

APPENDIX 16.5
Traffic Forecasting – Summary Report for the Environmental Statement

March 2008

THE MERSEY GATEWAY PROJECT

TRAFFIC FORECASTING – SUMMARY REPORT FOR THE ENVIRONMENTAL STATEMENT

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1. INTRODUCTION

1.1 Overview

- 1.1.1 The Mersey Gateway Traffic Model has been developed so that the transportation effects of the project are properly assessed in accordance with current Government guidance. The key development in the modelling approach prescribed by the guidance relates to the appraisal of variable demand in the context of congested networks where travel behaviour is also influenced by road user charging. The model complies with the Department for Transport's (DfT) WebTAG guidance in what is a relatively new area of DfT appraisal.
- 1.1.2 To provide the required analytical basis for the appraisal and promotion of the project, the traffic model was required to achieve the following:
- a. Meet DfT model validation criteria in the base year (2006);
 - b. Evaluate the impact on existing travel behaviour taking into account local and strategic re-assignment, changes in trip distribution and induced traffic effects;
 - c. Permit the investigation of toll charging options;
 - d. Provide the output required for economic evaluation, environmental assessment and business case appraisals;
 - e. Enable operational assessments to be undertaken to inform the design of the project; and
 - f. Appraise options for assessing proposals for the SJB as a local crossing in support of regeneration and local transport objectives.
- 1.1.3 The detailed model network extends from the M53 in the west to the M6 in the east, and from the M62 in the north to the M56 in the south. Four time periods of one hour were modelled within the Mersey Gateway Traffic Model as follows:
- a. Morning Peak Hour - 08:00 to 09:00 hours;
 - b. Inter Peak Hour - average 10:00 to 16:00 hours;
 - c. Evening Peak Hour - 16:00 to 17:00 hours;
 - d. Overnight Hour - average 19:00 to 07:00 hours.

1.2 Purpose of this Document

- 1.2.1 The development of the variable demand traffic model and the forecasting elements has, by necessity, been an extensive and iterative process in order that the objectives listed can be achieved confidently. The Local Model Validation Report and the Forecasting Reports are equally extensive and detailed.
- 1.2.2 This document has been produced to support the Environmental Statement by summarising the pertinent results from the modelling process. Specifically, the forecasting process and the progression from model output to inputs used in the following Environmental Statement Chapters and Supporting Documents are outlined:
- a. Noise
 - b. Air Quality
 - c. Transport Assessment

1.3 Contents of this Document

- 1.3.1 Section 2 presents a brief overview of the model followed by a summary of the validation results.

- 1.3.2 Section 3 provides a summary of the forecasting report beginning with a description of the future networks and leading to traffic forecasts via a discussion on the traffic growth.
- 1.3.3 Section 4 concludes this document by describing how the model forecasts have been used to produce forecast traffic information specifically for use in the various assessments.
- 1.3.4 A series of appendices provides supporting information:
 - a. Appendix A – Schedule of Do-Minimum Infrastructure Schemes
 - b. Appendix B - Schedule of Planned Developments
 - c. Appendix C - Calculation of Daily Traffic from Peak Hour models

2. THE TRAFFIC MODEL

2.1 Modelling traffic behaviour

Congested networks

- 2.1.1 The Project is designed to relieve the congested SJB to allow Halton's regeneration and local transport objectives to be achieved. There is local congestion approaching the SJB, and alternative crossings of the Mersey (at the Tunnels, through Warrington and on the M6 Thelwall Viaduct) experience congestion during extended peak periods and during times of accidents or incidents on the network. Centrally located within the sub-regional motorway network, the SJB plays an important network role. Each of the alternative crossings of the Mersey has experienced routine traffic growth over many years and this growth in traffic demand is expected to continue over the foreseeable future. It is therefore likely that the capacity of the road network-and the capacity of the SJB in particular-will have an increasing effect on future traffic levels and congestion as demand exceeds the capacity available.
- 2.1.2 The model therefore had to be able to model congestion and reflect the re-assignment and behavioural changes brought about by increasing congestion over the traffic evaluation period of the Project (15 years after opening) and the effects of imposing tolls.
- 2.1.3 The traffic model was specified as a variable demand traffic model, incorporating highway and public transport components to allow the modelling of travel behaviour. In essence the model reflects how travel choices are likely to be influenced by varying levels of congestion across the study network.

Attitude to paying tolls

- 2.1.4 Providing significant additional capacity, albeit modified by the use of SJB for local traffic and no-car modes, in a congested network can normally be handled by conventional assignment models. However, because of the opposing effect of requiring the payment of a toll to use that capacity, the model has to be able to reflect the interaction between re-assignment and behavioural response to paying tolls. This interaction has additional dimensions when considering values of time of travellers from different socio-economic groups and undertaking trips for different reasons. The traffic model developed for the appraisal of this project is able to model the behavioural responses required.

2.2 Model specification

Overview

- 2.2.1 The traffic model consists of a number of inter-related components. Separate highway and public transport models have been developed for the base year of 2006. These two models are brought together in the forecasting process and it is here that the variable demand element comes into play.
- 2.2.2 The forecasting process enables the behavioural responses to increasing congestion, payment of tolls and provision of new capacity to be assessed.
- 2.2.3 The output from the forecasting process, which also includes the physical changes anticipated on the travel networks (committed schemes and developments, regeneration proposals and changes in values of time and travel costs), then feeds into the economic, environmental and financial appraisals.
- 2.2.4 The data requirements of the model have been considerable. An extensive series of roadside interviews (RSIs) was conducted, and household survey data was analysed to inform trip making patterns. Journey time surveys, manual and automatic traffic counts, stated preference surveys to establish values of time and aerial surveys to check network performance were all undertaken.

Model Structure and Software

- 2.2.5 The components of the traffic model have been developed using proprietary and established software relevant to the requirements of the model. These included:
 - a. TRIPS – for the public transport component
 - b. SATURN – for the highway traffic component
 - c. DIADEM – for modelling variable demand

2.3 Base Year Validation

Traffic Flow Validation

- 2.3.1 For the three main modelled time periods, AM peak, Inter peak and PM peak hours, a comprehensive comparison between observed traffic counts and model assigned traffic flows was produced. The proportion of sites where the assigned traffic flow matches the traffic count lay between 72.4% and 76.1% while the proportion of sites meeting the DfT's flow criterion lay between 72.4% and 78.2%. Although these did not strictly meet the DfT's criterion of 85%, it has been accepted that the criterion is particularly onerous for a strategic model of this scale. In the circumstances of the Mersey Gateway highway model, these results are quite satisfactory. A similarly satisfactory result was obtained when the results were considered at cordon/screenline levels.

Journey Time Validation

- 2.3.2 The key validation criterion for this model is accurately to reproduce observed travel times across the highway network. This acts as a test not only of the assigned traffic flows, but also the coding of the highway network. The results demonstrated an excellent match between the model and observed journey times with significant observed junction delays accurately replicated. A substantial majority of model journey times lie within the 95% confidence limits of the observed journey times. Furthermore, the match against DfT criteria, within +/- 15% of mean observed travel times, is achieved in a significant majority of cases.

Validation across the River Mersey

- 2.3.3 A critical aspect of the Mersey Gateway model is the choice of route for drivers crossing the River Mersey. This covers not simply the quickest or shortest distance route but also the effect of the tolls applied at the Mersey Tunnels. In addition, it is important that traffic flows through Warrington are accurately represented as routes through Warrington form an upstream alternative to use of the SJB. Consideration was also given to traffic using the M6 Thelwall viaduct, which forms an alternative motorway route for some key movements, as well as forming an important strategic link in the national motorway network.
- 2.3.4 Comparisons between observed traffic counts and assigned model traffic flows demonstrate that the 2006 base year route choice reliably reflects the observed route choices across the River Mersey.

