or a revision to that strategy.

1.3.3 The approach involved using the land use and transport forecasting models that have been developed for the Greater Manchester area. The models assume levels of economic growth that are consistent with the Association of Greater Manchester Authorities' (AGMA)

Accelerated Growth Scenario (AGS), along with development of the sites and allocations contained within the emerging Local Development Frameworks.

1.4 Context and Nature of the Modelling Work

1.4.1 The approach to the study has utilised the land use and transport forecasting models that have been developed for the Greater Manchester area. The models used in this study are:

- a land use model (DELTA);
- a transport demand model (TRAM);
- a public transport assignment model (TRIPS); and
- a highway assignment model (SATURN), together with its emissions estimation attachment.

1.4.2 The modelling approach is therefore much more complex and sophisticated than a traffic assignment exercise. A traffic assignment exercise would only have assumed full development of all the sites put forward, and placed all the generated traffic onto the road and PT networks, regardless of responses to congestion. Whereas the modelling that has been adopted allows the model to determine how much of each development will be occupied, the resulting population and employment and the demand for travel arising from this. All of these responses take into account the changing costs of travel, and the impact this will have on the location of population and employment, the distribution of journeys, the mode choice for journeys, the time of day travelled and the route chosen.

1.4.3 The process used is recognised by DfT as appropriate in Greater Manchester, and has been used previously for the Transport Innovation Fund and Greater Manchester Transport Fund Prioritisation studies. The process was to input the land use data collected from Districts as their LDF preferred core strategy, or their best guess as to what it was likely to be at the time (Spring 2009).

1.4.4 The modelling needed to take place within the context of control figures for the fully modelled areas (roughly equivalent to the city region area). The control totals for population and employment growth were derived assuming the level of growth in the 'Accelerated Growth Scenario (AGS)' forecasts of the Greater Manchester Forecasting Model (GMFM, AGMA's economic forecasting model) inside Greater Manchester, and TEMPRO (Trip End Model Projections, Department for Transport software for giving access to national projections of growth in travel demand) growth outside of Greater Manchester. The growth implied by these two sources was summed to provide the overall level of growth for the fully modelled area.

1.4.5 All the planned developments that Districts have in their LDFs have been included in the inputs to the land use modelling, and have been assumed to be built, even though they imply growth at levels higher than implied by the control totals. The population and employment growth was distributed amongst the available development space by the land use model according to their relative accessibility. Normally, the land use model would have only permitted development of the more accessible sites.

1.4.6 A problem in this exercise has been which scenarios should be compared for LDF evidence base purposes – i.e. which comparisons clearly show the effects of the LDF allocations in transport terms relative to what we have now. For the 2026 situation (LDF end-date), the choice is clear – examine the situation with implementation of all LDF allocations to the extent permitted by the control totals, and assuming that all planned major transport schemes in the Greater Manchester Transport Fund (GMTF) have been implemented. There is, in theory, the possibility that some additional major schemes could be implemented between 2016 (the programmed completion of GMTF schemes) and 2026, but in practice it is likely that financial constraints will leave little scope for this.

1.4.7 It is more difficult to define the base situation, and in order to do this it is important to understand the question the study is intended to answer. For example, is the question to be answered:

- What is the difference between the transport impact effect with LDFs in 2026 and the point at which all current developments have been built, and all committed transport schemes have been built?
- What is the difference between the LDF transport impact and present flows on the network?
- What is the difference between the LDF transport impact and the situation in 2026 if there were no LDFs?

1.4.8 It was ultimately decided that, although none of the options were entirely satisfactory, the first of these options should be used with 2011 chosen as the modelled year to take into account developments currently under construction and the transport schemes that were committed at the start of the study. The comparison with present flows on the network would be difficult because model forecasts are only available for 2006 and 2011, and forecasts for 2011 take into account developments and transport schemes that will be completed over the next few years. The model forecasts for the third option would have the level of growth consistent with the situation with the LDFs, but the increases in population and employment would have to be catered for within existing floorspace, which is considered to be an unrealistic situation.

1.4.9 In addition, whether traffic growth results from the LDF allocations or from other exogenous factors such as car ownership and income growth, it is the case that the respective highway and public transport authorities will need to address future congestion problems, but it is not clear whether Inspectors will attempt to isolate the LDF effects at Public Inquiries.

Interpretation of the Results

1.4.10 This is a strategic model, and care should be taken not to focus on individual transport link loadings. It is more useful to look at localities where traffic is expected to increase, over a series of links, and at inter-District flows.

1.4.11 The land use data input to the work reflects, as stated above, the Districts' progress on their LDF core strategies as at Spring 2009. Whilst it is possible that some changes could be made as the Districts move forward to publication of their Core Strategies, especially those which are at an earlier stage in the process, it is unlikely that these will be of sufficient scale to change the conclusions at the level of interpretation of these results.

1.5 Structure of this Report

1.5.1 Following this introductory chapter the Report is structured as follows:

- Chapter 2 summarises the modelling approach adopted for the study and the suitability of the model for policy appraisal.
- Chapter 3 provides details of the land use inputs used for this work including the definitions of the population and employment growth scenarios and the land use inputs used to represent the LDFs.
- Chapter 4 describes the transport scenario assumptions for the Do Minimum and Greater Manchester Proposals scenarios, including the schemes assumed to be built over the modelled period for these scenarios.
- Chapter 5 describes the impacts of the changes in land use and to the transport network on the location of population and employment in Greater Manchester.
- Chapter 6 describes the impacts of the changes in land use, population, employment and the transport network on the demand for travel and on the transport network in Greater Manchester.
- Chapter 7 presents a summary of the impacts of the LDFs on population, employment and the transport networks.

1.6 Key Documents

1.6.1 Other than this report, the following key documents have been produced as part of this Study:

- Summary Report
- Project Note LDF2 "GMSPM2 – Planning Policy Inputs for the LDF Modelling (Appendix A)
- Project Note LDF3 "GMSPM2 – Land Use Results from the LDF Modelling" (Appendix B)
- Technical Note 1 "Transport Strategy Assumptions" (Appendix C)
- Technical Notes describing the impact on each of the ten districts of Greater Manchester.

2 The Model and Approach to Modelling

2.1 Introduction

2.1.1 The purpose of this chapter is to outline the approach to modelling that has been adopted for this study, the scenarios that have been tested with the models, the suitability of the models for undertaking policy appraisal and the limitations of the modelling approach that need to be considered in interpreting the model outputs.

2.2 Modelling Approach

2.2.1 The approach to the study has been to undertake land use and transport modelling to explore the relative impacts on land use and key transport metrics of the following:

- underlying travel demand trends;
- the land use allocations within the LDFs; and
- the potential impact of new capital investment in transport via the Transport Fund.

2.2.2 In order to isolate each driver in turn, artificial test scenarios were created and run through the models. As noted in Section 1.4, each test took employment and population control total inputs comprising the sum of the growth implied by the AGS forecasts for Greater Manchester and the TEMPRO forecasts for the rest of the City Region area. These were applied at the Fully Modelled Area level, and were therefore used to ensure that the target growth was achieved over this area. Population and employment growth were distributed amongst the available floorspace by the land use model, this distribution being undertaken by considering the accessibility of each of the sites with available space to take additional population or employment. It was assumed in the testing of the LDFs that all of the LDF developments were constructed, with the land use model determining the level of take up of the floorspace in each development.

2.2.3 The tests that were undertaken using the model are outlined below:

- Do Minimum which assumed the levels of economic and demographic growth contained within the AGS forecasts and basic transport trends (on car ownership etc) but no additional development after 2011 and no changes to the transport network beyond schemes already committed.
- The LDF Development Proposals Scenario which added the local authority planners best estimates of the likely LDF planning allocations (based on information available in February 2009) at a ward level to the assumptions for the Do Minimum.
- Greater Manchester Proposals Scenario which added a package of transport interventions that were planned for the Transport Fund to the assumptions for the LDF Development Proposals Scenario.

2.2.4 During the early stages of this study, the Greater Manchester Transport Fund schemes were agreed and approved by the AGMA leaders. Therefore, the focus of the reporting of this project has been on the impact of the LDFs on a situation where all of the schemes contained within the Greater Manchester Transport Fund have been completed.

2.2.5 The reporting of the transport impacts of the LDFs concentrates on comparing the forecasts for 2011 with those for 2026, assuming that all of the LDF developments are built, but not necessarily occupied, and that the Greater Manchester Transport Fund schemes are constructed over this period. Some comparison is made with the situation where new developments and the transport schemes have not been constructed, to show the overall impact of the LDFs and the transport schemes on the demand for travel within Greater Manchester.

2.3 Suitability of the Model for Policy Appraisal

2.3.1 The suite of models developed to support Greater Manchester's Transport Innovation Fund (TIF) bid provide a sound basis for assessing the transport impacts of the LDF Core Strategies. The land use and transport models are tools that can be used by policy makers to assist in understanding the likely impacts of different options. However, their forecasts should not be seen as a definitive statement on either traffic patterns, land use or the distribution of population and jobs.

2.3.2 These models have the capability of considering the following impacts of the LDF:

- the impact of the level of development on travel demand, and the impact that the time and money costs of travel have on the take up of new developments;
- the impact of the level of demand and supply on the routes drivers use to make journeys in the highway network, the delays the drivers impose on each other and the volumes of traffic travelling on each part of the network;
- the impact of the level of demand and supply on the public transport modes that public transport users chose, the route they will take and the consequent passenger flows and times on the public transport network; and
- the impacts of changes in transport conditions, resulting from changing provision of infrastructure and services and from changing levels of congestion, on the distribution of land-use activities in and around Greater Manchester; in particular through changes in the intensity of occupation of the available stock of development, and through changes in where development occurs within the constraints defined by the LDFs.

