A27 Chichester Bypass

Local Model Validation Report

July 2016

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GLOSSARY OF TERMS

ASR	Appraisal Specification Report
ATC	Automatic Traffic Count
DfT	Department for Transport
DIADEM	Dynamic Integrated Assignment and DEmand Modelling
DMRB	Design Manual for Roads and Bridges
GIS	Geographic Information System
HE	Highways England
HGV	Heavy Goods Vehicle
IAN	Interim Advice Notice
IP	Inter Peak
JTS	Journey Time Survey
LGV	Light Goods Vehicle
LMVR	Local Model Validation Report
MCC	Manual Classified Count
MCTC	Manual Classified Turning Count
MIDAS	Motorway Incident Detection and Automatic Signalling
NTEM	National Trip End Model
NTM	National Traffic Model
O/D	Origin / Destination
OGV	Other Goods Vehicle
PA	Public Accounts
PCF	Project Control Framework
PCU	Passenger Car Unit
PPK	Price per Kilometre
PPM	Price Per Minute
SATNET	SATURN Network Building Software
SATURN	Simulation and Assignment of Traffic to Urban Road Networks
SGAR	Stage Gate Assessment Review
TAG	Transport Analysis Guidance
TAME	Traffic Appraisal Modelling and Economics
TDCR	Traffic Data Collection Report
TEMPRO	Trip End Model Presentation pROgram
TRADS	TRAffic Database System
TRICS	Trip Rate Information Computer System
TRF	Traffic Forecast Report
UC	User Class
VDM	Variable Demand Modelling
VOC	Vehicle Operating Cost
VPH	Vehicles Per Hour
WebTAG	Web Based Transport Analysis Guidance
WSCC	West Sussex County Council

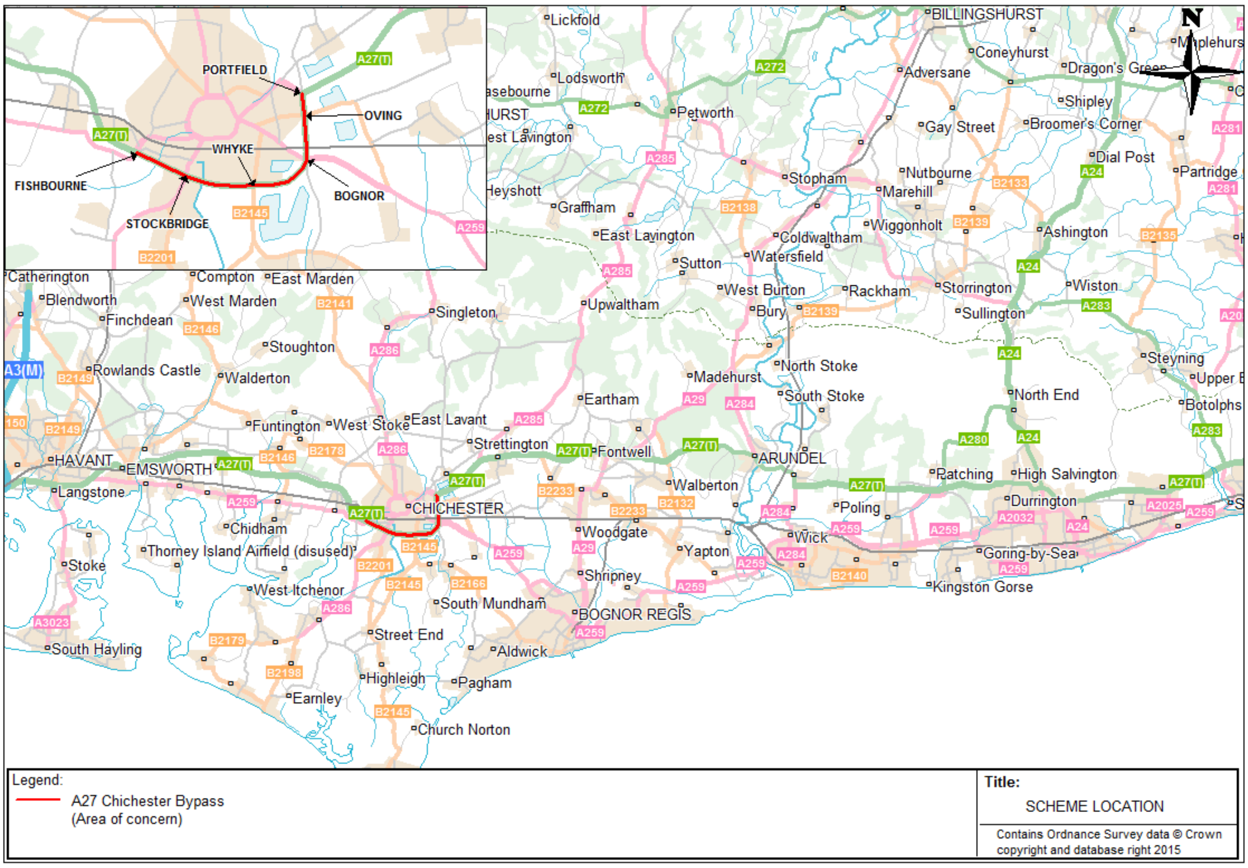
1 STUDY OVERVIEW

1.1 Background

1.1.1 Highways England[1] (HE) has commissioned Jacobs to develop a traffic model which can be used to assess different options proposed for the A27 Chichester bypass congestion relief scheme.

1.1.2 The A27 is the only strategic east-west road along the south coast, directly linking Eastbourne in East Sussex to Portsmouth in Hampshire via Brighton, Worthing, Arundel, Chichester and Havant, and onto Southampton and beyond using the M27. In Chichester the A27 loops around the south of the city, forming the Chichester Bypass. The 5km length of the bypass is dual carriageway and comprises five at-grade roundabouts (Fishbourne, Stockbridge, Whyke, Bognor Road and Portfield), and one signalised junction (Oving). Figure 1-1: Scheme Location - A27 Chichester bypass shows the location of these key junctions. These junctions are where the radial routes between the south coast (Manhood Peninsula and Bognor Regis) and the city centre cross the bypass, and junction spacing varies from 0.5km to 1.3km.

Figure 1-1: Scheme Location - A27 Chichester bypass



[1] Formerly the Highways Agency

1.1.3 Although a strategic route, the majority of traffic using the bypass is local traffic entering and leaving Chichester itself. It is the combination of the close proximity of the junctions and the conflict between the impeding north-south and east-west traffic flows that generates significant congestion and extensive queuing at most of the junctions at peak times, disrupting the mainline flow of the road and compromising its operation as a strategic route.

1.1.4 In 2000, the South Coast Multi Modal Study (SoCoMMS) recommended that these issues be resolved using high level local strategies including grade separation of four of the junctions along the A27. These options were rejected in 2003 by the Secretary of State (SoS) on environmental grounds. By March 2005, HE during public consultation presented new options which were developed with an aim to accommodate the views of all key stakeholders, minimise damage to the environment, support local issues and public transport solutions. Lower cost variations of the options were assessed and developed by HE, culminating in a shortlist of four options being promoted at the end of Project Control Framework (PCF) Stage 1 in 2010.

1.1.5 Since 2010, two further studies into the A27 around Chichester have been undertaken independently from HE. One was instigated by Chichester District Council (CDC) in 2012, the other by West Sussex County Council (WSCC) in 2013. The outcome of the studies proposed improvements to the bypass junctions which were designed in conjunction with housing developers or partly funded by local developers. None of the junction improvements identified in the CDC or WSCC reports has been implemented.

1.2 Scheme History

1.2.1 The previous HE study identified four options for improvements to the A27 Chichester Bypass. These considered different scenarios at each of the six junctions, including grade separation, full or restricted movement signalised junctions, signalisation of the existing roundabout, or to do nothing.

- *i. Option 11 - a mid-range option, including grade-separation of Fishbourne Junction and full signalisation of Bognor Road Junction (preferred option).*
- *ii. Option 13 – based on the original Option 1 presented for Public Consultation in 2004/2005 but without any improvements to the existing Portfield Junction. This option included grade separation at Fishbourne and Bognor Road Junctions with restricted movements at the intermediate junctions.*
- *iii. Option 15 – based on the original Option 2 presented for Public Consultation in 2004/2005 but without any improvements to the existing Portfield Junction. This option included grade separation at Fishbourne and Bognor Road Junctions with restricted movements at the intermediate junctions. It also included the SLR.*
- *iv. Option 19 – a least cost option, including grade-separation of Fishbourne Junction but with limited improvements at other junctions*

1.2.2 Subsequent to the suspension of the HE scheme in 2010, two further, low-cost, schemes were identified in studies commissioned by Local Authorities:

- *v. Options identified by West Sussex County Council*
- *vi. Options identified by Chichester District Council*

1.2.3 These options recommended junction improvements to all six junctions on the bypass and were envisaged as measures in order to ensure local developments did not cause the levels of congestion and queuing on the bypass to deteriorate beyond those forecasted in 2031 without any developments (but not the congestion levels in 2009). In addition two other options have been reviewed:

- *vii. a northern bypass*

- *viii. a southern bypass*

1.2.4 In 2015 a new study was commissioned was by Highways England to assess options to improvements to the A27 Chichester Bypass. During PCF Stage 1 a filtering process has been undertaken to determine the appropriate options to take forward into Stage 2 option selection. Details on these options are provided in the traffic forecasting report (TFR).

1.3 Statement of Scheme Objectives

1.3.1 HE aims to remove conflict and congestion at the bypass junctions and improve access to Chichester, the Bournes, the Manhood and the wider Bognor Regis area, enabling other local transport improvements to be implemented. The objectives of the scheme are presented in the Client scheme requirements and are set out below:

The scheme 'A27 Chichester Bypass - Upgrading 6 junctions on the existing 3.5m bypass' was included in the HM Treasury's June 2013 White Paper 'Investing in Britain's Future', as part of a 'Pipeline of HA road schemes which the government is committed to funding as part of this Spending Round, subject to value for money and deliverability.'

The scheme is also included in the 2014 Roads Investment Strategy and Autumn Statement. At a local level the Scheme aligns with:

The draft Chichester Local Plan

- by providing capacity to accommodate development, particularly housing, in the draft Plan.

The West Sussex Transport Plan:

- to assist introduction of a three-pronged strategy: increasing travel choice in all urban areas, influencing travel behaviour, and ensuring efficient use of the network
- to contribute to efficient, safe, less congested transport networks
- to encourage cycling and walking as real alternatives for short trips
- to facilitate improved priority for buses crossing the A27 on approaches to Chichester

Transport Objective

- Reduce congestion on the Chichester bypass
- Improve road safety, during construction, operation and maintenance for all, as defined in DMRB Volume 0 Section 2 Part 3 GD 04/12:
  - Road workers
  - Road users
  - Other parties

- Reduce adverse environmental impacts & eliminate where possible
  - Address existing Air Quality Management Areas (AQMAs) and ensure no further AQMAs are created as a result of selected option
  - Address existing noise priority areas and ensure no further noise priority areas as a result of selected option

- Improve journey time reliability on the Strategic Road Network (SRN).
- Improve capacity and support the growth of regional economies
  - Facilitate timely delivery of the scheme to enable provision of housing demand in line with the Chichester Local Plan
  - Improve regional connectivity
  - Improve accessibility to areas with tourist activity

Consider buildability, to ensure the design:

- Facilitates ease of construction within the scheme / land constraints
- Minimises disruption to road users and local residents from construction activities
- Facilitates practical traffic management solutions during construction

Regional and local objectives were agreed at a Workshop on 21 January 2015, and are listed below for information

Regional - West Sussex County Council (WSCC)

- Tackling Climate Change
- Promoting economic growth
- Improving Safety, Health and Security
- Improving Accessibility

Local - (Chichester District Council (CDC)

- Mitigating the impacts of congestion and manage traffic flows, especially on A27
- Encourage and support opportunities for businesses.
- Ensure provision for access to new housing
- Encourage and support opportunities for businesses.
- Improve transport links to support and encourage tourism.
- Maintain and improve connection of areas by footpaths and cycle paths
- Conserve and enhance the historic landscape and natural environment
- Take account of the potential future need for a park and ride site on the eastern and western approaches to the city

1.4 Purpose and Use of Model

1.4.1 Throughout the appraisal of an improvement scheme, traffic models are developed and refined. In general, traffic models become more detailed as a scheme progresses. The previous version of the traffic model was developed to assess the junction improvement options as described above, and to present the relevant results.

1.4.2 The 2009 Chichester Area Transport Model (CATM) is now being revised to bring it up to date and to allow it to provide the traffic forecasts needed for the current stage of option selection. The opportunity is also being taken to use the latest version of the software previously used.

1.4.3 The key objective behind development of CATM 2014 model is to understand the impact of identified options to relieve the congetion on A27 Chichester bypass. The model can be used for:

- Detailed representation of traffic patterns, flows, delays and congestion, and to support both future forecasts, and the Strategic Case for the scheme.
- Understanding the impacts of different potential scheme options, in order to optimise the proposals;
- Demonstrating the impacts that the scheme(s) are likely to have on the local and strategic road network;
- Allow assessment of the benefits of the scheme, and underpin the Value for Money Case for the scheme.
- Inform the environmental impacts of traffic flow on Noise, Air Quality and other environmental indices;

- Model the impacts of key strategic housing and nonhousing developments;
- Support local public/stakeholder consultation;

1.5 Purpose of this Report

1.5.1 It is necessary to ensure that the traffic model can accurately reflect current traffic conditions before future traffic flows can be derived. The process of comparing the traffic model with real life is known as "validation". Validation of the model to confirm how well it reproduces observed conditions (usually current or recent, depending on the year on which the model is based) is critical, since without a good standard of validation the level of confidence in its ability to forecast future conditions is likely to be very low.

1.5.2 The purpose of this report is therefore to:

- Describe how the traffic model was updated.
- Assess how well the traffic model compares with observations.

1.5.3 The structure of the remainder of this report is as follows:

- Chapter 2 – provides a general description of the development of the traffic model.
- Chapter 3 – describes the data used for calibration and validation.
- Chapter 4 – describes what the network element of the traffic model is and how it was developed.
- Chapter 5 – describes what the matrix element of the traffic model is and how it was developed.
- Chapter 6 – describes the assignment process and parameters.
- Chapter 7 – describes how the network was calibrated and validated.
- Chapter 8 – describes how the matrix was validated.
- Chapter 9 – provides the results of assignment calibration and validation.
- Chapter 10 – provides a summary and conclusions to the above.

2 MODEL DESCRIPTION AND SPECIFICATION

2.1 Overview

2.1.1 The traffic model comprises of two main components:

- **Network:** This is represented by a series of nodes and links. The nodes represent junctions, whilst the links represent the sections of road in-between the junctions. This is discussed further in Chapter 4; and
- **Traffic Demand:** the demand for travel represented by the starting point (known as an origin) and finishing point (known as a destination) of a journey, the information for which is stored within a “trip matrix”. This contains the number of trips from each origin to each destination. Origins and destinations are defined by geographic zones. This is discussed further in Chapter 7.

2.1.2 It was proposed and agreed in the Appraisal Specification Report (ASR) that the existing 2009 CATM SATURN network would be updated and enhanced to extend the simulation area and a new variable demand model would be built. A highway assignment model in SATURN has been frequently used to demonstrate the wide-scale impacts of highway improvements schemes and, as the CATM 2014 has been developed based on 2009 CATM SATURN model, the new highway assignment model has been developed in SATURN (V11.3.12F). A demand model in DIADEM (V 5.0) has been developed. Together the two models will provide traffic forecasts that are sufficiently robust to allow option selection to take place.

2.1.3 This section describes the core components of the model and provides a justification for adopting those elements. It details the provenance of the Base Year model and describes its main specifications; such as its geographical coverage, zoning, level of detail, segmentation and the software used. The overall methodology of model development is shown in Figure 2-1.

2.2 Model Provenance

2.2.1 As discussed in the previous chapter, a comprehensive update of the 2009 CATM model was carried out as part of its progression to Stage 2 of the PCF.

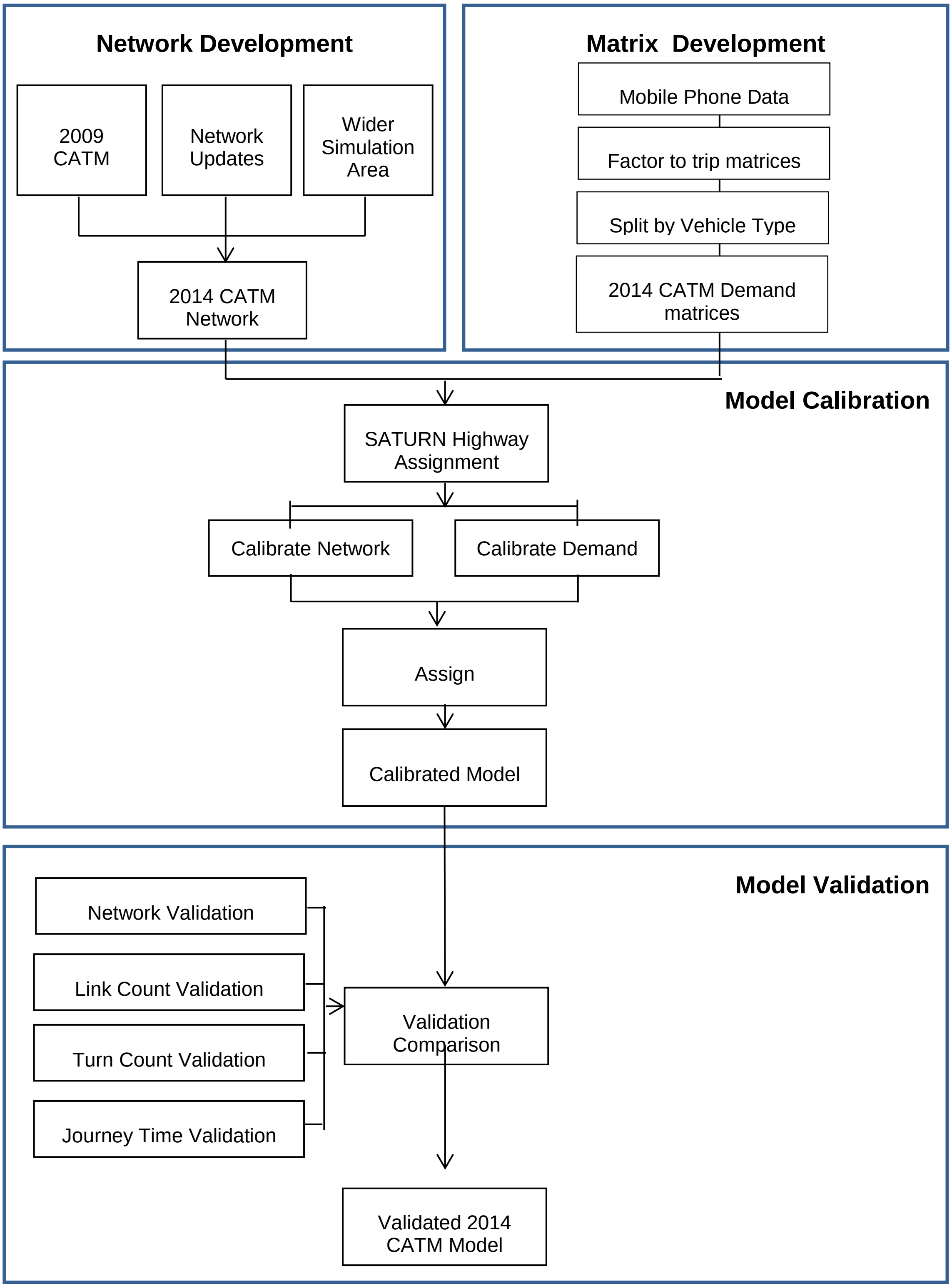
2.2.2 The 2009 network model was updated to reflect the 2014 scenario. The changes mainly include:

- Updates to Chichester to reflect the network changes since 2009
- Wider simulation area
- Some network junctions which were modelled in a simplified form have been recoded to reflect actual highway network geometry
- Models the motorway merges using the new coding options available in SATURN.

2.2.3 2009 CATM was an approved model which produced robust results for previous studies. The changes in the simulation area have been made to reflect the actual change in speed limits, turn restriction and capacity changes. A complete log of the junctions which have been edited is included in APPENDIX B.

2.2.4 The original CATM demand model was completed in 2006 and was fit for purpose at that time. Since then the DfT’s WebTAG criteria has changed and a review of the model determined that the model was not compliant against the latest set of criteria and therefore unfit to forecast the impact of the proposed options. A new demand model has been developed using a trip matrix developed from mobile phone data and variable demand model in DIADEM.

Figure 2-1: Methodology for model development



2.3 Demand Model

2.3.1 WebTAG states that "any change to transport conditions will, in principle, cause a change in demand. The purpose of variable demand modelling is to predict and quantify these changes[2]".

2.3.2 DIADEM is a computer software package that was developed to assess variable demand for traffic models. Highways England has confirmed that traffic forecasting and economic assessment based on a SATURN traffic model would meet their requirements. DIADEM is used to model variable demand responses. TAG Unit M2 Appendix H states that "The DIADEM framework controls iteration within assignment and between demand and assignment, to ensure that the calculations reaches an acceptable equilibrium".

2.3.3 The Variable Demand model is an incremental Origin-Destination based model using the same purpose definitions as the assignment model. The distribution response (destination choice) is included in the Variable Demand Model, together with a frequency response for optional (other purpose) trips. The spatial coverage of the Variable Demand model is the same as for the Assignment model and they use the same zone system and generalised cost parameters.

2.4 Highway Model

2.4.1 The highway assignment model is a link and junction based model where the junctions are modelled in detail for the study area and links are coded in fixed route area. More details related to the modelled areas and network components is discussed further in Chapter 4.

2.4.2 The trips within the matrices are "assigned" by the SATURN modelling software onto the network. This is an iterative process, because as the traffic builds up on links and through junctions, travel time increases, in response to this some drivers may transfer to another route. On successive iterations such transfers should decrease to the point where the flows are stable, at which point the model is said to have "converged".

2.4.3 The resultant flows and journey times from the converged model can then be compared to observed values to see how well the model represents real life traffic conditions and determine whether the model is fit-for-purpose for assessing the effects of the new scheme. This process is known as "validation". In order to achieve an acceptable level of validation, the traffic model is first subject to local adjustments. These adjustments can be applied to both the network and the matrix in a process known as "calibration". This is discussed in Chapter 8.

2.4.4 Section 6.2 discusses the assignment process and parameters involved in the model in more detail.

[2] WebTAG unit M2: Variable Demand Modelling, January 2014

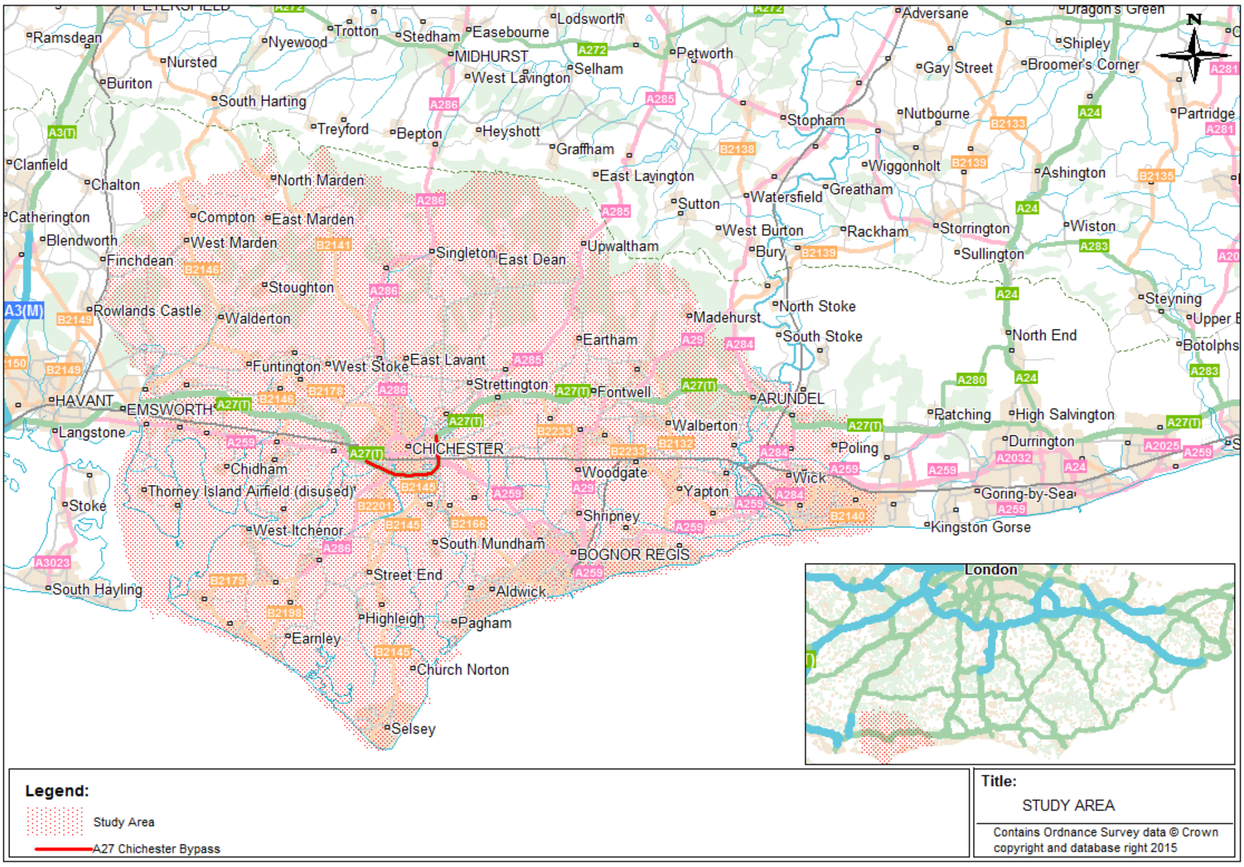
2.5 Model coverage

2.5.1 The starting point for the development of any traffic model is to identify the study area. This was identified to cover the area directly affected by the proposals being tested, with the potential to assess some peripheral impacts on strategic routes in the vicinity of the affected area.

2.5.2 The study area was defined taking into consideration the area which would get affected by implementation of the scheme and agreed with the stakeholders. The study area comprised the south of Chichester District (to the northern edge of the South Downs) and that portion of Arun District west of Arundel and the River Arun. This is the same area as corresponds to the 2009 CATM Study. This wider area allowed detailed representation (through to actual trip ends) of much of the highways traffic in the centre of Chichester and that using the A27.

2.5.3 The remainder of Sussex and immediately surrounding counties was modelled at medium level of resolution, with more distant areas (e.g. the south west) coded at regional or coarser level of resolution. Figure 2-2 shows the area covered in the model.

Figure 2-2: Study area



2.6 Zoning System

2.6.1 Zones are used to represent geographical areas for which trip origins and destinations are amalgamated to give a manageable matrix size. Smaller zones may cover locations with a particular land use, such as residential areas, employment areas, shopping centres, schools or car parks.

2.6.2 A graduated approach was adopted, with zone detail reducing with distance from the area of detailed modelling.

2.6.3 The primary building block of the zoning system was the 2011 Census Geography, with consistency between Census Output Areas, Districts and Counties maintained where possible.

2.6.4 Within the Fully Modelled Area, and in particular the core area of detailed modelling, zone size has been considered with respect to the likely trip making activity. To achieve this, the zoning system of 2009 CATM has been reviewed and recoded to take into account the location of significant new developments and design options to be tested for A27 Chichester bypass. In addition to this the zones on the eastern and northern boundary of Arun District have been disaggregated to widen the study area. These are shown in APPENDIX A.

2.6.5 The location of significant new developments and natural barriers (such as rivers, railways, motorways/major roads) have been respected where possible, forming natural zone boundaries.

2.6.6 In general, the zoning system used within any traffic model contains three levels of zones:-

- A large number of small zones for areas within the area under investigation (represented by the detailed ("simulation") area).
- A moderate number of medium–sized zones close to the area under investigation (Rest of fully modelled area).
- A small number of large zones (known as "external" zones) outside the area under investigation.

2.6.7 The reason for this "hierarchy" of zones is that greater modelling detail is usually required in the vicinity of the scheme, where zone to zone movements have more route choice, whilst further away the main consideration is usually just to ensure that trips enter the study area at the correct points.

2.6.8 The zoning system used in this model is shown in APPENDIX A. In total the model comprised 257 zones and can be classified as follows on geographical basis:

- 1 to 212 represent the Study area zones of Chichester and Arun District
- 213 to 252 External Zones
- 253 to 257 Future developments

2.7 Sectors

2.7.1 To facilitate the study of broader patterns of movements within and through the traffic model, the zones have been grouped together into broader more strategic areas known as sectors. The sector definitions used in the model are shown in APPENDIX A. The zone to sector correspondence is given in Table 2-1 below:

Table 2-1: Zones to Sector Correspondence

Sector Number	Description	Zones
1	Bosham, Nutbourne, Southbourne, Emsworth	71-77
2	Witterings	58-60, 63-67
3	Selsey	61-62, 68-70, 94-96
4	Bognor Regis	91-93, 132-196
5	Chichester to Arun and Routes to North East	97-131, 207-211, 227, 229-236, 239, 249-251
6	South Downs, North of Chichester	3-6, 8-12, 19-22, 35, 42, 46, 49-57,

Sector Number	Description	Zones
		78-90, 223-224, 253-257
7	Hampshire, West Midlands and North	213-222, 225-226, 228, 248, 252
8	East of Arun	197-206, 212, 237-238, 240-247
9	Centre of chichester	1-2, 7, 13-18, 23-45, 47-48

2.8 Time Periods and Base Year

2.8.1 As mentioned above, traffic models should cover a geographical area beyond which no significant changes in flows are likely to occur as a result of implementing the scheme in question. Similarly, traffic models should also cover those time periods when the most significant flow changes are likely to occur. As traffic flows tend to be higher on weekdays rather than weekends, and tend to be higher during the daytime than evenings or night–time, traffic models usually cover weekday AM and PM peak hours and the period in between (known as the "Inter–Peak").

2.8.2 From previous analysis of the permanent Automatic Traffic Count (ATC) survey information, the following peak hours were identified and have been modelled:

- Weekday AM peak hour = 08:00 – 09:00
- Weekday Inter-Peak (IP) average hour = average of 10:00 to 16:00
- Weekday PM peak hour = 17:00 – 18:00

2.8.3 The traffic model has been developed to represent a typical weekday in July 2014, the year and month in which the most recent traffic data was obtained. A factor will be used to convert the base matrix to neutral months for forecast years.

2.9 User Class Segmentation

2.9.1 Journeys are undertaken for a variety of purposes and different journey purposes are associated with different rates of trip making and patterns of travel. The use of journey purpose segments is also consistent with the needs of variable demand forecasting and economic analysis.

2.9.2 The highway assignment model groups traffic into "user classes". These segmentations differentiate between the characteristics of road users, both in terms of their use and their physical attributes. HGVs for example are physically larger than cars, and therefore take up more road space per vehicle. The user classes are summarised as:

- User Class 1 (UC1): Cars used for Commuting
- User Class 2 (UC2): Cars used for Employer's Business
- User Class 3 (UC3): Cars used for Other purposes
- User Class 4 (UC4): Light Goods Vehicles (LGVs)
- User Class 5 (UC5): Heavy Goods Vehicles (HGVs)

2.9.3 The model aggregates the user classes into "vehicle classes" for use in reporting. The results of the Base Year model will be reported by these vehicle classes, which can be summarised as:

- Vehicle Class 1 (VC1): Cars
- Vehicle Class 2 (VC2): Light Goods Vehicles (LGVs)

- Vehicle Class 3 (VC3): Heavy Goods Vehicles (HGVs)

2.10 Journey Purpose Segmentation

2.10.1 The demand model distinguishes between different journey purposes. The correspondence between journey purposes, user classes, and vehicle classes is provided in Table 2-2.

Table 2-2: Purpose, User Class and Vehicle Class Correspondence

Purpose	User Class (UC)	Vehicle Class (VC)
Home Based Work (HBW)	UC1	VC1
Home Based Employer's Business (HBEB)	UC2	
Non-Home Based Employer's Business (NHBEB)		
Home Based Education (HBED)	UC3	
Home Based Shopping (HBS)		
Home Based Other (HBO)		
Non-Home Based Other (NHBO)		
LGV	UC4	VC2
HGV	UC5	VC3

2.10.2 LGV trips may be subdivided into employer's business and personal use. As personal use represents a small proportion of the total, and no detailed information on the proportion is available for the study area, all LGV trips are treated as being for employer's business purposes.

2.11 Traffic Unit

2.11.1 SATURN uses Passenger Car Units (PCUs) as its default traffic unit rather than number of vehicles. PCU factors reflect the fact that, in terms of use of highway and junction capacity, a HGV has a disproportionately greater impact on capacity than cars and LGVs due to the increased road space that they occupy and their lower acceleration and performance characteristics. The average length of a vehicle in a queue in the traffic model is 5.75m per PCU. This is the default used by SATURN. This value allows for OGVs and the gaps left between smaller vehicles such as cars. The vehicle classes discussed earlier in this section need to be converted to PCUs for use within SATURN. Table 2-3 gives the PCU factors used for each vehicle class.

Table 2-3: Vehicle Classes and PCU Factors

Userclass	Vehicle Class	Vehicle Type	National PCU Factor	Modelled PCU Factor
UC1 to UC3 (Cars)	**VC1**	Car, Taxi	1.0	1.0
UC 4 (Light Goods Vehicles)	**VC2**	Van <3.5 tonnes (LGV)	1.0	1.0
UC5 (Heavy Goods Vehicles)	**VC3**	Rigid Goods Vehicle	1.9	2.3
		Articulated Goods Vehicle	2.9	
		Buses & coaches (PSV)	2.5	

Source: FORGE The Road Capacity and Costs Model Research Report (Department for Transport, April 2005) Table 8

2.11.2 National PCU factors for cars and LGVs have been used in the model. The PCU factor for HGVs is an average of national PCU factors weighted in accordance to the observed proportions of HGVs. By applying the above PCU factors to the observed OGV proportions in Table 2-4, a weighted PCU factor of 2.3 was derived for the HGV vehicle class.

Table 2-4: National Vehicle Class Proportions for all Road Types in 2014

	National Data – All road types		Based on data collected 2014	
Vehicle Class	Proportion of Flow (%)	Proportion of Vehicle Type	Proportion of Flow (%)	Proportion of Vehicle Type
Lights	***93.9***	-	***91.7***	-
Car	79.3	85.7	85.1	92.9
LGV	14.6	14.3	6.6	7.1
Heavy	***6.1***	-	***8.3***	-
OGV1 + PSV			5.2	63.1
OGV2			3.1	36.9

Source: Transport Statistics Great Britain (DfT – 2014) TRA0101

2.12 Vehicle Split

2.12.1 It is evident from the above Table 2-4 that the vehicle type distribution in the region are comparable to the national values. However the split of light vehicles into cars and LGV is considerably different to the national splits. This is because the majority of the data used for calibration and validation is collected automatically (TRADS, WSCC) where the vehicle classification is done based on the length of the vehicle.

2.12.2 Appreciating the shortfall in classification system adopted in automated system it is advisable to consider the outputs of the model accordingly and assess the calibration and validation results at lights and heavy vehicle level.

2.13 Summary

2.13.1 The following is a summary of the development of the traffic model:

- Highway Model: A highway assignment model has been developed in SATURN (V11.3.10E).
- Demand Model: The Variable Demand model (in DIADEM V 5.0) using the same purpose definitions as the assignment model. The distribution response (destination choice) will be included in the Variable Demand Model, together with a frequency response for ‘other’ purpose trips.
- Study Area: The detailed study area encompasses the main centres of Chichester and Bognor Regis. It extends from the coast, to the Hampshire border, the northern edge of the South Downs and include parts of Arun district to the west of Arundel and the River Arun.
- Time Periods: The time periods covered by the model represent an early July weekday (i.e. pre school holidays) in 2014 and cover the AM peak hour (08:00 – 09:00), Inter–Peak (IP Average of 10:00 – 16:00) and PM peak hour (17:00 – 18:00).
- Base Year: The model has been validated to a base year of July 2014. A factor will be used to convert base matrix to neutral months in forecast years.

- User Classes: Five User Classes (vehicle types) modelled are Cars Commute, Cars Business, Cars Other, Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs).

3 SUMMARY OF DATA COLLECTION

3.1 Overview

3.1.1 This section discusses the observed data used in the calibration and validation of the 2014 Chichester Area Traffic Model (CATM) model. This includes the link flow observations used in the calibration and validation of the modelled flows within the highway assignment, and the observed journey time data used for the validation of the modelled times.

3.1.2 This section should also be read in conjunction with the Traffic Data Collection Report, A27 Chichester Bypass Scheme, March 2015.

3.2 Secondary Data Sources

3.2.1 The validated 2009 Chichester Area Traffic Model (CATM) has been used as the basis for developing the 2014 traffic model. This section briefly describes the secondary data sources used to develop the 2014 model.

3.2.2 Full details of all the traffic data collected for the model are available in the Traffic Data Collection Report, March 2015. The following paragraphs are intended to provide a summary of where the surveys were undertaken and the types of surveys involved.

3.2.3 Available information was obtained from the following data sources, namely:

- Highways England (HE)
- West Sussex County Council (WSCC)
- Department for Transport (DfT)

3.2.4 The information obtained included:

- Permanent WSCC Automatic Traffic Counts (ATC)
- Highways England TRADS Automatic Traffic Counts (ATC)
- DfT Traffic Count Database Annual Daily Traffic (AADT)
- Highways England Journey Time Database (JTDB) data

3.2.5 The data was processed to include the period for which mobile phone data was collected i.e. the weeks commencing on 7th and 14th of July 2014.

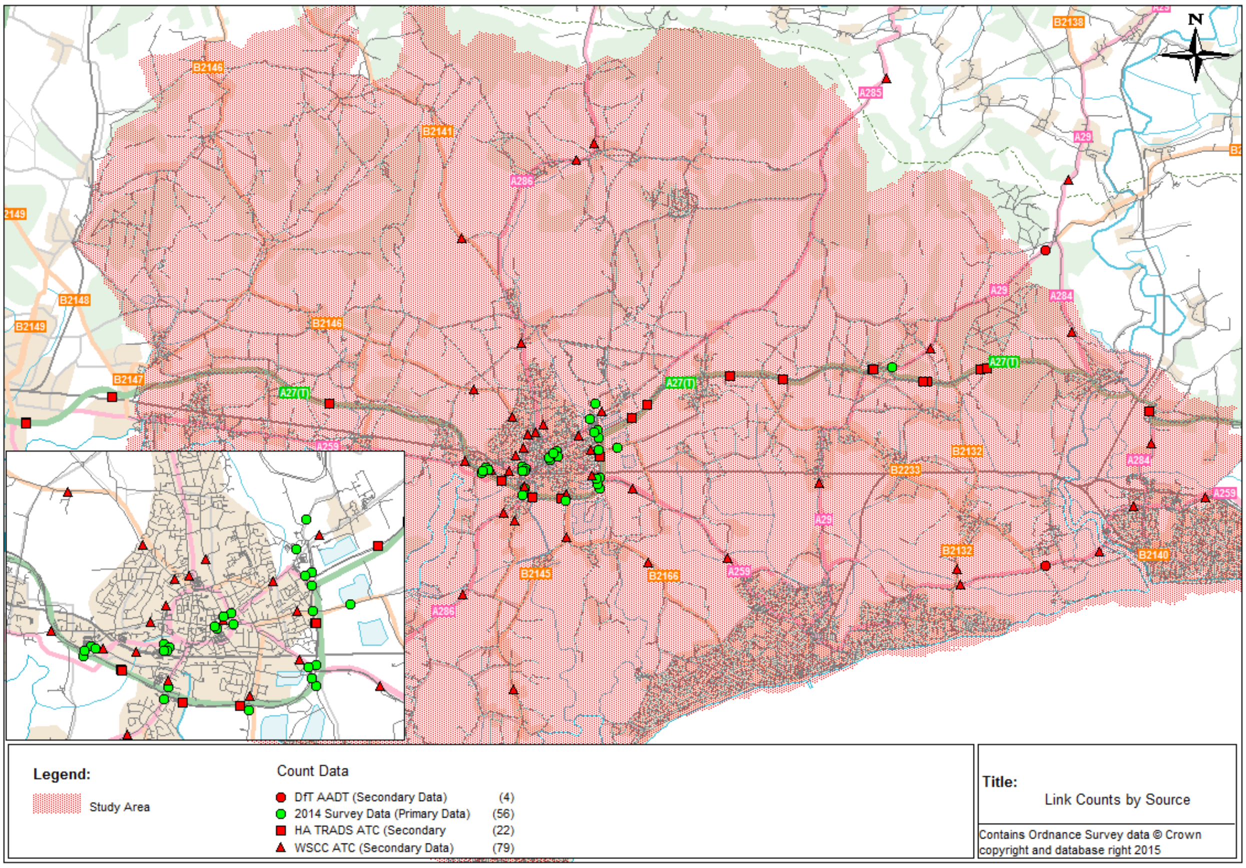
3.3 2014 Primary Data Collection

3.3.1 In addition to the data collated from secondary sources described above, a significant component of the study involved collecting additional robust primary data for use in the model development process. Based on the review of the data available and an understanding of the data required to build the model, the scope of the data collection exercise was developed. These were corresponding to the matrix building, calibration, and validation stages of the model development process. Full details of the primary data collected are available in the Traffic Data Collection Report (March 2015) and a summary and their associated use in the model development process is presented in Table 3-1.

Table 3-1: Summary of Primary Data Collection

Survey Type	Data Purpose	Period Collected
Manual Classified Turning Counts (MCTCs)	Traffic Volume Calibration/Validation	June & November 2014
Manual Classified Counts (MCCs)	Traffic Volume Calibration/Validation	June & November 2014
Journey Time Surveys (JTS)	Journey Time Validation	June & November 2014
Anonymised Mobile Phone Data	Matrix Building	July 2014

Figure 3-1: Link Counts by Data Source

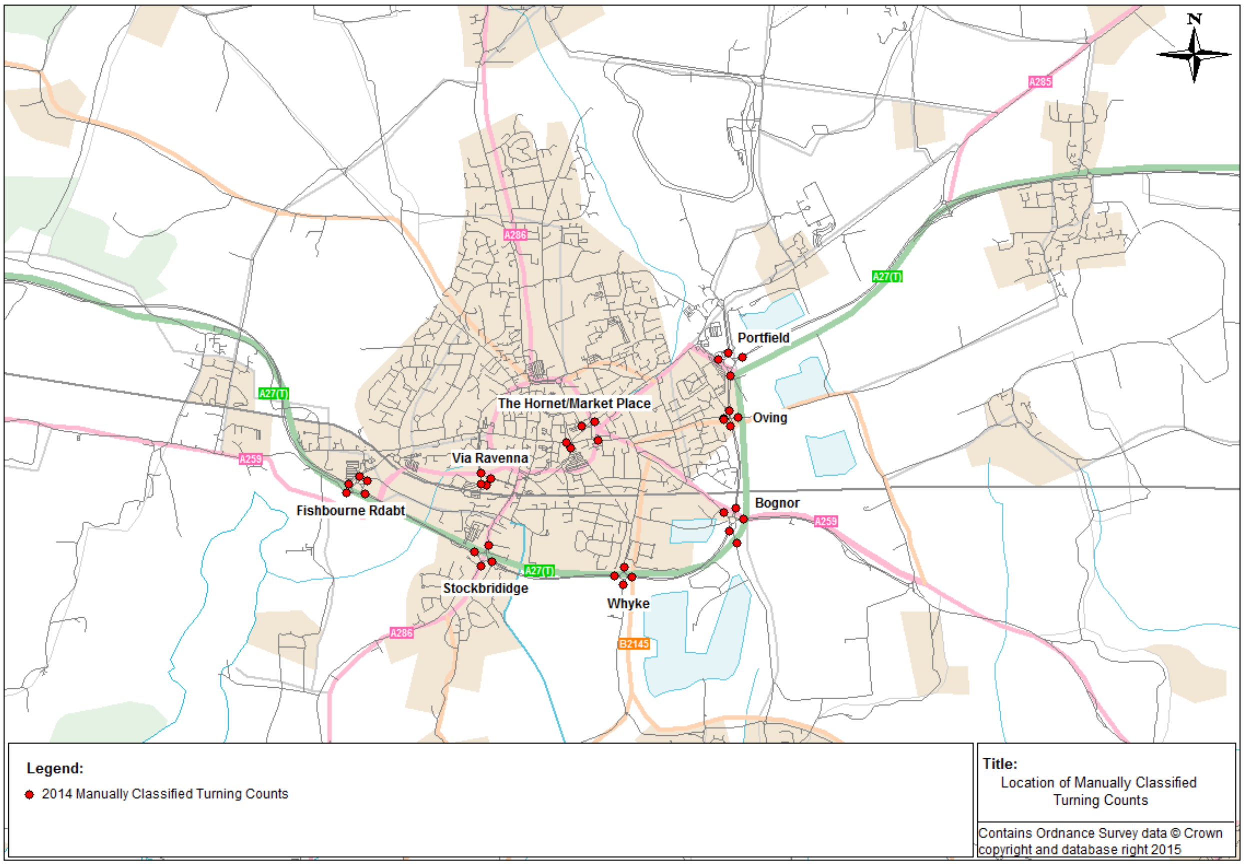


3.4 Manually Classified Turning Counts

3.4.1 MCTCs were undertaken at the eight locations as shown in Figure 3-2; video recordings were made from 07:00 – 19:00 on the 12th of June (and 25th of November for the site8) and transcribed to give flows split into 15 minute intervals:

- Site 1: A27 Chichester ByPass/ A259 Cathedral Way/ Terminus Rd/ Fishbourne Rd
- Site 2: A286 Avenue De Chartres / A259 Via Ravenna
- Site 3: A285 St Pancras / East Street / The Hornet / Market Place / A286 New Park
- Site 4: A27 Chichester ByPass / Portfield Way / Arundel Road
- Site 5: A27 Chichester ByPass / A259 Bognor Road / Vinnetrow Road
- Site 6: A27 Chichester ByPass / B2145 Whyke Road
- Site 7: A27 Chichester ByPass / A286 Stockbridge Road
- Site 8: A27 Chichester ByPass / B2144 Oving Road

Figure 3-2: Manual Classified Turning Counts (MCTC)

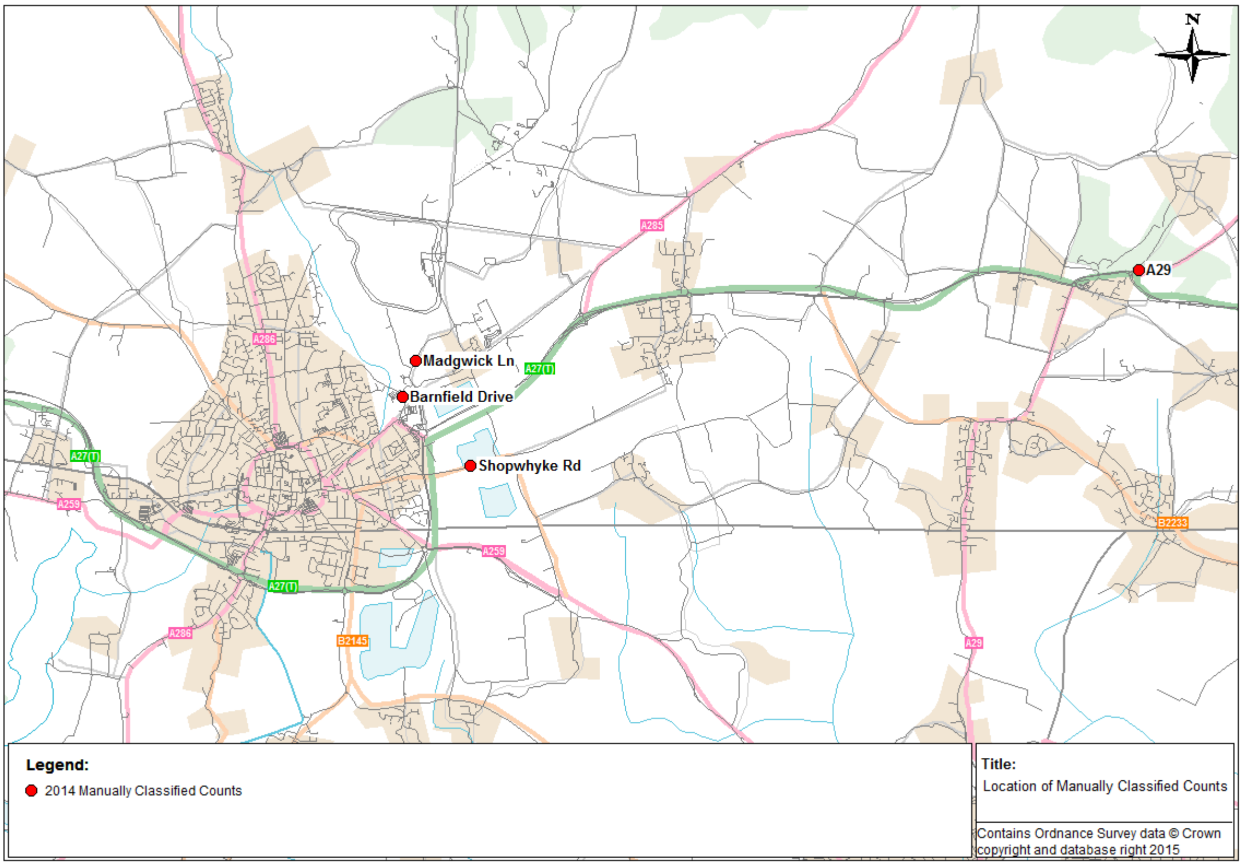


3.5 Manual classified counts

3.5.1 Manual classified counts were also undertaken by setting up cameras to record the traffic flows from 07:00 – 19:00 on the 12th of June (and 25th of November for site 4) and transcribed to give flows split into 15 minute intervals at the following locations:

- Site1: Barnfield Drive between Junction with Westhampnett Road and Homebase Roundabout
- Site2: Madgwick Lane between the two Roundabouts
- Site3: Shopwhyke Road between A27 Chichester By-Pass & Drayton Lane
- Site4: A29 between the A27 Arundel Road and Reynold Lane

Figure 3-3: Manual Classified Counts (MCCs)



3.6 Journey Time Data

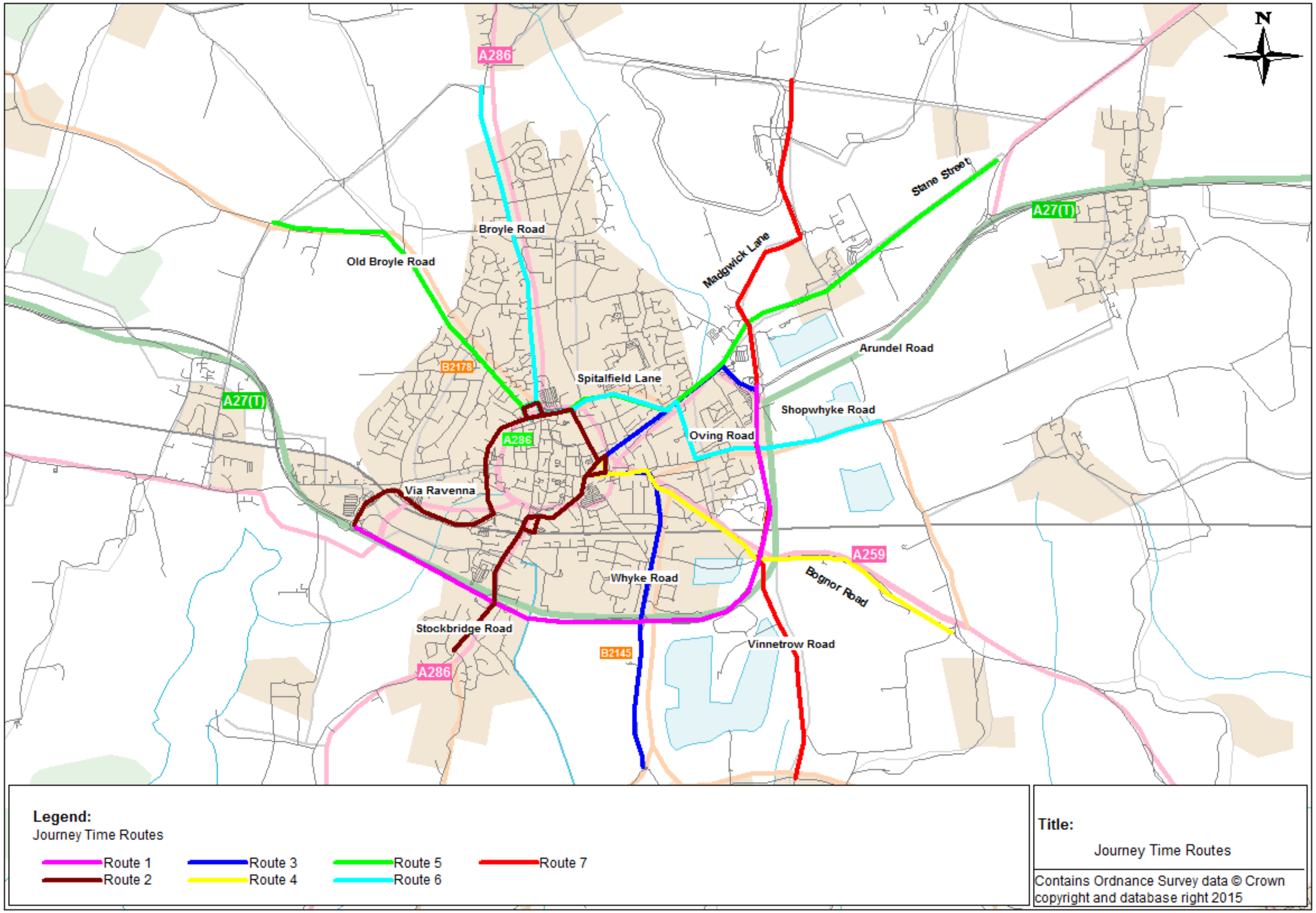
3.6.1 Journey time data is used to check and compare the delays and travel times calculated by the model. Journey time data was collected from TrafficMaster. The dataset is based on data gathered using Satellite Navigation devices installed in cars and other vehicles. Travel times are specified for links in the Integrated Transport Network (ITN). Times along a set route are collated by aggregating the set of ITN links along the route.

3.6.2 To ensure accurate journey time representation there were journey time routes on both the local road network and the strategic road network. This was in order to ensure a robust economic appraisal and to cover any potential parallel routing issues in the modelling. Seven routes were identified in all which are stated below:

- Route 1: A27 Chichester By-Pass b/w A259 Cathedral Way & A285 Portfield Way
- Route 2: A27 Chichester By-Pass to A286 Stockbridge Road
- Route 3: A27 Arundel Road to B2145 Lagness Road
- Route 4: A259 Bognor Road b/w A285 St Pancras & B2144 Drayton Lane
- Route 5: B2178 Old Broyle Rd /A285 Stane St
- Route 6: A286 Lavant rd/ A285/B2144 Shopwhyke Rd
- Route 7: Madgwick ln / A27 Chichester byPass/ Vinnetrow rd

3.6.3 The locations of all the above routes are shown in Figure 3-4..

Figure 3-4: Journey Time Routes



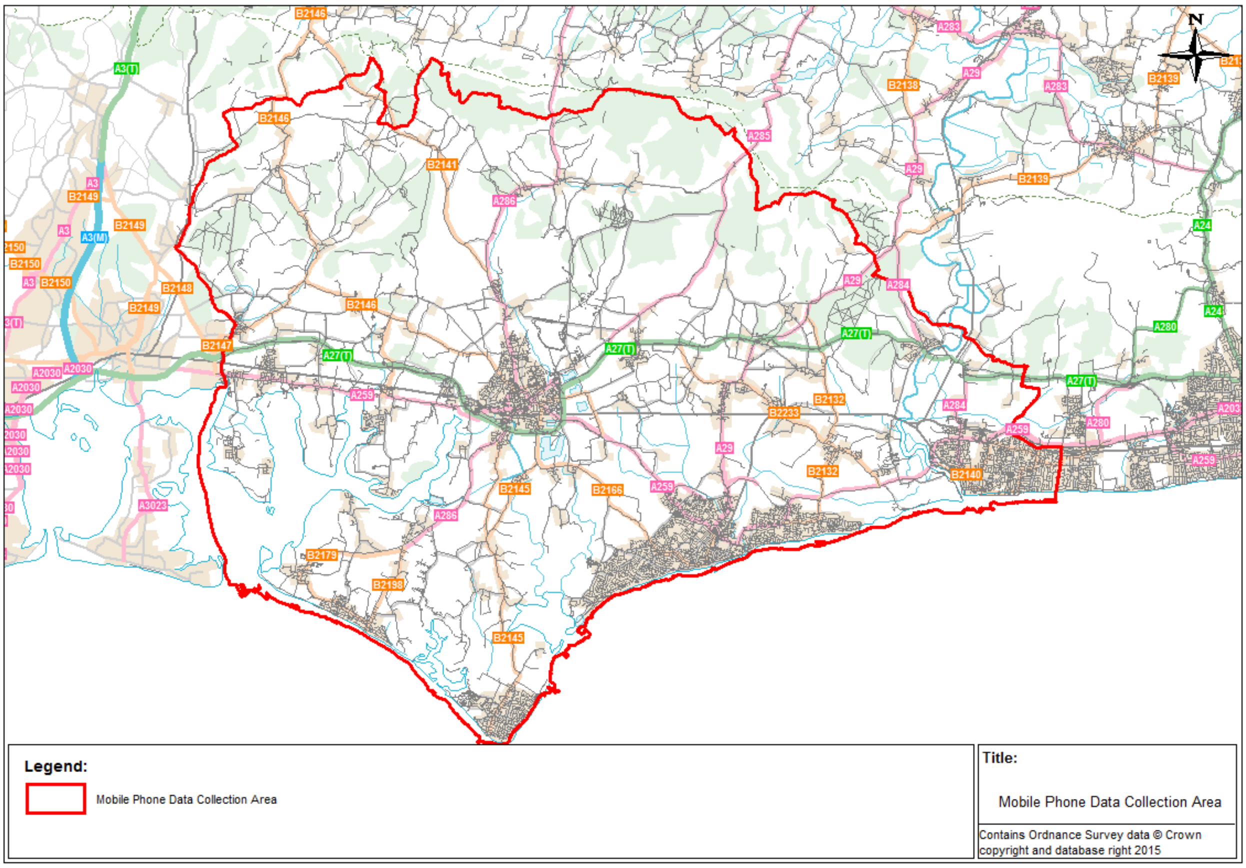
3.6.4 Since the traffic model represents a typical weekday in July 2014, GPS data for the same month was processed. To avoid any anomalies, data of holiday periods was removed and only 1st to 20th July 2014 data was used. Furthermore, only weekdays, Tuesday to Thursday were considered from the aforementioned period since Mondays and Fridays are considered less typical weekdays.

3.7 Mobile Phone Data

3.7.1 The 2014 trip matrices have been produced based solely on mobile phone data. A mobile phone dataset of trips was obtained from INRIX, having been built from the mobile phone service provider O2. The data was collected for Tuesdays, Wednesdays and Thursdays over a fortnight in early July 2014. The dates used were before the school holiday period, and did not coincide with major Goodwood events which could have distorted travel patterns.

3.7.2 The whole process of the matrix development is explained in section 5. The mobile phone data coverage area can be seen in Figure 3-5 and is identical to the study area. The Chicester bypass schemes are located in the centre of this area, where the A27 (shown in green running west-east) loops downwards to pass to the south of the city centre.,

Figure 3-5: Mobile Phone Data Coverage Area



3.8 Calibration Data

3.8.1 Screenlines were developed for the calibration and validation of trip matrices. The counts which formed the screenline were used for calibration and were from a mix of data sources as stated below. More details on the the counts used for calibration is available in Sections 8 and 9.

- ATC (TRADS) and MCTC on A27 in the study area
- ATC (WSCC) between Chichester and Bognor Regis and Bognor Regis and Littlehampton
- ATC (WSCC) and MCTC on A and B roads in and out of Chichester
- ATC (WSCC) and MCTC on local roads in and out of Chichester
- ATC and Link counts from turn count data collected by Jacobs in Chichester.

3.9 Validation Data

3.9.1 The traffic counts which were not part of any screenline were used for validation. These counts covered various locations on A27 and the wider study area and turning counts on major junctions of A27 Chichester bypass. In addition to the counts journey time survey data was used to validate the robustness of the model.

3.9.2 No matrix estimation was used but these counts helped in developing the expansion factors for matrices.

3.9.3 The observed counts were compared against the modelled and are summarised in Table 9-5 below.

Table 9-5: Summary of calibration counts (target >85%)

Criteria	All Vehicles					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	62	84%	65	88%	62	84%
Number of links meeting Acceptability criteria (GEH)	64	86%	65	88%	64	86%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**65**	**89%**	**67**	**92%**	**66**	**90%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	Cars					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	56	82%	59	87%	61	90%
Number of links meeting Acceptability criteria (GEH)	52	76%	56	82%	60	88%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**56**	**82%**	**60**	**88%**	**62**	**91%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	LGVs					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	64	94%	65	96%	62	91%
Number of links meeting Acceptability criteria (GEH)	54	79%	55	81%	47	69%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**64**	**94%**	**65**	**96%**	**62**	**91%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	Lights (Cars + LGV)					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	59	87%	57	84%	56	82%
Number of links meeting Acceptability criteria (GEH)	58	85%	56	82%	59	87%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**60**	**88%**	**61**	**90%**	**62**	**91%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	HGVs					
	AM		IP		PM	

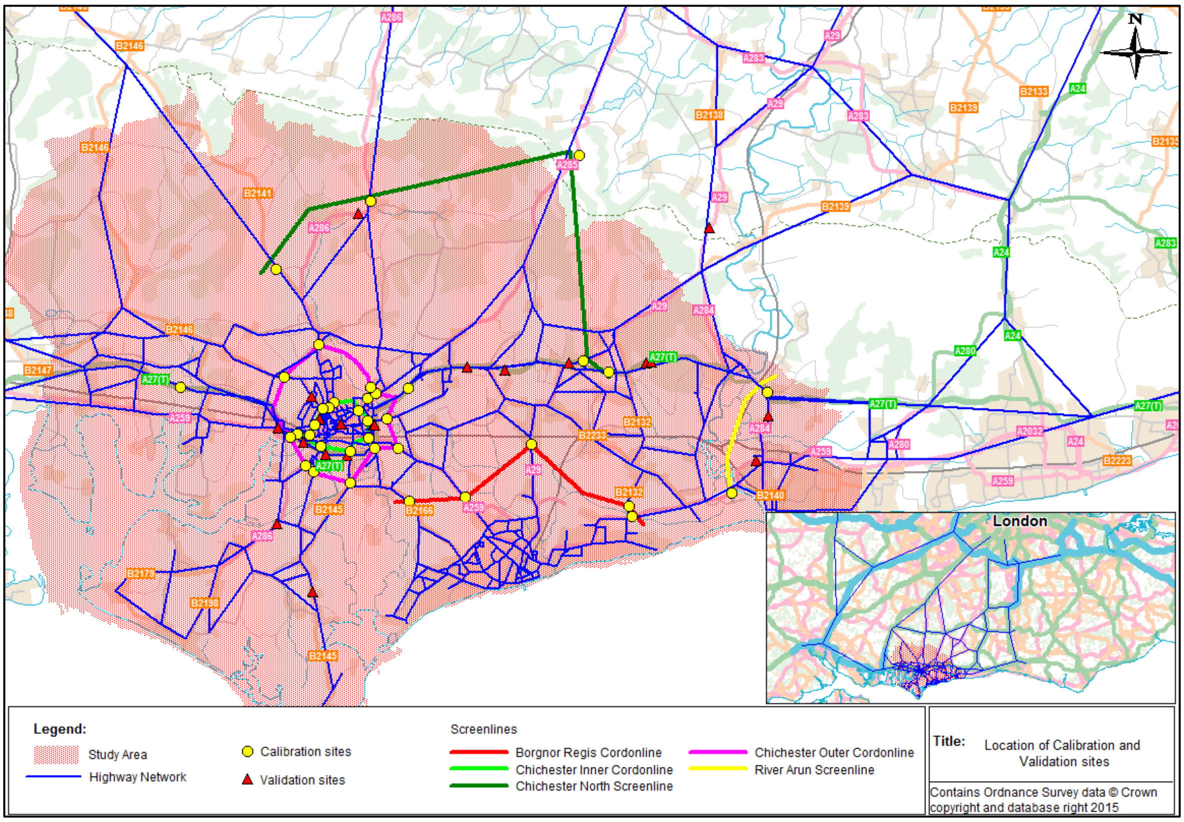
Number of links meeting Acceptability criteria (hourly flow)	68	100%	68	100%	68	100%
Number of links meeting Acceptability criteria (GEH)	67	99%	65	96%	67	99%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**68**	**100%**	**68**	**100%**	**68**	**100%**
Total Number of links	74	N/A	74	N/A	74	N/A

3.9.4 The table demonstrates that the 85% criterion is exceeded for all time periods for total, lights, LGV and HGV traffic. Car flows satisfy the 85% criterion for inter peak and PM peak periods; however the figure for AM peak (at 82%) falls slightly below the target. This shortfall is due to the manual classified counts (used to split total vehicles by type) having much higher LGV proportions than were found in the ATC data, which is particularly the case in the morning peak. Recognising this difference in the classification accuracy between manual and automated counts it is appropriate to focus comparison on the light vehicle total (which exceed the 85% target in all periods) rather than the car figures in isolation. This is encouraging as it gives confidence that modelled flows as a whole are representative of real life traffic flows.

3.9.5 Full breakdown of the comparison at individual count level is included in APPENDIX D.

3.9.6 Figure 3-6 shows the location of calibration and validation sites of the model, detailed description and figures are available in section 8 and 9.

Figure 3-6 Location of Calibration and Validation Sites



4 MODEL NETWORK DEVELOPMENT

4.1 Overview

4.1.1 This section of the report summarises the components that make up the model network. Chapter 5 details how the trip matrices, containing the journeys on the road network, have been derived.

4.1.2 In a SATURN network, junctions are represented by nodes, whilst links represent the roads in between the junctions. Model networks also consist of zones and connectors that attach zones to the network.

4.2 Network structure

4.2.1 The modelled area was defined by identifying the area within which traffic flows or journey times are likely to experience a significant change as a result of implementing the scheme. The extent of the modelled area was agreed with HE TAME and agreed with the stakeholders at the model scoping stage. The model spreads over the West Sussex County boundary. The density of the network however differs in accordance to its vicinity to the scheme. Within this area all the strategic roads were modelled including the A27, A259, A29 and A284.

4.2.2 Traffic models contain a higher level of detail for the area closest to the scheme in question, with a declining level of detail further away. The traffic model for this scheme contains two levels of detail, as outlined below and also shown in **Error! Reference source not found.**.

4.2.3 **Simulation area:** this is coded based on the area over which proposed interventions are expected to have influence and is further subdivided as follows:

- Detailed Simulation Area: This includes the detailed study area where significant impacts of the scheme are certain and includes Chichester and Bognor Regis. In this region the zoning system is at very detailed level. It includes rural links as well as roads in urban areas that are likely to be affected by the scheme.
- Rest of Fully Modelled Area (buffer area): This is the area over which the impacts of interventions are considered to be quite likely but relatively weak in magnitude. This area has somewhat larger zones and less network detail than for the Area of Detailed Modelling. This accounts for strategic trips affected by the scheme that may be entering or leaving the area which would be influenced by the proposed scheme. It extends to the coast, the Hampshire border, the northern edge of the South Downs and includes parts of Arun district to the west of Arundel and the River Arun.

4.2.4 **External Area:** In this area impacts of interventions would be so small as to be reasonably assumed to be negligible. It is coded in very coarse detail as it is only a source for external trips to or from other regions in the UK to enter or leave the model.

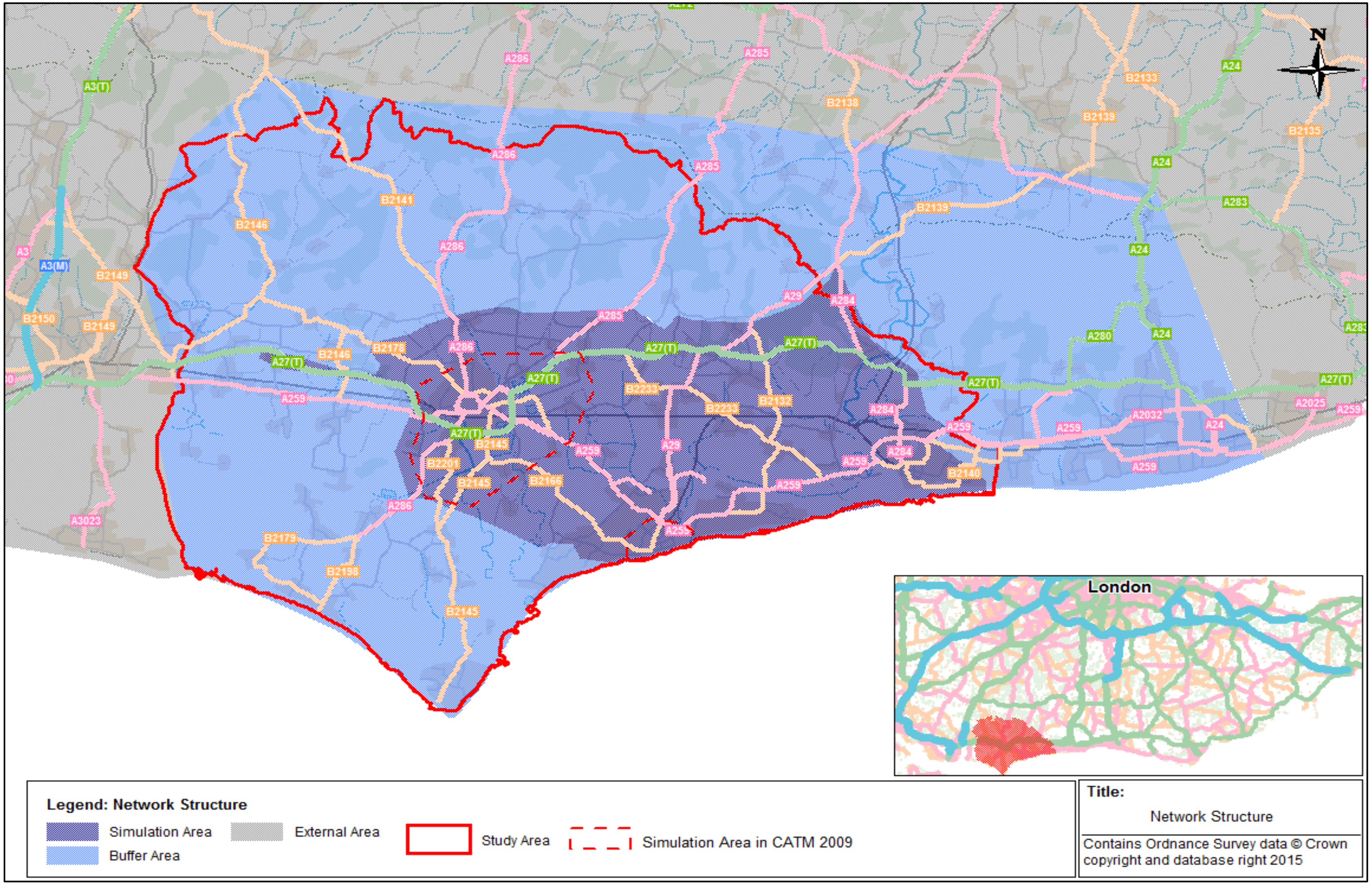
4.2.5 The model includes all important highway links and junctions within the area of influence of the scheme to enable a more robust modelling of travel times, routing and assignment to be achieved. For this scheme, this includes all motorways, A Roads and B Roads within the study area. Unclassified roads in the study area were also included where these carried significant levels of traffic, or where roads are likely to be affected by the proposed scheme.

4.3 Network Update and extension of simulation area

4.3.1 The 2009 network has calibrated and validated successfully, giving acceptable levels of match to screenline counts and journey times hence provides a good starting point for the development of the new 2014 highways network used in this study.

4.3.2 In the previous model the Chichester and Bognor Regis areas formed detailed simulation areas, with speed-flow modelling applied across the study area. In this study the simulation area is expanded as shown in **Error! Reference source not found.** to allow the model to be used for other future studies.

Figure 4-1 Location of Calibration and Validation Sites



4.4 Network Coding

4.4.1 The coding of any modelled network broadly consists of junctions (known as "nodes") and the sections of road in-between the junctions (known as "links"). Different types of junctions, such as roundabouts, signals or priority junctions can be explicitly modelled within SATURN.

