Client **SEMMMS Project Board**

Project **A6 To Manchester Airport Relief Road**

Subject **HFAS Report 1718A: SEMMMS8 Forecasting Report - APPENDICES**

This document contains the appendices for HFAS Report 1718.

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Appendix 1

MVA Technical Note 16

A6 to Manchester Airport Relief Road

Forecasting Note

Forecasting Note

Project Title:	A6 to Manchester Airport Relief Road
MVA Project Number:	C3A581
Subject:	Core, Pessimistic and Optimistic Scenario Forecasts – Design Freeze 6
Note Number:	16 Version: 8
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1 Introduction

1.1 A consortium of local authorities (Stockport Metropolitan Borough Council, Manchester City Council and Cheshire East Council) and Manchester Airport Group has been working between 2010 and 2012 to prepare a submission to DfT for part-funding of the A6 to Manchester Airport Relief Road (see Figure 1.1). The scheme is based on the recommendations of the South East Manchester Multi Modal Strategy (SEMMMS) commissioned by central government in 1998, which highlighted a number of transport improvement opportunities that would benefit the local area. The relief road was a key element of that strategy and is designed to improve surface access to, from and between Manchester Airport and local town and district centres and employment sites, reduce the impact of traffic congestion on communities in Stockport, South Manchester and Northeast Cheshire, regenerate these communities through reduced severance and improved accessibility, and provide an improved route for freight.

1.2 The proposed scheme will connect the A6 at Hazel Grove with the M56 at Manchester Airport. It consists of approximately 10 Km of new dual two lane carriageway and seven new junctions, and will also incorporate the existing 4 km section of the A555 dual carriageway to the south of Bramhall.

1.3 MVA Consultancy was first commissioned in February 2010 to construct a transport model system fit for the purpose of providing modelling inputs for a Major Scheme Business Case (MSBC) of the A6 to Manchester Airport Relief Road to the Department for Transport (DfT). This system has been developed and subsequently used to provide demand forecasts of the A6 to Manchester Airport Relief Road, as well as inputs for operational, economic and environmental analyses. MVA considers this system fit for the purpose of assessing the impacts of the A6 to Manchester Airport Relief Road and a primary consideration during the

preparation of this report has been to demonstrate how the system complies with the DfT modelling requirements, as set out in the Transport Analysis Guidance (TAG).

1.4 SEMMMS VDM has been used to produce forecasts of the preferred scheme for an opening year of 2017 and design year of 2032. Three scenarios have been tested: a Core scenario and two alternative scenarios incorporating more Pessimistic and Optimistic assumptions regarding land use developments and implementation of transport schemes. This technical note sets out the key assumptions and transport outturns from these forecasts. No other forecasts have been produced to date.

1.5 This technical note is structured as follows:

- land use and demographic assumptions;
- supply assumptions;
- treatment of Manchester Airport;
- results EXCEL workbook;
- do minimum forecasts for core, pessimistic and optimistic scenarios;
- preferred scheme forecasts for core, pessimistic and optimistic scenarios; and
- Appendix A public transport do minimum scheme details.

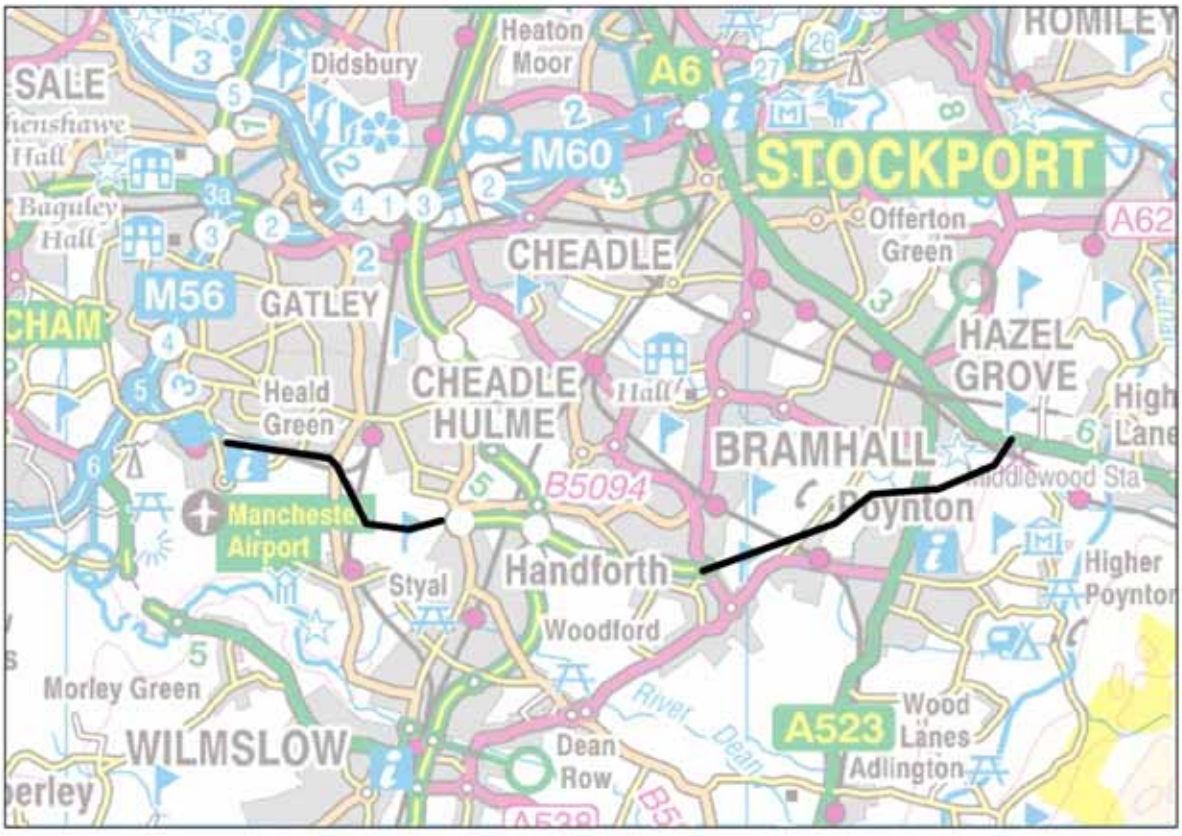

Figure 1.1 A6 to Manchester Airport Relief Road

2 Land Use and Demographic Assumptions

2.1 The requirement of the Department for Transport is that major transport schemes such as the A6 to Manchester Airport Relief Road are assessed under 3 scenarios for each of an opening year (assumed to be 2017 for SEMMMS) and design year (15 years after opening, i.e. 2032 (TAG Unit 3.15.5). The scenarios are:

- a core (most likely) scenario;
- a pessimistic scenario; and
- an optimistic scenario.

2.2 These scenarios represent three variant 'views' of the world, reflecting alternative land use, highway and public transport infrastructure investments, and economic assumptions (e.g. value of time). In this section, we set out the land use and demographic assumptions that were included in these forecasts.

2.3 The work to define land use assumptions for the SEMMMS forecasting exercise has focussed on an Area of Influence (AofI) of the scheme as shown in Figure 2.1. The AofI was defined using preliminary versions of the SEMMMS7 SATURN model to determine the geographic area over which the A6 to Manchester Airport Relief road scheme had a significant impact on traffic route choice. In fact land use assumptions were derived across a slightly wider area than the AofI covering the whole of Stockport, Trafford, Cheshire East and part of Manchester City authorities. (This definition of the AofI was used in developing the zone system for the demand model, which is identical within the AofI to the zone system used for the assignment models. It is worth noting however that HFAS later produced an updated definition of the AofI, for which highway assignment validation was focussed).

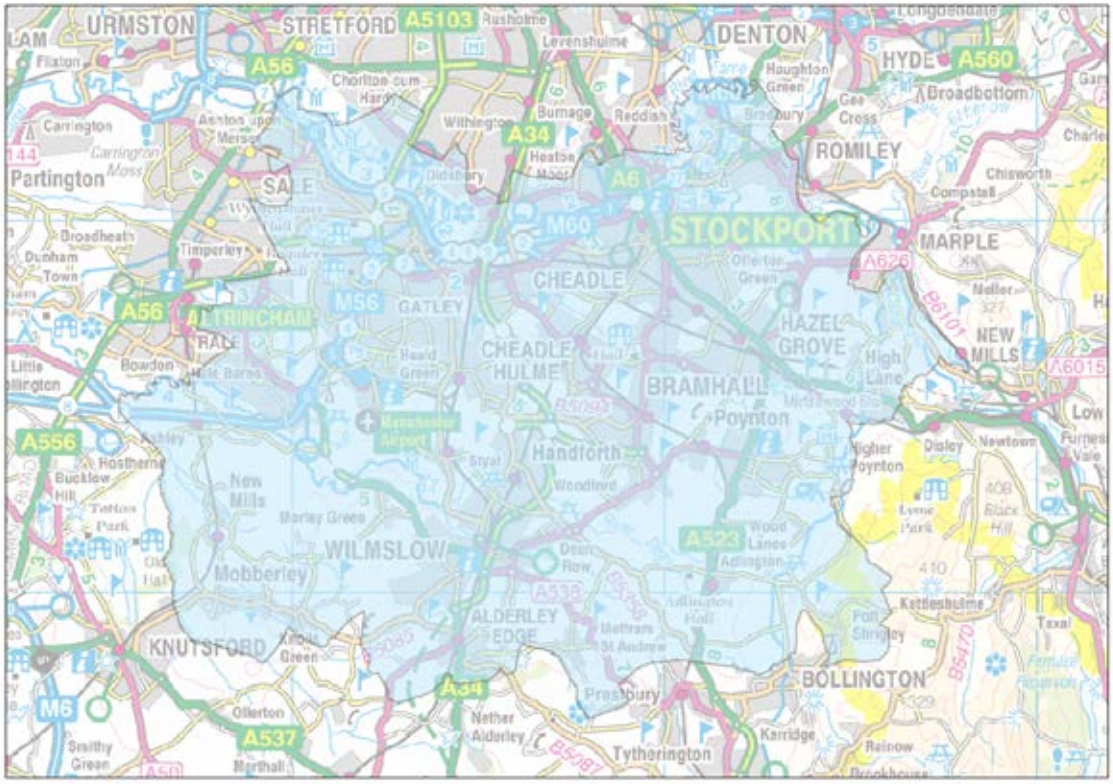

Figure 2.1 A6 to Manchester Airport Relief Road Area of Influence

2.4 Future year growth assumptions have been derived using data from a variety of sources:

- planning data from Local Authorities which partly lie in the AofI;
- data provided by Manchester Airport;
- National Trip End Model (NTEM) 6.2; and
- The National Transport Model (NTM).

2.5 Representatives of the consultant Atkins met with planning officers from Stockport, Manchester City, Cheshire East and Trafford councils to understand their aspirations for future development across their authorities. Manchester City Council was asked to provide information about future developments for the section of their authority lying within the AofI of the A6 to Manchester Airport Relief Road (see Figure 2.2). Atkins used this information to develop an uncertainty log (as specified in TAG 3.15.5) setting out the likelihood that each development would come to fruition by 2017 and also 2032.

2.6 In 2009 David Simmonds Consultancy met with all 10 authorities of Greater Manchester, enabling future land use forecasts to be developed for work associated with the Local Development Framework (LDF). Data from these forecasts was used to alter the distribution of travel across Greater Manchester over time in line with Local Authority plans, for zones in Greater Manchester not covered by the detailed uncertainty log.

2.7 Production and attraction travel growth was constrained to NTEM 6.2 forecasts as required by DfT, at the Local Authority district level within Greater Manchester and Cheshire East and at the county level beyond.

2.8 HFAS and Atkins met with Manchester Airport Group (MAG) to understand their expectations for future passenger growth and employment growth both within the airport itself and on adjacent development sites being promoted by MAG. These assumptions were subsequently included in SEMMMS VDM forecasts.

2.9 Light and other goods vehicles are represented in the SEMMMS VDM base model. Growth forecasts from the National Transport Model (NTM) were applied to these freight matrices.

Developments

2.10 Following consultation with Stockport, Manchester City, Cheshire East and Trafford, Atkins developed an uncertainty log detailing the likelihood of future developments within the Area of Influence coming to fruition by 2017 and 2032. Consistent with TAG 3.15.5, schemes were categorised as:

- hypothetical;
- reasonably foreseeable;
- more than likely; and
- near certain.

2.11 Table 2.1 shows the allocation of each of these categories to each of the pessimistic, core and optimistic scenarios.

Table 2.1 Scenario Definitions

	Pessimistic	Core	Optimistic
Hypothetical	X	X	X
Reasonably foreseeable	X	X	✓
More than Likely	X	✓	✓
Near certain	✓	✓	✓

2.12 MVA then constructed travel patterns for these developments exogenously to the SEMMMS VDM model, which were input to the future year demand matrices at the trip generation stage. Trip rates for different types of land use were identified from the TRICS database by mode and time period for each development. The SEMMMS consortium required that 85th percentile trip rates were used to provide flows which provided a robust assessment of the operation of the road scheme. These trip ends were disaggregated into the SEMMMS VDM segments using purpose and car availability splitting factors, derived from the base shares of zones identified as having similar land use. Finally, distributions were applied to the trip ends, making use of purpose specific base year trip distributions associated with neighbouring zones.

LDF Growth

2.13 A detailed uncertainty log and subsequently representative travel patterns were derived for future developments for zones within the AofI of the A6 to Manchester Airport Relief Road as described above. By definition the accuracy of modelling in the AofI is of most importance to the appraisal of the scheme. However it was important to include some representation of changes to future land use across the county of Greater Manchester, in particular considering the proximity of the Regional Centre of Manchester City Centre to the AofI.

2.14 Previous work by MVA and David Simmonds Consultancy using GMSPM2 to represent the Local Development Framework provided a readily available dataset for redistributing trips across the rest of Greater Manchester, not just within the AofI. Growth factors were applied to production and attractions trip ends for zones within Greater Manchester (beyond the AofI of the scheme) based on forecasts of changes in trip making due to net gain in dwellings, office floor space and industrial floor space.

NTEM Growth

2.15 When creating the future year demand matrices input to SEMMMS VDM, changes were first made to the travel patterns associated with the developments within the AofI included in the uncertainty log. The information from the GMSPM2 LDF forecasts was then used to adjust travel patterns across the rest of Greater Manchester, but not within the AofI.

2.16 In a final step, trip end growth was controlled on to NTEM 6.2 forecasts. This was undertaken at the district level within Greater Manchester, the pre-April 2009 Cheshire East districts[1] and at the county level beyond (East Midlands, Derbyshire, Yorkshire, Lancashire and Merseyside). Growth for the 15 external zones was controlled to the NTEM growth forecast for Great Britain as a whole.

2.17 NTEM trip end growth factors were applied separately for productions and attractions, disaggregated by mode, purpose and household car availability.

Manchester Airport

2.18 Manchester Airport is a significant trip attractor within the AofI of the A6 to Manchester Airport Relief Road. Situated at the western end of the scheme future growth in passenger and employee travel would be expected to have a significant impact on scheme appraisal. HFAS and Atkins therefore met with representatives of MAG to understand their view on future changes to travel demand at the Airport. HFAS produced a note documenting the assumptions which would be included in forecasts, and these were agreed with MAG through further liaison.

2.19 The zoning system at Manchester Airport developed for the SEMMMS8 SATURN and PT-TRIPS assignment models were highly disaggregate in order to improve accuracy of network loading in the assignment models. MVA considered this level of aggregation inappropriate for demand response modelling as air travellers' response to changing Airport access costs is best thought of in terms of the whole journey from home to the check-in desk, rather than to a particular car park or public transport terminus. For this reason a single zone was used within the demand model to represent demand to/from Manchester Airport terminals (see Figure 2.2).

2.20 Further, special treatment was given to passenger and employee trips to/from Manchester Airport in SEMMMS VDM. These trips were allocated to a separate set of demand segments, in order that different choice responses could be imposed on this demand from those used across the rest of the model. Choice response associated with these Airport demand segments has been restricted to mode choice, as distributional and time of day responses to changing access travel cost are unlikely to impact on passengers and employees travelling to an Airport. For example air passengers have a very restricted set of airport choices, and time of day choice is strongly influenced by flight schedules.

2.21 Separating travel to/from Manchester Airport from the other demand segments facilitated the application of differential growth to this demand, from that applied to the rest of the model. For the Core scenario forecasts of passenger numbers were obtained from the UK Air Passenger Forecasts (central scenario). Pessimistic and Optimistic forecasts were needed to meet the DfTs requirements, and so Low and high forecasts were applied in the pessimistic and optimistic scenarios respectively. These forecasts are shown in Table 2.2.

[1] Cheshire County Council and six borough councils were abolished in April 2009 and replaced by two unitary authorities. The new Cheshire East Council covers the area of the old Macclesfield, Crewe and Nantwich, and Congleton borough councils.

2.22 Interpolation of these forecasts gave rise to a forecast of passenger demand of 18.6 million passengers per annum (mppa) in 2009. Appropriate growth factors were subsequently derived for growth in passengers, and hence passenger surface access trips, from 2009 to 2017 and 2009 to 2032.

Table 2.2 Growth in air passengers at Manchester Airport

	Pessimistic		Core		Optimistic	
Year	**mppa**	**Index**	**mppa**	**Index**	**mppa**	**Index**
2009	18.6	100	18.6	100	18.6	100
2017 (interpolated value)	23.1	124	23.1	124	26.3	142
2020	25.0	---	25.0	---	30.0	---
2030	30.0	---	35.0	---	35.0	---
2032 (interpolated value)	31.1	167	37.4	201	37.4	201

Source: UK Aviation Forecasts, Department for Transport, August 2011

2.23 Growth in all person trips to and from Manchester Airport was assumed to increase by the same ratio as that of passengers. This assumption implies that the number of employees at the airport would increase in the same proportion as air patronage. MAG have reviewed these assumptions and agreed that they are reasonable.

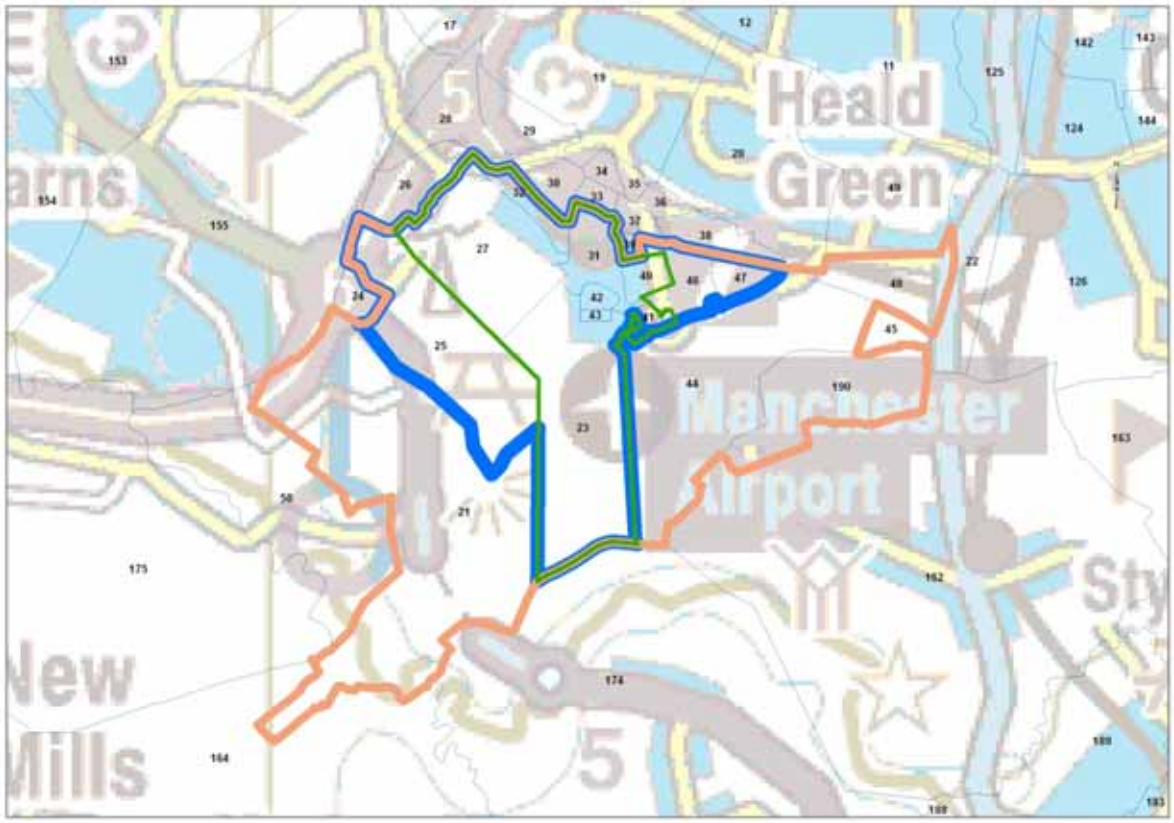

Figure 2.2 Manchester Airport Boundaries: Zones bounded by the ORANGE line are included in the separate Airport demand segments. The BLUE line defines the demand management area and the GREEN line defines the terminal zones for which demand has been aggregated to a single zone and a mode split model is applied.

Freight Growth

2.24 Freight growth was applied uniformly across the whole model using data from the National Transport Model (NTM) 2009. The growth factors are shown in Table 2.3.

Table 2.3 Goods vehicle growth factors

Year	Goods vehicle type	Growth Factor (from 2009)
2017	LGV	1.19
	OGV	1.04
2032	LGV	1.65
	OGV	1.16

2.25 Separate goods vehicle trip end growth constraints were applied to Manchester Airport's cargo terminal (SEMMMS8 zone 288, SEMMMS VDM zone 25). Details of these growth factors are given in section 4 of this note which provides more detail about forecasting of travel demand at Manchester Airport.

3 Supply Assumptions

3.1 Each highway and public transport (PT) scheme is determined to be either hypothetical, reasonable foreseeable, more than likely or near certain in 2017 and 2032. Table 2.1 above shows the allocation of schemes to scenarios.

Highway

3.2 Atkins made contact with the relevant local authorities and the Highways Agency in order to understand which highway schemes should be included in the do minimum networks at 2017 and 2032. HFAS subsequently coded these schemes on to the base year SATURN assignment networks and provided them to MVA for inclusion in the SEMMMS VDM.

3.3 The following highway schemes are included in the 2017 core, pessimistic and optimistic scenarios (do minimum and do something scheme) networks. The optimistic scenario also contains the Davenport Green scheme which is determined to be reasonably foreseeable in both future years:

- Davenport Green (*optimistic scenario only*);
- A556 Knutsford to Bowdon Improvements;
- M60 J12-15 widening;
- M60 J8 to 12 Managed Motorway Scheme (assumed to operate in morning and evening peak periods);
- Cross City Bus (Oxford Road);
- Highway impacts of Metrolink Phase 3B (Chorlton – Airport);
- Airport City Infrastructure;
- Manchester Airport Blue works (M56 J6);
- Manchester Airport Yellow works (Runger Lane);
- Poynton town centre enhancements; and
- Alderley Edge bypass (completed after the model base yeat).

3.4 The following additional schemes were determined to be near certain by 2032 and are included in all three of the 2032 do minimum and preferred scheme networks:

- Manchester Airport Red works (M56 J5-6 widening); and
- Western Gateway Infrastructure Scheme (WGIS) – full.

Public Transport Schemes

3.5 TfGM, Research & Intelligence provided the SEMMMS modelling team with a perspective on the likelihood that prospective public transport schemes will come to fruition across Greater Manchester in 2017 and 2032. The list of schemes and their likelihood of completion is shown in Table 3.1.

Table 3.1 Likelihood of Completion of PT Schemes at 2017 and 2032

Scheme	2017	2032
Metrolink: Chorlton to East Didsbury	Near Certain[2]	Near Certain
Metrolink: Droylsden to Ashton	Near Certain	Near Certain
Leigh-Salford-Manchester Busway	Near Certain	Near Certain
Airport and 2CC - Metrolink	Near Certain	Near Certain
Altrincham Interchange	Near Certain	Near Certain
Elements of Cross City Bus Package	Near Certain[3]	Near Certain
Park and Ride in Greater Manchester	50% NC 50% MTL	50% NC 50% MTL
Fund contributions to stations	50% NC 50% MTL	50% NC 50% MTL
Metrolink - Trafford Park	Hypothetical	Hypothetical
Stockport Interchange	Hypothetical	Hypothetical

Source: TfGM Research + Intelligence

3.6 The Core scenario is defined as those schemes which are near certain or more than likely to come to fruition by 2017 or 2032. However, the park and ride schemes and funding contributions to stations are not included in the scenario definition as no scheme specifications are available at the present time.

3.7 Following the discussions with MAG, the Metrolink extension to Manchester Airport was assumed more than likely for both the opening and design years and is included in the Core, Pessimistic and Optimistic scenarios at both these years. Completion of this scheme is

[2] Funding for the Chorlton to East Didsbury and Droylsden to Ashton Metrolink extensions were confirmed by the Chancellor of the Exchequer in the 22nd June 2010 Emergency Budget.

[3] Funding confirmed by DfT in December 2011.

considered a high priority for Manchester Airport and it is a key element in the Airports Ground Transport Plan.

3.8 Hence, the PT schemes included in all three scenarios are identical for both the opening and design years, with the exception of the 2017 pessimistic scenario. They are:

- Metrolink: Chorlton to East Didsbury;
- Metrolink: Droylsden to Ashton;
- Metrolink: Airport and 2CC;
- Leigh-Salford-Manchester Busway; and
- Altrincham Interchange (excluded from 2017 pessimistic).

3.9 Further details of the coding of these schemes are available in Appendix A. These schemes were coded by MVA based on coding from previous modelling work. Bus services were adjusted to fit the revised networks following the addition of the highway schemes.

Public Transport Fares

3.10 Public transport fares have been assumed to rise at 1% per annum above the growth in RPI between 2009 and 2017 and 2032. 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 (TAG 3.15.4, 5.2.2).

3.11 It is assumed that the current ticketing options available to passengers of all modes are those that would be available in the future, as is implicitly assumed in the fare tables.

Values of Time

3.12 Values of time for input to the demand and assignment models have been derived using data from TAG 3.5.6 for the base year, 2017 and 2032.

Vehicle Operating Costs

3.13 Vehicle operating costs for input to the demand and assignment models have been derived using data from TAG 3.5.6 for the base year, 2017 and 2032.

Definition of Proposed Do-Something Scheme

3.14 The preferred scheme that has been assessed in these forecasts is that of Design Freeze 6. It has been represented as a two lane dual carriageway with a mixture of grade separated and at-grade junctions. The key junctions are:

- B5166 Styal Road – signalised;
- B5238 Wilmslow Road – grade separated;
- A34 Kingsway / Handforth Bypass – grade separated;

- A5102 Woodford Road - grade separated;
- A523 Macclesfield Road – signalised; and
- A6 Buxton Road – signalised.

3.15 The scheme also includes an upgrade from one lane to two of the existing Ringway Road West from Shadow Moss Road to the M56 spur at the Airport.

4 Treatment of Manchester Airport

4.1 Following their discussions with MAG, HFAS produced a note "*Modelling of Manchester Airport – Forecasting Assumptions*", which set out what assumptions would be made in SEMMMS VDM with regard to future travel to/from Manchester Airport and likely infrastructure enhancements.