2.3.3 The above functionality means that the models will provide a sound basis for assessing the strategic impacts of the LDF Core Strategies. However, it is important to be aware of certain limitations of the modelling approach in interpreting the model outputs, as detailed in the remainder of this section.

The Economic and Demographic Scenario

2.3.4 This assumed economic and demographic scenario allows spatial and transport policy to be tested against high levels of economic growth, to appraise whether it helps or impedes growth. The levels of growth in GDP forecast by the AGS are greater than those forecast in most national economic projections. This reflects the aspiration of the economic strategy that GDP within Greater Manchester would grow at a faster rate in order to 'catch-up' with the national level. The ability of Greater Manchester to achieve this growth aspiration will depend, in part, on the mix of new developments and improvements in the transport infrastructure.

The Planning Policy Inputs

2.3.5 The approach adopted was that the model would assume that all planning permissions and land allocations are developed, but not necessarily occupied. This allows the 'worst-case' scenario, in terms of congestion and levels of traffic generated to be appraised. The land-use model has the functionality that would allow an assessment of market demand to be made whereby permissions and allocations would only be developed to a level that would result in an acceptable return for the developer. This functionality would favour development in locations which were the most accessible. Had that functionality been applied then a slightly different pattern of land use, population and employment might have been forecast. This in turn could have affected patterns of transport. It was decided not to use this functionality because evidence would be needed about the impact of each proposed development site.

2.3.6 Whilst the modelling requires that the planning inputs are allocated at ward level, the study does not make any assessment of individual sites.

2.3.7 The information on planning policy inputs provided by the local authorities may have underestimated the levels of windfall development that are likely to come forward, especially in the medium to long term term. As noted in paragraph 1.4.11, some changes may be made to the LDF core strategies as they are finalised from the assumptions included in the model. However, it is unlikely that these will be of sufficient scale to change the conclusions at the level of interpretation of these results.

The Transport Models

2.3.8 These have been developed at a countywide level to assess the likely transport impacts of transport strategies over time. No specific work has been undertaken on any scheme and so the work does not represent the definitive modelling for scheme assessments. However, the modelling work that has been undertaken allows the contribution of the schemes towards the accessibility of developments contained within the LDFs to be taken into account.

2.3.9 As the modelling system has a fixed factor for applying travel demand growth from a 3 hour morning peak to the more detailed peak hour traffic model, no allowance is made for any peak spreading effects that may occur in the future. The implication is that any peak hour congestion statistics are likely to be over-stated to a degree.

2.3.10 The modelling approach does not include the modelling of crowding effects on public transport. The implication of this is that public transport services are effectively allowed to continue to pick up passengers even when full, and passengers also see no disbenefit to standing or travelling in crowded conditions. There is therefore a possibility of the demand for public transport services being overstated, these additional trips would otherwise need to travel by an alternative mode, be diverted elsewhere or make the journey at a different time.

3 Land Use Scenario and Policies

3.1 Introduction

3.1.1 The purpose of this Chapter is to outline the economic and demographic scenario assumptions, the planning policy data sources and the policy inputs to the land use model. Chapter 2 outlined that artificial test scenarios were created in which employment and population control totals were used to fix the level of employment and population growth in the modelled area. The modelling assumed that that all of the LDF developments were built, with the land use model determining the level of take up of the new floorspace in each development, based on the accessibility of the development relative to other developments.

3.1.2 Following this introductory section the remainder of this Chapter is structured as follows:

- Section 3.2 describes the population and employment scenarios ;
- Section 3.3 outlines the processes involved in collecting the required data on planning policy, and the sources of the data; and
- Section 3.4 provides a brief summary of the planning policy inputs to the model.

3.2 Overall Economic and Demographic Scenarios

3.2.1 As noted earlier in this Report, economic and demographic scenarios have been developed in order to control the level of population and employment growth within the modelled area. This means that the model does not allow the total population and employment to be influenced by changes in land-use or transport policies within the modelled area. Therefore, the overall population and employment have not been affected by the inclusion of the LDF developments or the transport schemes in the Greater Manchester Transport Fund, however the location of the population and employment has. The Economic Growth Scenario and the Demographic Growth Scenario are summarised in this Section, and described in more detail in Project Note LDF3 "GMSPM2 – Land Use Results from the LDF Modelling", which is included as Appendix B.

Economic Growth Scenario

3.2.2 GMSPM2's Regional Economic Model has been calibrated so as to be consistent with the level of growth in the GMFM 2007 AGS forecasts for Greater Manchester, and TEMPRO for the rest of the modelled area. The total growth implied by summing the growth from these two sources was applied as the controlled growth for the modelled area. The scenario was calibrated on the data provided for the period 2001-2021 and then extrapolated to 2026 based on growth in previous years. Total growth in employment, across the modelled area, is as shown in Figure 3.1. Employment growth over the period is fairly modest, increasing by 13% over the twenty year period.

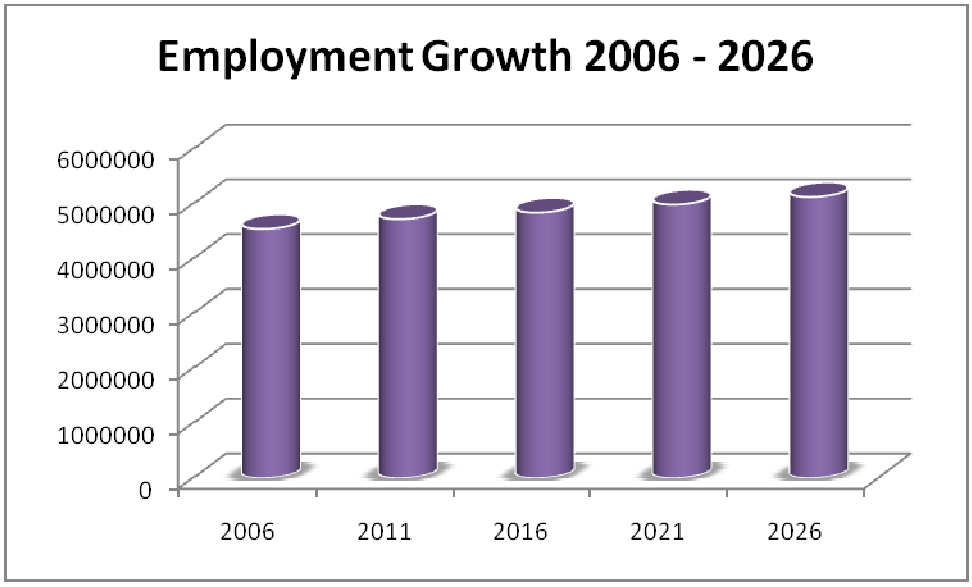

Figure 3.1 Employment Growth in the Modelled Area

3.2.3 The GMSPM2 inputs were adjusted so that the distribution of growth across the modelled area broadly corresponded with the required growth. The model parameters which influence the location of economic activity have been adjusted to ensure the distribution of growth in the Do Minimum scenario meets the GMFM forecasts for Greater Manchester. However, the changing land-use and transport policies in the Greater Manchester Proposals Scenario will change the distribution of this growth, with the overall growth in Greater Manchester, as opposed to within the fully modelled area, allowed to change to reflect changing accessibility within and around the Greater Manchester area.

Demographic Growth Scenario

3.2.4 The demographic scenario has been calibrated so as to match the level of growth in the GMFM 2007 AGS forecasts for Greater Manchester, and TEMPRO for the rest of the modelled area. The target growth was set for the modelled area, and was the sum of the growth implied by the two sources. The forecast growth in population and households within the Modelled Area are shown in Figure 3.2. Overall the population is assumed to increase by 7% and the number of households by 16% between 2011 and 2026, implying a 7% decrease in average household size over the period.

3.2.5 As for employment, some adjustment was done to match the distribution of demographic change to be consistent with the AGS across Greater Manchester, whilst still allowing the model results to vary as land-use and transport inputs are changed in different tests.

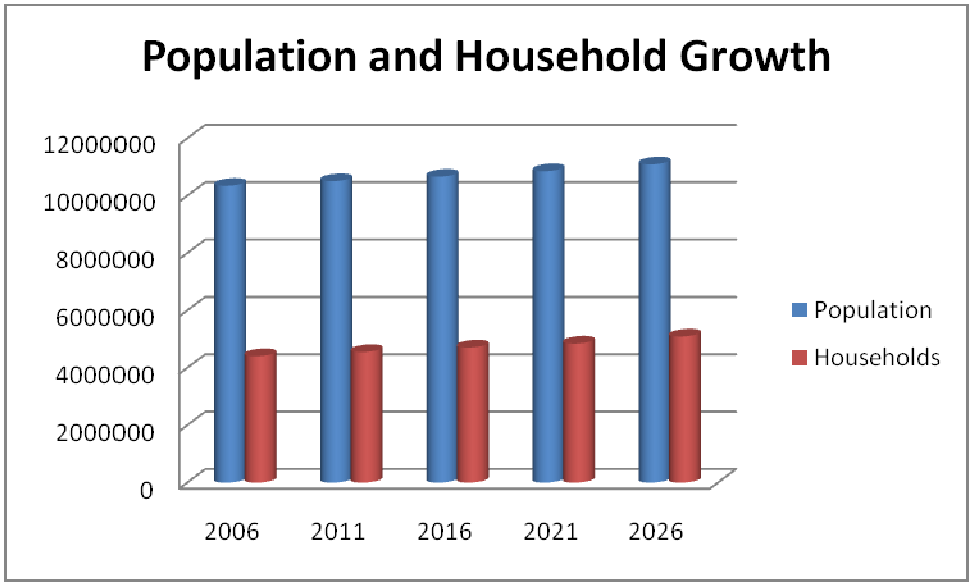

Figure 3.2 Population and Household Growth in the Modelled Area

Airport

3.2.6 The number of jobs in the airport zone has been constrained so as to be broadly consistent with forecasts provided by Manchester Airport Group, which is a specific employment projection. These forecasts state that on-site employment will rise from 19,201 in 2007 to 24,780 in 2015 and 27,950 in 2030. These targets have not been implemented as hard constraints, instead floorspace has been input into the zone to attract approximately the correct number of jobs. However, the level of employment in the airport zone will vary as the location of jobs responds to differing planning inputs and transport policies.