4.4.2 The new simulation network was coded by finalising its extent and density in GIS. The density of the network considered all dual-carriageways, A-roads, B-roads, key minor roads, residential and unclassified roads in the simulation area. The GIS based network was then converted to SATURN fomat using a 'GIS to SATURN' script which outputs a simple simulation as well as buffer SATURN network with actual lengths; default values for saturation flow, speed and number of lanes.

4.4.3 This output from the script provided a good starting point and was updated to include details such as junction type, turn restrictions, number of lanes and speed limits based on GIS information available through Google Earth. The images from Google Earth were imported to AutoCAD to scale and measurements were made which gave a decent approximation of the onsite scenario. This processed data was incorporated in the spreadsheets which estimates the turn saturation flows and the default values were replaced by estimated turn saturation flow capacity more details on the formulae used for estimating the turn saturation flows for different junction types is included in section **Error! Reference source not found.**.

4.4.4 For roundabouts the classifications of saturation flows and other roundabout parameters, such as circulating capacity and the time to circulate the roundabout, are based on the roundabout size and the number of lanes approaching the roundabout. Roundabouts have been classified as mini-roundabouts, 'normal' roundabouts with single or flared approaches, and 'large' roundabouts with two or more lane approaches.

4.4.5 Priority junctions used the direct application of SATURN give-way and opposed traffic turn priority markers to represent the individual movements at a junction.

4.4.6 Signal staging and timings were coded using observed data provided by WSCC for the signalised junctions within the model. However, due to many signalised junctions being optimised, and timings varying throughout time periods, alterations were made to timings to enable count and journey time validation where necessary.

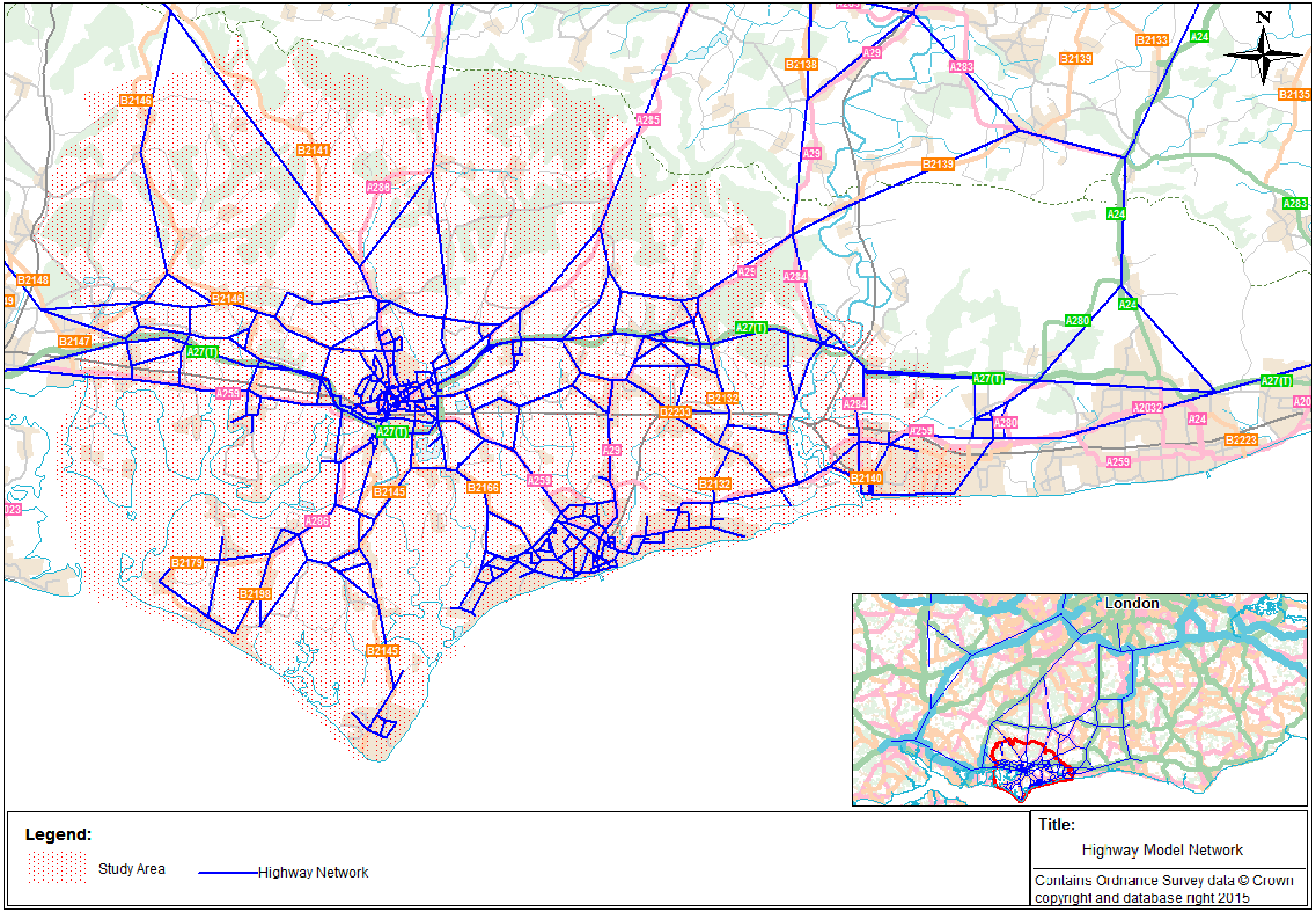
4.4.7 For modelling motorway merge type junctions the methodology recommended by SATURN guidance has been applied, which suggests the use of a turn priority marker. The marker implies that a vehicle joining a motorway from a slip road needs only to find a gap in the single nearest lane of traffic.

4.4.8 All the 2009 CATM junctions codings which have been revised follow the same principles for turn saturation flow calculation. The list of junctions which were edited is given in APPENDIX B.

4.4.9 Bus routes and their frequencies have been updated and included in CATM 2014 model. Buses are not part of the demand but with the correct information SATURN maintains the level of congestion to represent their presence.

4.4.10 The physical attributes and location of each link in the model (i.e. urban or rural) were used to inform the performance characteristics that they were attributed. These were based on COBA link classifications (derived from the COBA Manual in DMRB Volume 13, Section 1, Part 5). Each COBA link classification has a capacity index number associated with it. This index number refers to an appropriate speed-flow curve based on the nature of the link. The speed-flow curve defines the key determinants of a link's performance, such as its saturation capacity, the speed that vehicles travel at this level of saturation and the speed that vehicles travel in free-flow conditions. Speed-flow curves are discussed in more detail later in Section 4.6.

Figure 4-2: Highway Network of the modelled area



4.5 Turn Saturation Flow Capacity for Junctions

4.5.1 Junction coding also includes the coding of saturation capacities for turning movements at each junction. Saturation capacities reflect the maximum number of PCUs per hour that can make a particular turning movement depending on a number of variables relating to the junction type, priority rules and other impedances.

4.5.2 As stated above for the new simulation area a script was used which ouputs the simulation network with actual link lengths and default values for number of lanes, speed and saturation flow. A spreadsheet-based saturation flow calculator was developed, incorporating the main aspects of the empirical formulae from TRL reports RR67 and LR942 as detailed in following sections. The turn saturation flows for all junctions coded in the SATURN simulation network reflect local scenario and the use of global values is avoided as far as possible. This supported the development of a robust network. These junction inputs have been derived from desk-based research, digital mapping tools and CAD. In some instances basic assumptions have been made regarding inputs, such as gradient and visibility due to the inherent difficulty in accurately deriving this information. Where appropriate, local adjustments were also made to these saturation flows as part of the model calibration process.

4.5.3 Saturation flows for signalised junctions were calculated based on formula based on Research Report 67 (Kimber, McDonald and Hounsell, Transport Research Laboratory, 1986) using the following stated function.

$$S(r, n, w_l)=(2080 - 140\delta_n + 100(w_l - 3.25))/(1+1.5\, r)$$

w_l = lane *width*
r = Radius of turn
δn = nearside or kerbside lane indicator

4.5.4 Saturation flows for roundabouts were calculated based on empirical formula stated in TRRL LR 942, The Traffic Capacity of Roundabouts (RM Kimber, 1980). The primary elements of design are e and l (or l'); a simplified form of the predictive equation was used as follows:

$$S = 303*(v+(e-v)/(1+3.2*(e-v)/l'))$$

v = approach width
e = entry width
l'= Effective Flare length (m)

4.5.5 Since a very large number of priority junctions had to be coded, standard values as stated in Table 4-1 were used. During the process of model calibration, some junctions were revisited in order to improve the model performance, but were kept within the bounds of the values detailed in Table 4-2.

Table 4-1: Standard Turning Saturation Flows (PCUs per lane) for Priority Junction

Turn Link Type	Left	Ahead	Right
Major Arm – Unopposed movement without flare	1650	2000	1650
Major Arm – Opposed movement without flare		1250	1200
Minor Arm - Give way link without flare	1200	950	875
Major Arm – Unopposed movement with flare	1681	2038	1681
Major Arm – Opposed movement with flare		1274	1223
Minor Arm - Give way link with flare	1223	968	892

Table 4-2: Range Value Turn Saturation Flows (PCUs per lane) for Priority Junction

Turn Link Type	Left	Ahead	Right
Major Arm – Unopposed movement without flare	1400 to 1900	1700 to 2300	1400 to 1900
Major Arm – Opposed movement without flare		1050 to 1450	1000 to 1400
Minor Arm - Give way link without flare	1000 to 1400	800 to 1100	750 to 1000
Major Arm – Unopposed movement with flare	1450 to 1950	1750 to 2350	1450 to 1950
Major Arm – Opposed movement with flare		1100 to 1450	1050 to 1400
Minor Arm - Give way link with flare	1050 to 1400	800 to 1100	750 to 1050

4.6 Speed-Flow Curves

4.6.1 On roadway links increasing traffic volumes result in decreasig speeds. It is also the case that different types of roads have different levels of capacity, for example, motorways and dual carriageways have a greater capacity than urban roads. Both the above characteristics are modelled within SATURN using speed/flow curves based on those given in the TAG Unit M3.1 Appendix D, but adjusted to give values in PCUs, which, as mentioned in Chapter 2, is the traffic unit that SATURN uses.

4.6.2 The link characteristics described in the manual were translated into parameters appropriate for use in the SATURN model. A total of 75 different link types were drawn up based on COBA, to accommodate all different combinations of urban/suburban/rural, levels of development, road widths, number of lanes, and vehicle restrictions. For each link type, the relationship between vehicle flow and average speed, also known as a speed-flow curve was defined. The full list of link types, along with free flow speed, capacity, and parameters for the volume-delay function for cars and LGV is given in Table 4-3.

4.6.3 In the buffer network, whilst junctions were not explicitly modelled, the delays associated with them have been reflected in the allocation of appropriate speed/flow curves. Hence, in built–up areas, urban speed/flow curves reflect the greater influence of junction delays and link delays (due to parked vehicles etc). However, for rural links, journey times are less affected by junction delays and this is reflected in the rural speed/flow curves.

Table 4-3: Speed-Flow Curves

Index	Area	Description	Free-flow Speed – kph (mph)	Speed at Capacity – kph (mph)	Capacity (PCU)	Flow Delay Power n
3	Rural	A 27 - Dual carriageway 2 lanes	112 (70)	30 (19)	4000	3.0
101	Rural	Rural 6-lane Motorway	112 (70)	79 (49)	13140	2.75
102	Rural	Rural 5-lane Motorway	112 (70)	79 (49)	10950	2.75
103	Rural	Rural 4-lane Motorway	112 (70)	74 (46)	8760	3.1
104	Rural	Rural 3-lane Motorway	112 (70)	74 (46)	6570	3.3
105	Rural	Rural 2-lane Motorway	112 (70)	67 (42)	4380	2.9
106	Rural	Rural 1-lane Motorway	112 (70)	76 (48)	2190	2.9
107	Rural	Rural 5-lane ATM Motorway	99 (62)	74 (46)	10925	4.7
108	Rural	Rural 4-lane ATM Motorway	99 (62)	74 (46)	8740	4.7
109	Rural	Rural 3-lane ATM Motorway	99 (62)	74 (46)	6555	4.7
110	Rural	Rural 4-lane Narrow Motorway	80 (50)	67 (42)	8760	6
111	Rural	3-lane Slip-Road Motorways	92 (58)	55 (34)	5190	2.35
112	Rural	2-lane Slip-Road Motorways	92 (58)	55 (34)	3460	2.35
113	Rural	1-lane Slip-Road Motorways	92 (58)	55 (34)	1730	2.35
114	Rural	4-lane Motorway Gyratory	64 (40)	35 (22)	6565	3.75
115	Rural	3-lane Motorway Gyratory	64 (40)	32 (20)	5100	3.8
116	Rural	2-lane Motorway Gyratory	64 (40)	31 (19)	3400	1.75
117	Rural	1-lane Motorway Gyratory	64 (40)	31 (19)	1700	1.75
118	Rural	5-lane Motorway Gyratory	64 (40)	35 (22)	8205	3.75

Index	Area	Description	Free-flow Speed – kph (mph)	Speed at Capacity – kph (mph)	Capacity (PCU)	Flow Delay Power n
119	Rural	4-lane Slip-Road Motorways	92 (58)	55 (34)	6920	2.35
131	Rural	Rural 4 lane A-Road	112 (70)	73 (46)	7600	2.75
132	Rural	Rural 3 lane A-Road	112 (70)	73 (46)	6030	2.75
133	Rural	Rural 2 lane A-Road	104 (65)	68 (43)	4020	2.7
134	Rural	Rural S10 Very Good A-Road	96 (60)	42 (26)	1730	2.05
135	Rural	Rural S7.3 Good A-Road	88 (55)	41 (26)	1640	2.35
136	Rural	Rural S7.0 Typical A-Road	60 (38)	38 (24)	1640	2.1
137	Rural	Dual Lane Slip-Road A-Roads	87 (54)	42 (26)	3460	2.05
138	Rural	Single Lane Slip-Road A-Roads	87 (54)	42 (26)	1730	2.05
149	Rural	Rural 5 lane A-Road	112 (70)	73 (46)	9500	2.75
150	Rural	2-lane A-Road Gyratory	64 (40)	31 (19)	3400	1.75
151	Rural	1-lane A-Road Gyratory	64 (40)	31 (19)	1700	1.75
152	Rural	3-lane A-Road Gyratory	64 (40)	31 (19)	5100	1.75
153	Rural	Rural S7.3 Good A-Road (50mph limit)	75 (47)	41 (26)	1640	2.35
154	Rural	Rural 2 lane A-Road (50mph limit)	75 (47)	41 (26)	3280	2.7
155	Rural	4-lane A-Road Gyratory	64 (40)	31 (19)	6800	1.75
156	Rural	4-lane Slip-Road A-Roads	87 (54)	42 (26)	6920	2.05
161	Rural	Rural S7.3 Good B-Road	88 (55)	41 (26)	1640	2.35
162	Rural	Rural S7.0 Typical B-Road	60 (38)	38 (24)	1640	2.1
163	Rural	Rural S6.5 Bad	52 (33)	40 (25)	1640	1.35
164	Rural	Unclassified Roads	50 (31)	40 (25)	1640	1.35
182	Rural	Rural S7.3 Good B-Road (2 lanes)	88 (55)	41 (26)	3280	2.35
183	Rural	Rural S7.3 Good B-Road (50mph limit)	75 (47)	41 (26)	1640	2.35
184	Rural	Rural 2 lane B-road	104 (65)	68 (43)	4020	2.7
186	Rural	Rural 3-lane B-road	104 (65)	68 (43)	6030	2.7
187	Rural	Rural 2-lane B-Road (50mph limit)	75 (47)	41 (26)	3280	2.35
139	Suburban	Suburban 4-lane A-Road Slight Development	75 (47)	35 (22)	6565	2.3
140	Suburban	Suburban 3-lane A-Road Slight Development	75 (47)	34 (21)	5100	2.3
141	Suburban	Suburban 2-lane A-Road Slight Development	71 (44)	35 (22)	3400	1.15
142	Suburban	Suburban 1-lane A-Road Slight Development	64 (40)	24 (15)	1700	2.6
143	Suburban	Suburban 4-lane A-Road Typical Development	64 (40)	35 (22)	6565	3.75
144	Suburban	Suburban 3-lane A-Road Typical Development	64 (40)	32 (20)	5100	3.8
145	Suburban	Suburban 2-lane A-Road Typical Development	64 (40)	31 (19)	3400	1.75
146	Suburban	Suburban 1-lane A-Road Typical Development	64 (40)	31 (19)	1700	1.75
147	Suburban	Suburban 2-lane A-Road (30mph limit)	48 (30)	31 (19)	3400	1.75
148	Suburban	Suburban 1-lane A-Road (30mph limit)	48 (30)	31 (19)	1700	1.75
165	Suburban	Suburban 4-lane B-Road Slight Development	75 (47)	35 (22)	6565	2.3
166	Suburban	Suburban 3-lane B-Road Slight Development	75 (47)	34 (21)	5100	2.3
167	Suburban	Suburban 2-lane B-Road Slight Development	71 (44)	35 (22)	3400	1.15
168	Suburban	Suburban 1-lane B-Road Slight Development	64 (40)	24 (15)	1700	2.6
169	Suburban	Suburban 4-lane B-Road Typical Development	64 (40)	35 (22)	6565	3.75
170	Suburban	Suburban 3-lane B-Road Typical Development	64 (40)	32 (20)	5100	3.8
171	Suburban	Suburban 2-lane B-Road Typical Development	64 (40)	31 (19)	3400	1.75
172	Suburban	Suburban 1-lane B-Road Typical Development	64 (40)	31 (19)	1700	1.75
180	Suburban	Suburban 2-lane B-Road (30mph limit)	48 (30)	31 (19)	3400	1.75
181	Suburban	Suburban 1-lane B-Road (30mph limit)	48 (30)	31 (19)	1700	1.75
185	Suburban	Suburban 3-lane B-Road (30mph limit)	48 (30)	31 (19)	5100	1.75
173	Urban	Urban 60mph Fixed Speed	96 (60)	96 (60)	99999	0
174	Urban	Urban 50mph Fixed Speed	80 (50)	80 (50)	99999	0
175	Urban	Urban 40mph Fixed Speed	64 (40)	64 (40)	99999	0
176	Urban	Urban 30mph Fixed Speed (30 mph limit no impedances)	48 (30)	48 (30)	99999	0
177	Urban	Urban 25mph Fixed Speed (30 mph limit limited no impedances)	40 (35)	40 (35)	99999	0
178	Urban	Urban 20mph Fixed Speed (30 mph limit significant impedances or 20 mph limit no impedance)	32 (20)	32 (20)	99999	0
179	Urban	Urban 15mph Fixed Speed (20 mph limit	24 (15)	24 (15)	99999	0

Index	Area	Description	Free-flow Speed – kph (mph)	Speed at Capacity – kph (mph)	Capacity (PCU)	Flow Delay Power n
		limited no impedances)				

4.6.4 For HGV's, the speed capacity index function is adjusted such that HGVs have a maximum speed of 96km/h (60mph) using CLICKS function in SATURN these are shown in Table 4-4 below:

Table 4-4: HGV Free Flow Speeds

Index	Description	Car /LGV Free-flow Speed – kph (mph)	HGV Free-flow Speed – kph (mph)
3	A 27 - Dual carriageway 2 lanes	112 (70)	96 (60)
101	Rural 6-lane Motorway	112 (70)	96 (60)
102	Rural 5-lane Motorway	112 (70)	96 (60)
103	Rural 4-lane Motorway	112 (70)	96 (60)
104	Rural 3-lane Motorway	112 (70)	96 (60)
105	Rural 2-lane Motorway	112 (70)	96 (60)
106	Rural 1-lane Motorway	112 (70)	96 (60)
131	Rural 4 lane A-Road	112 (70)	96 (60)
132	Rural 3 lane A-Road	112 (70)	96 (60)
133	Rural 2 lane A-Road	104 (65)	88 (55)
134	Rural S10 Very Good A-Road	96 (60)	64 (40)
135	Rural S7.3 Good A-Road	88 (55)	64 (40)
136	Rural S7.0 Typical A-Road	60 (38)	64 (40)
153	Rural S7.3 Good A-Road (50mph limit)	75 (47)	60 (38)
154	Rural 2 lane A-Road (50mph limit)	75 (47)	60 (38)
161	Rural S7.3 Good B-Road	88 (55)	64 (40)
162	Rural S7.0 Typical B-Road	60 (38)	56 (35)
163	Rural S6.5 Bad	52 (33)	48 (30)
164	Unclassified Roads	50 (31)	48 (30)
182	Rural S7.3 Good B-Road (2 lanes)	88 (55)	64 (40)
183	Rural S7.3 Good B-Road (50mph limit)	75 (47)	60 (38)
184	Rural 2 lane B-road	104 (65)	88 (55)
186	Rural 3-lane B-road	104 (65)	88 (55)
187	Rural 2-lane B-Road (50mph limit)	75 (47)	60 (38)
139	Suburban 4-lane A-Road Slight Development	75 (47)	64 (40)
140	Suburban 3-lane A-Road Slight Development	75 (47)	64 (40)
141	Suburban 2-lane A-Road Slight Development	71 (44)	64 (40)
142	Suburban 1-lane A-Road Slight Development	64 (40)	56 (35)
143	Suburban 4-lane A-Road Typical Development	64 (40)	56 (35)
144	Suburban 3-lane A-Road Typical Development	64 (40)	56 (35)
145	Suburban 2-lane A-Road Typical Development	64 (40)	56 (35)
146	Suburban 1-lane A-Road Typical Development	64 (40)	56 (35)
165	Suburban 4-lane B-Road Slight Development	75 (47)	64 (40)
166	Suburban 3-lane B-Road Slight Development	75 (47)	64 (40)
167	Suburban 2-lane B-Road Slight Development	71 (44)	64 (40)
168	Suburban 1-lane B-Road Slight Development	64 (40)	56 (35)
169	Suburban 4-lane B-Road Typical Development	64 (40)	56 (35)
170	Suburban 3-lane B-Road Typical Development	64 (40)	56 (35)
171	Suburban 2-lane B-Road Typical Development	64 (40)	56 (35)
172	Suburban 1-lane B-Road Typical Development	64 (40)	56 (35)
173	Urban 60mph Fixed Speed	96 (60)	64 (40)
174	Urban 50mph Fixed Speed	80 (50)	60 (38)
175	Urban 40mph Fixed Speed	64 (40)	56 (35)
176	Urban 30mph Fixed Speed (30 mph limit no impedances)	48 (30)	32 (20)
177	Urban 25mph Fixed Speed (30 mph limit limited no impedances)	40 (35)	32 (20)
178	Urban 20mph Fixed Speed (30 mph limit significant impedances or 20 mph limit no impedance)	32 (20)	32 (20)

Index	Description	Car /LGV Free-flow Speed – kph (mph)	HGV Free-flow Speed – kph (mph)
179	Urban 15mph Fixed Speed (20 mph limit limited no impedances)	24 (15)	24 (15)

4.7 Zones and Zone Connectors

4.7.1 The zoning system for the model has been discussed in detail in section 2.6 and the figures are included in APPENDIX A.

4.7.2 The zones represent geographical areas for which trip origins and destinations are amalgamated to give a manageable matrix size. Smaller zones may cover locations with a particular land use. There are a large number of small zones representing the urban areas in Chichester, Bognor Regis and Arudel, whereas Scotland, which is a large distance away, is represented by a large single zone.

4.7.3 Zones are connected to the links in the traffic model using “zone centroid connectors”. With this traffic model, the distances input for the zone centroid connector are those representing the distances between the middle of the zone and the network. A zone may have more than one centroid connector, in which case they should reflect the relative access costs (time, distance) to gain the network as they then influence route choice.

4.8 Summary of Network Development

4.8.1 The following is a summary of the main points associated with the development of the network for the traffic model:

- Network Components: In the network, junctions are represented by nodes, whilst links represent the roads in between the junctions. The modelled network also includes zones and connectors that attach zones to the network.
- Link and Junction Coding: CATM 2009 network has been reviewed and updated to 2014 and additional simulation network added to the new base model.
- Modelling standards: Model parameters, assumptions, speed flow curves and standardised methodology to code the turn saturation have been followed to keep the coding consistent.
- Network checks: Sufficient network checks have been performed to ensure the model is robust.
- Zoning System: Zones represent the starting or finishing points of journeys. The zoning system and the sectors used in this model are shown in APPENDIX A.

5 MATRIX DEVELOPMENT

5.1 Overview

5.1.1 The methods used in the development of travel matrices for this study do not follow conventional approaches described in DMRB where synthesised demand matrices and road side interview data are merged to create demand matrices. These more traditional approaches, which utilise trip end modelling and trip distribution to facilitate matrix synthesis and infill were not included as part of the study ASR.

5.1.2 This study uses mobile phone data as its primary data source for building travel demand matrices. The approaches to using such datasets are innovative, with exploration of the dataset's qualities and use of pragmatic solutions to overcome difficulties playing a key role. Methods which use inferences to impute journey characteristics (such as journey purpose, home location or vehicle type) were specifically excluded from the approach adopted as these were not viewed as robust and proven techniques.

5.2 The Mobile Phone Dataset

5.2.1 A mobile phone dataset of trips was obtained from INRIX, having been built from the mobile phone service provider O2. The data was collected for Tuesdays, Wednesdays and Thursdays over a fortnight in early July 2014. The dates used were before the school holiday period, and did not coincide with major Goodwood events which could have distorted travel patterns.

5.2.2 Travel patterns were collected in the form of 'trip' matrices where each 'trip' is the trace of the movements of a mobile phone between resting points (which correspond to the start and end points of the trip).

5.2.3 Data were collected for all trips within, into, out of or through the Chichester study area. Trips coming into the area were tracked back through time to obtain a true origin point, and likewise trips leaving the study area were traced forward to their destination. Trip matrices were built for the individual hours of the morning and evening peak (i.e. those hours in the intervals 07.00 to 10.00 and 16.00 to 19.00), and inter-peak trips were accumulated into a single group. The start time of the journey determined which 'time slice' that trip was accumulated into.

5.2.4 Further information was obtained for trips starting outside the study area before 07.00 which were still travelling during the morning peak period. This facilitated correction of longer distance trips in the matrices from a 'start of journey' time basis to 'time when entered the study area'.

5.2.5 The processing undertaken by INRIX filtered out rail trips. Trips which followed a rail route were identified and removed from the dataset. The process removed entire journeys, including the public transport access and egress legs which could be by car, walk or other modes. Trips undertaken entirely by slow mode (e.g. walk and cycle) were identified and filtered out of the dataset. The remaining trips comprise car (driver and passenger), bus, taxi and motor cycle modes of travel.

5.2.6 A few zones did not have trips explicitly allocated to them by the initial data processing undertaken by INRIX. Their trips were allocated to a group of two or three adjacent study area zones, and the demand was split between them using proportions based on demographic data prior to delivery.

5.2.7 The processing by INRIX did not segment trips by vehicle type or use inferences to impute journey purposes.

5.3 Review of the mobile phone dataset

5.3.1 The mobile phone dataset was reviewed to understand its coverage (in space and time) and identify potential issues in its use. Correlation between observed movements (as unexpanded mobile phone traces), the zonal totals of originating and terminating movements, and the zonal demographic characteristics were checked.

5.3.2 A number of zones were identified which had large numbers of originating or terminating movements but did not have the population or employment to support this level of travel activity. For residential zones observed movements per household was used to guide this identification work. The trip ends for town centre zones were reviewed against local land use, and no significant anomalies were identified. When viewed on a map of the study area with these movement totals represented as histograms, these zones readily stand out. These locations are referred to in this report as 'data spikes'. Out of 212 zones in the detailed study area a total of nine data spike locations were identified. Of these seven are distinct zones (to which movements were allocated), and the other two are areas where the movements were split using demographic data between two or three adjacent study area zones.

5.3.3 It is recognised that tracing of more recent mobile phones is spatially more accurate. Third generation (3G) handsets in passive mode are detected when they move between the cells covered by different mobile phone transmitter masts, affording a good level of locational accuracy. Second generation is, however, less accurate with events recorded when a phone moves from one group of masts to another adjacent group. This lower spatial resolution, and the allocation based on 'main' mast location in the group is believed to be the reason for these 'data spikes'.

5.3.4 The range covered by each mobile phone transmitter can also contribute to these data spikes. As the terrain is generally flat, the masts would operate over long distances, and those on the lower slopes of the South Downs overlooking the flat coastal plain would have even longer range. As cell boundaries are not rigidly defined those masts with longer range would record more movement ends at the expense of those adjacent masts in less prominent locations. This can cluster third generation phone traces and accentuate the data spikes.

5.3.5 Having identified the data spike locations checks were made on the mobile phone traces, or observed movements. Desire line plots of phone traces show stronger flows between data spike locations, and to a lesser extent between spike zones and external zones.

5.3.6 We reviewed data on mobile phone mast locations (based on data from Ofcom and sitefinder.ofcom.org.uk), estimating their spatial coverage (based on distance to nearest mast) and plotted against study area zones. The 'data spike' zones were typically adjacent or close to mobile phone cells or model zones where the observed movements per household was much lower. Using this information we developed a strategy to reallocate the excess trips in a data spike to surrounding phone cells and study area zones.

5.3.7 The consequences of lower levels of spatial accuracy found in part of the dataset was considered, and its implications on matrix building.

5.3.8 The lack of spatial detail in parts of the mobile phone dataset may cause it to be incomplete. Short distance trips may go unrecorded (when there is no event changing in cell group during the journey); the same may apply to very local return trips with short stop-overs (e.g. home to drop children at school and return). Such under recording will result in shortages of such trips in demand matrices.

5.3.9 Where mobile phone traces are not spatially accurate it is not possible to identify rail trips and exclude them from the mobile phone dataset. To compensate it was assumed that rail trips may have been missed in the data filtering processes.

5.3.10 Although most zones in the study area had some originating and terminating trips, a few zones had no trip ends in one or more of the modelled periods. As these zones typically had significant populations and/or employment corrective action was considered appropriate.

5.3.11 Some of the recorded trips originated or terminated in zones on the edge of the study area which have few trip generators or attractors. This was often coupled with zones further away from Chichester along the main road corridor which had no trip ends recorded. Trips which were in excess of what the zone's land use and demography would warrant had their external trip end moved to further away from Chichester along the main route corridor being followed.

5.3.12 The mobile phone movements were built into unexpanded matrices in order to check the scale of expansion needed to create trip matrices. These movement matrices had been corrected for arrival time in the study area and public transport trips, as described in the following sections. Comparisons of demand (at sector level) against traffic counts at sector boundaries (the Arun and Bognor screenlines, and A27 west of Chichester) confirmed that expansion factors would need to vary between time periods and between sectors of the study area if counts were to be matched.

5.4 Processing the mobile phone data to create demand matrices

5.4.1 The transformation of data from mobile phone traces to trip matrices requires a series of steps:

- Time period correction
- Treatment of "spike zones" with excessive trip ends
- Removal of PT trips
- Expansion from sample to full population
- Splitting of trips by vehicle type
- Splitting of personal trips by journey purpose

5.5 Time period corrections

5.5.1 Where trips originated at locations distant from the study area their time of arrival into the modelled study area was revised to reflect when they reached that area. Their travel time to reach the study area boundary was estimated from network skims and the trips delayed to a later period so that they are modelled in the study area for the time period when they reached that area. Long distance trips departing from remote zones before 07.00 were added into the appropriate time period, and such departures in the morning peak, inter-peak or evening peak were similarly delayed to a later time (which may lie in the following time period). This adjustment assumed that inter-peak departures for any origin/destination combination were divided evenly over the six hour period.

5.6 Treatment of data spikes

5.6.1 The following section describes how the zones which had excessive mobile phone movements ending in them (data spikes) were treated.

5.6.2 The general approach used to treat data spikes was to redistribute trip ends across a number of adjacent and nearby zones. The zones receiving trip-ends were selected using trip rate information (typically per household, but jobs & land use were also taken into account) and maps showing phone mast locations and zone boundaries.

5.6.3 An additive approach where trip ends were added into receiving zones was preferred as some zones had trip end totals of zero, and which could not readily be increased by multiplicative scaling. A proportion of trips to a data spike zone were allocated to a nearby destination, with their origin zones unchanged. Similarly trips outward from data spike zones had origins relocated to nearby zones and their destination unchanged. Where flows were between two data spike zones both origin and destination ends were redistributed over neighbouring zones.

5.6.4 The reallocation process was guided by zonal household totals and job totals obtained from the 2011 Census.

5.6.5 The main data spike zone in the model, which lies to the north east of Chichester along the A285, had most trips reallocated to north, central and east Chichester and the Tangmere / Boxgrove zones. Most of the morning peak trips from the data spike zone were reallocated to start from residential zones in the receiving area. As many of these already had originating trips the process ‘topped-up’ trips where car trip rates from the zone fell below average values. A minimal top-up or no change were applied to zones which already had average or above-average trip rates respectively. A smaller proportion of trips were re-allocated to business or industrial locations. Morning peak trips to the data spike zone were largely reallocated to zones with jobs. In the town centre the exact locations focused not on the workplace but on main car park locations as the highways network did not contain a walk network representation of access to the town centre zones. The evening peak treatment used residential locations in Chichester as the main focus of trip destinations, and workplace for origins; it also increased trips to/from retail (superstore) locations. The inter-peak top-up treatment was based on an average of morning origin and destination splits. The extent of trip-end shortfall for a zone often varied between time periods, so the principal of topping-up to an average level always applied rather than strict proportions of trips from a data spike being allocated to a particular receiving zone.

5.6.6 One further data spike occurred on the south edge of Chicester city centre, at Stockbridge (zones 58/59/60). A small number of mobile phone trace-ends were re-allocated to zones along the south edge of Chichester city centre.

5.6.7 For the Chichester area the locations of phone masts is shown in Figure 5-1, overlaid with study area zones, with the data spike zones shaded. The re-allocation of mobile phone trace-ends are shown for the morning peak in the Chichester area as Figure 5-2. For each zone a histogram representation shows the number of originating and terminating traces, with each shown before and after the re-allocation process.

Figure 5-1 Mobile phone masts, model zones, and data spike locations

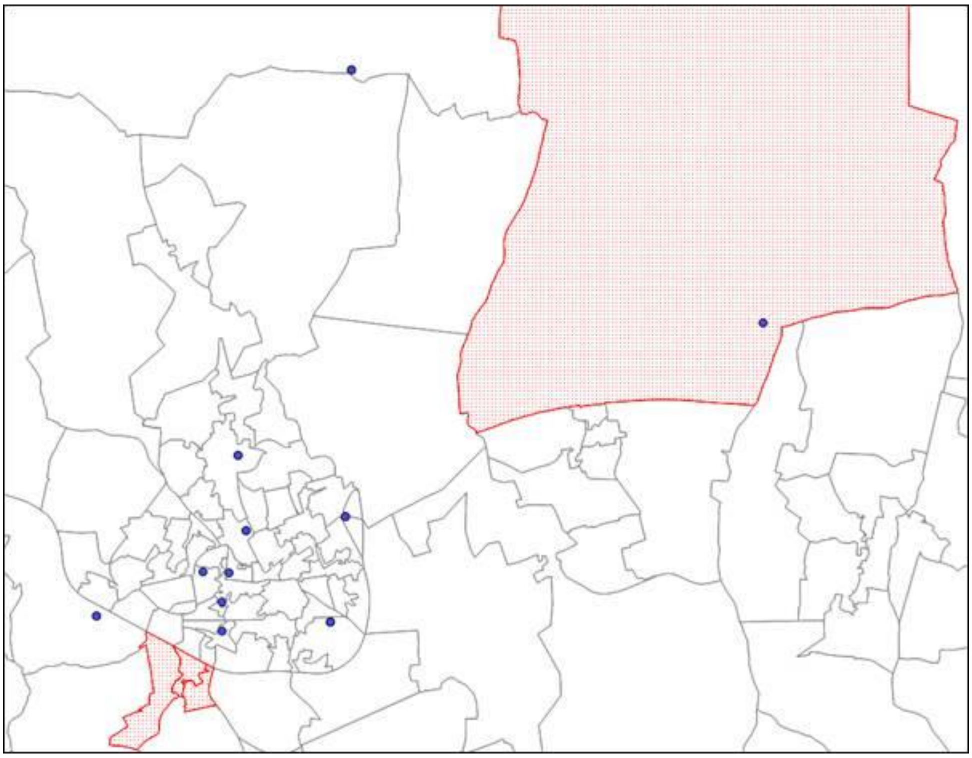
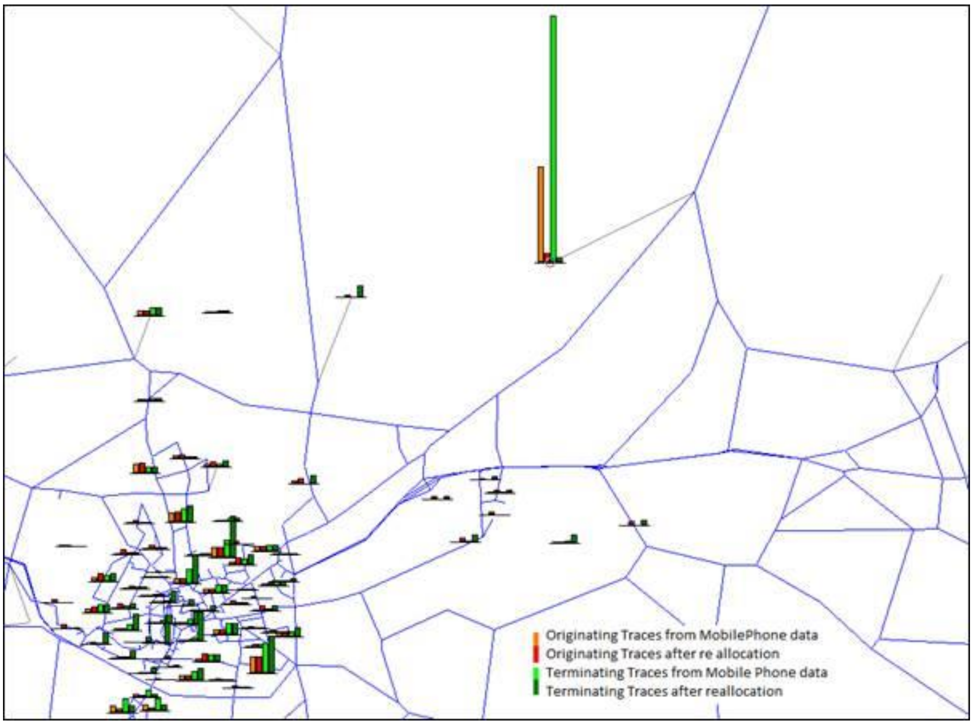


Figure 5-2 Mobile phone trace-ends in Chichester – data spike processing (AM)



5.6.8 The data spike in the Barnham / Yapton area was handled in similar detail, as residences are scattered across the area while jobs were more concentrated in town centres, Ford prison and Climping industrial park.

5.6.9 In Bognor the reallocation was less detailed (not being defined by modelled time period) as our objectives were to reproduce cross screenline flows rather than detailed within Bognor flows. The Birdham data spike was also handled at a less detail, with trip-ends primarily reallocated to Wittering, and Selsey, with a small number to Bosham. Similarly the two data spike zones in the Littlehampton area were treated at this broad level as additional detail would have limited effect on traffic assignments in the Chichester area. The larger of these spikes was on the edge of the modelled area and as the external Angmering/Worthing area had no trace-ends part of that data spike was re-allocated along the corridor (as described in 5.3.11).

5.6.10 Figures showing the reallocation of trip-ends from the main data spike zones in the study area are presented in **Error! Reference source not found.**.

5.7 Removal of public transport trips from the mobile phone dataset

5.7.1 The mobile phone dataset included bus trips, and (due to spatial resolution issues associated with data spikes) some rail trips. These were removed by scaling down sector-to-sector movements by appropriate proportions. The most recent and detailed data source available is the 2011 Census Journey to Work which gives mode of main leg of journey at mid-level Super Output Areas (MSOA) level. For the morning peak, where home to work trips are a major proportion of demand, the proportion of bus trips in the total vehicular person trips was used; phone traces were scaled down using this factor to estimate car driver and passenger movements. For movements between the main towns served by railway station (Littlehampton, Bognor, Barnham and Chichester) the factor was calculated included rail trips. For the evening peak the morning peak factors were applied but with direction reversed.

5.7.2 As data collection for this was restricted to highways mode there was no spatially detailed recent information for inter-peak public transport proportions. Proportions of trips between sectors from the previous Chichester Area Transport Study were used as detailed in Table 5-1. As this data is not recent any error in the values used would be compensated for later in data expansion, as this step is also performed at sector to sector level.

Table 5-1: Assumed PT proportions

AM	1	2	3	4	5	6	7	8	9
1	3.4%	2.0%	0.0%	1.1%	0.0%	0.7%	0.0%	0.0%	5.4%
2	2.6%	3.0%	3.8%	2.2%	1.9%	1.4%	0.0%	1.5%	8.4%
3	5.3%	8.4%	2.1%	7.2%	2.9%	3.1%	0.0%	2.6%	14.2%
4	2.9%	4.6%	5.5%	5.6%	1.7%	2.5%	0.0%	7.3%	9.5%
5	0.0%	0.6%	0.0%	2.6%	0.9%	0.7%	0.0%	3.6%	1.3%
6	1.6%	6.3%	2.0%	2.3%	0.0%	0.5%	0.0%	2.3%	5.4%
7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	0.0%	3.9%	2.3%	9.7%	3.0%	1.2%	0.0%	8.5%	18.4%
9	5.4%	9.0%	10.0%	6.8%	2.0%	4.0%	0.0%	7.3%	4.2%
IP	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	12.9%	0.0%	0.0%	0.0%	0.0%	3.8%	2.6%	0.0%	0.0%
2	0.0%	2.0%	2.0%	0.0%	0.0%	8.3%	0.0%	0.0%	0.0%
3	0.0%	2.0%	2.0%	0.0%	0.0%	8.3%	0.0%	0.0%	0.0%
4	0.0%	0.0%	0.0%	2.8%	4.2%	5.5%	2.2%	1.9%	1.9%
5	0.0%	0.0%	0.0%	2.7%	2.0%	2.0%	0.0%	4.1%	4.1%
6	7.3%	14.5%	14.5%	8.8%	6.8%	3.2%	4.7%	2.3%	2.3%
7	2.4%	0.0%	0.0%	1.5%	0.0%	2.0%	0.0%	0.0%	0.0%
8	0.0%	0.0%	0.0%	2.2%	3.2%	0.7%	0.0%	0.0%	0.0%

9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

PM	1	2	3	4	5	6	7	8	9
1	3.4%	2.6%	5.3%	2.9%	0.0%	1.6%	0.0%	0.0%	5.4%
2	2.0%	3.0%	8.4%	4.6%	0.6%	6.3%	0.0%	3.9%	9.0%
3	0.0%	3.8%	2.1%	5.5%	0.0%	2.0%	0.0%	2.3%	10.0%
4	1.1%	2.2%	7.2%	5.6%	2.6%	2.3%	0.0%	9.7%	6.8%
5	0.0%	1.9%	2.9%	1.7%	0.9%	0.0%	0.0%	3.0%	2.0%
6	0.7%	1.4%	3.1%	2.5%	0.7%	0.5%	0.0%	1.2%	4.0%
7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	0.0%	1.5%	2.6%	7.3%	3.6%	2.3%	0.0%	8.5%	7.3%
9	5.4%	8.4%	14.2%	9.5%	1.3%	5.4%	0.0%	18.4%	4.2%

5.8 Expansion

5.8.1 Expansion factors were used to convert the resulting mobile phone movements to highways demand at person level. The factors were initially specified for each sector-to-sector movement and time period by comparing unexpanded trips and screenline trip totals. As the screenlines generally follow sector boundaries the sector-to-sector movements can readily be identified, and the expansion factors calculated. These values were then revised through a series of iterations as the matrices were developed.

5.9 Splitting of demand by vehicle type

5.9.1 The total expanded trips were split into vehicle types (LGV, HGV and car) using proportions observed as manual classified turning count data for the junctions along the Chichester bypass (from Fishbourne roundabout to Portfield roundabout). Although only collected for a single day this data is more accurate than automated traffic count as cars are better distinguished from LGVs and similarly LGVs differentiated from HGVs.

5.9.2 Proportions were calculated by modelled time period and direction of travel. Turning movements to or from the Chichester centre (north) side of the bypass were combined and a set of proportions obtained for each direction. Proportions were also calculated for the A27 at each end of the bypass. Roads to the south of the bypass were grouped in line with the sector they fed, and split proportions calculated. The Fishbourne/Southbourne and Wittering sectors used A259 west and A286 south traffic proportions respectively. Selsey sector splits were based on B2145 demand at Whyke roundabout. Bognor sector splits were based on combined flows at A259 east, Vinnetrow Road and Shopwhyke Road.

5.9.3 As any traffic movement has two potential split proportions which may be applied, the proportions used were determined on a sector-to-sector basis. Vehicle type proportions for the north side of the bypass were used for movements to or from Chichester centre and the wider sector lying to the north and west; these locations had much lower proportions of HGV than the A27/A259 corridors which took longer distance HGV trips. Movements to or from the south side of the bypass were based on the splits for the sector / road used to or from the A27. Movements along the entire bypass (i.e A27 west of Fishbourne to/from A27 east of Portfield) used factors based on those at the end of the bypass.

5.9.4 When applied at sector to sector level to demand matrices the HGV and LGV splits did not match observed proportions observed on links, so proportions were revised to give a better fit to vehicle types by location and direction. The following example illustrates why this is necessary. Considering GVs from A27 west, some of these would go into Chichester. That movement has a lower GV proportion than applies to GVs continuing along the A27. Applying the lower (correct) GV proportions for the into Chichester movement requires an increase in GV proportions to the A27 corridor in order to retain a match to observed GV proportions on the A27 west.

5.10 Journey purpose

5.10.1 Car demand was split by journey purpose using the time period specific proportions for originating and terminating trips in each NTEM area. Data were at NTEM zone level for much of the study area, with Chichester factors based on grouped NTEM zones (due to rezonings between versions of NTEM) and South East Region factors were used for external trips. The proportions were applied to the car trip ends to obtain purpose specific trip ends, and these were used to furness the car matrix to give purpose specific matrices.

5.10.2 The NTEM data and trip matrices were at person level, so occupancy factors from WebTAG Databook (Autumn 2014) were applied to get vehicular trips by purpose group. A similar conversion was also applied to LGV trips.

5.11 Demand matrix development

5.11.1 The demand matrix development followed the steps outlined above. The treatment of spike zones and the expansions factors were updated iteratively to improve the fit to total vehicular flows across sector boundaries. During earlier rounds of matrix development the vehicle type and journey purpose were represented by overall generic values. Once a reasonable level of fit to total vehicles at screenline count level had been achieved these generic values were replaced by more detailed information.

5.11.2 The initial set of sector-to-sector vehicle type proportions were used in a highway assignment run, and proportions of traffic assigned compared against the observed turning count splits. During the matrix development process the vehicle type proportions were revised to improve match to the observed values.

5.11.3 The matrix development process did not directly use SATURN matrix estimation in creating the demand matrices, but some runs of that software helped to identify where changes to the demand matrix were desirable, and so inform the changes to the expansion factors or other inputs detailed above.

5.11.4 Matrix expansion was primarily achieved using sector-to-sector factors. As the NTEM zoning level used to split journey purposes was coarse without differentiation of residential and employment locations, the process did not seek to reproduce trip length distributions by journey purpose. A number of additional adjustments were made at sub-sector to sub-sector level. These were applied where trips between groups of zones (or sub-sectors) differed in scale from that obtained using sector-to-sector expansion. Such sub-sector groups of zones were identified by select link processes the adjustment factor estimated from select link flow and link traffic count. The matrices by the sector system as described in section 2.7 for each period by vehicle type are included in Table 5-2, Table 5-3 and Table 5-4.

Table 5-2: AM period Sector to Sector matrices

AM Car	1	2	3	4	5	6	7	8	9	Total
1	208	158	89	95	142	794	916	53	1407	**3861**
2	205	294	442	126	275	540	392	75	296	**2643**
3	98	474	331	267	203	571	187	109	552	**2793**
4	180	228	345	9150	2242	1301	1232	1195	1349	**17223**
5	116	431	185	1712	3278	870	668	2777	1794	**11832**
6	504	528	243	776	1022	2116	892	249	2502	**8833**
7	573	206	223	445	730	1043	2422	704	1542	**7888**
8	66	139	63	764	2327	487	1255	12931	686	**18718**

9	259	524	289	626	596	1448	722	161	930	**5555**
Total	**2209**	**2983**	**2210**	**13960**	**10815**	**9171**	**8689**	**18254**	**11056**	**79347**

AM LGV	1	2	3	4	5	6	7	8	9	Total
1	73	56	31	33	50	279	323	19	171	**1035**
2	28	40	60	17	37	73	53	10	36	**353**
3	17	84	58	47	36	101	33	19	67	**463**
4	28	35	53	1410	345	201	190	184	164	**2610**
5	22	126	43	342	217	116	89	369	218	**1542**
6	98	155	56	155	184	381	161	45	304	**1538**
7	111	60	52	89	257	367	63	248	187	**1434**
8	13	41	15	153	217	45	117	1181	83	**1864**
9	47	94	52	113	107	261	130	29	113	**945**
Total	**437**	**690**	**420**	**2359**	**1450**	**1823**	**1158**	**2103**	**1343**	**11784**

AM HGV	1	2	3	4	5	6	7	8	9	Total
1	30	23	13	14	21	115	133	8	48	**403**
2	8	11	17	5	10	20	15	3	10	**98**
3	4	19	13	11	8	23	7	4	19	**108**
4	11	14	21	546	134	78	74	71	46	**994**
5	8	33	9	176	86	46	43	146	61	**608**
6	34	40	12	80	63	131	55	15	85	**517**
7	39	16	11	46	237	151	26	228	53	**805**
8	5	11	3	79	311	65	268	1694	23	**2458**
9	16	33	18	39	37	90	45	10	32	**319**
Total	**154**	**198**	**116**	**995**	**907**	**719**	**665**	**2180**	**378**	**6311**

Table 5-3: IP period Sector to Sector matrices

IP Car	1	2	3	4	5	6	7	8	9	Total
1	379	424	231	291	277	646	730	362	1013	**4352**
2	318	227	432	452	493	1294	544	378	1187	**5324**
3	176	624	332	683	312	434	468	291	814	**4133**
4	262	548	549	12216	3194	1691	1598	2374	2675	**25106**
5	295	490	479	3366	4729	1219	2002	3248	2068	**17898**
6	485	897	467	2160	1024	2147	1898	1049	4486	**14612**
7	747	1144	499	1302	1707	2178	4785	1224	1996	**15582**
8	231	382	225	2874	4187	934	1326	14598	561	**25318**
9	1208	1528	1098	2957	2275	4375	1431	657	2852	**18381**
Total	**4100**	**6263**	**4313**	**26302**	**18197**	**14918**	**14781**	**24182**	**17651**	**130706**

IP LGV	1	2	3	4	5	6	7	8	9	Total
1	82	92	50	63	60	139	158	78	166	**886**
2	61	44	83	87	95	249	105	73	194	**990**
3	42	149	79	163	74	103	111	69	133	**924**
4	45	95	95	2117	554	293	277	411	438	**4326**

5	79	94	116	565	299	245	402	653	339	**2791**
6	130	171	113	363	167	350	309	171	734	**2508**
7	200	219	121	219	368	470	77	264	327	**2266**
8	62	73	55	483	384	86	122	1290	92	**2645**
9	197	249	179	481	370	712	233	107	467	**2995**
Total	**898**	**1184**	**892**	**4540**	**2370**	**2647**	**1794**	**3116**	**2889**	**20330**

IP HGV	1	2	3	4	5	6	7	8	9	Total
1	37	41	22	28	27	63	71	35	53	**378**
2	15	10	20	21	23	59	25	17	62	**251**
3	12	43	23	47	21	30	32	20	43	**271**
4	20	42	42	934	244	129	122	182	140	**1855**
5	37	22	31	227	142	117	234	311	108	**1229**
6	61	40	30	145	52	109	97	53	234	**821**
7	94	51	32	88	361	212	35	259	104	**1235**
8	29	17	14	193	548	122	394	1840	29	**3187**
9	61	78	56	150	116	223	73	33	149	**939**
Total	**366**	**343**	**270**	**1834**	**1534**	**1064**	**1083**	**2751**	**921**	**10166**

Table 5-4: PM period Sector to Sector matrices

PM Car	1	2	3	4	5	6	7	8	9	Total
1	219	164	122	180	133	589	672	58	469	**2607**
2	254	277	508	484	424	557	620	56	412	**3593**
3	118	303	190	655	214	303	277	137	239	**2435**
4	204	122	220	8859	2222	1008	1295	1004	473	**15407**
5	176	306	453	2560	4492	1189	1811	3201	1081	**15270**
6	586	529	361	1296	1028	1613	1303	419	1929	**9063**
7	832	355	421	1099	1004	1422	4497	1085	1241	**11956**
8	67	72	97	1602	2686	390	912	14353	168	**20347**
9	411	965	610	2146	2117	2540	1054	561	2427	**12831**
Total	**2867**	**3094**	**2983**	**18882**	**14320**	**9611**	**12440**	**20875**	**8438**	**93509**

PM LGV	1	2	3	4	5	6	7	8	9	Total
1	28	21	16	23	17	75	85	7	50	**321**
2	31	34	61	59	51	67	75	7	44	**429**
3	16	42	26	90	29	42	38	19	26	**329**
4	30	18	33	1325	332	151	194	150	51	**2284**
5	32	25	57	411	289	225	342	605	116	**2100**
6	107	43	45	208	106	167	135	43	207	**1061**
7	152	29	52	176	127	180	57	138	133	**1044**
8	12	6	12	257	114	17	39	588	18	**1062**
9	43	100	63	222	219	263	109	58	260	**1337**
Total	**450**	**316**	**365**	**2771**	**1285**	**1186**	**1074**	**1615**	**906**	**9968**

PM HGV	1	2	3	4	5	6	7	8	9	Total
1	8	6	4	6	5	21	23	2	11	**86**
2	8	9	16	16	14	18	20	2	10	**112**
3	5	14	9	30	10	14	13	6	6	**106**
4	7	4	7	288	72	33	42	33	11	**497**
5	10	6	14	77	60	46	85	125	25	**449**
6	34	11	11	39	24	37	30	10	45	**241**
7	49	7	13	33	72	50	16	78	29	**347**
8	4	1	3	48	120	17	85	618	4	**900**
9	9	22	14	49	49	59	24	13	57	**297**
Total	**134**	**80**	**91**	**587**	**425**	**294**	**338**	**887**	**198**	**3034**

6 ASSIGNMENT PROCEDURES

6.1 Overview

6.1.1 The Stage 2 Base Year model comprises of two elements; the highway network (as discussed in Model Network Development and the demand that travels on it (discussed in MATRIX DEVELOPMENT).

6.1.2 This section discusses the assignment and simulation functions in more detail and explains how the model takes journeys from the trip matrices and loads them onto the transport network, predicting the routes that vehicles select for their trips between zones. It also briefly summarises the theory that underpins SATURN's assignment-simulation process before moving onto the calculation of the travel cost parameters that SATURN uses to distribute traffic onto routes within the network (namely Value of Time (VOT) and Vehicle Operating Cost (VOC)).

6.2 Assignment – Simulation loops

6.2.1 For a given trip between an origin zone and destination zone, there are likely to be a number of different routes that road users can choose. Assignment is the process that traffic models use to predict the routes that road users take between their respective origins and destinations. The assignment procedure used in SATURN for the traffic model aims to satisfy Wardrop's Principle of Traffic Equilibrium, which states that at equilibrium, traffic arranges itself such that the cost of travel on all the routes used between each origin and destination (O/D) pair is equal to the minimum cost of travel. Therefore at equilibrium no individual trip maker can reduce their cost of travel by changing route. The cost of travel referred to above is calculated after all traffic has been loaded onto the network, accounting for the effect of congestion on route choice. The model therefore provides a useful representation of average driver behaviour under long term conditions of recurrent congestion. Such a model makes a number of assumptions, in particular :

- That network conditions and travel demand do not vary within the modelled period.
- That travellers in the network have had a long–term experience with these conditions, so that they perceive the travel costs correctly and know the "best" routes to take.
- That all drivers within a particular User Class perceive travel costs in the same way. Costs are a combination of time and vehicle running cost, termed 'generalised cost'.

6.2.2 SATURN is built upon two key modelling functions (or sub models); simulation and assignment. These functions combine in an iterative process known as "assignment-simulation loops", and seek to distribute traffic across the network in a way that satisfies Wardrop's Principle of Traffic Equilibrium. The process is shown graphically in Figure 6-1.

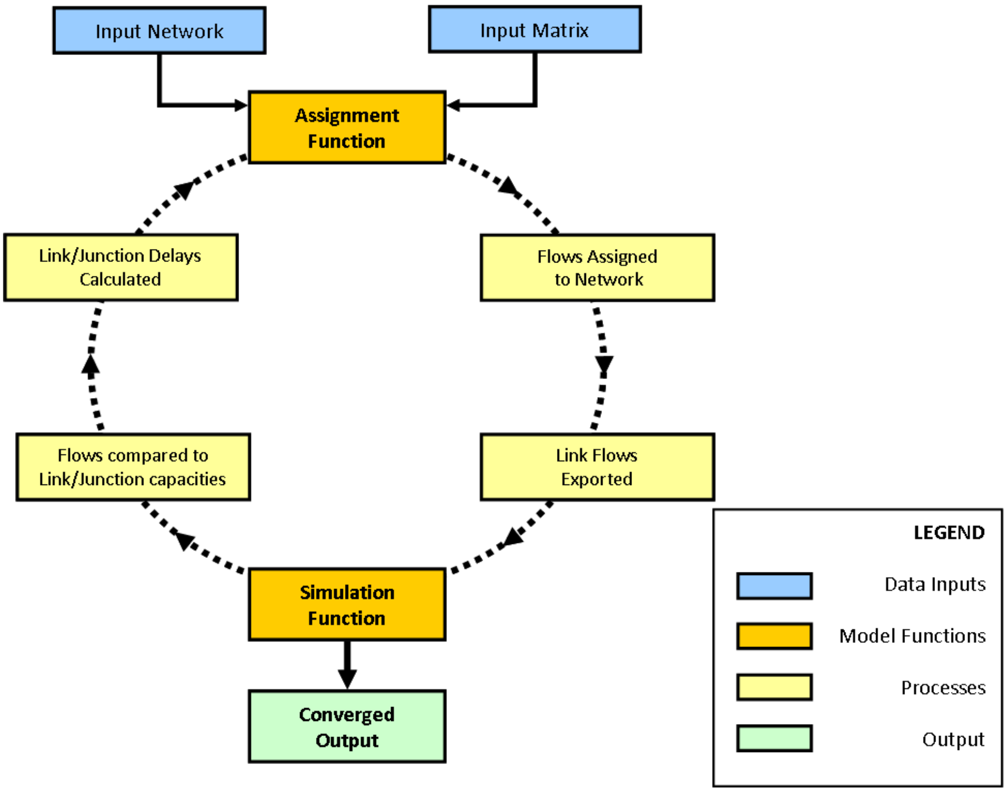
6.2.3 The assignment function employs the Frank-Wolfe algorithm to find an equilibrium solution. At the beginning of this assignment process, traffic is loaded onto the network by an all-or-nothing assignment that assumes free-flow costs. Since this assigns all traffic travelling between a given O/D pair to a single route, equilibrium is unlikely to be achieved. The assignment function then undertakes further assignments based on the travel costs resulting from the previous assignment. As a result of these updated costs, certain routes become less attractive to road users (for instance due to congestion) whilst others become more attractive. The Frank-Wolfe algorithm uses these assignments to proportion traffic onto routes such that the cost of travel incurred by road users is minimised, with the aim of assigning traffic so that competing routes for each O/D pair have equal costs (hence no user can change route to reduce travel cost).

6.2.4 The simulation function provides flow-delay curves for turning movements at each junction after each assignment iteration. These flow-delay curves are calculated by SATURN using simulations of junction performance (based on user-defined characteristics of the junction such as saturation flow) and routes specified by the assignment function. These curves are subsequently fed back into the assignment function as part of the "assignment-simulation Loop" to assign trips to routes.

6.2.5 Therefore, whilst the assignment and simulation can be seen as separate functions within SATURN, they interact iteratively and rely on one another to refine estimates of flow and delay. SATURN alternately performs an assignment followed by a simulation until flows are satisfactorily converged (convergence is discussed later in Section 6.4).

6.2.6 The traffic model assignment also utilises a recent development in SATURN. The network aggregation technique works by combining links in a series before network assignment is carried out. This form of pre-tree building has the benefit of dramatically reducing the time required to run assignment (not simulation). Tests have shown the assigned solutions are virtually identical to non-network aggregated runs.

Figure 6-1: Assignment-Simulation Loops in SATURN



6.3 Generalised Cost Parameters

6.3.1 VOT and VOC components are fixed values that help to inform the generalised cost formulation in route assignment. Generalised cost is the sum of the monetary (e.g. fuel or fare) and non-monetary (e.g. time) travel costs of a journey. VOT and VOC provide values that can be applied as coefficients to the journey distance and journey time of a particular route. TAG Unit M3-1, 2.8.1 provides the formula for the calculation of generalised cost as follows:

Generalised Cost = (VOT * Time) + (VOC * Distance) + Toll

6.3.2 The parameters are influenced by a range of factors, which include the purpose of travel, the speeds travelled by vehicles and the number of passengers within a car. Both VOT and VOC used in the model are based on tables in TAG Data book (table A1.3.6, November 2014).

6.3.3 The next stage in the process was to calculate the costs associated with running a vehicle in the network (or VOC). VOC are comprised of two elements; fuel and non-fuel related costs. For demand modelling, costs must be expressed in perceived cost terms. The perceived cost of non-fuel VOCs differs for work and non-work time. In work time, the perceived cost is the cost perceived by businesses and is therefore equal to the resource cost. In non-work time, it is assumed that travellers do not perceive non-fuel VOCs, so the perceived cost is zero. Therefore, for business related journey purposes (i.e. Car Employer's Business, LGV and HGV), the VOC was calculated in accordance with TAG Unit A1.3 by summing together the fuel and non-fuel related costs of undertaking a trip. For the remaining journey purposes (Car Commute and Car Other), VOC were taken to be the fuel cost only.

6.3.4 Fuel cost calculations were derived from two factors: the anticipated fuel consumption per kilometre and the cost of fuel per kilometre. In order to estimate fuel consumption of traffic in the network, vehicle specific parameters were applied from TAG Data book (Table A1.3.12 and A1.3.13). These constants were used in the following formula to calculate fuel consumption in litres per kilometre for 2014 in 2010 prices.

$$L = (a + bv + cv^2 + dv^3) / v$$

where:

L	Fuel Consumption (litres per kilometre)
V	Average Speed in Network
a / b / c / d	Constants

6.3.5 The final component of VOC is the non-fuel related costs such as vehicle maintenance and the cost of oil, tyres, etc. These were only considered for certain journey purposes (Car Employer's Business, LGV and HGV). Non-fuel VOC figures were calculated using the following formula (TAG Unit A1.3, Paragraph 5.1.10), specific to the distance and vehicle capital parameters associated with the user class (TAG Unit A1.3, Table A1.3.14 and A1.3.15):

$$C = a1 + b1 / V$$

where:

C	Non-Fuel VOC (pence per kilometre)
a1	Distance-related Costs (dependent upon user class)
b1	Vehicle Capital Costs (dependent upon user class)
V	Average link speed in kilometres per hour

6.3.6 The final VOT and VOC figures for each user class were then used in the model so they could be multiplied by the specific distances and times associated with routes in the network. The complete generalised cost formula allows for tolls, but none are modelled in this study. The generalised cost could then be calculated for each route to inform the assignment of traffic.

6.3.7 The final coefficients used to calculate the generalised cost of any trip in the traffic model given in Table 6-1: Generalised Cost Parameters for 2014 in 2010 prices are based on TAG unit A1.3, November 2014 which was the latest version when the model was calibrated.

6.3.8 It should be noted that VOT values assumed for

- LGV represent an average LGV given in Table A 1.3.6 of WebTAG Databook , and
- HGV is assumed to be twice the TAG Unit A1.3 in accordance to TAG Unit M3.1 paragraph 2.8.8.

Table 6-1: Generalised Cost Parameters for 2014 in 2010 prices

User Class	Period					
	AM		Inter peak		PM	
	PPM	PPK	PPM	PPK	PPM	PPK
Car Commute	13.52	6.73	13.42	6.73	13.23	6.73
Car Work	45.84	12.51	44.78	12.51	44.07	12.51
Car other	17.25	6.73	17.93	6.73	18.45	6.73
LGV	21.84	15.23	21.84	15.23	21.84	15.23
HGV	41.80	39.45	41.80	39.45	41.80	39.45

PPM = Pence per Minute – VOT cofficient, PPK = Pence per Kilometre – VOC coefficient

6.4 Convergence Criteria

6.4.1 Before the results of the Base Year model can be relied upon to represent baseline conditions and serve as a platform for forecast models, the convergence of the assignment process needs to be assessed. TAG Unit M3-1 stresses the importance of convergence in providing stable and robust modelled outputs. SATURN uses the following measures of convergence:

- Proximity to the assignment objective; and
- Stability of model outputs between consecutive iterations.

6.4.2 The first measure relates to how close the model is to a particular converged solution, which varies depending on the preferences of the user or software package being used. In SATURN this equates to how close the model is to Wardrop's Principle of Equilibrium and is measured using the Delta (or Gap) function. Delta (denoted δ) is calculated below:

$$\delta = \frac{\sum Tpij\ (Cpij - Cij^*)}{\sum Tpij\ Cij^*}$$

where:

T_{pij} is the flow on route p from origin i to destination j

T_{ij} is the total travel from i to j

C_{pij} is the (congested) cost of travel from i to j on path p

C_{ij}^* is the minimum cost of travel from i to j

Source: TAG Unit M3.1, Appendix C, Paragraph C2.4)

6.4.3 The Delta value therefore represents the excess cost incurred by failing to travel on the route with the lowest generalised cost and is expressed relative to that minimum route cost. The excess cost is summed over each route between each O/D pair and multiplied by the number of trips between each O/D pair. This is divided by the minimum cost summed over each route between each O/D pair and multiplied by the number of trips between each O/D pair.

6.4.4 The second measure relates to the need for a stability indicator, which is demonstrated by measuring the level of flow change on links between iterations. WebTAG Unit 3.19 provides the most recent definition of the convergence criteria that traffic models should aim to achieve in order to provide stable, consistent and robust results. These are presented in Table 6-2.

Table 6-2: Convergence Criteria

Convergence Type	Convergence Measure	Acceptable Values
Proximity Indicator	Delta or Gap Function (denoted δ)	<0.1%
Stability Indicator	% of links with flow change < 1%	Four successive iterations, with >98% links meeting criteria

Source: TAG Unit M3.1 (Table 4)

6.4.5 Satisfying these convergence requirements gives confidence that a model is capable of producing robust and repeatable outputs. This is also important for future forecasting work, where it is essential to be able to differentiate between the real differences between scenarios and not simply differences in convergence. Problems with convergence can also be indicative of other underlying problems such as having too much demand in the model.

6.4.6 To make sure that the model is given the opportunity to converge adequately, it is necessary to define convergence parameters in SATURN so that the assignment process stops once the convergence criteria are met. The convergence parameters coded into this traffic model are provided in Table 6-3.

Table 6-3: Coded Convergence Parameters

Parameter	Description	Model Coding	SATURN Manual Default
ISTOP	Measure of convergence of the assignment-simulation loops. The loops stop if ISTOP percent of link flows change by less than PCNEAR percent.	99	95
PCNEAR	% change in flows judged to be “near” in successive assignments.	1	5
NISTOP	The number of successive loops which must satisfy the ISTOP criteria.	4	4
MASL	Maximum number of assignment / simulation loops.	401	15
NITA	Maximum number of assignment iterations.	20	20
NITS	Maximum number of simulation iterations.	40	20
STPGAP	Critical gap value used to terminate assignment-simulation loops	0.03	1
KONSTP	The stopping criteria for assignment-simulation loops.	5	-

6.4.7 By setting the parameter KONSTP to ‘5’ SATURN seeks to terminate the assignment only when proximity (STPGAP) and stability (ISTOP/PCNEAR/NISTOP) measures are both satisfied. It is clear from the table above that the criteria coded into SATURN are either consistent with, or more onerous than the requirements laid out in TAG Unit M3.1.

6.4.8 In accordance with the criteria described above, an assessment of the level of model convergence is given along with the model results provided in section 9.2, Table 9-1 and Table 9-2.

6.5 Summary of Assignment Procedures

6.5.1 The following is a summary of the main points associated with the assignment procedure adopted in the highway model:

- Assignment Procedures: The assignment procedure used within SATURN is the default one, Wardrop’s Equilibrium.
- Generalised Cost Parameters: Generalised cost parameters are calculated using TAG Data Book, November 2014.

- Convergence criteria: The convergence criteria adopted are robust and meet the WebTAG requirements.

7 NETWORK CALIBRATION AND VALIDATION

7.1 Overview

7.1.1 The traffic model has been developed to provide the basis for traffic forecasts for the development of the scheme. However, before future traffic flows can be derived, the traffic model needs to be able to accurately reflect current traffic conditions. A number of checks have been undertaken on the network coding to ensure the model reflects realistic road conditions.

7.2 Network checks

7.2.1 Based on the coded characteristics of each link, a number of checks of the network were made. The first of these was the standard network check offered by the modelling package, which checked things like network connectivity and illogical coding of junctions.

7.2.2 Additional checking focussed on the coded attributes of the links, including link speeds, number of lanes, capacity and turn restriction, as detailed below.

7.2.3 All the key junctions have been checked for their geometric parameters affecting the saturation flow and the link attributes related to the junction have been coded in accordance to the actual scenario.

7.2.4 Speed Limits and Road Type/Classifications were checked for the entire modelled area using desktop imaging software to ensure that the speed limits were correct and roads correctly classified.

7.2.5 The lengths of all links in the simulation area are derived using GIS measurement and that old coding has been checked for all major roads. This was followed by checks on coded link lengths by means of a comparison against the "crow–fly" distance between link end-nodes. SATURN produces warning messages if the coded link length is significantly in excess of (or less than) the crow–fly distance, and these warnings were checked and verified.

7.2.6 Free flow link speeds are a function of the link type (as specified in Speed-Flow Curves 4.6) and the speeds in the model were checked by plotting in GIS and colouring links according to speed, in set bands as shown below. This plot is shown below in **Error! Reference source not found.** for the detailed study area.

7.2.7 The approach of coding the flares at traffic signals and priority junctions has changed in SATURN, 2009 CATM nodes were recoded to take into account the new robust approach.

7.2.8 The following checks were carried out on the 2009 network to ensure that current road conditions are correctly represented; a full log of the changes has been presented in APPENDIX B:

- Checks for inclusion of any recently implemented traffic schemes, restrictions (e.g. speed limit changes, weight and on-street parking which may affect link capacity, one way and no-through streets etc.)
- Checks to the traffic signal timings and inclusion in the simulation part of the network. Level crossings affect movements to the south of Chichester centre, so information on "gates down time" and train frequency were used in calculations of cycle times to ensure good representation of delays in the network.
- Checks on link capacity (e.g. lanes available to traffic) taking account of parked vehicles, bus stops etc.
- Bus routes and their frequencies have been updated.

7.2.9 To aid checks on the network, 'stress testing' was undertaken, in which the base year matrices were factored up and assigned to the network, to see where the increased demand leads to excessive delays. This more easily identified junctions which required coding changes.