Route Choice

- 2.3.5 Not only is it important for the model to match observed traffic flows and journey times, it is also particularly important for the purposes of this study that the model route choices reflect those choices actually observed. This was checked, for trips across the River Mersey, by comparison of the observed trip patterns from the RSIs carried out on each river crossing with corresponding selected link analyses from the model. These analyses have been carried out and the overall comparisons are very good.

3. FORECASTING

3.1 Treatment of Uncertainty

- 3.1.1 There are three principal elements to the production of traffic forecasts for input to the various environmental appraisals. These are:
- a. The definition of changes in transport networks that might happen with or without the project that will either add additional capacity on existing routes, create new routes or encourage shifts between transport modes;
 - b. The estimation of traffic growth, both spatially and temporally, based on changes in land use; and
 - c. The estimation or adoption of changes in economic parameters independent of the above two elements, i.e. changes in fuel cost or values of time.
- 3.1.2 The above combine to influence outturn traffic forecasts for the project and all have inherent uncertainty because they rely on estimates or assumptions.
- 3.1.3 For traffic forecasting the Department for Transport (DfT) provides guidance on the treatment of uncertainty which indicates that future development and network changes should be categorised as either most likely, optimistic or pessimistic (in terms of economic output, i.e. their effect on the economy).
- 3.1.4 The following table (Table 3.1) outlines how development and network changes should be categorised in terms of their probability of being delivered according to their status in the planning process.
- 3.1.5 The DfT guidance goes on to state, for example, that developments or network changes categorised (according to Table 4.1) as 'near certain' or 'more than likely' are expected to be included in the 'most likely' forecasting scenario. Outcomes in the 'reasonably foreseeable' category are expected to be excluded from the 'most likely' scenario and no outcomes categorised as 'hypothetical' should be included in the 'most likely' scenario.
- 3.1.6 Uncertainty therefore, relating to network changes or traffic growth, is catered for by examining probability of delivery and this has to be project specific. Both network changes and traffic growth have been examined for this project and are reported later.

3.1.7 Economic parameters used for forecasting similarly have uncertainty attached but in scheme appraisal, where traffic forecasts come into play, cannot be scheme specific and are given as inputs by the DfT. These are also described later.

Table 3.1 Treatment of Uncertainty

Probability of input	Status
Near certain: the outcome will happen or there is a high probability that it will happen.	<ul style="list-style-type: none"> • Intent announced by proponent to regulatory authorities • Approved development proposals • Projects under construction.
More than likely: the outcome is likely to happen but there is some uncertainty.	<ul style="list-style-type: none"> • Submission of planning or consent application imminent • Development application within the consent process
Reasonably foreseeable: the outcome may happen but there is significant uncertainty.	<ul style="list-style-type: none"> • Identified within a development plan • Not directly associated with the transport strategy/scheme, but may occur if the scheme is implemented • Development conditional upon the transport scheme proceeding.
Hypothetical: there is considerable uncertainty whether the outcome will ever happen.	<ul style="list-style-type: none"> • Conjecture based upon currently available information • Discussed on a conceptual basis • One of a number of possible inputs in an initial consultation process.

3.2 Forecast Year Networks

3.2.1 Future Do-Minimum (without the Project) and Do-Something (with the Project) networks are required for the project opening year of 2015 and its design year of 2030. Because of the variable demand nature of the traffic model and the interaction between travel modes, both highway and public transport future networks are required.

3.2.2 It was therefore necessary to consult with local authorities and public transport operators to determine what transport network improvements were being planned and their status within the planning process.

3.2.3 The following local authorities were consulted in order to gather relevant information:

- a. Cheshire County Council
- b. Halton Borough Council
- c. Knowsley Metropolitan Borough Council

- d. Liverpool City Council
- e. St Helens Metropolitan Borough Council
- f. Sefton Metropolitan Borough Council
- g. Warrington Borough Council
- h. Wirral Borough Council

3.2.4 The following regional bodies were also consulted in order to verify information:

- a. North West Regional Assembly
- b. Highways Agency
- c. Government Office North West
- d. North West Development Agency.

3.2.5 Others, including Peel Holdings and Liverpool John Lennon Airport, were also consulted as part of this process. Documents such as the Regional Funding Agreement (RFA) and the draft Regional Spatial Strategy (RSS) have also been reviewed.

3.3 Do-Minimum Highway Network Changes

3.3.1 The Do-Minimum highway network has been created by the addition of 'most likely' transport improvements.

3.3.2 Appendix A presents the 'most likely' transport improvements included within the Do-Minimum highway network for both 2015 and 2030 based on the status accorded to them by the various organisations.

3.4 Do-Minimum Public Transport Network Changes

3.4.1 The definition of the do-minimum public transport schemes has been based upon an examination of the following sources:

- a. Local Transport Plan commitments/investments;
- b. Network Rail 2007 Business Plan;
- c. Network Rail; and
- d. service commitments in the relevant local rail franchises.

3.4.2 The different rail franchises with services operating within the study area of the variable demand model were:

- a. Virgin West Coast (Liverpool-Runcorn-Euston);
- b. East Midlands (Liverpool-Manchester);
- c. West Midlands (Birmingham-Liverpool);
- d. Trans-Pennine Express (Manchester-Liverpool);
- e. Northern Trains (Manchester-Liverpool);
- f. Arriva Trains Wales (Manchester-Runcorn-Chester-Llandudno); and
- g. Merseyrail (Chester/Ellesmere Port-Liverpool).

Rail

- 3.4.3 Future committed plans for rail services are contained in the West Midlands and Virgin West Coast franchise commitments. The former states the following: “two trains an hour all day between Birmingham and Liverpool and Birmingham and Northampton from December 2008 on the completion of the West Coast Main Line modernisation” with both services calling at both Runcorn and Liverpool South Parkway.
- 3.4.4 For the West Coast, as sourced from the West Coast Business Plan of Network Rail, and the DfT West Coast Main Line: Progress Report, the 2009 timetable will include London to Liverpool running around 20 minutes quicker and with extra peak trains. In more detail, the 2009 timetable will bring a significant further acceleration, by comparison with the September 2004 timetable and will dedicate more capacity for the Liverpool and Runcorn markets as the number of intermediate calls on the Liverpool journey will be reduced from five to two, Runcorn and Stafford, with a regular journey time of approximately 2h 8min. Additional calls are planned at Watford Junction and Milton Keynes to serve the morning northbound and evening southbound markets. The other calls currently made will be transferred to the extra services on other routes. Additional trains will run at peak times, increasing the frequency to half-hourly at these peak times of day. These additional trains will serve Nuneaton, Tamworth and Lichfield, giving these stations fast Pendolino trains to and from London.
- 3.4.5 For the East Midlands, the Invitation to Tender included a requirement that the present hourly Liverpool to Norwich service calls at Liverpool South Parkway. It is known that Trans-Pennine Express has aspirations to call at this new station, but no firm commitment has been given to date. It has been assumed that the Liverpool-Norwich service will call at Liverpool South Parkway.
- 3.4.6 Halton fully supports the Merseytravel Major Scheme Bid for the full reopening of the Halton Curve, with Halton proposing a new station at Beechwood. Such a reopening would enable a direct service from North Wales/Chester to Liverpool South Parkway (for the Airport)/Liverpool to run. However, at this stage such a scheme could not be included in the Do-Minimum specification under the ‘most likely’ scenario.
- 3.4.7 Future fares policy can be derived from rail franchise commitments and the High Level Output Statement (HLOS) of July 2007, “Delivering a Sustainable Railway”. From the former source, for the West Midlands franchise the following applies: “As with all franchises, unregulated fares will be the responsibility of the operator. In the West Midlands, London and Birmingham Railway Ltd is expected to increase fares for journeys on the London to Northampton route by 3% above inflation per annum. Average rises on all other routes within the franchise including those in the West Midlands conurbation are expected to be no higher than RPI+1%”.
- 3.4.8 For the East Midlands franchise, regulated fares will rise annually by RPI +1% in line with Government policy, while unregulated fares are expected to increase by an average of RPI + 3.4% per annum.
- 3.4.9 For Virgin West Coast, it is stated that “fares will continue to be set in a manner consistent with current policy”.
- 3.4.10 From the HLOS document it is apparent that the policy is that “Government will continue to limit annual rises of regulated fares in line with national policy, which is currently RPI+1%.” DfT Rail Appraisal Guidance provides instruction to adopt RPI+1% for all fares into the future.