4.2 The passenger and airport related employee assumptions were covered in Section 2 of this note.

4.3 Figure 4.1 shows the zones around Manchester Airport, some of which are discussed in the following sections.

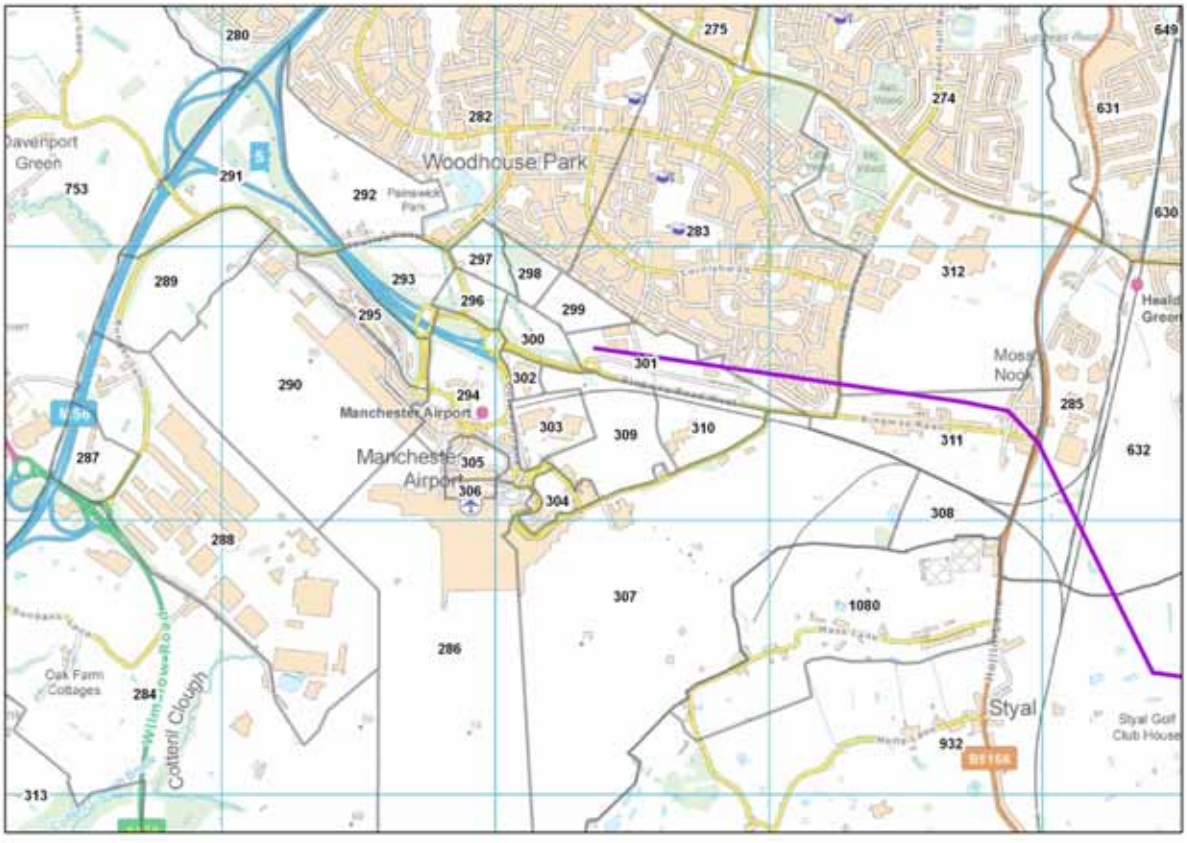

Figure 4.1 Manchester Airport Assignment Model Zones

Freight

4.4 Goods vehicle growth forecasts were calculated based on a combination of previous demand forecasts for the Blue/Yellow works and floor space figures taken from MAG's "*The Need for Land*" document (June 2010)[4]. The final assumptions which were applied to both light and other goods were:

- 49% and 45% growth in goods traffic to/from the Cargo Centre (SEMMMS8 zone 288, SEMMMS VDM zone 25) between 2009 and 2017 for AM and PM peak hours respectively;
- 49% growth between 2009 and 2017 for the inter peak goods traffic to/from the Cargo Centre (based on the AM peak outbound growth from the Blue/Yellow works forecasts i.e. the higher of the peak figures); and
- 51% growth in goods traffic to/from the Cargo Centre between 2017 and 2032 (all periods) in line with the Airport's projected growth (2013 to 2030) in floor area; this will be a robust estimate as it will assume that the level of floor area growth is reflected directly in the growth of goods vehicle movements.

4.5 For all other Airport zones, goods vehicle trips were assumed to grow in line with NTM forecasts to 2017 and 2032 (see section 2 of this note).

Parking

4.6 It is estimated that by 2032 there will be a need for an additional 18,000 to 32,400 additional car park spaces for passenger use and approximately 4,400 spaces for staff use (source: "*The Need for Land*" – MAG). Furthermore, it is anticipated that some existing long stay car parks will need to be relocated to allow expansion of the apron areas.

4.7 Following discussion with MAG, the following assumptions have been made:

- Long stay parking displaced from the Sydney Avenue area (SEMMMS8 zone 289, SEMMMS VDM zone 26) will be relocated to Oak Farm (SEMMMS8 zone 284, SEMMMS VDM zone 21).
- Long stay parking displaced from the Ringway Road area (SEMMMS8 zone 309 and 310, SEMMMS VDM zone 46 and 47) will be relocated to land north of Ringway Road and east of Shadow Moss Road (SEMMMS8 zone 311, SEMMMS VDM zone 48). The new car park is in the area covered by zone 312, however the connections for zone 311 are a good representation for the car park, and connect into Ringway Road between the junctions with Shadow Moss Lane and Hollin Lane.
- Short stay parking within the central terminal area will be assumed to expand to meet demand.

[4] http://www.manchester.gov.uk/download/13737/manchester_airport-the_need_for_land

4.8 As suggested by MAG, privately operated Airport-related car parks in the Moss Lane area (SEMMMS8 Zone 1080, SEMMMS VDM zone 190) will be assumed to remain at current levels (i.e. no growth over time).

Non-flight Related Airport Developments

4.9 There are two commercial developments for Manchester Airport to be included in future year forecasts under all three scenarios. These are:

- Airport City (formerly know as the Burford site); and
- Manchester Business Park (formerly know as the Arlington/Goodmans site).

4.10 The following assumptions have been made for the developments:

- For Airport City (Burford), it is assumed that the site is fully developed and occupied by 2032; development/occupation by 2017 is assumed to be 50%, 25% and 75% under core, pessimistic and optimistic scenarios respectively; and
- For Arlington/Goodmans, that the site is fully developed by 2032 development/occupation by 2017 is assumed to be 66%, 50% and 100% under core, pessimistic and optimistic scenarios respectively. These figures reflect the fact that about a quarter of the permitted floorspace is currently built and occupied (by Cuzzons, Regus and Ericcson)

Table 4.1 Estimated Floorspace and Jobs on the Airport City and Goodmans Development Sites

	Airport City / Burford			Goodmans / Arlington		
	Core	Pessimistic	Optimistic	Core	Pessimistic	Optimistic
Permitted Floorspace (B1)	50,000	50,000	50,000	62,700	62,700	62,700
Occupied 2009	0	0	0	17,065	17,065	17,065
Occupied 2015	25,000	12,500	37,500	41,800	31,350	62,700
Occupied 2030	50,000	50,000	50,000	62,700	62,700	62,700
Jobs 2009	0	0	0	806	806	806
Jobs 2015	1,180	590	1,770	1,970	1,480	2,960
Jobs 2030	2,360	2,360	2,360	2,960	2,960	2,960

Mode Shares

4.11 MAG has set a target of 40% of trips to and from Manchester Airport being by non-car modes. The Airport Masterplan states that this will be achieved by:

- promotion of public transport;
- completion of the Airport extension to the Metrolink network.
- developing a mix of off site park-and-ride and on site parking;
- discouraging "kiss and fly" and taxi use; and
- use of demand management techniques designed to discourage private vehicles entering the airport area.

4.12 The Airport Metrolink extension and demand management measures have been incorporated in each scenario within SEMMMS VDM, such that increases in the cost of car trips to/from the airport relative to other modes will lead to reduction in mode share for car. However SEMMMS VDM does not aim to explicitly meet the 40% mode share target for non car trips set by Manchester Airport. Rather the calibrated VDM predicts mode choice (along with destination choice and time-of-day choice) based on the generalised cost of each alternative.

4.13 Demand to and from Manchester Airport is modelled in separate demand segments to the rest of the model, allowing only mode split changes to be modelled, i.e. no distribution or macro time of day response to cost changes. This ensures that the increase in cost of car travel to/from the airport can only result in a modal switch rather than a destination or time of day switch.

5 Forecast Model Convergence

5.1 All of the forecast models reach a good level of convergence based on the the DfT %Gap statistic (TAG 3.10.4, 1.5), which states that a value of 0.2% should be achieved. Table 5.1 presents the GAP statistics for the Core, Optimistic and Pessimistic scenarios. For the 2017 tests, the GAP statistic is less than 0.2%, however for 2032 the figures are slightly higher than the guidance recommends. The decision was taken not to run any further loops of the demand model to reduce these GAP statistics, due to timescales. We envisage that one more loop of the demand model would achieve a GAP statistic lower than 0.2.

Table 5.1 GAP Statistics

		2017	2032
Core	Do-Minimum	0.110	0.365
	Do-Something	0.111	0.362
Optimistic	Do-Minimum	0.116	0.380
	Do-Something	0.113	0.373

Pessimistic	Do-Minimum	0.109	0.362
	Do-Something	0.111	0.359

6 Results EXCEL Workbook

6.1 Three EXCEL workbooks have been prepared to accompany this note containing summaries of 2009 base year trip making as well as 2017 and 2032 future year input and outturn trip matrices:

- TN16 v6 - SEMMMS Relief Road Core Forecasts.xls;
- TN16 v6 - SEMMMS Relief Road Pessimistic Forecasts.xls; and
- TN16 v6 - SEMMMS Relief Road Optimistic Forecasts.xls;

6.2 The matrices input to the VDM reflect changes in land use, income and car ownership. The outturn matrices produced by the VDM additionally reflect the impacts of changes in the generalised costs of travel.

6.3 Data is presented on a 4x4 sector system and a 16x16 sector system. The 4x4 system is the Area of Influence, Rest of Greater Manchester, Buffer and External areas of the model. The sixteen sector system is shown as Figure 6.1.

Figure 6.1 – 16 Sector System

Core Scenario Do Minimum Forecasts

6.4 In this section, we describe the headline transport outturns of the Core scenario do minimum forecasts at 2017 and 2032.

6.5 Table 6.1 shows the percentage changes relative to the base matrices of the unconstrained input matrices and congestion constrained outturn demand matrices for the do minimum forecasts at 2017 and 2032. Highway congestion operates to constrain car demand within the model both at 2017 and 2032, with demand switching to PT.

Table 6.1 All day trip changes relative to the 2009 base model for the do minimum, 2017 and 2032 input and output whole model demand matrices – Core scenario

	Car	PT	Walk/Cycle
2009 Base Year Trips	23,033,671	3,210,156	11,249,688
2017 Unconstrained Input Matrix	10%	-4%	-1%
2017 Do Minimum Output Matrix	10%	-1%	-1%
2032 Unconstrained Input Matrix	23%	-3%	2%
2032 Do Minimum Output Matrix	23%	0%	1%

6.6 Growth from the base to the forecast year input matrices reflects TEMPRO growth factors (10% for car and -4% for PT at 2017). There is less growth within the AofI (7% at 2017 and 17% at 2032 for car) as there is relatively less development compared to other parts of Greater Manchester, most notably the Regional Centre.

6.7 The do minimum output matrices show an increase in longer distance car trips (in particular AofI <> Buffer/External) and a decrease in shorter trips (within AOfI/GM) relative to the input matrices. This reflects the relatively modest increase in vehicle operating costs over time due to improvements in vehicle efficiency relative to larger increases in value of time.

6.8 As one would expect the changes in mode share and average trip length are marginal between the 2009 base year and the 2017 and 2032 do minimum forecasts. Mode share for car within the whole model increases by 2% from the base to 2017 and by 4% to 2032.

6.9 Changes in total car trips from each sector are shown in Table 6.2 All Day Car Trip changes by sector. It can be seen from the spreadsheet that the matrices are symmetrical and hence the trends shown are representative of all trips to/from each sector. The largest growth is in trips from Manchester Airport and the Manchester district as this is where the majority of the developments are situated.

Table 6.2 All Day Car Trip changes by sector – Core scenario do minimum

Sector	Base Trips from Sector	Change to 2017 Do Minimum	Change to 2032 Do Minimum
Manchester Airport	124,640	20%	50%
Cheadle & Wilmslow	276,449	4%	10%
Stockport	527,654	8%	21%
Sale & Altrincham	483,997	7%	20%
Manchester	1,607,445	13%	27%
Knutsford & Northwich	231,971	6%	13%
Macclesfield	306,023	10%	26%
Wigan	935,434	9%	21%
Bolton & Bury	798,760	5%	9%
Rochdale	380,374	7%	1%
Oldham & Ashton	798,315	9%	25%
North of GM	7,431,429	12%	31%
East of GM	3,274,880	11%	26%
South of GM	1,650,207	8%	20%
West of GM	4,180,905	7%	14%
External	25,189	13%	41%
Total	**23,033,671**	**10%**	**23%**

6.10 In summary, the sector to sector trip matrices by mode presented in the spreadsheet show plausible changes in the demand relative to the base model for the 2017 and 2032 do minimum forecasts. The unconstrained demand matrices input to SEMMMS VDM have been constrained to NTEM 6.2 forecasts at the district level within Greater Manchester and Cheshire East and at the county level beyond. The effect of this can be clearly seen in the homogeneity of the 4x4 sector to sector matrices when viewed by mode.

7 Core Scenario Proposed Scheme Forecasts

7.1 In this section, we describe the headline transport outturns of the Core scenario preferred scheme forecasts at 2017 and 2032.

7.2 As one would expect the scheme produces negligible changes in demand relative to the respective do minimum when viewed on the basis of the 4x4 sector system. There are small increases in car demand from the AofI to the buffer area at the expense of PT.

7.3 Distributional effects of the scheme can be seen by looking at the 16x16 sector changes from the do minimum. There are modest reductions on some sector pairs (<4%) where trips are redistributed as a result of the scheme. The largest increases can be seen on the following sector pairs:

- Manchester Airport – East of GM (9% at 2017 and 8% at 2032);
- Cheadle & Wilmslow - East of GM (20% at 2017 and 17% at 2032);
- East of GM – Cheadle & Wilmslow (19% at 2017 and 17% at 2032);
- East of GM – Manchester Airport (10% at 2017 and 9% at 2032); and
- West of GM – Stockport (11% at 2017 and 11% at 2032).

7.4 As can be seen from the sector map these are all movements that cross the AofI, which will benefit through improved journey time as a result of the scheme. As one would expect the changes in mode share and average trip length are marginal between the 2017 and 2032 do minimum and proposed scheme forecasts respectively.

7.5 In summary, the changes in 16x16 sector to sector car trip matrices for the scheme are in the appropriate geographical locations and are of a sensible order.

8 Optimistic Scenario Do Minimum Forecasts

8.1 In this section, we describe the headline transport outturns of the Optimistic scenario do minimum forecasts at 2017 and 2032.

8.2 Table 8.1 shows the percentage changes relative to the base matrices of the unconstrained input matrices and congestion constrained outturn demand matrices for the do minimum forecasts at 2017 and 2032. Core scenario forecasts are shown in brackets for comparison.

Table 8.1 All day trip changes relative to the 2009 base model for the do minimum, 2017 and 2032 input and output whole model demand matrices – Optimistic scenario

	Car	PT	Walk/Cycle
2009 Base Year Trips	23,033,671	3,210,156	11,249,688
2017 Unconstrained Input Matrix	10% (10%)	-4% (-4%)	-1% (-1%)
2017 Do Minimum Output Matrix	10% (10%)	-1% (-1%)	-1% (-1%)
2032 Unconstrained Input Matrix	23% (23%)	-3% (-3%)	2% (2%)
2032 Do Minimum Output Matrix	22% (23%)	0% (0%)	1% (1%)

8.3 Growth from the base to the forecast year input matrices reflects TEMPRO growth factors (10% for car and -4% for PT at 2017). There is less growth within the AofI (8% at 2017 and 16% at 2032 for car) as there is relatively less development compared to other parts of Greater Manchester, most notably the Regional Centre. The forecast year input matrices are of approximately the same size for the Core, Pessimistic and Optimistic scenarios, because although the amount of development trips varies, the overall trip-ends are controlled to NTEM forecasts.

8.4 Changes in total car trips from each sector are shown in Table 8.2 All Day Car Trip changes by sector. Core scenario forecasts are shown in brackets for comparison. It can be seen from the spreadsheet that the matrices are symmetrical and hence the trends shown are representative of all trips to/from each sector. The largest growth is in trips from Manchester Airport and the Manchester district as this is where the majority of the developments are situated.

8.5 The growth in trips is significantly higher in the Optimistic scenario than in the Core scenario for the Manchester Airport (both years) and Macclesfield (2032) sectors, this is because these sectors see the highest growth in development trips between the Core and the Optimistic scenarios.

8.6 In 2032, many sectors see a slight reduction (1-5% points) in the levels of car growth between the Core and the Optimistic scenarios. The most noticeable example of this is in the Knutsford & Northwich district, where the growth is 8% lower in the Optimistic scenario than in the Core scenario. Two possible reasons for this are as follows:

- Highway congestion operates to constrain car demand within the model, to a greater extent in 2032 than in 2017, with demand switching to PT.
- Trip end growth was controlled to NTEM 6.2 forecasts at a TEMPRO district level. In districts which contain higher numbers of development trips (for example Macclesfield Borough), we see a decrease in trips in the parts of the district without development trips (for example Knutsford).

Table 8.2 – All Day Car Trip changes by sector – Optimistic scenario do minimum

Sector	Base Trips from Sector	Change to 2017 Do Minimum	Change to 2032 Do Minimum
Manchester Airport	124,640	28% (20%)	54% (50%)
Cheadle & Wilmslow	276,449	3% (4%)	5% (10%)
Stockport	527,654	9% (8%)	20% (21%)
Sale & Altrincham	483,997	6% (7%)	19% (20%)
Manchester	1,607,445	13% (13%)	27% (27%)
Knutsford & Northwich	231,971	3% (6%)	5% (13%)
Macclesfield	306,023	15% (10%)	46% (26%)
Wigan	935,434	9% (9%)	21% (21%)
Bolton & Bury	798,760	5% (5%)	9% (9%)
Rochdale	380,374	7% (7%)	1% (1%)
Oldham & Ashton	798,315	8% (9%)	25% (25%)
North of GM	7,431,429	12% (12%)	31% (31%)
East of GM	3,274,880	10% (11%)	25% (26%)
South of GM	1,650,207	8% (8%)	19% (20%)

West of GM	4,180,905	7% (7%)	14% (14%)
External	25,189	15% (13%)	40% (41%)
Total	**23,033,671**	**10% (10%)**	**23% (23%)**

8.7 In summary, the sector to sector trip matrices by mode presented in the spreadsheet show plausible changes in the demand relative to the base model for the 2017 and 2032 do minimum forecasts. The unconstrained demand matrices input to SEMMMS VDM have been constrained to TEMPRO 6.2 forecasts at the district level within Greater Manchester and Cheshire East and at the county level beyond. The effect of this can be clearly seen in the homogeneity of the 4x4 sector to sector matrices when viewed by mode.

9 Optimistic Scenario Proposed Scheme Forecasts

9.1 In this section, we describe the headline transport outturns of the Optimistic scenario preferred scheme forecasts at 2017 and 2032.

9.2 As with the Core scenario, the scheme produces negligible changes in demand relative to the respective do minimum when viewed on the basis of the 4x4 sector system. There are small increases in car demand from the AofI to the buffer area at the expense of PT.

9.3 Distributional effects of the scheme can be seen by looking at the 16x16 sector changes from the do minimum. There are modest reductions on some sector pairs (<4%) where trips are redistributed as a result of the scheme. The largest increases can be seen on the following sector pairs:

- Manchester Airport – East of GM (9% at 2017 and 9% at 2032);
- Cheadle & Wilmslow - East of GM (21% at 2017 and 19% at 2032);
- East of GM – Cheadle & Wilmslow (20% at 2017 and 18% at 2032);
- East of GM – Manchester Airport (9% at 2017 and 9% at 2032); and
- West of GM – Stockport (10% at 2017 and 11% at 2032).

9.4 As can be seen from the sector map these are all movements that cross the AofI, which will benefit through improved journey time as a result of the scheme. These results are very similar to the core forecast results.

9.5 As one would expect the changes in mode share and average trip length are marginal between the 2017 and 2032 do minimum and proposed scheme forecasts respectively.

9.6 In summary, the changes in 16x16 sector to sector car trip matrices for the scheme are in the appropriate geographical locations and are of a sensible order.

10 Pessimistic Scenario Do Minimum Forecasts

10.1 In this section, we describe the headline transport outturns of the Pessimistic scenario do minimum forecasts at 2017 and 2032.

10.2 Table 10.1 shows the percentage changes relative to the base matrices of the unconstrained input matrices and congestion constrained outturn demand matrices for the do minimum forecasts at 2017 and 2032. Core scenario forecasts are shown in brackets for comparison.

Table 10.1 All day trip changes relative to the 2009 base model for the do minimum, 2017 and 2032 input and output whole model demand matrices – Pessimistic scenario

	Car	PT	Walk/Cycle
2009 Base Year Trips	23,033,671	3,210,156	11,249,688
2017 Unconstrained Input Matrix	10% (10%)	-4% (-4%)	-1% (-1%)
2017 Do Minimum Output Matrix	10% (10%)	-1% (-1%)	-1% (-1%)
2032 Unconstrained Input Matrix	23% (23%)	-3% (-3%)	2% (2%)
2032 Do Minimum Output Matrix	22% (23%)	0% (0%)	1% (1%)

10.3 Growth from the base to the forecast year input matrices reflects TEMPRO growth factors (10% for car and -4% for PT at 2017). There is less growth within the AofI (8% at 2017 and 16% at 2032 for car) as there is relatively less development compared to other parts of Greater Manchester, most notably the Regional Centre.

10.4 Changes in total car trips from each sector are shown in Table 10.2 All Day Car Trips changes by sector. Core scenario forecasts are shown in brackets for comparison. It can be seen from the spreadsheet that the matrices are symmetrical and hence the trends shown are representative of all trips to/from each sector. The largest growth is in trips from Manchester Airport and the Manchester district as this is where the majority of the developments are situated.

10.5 The growth in trips is lower in the Pessimistic scenario than in the Core scenario for the Manchester Airport (both years) sector, which is in line with the lower occupancy levels at the Airport developments in the Pessimistic scenarios.

Table 10.2 – All Day Car Trip changes by sector – Pessimistic scenario do minimum

Sector	Base Trips from Sector	Change to 2017 Do Minimum	Change to 2032 Do Minimum
Manchester Airport	124,640	19% (20%)	43% (50%)
Cheadle & Wilmslow	276,449	5% (4%)	13% (10%)
Stockport	527,654	8% (8%)	20% (21%)
Sale & Altrincham	483,997	10% (7%)	20% (20%)
Manchester	1,607,445	12% (13%)	27% (27%)
Knutsford & Northwich	231,971	6% (6%)	14% (13%)
Macclesfield	306,023	9% (10%)	22% (26%)
Wigan	935,434	9% (9%)	21% (21%)
Bolton & Bury	798,760	5% (5%)	9% (9%)
Rochdale	380,374	7% (7%)	1% (1%)
Oldham & Ashton	798,315	8% (9%)	25% (25%)
North of GM	7,431,429	12% (12%)	31% (31%)
East of GM	3,274,880	11% (11%)	26% (26%)
South of GM	1,650,207	8% (8%)	20% (20%)
West of GM	4,180,905	7% (7%)	14% (14%)
External	25,189	13% (13%)	39% (41%)
Total	**23,033,671**	**10% (10%)**	**23% (23%)**

10.6 In summary, the sector to sector trip matrices by mode presented in the spreadsheet show plausible changes in the demand relative to the base model for the 2017 and 2032 do minimum forecasts. The unconstrained demand matrices input to SEMMMS VDM have been constrained to TEMPRO 6.2 forecasts at the district level within Greater Manchester and Cheshire East and at the county level beyond. The effect of this can be clearly seen in the homogeneity of the 4x4 sector to sector matrices when viewed by mode.

11 Pessimistic Scenario Proposed Scheme Forecasts

11.1 In this section, we describe the headline transport outturns of the Pessimistic scenario preferred scheme forecasts at 2017 and 2032.

11.2 As with the Core scenario, the scheme produces negligible changes in demand relative to the respective do minimum when viewed on the basis of the 4x4 sector system. There are small increases in car demand from within the AofI and from the AofI to the buffer area at the expense of PT.

11.3 Distributional effects of the scheme can be seen by looking at the 16x16 sector changes from the do minimum. There are modest reductions on some sector pairs (<4%) where trips are redistributed as a result of the scheme. The largest increases can be seen on the following sector pairs:

- Manchester Airport – East of GM (9% at 2017 and 7% at 2032);
- Cheadle & Wilmslow - East of GM (20% at 2017 and 17% at 2032);
- Stockport - West of GM (10% at 2017 and 11% at 2032);
- East of GM – Cheadle & Wilmslow (19% at 2017 and 16% at 2032);
- East of GM – Manchester Airport (10% at 2017 and 7% at 2032); and
- West of GM – Stockport (11% at 2017 and 12% at 2032).

11.4 As can be seen from the sector map these are all movements that cross the AofI, which will benefit through improved journey time as a result of the scheme.

11.5 As one would expect the changes in mode share and average trip length are marginal between the 2017 and 2032 do minimum and proposed scheme forecasts respectively.

11.6 In summary, the changes in 16x16 sector to sector car trip matrices for the scheme are in the appropriate geographical locations and are of a sensible order.

12 Appendix A: Public Transport Do Minimum Scheme Details

Metrolink

12.1 The committed Metrolink Capacity and Renewals programme and the Phase 3a extensions to the network were included in the Do Minimum strategies at both 2017 and 2032. The Capacity and Renewals work began in 2007 and work on the construction of the 3a extensions has commenced, with phased openings between 2010 and 2012. Representation is included of the Metrolink extensions from Chorlton to East Didsbury, Droylsden to Ashton, and Media City to Cornbrook. The assumed service pattern presented in Table 1 is for services across the whole network and reflects assumptions previously agreed with GMPTE, Research and Intelligence and used for forecasts on their behalf. They include:

- the extension from Victoria to Oldham and Rochdale along the existing railway line (note that the rail services along the Oldham/Rochdale railway line were removed from the model in future years);
- the extension from Piccadilly to Ashton;
- the spur to MediaCity UK; and
- the extension from Trafford Bar to East Didsbury.

Table 1 Metrolink Service Patterns

Service	Via	Trams per Hour
Bury to Altrincham	Mosley Street	5
Bury to Ashton	Piccadilly	5
Altrincham to Ashton	Piccadilly	5
Piccadilly to Eccles		5
Shaw to East Didsbury	Mosley Street	5
MediaCity to Cornbrook		5
Rochdale Station to East Didsbury	Mosley Street	5

12.2 The Metrolink extension to Manchester Airport is included in both 2017 and 2032. Introduction of the Metrolink extension requires the second city crossing to be implemented in order to accommodate the number of trams that will then be accessing Manchester City Centre. MVA have assumed the following schedule of Metrolink services when introducing the Metrolink extension to Manchester Airport. This is the full set of Metrolink services that have been included in forecasts which include the extension to the Airport.

Table 2 Metrolink Service Patterns Including Manchester Airport Extension

Service	Via	Trams per Hour
Bury to Altrincham	Mosley Street	5
Bury to Ashton	Piccadilly	5
Altrincham to Ashton	Piccadilly	5
Piccadilly to Eccles		5
Shaw to Airport	Oldham Town Centre and 2CC	5
Rochdale Station to Airport	Oldham Town Centre and 2CC	5
Media City to Piccadilly		5
East Didsbury to Victoria	2CC	10

Bus

12.3 Bus service patterns and frequencies have been assumed to be unchanged from those in the modelled base year of 2009.

12.4 In addition, the Core scenarios at 2017 and 2032 include elements of the Cross City Bus Package and the Leigh Salford Manchester guided bus way scheme.

Table 3 Cross City Bus Service Frequency (buses per hour)

Line	AM	IP	PM	Evening
Manchester Royal Infirmary and Leigh	4	3	4	2
Manchester Royal Infirmary and Atherton	4	3	4	2
Manchester Royal Infirmary and Middleton	6	6	6	2
Parrs Wood and Pendelton	6	6	6	2
Christie Hospital and Pendleton	6	6	6	2

12.5 A service frequency of 6 services per hour in each direction has been assumed for the Leigh Salford Manchester guided bus way scheme

Rail

12.6 Rail service patterns and frequencies have been assumed to be unchanged from those in the base year of 2009.

Interchanges

12.7 Altrincham Interchange has been represented through a set of explicit generalised cost adjustments. The best available assumptions were those which were previously agreed with GMPTE and used in modelling of the Transport Innovation Fund bid and later work on Greater Manchester Scheme Prioritisation. All trips interchanging between Metrolink and other public transport sub-modes in the SEMMMS7 public transport base model received a -1.52 minute adjustment. Trips interchanging from bus to bus received a -1.22 minute adjustment.

Appendix 2

HFAS Briefing Note 2023-55-B01

Manchester Airport Assumptions

Client **SEMMMS Project Board**

Project **A6 to Manchester Airport Relief Road**

Subject **Modelling of Manchester Airport –SEMMMS8 Forecasting Assumptions**

This note outlines the assumptions to be made in modelling Manchester Airport in the SEMMMS8 SATURN Model and SEMMMS8 VDM. It updates/replaces GMTU Briefing Note 2023-00-B33.

This Note	**2023-55-B01-SEMMMS8 Mcr Airport Assumptions_v1.0.doc**		
Originator	David Nixon		Check /
Version	Comments	Date	Approve
1.0	Final Version	091112	DN

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A6 to Manchester Airport Relief Road
Modelling of Manchester Airport – Forecasting Assumptions

1. Introduction

1.1 Transport for Greater Manchester Highways Forecasting and Analytical Services (TfGM HFAS) and MVA have been commissioned by the SEMMMS Project Board to update the SEMMMS SATURN traffic model and SEMMMS Variable Demand Model (SEMMMS VDM) respectively to reflect changes to planning assumptions and scheme design. The outputs from the updated models will inform further appraisal of the proposed A6 to Manchester Airport Relief Road. Both models require significant data inputs, a number of which relate specifically to Manchester Airport.