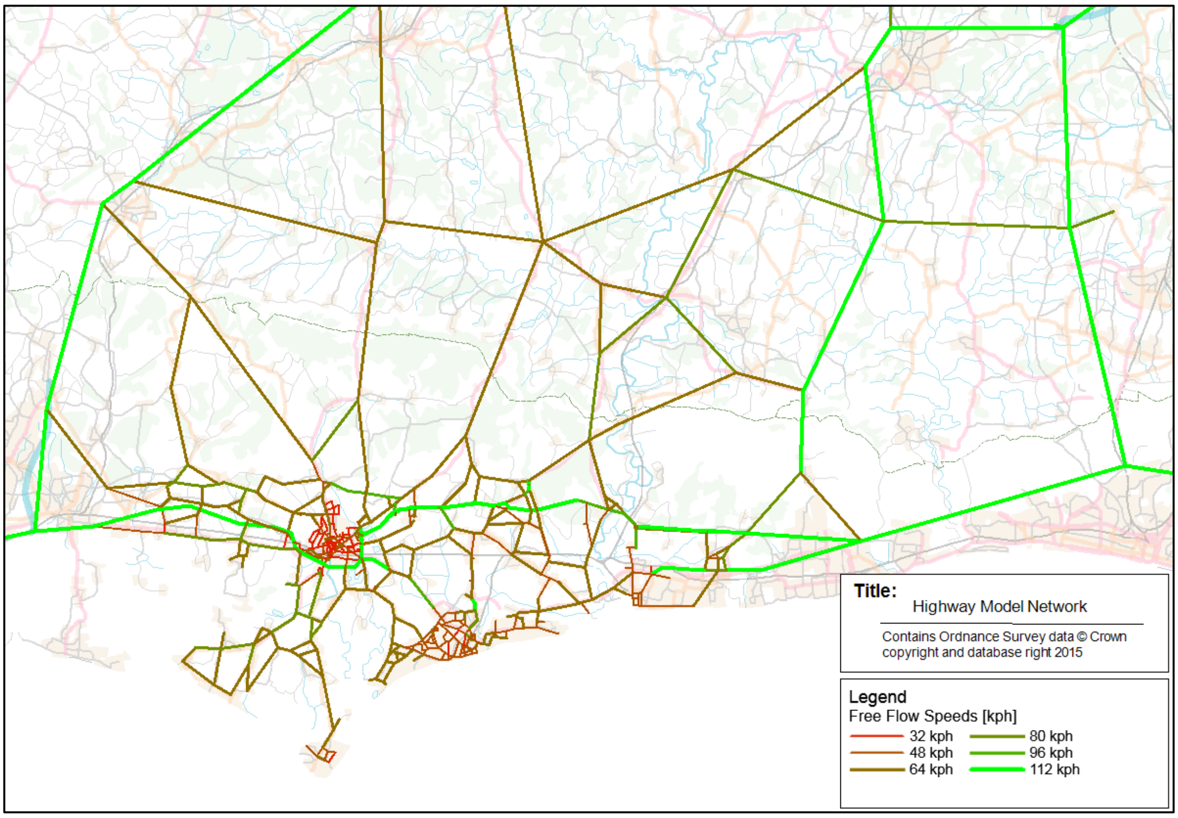
7.3 Network speed checks

7.3.1 **Error! Reference source not found.** shows freeflow speeds on the network. The plot shows that in urban areas of Chichester where the 20mph speed limit scheme operates, the freeflow speeds are 32 kph and under. This is also the case on residential streets in Bognor Regis.

7.3.2 A27 Chichester Bypass and A27 in rural areas has a freeflow speed of 112kph.

7.3.3 In rural areas the free flow speed was between 70kph and 112kph depending on the road type; these roads are national speed limit roads.

Figure 7-1 Network Freeflow Speeds



7.4 Route checks

7.4.1 The model was further checked by examining shortest paths and minimum generalised cost routes through the network. These checks were done at an early stage of the model development, using an assignment of very early versions of the synthetic trip matrices, and again towards the end of the model development process, with later versions of the trip matrices. Major urban areas covered by the network were identified, and routes between them checked against local knowledge, common sense, and also routes suggested by Google Maps. The urban areas identified are listed below:

- Chichester
- Bognor Regis

- Littlehampton
- Emsworth
- Petworth
- Arundel
- Worthing

7.4.2 In accordance to TAG Unit M3.1 guidance, the number of routes that should be checked is defined by:

- *Number of OD Pairs = (Number of Zones)$^{0.25}$ * (Number of User Classes)*
- *Number of OD Pairs = 252 $^{0.25}$ * 5*
- *Number of OD Pairs = 19.92*

7.4.3 On that basis, with 252 core zones (5 zones represent future developments), and 5 user classes, a minimum of 20 OD pairs should be checked. Using all 21 OD combinations from the above list, and checking in both directions, a total of 42 directional routes were checked to ensure a robust network. The routes selected meet advised criteria as they:

- Relate to significant number of trips
- Are of significant length
- Pass through areas of interest
- Include both directions of travel
- Link different compass areas
- Coincide with journey time routes as appropriate

7.4.4 The ability of the model to robustly represent route choice within the network depends on:

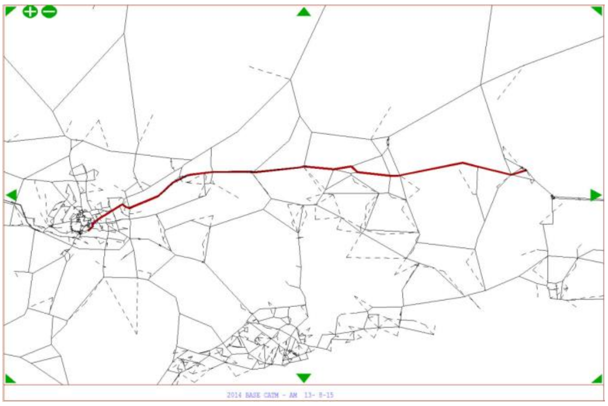
- Correct zone sizing and definition, network structure and the realism of the zone centroid connectors to the modelled network.
- Accuracy of the network coding.
- Accuracy with which delays at junctions and cruise speeds on links are modelled.
- Accuracy of the trip matrices.

7.4.5 Some examples of the routes checked in the model are illustrated in Figure 7-2, with the route shown in red.

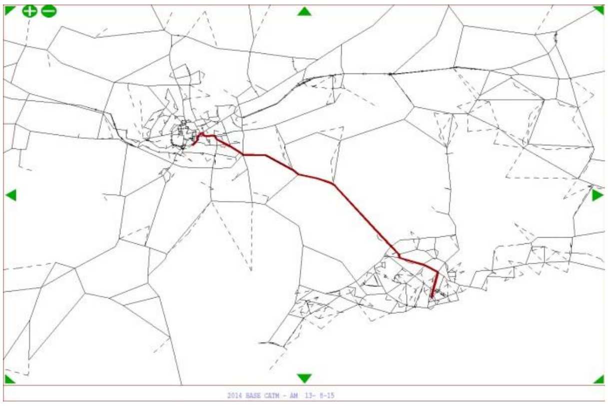
7.4.6 All the routes from the SATURN model were checked against routes shown by AA planner. The modelled network was adjusted to correct the route where necessary. In most cases a change of link type, or junction capacity was sufficient to correct the route. In a small number of cases a centroid connector was amended.

7.4.7 Congested networks of AM and PM peak showed more than one route was used for a given origin – destination pair. However they all looked logical. The full set of route checks for all time periods is included in APPENDIX C.

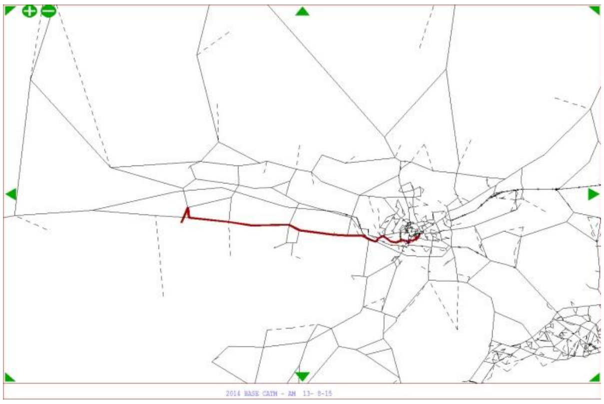
Figure 7-2: Route Checks AM from Chichester



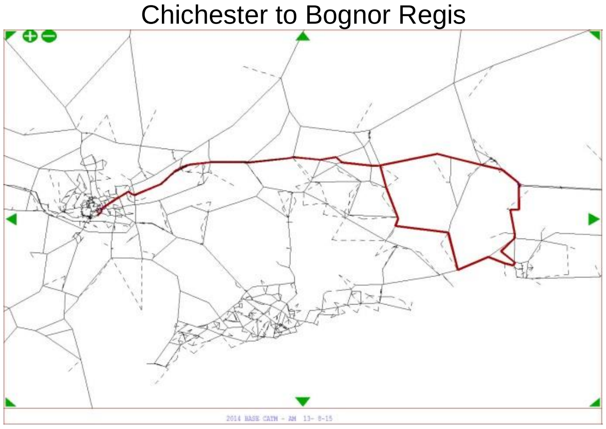
Chichester to Arundel



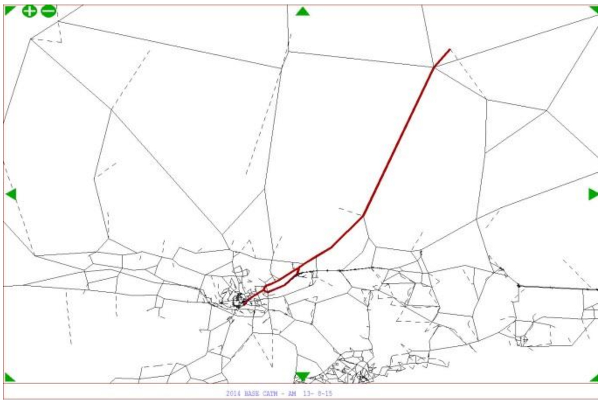
Chichester to Bognor Regis



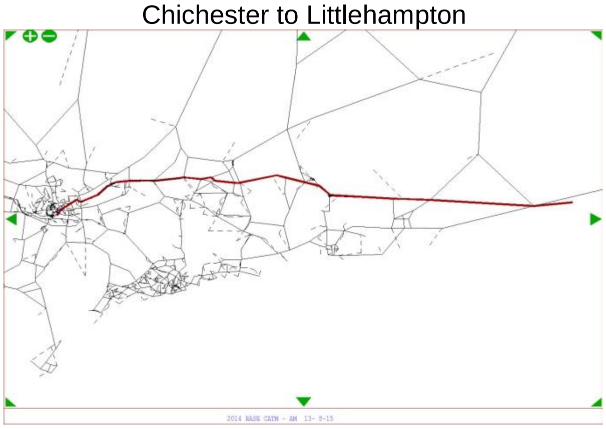
Chichester to Southbourne/Emsworth



Chichester to Littlehampton



Chichester to Petworth



Chichester to Worthing

7.4.8 To meet with the WebTAG criteria, the routes that were checked are detailed in APPENDIX C.

8 MATRIX VALIDATION

8.1 Overview

8.1.1 The purpose of this section is to explain the various stages used to develop and adjust the traffic demand before it can be assigned to the model network described above.

8.1.2 In line with the ASR, the highway matrices were built for three vehicle categories: Car, LGV and HGV. The Car matrices are further split based on user class into Commute, Business and Other, in line with WebTAG requirements.

8.1.3 The impact of different vehicle categories on the assignment process is weighted by representing the trips as passenger car units (PCU's) - as detailed in Table 2-3.

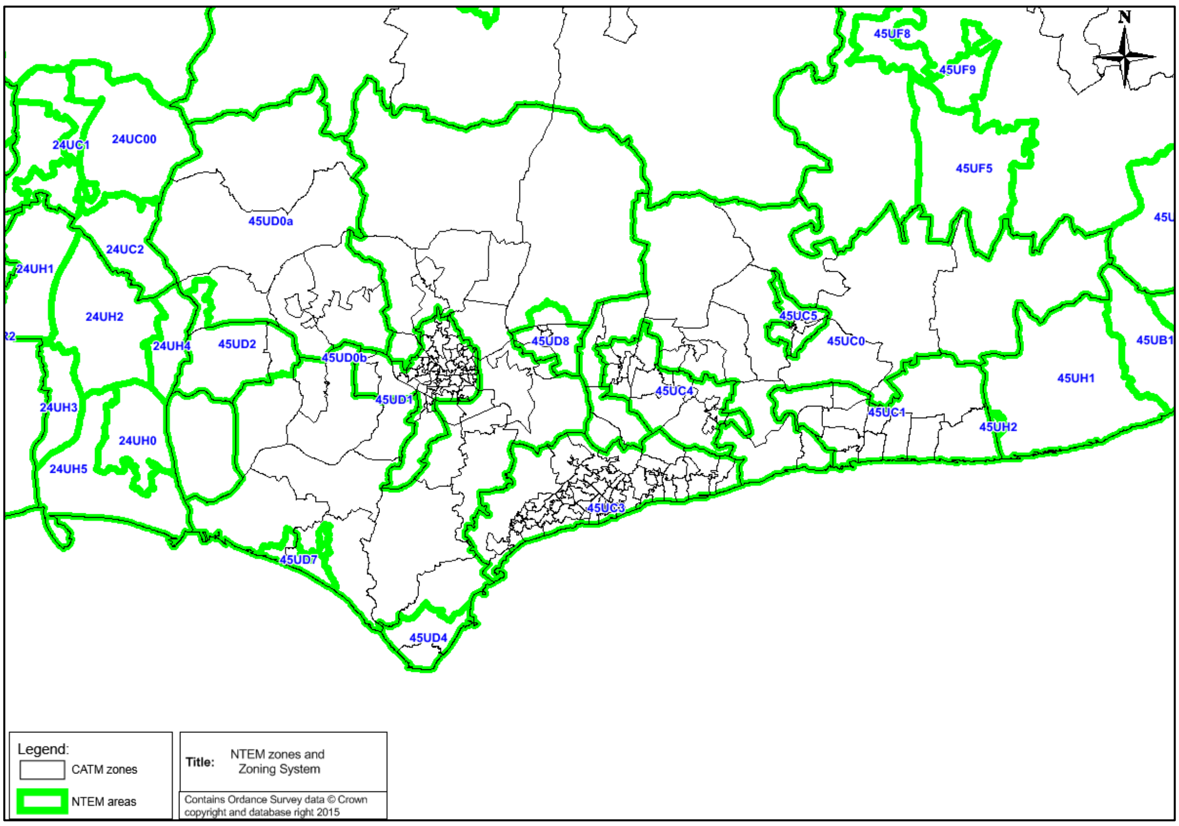
8.1.4 Three time periods have been modelled to ensure that the model represents the typical range of traffic movements undertaken on the network and traffic conditions. The time periods are for weekday and relate to the following periods:

- AM Peak Hour (08:00-09:00);
- Inter-Peak Hour (Average 10:00-16:00); and
- PM Peak Hour (17:00-18:00).

8.2 Comparison against NTEM trip ends

8.2.1 Figure 8-1 shows the zoning systems used by NTEM and the model. The most recently available NTEM boundaries are for version 5.2, but data from NTEM version 6.2 is used throughout this study. The model study area comprises Chichester District zones, plus Arun District zones excluding the eastern parts of 45UC0 and 45UC1.

Figure 8-1 NTEM and Model Zoning systems



8.2.2 There is a difference between NTEM versions, with three zones at version 5 zones (45UD0a, 45UD0b and 45UD1) merged, to form the two parts of the version 6 Chichester rural area (comprising 46UD0a and 45UD0b). Due to this change, and differences between zone and NTEM boundaries, that part of Chicester District which lies inside the study area is treated as a single unit for comparison of trip-ends. The Chichester area is made up of NTEM zones 45UD0a, 45UD0b (both rural Chichester), 45UD2 (Southbourne), 45UD4 (Selsey), 45UD7 (East Wittering) and 45UD8 (Tangmere/Boxgrove), and total trips for the Chichester part of the study area were calculated by accumulating these zones.

8.2.3 The portion of Arun district in the study area comprised 45UC3 (Bognor Regis), 45UC4 (Westergate / Barnham / Yapton), and 45UC5 (Arundel) together with parts of 45UC0 (rural Arun) and 45UC1 (Littlehampton main). For partial NTEM zones the proportion of trip-ends used is derived from the proportion of 2011 Census households which lie inside the study area. The calculation of proportions of zones are shown in Table 8-1, and the calculation of trip-ends for the part of Arun District which lies inside the study area is shown for AM period in Table 8-2.

Table 8-1 Proportions on NTEM zones in study area

Area		Zones inside area	Households	Zones outside area	Households
45UC0 rural (Arun)	Zones	103	132	239	68
		107	117	240	204
		110	291	241	1144
		111	100		
		112	118		
		113	119		
		114	237		
		115	303		
		116	85		
		118	423		
		130	54		
		180	150		
		199	153		
		209	89		
		212	228		
	Totals		2599		1416
	Proportion inside study area		64.7%		
45UC1 Littlehampton main	Zones	197	4269	237	2812
		198	2429	238	2358
		200	3556	242	3257
		201	460		
		202	2878		
		203	1957		
		204	265		
		205	1948		
		206	1092		
	Totals		18854		8427
	Proportion inside study area		69.1%		

Table 8-2 Trip-ends for study area portion of Arun (AM)

Area	Modelled trip ends		Proportion	Study Area Trip-ends	
	Originating	Terminating		Originating	Terminating
45UC0 rural (Arun)	3203	4273	0.65	2082	2777
45UC1 Littlehampton(main)	15985	13599	0.69	11030	9383
45UC3 Bognor Regis	17560	14185	1	17560	14185
45UC4 Westergate / Barnham / Yapton	3805	2601	1	3805	2601
45UC5 Arundel	1109	1027	1	1109	1027
Arun Total				35586	29974

8.2.4 Total car (vehicular) trip-ends were compared by time period and authority area. As NTEM proportions were used to divide trips by purpose the comparison is limited to total trip ends as proportionate differences are the same for each journey purpose. The comparison is shown in Table 8-3.

Table 8-3: Comparison of car trip demand with NTEM trip ends

Local Authority Area	Period	Trip ends	Modelled trip ends	NTEM trip ends	Percentage difference
Chichester	AM	Originating	27038	27591	-2.0%
		Terminating	31456	30139	4.4%
	IP	Originating	52535	51823	1.4%
		Terminating	53095	51165	3.8%
	PM	Originating	36505	34440	6.0%
		Terminating	32304	32701	-1.2%
Arun	AM	Originating	34497	35586	-3.1%
		Terminating	30161	29974	0.6%
	IP	Originating	52382	60045	-12.8%
		Terminating	52840	60708	-13.0%
	PM	Originating	36022	37421	-3.7%
		Terminating	39929	41785	-4.4%

8.2.5 As noted above short distance trips were under recorded in the mobile phone dataset. The use of detailed screenlines around the city centre for Chichester meant that shorter distance trips in that area were captured in screenline counts. By matching these screenline counts the demand matrices would have correct levels of trips to and from Chichester centre. The trips in the developed demand matrices would have lengths based on the mobile phone data trip length distributions, so short distance trips are under represented and trips longer than a few kilometres would be slightly over represented. Therefore a good level of correspondence is expected in the Chichester local authority area. The table shows similar trip end totals for each modelled period.

8.2.6 In the Arun area there are fewer screenlines which intercept short distance trips, so any under recording in the mobile phone dataset feeds through to the expanded trip matrices. The modelled trip ends for peak periods (except for AM terminating) fall slightly short of NTEM totals (by up to 4.4%) and for inter-peak are about 13% below NTEM. Much of this discrepancy is in local short distance traffic within the Littlehampton, Bognor and Barnham sectors, with longer distance travel along the A27 corridor less affected by this shortfall.

8.3 Checks on zonal trip ends

8.3.1 The matrix development included processing to re-locate spike zone trip ends (resulting from lower levels of spatial accuracy in mobile phone data) to nearby zones. The resulting zonal trip-ends were examined, and are shown below as plots of trip ends against households in the zone. A fair degree of correlation between trip ends and households in a zone is expected for AM peak trip origins and PM peak trips terminating, with a lower level of correlation for inter-peak total trip-ends.

8.3.2 These checks filtered out zones where other land use factors affect such correlations, such as town centre zones; zones where employment significantly outnumbers households; secondary and large private schools locations; superstore sites; tourist attractions; and zones at the edge of the study area where trip-end location and the cut-off of mobile phone data capture are not precise.

8.3.3 The plots of trip ends against households in each zone are given below in Figure 8-2, Figure 8-3 and Figure 8-4. Recognising that car availability and usage would vary significantly between inner town centre zones and rural locations, the plots show acceptable trip rates and levels of correlation, so confirming that the re-allocation of trip-ends has given realistic results.

Figure 8-2: Trips from zone in AM peak against number of households

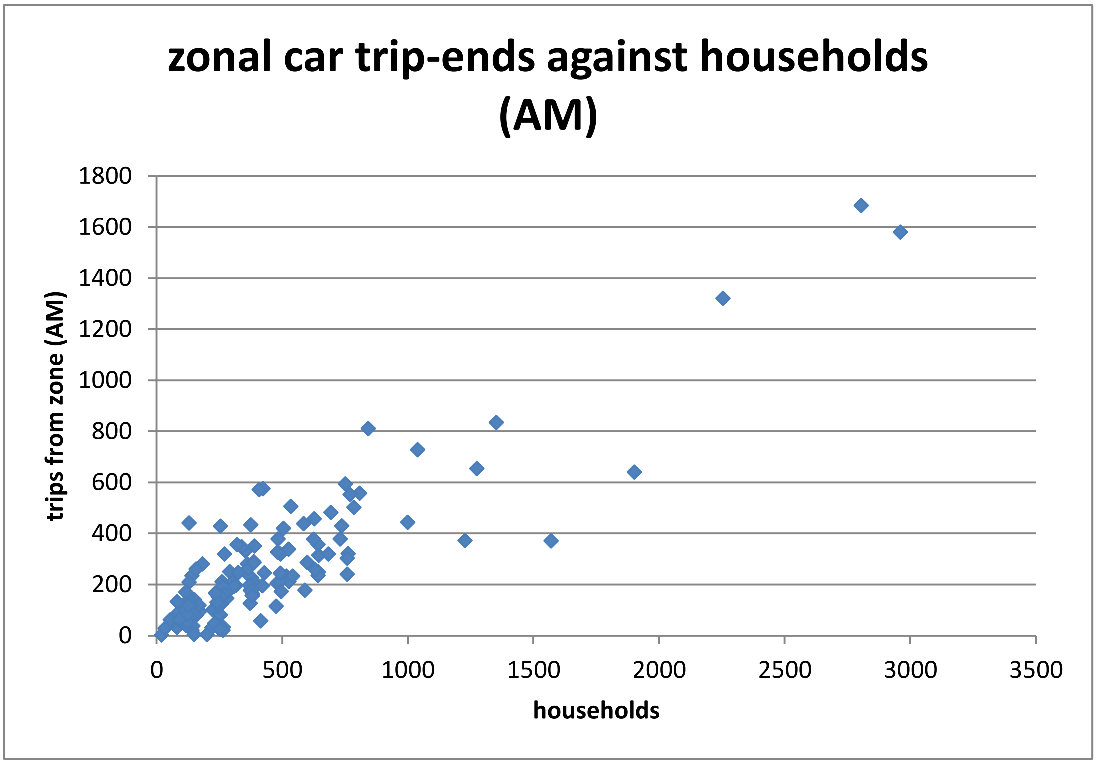


Figure 8-3: Trips to & from zone in inter-peak against number of households

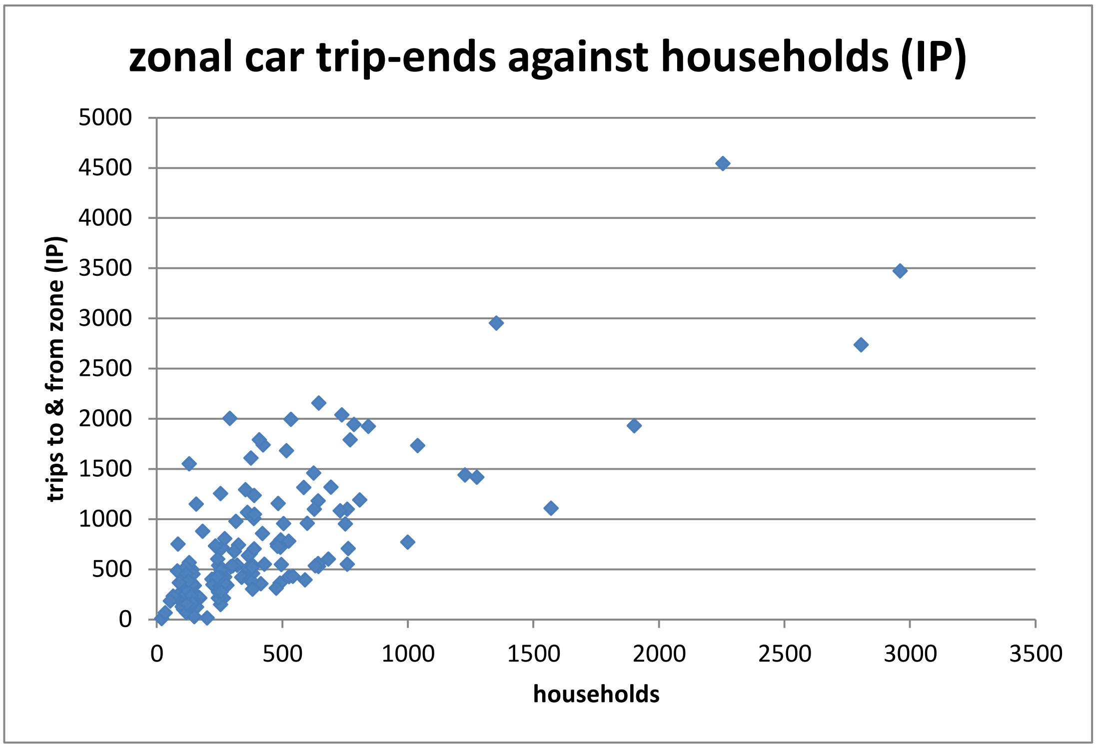
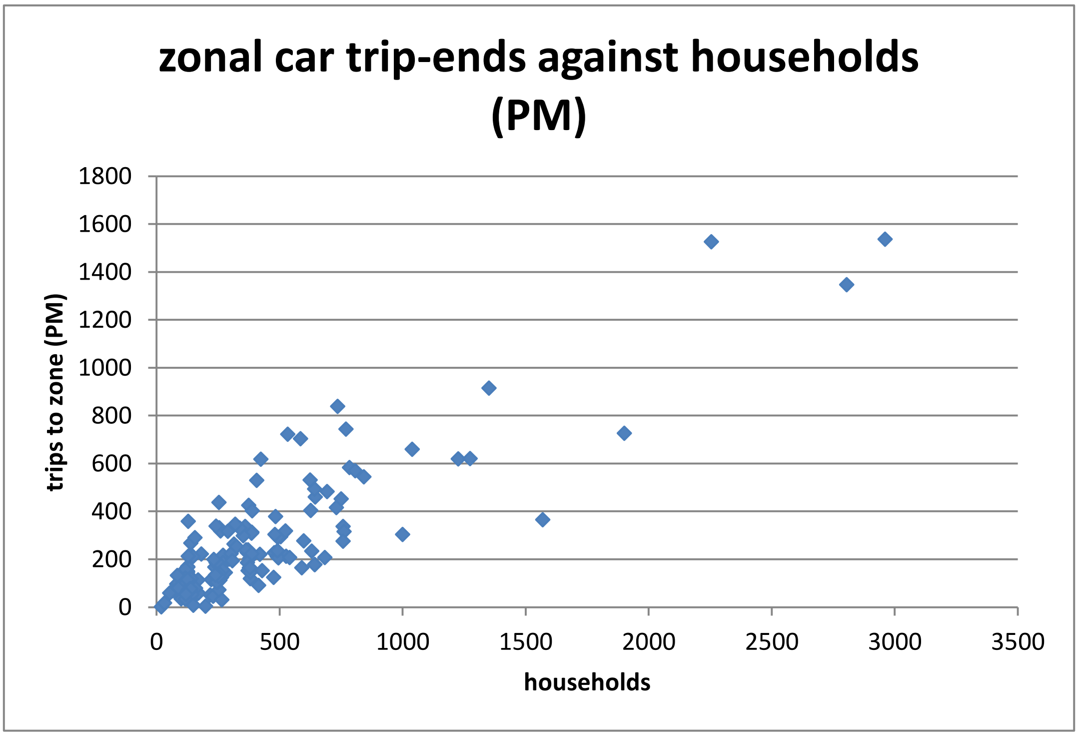


Figure 8-4: Trips to zone in evening peak against number of households



8.4 Comparison against Census Workplace flows

8.4.1 The 2011 Census provides information on movements between location of residence and location of workplace; this is sub-divided by mode of travel (used on the longest part of the journey). The dataset is available for Mid-level Super Output areas. The dataset does not replicate daily commuting travel demand in the morning peak but it gives insight into the travel patterns and a source for sense-checking the commute trip patterns derived from mobile phone data. The collection and definition of the Census dataset differs from a travel survey, with key differences being:

- Workers who do not have a fixed workplace, or work in a mobile context, the base that they report to is recorded as their workplace;
- The dataset includes full time and part time workers; these will have different commute patterns;
- work patterns for full time staff may be “Monday to Friday 9 to 5” or working days spread over the 7 day week (possibly focusing on weekend hours), as is common in retail or leisure/entertainment – the latter contribute less to daily weekday traffic;
- Work patterns for part time staff could be selected days of the week, particular time periods (e.g. morning or evening work); such trips are more likely to be shorter distance than for full-time workers.

8.4.2 Comparisons between trip matrices and Census data were based on sectors in Arun district (Bognor, Barnham and the part of Littlehampton in the study area). The area of Chichester District inside the study area was treated as a single sector as MSOA boundaries do not coincide well with zone/sector systems and the Chichester city built up area itself straddles 3 MSOAs. Comparisons are based on trips within the study area, as commuting flows to / from external zones are less accurately represented in the model.

8.4.3 The AM peak commute flows are given in Table 8-4 as flows and in Table 8-5 as proportions of the total within study area flow. Data for car trips were extracted from the 2011 Census dataset which cross-tabulates location of residence by location of workplace by method of travel at MSOA level (WU03EW). Taking the car flows within the study area, the corresponding Census dataset proportions were calculated and are given in Table 8-6. The proportions in the model and census dataset are generally close, with the exception of the Bognor to Chichester movements. In the model (which uses NTEM trip purpose proportions) about 45% of car trips are allocated to commute, with a similar proportion to other purpose. Given the high levels of congestion and delay crossing the A27 into Chichester centre (the main trip attractor) it is likely that other purpose trips would be more likely to travel later and higher proportions of the flow would be commute. Recognising the differences in dataset content and the flow mix for Bognor to Chichester, the model matrices give a sensible trip distribution.

Table 8-4: AM Commute flows within the study area (vehicles)

Origin \ Destination	Chichester	Bognor	Barnham	Littlehampton
Chichester	9242	1025	589	129
Bognor	2002	4567	980	298
Barnham	834	690	225	511
Littlehampton	251	161	342	1563

Table 8-5: Proportions of AM Commute trips within study area

Origin \ Destination	Chichester	Bognor	Barnham	Littlehampton

Chichester	39.5%	4.4%	2.5%	0.6%
Bognor	8.6%	19.5%	4.2%	1.3%
Barnham	3.6%	2.9%	1.0%	2.2%
Littlehampton	1.1%	0.7%	1.5%	6.7%

Table 8-6: Proportions of Census travel to work data within area

Origin \ Destination	Chichester	Bognor	Barnham	Littlehampton
Chichester	32.5%	3.0%	1.4%	0.7%
Bognor	16.7%	15.3%	3.4%	2.6%
Barnham	5.1%	2.0%	3.4%	1.6%
Littlehampton	2.1%	1.3%	2.2%	6.7%

9 ASSIGNMENT CALIBRATION AND VALIDATION

9.1 Overview

9.1.1 This chapter summarises the criteria used for validation of the model and convergence standards used to check the stability and reliability of the assignment results.

9.1.2 These criteria and standards are based on the measures set out in TAG Unit M3.1.

9.2 Model Convergence

9.2.1 Convergence is the measurement of the stability of the traffic model, whereby the spread (or "distribution") of trips does not vary significantly between iterations and so the model is said to be in "equilibrium". A converged model is therefore stable and produces results that are consistent and robust.

9.2.2 For user equilibrium assignment in SATURN uses the following measures of convergence:

- Proximity to the assignment objective; and
- Stability of model outputs between consecutive iterations.

9.2.3 The first measure relates to how close the model is to a particular converged solution, which varies depending on the preferences of the user or software package being used. In SATURN this equates to how close the model is to Wardrop's Principle of Equilibrium and is measured using the Delta (or Gap) function. Delta (denoted δ) is calculated below:

$$\delta = \frac{\sum Tpij\ (Cpij - Cij^*)}{\sum Tpij\ Cij^*}$$

where:

T_{pij}	is the flow on route p from origin i to destination j
T_{ij}	is the total travel from i to j
C_{pij}	is the (congested) cost of travel from i to j on path p
C_{ij}^{*}	is the minimum cost of travel from i to j

Source: TAG Unit M3.1, Appendix C, Paragraph C2.4)

9.2.4 The Delta value therefore represents the excess cost incurred by failing to travel on the route with the lowest generalised cost and is expressed relative to that minimum route cost. The excess cost is summed over each route between each O/D pair and multiplied by the number of trips between each O/D pair. This is divided by the minimum cost summed over each route between each O/D pair and multiplied by the number of trips between each O/D pair.

9.2.5 The second measure relates to the need for a stability indicator, which is demonstrated by measuring the level of flow change on links between iterations. WebTAG M3.1, Table 4 provides the most recent definition of the convergence criteria that traffic models should aim to achieve in order to provide stable, consistent and robust results. These are presented in Table 9-1.

Table 9-1: Summary of Convergence Measures and Base Model Acceptable Values

Measure of Convergence	Base Model Acceptable Values
Delta and %GAP	Less than 0.1% or at least stable with convergence fully documented and all other criteria met.
Percentage of Links with Flow Change (P)<1%	Four consecutive iterations greater than 98%

Percentage of Links with Cost Change (P2)<1%	Four consecutive iterations greater than 98%

9.2.6 The convergence for each model period is summarised in Table 9-2 below.

Table 9-2: Assignment Convergence

Time Period	Assignment Simulation Loop	Proximity indicator: Delta (δ) / (Gap (%)	Stability Indicator: % Flow (Link Flows Differing by < 1% Between Assignment & Simulation)	Stability Indicator : % Delays (Turn Delays Differing by < 1% Between Assignment & Simulation)
AM	F-3	0.00061%	99.1%	99.3%
	F-2	0.00078%	99.2%	99.6%
	F-1	0.00079%	99.2%	99.9%
	Final Iteration (F)	0.00099%	99.4%	99.5%
IP	F-3	0.00024%	99.3%	99.8%
	F-2	0.00020%	99.5%	99.6%
	F-1	0.00021%	99.6%	99.7%
	Final Iteration (F)	0.00027%	99.6%	99.6%
PM	F-3	0.0025%	99.2%	99.6%
	F-2	0.0016%	99.3%	99.8%
	F-1	0.0016%	99.2%	99.9%
	Final Iteration (F)	0.0014%	99.7%	99.8%

9.2.7 The results show that the model achieves a high level of convergence and is compliant with the requirements detailed in TAG Unit M3-1.

9.2.8 According to the advice at least 98% of the links should have a percentage change in flow or cost less than 1% in four consecutive iterations. This is to assure tighter convergence and better stability of the model for intended schemes appraisals. The results are stable for at least four consecutive assignment/simulation loops and the delta values comfortably exceed the targets specified in WebTAG. The table above shows that the model is suitably converged and gives a high degree of confidence that the calibration and validation results presented in this section are accurate and are not impacted by poor convergence.

9.3 Validation Criteria and Acceptability Guidelines

9.3.1 The validation of the highway assignment has been quantified using the following measures taken from WebTAG unit M3.1 paragraph 3.2.3:

- Assigned flows and counts totalled for each screenline or cordon, as a check on the quality of the trip matrices;
- Assigned flows and counts on individual links as a check on the quality of the assignment; and
- Modelled and observed journey times along routes, as a check on the quality of the network and the assignment.

9.3.2 Base matrix validation is defined as the differences between modelled and observed flows along screenlines within the model, the criteria to meet is set out in Table 9-3 below.

Table 9-3: Screenline Flow Validation Criterion

Criterion	Acceptability Guideline
Differences between modelled flows and counts should be less than 5% of the counts	All or nearly all screenlines

9.3.3 Although the main screenlines have 5 or more links (Chichester city having 12 or 13, Bognor and Northern both having 5 links), the River Arun screenline has just two links as the river forms a natural barrier and other crossing points lie outside the study area.

9.3.4 In additon to validation of total screenline flows, WebTAG Unit M3.1 also contains guidelines on the validation criteria for individual links or turning movements.

9.3.5 There are two measures set out by WebTAG to assess the individual link counts statistically. The first of these is GEH, which is described as a “goodness of it” statistic as it takes into account both the absolute difference and the percentage difference between the modelled flow and the observed flow. The GEH statistic is defined as:

$$GEH = \sqrt{\frac{(M - O)^2}{(M + O)/2}}$$

Where: M = the modelled flow and O = the observed flow

9.3.6 With regard to the use of GEH, WebTAG Unit M3.1 advises that for individual link flows GEH < 5 in 85% of cases.

9.3.7 The second is made by reference to the following Table 9-4, from WebTAG Unit M 3-1:

Table 9-4: Link Flow Criterion

Size of observed flow	Criteria for valid modelled flow
< 700 vehicles/hour	Modelled flow within 100 vehicles/hour of observed flow
700-2,700 vehicles/hour	Modelled flow within 15% of observed flow
> 2,700 vehicles/hour	Modelled flow within 400 vehicles/hour of observed

9.4 Count Calibration

9.4.1 There are 105 counts in total of which 74 counts were on screenlines and were used to calibrate the model. The remaining 31, which are independent link counts on major roads, were used to validate the model. The locations of the counts used for calibration are shown in Figure 9-1.

9.4.2 No matrix estimation was used but these counts helped in developing the expansion factors for matrices.

9.4.3 The observed counts were compared against the modelled and are summarised in Table 9-5 below.

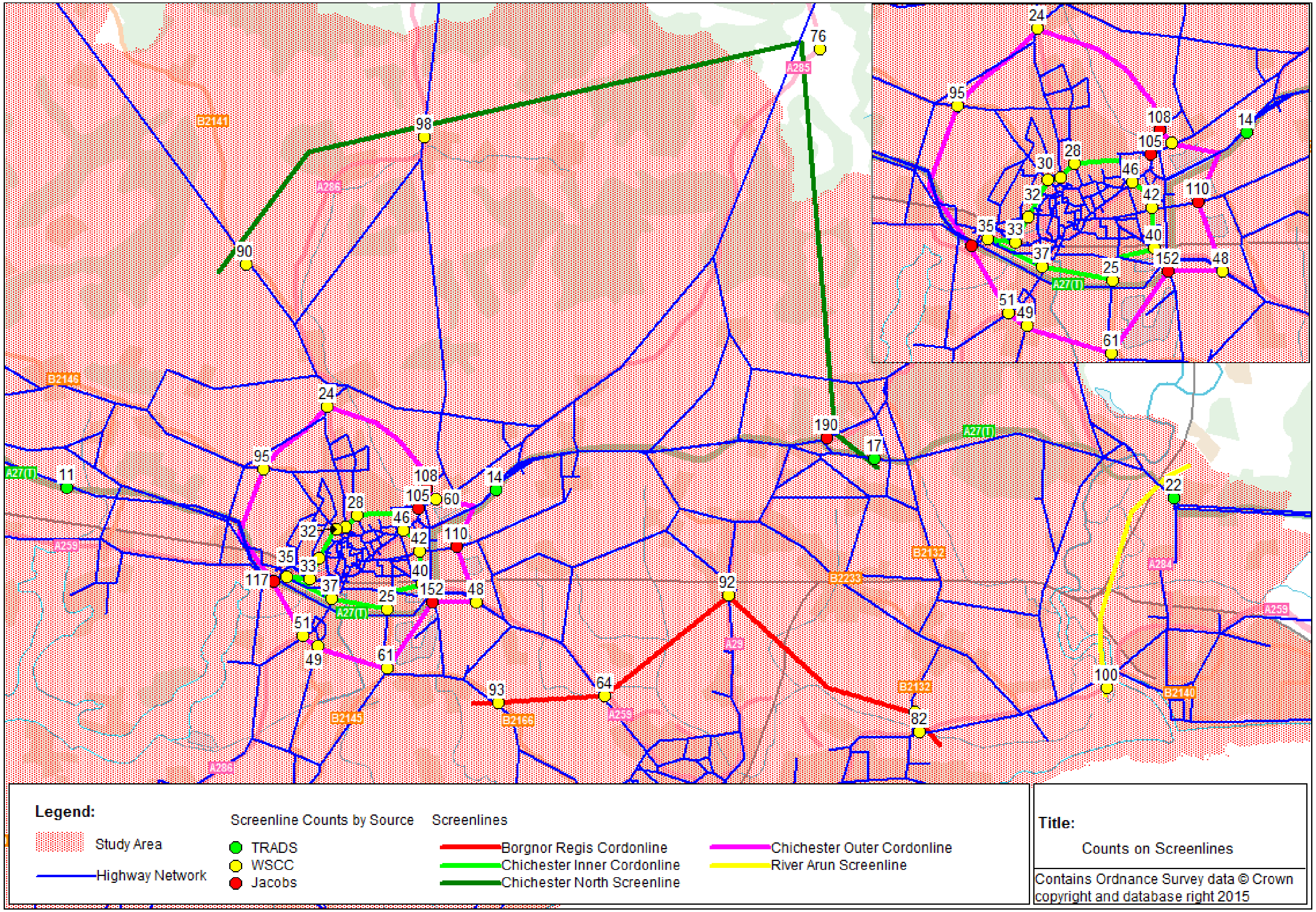
Table 9-5: Summary of calibration counts (target >85%)

Criteria	All Vehicles					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	62	84%	65	88%	62	84%
Number of links meeting Acceptability criteria (GEH)	64	86%	65	88%	64	86%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**65**	**89%**	**67**	**92%**	**66**	**90%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	Cars					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	56	82%	59	87%	61	90%
Number of links meeting Acceptability criteria (GEH)	52	76%	56	82%	60	88%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**56**	**82%**	**60**	**88%**	**62**	**91%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	LGVs					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	64	94%	65	96%	62	91%
Number of links meeting Acceptability criteria (GEH)	54	79%	55	81%	47	69%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**64**	**94%**	**65**	**96%**	**62**	**91%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	Lights (Cars + LGV)					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	59	87%	57	84%	56	82%
Number of links meeting Acceptability criteria (GEH)	58	85%	56	82%	59	87%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**60**	**88%**	**61**	**90%**	**62**	**91%**
Total Number of links	74	N/A	74	N/A	74	N/A
Criteria	HGVs					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	68	100%	68	100%	68	100%
Number of links meeting Acceptability criteria (GEH)	67	99%	65	96%	67	99%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**68**	**100%**	**68**	**100%**	**68**	**100%**
Total Number of links	74	N/A	74	N/A	74	N/A

9.4.4 The table demonstrates that the 85% criterion is exceeded for all time periods for total, lights, LGV and HGV traffic. Car flows satisfy the 85% criterion for inter peak and PM peak periods; however the figure for AM peak (at 82%) falls slightly below the target. This shortfall is due to the manual classified counts (used to split total vehicles by type) having much higher LGV proportions than were found in the ATC data, which is particularly the case in the morning peak. Recognising this difference in the classification accuracy between manual and automated counts it is appropriate to focus comparison on the light vehicle total (which exceed the 85% target in all periods) rather than the car figures in isolation. This is encouraging as it gives confidence that modelled flows as a whole are representative of real life traffic flows.

9.4.5 Full breakdown of the comparison at individual count level is included in APPENDIX D.

Figure 9-1: Screenline flow for Calibration



9.5 Calibration Screenlines

9.5.1 To assess the performance of the model, individual link counts were arranged into screenlines and cordons to see if the flows approaching the key area within the study area are realistic. According to WebTAG Unit M 3-1, Table 1 the difference between modelled flows and counts should be less than 5% of the counts for all or nearly all screenlines. Five screenlines were setup within the study area to assess the model; their location is shown in Figure 9-1.

9.5.2 The counts on five screenlines were classified by direction and the results by period are presented below in Table 9-6. The table shows that all calibration screenlines are within 5% of screenline counts except for the Bognor screenline Northbound in IP which has a difference of 5.06% or is two vehicles outside the target range. Of the 30 screenlines 29 (or 97%) meet the target of difference below 5%, with the one remaining case falling marginally outside that range.

9.5.3 It should be noted that overall modelled traffic in all time periods accurately match total traffic counts, ensuring that there is the correct amount of traffic in the local area.

9.5.4 Further information on the screenline calibration is given in APPENDIX D.

Table 9-6: Screenline calibration results

Screenline Name	No. of Links	AM				
		Observed	Modelled	% Diff.	Pass?	% of links Compliant
Chichester Inner Cordon - Inbound	12	6,139	6,159	0%	Pass	83%
Chichester Inner Cordon - Outbound	12	3,900	3,762	-4%	Pass	92%
Chichester Outer Cordon- Inbound	13	9,334	9,753	4%	Pass	85%
Chichester Outer Cordon - Outbound	13	6,840	6,925	1%	Pass	77%
Northern Screenline – SB	5	2,798	2,858	2%	Pass	100%
Northern Screenline – NB	5	2,344	2,395	2%	Pass	80%
Bognor Regis Screenline – SB	5	2,172	2,213	2%	Pass	100%
Bognor Regis Screenline – NB	5	3,624	3,638	0%	Pass	100%
River Arun Screenline – EB	2	2,322	2,238	-4%	Pass	100%
River Arun Screenline – WB	2	2,444	2,449	0%	Pass	100%

Screenline Name	No. of Links	IP				
		Observed	Modelled	% Diff.	Pass?	% of links Compliant
Chichester Inner Cordon - Inbound	12	4,455	4,394	-1%	Pass	100%
Chichester Inner Cordon - Outbound	12	4,556	4,563	0%	Pass	100%
Chichester Outer Cordon- Inbound	13	7,314	7,383	1%	Pass	85%
Chichester Outer Cordon - Outbound	13	7,286	7,374	1%	Pass	69%
Northern Screenline – SB	5	2,126	2,209	4%	Pass	100%
Northern Screenline – NB	5	1,963	2,060	5%	Pass	80%
Bognor Regis Screenline – SB	5	2,532	2,635	4%	Pass	100%

Bognor Regis Screenline – NB	5	2,409	2,531	5%	Fail	100%
River Arun Screenline – EB	2	2,150	2,075	-3%	Pass	100%
River Arun Screenline – WB	2	2,161	2,129	-1%	Pass	100%
Screenline Name	**No. of Links**	**PM**				
		Observed	**Modelled**	**% Diff.**	**Pass?**	**% of links Compliant**
Chichester Inner Cordon - Inbound	12	4,448	4,287	-4%	Pass	92%
Chichester Inner Cordon - Outbound	12	5,949	6,078	2%	Pass	83%
Chichester Outer Cordon-Inbound	13	7,999	8,334	4%	Pass	92%
Chichester Outer Cordon - Outbound	13	10,000	9,567	-4%	Pass	85%
Northern Screenline – SB	5	2,618	2,738	5%	Pass	100%
Northern Screenline – NB	5	2,749	2,873	5%	Pass	80%
Bognor Regis Screenline – SB	5	4,172	4,102	-2%	Pass	100%
Bognor Regis Screenline – NB	5	2,478	2,593	5%	Pass	100%
River Arun Screenline – EB	2	2,761	2,789	1%	Pass	50%
River Arun Screenline – WB	2	2,453	2,359	-4%	Pass	100%

9.5.5 The screenlines with lower percentages of compliant links were reviewed to assess the impact of poorer fit on the assessment of A27 bypass schemes.

9.5.6 The Chichester Inner and Outer cordons, which are closest to the bypass scheme, typically have one or more links failing to meet the link calibration criteria in each direction / period combination. It is valuable to review which links failed, as those on the north side of the cordon are less closely linked to the A27 junctions and less critical to the accurate modelling of the A27 corridor. A number of the failures are on:

- Local roads within Chichester such as Barnfield Road (sites 105 & 106) and College Lane (sites 27 & 28) which carry local traffic to the north east of the city centre; the former of these locations is not an ATC, but a one day MCC which is less accurate;
- Madgewick Lane (sites 107 & 108), a minor road linking the north east side of city centre to Goodwood and continuing across the south downs; data is not ATC but one day MCC, so is less accurate;
- B2178 Old Broyle Road (sites 95 and 96), which links to villages on the north-west side of the city centre;
- Stane Street (through Westhampnett at sites 59 & 60) which parallels th A27 east of Portfield roundabout. The poor calibration results on this link, which occur for eastbound flows, are counter-balanced by fit errors in the reverse direction on the A27 eastbound carriageway, suggesting a small imbalance in traffic assigned between the faster A27 and slower Stane Street.

The first three of these are not close to the Chicester bypass, so errors in model fit there would have limited effect on scheme appraisal. These three groups have much lighter traffic flows than the main A roads in the city area, and are not close to air quality or noise sensitivity areas.

9.5.7 There are a small number of links which are closer to the bypass scheme and fail calibration criteria. These are at sites 37, 41, 48, 109(MCC) and 152(MCC) for AM, 42, 52 and 118(MCC) for IP and 52 for PM. Three of these, as noted, are manual classified counts for one day, so less accurate as count data. Three of ATC sites have adjacent parallel links to / from the A27 which have errors in the reverse direction and to some extent counter-balance the error (these are 37 with 25 and 48 with 110 in AM, and 42 with 40 in IP).

9.5.8 Links failing calibration in the Northern screenline (one link in northbound in each period), and the Arun screenline (A259 in one direction in PM peak) are further from the bypass scheme, where poorer fit is less critical.

9.6 Count Validation

9.6.1 Count validation relies on making similar comparisons to the ones made for the count calibration, but against independent counts, i.e. those not used in the model building process up to this point. The locations of these independent counts are shown in Figure 9-2.

9.6.2 A total of 31 sites were used in validation, with 27 having count data by vehicle class. The four locations where total vehicle count is the only available data lie to the east of the River Arun, and so are distant from the A27 Chichester bypass schemes.

9.6.3 Full validation results are contained in APPENDIX E, Table 9-7 below provides a summary of the detailed results:

Table 9-7: Summary of Validation Results – Link Flows (target >85%)

Criteria	All Vehicles					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	26	84%	27	87%	27	87%
Number of links meeting Acceptability criteria (GEH)	28	90%	24	77%	25	81%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**28**	**90%**	**27**	**87%**	**27**	**87%**
Total Number of link counts	31	N/A	31	N/A	31	N/A
Total Number of Link counts by vehicle class	27	N/A	27	N/A	27	N/A

Criteria	Cars					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	24	89%	23	85%	21	78%
Number of links meeting Acceptability criteria (GEH)	23	85%	22	81%	20	74%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**25**	**93%**	**23**	**85%**	**23**	**85%**
Total Number of link counts	31	N/A	31	N/A	31	N/A
Total Number of Link counts by vehicle class	27	N/A	27	N/A	27	N/A

Criteria	LGV					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	23	85%	25	93%	23	85%
Number of links meeting Acceptability criteria (GEH)	12	44%	17	63%	15	56%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**23**	**85%**	**25**	**93%**	**23**	**85%**
Total Number of link counts	31	N/A	31	N/A	31	N/A
Total Number of Link counts by vehicle class	27	N/A	27	N/A	27	N/A

Criteria	Lights					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	26	96%	25	93%	23	85%
Number of links meeting Acceptability criteria (GEH)	25	93%	25	93%	23	85%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**26**	**96%**	**25**	**93%**	**24**	**89%**
Total Number of link counts	31	N/A	31	N/A	31	N/A
Total Number of Link counts by vehicle class	27	N/A	27	N/A	27	N/A

Criteria	HGVs					
	AM		IP		PM	
Number of links meeting Acceptability criteria (hourly flow)	27	100%	27	100%	27	100%
Number of links meeting Acceptability criteria (GEH)	26	96%	25	93%	27	100%
Number of links meeting Acceptability criteria (GEH OR Hourly flows)	**27**	**100%**	**27**	**100%**	**27**	**100%**
Total Number of link counts	31	N/A	31	N/A	31	N/A
Total Number of Link counts by vehicle class	27	N/A	27	N/A	27	N/A

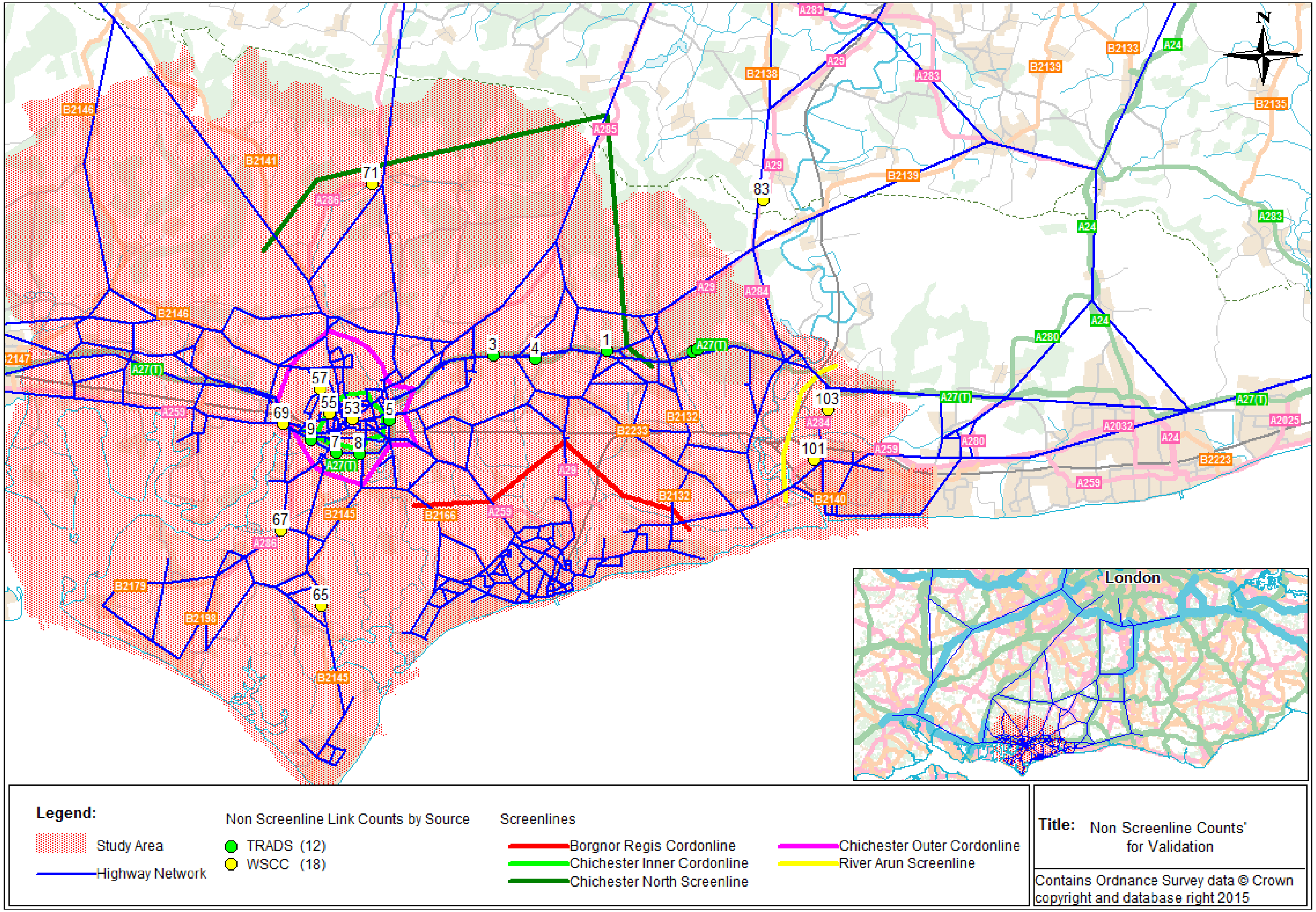
9.6.4 The above results show that the traffic model validates well for Lights, HGV and all vehicle level all the Weekday AM, IP and PM periods, exceeding the WebTAG criteria of 85%. As noted above (9.4.4) the comparisons against automated counts for car and LGV are less close due to substantial differences between LGV and car proportions in manual and automated counts. It is therefore more appropriate to focus on the accuracy of light vehicle and total vehicle counts.

9.6.5 The validation sites giving poorest fit (failing both GEH and flow criteria) are:

- Three and four locations in the AM and IP periods respectively, east of the River Arun, on the A29 at Bury (where it crosses the South Downs) and on A259 in Fishbourne; the first two of these locations are at the edge of the study area;
- Four locations east of the River Arun or on local roads in Chichester in the PM peak; two of these are at the edge of the study area.

9.6.6 A total of 12 sites along the A27 (between Fishbourne roundabout and the River Arun) have been used in validation. All of these have total flow differences below 15% from count except one in the inter peak period which differs by 15.3%. Of these 36 results (at site by time period level), 25 are within 10% of count, with 13 of them within 5% of count. This high level of fit to counts along the A27 corridor supports the model's fitness for purpose to assess the Chichester bypass schemes.

Figure 9-2: Link Count for Validation



9.7 Checks against Turning count data

9.7.1 Turn counts for key junctions on A27 Chichester Bypass for all modelled periods were checked against observed flows. The guidance suggest the assessment may follow the same criteria as for link counts which are stated in section 9.3. However the data were collected for a single day, and for most arms there are no ATC counts adjacent to the junction. As the MCCs are not collected with ATCs, WebTAG M.1 para 4.3.6 indicates that they may be used for diagnostics during calibration, but should not be used for formal validation.

9.7.2 Location of sites where the turn count data was collected is shown in Figure 3-2 . Table 9-8 summarises the assessment and show how many movements pass the WebTAG criteria. APPENDIX F includes detailed tables and graphical representation of data for each junction.

Table 9-8: Summary of Turn Flow Validation Results (target >85%)

Criteria	All Vehicles					
	AM		IP		PM	
Number of turns meeting Acceptability criteria (hourly flow)	119	86%	121	88%	121	88%
Number of turns meeting Acceptability criteria (GEH)	96	70%	85	62%	91	66%
Number of turns meeting Acceptability criteria (GEH OR Hourly flows)	**122**	**88%**	**121**	**88%**	**124**	**90%**
Total Number of turns	138	N/A	138	N/A	138	N/A
Criteria	Cars					
	AM		IP		PM	
Number of turns meeting Acceptability criteria (hourly flow)	126	91%	127	92%	125	91%
Number of turns meeting Acceptability criteria (GEH)	100	72%	90	65%	95	69%
Number of turns meeting Acceptability criteria (GEH OR Hourly flows)	**127**	**92%**	**127**	**92%**	**125**	**91%**
Total Number of turns	138	N/A	138	N/A	138	N/A
Criteria	LGVs					
	AM		IP		PM	
Number of turns meeting Acceptability criteria (hourly flow)	136	99%	135	98%	130	94%
Number of turns meeting Acceptability criteria (GEH)	114	83%	127	92%	115	83%
Number of turns meeting Acceptability criteria (GEH OR Hourly flows)	**136**	**99%**	**135**	**98%**	**130**	**94%**
Total Number of turns	138	N/A	138	N/A	138	N/A
Criteria	Lights					
	AM		IP		PM	
Number of turns meeting Acceptability criteria (hourly flow)	121	88%	121	88%	123	89%
Number of turns meeting Acceptability criteria (GEH)	96	70%	88	64%	91	66%
Number of turns meeting Acceptability criteria (GEH OR Hourly flows)	**123**	**89%**	**123**	**89%**	**125**	**91%**
Total Number of turns	138	N/A	138	N/A	138	N/A
Criteria	HGVs					
	AM		IP		PM	
Number of turns meeting Acceptability criteria (hourly flow)	121	88%	121	88%	123	89%
Number of turns meeting Acceptability criteria (GEH)	133	96%	136	99%	138	100%
Number of turns meeting Acceptability criteria (GEH OR Hourly flows)	**138**	**100%**	**138**	**100%**	**138**	**100%**
Total Number of turns	138	N/A	138	N/A	138	N/A

9.7.3 Although these results should not be formally viewed as validation, they give an indication of model fit. It is recognised in WebTAG M1 para 3.2.9 that turn counts may be less well reproduced than link flows. The results above show good fit at hourly flow level, but poorer fit when GEH is used.

9.8 Journey Time Validation

9.8.1 Journey times within the model were checked by comparison of the modelled journey times against the observed times along the routes identified in section 3.6.

9.8.2 Criteria to demonstrate satisfactory validation of modelled journey times are detailed in WebTAG M3.1 Table 3 . This states that modelled journey times should be within ±15% of the mean observed journey time (or within 1 minute, if higher). The WebTAG acceptability guideline states that this criteria should be attained on more than 85% of routes. In addition, to reflect the variability (and statistical variance) in the journey times by time of day and under varying travel conditions, also recommends that 95% confidence intervals for observed journey times should be derived for presentation purposes.

9.8.3 All journey time measurements were completed in all three time periods for the seven routes shown in Figure 3-4 and listed in section 3.6.

9.8.4 To ensure rigour in the modelled delays and journey times, the model was developed in order to ensure that the modelled times match the observed times not just for the total time along the routes, but also at all points of the routes. To that end, distance versus time graphs for the modelled and observed times are also provided in 0.

9.8.5 Table 9-9 summarises the performance of the model in terms of the WebTAG criteria

Table 9-9: Validation – Summary of Results for Journey Times

Route	Direction	Peak	Ave Observed Journey Time (secs)	Modelled Journey Time (secs)	Difference (secs)	% Difference	Model Journey time within Confidence Interval ?	Differen within 1 min?	Pass?
1	Northbound	AM	466	398	-68	-14.7%	Yes	No	Pass
		IP	361	339	-22	-6.1%	Yes	Yes	Pass
		PM	425	401	-24	-5.7%	Yes	Yes	Pass
	Southbound	AM	439	484	45	10.1%	Yes	Yes	Pass
		IP	498	426	-71	-14.3%	Yes	No	Pass
		PM	708	606	-102	-14.4%	Yes	No	Pass
2	Eastbound	AM	593	672	79	13.3%	Yes	No	Pass
		IP	712	672	-40	-5.7%	Yes	Yes	Pass
		PM	817	837	19	2.4%	Yes	Yes	Pass
	Westbound	AM	670	697	26	3.9%	Yes	Yes	Pass
		IP	604	664	60	10.0%	Yes	Yes	Pass
		PM	735	793	58	7.9%	Yes	Yes	Pass
3	Northbound	AM	559	516	-43	-7.7%	Yes	Yes	Pass
		IP	549	482	-67	-12.2%	Yes	No	Pass
		PM	575	503	-71	-12.4%	Yes	No	Pass
	Southbound	AM	533	533	0	0.0%	Yes	Yes	Pass
		IP	472	480	7	1.5%	Yes	Yes	Pass
		PM	501	548	47	9.4%	Yes	Yes	Pass

Route	Direction	Peak	Ave Observed Journey Time (secs)	Modelled Journey Time (secs)	Difference (secs)	% Difference	Model Journey time within Confidence Interval ?	Differen within 1 min?	Pass?
4	Eastbound	AM	254	259	5	1.8%	Yes	Yes	Pass
		IP	264	321	56	21.3%	No	Yes	Pass
		PM	347	389	42	12.1%	Yes	Yes	Pass
	Westbound	AM	409	433	25	6.0%	Yes	Yes	Pass
		IP	289	311	22	7.7%	Yes	Yes	Pass
		PM	271	308	37	13.5%	Yes	Yes	Pass
5	Eastbound	AM	591	592	1	0.2%	Yes	Yes	Pass
		IP	601	521	-81	-13.5%	Yes	No	Pass
		PM	635	577	-59	-9.2%	Yes	Yes	Pass
	Westbound	AM	602	601	-1	-0.1%	Yes	Yes	Pass
		IP	620	554	-66	-10.7%	Yes	No	Pass
		PM	641	606	-35	-5.5%	Yes	Yes	Pass
6	Eastbound	AM	583	614	32	5.4%	Yes	Yes	Pass
		IP	562	570	8	1.4%	Yes	Yes	Pass
		PM	606	648	42	6.9%	Yes	Yes	Pass
	Westbound	AM	614	645	31	5.0%	Yes	Yes	Pass
		IP	599	599	0	0.0%	Yes	Yes	Pass
		PM	624	647	24	3.8%	Yes	Yes	Pass
7	Northbound	AM	559	641	82	14.7%	Yes	No	Pass
		IP	507	440	-67	-13.3%	Yes	No	Pass
		PM	452	446	-6	-1.2%	Yes	Yes	Pass
	Southbound	AM	465	516	51	10.9%	Yes	Yes	Pass
		IP	498	497	-1	-0.3%	Yes	Yes	Pass
		PM	634	585	-49	-7.7%	Yes	Yes	Pass

9.8.6 The above results show that the Stage 2 traffic model validates well against journey times, exceeding the WebTAG criteria.

9.9 Realism Tests

9.9.1 WebTAG M2 paragraph 6.4.14 expects that:

- the annual average fuel cost elasticity should lie within the range **-0.25 to -0.35** (overall, across all purposes; and
- the annual average fuel cost elasticity should lie on the right side of **-0.3**, taking account of the levels of income and average trip lengths prevailing in the modelled area.

9.9.2 The characteristics of the Chichester model and study area which influence 'right side' are summarised below:

- trip lengths are much longer than average values, and short distance trips are under-recorded in the mobile phone dataset; such a deviation is expected to result in stronger elasticities;
- car driver mode shares are close to (but very slightly above) average; such a deviation from average may slightly reduce elasticities;
- The proportions of trips in low elasticity segments are based on NTEM proportions, which for the study area are only slightly different from average values, so are not expected to affect right side considerations.

Considering all of these, the dominant effect is the longer trip length in the demand matrices and a stronger than average response is appropriate (i.e. overall annual elasticity should be in range -0.3 to -.035).

9.9.3 The other purpose trips have a frequency response built into the variable demand model. Such frequency responses were not used for commute or employer's business purpose trips. We had in the past used a frequency choice coefficient of 0.1 for induced / supressed demand in regional studies such as the Tyne Wear Transport Model, and a higher 0.16 for M25/J30. For this study we selected a lower setting of 0.08 recognising that:

- The demand matrices under represent short distance trips, which are the most likely trips to increase in number or transfer to/from active modes. The longer trips found in the demand matrix are (relatively) less likely to be induced / supressed.
- The composite cost differences for standardised tests like fuel cost elasticity would give higher weight to the larger cost changes of longer trips than would be the case if short distance trips were well represented. Composite cost differences would be larger, and previously used parameters would induce / supress more trips (as trip-ends) than is considered realistic.

9.9.4 Calibration of the destination model parameters was conducted in line with guidance from WebTAG M2 para 6.6.5 using median values taken from Table 5.1 of the same document. A sequence of model runs were conducted, as described below, in order to achieve calibration. The input parameters and results are shown in Table 9-10 and Table 9-11 respectively.

9.9.5 Run 1 used the median parameter settings from WebTAG M2 Table 5.1 for all time periods. The results in all time periods for commute and 'other' purposes are very sensitive. This high sensitivity is in part due to above average proportions of longer distance trips. This leads to larger fuel cost changes, which without any cost damping give greater responses.

9.9.6 It is noted that (contrary to other purposes) employer business trips were less sensitive than desired, and examination of results identified two underlying causes for this. Firstly the high value of time means that the fuel cost increase in realism tests has relatively lower impact than for the other user classes. Secondly any time savings obtained in the assignment will reduce the effect of fuel cost increases. The first run gave higher than expected elasticities for other purpose trips, which form a significant part of the car demand matrix. These have the effect of shifting longer distance movements towards lower distance alternatives, and through the frequency responses also reduce trip making. The Chichester network is highly congested in the peak periods, with delays of several minutes occurring at key junctions along the A27. A small reduction in demand flow under such congested conditions leads to time savings from reduced congestion. The fuel cost increases in realism tests are diluted by time savings for I-J movements which pass through key congested junctions, giving a weaker response.

9.9.7 As employers business is the smaller user class, accounting for about 10% of trips, detailed tuning of its destination choice settings is deferred until the elasticities (and induced /

supressed demand effects of frequency choice) of the major user classes have realistic responses.

9.9.8 Run 2 decreased the distribution parameters to 25% below median values. The elasticities weakened, but remained too sensitive.

9.9.9 As a next step Run 3 introduced distance based cost damping, based on the commonly used values quoted in WebTAG M2 para 3.3.10, namely k and d' set to 30km and alpha to 0.5. This again reduced sensitivity for commute and other trips, but responses remained too strong. Commute trips remained more sensitive than other purpose in AM and IP periods, so were unacceptable. WebTAG M2 para 3.3.4 recognises that "It may also be necessary to vary cost damping parameters by trip purpose. However, these variations by mode and purpose should be avoided unless it is essential to achieve acceptable model performance".

9.9.10 In Run 4 we tested distance based cost damping using average trip lengths derived from NTS (in line with WebTAG M2 para 3.3.8, second bullet). These were 16km commute, 22km employers business and 14km for other purposes. The k and d' values were set accordingly, and alpha value retained at 0.5 for all purposes. This reduced commute sensitivity too far, and other purpose trips continued to be less sensitive than the former. As a next step runs 2 to 4 were repeated using larger distribution parameters, at 12.5% below median.

9.9.11 The sequence of runs 5 to 7 gave reductions from the initial over-sensitive responses towards more acceptable responses for commute and other purposes. However employers business trips were less sensitive than required, especially in the morning peak. Further tests using higher distribution factors for that purpose showed that changing to median +25% gave more suitable responses.

9.9.12 Further test runs resulted in the set of parameters used for Run 8. Other purpose responses were weaker than desirable, so cost dampening was slackened slightly across all time periods. The average trip length in the AM period matrices were lower than those in the other two time periods, so cost damping was slackened (i.e. alpha value reduced) to allow a slightly stronger response for employers business and other purpose trips. The proportion of within study area trips in the entire matrix was much lower in the PM period, giving more shorter distance trips and weaker responses; reducing the cost damping for commute trips in this period gave an acceptable response.

9.9.13 The run 8 is reported using the final calibration results, based on the changes outlined above. The resulting elasticities (based on all trips except external to external, which are not fully represented and responsive) from Run 8 have:

- all purpose all day elasticities on the right side of -0.3 (result -0.35, is in range -0.3 to -0.35);
- inter peak elasticities more sensitive than peak period;
- commute elasticity (by period and all day) close to the all-purpose values;
- employers business elasticities close to -0.10;
- other purpose elasticities close to -0.38.

Table 9-10: Parameter settings used in calibration

Run	Distribution Parameter			Trip frequ-ency	Cost damping – k & d'			Cost damping - alpha		
	Comm-ute	Emloy-ers bus-iness	Other	Other	Comm-ute	Emloy-ers bus-iness	Other	Comm-ute	Emloyers business	Other
1	Median	Median	Median	0.08	n/a	n/a	n/a	n/a	n/a	n/a
2	-25%	-25%	-25%	0.08	n/a	n/a	n/a	n/a	n/a	n/a
3	-25%	-25%	-25%	0.08	30k	30k	30k	0.5	0.5	0.5
4	-25%	-25%	-25%	0.08	16k	22k	14k	0.5	0.5	0.5
5	-12.5%	-12.5%	-12.5%	0.08	n/a	n/a	n/a	n/a	n/a	n/a
6	-12.5%	-12.5%	-12.5%	0.08	30k	30k	30k	0.5	0.5	0.5
7	-12.5%	-12.5%	-12.5%	0.08	16k	22k	14k	0.5	0.5	0.5
8 AM	-12.5%	25.0%	-12.5%	0.08	16k	22k	14k	0.5	0.2	0.3
8 IP	-12.5%	25.0%	-12.5%	0.08	16k	22k	14k	0.5	0.5	0.4
8 PM	-12.5%	25.0%	-12.5%	0.08	16k	22k	14k	0.3	0.5	0.4

Table 9-11: Elasticity results

Period	Purpose	Run							
		1	2	3	4	5	6	7	8
AM	Commute	-0.94	-0.77	-0.38	-0.27	-0.86	-0.43	-0.32	-0.31
	Employers business	-0.04	-0.04	-0.02	-0.02	-0.04	-0.02	-0.02	-0.09
	Other	-0.64	-0.53	-0.31	-0.22	-0.59	-0.36	-0.25	-0.37
	All	-0.76	-0.62	-0.33	-0.23	-0.70	-0.38	-0.27	-0.32
IP	Commute	-1.36	-1.06	-0.42	-0.30	-1.22	-0.49	-0.35	-0.35
	Employers business	-0.09	-0.10	-0.07	-0.07	-0.09	-0.08	-0.07	-0.10
	Other	-0.92	-0.75	-0.40	-0.28	-0.84	-0.45	-0.32	-0.39
	All	-0.91	-0.74	-0.37	-0.26	-0.83	-0.42	-0.30	-0.36
PM	Commute	-1.12	-0.86	-0.23	-0.17	-1.00	-0.26	-0.19	-0.27
	Employers business	-0.07	-0.09	-0.07	-0.07	-0.08	-0.08	-0.08	-0.10
	Other	-0.88	-0.73	-0.41	-0.29	-0.81	-0.47	-0.34	-0.41
	All	-0.92	-0.74	-0.32	-0.23	-0.84	-0.36	-0.26	-0.33
24hr AADT	Commute	-1.14	-0.89	-0.33	-0.24	-1.02	-0.39	-0.28	-0.31
	Employers business	-0.08	-0.09	-0.06	-0.06	-0.08	-0.07	-0.07	-0.10
	Other	-0.88	-0.72	-0.39	-0.28	-0.80	-0.45	-0.32	-0.39
	All	-0.89	-0.72	-0.35	-0.25	-0.81	-0.40	-0.29	-0.35

9.9.14 Network based elasticities were calculated, and results (see Table 9-12 below) are lower than the matrix based values summarised above. It is noted that there are substantial external to external long distance trips along the A27 corridor. As the model has incomplete representation of trips to or from external zones these trips are not fully responsive to cost changes. These trips are excluded from the matrix based calculation, but are not separated out from other trips in the highways assignment and subsequent network-based calculations.