3.4.11 Bus

- 3.4.12 There are no committed plans to change the scale or coverage of the bus network or of the supporting infrastructure contained in Local Transport Plans (LTP). The Halton LTP2 contains commitments to upgrade the current busway and to provide real time information, improve the main bus stations and to work with the operators to improve the quality of buses used. The emerging Sustainable Transport Strategy has begun to define changes to public transport commensurate with the emerging Regeneration Strategy and the relief of Silver Jubilee Bridge (SJB) but currently, for a 'Most Likely' scenario, will have insufficient delivery certainty. No changes to the bus network have been included compared to the 2006 base network.
- 3.4.13 The number of public transport users crossing the River Mersey in Halton is very small in comparison with the number of vehicles crossing the SJB. Even with a doubling of public transport use, the impact on vehicle flows (in terms of mode choice) may be expected to be minimal in scheme appraisal terms (although such a significant increase will be significant in terms of local accessibility and sustainability). Hence, at this stage, it is reasonable, for the purposes of traffic forecasts for scheme appraisal and environmental assessment, to exclude potential public transport improvements from the 'Most Likely' scenario.
- 3.4.14 Due to the commercial freedom enjoyed by bus operators outside London or Passenger Transport Executive (PTE) areas, there is no national guidance over bus fare increases. Based upon advice from DfT the best assumption is that recent trends are carried forward into future years. Reference to Chapter 5 of Transport Statistics Great Britain provided information on the recent trend of bus fares.
- 3.4.15 Focussing upon the two areas of English Metropolitan areas and English other areas, and removing the effects of background price increases using the Retail Prices Index (RPI), shows quite clearly that bus fares have increased by approximately 25% in real terms over and above background inflation in the ten years between 1995 and 2005/6. Taking these figures with the advice from DfT, the best assumption for bus fares in the future is that they will continue to rise at this rate, equivalent to RPI+2.1% per annum when averaged between the two English areas.
- 3.4.16 On the basis of this analysis, it was concluded that rail fares should increase by RPI + 1% and bus fares should increase by RPI+2.1% into the future. Table 3.2 summarises the resulting fares increases from the base year of 2006 to the opening and design years. It is proposed to investigate increased public sector support for bus and rail fares for local services as part of the Mersey Gateway Sustainable Transport study.

Table 3.2 Assumed Increases in future Public Transport Fares

Period	Rail	Bus
2006-2015	9.4%	20.6%
2006-2030	27.0%	64.7%

3.5 Do-Something Highway Network Changes

The Project

3.5.1 The Mersey Gateway Project has been coded into the future 2015 and 2030 Do-Something networks (which also includes the Do-minimum schemes described above). The detailed project components and layouts adopted for the traffic forecasts reflect the Reference Design. The Project includes tolls on the new crossing and the existing SJB

Tolls

3.5.2 For the traffic forecasts used for the environmental assessments tolls have been assumed to increase in line with inflation, i.e. they remain constant in real terms. No adjustment has been applied for any possible increase in proportion of vehicles making use of electronic tags.

3.5.3 The resulting toll levels used in the forecasts, for each of the vehicle types and user classes modelled were:

a. Car Commute High Income	£1.20	
b. Car Commute Medium Income	£1.20	
c. Car Commute Low Income	£1.20	
d. Car Employer's Business	£1.30	i.e. no season ticket discount
e. Car Other High Income	£1.25	
f. Car Other Medium Income	£1.25	
g. Car Other Low Income	£1.25	
h. LGV	£1.30	i.e. no season ticket discount
i. OGV	£4.65	weighted average, i.e. no discount

3.6 Traffic Growth

Development Assumptions

3.6.1 Appendix B presents a schedule of significant proposed development and redevelopment schemes resulting from the consultations described above in 3.2.3. Each entry has been included in the either the 'most likely', the 'optimistic' or the 'pessimistic' scenarios for both 2015 and 2030.

Growth in car trips

3.6.2 To calculate future trips as a result of the proposed new developments, TRICS 2007(b) was used. TRICS is a database system comprising a large number of records containing traffic counts for individual developments across a wide range of land-use categories. TRICS analyses individual or selected sets of survey counts to produce trip rate information.

3.6.3 Within the TRICS database, the following survey sites were used:

- a. Local
- b. East Anglia
- c. East Midlands
- d. West Midlands
- e. Yorkshire & Lincolnshire
- f. North West
- g. North

- 3.6.4 To ensure consistency with data used for the development of the 2006 base model, the surveys used in the TRICS database were those undertaken during weekdays coincident with modelled peak and off peak hours.
- 3.6.5 Surveys selected from the TRICS database were generally dated post 2002. However, in some instances this gave a very small number of surveys from which to generate a trip rate. To generate a greater number of surveys and increase trip rate reliability, surveys were used from 2000 onwards.
- 3.6.6 At a number of sites, where there was more than a single land-use, the data did not always show a breakdown for the different land uses. Therefore an equal split between the different land uses was generally assumed. In some cases, the area of, for example, a hotel or car show room was estimated from previous survey data in TRICS.
- 3.6.7 For this analysis it was assumed that all development trips were car trips, except for warehousing and industrial developments, where 80% of trips were assumed to be OGV movements.

TEMPRO Growth Factors

- 3.6.8 To ensure consistency between local growth assumptions (based on changes in land use) and national assumptions, the DfT expect transport forecasts to adopt TEMPRO national projections for socio-economic and demographic growth. Adopting TEMPRO forecasts ensures that population, employment and trip making are controlled to local, regional and national levels. Table 3.3 presents a summary of the TEMPRO v5.3 planning assumptions relevant to the model study area.
- 3.6.9 Table 3.4 presents the resulting car driver trip growth projections based on the local, regional and national economic growth and demographic changes embodied within Table 3.3. The overall growth adopted for traffic forecasts for the Mersey Gateway project has been controlled to these figures although the detailed zonal growth (within the variable demand traffic model) will be based on the 'Most Likely' development assumptions contained within Appendix B and content of Table 3.2.

Table 3.3 Planning Assumptions from TEMPRO

Authority	Population			Employment		
	2006	2015	2030	2006	2015	2030
Halton	118,394	119,816	118,980	61,317	64,082	67,608
Knowsley	149,493	148,126	144,150	60,145	59,424	59,428
Liverpool	435,494	443,237	442,041	199,741	198,218	198,944
Sefton	385,579	379,632	376,257	136,092	134,471	134,900
St. Helens	175,231	167,769	161,881	62,699	60,759	60,786
Warrington	366,865	369,006	374,394	238,876	249,215	263,078
Wirral	306,862	303,731	305,165	96,625	95,452	95,720

Table 3.4 Forecast Car Driver Trip Growth

Authority	Car Trip Growth 2006 to 2015	Car Trip Growth 2006 to 2030
Halton	7.6%	13.8%
Knowsley	6.6%	11.9%
Liverpool	8.6%	16.8%
Sefton	4.8%	9.9%
St. Helens	4.9%	8.3%
Warrington	6.4%	12.8%
Wirral	4.2%	9.4%
North West Region average	6.2%	14.4%

3.6.10 Table 3.5 presents forecast changes in car vehicle occupancy. These changes are based on the observed car occupancy derived from the RSI survey database and the future trends set out in WebTag.