3.3 Planning Policy Data Sources

3.3.1 Planning policy data are key inputs to the model for the testing of the LDF core strategies, as they provide the information on where additional housing and employment floorspace are to be located, and therefore control the distribution of any future development. The collation, processing and summary of the planning policy inputs is described in detail in DSC Project Note LDF2 "GMSPM2 – Planning Policy Inputs for the LDF Modelling" which is attached to this report as Appendix A. This section briefly outlines the data sources that have been used to obtain the planning policy inputs.

3.3.2 Planning data has been collected on future residential, office and industrial developments across Greater Manchester. The process of data collection involved the following stages:

- The collection of data held by Urban Vision, which had been supplied by each of the districts using a standard template. This data was processed and reviewed, with a number of issues identified that needed addressing before the data could be used.
- A round of consultation with the district planning authorities was undertaken in order to clarify areas of uncertainty in the data provided by Urban Vision, and to seek additional information where necessary.

- A further round of consultation with each of the district planning authorities was undertaken in order to give them the opportunity to refine their data as appropriate.
- The Manchester Airports Group was consulted to collect data on the future growth projections for the Airport.
- Desk based research was carried out to collect the total amount of residential development included in the Regional Spatial Strategies for local authorities outside of Greater Manchester, as well as collecting data from published sources on allocations for employment land in the same areas.

3.3.3 A number of assumptions have been made in processing the information. Some local authorities supplied data for 'employment' use rather than separate data for industrial and office developments. Where this is the case it has been assumed that the proportion that is office and industry reflects the (GMFM) employment forecasts. Information was sometimes supplied for areas of land rather than floorspace; we have assumed variable plot ratios with higher ratios in the regional centre and lower ratios in the suburbs. The models use the 2001 ward boundaries as zone boundaries, but the data was provided using the 2004 wards. Therefore, assumptions had to be made about the location of developments in order to fit the model zone system.

3.4 LDF Developments – Greater Manchester

3.4.1 The planning policy data received from local authorities are key inputs to the land use modelling. They control the distribution of future development, and specify the location and amount of additional housing and employment floorspace within each of the ten districts of Greater Manchester. This section summarises the planning policy inputs for the local authorities within Greater Manchester.

Residential Development

3.4.2 Table 3.1 and Table 3.2 show the amounts of residential development and demolitions expected to come forward by local planning authority area. It should be noted that the data input to the model includes a representation of development associated with Housing Growth Point initiatives for Bolton, Manchester, Trafford and Salford. This additional development is phased and assumed to be developed between 2008 and 2018 (2012 to 2018 in Salford). The information for Bolton and Trafford was received from their respective councils, but assumptions had to be made about the Salford development as information had not been received at the time the models were run.

3.4.3 The requirements for the planning policy inputs to the model are that the data be input in terms of additional floorspace each year. In order to meet these requirements, it was assumed that the level of provision of development was evenly spread throughout the period that a development was being constructed.

3.4.4 Information on residential developments was provided in the form of the number of dwellings, so the number of units was multiplied by an assumed average dwelling size. The average dwelling size varied by district, however, across most of the modelled area an average size of 100 square metres was assumed. Within Manchester where the majority of development was flats, it was assumed that the floorspace of new developments would reflect the floorspace of existing housing stock.

3.4.5 It should be noted that the information on demolitions is based on the best information that had been made available at the time of inputting data into the model. Where no data was available, it was assumed that no demolitions were to take place.

Table 3.1 Residential Developments 2008-2028 (Dwellings)

District	Completions 2001/2 – 2007/8	New Build			
		2008-13	2013-18	2018-23	2023-28
Bolton	5,741	3,468	3,472	3,472	3,482
Bury	3,845	3,202	3,538	2,612	937
Manchester	24,696	15,149	22,852	20,558	17,500
Oldham	2,987	1,641	1,734	1,445	1,445
Rochdale	2,926	3,787	4,250	2,859	1,588
Salford	6,515	8,236	11,468	9,991	8,757
Stockport	2,912	2,451	2,349	2,257	2,000
Tameside	4,904	4,460	4,980	3,860	4,040
Trafford	4,233	3,340	3,580	2,940	2,900
Wigan	6,417	5,290	4,993	4,993	2,971
Greater Manchester	**65,176**	**49,369**	**61,833**	**53,637**	**44,270**

Table 3.2 Residential Demolitions 2008-2028 (Dwellings)

District	Demolitions 2001/2 – 2007/8	Demolitions			
		2008-13	2013-18	2018-23	2023-28
Bolton	729	0	0	0	0
Bury	196	0	0	0	0
Manchester	4,000	0	0	0	0
Oldham	1,140	0	0	0	0
Rochdale	1,296	555	533	500	500
Salford	0	0	0	0	0
Stockport	0	100	100	100	100
Tameside	1,883	600	350	350	350
Trafford	389	0	0	0	0
Wigan	401	400	400	400	400
Greater Manchester	**1,0034**	**1,655**	**1,383**	**1,350**	**1,350**

Office Development

3.4.6 Table 3.3 show the amounts of office development included in the planning policy inputs. It should be noted that the inputs for 2002-8 were calculated using Valuation Office data on floorspace. The employment floorspace figures for Manchester are based in part on the increase in floorspace forecast by the Greater Manchester Forecasting Model, as this was the most reliable data available for this district.

Table 3.3 Office Planning Policy Inputs by District (square metres)

District	2001	2002-8	2008-13	2013-18	2018-23	2023-28
Bolton	307,000	79,262	15,000	20,000	15,000	15,000
Bury	149,000	31,754	55,383	151,455	38,243	46,130
Manchester	2,155,000	178,295	128,282	289,577	175,270	79,079
Oldham	218,000	27,525	26,607	136,946	45,765	32,537
Rochdale	180,000	30,566	44,086	58,761	45,295	35,203
Salford	546,000	20,421	134,666	134,666	134,666	134,666
Stockport	475,000	47,500	20,460	34,300	30,700	24,400
Tameside	180,000	29,032	-3,396	16,353	36,235	38,142
Trafford	572,000	47,131	58,942	53,901	57,688	38,097
Wigan	275,000	29,668	105,405	102,950	55,308	44,983
Greater Manchester	**5,056,998**	**521,155**	**585,434**	**998,909**	**634,168**	**488,236**

Industrial Development

Table 3.4 show the amounts of permissible industrial developments included in the model, inputs for 2002-8 have been calculated using Valuation Office data on floorspace.

Table 3.4 Industrial (Industry + Warehousing) Planning Policy Inputs by District (square metres)

District	2001	2002-8	2008-13	2013-18	2018-23	2023-28
Bolton	2,682,999	-309,000	25,000	25,000	35,000	30,000
Bury	1,497,000	-198,000	5,840	15,052	-46,468	0
Manchester	3,421,999	-758,000	-122,249	-27,096	-32,429	-26,507
Oldham	2,941,999	-255,000	-29,271	59,537	57,685	41,013
Rochdale	2,822,000	-212,000	248,513	88,483	48,825	36,597
Salford	2,151,999	-40,000	-73,769	-73,769	-73,769	-73,769
Stockport	1,810,000	-54,000	2,100	3,500	4,600	4,200
Tameside	2,171,999	-163,000	-6,604	28,647	58,765	61,858
Trafford	2,457,999	-53,000	-37,808	-35,204	-23,866	-20,117
Wigan	2,404,000	34,285	177,538	254,008	341,595	289,720
Greater Manchester	**24,361,993**	**-2,007,714**	**189,290**	**338,158**	**369,939**	**342,995**

4 Transport Scenario Assumptions

4.1 Introduction

4.1.1 The purpose of this Chapter is to set out the transport assumptions that have been included in the transport strategies utilised for the Do Minimum and Greater Manchester Proposals Scenario for each modelled year. The transport assumptions that have been included in the model runs are described in detail in Technical Note 1 "Transport Strategy Assumptions", which is attached as Appendix C.

4.1.2 Two transport strategies have been developed for the assessment of the LDFs, with each having different assumptions about the transport schemes that are to be completed over the period for which the LDFs have been tested. These two scenarios are designed to test the LDFs with no transport schemes other than those already fully committed and with a most likely transport investment programme. The two transport strategies contained within the modelled scenarios can be summarised as follows:

- the **Do Minimum Scenario** contains only those schemes that are fully committed or already under construction; and
- the **Greater Manchester Proposals Scenario** contains the most likely transport investment programme, which has arisen out of the AGMA Scheme Prioritisation process (the transport strategy being referred to as the Phase 1 Reference Strategy in Technical Note 1).