Table 9-12: Network based elasticity results

Period	Purpose	Elasticity
AM	Commute	-0.23
	Employers business	-0.08
	Other	-0.31
	All	-0.25
IP	Commute	-0.26
	Employers business	-0.09
	Other	-0.32
	All	-0.29
PM	Commute	-0.32
	Employers business	-0.07
	Other	-0.32
	All	-0.30
24hr AADT	Commute	-0.27
	Employers business	-0.08
	Other	-0.32
	All	-0.29

9.9.15 Journey time elasticity is presented in Table 9-13; an average value slightly stronger than -1.0 was obtained, with purpose / period specific elasticities varying between -0.41 and -1.34. This meets WebTAG M2 para 6.4.29 recommendation that journey time elasticities are no stronger than -2.0,

Table 9-13: Journey time elasticity results

Period	Purpose	Elasticity
AM	Commute	-0.77
	Employers business	-0.41
	Other	-1.15

	All	-0.94
IP	Commute	-0.91
	Employers business	-0.48
	Other	-1.29
	All	-1.24
PM	Commute	-0.69
	Employers business	-0.51
	Other	-1.34
	All	-1.06

9.9.16 Variable demand modelling has been performed using the DIADEM software. Realism test have readily converged giving a relative gap of 0.1% (in line with WebTAG M2 para 6.3.8).

9.10 Summary of Calibration / Validation Results and Quality of Model Fit

9.10.1 This model development has as its primary objective the assessment of schemes to upgrade the A27 Chichester bypass.

9.10.2 The model has used mobile phone data collected in July 2014 as its main travel demand data source. The mobile phone data area is one where there have since been improvements in the quality of data (due to wider use of 3rd and 4th generation phones) and the acceptance of methods to impute trip characteristcs at the disaggregate level. The methods used in this study were innovative, designed to understand the quality of data provided (without imputation) and address any deficiencies found.

9.10.3 The mobile phone data had deficiencies which followed through into the demand matrices; these are considered below

- The mobile phone based demand matrices under represented short distance trips. This shortcoming would affect short distance trips to and from Chichester, but as these are (in effect) replaced by slightly longer trips the cross cordon flows are not materially affected. As cordon counts are modelled by flows meeting calibration criteria the flows on and across the A27 corridor are well represented in the model;
- Comparisons with NTEM trip ends highlight under representation of trip ends within Arun district, in particular for movements within the Littlehampton, Bognor and Barnham sectors. Short distance trips within sector were less comprehensively observed in the mobile phone dataset, and absence of screenlines intercepting these trips means no control was applied to rectify this situation. These under represented trips are local rather than trunk road traffic (which intercepts screenlines), so has minimal impact on traffic volumes on the A27 and the bypass schemes.

If quality of model fit to observed data can be demonstrated then the issues recorded above would not materially degrade the model's quality and fitness for purpose.

9.10.4 The main calibration results, and their contribution to a robust model, are summarised below:

- When compared with counts the total, light and HGV flows meet the criterion that at least 85% of links have acceptable flows;

- All screenlines except one meet the flow within 5% criterion; the failing screenline has an error of 5.06 and is just two vehicles outside the acceptable range;
- Closer examination of the links failing to meet the flow criteria shows that several are away from the Chichester bypass scheme, either on the edge of study area, or on the northern edge of Chichester. Of the failing links closer to the A27 corridor in Chichester three failures use less reliable one day MCC data, and three further links have an adjacent parallel link which has an error of opposite sign which partially or fully counter balances the failing link. These analyses confirm that many of the errors on failing links would not have effects which are detrimental to the assessment of the A27 in the Chicester bypass schemes.
- Link validation is strong along the A27 corridor from Hampshire border to River Arun; of the 36 checks (12 sites by 3 periods) just one has an error in excess of 15% (with value 15.3%). Of the 36 results 25 are within 10% and 13 within 5%;
- Journey time validation gives results matching guideline criteria for a selection of routes along the A27 Chicester bypass, crossing this trunk road, and through the city centre;
- Realism results give elasticities which are in the right side of the acceptable -0.25 to -0.35 expected range.
- Assignment and variable demand modelling have both converged to gap measures consistent with WebTAG guidance.

9.10.5 The quality of model fit to WebTAG guideline criteria is good across the full range of measures used. The modelling deficiencies arising from use of mobile phone data, as noted above, do not materially detract from the quality of fit obtained or reduce the model's suitability to assess Chichester bypass schemes. Furthermore, the good quality fit to observed flows along the A27 corridor from the Hampshire border to River Arun gives a robust basis for the development and appraisal of future A27 Chichester bypass schemes across a range of forecast years.

10 SUMMARY AND CONCLUSIONS

10.1 Summary

10.1.1 This report outlines the development of the Stage 2 traffic model for the A27 Chichester Bypass Congestion Relief Scheme under the following chapter headings for which summaries are provided.

10.1.2 Development of the Traffic Model:

- Highway Model: A highway assignment model was developed in SATURN (V11.3.12F).
- Study Area: The detailed study area encompasses the main centres of Chichester and Bognor Regis. It extends to the coast, the Hampshire border, the northern edge of the South Downs and include parts of Arun district to the west of Arundel and the River Arun.
- Time Periods: The time periods covered by the model represent a weekday in July 2014 and cover the AM peak hour (08:00 – 09:00), Inter–Peak (IP Average of 10:00 – 16:00) and PM peak hour (17:00 – 18:00).
- Base Year: The model was validated to a base year of July 2014. A factor to convert base matrix to neutral forecast years will be used.
- User Classes: Five User Classes (vehicle types) modelled are Cars Commute, Cars Business, Cars Other, Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs).

10.1.3 Network Development:

- Network Components: In the network, junctions are represented by nodes, whilst links represent the roads in between the junctions. The modelled network also includes zones and connectors that attach zones to the network.
- Network Coverage: The area covered by the traffic model is greater than that covered by the study area. This is to ensure that trips enter the study area at the correct points. The traffic model extends from Fishbourne west of Chichester (A27 Chichester Bypass) to A27/A284 Junction near Crossbush in East and till East Lavant in north of Chichester.
- Link and Junction Coding: The road network has been reviewed and updated to 2014.
- Modelling standards: Model parameters, assumptions, speed flow curves and standardised methodology to code the turn saturation have been followed to keep the coding consistent.
- Network checks: Sufficient network checks have been performed to ensure the model is robust.
- Zoning System: Zones represent the starting or finishing points of journeys. A hierarchy of zones is used, with a large number of small zones in the urban areas and the area of concern, a moderate number of moderate–sized zones further away, and a small number of large zones on the periphery.
- Assignment Procedures: The assignment procedure used within SATURN is the default one, Wardrop’s Equilibrium.
- Generalised Cost Parameters: Generalised cost parameters are calculated using TAG Data Book, November 2014.

- Convergence criteria: The convergence criteria adopted are robust and meet the WebTAG requirements.

10.1.4 Trip Matrix Development:

- The base year demand matrices are based on traces of mobile phone movements collected in early July 2014;
- The mobile phone data has been processed to overcome problems with spatial resolution and remove movements by public transport;
- The processed data was later expanded from sample to full demand matrices, which were split by vehicle type and journey purpose.

10.1.5 Assignment of matrices to network gave good calibration results at screenline, link, and journey time level, and levels of validation at sites for strategic and local link flows for all the AM, IP and PM periods. A significant number of the links which failed to meet calibration criteria were not close to the area of the A27 Chichester bypass and its proposed upgrade schemes (so errors would have limited impact on the scheme), or had less accurate observed values based on MCC rather than ATC data.

10.1.6 Representation of A27 flows (from Hampshire border to River Arun) was within GEH 5 or 15% difference across links in all time periods

10.1.7 Journey times for routes across Chichester and along the bypass met WebTAG cirteria.

10.1.8 Realism test gave elasticities on the correct side of the -0.25 to -0.35 expected range.

10.1.9 The quality of model fit attained provides a good platform for the robust assessment of A27 bypass scheme options.

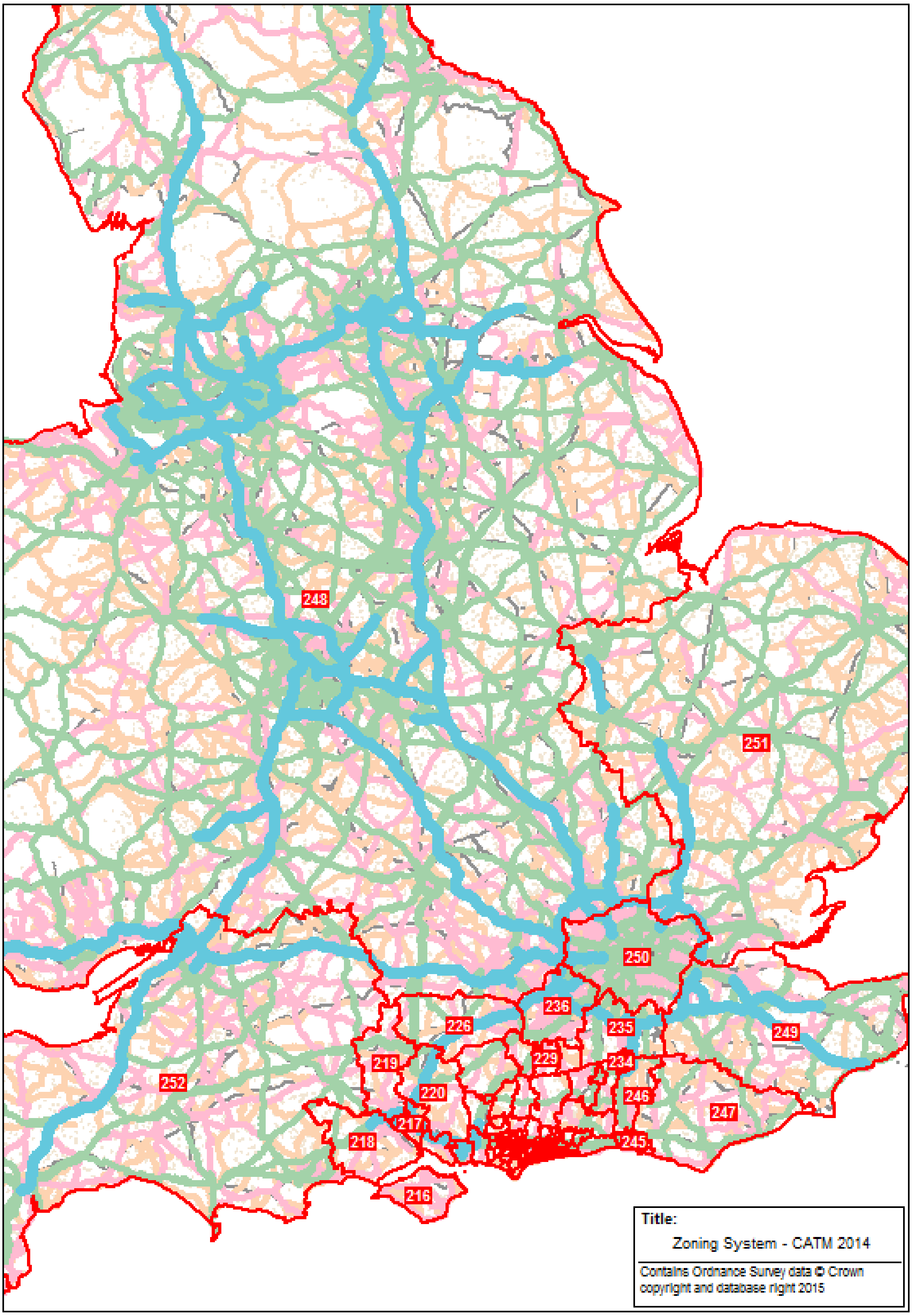
10.2 Conclusions

10.2.1 The Stage 2 traffic model is capable of producing sufficiently accurate estimates of existing traffic conditions within the study area, and in particular around the A27 Chicester bypass, such that the final validation results meet the necessary criteria in DMRB and WebTAG. The model can be used with confidence to estimate a robust set of future traffic flows for proposed schemes to upgrade that bypass.

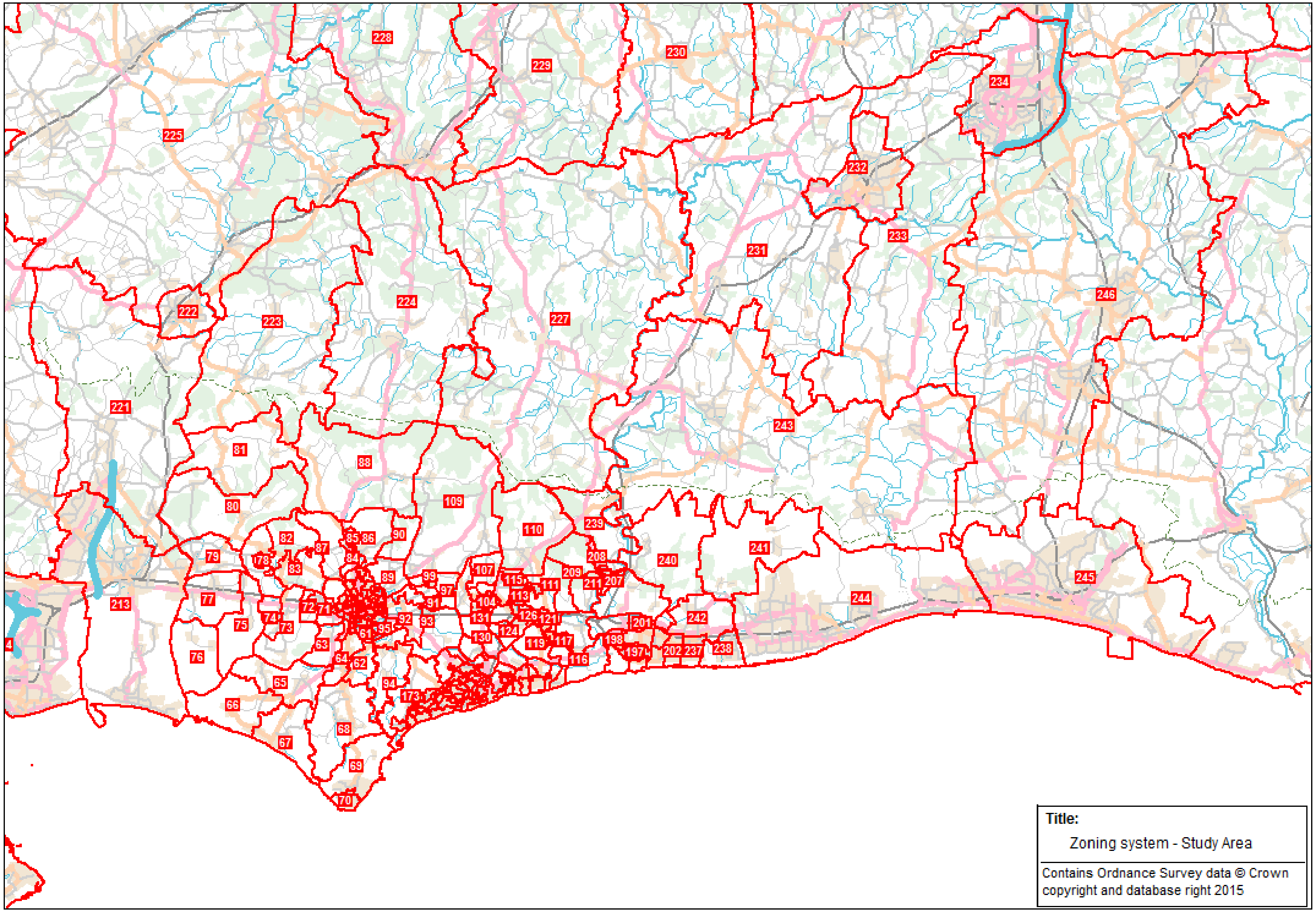
APPENDICES

APPENDIX A ZONING SYSTEM

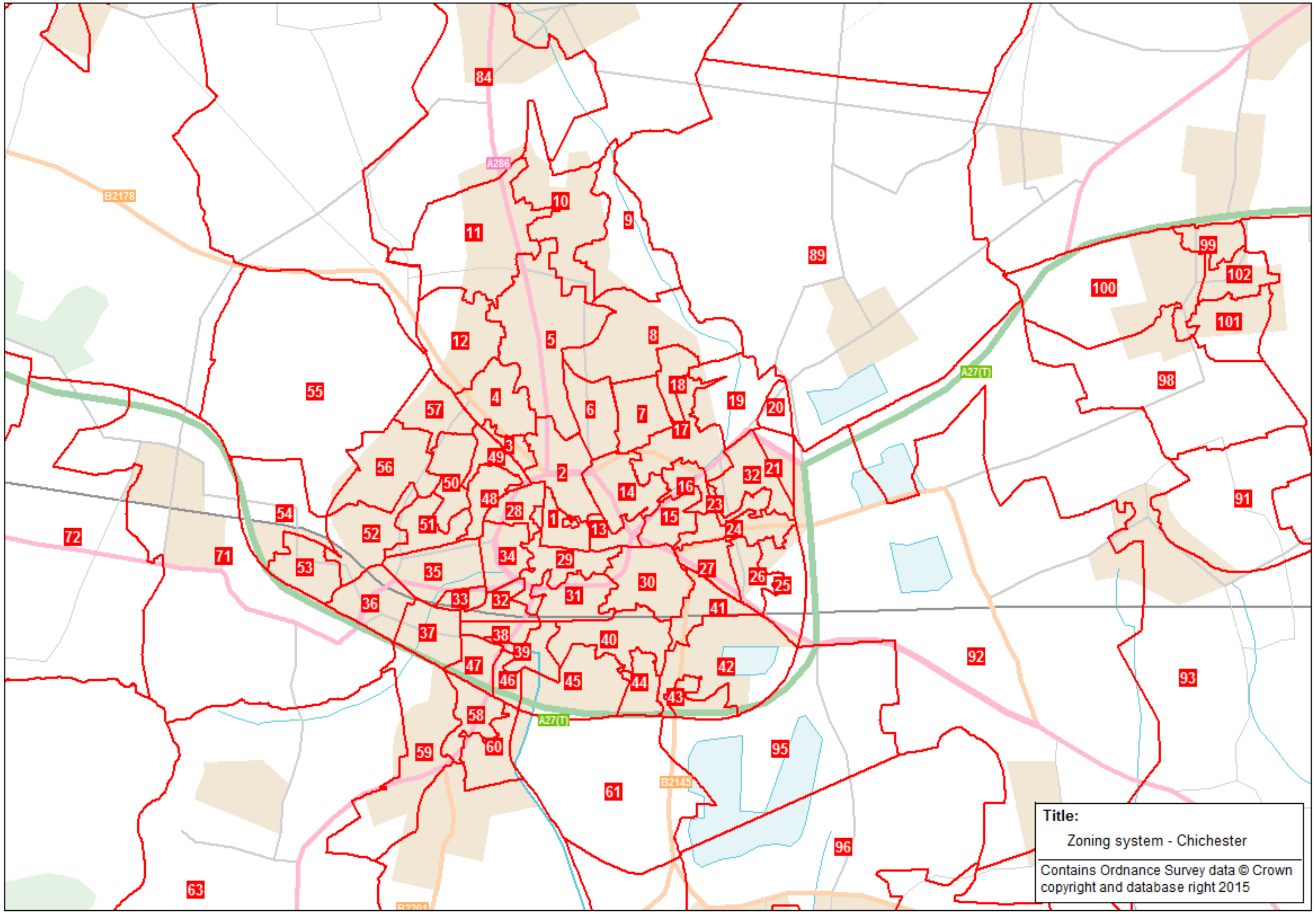
SHEET 1 Zoning System – CATM 2014



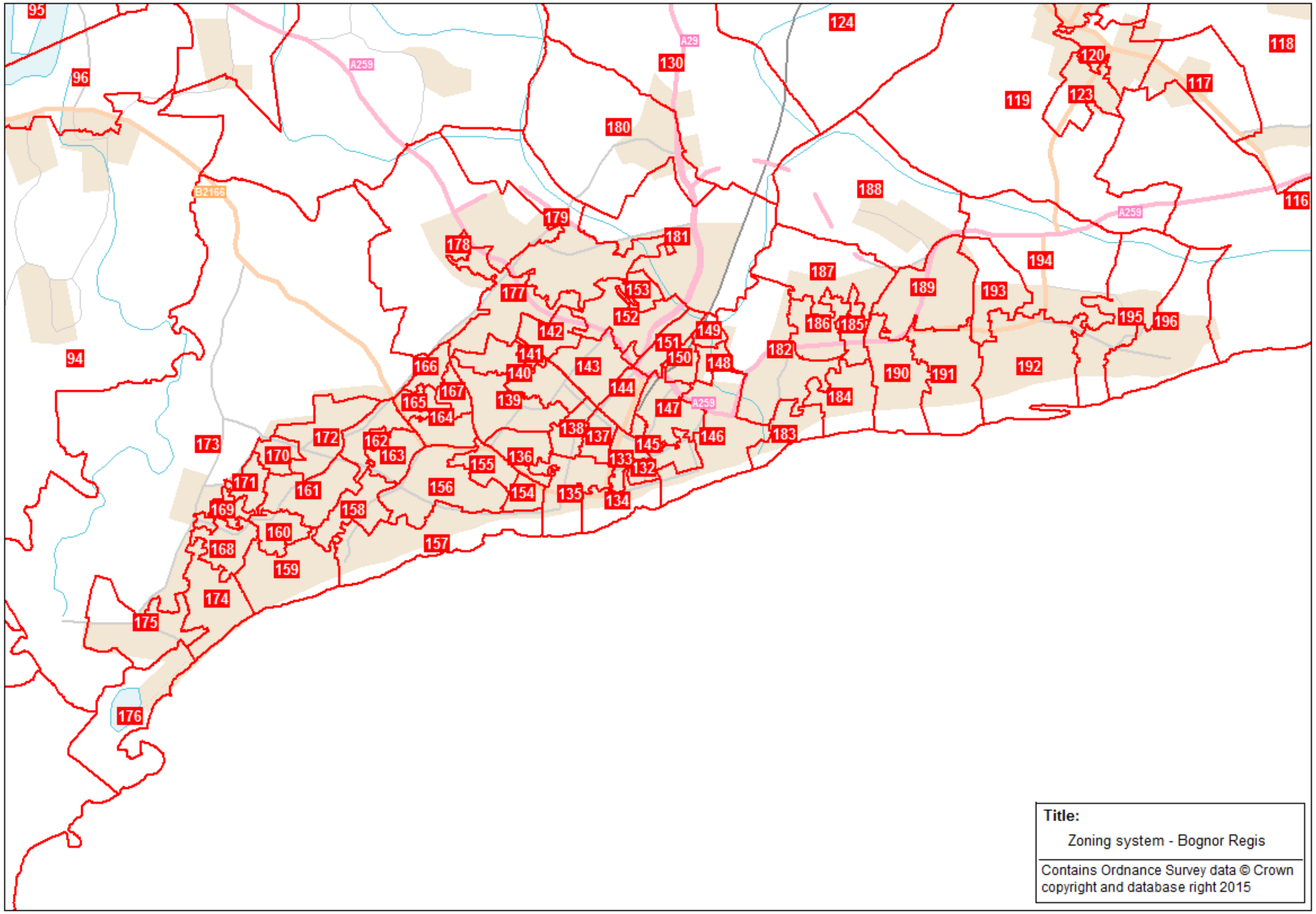
SHEET 2 **Zoning System – Study Area**



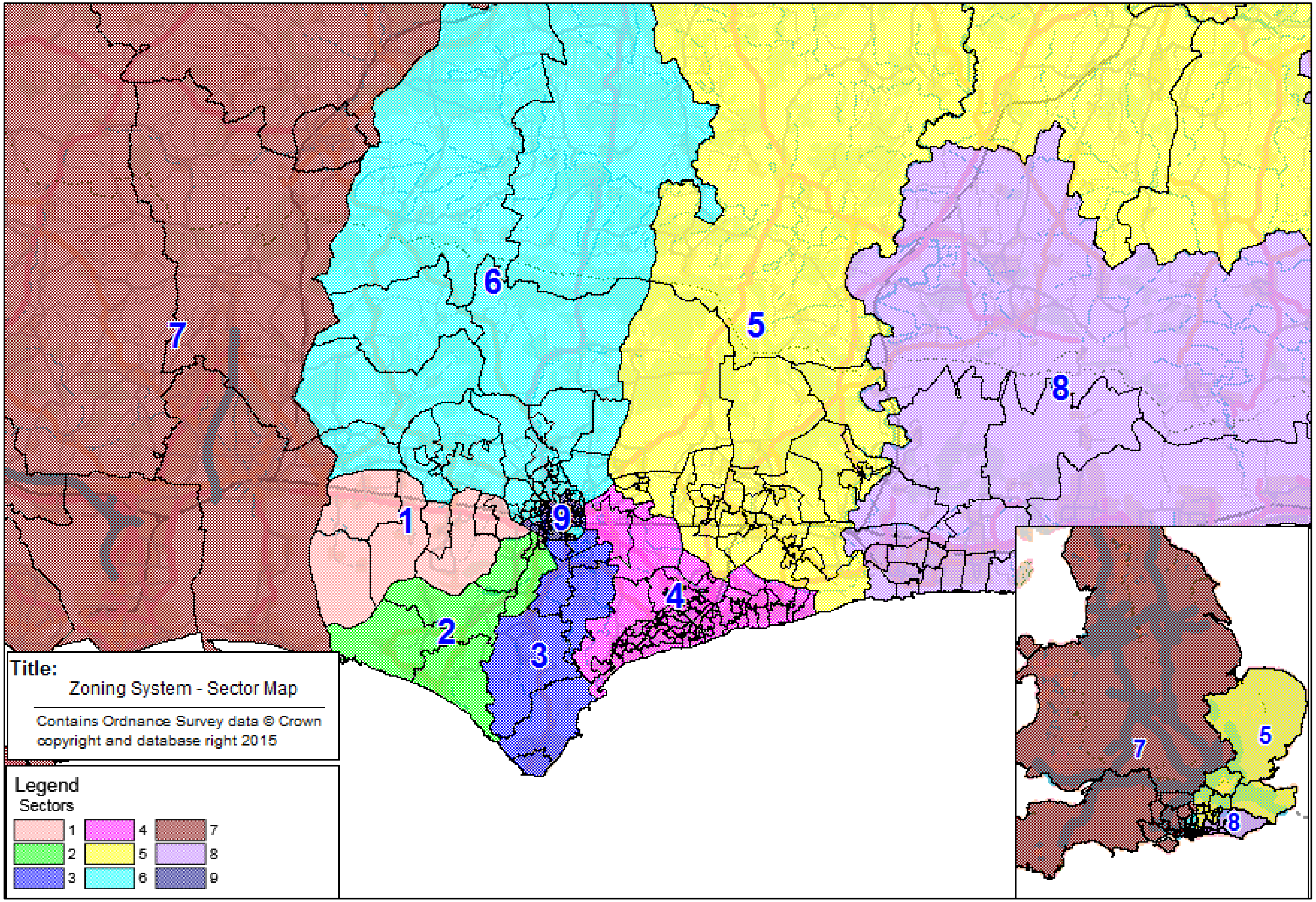
SHEET 3 Zoning System – Chichester



SHEET 4 **Zoning System – Bognor Regis**



SHEET 5 **Zoning System – Sector Map**



APPENDIX B LOG OF NETWORK CHANGES TO CATM 2009

SHEET 1 Log of changes

Node	Junction Type	Reference	Action
4156	External Node	A27 west of Fishbourne Roundabout	Recoded as dummy node due to simulation area extension.
4151	Dummy Node	A27 west of Fishbourne Roundabout	A27 capacity increased to reflect 2 lanes
4050	Dummy Node	A27 west of Fishbourne Roundabout	A27 capacity increased to reflect 2 lanes
4055	External Node	A27 west of Fishbourne Roundabout	A27 capacity increased to reflect 2 lanes
9001	Roundabout with U Turns	A27 Fishbourne	Saturations modified to conform with detailed Rdabout design
4227	Priority Junction	Dell Quay Rd	Give-way and flare added at Appledram Ln S
4746	Dummy Node	Fishbourne Rd E	Fishbourne Rd E speed reduced to 20mph
4845	Priority Junction	Fishbourne Rd E	Changed from Priority Junction to Roundabout, Fishbourne Rd E speed reduced to 20mph
5046	Roundabout with U Turns	Cathedral Way	North arm speed decreased
5047	Roundabout no U-turns	Westgate	Arm speeds reduced, Arm added to accommodate future West Chichester development
5150	Priority Junction	Sherborne Rd	Saturations re-calculated, arm's order corrected
5544	Roundabout	Via Ravenna	Link distances modified
5558	Priority Junction	St Paul's Rd	Junction recoded (saturations + distances modified), Norwich Rd arm flare and St Paul's Rd SFCs added, Norwich Rd and Sherborne Rd speeds reduced to 20 mph
5635	Priority Junction	Stockbridge Rd	Recoded as a Roundabout
5648	Roundabout with U Turns	Westgate / West St	West St entry width changed to 1 lane
5739	Roundabout with U Turns	A27 Stockbridge	A27 entry widths changed to 3 lanes
5740	Priority Junction	Stockbridge Rd	Northbound entry width changed to 1 lane, north arm link's distance adjusted
5743	External Node	Parking entry	Parking entry changed to 2 lanes
5744	Roundabout with U Turns	Via Ravenna/ Avenue De Charles	Via Ravenna and Avenue De Charles entry widths adjusted
5840	Signalised	A286 Stockbridge Rd / Terminus Rd	Flares added in all arms, signal times modified
5841	Priority Junction	Stockbridge Rd / Canal Wharf	Canal Wharf approach width changed to 1 lane, link distances corrected
5940	signalised	Stockbridge Rd	Link distances corrected
5941	Priority Junction	Stockbridge Rd	Link distances corrected
5943	Priority Junction	Southgate	Northbound link changed to 2 lanes, link diastances corrected
5946	Signalised	Avenue De Chartres	Westbound approach width changed to 1 lane
5948	Priority Junction	West St	Eastbount stream modified to bus-only
5966	Priority Junction	A286 Broyle Rd/ The Broadway/ Brandy Hotel Ln	Flares added for the major road arms
6043	Priority Junction	Canal Wharf	South arm's approach changed to 1 lane with flare, left bus-only turn from south arm added
6045	Priority Junction	South St	Northbound stream changed to bus-only
6046	Priority Junction	South St/ Market Ave	Southbound approach changed to 1 lane with flare, Eastbound approach changed to 2 lanes with flare
6048	Priority Junction	South St	Both arms changed to bus-only lanes
6049	Priority Junction	West St/ Chapel St	Chapel St's right turn removed, Eastbound approach turned to bus only
6050	Priority Junction	Chapel St	Eastbound approach changed to 2 lanes, Chapel St changed to 1-way
6060	Priority Junction	A286 Broyle Rd/	Northbound approach changed to 1 lane and flare added

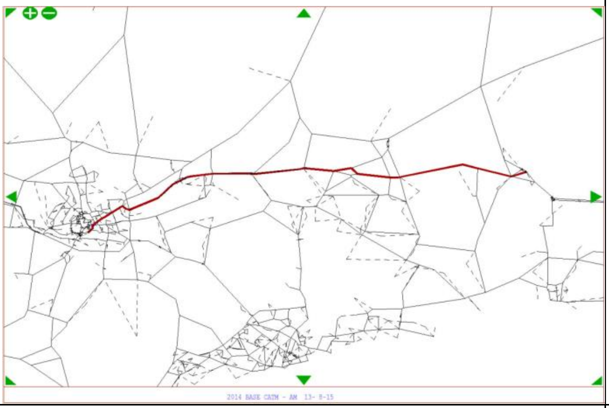
		Wellington Rd	
6143	Priority Junction	Basin Rd / Market Ave	Market Ave's approach lanes modified and flares added
6151	Priority Junction	North St / N Walls	N Walls approach changed to 1 lane + flare
6158	Priority Junction	A286 Broyle Rd/ Sometown	Northbounf approach changed to 1 lane, flare added at Somertown approach
6241	Priority Junction	E Pallant	Priority markers corrected
6242	Priority Junction	South St	Northbound approach modified to bus only
6243	Priority Junction	Market Ave	Link distances adjusted
6244	External Node	Parking	Node deleted (Parking)
6247	Priority Junction	E Pallant Parking	East arm changed to exit only
6250	Priority Junction	Priory Rd / St Peter's/ St Martin's Sq	Southbound approach changed to 1 lane
6261	Priority Junction	College Ln/ Wellington Rd/ Connoly Way	Flare added at Wellington Rd approach, speed changed to 20 mph for all links
6266	Priority Junction	Summersdale Rd/ The broadway/ Winterbourne Rd	All link speeds reduced to 20 mph, Flare added at Winterbourne Rd approach
6343	Priority Junction	St John's St	Priority marker added at Westbound approach
6358	Priority Junction	College Ln	College ln speed reduced to 20 mph
6443	Priority Junction	A286 Market Rd/ Stirling Rd/ St John's St	Number of lanes modified and flares added, link distances adjusted
6444	Priority Junction	St John's St	Car park link deleted hence node modified
6445	Priority Junction	A286 Market Rd	Car park link deleted hence node modified
6447	Priority Junction	East St/ E Walls	E Walls link changed to 1-way street, turns modified
6449	Priority Junction	E Walls/ E Row	Links at node were incorrect and have been modified
6450	Priority Junction	Priory Rd / E Walls	Turns at node were incorrect and have been modified
6451	Priority Junction	A286 New Park Rd/ Litten Terrace	Litten Terrace link changed to 1 lane and speed reduced to 20 mph
6453	Priority Junction	Spitalfield Ln/ College Ln	Spitalfield Ln west arm distance adjusted, College Ln and Spitalfield Ln east arm approach lanes changed to 1 and flares added
6548	Priority Junction	New Park Rd	Car park link deleted, node modified to dummy node
6550	Priority Junction	New Park Rd / Priory Rd	North arm approach width changed to 1 lane
6649	Priority Junction	St Pancras/ Alexandra Rd	Alexandra road approach changed to 1 lane + flare and speed reduced to 20 mph
6652	Priority Junction	Litten Terrace/ Alexandra Rd	Alexandra road changed to 1-way road and speed reduced to 20 mph
6752	Priority Junction	St Pancras/ Adelaide Rd	All arm links' speeds reduced to 20 mph
6851	Priority Junction	St Pancras/ Adelaide Rd	Adelaide road approach changed to 1 lane and its speed reduced to 20 mph
6855	Priority Junction	Douglas Martin Rd/ Swanfield Dr	Changed to Roundabout (no U-Turns), all arm speeds reduced to 20 mph
6925	Roundabout no U-turns	B2145/B2166	Approach width changed to 2 lanes for all three arms
6953	Priority Junction	Spitalfield Ln/ Melbourne Rd	Melbourne Rd changed from 2 lanes to 1 lane + flare and speed reduced to 20 mph
7044	Priority Junction	Whyke Rd/ York Rd/ Cambrai Ave	Whyke Rd distances adjusted
7047	Priority Junction	Bognor Rd/ Whyke Rd	Whyke Rd, Bognor Rd north distances adjusted, flare added at Bognor Rd north arm approach.
7053	Priority Junction	Spitalfield Ln/ Swanfield Dr	Swanfield Dr approach changed to 1 lane and speed reduced to 20 mph
7154	Priority Junction	Swanfield Dr/ Greenfield Rd	All arm links' speeds reduced to 20 mph
7349	Roundabout no U-turns	B2144 Oving Rd/ Florence Rd/ St James' Rd	Oving Rd west arm's speed changed to 20 mph, St James' Rd speed changed to 20 mph
7444	Priority Junction	Bognor Rd/ Florence Rd	Florence Rd approach changed to 1 lane + flare and speed reduced to 20 mph, Bognor Rd south arm's approach changed to 1 lane + flare
7656	Roundabout no U-turns	Westhampnett Rd/ Portfield Way	Changed to Roundabout with U-Turns

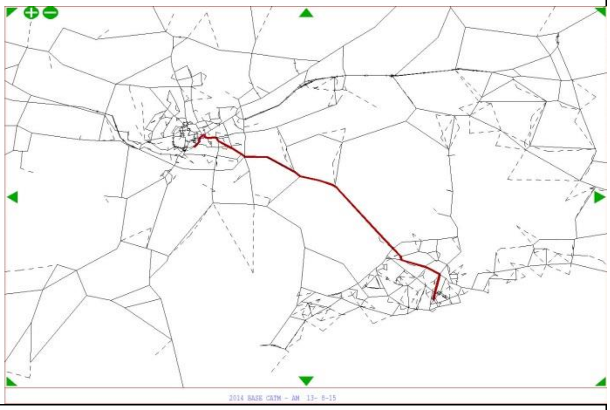
7658	Priority Junction	Westhampnett Rd/ Barnfield Dr	Changed to Roundabout, new node added in Barnfield Dr and speed reduced to 20 mph
7742	Priority Junction	A259 Bognor Rd	Bognor Rd north arm changed to 1 lane and flare added, south-west arm's speed reduced to 20 mph
7755	Priority Junction	Portfield Way	North arm's approach changed to 2 lanes and distance adjusted, south arm's approach changed to 1 lane + flare
8362	Priority Junction	Stane St/ Claypit Ln	Claypit Ln changed to 1-way
9236	Roundabout with U Turns	A259 Bognor Rd	Link speeds modified
9773	Priority Junction	A285 Stame Rd/ Roman Rd	Roman Rd's and Stame Rd north arm's approach lanes modified, flare added at Roman Rd
10003	Roundabout with U Turns	Portfield Roundabout	Saturation flows re-calculated, dummy node added in the approach to the roundabout to accommodate the change of lane number, Gap increased.
10004	Roundabout with U Turns	Westhampnett Road/' Stane St Roundabout	Saturation flows re-calculated
10006	Roundabout with U Turns	A27 Boxgrove Roundabout	Joined with new simulation area, west arm link's saturation flow increased
11012	Priority Junction	A286 Birdham Rd/ Wophams Ln	Flare lanes added at Birdham Rd south and Wophams Ln
11014	Priority Junction	A27 Chichester By-Pass	Recoded in the new simulation area
11015	Priority Junction	A27 Chichester By-Pass	Connected with a new simulation node
20002	Signalised	A286 Broyle Rd	Both arms changed to 1 lane links
30007	External Node	The St	Converted to internal simulation node from external
30008	External Node	A27 Arundel Rd	Deleted in the new simulation network
6948	Priority Junction	A259 The Hornet/ Oving Rd	Oving Rd speed reduced to 20 mph, The hornet's south approach changed to 1 lane + flare
9471	Priority Junction	Roman Rd / Strettington Ln	Priority markers adjusted
5832	Signalised	Grosvenor Gardens/ Gossamer Ln/ Nyetimber Ln/ Rose Green Rd	Re-coded in the extended simulation area
6044	Signalised	Southgate/ Basin Rd	Southgate links' distances adjusted
6635	Signalised		Re-coded in the extended simulation area
6934	Signalised		Re-coded in the extended simulation area
7436	Signalised		Re-coded in the extended simulation area
6446	Signalised	Market Rd/ East St/ The Hornet/ St Pancras	Signal times and distances adjusted
6543	Signalised	Market Rd/ East St/ The Hornet/ St Pancras	Signal times adjusted
6631	Signalised		Re-coded in the extended simulation area
7952	Signalised	A27/ Oving Rd	Signal stages and times modified, Oving Rd speed reduced to 20 mph
6064	Buffer Node	Halnaker Junction	Converted to simulation node (priority junction) from buffer
8166	Roundabout with U Turns	Madgwick Ln/ Claypit Ln	Converted to roundabout from external node
9366	Priority - Diverge	A27/A285 Junction	Diverge capacity reduced, A27 west arm link distance adjusted
9567	Roundabout with U Turns	A27/A285 Junction	West arm link distance adjusted
9869	Priority Junction	A27/A285 Junction	Link distances adjusted, A27 entry merge priority marker added
9868	Priority Junction	A27/A285 Junction	Connected on the east to an intermediate node hence distance changed
9566	Roundabout with U Turns	A27/A285 Junction	Access link at Tangmere added, exit link distance adjusted
9365	Priority Junction	A27/A285 Junction	Link distances adjusted, A27 entry merge priority marker added
7061	Roundabout with U Turns	Barnfield Dr	Roundabout added

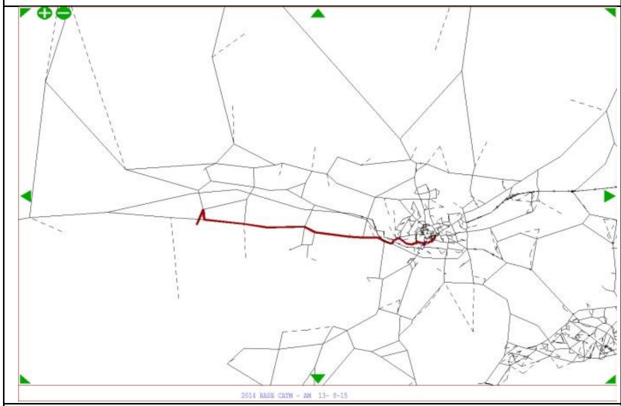
7060	External Node	Barnfield Dr	External node added to connect a zone
7062	External Node	Barnfield Dr	External node added to connect a zone
6973 - 1656	Buffer Link		Power of SFC changed from 0.3 to 3 as the link is a Aroad
1771 - 1148	Buffer Link	A29 Billinghurt - Pullborough - Bury	Power of SFC changed from 0.3 to 3 as the link is a Aroad
1148 - 1199	Buffer Link		Power of SFC changed from 0.3 to 3 as the link is a Aroad
1199 - 1038	Buffer Link		Power of SFC changed from 0.3 to 3 as the link is a Aroad
50235 - 1236	Buffer Link	Arundel Rd West of A24	Power of SFC changed from 0.3 to 3 as the link is a Aroad
1236 - 1224	Buffer Link		Power of SFC changed from 0.3 to 2 as the link is a Aroad
1227 - 50203	Buffer Link		Power of SFC changed from 0.3 to 2 as the link is a Aroad

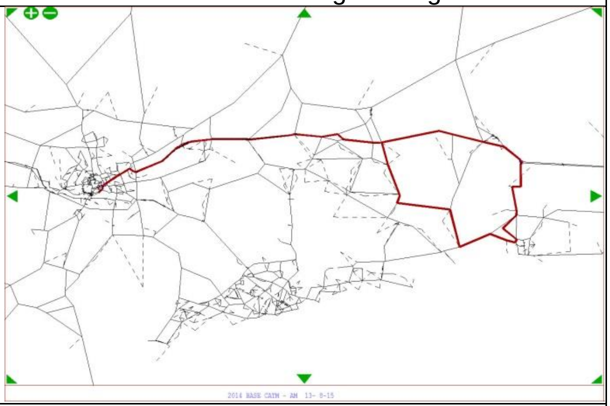
APPENDIX C TRIP ROUTING CHECKS

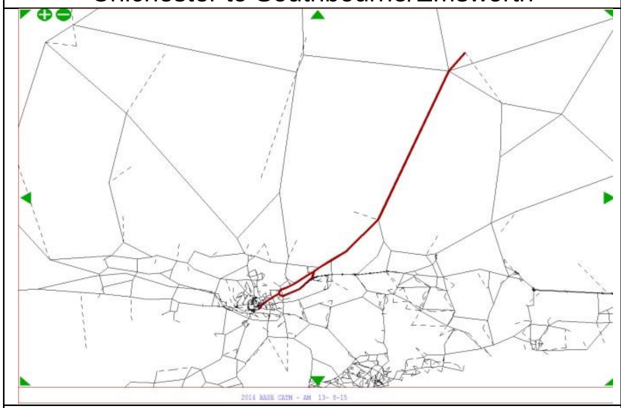
SHEET 1 AM Route Checks

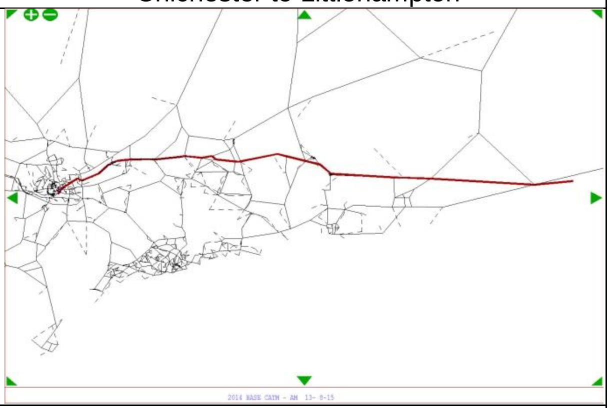

Chichester to Arundel

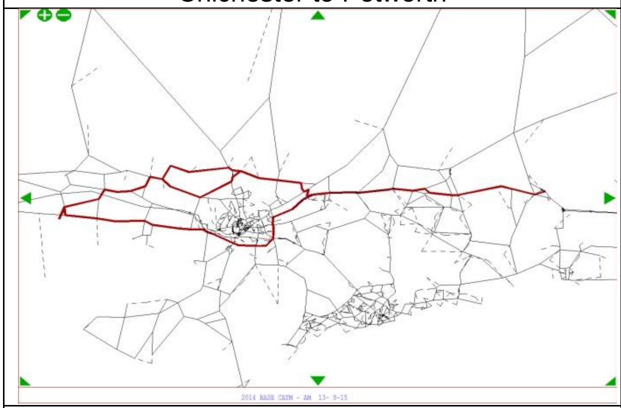

Chichester to Bognor Regis

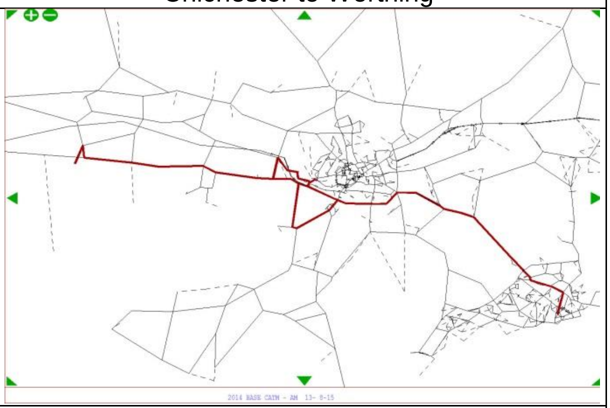

Chichester to Southbourne/Emsworth

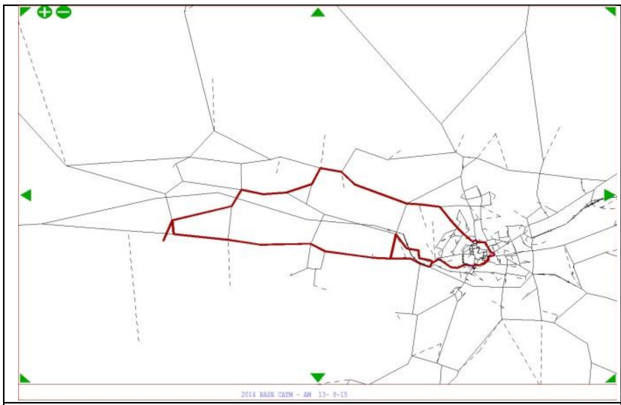

Chichester to Littlehampton


Chichester to Petworth

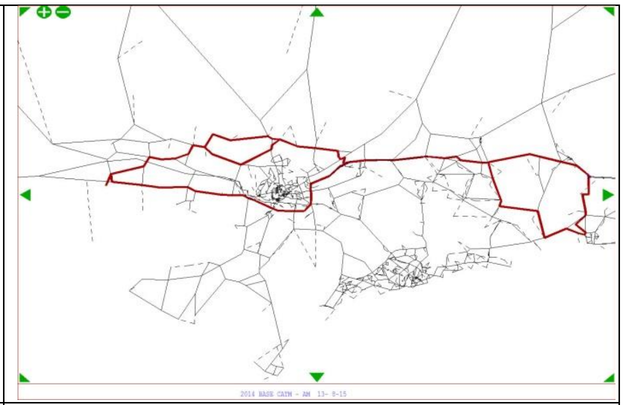

Chichester to Worthing


Southbourne/Emsworth to Arundel

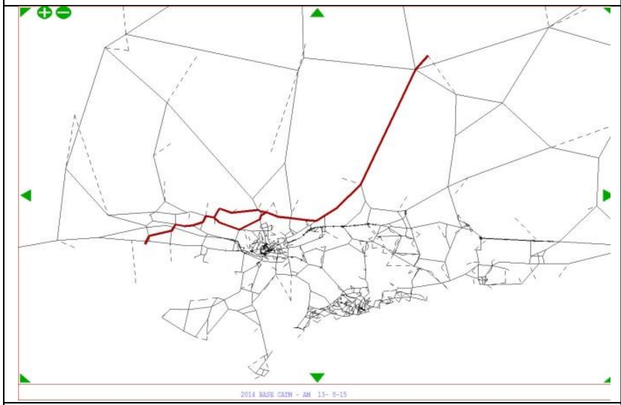

Southbourne/Emsworth to Bognor Regis



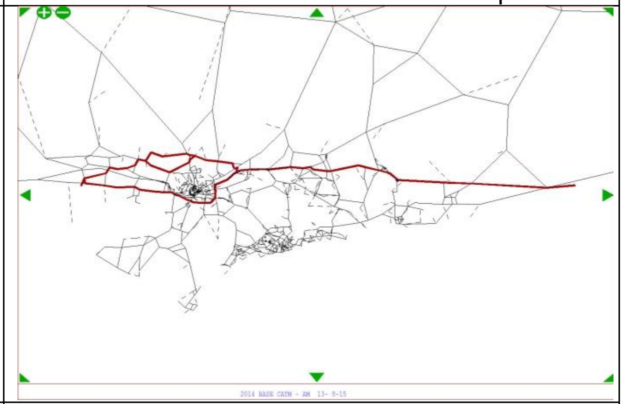
Southbourne/Emsworth to Chichester



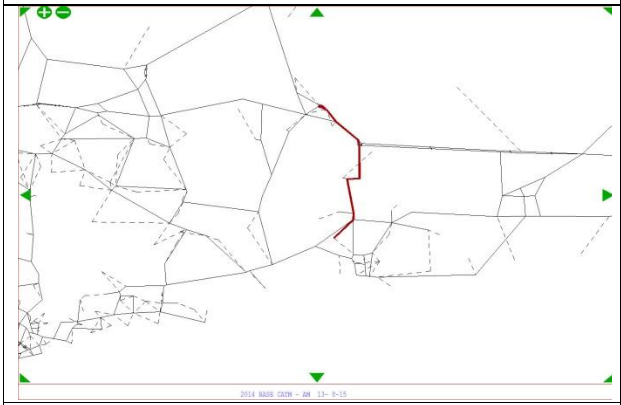
Southbourne/Emsworth to Littlehampton



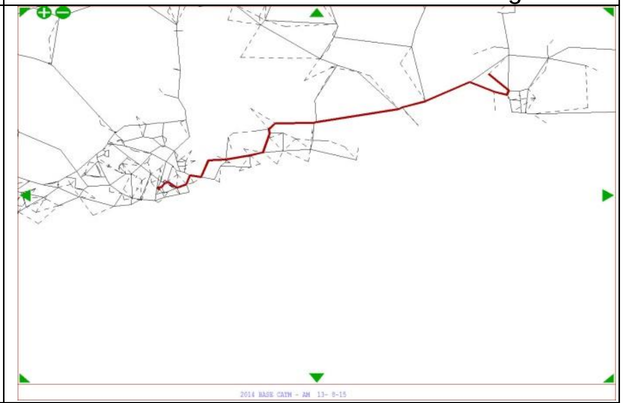
Southbourne/Emsworth to Petworth



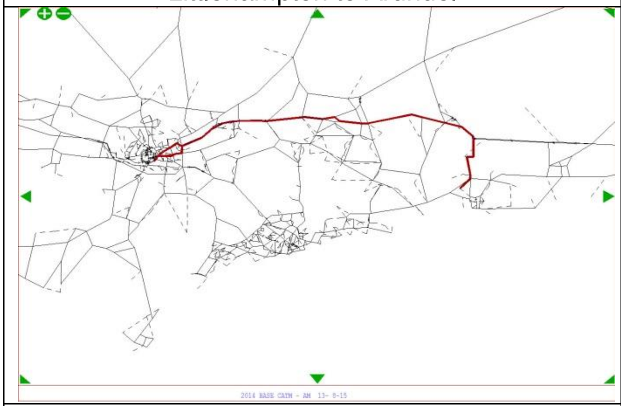
Southbourne/Emsworth to Worthing



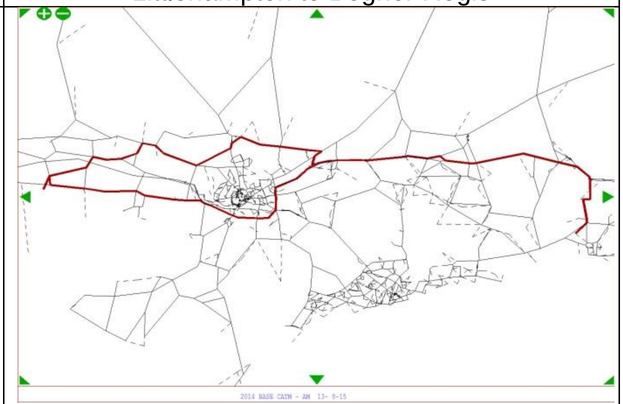
Littlehampton to Arundel



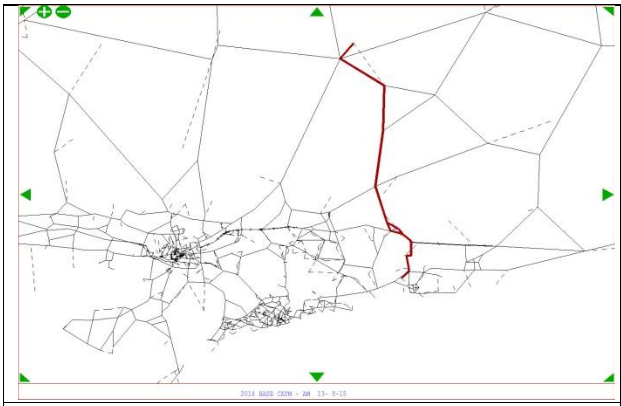
Littlehampton to Bognor Regis



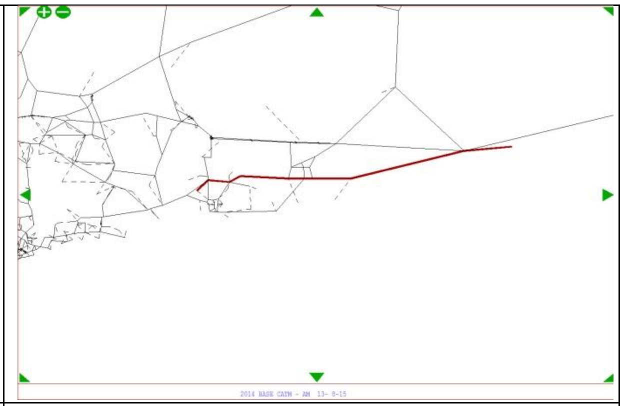
Littlehampton to Chichester



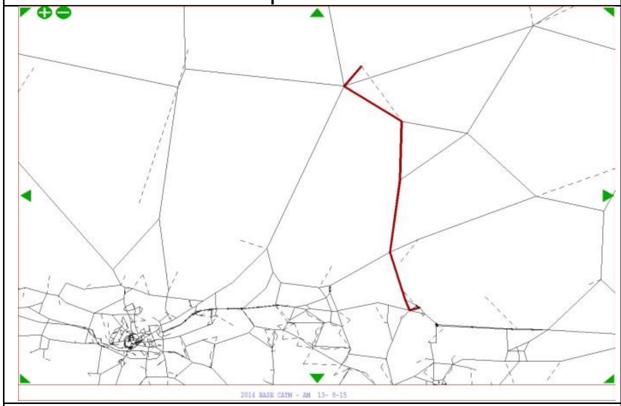
Littlehampton to Southbourne/Emsworth



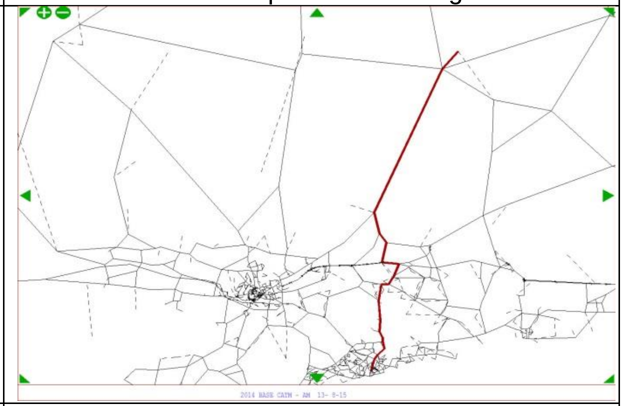
Littlehampton to Petworth



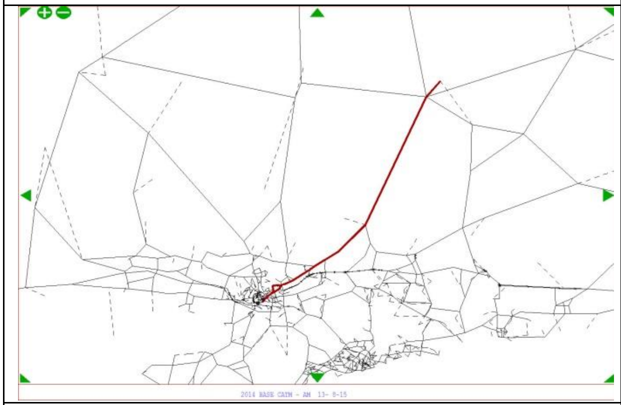
Littlehampton to Worthing



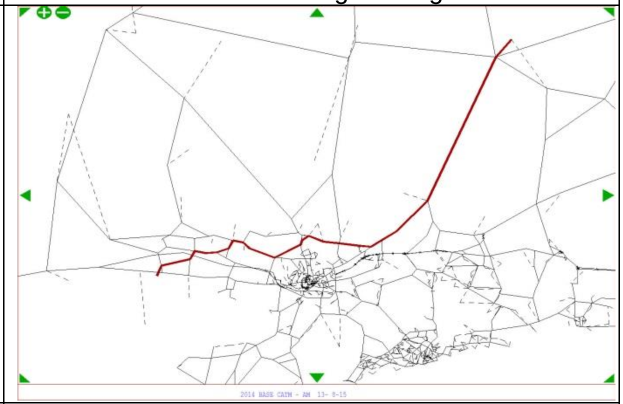
Petworth to Arundel



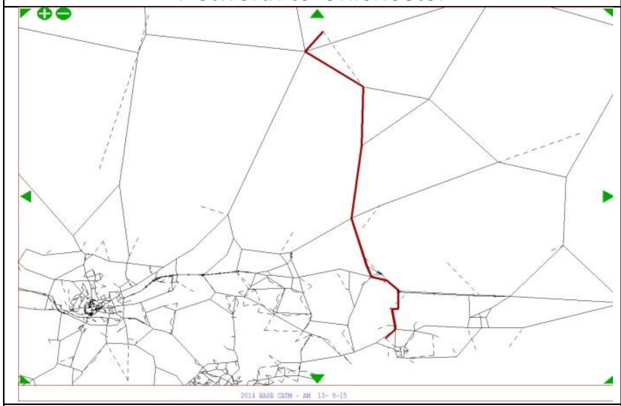
Petworth to Bognor Regis



Petworth to Chichester



Petworth to Southbourne/Emsworth



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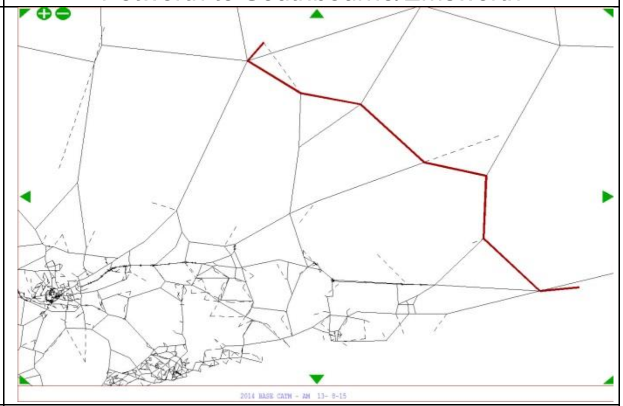
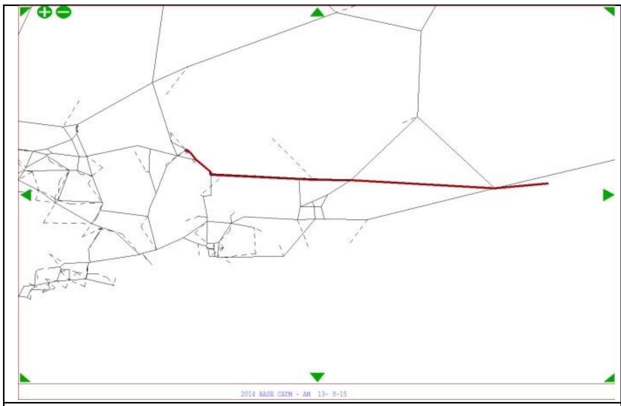
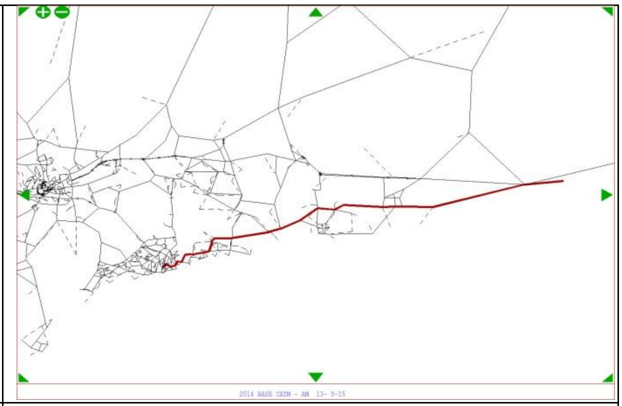


Petworth to Worthing


Worthing to Arundel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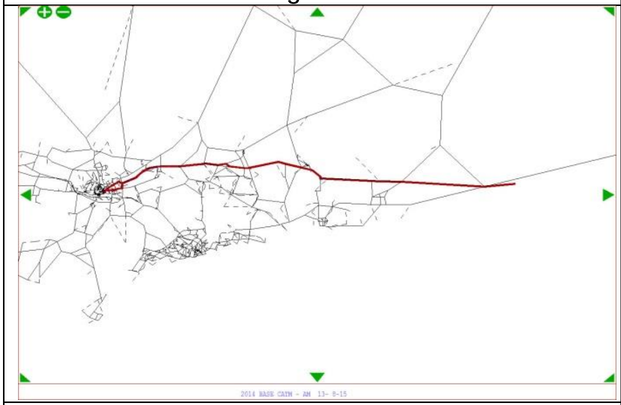
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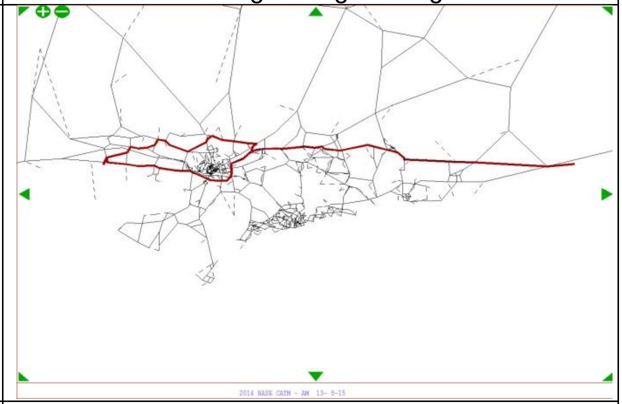
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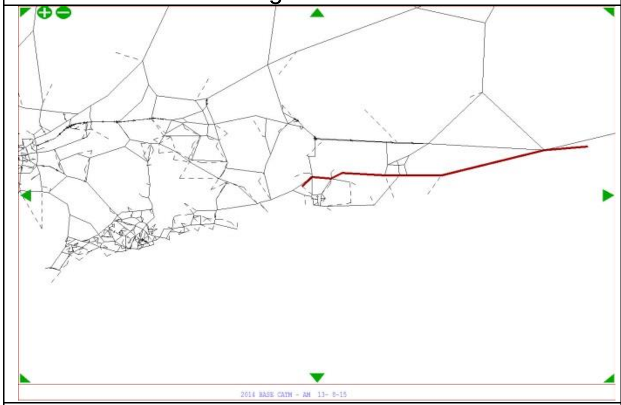
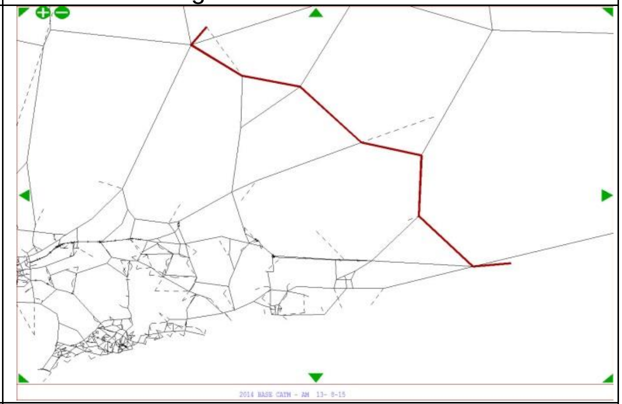
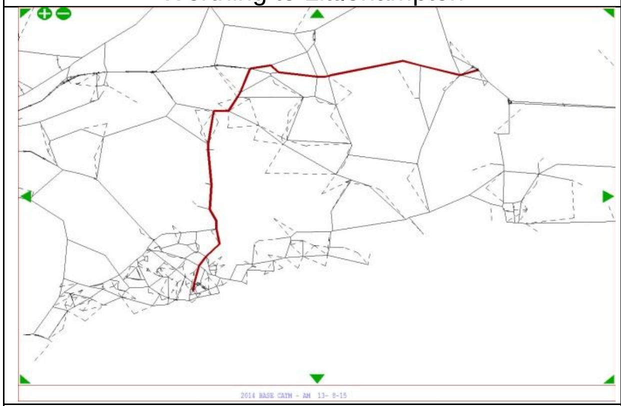
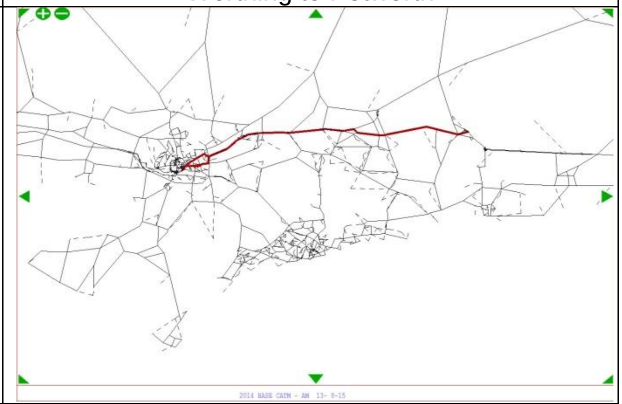

Worthing to Littlehampton


Worthing to Petworth


Arundel to Bognor Regis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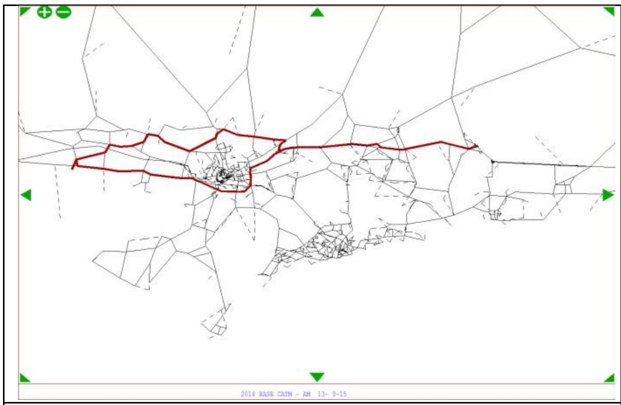

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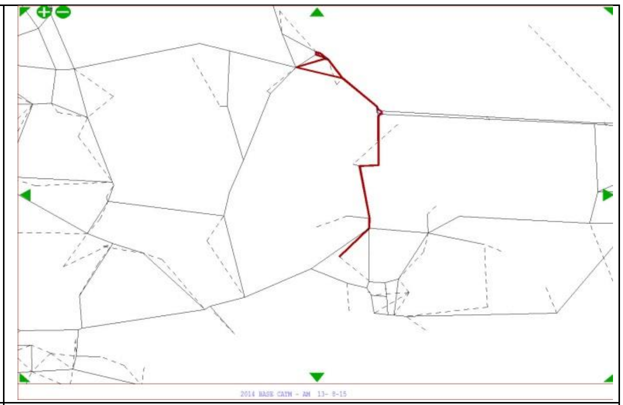
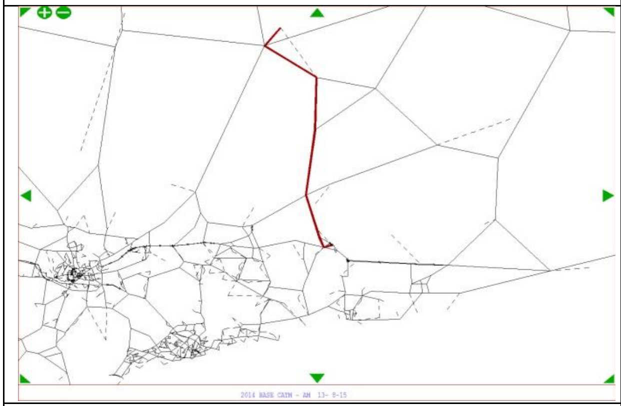


Arundel to Littlehampton



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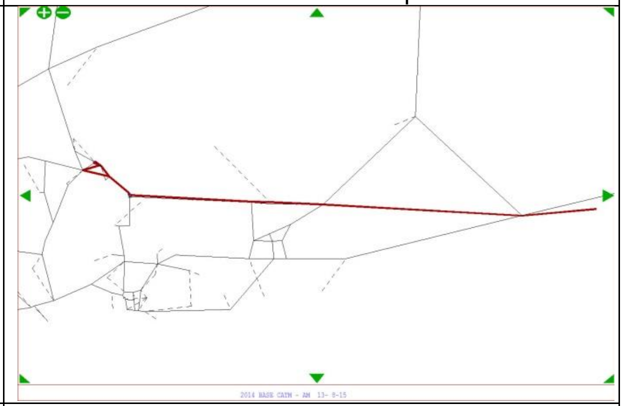

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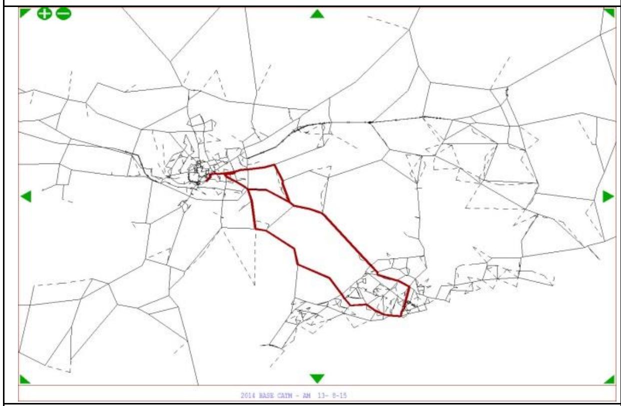
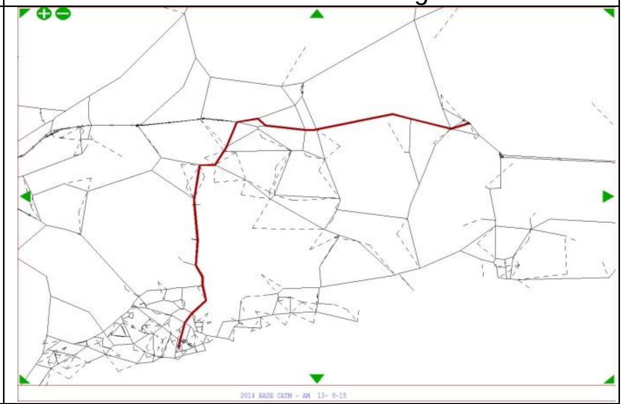