1.2 In September 2009, GMTU officers met representatives of Manchester Airport Group (MAG) and AECOM to discuss the information that GMTU considered necessary to adequately represent Manchester Airport in the SEMMMS transport models.

1.3 Subsequent meetings between the MAG, their consultants AECOM, and the modelling team represented by (the then) GMTU and Atkins sought to determine an "evidence base" for the Airport that would support modelling work for 2009, 2015 (the anticipated SEMMMS opening year at that time) and 2030 (SEMMMS design year) horizons. Based on the discussions at those meetings, a briefing note (GMTU Note 2023-00-B33) was produced setting out the assumptions to be applied to represent the Airport and associated developments in SEMMMS7B forecasts for 2015 and 2030.

1.4 Since the SEMMMS7B forecasts were completed:

- The opening year for the A6 to Manchester Airport Relief Road has changed to 2017, with the design year therefore becoming 2032;
- Forecasts of passenger growth at Manchester Airport have been updated;
- MAG have progressed the planning of the Airport City development;
- The Government has assigned the Airport and its surrounds Enterprise Zone status; and
- Work has commenced on the Metrolink Extension to Manchester Airport.

1.5 As a result, prior to commencing a new round of updated SEMMMS forecasting (SEMMMS8), a review of the previous assumptions made for Manchester Airport and its surrounds has been undertaken.

1.6 This note summarises the findings of the review and details the assumptions to be made for Manchester Airport in the SEMMMS8 forecasts.

2. Data Inputs

2.1 SEMMMS VDM will be used to determine future horizon overall levels of trip making by available travel modes. The model needs transport supply (infrastructure, frequencies etc) and demand (jobs and population) data, and information on respective travel costs.

2.2 SEMMMS SATURN provides the highway network infrastructure information and determines route choice and highway travel costs based on the highway travel demand under set scenarios, which in turn is derived iteratively by SEMMMS VDM. SEMMMS VDM also refers to Public Transport (PT) costs derived from a further, PT, model that completes the modelling suite. SEMMMS VDM determines travel mode splits derived via the highway and PT models and provides demand forecasts that feed back into them in order to iteratively identify balanced costs across the transport system.

2.3 Key inputs to SEMMMS VDM aside from network costs are information on current and envisaged land use, development and employment.

2.4 Key inputs to SEMMMS SATURN are the future topology of the network, its capacity, and traffic loading points (i.e. locations where traffic may be entering or leaving the network).

2.5 The two models operate on a zonal basis, with SEMMMS VDM using aggregations of SEMMMS SATURN model zones away from the schemes area of influence (AOI) and one-to-one correlations in the AOI , including the airport and its environs.

2.6 In order to meet Department for Transport requirements there is a need to develop:

- A core (most likely) scenario;
- A pessimistic scenario; and
- An optimistic scenario.

2.7 This means that a range of development and (possibly) infrastructure options will need to be identified.

2.8 The key assumptions relating to Manchester Airport are set out below.

3. Passenger Growth

3.1 Following discussions with MAG, it has been agreed that the future Airport passenger growth assumed for SEMMMS8 purposes will be as per the Department for Transport's UK Aviation Forecasts published in August 2011. These updated forecasts replace the UK Air Passenger and CO_2 Forecasts 2009 used in the SEMMMS7 forecasts.

3.2 The UK Aviation Forecasts provide future airport passenger numbers under three scenarios; providing low, central and high forecasts. The central forecasts take account of forecast changes in GDP, air fares (and through these, fuel and non-fuel costs) and "market maturity". The low and high forecasts are based on a range of sensitivity tests relating to variations in GDP, oil prices, air passenger duty and non-fuel costs, and the impacts of emission standards.

3.3 The projections for Manchester Airport are shown in Table 1 below. The figures in brackets are the previous (2009) forecasts. The central forecast will be used as the basis of the SEMMMS8 core forecasts. Low and high passenger forecasts will be applied in the pessimistic and optimistic scenarios respectively.

Table 1 UK Aviation Forecasts - Projections for Manchester Airport (Millions of Passengers per Annum)

Year	Low (Pessimistic)	Central (Core)	High (Optimistic)
2009 (2005)	18.6 (20)	18.6 (20)	18.6 (20)
2020 (2015)	25 (30)	25 (30)	30 (30)
2030	30 (40)	35 (45)	35 (45)

Notes:

Source: UK Aviation Forecasts, Department for Transport, August 2011, Tables G2 and G3

4. Airport Employee Growth

4.1 For modelling purposes we would ideally wish to know the number of person trips generated by workers at Manchester Airport in each of the forecast years and modelled time periods (0800-0900, an average interpeak hour between 1000 and 1500, and 1700-1800). However, these are understandably difficult figures to determine.

4.2 In previous demand modelling work in Greater Manchester (using GMSPM2 and SEMMMS7 VDM), the ratio of Airport site employees to passenger throughput has been assumed to remain unchanged from 2006 e.g. if passenger throughput doubles, Airport employees double.

4.3 In the absence of more detailed information, and following discussion with MAG, this assumption will again be adopted for SEMMMS8 forecasting.

5. Commercial Development Adjacent to Manchester Airport - Airport City and Manchester Business Park

5.1 An additional 5,000 jobs were assumed in GMSPM2 to reflect the development of the 'Airport City' site over the next 10-15 years. This figure was based on the planning consents for what were historically known as the Burford and Arlington (later Goodmans) development sites to the north of Manchester Airport.

5.2 The Burford site, which is now the proposed site of Airport City, was granted outline planning permission by MCC on April 2006 for the development of 50,000 square metres of office /business park (B1) type development.

5.3 The Arlington/Goodmans site has permission for 62,700 square metres of office/business park (B1) type development. This site is currently being developed as individual plots.

5.4 When the assumptions for the SEMMMS7 forecasts were being determined, MAG was still undertaking research into the feasibility of various development mixes for the Airport City site. Given the uncertainty regarding the nature of future development it was therefore assumed that the development assumptions for the Airport City/Burford and Arlington/Goodmans sites would be as per the permissions current at that time (April 2010).

5.5 Since Spring 2010:

- MAG has continued with planning of the Airport City site; and
- The Government has designated Manchester Airport and its surrounding area (including Airport City) as an Enterprise Zone.

5.6 The further planning of Airport City has resulted in a development which will be more mixed use in nature, rather than being predominantly B1 development. The accessibility of the site has also been reviewed and the development now being progressed will incorporate new links to the central rail station at the Airport.

5.7 At this time there remains a degree of uncertainty regarding the exact details of the new Airport City Development. Consequently, it was been decided that the SEMMMS7 assumptions should be carried forward to SEMMMS8. However, to provide reassurance as to the robustness of these assumptions, AECOM (on behalf of MAG) have carried out a review of the trip generation estimates for the development produced by MVA for use in the SEMMMS VDM. AECOMS findings are that the trip rates and resulting trip generation are indeed robust.

5.8 The designation of the Enterprise Zone will facilitate development of Airport City and other sites in the Airport area. Essentially it consists of a series of linked sites which will support/complement development of Airport City. However, it will also include areas to the west of Manchester Airport near the University Hospital of South Manchester (Wythenshawe Hospital) that will be developed to serve the health and biotech sectors.

5.9 The scale of the EZ development may be considerable. However, little detail is yet available on development content or supporting infrastructure, and it has therefore been decided not to incorporate the EZ (other than for Airport City) in the current forecasts. If details are confirmed subsequently, sensitivity testing could be undertaken to determine the impacts of the proposals.

5.10 Table 2 shows the assumed levels of development and employment at Airport City and Arlington/Goodmans in 2009, 2017 and 2032. The employment estimates are based on data from business park and office developments on the TRICS Traffic Generation Database.

5.11 For the SEMMMS modelling, core pessimistic and optimistic scenarios have been identified. The scenarios assume:

- For Airport City (Burford), that the site is fully developed and occupied by 2032; development/occupation by 2017 is assumed to be 50%, 25% and 75% under core, pessimistic and optimistic scenarios respectively
- For Arlington/Goodmans, that the site is fully developed by 2032 development/occupation by 2017 is assumed to be 66%, 50% and 100% under core, pessimistic and optimistic scenarios respectively. These figures reflect the fact that about a quarter of the permitted floorspace is currently built and occupied (by Cuzzons, Regus and Ericcson).

Table 2 Estimated Jobs on the Airport City and Goodmans Developments						
	Airport City/Burford			Goodmans		
	Core	Pessimistic	Optimistic	Core	Pessimistic	Optimistic
Permitted Floorspace (B1)	50,000	50,000	50,000	62,700	62,700	62,700
Occupied 2009	0	0	0	17,065	17,065	17,065
Occupied 2017	25,000	12,500	37,500	41,800	31,350	62,700
Occupied 2032	50,000	50,000	50,000	62,700	62,700	62,700
Jobs 2009	0	0	0	806	806	806
Jobs 2017	1180	590	1770	1970	1480	2960
Jobs 2032	2360	2360	2360	2960	2960	2960

6. Other Commercial Development Adjacent to Manchester Airport – Davenport Green

6.1 MAG has drawn attention to the potential development of the Davenport Green site to the west of the M56 but accessed by Thorley Lane/Runger Lane to the east of the motorway.

6.2 This site was earmarked for a development of up to 93,000 square metres of B1 floorspace and until recently had outline planning consent for a first phase of 46,450 square metres. This permission has now lapsed and Trafford MBC (in whose area the site lies) have recently changed the B1 allocation to 'countryside' in their LDF. This change does not however preclude future development of the site as part of the wider Airport Enterprise Zone.

6.3 A further issue in determining the future development of the Davenport Green site is that of Metrolink. Discussions with MCC confirm that the completion of the Wythenshawe Loop Metrolink extension was a key factor in making the Davenport Green site viable. However, plans for the western side of the loop, which would have served Davenport Green have now been dropped.

6.4 In the light of the uncertainty surrounding the timing and nature of development at Davenport Green we do not consider it necessary to incorporate Davenport Green in the core SEMMMS forecasts. However, we will include the Davenport Green site within the SEMMMS8 Optimistic scenario.

6.5 As with other developments the number of trips generated by the development and their modal split will be estimated within the VDM based on the number of jobs. Using the jobs/floorspace ratios determined from TRICS and used in the calculation of jobs at the Airport City and Goodmans sites we will assume:

- 25% development/occupation of previously consented floorspace (11, 600 sq m) by 2017, creating 550 jobs;
- 100% development/occupation of previously consented floorspace (46,450 sq m) by 2032, creating 2,200 jobs.

7. Derivation of Modal Split

7.1 For most trips there are generally a choice of modes i.e. car, bus, heavy rail, Metrolink, cycle and walk.

7.2 MAG has set a target of 40% of trips to and from Manchester Airport being by non-car modes. The Airport Masterplan states that this will be achieved by:

- Promotion of public transport;
- Developing a mix of off site “park and ride” and on site parking;
- Discouraging “kiss and fly” and taxi use; and
- Use of demand management techniques.

7.3 The measures identified by MAG under these general headings are set out in the Airport’s Ground Transport Plan. The key measures are summarised below.

Roads

- Demand management of road traffic, focusing on reducing the number of vehicle trips per passenger; MAG have indicated that a key aspect of the demand management will be the introduction of a £2 access charge for vehicles entering the Airport area between 2017 and 2032;
- Explore opportunities to develop dedicated high-occupancy vehicle or bus lanes on strategic airport approach roads; and
- Use of technology to provide improved driver information, and the introduction of Active Traffic Management measures.

Parking

- Accommodate growth in short stay parking within the central terminal area;
- Discourage use of the car by employees through relocation of long stay staff spaces to the periphery of the Airport and incentive schemes; and
- Develop strategic park and ride sites.

Rail

- Complete the third rail platform at the interchange (now open);
- Increase capacity on Transpennine routes through lengthening trains and improving frequencies;
- Add new services to the Midlands and North Wales; and
- For the longer term, review the feasibility of new infrastructure in the Manchester Hub and support improvements, and work with Network Rail et al to develop a western rail link.

Coach

- Develop new coach links into under-served PT markets such as Merseyside, North Wales and Central and East Lancashire; and
- Increase frequencies and reliability on existing routes; this is linked to the development of bus only lanes on key sections of the strategic road network.

Bus

- Work with operators and Transport for Greater Manchester to improve service provision;
- Take full advantage of SEMMMS Quality Bus Corridor Improvements;
- Develop new demand responsive and early/late services; and
- For the longer term, work to improve bus access to rail and tram stops with services to GM.

Metrolink

- Complete the Airport Metrolink Link.

Walking and Cycling

- Improve local cycle routes, including the Airport Orbital Cycleway; and

- Ensure provision of cycle parking facilities across the Airport.

7.4 For previous strategic modelling in Greater Manchester, the modal split of trips to/from Manchester Airport has been derived within the demand model and reflected the supply and cost of the various alternative modes available to the trip maker. No attempt was made to impose the specific modal split targets set out in the Airport Masterplan and Ground Transport Plan. We will adopt the same approach for SEMMMS modelling.

7.5 The modelling will seek to incorporate those measures outlined above which are clearly defined and that can be represented in the VDM and/or SATURN models. By far the most significant impacts on modal split will be those resulting from the proposed access charge and the completion of the Airport Metrolink line.

7.6 Within SEMMMS VDM it will therefore be assumed that for core modelling:

- A £2 (at 2009 prices) access charge will be implemented at a point between 2017 and 2030; this will also be modelled explicitly in the SATURN model at 2030
- Airport Metrolink is open by 2017; frequencies and interchange opportunities (e.g. in the City Centre) will be confirmed with TfGM.

7.7 Many of the other improvements referred to in the GTP and Need for Land – particularly those affecting heavy rail – are not yet defined sufficiently to permit modelling and/or are not yet committed. Similarly, although the Public Transport model being built as part of the SEMMMS VDM will be capable of modelling improvements to service provision/frequencies (bus and rail), to do so would require such changes to be clearly specified. The impact on modal split of such changes within the VDM is likely to be marginal.

Freight Vehicle Movements

7.8 The Cargo Centre located off Runger Lane is a significant generator of goods vehicle movements. However, many of these movements occur outside the normal traffic peak periods.

7.9 MAG has plans to significantly expand floorspace for airlines, freight forwarders etc. However, the impact of these plans on freight vehicle movements is unclear. It is also unclear which sites will be subject to development for freight purposes. It is likely that a significant amount of the new development will be located on the Oak Farm site west of the current Cargo Centre and adjacent to the A538 Wilmslow Road.

7.10 Discussions with the Airports traffic consultants, AECOM, suggest that there is little concrete information available on future growth in good vehicle movements. Therefore at AECOMs

suggestion, the forecasts used for development of the layouts for the Blue and Yellow works some 4-5 years ago will be used to determine the levels of growth assumed for the Cargo Centre. These forecasts were based on 2005 flows and projected forward to 2011. The levels of growth indicated by these (PCU) flows are:

- A 64% increase in inbound traffic between 0800 and 0900
- A 49% increase in outbound traffic between 0800 and 0900
- A 45% increase in inbound traffic between 1700 and 1800
- An 84% increase in outbound traffic between 1700 and 1800

7.11 These figures are (and were at the time of the Blue/Yellow works forecasting) recognized as being extremely robust, although clearly as they are PCU flows they represent growth in trips for all purposes and by all vehicle types. It should also be noted that the figures include vehicle trips associated with the aircraft maintenance area that is also accessed off Avro Way. Growth in inbound trips in the morning and outbound trips in the evening will include a substantial number of commute trips by employees. However, the growth in outbound traffic in the morning and inbound traffic in the evening is more likely to be due to goods traffic.

7.12 In its "Need for Land" document MAG suggests that the land set aside for cargo use will increase by between 33% and 83% by 2030 (24 Ha to 32-44 Ha). The same document quotes floorspace figures of 79,617 sq m at 2013 and 120,000 sq m at 2030, an increase of 51%. However, the document suggests that a substantial amount of the growth will occur in the Oak Farm and Sun Bank Lane areas rather than on the existing Cargo Centre site.

7.13 Given MAG's wish to be as consistent as possible with the forecasts already produced for the Blue and Yellow Works, for the SEMMMS Central forecasts we will assume:

- 49% and 45% growth in goods traffic to/from the Cargo Centre (zone 288) in 2017 AM and PM peak hours respectively
- 49% growth in the 2017 interpeak goods traffic to/from the Cargo Centre (based on the AM peak outbound growth from the Blue/Yellow works forecasts i.e. the higher of the peak figures)
- 51% growth in goods traffic to/from the Cargo Centre between 2017 and 2032 (all periods) in line with the Airport's projected growth (2013 to 2030) in floor area; this will be a robust estimate as it will assume that the level of floor area growth is reflected directly in the growth of goods vehicle movements.

7.14 For all other Airport zones, goods vehicle trips will be assumed to grow in line with NTM forecasts to 2017 and 2032.

7.15 As with the Development at Airport City and within the Enterprise zone, if further details of the location and scale of future air freight-related development becomes available this could be incorporated into later sensitivity tests.

Car Parking

7.16 "The Need for Land" outlines MAG's future parking requirements in some detail. Based on an airport passenger throughput of 40 mppa in 2030, it is estimated that there will be a requirement for between 18,000 and 32,400 additional car park spaces for passenger use, and around 4,400 additional spaces for staff use. The precise requirements will clearly be based on the extent to which the modal shift from private car to public transport can be achieved.

7.17 However, in addition to a requirement for additional spaces, there will be a need to relocate some car parking to facilitate the expansion of apron areas. This will particularly impact on the long stay car parks situated off Sydney Avenue (near Terminal 2) and Ringway Road (east of Terminal 3).

7.18 Following discussion with MAG, for SEMMMS modelling we will assume that:

- Long stay parking displaced from the Sydney Avenue area will be relocated to Oak Farm
- Long stay parking displaced from the Ringway Road area will be relocated to land north of Ringway Road and east of Shadow Moss Road.

7.19 Short stay parking within the central terminal area will be assumed to expand to meet demand.

7.20 As suggested by MAG, privately run parking in the Moss Lane area (SATURN Zone 1080) will be assumed to remain at current levels (i.e. no growth will be assumed).

Highway Schemes

7.21 For Core modelling we will assume a number of committed or likely highway schemes in the vicinity of Manchester Airport, namely:

- The "Rainbow Works" package of schemes (Blue, Yellow and Red works);
- The proposed realignment of Ringway Road between Ringway Road West and Terminal 3

7.22 The "Rainbow Works" consist of:

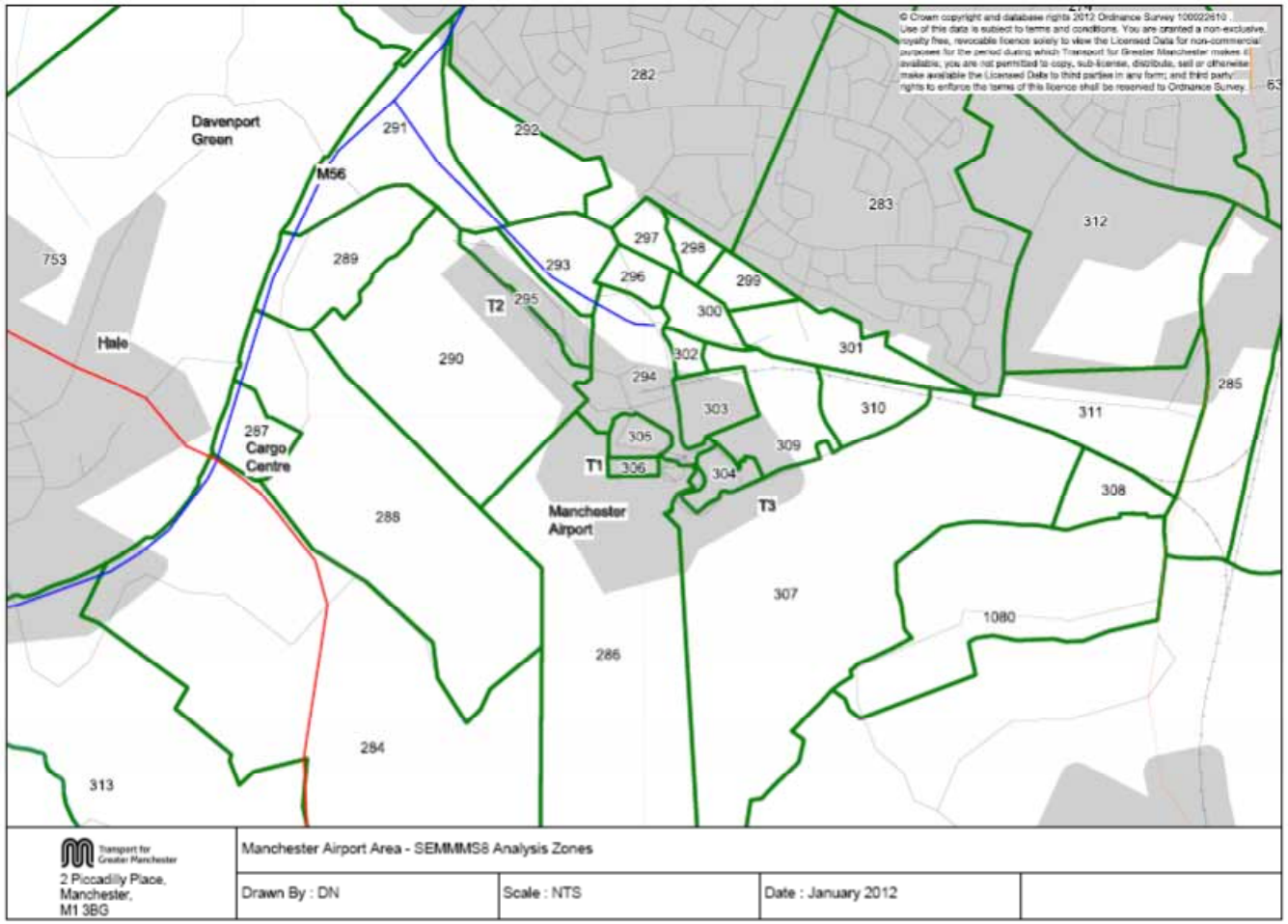
- The improvement of M56 Junction 6 (Blue Works)
- The realignment and improvement of Runger Lane and Thorley Lane between M56 Junction 6 and Terminal 2 and improvements to the M56 westbound on-slip (Yellow Works); and
- The improvement to dual-five lane standard of the M56 between Junctions 5 and 6 (Red Works).

7.23 These can be regarded as committed schemes as they are requirements of the planning permission for Terminal 2 or Runway 2.

7.24 MAG has advised that the Blue and Yellow works are likely to be in place by 2017, based on current forecasts of passenger growth. The Red Works will follow, being open by 2032

7.25 The proposed realignment of Ringway Road is tied to the intention to expand the apron area around Terminal 3. This would require Ringway Road to be realigned to the north. We believe this to be a committed scheme. We will assume that this realignment is complete by 2017. The road will be assumed to be constructed to 7.3m wide, all-purpose single carriageway standard.

7.26 In addition to the above, the original (lapsed) planning permission for the Davenport Green development incorporated conditions relating to capacity improvements on the M56 eastbound and westbound off-slips and improvements/changes to the operation of the Runger Lane/Thorley Lane junction. The improvements to the westbound off-slip are effectively covered by the Red Works. The improvements to the eastbound off-slip and Runger Lane/Thorley Lane junction will be incorporated (alongside the development) in the Optimistic scenario networks only.


Davenport Green
M56
753
289
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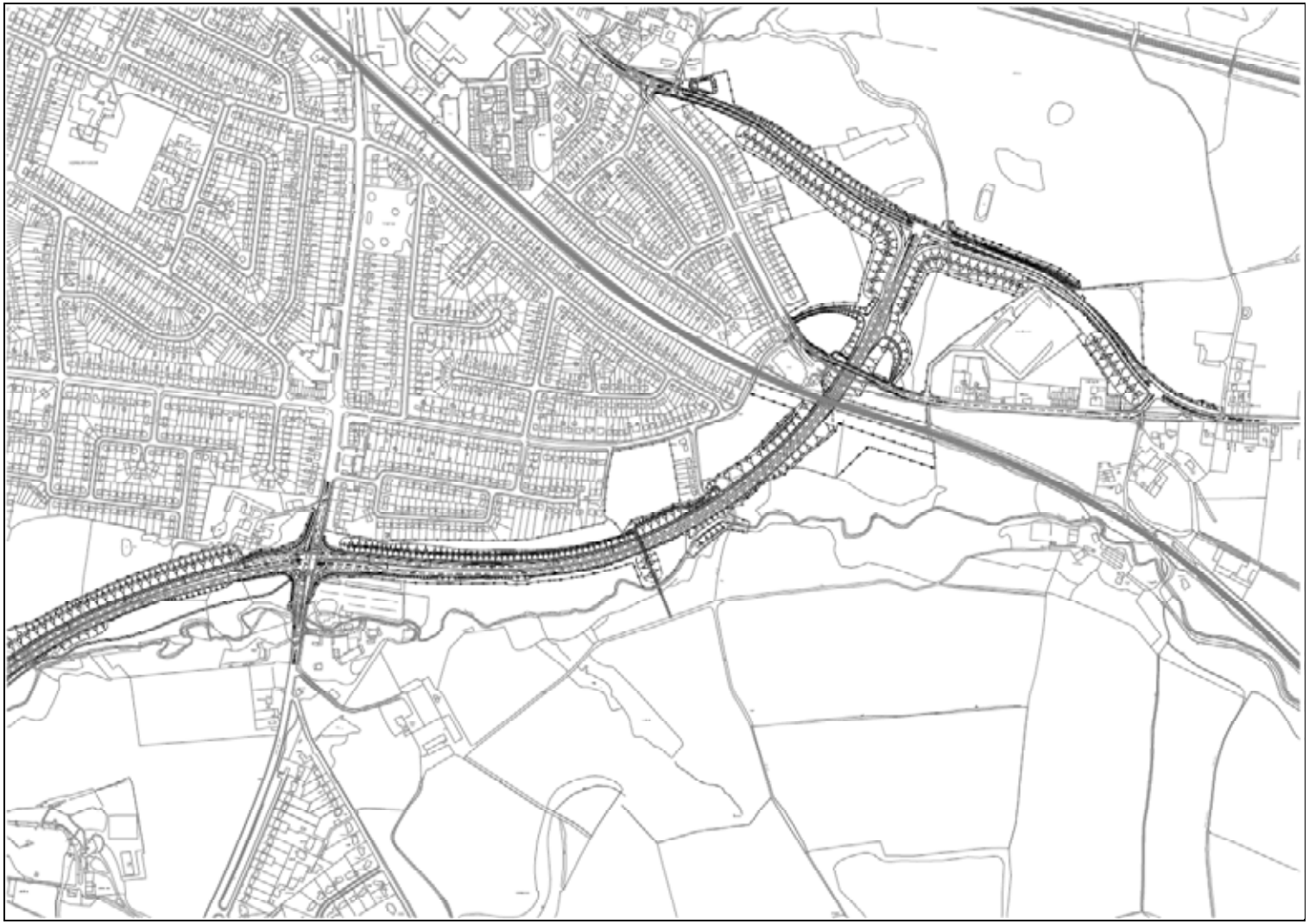
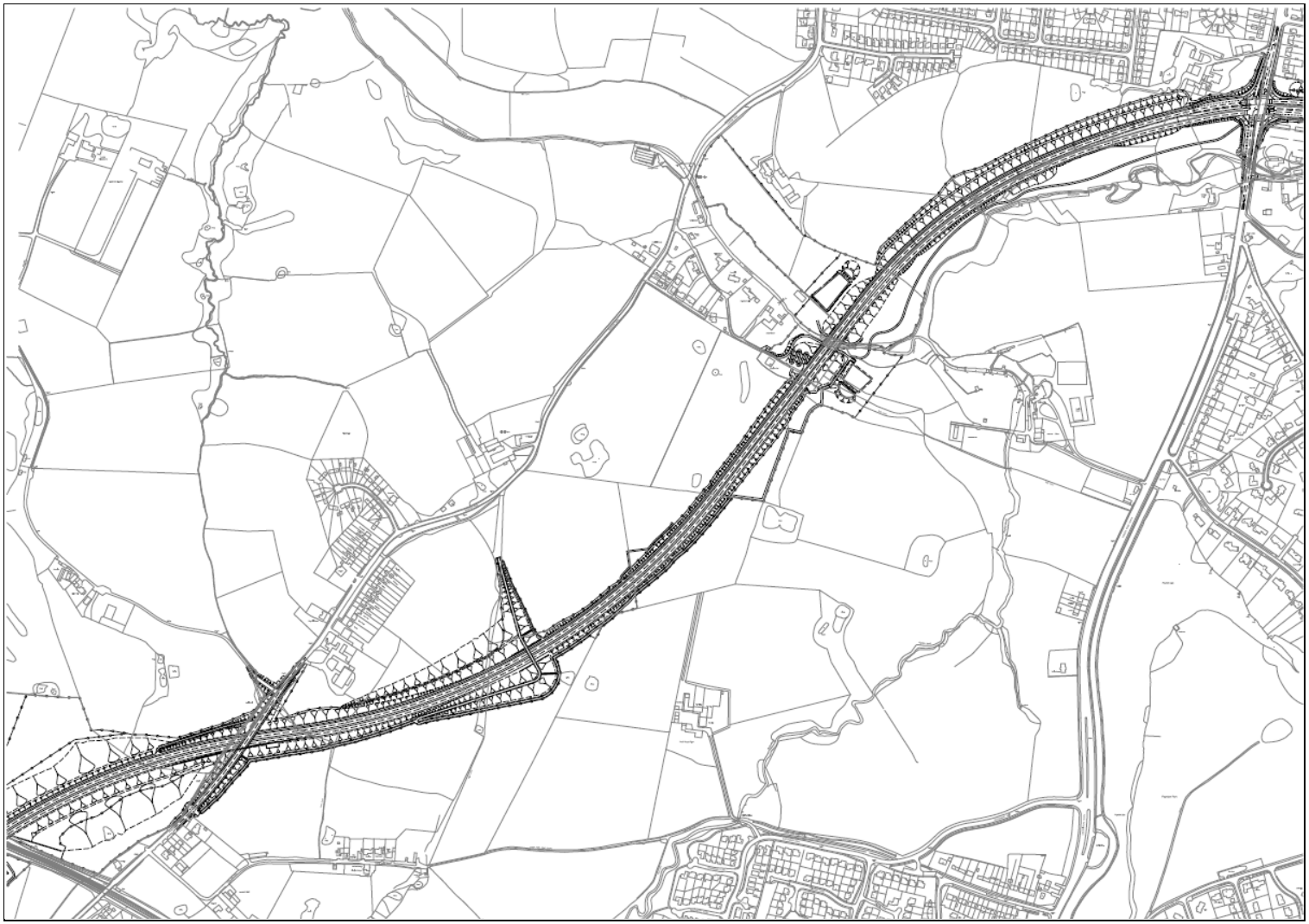
282
283
312
297
298
293
296
299
T2
295
300
Hale
290
302
301
294
303
310
311
285
287
Cargo Centre
305
309
T1
306
304
308
T3
Manchester Airport
288
307
1080
286
284
313
Manchester Airport Area - SEMMMS8 Analysis Zones
2 Piccadilly Place, Manchester, M1 3BG
Drawn By : DN
Scale : NTS
Date : January 2012