Table 3.5 Projected Changes in Car Occupancy

Trip Purpose	Car Occupancies		
	2006	2015	2030
Car Commute	1.2772	1.2628	1.2405
Car Other	1.6119	1.5802	1.5309
Car Employers Business	1.3016	1.2898	1.2713

Growth in public transport trips

3.6.11 TEMPRO V5.3 has also been used to generate growth in future public transport trips, as summarised in Table 3.6.

Table 3.6 Forecast Public Transport Trip Growth

Authority	Bus Trip Growth 2006 to 2015	Rail Trip Growth 2006 to 2015	Bus Trip Growth 2006 to 2030	Rail Trip Growth 2006 to 2030
Halton	-4.9%	-1.8%	-10.9%	-4.1%
Knowsley	-6.2%	-2.5%	-15.2%	-10.5%
Liverpool	-3.8%	-1.5%	-12.0%	-8.1%
Sefton	-6.6%	-3.6%	-15.0%	-9.4%
St. Helens	-8.8%	-5.3%	-21.4%	-2.5%
Warrington	-5.3%	-0.8%	-11.6%	-3.9%
Wirral	-6.4%	-3.7%	-14.4%	-9.1%
North West Region average	-4.1%	-0.8%	-10.2%	-3.7%

Growth in Light Goods Vehicle Trips

3.6.12 National Road Traffic Forecasts 1997 (NRTF 1997) were used to generate growth in Light Goods Vehicle Trips. The growth, given in Table 3.7, was applied globally to base year network demand.

Table 3.7 Forecast Light Goods Vehicle Trip Growth

Reference Years	% LGV Growth
2006 to 2015	21.9%

Growth in Other Goods Vehicle Trips

3.6.13 National Road Traffic Forecasts 1997 (NRTF97) were used to generate the growth in Other Goods Vehicle (OGV) Trips. NRTF gives growth figures separately for rigid and articulated goods vehicles. To derive a figure for overall OGV growth, a split of rigid goods vehicles and articulated goods vehicles had to be calculated.

3.6.14 Using detailed classified count data for 2007 at the Silver Jubilee Bridge, the split was calculated to be 48.2% rigid goods vehicles and 51.8% articulated goods vehicles. The resulting growth for the central forecasts is given in Table 3.8. As with Light Goods Vehicles, this growth was applied globally to base year network demand.

Table 3.8 Forecast Other Goods Vehicle Trip Growth

Reference Years	% Rigid Growth from NRTF	% Artic Growth from NRTF	% Overall OGV Growth Applied
2006 to 2015	7.9%	24.6%	16.6%
2006 to 2030	24.7%	75.0%	50.8%

3.7 Most Likely Traffic Forecasts

Overview

3.7.1 This section presents the resulting Variable Demand Modelling (VDM) forecasts assigned to the Mersey Gateway scheme, with tolls applied to both the Mersey Gateway and SJB.

3.7.2 The following runs have been carried out:

- a. VDM forecasts for each time period for the Do-Minimum for 2015 and 2030.
- b. VDM forecasts for each time period for the Do-Something (with tolls on both SJB and Mersey Gateway) for 2015 and 2030.

3.7.3 These runs incorporate the combined impacts of expected traffic growth and tolling.

3.7.4 The 2015 and 2030 forecasts are based on the development projects, infrastructure schemes, tolls and growth forecasts described above.

3.7.5 Traffic forecasts were produced for each modelled time period and combined, based on an analysis of annual traffic flow profiles, to produce 24hr Annual Average Weekday Traffic (AADT) forecasts (for Air Quality analysis) or 18 hour AAWT forecasts (for Noise analysis).

- 3.7.6 Forecast traffic information was made available, as required, for each of the environmental assessments. These specific data sets are described later following a brief presentation of selected traffic forecast information to give an overview of traffic growth across the study area.

Traffic Flows across the River Mersey

- 3.7.7 Table 3.9 presents comparisons of the assigned traffic flows across the River Mersey for the 2015 Do-Minimum compared to the 2006 base year for each model time period and for the 24 hour AAWT respectively. Tables 3.10 then presents corresponding comparisons for the 2030 Do-Minimum, also compared to the 2006 base year.

Table 3.9 Comparison of 2006 Base Year and 2015 Do-Minimum Traffic Flows across the River Mersey – 24 Hour 2-way AAWT (thousands)

Link Description	2006 Base Year Model Traffic Flow				2015 Do-Minimum Traffic Flow				% Diff
	Car	LGV	OGV	Total	Car	LGV	OGV	Total	
Kingsway Tunnel	33	4.3	4.4	41	43	5.4	5.0	54	32%
Queensway Tunnel	32	4.1	0.0	36	37	4.8	0.0	42	17%
Silver Jubilee Bridge	69	8.9	5.9	84	77	10	6.8	94	12%
Warrington	59	4.9	5.1	69	65	5.9	5.4	77	12%
M6 Thelwall Viaduct	119	18	27	164	135	22	32	188	15%
Total	313	40	43	394	358	48	49	455	15%

Table 3.10 Comparison of 2006 Base Year and 2030 Do-Minimum Traffic Flows across the River Mersey – 24 Hour 2-way AAWT (thousands)

Link Description	2006 Base Year Model Traffic Flow				2030 Do-Minimum Traffic Flow				% Diff
	Car	LGV	OGV	Total	Car	LGV	OGV	Total	
Kingsway Tunnel	33	4.3	4.4	41	50	7.5	6.4	64	56%
Queensway Tunnel	32	4.1	0.0	36	41	6.0	0.0	47	31%
Silver Jubilee Bridge	69	8.9	5.9	84	75	13	8.2	97	15%
Warrington	59	4.9	5.1	69	67	7.8	6.3	81	17%
M6 Thelwall Viaduct	119	18	27	164	128	28	40	195	19%
Total	313	40	43	394	360	62	61	484	23%

- 3.7.8 The following key conclusions can be drawn from these model results:

- a. Traffic across the SJB in 2015 is forecast to increase by over 12% in the Do-Minimum situation over a 24 hour weekday period, broadly in line with overall traffic growth .

- b. Traffic across the SJB in 2030 is only forecast to increase by a further 3% over 2015 in the Do-Minimum situation; this is significantly lower than the overall traffic growth and reflects the increasing level of constraint as network capacity is exceeded by demand.