Bognor Regis to Chichester



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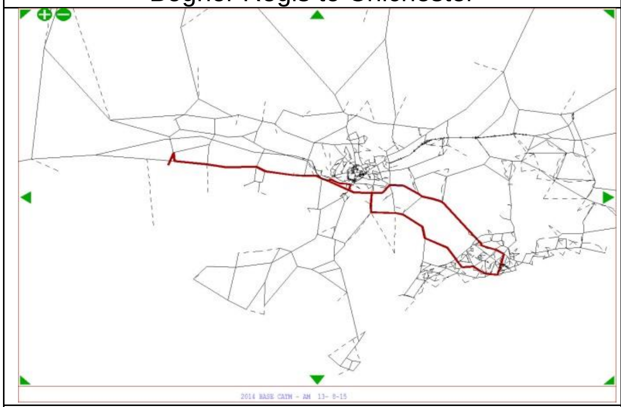
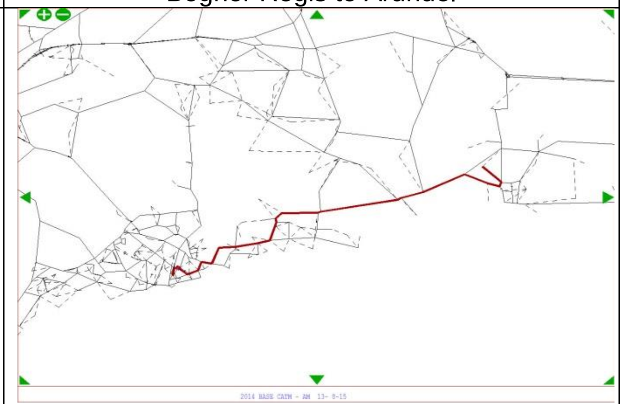
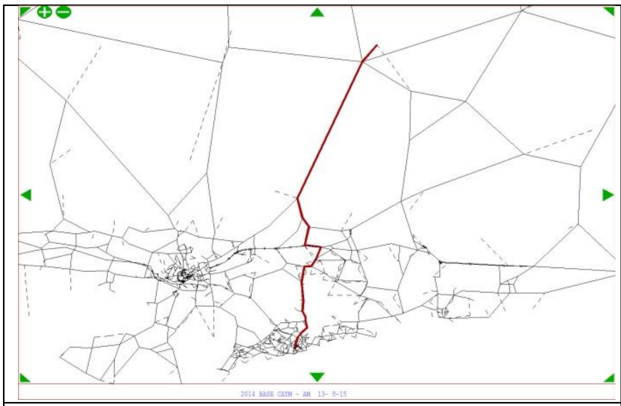
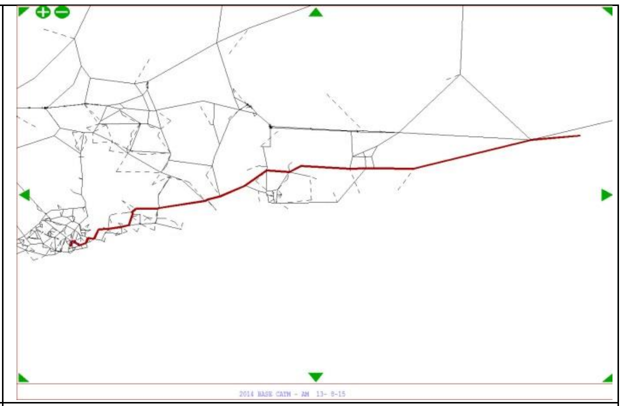


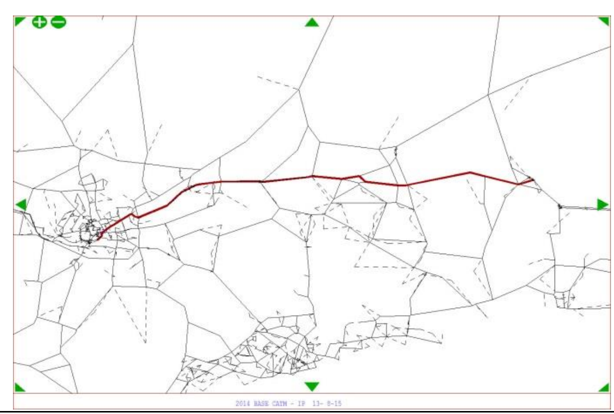
Bognor Regis to Southbourne/Emsworth

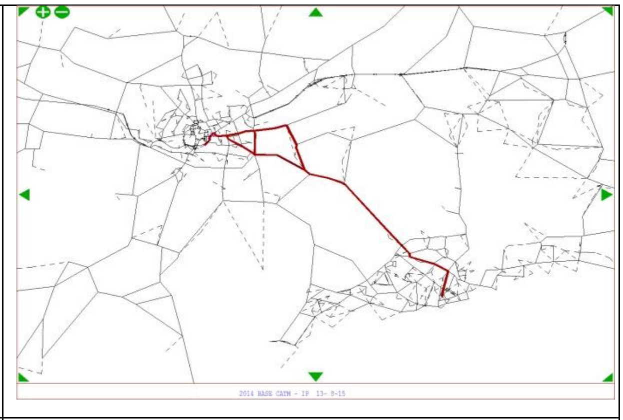


Bognor Regis to Littlehampton

	
Bognor Regis to Petworth	Bognor Regis to Worthing

SHEET 2 IP Route Checks


Chichester to Arundel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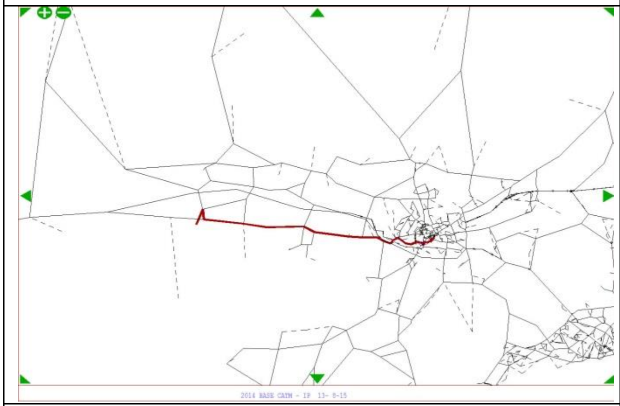
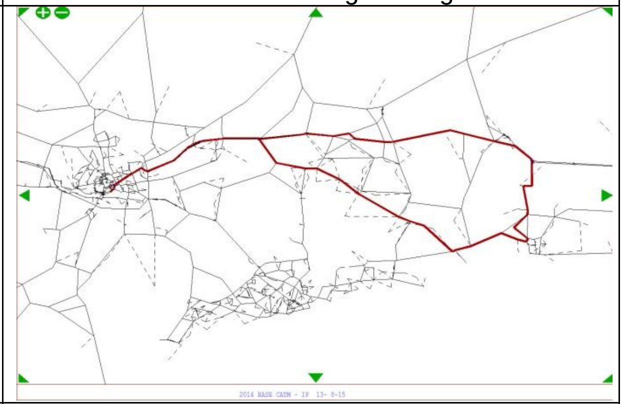

Chichester to Southbourne/Emsworth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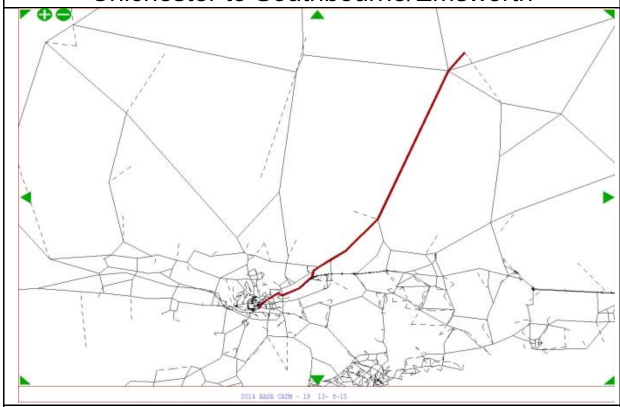
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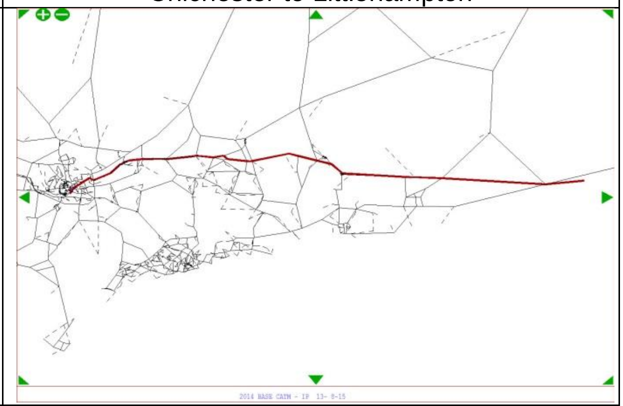
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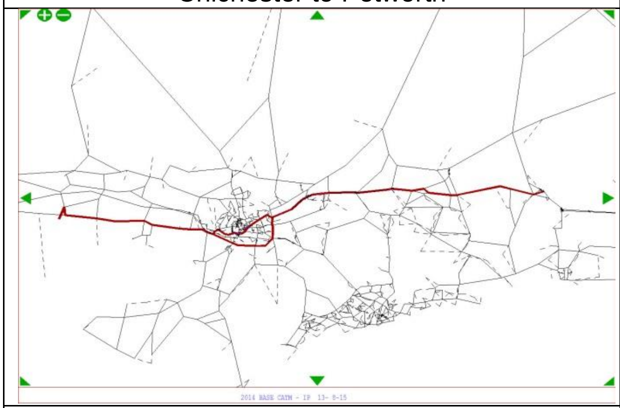
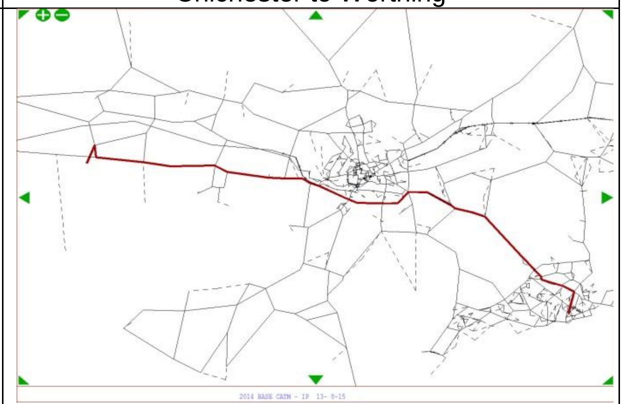

Southbourne/Emsworth to Arundel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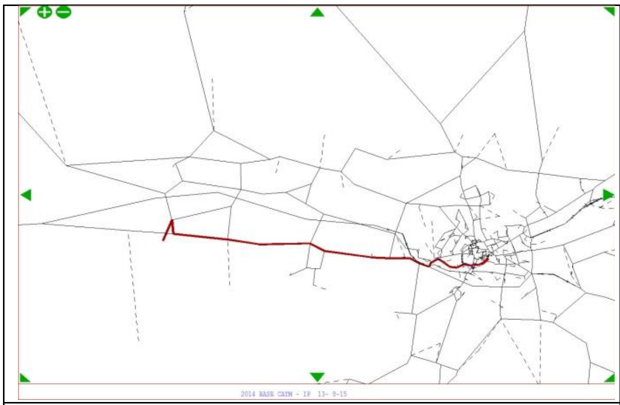
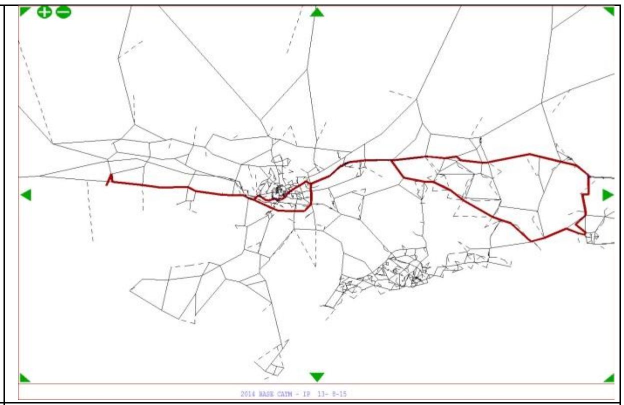
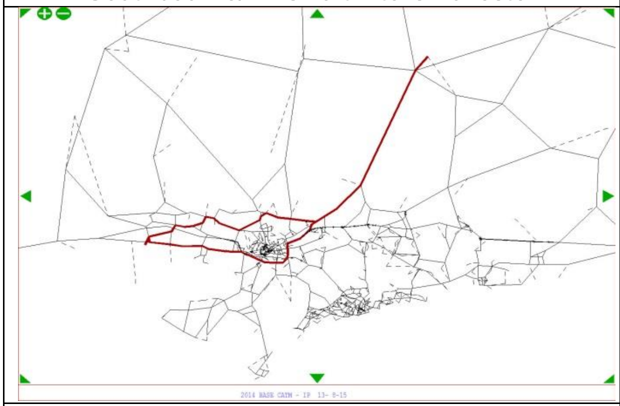
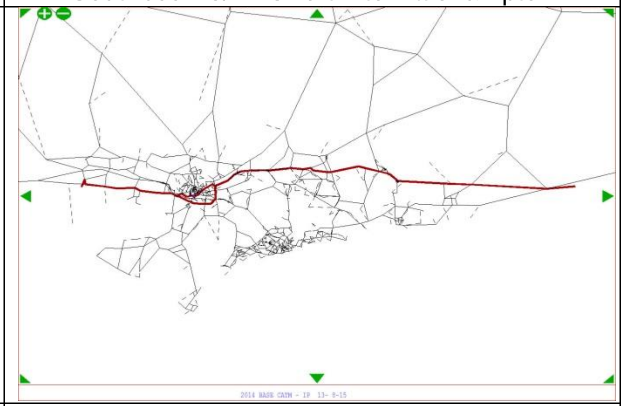
	
Southbourne/Emsworth to Chichester	Southbourne/Emsworth to Littlehampton
	
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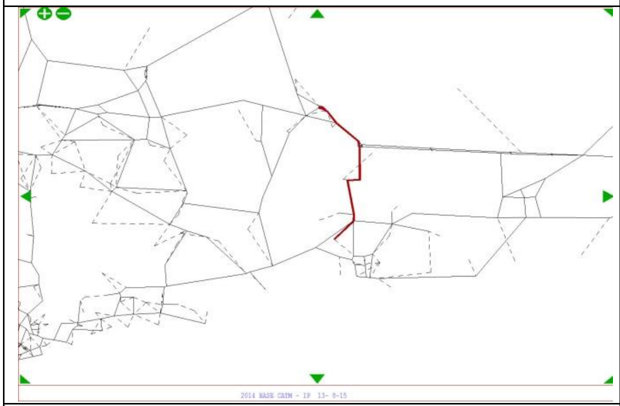
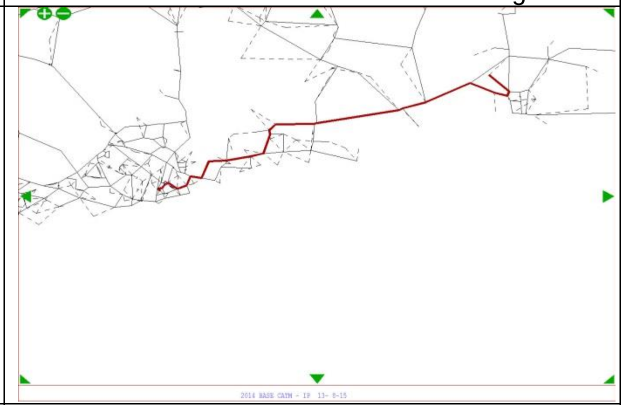
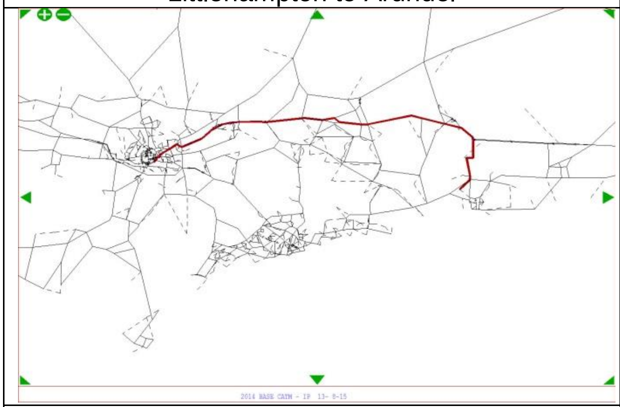
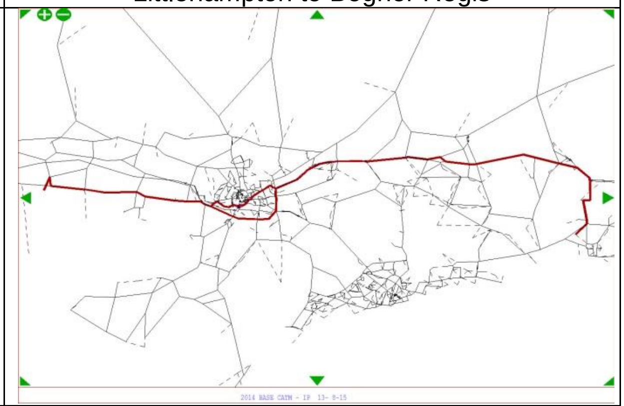
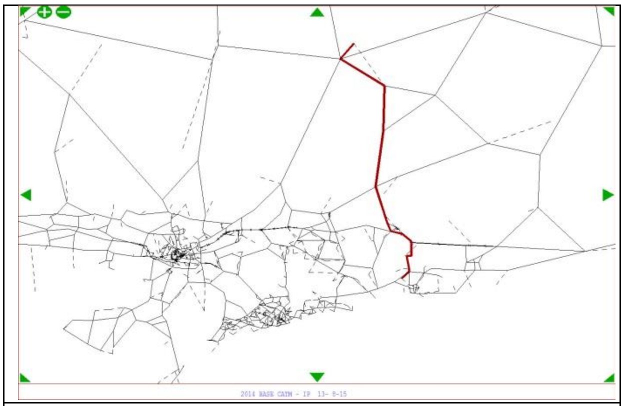
	
Littlehampton to Arundel	Littlehampton to Bognor Regis
	
Littlehampton to Chichester	Littlehampton to Emswortth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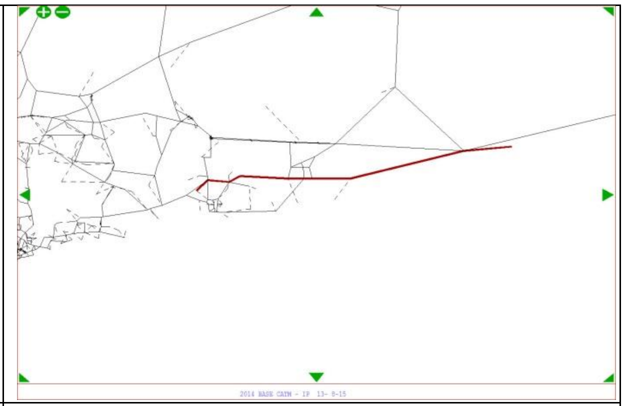
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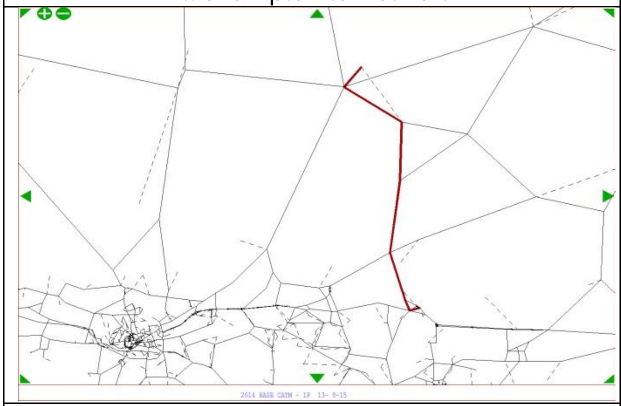
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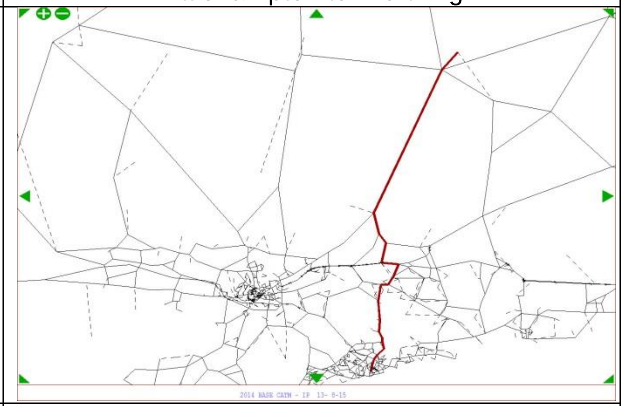
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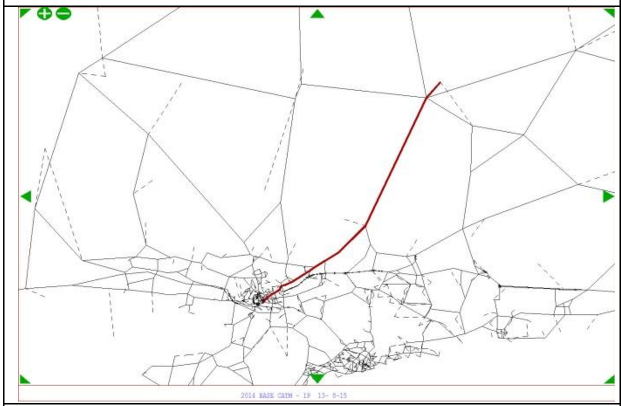
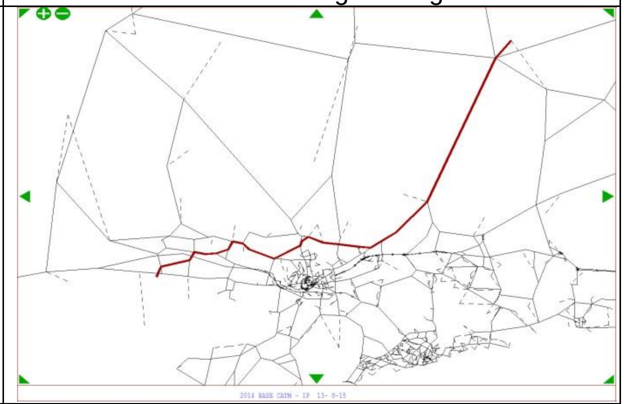
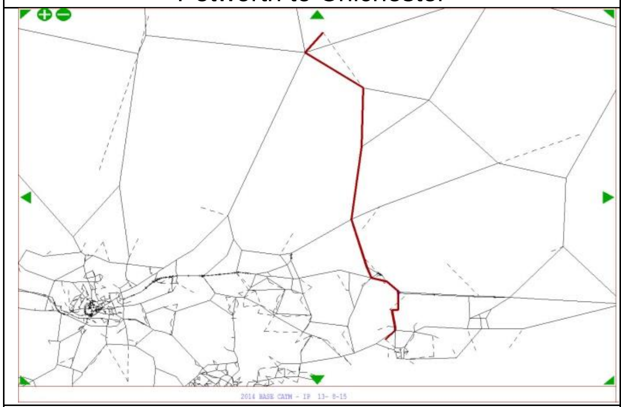
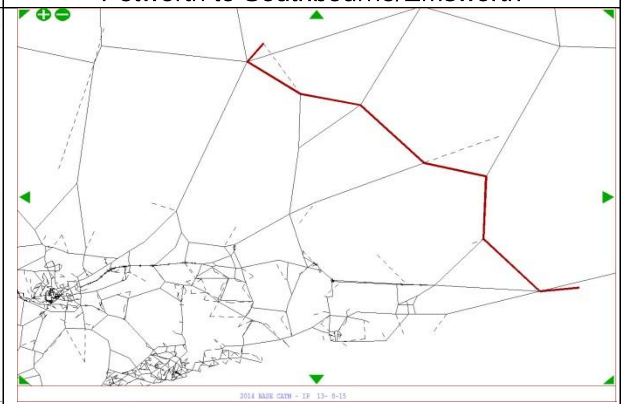
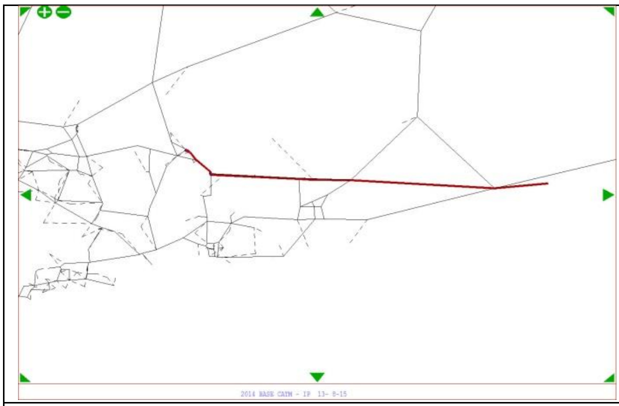

Petworth to Chichester


Petworth to Southbourne/Emsworth


Petworth to Littlehampton


Petworth to Worthing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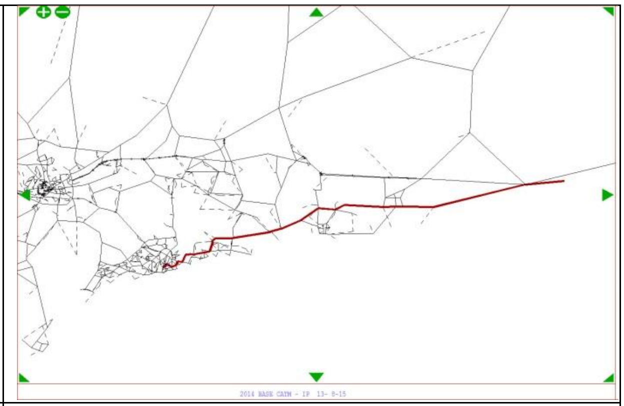
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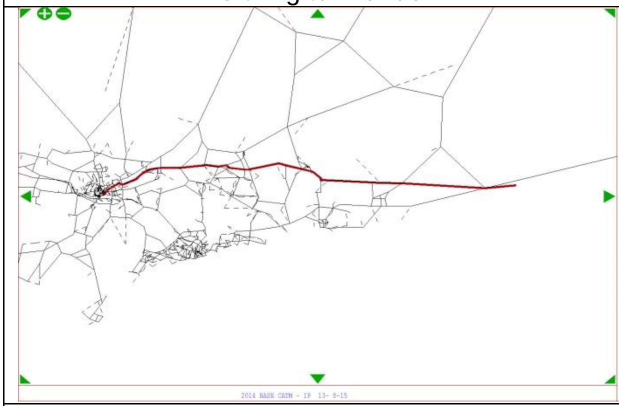
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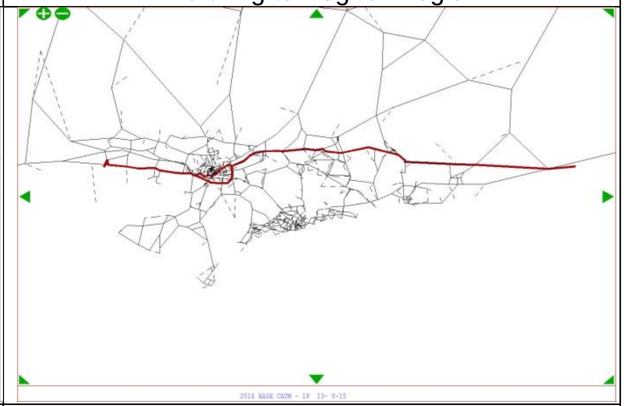
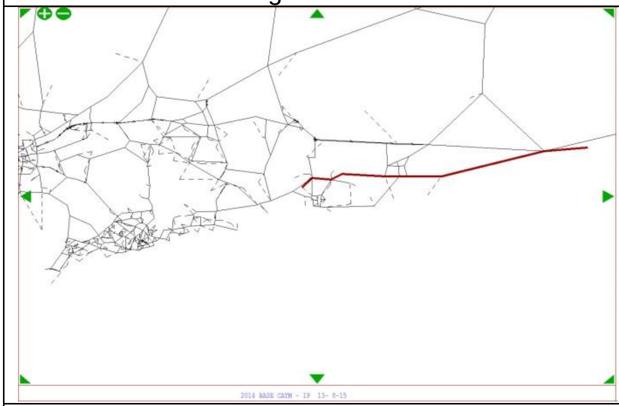
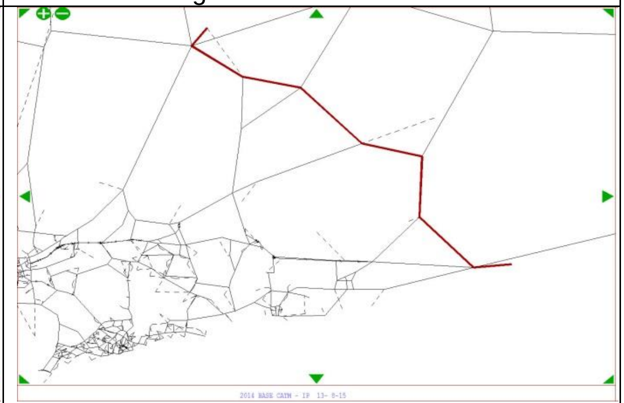
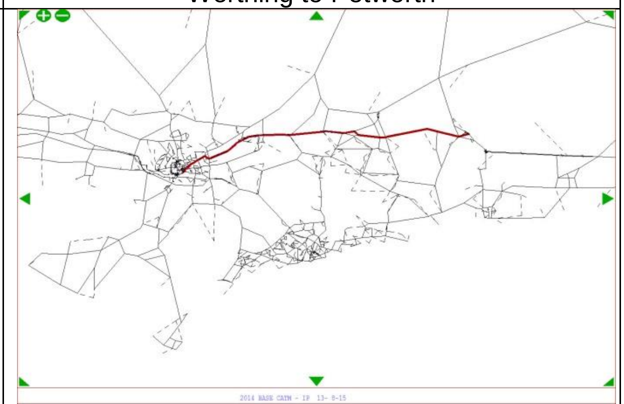
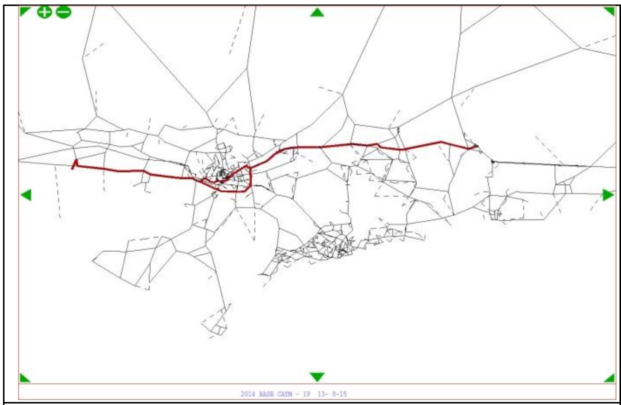

Worthing to Southbourne/Emsworth


Worthing to Littlehampton

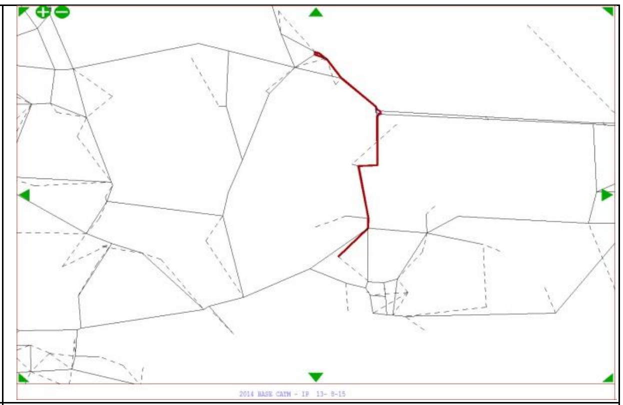

Worthing to Petworth


Arundel to Bognor Regis

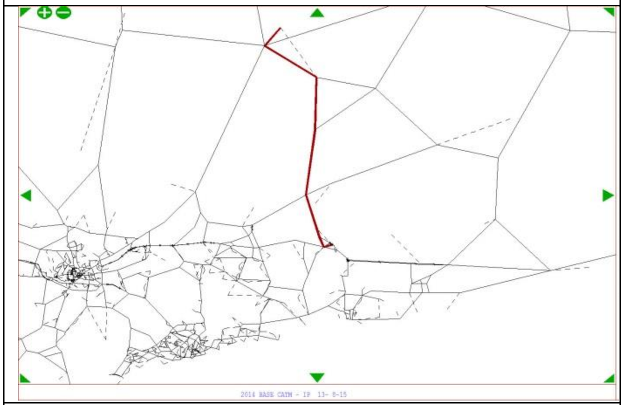

Arundel to Chichester



Arundel to Southbourne/Emsworth



Arundel to Littlehampton



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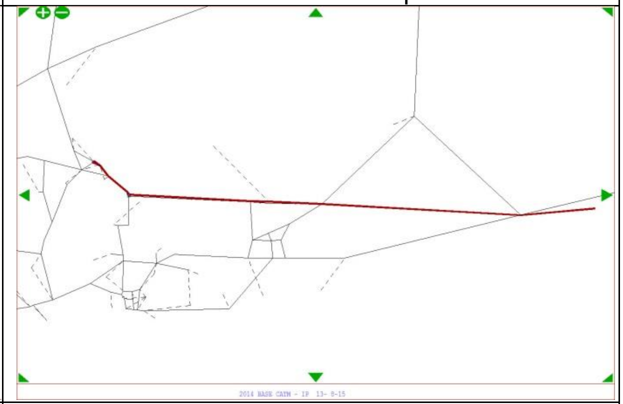

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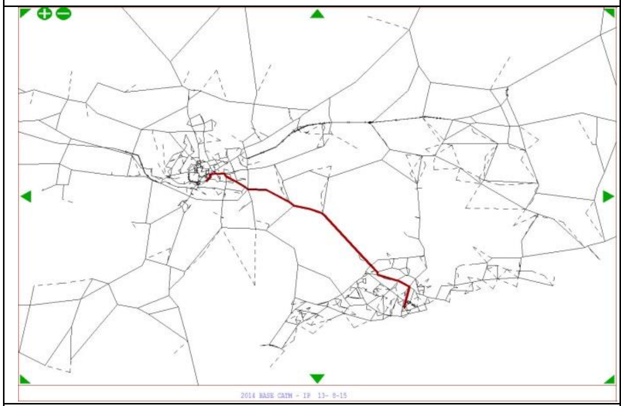
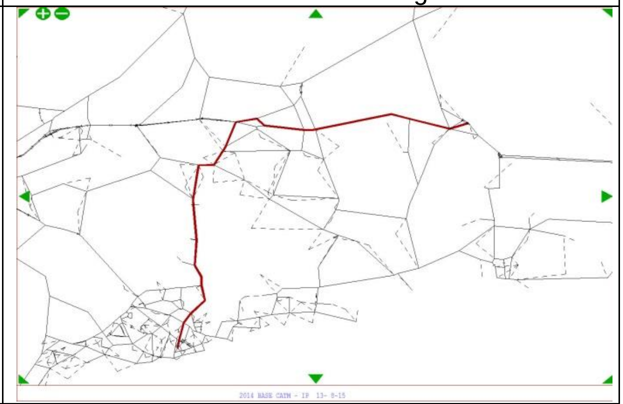


Bognor Regis to Chichester



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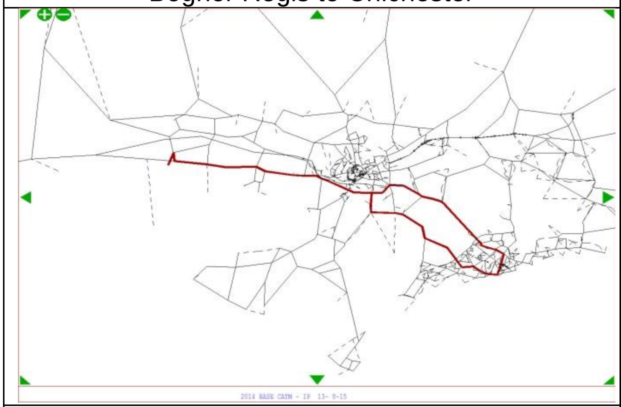
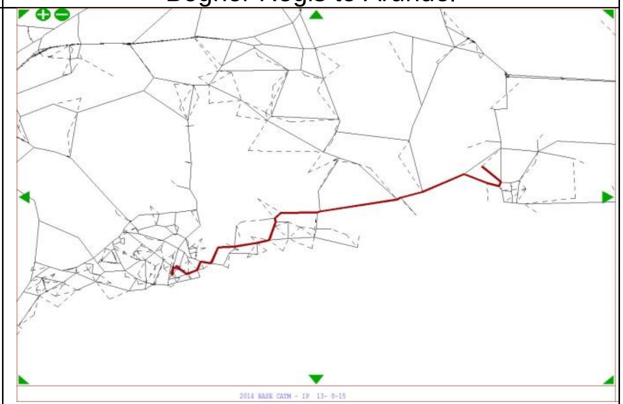
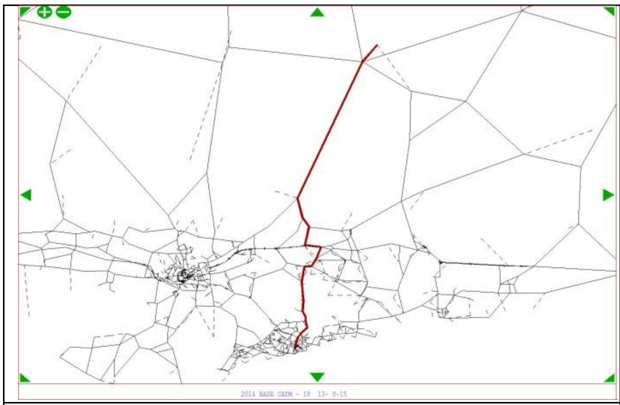
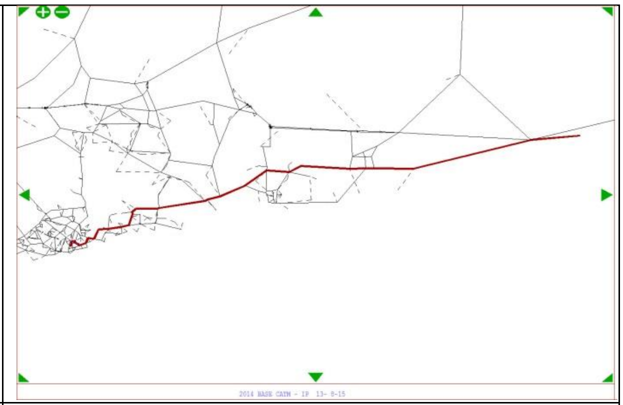


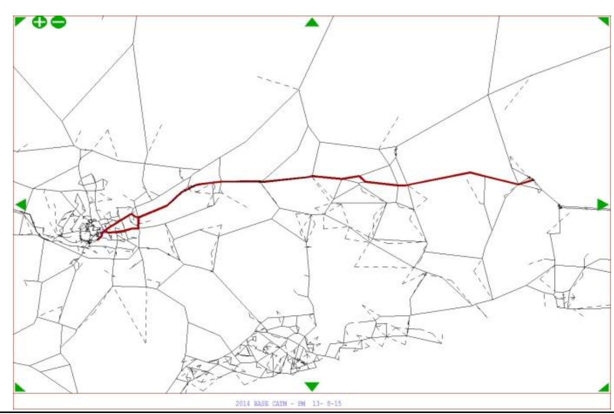
Bognor Regis to Southbourne/Emsworth



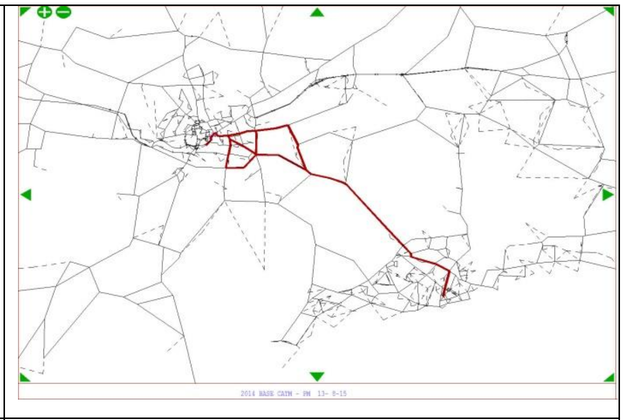
Bognor Regis to Littlehampton

	
Bognor Regis to Petworth	Bognor Regis to Worthing

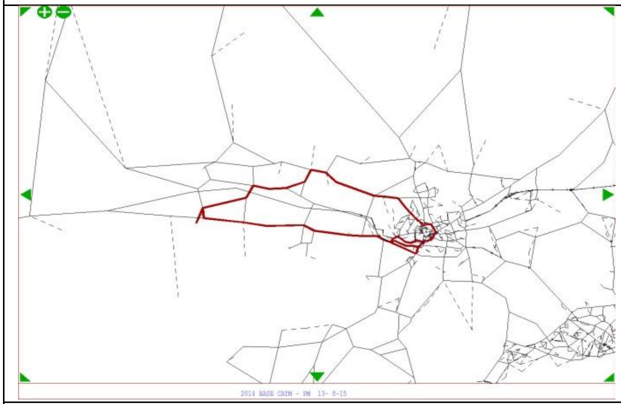
SHEET 3 PM Route Checks



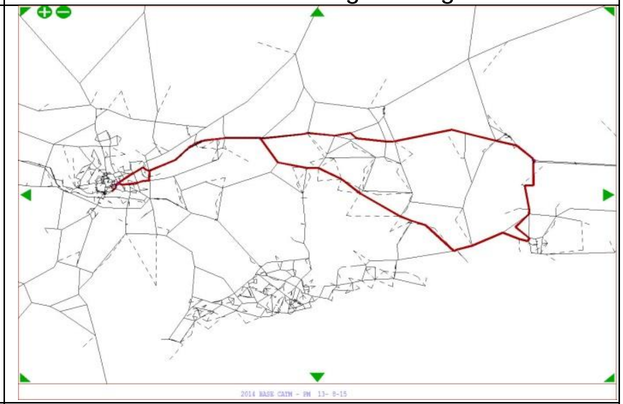
Chichester to Arundel



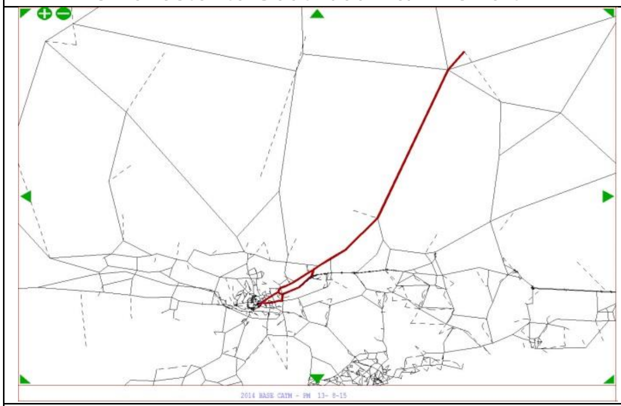
Chichester to Bognor Regis



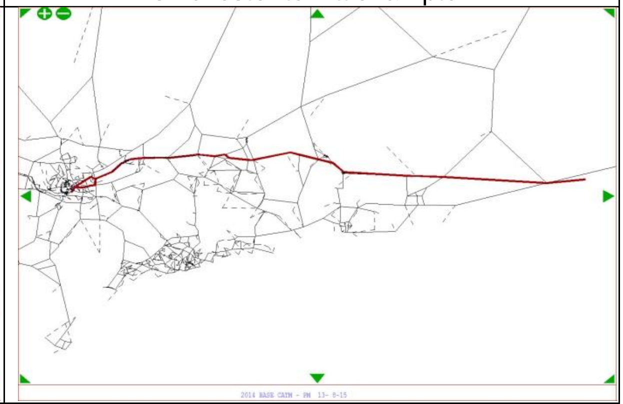
Chichester to Southbourne/Emsworth



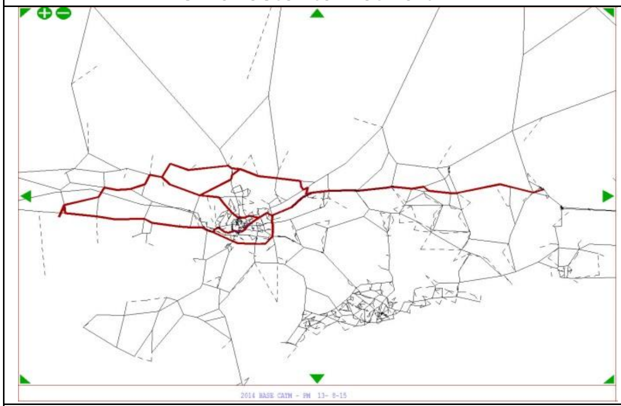
Chichester to Littlehampton



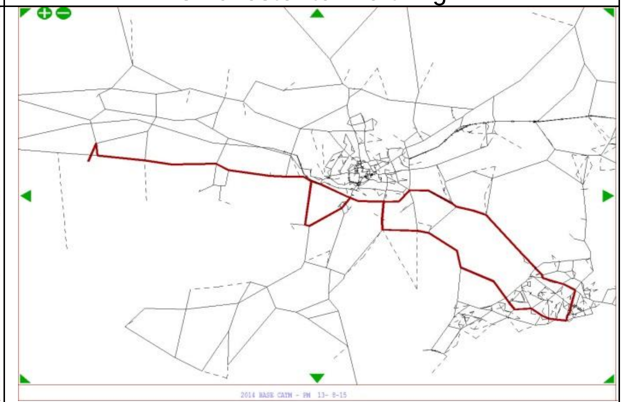
Chichester to Petworth



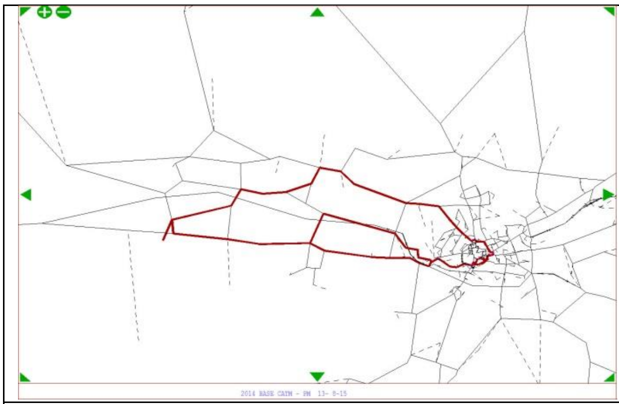
Chichester to Worthing



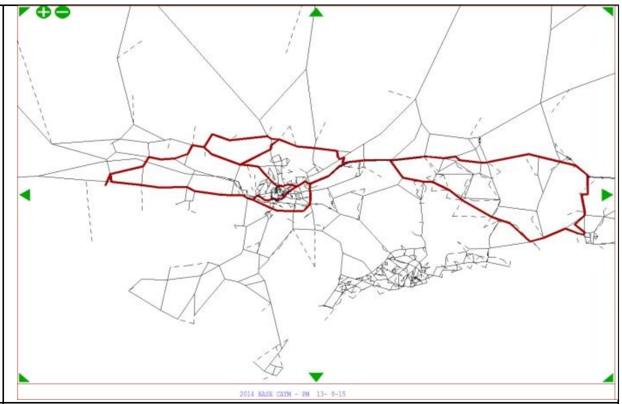
Southbourne/Emsworth to Arundel



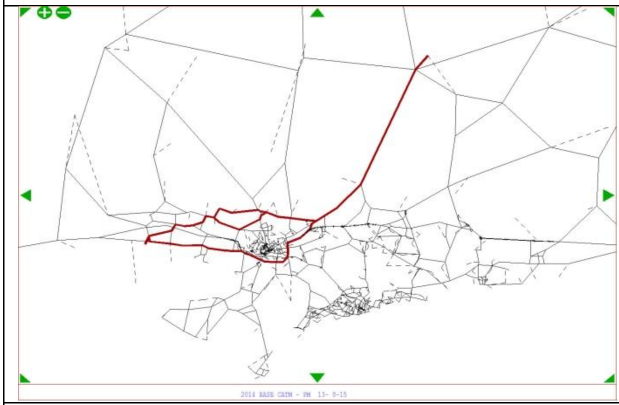
Southbourne/Emsworth to Bognor Regis



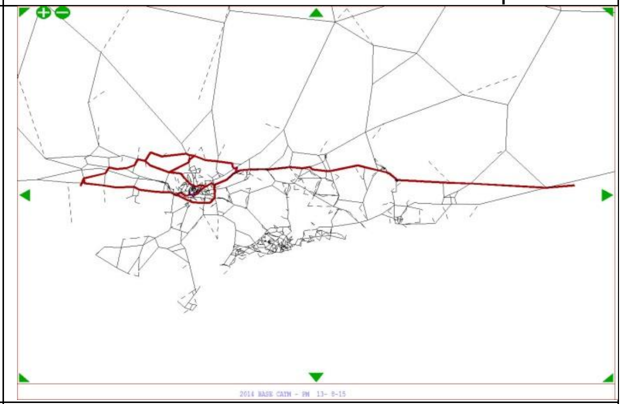
Southbourne/Emsworth to Chichester



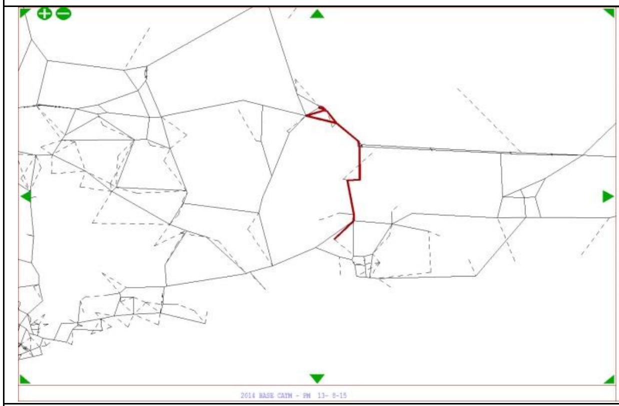
Southbourne/Emsworth to Littlehampton



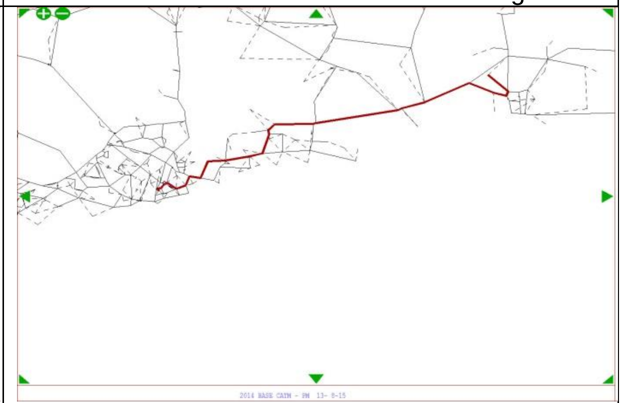
Southbourne/Emsworth to Petworth



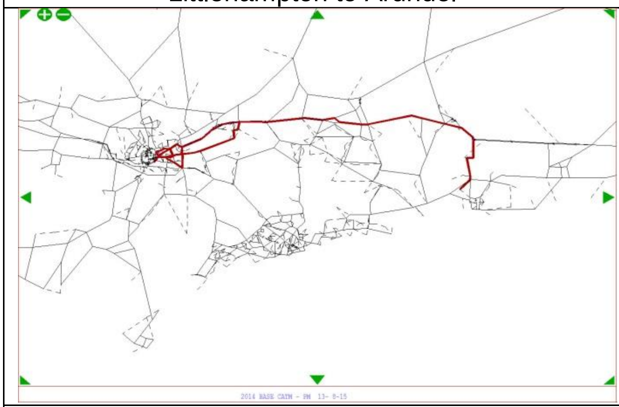
Southbourne/Emsworth to Worthing



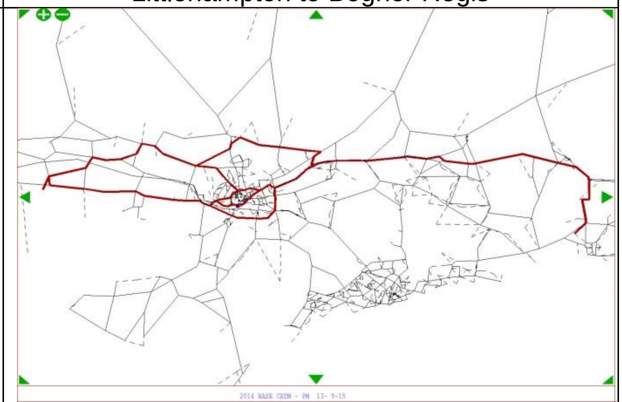
Littlehampton to Arundel



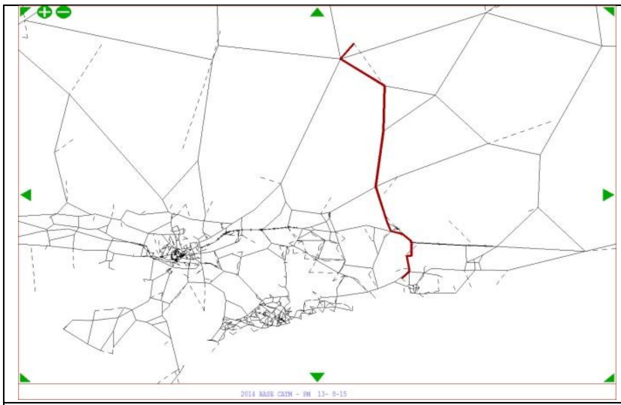
Littlehampton to Bognor Regis



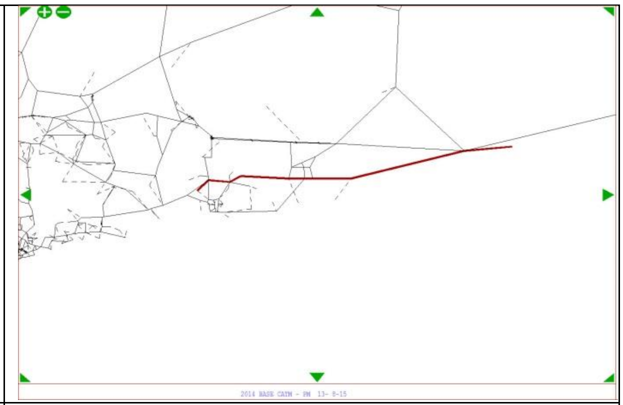
Littlehampton to Chichester



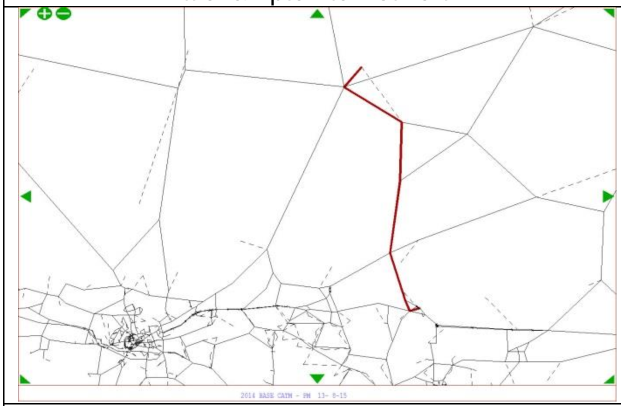
Littlehampton to Emswortth



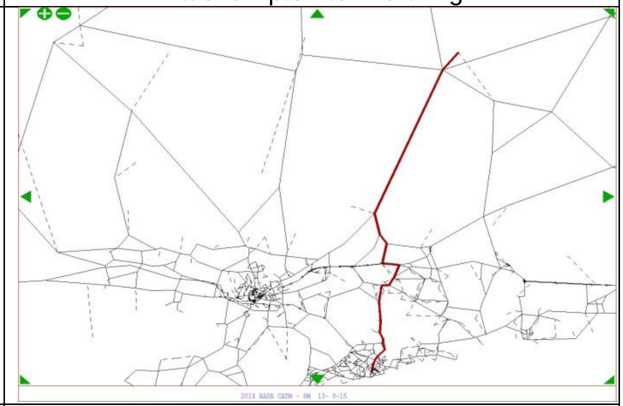
Littlehampton to Petworth



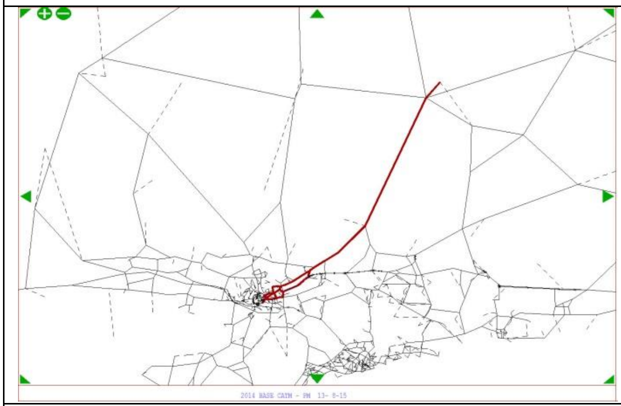
Littlehampton to Worthing



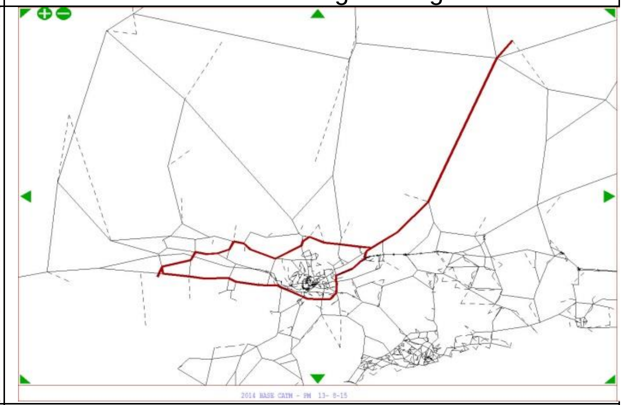
Petworth to Arundel



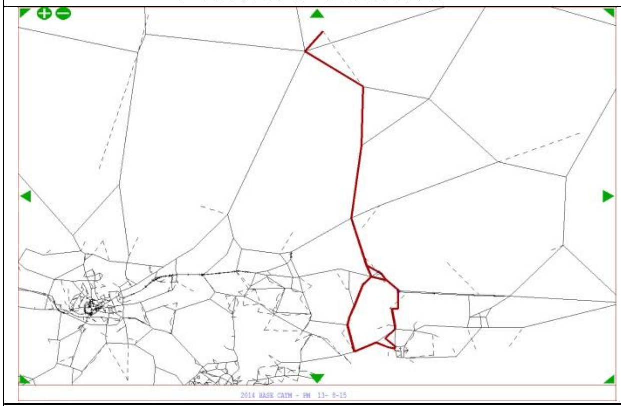
Petworth to Bognor Regis



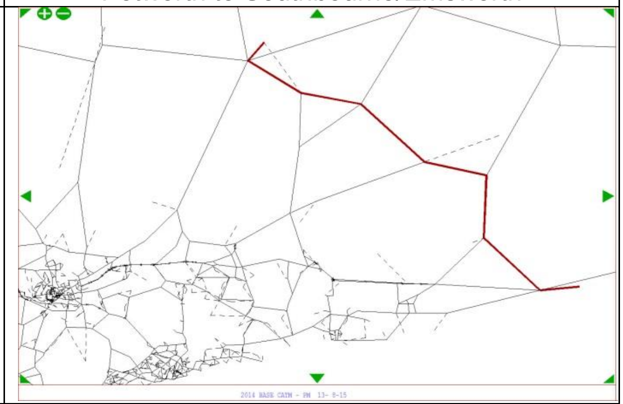
Petworth to Chichester



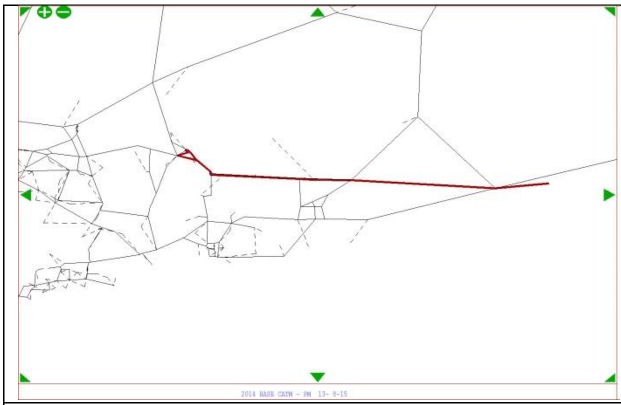
Petworth to Southbourne/Emsworth



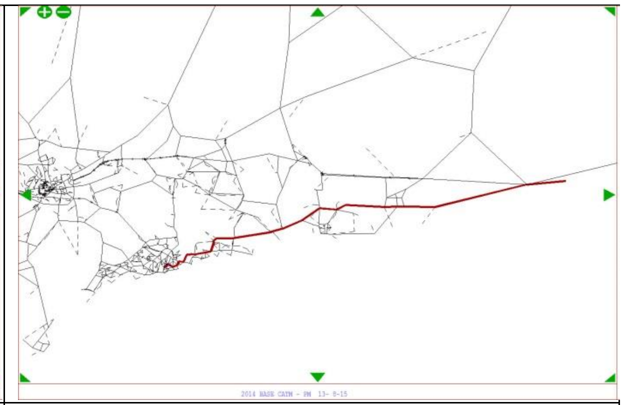
Petworth to Littlehampton



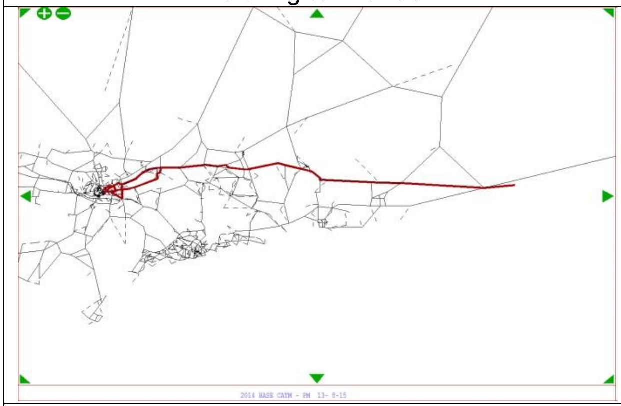
Petworth to Worthing



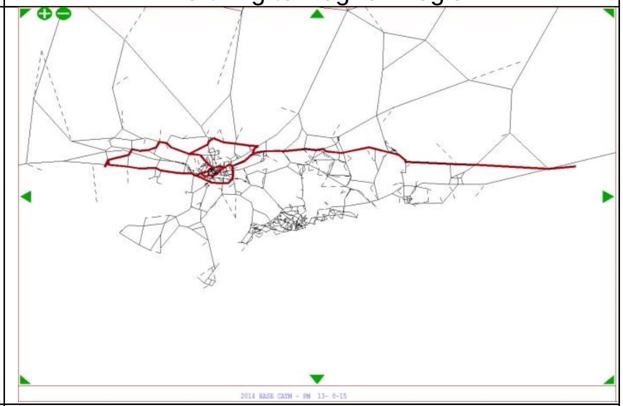
Worthing to Arundel



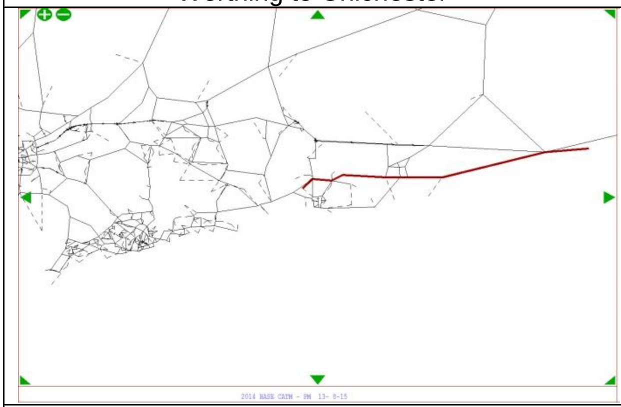
Worthing to Bognor Regis



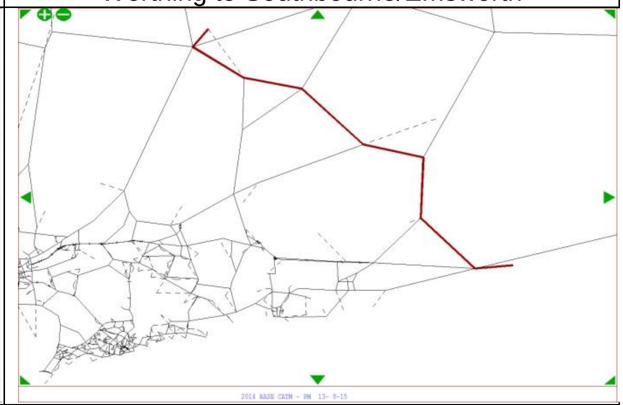
Worthing to Chichester



Worthing to Southbourne/Emsworth

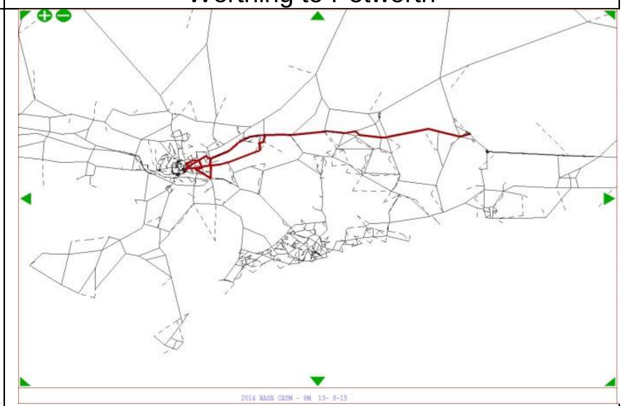


Worthing to Littlehampton

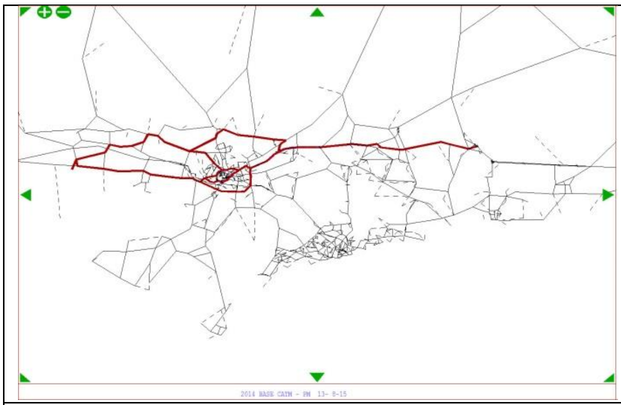


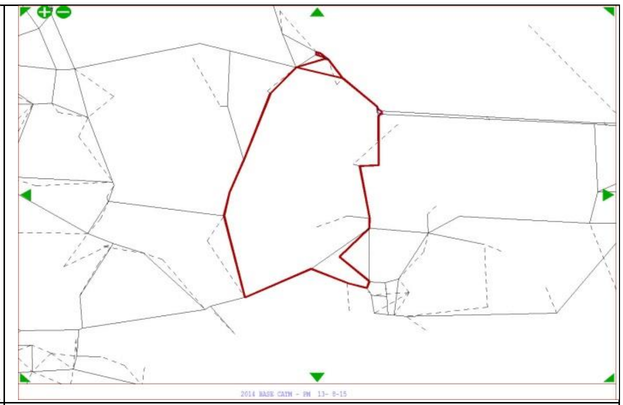
Worthing to Petworth

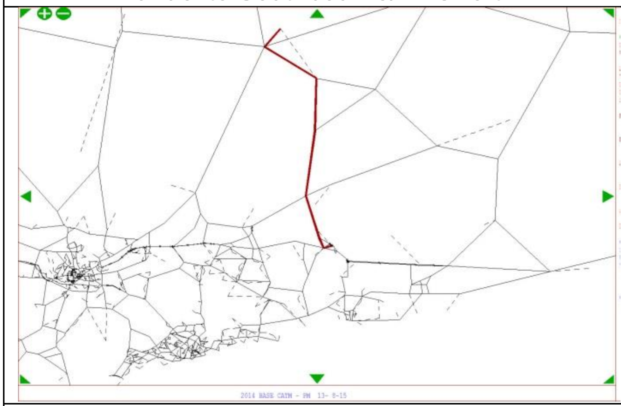
Arundel to Bognor Regis



Arundel to Chichester


Arundel to Southbourne/Emsworth


Arundel to Littlehampton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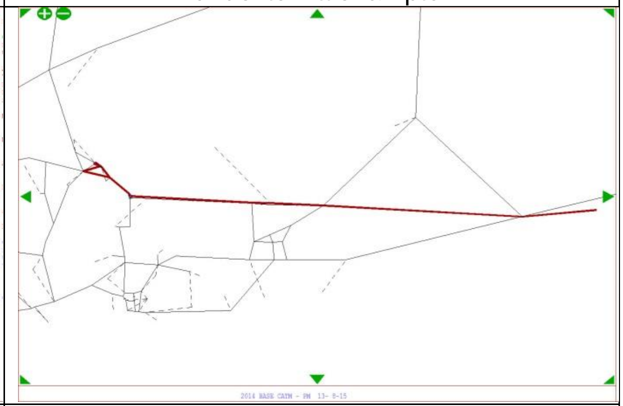
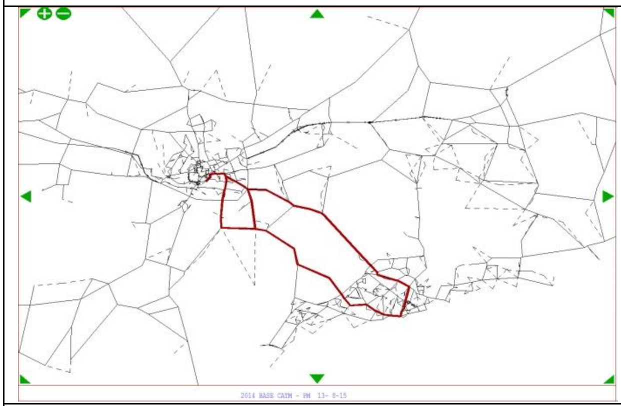
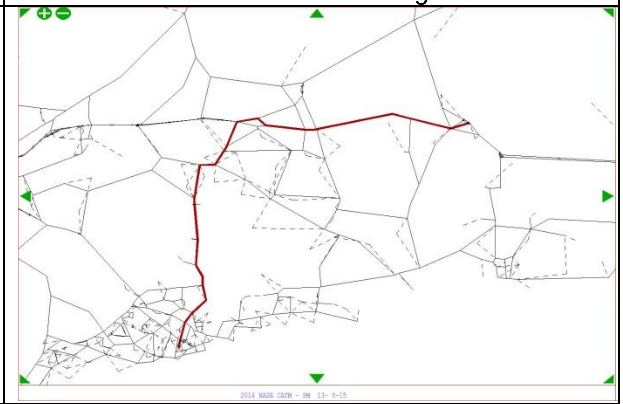
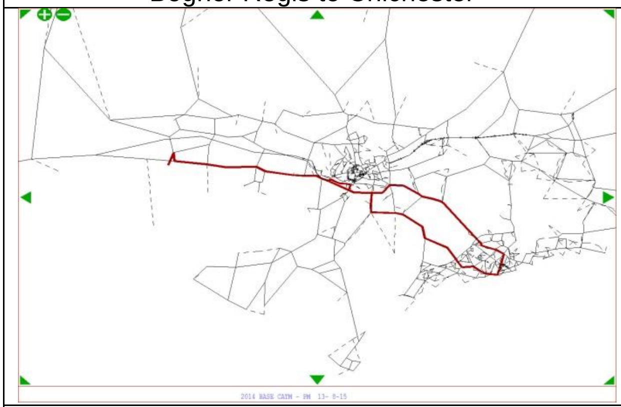
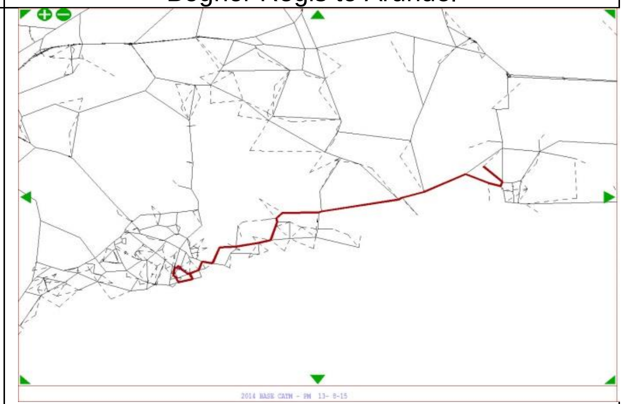
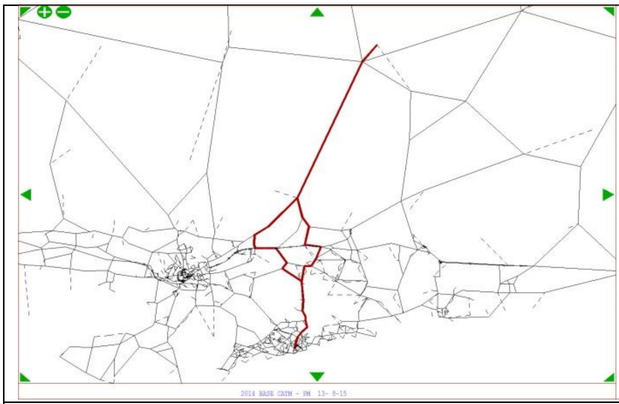
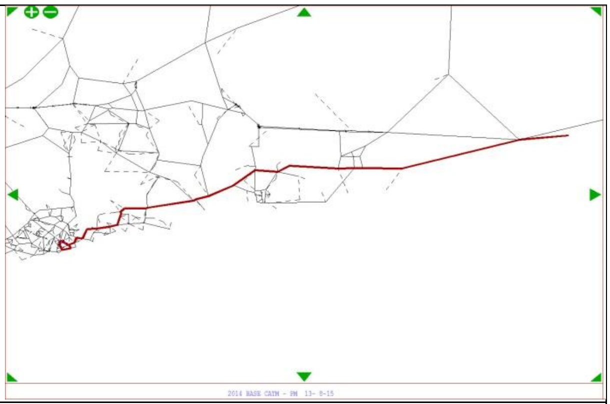