Appendix 3

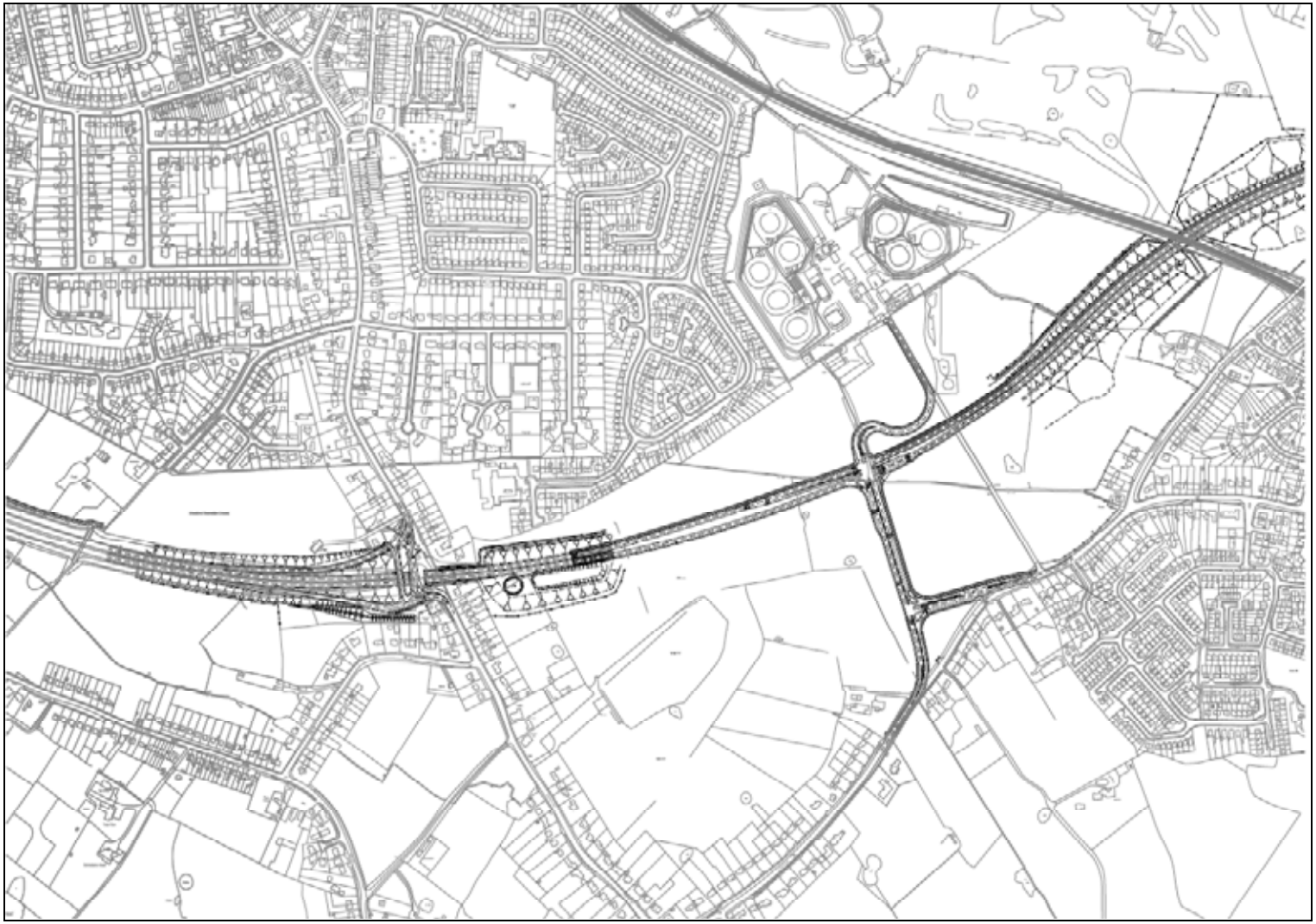
Scheme Design Freeze 6



Scheme/ A6 Buxton Road and A523 Macclesfield Road

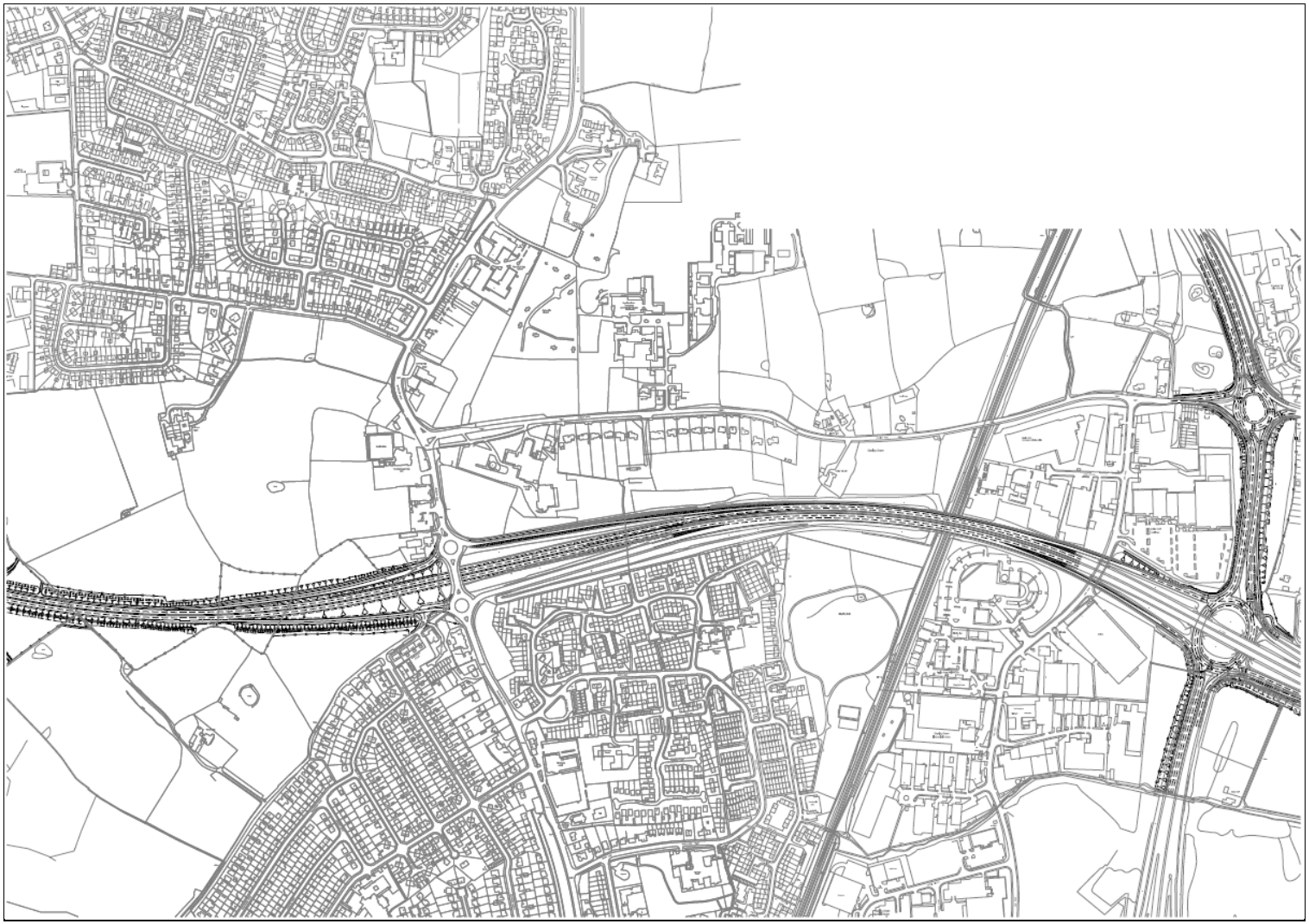


Scheme/ Chester Road

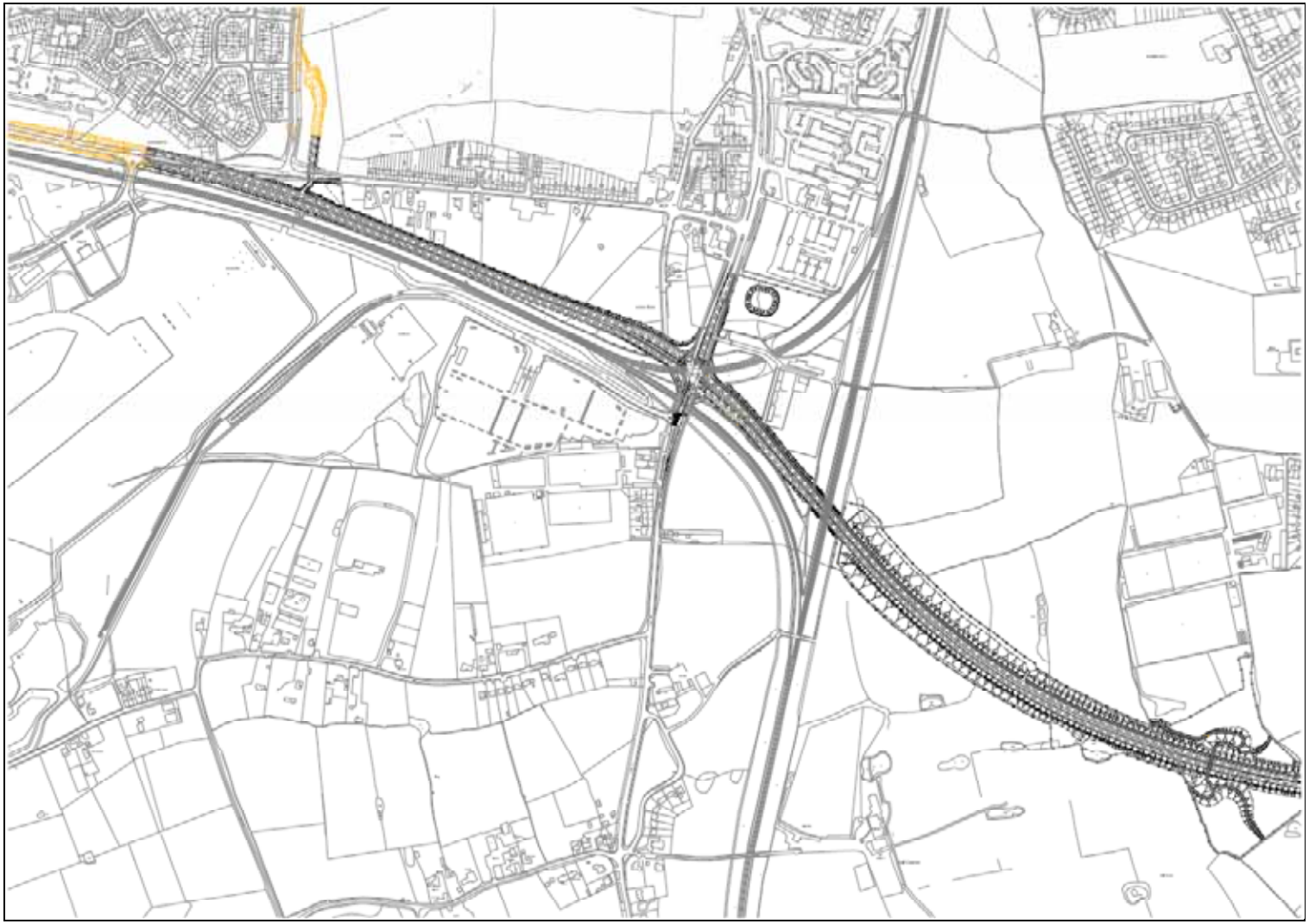


Scheme/ A5102 Woodford Road

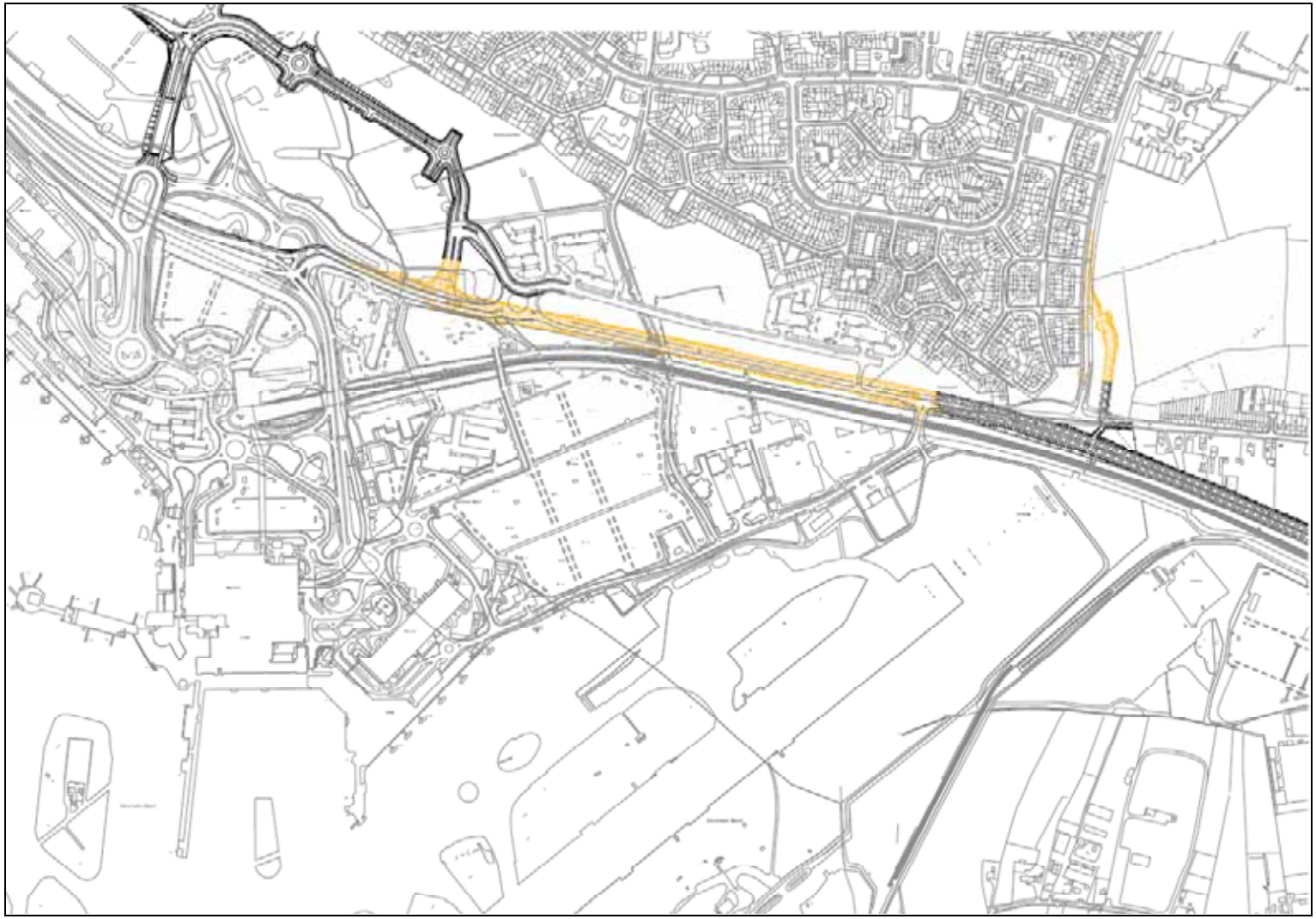
Scheme (MAELR) / A34 Wilmslow and Handforth Bypass



Scheme (MAELR)/ B5358 Wilmslow Road



Scheme /B5166 Styal Road



Scheme/ Shadowmoss Road /Ringway Road/ Airport City North

Appendix 4

Scheme Pessimistic Forecasts – Screenline Crossing Flows in Area of Influence

Appendix 4.1: Screenline 1 North of Scheme Screenline - Crossing Flows in pcu's

Crossing Links	Time Period	Northbound								Southbound							
		2017				2032				2017				2032			
		DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff
1. A5102 Woodford Rd	AM	629	663	34	5%	539	822	283	53%	1066	807	-259	-24%	1049	1108	59	6%
2. Moss Lane		149	104	-44	-30%	159	109	-50	-32%	314	211	-103	-33%	362	345	-17	-5%
3. Gil Bent Road		600	535	-65	-11%	586	527	-59	-10%	636	875	239	38%	621	1021	399	64%
4. A34 Handforth Bypass		2391	2731	340	14%	2365	2981	616	26%	2354	2614	261	11%	2503	2782	279	11%
5. B5358 Wilmslow Rd		965	729	-236	-24%	1114	768	-346	-31%	691	434	-257	-37%	798	508	-290	-36%
6. Finney Lane East		706	581	-125	-18%	628	613	-16	-3%	791	493	-297	-38%	984	606	-379	-38%
7. St Anns Road North		458	384	-74	-16%	348	422	74	21%	403	254	-148	-37%	659	299	-360	-55%
8. Finney Lane West		1214	639	-575	-47%	1454	881	-573	-39%	789	546	-242	-31%	477	616	140	29%
9. B5166 Styal Road		733	911	177	24%	835	998	163	20%	1023	764	-259	-25%	1118	1011	-107	-10%
10. Shadowmoss Road		430	94	-336	-78%	473	121	-352	-74%	139	126	-13	-9%	130	166	36	28%
11. Selstead Road		340	350	10	3%	394	419	25	6%	258	245	-13	-5%	705	491	-214	-30%
12. M56		5970	5840	-130	-2%	6674	6355	-320	-5%	6530	6242	-288	-4%	7374	7194	-180	-2%
Total		**14586**	**13562**	**-1024**	**-7%**	**15569**	**15014**	**-554**	**-4%**	**14992**	**13611**	**-1381**	**-9%**	**16780**	**16146**	**-634**	**-4%**
1. A5102 Woodford Rd	IP	591	654	63	11%	770	802	33	4%	640	449	-192	-30%	804	644	-159	-20%
2. Moss Lane		223	213	-10	-5%	264	231	-33	-13%	213	188	-25	-12%	273	203	-69	-25%
3. Gil Bent Road		331	371	40	12%	379	455	76	20%	414	492	78	19%	562	619	57	10%
4. A34 Handforth Bypass		1945	2004	59	3%	2185	2417	232	11%	1994	1988	-6	0%	2276	2386	110	5%
5. B5358 Wilmslow Rd		628	668	40	6%	753	774	21	3%	486	615	129	27%	614	706	92	15%
6. Finney Lane East		679	519	-160	-24%	750	612	-138	-18%	585	431	-154	-26%	578	424	-153	-27%
7. St Anns Road North		188	188	1	1%	155	170	15	10%	270	194	-76	-28%	403	219	-184	-46%
8. Finney Lane West		862	405	-457	-53%	972	443	-529	-54%	870	492	-377	-43%	887	592	-295	-33%
9. B5166 Styal Road		648	627	-21	-3%	849	785	-64	-7%	607	495	-112	-18%	862	607	-255	-30%
10. Shadowmoss Road		159	37	-121	-77%	219	65	-154	-70%	129	52	-77	-59%	78	63	-15	-19%
11. Selstead Road		160	148	-13	-8%	230	205	-25	-11%	111	139	28	25%	311	258	-53	-17%
12. M56		5190	5130	-60	-1%	6256	6035	-220	-4%	4988	4934	-54	-1%	5986	5816	-170	-3%
Total		**11605**	**10965**	**-640**	**-6%**	**13781**	**12995**	**-786**	**-6%**	**11307**	**10471**	**-837**	**-7%**	**13633**	**12539**	**-1095**	**-8%**

Appendix 4.1 Continued: Pessimistic Screenline 1 North of Scheme Screenline - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Northbound**								**Southbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A5102 Woodford Rd	**PM**	719	907	188	26%	872	979	107	12%	793	700	-93	-12%	887	838	-50	-6%
2. Moss Lane		271	246	-25	-9%	266	236	-30	-11%	468	176	-292	-62%	520	280	-240	-46%
3. Gil Bent Road		525	477	-48	-9%	600	650	50	8%	410	588	178	44%	521	723	202	39%
4. A34 Handforth Bypass		2413	2670	257	11%	2619	2850	231	9%	2952	3279	327	11%	2952	3124	173	6%
5. B5358 Wilmslow Rd		788	721	-66	-8%	794	748	-45	-6%	864	642	-222	-26%	706	888	182	26%
6. Finney Lane East		875	563	-312	-36%	620	684	64	10%	662	451	-211	-32%	694	523	-171	-25%
7. St Anns Road North		241	197	-44	-18%	292	241	-51	-17%	501	182	-320	-64%	632	212	-420	-66%
8. Finney Lane West		913	420	-493	-54%	1031	523	-508	-49%	964	738	-226	-23%	744	951	208	28%
9. B5166 Styal Road		1040	893	-147	-14%	959	1155	196	20%	1052	739	-313	-30%	1442	965	-476	-33%
10. Shadowmoss Road		223	117	-106	-47%	332	160	-171	-52%	106	133	27	25%	109	218	108	99%
11. Selstead Road		476	455	-20	-4%	556	569	12	2%	228	240	12	5%	555	456	-99	-18%
12. M56		6060	6064	4	0%	7429	7284	-145	-2%	6415	6251	-163	-3%	6746	6613	-133	-2%
Total		**14544**	**13732**	**-812**	**-6%**	**16369**	**16079**	**-290**	**-2%**	**15416**	**14119**	**-1297**	**-8%**	**16506**	**15791**	**-715**	**-4%**

Appendix 4.2 Screenline 2 South of Scheme - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Northbound**								**Southbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A6 Market Street	**AM**	118	72	-46	-39%	63	85	22	35%	116	139	23	20%	74	63	-11	-15%
2. A6 Buxton Road		685	905	220	32%	857	908	51	6%	571	752	182	32%	716	889	172	24%
3. Roundy Lane		13	9	-4	-29%	20	35	15	72%	17	14	-2	-13%	40	33	-7	-18%
4. A523 London Road		645	624	-20	-3%	703	694	-9	-1%	879	743	-136	-15%	996	1017	21	2%
5. Lees Lane		1165	1156	-9	-1%	1126	1142	16	1%	915	1031	116	13%	1035	956	-78	-8%
6. A5102 Hough Lane		510	375	-135	-27%	635	457	-179	-28%	719	686	-33	-5%	990	1015	25	2%
7. A34 Wilmslow Bypass		1460	1746	286	20%	1525	1877	352	23%	2091	2033	-58	-3%	1968	1855	-113	-6%
8. B5166 Manchester Road		913	863	-50	-6%	1010	989	-21	-2%	569	676	107	19%	461	749	287	62%
9. Cliff Road		2	2	0	0%	2	2	0	0%	567	480	-87	-15%	709	744	35	5%
Total		**5512**	**5752**	**240**	**4%**	**5942**	**6190**	**248**	**4%**	**6443**	**6555**	**111**	**2%**	**6989**	**7320**	**331**	**5%**
1. A6 Market Street	**IP**	151	155	4	2%	134	19	-115	-86%	238	333	95	40%	187	205	18	10%
2. A6 Buxton Road		486	572	86	18%	550	828	279	51%	394	467	72	18%	565	803	238	42%
3. Roundy Lane		13	11	-1	-12%	13	15	3	20%	10	10	0	2%	14	14	1	6%
4. A523 London Road		404	395	-9	-2%	564	479	-85	-15%	405	427	22	5%	551	507	-43	-8%
5. Lees Lane		687	680	-8	-1%	1012	835	-176	-17%	659	681	22	3%	756	727	-29	-4%
6. A5102 Hough Lane		362	166	-196	-54%	467	241	-226	-48%	243	140	-103	-42%	396	207	-189	-48%
7. A34 Wilmslow Bypass		1549	1824	275	18%	1423	2024	601	42%	1632	1564	-68	-4%	1783	1933	151	8%
8. B5166 Manchester Road		605	490	-115	-19%	911	667	-244	-27%	477	550	73	15%	507	556	49	10%
9. Cliff Road		2	2	0	0%	2	2	0	0%	100	94	-6	-6%	322	241	-82	-25%
Total		**4259**	**4294**	**36**	**1%**	**5075**	**5111**	**36**	**1%**	**4159**	**4266**	**107**	**3%**	**5082**	**5194**	**113**	**2%**

Appendix 4.2 Continued Screenline 2 South of Scheme - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Northbound**								**Southbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A6 Market Street	**PM**	60	31	-29	-49%	68	78	10	15%	134	112	-22	-16%	119	93	-26	-22%
2. A6 Buxton Road		504	624	120	24%	620	658	38	6%	773	1021	248	32%	917	1104	188	20%
3. Roundy Lane		119	108	-10	-9%	239	131	-107	-45%	8	9	0	1%	11	12	0	1%
4. A523 London Road		649	618	-31	-5%	699	753	54	8%	707	648	-59	-8%	802	739	-62	-8%
5. Lees Lane		1179	1078	-102	-9%	1179	1173	-6	0%	912	916	4	0%	985	1133	148	15%
6. A5102 Hough Lane		807	696	-111	-14%	987	914	-72	-7%	323	293	-31	-9%	492	411	-80	-16%
7. A34 Wilmslow Bypass		2057	2107	51	2%	1960	2136	175	9%	1886	2029	144	8%	1735	1976	241	14%
8. B5166 Manchester Road		926	1139	213	23%	1003	1212	209	21%	510	474	-36	-7%	642	583	-59	-9%
9. Cliff Road		2	3	1	26%	2	3	1	32%	524	343	-181	-35%	732	473	-259	-35%
Total		**6303**	**6403**	**100**	**2%**	**6755**	**7058**	**303**	**4%**	**5778**	**5846**	**68**	**1%**	**6435**	**6525**	**89**	**1%**