4.2 Transport Economic Assumptions

4.2.1 The Economic Assumptions that have been made in defining the transport scenario for the LDF tests are the same for both the Do Minimum and Greater Manchester Proposals scenarios.

4.2.2 The main source for the assumptions about these economic and cost parameters is Unit 3.5.6 of the Department for Transport's Transport Analysis Guidance (TAG). An updated draft of this unit was made available in December 2008, and the fuel cost element of vehicle operating costs, values of time and vehicle operating cost assumptions have all been taken from this updated unit.

4.2.3 Public transport fares are assumed to rise at 1% per annum above the growth in RPI between 2006 and all future years in the model. This is in line with the Department for Transports' guidance on changes in public transport fares, and is based on increases in regulated rail fares.

4.2.4 It is assumed that the current ticketing options available to passengers of all modes are those that would be available in the future. Although new ticketing methods are being developed which could increase the attractiveness of public transport, they are not definite and at this stage difficult to model.

4.3 Do Minimum Scenario

4.3.1 As noted earlier, the transport strategy contained within the Do Minimum Scenario has only included transport schemes that are either fully committed or are already under construction. These schemes are listed in the remainder of this section, and are shown in the figure contained within Appendix D.

Metrolink

4.3.2 The Phase 3a extensions to the Metrolink network, listed below, have been included in the Do Minimum Transport Scenario from 2011:

- the extension from Victoria to Oldham and Rochdale along the existing railway line;
- the extension from Piccadilly to Droylsden;
- the spur to MediaCity UK; and
- the extension from Trafford Bar to Chorlton (St Werburgh's Road).

Bus

4.3.3 Bus service patterns and frequencies in the Do Minimum Strategies have been assumed to be unchanged from those in the modelled base year of 2006.

Rail

4.3.4 Rail service patterns and frequencies in the Do Minimum Strategy have been assumed to be unchanged from those in the base year of 2006.

Interchanges

4.3.5 Rochdale Interchange has programme entry status in the Department for Transports (DfT) Regional Funding Allocation, and has therefore been included in the Do Minimum strategy from 2011 as it is considered likely to be built.

Highway Schemes

4.3.6 The traffic model base year is 2005, therefore the already completed schemes listed below have been added to the Do Minimum transport strategy from 2011:

- M60 Junction 5 to 8 widening;
- M62 Junction 21 / Kingsway Business Park;
- A5081 Park Way / Trafford Centre Access; and
- Gibfield Link Road.

4.3.7 In addition to the above, work has started on the A34 Alderley Edge Bypass, which has been added to the Do Minimum Strategy from 2011.

4.4 Greater Manchester Proposals Scenario

4.4.1 The schemes included in the transport strategy for the Greater Manchester Proposals Scenario are those that are included in the Greater Manchester Transport Fund as approved by the Association of Greater Manchester Authorities (AGMA) in May 2009. These schemes are listed in the remainder of this section, and are shown in the figure contained within Appendix E.

Metrolink

4.4.2 In addition to the Metrolink extensions included in the Do Minimum scenario, the following extensions are included in the Greater Manchester Transport Fund and are therefore included in the Greater Manchester Proposals Scenario, with the assumed year of opening for the purposes of the modelling shown in brackets:

- the extension from Chorlton to East Didsbury (2011);
- the extension from Droylsden to Ashton (2011);
- the extension from Rochdale Railway Station to Rochdale Town Centre (2016);
- the extension from Chorlton to the Airport (2016);
- the diversion into Oldham Town Centre (2016); and
- the Second City Crossing (2016).

Bus

4.4.3 As with the Do Minimum scenario, the bus services and frequencies in the Greater Manchester Proposals Scenario remain unchanged from the base year services. However, the Greater Manchester Proposals Scenario includes the Cross City Bus Package and the elements of the Leigh Salford Manchester guided busway scheme that are included in the DfT Regional Funding Allocation. The Cross City Bus Package involves direct services between Atherton/Lowton and MRI and between Middleton and MRI and is assumed to be in place by 2011. The Leigh Salford Manchester scheme is assumed to open in 2016.

Rail

4.4.4 Rail service patterns and frequencies are unchanged from those in the Do Minimum Strategy and the base year of 2006.

Interchanges

4.4.5 Bolton and Altrincham Interchanges are in included in the Greater Manchester Transport Fund and are therefore in the Greater Manchester Proposals Scenario from 2016.

Highway Schemes

4.4.6 In addition to the schemes included in the Do Minimum scenario, the following schemes have been included in the Greater Manchester Proposals Scenario:

- Ashton Northern Bypass Stage 2 in 2011 (this scheme has DfT programme entry);
- Mottram Bypass/Glossop Spur in 2021 (HA development stage / programme entry);

- SEMMMS Relief Road in 2021; and
- Wigan Inner Relief Route.

4.5 Other Assumptions

Goods Vehicle Forecasts

4.5.1 The models do not model goods vehicle demand responses in terms of time of day, distribution and frequency of journeys. However, it does model changes in routing of goods vehicles as traffic flows and speeds change. Future year goods vehicle demand has been estimated from the base year demand by applying growth factors based on the National Transport Model forecasts, which are the current forecasts recommended by DfT for forecasting goods vehicle growth.

Parking Assumptions

4.5.2 No explicit car parking policies have been modelled in the LDF work and so the parking choice functionality of the model was not used. The implicit assumptions within the analysis is therefore that the base year search times remain constant for each year into the future. It was assumed that parking charges remain constant in real terms through time.

4.5.3 There is the possibility of using the model to test the effect of different parking strategies for possible future work, including changes to parking provision related to the development assumptions.

5 Land Use, Population and Employment Forecasts

5.1 Introduction

5.1.1 This section describes the forecasts of change in both occupied floorspace and the activities that occupy that floorspace. As described earlier the model takes inputs in residential, retail, office and industrial floorspace and forecasts the distribution of households, population and employment that occupy that floorspace across the fully modelled area. The model is constrained so that new floorspace is only 'developed' in zones where the planning policy inputs indicate that local planning authorities expect development to take place. Furthermore the quantity of new development is consistent with the amounts of development that the planning authorities indicate will come forward.

5.1.2 Although the approach taken to modelling planning policy inputs implies that all the inputs provided by the local planning authorities are assumed to be built, it is still possible to make some observation on whether the scale of proposed development is consistent with the overall levels of growth implied within the Accelerated Growth Scenario.

Number of Jobs

5.1.3 Table 5.1 shows the change in the number of jobs within each district for the Greater Manchester Proposals Scenario over the period 2011 to 2026. The number of jobs within Greater Manchester is forecast to rise by around 100,758 (8%) over the 15 year period. Around 35% of this increase is forecast to be within the City of Manchester. The greatest relative changes in the number of jobs are seen in Bury, Manchester, Salford and Wigan where increases of more than 10% are seen. The increases in the number of jobs are smallest in Bolton and Stockport, both in absolute and relative terms.

5.1.4 The final map shown in Figure 5.1 shows the absolute change in the number of jobs between 2011 and 2026 by model zone. Over the 15 year period a concentration of jobs in the Regional Centre is forecast, which corresponds with the zones which see the largest increases in employment floorspace. Elsewhere the changing pattern of jobs also reflects employment floorspace change between 2011 and 2026. For example, there are large increases forecast in the number of jobs in Wigan resulting from the increases in office and industrial floorspace, and there are reductions in the number of jobs in the east of Bolton where there are reductions in office and industrial floorspace.

5.1.5 The number of jobs in those parts of the City Region beyond the Greater Manchester boundary is forecast to increase by around 46,663 (11%) during the same period. Around two thirds of the growth within this area is forecast to occur within High Peak, Macclesfield and Warrington local authority areas.

Table 5.1 Change in Jobs by District - Greater Manchester Proposals Scenario

District	2011	2026	Difference
Bolton	112,973	116,112	3%
Bury	67,487	76,146	13%
Manchester	318,212	353,934	11%
Oldham	87,504	92,696	6%
Rochdale	83,045	88,061	6%
Salford	117,096	131,212	12%
Stockport	128,448	131,916	3%
Tameside	78,551	83,834	7%
Trafford	126,870	133,561	5%
Wigan	116,017	129,489	12%
Greater Manchester	**1,236,204**	**1,336,962**	**8%**
Rest of Modelled Area	**420,144**	**466,808**	**11%**

5.1.6 There may be several contributory factors that explain this faster growth outside of Greater Manchester:

- Increasing levels of congestion within the Regional Centre and surrounds may become a deterrent and businesses re-locate to other, less congested, areas.
- The strategy of constraining growth in the southern parts of the County (including Stockport, Trafford and parts of the City of Manchester) may be having the effect of moving jobs further out into parts of Cheshire, Warrington and Derbyshire rather than deflecting growth to northern parts of the County. Although additional office floorspace is provided in these areas, this reflects the availability of employment sites within Cheshire and parts of High Peak and the provision of transport schemes which improve access to jobs in these areas, which have lower rents.
- Certain of the planned transport schemes improve accessibility to and from areas beyond the boundary of Greater Manchester. Notable schemes include the planned construction of the Glossop Spur, the Mottram by-pass and the SEMMMS highway route between the Airport and A6.

5.1.7 The increase in the number of jobs within Greater Manchester is broadly consistent with the increase in the number of residents in employment.