Arundel to Worthing


Bognor Regis to Chichester


Bognor Regis to Arundel


Bognor Regis to Southbourne/Emsworth


Bognor Regis to Littlehampton

	
Bognor Regis to Petworth	Bognor Regis to Worthing

APPENDIX D CALIBRATION COUNTS

SHEET 1 CALIBRATION COUNTS FOR AM PEAK

Screenline / Dir	Site Ref	Observed					Modelled					Diff.					% Diff.					GEH					WebTAG criterion GEH or Flow				
		Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Cars	LGVs	Lights	HGV	Total
Inner SL_IN	30	427	34	461	15	476	392	66	459	24	482	-34	33	-2	8	6	-8%	97%	0%	54%	1%	1.7	4.6	0.1	1.9	0.3	Pass	Pass	Pass	Pass	Pass
	32	617	52	668	12	680	635	93	728	32	760	19	41	60	21	80	3%	80%	9%	177%	12%	0.7	4.8	2.3	4.4	3.0	Pass	Pass	Pass	Pass	Pass
	43	315	8	323	4	327	189	62	250	16	266	-126	53	-73	12	-61	-40%	641%	-22%	285%	-19%	7.9	9.0	4.3	3.7	3.5	Fail	Pass	Pass	Pass	Pass
	33	700	66	766	21	787	659	88	747	30	776	-41	21	-19	9	-11	-6%	32%	-3%	42%	-1%	1.6	2.4	0.7	1.7	0.4	Pass	Pass	Pass	Pass	Pass
	35	349	41	390	13	403	269	32	301	12	313	-80	-8	-88	-1	-90	-23%	-20%	-23%	-8%	-22%	4.6	1.3	4.8	0.3	4.7	Pass	Pass	Pass	Pass	Pass
	37	390	50	440	13	453	552	69	620	19	639	162	19	181	6	186	41%	38%	41%	43%	41%	7.5	2.5	7.8	1.4	8.0	Fail	Pass	Fail	Pass	Fail
	25	495	49	544	22	566	384	59	444	19	462	-111	10	-101	-3	-104	-22%	21%	-18%	-14%	-18%	5.3	1.4	4.5	0.7	4.6	Fail	Pass	Pass	Pass	Pass
	40	579	75	653	16	669	500	67	567	23	590	-78	-8	-86	7	-79	-14%	-11%	-13%	44%	-12%	3.4	0.9	3.5	1.6	3.2	Pass	Pass	Pass	Pass	Pass
	42	281	13	294	6	300	287	38	325	21	346	5	26	31	15	46	2%	203%	10%	247%	15%	0.3	5.1	1.8	4.0	2.5	Pass	Pass	Pass	Pass	Pass
	46	823	37	861	21	882	877	110	987	26	1,013	54	73	126	4	131	7%	194%	15%	21%	15%	1.8	8.5	4.2	0.9	4.3	Pass	Pass	Pass	Pass	Pass
	105	374	30	404	4	408	198	28	226	13	239	-176	-1	-178	9	-169	-47%	-5%	-44%	232%	-41%	10.4	0.3	10.0	3.1	9.4	Fail	Pass	Fail	Pass	Fail
	28	160	18	178	10	188	224	36	260	11	271	64	18	82	2	83	40%	95%	46%	15%	44%	4.6	3.4	5.5	0.5	5.5	Pass	Pass	Pass	Pass	Pass
Inner SL_Out	29	262	28	290	17	307	258	49	307	9	316	-5	21	16	-7	9	-2%	75%	6%	-44%	3%	0.3	3.4	0.9	2.0	0.5	Pass	Pass	Pass	Pass	Pass
	31	332	39	371	15	386	340	57	397	22	419	8	19	26	7	33	2%	48%	7%	43%	9%	0.4	2.7	1.3	1.5	1.6	Pass	Pass	Pass	Pass	Pass
	44	170	10	180	4	184	158	24	182	12	194	-12	14	2	8	10	-7%	140%	1%	195%	6%	0.9	3.4	0.2	2.8	0.7	Pass	Pass	Pass	Pass	Pass
	34	373	38	410	15	425	362	61	423	38	462	-11	24	13	23	37	-3%	63%	3%	156%	9%	0.6	3.4	0.7	4.5	1.7	Pass	Pass	Pass	Pass	Pass
	36	94	35	130	9	139	161	28	189	6	195	67	-8	59	-3	56	71%	-21%	46%	-37%	40%	5.9	1.3	4.7	1.2	4.3	Pass	Pass	Pass	Pass	Pass
	38	269	46	314	19	333	201	44	245	18	262	-68	-2	-70	-1	-71	-25%	-5%	-22%	-5%	-21%	4.4	0.3	4.2	0.2	4.1	Pass	Pass	Pass	Pass	Pass
	26	214	45	259	16	275	219	36	255	12	267	6	-9	-4	-4	-8	3%	-21%	-1%	-25%	-3%	0.4	1.5	0.2	1.1	0.5	Pass	Pass	Pass	Pass	Pass
	39	503	65	568	19	587	507	97	604	39	643	4	32	37	19	56	1%	50%	6%	99%	10%	0.2	3.6	1.5	3.6	2.3	Pass	Pass	Pass	Pass	Pass
	41	208	20	228	2	230	84	17	101	11	112	-124	-3	-126	8	-118	-59%	-13%	-55%	348%	-51%	10.2	0.6	9.8	3.3	9.0	Fail	Pass	Fail	Pass	Fail
	45	584	52	636	19	655	467	117	583	23	607	-117	65	-52	4	-48	-20%	125%	-8%	20%	-7%	5.1	7.1	2.1	0.8	1.9	Fail	Pass	Pass	Pass	Pass
	106	129	16	145	4	149	87	18	105	7	112	-41	1	-40	3	-37	-32%	7%	-28%	80%	-25%	4.0	0.3	3.6	1.3	3.2	Pass	Pass	Pass	Pass	Pass
	27	192	24	215	15	230	134	22	156	17	173	-58	-2	-59	2	-57	-30%	-6%	-27%	13%	-25%	4.5	0.3	4.3	0.5	4.0	Pass	Pass	Pass	Pass	Pass
Outer SL_IN	24	470	62	532	20	552	501	89	590	35	625	31	27	58	15	73	6%	44%	11%	77%	13%	1.4	3.1	2.4	2.9	3.0	Pass	Pass	Pass	Pass	Pass
	95					664					777	-	-	-	-	113	-	-	-	-	17%	-	-	-	-	4.2	n/a	n/a	n/a	n/a	Pass
	11	1512	146	1,658	190	1,848	1,525	336	1,860	188	2,048	13	189	202	-2	200	1%	130%	12%	-1%	11%	0.3	12.2	4.8	0.1	4.5	Pass	Fail	Pass	Pass	Pass
	117	498	43	540	13	553	405	74	479	24	502	-92	31	-62	11	-51	-19%	72%	-11%	87%	-9%	4.4	4.1	2.7	2.6	2.2	Pass	Pass	Pass	Pass	Pass
	51	291	33	325	17	342	361	55	416	16	432	70	22	92	-2	90	24%	65%	28%	-11%	26%	3.9	3.3	4.8	0.5	4.6	Pass	Pass	Pass	Pass	Pass
	49	225	28	253	9	262	280	43	323	10	334	55	16	71	1	72	24%	56%	28%	11%	27%	3.5	2.6	4.2	0.3	4.2	Pass	Pass	Pass	Pass	Pass
	61	818	66	883	27	910	871	120	991	35	1,026	54	54	108	8	116	7%	83%	12%	29%	13%	1.8	5.6	3.5	1.4	3.7	Pass	Pass	Pass	Pass	Pass
	152	170	27	197	6	203	216	32	247	11	259	45	5	50	6	56	27%	17%	25%	98%	27%	3.3	0.9	3.4	1.9	3.7	Pass	Pass	Pass	Pass	Pass
	48	760	95	854	52	906	624	90	713	33	747	-136	-5	-141	-18	-159	-18%	-5%	-17%	-36%	-18%	5.2	0.5	5.0	2.8	5.5	Fail	Pass	Fail	Pass	Fail
	110	369	44	414	13	427	395	63	458	22	480	26	19	45	8	53	7%	43%	11%	62%	12%	1.3	2.6	2.1	2.0	2.5	Pass	Pass	Pass	Pass	Pass
	14	1875	96	1,971	115	2,086	1,791	249	2,041	144	2,184	-84	153	70	29	98	-4%	160%	4%	25%	5%	2.0	11.7	1.6	2.5	2.1	Pass	Fail	Pass	Pass	Pass
	60	243	22	265	18	283	167	23	190	16	206	-76	1	-74	-3	-77	-31%	5%	-28%	-14%	-27%	5.3	0.2	4.9	0.6	4.9	Pass	Pass	Pass	Pass	Pass
	108	261	22	283	15	298	107	18	125	7	133	-154	-4	-157	-8	-165	-59%	-17%	-56%	-53%	-56%	11.3	0.8	11.0	2.4	11.3	Fail	Pass	Fail	Pass	Fail
Outer SL_Out	23	398	53	450	17	467	464	77	541	29	569	66	25	90	12	102	17%	47%	20%	72%	22%	3.2	3.0	4.1	2.5	4.5	Pass	Pass	Pass	Pass	Pass
	96					266					298	-	-	-	-	32	-	-	-	-	12%	-	-	-	-	1.9	n/a	n/a	n/a	n/a	Pass
	12	1542	87	1,629	121	1,750	1,583	216	1,799	140	1,939	41	129	170	20	190	3%	148%	10%	16%	11%	1.0	10.5	4.1	1.7	4.4	Pass	Fail	Pass	Pass	Pass
	118	303	87	390	14	404	365	72	437	23	461	62	-15	47	10	57	21%	-18%	12%	72%	14%	3.4	1.7	2.3	2.3	2.7	Pass	Pass	Pass	Pass	Pass
	52	343	37	380	21	401	256	58	314	15	329	-87	21	-66	-6	-72	-25%	57%	-17%	-28%	-18%	5.1	3.1	3.6	1.4	3.8	Pass	Pass	Pass	Pass	Pass
	50	130	22	153	9	162	116	24	140	5	145	-15	2	-13	-4	-17	-11%	8%	-8%	-44%	-11%	1.3	0.3	1.1	1.5	1.4	Pass	Pass	Pass	Pass	Pass
	62	350	59	409	26	435	332	87	419	26	446	-18	28	10	0	11	-5%	48%	3%	1%	2%	1.0	3.3	0.5	0.1	0.5	Pass	Pass	Pass	Pass	Pass
	151	84	14	98	9	107	185	27	212	10	222	102	12	114	1	115	121%	86%	116%	17%	108%	8.8	2.7	9.1	0.5	9.0	Fail	Pass	Fail	Pass	Fail
	47	559	93	652	53	705	543	115	658	66	724	-16	22	6	13	19	-3%	23%	1%	23%	3%	0.7	2.1	0.2	1.6	0.7	Pass	Pass	Pass	Pass	Pass
	109	230	21	251	6	257	128	35	162	12	174	-103	13	-89	6	-83	-45%	64%	-35%	105%	-32%	7.7	2.6	6.2	2.0	5.7	Fail	Pass	Pass	Pass	Pass
	13	1060	113	1,173	123	1,297	1,015	216	1,231	131	1,362	-45	103	58	8	66	-4%	91%	5%	6%	5%	1.4	8.0	1.7	0.7	1.8	Pass	Fail	Pass	Pass	Pass
	59	196	22	218	15	233	63	16	79	5	85	-133	-6	-138	-10	-148	-68%	-26%	-64%	-65%	-64%	11.7	1.3	11.4	3.1	11.8	Fail	Pass	Fail	Pass	Fail
	107	277	59	336	21	357	133	27	160	11	171	-145	-32	-176	-10	-186	-52%	-54%	-52%	-48%	-52%	10.1	4.8	11.2	2.5	11.5	Fail	Pass	Fail	Pass	Fail
North SL_SB	90					191					193	-	-	-	-	2	-	-	-	-	1%	-	-	-	-	0.1	n/a	n/a	n/a	n/a	Pass
	98	266	48	314	8	322	301	53	353	19	372	35	5	39	11	50	13%	10%	12%	141%	16%	2.1	0.7	2.1	3.0	2.7	Pass	Pass	Pass	Pass	Pass
	76	174	22	196	5	201	176	33	209	17	227	3	11	13	12	26	1%	48%	7%	251%	13%	0.2	2.0	0.9	3.7	1.8	Pass	Pass	Pass	Pass	Pass
	190	458	79	537	17	554	540	90	631	32	663	83	11	94	15	109	18%	14%	17%	90%	20%	3.7	1.2	3.9	3.1	4.4	Pass	Pass	Pass	Pass	Pass
	18	1351	71	1422	109	1,531	1,159	138	1297	107	1,403	-192	67	-126	-2	-127	-14%	95%	-9%	-2%	-8%	5.4	6.6	3.4	0.2	3.3	Pass	Pass	Pass	Pass	Pass
North SL_NB	89					158					124	-	-	-	-	-34	-	-	-	-	-21%	-	-	-	-	2.8	n/a	n/a	n/a	n/a	Pass
	97	241	44	285	7	292	192	35	226	12	239	-50	-9	-59	5	-53	-21%	-21%	-21%	76%	-18%	3.4	1.4	3.7	1.7	3.3	Pass	Pass	Pass	Pass	Pass
	75	172	33	206	9	215	179	37	217	14	230	7	4	11	4	15	4%	11%	5%	48%	7%	0.5	0.6	0.8	1.3	1.0	Pass	Pass	Pass	Pass	Pass
	189	438	121	559	31	590	516	107	623	58	681	78	-13	64	26	91	18%	-11%	12%	84%	15%	3.6	1.3	2.6	3.9	3.6	Pass	Pass	Pass	Pass	Pass
	17	895	70	966	123	1,089	869	163	1032	88	1,120	-27	93	66	-35	31	-3%	132%	7%	-28%	3%	0.9	8.6	2.1	3.4	0.9	Pass	Pass	Pass	Pass	Pass
Bognor Regis SL_SB	93	329	54	383	21	404	310	58	368	22	390	-18	4	-15	1	-14	-6%	6%	-4%	3%	-3%	1.0	0.5	0.8	0.2	0.7	Pass	Pass	Pass	Pass	Pass
	64	525	85	610	44	654	538	109	647	61	708	14	23	37	17	54	3%	27%	6%	40%	8%	0.6	2.4	1.5	2.4	2.1	Pass	Pass	Pass	Pass	Pass
	92	355	74	429	15	444	284	57	340	28	368	-71	-18	-89	13	-76	-20%	-24%	-21%	91%	-17%	4.0	2.2	4.5	2.9	3.8	Pass	Pass	Pass	Pass	Pass
	80	131	15	146	7	153	152	31	182	17	199	21	16	36	10	46	16%	103%	25%	150%	30%	1.7	3.3	2.8	2.9	3.5	Pass	Pass	Pass	Pass	Pass
	82	429	64	493	24	517	419	85	503	44	547	-10	20	10	20	30	-2%	31%	2%	84%	6%	0.5	2.3	0.4	3.4	1.3	Pass	Pass	Pass	Pass	Pass

Screenline / Dir	Site Ref	Observed					Modelled					Diff.					% Diff.					GEH					WebTAG criterion GEH or Flow				
		Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Cars	LGVs	Lights	HGV	Total
Bognor Regis SL_NB	94	813	67	880	19	899	828	119	947	43	990	15	52	67	24	91	2%	77%	8%	130%	10%	0.5	5.4	2.2	4.4	3.0	Pass	Pass	Pass	Pass	Pass
	63	885	120	1004	43	1,047	901	136	1037	50	1,087	16	16	33	8	40	2%	14%	3%	18%	4%	0.5	1.4	1.0	1.1	1.2	Pass	Pass	Pass	Pass	Pass
	91	394	82	477	16	493	373	55	429	20	448	-21	-27	-48	4	-45	-5%	-33%	-10%	22%	-9%	1.1	3.3	2.3	0.8	2.1	Pass	Pass	Pass	Pass	Pass
	79	346	28	374	6	380	284	44	328	17	345	-62	17	-46	11	-35	-18%	60%	-12%	170%	-9%	3.5	2.8	2.4	3.2	1.8	Pass	Pass	Pass	Pass	Pass
	81	712	73	785	20	805	612	101	714	54	767	-100	28	-72	34	-38	-14%	38%	-9%	174%	-5%	3.9	3.0	2.6	5.6	1.4	Pass	Pass	Pass	Pass	Pass
Arun SL_EB	99					1133					1122	-	-	-	-	-11	-	-	-	-	-1%	-	-	-	-	0.3	n/a	n/a	n/a	n/a	Pass
	22	968	91	1059	130	1189	874	157	1030	86	1116	-95	66	-29	-44	-73	-10%	73%	-3%	-34%	-6%	3.1	5.9	0.9	4.3	2.1	Pass	Pass	Pass	Pass	Pass
Arun SL_WB	100					1124					971	-	-	-	-	-153	-	-	-	-	-14%	-	-	-	-	4.7	n/a	n/a	n/a	n/a	Pass
	21	1135	77	1212	108	1320	1210	130	1340	137	1478	76	53	128	29	158	7%	68%	11%	27%	12%	2.2	5.2	3.6	2.6	4.2	Pass	Pass	Pass	Pass	Pass
																											GEH OR Hourly flows				
																										Pass	56	64	60	68	66
																										Fail	12	4	8	0	8
																										%Pass	82%	94%	88%	100%	89%

SHEET 2 CALIBRATION COUNTS FOR IP PEAK

Screenline / Direction	Site Ref	Observed					Modelled					Diff.					% Diff.					GEH					WebTAG criterion GEH or Flow				
		Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Cars	LGVs	Lights	HGV	Total
Inner SL	30	411	38	449	18	467	455	81	536	20	556	44	42	87	2	89	11%	111%	19%	13%	19%	2.1	5.5	3.9	0.5	3.9	Pass	Pass	Pass	Pass	Pass
	32	372	34	406	14	420	310	52	362	20	382	-61	17	-44	6	-38	-17%	51%	-11%	46%	-9%	3.3	2.7	2.2	1.5	1.9	Pass	Pass	Pass	Pass	Pass
	43	157	6	163	4	167	91	34	125	8	133	-66	28	-38	4	-34	-42%	440%	-23%	98%	-20%	5.9	6.2	3.2	1.6	2.8	Pass	Pass	Pass	Pass	Pass
	33	496	38	534	19	553	377	45	422	23	445	-119	8	-111	4	-108	-24%	20%	-21%	18%	-19%	5.7	1.2	5.1	0.8	4.8	Fail	Pass	Fail	Pass	Pass
	35	181	25	206	16	222	155	23	179	9	188	-25	-2	-28	-7	-34	-14%	-9%	-13%	-43%	-15%	2.0	0.4	2.0	1.9	2.4	Pass	Pass	Pass	Pass	Pass
	37	278	37	314	13	327	315	60	375	19	394	37	23	60	6	67	13%	63%	19%	49%	20%	2.2	3.3	3.3	1.6	3.5	Pass	Pass	Pass	Pass	Pass
	25	306	38	344	20	364	310	53	363	18	381	4	15	19	-2	17	1%	39%	5%	-12%	5%	0.2	2.2	1.0	0.5	0.9	Pass	Pass	Pass	Pass	Pass
	40	433	47	480	17	497	468	82	549	26	576	35	35	70	9	79	8%	75%	15%	53%	16%	1.6	4.4	3.1	1.9	3.4	Pass	Pass	Pass	Pass	Pass
	42	189	18	207	4	211	107	23	130	10	140	-82	5	-77	6	-71	-43%	28%	-37%	140%	-34%	6.7	1.1	5.9	2.2	5.3	Pass	Pass	Pass	Pass	Pass
	46	771	39	810	21	831	691	112	804	48	852	-80	73	-7	27	21	-10%	186%	-1%	131%	2%	2.9	8.4	0.2	4.6	0.7	Pass	Pass	Pass	Pass	Pass
	105	227	18	245	6	251	137	24	161	9	170	-90	6	-84	3	-81	-40%	33%	-34%	47%	-32%	6.7	1.3	5.9	1.0	5.6	Pass	Pass	Pass	Pass	Pass
	28	122	14	137	8	145	140	24	164	14	178	17	10	27	6	33	14%	69%	20%	75%	23%	1.5	2.3	2.2	1.8	2.6	Pass	Pass	Pass	Pass	Pass
Inner SL	29	354	23	377	18	395	350	68	418	13	430	-4	44	40	-5	35	-1%	192%	11%	-28%	9%	0.2	6.6	2.0	1.3	1.7	Pass	Pass	Pass	Pass	Pass
	31	384	29	413	11	424	375	61	437	29	465	-9	32	24	18	41	-2%	113%	6%	160%	10%	0.5	4.8	1.1	4.0	2.0	Pass	Pass	Pass	Pass	Pass
	44	146	13	158	4	162	142	76	218	10	228	-3	63	60	6	66	-2%	500%	38%	173%	41%	0.3	9.5	4.4	2.4	4.7	Pass	Pass	Pass	Pass	Pass
	34	508	35	543	25	568	475	27	502	33	535	-34	-7	-41	8	-33	-7%	-21%	-8%	34%	-6%	1.5	1.3	1.8	1.6	1.4	Pass	Pass	Pass	Pass	Pass
	36	153	35	188	13	201	192	29	221	10	231	39	-6	33	-3	30	26%	-17%	18%	-26%	15%	3.0	1.1	2.3	1.0	2.0	Pass	Pass	Pass	Pass	Pass
	38	360	34	394	16	410	306	54	360	19	379	-54	21	-33	3	-31	-15%	62%	-8%	17%	-7%	3.0	3.1	1.7	0.6	1.5	Pass	Pass	Pass	Pass	Pass
	26	264	31	295	18	313	297	50	347	17	364	33	20	52	-2	51	12%	65%	18%	-8%	16%	2.0	3.1	2.9	0.4	2.8	Pass	Pass	Pass	Pass	Pass
	39	525	63	588	18	606	482	81	562	28	590	-43	18	-25	9	-16	-8%	28%	-4%	51%	-3%	1.9	2.1	1.1	2.0	0.6	Pass	Pass	Pass	Pass	Pass
	41	222	15	237	5	242	145	34	179	10	188	-77	18	-59	5	-54	-35%	120%	-25%	104%	-22%	5.7	3.7	4.1	1.8	3.6	Pass	Pass	Pass	Pass	Pass
	45	739	48	788	23	811	567	90	657	26	683	-172	42	-131	3	-128	-23%	86%	-17%	12%	-16%	6.7	5.0	4.9	0.6	4.7	Fail	Pass	Pass	Pass	Pass
	106	212	22	234	7	241	160	26	187	9	195	-52	4	-48	2	-46	-24%	18%	-20%	28%	-19%	3.8	0.8	3.3	0.7	3.1	Pass	Pass	Pass	Pass	Pass
	27	155	18	173	10	183	210	37	248	25	272	55	19	75	15	89	36%	107%	43%	152%	49%	4.1	3.7	5.1	3.6	5.9	Pass	Pass	Pass	Pass	Pass
Outer SL	24	359	47	406	15	421	287	58	345	24	369	-71	10	-61	9	-52	-20%	21%	-15%	58%	-12%	4.0	1.4	3.2	2.0	2.6	Pass	Pass	Pass	Pass	Pass
	95					297					270	-	-	-	-	-27	-	-	-	-	-9%	-	-	-	-	1.6	n/a	n/a	n/a	n/a	Pass
	11	1289	115	1,405	187	1,592	1,346	244	1,591	122	1,713	57	129	186	-65	121	4%	112%	13%	-35%	8%	1.6	9.6	4.8	5.3	3.0	Pass	Fail	Pass	Pass	Pass
	117	392	72	464	19	483	435	86	520	33	554	43	13	57	14	71	11%	19%	12%	74%	15%	2.1	1.5	2.6	2.8	3.1	Pass	Pass	Pass	Pass	Pass
	51	432	53	485	23	508	326	72	398	17	415	-106	20	-87	-6	-93	-25%	37%	-18%	-25%	-18%	5.5	2.5	4.1	1.3	4.3	Fail	Pass	Pass	Pass	Pass
	49	160	24	184	10	194	185	39	224	11	235	24	15	39	1	41	15%	62%	21%	15%	21%	1.9	2.7	2.8	0.4	2.8	Pass	Pass	Pass	Pass	Pass
	61	454	51	505	28	533	525	84	609	27	636	71	33	104	-1	103	16%	64%	21%	-3%	19%	3.2	4.0	4.4	0.2	4.3	Pass	Pass	Pass	Pass	Pass
	152	153	30	183	10	193	188	34	222	13	234	35	4	39	2	41	23%	14%	21%	24%	21%	2.7	0.7	2.7	0.7	2.8	Pass	Pass	Pass	Pass	Pass
	48	636	89	726	57	783	607	111	717	43	760	-30	21	-8	-14	-23	-5%	24%	-1%	-25%	-3%	1.2	2.1	0.3	2.0	0.8	Pass	Pass	Pass	Pass	Pass
	110	192	23	215	6	221	213	33	246	12	258	20	10	31	6	37	11%	45%	14%	103%	17%	1.4	2.0	2.0	2.0	2.4	Pass	Pass	Pass	Pass	Pass
	14	1258	102	1,360	150	1,510	1,245	205	1,450	142	1,592	-13	103	90	-8	82	-1%	100%	7%	-5%	5%	0.4	8.3	2.4	0.6	2.1	Pass	Fail	Pass	Pass	Pass
	60	253	23	276	18	294	140	25	165	7	172	-113	2	-111	-10	-122	-45%	9%	-40%	-59%	-41%	8.1	0.4	7.5	3.0	8.0	Fail	Pass	Fail	Pass	Fail
	108	231	37	268	17	285	129	32	161	14	175	-102	-5	-107	-3	-110	-44%	-13%	-40%	-18%	-39%	7.6	0.8	7.3	0.8	7.3	Fail	Pass	Fail	Pass	Fail
Outer SL	23	346	46	392	14	406	271	47	318	14	332	-75	1	-74	-1	-74	-22%	2%	-19%	-4%	-18%	4.3	0.2	3.9	0.1	3.9	Pass	Pass	Pass	Pass	Pass
	96					324					335	-	-	-	-	11	-	-	-	-	3%	-	-	-	-	0.6	n/a	n/a	n/a	n/a	Pass
	12	1186	117	1,303	179	1,481	1,320	210	1,531	133	1,664	134	94	228	-45	183	11%	80%	18%	-25%	12%	3.8	7.3	6.1	3.6	4.6	Pass	Pass	Fail	Pass	Pass
	118	423	72	495	20	515	527	128	655	39	694	105	56	160	18	179	25%	78%	32%	89%	35%	4.8	5.6	6.7	3.3	7.3	Pass	Pass	Fail	Pass	Fail
	52	510	39	548	29	577	299	38	337	11	348	-211	-1	-212	-17	-229	-41%	-3%	-39%	-61%	-40%	10.5	0.2	10.1	3.9	10.7	Fail	Pass	Fail	Pass	Fail
	50	160	21	181	7	188	209	40	249	12	261	49	20	69	4	73	31%	94%	38%	55%	39%	3.6	3.5	4.7	1.3	4.9	Pass	Pass	Pass	Pass	Pass
	62	471	53	524	30	554	421	94	515	27	543	-50	41	-9	-2	-11	-11%	77%	-2%	-7%	-2%	2.4	4.8	0.4	0.4	0.5	Pass	Pass	Pass	Pass	Pass
	151	227	38	265	11	276	285	35	320	13	333	58	-2	55	1	57	25%	-6%	21%	12%	21%	3.6	0.4	3.2	0.4	3.2	Pass	Pass	Pass	Pass	Pass
	47	634	91	725	59	784	680	115	795	54	849	46	24	70	-5	65	7%	27%	10%	-8%	8%	1.8	2.4	2.5	0.7	2.3	Pass	Pass	Pass	Pass	Pass
	109	220	25	246	6	252	201	34	234	15	250	-20	8	-12	9	-2	-9%	32%	-5%	152%	-1%	1.4	1.5	0.8	2.8	0.2	Pass	Pass	Pass	Pass	Pass
	13	1133	96	1,229	133	1,362	1,166	217	1,382	95	1,478	33	120	154	-38	116	3%	125%	13%	-28%	9%	1.0	9.6	4.3	3.5	3.1	Pass	Fail	Pass	Pass	Pass
	59	247	25	272	23	295	130	23	153	8	161	-116	-2	-118	-15	-134	-47%	-8%	-44%	-65%	-45%	8.5	0.4	8.1	3.9	8.8	Fail	Pass	Fail	Pass	Fail
	107	224	33	257	15	272	103	17	121	7	128	-121	-15	-137	-8	-144	-54%	-47%	-53%	-51%	-53%	9.5	3.1	9.9	2.3	10.2	Fail	Pass	Fail	Pass	Fail
North SL	90					131					117	-	-	-	-	-14	-	-	-	-	-11%	-	-	-	-	1.3	n/a	n/a	n/a	n/a	Pass
	98	240	44	284	7	291	258	57	315	27	342	18	13	31	20	51	7%	31%	11%	289%	18%	1.1	1.9	1.8	4.9	2.9	Pass	Pass	Pass	Pass	Pass
	76	180	28	209	9	218	198	40	239	27	266	18	12	30	17	48	10%	43%	14%	188%	22%	1.3	2.1	2.0	4.1	3.1	Pass	Pass	Pass	Pass	Pass
	190	304	78	382	19	401	303	59	362	26	388	-1	-19	-20	7	-13	0%	-25%	-5%	37%	-3%	0.1	2.4	1.1	1.5	0.7	Pass	Pass	Pass	Pass	Pass
	18	881	77	958	127	1,085	886	113	999	97	1,096	5	36	41	-30	12	1%	48%	4%	-23%	1%	0.2	3.7	1.3	2.8	0.4	Pass	Pass	Pass	Pass	Pass
North SL	89					113					80	-	-	-	-	-33	-	-	-	-	-29%	-	-	-	-	3.4					
	97	196	35	231	6	237	218	41	259	14	273	22	6	28	8	36	11%	16%	12%	147%	15%	1.6	0.9	1.8	2.7	2.3	Pass	Pass	Pass	Pass	Pass
	75	149	21	171	6	177	138	31	168	15	183	-12	10	-2	8	6	-8%	46%	-1%	131%	3%	1.0	1.9	0.2	2.6	0.5	Pass	Pass	Pass	Pass	Pass
	189	293	69	362	15	377	319	69	388	31	419	26	0	26	16	42	9%	0%	7%	104%	11%	1.5	0.0	1.4	3.3	2.1	Pass	Pass	Pass	Pass	Pass
	17	868	73	941	119	1,060	893	145	1038	66	1,104	25	72	97	-52	45	3%	100%	10%	-44%	4%	0.8	6.9	3.1	5.4	1.4	Pass	Pass	Pass	Pass	Pass
Bognor Regis SL	93	461	55	517	17	534	447	86	533	30	563	-15	31	16	13	29	-3%	56%	3%	76%	6%	0.7	3.7	0.7	2.7	1.3	Pass	Pass	Pass	Pass	Pass
	64	665	80	744	48	792	716	120	836	44	880	52	40	92	-4	88	8%	51%	12%	-9%	11%	2.0	4.0	3.3	0.6	3.0	Pass	Pass	Pass	Pass	Pass
	92	332	69	401	14	415	258	44	301	18	319	-74	-26	-100	4	-96	-22%	-37%	-25%	32%	-23%	4.3	3.4	5.3	1.1	5.0	Pass	Pass	Fail	Pass	Pass
	80	144	19	163	7	170	140	24	164	10	173	-4	5	1	2	3	-3%	28%	1%	30%	2%	0.3	1.1	0.1	0.8	0.3	Pass	Pass	Pass	Pass	Pass
	82	536	67	602	19	621	565	95	660	39	699	29	29	57	21	78	5%	43%	10%	110%	13%	1.2	3.2	2.3	3.8	3.0	Pass	Pass	Pass	Pass	Pass
or R e	94	428	51	480	18	498	453	77	530	33	563	25	25	50	15	65	6%	49%	10%	83%	13%	1.2	3.2	2.2	3.0	2.8	Pass	Pass	Pass	Pass	Pass

Screenline / Direction	Site Ref	Observed					Modelled					Diff.					% Diff.					GEH					WebTAG criterion GEH or Flow				
		Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Cars	LGVs	Lights	HGV	Total
	63	638	82	720	50	770	692	119	812	46	858	54	37	91	-3	88	8%	45%	13%	-7%	11%	2.1	3.7	3.3	0.5	3.1	Pass	Pass	Pass	Pass	Pass
	91	335	48	383	13	396	257	44	300	19	319	-79	-4	-83	6	-77	-23%	-9%	-22%	45%	-19%	4.6	0.6	4.5	1.5	4.1	Pass	Pass	Pass	Pass	Pass
	79	147	20	168	7	175	146	25	171	11	182	-1	4	4	4	7	-1%	22%	2%	49%	4%	0.1	0.9	0.3	1.2	0.5	Pass	Pass	Pass	Pass	Pass
	81	484	65	549	21	570	481	87	568	40	608	-3	22	19	19	38	-1%	34%	4%	89%	7%	0.1	2.6	0.8	3.4	1.6	Pass	Pass	Pass	Pass	Pass
Arun SL	99					989					944	-	-	-	-	-45	-	-	-	-	-5%	-	-	-	-	1.4	n/a	n/a	n/a	n/a	Pass
	22	950	87	1037	124	1161	908	152	1060	71	1131	-42	65	23	-53	-30	-4%	75%	2%	-43%	-3%	1.4	6.0	0.7	5.4	0.9	Pass	Pass	Pass	Pass	Pass
Arun SL	100					1022					1001	-	-	-	-	-21	-	-	-	-	-2%	-	-	-	-	0.6	n/a	n/a	n/a	n/a	Pass
	21	930	83	1014	125	1139	915	98	1013	114	1127	-15	15	0	-11	-12	-2%	18%	0%	-9%	-1%	0.5	1.6	0.0	1.0	0.3	Pass	Pass	Pass	Pass	Pass
																											GEH OR Hourly flows				
																										Pass	60	65	59	68	67
																										Fail	8	3	9	0	6
																										% Pass	88%	96%	87%	100%	92%

SHEET 3 **CALIBRATION COUNTS FOR PM PEAK**

ine / Directio	Site Ref	Observed Car	Observed LGV	Observed Lights	Observed HGV	Observed Total	Modelled Car	Modelled LGV	Modelled Lights	Modelled HGV	Modelled Total	Diff. Car	Diff. LGV	Diff. Lights	Diff. HGV	Diff. Total	% Diff. Car	% Diff. LGV	% Diff. Lights	% Diff. HGV	% Diff. Total	GEH Car	GEH LGV	GEH Lights	GEH HGV	GEH Total	WebTAG criterion GEH or Flow Cars	LGVs	Lights	HGV	Total
Inner SL	30	434	18	452	7	459	408	49	457	8	465	-26	31	5	1	6	-6%	168%	1%	15%	1%	1.3	5.3	0.2	0.4	0.3	Pass	Pass	Pass	Pass	Pass
	32	378	20	398	6	404	317	37	354	9	363	-61	17	-44	2	-41	-16%	86%	-11%	39%	-10%	3.3	3.2	2.3	0.9	2.1	Pass	Pass	Pass	Pass	Pass
	43	184	3	188	1	189	15	24	39	3	42	-169	21	-149	2	-147	-92%	639%	-79%	123%	-78%	17.0	5.6	14.0	1.1	13.7	Fail	Pass	Fail	Pass	Fail
	33	551	25	576	8	584	473	32	505	14	520	-78	7	-71	6	-64	-14%	30%	-12%	77%	-11%	3.4	1.4	3.0	1.8	2.7	Pass	Pass	Pass	Pass	Pass
	35	162	11	173	7	180	138	15	153	3	156	-24	4	-21	-4	-24	-15%	31%	-12%	-52%	-13%	2.0	1.0	1.6	1.6	1.9	Pass	Pass	Pass	Pass	Pass
	37	299	35	334	10	344	336	45	381	10	391	37	10	47	0	47	12%	27%	14%	3%	14%	2.1	1.5	2.5	0.1	2.4	Pass	Pass	Pass	Pass	Pass
	25	229	19	248	11	259	281	29	309	7	317	52	9	62	-4	58	23%	49%	25%	-35%	22%	3.3	1.9	3.7	1.3	3.4	Pass	Pass	Pass	Pass	Pass
	40	491	37	528	13	541	371	51	422	11	433	-120	14	-106	-2	-108	-24%	38%	-20%	-15%	-20%	5.8	2.1	4.9	0.5	4.9	Fail	Pass	Pass	Pass	Pass
	42	227	17	244	3	247	267	47	315	9	324	41	30	71	6	77	18%	178%	29%	173%	31%	2.6	5.3	4.3	2.3	4.6	Pass	Pass	Pass	Pass	Pass
	46	764	28	792	15	807	709	154	863	21	885	-54	126	71	6	78	-7%	446%	9%	41%	10%	2.0	13.2	2.5	1.4	2.7	Pass	Fail	Pass	Pass	Pass
	105	257	23	280	4	284	222	25	248	6	254	-34	2	-32	2	-30	-13%	10%	-12%	58%	-11%	2.2	0.5	2.0	1.0	1.8	Pass	Pass	Pass	Pass	Pass
	28	133	10	142	8	150	117	15	132	6	139	-16	6	-10	-2	-11	-12%	62%	-7%	-21%	-8%	1.4	1.7	0.8	0.6	0.9	Pass	Pass	Pass	Pass	Pass
Inner SL	29	477	12	489	7	496	390	36	426	9	435	-87	24	-63	2	-61	-18%	192%	-13%	25%	-12%	4.2	4.8	2.9	0.6	2.8	Pass	Pass	Pass	Pass	Pass
	31	637	21	657	6	663	586	94	680	19	699	-50	73	23	13	36	-8%	350%	3%	238%	5%	2.0	9.6	0.9	3.8	1.4	Pass	Pass	Pass	Pass	Pass
	44	334	8	341	3	344	275	101	375	6	382	-59	93	34	3	38	-18%	124%	10%	118%	11%	3.4	12.7	1.8	1.6	2.0	Pass	Pass	Pass	Pass	Pass
	34	525	22	547	17	564	402	37	438	20	459	-124	15	-109	4	-105	-24%	68%	-20%	22%	-19%	5.8	2.7	4.9	0.9	4.7	Fail	Pass	Pass	Pass	Pass
	36	262	23	285	8	293	219	21	240	7	247	-43	-2	-45	-1	-46	-16%	-9%	-16%	-13%	-16%	2.8	0.4	2.8	0.4	2.8	Pass	Pass	Pass	Pass	Pass
	38	448	14	462	11	473	448	47	495	8	503	0	33	33	-3	30	0%	236%	7%	-26%	6%	0.0	6.0	1.5	0.9	1.3	Pass	Pass	Pass	Pass	Pass
	26	404	14	419	12	431	448	45	492	10	503	43	30	74	-2	72	11%	211%	18%	-18%	17%	2.1	5.6	3.5	0.7	3.3	Pass	Pass	Pass	Pass	Pass
	39	619	36	654	12	666	675	83	759	18	777	57	47	104	6	111	9%	132%	16%	54%	17%	2.2	6.1	3.9	1.6	4.1	Pass	Pass	Pass	Pass	Pass
	41	395	16	411	2	413	344	43	387	9	396	-51	27	-24	7	-17	-13%	168%	-6%	339%	-4%	2.6	4.9	1.2	3.0	0.8	Pass	Pass	Pass	Pass	Pass
	45	895	29	924	10	934	1,027	106	1,132	21	1,153	132	77	209	11	219	15%	267%	23%	104%	23%	4.3	9.4	6.5	2.7	6.8	Pass	Pass	Fail	Pass	Fail
	106	388	28	416	2	418	187	20	207	5	212	-201	-8	-209	3	-206	-52%	-30%	-50%	159%	-49%	11.8	1.7	11.9	1.7	11.6	Fail	Pass	Fail	Pass	Fail
	27	230	15	245	9	254	256	47	303	11	314	26	32	58	2	60	11%	219%	24%	19%	24%	1.7	5.8	3.5	0.6	3.5	Pass	Pass	Pass	Pass	Pass
Outer SL	24	464	61	526	19	545	563	48	611	11	623	99	-13	86	-8	78	21%	-21%	16%	-41%	14%	4.4	1.7	3.6	2.0	3.2	Pass	Pass	Pass	Pass	Pass
	95					301	284	34	318	8	325	-	-	-	-	24	-	-	-	-	8%	-	-	-	-	1.4	n/a	n/a	n/a	n/a	Pass
	11	1839	72	1,911	75	1,986	1,870	216	2,086	69	2,154	31	144	174	-6	168	2%	200%	9%	-8%	8%	0.7	12.0	3.9	0.7	3.7	Pass	Fail	Pass	Pass	Pass
	117	369	45	414	6	420	343	42	385	16	401	-25	-3	-29	9	-19	-7%	-7%	-7%	147%	-5%	1.3	0.5	1.4	2.8	1.0	Pass	Pass	Pass	Pass	Pass
	51	516	50	566	10	576	488	57	546	8	554	-27	7	-20	-2	-22	-5%	14%	-4%	-20%	-4%	1.2	1.0	0.8	0.7	0.9	Pass	Pass	Pass	Pass	Pass
	49	200	21	221	5	226	155	22	177	6	183	-45	1	-44	1	-43	-23%	6%	-20%	26%	-19%	3.4	0.3	3.1	0.5	3.0	Pass	Pass	Pass	Pass	Pass
	61	463	48	511	16	527	548	71	618	18	636	85	22	107	2	109	18%	47%	21%	15%	21%	3.8	2.9	4.5	0.6	4.5	Pass	Pass	Pass	Pass	Pass
	152	156	24	180	9	189	182	25	207	7	214	26	1	27	-2	25	17%	5%	15%	-24%	13%	2.0	0.2	2.0	0.8	1.8	Pass	Pass	Pass	Pass	Pass
	48	758	73	831	25	856	736	91	827	28	855	-23	19	-4	3	-1	-3%	26%	0%	11%	0%	0.8	2.1	0.1	0.5	0.0	Pass	Pass	Pass	Pass	Pass
	110	232	18	250	1	251	191	42	233	11	244	-41	24	-17	10	-7	-18%	131%	-7%	998%	-3%	2.8	4.3	1.1	4.1	0.5	Pass	Pass	Pass	Pass	Pass
	14	1337	82	1,419	70	1,489	1,401	194	1,596	66	1,662	65	113	177	-4	173	5%	137%	12%	-6%	12%	1.7	9.6	4.6	0.5	4.4	Pass	Fail	Pass	Pass	Pass
	60	195	17	212	8	220	220	29	248	7	255	25	11	36	-1	35	13%	65%	17%	-14%	16%	1.7	2.3	2.4	0.4	2.3	Pass	Pass	Pass	Pass	Pass
	108	359	50	410	3	413	188	32	220	7	228	-171	-19	-190	4	-185	-48%	-37%	-46%	147%	-45%	10.3	2.9	10.7	1.9	10.4	Fail	Pass	Fail	Pass	Fail
Outer SL	23	521	69	590	22	612	511	54	565	11	577	-10	-15	-25	-10	-35	-2%	-21%	-4%	-48%	-6%	0.4	1.9	1.0	2.6	1.4	Pass	Pass	Pass	Pass	Pass
	96					752					488	-	-	-	-	-264	-	-	-	-	-35%	-	-	-	-	10.6	n/a	n/a	n/a	n/a	Fail
	12	1832	103	1,935	92	2,027	1,828	218	2,045	86	2,131	-5	115	111	-6	104	0%	112%	6%	-7%	5%	0.1	9.1	2.5	0.7	2.3	Pass	Fail	Pass	Pass	Pass
	118	405	43	448	12	460	389	53	442	16	458	-17	10	-6	4	-2	-4%	24%	-1%	35%	-1%	0.8	1.5	0.3	1.1	0.1	Pass	Pass	Pass	Pass	Pass
	52	490	23	513	10	523	287	29	316	4	320	-203	6	-197	-6	-203	-41%	25%	-38%	-57%	-39%	10.3	1.1	9.7	2.1	9.9	Fail	Pass	Fail	Pass	Fail
	50	239	20	259	3	262	269	30	299	7	306	30	10	40	4	44	12%	51%	15%	155%	17%	1.9	2.0	2.4	1.9	2.6	Pass	Pass	Pass	Pass	Pass
	62	888	56	944	18	962	880	102	981	22	1,003	-9	46	37	4	41	-1%	82%	4%	21%	4%	0.3	5.2	1.2	0.9	1.3	Pass	Pass	Pass	Pass	Pass
	151	321	57	378	12	390	261	34	296	8	304	-60	-22	-82	-4	-86	-19%	-40%	-22%	-32%	-22%	3.5	3.3	4.5	1.2	4.6	Pass	Pass	Pass	Pass	Pass
	47	833	81	914	24	938	853	111	964	29	993	19	30	49	5	55	2%	37%	5%	23%	6%	0.7	3.1	1.6	1.0	1.8	Pass	Pass	Pass	Pass	Pass
	109	479	60	539	3	542	447	59	506	12	518	-33	-1	-33	9	-24	-7%	-1%	-6%	311%	-4%	1.5	0.1	1.5	3.4	1.0	Pass	Pass	Pass	Pass	Pass
	13	1876	64	1,939	51	1,990	1,687	184	1,871	58	1,928	-188	120	-69	7	-62	-10%	188%	-4%	13%	-3%	4.5	10.8	1.6	0.9	1.4	Pass	Fail	Pass	Pass	Pass
	59	262	10	272	9	281	329	37	366	9	375	67	27	94	0	94	26%	259%	34%	-2%	33%	3.9	5.5	5.3	0.0	5.2	Pass	Pass	Pass	Pass	Pass
	107	240	18	258	3	261	146	17	163	4	167	-94	-2	-95	1	-94	-39%	-9%	-37%	30%	-36%	6.8	0.4	6.6	0.5	6.5	Pass	Pass	Pass	Pass	Pass
North SL	90					200					183	-	-	-	-	-17	-	-	-	-	-9%	-	-	-	-	1.3	n/a	n/a	n/a	n/a	Pass
	98	269	49	318	8	326	279	36	315	8	323	9	-13	-3	1	-3	3%	-26%	-1%	7%	-1%	0.6	1.9	0.2	0.2	0.2	Pass	Pass	Pass	Pass	Pass
	76	238	37	275	3	278	190	33	223	11	233	-48	-4	-52	7	-45	-20%	-10%	-19%	210%	-16%	3.3	0.6	3.3	2.7	2.8	Pass	Pass	Pass	Pass	Pass
	190	530	150	681	6	687	595	103	697	23	721	64	-48	16	17	34	12%	-32%	2%	287%	5%	2.7	4.3	0.6	4.5	1.3	Pass	Pass	Pass	Pass	Pass
	18	1013	57	1070	57	1,127	1,141	91	1232	47	1,279	128	34	162	-10	151	13%	59%	15%	-18%	13%	3.9	3.9	4.8	1.4	4.4	Pass	Pass	Pass	Pass	Pass
North SL	89					206					191	-	-	-	-	-15	-	-	-	-	-8%	-	-	-	-	1.1					
	97	346	63	409	10	419	334	40	373	9	383	-13	-23	-36	-1	-36	-4%	-37%	-9%	-8%	-9%	0.7	3.2	1.8	0.3	1.8	Pass	Pass	Pass	Pass	Pass
	75	269	20	289	2	291	283	43	325	10	335	13	23	36	8	44	5%	118%	13%	363%	15%	0.8	4.1	2.1	3.1	2.5	Pass	Pass	Pass	Pass	Pass
	189	512	47	560	8	568	495	71	566	21	588	-17	24	7	13	20	-3%	51%	1%	161%	4%	0.8	3.1	0.3	3.4	0.8	Pass	Pass	Pass	Pass	Pass
	17	1170	41	1211	54	1,266	1,211	129	1340	38	1,378	41	88	128	-16	112	3%	213%	11%	-30%	9%	1.2	9.5	3.6	2.4	3.1	Pass	Pass	Pass	Pass	Pass
Bognor Regis SL	93	1,069	85	1154	13	1,167	953	130	1083	33	1,115	-116	45	-72	20	-52	-11%	53%	-6%	159%	-4%	3.7	4.3	2.1	4.2	1.5	Pass	Pass	Pass	Pass	Pass
	64	1032	45	1078	18	1,096	1058	145	1202	30	1,232	25	100	125	11	136	2%	220%	12%	62%	12%	0.8	10.2	3.7	2.3	4.0	Pass	Pass	Pass	Pass	Pass
	92	504	105	609	21	630	438	64	502	12	515	-66	-41	-107	-9	-115	-13%	-39%	-18%	-41%	-18%	3.0	4.4	4.5	2.1	4.8	Pass	Pass	Pass	Pass	Pass
	80	206	22	228	3	231	211	34	245	7	252	5	13	17	4	21	2%	58%	8%	107%	9%	0.3	2.4	1.1	1.6	1.3	Pass	Pass	Pass	Pass	Pass
	82	970	74	1044	4	1,048	822	134	956	32	988	-148	60	-87	27	-60	-15%	82%	-8%	619%	-6%	4.9	5.9	2.8	6.4	1.9	Pass	Pass	Pass	Pass	Pass
nor Regi	94	408	48	457	9	466	470	69	538	15	553	61	20	81	6	87	15%	42%	18%	66%	19%	2.9	2.6	3.6	1.7	3.9	Pass	Pass	Pass	Pass	Pass
	63	684	51	735	21	756	609	88	697	26	723	-75	37	-38	5	-33	-11%	72%	-5%	25%	-4%	2.9	4.4	1.4	1.1	1.2	Pass	Pass	Pass	Pass	Pass

…ine / Directio	Site Ref	Observed					Modelled					Diff.					% Diff.					GEH					WebTAG criterion GEH or Flow				
		Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Cars	LGVs	Lights	HGV	Total
	91	372	78	450	15	465	355	55	411	12	422	-17	-22	-39	-4	-43	-5%	-29%	-9%	-24%	-9%	0.9	2.7	1.9	1.0	2.0	Pass	Pass	Pass	Pass	Pass
	79	166	20	186	5	191	239	35	273	8	281	73	15	88	2	90	44%	74%	47%	44%	47%	5.1	2.8	5.8	0.9	5.9	Pass	Pass	Pass	Pass	Pass
	81	542	52	594	6	600	518	77	595	18	613	-25	26	1	12	13	-5%	49%	0%	208%	2%	1.1	3.2	0.0	3.5	0.5	Pass	Pass	Pass	Pass	Pass
Arun SL	99					1407					1231	-	-	-	-	-176	-	-	-	-	-13%	-	-	-	-	4.8	n/a	n/a	n/a	n/a	Pass
	22	1246	53	1299	55	1354	1344	169	1513	44	1558	99	116	214	-11	204	8%	218%	17%	-19%	15%	2.7	11.0	5.7	1.5	5.3	Pass	Fail	Fail	Pass	Fail
Arun SL	100					1274					1189	-	-	-	-	-85	-	-	-	-	-7%	-	-	-	-	2.4	n/a	n/a	n/a	n/a	Pass
	21	1072	56	1128	51	1179	1071	50	1121	50	1170	-2	-6	-8	-1	-9	0%	-10%	-1%	-2%	-1%	0.1	0.8	0.2	0.2	0.3	Pass	Pass	Pass	Pass	Pass
																											GEH OR Hourly flows				
																										Pass	62	62	62	68	66
																										Fail	6	6	6	0	7
																										%Pass	91%	91%	91%	100%	90%

APPENDIX E FLOW VALIDATION

SHEET 1 VALIDATION COUNTS FOR AM PEAK

Link Details			Observed					Modelled					Diff.				
Ref	Direction	Source	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total
1	EB	TRADS	1238	120	1358	151	1509	1,293	259	1,552	141	1,693	56	138	194	-10	184
2	WB	TRADS	1739	95	1834	124	1958	1,646	223	1,869	129	1999	-93	128	35	5	40
3	EB	TRADS	1143	134	1276	135	1411	1,165	253	1,417	139	1557	22	119	141	5	146
4	WB	TRADS	1644	87	1731	121	1852	1,588	208	1,796	125	1921	-56	120	65	4	69
5	EB	TRADS	920	106	1025	128	1153	757	155	912	120	1033	-163	50	-113	-7	-120
6	WB	TRADS	1137	97	1234	125	1359	1,089	177	1,266	126	1392	-49	81	32	1	33
7	EB	TRADS	1163	137	1300	160	1460	991	222	1,214	168	1381	-172	85	-87	8	-79
8	WB	TRADS	1667	137	1804	164	1968	1,608	237	1,844	145	1989	-60	100	40	-19	21
9	EB	TRADS	1101	154	1256	185	1440	1,092	245	1,336	171	1507	-10	91	81	-14	67
10	WB	TRADS	1726	134	1860	160	2020	1,487	201	1,689	138	1827	-239	68	-171	-21	-192
15	EB	TRADS	939	70	1009	109	1118	794	149	942	83	1025	-146	79	-67	-26	-93
16	WB	TRADS	1164	55	1219	97	1316	1,138	132	1,270	113	1382	-26	77	50	16	66
53	NB	WSCC	826	80	905	20	925	813	145	958	22	980	-13	65	53	2	55
55	NB	WSCC	486	37	523	22	545	424	70	495	24	519	-61	33	-28	2	-26
56	SB	WSCC	582	27	609	22	631	546	83	629	21	650	-36	56	20	-2	19
57	NB	WSCC	277	27	304	6	310	221	38	260	15	275	-56	12	-44	9	-35
58	SB	WSCC	639	40	679	9	688	659	105	764	31	795	20	65	85	22	107
65	NB	WSCC	560	64	624	27	651	618	101	718	24	742	58	36	94	-3	91
66	SB	WSCC	372	61	432	23	455	340	72	411	20	431	-32	11	-21	-3	-24
67	NB	WSCC	550	50	600	19	619	531	70	601	20	621	-20	21	1	1	2
68	SB	WSCC	424	84	508	17	525	464	116	580	35	615	40	32	71	18	90
69	EB	WSCC	439	55	494	13	507	562	124	686	42	728	123	69	192	29	221
70	WB	WSCC	374	80	454	20	474	456	76	532	23	554	83	-5	78	2	80
71	EB	WSCC	154	26	179	6	185	128	24	152	8	160	-26	-2	-28	2	-25
72	WB	WSCC	204	16	220	8	228	206	35	241	12	252	2	19	21	4	24
83	NB	WSCC	436	63	499	21	520	359	62	421	42	462	-77	-2	-78	21	-58
84	SB	WSCC	306	39	345	24	369	349	59	408	17	425	43	20	63	-7	56
101	EB	WSCC					698	533	78	611	31	643					-55
102	WB	WSCC					840	386	55	440	45	485					-355
103	NB	WSCC					464	513	37	550	24	574					110
104	SB	WSCC					477	265	77	342	15	357					-120

Ref	% Diff.					GEH					GEH OR Hourly flows				
	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total
1	4%	115%	14%	-7%	12%	1.6	10.1	5.1	0.8	4.6	Pass	Fail	Pass	Pass	Pass
2	-5%	135%	2%	4%	2%	2.3	10.1	0.8	0.5	0.9	Pass	Fail	Pass	Pass	Pass
3	2%	89%	11%	4%	10%	0.6	8.6	3.8	0.4	3.8	Pass	Fail	Pass	Pass	Pass
4	-3%	138%	4%	4%	4%	1.4	9.9	1.5	0.4	1.6	Pass	Fail	Pass	Pass	Pass
5	-18%	47%	-11%	-6%	-10%	5.6	4.3	3.6	0.7	3.6	Fail	Pass	Pass	Pass	Pass
6	-4%	84%	3%	1%	2%	1.5	6.9	0.9	0.1	0.9	Pass	Pass	Pass	Pass	Pass
7	-15%	62%	-7%	5%	-5%	5.2	6.4	2.4	0.6	2.1	Pass	Pass	Pass	Pass	Pass
8	-4%	73%	2%	-12%	1%	1.5	7.3	0.9	1.5	0.5	Pass	Pass	Pass	Pass	Pass
9	-1%	59%	6%	-7%	5%	0.3	6.4	2.2	1.0	1.7	Pass	Pass	Pass	Pass	Pass
10	-14%	51%	-9%	-13%	-10%	6.0	5.2	4.1	1.7	4.4	Pass	Pass	Pass	Pass	Pass
15	-16%	112%	-7%	-24%	-8%	4.9	7.5	2.1	2.7	2.8	Pass	Pass	Pass	Pass	Pass
16	-2%	139%	4%	16%	5%	0.8	7.9	1.4	1.6	1.8	Pass	Pass	Pass	Pass	Pass
53	-2%	82%	6%	11%	6%	0.4	6.2	1.7	0.5	1.8	Pass	Pass	Pass	Pass	Pass
55	-13%	88%	-5%	10%	-5%	2.9	4.5	1.3	0.5	1.1	Pass	Pass	Pass	Pass	Pass
56	-6%	206%	3%	-7%	3%	1.5	7.5	0.8	0.3	0.7	Pass	Pass	Pass	Pass	Pass
57	-20%	44%	-15%	153%	-11%	3.6	2.1	2.6	2.8	2.1	Pass	Pass	Pass	Pass	Pass
58	3%	164%	12%	252%	16%	0.8	7.6	3.1	5.0	3.9	Pass	Pass	Pass	Pass	Pass
65	10%	56%	15%	-12%	14%	2.4	4.0	3.6	0.6	3.5	Pass	Pass	Pass	Pass	Pass
66	-9%	18%	-5%	-12%	-5%	1.7	1.4	1.0	0.6	1.1	Pass	Pass	Pass	Pass	Pass
67	-4%	41%	0%	5%	0%	0.8	2.7	0.0	0.2	0.1	Pass	Pass	Pass	Pass	Pass
68	9%	38%	14%	110%	17%	1.9	3.2	3.1	3.6	3.8	Pass	Pass	Pass	Pass	Pass
69	28%	125%	39%	230%	44%	5.5	7.3	7.9	5.6	8.9	Fail	Pass	Fail	Pass	Fail
70	22%	-6%	17%	12%	17%	4.1	0.5	3.5	0.5	3.5	Pass	Pass	Pass	Pass	Pass
71	-17%	-6%	-15%	41%	-14%	2.2	0.3	2.1	0.9	1.9	Pass	Pass	Pass	Pass	Pass
72	1%	120%	9%	49%	11%	0.1	3.8	1.4	1.2	1.6	Pass	Pass	Pass	Pass	Pass
83	-18%	-2%	-16%	99%	-11%	3.9	0.2	3.7	3.7	2.6	Pass	Pass	Pass	Pass	Pass
84	14%	52%	18%	-30%	15%	2.4	2.9	3.2	1.6	2.8	Pass	Pass	Pass	Pass	Pass
101					-8%					2.1	n/a	n/a	n/a	n/a	Pass
102					-42%					13.8	n/a	n/a	n/a	n/a	Fail
103					24%					4.8	n/a	n/a	n/a	n/a	Pass
104					-25%					5.9	n/a	n/a	n/a	n/a	Fail

	GEH OR Hourly flows				
	Car	LGV	Lights	HGV	Total
Pass	25	23	26	27	28
Fail	2	4	1	0	3
%Pass	93%	85%	96%	100%	90%

SHEET 2 VALIDATION COUNTS FOR IP PEAK

Link Details			Observed					Modelled					Diff.					% Diff.					GEH					GEH OR Hourly flows				
Ref	Direction	Source	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total
1	EB	TRADS	1149	97	1247	148	1395	1160	205	1364	93	1457	11	107	118	-55	62	1%	110%	9%	-37%	4%	0.3	8.7	3.3	5.0	1.7	Pass	Fail	Pass	Pass	Pass
2	WB	TRADS	1234	110	1344	161	1505	1149	167	1316	113	1429	-85	57	-28	-48	-76	-7%	52%	-2%	-30%	-5%	2.5	4.8	0.8	4.1	2.0	Pass	Pass	Pass	Pass	Pass
3	EB	TRADS	1231	114	1345	141	1486	1274	232	1506	100	1606	43	117	161	-41	120	4%	103%	12%	-29%	8%	1.2	8.9	4.3	3.7	3.0	Pass	Fail	Pass	Pass	Pass
4	WB	TRADS	1111	106	1217	148	1365	1015	149	1164	108	1272	-97	43	-53	-40	-93	-9%	41%	-4%	-27%	-7%	3.0	3.8	1.5	3.5	2.6	Pass	Pass	Pass	Pass	Pass
5	EB	TRADS	1077	84	1161	126	1287	832	165	998	92	1090	-245	82	-163	-33	-197	-23%	97%	-14%	-26%	-15%	7.9	7.3	5.0	3.2	5.7	Fail	Pass	Pass	Pass	Pass
6	WB	TRADS	1019	105	1124	152	1276	896	161	1057	118	1175	-123	57	-66	-35	-101	-12%	54%	-6%	-23%	-8%	4.0	4.9	2.0	3.0	2.9	Pass	Pass	Pass	Pass	Pass
7	EB	TRADS	1289	114	1404	166	1570	1040	199	1240	118	1357	-249	85	-164	-49	-213	-19%	75%	-12%	-29%	-14%	7.3	6.8	4.5	4.1	5.6	Fail	Pass	Pass	Pass	Pass
8	WB	TRADS	1200	117	1318	190	1507	993	167	1160	124	1283	-208	50	-158	-66	-224	-17%	42%	-12%	-35%	-15%	6.3	4.2	4.5	5.3	6.0	Fail	Pass	Pass	Pass	Pass
9	EB	TRADS	1341	133	1474	166	1640	1301	210	1511	123	1634	-40	77	37	-43	-6	-3%	58%	3%	-26%	0%	1.1	5.9	1.0	3.6	0.1	Pass	Pass	Pass	Pass	Pass
10	WB	TRADS	1296	131	1426	189	1615	1226	201	1427	132	1559	-70	71	1	-57	-56	-5%	54%	0%	-30%	-3%	2.0	5.5	0.0	4.5	1.4	Pass	Pass	Pass	Pass	Pass
15	EB	TRADS	836	62	899	108	1007	867	142	1009	65	1074	31	80	110	-43	67	4%	127%	12%	-40%	7%	1.0	7.9	3.6	4.6	2.1	Pass	Pass	Pass	Pass	Pass
16	WB	TRADS	881	65	946	119	1065	876	106	982	101	1083	-4	40	36	-18	18	0%	62%	4%	-15%	2%	0.1	4.4	1.2	1.8	0.5	Pass	Pass	Pass	Pass	Pass
53	NB	WSCC	928	79	1007	24	1031	878	154	1031	42	1074	-51	74	24	19	43	-5%	94%	2%	79%	4%	1.7	6.9	0.7	3.3	1.3	Pass	Pass	Pass	Pass	Pass
55	NB	WSCC	447	32	479	19	498	399	72	470	24	495	-48	39	-9	5	-3	-11%	121%	-2%	29%	-1%	2.3	5.4	0.4	1.2	0.2	Pass	Pass	Pass	Pass	Pass
56	SB	WSCC	519	35	554	22	576	425	84	509	17	526	-94	49	-45	-5	-50	-18%	138%	-8%	-23%	-9%	4.3	6.3	2.0	1.2	2.1	Pass	Pass	Pass	Pass	Pass
57	NB	WSCC	323	24	347	7	354	257	42	299	18	317	-65	18	-48	11	-37	-20%	73%	-14%	144%	-10%	3.8	3.1	2.6	3.0	2.0	Pass	Pass	Pass	Pass	Pass
58	SB	WSCC	294	26	320	10	330	207	35	243	15	258	-87	10	-77	5	-72	-30%	37%	-24%	52%	-22%	5.5	1.7	4.6	1.5	4.2	Pass	Pass	Pass	Pass	Pass
65	NB	WSCC	410	59	469	22	491	383	84	468	25	492	-27	26	-1	3	1	-7%	44%	0%	13%	0%	1.4	3.0	0.1	0.6	0.1	Pass	Pass	Pass	Pass	Pass
66	SB	WSCC	430	60	489	22	511	437	90	527	28	555	8	30	38	6	44	2%	50%	8%	27%	9%	0.4	3.5	1.7	1.2	1.9	Pass	Pass	Pass	Pass	Pass
67	NB	WSCC	532	70	602	25	627	496	91	587	23	611	-36	21	-15	-2	-16	-7%	30%	-2%	-6%	-3%	1.6	2.4	0.6	0.3	0.7	Pass	Pass	Pass	Pass	Pass
68	SB	WSCC	632	84	716	26	742	605	111	716	32	748	-27	27	0	6	6	-4%	32%	0%	24%	1%	1.1	2.7	0.0	1.1	0.2	Pass	Pass	Pass	Pass	Pass
69	EB	WSCC	426	63	489	24	513	509	101	610	41	651	83	38	120	17	138	19%	60%	25%	74%	27%	3.8	4.2	5.1	3.1	5.7	Pass	Pass	Fail	Pass	Fail
70	WB	WSCC	416	60	476	23	499	441	90	531	32	563	25	30	55	9	64	6%	51%	12%	39%	13%	1.2	3.5	2.5	1.7	2.8	Pass	Pass	Pass	Pass	Pass
71	EB	WSCC	158	19	177	9	186	139	27	167	8	175	-19	8	-11	-1	-11	-12%	42%	-6%	-8%	-6%	1.5	1.7	0.8	0.3	0.8	Pass	Pass	Pass	Pass	Pass
72	WB	WSCC	174	20	194	9	203	156	33	188	16	204	-18	13	-6	7	1	-11%	64%	-3%	73%	1%	1.4	2.5	0.4	1.9	0.1	Pass	Pass	Pass	Pass	Pass
83	NB	WSCC	262	41	303	24	327	188	40	228	25	252	-75	-1	-76	1	-75	-29%	-3%	-25%	5%	-23%	5.0	0.2	4.7	0.2	4.4	Pass	Pass	Pass	Pass	Pass
84	SB	WSCC	331	56	387	28	415	201	38	240	17	256	-129	-18	-147	-12	-159	-39%	-32%	-38%	-41%	-38%	7.9	2.6	8.3	2.4	8.7	Fail	Pass	Fail	Pass	Fail
101	EB	WSCC					674	388	73	461	40	501					-173					-26%					7.1	n/a	n/a	n/a	n/a	Fail
102	WB	WSCC					716	446	64	510	40	551					-165					-23%					6.6	n/a	n/a	n/a	n/a	Fail
103	NB	WSCC					402	397	41	438	39	478					76					19%					3.6	n/a	n/a	n/a	n/a	Pass
104	SB	WSCC					465	312	52	364	20	384					-81					-17%					3.9	n/a	n/a	n/a	n/a	Pass

	GEH OR Hourly flows				
	Car	LGV	Lights	HGV	Total
Pass	23	25	25	27	27
Fail	4	2	2	0	4
%Pass	85%	93%	93%	100%	87%

SHEET 3 VALIDATION COUNTS FOR PM PEAK

Link Details			Observed					Modelled					Diff.					% Diff.					GEH					GEH OR Hourly flows				
Ref	Direction	Source	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total	Car	LGV	Lights	HGV	Total
1	EB	TRADS	1822	58	1880	65	1945	1646	191	1837	57	1894	-176	133	-43	-8	-51	-10%	229%	-2%	-12%	-3%	4.2	11.9	1.0	1.0	1.2	Pass	Fail	Pass	Pass	Pass
2	WB	TRADS	1538	90	1627	67	1695	1675	188	1864	62	1926	138	99	236	-5	231	9%	110%	15%	-8%	14%	3.4	8.4	5.7	0.6	5.4	Pass	Pass	Pass	Pass	Pass
3	EB	TRADS	2163	90	2253	71	2324	1868	207	2075	63	2138	-295	117	-178	-8	-186	-14%	130%	-8%	-11%	-8%	6.6	9.6	3.8	0.9	3.9	Pass	Fail	Pass	Pass	Pass
4	WB	TRADS	1303	88	1391	64	1455	1351	148	1499	57	1556	48	60	108	-7	101	4%	68%	8%	-11%	7%	1.3	5.5	2.8	0.9	2.6	Pass	Pass	Pass	Pass	Pass
5	EB	TRADS	1227	47	1274	55	1329	1011	111	1122	45	1167	-216	64	-153	-9	-162	-18%	135%	-12%	-17%	-12%	6.5	7.2	4.4	1.3	4.6	Fail	Pass	Pass	Pass	Pass
6	WB	TRADS	1016	54	1070	56	1126	864	63	926	53	980	-153	9	-144	-3	-146	-15%	17%	-13%	-5%	-13%	5.0	1.2	4.6	0.3	4.5	Pass	Pass	Pass	Pass	Pass
7	EB	TRADS	1783	74	1858	80	1938	1554	184	1737	64	1801	-230	109	-120	-17	-137	-13%	147%	-6%	-21%	-7%	5.6	9.6	2.8	1.9	3.2	Pass	Fail	Pass	Pass	Pass
8	WB	TRADS	1420	102	1522	104	1626	1241	113	1354	69	1423	-180	12	-168	-35	-203	-13%	12%	-11%	-33%	-12%	4.9	1.1	4.4	3.7	5.2	Pass	Pass	Pass	Pass	Pass
9	EB	TRADS	1774	88	1862	73	1935	1657	190	1847	65	1912	-117	102	-15	-8	-23	-7%	116%	-1%	-10%	-1%	2.8	8.7	0.4	0.9	0.5	Pass	Fail	Pass	Pass	Pass
10	WB	TRADS	1552	98	1649	91	1740	1531	144	1675	73	1749	-21	47	26	-18	8	-1%	48%	2%	-19%	0%	0.5	4.3	0.6	2.0	0.2	Pass	Pass	Pass	Pass	Pass
15	EB	TRADS	1192	46	1238	48	1286	1147	129	1276	37	1314	-45	83	38	-10	28	-4%	181%	3%	-22%	2%	1.3	8.9	1.1	1.6	0.8	Pass	Pass	Pass	Pass	Pass
16	WB	TRADS	966	46	1012	52	1064	1099	75	1174	48	1221	133	29	161	-4	157	14%	61%	16%	-8%	15%	4.1	3.7	4.9	0.6	4.6	Pass	Pass	Pass	Pass	Pass
53	NB	WSCC	1274	76	1350	30	1380	1414	158	1572	29	1601	140	82	222	-1	221	11%	108%	16%	-4%	16%	3.8	7.6	5.8	0.2	5.7	Pass	Pass	Fail	Pass	Fail
55	NB	WSCC	583	16	599	11	610	453	57	510	15	525	-130	42	-88	3	-85	-22%	268%	-15%	30%	-14%	5.7	6.9	3.8	1.0	3.6	Fail	Pass	Pass	Pass	Pass
56	SB	WSCC	598	23	621	13	634	548	109	657	9	666	-50	86	36	-4	32	-8%	374%	6%	-31%	5%	2.1	10.6	1.4	1.2	1.2	Pass	Pass	Pass	Pass	Pass
57	NB	WSCC	733	30	763	4	767	389	71	460	10	470	-344	40	-303	6	-297	-47%	132%	-40%	176%	-39%	14.5	5.7	12.3	2.4	11.9	Fail	Pass	Fail	Pass	Fail
58	SB	WSCC	322	22	345	2	347	269	31	300	7	307	-53	8	-45	5	-40	-17%	37%	-13%	202%	-12%	3.1	1.6	2.5	2.2	2.2	Pass	Pass	Pass	Pass	Pass
65	NB	WSCC	517	49	567	12	579	466	62	528	20	548	-52	13	-39	8	-31	-10%	27%	-7%	62%	-5%	2.3	1.8	1.6	1.9	1.3	Pass	Pass	Pass	Pass	Pass
66	SB	WSCC	631	64	696	11	707	662	81	743	20	762	30	17	47	8	55	5%	26%	7%	74%	8%	1.2	2.0	1.8	2.1	2.0	Pass	Pass	Pass	Pass	Pass
67	NB	WSCC	664	79	744	12	756	672	80	752	20	772	8	1	8	8	16	1%	1%	1%	64%	2%	0.3	0.1	0.3	2.0	0.6	Pass	Pass	Pass	Pass	Pass
68	SB	WSCC	683	58	741	9	750	583	57	640	14	653	-100	-1	-101	4	-97	-15%	-2%	-14%	49%	-13%	4.0	0.1	3.8	1.3	3.6	Pass	Pass	Pass	Pass	Pass
69	EB	WSCC	447	47	494	14	508	505	61	566	15	581	58	14	72	1	73	13%	30%	14%	10%	14%	2.6	1.9	3.1	0.4	3.1	Pass	Pass	Pass	Pass	Pass
70	WB	WSCC	469	46	515	11	526	410	58	468	16	485	-59	12	-47	6	-41	-13%	26%	-9%	56%	-8%	2.8	1.7	2.1	1.6	1.8	Pass	Pass	Pass	Pass	Pass
71	EB	WSCC	244	17	261	3	264	223	24	248	6	253	-21	8	-13	2	-11	-8%	46%	-5%	72%	-4%	1.4	1.7	0.8	1.1	0.7	Pass	Pass	Pass	Pass	Pass
72	WB	WSCC	218	23	241	7	248	160	20	180	5	185	-58	-3	-61	-2	-63	-27%	-12%	-25%	-26%	-25%	4.2	0.6	4.2	0.7	4.3	Pass	Pass	Pass	Pass	Pass
83	NB	WSCC	428	29	457	13	470	328	51	379	15	394	-100	22	-78	2	-76	-23%	73%	-17%	17%	-16%	5.1	3.4	3.8	0.6	3.6	Pass	Pass	Pass	Pass	Pass
84	SB	WSCC	594	73	667	14	681	458	79	537	17	554	-136	6	-131	3	-127	-23%	8%	-20%	23%	-19%	5.9	0.6	5.3	0.8	5.1	Fail	Pass	Fail	Pass	Fail
101	EB	WSCC					816	610	105	715	23	738					-78					-10%					2.8	n/a	n/a	n/a	n/a	Pass
102	WB	WSCC					801	617	71	688	21	710					-91					-11%					3.3	n/a	n/a	n/a	n/a	Pass
103	NB	WSCC					477	364	18	381	9	390					-87					-18%					4.2	n/a	n/a	n/a	n/a	Pass
104	SB	WSCC					617	335	74	409	8	417					-200					-32%					8.8	n/a	n/a	n/a	n/a	Fail