Appendix 4.3: Pessimistic Screenline 3 East of M56 - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Eastbound**								**Westbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A538 Wilmslow Road	**AM**	1303	1305	2	0%	1477	1421	-56	-4%	1395	1445	50	4%	1654	1807	153	9%
2. Runger Lane		556	687	131	24%	669	728	59	9%	301	369	67	22%	409	441	33	8%
3. M56 Spur		3139	3541	402	13%	3900	4430	530	14%	2049	2951	902	44%	2606	3366	760	29%
4. Simonsway		1142	1167	25	2%	1158	1308	150	13%	1113	1019	-95	-9%	1153	1101	-52	-5%
5. Hollyhedge Road		987	973	-14	-1%	1118	1117	-1	0%	767	668	-98	-13%	915	846	-69	-8%
6. M56-M60 Link		2843	2626	-217	-8%	3104	2841	-263	-8%	3174	2922	-251	-8%	3006	2998	-8	0%
7. A560 Altrincham Road		1390	1413	22	2%	1429	1431	2	0%	1396	1380	-16	-1%	1425	1413	-11	-1%
8. B5167 Palatine Road		1121	1131	10	1%	1122	1101	-21	-2%	898	878	-20	-2%	1095	1084	-11	-1%
9. M60		4150	4032	-118	-3%	4631	4690	60	1%	7114	7185	71	1%	7850	7915	65	1%
Total		**16631**	**16875**	**244**	**1%**	**18608**	**19067**	**459**	**2%**	**18208**	**18818**	**610**	**3%**	**20112**	**20971**	**859**	**4%**
1. A538 Wilmslow Road	**IP**	630	547	-83	-13%	725	674	-51	-7%	1299	1272	-27	-2%	1541	1536	-5	0%
2. Runger Lane		288	324	36	13%	366	462	96	26%	263	321	59	22%	346	429	83	24%
3. M56 Spur		1874	2264	390	21%	2529	2961	432	17%	1735	2142	407	23%	2480	2872	392	16%
4. Simonsway		842	826	-16	-2%	868	875	7	1%	1028	891	-137	-13%	1077	951	-126	-12%
5. Hollyhedge Road		600	585	-15	-2%	742	707	-35	-5%	517	534	17	3%	682	664	-18	-3%
6. M56-M60 Link		2486	2405	-82	-3%	3004	2812	-191	-6%	2405	2304	-101	-4%	2780	2636	-145	-5%
7. A560 Altrincham Road		1162	1158	-4	0%	1310	1301	-9	-1%	1155	1125	-30	-3%	1306	1283	-23	-2%
8. B5167 Palatine Road		869	868	-2	0%	1056	999	-57	-5%	953	965	11	1%	1026	1025	-2	0%
9. M60		3047	3029	-18	-1%	3609	3602	-7	0%	4875	4967	92	2%	5877	5927	50	1%
Total		**11799**	**12006**	**207**	**2%**	**14207**	**14393**	**185**	**1%**	**14230**	**14521**	**290**	**2%**	**17116**	**17323**	**207**	**1%**

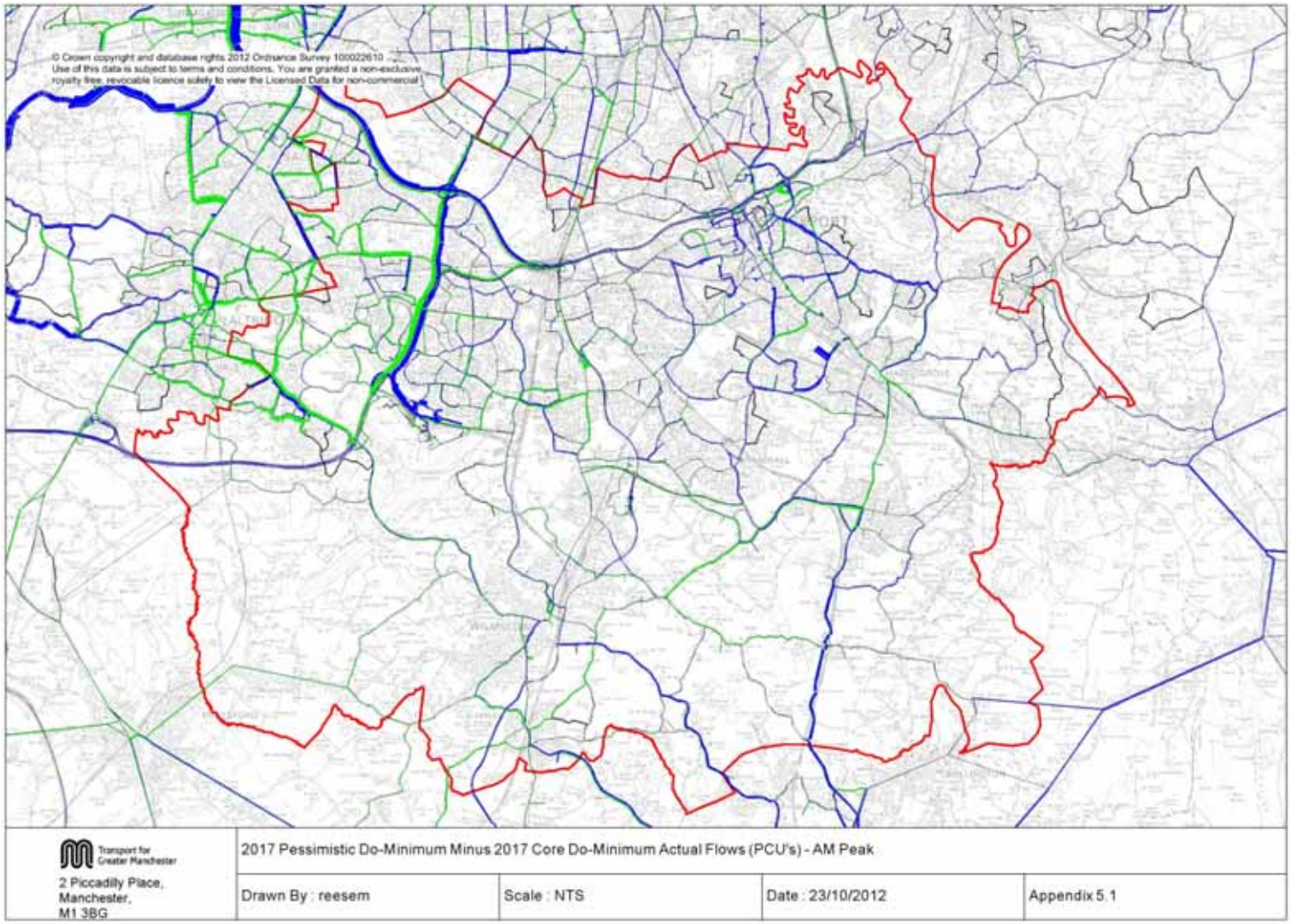
Appendix 4.3 Continued: Pessimistic Screenline 3 East of M56 - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Eastbound**								**Westbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A538 Wilmslow Road	**PM**	754	687	-67	-9%	797	778	-19	-2%	2166	2014	-152	-7%	2625	2672	47	2%
2. Runger Lane		488	533	45	9%	477	512	35	7%	439	484	45	10%	642	678	37	6%
3. M56 Spur		2065	2576	511	25%	2276	2898	623	27%	2393	3104	711	30%	3374	3858	484	14%
4. Simonsway		936	996	60	6%	1014	1041	27	3%	1246	1178	-68	-5%	1226	1179	-46	-4%
5. Hollyhedge Road		880	889	9	1%	1000	1085	84	8%	852	922	70	8%	960	948	-13	-1%
6. M56-M60 Link		2452	2355	-97	-4%	2927	2709	-218	-7%	2748	2620	-129	-5%	2956	2778	-178	-6%
7. A560 Altrincham Road		1100	981	-119	-11%	1228	1132	-97	-8%	1254	1204	-50	-4%	1313	1256	-57	-4%
8. B5167 Palatine Road		1217	1275	58	5%	1294	1328	34	3%	971	910	-61	-6%	1008	946	-62	-6%
9. M60		4570	4502	-68	-1%	5123	5029	-94	-2%	6559	6688	129	2%	7168	7379	211	3%
Total		**14462**	**14794**	**332**	**2%**	**16136**	**16512**	**376**	**2%**	**18628**	**19123**	**495**	**3%**	**21271**	**21694**	**424**	**2%**

Appendix 4.4 Pessimistic Screenline 4 East of A34 - Crossing Flows in pcu's																	
Crossing Links	Time Period	Eastbound								Westbound							
		2017				2032				2017				2032			
		DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff
1. A5102 Woodford Road	AM	845	612	-234	-28%	1121	910	-211	-19%	899	837	-63	-7%	1306	1119	-187	-14%
2. A55 MAELR		723	1983	1259	174%	996	2260	1264	127%	1506	2690	1184	79%	1585	3068	1483	94%
3. B5094 Stanley Road		1064	889	-175	-16%	814	954	140	17%	1492	1606	114	8%	1388	1745	358	26%
4. Etchells Road		551	577	26	5%	543	573	30	5%	806	723	-83	-10%	906	780	-126	-14%
5. A5149 Cheadle Road		583	575	-8	-1%	584	632	48	8%	761	631	-130	-17%	1049	800	-249	-24%
6. Councillor Lane		580	535	-44	-8%	796	694	-102	-13%	603	517	-86	-14%	712	624	-88	-12%
7. A560 Stockport Road		1259	1360	102	8%	1411	1446	35	3%	1904	1877	-28	-1%	1941	1919	-22	-1%
Total		**5605**	**6532**	**926**	**17%**	**6266**	**7470**	**1204**	**19%**	**7971**	**8879**	**908**	**11%**	**8887**	**10055**	**1169**	**13%**
1. A5102 Woodford Road	IP	491	292	-199	-40%	1035	473	-562	-54%	364	363	-1	0%	762	496	-265	-35%
2. A55 MAELR		848	1589	741	87%	1158	2085	927	80%	854	1306	452	53%	1298	1834	537	41%
3. B5094 Stanley Road		690	737	47	7%	784	830	46	6%	801	896	95	12%	1034	1078	44	4%
4. Etchells Road		584	525	-59	-10%	605	587	-18	-3%	597	519	-78	-13%	665	568	-97	-15%
5. A5149 Cheadle Road		424	382	-42	-10%	477	427	-49	-10%	480	428	-52	-11%	513	518	6	1%
6. Councillor Lane		463	437	-27	-6%	545	501	-44	-8%	318	313	-5	-2%	395	396	1	0%
7. A560 Stockport Road		1161	1107	-53	-5%	1402	1391	-11	-1%	1509	1396	-113	-7%	1733	1680	-54	-3%
Total		**4661**	**5068**	**408**	**9%**	**6006**	**6294**	**288**	**5%**	**4923**	**5222**	**299**	**6%**	**6399**	**6571**	**172**	**3%**
1. A5102 Woodford Road	PM	1269	935	-334	-26%	1509	1246	-263	-17%	519	547	28	5%	948	877	-71	-8%
2. A55 MAELR		1187	2743	1555	131%	1413	3220	1807	128%	1202	1613	411	34%	1356	1965	609	45%
3. B5094 Stanley Road		1521	1166	-356	-23%	1550	1234	-317	-20%	779	963	184	24%	1011	1138	127	13%
4. Etchells Road		744	705	-39	-5%	791	755	-36	-5%	645	547	-98	-15%	642	627	-15	-2%
5. A5149 Cheadle Road		612	573	-39	-6%	663	629	-34	-5%	598	527	-71	-12%	726	610	-116	-16%
6. Councillor Lane		782	642	-141	-18%	828	738	-90	-11%	396	384	-12	-3%	446	453	7	2%
7. A560 Stockport Road		1442	1429	-12	-1%	1427	1437	11	1%	1813	1810	-3	0%	1896	1930	33	2%
Total		**7558**	**8192**	**635**	**8%**	**8180**	**9258**	**1078**	**13%**	**5951**	**6390**	**439**	**7%**	**7024**	**7599**	**575**	**8%**

Appendix 4.5 Pessimistic Screenline 4 High Peak to Bredbury - Crossing Flows in pcu's																
Crossing Links	**Time Period**	**Eastbound**								**Westbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A6 Buxton Road	**AM**	978	1172	194	20%	1110	1214	104	9%	934	1083	150	16%	1048	995	-53	-5%
2. Windlehurst Road		343	402	58	17%	556	523	-33	-6%	529	505	-24	-4%	557	518	-39	-7%
3. A626 Stockport Road		708	681	-27	-4%	767	768	1	0%	1112	1238	126	11%	1290	1411	121	9%
4. Otterspool Road		833	813	-19	-2%	894	947	54	6%	809	777	-31	-4%	910	940	30	3%
5. B6104 Stockport Road		722	774	52	7%	926	1056	129	14%	815	857	42	5%	806	852	46	6%
6. A560 Stockport Road East		489	436	-53	-11%	719	644	-75	-10%	700	691	-9	-1%	766	780	14	2%
Total		**4073**	**4278**	**205**	**5%**	**4972**	**5152**	**180**	**4%**	**4898**	**5152**	**254**	**5%**	**5377**	**5496**	**120**	**2%**
1. A6 Buxton Road	**IP**	832	990	158	19%	972	1203	231	24%	813	902	89	11%	882	1034	152	17%
2. Windlehurst Road		226	243	17	8%	278	281	3	1%	215	202	-13	-6%	251	200	-52	-21%
3. A626 Stockport Road		831	822	-9	-1%	992	967	-25	-2%	790	859	69	9%	1020	1101	82	8%
4. Otterspool Road		710	690	-21	-3%	802	765	-37	-5%	810	780	-29	-4%	970	943	-27	-3%
5. B6104 Stockport Road		650	654	4	1%	708	727	19	3%	610	626	15	3%	723	740	17	2%
6. A560 Stockport Road East		627	634	8	1%	788	785	-3	0%	718	706	-12	-2%	853	854	1	0%
Total		**3876**	**4032**	**156**	**4%**	**4541**	**4729**	**189**	**4%**	**3956**	**4074**	**119**	**3%**	**4699**	**4872**	**173**	**4%**
1. A6 Buxton Road	**PM**	1119	1308	189	17%	1250	1352	102	8%	803	871	67	8%	907	896	-11	-1%
2. Windlehurst Road		444	415	-28	-6%	465	435	-29	-6%	213	149	-63	-30%	325	266	-59	-18%
3. A626 Stockport Road		1383	1252	-131	-9%	1495	1495	0	0%	1141	1219	79	7%	1130	1187	57	5%
4. Otterspool Road		743	695	-48	-7%	951	890	-61	-6%	1059	1016	-43	-4%	1125	1093	-32	-3%
5. B6104 Stockport Road		977	1121	144	15%	1100	1150	50	5%	580	595	15	3%	636	659	23	4%
6. A560 Stockport Road East		1246	1180	-65	-5%	1174	1243	69	6%	820	795	-25	-3%	961	952	-9	-1%
Total		**5912**	**5972**	**60**	**1%**	**6435**	**6565**	**130**	**2%**	**4615**	**4645**	**29**	**1%**	**5085**	**5053**	**-32**	**-1%**