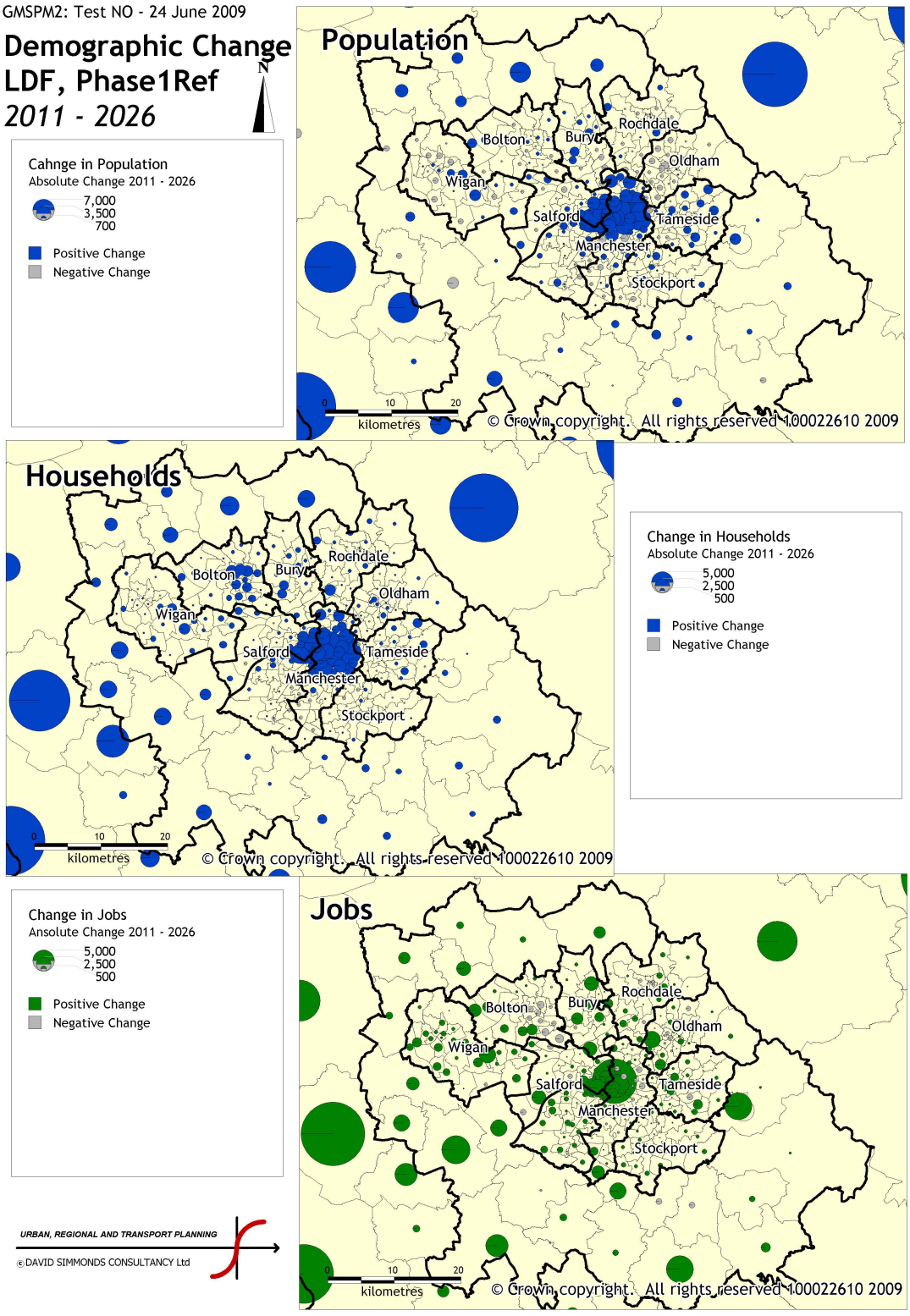

Figure 5.1 Change in Population, Households and Jobs by Model Zone between 2011 and 2026 – Greater Manchester Proposals Scenario

5.2 Residential Land

5.2.1 The change in the number of households within each district between 2011 and 2026 is shown in Table 5.2. Over this period the LDF planning policy inputs imply a 13% increase in residential floorspace within Greater Manchester. The forecast increase in the number of households over the same period is 12%. Therefore, the increase in the supply of residential floorspace is greater than the increase in households over this period. Over half of the growth in households within Greater Manchester occurs within the City of Manchester, with the smallest increases occurring within Stockport, Trafford and Tameside.

Table 5.2 Change in Households by District between 2011 and 2026 - Greater Manchester Proposals Scenario

District	2011	2026	Difference
Bolton	118,952	133,102	12%
Bury	80,496	86,646	8%
Manchester	216,967	284,241	31%
Oldham	92,228	95,924	4%
Rochdale	87,971	94,380	7%
Salford	101,083	119,618	18%
Stockport	120,802	120,960	0%
Tameside	93,689	97,821	4%
Trafford	91,680	94,595	3%
Wigan	134,898	143,019	6%
Greater Manchester	**1,138,768**	**1,270,306**	**12%**
Rest of Modelled Area	**412,032**	**447,550**	**9%**

5.2.2 Table 5.3 shows the proportions of the population of each district residing in the city and town centre zones in 2011 and 2026 for the Greater Manchester Proposals Scenario. The model forecasts that the proportion of households residing in city and town centre zones across Greater Manchester increases from 16% to 18%. Manchester and Salford see the largest increases as households move into the new developments within the Regional Centre, whilst only Wigan sees a reduction in the proportion of households living in its town centre. The proportions of the population of Oldham, Rochdale and Wigan living in town centres are low in 2011 and these districts see modest increases by 2026.

Table 5.3 Proportion of Households Residing in City and Town Centre Zones by District - Greater Manchester Proposals Scenario

District	2011	2026
Bolton	21%	24%
Bury	16%	16%
Manchester	17%	23%
Oldham	7%	8%
Rochdale	1%	2%
Salford	13%	18%
Stockport	23%	23%
Tameside	25%	25%
Trafford	18%	18%
Wigan	10%	10%
Greater Manchester	**16%**	**18%**

5.2.3 The occupancy rates for residential property in each district are shown in Table 5.4 for both 2011 and 2026 in the Greater Manchester Proposals Scenario. The occupancy rates increase as demand for floorspace rises, and it can be seen that the increase in occupancy rates is greatest within the city and town centre zones, over the period 2011-2026. However, the occupancy rates in these centres in 2011 were typically lower than in the other parts of each local authority area. This higher rate of growth may be part of a catching-up process, possibly also reflecting constraints on the amount of residential development away from the centres, with the majority of the districts shown a 100% occupancy rate by 2026.

5.2.4 The fact that occupancy rates are increasing but the number of households increases by less than the quantity of residential floorspace suggests that the quantity of floorspace a household occupies is increasing. This in part reflects the land use model's approach to the modelling of residential property where it models square metres of floorspace rather than dwelling units, which enables to model to reflect changes in the size of residential properties.

Table 5.4 Occupancy Rates by District - Greater Manchester Proposals Scenario

District	2011		2026	
	District Average	City/Town Centre Average	District Average	City/Town Centre Average
Bolton	98%	95%	99%	98%
Bury	99%	99%	100%	100%
Manchester	94%	90%	95%	92%
Oldham	99%	96%	100%	99%
Rochdale	99%	99%	100%	100%
Salford	97%	95%	98%	97%
Stockport	99%	98%	100%	100%
Tameside	99%	98%	100%	100%
Trafford	99%	98%	100%	99%
Wigan	99%	99%	100%	100%
Greater Manchester	**98%**	**96%**	**99%**	**98%**

5.2.5 The first two maps of Figure 5.1 show the absolute changes in population and households by zone between 2011 and 2026. The distribution of population and households varies as households respond to the changes in residential floorspace. In the Regional Centre, where there are large increases in floorspace, the population and number of households more than double. In those zones where there is little new residential development, small percentage decreases in population and, to a lesser extent households, occur.

5.3 Office Floorspace

5.3.1 The change in office floorspace in each of the districts of Greater Manchester between 2011 and 2026 for the Greater Manchester Proposals Scenario is shown in Table 5.5, and the change in office employment is shown in Table 5.6. Over the period the LDF policies inputs imply a 39% increase in office floorspace within Greater Manchester and 47% within the rest of the Fully Modelled Area. At the same time, the model forecasts that the number of people in office-based employment increases by 13% within Greater Manchester and 23% within the surrounding area. In both areas the percentage increases for floorspace, is much greater than that for office-based employment. This oversupply may reflect the requirement, within planning policy, to provide for a range of sites for employment activities.

5.3.2 The change in office-based employment varies greatly by district with Bury, Manchester, Salford and Wigan all seeing significant percentage increases in employment. However, the increases in Rochdale, Tameside and Trafford are low, with Bolton and Stockport seeing decreases. The greatest absolute increases are seen in Manchester and Salford, reflecting the concentration of new development on the Regional Centre and the area surrounding it.