3.7.9 Tables 3.11 and 3.12 present forecast traffic flow information which compares the Do-Minimum with the Do-Something at 2015 and 2030. The following key conclusions can be drawn from the model results referred to in those two tables:

Table 3.11 Comparison of 2015 Do-Minimum and Do-Something Traffic Flows across the River Mersey – 24 Hour 2-way AAWT (thousands)

Link Description	2015 Do-Minimum Traffic Flow				2015 Do-Something Traffic Flow				% Diff
	Car	LGV	OGV	Total	Car	LGV	OGV	Total	
Kingsway Tunnel	43	5.4	5.0	54	44	5.3	5.1	55	2%
Queensway Tunnel	37	4.8	0	42	39	4.7	0.0	44	5%
Silver Jubilee Bridge	77	10	6.8	94	7.6	3.0	2.2	13	-86%
Mersey Gateway	0.0	0.0	0.0	0.0	48	8.0	4.8	61	-
Warrington	65	5.9	5.4	77	69	5.6	5.2	80	4%
M6 Thelwall Viaduct	135	22	32	188	137	22	32	191	2%
Total	358	48	49	455	345	48	49	444	-2%

Table 3.12 Comparison of 2030 Do-Minimum and Do-Something Traffic Flows across the River Mersey – 24 Hour 2-way AAWT (thousands)

Link Description	2030 Do-Minimum Traffic Flow				2030 Do-Something Traffic Flow				% Diff
	Car	LGV	OGV	Total	Car	LGV	OGV	Total	
Kingsway Tunnel	50	7.5	6.4	64	51	7.3	6.3	65	2%
Queensway Tunnel	41	6.0	0.0	47	41	6.0	0.0	47	0%
Silver Jubilee Bridge	75	13	8.2	97	9.5	4.1	2.7	16	-84%
Mersey Gateway	0.0	0.0	0.0	0.0	60	11	6.6	78	-
Warrington	67	7.8	6.3	81	70	7.4	6.2	84	4%
M6 Thelwall Viaduct	128	28	40	195	130	28	40	197	1%
Total	360	62	61	484	362	64	61	487	1%

- a. In 2015, traffic across the SJB is expected to reduce by 86% as compared to the corresponding Do-Minimum, as a result of the combined effect of construction of the Mersey Gateway scheme and the introduction of tolls on both crossings. The daily traffic (AAWT) traffic across the River Mersey for the SJB+MG combined is reduced by 22% in comparison with the Do-Minimum, and this is 12% lower than in 2006;

- b. In 2030, traffic across the SJB is also expected to reduce by 83% as compared to the corresponding Do-Minimum, as a result of the combined effect of construction of the Mersey Gateway and the introduction of tolls on both crossings. Overall 24 hour AAWT across the River Mersey for the SJB+MG combined is reduced by 3% in comparison with the Do-Minimum. The gap between Do Something and Do Minimum is expected to reduce over time as congestion increases on alternative toll free routes and sensitivity to tolls decreases;
- c. In 2030, forecast traffic flows amount to almost 78,000 vehicles per weekday across the MG and over 16,000 vehicles per weekday across the SJB; a total of 94,000 vehicle per weekday crossing the Mersey in Halton; this compares with almost 84,000 vehicles per weekday across the SJB in 2006. The forecasts show that tolls suppress traffic levels to ensure that congestion does not reoccur in Halton in the foreseeable future; and
- d. In 2015, traffic flows across the River Mersey in Halton as a whole are expected to decrease by 3% as a result of the Mersey Gateway scheme, with this decrease spread over all time periods except PM peak, where flows increase slightly by 0.7%. This can be explained by the increase in overall generalised cost as a result of the toll. However in 2030, the corresponding net increase amounts to only 0.7% and this is concentrated in the peak periods; during the off peak periods traffic flows are forecast to reduce after introduction of the Mersey Gateway scheme. This appears to reflect the impact of congestion on the wider highway network such that additional traffic cannot reach the River Mersey crossings during peak periods.

4. USE OF FORECASTS

4.1 Noise

4.1.1 The Noise assessment required 18-hour forecast traffic data for the 'Most Likely' forecast. Specific data requirements included:

- a. Annual Average Weekday Traffic (AAWT) for all links within the variable traffic model network
- b. Percentage of Other Goods Vehicles (OGVs) exceeding 1525kg unladen weight
- c. Unique node and link identification including link description, i.e. dual 2-lane carriageway

4.1.2 Data were required for the following years:

- a. Base year 2006
- b. Do-Minimum 2015 and 2030
- c. Do-Something 2015 and 2030

4.1.3 The data were supplied in spreadsheet (Excel) format and Mapinfo format.

4.2 Air

4.2.1 The Air Quality assessment required 24-hour forecast data for the 'Most Likely' forecast. Specific data requirements included:

- a. Identification of the area of influence of the project based on links showing a +/- 10% change in traffic flows (+/- 5% for motorways) for Annual Average Daily Traffic (AADT).
- b. Average AADT speeds
- c. One-way and two-way link flows
- d. Traffic flows disaggregated by vehicle type as shown in Table 4.13 below

Class 1	Class 2	Class 3
Cars diesel	Car	LDVs
Cars petrol		
Taxis	Can be treated as a separate class	
LGV diesel	LGV	
LGV petrol		
Motorcycle/mopeds	Can be treated as a separate class	
Buses/coaches	Also called PSV (Public Service Vehicles)	HDVs
Rigid_2_axle	HGVs Rigid	
Rigid_3_axle		
Rigid_4_axle		
Artic_3_4_axle	HGVs Artic	
Artic_5_axle		
Artic_6_axle		

4.2.2 Data were required for the following years:

- a. Base year 2006
- b. Do-Minimum 2015 and 2030
- c. Do-Minimum 2015 and 2030

4.2.3 The data were supplied in spreadsheet (Excel) format and Mapinfo format.

4.3 Transport Assessment

The Transport Assessment required data from the 'most likely' forecast scenario and from a wide range of other sources. Specific data requirements included:

- Forecast changes on the highway network (+/- 5%, 10%, 30%)
- Journey time data
- Forecast traffic flows on specific links in am and pm peak periods

Data were required for the following years:

- Base year 2006
- 2015 Do-Minimum and Do-Something
- 2030 Do-Minimum and Do-Something

Appendix A - Schedule of Do-Minimum Infrastructure Schemes

Development	Summary	Location	Access/ Infrastructure changes	Quantification in 2015			Quantification in 2030		
				Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Atlantic Gateway SIA	Phase 5 and 6 - dualling of carriage way between Great Howard Street junction and previously widened section near Blackstone street. Phase 6 is from Millers Bridge to north of Bankfield Street	Liverpool	Dual carriageway sections of A565	✓	✓	✓	✓	✓	✓
M62 junction 6	Improvements to the Tarbock interchange, junction 6 M62. Awaiting decision from Public Inquiry. *Permission given February 2007, expected completion date 2009*	Knowsley	Two new link roads connecting M57 and M62.	✓	✓	✓	✓	✓	✓
Switch Island link	Link between Switch Island and the A565 bypassing the communities of Netherton and Thornton at Thornton. Not yet in RFA programme.	Sefton	Proposals for a new single carriageway road link between the Switch Island junction (where the M57, M58, A5036 and A59 meet) and the A565 at Thornton.	✓	✓	✓	✓	✓	✓
Port access at Seaforth -	Not yet in RFA programme.	Sefton	Improvements to the A5036(T). Details still to be obtained.						
Eastern Approaches SIA	Edge Lane - measures to widen and improve Edge Lane corridor for cyclists and pedestrians. In RFA for funding in next 3 years.	Liverpool	Improvements within the boundaries of existing highway and widening at Edge Lane West. Re-	✓	✓	✓	✓	✓	✓

Development	Summary	Location	Access/ Infrastructure changes	Quantification in 2015			Quantification in 2030		
				Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Hall Lane Strategic Gateway	Hall Lane, major gateway to the City Centre and a key link road from the M62. Planning a scheme to improve access and reduce the delays to the City Centre. In RFA for funding in next 3 years.	Liverpool	landscaping central reservation, new kerbs, new street lighting etc. Widening to dual carriage way at Edge Lane West Detailed layout and signal staging provided.	✓	✓	✓	✓	✓	✓
A58 Blackbrook Diversion	This scheme consists of a new single carriageway road centred on West End Road (A58),.In RFA for funding in next 3 years.	St Helens	This scheme consists of 1.1 km of new single carriageway road centred on West End Road (A58), It will also include an improved junction to the A580 (T) and environmental treatment of West End Road.	✓	✓	✓	✓	✓	✓
A556 Improvements	Convert to 2 lane dual carriage way M6 to M56 along existing route. Public consultation due late 2007. Not yet in RFA programme.	Cheshire		✓	✓	x	✓	✓	✓
M6 widening	Widening to 4 lanes between junctions 11 and 19	Cheshire/ Staffs		Outside model area					