	GEH OR Hourly flows				
	Car	LGV	Lights	HGV	Total
Pass	23	23	24	27	27
Fail	4	4	3	0	4
%Pass	85%	85%	89%	100%	87%

APPENDIX F TURN FLOW VALIDATION

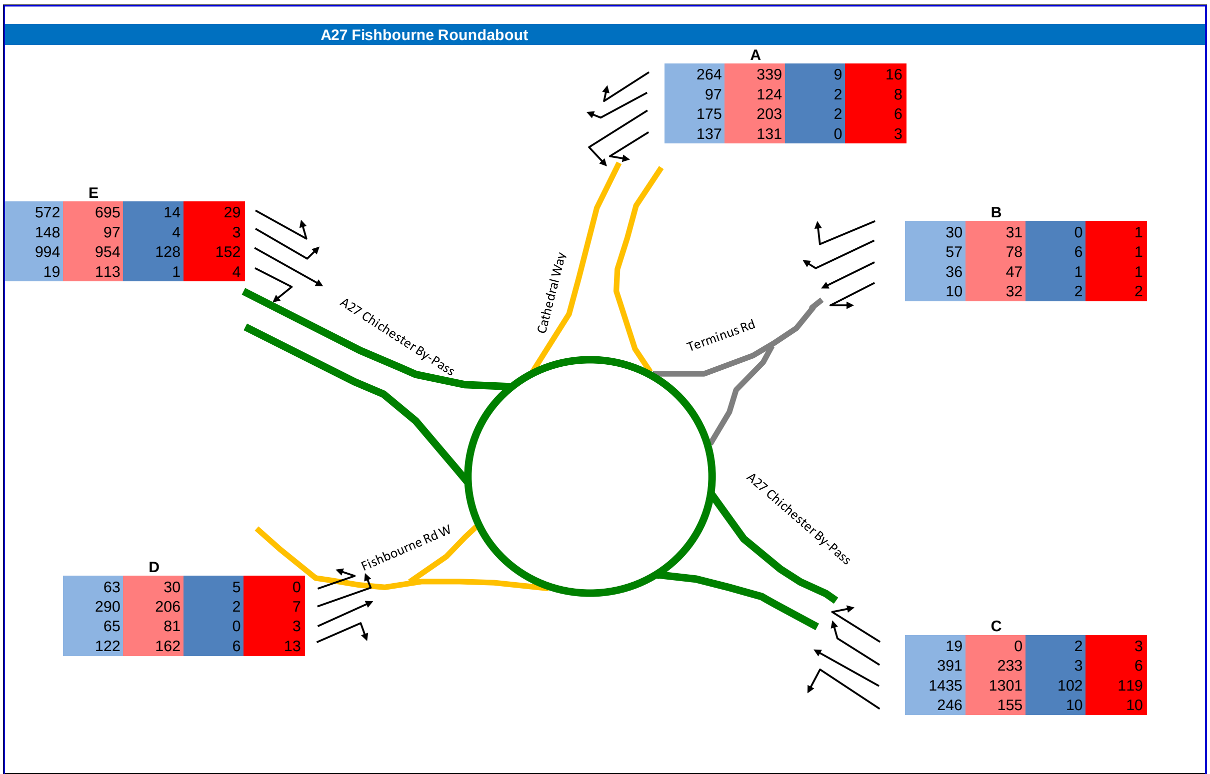
SHEET 1 Turn Validation - AM – Peak Hour

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
Fishbourne	E To A	520	52	572	14	586	569	126	695	29	724	49	74	123	15	138	9%	140%	21%	109%	24%	2.1	7.8	4.9	3.3	5.4	1	1	0	1	0	Pass	Pass	Pass	Pass	Fail
	E To B	114	34	148	4	151	87	10	97	3	100	-27	-24	-51	-1	-51	-24%	-70%	-34%	-24%	-34%	2.7	5.1	4.6	0.5	4.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To C	691	303	994	128	1122	774	180	954	152	1106	83	-123	-40	24	-16	12%	-41%	-4%	19%	-1%	3.1	7.9	1.3	2.1	0.5	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	E To D	16	3	19	1	20	94	20	113	4	117	78	17	94	3	97	493%	573%	501%	304%	491%	10.5	5.0	11.6	1.9	11.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To E	8	6	14	2	16	0	0	0	0	0	-8	-6	-14	-2	-16	-100%	-100%	-100%	-100%	-100%	4.0	3.4	5.3	2.0	5.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	125	12	137	0	137	118	13	131	3	134	-7	1	-6	3	-3	-5%	9%	-4%		-2%	0.6	0.3	0.5	2.4	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	161	14	175	2	177	171	31	203	6	209	10	17	28	4	32	6%	124%	16%	203%	18%	0.7	3.6	2.0	2.0	2.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	87	10	97	2	99	102	22	124	8	132	15	12	27	6	33	17%	122%	28%	304%	33%	1.5	3.0	2.6	2.7	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To E	247	18	264	9	273	289	50	339	16	355	42	32	75	7	82	17%	181%	28%	80%	30%	2.6	5.5	4.3	2.0	4.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	6	4	10	2	12	28	4	32	2	34	22	0	22	0	22	386%	4%	233%	4%	195%	5.4	0.1	4.9	0.1	4.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	21	15	36	1	37	40	7	47	1	48	19	-8	11	0	11	89%	-54%	29%	4%	28%	3.4	2.5	1.6	0.0	1.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To E	43	13	57	6	62	67	12	78	1	79	24	-1	21	-5	17	55%	-11%	38%	-83%	27%	3.2	0.4	2.6	2.6	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	20	10	30	0	30	27	4	31	1	32	7	-6	1	1	2	34%	-58%	4%		8%	1.4	2.1	0.2	1.4	0.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	185	60	246	10	255	131	23	155	10	165	-54	-37	-91	0	-90	-29%	-62%	-37%	1%	-35%	4.3	5.8	6.4	0.0	6.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	1183	251	1435	102	1536	1153	148	1301	119	1420	-30	-103	-134	17	-116	-3%	-41%	-9%	17%	-8%	0.9	7.3	3.6	1.6	3.0	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	C To A	370	21	391	3	394	203	30	233	6	239	-167	9	-158	3	-155	-45%	44%	-40%	102%	-39%	9.9	1.8	8.9	1.4	8.7	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	C To B	12	7	19	2	21	0	0	0	3	3	-12	-7	-19	1	-18	-100%	-100%	-100%	52%	-86%	4.9	3.7	6.1	0.6	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To E	61	2	63	5	68	30	0	30	0	30	-31	-2	-33	-5	-38	-51%	-100%	-52%	-100%	-56%	4.6	2.0	4.8	3.1	5.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	275	16	290	2	292	176	31	206	7	213	-99	15	-84	5	-79	-36%	100%	-29%	261%	-27%	6.6	3.2	5.3	2.4	5.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	58	7	65	0	65	70	11	81	3	84	12	4	16	3	19	20%	62%	25%		29%	1.5	1.4	1.9	2.4	2.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	104	18	122	6	128	129	32	162	13	175	25	14	40	7	47	24%	74%	33%	123%	37%	2.3	2.7	3.3	2.3	3.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Stockbridge	D To A	48	10	57	5	62	88	11	99	4	103	40	1	42	-1	41	85%	11%	72%	-19%	65%	4.9	0.3	4.7	0.4	4.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	732	259	991	114	1105	849	198	1047	160	1207	117	-61	56	46	102	16%	-24%	6%	41%	9%	4.2	4.1	1.8	3.9	3.0	0	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	179	73	252	17	269	154	36	190	7	197	-25	-37	-62	-10	-72	-14%	-51%	-25%	-58%	-27%	2.0	5.0	4.2	2.8	4.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	0	2	2	0	2	0	0	0	0	0	0	-2	-2	0	-2		-100%	-100%		-100%	0.0	2.0	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	104	32	136	6	142	31	5	36	2	38	-73	-27	-100	-4	-104	-70%	-85%	-74%	-66%	-73%	8.9	6.3	10.8	2.0	11.0	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	A To C	98	28	126	8	134	181	40	221	12	233	83	12	95	4	99	85%	41%	75%	53%	74%	7.0	2.0	7.2	1.3	7.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	70	19	88	7	95	2	0	3	4	7	-68	-19	-85	-3	-88	-97%	-100%	-97%	-42%	-93%	11.3	6.1	12.6	1.2	12.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	152	33	185	6	191	237	58	295	16	311	85	25	110	10	120	55%	78%	59%	169%	63%	6.1	3.8	7.1	3.0	7.6	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	B To D	1257	234	1491	100	1591	1161	153	1315	124	1439	-96	-81	-176	24	-152	-8%	-35%	-12%	24%	-10%	2.8	5.8	4.7	2.3	3.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	217	30	247	6	252	210	25	235	5	240	-7	-5	-12	-1	-12	-3%	-16%	-5%	-16%	-5%	0.5	0.9	0.7	0.4	0.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	18	2	20	0	20	0	0	0	0	0	-18	-2	-20	0	-20	-100%	-100%	-100%		-100%	6.0	2.0	6.3	0.0	6.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
	C To D	334	40	374	13	387	332	49	380	11	391	-2	9	6	-2	4	-1%	22%	2%	-14%	1%	0.1	1.3	0.3	0.5	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	181	21	202	6	208	252	33	285	10	295	71	12	83	4	87	39%	60%	41%	70%	42%	4.8	2.4	5.3	1.5	5.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	141	41	182	12	194	112	19	131	5	136	-29	-22	-51	-7	-58	-21%	-54%	-28%	-57%	-30%	2.6	4.0	4.1	2.3	4.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Whyke	D To A	105	34	139	5	144	154	29	183	11	194	49	-5	44	6	50	47%	-14%	32%	122%	35%	4.3	0.8	3.5	2.1	3.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	721	261	982	120	1102	748	162	910	146	1056	27	-99	-72	26	-46	4%	-38%	-7%	22%	-4%	1.0	6.8	2.3	2.3	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	149	28	177	8	185	90	31	121	10	131	-59	3	-56	2	-54	-40%	12%	-32%	26%	-29%	5.4	0.6	4.6	0.7	4.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	2	0	2	0	2	0	0	0	0	0	-2	0	-2	0	-2	-100%		-100%		-100%	2.0	0.0	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	42	6	48	2	50	32	0	32	0	32	-10	-6	-16	-2	-18	-24%	-100%	-33%	-100%	-36%	1.7	3.4	2.5	2.0	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	82	15	97	7	104	100	20	120	7	127	18	5	23	0	23	23%	30%	24%	4%	22%	1.9	1.1	2.2	0.1	2.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	74	24	98	1	99	88	15	103	5	108	14	-9	5	4	9	19%	-38%	5%	421%	9%	1.6	2.0	0.5	2.3	0.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	1	1	2	0	2	0	0	0	0	0	-1	-1	-2	0	-2	-100%	-100%	-100%		-100%	1.4	1.4	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	123	29	151	9	160	142	36	178	9	187	19	7	27	0	27	16%	25%	18%	1%	17%	1.7	1.3	2.1	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	1104	204	1308	104	1412	1064	158	1222	118	1340	-40	-46	-86	14	-72	-4%	-23%	-7%	14%	-5%	1.2	3.4	2.4	1.3	1.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	62	14	76	2	78	22	2	24	0	24	-40	-12	-52	-2	-54	-65%	-86%	-69%	-100%	-69%	6.2	4.2	7.4	2.0	7.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	0	2	2	0	2	0	0	0	0	0	0	-2	-2	0	-2		-100%	-100%		-100%	0.0	2.0	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	394	39	433	6	439	458	63	521	21	542	64	24	88	15	103	16%	60%	20%	265%	24%	3.1	3.3	4.0	4.2	4.7	1	1	1	1	0	Pass	Pass	Pass	Pass	Pass
	C To A	294	34	327	12	339	209	28	236	7	243	-85	-6	-91	-5	-96	-29%	-17%	-28%	-39%	-28%	5.3	1.0	5.4	1.5	5.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	151	30	180	10	190	205	29	234	6	240	54	-1	54	-4	50	36%	-3%	30%	-38%	26%	4.1	0.1	3.7	1.3	3.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Bognor Rd	D To E	66	16	82	3	85	21	0	21	0	21	-45	-16	-61	-3	-64	-68%	-100%	-74%	-100%	-75%	6.9	5.6	8.5	2.4	8.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	606	216	822	90	912	688	142	831	117	948	82	-74	9	27	36	14%	-34%	1%	30%	4%	3.2	5.5	0.3	2.6	1.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	221	73	294	44	338	216	49	265	35	300	-5	-24	-29	-9	-38	-2%	-33%	-10%	-20%	-11%	0.3	3.1	1.7	1.4	2.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	13	2	15	5	20	59	1	59	0	59	46	-1	44	-5	39	358%	-49%	297%	-100%	198%	7.7	0.8	7.3	3.1	6.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	2	0	2	0	2	0	0	0	0	0	-2	0	-2	0	-2	-100%		-100%		-100%	2.0	0.0	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To A	67	34	101	3	104	63	13	75	5	80	-4	-21	-26	2	-24	-5%	-62%	-26%	70%	-23%	0.5	4.4	2.8	1.0	2.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To B	215	38	253	12	265	300	60	360	27	387	85	22	107	15	122	40%	57%	42%	130%	46%	5.3	3.1	6.1	3.5	6.8	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	E To C	68	10	77	1	78	95	19	114	7	121	27	9	37	6	43	40%	94%	47%	614%	54%	3.0	2.4	3.7	3.0	4.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To D	68	19	86	2	88	67	12	79	4	83	-1	-7	-7	2	-5	-1%	-36%	-8%	104%	-6%	0.1	1.7	0.8	1.2	0.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	57	13	70	12	82	34	7	42	4	46	-23	-6	-28	-8	-36	-41%	-46%	-40%	-66%	-44%	3.5	1.9	3.8	2.8	4.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	42	8	50	2	51	34	8	41	4	45	-8	0	-9	2	-6	-18%	1%	-17%	102%	-13%	1.2	0.0	1.3	1.2	0.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	935	158	1093	66	1159	926	150	1076	111	1187	-9	-8	-17	45	28	-1%	-5%	-2%	67%	2%	0.3	0.7	0.5	4.7	0.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To E	65	23	88	3	91	95	13	108	7	115	30	-10	20	4	24	45%	-43%	23%	136%	26%	3.3	2.3	2.0	1.8	2.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	3	1	4	5	9	0	0	0	0	0	-3	-1	-4	-5	-9	-100%	-100%	-100%	-100%	-100%	2.4	1.4	2.8	3.1	4.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	10	3	13	1	14	0	0	0	0	0	-10	-3	-13	-1	-14	-100%	-100%	-100%	-100%	-100%	4.4	2.4	5.0	1.4	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	368	60	428	43	470	277	41	318	15	333	-91	-19	-110	-28	-137	-25%	-32%	-26%	-65%	-29%	5.0	2.7	5.7	5.2	6.9	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	B To E	379	57	437	10	446	347	48	395	18	413	-32	-9	-42	8	-33	-9%	-16%	-10%	86%	-7%	1.7	1.3	2.0	2.2	1.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	65	18	83	9	92	0	0	0	0	0	-65	-18	-83	-9	-92	-100%	-100%	-100%	-100%	-100%	11.4	6.1	12.9	4.2	13.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
	B To B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	56	6	61	1	62	2	0	2	0	2	-54	-6	-59	-1	-60	-96%	-100%	-97%	-100%	-97%	10.0	3.4	10.6	1.4	10.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	77	12	88	1	89	186	27	213	9	222	109	15	125	8	133	142%	134%	141%	838%	149%	9.5	3.5	10.2	3.6	10.6	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	C To A	37	8	45	2	47	28	5	32	2	34	-9	-3	-13	0	-13	-25%	-35%	-29%	4%	-28%	1.7	1.1	2.1	0.1	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	0	2	2	2	4	0	0	0	0	0	0	-2	-2	-2	-4		-100%	-100%	-100%	-100%	0.0	2.0	2.0	2.0	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Oving Rd	C To D	10	7	17	1	18	0	0	0	0	0	-10	-7	-17	-1	-18	-100%	-100%	-100%	-100%	-100%	4.4	3.7	5.8	1.4	6.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	632	227	858	102	960	713	138	851	115	966	81	-89	-7	13	6	13%	-39%	-1%	13%	1%	3.1	6.6	0.3	1.3	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	70	8	78	0	78	44	18	61	6	67	-26	10	-17	6	-11	-37%	127%	-22%		-14%	3.5	2.8	2.1	3.5	1.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	64	15	80	1	81	18	4	22	8	30	-46	-11	-58	7	-51	-72%	-74%	-72%	733%	-63%	7.2	3.7	8.1	3.3	6.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	78	11	88	0	88	66	13	80	3	83	-12	2	-8	3	-5	-15%	23%	-9%		-6%	1.4	0.7	0.9	2.4	0.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	6	1	7	2	9	0	0	0	0	0	-6	-1	-7	-2	-9	-100%	-100%	-100%	-100%	-100%	3.4	1.4	3.7	2.0	4.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	90	4	94	4	98	18	4	22	3	25	-72	0	-72	-1	-73	-80%	1%	-77%	-24%	-74%	9.8	0.0	9.5	0.5	9.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	934	209	1142	83	1226	1010	163	1173	123	1296	76	-46	31	40	70	8%	-22%	3%	48%	6%	2.5	3.4	0.9	3.9	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	145	21	165	3	168	94	12	106	16	122	-51	-9	-59	13	-46	-35%	-42%	-36%	439%	-28%	4.6	2.2	5.1	4.2	3.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	106	8	113	2	115	99	18	117	6	123	-7	10	4	4	8	-6%	134%	3%	213%	7%	0.7	2.9	0.3	2.1	0.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	195	15	210	1	211	194	27	220	5	225	-1	12	10	4	14	0%	76%	5%	421%	7%	0.1	2.5	0.7	2.3	0.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	159	12	171	1	172	102	19	121	11	132	-57	7	-50	10	-40	-36%	65%	-29%	1046%	-23%	5.0	1.9	4.1	4.1	3.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Portfield	D To A	18	6	24	0	24	0	0	0	0	0	-18	-6	-24	0	-24	-100%	-100%	-100%		-100%	6.0	3.4	6.9	0.0	6.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	358	55	414	15	429	330	91	421	19	440	-28	36	7	4	11	-8%	64%	2%	28%	3%	1.5	4.2	0.4	1.0	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	125	20	145	5	149	5	5	10	4	14	-120	-15	-135	-1	-135	-96%	-75%	-93%	-19%	-91%	14.9	4.2	15.3	0.4	15.0	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	D To D	50	8	58	1	59	8	2	9	0	9	-42	-6	-49	-1	-50	-84%	-75%	-85%	-100%	-85%	7.9	2.7	8.5	1.4	8.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	31	3	34	5	39	38	0	38	0	38	7	-3	4	-5	-1	24%	-100%	13%	-100%	-2%	1.2	2.4	0.7	3.1	0.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	120	24	144	11	154	103	17	120	12	132	-17	-7	-24	1	-22	-14%	-28%	-16%	10%	-15%	1.6	1.5	2.1	0.3	1.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	6	2	8	0	8	3	1	4	0	4	-3	-1	-4	0	-4	-49%	-49%	-49%		-49%	1.4	0.8	1.6	0.0	1.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	2	0	2	3	5	0	0	0	0	0	-2	0	-2	-3	-5	-100%		-100%	-100%	-100%	2.0	0.0	2.0	2.4	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	938	156	1094	70	1164	1013	155	1168	125	1293	75	-1	74	55	129	8%	-1%	7%	78%	11%	2.4	0.1	2.2	5.5	3.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	690	64	754	12	766	778	94	872	19	891	88	30	118	7	125	13%	46%	16%	60%	16%	3.2	3.3	4.1	1.8	4.3	1	1	0	1	0	Pass	Pass	Pass	Pass	Pass
	B To A	83	18	101	5	106	0	0	0	0	0	-83	-18	-101	-5	-106	-100%	-100%	-100%	-100%	-100%	12.9	6.0	14.2	3.1	14.6	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	B To B	14	3	17	2	19	0	0	0	0	0	-14	-3	-17	-2	-19	-100%	-100%	-100%	-100%	-100%	5.3	2.4	5.8	2.0	6.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	193	26	219	7	226	60	10	71	4	75	-133	-16	-148	-3	-151	-69%	-61%	-68%	-42%	-67%	11.8	3.7	12.3	1.3	12.3	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	C To A	220	62	282	13	295	107	21	128	13	141	-113	-41	-154	0	-154	-51%	-66%	-55%	1%	-52%	8.8	6.4	10.8	0.0	10.4	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	C To B	518	212	730	97	827	648	126	774	112	886	130	-86	44	15	59	25%	-41%	6%	15%	7%	5.4	6.6	1.6	1.5	2.0	0	1	1	1	1	Fail	Pass	Pass	Pass	Pass
	C To C	6	0	6	7	13	1	2	3	1	4	-5	2	-3	-6	-9	-83%		-49%	-86%	-69%	2.7	2.0	1.4	3.0	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Avenue de Chartres / Via	A To B	165	26	191	6	197	98	20	118	3	121	-67	-6	-73	-3	-76	-40%	-24%	-38%	-49%	-39%	5.8	1.3	5.9	1.4	6.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	59	1	60	0	60	69	8	77	2	79	10	7	17	2	19	17%	716%	29%		32%	1.3	3.3	2.1	2.0	2.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	271	22	293	10	303	198	30	229	23	252	-73	8	-64	13	-51	-27%	39%	-22%	135%	-17%	4.8	1.7	4.0	3.3	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	12	3	15	0	15	0	0	0	0	0	-12	-3	-15	0	-15	-100%	-100%	-100%		-100%	4.8	2.4	5.4	0.0	5.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
	B To C	56	0	56	0	56	182	23	205	7	212	126	23	149	7	156	226%		267%		280%	11.6	6.8	13.1	3.7	13.5	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	B To D	233	8	241	5	246	202	35	237	17	254	-31	27	-4	12	8	-13%	346%	-2%	247%	3%	2.1	5.9	0.3	3.7	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	168	26	194	15	209	167	25	192	11	203	-1	-1	-2	-4	-6	0%	-6%	-1%	-25%	-3%	0.0	0.3	0.1	1.0	0.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	9	0	9	1	10	0	0	0	0	0	-9	0	-9	-1	-10	-100%		-100%	-100%	-100%	4.2	0.0	4.2	1.4	4.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	12	1	13	0	13	5	1	6	0	6	-7	0	-7	0	-7	-60%	4%	-55%		-55%	2.5	0.0	2.4	0.0	2.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	8	0	8	0	8	3	1	3	0	3	-5	1	-5	0	-5	-61%		-61%		-61%	2.0	1.4	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	1	0	1	0	1	2	0	2	0	2	1	0	1	0	1	108%		108%		108%	0.9	0.0	0.9	0.0	0.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	325	23	348	13	361	213	1	215	17	232	-112	-22	-133	4	-129	-35%	-96%	-38%	33%	-36%	6.8	6.3	7.9	1.1	7.5	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	D To B	325	19	344	5	349	333	73	406	9	415	8	54	62	4	66	2%	292%	18%	84%	19%	0.4	8.0	3.2	1.6	3.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	103	1	104	0	104	92	11	103	3	106	-11	10	-1	3	2	-11%	1022%	-1%		2%	1.1	4.1	0.1	2.4	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Hornet/ Needlema	A To B	452	73	524	19	543	498	87	585	37	622	46	14	61	18	79	10%	20%	12%	99%	15%	2.1	1.6	2.6	3.5	3.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	499	47	546	8	554	536	74	610	19	629	37	27	64	11	75	7%	57%	12%	142%	14%	1.6	3.5	2.7	3.0	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	689	95	784	18	802	854	120	974	54	1028	165	25	190	36	226	24%	26%	24%	206%	28%	5.9	2.4	6.4	6.1	7.5	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
St Pancras/ New Park Rd	G To A	455	72	526	10	536	518	82	600	37	637	63	10	74	27	101	14%	15%	14%	278%	19%	2.9	1.2	3.1	5.6	4.2	1	1	1	1	0	Pass	Pass	Pass	Pass	Pass
	F To G	444	87	531	11	542	516	72	588	10	598	72	-15	57	-1	56	16%	-17%	11%	-7%	10%	3.3	1.7	2.4	0.2	2.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	F To A	299	55	354	23	376	297	73	370	12	382	-2	18	16	-11	6	-1%	33%	5%	-47%	2%	0.1	2.3	0.9	2.5	0.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Market Rd/ The Hornet/ St Pancras	D To E	14	6	20	1	21	0	0	0	1	1	-14	-6	-20	0	-20	-100%	-100%	-100%	2%	-95%	5.2	3.4	6.3	0.0	6.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To F	368	54	421	20	441	247	66	313	6	319	-121	12	-108	-14	-122	-33%	22%	-26%	-69%	-28%	6.9	1.6	5.7	3.8	6.3	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	E To F	44	14	59	5	63	16	3	18	1	19	-28	-11	-41	-4	-44	-64%	-79%	-69%	-79%	-70%	5.1	3.9	6.6	2.2	6.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	726	50	776	16	792	675	98	773	38	811	-51	48	-3	22	19	-7%	96%	0%	142%	2%	1.9	5.6	0.1	4.3	0.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	132	19	151	2	153	164	20	184	20	204	32	1	33	18	51	25%	4%	22%	942%	34%	2.7	0.2	2.6	5.5	3.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To F	329	74	403	9	412	550	76	627	15	642	221	3	224	6	230	67%	3%	56%	70%	56%	10.5	0.3	9.9	1.8	10.0	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
																						GEH Statistics					Flow Criterion					GEH OR Hourly flows				
																					% Pass	72%	83%	70%	96%	70%	91%	99%	88%	100%	86%	92%	99%	89%	100%	

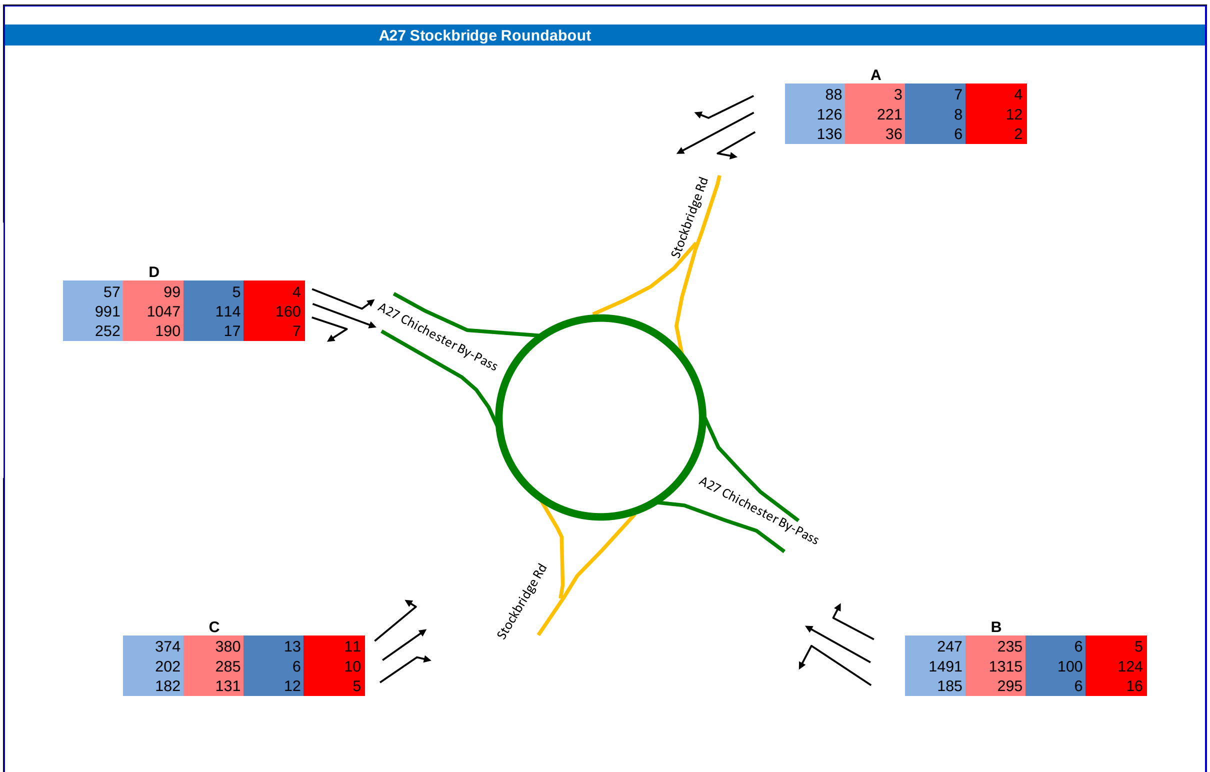


Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Fishbourne Roundabout



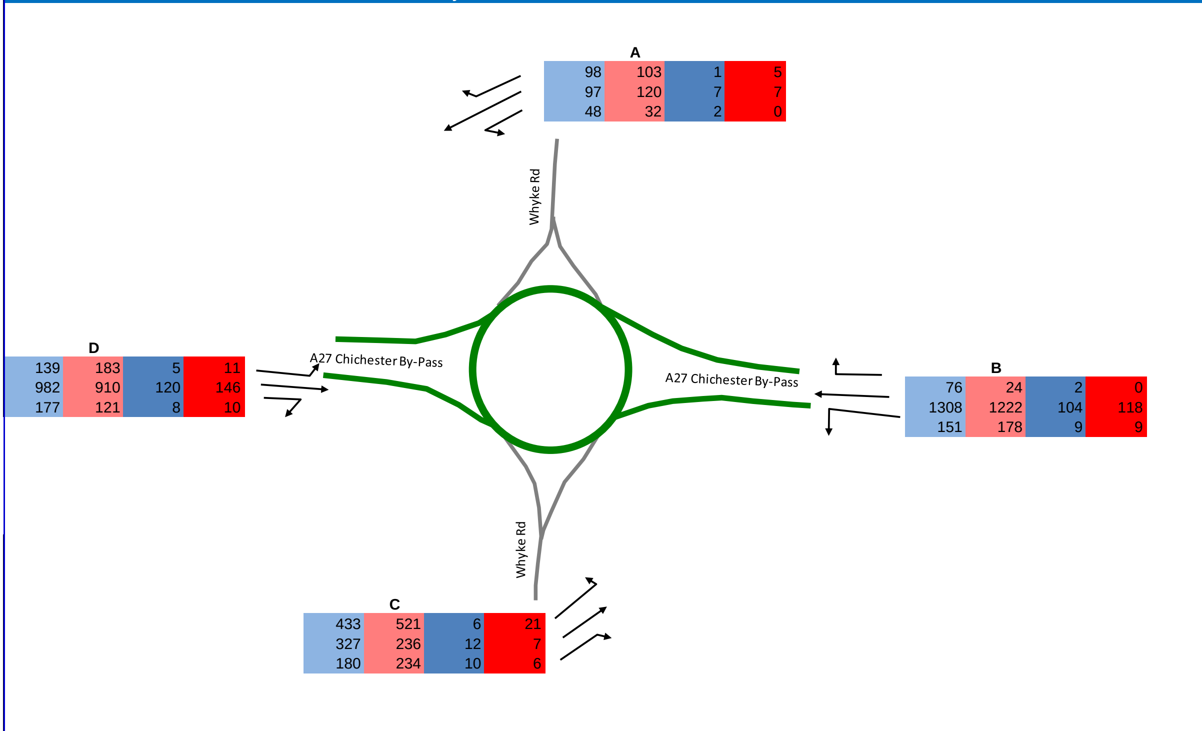
Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Stockbridge Roundabout

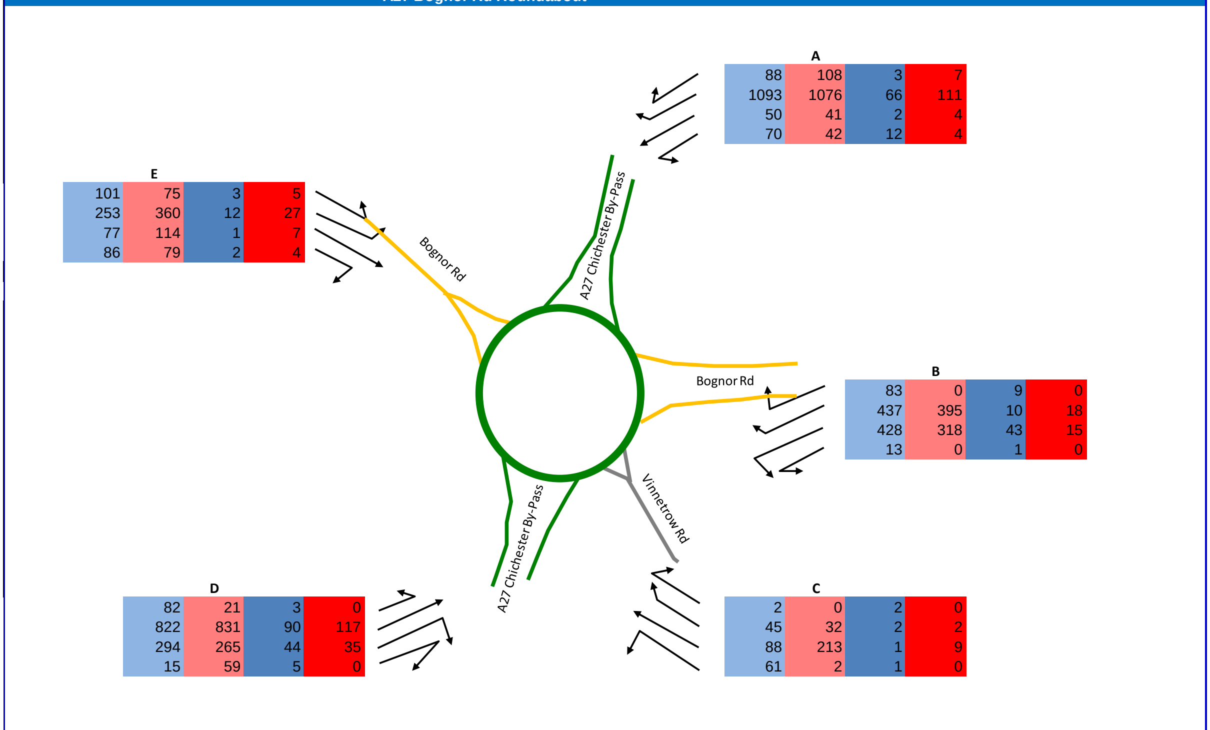
A27 Whyke Roundabout



Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE: Turning Movements at A27 Whyke Roundabout

A27 Bognor Rd Roundabout



Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE: Turning Movements at A27 Bognor Rd Roundabout

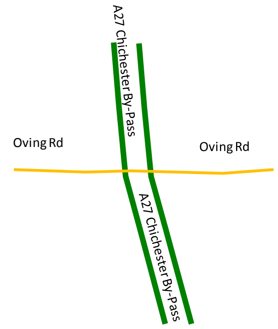
A27 Oving Road Signalised Junction

A

165	106	3	16
1142	1173	83	123
94	22	4	3

D

80	22	1	8
88	80	0	3
7	0	2	0



B

171	121	1	11
210	220	1	5
113	117	2	6

C

17	0	1	0
858	851	102	115
78	61	0	6

Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
A27 Oving Road Signalised Junction

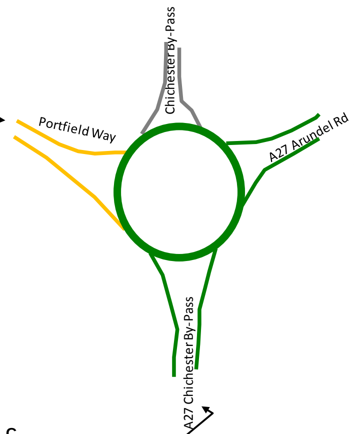
A27 Portfield Roundabout

A

8	4	0	0
144	120	11	12
34	38	5	0

D

24	0	0	0
414	421	15	19
145	10	5	4



B

101	0	5	0
754	872	12	19
1094	1168	70	125

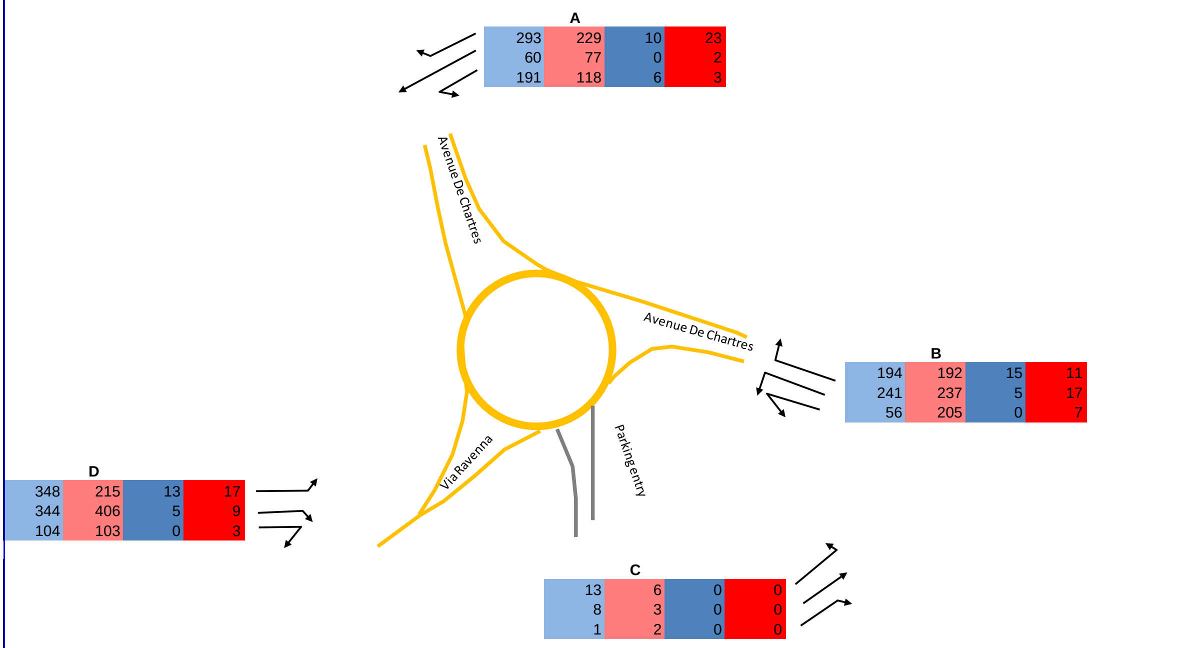
C

219	71	7	4
282	128	13	13
730	774	97	112

Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
A27 Portfield Roundabout

Via Ravenna/Avenue De Chartres Roundabout



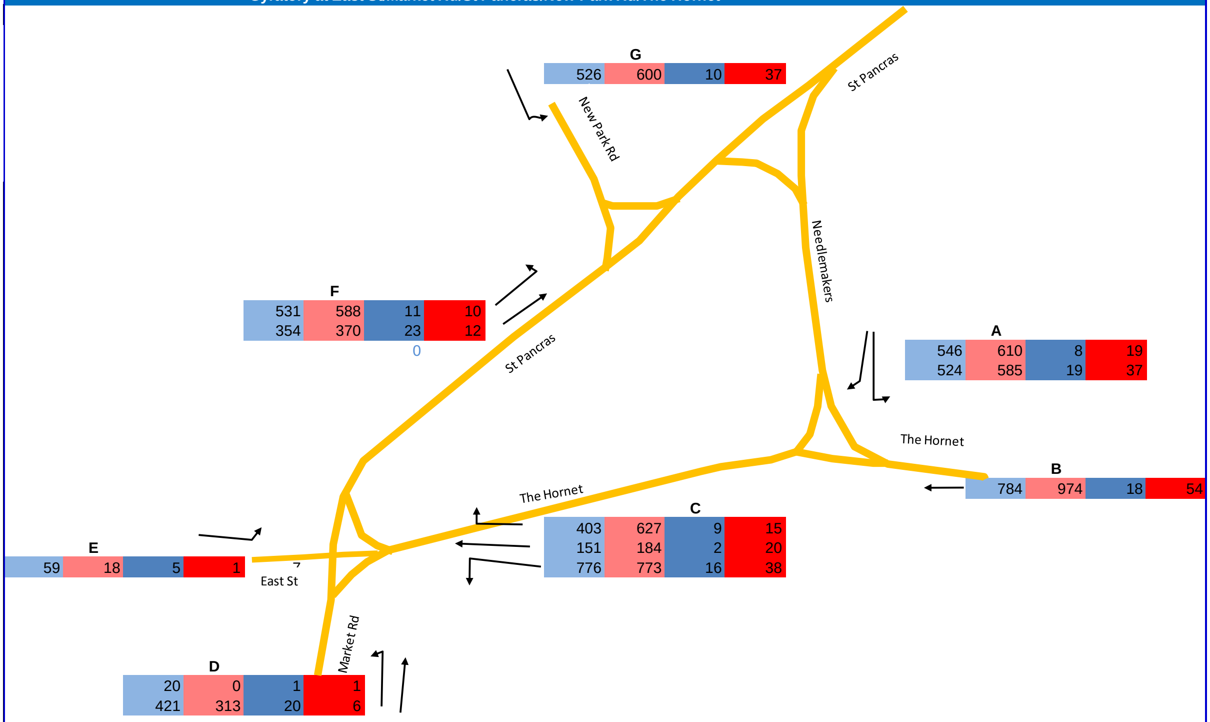
Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
Via Ravenna/Avenue De Chartres Roundabout

Gyratory at East St/Market Rd/St Pancras/New Park Rd/The Hornet



Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

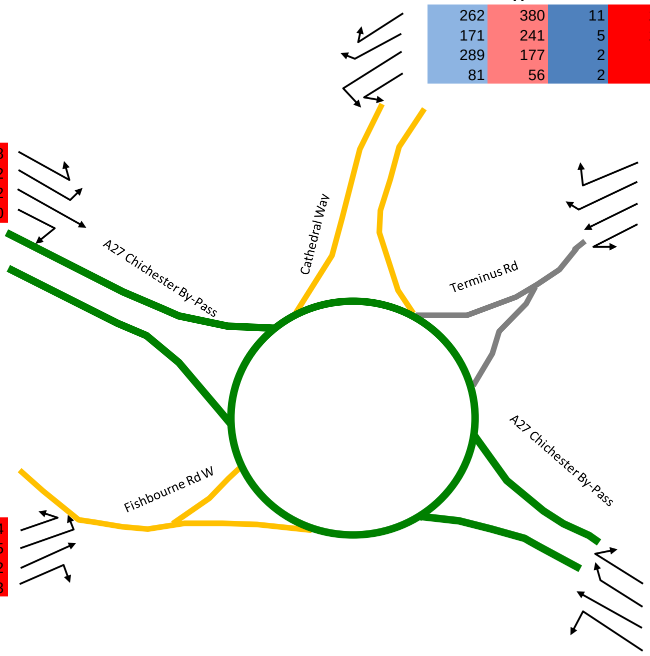
Turning Movements at
Gyratory at East St/Market Rd/St Pancras/New Park Rd/The Hornet

SHEET 2 Turn Validation – IP – Average Hour

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
Fishbourne	E To A	235	32	268	10	278	373	67	440	18	458	138	35	172	8	180	59%	107%	64%	78%	65%	7.9	4.9	9.2	2.1	9.4	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	E To B	36	16	53	5	58	36	5	42	2	44	0	-11	-11	-3	-14	-1%	-69%	-20%	-60%	-24%	0.1	3.4	1.5	1.6	1.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To C	809	206	1014	107	1121	812	136	948	92	1040	3	-70	-66	-15	-81	0%	-34%	-7%	-14%	-7%	0.1	5.4	2.1	1.5	2.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To D	42	8	51	2	53	125	36	161	10	171	83	28	111	8	118	195%	346%	219%	395%	226%	9.0	5.9	10.7	3.3	11.2	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	E To E	2	0	3	0	3	0	0	0	0	0	-2	0	-3	0	-3	-100%		-100%		-100%	2.0	0.0	2.5	0.0	2.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	66	15	81	2	83	48	8	56	2	58	-18	-7	-25	0	-25	-27%	-47%	-31%	-1%	-30%	2.3	2.1	3.0	0.0	3.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	271	18	289	2	291	162	15	177	4	181	-109	-3	-112	2	-110	-40%	-17%	-39%	98%	-38%	7.4	0.8	7.3	1.1	7.2	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	A To D	159	13	171	5	176	194	47	241	11	252	35	34	70	6	76	22%	258%	41%	118%	43%	2.7	6.2	4.9	2.1	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To E	225	36	262	11	273	325	55	380	15	395	100	19	118	4	122	44%	51%	45%	35%	45%	6.0	2.8	6.6	1.1	6.7	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	A To A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	20	6	26	2	28	88	10	98	4	102	68	4	72	2	74	350%	62%	281%	94%	267%	9.3	1.3	9.2	1.1	9.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	32	8	40	0	40	33	7	40	2	42	1	-1	0	2	2	3%	-15%	0%		5%	0.2	0.4	0.0	2.0	0.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To E	34	13	47	5	53	26	4	29	1	30	-8	-9	-18	-4	-23	-24%	-70%	-39%	-81%	-43%	1.5	3.2	3.0	2.4	3.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	45	8	54	1	55	46	8	54	3	57	1	0	0	2	2	2%	-3%	1%	191%	4%	0.1	0.1	0.1	1.4	0.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	170	40	210	12	222	176	38	214	15	229	6	-2	4	3	7	4%	-6%	2%	24%	3%	0.5	0.4	0.3	0.8	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	876	261	1135	134	1270	899	139	1037	110	1147	23	-122	-98	-24	-123	3%	-47%	-9%	-18%	-10%	0.8	8.6	3.0	2.2	3.5	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	C To A	135	15	150	2	153	112	20	133	3	136	-23	5	-17	1	-17	-17%	32%	-12%	49%	-11%	2.1	1.2	1.5	0.6	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	10	3	12	1	13	39	4	44	3	47	29	1	32	2	34	286%	32%	263%	197%	258%	5.8	0.5	6.0	1.4	6.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	6	2	8	1	9	0	0	0	0	0	-6	-2	-8	-1	-9	-100%	-100%	-100%	-100%	-100%	3.5	2.0	4.0	1.4	4.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To E	18	5	23	3	27	47	10	56	4	60	29	5	33	1	34	161%	89%	140%	26%	126%	5.1	1.7	5.2	0.4	5.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	178	16	195	6	201	117	21	138	5	143	-61	5	-57	-1	-58	-34%	32%	-29%	-21%	-29%	5.0	1.2	4.4	0.6	4.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	33	10	42	1	43	32	5	38	2	40	-1	-5	-4	1	-3	-3%	-48%	-10%	89%	-8%	0.2	1.7	0.7	0.8	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	162	41	204	10	213	239	49	288	23	311	77	8	84	13	98	47%	19%	42%	141%	46%	5.4	1.1	5.4	3.3	6.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	0	0	1	0	1	0	0	0	0	0	0	0	-1	0	-1			-100%		-100%	0.0	0.0	1.5	0.0	1.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Stockbridge	D To A	43	11	55	3	58	41	7	48	4	52	-2	-4	-7	1	-6	-6%	-37%	-12%	32%	-10%	0.4	1.4	0.9	0.5	0.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	881	207	1088	106	1194	889	159	1049	106	1155	8	-48	-39	0	-39	1%	-23%	-4%	0%	-3%	0.3	3.6	1.2	0.0	1.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	291	41	333	12	345	370	44	415	13	428	79	3	82	1	83	27%	6%	25%	7%	24%	4.4	0.4	4.2	0.2	4.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	4	2	6	0	6	0	0	0	0	0	-4	-2	-6	0	-6	-100%	-100%	-100%		-100%	2.8	2.0	3.5	0.0	3.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	123	30	153	6	159	64	9	74	5	79	-59	-21	-79	-1	-80	-48%	-70%	-52%	-18%	-50%	6.1	4.7	7.4	0.5	7.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	184	26	209	6	215	177	34	212	11	223	-7	9	3	5	8	-4%	33%	1%	80%	4%	0.5	1.6	0.2	1.7	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	60	15	75	4	80	68	11	79	3	82	8	-4	4	-1	2	13%	-28%	5%	-26%	3%	1.0	1.2	0.4	0.6	0.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	1	0	1	0	1	0	0	0	0	0	-1	0	-1	0	-1	-100%		-100%		-100%	1.4	0.0	1.4	0.0	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	195	28	223	8	231	101	25	126	6	132	-94	-3	-97	-2	-99	-48%	-12%	-44%	-26%	-43%	7.7	0.6	7.4	0.8	7.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	894	250	1143	131	1275	865	137	1002	116	1118	-29	-113	-141	-15	-157	-3%	-45%	-12%	-12%	-12%	1.0	8.2	4.3	1.4	4.5	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	B To A	100	20	120	4	124	27	5	32	1	33	-73	-15	-88	-3	-91	-73%	-75%	-73%	-75%	-73%	9.2	4.3	10.1	1.9	10.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	15	3	18	1	19	0	0	0	0	0	-15	-3	-18	-1	-19	-100%	-100%	-100%	-100%	-100%	5.5	2.5	6.0	1.4	6.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	247	55	302	16	318	302	55	357	13	370	55	0	55	-3	52	22%	0%	18%	-20%	16%	3.3	0.0	3.0	0.9	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	170	29	199	7	206	252	49	301	15	316	82	20	102	8	110	48%	72%	51%	110%	53%	5.6	3.3	6.5	2.4	6.8	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	C To B	156	30	186	12	198	87	31	118	7	125	-69	1	-68	-5	-73	-44%	5%	-36%	-43%	-37%	6.3	0.3	5.5	1.7	5.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Whyke	D To A	66	27	94	4	98	94	19	113	7	120	28	-8	19	3	22	43%	-30%	20%	73%	22%	3.2	1.7	1.9	1.3	2.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	949	217	1167	112	1279	871	152	1023	100	1123	-78	-65	-144	-12	-156	-8%	-30%	-12%	-11%	-12%	2.6	4.8	4.3	1.2	4.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	160	27	187	8	195	75	28	104	10	114	-85	1	-83	2	-81	-53%	3%	-44%	24%	-42%	7.8	0.1	6.9	0.6	6.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	8	1	9	1	10	0	0	0	0	0	-8	-1	-9	-1	-10	-100%	-100%	-100%	-100%	-100%	4.0	1.4	4.3	1.4	4.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	39	7	46	1	47	75	10	85	4	89	36	3	39	3	42	93%	40%	85%	292%	90%	4.8	1.0	4.8	1.9	5.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	116	18	135	9	144	168	31	199	10	209	52	13	64	1	65	44%	69%	48%	9%	45%	4.3	2.5	5.0	0.3	4.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	64	28	92	3	95	54	10	63	3	66	-10	-18	-29	0	-29	-16%	-64%	-31%	-2%	-30%	1.3	4.0	3.3	0.0	3.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	0	1	1	0	1	0	0	0	0	0	0	-1	-1	0	-1		-100%	-100%		-100%	0.0	1.4	1.4	0.0	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	126	25	152	10	162	178	35	213	8	221	52	10	62	-2	59	41%	39%	41%	-21%	37%	4.2	1.8	4.6	0.7	4.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	966	243	1209	124	1333	775	129	904	108	1012	-191	-114	-305	-16	-321	-20%	-47%	-25%	-13%	-24%	6.5	8.4	9.4	1.5	9.4	0	0	0	1	0	Fail	Fail	Fail	Pass	Fail
	B To A	29	6	35	1	36	66	10	76	3	79	37	4	41	2	43	125%	65%	115%	197%	117%	5.3	1.4	5.4	1.4	5.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	1	0	1	1	2	0	0	0	0	0	-1	0	-1	-1	-2	-100%		-100%	-100%	-100%	1.4	0.0	1.4	1.4	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	164	28	192	11	203	164	29	193	12	205	0	1	1	1	2	0%	5%	1%	7%	1%	0.0	0.3	0.1	0.2	0.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	123	18	143	10	153	150	24	174	7	181	27	6	31	-3	28	22%	31%	22%	-31%	18%	2.3	1.2	2.5	1.1	2.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	122	27	149	8	157	211	32	242	8	250	89	5	93	0	93	72%	21%	63%	-2%	59%	6.9	1.0	6.7	0.1	6.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Bognor Rd	D To E	71	18	89	5	94	36	6	41	2	43	-35	-12	-48	-3	-51	-49%	-67%	-54%	-60%	-54%	4.8	3.5	5.9	1.6	6.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	796	169	964	83	1046	735	142	877	81	958	-61	-27	-87	-2	-88	-8%	-16%	-9%	-2%	-8%	2.2	2.1	2.9	0.2	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	224	53	277	30	307	290	45	335	29	364	66	-8	58	-1	57	29%	-14%	21%	-4%	19%	4.1	1.1	3.3	0.2	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	20	4	24	2	26	96	1	97	0	97	76	-3	73	-2	71	375%	-75%	300%	-100%	269%	9.9	1.9	9.3	2.0	9.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	5	2	7	1	8	0	0	0	0	0	-5	-2	-7	-1	-8	-100%	-100%	-100%	-100%	-100%	3.2	2.0	3.8	1.4	4.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To A	78	29	106	5	111	35	6	41	2	43	-43	-23	-65	-3	-68	-55%	-79%	-61%	-61%	-61%	5.7	5.4	7.6	1.6	7.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To B	256	40	296	11	307	333	56	389	20	409	77	16	93	9	102	30%	41%	32%	78%	33%	4.5	2.3	5.0	2.2	5.4	1	1	1	1	0	Pass	Pass	Pass	Pass	Fail
	E To C	102	14	116	1	117	136	23	158	8	166	34	9	42	7	49	33%	61%	36%	684%	42%	3.1	2.0	3.6	3.3	4.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To D	68	18	87	4	91	0	0	0	0	0	-68	-18	-87	-4	-91	-100%	-100%	-100%	-100%	-100%	11.7	6.1	13.2	2.9	13.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	89	12	101	7	108	72	17	88	6	94	-17	5	-13	-1	-14	-19%	40%	-13%	-15%	-13%	1.9	1.3	1.3	0.4	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	78	13	92	6	98	59	13	72	5	77	-19	0	-20	-1	-21	-24%	-1%	-22%	-17%	-21%	2.3	0.0	2.2	0.5	2.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	720	175	895	97	992	735	127	862	103	965	15	-48	-33	6	-27	2%	-27%	-4%	6%	-3%	0.6	3.9	1.1	0.6	0.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
	A To E	31	11	42	2	44	30	5	35	3	38	-1	-6	-7	1	-6	-4%	-55%	-17%	49%	-14%	0.2	2.2	1.2	0.6	1.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	2	0	2	2	4	0	0	0	0	0	-2	0	-2	-2	-4	-100%		-100%	-100%	-100%	2.0	0.0	2.0	2.0	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	25	4	29	2	31	0	0	0	0	0	-25	-4	-29	-2	-31	-100%	-100%	-100%	-100%	-100%	7.0	2.9	7.6	2.0	7.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	279	64	343	35	378	310	51	361	19	380	31	-13	18	-16	2	11%	-20%	5%	-46%	1%	1.8	1.7	1.0	3.1	0.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To E	202	36	238	11	249	280	50	330	17	347	78	14	92	6	98	39%	39%	39%	50%	39%	5.0	2.1	5.5	1.5	5.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	115	11	127	9	136	17	9	26	7	33	-98	-2	-101	-2	-103	-85%	-21%	-79%	-24%	-76%	12.1	0.7	11.5	0.8	11.2	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	B To B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	31	8	39	3	42	3	1	3	0	3	-28	-7	-36	-3	-39	-90%	-88%	-92%	-100%	-93%	6.8	3.4	7.9	2.5	8.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	65	9	74	1	75	123	22	145	7	152	58	13	71	6	77	90%	137%	96%	580%	102%	6.0	3.2	6.8	3.0	7.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	53	10	63	5	68	61	11	73	5	78	8	1	10	0	10	16%	7%	16%	-3%	15%	1.1	0.2	1.2	0.1	1.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	4	2	6	2	8	1	0	1	0	1	-3	-2	-5	-2	-7	-76%	-100%	-84%	-100%	-88%	2.0	2.0	2.7	2.0	3.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Oving Rd	C To D	25	10	35	1	36	30	4	34	1	35	5	-6	-1	0	-1	19%	-60%	-4%	-1%	-4%	0.9	2.3	0.2	0.0	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	847	202	1048	95	1143	760	152	913	85	998	-87	-50	-135	-10	-145	-10%	-25%	-13%	-10%	-13%	3.1	3.8	4.3	1.0	4.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	43	7	51	1	52	43	9	51	6	57	0	2	1	5	5	-1%	27%	1%	494%	11%	0.1	0.7	0.1	2.7	0.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	86	15	101	2	103	83	15	98	6	104	-3	0	-3	4	1	-3%	-2%	-3%	194%	1%	0.3	0.1	0.3	2.0	0.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	97	11	108	1	109	55	17	72	3	75	-42	6	-36	2	-34	-43%	52%	-33%	194%	-31%	4.8	1.5	3.8	1.4	3.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	16	6	21	1	22	7	2	9	1	10	-9	-4	-12	0	-12	-57%	-67%	-58%	-2%	-55%	2.7	2.0	3.2	0.0	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	78	7	85	3	88	103	8	111	6	117	25	1	26	3	29	32%	13%	31%	98%	33%	2.7	0.3	2.6	1.4	2.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	801	223	1024	108	1132	848	152	999	114	1113	47	-71	-25	6	-19	6%	-32%	-2%	5%	-2%	1.6	5.2	0.8	0.6	0.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	60	16	76	3	79	37	9	46	6	52	-23	-7	-30	3	-27	-38%	-44%	-39%	98%	-34%	3.3	2.0	3.8	1.4	3.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	38	6	45	1	46	41	8	49	4	53	3	2	4	3	7	9%	31%	9%	292%	15%	0.5	0.7	0.6	1.9	1.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	86	10	96	1	97	40	9	49	3	52	-46	-1	-47	2	-45	-53%	-12%	-49%	194%	-46%	5.8	0.4	5.5	1.4	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	86	7	94	3	97	131	16	147	6	153	45	9	53	3	56	53%	124%	57%	96%	58%	4.4	2.6	4.8	1.4	5.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Portfield	D To A	14	3	17	0	17	0	0	0	0	0	-14	-3	-17	0	-17	-100%	-100%	-100%		-100%	5.3	2.5	5.9	0.0	5.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	465	49	514	10	524	420	69	489	20	509	-45	20	-25	10	-15	-10%	39%	-5%	98%	-3%	2.1	2.5	1.1	2.6	0.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	294	27	321	5	326	117	12	129	8	137	-177	-15	-192	3	-189	-60%	-56%	-60%	58%	-58%	12.3	3.4	12.8	1.2	12.4	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	D To D	114	5	119	0	119	4	1	5	0	5	-110	-4	-114	0	-114	-96%	-80%	-96%		-96%	14.3	2.3	14.5	0.0	14.5	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	A To B	29	7	35	10	45	4	0	4	0	4	-25	-7	-31	-10	-41	-86%	-100%	-89%	-100%	-91%	6.2	3.8	7.1	4.5	8.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	135	28	165	20	185	120	25	145	12	157	-15	-3	-20	-8	-28	-11%	-12%	-12%	-41%	-15%	1.4	0.6	1.6	2.0	2.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	24	4	28	1	29	1	0	1	0	1	-23	-4	-27	-1	-28	-96%	-100%	-96%	-100%	-97%	6.5	2.8	7.1	1.4	7.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	1	0	1	1	2	0	0	0	0	0	-1	0	-1	-1	-2	-100%		-100%	-100%	-100%	1.4	0.0	1.4	1.4	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	649	184	833	95	928	741	130	871	105	976	92	-54	38	10	48	14%	-29%	5%	11%	5%	3.5	4.3	1.3	1.0	1.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	432	41	474	8	482	504	75	579	37	616	72	34	105	29	134	17%	81%	22%	358%	28%	3.3	4.4	4.6	6.1	5.7	1	1	0	1	0	Pass	Pass	Pass	Pass	Fail
	B To A	30	7	37	9	46	0	0	0	0	0	-30	-7	-37	-9	-46	-100%	-100%	-100%	-100%	-100%	7.8	3.8	8.6	4.3	9.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	7	1	8	0	8	0	0	0	0	0	-7	-1	-8	0	-8	-100%	-100%	-100%		-100%	3.8	1.4	4.0	0.0	4.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	305	25	330	5	335	80	11	91	6	97	-225	-14	-239	1	-238	-74%	-56%	-72%	19%	-71%	16.2	3.3	16.5	0.4	16.2	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	C To A	168	34	202	22	224	119	17	136	10	146	-49	-17	-66	-12	-78	-29%	-50%	-33%	-55%	-35%	4.1	3.4	5.1	3.0	5.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	606	165	771	81	851	742	147	890	75	965	136	-18	119	-6	114	22%	-11%	15%	-7%	13%	5.2	1.4	4.1	0.7	3.8	0	1	1	1	1	Fail	Pass	Pass	Pass	Pass
	C To C	2	1	3	1	4	10	2	12	1	13	8	1	9	0	9	395%	98%	296%	-1%	222%	3.3	0.8	3.3	0.0	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Avenue de Chartres / Via Ravenna Rdb	A To B	141	22	163	4	167	41	10	51	1	52	-100	-12	-112	-3	-115	-71%	-55%	-69%	-75%	-69%	10.5	3.1	10.8	1.9	11.0	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	A To C	20	0	20	0	20	20	3	23	1	24	0	3	3	1	4	-2%		13%		18%	0.1	2.4	0.6	1.4	0.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	293	34	326	17	344	252	1	253	20	273	-41	-33	-73	3	-71	-14%	-97%	-22%	15%	-21%	2.5	7.8	4.3	0.6	4.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	17	2	19	1	20	0	0	0	0	0	-17	-2	-19	-1	-20	-100%	-100%	-100%	-100%	-100%	5.9	2.0	6.2	1.4	6.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	28	1	28	0	28	62	10	72	3	75	34	9	44	3	47	125%	880%	161%		172%	5.2	3.8	6.3	2.4	6.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	219	13	233	3	236	201	24	225	13	238	-18	11	-8	10	2	-8%	81%	-3%	325%	1%	1.3	2.5	0.5	3.5	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	123	19	143	15	158	202	38	240	12	252	79	19	97	-3	94	64%	96%	68%	-22%	59%	6.2	3.5	7.0	0.9	6.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	16	3	19	1	20	0	0	0	0	0	-16	-3	-19	-1	-20	-100%	-100%	-100%	-100%	-100%	5.7	2.5	6.2	1.4	6.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	42	1	42	0	42	28	4	32	1	33	-14	3	-10	1	-9	-34%	288%	-24%		-22%	2.4	1.9	1.7	1.4	1.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	18	1	18	0	18	19	3	22	1	23	1	2	4	1	5	9%	191%	26%		31%	0.3	1.4	1.0	1.4	1.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	24	1	24	0	24	53	9	61	3	64	29	8	37	3	40	124%	774%	157%		170%	4.7	3.6	5.7	2.4	6.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	242	19	261	14	275	125	2	128	17	145	-117	-17	-133	3	-130	-48%	-90%	-51%	19%	-47%	8.6	5.3	9.5	0.7	9.0	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	D To B	259	19	278	3	282	225	39	264	5	269	-34	20	-14	2	-13	-13%	101%	-5%	63%	-4%	2.2	3.6	0.9	1.0	0.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	29	1	29	0	29	31	5	35	2	37	2	4	6	2	8	9%	390%	23%		30%	0.4	2.3	1.1	2.0	1.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	3	0	3	0	3	0	0	0	0	0	-3	0	-3	0	-3	-100%		-100%		-100%	2.5	0.0	2.5	0.0	2.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
The Hornet/ Needle makers	A To B	496	73	568	18	586	654	113	767	40	807	158	40	199	22	221	32%	56%	35%	127%	38%	6.6	4.2	7.7	4.2	8.4	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	A To C	415	41	454	7	461	371	54	425	25	450	-44	13	-29	18	-11	-11%	31%	-6%	264%	-2%	2.2	1.9	1.4	4.5	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	446	62	508	19	527	609	105	715	39	754	163	43	207	20	227	37%	69%	41%	101%	43%	7.1	4.7	8.4	3.6	9.0	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
St Pancras / New Park Rd	G To A	463	75	538	10	548	511	82	593	33	626	48	7	55	23	78	10%	9%	10%	224%	14%	2.2	0.7	2.3	4.9	3.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	F To G	357	56	412	10	421	400	73	474	22	496	43	17	62	12	75	12%	31%	15%	124%	18%	2.2	2.1	3.0	3.1	3.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	F To A	461	45	508	18	525	477	80	558	20	578	16	35	50	2	53	4%	77%	10%	13%	10%	0.8	4.4	2.2	0.5	2.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Market Rd/ The Hornet/ St Pancras	D To E	21	3	24	1	25	0	0	0	1	1	-21	-3	-24	0	-24	-100%	-100%	-100%	2%	-96%	6.4	2.4	6.9	0.0	6.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To F	471	46	517	21	538	422	76	498	12	510	-49	30	-19	-9	-28	-10%	65%	-4%	-42%	-5%	2.3	3.8	0.9	2.1	1.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To F	131	13	143	1	144	55	9	64	3	67	-76	-4	-79	2	-77	-58%	-33%	-55%	191%	-54%	7.9	1.3	7.8	1.4	7.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	466	44	510	19	528	486	74	561	31	592	21	30	51	12	64	4%	68%	10%	66%	12%	0.9	3.9	2.2	2.5	2.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	156	12	170	1	171	94	15	109	5	114	-62	3	-61	4	-57	-40%	20%	-36%	421%	-33%	5.6	0.7	5.2	2.3	4.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To F	223	44	264	6	270	401	69	470	28	498	178	25	206	22	229	79%	56%	78%	376%	85%	10.0	3.3	10.8	5.4	11.7	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
																						GEH Statistics					Flow Criterion					GEH OR Hourly flows				
																						65%	92%	64%	99%	62%	92%	98%	88%	100%	88%	92%	98%	89%	100%	88%

A27 Fishbourne Roundabout



A

262	380	11	15
171	241	5	11
289	177	2	4
81	56	2	2

B

54	54	1	3
47	29	5	1
40	40	0	2
26	98	2	4

C

12	44	1	3
150	133	2	3
1135	1037	134	110
210	214	12	15

D

23	56	3	4
195	138	6	5
42	38	1	2
204	288	10	23

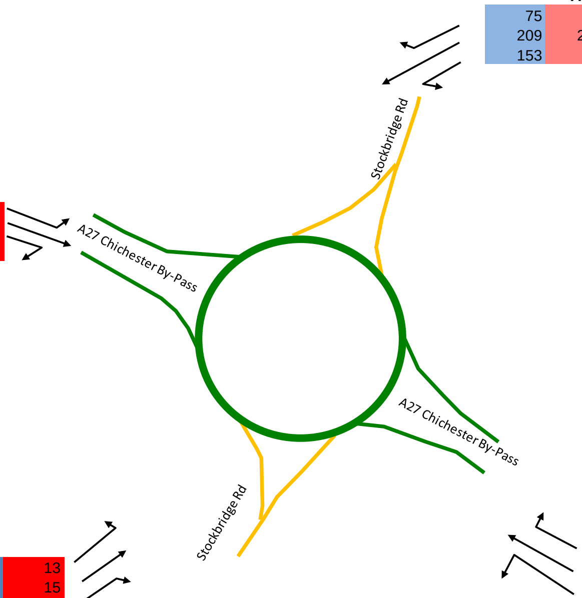
E

268	440	10	18
53	42	5	2
1014	948	107	92
51	161	2	10

Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
A27 Fishbourne Roundabout

A27 Stockbridge Roundabout



A

75	79	4	3
209	212	6	11
153	74	6	5

B

120	32	4	1
1143	1002	131	116
223	126	8	6

C

302	357	16	13
199	301	7	15
186	118	12	7

D

55	48	3	4
1088	1049	106	106
333	415	12	13

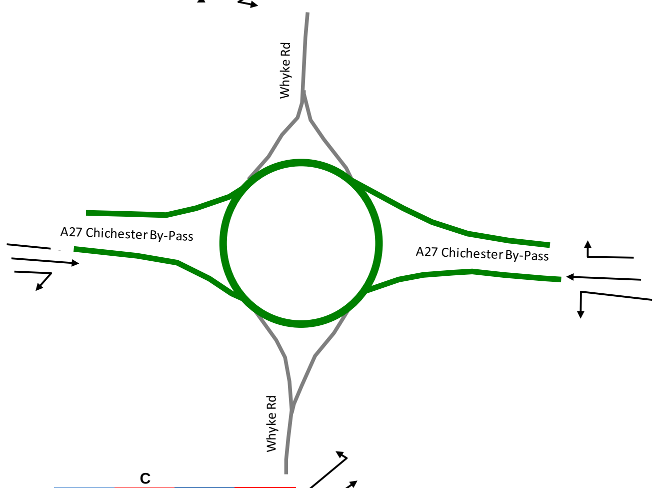
Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
A27 Stockbridge Roundabout