Appendix 5

Pessimistic Forecasts – Actual Flow Differences Pessimistic Minus Core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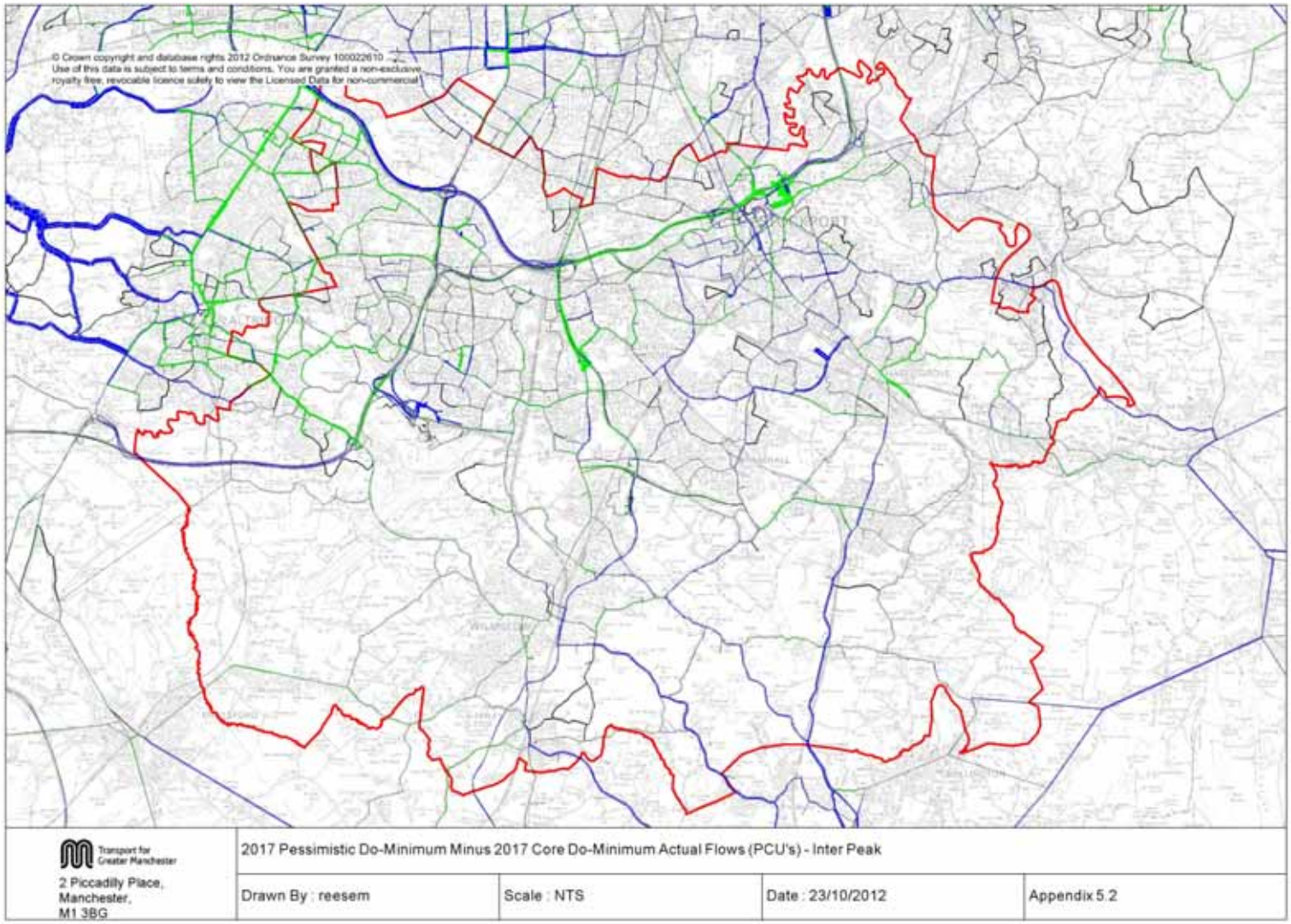
2 Piccadilly Place, Manchester, M1 3BG
2017 Pessimistic Do-Minimum Minus 2017 Core Do-Minimum Actual Flows (PCU's) - AM Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.1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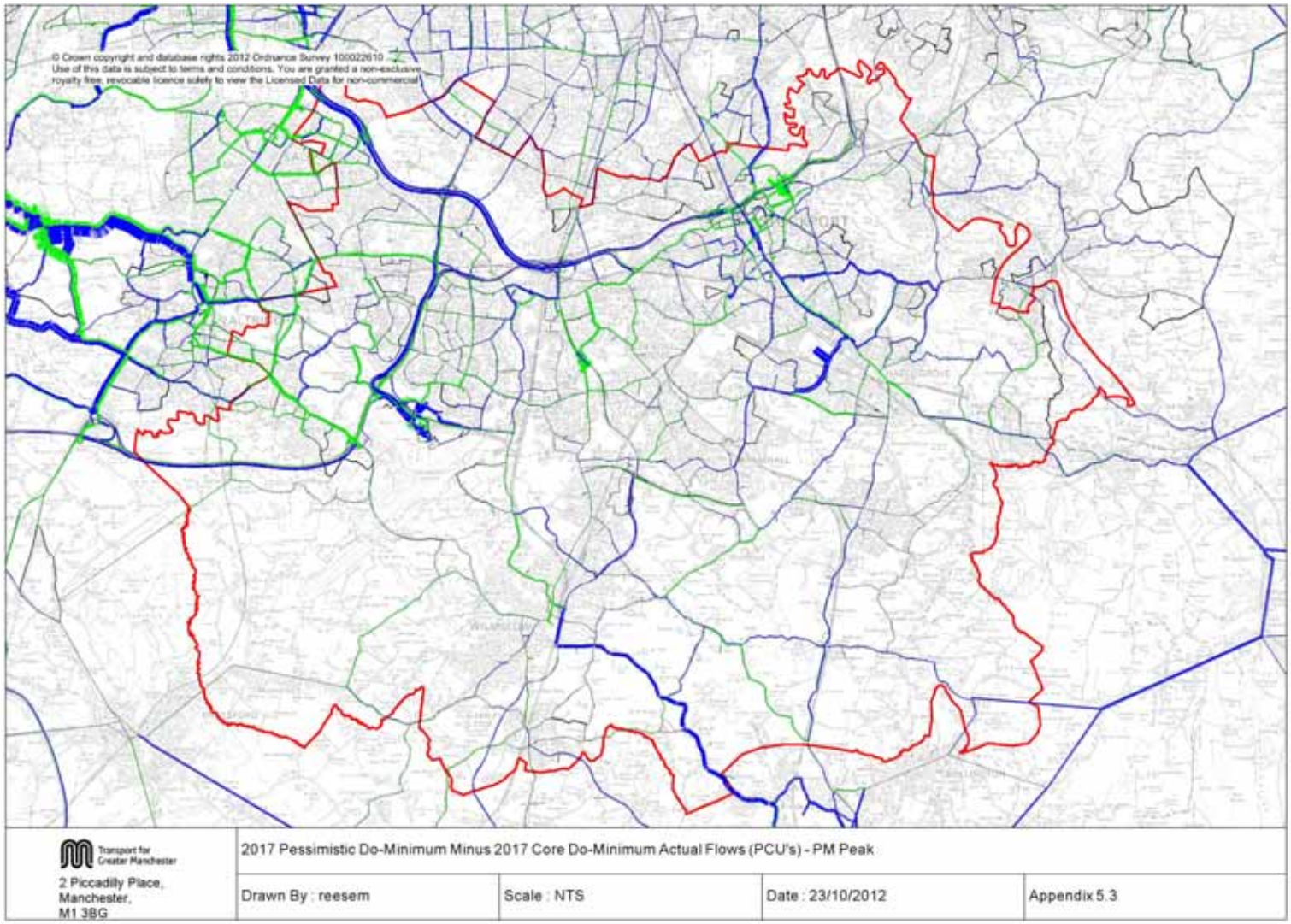
2017 Pessimistic Do-Minimum Minus 2017 Core Do-Minimum Actual Flows (PCU's) - Inter Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.2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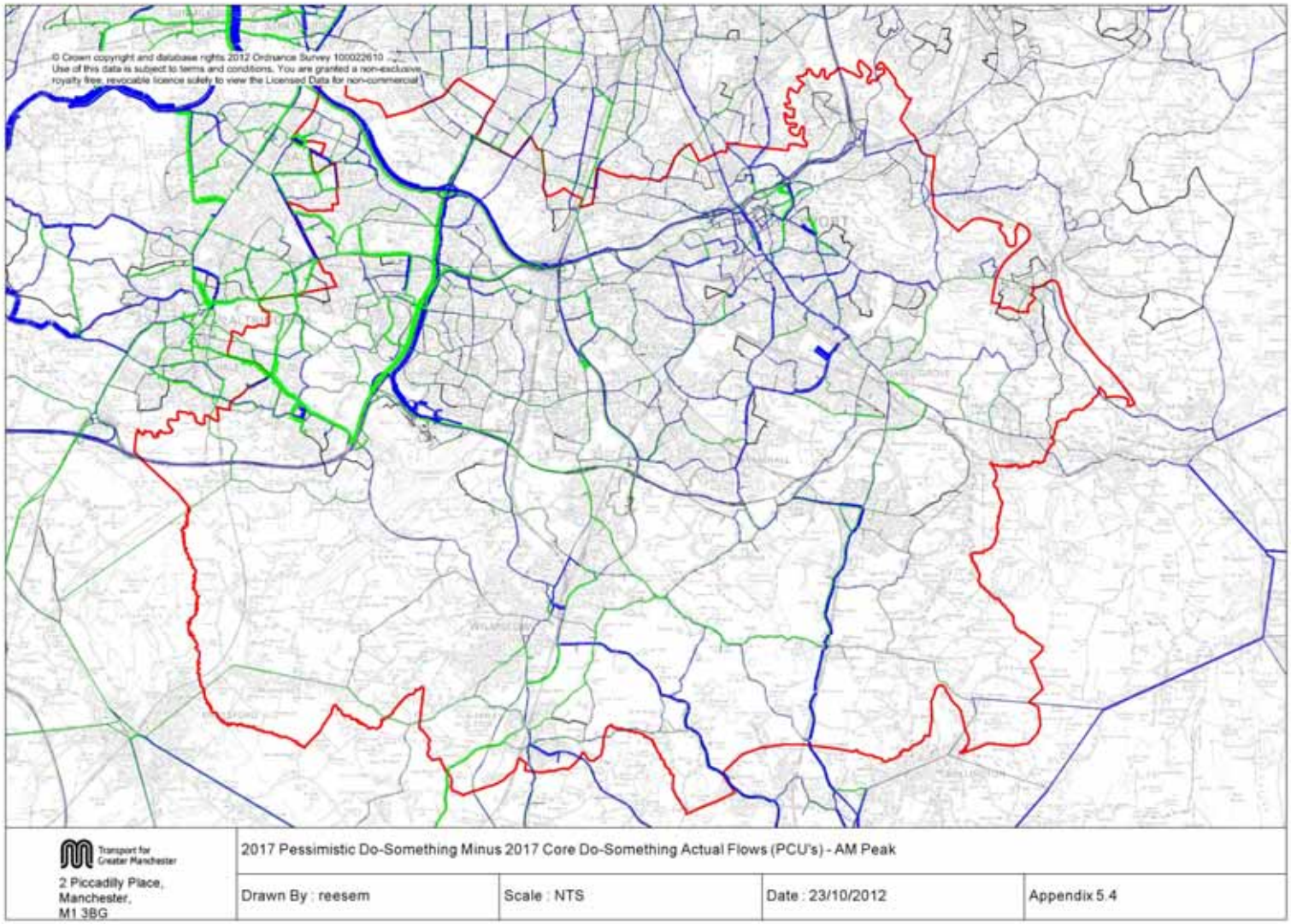
2017 Pessimistic Do-Minimum Minus 2017 Core Do-Minimum Actual Flows (PCU's) - PM Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.3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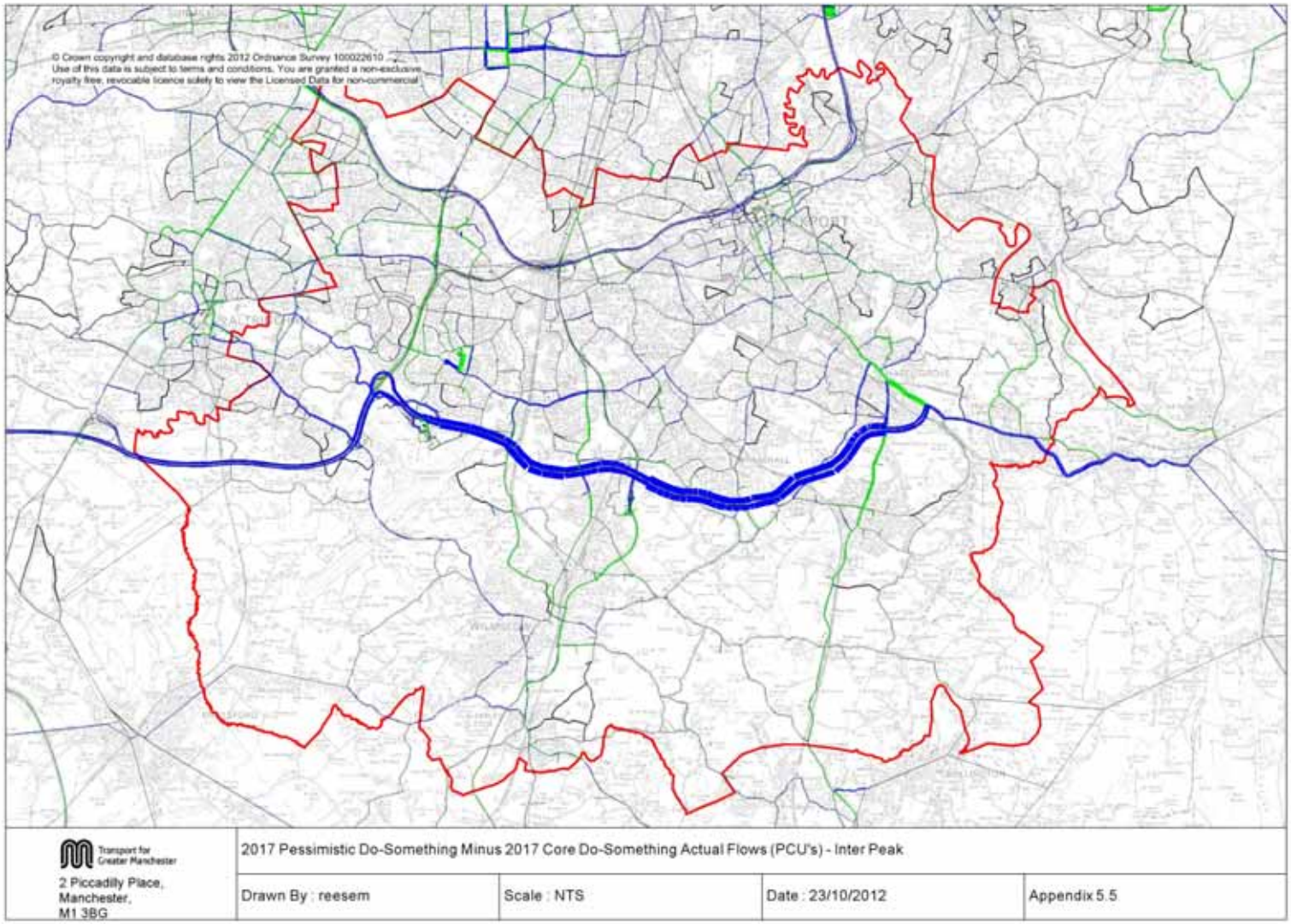
2017 Pessimistic Do-Something Minus 2017 Core Do-Something Actual Flows (PCU's) - AM Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.4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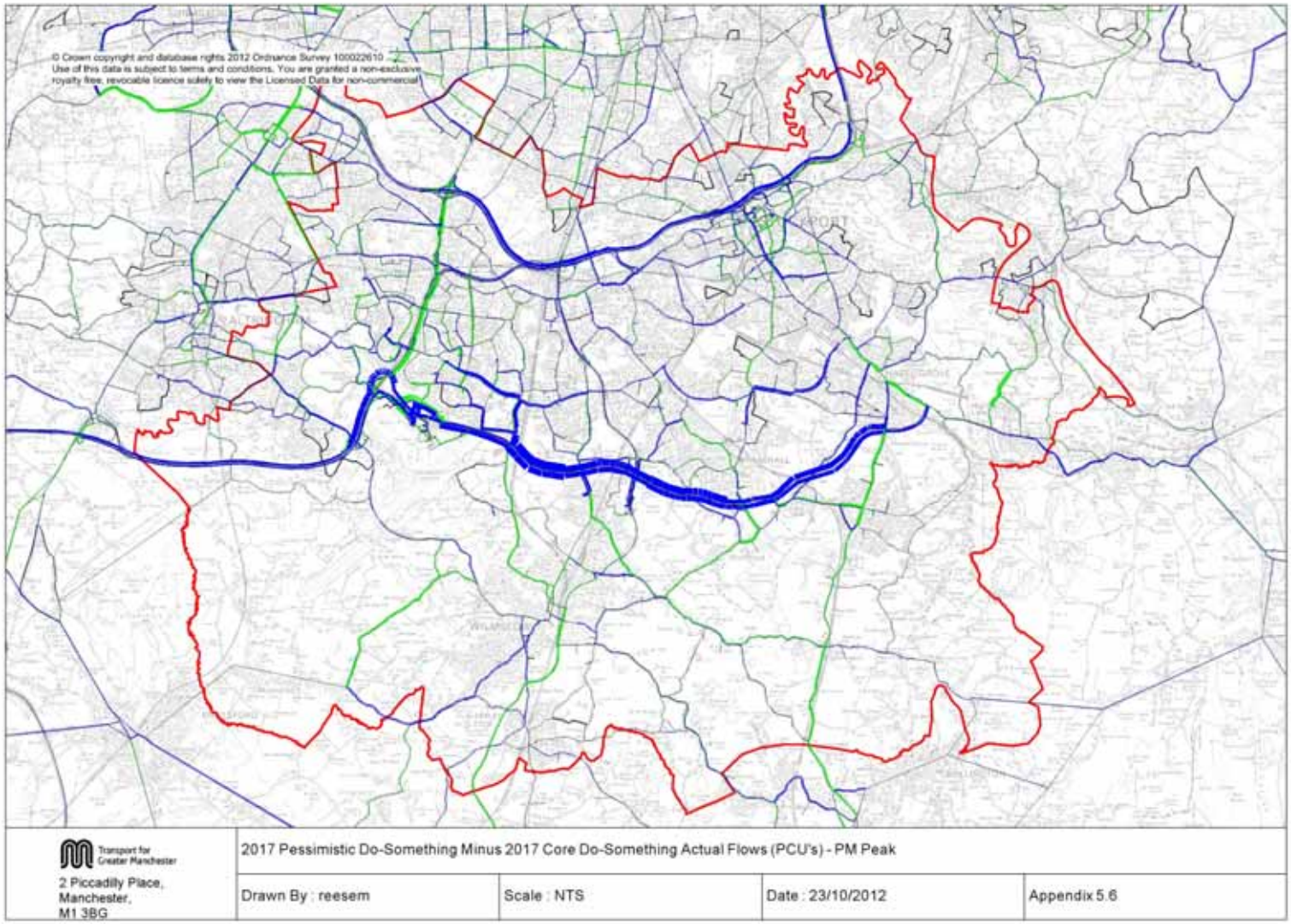
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.5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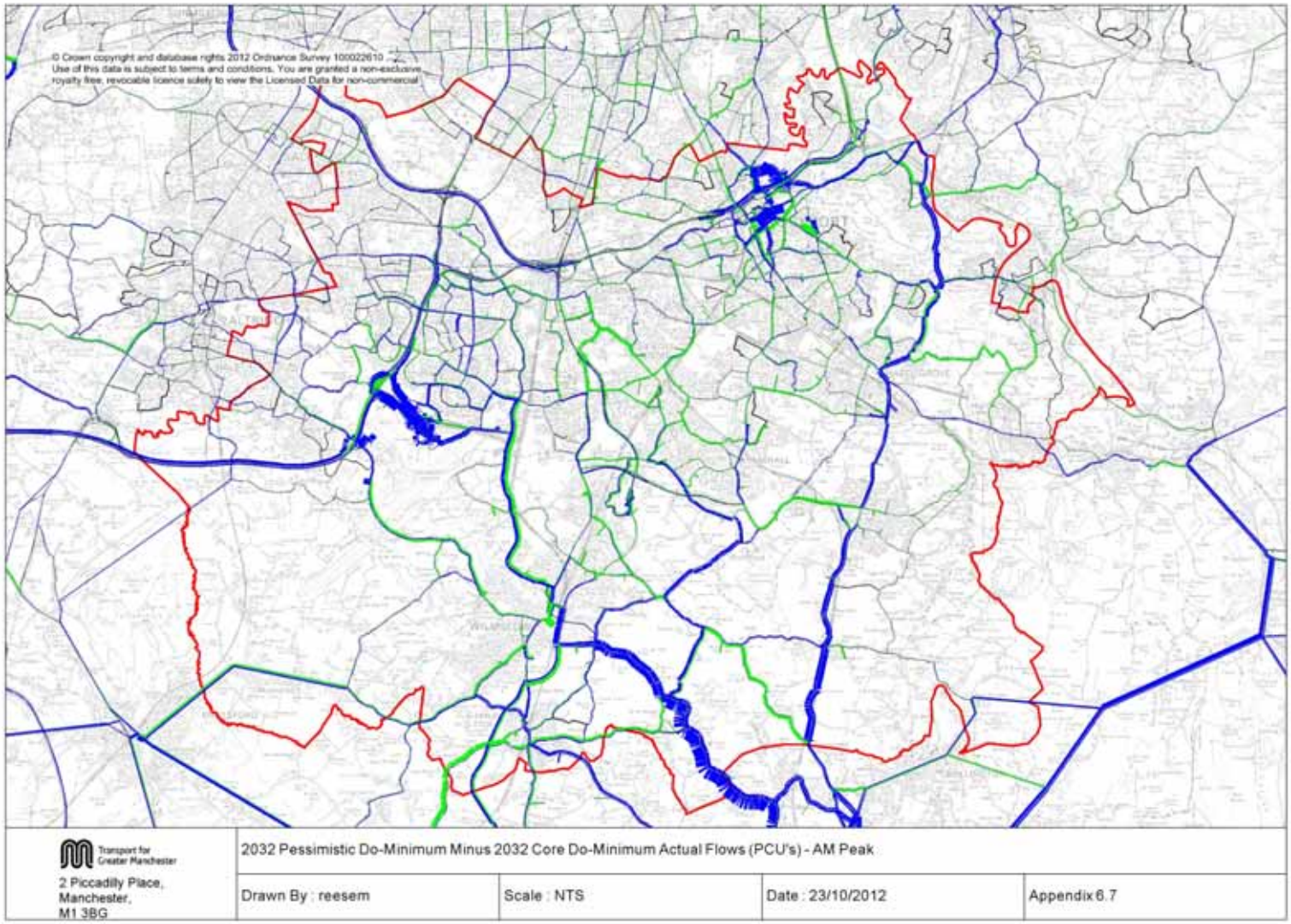
2017 Pessimistic Do-Something Minus 2017 Core Do-Something Actual Flows (PCU's) - PM Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.6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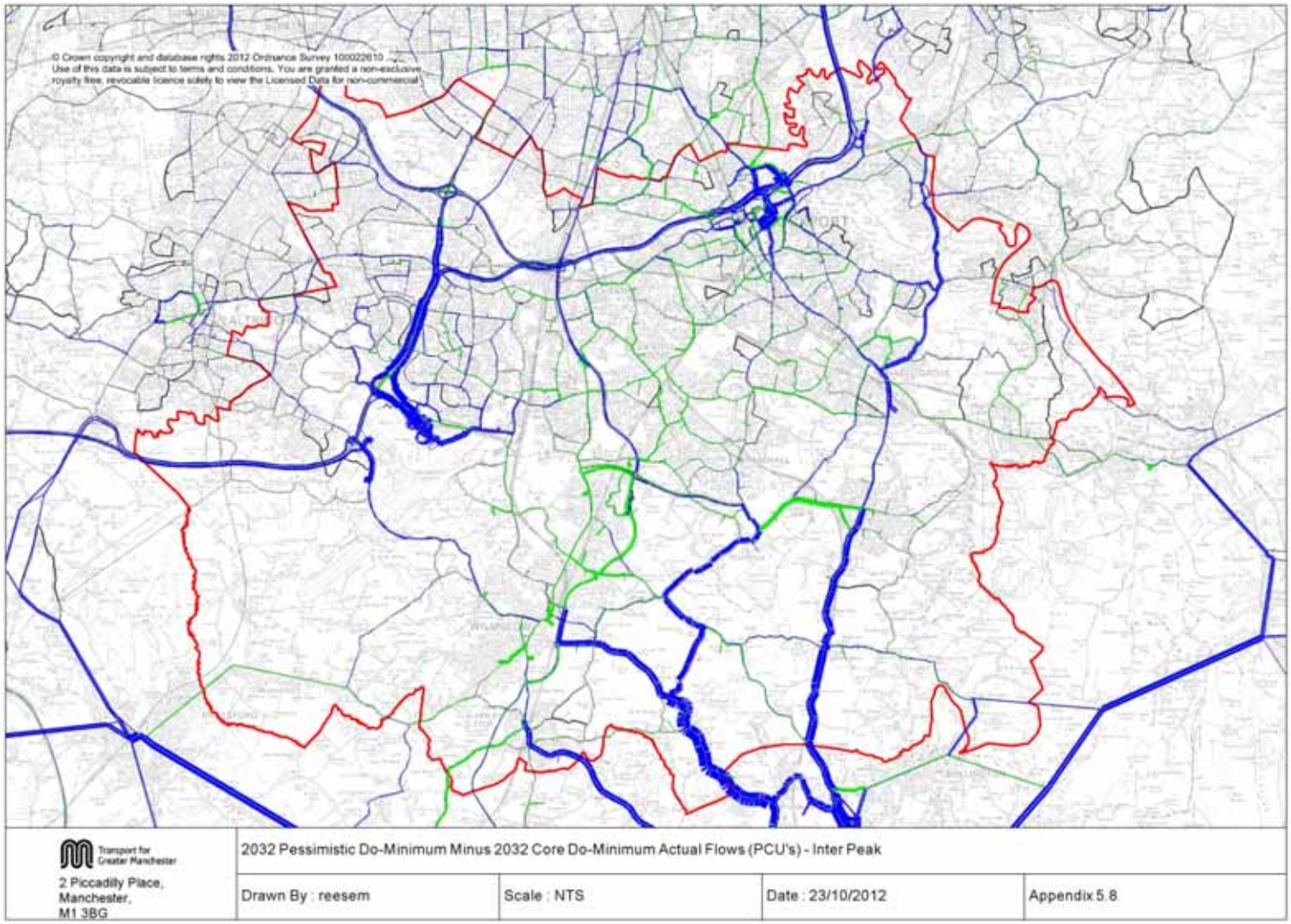
2032 Pessimistic Do-Minimum Minus 2032 Core Do-Minimum Actual Flows (PCU's) - AM Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 6.7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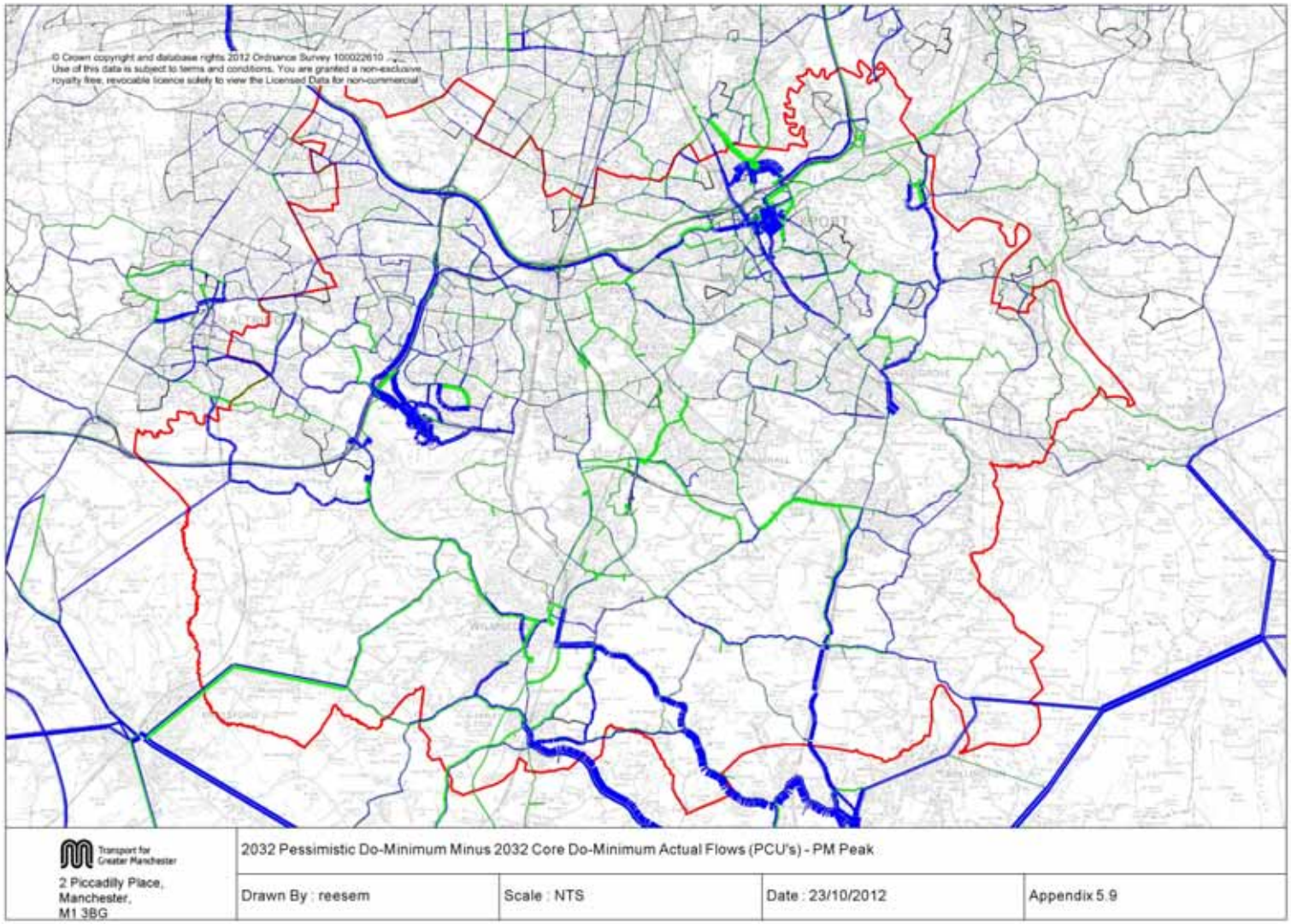
2032 Pessimistic Do-Minimum Minus 2032 Core Do-Minimum Actual Flows (PCU's) - Inter Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.8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2032 Pessimistic Do-Minimum Minus 2032 Core Do-Minimum Actual Flows (PCU's) - PM Peak
Drawn By : reesem
Scale : NTS
Date : 23/10/2012
Appendix 5.9

Appendix 6

Pessimistic Forecasts – Journey Times in Area of Influence

Appendix 6: 2017 Forecast Journey Times (Pessimistic)

Route	Distance	AM Peak			Inter Peak			PM Peak		
		Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)
1	8.7	26.9	29.9	3.0	21.8	23.0	1.2	24.9	27.7	2.8
	8.7	25.5	25.8	0.3	21.2	22.1	0.9	27.4	27.9	0.4
2	16.4	21.0	20.7	-0.3	19.9	19.9	0.0	20.4	20.2	-0.1
	16.4	20.5	20.3	-0.2	19.9	19.8	0.0	20.5	20.6	0.0
3	10.2	14.7	14.5	-0.1	12.7	12.6	-0.1	13.8	13.6	-0.2
	10.2	13.9	13.8	-0.2	12.7	12.7	0.0	14.1	13.9	-0.2
4	6.6	6.9	6.9	0.0	6.5	6.5	0.0	6.8	6.8	0.0
	6.6	6.8	6.8	0.0	6.4	6.4	0.0	6.8	6.8	0.0
5	7.3	7.3	7.3	0.0	6.2	6.2	0.0	7.7	7.8	0.1
	6.8	7.2	7.3	0.0	6.0	6.1	0.0	7.4	7.4	0.0
6	10	16.3	17.2	0.9	14.3	15.1	0.8	16.3	17.4	1.1
	10	18.1	18.1	0.0	13.4	14.2	0.8	15.4	16.4	1.0
7	8.3	7.4	7.7	0.3	4.7	4.8	0.1	5.9	6.0	0.1
	8.3	7.0	7.3	0.3	5.4	5.5	0.1	9.3	9.7	0.4
8	7.6	11.3	11.3	0.0	9.4	9.9	0.4	11.3	11.6	0.2
	7.6	11.3	10.9	-0.4	9.4	9.5	0.1	11.1	11.0	0.0
9	14.5	24.8	23.3	-1.5	16.1	15.8	-0.3	22.8	22.5	-0.3
	14.4	25.1	23.8	-1.4	15.3	15.5	0.2	22.3	20.4	-1.9
10	10	17.1	19.0	1.9	15.3	17.0	1.7	19.6	21.4	1.8
	10	18.4	17.7	-0.8	14.8	15.7	0.9	15.5	16.4	0.9
11	13.9	23.6	21.8	-1.8	17.7	18.3	0.6	20.3	21.1	0.8
	13.7	22.4	21.1	-1.3	17.4	18.6	1.2	23.4	20.4	-3.0
12	22	36.6	35.3	-1.2	29.7	28.9	-0.7	32.8	31.8	-1.0
	22.2	37.2	35.1	-2.1	30.3	29.9	-0.4	35.6	33.9	-1.7
13	17	17.5	16.9	-0.6	13.6	13.4	-0.2	19.7	19.8	0.1
	17	17.2	16.9	-0.3	12.9	12.8	-0.1	15.6	15.5	-0.1
14	5.2	15.1	14.3	-0.9	10.0	10.0	0.1	12.5	12.4	-0.1
	5.2	14.1	12.7	-1.4	11.2	10.9	-0.4	13.7	13.1	-0.6
15	5.8	13.3	12.2	-1.1	10.1	9.9	-0.2	12.7	11.6	-1.1
	5.8	17.6	13.1	-4.5	10.1	9.9	-0.2	12.9	12.1	-0.8

Appendix 6: 2032 Forecast Journey Times (Pessimistic)

Route	Distance	AM Peak			Inter Peak			PM Peak		
		Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)
1	8.7	29.9	32.8	2.9	22.6	24.9	2.3	26.6	30.0	3.5
	8.7	26.4	28.6	2.2	22.7	22.9	0.2	29.8	30.3	0.4
2	16.4	23.4	22.7	-0.7	20.4	20.2	-0.1	21.7	21.4	-0.3
	16.4	22.2	21.8	-0.4	20.2	20.2	-0.1	22.0	21.8	-0.1
3	10.2	16.1	15.8	-0.3	13.0	13.1	0.1	14.5	14.4	0.0
	10.2	14.6	14.5	-0.1	12.9	12.8	0.0	14.8	14.7	-0.1
4	6.6	6.9	6.9	0.0	6.5	6.5	0.0	6.9	6.9	0.0
	6.6	6.8	6.8	0.0	6.4	6.4	0.0	6.8	6.8	0.0
5	7.3	8.0	7.9	-0.1	6.9	6.8	-0.1	9.5	9.3	-0.2
	6.8	8.3	8.3	0.0	6.6	6.6	0.0	7.9	7.9	0.0
6	10	17.4	17.5	0.2	14.9	15.6	0.7	20.2	18.3	-1.9
	10	22.6	20.7	-1.9	13.6	14.4	0.8	17.4	17.4	0.1
7	8.3	9.2	9.8	0.6	5.4	5.6	0.2	6.9	7.5	0.5
	8.3	8.0	9.3	1.3	6.2	6.4	0.2	12.3	12.9	0.6
8	7.6	13.5	11.6	-1.9	9.7	10.0	0.4	14.8	12.2	-2.6
	7.6	14.9	11.3	-3.6	10.1	9.6	-0.5	13.6	11.6	-2.1
9	14.5	28.7	25.3	-3.4	18.9	17.7	-1.2	28.6	26.2	-2.4
	14.4	31.7	29.3	-2.4	17.9	16.9	-1.0	26.8	24.7	-2.0
10	10	19.2	19.9	0.7	15.6	17.2	1.7	22.0	22.0	0.0
	10	23.3	19.7	-3.6	15.0	15.7	0.7	16.7	16.9	0.2
11	13.9	25.4	22.8	-2.6	18.3	18.8	0.5	21.3	21.9	0.6
	13.7	28.1	22.0	-6.1	19.0	18.7	-0.3	31.7	21.7	-10.0
12	22	37.9	37.4	-0.5	31.2	30.2	-1.0	35.9	33.5	-2.4
	22.2	41.7	38.7	-3.0	31.6	31.0	-0.6	40.8	38.0	-2.8
13	17	22.0	21.1	-0.8	16.5	16.3	-0.2	24.3	24.5	0.1
	17	20.1	19.8	-0.2	14.7	14.5	-0.1	17.7	17.7	0.0
14	5.2	16.8	15.5	-1.3	10.3	10.3	0.0	13.5	13.4	-0.1
	5.2	17.0	13.4	-3.7	11.8	11.1	-0.6	15.1	13.6	-1.5
15	5.8	16.3	13.2	-3.1	11.5	10.3	-1.2	15.5	12.5	-3.1
	5.8	21.4	15.1	-6.3	11.0	10.3	-0.7	14.9	12.6	-2.2

Appendix 7

Optimistic Forecasts – Screenline Crossing Flows in Area of Influence

Appendix 7.1: Optimistic Screenline 1 North of Scheme Screenline - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Northbound**								**Southbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A5102 Woodford Road	**AM**	618	696	78	13%	668	865	197	30%	1120	888	-232	-21%	1240	1111	-129	-10%
2. Moss Lane		118	100	-18	-15%	112	110	-2	-2%	261	219	-42	-16%	360	382	22	6%
3.Gil Bent Road		552	505	-47	-8%	677	520	-157	-23%	689	1042	353	51%	627	1013	386	61%
4. A34 Handforth Bypass		2312	2752	440	19%	2393	3159	766	32%	2448	2726	278	11%	2492	2777	285	11%
5. B5358 Wilmslow Road		997	731	-266	-27%	1196	823	-374	-31%	739	396	-343	-46%	815	427	-389	-48%
6. Finney Lane East		745	538	-207	-28%	695	565	-130	-19%	786	498	-288	-37%	992	625	-366	-37%
7. St Anns Road North		421	365	-56	-13%	319	418	99	31%	391	285	-106	-27%	575	300	-275	-48%
8. Finney Lane West		1220	724	-496	-41%	1454	1017	-437	-30%	819	506	-312	-38%	565	568	3	1%
9. B5166 Styal Road		812	906	94	12%	995	1029	34	3%	1042	917	-125	-12%	910	1013	103	11%
10. Shadowmoss Road		466	83	-383	-82%	525	194	-331	-63%	171	148	-23	-13%	146	166	19	13%
11. Selstead Road		344	370	27	8%	380	403	23	6%	322	306	-16	-5%	864	664	-200	-23%
12. M56		5951	5788	-163	-3%	6814	6468	-346	-5%	6931	6660	-271	-4%	7537	7334	-204	-3%
Total		**14556**	**13558**	**-998**	**-7%**	**16229**	**15572**	**-657**	**-4%**	**15718**	**14591**	**-1127**	**-7%**	**17124**	**16379**	**-744**	**-4%**
1. A5102 Woodford Road	**IP**	612	665	53	9%	796	872	76	10%	610	465	-145	-24%	811	726	-85	-10%
2. Moss Lane		220	210	-10	-4%	263	232	-30	-12%	201	178	-23	-11%	250	199	-51	-20%
3.Gil Bent Road		355	397	42	12%	393	450	58	15%	468	525	57	12%	568	674	106	19%
4. A34 Handforth Bypass		1990	2191	200	10%	2290	2717	427	19%	2088	2093	5	0%	2392	2527	135	6%
5. B5358 Wilmslow Road		632	659	28	4%	760	748	-12	-2%	466	588	122	26%	548	661	113	21%
6. Finney Lane East		668	528	-140	-21%	717	584	-133	-19%	583	449	-135	-23%	574	471	-103	-18%
7. St Anns Road North		187	183	-4	-2%	150	191	41	27%	271	193	-78	-29%	365	221	-144	-40%
8. Finney Lane West		889	425	-464	-52%	958	479	-480	-50%	875	502	-373	-43%	897	571	-326	-36%
9. B5166 Styal Road		711	687	-24	-3%	883	856	-27	-3%	667	542	-125	-19%	901	651	-249	-28%
10. Shadowmoss Road		199	41	-158	-80%	288	46	-242	-84%	130	60	-70	-54%	104	77	-27	-26%
11. Selstead Road		211	172	-39	-19%	289	249	-40	-14%	153	157	4	3%	382	308	-74	-19%
12. M56		5435	5333	-102	-2%	6508	6275	-233	-4%	5238	5162	-76	-1%	6221	6024	-196	-3%
Total		**12109**	**11491**	**-617**	**-5%**	**14295**	**13699**	**-596**	**-4%**	**11750**	**10915**	**-836**	**-7%**	**14011**	**13109**	**-902**	**-6%**

Appendix 7.1 Continued: Optimistic Screenline 1 North of Scheme Screenline - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Northbound**								**Southbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A5102 Woodford Road	**PM**	729	944	216	30%	787	977	189	24%	752	687	-65	-9%	843	839	-4	-1%
2. Moss Lane		259	234	-25	-10%	296	233	-63	-21%	482	169	-313	-65%	515	272	-243	-47%
3.Gil Bent Road		553	636	83	15%	591	704	112	19%	467	599	132	28%	505	701	196	39%
4. A34 Handforth Bypass		2397	2778	381	16%	2554	3106	552	22%	2869	3072	203	7%	2878	3103	225	8%
5. B5358 Wilmslow Road		770	672	-98	-13%	848	687	-161	-19%	814	795	-19	-2%	775	922	147	19%
6. Finney Lane East		790	611	-179	-23%	767	655	-112	-15%	666	467	-199	-30%	630	530	-99	-16%
7. St Anns Road North		272	196	-76	-28%	307	265	-42	-14%	565	187	-378	-67%	621	211	-410	-66%
8. Finney Lane West		957	451	-507	-53%	969	521	-448	-46%	889	814	-75	-8%	892	938	46	5%
9. B5166 Styal Road		1108	980	-128	-12%	1038	1195	156	15%	1166	887	-279	-24%	1441	962	-479	-33%
10. Shadowmoss Road		266	147	-120	-45%	442	221	-221	-50%	111	181	71	64%	103	209	106	103%
11. Selstead Road		568	553	-14	-3%	579	601	22	4%	294	236	-58	-20%	615	499	-117	-19%
12. M56		6512	6434	-78	-1%	7881	7578	-303	-4%	6510	6364	-146	-2%	6864	6737	-128	-2%
Total		**15179**	**14635**	**-545**	**-4%**	**17059**	**16743**	**-316**	**-2%**	**15584**	**14458**	**-1126**	**-7%**	**16684**	**15923**	**-761**	**-5%**