Development	Summary	Location	Access/ Infrastructure changes	Quantification in 2015			Quantification in 2030		
				Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
M6 Junction 21a improvements to Croft Interchange,	Short term improvements for the purpose of demand management	Warrington		✓	✓	✓	✓	✓	✓
Bidston Moss viaduct improvements	Major strengthening works, complete by 2011. Not yet in RFA programme.	Wirral		✓	✓	✓	✓	✓	✓
M6 Junction 22 southbound, Newton-le-Willows	Ramp metering		Started 19 June	✓	✓	✓	✓	✓	✓
M6 junction 25 southbound, Bryn	Ramp metering	Greater Manchester	Started 19 June	✓	✓	✓	✓	✓	✓
M62 junction 11 eastbound, Risley	Ramp metering		Started 19 June	✓	✓	✓	✓	✓	✓
M6 junction 23 southbound, Haydock	Ramp metering		Started 26 June	✓	✓	✓	✓	✓	✓
M6 junction 22 northbound, Newton-le-Willows	Ramp metering		Started 26 June	✓	✓	✓	✓	✓	✓
M6 junction 24 northbound, Ashton in Makerfield	Ramp metering		Started 26 June	✓	✓	✓	✓	✓	✓
M6 junction 23 northbound, Haydock	Ramp metering		Started 3 July	✓	✓	✓	✓	✓	✓

Development	Summary	Location	Access/ Infrastructure changes	Quantification in 2015			Quantification in 2030		
				Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
M6 junction 18 northbound, Middlewich	Ramp metering		Started 3 July	✓	✓	✓	✓	✓	✓
M62 junction 19 eastbound, Heywood	Ramp metering	Greater Manchester	Started 3 July	✓	✓	✓	✓	✓	✓
Halton Curve	Re-open for regular local stopping passenger services between Liverpool and Chester/North Wales. Included in the RSS and LTP, but not high priority. Expected to form part of a TIF bid.	Widnes/Runcorn	Unknown	x	x	x	x	x	✓

Appendix B - Schedule of Planned Developments

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Ditton Strategic Rail Freight Park	10,000m ² of distribution warehousing	114	Widnes	B8	Connecting freight park to A5300 at southern end, developing a road system to connect to main sites within the freight park.	✓	✓	×	✓ total of 400,000m ² of rail served buildings	✓ furt 25,000m ² B8 on Greenfield land.	×
Halebank Regeneration Area	Housing on former Asda site, planning permission granted for 200 units. Further housing development planned on Golden Triangle site and in the north-west of the regeneration area.	107	Widnes	C3	Unknown	200 residential units on Asda site, further 200 on Golden Triangle and other site	200 residential units on Asda site	200 residential units on Asda site	200 residential units on Asda site, further 200 on Golden Triangle and other site	200 residential units on Asda site, further 200 on Golden Triangle and other site	200 residential units on Asda site

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Widnes Waterfront Economic development zone	Land off Earle Road (Venture Fields), 110 bed hotel with 100 car parking spaces, 1,213 square metre cinema, 4,859 square metre ice rink and laser facility, 815m ² climbing wall 5,874m ² bowling and bingo facility, A3 retail of 557m ² , 650 square metre family pub. Also B2/B8 uses of 1,634 m ² . Due to begin immediately permissions are in place.	150/1 52	Widnes	B1, D2, A1, A3, C1	Junction improvement at Earle Road/Ashley Way/Fiddlers Ferry Road junction. Land reserved for new boulevard route.	✓	✓ 50% complete	x	✓	✓	x
	East of Tan House Lane.	150/1 52	Widnes	B2, B8			✓				

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	B2/B8 use of 1,634m ² . Due to begin immediately permissions are in place.										
Daresbury Business Park	49,000m ² Business Park	73	Runcorn	B1			✓				
Manor Park	30,000m ² storage/distribution, 5,000m ² Industrial	62	Runcorn	B2, B8			✓				
The Heath	Former ICI headquarters, now a business and technology park. Outline planning permission granted for 17,350 square metres expansion for business uses.	59	Runcorn	B1			✓				

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Approach 580 SIA	New district centre at Stonebridge Cross - retail (27,000 square metres), residential (300 units), community facilities.	450	Liverpool	A1, C3, D1			✓				
	Stonebridge business park. 10,000m ² Business Park, 10,000m ² Industrial Estate, 13,400m ² storage/distribution	447	Liverpool	B1, B2	Improvements within the boundaries of existing highway and widening at Edge Lane West. Re-landscaping central reservation, new kerbs, new street lighting etc. Widening to dual carriage way at Edge Lane West		✓				

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	Liverpool Science Park (Edge Lane) - 67 hectare site, already substantially developed. Existing Wavertree Technology Park allocated for B1, B2, B8 in the adopted UDP, and the former MTL site allocated for B1 and B2. Outline planning permission for B1 and B2 uses covering the former Marconi site, former MTL site and part of Wavertree Technology Park given in March 2005.	370	Liverpool			✓ 25% increase in employment	✓ Assume 10% increase in employ ment	x			x

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Estuary Business Park	40,500m ² Business Park, 24,000m ² Warehousing	409	Liverpool	B1, B8			.	.			.
Speke/Halewood SIA	Blue Lands/Wings Leisure Park - leisure facilities	494	Liverpool	D2		8,000m ²	8,000 m ²				
	Edwards Lane - residential	118	Liverpool	C3		148 residential units	148 residential units				
	Blue Lands South - light industrial, hotel, distribution, car showroom, day nursery	407	Liverpool	B1c, C1, B8, B2, A1, D1		22,000m ² , 100 room hotel	22,000m ² , 100 room hotel				
	Redrow Cressington Heath - high and low density housing	403	Liverpool	C3		66 residential units	66 residential units				

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	Evans Road (Venturepoint) - office, light industrial, industrial and distribution development	118	Liverpool	B1a, B1c, B2, B8		11,686 square metres	11,686 square metres				
	Dunlop Playing Fields - office and light industrial, distribution, hotel development	494	Liverpool	B1, B8, C1		30,100m ²	30,100m ²				
	Glaxo - office and light industrial and industrial development	406	Liverpool	B1, B2		8,800 square metres	8,800 square metres				

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Paradise Street	New mixed development , under construction due for completion in 2008. Retail 145,000m ² and additional 39500m ² for 2 department stores. Leisure 21500m ² . Redidential 600 units, 2100 new car parking spaces, 2 hotels with 377 rooms.	361	Liverpool	A1, D2, C3, C1							

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Kings Dock	Multi-use arena under construction, capacity of 15,000, 1350 seat conference centre, 18,000m ² of office space, 9,000m ² of new retail and leisure space, 3,500 car parking spaces, up to 1,800 residential units. Construction underway, arena and conference centre due to open 2008.	376	Liverpool								
G Park (formerly Axis)	10,000m ² Business Park, 55,000m ² Warehousing	447	Liverpool								

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Knowsley Industrial Park	32,000m ² Industrial Estate, 85,000m ² Warehousing	449	Knowsley	B2, B8							
Knowsley Business Park	24,000m ² Business park	452	Knowsley	B1							
Kings Business Park	Located within Huyton/Prescot SIA. Approx. 3 hectares of 20 hectares remaining undeveloped. Allocated as a strategic employment site in adopted UDP. Already substantially developed site.	455	Knowsley	B1							

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Prescott Business Park (Former BICC site)	8,792m ² Business Park, 9,280m ² Industrial Estate	458	Knowsley	B1 & B2							
North Huyton Action Area	1,200 residential units, net increase of 400 units	453	Knowsley	C3		✓	✓	*	✓	✓	*
Port of Liverpool Post-Panamax terminal	Capability to accommodate post-Panamax container ships. Investment of £90-100 million, awaiting decision of Public Inquiry. Likely to generate an extra 10,000 HGV movements per week by 2030	489	Sefton	B2, B8		16 million tonnes p.a.	10 million tonnes p.a.?	*	45 million t.p.a.	30 million t.p.a.	15 million t.p.a.