Table 5.5 Change in Office Floorspace by District between 2011 and 2026 - Greater Manchester Proposals Scenario (sq metres)

District	2011	2026	Difference
Bolton	399,278	498,382	25%
Bury	213,979	453,497	112%
Manchester	2,369,202	3,058,146	29%
Oldham	261,488	474,359	81%
Rochdale	237,023	379,870	60%
Salford	647,278	1,051,471	62%
Stockport	534,765	622,591	16%
Tameside	206,870	272,534	32%
Trafford	654,482	812,395	24%
Wigan	367,933	595,473	62%
Greater Manchester	**5,892,299**	**8,218,718**	**39%**
Rest of Modelled Area	**1,729,384**	**2,535,078**	**47%**

Table 5.6 Change in Office-Base Employment by District between 2011 and 2026 - Greater Manchester Proposals Scenario

District	2011	2026	Difference
Bolton	21,161	19,163	-9%
Bury	12,842	18,617	45%
Manchester	96,582	114,626	19%
Oldham	14,203	16,384	15%
Rochdale	13,465	14,351	7%
Salford	29,002	37,420	29%
Stockport	27,291	24,972	-8%
Tameside	12,177	12,268	1%
Trafford	32,377	33,536	4%
Wigan	19,201	22,759	19%
Greater Manchester	**278,301**	**314,096**	**13%**

5.3.3 Table 5.7 shows the proportion of the office-based employment in each district that is located in the town and city centres in 2011 and 2026 for the Greater Manchester Proposals Scenario. The model forecasts that the proportions of office employment in each district within the town and city centres decreases in Bolton, Bury, Oldham, Rochdale, Tameside, Trafford and Wigan, over the period 2011 to 2026. For example, in Oldham the proportion is forecast to decline from 37% of the borough's office-based employment to 25%. In contrast the proportion of both Manchester and Salford's office-based employment increases, again reflecting the concentration of development on the Regional Centre.

5.3.4 The assumption, within the model, that all sites are developed may have contributed towards a dispersed pattern of office employment growth. If the modelling of development had taken into account market demand then some sites may not have been deemed sufficiently profitable to have been developed. It is not possible, with the testing strategy adopted for this study, to determine which locations these sites would have been in. Many of the sites in locations away from the town and city centres may have relatively good accessibility and are seen as being good locations for business.

Table 5.7 Proportion of Office-Based Employment Located within Town and City Centres in Each District – Greater Manchester Proposals Scenario

District	2011	2026
Bolton	48%	42%
Bury	49%	48%
Manchester	71%	80%
Oldham	37%	25%
Rochdale	20%	13%
Salford	34%	41%
Stockport	38%	37%
Tameside	42%	37%
Trafford	31%	29%
Wigan	23%	20%
Greater Manchester	**48%**	**50%**

5.4 Industrial Floorspace

5.4.1 Over the period 2011 to 2026 the LDF policy inputs imply increases of 5% and 10% in industrial floorspace within Greater Manchester and the rest of the Fully Modelled Area respectively. At the same time the model forecasts that the number of people employed in industrial-based employment decreases by 6% within Greater Manchester and 5% in the rest of the Fully Modelled Area. The decline in manufacturing employment reflects the AGS forecast of a continuing shrinking of many of the Area's traditional industries.

Table 5.8 Change in Industrial Floorspace by District between 2011 and 2026 - Greater Manchester Proposals Scenario (sq metres)

District	2011	2026	Difference
Bolton	2,394,508	2,514,283	5%
Bury	1,302,538	1,273,486	-2%
Manchester	2,589,721	2,520,248	-3%
Oldham	2,669,450	2,799,540	5%
Rochdale	2,759,126	3,017,893	9%
Salford	2,067,871	1,860,714	-10%
Stockport	1,757,277	1,768,708	1%
Tameside	2,003,506	2,105,265	5%
Trafford	2,382,330	2,296,112	-4%
Wigan	2,544,811	3,385,274	33%
Greater Manchester	**22,471,138**	**23,541,523**	**5%**
Rest of Modelled Area	**9,354,928**	**10,245,014**	**10%**

5.5 Inclusive and Liveable Communities

5.5.1 The 2007 Index of Multiple Deprivation is published for Lower Super Output Areas (LSOAs). It ranks all LSOAs across England in terms of their level of deprivation as measured across a range of factors. Its use of output area geography represents a different geography to that used in defining the zones within the land use and transport models. Nevertheless it is possible to overlap the two sets of boundaries and identify those LSOA's that fall within each transport model zone. In analysing the forecast change in land use and population, we have considered the change that is occurring in those zones that overlap with the LSOAs that rank amongst the top 15% most deprived areas within the country.

5.5.2 At a county level the model forecasts that the number of people in employment living within these zones increases by 13.9% in the period 2011 to 2026. This compares to an increase of 1.7% in the numbers of people in employment living in the other zones within Greater Manchester.

5.5.3 Whilst it cannot be assumed that this increase in zones overlapping with the areas of high deprivation will bring direct benefit to those currently living within these deprived communities – there may, for example, be a displacement effect with people moving into these areas from elsewhere because of their relative attractiveness to employment – the

forecasts suggest that many of these areas will experience more people in work and presumably more money within the local economy.

5.5.4 The models are not able to give an indication as to where deprivation exists, it can merely be used to indicated changes in employment and this be correlated to the already deprived areas. Therefore, the model cannot be used to predict which areas will suffer from deprivation in the future, particularly if an area that is not currently deprived is to become deprived.

6 Forecast Impacts on Transport Networks

6.1 Introduction

6.1.1 The purpose of this Chapter is to describe the strategic impacts of the LDFs on the transport networks in Greater Manchester. Within this Chapter the model outcomes that are described are based on the outputs from the testing of the Greater Manchester Proposals Scenario, and compare the key transport indicators for 2026 with those for 2011. The outcomes that are described assume that both the planning policy inputs of the Local Development Frameworks, and the transport schemes comprising the Greater Manchester Transport Fund are built. In order to show the overall impact of the Greater Manchester Proposals, some results are presented from the Do Minimum scenario.

6.1.2 This Chapter considers the impact of the LDFs and the transport schemes under the following headings:

- changes in trip making;
- impact on commuting trips;
- impact on journey times;
- impact on the highway network;
- impact on Public Transport; and
- impact on environmental indicators.

6.2 Changes in Trip Making

6.2.1 The model forecasts of the changes in trip making between 2011 and 2026 in the Do Minimum scenario are provided in Table 6.1. This shows that without the LDFs and transport schemes, traffic levels are expected to increase over time, with a reduction in public transport demand. This is as a result of increasing levels of population, employment, income and car ownership, together with declining relative affordability of public transport compared with car. The model forecasts suggest increases in the number of car trips of 16% and decreases in public transport trips of 6% between 2011 and 2026. The growth in car trips is further accentuated by the use of the AGS high economic growth scenario for the model tests. Higher levels of economic growth are forecast to result in higher employment and income levels; the latter leading to higher levels of car ownership and availability.

6.2.2 As reported in Chapter 5, under the Greater Manchester Proposals Scenario the number of households within Greater Manchester is forecast to increase by around 12% between 2011 and 2026, with employment rising by 8%. The impact of the housing and employment increases, along with the inclusion of the transport schemes, is shown in Table 6.2. The overall level of trip making in Greater Manchester is forecast to increase by 8%, with forecast increases in car trips of 15% and public transport demand remaining constant between 2011 and 2026.

6.2.3 These results show that the combination of the LDF developments and the transport schemes are expected to arrest the decline in overall public transport patronage that would otherwise be expected. The concentration of residential and employment development in the Regional

Centre, the area of Greater Manchester which is best served by public transport, means that development in this area is likely to attract a higher public transport usage than elsewhere. Improvements to the transport network, such as the Metrolink network and the Leigh Salford Manchester busway, will further improve the attractiveness of using public transport to access the Regional Centre. However, traffic levels are forecast to continue increasing, albeit at a lower level, with the overall public transport mode share forecast to decrease over time.

6.2.4 Costs of using public transport increase at a greater level than costs resulting from congestion, mainly as a result of increases in public transport fares. This means that people do not turn to public transport despite worsening congestion. This effect is exaggerated by the fact that the increasing congestion also has an impact on bus journey times. Public transport is also only a really attractive alternative for trips to the Regional Centre, plus a few other isolated areas, particularly with the dispersal of developments and trip patterns on other districts, and increasing car availability.

6.2.5 The model forecasts suggest that with the combination of the LDFs and transport schemes a 7% reduction in walk and cycle journeys is expected over the period 2011 to 2026. The concentration of employment and population in the city centre is likely to encourage more walking trips, whereas the transport improvements are likely to result in walk and cycle becoming less attractive relative to public transport. Also, there are no measure to encourage walking and cycling included within the Greater Manchester Transport Fund schemes. As a result of these factors a similar level of reduction in walk and cycle journeys is seen in the Do Minimum Scenario and in the Greater Manchester Proposals scenario.

Table 6.1 Change in Greater Manchester Trip Productions and Attractions between 2011 and 2026 – Do Minimum Scenario

	2011	2026	Difference
Productions			
Car	2,080,795	2,411,717	+16%
Public Transport	312,820	293,062	-6%
Walk/Cycle	895,928	832,514	-7%
Total	**3,289,544**	**3,537,293**	**+8%**
Attractions			
Car	2,081,388	2,418,904	+16%
Public Transport	332,430	312,973	-6%
Walk/Cycle	896,032	832,874	-7%
Total	**3,309,850**	**3,564,750**	**+8%**

Table 6.2 Change in Greater Manchester Trip Productions and Attractions between 2011 and 2026 – Greater Manchester Proposals Scenario

	2011	2026	Difference
Productions			
Car	2,080,795	2,395,171	+15%
Public Transport	312,820	311,772	0%
Walk/Cycle	895,928	831,077	-7%
Total	**3,289,544**	**3,538,020**	**+8%**
Attractions			
Car	2,081,388	2,402,074	+15%
Public Transport	332,430	332,605	0%
Walk/Cycle	896,032	831,386	-7%
Total	**3,309,850**	**3,566,066**	**+8%**

6.2.6 The change in the number of car and public transport trips to, from and within Greater Manchester between 2011 and 2026 for the Greater Manchester Proposals Scenario is shown in Table 6.3. This highlights that the growth in car trips is occurring in each of the modelled time periods, with the overall increase being 14% between 2011 and 2026. There is very little difference in the level of growth between time periods despite the fact that increasing levels of congestion would be expected to result in greater increases outside of the peaks. However, this effect has clearly been balanced by the increasing levels of employment influencing the peak period demand.