Appendix 7.2: Optimistic Screenline 2 South of Scheme - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Northbound**								**Southbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A6 Market Street	**AM**	119	69	-49	-42%	84	139	55	65%	116	139	23	20%	73	62	-11	-15%
2. A6 Buxton Road		677	911	234	35%	906	861	-45	-5%	573	762	190	33%	705	882	177	25%
3. Roundy Lane		8	8	0	0%	53	107	54	103%	27	14	-13	-46%	195	178	-17	-9%
4. A523 London Road		705	637	-68	-10%	847	890	43	5%	986	964	-22	-2%	1138	1158	20	2%
5. Lees Lane		1239	1219	-20	-2%	1248	1277	29	2%	886	903	17	2%	965	904	-61	-6%
6. A5102 Hough Lane		499	334	-165	-33%	610	556	-53	-9%	740	585	-154	-21%	955	883	-72	-7%
7. A34 Wilmslow Bypass		1656	1827	171	10%	1811	2025	214	12%	2034	1984	-50	-2%	2085	1911	-174	-8%
8. B5166 Manchester Road		986	930	-56	-6%	1072	1091	19	2%	586	699	113	19%	579	826	247	43%
9. Cliff Road		2	2	0	0%	2	2	0	0%	571	502	-70	-12%	549	681	131	24%
Total		**5892**	**5937**	**46**	**1%**	**6632**	**6948**	**316**	**5%**	**6519**	**6552**	**34**	**1%**	**7245**	**7485**	**241**	**3%**
1. A6 Market Street	**IP**	152	155	3	2%	134	38	-96	-72%	253	341	89	35%	196	222	26	13%
2. A6 Buxton Road		476	606	129	27%	508	779	271	53%	390	495	105	27%	529	754	226	43%
3. Roundy Lane		11	10	-1	-11%	16	15	-1	-7%	8	9	0	3%	8	8	0	-2%
4. A523 London Road		501	434	-67	-13%	714	691	-23	-3%	531	515	-16	-3%	983	879	-103	-11%
5. Lees Lane		785	805	20	3%	1163	910	-253	-22%	641	628	-13	-2%	841	735	-106	-13%
6. A5102 Hough Lane		335	158	-177	-53%	514	308	-206	-40%	259	157	-102	-39%	349	208	-141	-40%
7. A34 Wilmslow Bypass		1515	1778	263	17%	1377	2054	676	49%	1640	1604	-36	-2%	1735	2018	284	16%
8. B5166 Manchester Road		640	476	-164	-26%	973	763	-210	-22%	488	552	65	13%	503	544	41	8%
9. Cliff Road		2	2	0	0%	2	2	0	0%	96	84	-12	-12%	302	194	-108	-36%
Total		**4417**	**4424**	**7**	**0%**	**5401**	**5560**	**159**	**3%**	**4305**	**4385**	**80**	**2%**	**5444**	**5562**	**118**	**2%**

Appendix 7.2 Continued: Optimistic Screenline 2 South of Scheme - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Northbound**								**Southbound**							
		2017				**2032**				**2017**				**2032**			
1. A6 Market Street	**PM**	60	17	-43	-71%	83	118	36	43%	138	113	-25	-18%	119	94	-25	-21%
2. A6 Buxton Road		497	654	157	32%	612	589	-22	-4%	806	1028	222	28%	916	1131	215	24%
3. Roundy Lane		155	102	-53	-34%	355	183	-173	-49%	8	8	0	0%	10	9	0	-5%
4. A523 London Road		679	647	-32	-5%	722	804	82	11%	796	681	-115	-14%	898	882	-16	-2%
5. Lees Lane		1213	1071	-142	-12%	1224	1281	57	5%	939	1035	95	10%	958	1064	106	11%
6. A5102 Hough Lane		827	675	-151	-18%	1072	818	-253	-24%	358	308	-50	-14%	509	386	-123	-24%
7. A34 Wilmslow Bypass		1781	2134	353	20%	1696	2082	386	23%	1829	2020	191	10%	1678	1955	277	16%
8. B5166 Manchester Road		938	1030	93	10%	979	1109	130	13%	530	497	-33	-6%	579	513	-66	-11%
9. Cliff Road		2	2	0	0%	2	2	0	0%	599	368	-231	-39%	782	443	-339	-43%
Total		**6151**	**6332**	**181**	**3%**	**6744**	**6987**	**243**	**4%**	**6005**	**6059**	**54**	**1%**	**6449**	**6478**	**28**	**0%**

Appendix 7.3: Optimistic Screenline 3 East of M56 - Crossing Flows in pcu's																	
Crossing Links	Time Period	Eastbound								Westbound							
		2017				2032				2017				2032			
		DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff
1. A538 Wilmslow Road	AM	1464	1546	81	6%	1772	1667	-105	-6%	1422	1611	188	13%	1740	2008	268	15%
2. Runger Lane		32	32	0	1%	127	127	1	0%	165	166	0	0%	579	574	-5	-1%
3. M56 Spur		3849	4231	382	10%	4364	4898	534	12%	2282	3201	919	40%	2974	3707	732	25%
4. Simonsway		1197	1310	113	9%	1200	1338	138	11%	1156	1059	-97	-8%	1197	1189	-8	-1%
5. Hollyhedge Road		1022	1027	5	0%	1177	1241	64	5%	844	741	-103	-12%	991	933	-57	-6%
6. M56-M60 Link		2853	2636	-216	-8%	3094	2808	-286	-9%	3223	2966	-257	-8%	2920	2887	-33	-1%
7. A560 Altrincham Road		1395	1388	-8	-1%	1406	1410	4	0%	1395	1381	-14	-1%	1424	1407	-17	-1%
8. B5167 Palatine Road		1168	1162	-6	-1%	1072	1073	1	0%	913	864	-49	-5%	1084	1060	-24	-2%
9. M60		4197	4097	-100	-2%	4674	4654	-20	0%	7228	7301	73	1%	7927	7981	54	1%
Total		**17176**	**17428**	**252**	**1%**	**18886**	**19217**	**331**	**2%**	**18628**	**19291**	**662**	**4%**	**20835**	**21745**	**910**	**4%**
1. A538 Wilmslow Road	IP	780	682	-98	-13%	943	903	-41	-4%	1407	1497	90	6%	1738	1760	22	1%
2. Runger Lane		91	91	1	1%	182	182	0	0%	56	56	0	0%	210	210	-1	0%
3. M56 Spur		2229	2677	449	20%	2854	3310	455	16%	2134	2591	457	21%	2890	3305	415	14%
4. Simonsway		863	857	-6	-1%	898	942	43	5%	1087	960	-127	-12%	1132	1028	-104	-9%
5. Hollyhedge Road		629	645	16	3%	779	745	-34	-4%	559	556	-3	-1%	752	754	2	0%
6. M56-M60 Link		2536	2435	-101	-4%	3068	2889	-179	-6%	2450	2340	-109	-4%	2815	2654	-160	-6%
7. A560 Altrincham Road		1147	1130	-17	-1%	1304	1274	-30	-2%	1175	1156	-19	-2%	1275	1249	-26	-2%
8. B5167 Palatine Road		901	890	-11	-1%	1044	1021	-23	-2%	949	970	21	2%	1030	1034	3	0%
9. M60		3131	3104	-27	-1%	3663	3655	-8	0%	4992	5065	73	1%	5975	6066	91	2%
Total		**12306**	**12513**	**206**	**2%**	**14737**	**14921**	**184**	**1%**	**14808**	**15190**	**382**	**3%**	**17818**	**18059**	**241**	**1%**

Appendix 7.3 Continued: Optimistic Screenline 3 East of M56 - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Eastbound**								**Westbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A538 Wilmslow Road	**PM**	801	709	-92	-12%	765	732	-33	-4%	2472	2368	-104	-4%	2889	2892	4	0%
2. Runger Lane		231	230	-2	-1%	616	613	-3	0%	29	28	0	-1%	111	110	-1	-1%
3. M56 Spur		2272	2902	629	28%	2554	3206	652	26%	3049	3618	569	19%	3884	4270	385	10%
4. Simonsway		991	1057	66	7%	1100	1069	-31	-3%	1271	1210	-61	-5%	1230	1254	24	2%
5. Hollyhedge Road		888	912	24	3%	1054	1112	59	6%	937	951	14	2%	1011	1009	-3	0%
6. M56-M60 Link		2555	2401	-154	-6%	2931	2747	-184	-6%	2731	2624	-107	-4%	2911	2736	-175	-6%
7. A560 Altrincham Road		1093	964	-128	-12%	1192	1127	-66	-6%	1192	1126	-66	-6%	1294	1235	-59	-5%
8. B5167 Palatine Road		1252	1285	32	3%	1247	1258	11	1%	960	922	-38	-4%	1004	986	-18	-2%
9. M60		4608	4562	-46	-1%	5138	5044	-95	-2%	6661	6794	133	2%	7289	7475	186	3%
Total		**14691**	**15020**	**329**	**2%**	**16598**	**16909**	**311**	**2%**	**19301**	**19641**	**340**	**2%**	**21622**	**21966**	**344**	**2%**

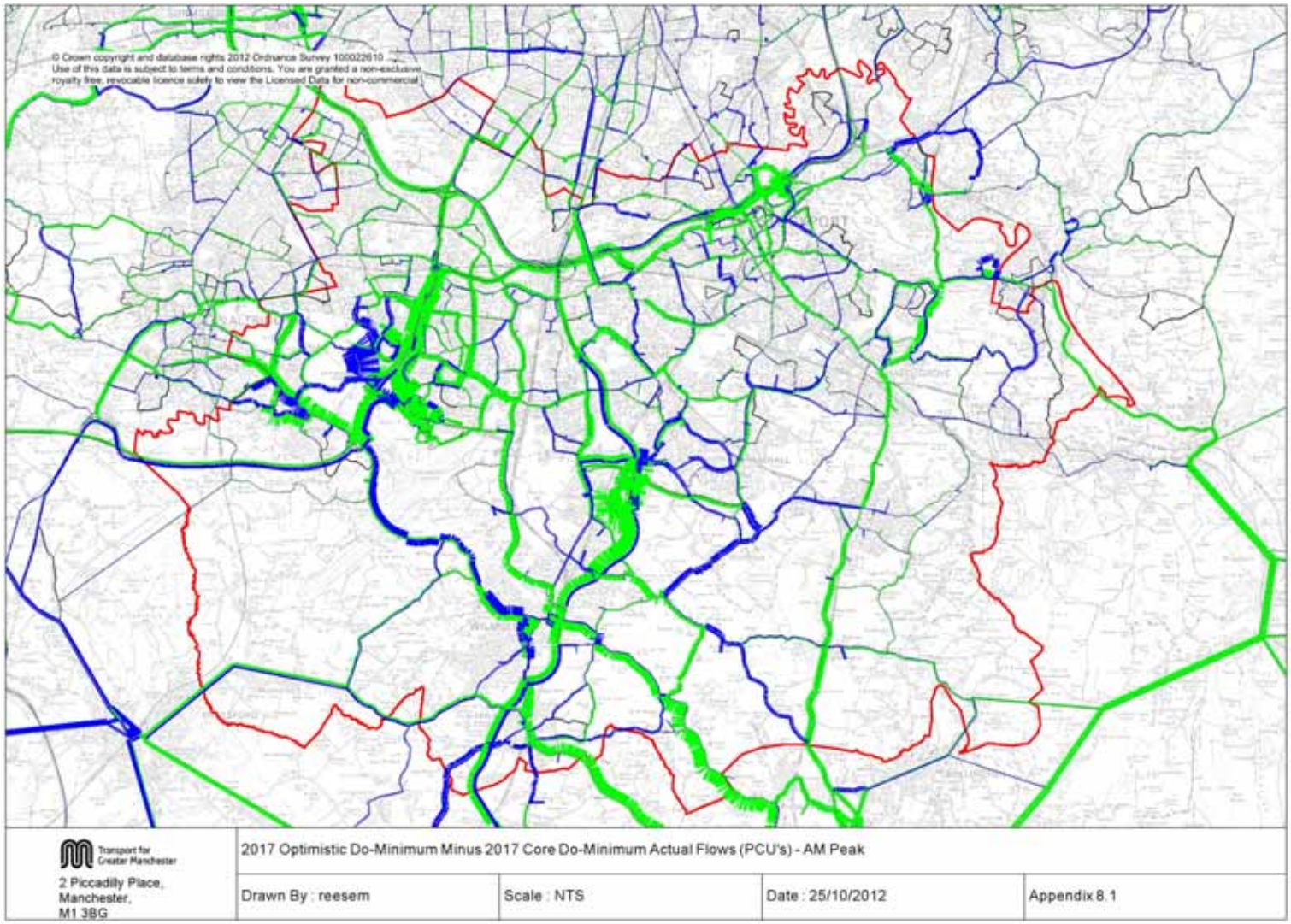
Appendix 7.4 Optimistic Screenline 4 East of A34 - Crossing Flows in pcu's

Crossing Links	Time Period	Eastbound								Westbound							
		2017				2032				2017				2032			
		DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff	DM	DS	Diff	% Diff
1. A5102 Woodford Road	AM	740	781	41	6%	1117	1308	192	17%	845	720	-125	-15%	996	1038	42	4%
2. A555 MAELR		726	1943	1217	168%	773	2249	1476	191%	1564	3024	1460	93%	1577	3370	1793	114%
3. B5094 Stanley Road		841	882	41	5%	810	967	157	19%	1371	1714	343	25%	1383	1738	355	26%
4. Etchells Road		525	539	14	3%	509	567	58	11%	805	710	-96	-12%	876	749	-127	-14%
5. A5149 Cheadle Road		521	573	52	10%	554	619	64	12%	814	667	-146	-18%	981	841	-140	-14%
6. Councillor Lane		637	546	-91	-14%	824	729	-95	-12%	659	555	-104	-16%	761	637	-124	-16%
7. A560 Stockport Road		1353	1384	31	2%	1435	1478	44	3%	1933	1895	-39	-2%	1944	1919	-25	-1%
Total		**5343**	**6648**	**1305**	**24%**	**6022**	**7917**	**1895**	**31%**	**7991**	**9285**	**1294**	**16%**	**8518**	**10291**	**1773**	**21%**
1. A5102 Woodford Road	IP	511	350	-161	-32%	1325	678	-647	-49%	414	367	-47	-11%	804	608	-197	-24%
2. A555 MAELR		914	1755	841	92%	1138	2013	875	77%	823	1472	649	79%	1329	1715	386	29%
3. B5094 Stanley Road		701	753	52	7%	726	776	50	7%	871	957	85	10%	1101	1144	44	4%
4. Etchells Road		577	519	-58	-10%	607	566	-41	-7%	596	527	-69	-12%	637	570	-67	-11%
5. A5149 Cheadle Road		426	390	-36	-9%	453	426	-27	-6%	475	427	-47	-10%	555	533	-23	-4%
6. Councillor Lane		471	442	-28	-6%	555	500	-55	-10%	338	328	-10	-3%	403	398	-5	-1%
7. A560 Stockport Road		1197	1152	-45	-4%	1414	1416	2	0%	1558	1466	-92	-6%	1681	1636	-45	-3%
Total		**4797**	**5362**	**565**	**12%**	**6218**	**6375**	**157**	**3%**	**5076**	**5543**	**468**	**9%**	**6511**	**6604**	**93**	**1%**
1. A5102 Woodford Road	PM	1401	844	-557	-40%	1611	1200	-411	-25%	687	589	-98	-14%	976	817	-160	-16%
2. A555 MAELR		1401	3065	1664	119%	1379	3277	1899	138%	1183	1539	356	30%	1307	1854	547	42%
3. B5094 Stanley Road		1517	1296	-221	-15%	1577	1276	-301	-19%	823	957	134	16%	1075	1105	30	3%
4. Etchells Road		750	715	-35	-5%	839	745	-94	-11%	612	549	-63	-10%	620	614	-5	-1%
5. A5149 Cheadle Road		649	579	-70	-11%	661	617	-44	-7%	611	533	-78	-13%	746	605	-141	-19%
6. Councillor Lane		807	685	-122	-15%	845	726	-119	-14%	404	402	-2	-1%	499	461	-37	-7%
7. A560 Stockport Road		1442	1412	-30	-2%	1423	1459	37	3%	1829	1869	41	2%	1927	1966	39	2%
Total		**7966**	**8596**	**630**	**8%**	**8334**	**9301**	**966**	**12%**	**6148**	**6437**	**288**	**5%**	**7149**	**7422**	**273**	**4%**

Appendix 7.5: Optimistic Screenline 5 High Peak to Bredbury - Crossing Flows in pcu's																	
Crossing Links	**Time Period**	**Eastbound**								**Westbound**							
		2017				**2032**				**2017**				**2032**			
		DM	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**	**DM**	**DS**	**Diff**	**% Diff**
1. A6 Buxton Road	**AM**	966	1165	199	21%	1082	1203	120	11%	926	1086	160	17%	1089	921	-168	-15%
2. Windlehurst Road		300	363	63	21%	543	478	-64	-12%	519	491	-28	-5%	562	488	-74	-13%
3. A626 Stockport Road		828	740	-88	-11%	921	992	71	8%	1156	1291	135	12%	1439	1560	121	8%
4. Otterspool Road		875	860	-15	-2%	1025	1043	18	2%	844	809	-35	-4%	997	995	-1	0%
5. B6104 Stockport Road		758	800	42	6%	861	938	77	9%	821	846	25	3%	774	825	51	7%
6. A560 Stockport Road East		447	416	-31	-7%	713	659	-54	-8%	671	639	-32	-5%	815	804	-11	-1%
Total		**4174**	**4344**	**170**	**4%**	**5146**	**5313**	**167**	**3%**	**4937**	**5161**	**224**	**5%**	**5676**	**5594**	**-82**	**-1%**
1. A6 Buxton Road	**IP**	836	1013	177	21%	941	1173	232	25%	798	921	123	15%	838	1003	165	20%
2. Windlehurst Road		209	227	18	9%	285	292	7	2%	212	184	-28	-13%	261	209	-52	-20%
3. A626 Stockport Road		925	885	-41	-4%	1084	1064	-20	-2%	820	901	81	10%	1127	1216	89	8%
4. Otterspool Road		738	726	-12	-2%	861	869	8	1%	896	825	-71	-8%	1055	1008	-47	-4%
5. B6104 Stockport Road		646	650	4	1%	735	718	-17	-2%	599	607	8	1%	719	737	18	3%
6. A560 Stockport Road East	**PM**	628	630	2	0%	792	790	-1	0%	703	690	-14	-2%	864	855	-8	-1%
Total		**3982**	**4130**	**148**	**4%**	**4699**	**4906**	**207**	**4%**	**4029**	**4128**	**99**	**2%**	**4862**	**5029**	**167**	**3%**
1. A6 Buxton Road		1151	1318	167	15%	1240	1387	146	12%	785	880	95	12%	879	806	-73	-8%
2. Windlehurst Road		429	401	-29	-7%	490	422	-68	-14%	232	140	-92	-40%	354	298	-55	-16%
3. A626 Stockport Road		1483	1391	-91	-6%	1495	1495	0	0%	1213	1312	99	8%	1195	1250	55	5%
4. Otterspool Road		859	794	-65	-8%	1048	979	-69	-7%	1086	1025	-60	-6%	1130	1091	-38	-3%
5. B6104 Stockport Road		962	1069	108	11%	1081	1130	49	5%	572	577	5	1%	635	659	24	4%
6. A560 Stockport Road East		1203	1186	-17	-1%	1120	1203	83	7%	809	799	-10	-1%	941	949	9	1%
Total		**6086**	**6159**	**73**	**1%**	**6474**	**6615**	**141**	**2%**	**4696**	**4733**	**37**	**1%**	**5133**	**5054**	**-79**	**-2%**