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Port of Liverpool - new warehousing	Likely investment in 100,000 m ² of warehousing	316	Sefton	B8		35,000	20,000	0	100,000	65000	30000
Liverpool John Lennon Airport - terminal extension	Increase in terminal floor space of 73,000 square metres including a new public transport interchange. Planning permission	409	Liverpool				✓	.			
Liverpool John Lennon Airport - eastern access road	from A562 to airport	409	Liverpool/ Knowsley			✓	✓	x	✓	✓	✓
Woodside	Master plan being prepared for a small business park and possibly up to 500 residential units	283	Wirral	B1, C3		✓	✓	x	✓	✓	✓

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Wirral International Business Park	28,800m ² Business Park, 30,000m ² Industrial Estate, 40,000m ² Storage/distribution	308	Wirral	B1, B2, B8							
Wirral Waters - Birkenhead Docks.	High density redevelopment of Birkenhead docks, but fairly modest delivery rate. Twelve Quays (SIA) remain in operation as a Ro-Ro facility. East Float and Victoria Dock will be the site of 15,000 residential units and office space for 27,000 jobs. South of	A1 - 277, B1, C3 - 274, 275, 282, 283	Wirral	A1, B1, C3		2,000 residential, 10,000 square metres office/retail	half Peel's estimate - 1,000 residential, 5,000 square metres office/retail	*	10,000 residential, 50,000 square metres office/retail	7,500 residential, 25,000 square metres office/retail	*

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	Birkenhead dock will be a 30,000 square metres of business use development. Bidston Moss will be the site of retail development of 20,000 square metres, comparable to the Trafford Centre in Greater Manchester.										
Vulcan Works Urban Village	650 residential units, Public Inquiry January 2007	475	St Helens			✓	✓ 50%	x	✓	50%	x
Worsley Brow Urban Village	1200 residential units, waiting for the result of Public Inquiry	469	St Helens			✓	✓ 50%	x	✓	50%	x

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Lea Green Urban Village	Planning permission granted for 550 residential units, very likely to be completed by 2015	462	St Helens				✓				
St Helens town centre	Replacement of retail units, 1000 residential units, new railway station. Underway currently	468	St Helens	A1, C3, D2		✓	✓	x	✓	✓	
Cowley Hill	Cowley Hill planning application for 200 residential units and 500,000 square metres at Pilkington-owned site	464	St Helens	C3, B1		✓	✓	x	✓	✓	✓
						200 residential units	200 residential units		B1 100%	B1 50%	B1 0%

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	Pilkington surplus land, 10,300m ² Business park, 12,200m ² Storage/distribution	464	St Helens	B1, B8			✓			✓	
Parkside Former Colliery	660,000m ² Storage/distribution	273	St Helens	B8			✓			✓	
Mere Grange	29,600m ² Business Park	462	St Helens	B1			✓			✓	
North Road / Pioneer Business Park	32,388m ² Business park	428	Ellesmere Port & Neston	B1			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Omega - employment site	297,289m ² business park/148,500 square metres industrial and distribution space, 130,000 square metres office development . HA unsupportive of further phases. Development led by English Partnerships . Business Park Development at zone 499. Industrial Estate at zone 500.	499 & 500	Warrington	B1		✓	✓	✓	No further development - lack of support from HA		

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Birchwood Park	Birchwood Park Parcel 7 - 52,721m ² gfa Business park/Industrial estate.	271	Warrington	B1 & B2			✓			✓	
	Birchwood Park - Parcel 3, Powell Avenue - 12,668m ² gfa business park/industrial estate	271	Warrington	B1			✓			✓	
	Birchwood Park - Parcel 2, Cavendish Avenue - 4,517m ² gfa Business park/Industrial estate	271	Warrington				✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	Birchwood Park (Site 1) Buildings 107,108, Dalton Avenue - 3,762m ² gfa Business park/Industrial estate	271	Warrington				✓			✓	
	Birchwood Park - Parcel 3, Powell Avenue 2,592 m ² gfa Business park/Industrial estate	271	Warrington				✓			✓	
	Birchwood Corporate 3.75 site area ha	253	Warrington	B1			✓			✓	
	Birchwood Corporate (Expansion Zone) 1.73 site area ha	253	Warrington	B1			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Gemini	Gemini 16.1, Gemini Business Park, Warrington 5,853m ² gfa business park	259	Warrington	B1			✓			✓	
	Gemini 16 - 7.6 site area ha	259	Warrington	B1			✓			✓	
	Gemini 14c - 1.24 site area ha. Part of temp M&S Overspill Car Park	259	Warrington	B1, B2, B8			✓			✓	
Gateway 49	(formerly Kerfoot Business Park / Record Business Park), Kerfoot Street - 10,796m ² gfa. Business Park/Storage /distribution	235	Warrington	B1 & B8			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
New World Ltd,	New World House, Thelwall Lane, Warrington - 10,227m ² gfa. Mixed use inc 50 dwellings.	229	Warrington	mixed use inc C3			✓			✓	
Warrington Collegiate	Winwick Road Campus, Winwick Road - 8,965m ² gfa. Pub/Restaurant with 78 bed budget hotel with parking	234	Warrington	A3, C1			✓			✓	
Sterile Technologies (UK) Clinical Waste Treatment Centre	5,718 m ² gfa industrial use. Healthcare waste treatment & recycling centre (Steam cleaning).	235	Warrington	B2			✓			✓	
Juniper Lane	5,089m ² gfa Business park	251	Warrington	B1			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Blocks 6 - 10, Mandarin Court (Phase 2), Centre Park	4,831m2 gfa business park	211	Warrington	B1			✓			✓	
Stanford House, Garrett Field, Birchwood Science Park South	4,692m2 gfa business park. Proposed demolition of existing office block & replacement with 4 no. office blocks. Superseded by Carphone Warehouse taking existing unit	271	Warrington	B1			✓			✓	
Land east of Latchford Locks	3,714 gfa m ² storage/distribution	229	Warrington	B8			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Fiddlers Ferry Power Station, Ash Processing Plant, Widnes Road	3,600m ² gfa Industrial use	187	Warrington	B2			✓			✓	
Business Homes (Phase 2 & 3), Birchwood One, Dewhu	3,397m ² gfa Business park. 10 No. small 2 storey B1 business units	271	Warrington	B1			✓			✓	
Imco Recycling (UK) Ltd - Aluminium Recycling Cent	3,340m ² gfa Industrial use. Specialist plant to process aluminium bearing drosses & aluminium scrap from adjacent British Alcan facility	229	Warrington	B2			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Burtonwood Brewery, Bold Lane	3,327m ² gfa Storage/distribution. Warehouse for product & bottle storage	273	Warrington	B8			✓			✓	
WRDC Site 26, behind Spencer House, Birchwood Cent	2,601m ² gfa Storage/distribution. Proposed 2 storey office block	271	Warrington	B1			✓			✓	
Fiddlers Ferry Power Station Biomass Store	2,500m ² gfa storage/distribution	187	Warrington	B8			✓			✓	
Trident Industrial Estate, Daten Avenue, Risley	2,200m ² gfa business park/industrial/storage/distribution	271	Warrington	B1, B2, B8			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Park Royal International Hotel, Stretton Road, Stretton	1,922m ² gfa. Redevelopment of 2 pairs of semi-detached house with extension to hotel to provide 43 additional bedrooms	266	Warrington	C1			✓			✓	
Next Warehouse (Phase 1)	1,512m ² gfa warehousing	259	Warrington	B8			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Capitol Park	6.03 site area ha - New Town employment development site. Section 7.1 permissions (general employment), Section 7.2 (Truck Stop). Former household waste site	257	Warrington	B1, B2, B8			✓			✓	
Behind former Lever's Distribution / Excel Logistics	1.71 ha site area, 5,750 m ² gfa	267	Warrington	B8			✓			✓	
Warrington Central Trading Estate, Bewsey Road, Warrington	1.4 ha site area	220	Warrington	B1, B2 & B8			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Eddie Stobart (prev. TNT/Shell National Distribution)	0.96 ha site area	251	Warrington	B1, B2, B8		✓			✓		
Sites F, G1 and G2 Trident Industrial Estate, Daten Avenue	0.41 site ha business/industrial/storage/distribution	271	Warrington	B1, B2, B8		✓			✓		
(behind Asics / HT Electrical), Europa Boulevard	0.4 ha site area	259	Warrington	B1, B2, B8		✓			✓		
Golden Square	30,424m ² gfa extension to golden square shopping centre	200	Warrington	A1		✓			✓		
Farrell Street South	550 units outstanding	207	Warrington	C3		✓			✓		
Howley Quay, Howley Lane	82 units outstanding	207	Warrington	C3		✓			✓		
Land off Howley Lane	80 units outstanding	207	Warrington	C3		✓			✓		