6.2.7 Public transport journeys are actually shown to increase, despite productions and attractions within Greater Manchester being shown to remain constant. This is likely to be a result of the population and employment increases in the Regional Centre attracting journeys with one end outside of the study area. This increase occurs mainly in the morning and evening peak periods.

Table 6.3 Change in Trips To/From/Within Greater Manchester between 2011 and 2026 – Greater Manchester Proposals Scenario

	2011	2026	Difference
Car			
Morning Peak	1,277,461	1,453,243	+14%
Inter-peak	2,010,102	2,282,051	+14%
Evening Peak	1,578,286	1,782,008	+13%
Rest of Day	782,127	919,849	+18%
Total	**5,647,977**	**6,437,150**	**+14%**
Public Transport			
Morning Peak	221,025	226,396	+2%
Inter-peak	276,788	275,665	0%
Evening Peak	222,050	230,284	+4%
Rest of Day	57,508	62,223	+8%
Total	**777,372**	**794,568**	**+2%**

6.2.8 The percentage changes in trip productions and attractions by mode between 2011 and 2026 for the Greater Manchester Proposals Scenario for each of the districts in Greater Manchester are shown in Table 6.4. Each of the districts is showing increases in the number of trip productions and attractions, with the exception of productions in Oldham and attractions in Stockport. The level of production and attraction increases in Manchester and Salford are high, resulting in 30% increases in the number of car productions and accompanying increases in public transport, walking and cycling productions and attractions.

6.2.9 The only districts in Greater Manchester where the proportion of office employment that is concentrated in city and town centres is forecast to increase are Manchester and Salford. As a result of this, these are the only districts that are forecast to have significant increases in public transport attractions between 2011 and 2026. The remainder of the districts, where the proportion of office employment within town centres is forecast to decrease, are expected to see decreases in public transport attractions. Therefore, for areas away from the Regional Centre, the dispersal of employment development across districts is expected to result in the continued dominance of the use of private car.

Table 6.4 Change in Trips Productions and Attractions by District between 2011 and 2026 – Greater Manchester Proposals Scenario

	Productions				Attractions			
	Car	PT	Walk /Cycle	Total	Car	PT	Walk /Cycle	Total
Bolton	10%	-6%	-10%	3%	8%	-11%	-11%	2%
Bury	12%	-5%	-8%	5%	21%	-3%	-7%	11%
Manchester	29%	9%	3%	17%	19%	8%	4%	14%
Oldham	9%	-13%	-15%	0%	13%	-11%	-15%	3%
Rochdale	11%	-10%	-13%	3%	15%	-9%	-13%	5%
Salford	30%	10%	2%	20%	24%	9%	2%	17%
Stockport	8%	-8%	-11%	2%	7%	-13%	-12%	0%
Tameside	17%	-9%	-11%	7%	16%	-9%	-10%	6%
Trafford	12%	1%	-8%	6%	14%	-3%	-9%	7%
Wigan	11%	1%	-12%	4%	15%	-6%	-12%	5%
Total	**15%**	**0%**	**-7%**	**8%**	**15%**	**0%**	**-7%**	**8%**

6.3 Impact on Commuting Trips

6.3.1 The trend for commuting journeys over time is expected to follow that for overall travel demand, with a shift away from public transport, walking and cycling to car. The changes in commuting trip productions and attractions by district between 2011 and 2026 for the Greater Manchester Proposals Scenario are shown in Table 6.5.

6.3.2 The overall levels of economic growth in the Do Minimum Scenario are forecast to result in an increase of 17% in car commuting trips, a decrease in public transport commuting trips of 2% and in walk/cycle of 7% between 2011 and 2026. With the LDF developments and the transport schemes public transport commuting journeys are forecast to increase by 2% between 2011 and 2026. However, increases on a district basis are confined to trips with a production or attraction in Manchester, Salford and Wigan, again highlighting the impact of the concentration of residential and office development in the Regional Centre on increasing public transport patronage for these district, as well as the significant increase in employment in Wigan.

6.3.3 Although Manchester and Salford are forecast to see increases in public transport commuting between 2011 and 2026, they are also forecast to have the largest increases in car commuting, with over 20% increases in productions and attractions over the period. The

overall levels of economic and population growth, without the LDFs and the transport schemes, are only forecast to result in an increase in car trips of around 18%. However, with the inclusion of the LDFs and the transport schemes this forecast increase in car commuting in Salford is higher. Therefore, although the forecasts are predicting increases in the use of public transport for commuting, significant increases in commuting traffic are still forecast over the period, with commuting journeys by car increasing by 15%.

6.3.4 Walking and cycling journeys are forecast to decrease over time without the LDFs and the transport schemes. However, the impact of the LDFs and transport schemes are that walking and cycling trips decrease at a greater rate than would otherwise be expected, the decrease being 9% between 2011 and 2026. This impact is likely to be a result of the transport schemes which will provide improvements to both highway and public transport, with no schemes incorporated in the model assumptions that improve walking and cycling facilities.

6.3.5 The lowest increases in commuting trips between 2011 and 2026 are seen in Bolton, Oldham, Rochdale and Stockport, both in terms of productions and attractions. These districts are also those that have seen the largest decreases in public transport, walking and cycling, as well as the smallest increases in car trips. This impact will be the result of the low forecasts increases in population and employment for these districts.

Table 6.5 Change in Commuting Trips Productions and Attractions by District between 2011 and 2026 – Greater Manchester Proposals Scenario

	Productions				Attractions			
	Car	PT	Walk/ Cycle	Total	Car	PT	Walk/ Cycle	Total
Bolton	10%	-2%	-11%	6%	9%	-8%	-12%	4%
Bury	13%	-1%	-7%	8%	18%	-2%	-7%	11%
Manchester	25%	8%	-7%	15%	21%	9%	-6%	15%
Oldham	11%	-9%	-14%	4%	12%	-9%	-13%	5%
Rochdale	13%	-6%	-11%	7%	12%	-6%	-12%	6%
Salford	25%	8%	-6%	17%	21%	9%	-8%	16%
Stockport	8%	-4%	-10%	4%	7%	-12%	-11%	2%
Tameside	16%	-5%	-12%	8%	16%	-7%	-11%	8%
Trafford	11%	2%	-8%	7%	11%	-3%	-9%	7%
Wigan	15%	12%	-7%	11%	17%	2%	-6%	11%
Total	**15%**	**2%**	**-9%**	**9%**	**15%**	**3%**	**-9%**	**10%**

6.4 Impact on Journey Times

6.4.1 The change in journey times over sections of the M60 between 2011 and 2026, for the Greater Manchester Proposals Scenario, are shown in Table 6.6. Over recent years the growth has been particularly high on the motorway network and this trend is forecast to continue with journey times on the M60 increasing by up to 50% between 2011 and 2026. Therefore, it is clear that the LDFs are going to have a significant impact on congestion on certain stretches of the motorway, with journey times on the majority of links increasing by 10% or more. The impact is varied around the M60, the section between the M66 and the M62 anti-clockwise seeing the largest increase in journey times over the period. The impact is greatest in the morning peak, however there are also significant increases in the evening peak.

6.4.2 The impact of the LDFs on the other sections of motorway in Greater Manchester is more varied, as shown in Table 6.7. The most significant impacts in the morning peak are felt heading towards Manchester on the M67 and the M62 from both directions. The journey times on the M67 seeing an increase of 33% between 2011 and 2026. As was seen with the M60 journey times, the impacts in the evening peak are smaller, the M62 towards Huddersfield experiencing the largest increase in journey times of 18% between 2011 and 2026.

6.4.3 Table 6.8 shows the changes in journey times on the key radial routes into the Regional Centre between 2011 and 2026 for the Greater Manchester Proposals Scenario. As can be seen from this table, the majority of the radial routes have seen increases in journey times in excess of 20% between 2011 and 2026, both inbound to the Regional Centre in the morning peak and outbound in the evening peak. The A56 (Bury), A635 (Stalybridge), A57 (Hyde), M602/A57 (Irlam), A580 (Boothstown) and A666 (Bolton) have all seen journey time increases in excess of 30%.

6.4.4 The concentration of residential and employment development in the Regional Centre has been highlighted in this report. While this has had an impact in terms of arresting the decline in public transport patronage, it has also resulted in increased stress on the radial routes, with rising congestion hitting bus levels of service as well as private car travel times.