Appendix 8

Optimistic Forecasts – Actual Flow Differences Optimistic Minus Core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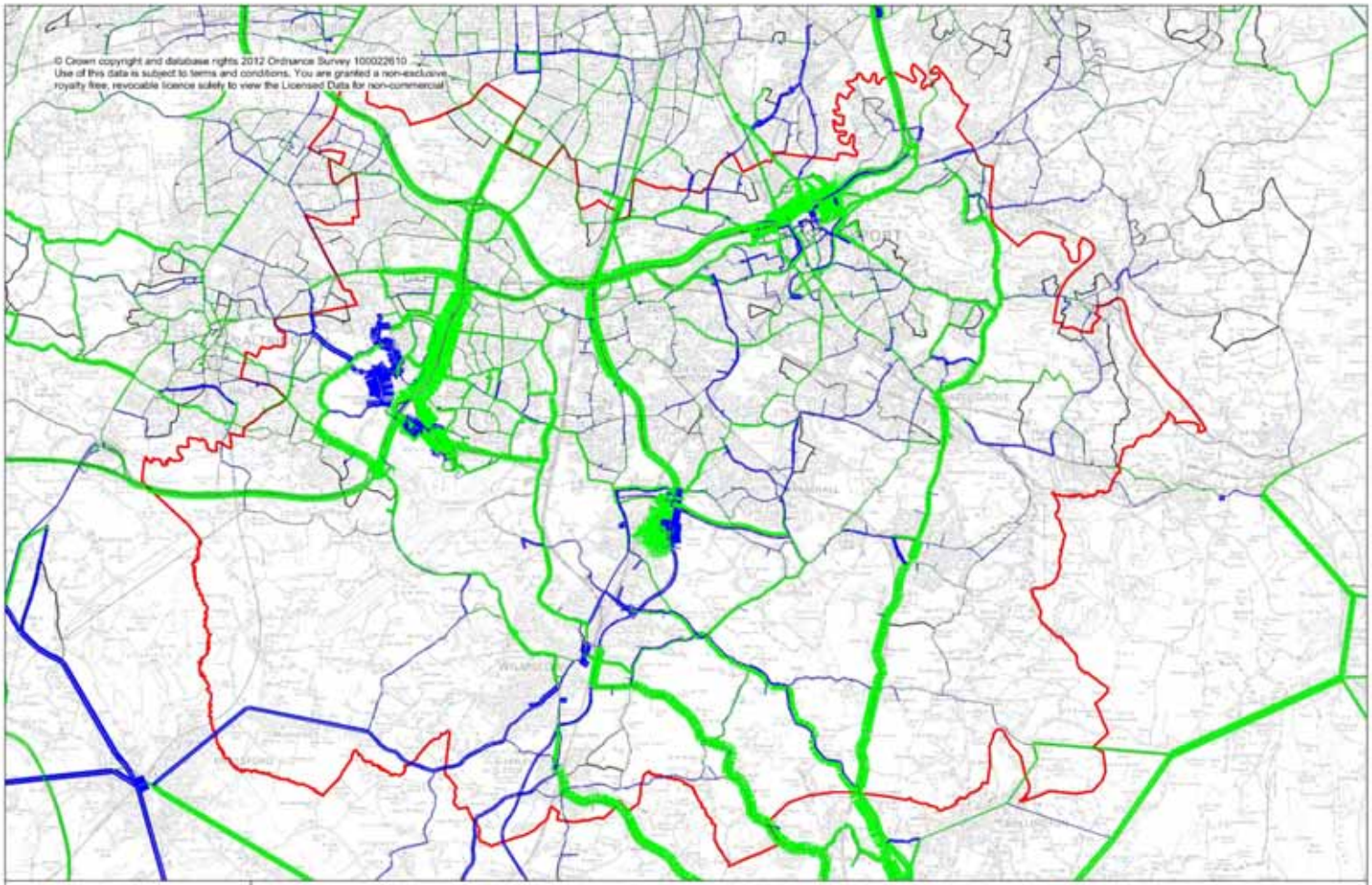
Transport for Greater Manchester
2 Piccadilly Place, Manchester, M1 3BG
2017 Optimistic Do-Minimum Minus 2017 Core Do-Minimum Actual Flows (PCU's) - AM Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.1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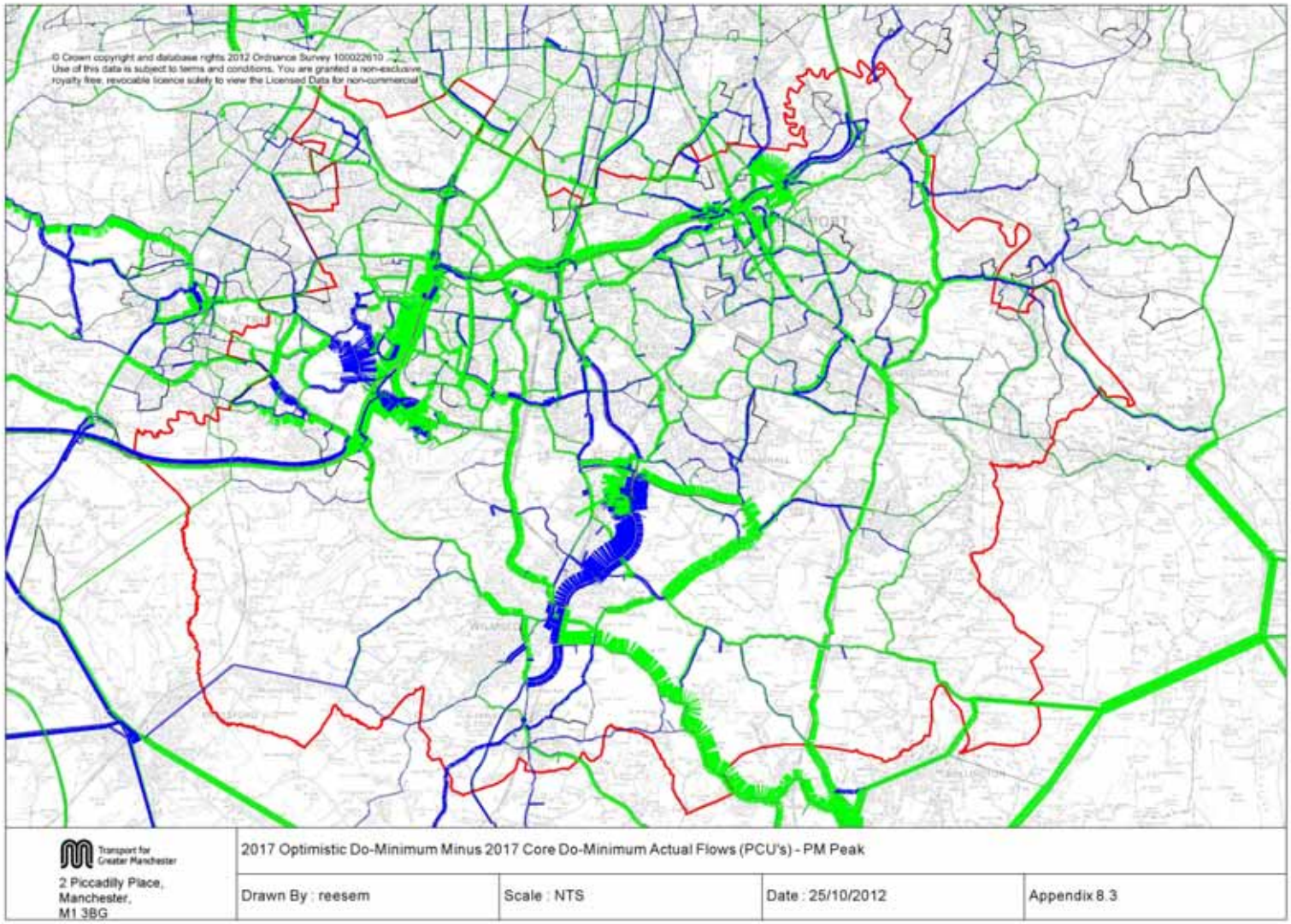
2017 Optimistic Do-Minimum Minus 2017 Core Do-Minimum Actual Flows (PCU's) - Inter Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.2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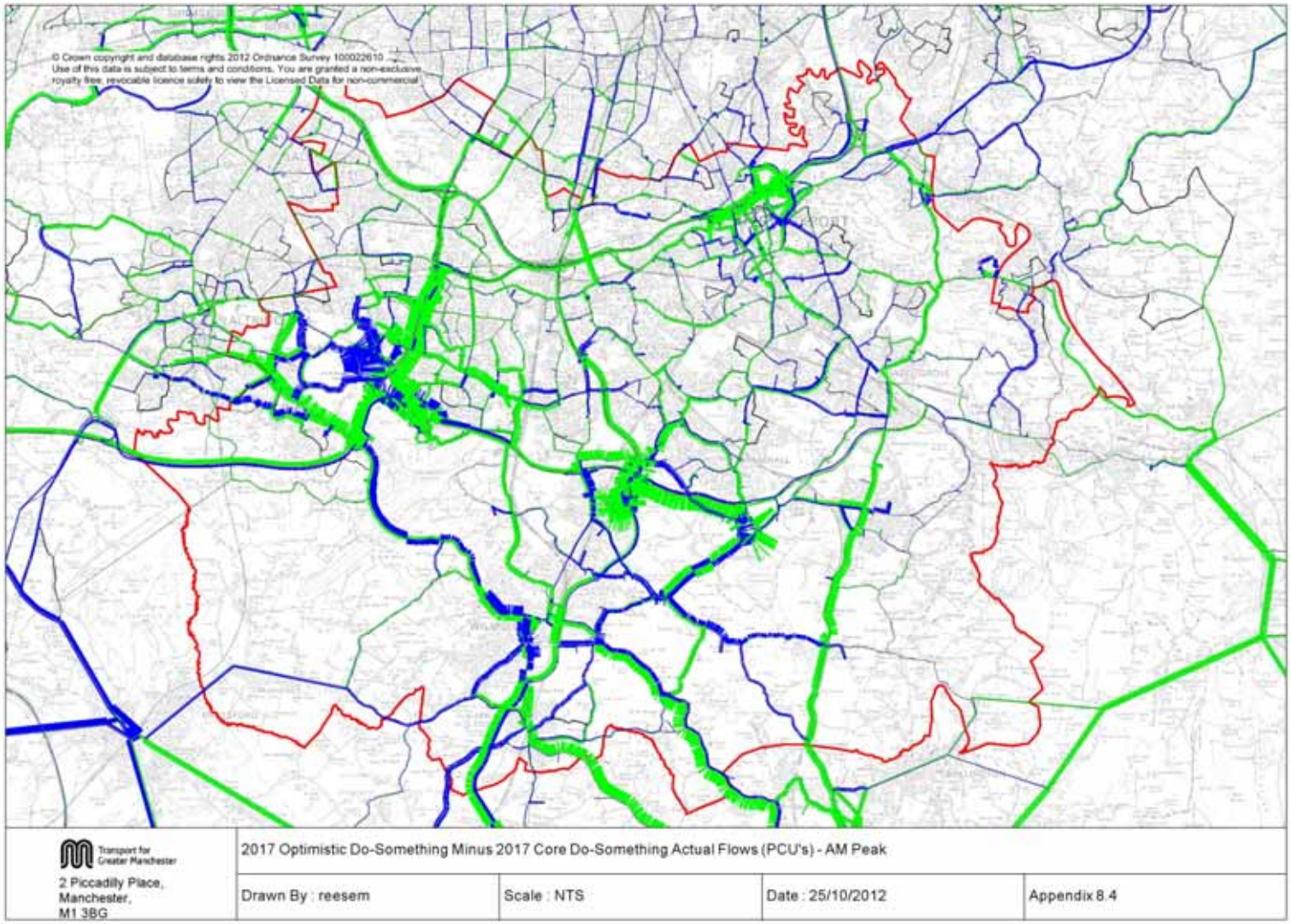
2017 Optimistic Do-Minimum Minus 2017 Core Do-Minimum Actual Flows (PCU's) - PM Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.3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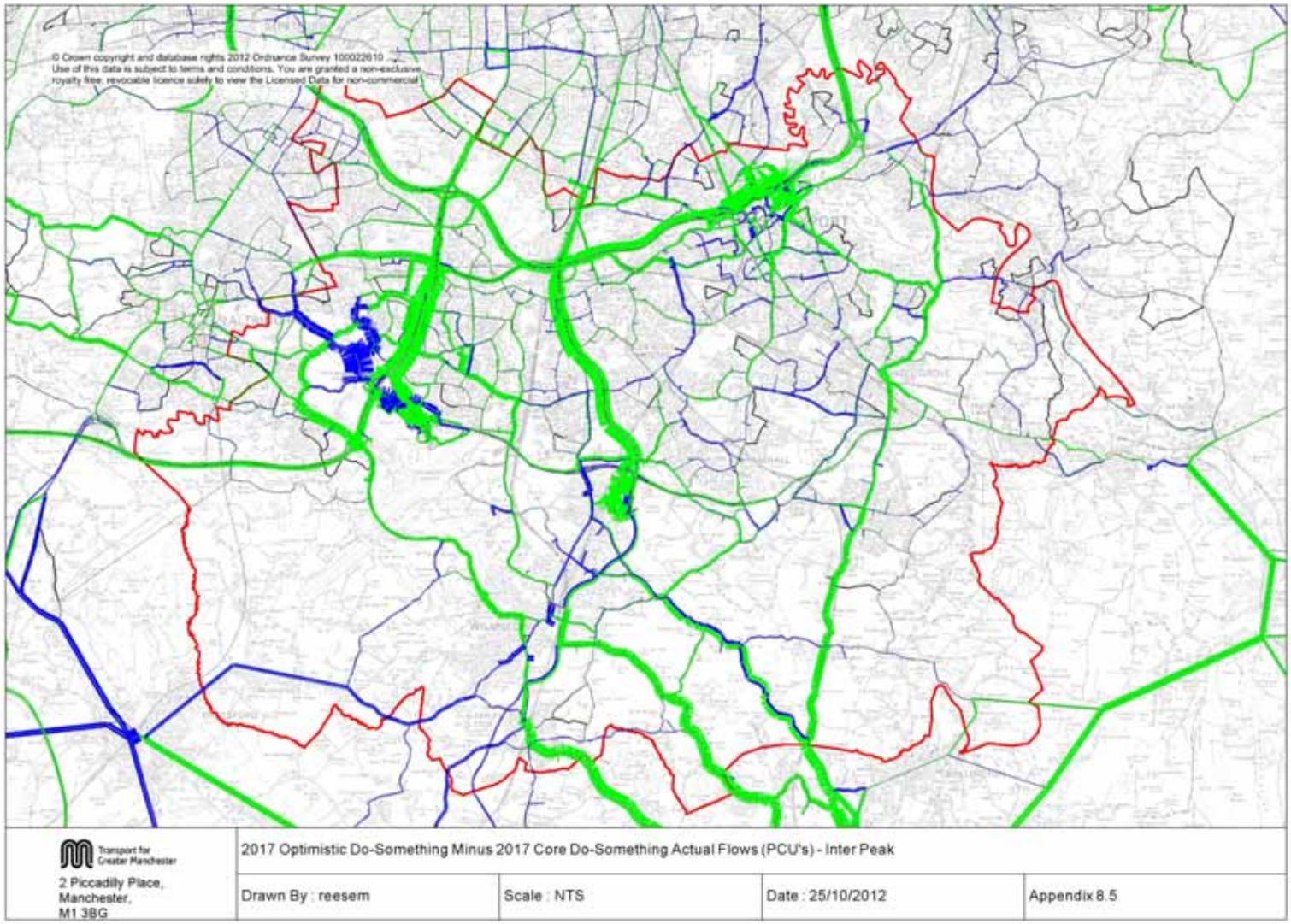
2017 Optimistic Do-Something Minus 2017 Core Do-Something Actual Flows (PCU's) - AM Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.4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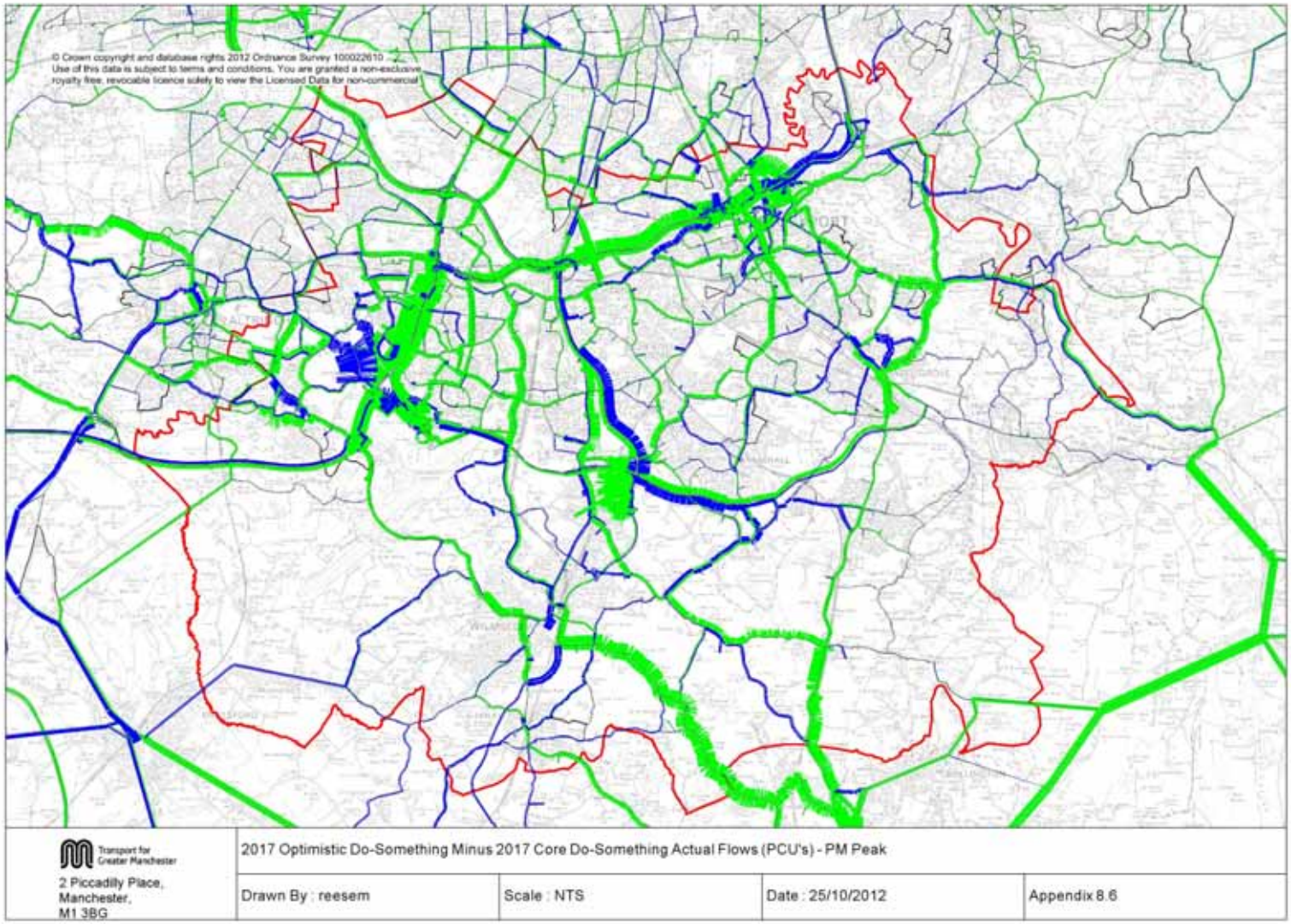
2017 Optimistic Do-Something Minus 2017 Core Do-Something Actual Flows (PCU's) - Inter Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.5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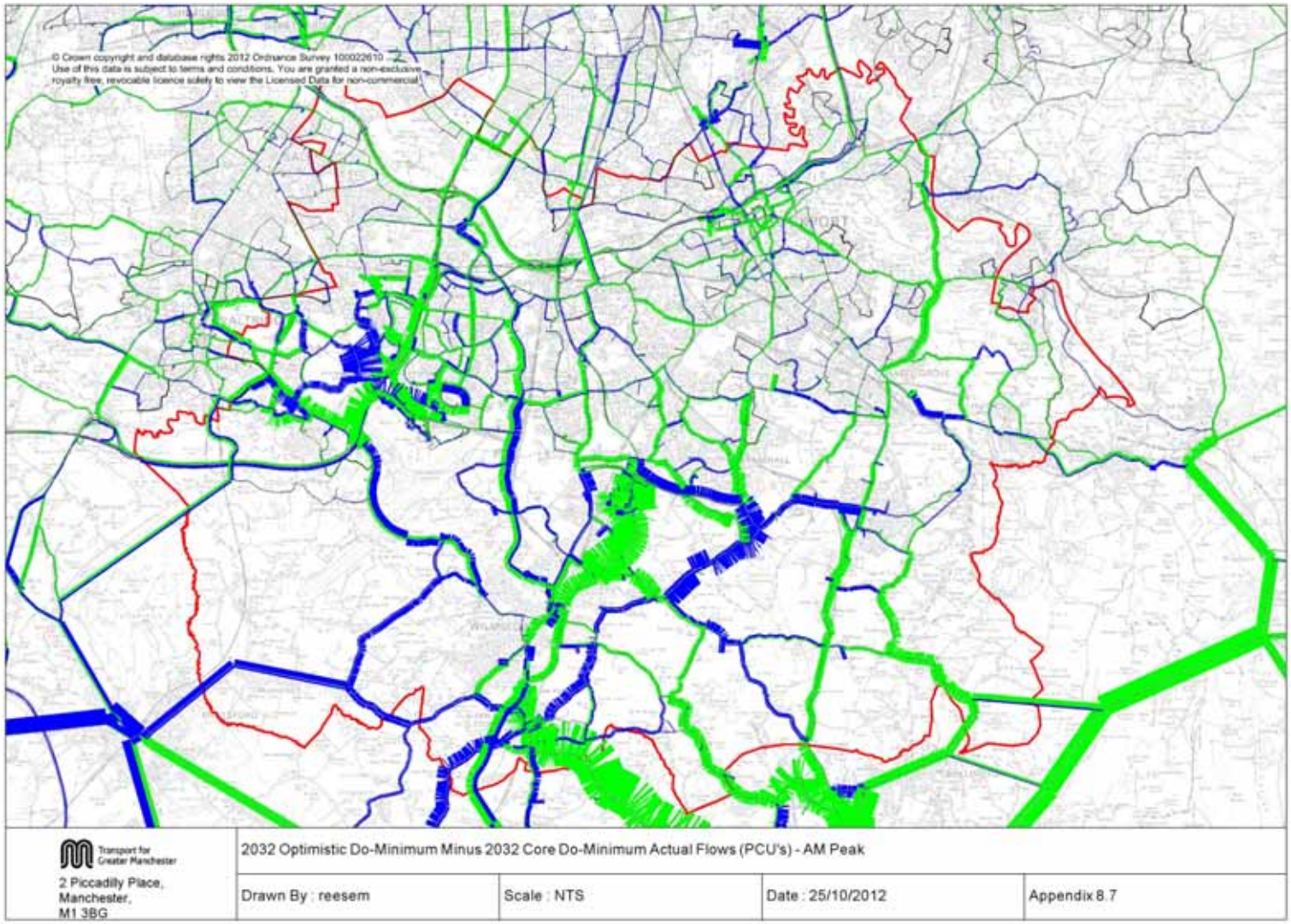
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.6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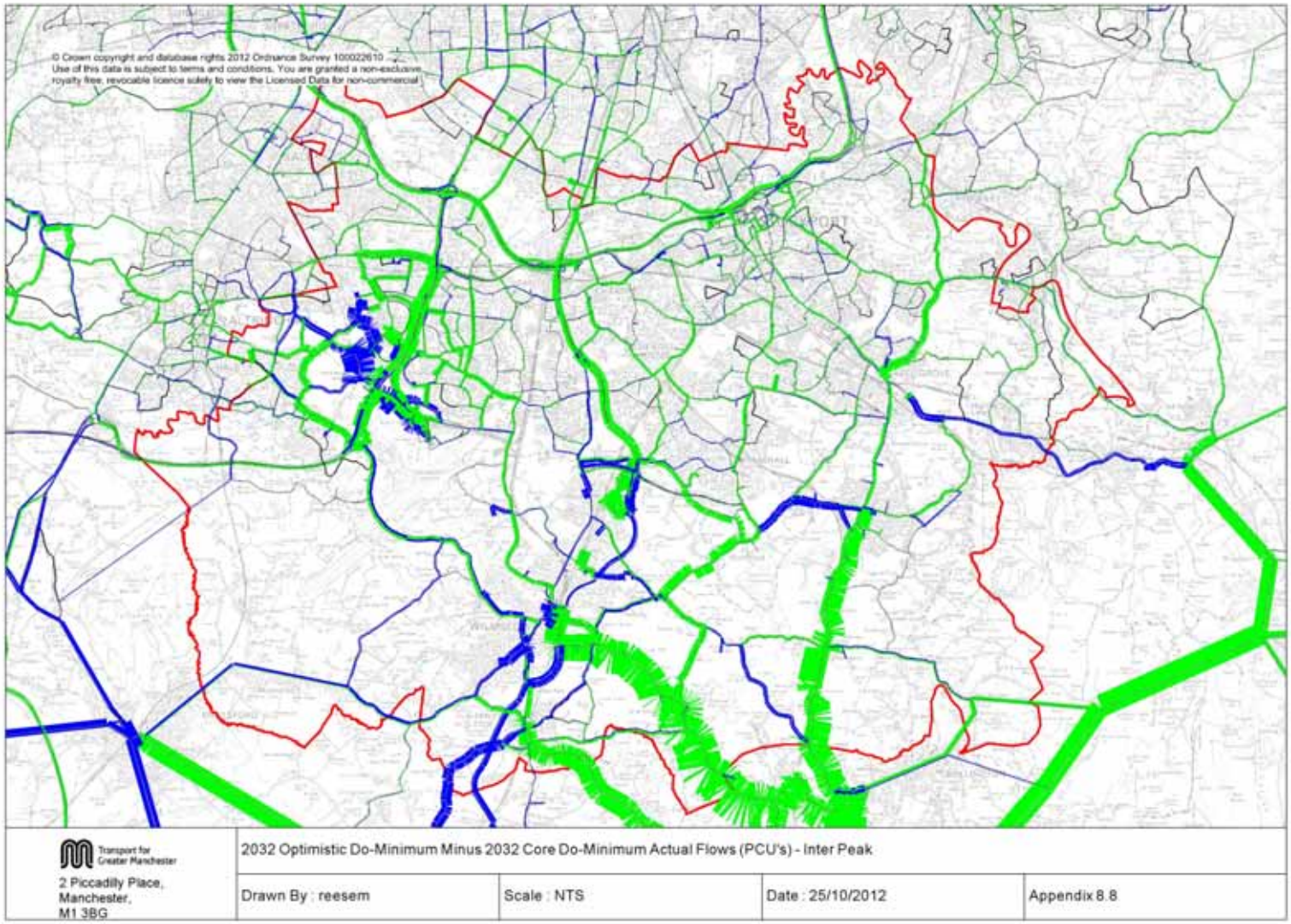
2032 Optimistic Do-Minimum Minus 2032 Core Do-Minimum Actual Flows (PCU's) - AM Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.7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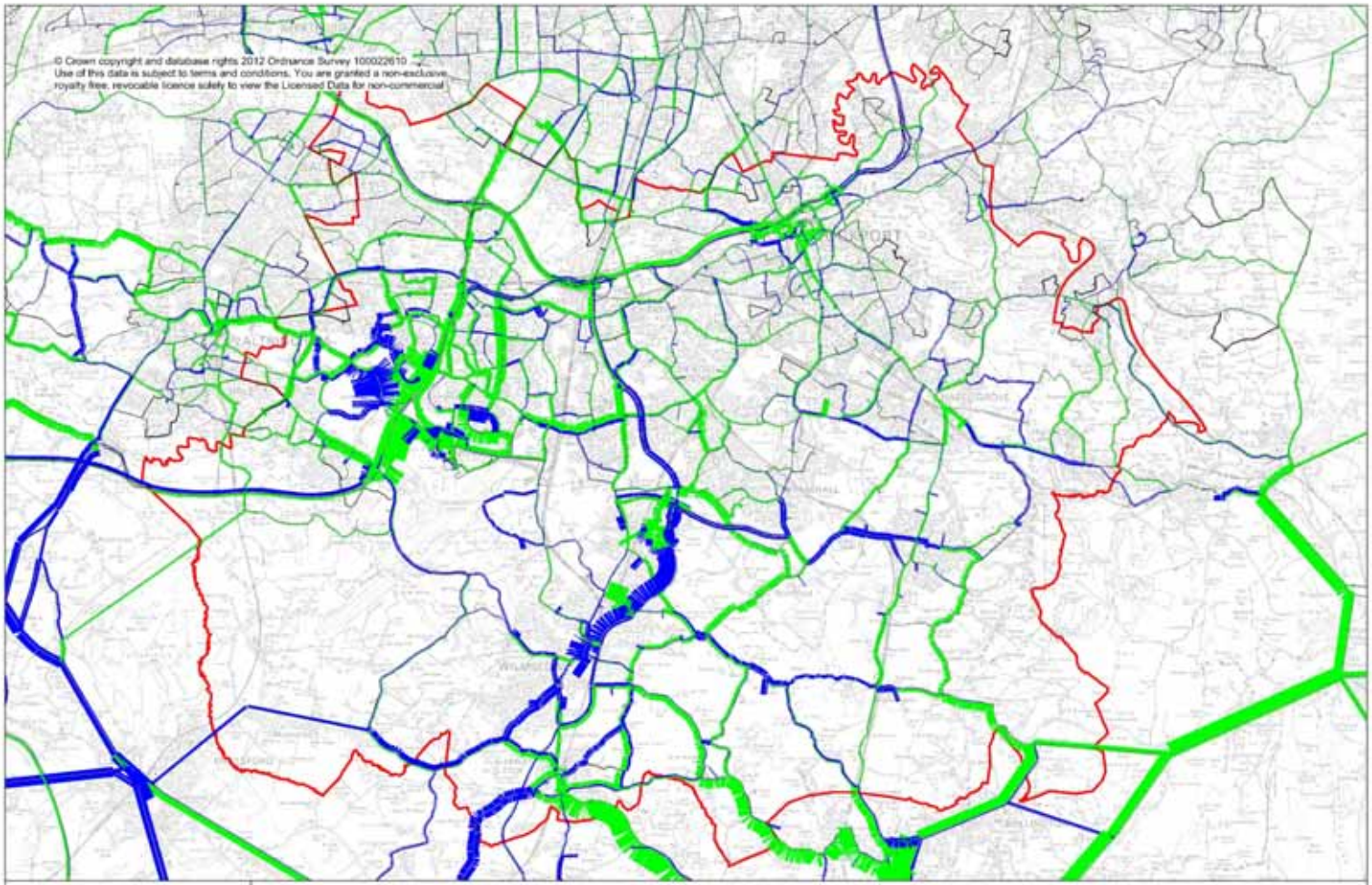
2032 Optimistic Do-Minimum Minus 2032 Core Do-Minimum Actual Flows (PCU's) - Inter Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.8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2032 Optimistic Do-Minimum Minus 2032 Core Do-Minimum Actual Flows (PCU's) - PM Peak
Drawn By : reesem
Scale : NTS
Date : 25/10/2012
Appendix 8.9

Appendix 9

Optimistic Forecasts – Journey Times in Area of influence

Appendix 9: 2017 Forecast Journey Times (Optimistic)

Route	Distance	AM Peak			Inter Peak			PM Peak		
		Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)
1	8.7	27.4	30.8	3.4	21.8	23.3	1.5	25.3	28.3	3.0
	8.7	25.5	25.7	0.2	22.3	22.2	-0.2	27.8	28.1	0.3
2	16.4	21.4	21.1	-0.2	20.0	20.0	0.0	20.8	20.6	-0.1
	16.4	21.1	20.8	-0.3	20.0	20.0	0.0	21.1	21.1	-0.1
3	10.2	14.8	14.4	-0.3	12.7	12.6	-0.1	13.7	13.5	-0.2
	10.2	13.8	13.7	-0.1	12.6	12.6	0.0	14.0	13.8	-0.2
4	6.6	6.8	6.9	0.0	6.5	6.5	0.0	6.8	6.8	0.0
	6.6	6.8	6.8	0.0	6.4	6.4	0.0	6.8	6.8	0.0
5	7.3	7.4	7.5	0.0	6.4	6.4	0.0	8.2	8.2	-0.1
	6.8	7.5	7.6	0.1	6.1	6.2	0.0	7.5	7.5	0.0
6	10	16.2	17.4	1.1	14.4	15.1	0.8	17.1	17.6	0.6
	10	18.4	18.2	-0.3	13.4	14.1	0.8	15.6	16.4	0.9
7	8.3	7.6	8.0	0.5	4.7	4.8	0.1	5.8	6.1	0.3
	8.3	6.9	7.2	0.3	5.4	5.6	0.1	9.7	10.1	0.4
8	7.6	11.7	11.3	-0.4	9.4	9.9	0.5	12.1	11.6	-0.4
	7.6	11.8	10.9	-0.9	9.4	9.5	0.1	11.5	11.0	-0.5
9	14.5	24.9	23.5	-1.4	16.6	16.2	-0.4	24.4	23.3	-1.2
	14.4	25.7	24.3	-1.4	15.6	15.6	0.0	23.3	21.8	-1.5
10	10	17.8	20.0	2.2	15.3	17.2	1.8	21.1	21.9	0.9
	10	19.5	18.1	-1.4	14.8	15.6	0.8	15.7	16.6	0.9
11	13.9	24.3	22.3	-1.9	17.8	18.3	0.6	20.4	21.2	0.9
	13.7	22.6	21.3	-1.4	17.5	18.6	1.1	24.8	20.6	-4.2
12	22	37.6	36.2	-1.5	29.8	29.2	-0.6	33.5	32.6	-0.9
	22.2	38.1	35.9	-2.2	30.4	30.1	-0.3	36.0	34.9	-1.1
13	17	17.6	17.1	-0.5	13.9	13.8	-0.1	20.2	19.9	-0.3
	17	17.5	17.2	-0.3	13.0	13.0	-0.1	15.8	15.7	-0.1
14	5.2	15.4	14.5	-1.0	10.0	10.0	0.1	12.5	12.8	0.2
	5.2	14.6	12.8	-1.8	11.2	10.9	-0.4	14.1	13.2	-0.9
15	5.8	13.2	12.2	-1.0	10.2	10.0	-0.2	13.1	11.7	-1.5
	5.8	18.2	13.7	-4.5	10.2	9.9	-0.3	13.1	12.0	-1.1

Appendix 9: 2032 Forecast Journey Times (Optimistic)

Route	Distance	AM Peak			Inter Peak			PM Peak		
		Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)	Do-Minimum Time (minutes)	Do-Something Time (minutes)	Difference (minutes)
1	8.7	31.0	35.8	4.7	22.9	24.9	2.0	27.8	30.2	2.4
	8.7	26.3	28.3	2.0	22.8	24.2	1.4	31.3	30.7	-0.6
2	16.4	26.5	26.0	-0.5	21.6	21.5	-0.1	22.3	21.9	-0.3
	16.4	25.2	24.6	-0.6	22.6	22.4	-0.2	25.7	25.7	0.0
3	10.2	15.8	15.9	0.0	12.9	13.0	0.0	14.2	14.2	0.0
	10.2	14.6	14.5	-0.1	12.9	12.8	-0.1	14.6	14.4	-0.3
4	6.6	7.5	7.5	0.0	7.0	7.0	0.0	8.3	8.1	-0.2
	6.6	6.8	6.8	0.0	6.4	6.4	0.0	6.8	6.8	0.0
5	7.3	8.2	8.1	-0.1	7.1	7.0	-0.1	9.9	9.8	-0.2
	6.8	8.5	8.5	0.0	6.7	6.7	0.0	8.0	8.0	0.0
6	10	17.4	18.1	0.7	14.9	15.6	0.8	21.6	18.2	-3.4
	10	22.1	20.5	-1.6	13.6	14.4	0.8	17.3	17.8	0.5
7	8.3	9.6	9.1	-0.5	5.4	5.6	0.2	6.9	7.4	0.4
	8.3	8.0	9.1	1.1	6.3	6.4	0.2	12.7	13.3	0.6
8	7.6	13.5	12.4	-1.2	9.9	10.1	0.2	15.2	12.2	-3.0
	7.6	13.9	11.3	-2.6	10.0	9.6	-0.4	13.6	11.3	-2.2
9	14.5	29.8	26.9	-2.9	19.7	18.5	-1.2	29.2	27.1	-2.0
	14.4	31.3	30.6	-0.6	18.6	17.3	-1.3	27.0	25.0	-2.0
10	10	23.5	23.5	0.0	19.3	20.0	0.6	24.7	24.7	0.0
	10	24.7	22.2	-2.5	15.5	16.2	0.8	16.2	17.0	0.8
11	13.9	26.6	23.6	-3.1	18.5	18.7	0.2	21.9	21.8	-0.1
	13.7	26.9	21.8	-5.1	18.9	18.6	-0.3	31.2	21.7	-9.5
12	22	42.9	41.0	-1.9	31.6	30.7	-0.9	36.9	35.6	-1.3
	22.2	41.3	40.2	-1.1	31.5	31.0	-0.5	40.3	37.9	-2.4
13	17	22.2	21.2	-1.0	16.9	16.7	-0.2	24.8	24.9	0.2
	17	20.1	20.0	-0.2	14.8	14.7	-0.1	17.8	17.8	0.0
14	5.2	17.4	15.9	-1.5	10.3	10.4	0.1	13.7	13.5	-0.2
	5.2	17.0	13.6	-3.4	11.6	11.3	-0.4	14.9	13.7	-1.3
15	5.8	16.2	13.2	-3.0	11.9	10.5	-1.4	16.2	12.6	-3.6
	5.8	22.4	15.1	-7.3	11.2	10.5	-0.7	15.3	12.7	-2.6