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Edwards Cheshire, Navigation Street	77 units outstanding	207	Warrington	C3			✓			✓	
Former Tinsley Wire Works, Dalton Bank	2 units under construction + 81 units outstanding Total = 83	207	Warrington	C3			✓			✓	
John St/Winwick St	284 units outstanding	208	Warrington	C3			✓			✓	
Cheshire Lines Warehouse	222 units outstanding	208	Warrington	C3			✓			✓	
Winwick Bridge, Winwick Street / Bewsey Street	Mixed use including 613 apartments. Inquiry Feb 2007	208	Warrington	C3			✓			✓	
Saxon Park Off Forest Way, WA5 1DF	38 units under construction + 227 units outstanding Total = 265	210	Warrington	C3			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Site at junction of Wilderspool Causeway/ Gainsborough Road	108 units outstanding	212	Warrington	C3			✓			✓	
J&G Greenall's Distillery, Loushers Lane	2006/08117 - Outline application - App withdrawn. resubmission imminent 250 units	213	Warrington	C3			✓			✓	
Beers Timber & Building, Station Road	110 units outstanding	214	Warrington	C3			✓			✓	
Cantilever Garden Centre, Latchford East	54 under construction	214	Warrington	C3			.			✓	
Kingsway South / Grange Avenue, Latchford	65 units under construction	215	Warrington	C3			.			✓	
Cardinal Newman High School	110 units outstanding	216	Warrington	C3			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Land at Former Carrington Wire works and site of Mayne coaches, Battersby Lane	569 units outstanding	218	Warrington	C3			✓			✓	
Warrington Central Trading Estate, Bewsey Road	123 units outstanding	220	Warrington	C3			✓			✓	
Marsden Vanplan Ltd, Longshaw Street	100 units outstanding	221	Warrington	C3			✓			✓	
Former Britannia Wire Works, Bewsey Road, Bewsey	17 units under construction + 287 units outstanding Total = 304	221	Warrington	C3			✓			✓	
George Howard Scrap Yard Ltd, 94 Folly Lane	152 units outstanding	221	Warrington	C3			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Thelwall Lane, Latchford	122 units outstanding	228	Warrington	C3			✓			✓	
New World Ltd, New World House, Thelwall Lane	450 units outstanding	229	Warrington	C3			✓			✓	
Chapelford Urban Village	Remainder - 1,014 units outstanding	238	Warrington	C3			✓			✓	
	(Phase 4) - 11 units under construction + 102 units remaining = 113	238	Warrington	C3			✓			✓	
	Harvard Grange (Phase 3) - 6 units under construction + 70 units outstanding = 76	238	Warrington	C3			✓			✓	
	North Square - 146 units outstanding	239	Warrington	C4			✓			✓	
	Chandler	260	Warrington	C3			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	Place (Parcel 2) Chapelford Urban Village, Whittle Hall - 17 units under construction + 41 units outstanding = 58										
Phase 4, Washington Drive	188 units outstanding	240	Warrington	C3			✓			✓	
GH Grappenhall Heys (Remainder)	573 units outstanding	239	Warrington	C3			✓			✓	
KW8 N (Tourney Green North), Kingswood	90 units outstanding	260	Warrington	C3			✓			✓	
PG11/14 Stretton Road / Pewterspear Green Road	148 units outstanding	266	Warrington	C3			✓			✓	
PG13 Pewterspear Green Road	66 units outstanding	266	Warrington	C3			✓			✓	
AC Appleton Cross	400 units outstanding	267	Warrington	C3			✓			✓	

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
Land at Oughtrington Lane / Longbutt Lane, Lymm	214 units outstanding	269	Warrington	C3			✓			✓	
Hubert Jones Tankworks Site, Birchbrook Road, Heatley	38 units under construction + 150 units outstanding Total = 188	269	Warrington	C3			✓			✓	
Anson Close / Blenheim Close, Blackbrook, Poulton North	88 units under construction + 45 units outstanding Total = 133	495	Warrington	C3			✓			✓	
Cables Park	400 residential units near to retail park	458	Knowsley	C3		✓	x	x	✓	✓	x
Port of Liverpool - central docks redevelopment	Likely to be comparable investment as Wirral Waters - £4-5 billion mixed residential and leisure development	341 Princess Dock	Liverpool	Mixed leisure and residential - A3, A4, C1, C3, D2		✓ assume 1,000 residential units	x	x	✓ assume 5,000 residential units	✓ assume 1,000 residential units	x

Development	Summary	Zone	Location	Land Use	Access/Infra-structure changes	Quantification in 2015			Quantification in 2030		
						Optimistic	Most Likely	Pessimistic	Optimistic	Most Likely	Pessimistic
	No planning application or press release issued, aspirational only. However it is considered viable by Peel.										
Liverpool Football Club - new stadium	Mixed use development - retail, offices, residential, community and hotel uses, plus new public open space.	330	Liverpool	D2		x	x	x	✓	✓	x
The wireworks site	Winwick Street - retail	208	Warrington	A1		x	x	x	✓	✓ 5,490m ²	✓

Appendix C – Derivation of AAWT and AADT figures

Model Hour to AADT Factors

This technical note presents the factors required to convert from model hours to AADT, AAWT etc. These factors have generally been derived from analysis of the detailed traffic count data collected at the SJB.

These model period to model hour factors, taken from the LMVR Table 4.14, should be used to convert from the model hour flows to calculate the corresponding AAWT.

Table 1 Model Period to Model Hour Factors

Model Period to Hour Factors	Factor	Inverse Factor
AM Peak Period to AM Peak Hour	0.360	2.77778
Inter Peak Period to Inter Peak Hour	0.167	6
PM Peak Period to PM Peak Hour	0.353	2.83286
Overnight Period to Overnight Hour	0.083	12

To convert from AAWT to annual average traffic multiply by 315.7, based on SJB data.

Then to calculate AADT, if required, divide AAWT by 365.

Similarly, for 18 hour AAWT, rather than taking 12 times the Overnight hour, use $12 * 0.8276$ times the overnight hour, as most of the overnight traffic is during the evening and hence 06:00 until 24:00 covers a majority of the overnight traffic.