Table 6.6 Change in M60 Journey Times between 2011 and 2026 – Greater Manchester Proposals Scenario (minutes : seconds)

	Morning Peak			Evening Peak		
	2011	2026	Difference	2011	2026	Difference
Clockwise						
M66-M67	9:16	11:36	25%	8:31	10:33	24%
M67-M56	9:36	12:31	30%	10:49	12:10	11%
M56-M62	9:39	11:17	17%	9:09	10:20	10%
M62-M66	9:19	10:55	17%	9:54	10:32	6%
Anti-Clockwise						
M67-M66	7:40	9:20	18%	7:45	8:26	9%
M56-M67	9:20	10:29	16%	9:52	12:40	22%
M62-M56	10:12	11:31	13%	11:33	13:21	16%
M66-M62	10:18	15:15	48%	10:29	12:29	19%

Table 6.7 Change in Other Motorway Journey Times between 2011 and 2026 – Greater Manchester Proposals Scenario (minutes : seconds)

	Morning Peak			Evening Peak		
	2011	2026	Difference	2011	2026	Difference
M56						
Northbound	18:47	19:42	5%	14:55	17:80	15%
Southbound	9:40	10:20	11%	9:19	10:14	10%
M62 West						
Eastbound	6:58	8:41	25%	6:33	7:70	9%
Westbound	7:43	8:39	12%	10:22	10:90	-2%
M62 East						
Eastbound	8:30	8:22	4%	8:28	9:39	14%
Westbound	8:10	9:53	23%	8:29	9:59	18%
M61						
Northbound	4:35	4:54	7%	5:49	6:50	5%
Southbound	2:31	2:47	11%	2:53	3:17	14%
M602						
Eastbound	4:30	4:14	-6%	3:0	3:16	9%
Westbound	3:11	3:44	17%	5:44	6:22	11%
M67						
Eastbound	2:30	2:40	1%	2:8	2:80	0%
Westbound	2:28	3:17	33%	2:25	2:19	-4%

Table 6.8 Changes in Journey Times on Radial Routes to/from City Centre between 2011 and 2026 – Greater Manchester Proposals Scenario (minutes : seconds)

	Morning Peak			Evening Peak		
	2011	2026	Difference	2011	2026	Difference
A56 (Bury)	30:58	44:36	44%	32:56	43:57	33%
A664 (Rochdale)	37:40	46:45	24%	41:3	51:42	26%
A62 (Oldham)	26:19	34:21	31%	25:1	32:10	28%
A635 (Stalybridge)	28:34	40:49	43%	32:4	44:35	39%
A57 (Hyde)	30:16	40:38	34%	44:8	63:28	44%
A6 (Hazel Grove)	44:58	53:40	18%	42:35	53:18	25%
A34 (Stanley Green)	33:58	41:50	23%	29:25	36:25	24%
A5103 (Airport)	21:31	28:51	34%	23:7	29:18	27%
A56 (Altrincham)	35:47	41:43	17%	35:25	42:49	21%
M602/A57 (Irlam)	37:56	47:30	24%	24:55	37:57	52%
A580 (Boothstown)	21:40	32:40	48%	25:7	42:47	70%
A666 (Bolton)	28:30	39:32	39%	29:40	45:59	55%

6.5 Impact on Highway Network

6.5.1 The change in the passenger car unit (pcu) kilometres on non-motorway roads between 2011 and 2026 for the Greater Manchester Proposals Scenario is provided in Table 6.9. As would be expected with the increases in trip making already noted, pcu kilometres in each time period have increased by between 17% and 19%. This represents a significant impact on traffic levels on the non-motorway network. The impact of this on average vehicle speeds in the networks is shown in Table 6.10, which shows that the decrease in average speeds in the peak hours is 17% across all non-motorway roads, with the inter-peak seeing a lower decrease of 10%.

6.5.2 The impact on journey times on local roads is at the bottom end of the range of increases seen for motorways and radial routes, and does include the impact on journey times for the radial routes which are the busiest routes. Therefore, the network-wide traffic growth on local roads is forecast to be lower than on motorways and the radial routes, with the impact on journey times being lower for the motorways and radial routes.

Table 6.9 Change in Non-Motorway Passenger Car Unit (PCU) Kilometres within Greater Manchester between 2011 and 2026 – Greater Manchester Proposals Scenario

	2011	2026	Difference
Morning Peak	2,796,642	3,324,095	+19%
Inter-peak	2,092,633	2,492,384	+19%
Evening Peak	2,896,322	3,393,387	+17%

Table 6.10 Change Average Vehicle speeds within Greater Manchester (kilometres per hour) between 2011 and 2026 – Greater Manchester Proposals Scenario

	2011	2026	Difference
Morning Peak	28.48	23.54	-17%
Inter-peak	36.51	32.77	-10%
Evening Peak	28.03	23.19	-17%

6.6 Impact on Public Transport

6.6.1 It has been reported in this Chapter that under the Greater Manchester Proposals Scenario the overall level of demand for public transport is forecast to remain constant between 2011 and 2026. However, the trends associated with each public transport mode are expected to vary, with rail and tram forecast to have increases in the number of boardings and alightings within Greater Manchester, as shown in Table 6.11. This increase is most significant for tram, which will be a result of the expansions to the Metrolink network that are included in the Greater Manchester Proposals Scenario.

6.6.2 The shift away from bus to rail and tram is forecast to occur in both the morning and inter-peak periods. This is likely to be a result of increased congestion on the highway network, which will have an impact on bus times, as well as the extensions to the Metrolink network highlighted above and changing income levels. The increases in demand for rail journeys is likely to place increased stress on existing rail services, particularly those that are already operating at or over capacity. It is therefore going to be essential that the capacity of rail services is addressed in order that the network is able to cater for this additional demand.

6.6.3 The increase in the overall number of public transport boardings and alightings, as well as the increase in passenger kilometres shown in Table 6.12, show that although demand is forecast to be constant within Greater Manchester, boardings and alightings are increasing suggesting slightly more interchanges per journey on average. The increases in passenger kilometres are at a greater level than the increase in boardings and alightings, suggesting that the mean average trip length for public transport journeys is increasing. This increase

in average trip length will also contribute to the increase in rail journeys, as rail is a more attractive mode for longer journeys. Therefore, the attractiveness of Manchester City Centre for employment is attracting journeys from outside of Greater Manchester into the centre, journeys for which public transport is an attractive mode.

Table 6.11 Change in Public Transport Boardings and Alightings between 2011 and 2026 – Greater Manchester Proposals Scenario

	Boardings			Alightings		
	2011	2026	Difference	2011	2026	Difference
Morning Peak						
Bus	63,473	60,880	-4%	65,094	62,141	-5%
Rail	11,880	12,741	7%	14,837	16,263	10%
Tram	13,971	19,906	42%	13,971	19,906	42%
Total	**89,324**	**93,526**	**5%**	**93,902**	**98,310**	**5%**
Inter-peak						
Bus	43,603	41,192	-6%	43,361	40,942	-6%
Rail	4,412	4,927	12%	3,483	3,872	11%
Tram	6,245	9,706	55%	6,245	9,706	55%
Total	**54,259**	**55,825**	**3%**	**53,088**	**54,520**	**3%**
Evening Peak						
Bus	59,318	59,144	0%	57,723	57,811	0%
Rail	11,421	12,934	13%	10,075	11,088	10%
Tram	12,355	17,359	41%	12,355	17,359	41%
Total	**83,095**	**89,436**	**8%**	**80,153**	**86,259**	**8%**

Table 6.12 Change in Public Transport Passenger Kilometres between 2011 and 2026 – Greater Manchester Proposals Scenario

	2011	2026	Difference
Morning Peak			
Bus	375,551	374,704	0%
Rail	251,880	279,878	+11%
Tram	116,088	164,839	+42%
TOTAL	**743,519**	**819,422**	**+10%**
Inter-peak			
Bus	249,425	238,341	-4%
Rail	94,069	109,420	+16%
Tram	52,097	86,396	+66%
TOTAL	**395,591**	**434,158**	**+10%**
Evening Peak			
Bus	374,654	385,958	+3%
Rail	220,969	257,207	+16%
Tram	108,022	148,362	+37%
TOTAL	**703,645**	**791,527**	**+12%**

6.7 Impact on Environmental Indicators

6.7.1 The impact of the Greater Manchester Proposals Scenario on environmental indicators is shown in Table 6.13, showing the change between 2011 and 2026. The analysis has made use of Department for Transport research that suggests that fuel efficiency will improve over time and improvements in engine standards for emissions will continue. The net result is that despite the forecast growth in vehicle traffic, NOx emissions are expected to fall by about 20% between 2011 and 2026. However, PM10 and CO2 emissions are expected to increase, with CO2 output from traffic forecast to grow by 15%.

6.7.2 The environmental impact is less than would otherwise have been the case without the LDFs and the transport schemes, the reduction in traffic increases having reduced NOx emissions further and lessened the impact on PM10 and CO2. The pattern is similar across most districts, although Oldham sees a 19% increase in CO2 emissions over the fifteen year

period, and the least impact is seen in Stockport with a 13% increase. Figures showing the changes in environmental indicators by model zone are provided in Appendix E.

Table 6.13 Change in Environmental Indicators by District between 2011 and 2026 (Tonnes per Annum) – Greater Manchester Proposals Scenario

District	NOx	PM10	CO2
Bolton	-20%	6%	14%
Bury	-21%	6%	17%
Manchester	-19%	7%	16%
Oldham	-17%	10%	19%
Rochdale	-24%	2%	14%
Salford	-21%	5%	17%
Stockport	-20%	5%	13%
Tameside	-19%	8%	17%
Trafford	-17%	8%	16%
Wigan	-17%	9%	17%
Greater Manchester	**-20%**	**6%**	**16%**

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