A27 Whyke Roundabout

A

92	63	3	3
135	199	9	10
46	85	1	4



D

94	113	4	7
1167	1023	112	100
187	104	8	10

B

35	76	1	3
1209	904	124	108
152	213	10	8

C

192	193	11	12
143	174	10	7
149	242	8	8

Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Whyke Roundabout

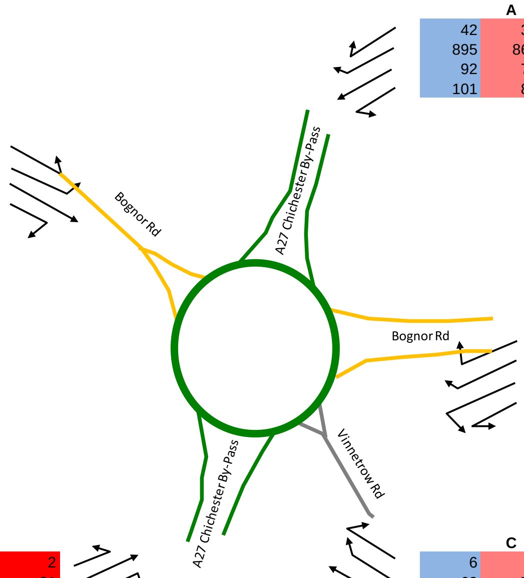
A27 Bognor Rd Roundabout

A

42	35	2	3
895	862	97	103
92	72	6	5
101	88	7	6

E

106	41	5	2
296	389	11	20
116	158	1	8
87	0	4	0



B

127	26	9	7
238	330	11	17
343	361	35	19
29	0	2	0

D

89	41	5	2
964	877	83	81
277	335	30	29
24	97	2	0

C

6	1	2	0
63	73	5	5
74	145	1	7
39	3	3	0

Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Bognor Rd Roundabout

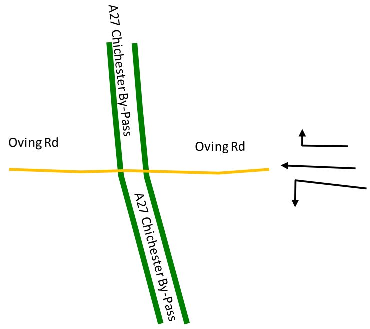
A27 Oving Road Signalised Junction

A

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
76	46	3	6
1024	999	108	114
85	111	3	6

D

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
101	98	2	6
108	72	1	3
21	9	1	1



B

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
94	147	3	6
96	49	1	3
45	49	1	4

C

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
35	34	1	1
1048	913	95	85
51	51	1	6

Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
A27 Oving Road Signalised Junction

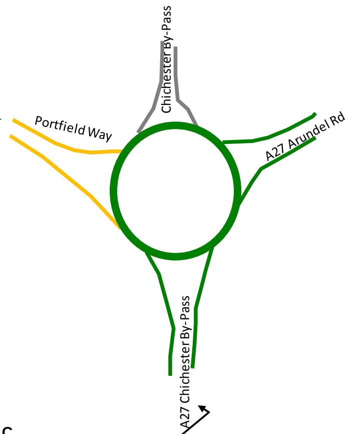
A27 Portfield Roundabout

A

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
28	1	1	0
165	145	20	12
35	4	10	0

D

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
17	0	0	0
514	489	10	20
321	129	5	8



B

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
37	0	9	0
474	579	8	37
833	871	95	105

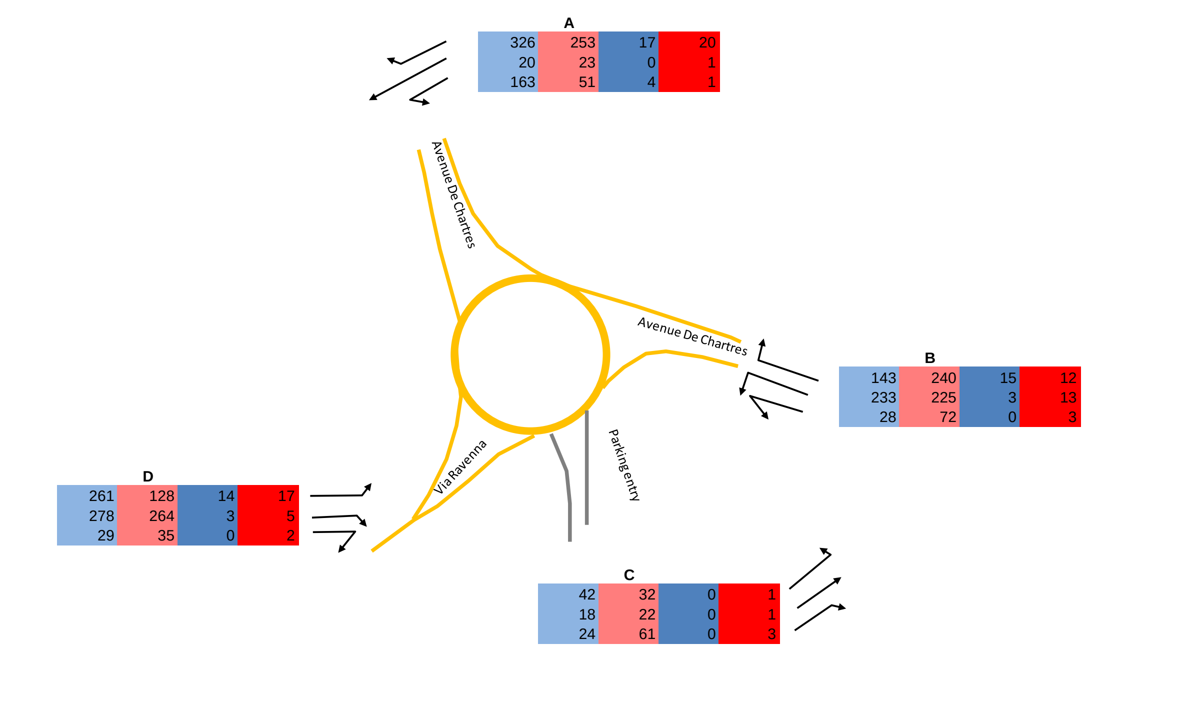
C

Observed Light Vehicles	Modelled Light Vehicles	Observed Heavy Vehicles	Modelled Heavy Vehicles
330	91	5	6
202	136	22	10
771	890	81	75

Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
A27 Portfield Roundabout

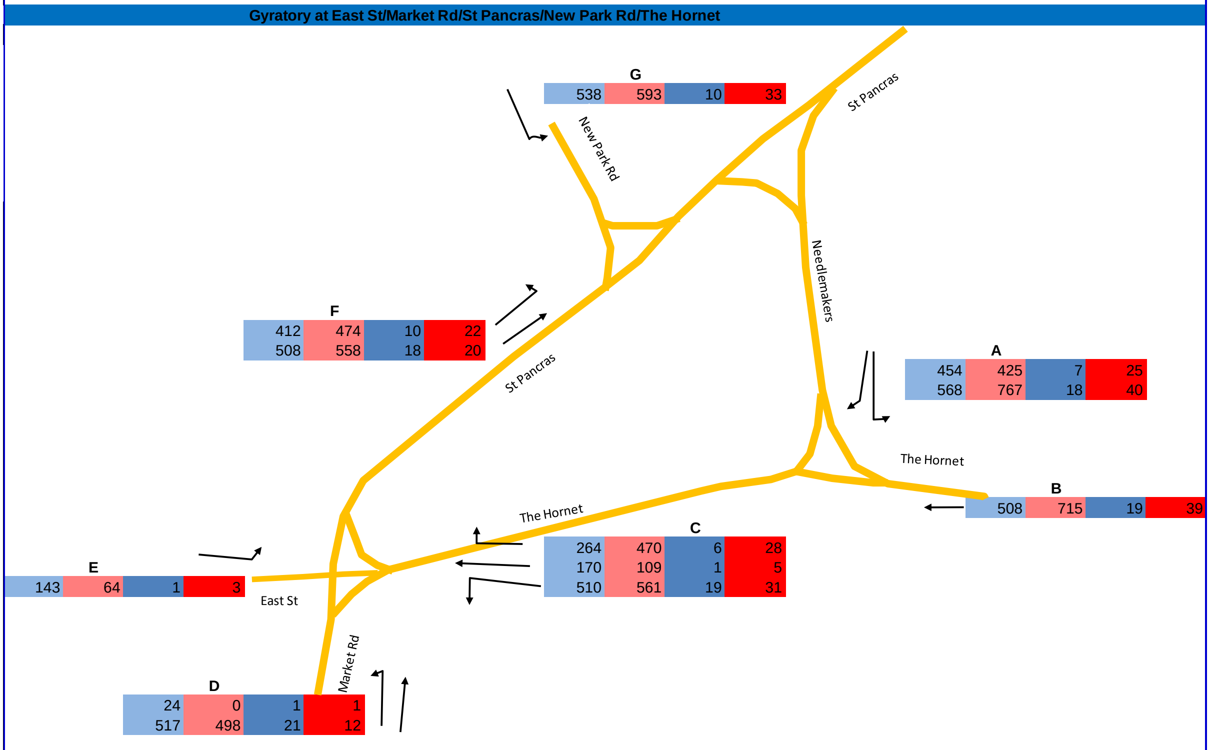
Via Ravenna/Avenue De Chartres Roundabout



Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
Via Ravenna/Avenue De Chartres Roundabou

Gyratory at East St/Market Rd/St Pancras/New Park Rd/The Hornet



Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

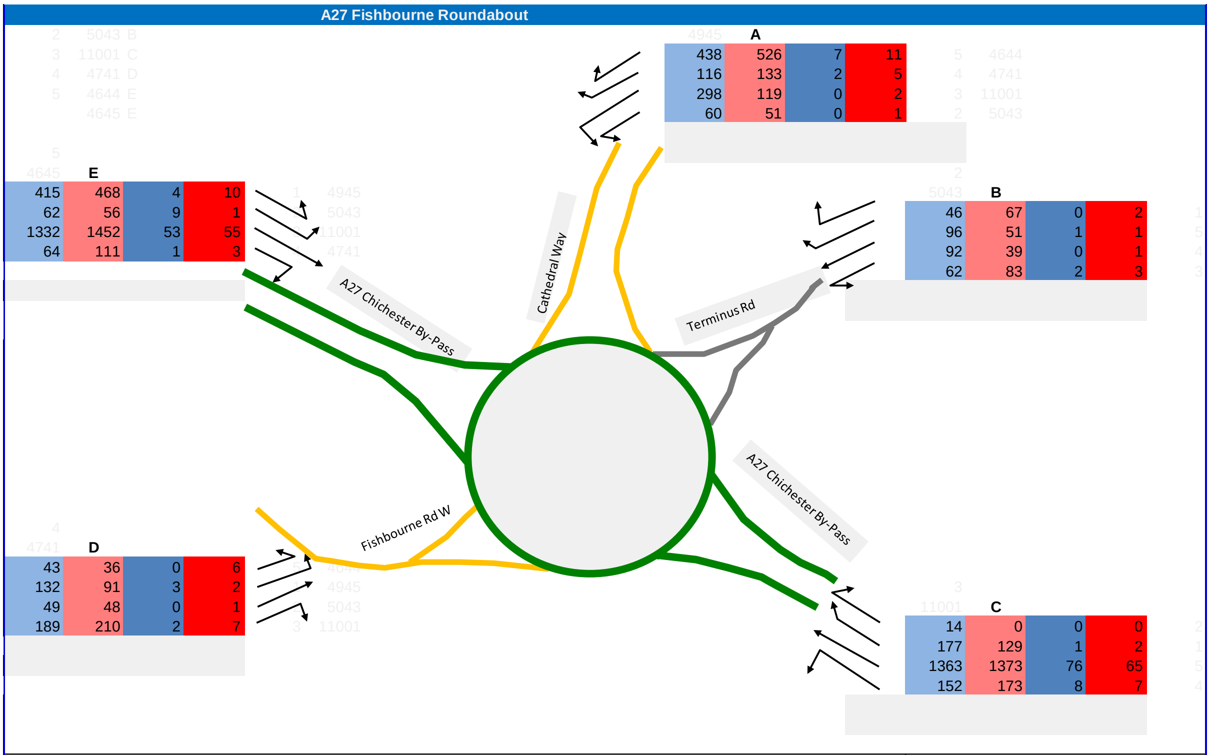
TITLE:
Turning Movements at
Gyratory at East St/Market Rd/St Pancras/New Park Rd/The Hornet

SHEET 3 **Turn Validation – PM – Peak Hour**

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
Fishbourne	E To A	390	25	415	4	419	420	47	468	10	478	30	22	53	6	59	8%	90%	13%	153%	14%	1.5	3.7	2.5	2.3	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To B	56	6	62	9	71	50	5	56	1	57	-6	-1	-6	-8	-14	-11%	-16%	-10%	-89%	-20%	0.9	0.4	0.8	3.6	1.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To C	1162	169	1332	53	1385	1300	152	1452	55	1507	138	-17	120	2	122	12%	-10%	9%	3%	9%	3.9	1.4	3.2	0.2	3.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To D	52	12	64	1	65	100	11	111	3	114	48	-1	47	2	49	91%	-7%	72%	203%	74%	5.4	0.3	5.0	1.4	5.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	55	12	60	0	60	46	5	51	1	52	-9	-7	-9	1	-8	-17%	-58%	-16%		-14%	1.3	2.4	1.3	1.4	1.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	284	14	298	0	298	106	13	119	2	121	-178	-1	-179	2	-177	-63%	-6%	-60%		-59%	12.8	0.2	12.4	2.0	12.2	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	A To D	112	4	116	2	118	113	20	133	5	138	1	16	17	3	20	1%	405%	15%	153%	17%	0.1	4.6	1.5	1.6	1.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To E	409	29	438	7	445	432	94	526	11	537	23	65	88	4	92	6%	227%	20%	59%	21%	1.1	8.3	4.0	1.4	4.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	58	4	62	2	64	78	5	83	3	86	20	1	21	1	22	35%	24%	35%	49%	35%	2.5	0.5	2.5	0.6	2.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	83	9	92	0	92	34	4	39	1	40	-49	-5	-53	1	-52	-59%	-56%	-58%		-56%	6.4	2.0	6.5	1.4	6.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To E	81	15	96	1	97	47	5	51	1	52	-34	-10	-45	0	-45	-42%	-67%	-47%	-1%	-46%	4.2	3.2	5.2	0.0	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	40	6	46	0	46	60	6	67	2	69	20	0	21	2	23	49%	-1%	44%		49%	2.8	0.0	2.7	2.0	3.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	137	16	152	8	160	153	20	173	7	180	16	4	21	-1	20	12%	26%	13%	-12%	12%	1.4	1.0	1.6	0.3	1.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	1133	231	1363	76	1439	1263	110	1373	65	1438	130	-121	10	-11	-1	12%	-52%	1%	-15%	0%	3.8	9.2	0.3	1.3	0.0	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	C To A	162	15	177	1	178	115	14	129	2	131	-47	-1	-48	1	-47	-29%	-6%	-27%	102%	-26%	4.0	0.2	3.9	0.8	3.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	12	2	14	0	14	0	0	0	0	0	-12	-2	-14	0	-14	-100%	-100%	-100%		-100%	4.9	2.0	5.3	0.0	5.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	13	2	15	0	15	0	0	0	0	0	-13	-2	-15	0	-15	-100%	-100%	-100%		-100%	5.1	2.0	5.4	0.0	5.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To E	37	6	43	0	43	32	3	36	6	42	-5	-3	-7	6	-1	-13%	-52%	-16%		-2%	0.8	1.5	1.1	3.5	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	127	5	132	3	135	79	12	91	2	93	-48	7	-41	-1	-42	-38%	129%	-31%	-37%	-31%	4.7	2.3	3.9	0.7	4.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	40	9	49	0	49	43	5	48	1	49	3	-4	-1	1	0	8%	-47%	-3%		-1%	0.5	1.7	0.2	1.4	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	165	24	189	2	191	188	22	210	7	217	23	-2	21	5	26	14%	-9%	11%	233%	14%	1.7	0.4	1.5	2.3	1.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Stockbridge	D To A	41	0	41	0	41	104	11	115	3	118	63	11	74	3	77	156%		183%		191%	7.5	4.7	8.4	2.4	8.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	1329	189	1518	58	1576	1264	153	1417	57	1474	-65	-36	-101	-1	-102	-5%	-19%	-7%	-2%	-6%	1.8	2.8	2.6	0.2	2.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	360	50	411	5	416	289	26	314	6	320	-71	-24	-97	1	-96	-20%	-49%	-24%	21%	-23%	4.0	4.0	5.1	0.4	5.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	154	17	168	2	170	95	8	103	1	104	-59	-9	-65	-1	-66	-38%	-53%	-39%	-50%	-39%	5.2	2.6	5.6	0.8	5.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	195	15	210	5	215	305	33	339	6	345	110	18	129	1	130	56%	118%	61%	19%	60%	7.0	3.6	7.8	0.4	7.8	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	A To D	51	3	54	1	55	40	4	44	1	45	-11	1	-10	0	-10	-21%	32%	-18%	-1%	-17%	1.6	0.5	1.4	0.0	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	1	0	1	0	1	0	0	0	0	0	-1	0	-1	0	-1	-100%		-100%		-100%	1.4	0.0	1.4	0.0	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	193	18	211	0	211	104	12	116	3	119	-89	-6	-95	3	-92	-46%	-33%	-45%		-44%	7.3	1.5	7.4	2.4	7.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	1043	237	1280	68	1348	1116	99	1215	66	1281	73	-138	-65	-2	-67	7%	-58%	-5%	-3%	-5%	2.2	10.6	1.8	0.3	1.9	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	B To A	111	11	122	6	128	20	2	23	1	24	-91	-9	-99	-5	-104	-82%	-82%	-81%	-83%	-81%	11.2	3.5	11.6	2.7	11.9	1	1	1	1	0	Pass	Pass	Pass	Pass	Fail
	B To B	9	2	11	0	11	0	0	0	0	0	-9	-2	-11	0	-11	-100%	-100%	-100%		-100%	4.2	2.0	4.7	0.0	4.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	343	44	388	9	397	377	42	419	6	425	34	-2	31	-3	28	10%	-5%	8%	-34%	7%	1.8	0.4	1.6	1.1	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	128	23	152	3	155	223	33	255	7	262	95	10	104	4	107	74%	42%	68%	131%	70%	7.1	1.8	7.3	1.8	7.4	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	C To B	174	33	207	6	213	206	24	231	6	237	32	-9	24	0	24	19%	-28%	12%	-1%	11%	2.3	1.7	1.6	0.0	1.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Whyke	D To A	40	9	49	0	49	139	14	154	4	158	99	5	105	4	109	251%	57%	217%		226%	10.5	1.5	10.5	2.8	10.8	1	1	0	1	0	Pass	Pass	Fail	Pass	Fail
	D To B	1227	166	1393	59	1452	1083	123	1207	51	1258	-144	-43	-186	-8	-194	-12%	-26%	-13%	-14%	-13%	4.2	3.6	5.2	1.1	5.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	403	42	445	7	451	331	46	377	9	386	-72	4	-68	2	-65	-18%	11%	-15%	30%	-14%	3.8	0.7	3.3	0.7	3.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	1	0	1	0	1	0	0	0	0	0	-1	0	-1	0	-1	-100%		-100%		-100%	1.4	0.0	1.4	0.0	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	44	7	50	1	51	43	4	47	1	48	-1	-3	-3	0	-3	-1%	-42%	-7%	1%	-7%	0.1	1.3	0.5	0.0	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	254	30	284	8	292	319	31	350	7	357	65	1	66	-1	65	25%	4%	23%	-12%	22%	3.8	0.2	3.7	0.3	3.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	90	11	101	3	104	86	9	95	2	97	-4	-2	-6	-1	-7	-5%	-17%	-6%	-33%	-7%	0.4	0.6	0.6	0.6	0.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	1	1	2	0	2	0	0	0	0	0	-1	-1	-2	0	-2	-100%	-100%	-100%		-100%	1.4	1.4	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	180	40	220	3	223	230	25	254	6	260	50	-15	34	3	37	28%	-37%	16%	102%	17%	3.5	2.6	2.2	1.4	2.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	1115	206	1321	55	1376	902	69	970	58	1028	-213	-137	-351	3	-348	-19%	-66%	-27%	5%	-25%	6.7	11.7	10.4	0.3	10.0	0	0	0	1	0	Fail	Fail	Fail	Pass	Fail
	B To A	19	1	20	0	20	21	2	22	0	22	2	1	2	0	2	12%	102%	11%		11%	0.5	0.8	0.5	0.0	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	0	2	0	1	1	0	0	0	0	0	0	-2	0	-1	-1		-100%		-100%	-100%	0.0	2.0	0.0	1.4	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	217	41	241	11	251	253	37	289	9	298	36	-4	48	-2	47	17%	-9%	20%	-17%	19%	2.4	0.6	3.0	0.6	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	113	35	126	8	134	121	12	133	3	136	8	-23	7	-5	2	7%	-65%	6%	-62%	2%	0.8	4.7	0.6	2.1	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	135	31	156	1	157	175	22	196	6	202	40	-9	40	5	45	30%	-28%	25%	506%	28%	3.2	1.7	3.0	2.7	3.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Bognor Rd	D To E	64	16	73	0	73	0	0	0	0	0	-64	-16	-73	0	-73	-100%	-100%	-100%		-100%	11.3	5.6	12.1	0.0	12.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	910	216	1040	51	1091	863	93	955	40	995	-47	-123	-85	-11	-96	-5%	-57%	-8%	-22%	-9%	1.6	9.9	2.7	1.7	3.0	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	D To B	376	73	439	17	455	436	56	492	17	509	60	-17	53	0	54	16%	-24%	12%	1%	12%	3.0	2.1	2.5	0.0	2.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	43	2	50	3	52	2	0	2	0	2	-41	-2	-48	-3	-50	-95%	-100%	-96%	-100%	-96%	8.6	2.0	9.4	2.4	9.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	5	0	6	1	7	0	0	0	0	0	-5	0	-6	-1	-7	-100%		-100%	-100%	-100%	3.1	0.0	3.4	1.4	3.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To A	31	35	40	0	40	0	0	0	0	0	-31	-35	-40	0	-40	-100%	-100%	-100%		-100%	7.9	8.4	9.0	0.0	9.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To B	391	39	461	11	472	450	59	509	13	522	59	20	48	2	50	15%	50%	11%	17%	11%	2.9	2.8	2.2	0.5	2.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To C	155	10	179	1	180	209	27	236	6	242	54	17	57	5	62	35%	167%	32%	494%	35%	4.0	3.9	4.0	2.7	4.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	E To D	130	19	160	1	161	0	0	0	0	0	-130	-19	-160	-1	-161	-100%	-100%	-100%	-100%	-100%	16.1	6.2	17.9	1.4	17.9	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	E To E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	35	13	43	5	48	0	0	0	0	0	-35	-13	-43	-5	-48	-100%	-100%	-100%	-100%	-100%	8.3	5.1	9.2	3.1	9.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	92	8	113	7	120	67	10	76	3	79	-25	2	-37	-4	-41	-27%	26%	-33%	-57%	-34%	2.8	0.7	3.8	1.8	4.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass

		Observed					Modelled					Diff.					% Diff.					GEH					WebTAG flow criterion					GEH OR Hourly flows				
	Movement	Cars + Taxis (Veh)	LGVs (Veh)	Lights (Veh)	HGVs (veh)	Total (veh)	Cars (Veh)	LGVs	Lights (Veh)	Heavies (veh)	Total (veh)	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total	Cars	LGVs	Lights	Heavies	Total
	A To D	732	158	910	47	956	777	51	829	49	878	45	-107	-81	2	-78	6%	-68%	-9%	5%	-8%	1.7	10.5	2.7	0.4	2.6	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	A To E	11	23	13	1	14	19	2	21	1	22	8	-21	8	0	8	74%	-91%	63%	1%	59%	2.1	5.9	2.0	0.0	1.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	0	1	0	0	0	0	0	0	0	0	0	-1	0	0	0		-100%				0.0	1.4	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	29	3	33	1	34	0	0	0	0	0	-29	-3	-33	-1	-34	-100%	-100%	-100%	-100%	-100%	7.6	2.4	8.1	1.4	8.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	365	62	439	15	454	438	49	486	18	504	73	-13	47	3	50	20%	-21%	11%	20%	11%	3.6	1.7	2.2	0.7	2.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To E	257	59	286	9	295	215	33	248	8	256	-42	-26	-38	-1	-39	-16%	-44%	-13%	-11%	-13%	2.7	3.8	2.3	0.3	2.3	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	101	19	121	2	123	82	10	92	2	94	-19	-9	-29	0	-29	-19%	-47%	-24%	0%	-24%	2.0	2.4	2.8	0.0	2.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	0	0	1	0	1	0	0	0	0	0	0	0	-1	0	-1			-100%		-100%	0.0	0.0	1.4	0.0	1.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	40	6	46	1	47	2	0	2	0	2	-38	-6	-44	-1	-45	-95%	-100%	-96%	-100%	-96%	8.3	3.5	9.0	1.4	9.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	58	12	62	0	62	95	15	110	4	114	37	3	48	4	52	65%	24%	79%		85%	4.3	0.8	5.2	2.8	5.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	58	8	72	8	80	83	10	94	3	97	25	2	22	-5	17	44%	24%	31%	-63%	22%	3.0	0.6	2.4	2.2	1.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	0	2	0	0	0	2	0	2	0	2	2	-2	2	0	2		-100%				2.0	2.0	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Oving Rd	C To D	10	7	14	0	14	6	0	6	0	6	-4	-7	-8	0	-8	-39%	-100%	-57%		-57%	1.4	3.7	2.5	0.0	2.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	896	227	993	30	1023	977	108	1085	44	1129	81	-119	92	14	106	9%	-52%	9%	48%	10%	2.6	9.2	2.9	2.4	3.2	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	C To B	81	8	88	0	88	28	3	31	1	32	-53	-5	-57	1	-56	-66%	-62%	-65%		-64%	7.2	2.1	7.4	1.4	7.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	76	16	79	0	79	150	15	166	5	171	74	-1	87	5	92	97%	-5%	110%		116%	6.9	0.2	7.8	3.2	8.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	175	11	186	0	186	194	27	221	4	225	19	16	35	4	39	11%	148%	19%		21%	1.4	3.7	2.4	2.8	2.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	14	1	16	0	16	0	0	0	0	0	-14	-1	-16	0	-16	-100%	-100%	-100%		-100%	5.3	1.4	5.6	0.0	5.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	168	4	180	3	183	226	28	254	7	261	58	24	74	4	78	34%	607%	41%	136%	43%	4.1	6.0	5.0	1.8	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	753	209	912	33	944	857	60	917	48	965	104	-149	5	15	21	14%	-71%	1%	47%	2%	3.7	12.8	0.2	2.4	0.7	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	A To D	115	21	130	1	131	123	15	139	6	145	8	-6	9	5	14	7%	-28%	7%	506%	11%	0.7	1.4	0.8	2.7	1.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	45	8	50	0	50	10	4	13	6	19	-35	-4	-37	6	-31	-78%	-49%	-74%		-62%	6.6	1.6	6.5	3.5	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	92	16	101	1	102	142	33	174	4	178	50	17	73	3	76	54%	108%	72%	304%	75%	4.6	3.5	6.2	1.9	6.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	75	12	79	0	79	39	6	45	2	47	-36	-6	-34	2	-32	-48%	-49%	-43%		-41%	4.8	2.0	4.3	2.0	4.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Portfield	D To A	23	6	24	1	25	0	0	0	0	0	-23	-6	-24	-1	-25	-100%	-100%	-100%	-100%	-100%	6.7	3.4	6.9	1.4	7.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	714	55	756	2	758	717	81	798	16	814	3	26	42	14	56	0%	46%	6%	708%	7%	0.1	3.1	1.5	4.7	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	252	20	272	1	273	151	12	163	5	168	-101	-8	-109	4	-105	-40%	-39%	-40%	405%	-39%	7.1	2.0	7.4	2.3	7.1	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	D To D	82	8	88	0	88	1	0	1	0	1	-81	-8	-87	0	-87	-99%	-100%	-99%		-99%	12.6	4.0	13.1	0.0	13.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To B	71	3	82	2	84	24	0	24	0	24	-47	-3	-58	-2	-60	-66%	-100%	-71%	-100%	-71%	6.9	2.4	8.0	2.0	8.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To C	160	24	197	4	201	166	28	194	8	202	6	4	-3	4	1	4%	18%	-2%	102%	1%	0.4	0.8	0.2	1.7	0.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	16	2	18	0	18	0	0	0	0	0	-16	-2	-18	0	-18	-100%	-100%	-100%		-100%	5.6	2.0	6.0	0.0	6.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To A	1	0	2	3	5	0	0	0	0	0	-1	0	-2	-3	-5	-100%		-100%	-100%	-100%	1.4	0.0	2.0	2.4	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	640	156	800	46	845	880	63	942	48	990	240	-93	142	2	145	38%	-60%	18%	5%	17%	8.7	8.9	4.8	0.4	4.8	0	1	0	1	0	Fail	Pass	Pass	Pass	Pass
	B To D	493	64	565	6	571	522	132	654	18	672	29	68	89	12	101	6%	105%	16%	203%	18%	1.3	6.8	3.6	3.5	4.0	1	1	1	1	0	Pass	Pass	Pass	Pass	Pass
	B To A	28	18	33	5	38	0	0	0	0	0	-28	-18	-33	-5	-38	-100%	-100%	-100%	-100%	-100%	7.4	6.0	8.1	3.1	8.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	5	3	5	0	5	0	0	0	0	0	-5	-3	-5	0	-5	-100%	-100%	-100%		-100%	3.1	2.4	3.1	0.0	3.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	242	26	261	1	262	62	8	70	3	73	-180	-18	-191	2	-189	-74%	-69%	-73%	203%	-72%	14.6	4.3	14.9	1.4	14.6	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	C To A	143	62	162	9	171	151	17	168	6	174	8	-45	6	-3	3	6%	-73%	3%	-33%	2%	0.7	7.2	0.4	1.1	0.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	857	212	993	49	1041	947	103	1050	42	1092	90	-109	57	-7	51	10%	-51%	6%	-13%	5%	3.0	8.7	1.8	1.0	1.5	1	0	1	1	1	Pass	Fail	Pass	Pass	Pass
	C To C	9	0	12	1	13	10	1	11	0	11	1	1	-1	-1	-2	12%		-7%	-100%	-15%	0.4	1.4	0.3	1.4	0.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
Avenue de Chartres / Via Ravenna Rdb	A To B	177	27	204	3	207	278	25	303	3	306	101	-2	99	0	99	57%	-8%	49%	-1%	48%	6.7	0.4	6.2	0.0	6.2	0	1	1	1	1	Fail	Pass	Pass	Pass	Pass
	A To C	6	0	6	0	6	8	1	9	0	9	2	1	3	0	3	32%		49%		49%	0.7	1.4	1.1	0.0	1.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	A To D	306	27	333	6	339	173	0	173	11	184	-133	-27	-160	5	-155	-43%	-100%	-48%	82%	-46%	8.6	7.4	10.1	1.7	9.6	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	A To A	9	1	10	1	11	0	0	0	0	0	-9	-1	-10	-1	-11	-100%	-100%	-100%	-100%	-100%	4.3	1.4	4.5	1.4	4.7	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	9	1	10	0	10	4	1	5	0	5	-5	0	-5	0	-5	-56%	-1%	-50%		-50%	2.0	0.0	1.9	0.0	1.9	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To D	240	9	249	2	251	165	30	195	8	203	-75	21	-54	6	-48	-31%	230%	-22%	296%	-19%	5.3	4.7	3.7	2.7	3.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To A	175	17	192	15	207	172	27	199	7	206	-3	10	7	-8	-1	-2%	57%	4%	-54%	-1%	0.2	2.1	0.5	2.4	0.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To B	17	0	17	1	18	0	0	0	0	0	-17	0	-17	-1	-18	-100%		-100%	-100%	-100%	5.9	0.0	5.9	1.4	6.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	105	0	105	0	105	44	4	48	1	49	-61	4	-57	1	-56	-58%		-54%		-53%	7.1	2.8	6.5	1.4	6.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To A	55	0	55	0	55	49	5	54	1	55	-6	5	-1	1	0	-10%		-1%		1%	0.8	3.2	0.1	1.4	0.1	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To B	62	0	62	0	62	216	23	239	4	243	154	23	177	4	181	251%		288%		294%	13.1	6.8	14.5	2.8	14.7	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	C To C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0.0	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To A	300	5	305	5	310	210	4	214	11	225	-90	-1	-91	6	-85	-30%	-21%	-30%	118%	-27%	5.6	0.5	5.7	2.1	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To B	372	20	392	2	394	332	35	367	4	371	-40	15	-25	2	-23	-11%	73%	-6%	98%	-6%	2.1	2.8	1.3	1.1	1.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To C	4	0	4	0	4	3	0	4	0	4	-1	0	0	0	0	-26%		-1%		-1%	0.6	0.0	0.0	0.0	0.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To D	2	0	2	0	2	0	0	0	0	0	-2	0	-2	0	-2	-100%		-100%		-100%	2.0	0.0	2.0	0.0	2.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
The Hornet/ Needle makers	A To B	811	80	892	16	907	1145	125	1270	31	1301	334	45	378	15	394	41%	56%	42%	98%	43%	10.7	4.4	11.5	3.2	11.8	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	A To C	269	23	291	5	296	199	22	221	10	231	-70	-1	-70	5	-65	-26%	-2%	-24%	104%	-22%	4.5	0.1	4.4	1.9	4.0	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	B To C	516	61	577	12	589	531	81	612	17	629	15	20	35	5	40	3%	34%	6%	40%	7%	0.7	2.4	1.4	1.3	1.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
St Pancras / New Park Rd	G To A	436	60	496	7	503	531	72	603	17	620	95	12	107	10	117	22%	21%	22%	140%	23%	4.3	1.5	4.6	2.9	4.9	1	1	0	1	0	Pass	Pass	Pass	Pass	Pass
	F To G	500	87	544	4	548	461	58	519	10	529	-39	-29	-25	6	-19	-8%	-34%	-5%	155%	-3%	1.8	3.4	1.1	2.3	0.8	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	F To A	750	33	783	15	798	953	100	1054	18	1072	203	67	271	3	274	27%	200%	35%	22%	34%	7.0	8.2	8.9	0.8	9.0	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
Market Rd/ The Hornet/ St Pancras	D To E	14	6	19	0	19	1	0	1	1	2	-13	-6	-18	1	-17	-93%	-100%	-95%		-89%	4.7	3.4	5.6	1.4	5.2	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	D To F	706	35	741	18	759	886	94	980	13	993	180	59	239	-5	234	26%	166%	32%	-26%	31%	6.4	7.3	8.2	1.2	7.9	0	1	0	1	0	Fail	Pass	Fail	Pass	Fail
	E To F	203	3	206	0	206	129	13	142	3	145	-74	10	-64	3	-61	-36%	329%	-31%		-30%	5.7	3.5	4.9	2.4	4.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To D	326	50	362	16	377	288	46	335	13	348	-38	-4	-27	-3	-29	-12%	-8%	-7%	-17%	-8%	2.2	0.6	1.4	0.7	1.5	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To E	97	9	106	0	106	42	5	48	1	49	-55	-4	-58	1	-57	-57%	-42%	-55%		-54%	6.6	1.4	6.6	1.4	6.4	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
	C To F	331	38	369	1	370	400	51	451	13	464	69	13	82	12	94	21%	33%	22%	1227%	25%	3.6	1.9	4.0	4.5	4.6	1	1	1	1	1	Pass	Pass	Pass	Pass	Pass
																						GEH Statistics					Flow Criterion					GEH OR Hourly flows				
																						69%	83%	66%	100%	64%	90%	94%	88%	100%	88%	90%	94%	89%	100%	88%

A27 Fishbourne Roundabout



A

438	526	7	11
116	133	2	5
298	119	0	2
60	51	0	1

B

46	67	0	2
96	51	1	1
92	39	0	1
62	83	2	3

C

14	0	0	0
177	129	1	2
1363	1373	76	65
152	173	8	7

D

43	36	0	6
132	91	3	2
49	48	0	1
189	210	2	7

E

415	468	4	10
62	56	9	1
1332	1452	53	55
64	111	1	3

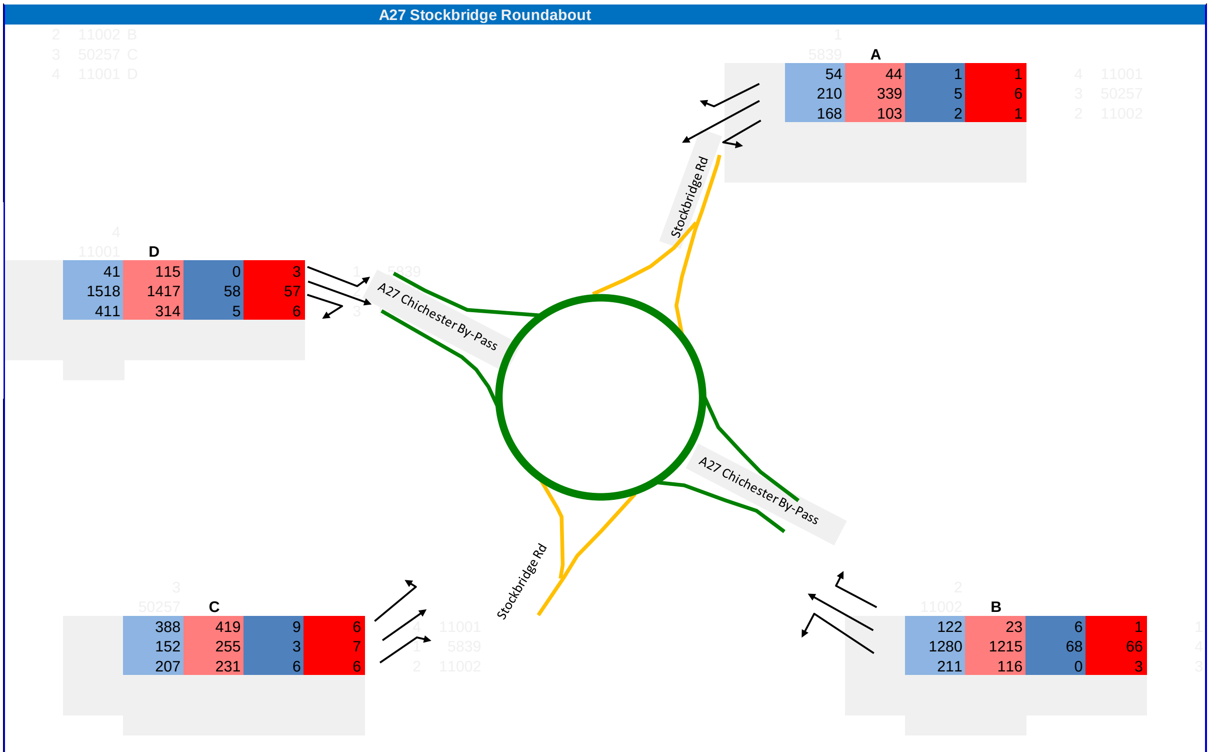
Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Fishbourne Roundabout

A27 Stockbridge Roundabout



A

54	44	1	1
210	339	5	6
168	103	2	1

B

122	23	6	1
1280	1215	68	66
211	116	0	3

C

388	419	9	6
152	255	3	7
207	231	6	6

D

41	115	0	3
1518	1417	58	57
411	314	5	6

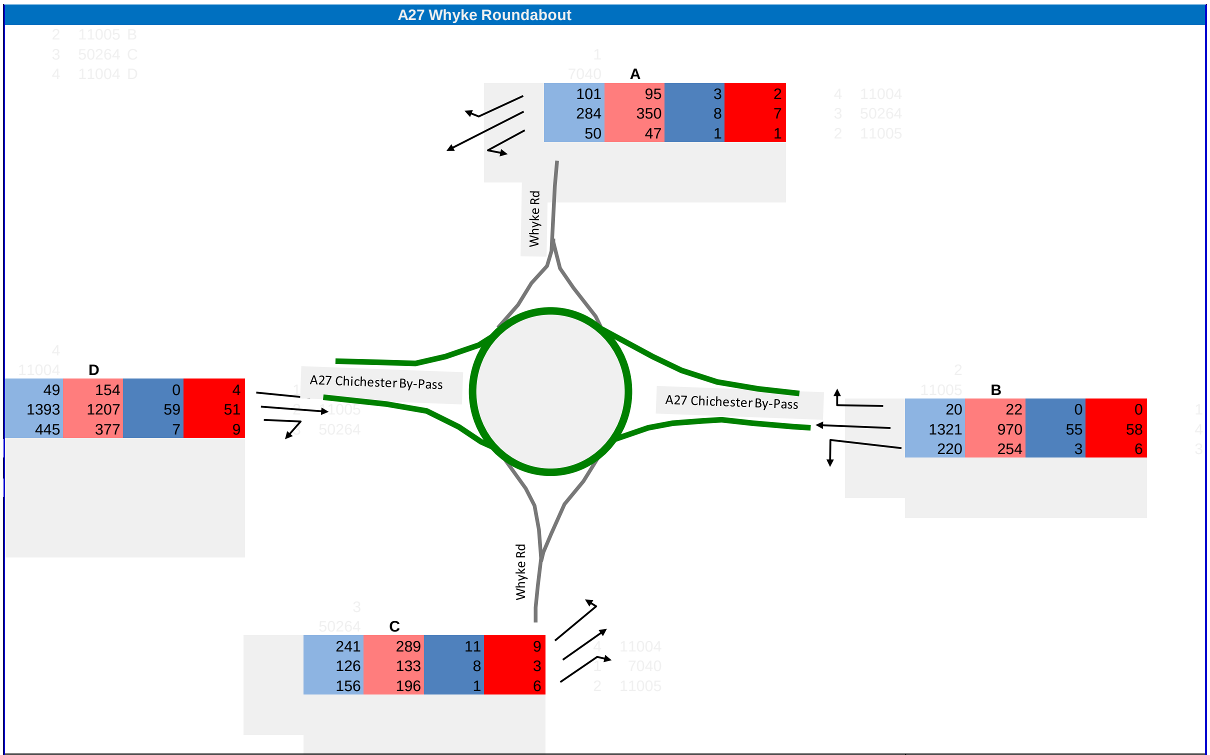
Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Stockbridge Roundabout

A27 Whyke Roundabout



A

101	95	3	2
284	350	8	7
50	47	1	1

B

20	22	0	0
1321	970	55	58
220	254	3	6

C

241	289	11	9
126	133	8	3
156	196	1	6

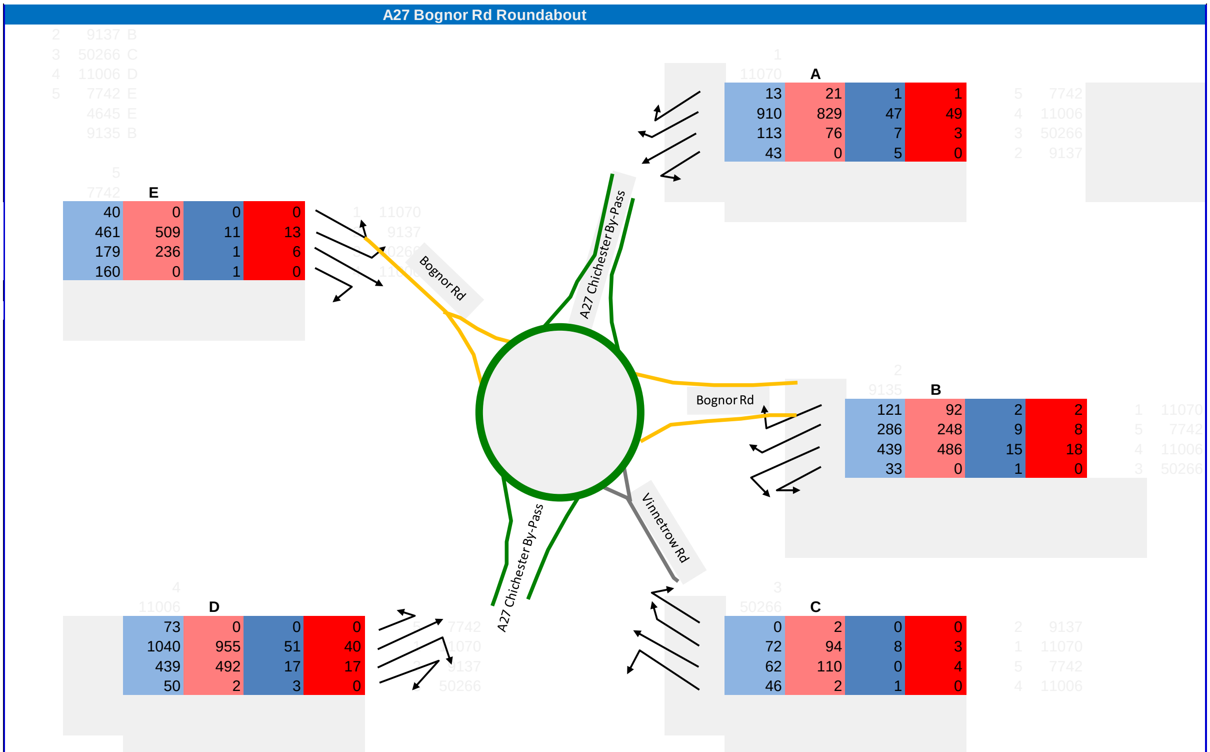
D

49	154	0	4
1393	1207	59	51
445	377	7	9

Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE: Turning Movements at A27 Whyke Roundabout

A27 Bognor Rd Roundabout



A

13	21	1	1
910	829	47	49
113	76	7	3
43	0	5	0

B

121	92	2	2
286	248	9	8
439	486	15	18
33	0	1	0

C

0	2	0	0
72	94	8	3
62	110	0	4
46	2	1	0

D

73	0	0	0
1040	955	51	40
439	492	17	17
50	2	3	0

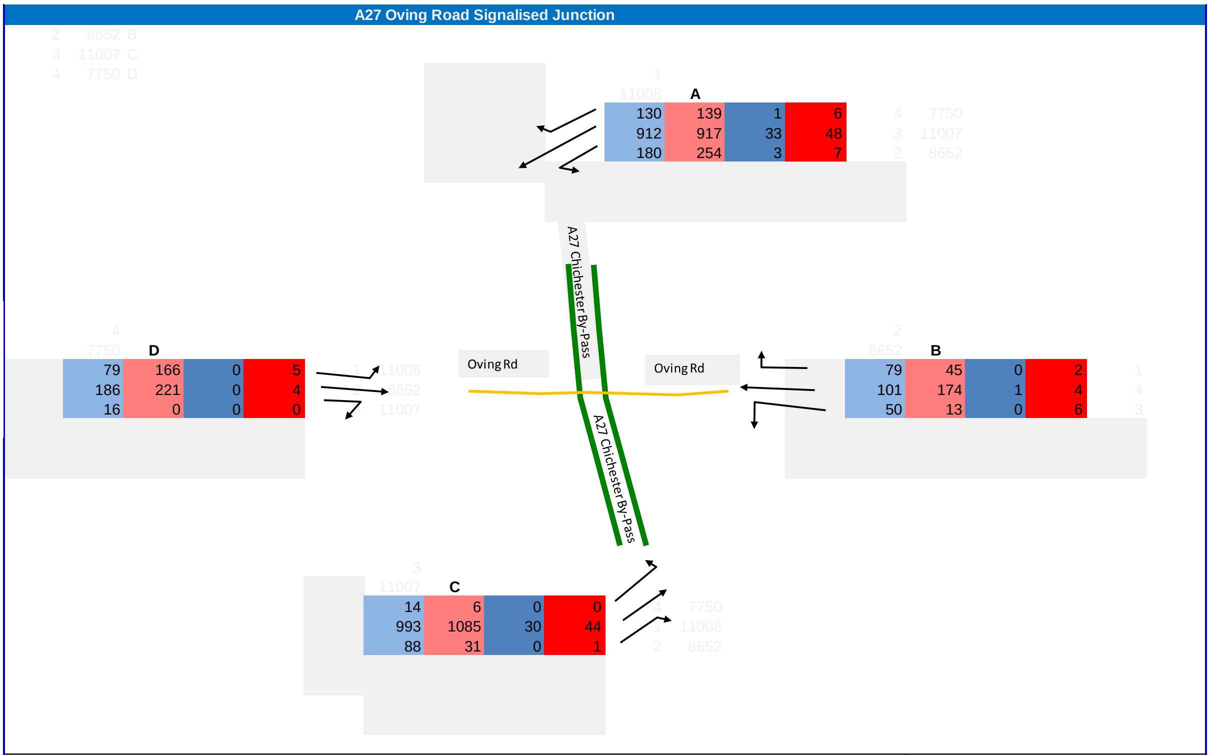
E

40	0	0	0
461	509	11	13
179	236	1	6
160	0	1	0

Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE: Turning Movements at A27 Bognor Rd Roundabout

A27 Oving Road Signalised Junction



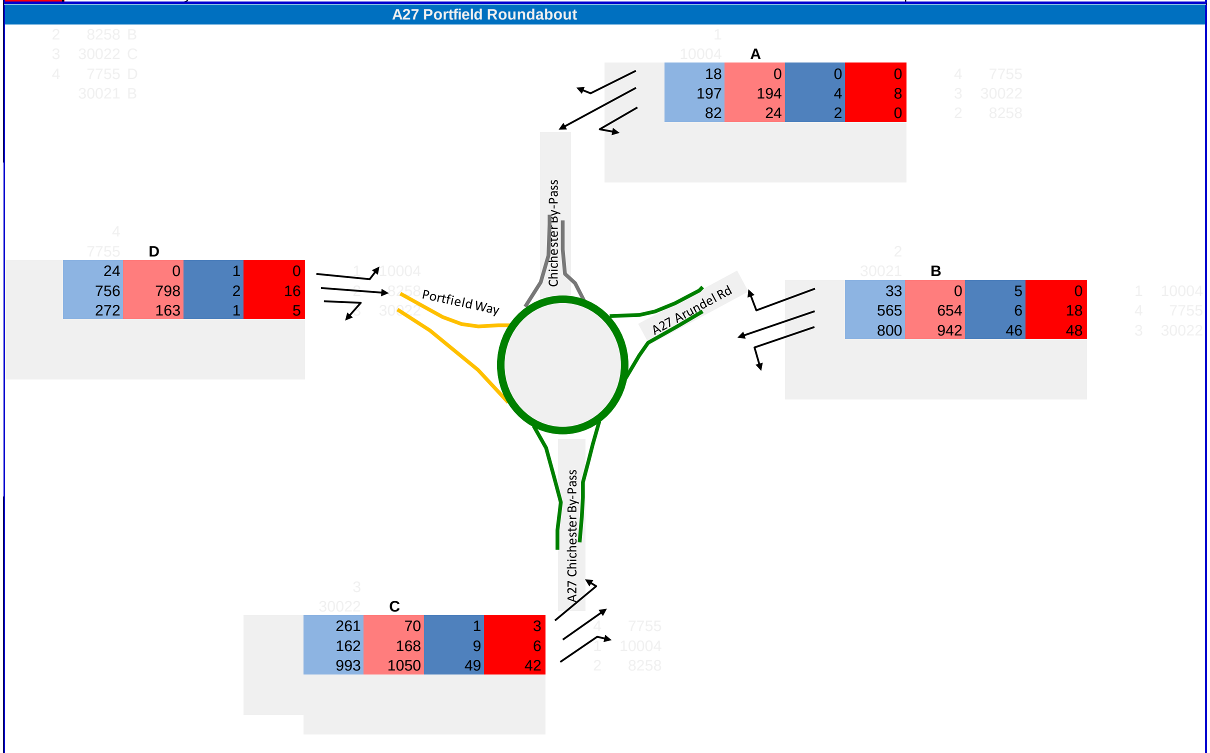
Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Oving Road Signalised Junction

A27 Portfield Roundabout



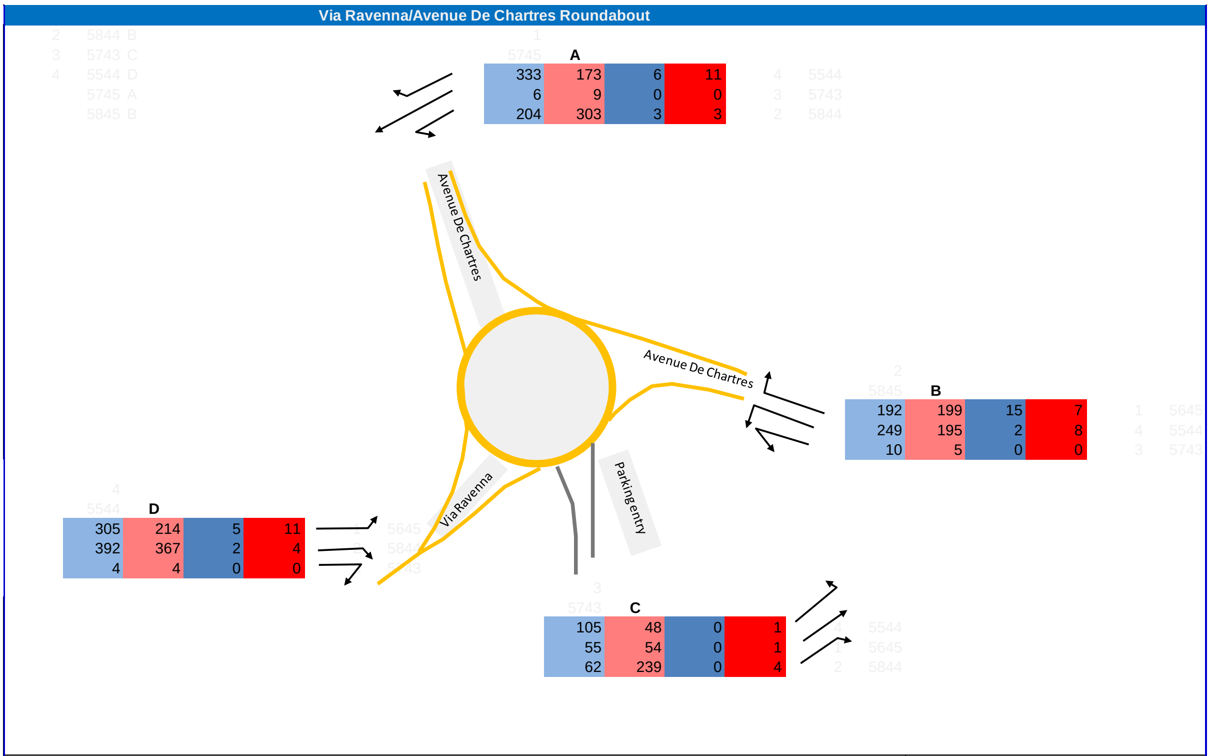
Legend:

- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:

Turning Movements at
A27 Portfield Roundabout

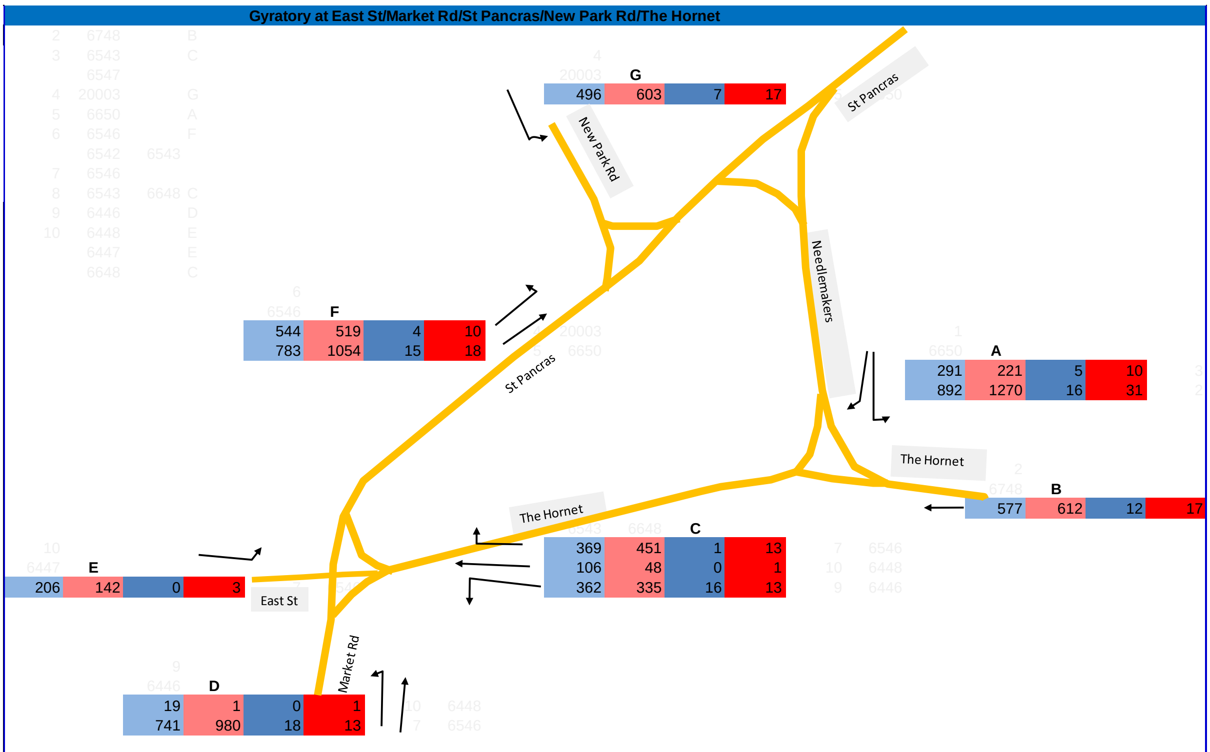
Via Ravenna/Avenue De Chartres Roundabout



Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
Via Ravenna/Avenue De Chartres Roundabout

Gyratory at East St/Market Rd/St Pancras/New Park Rd/The Hornet



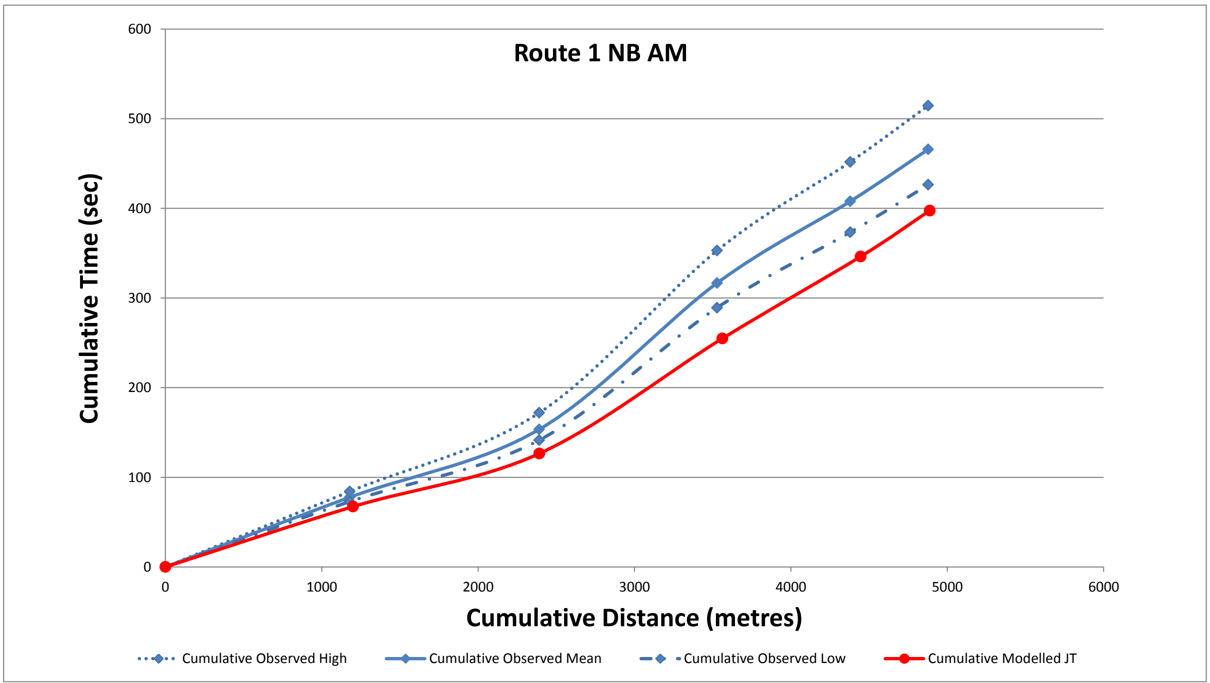
Legend:
- Observed Light Vehicles (includes Cars, Taxis and LGVs)
- Modelled Light Vehicles
- Observed Heavy Vehicles (includes HGVs, OGVs, Buses and Coaches)
- Modelled Heavy Vehicles

TITLE:
Turning Movements at
Gyratory at East St/Market Rd/St Pancras/New Park Rd/The Hornet

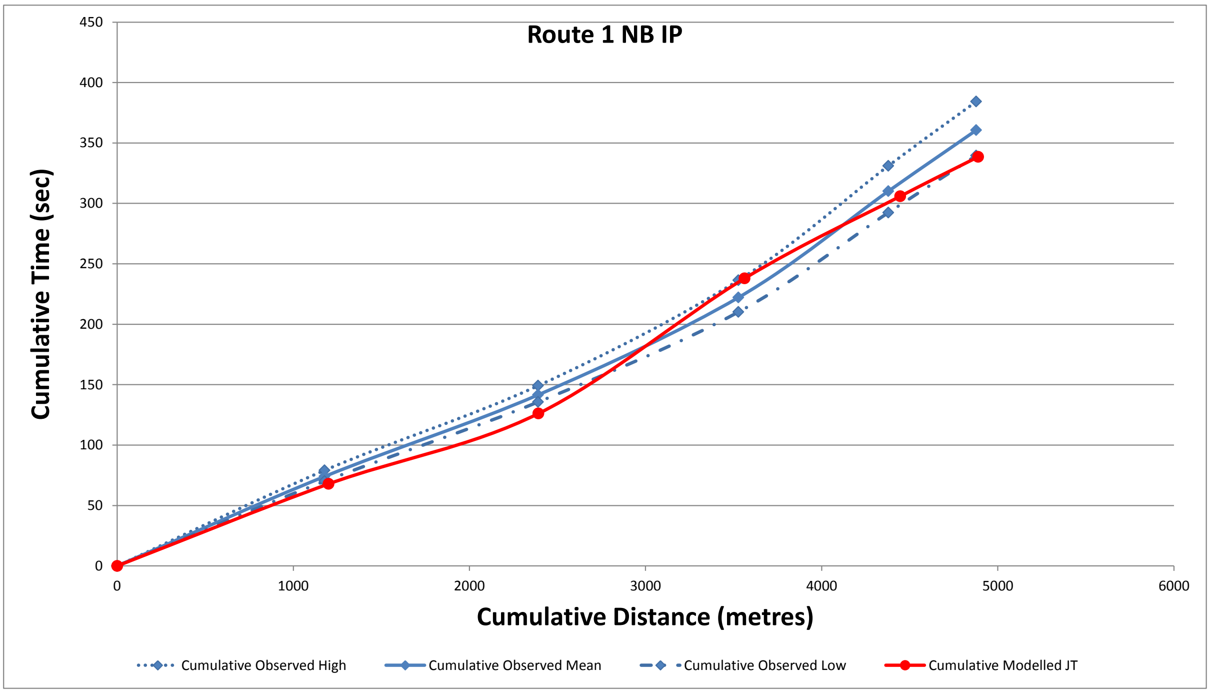
APPENDIX G JOURNEY TIME VALIDATION

SHEET 1 Route 1NB

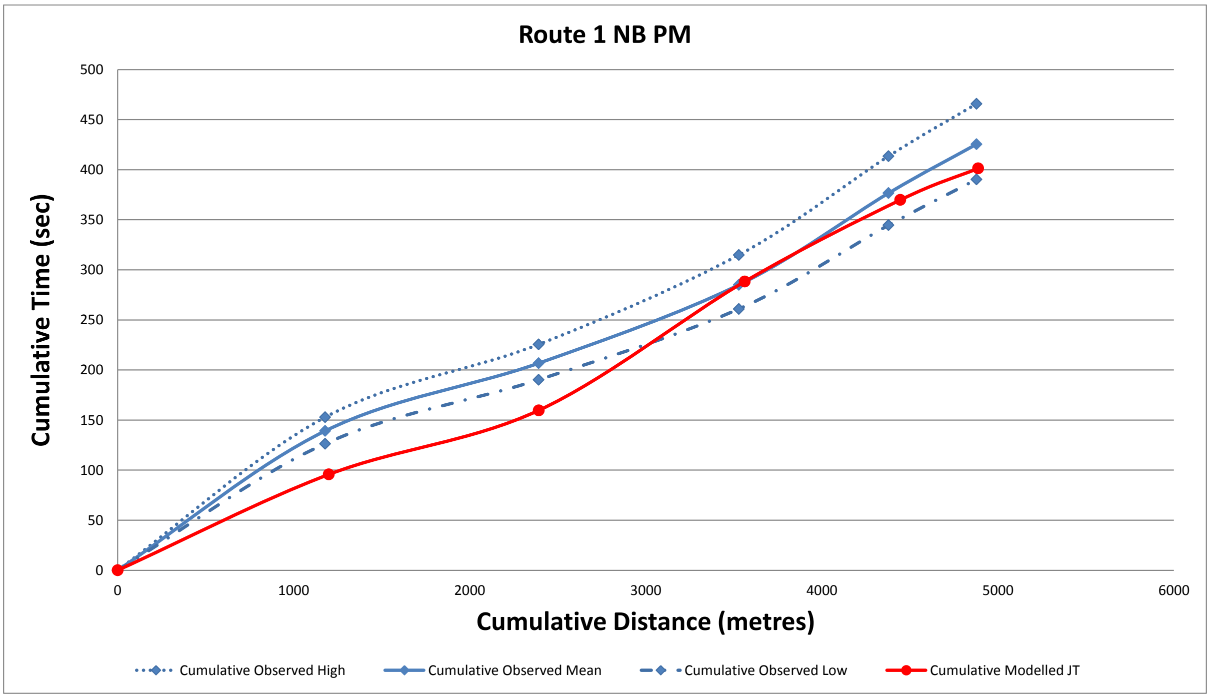
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
1NB	0 to 1	0	0	0	0	0	0			
1NB	1 to 2	1178	84	78	73	1200	67	-10	-13.4%	Pass
1NB	2 to 3	2391	172	154	142	2392	127	-17	-10.8%	Pass
1NB	3 to 4	3528	353	317	289	3562	255	-35	-11.0%	Pass
1NB	4 to 5	4379	452	408	373	4446	346	0	0.1%	Pass
1NB	5 to 6	4878	515	466	426	4888	398	-7	-1.5%	Pass
1NB	Total	4878	515	466	426	4888	398	**-68**	**-14.7%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
1NB	0 to 1	0	0	0	0	0	0			
1NB	1 to 2	1178	79	74	70	1200	68	-6	-8.4%	Pass
1NB	2 to 3	2391	149	142	136	2392	126	-9	-6.5%	Pass
1NB	3 to 4	3528	236	222	210	3562	238	31	14.0%	Pass
1NB	4 to 5	4379	331	310	292	4446	306	-20	-6.5%	Pass
1NB	5 to 6	4878	384	361	340	4888	339	-18	-5.0%	Pass
1NB	Total	4878	384	361	340	4888	339	-22	-6.1%	Pass

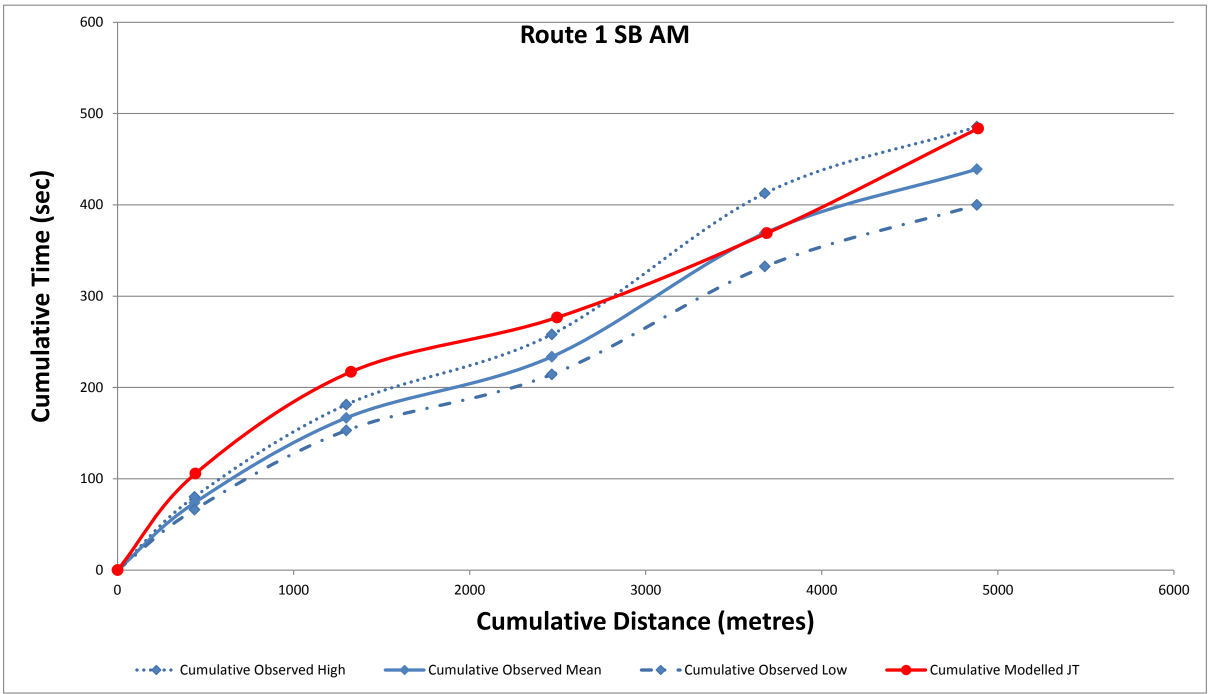


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
1NB	0 to 1	0	0	0	0	0	0			
1NB	1 to 2	1178	153	139	126	1200	96	-43	-31.2%	Pass
1NB	2 to 3	2391	226	207	190	2392	160	-4	-1.8%	Pass
1NB	3 to 4	3528	315	285	261	3562	288	50	17.7%	Pass
1NB	4 to 5	4379	414	377	345	4446	370	-10	-2.7%	Pass
1NB	5 to 6	4878	466	425	390	4888	401	-17	-4.1%	Pass
1NB	Total	4878	466	425	390	4888	401	-24	-5.7%	Pass

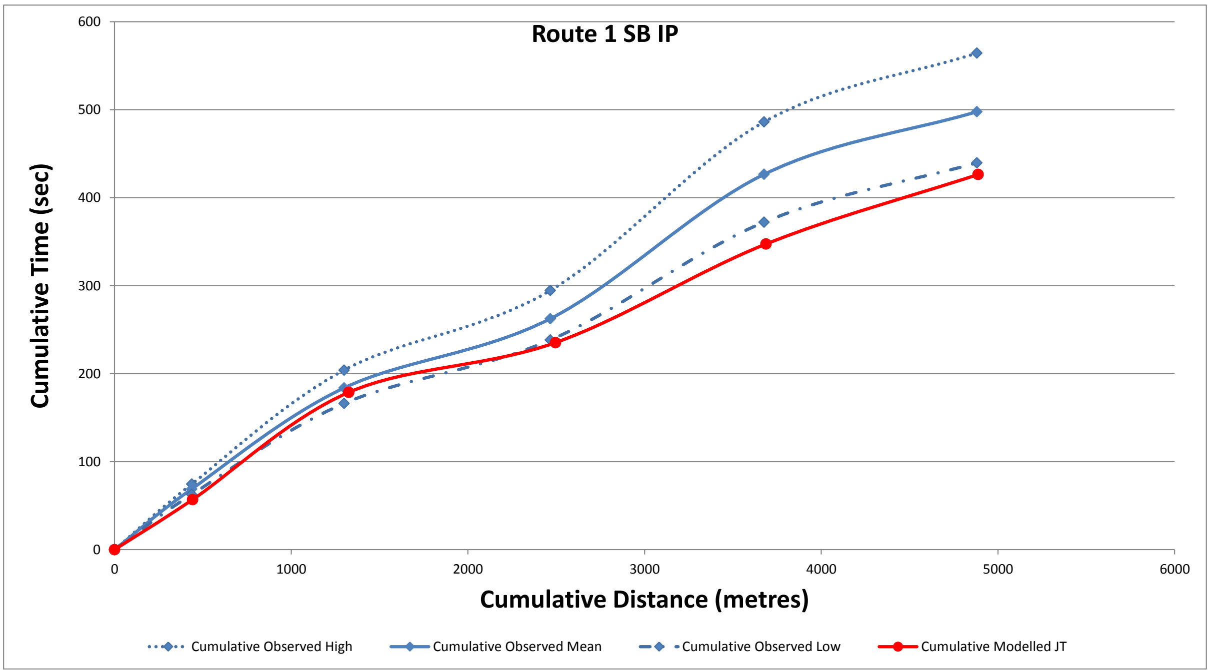


SHEET 1 **Route 1 SB**

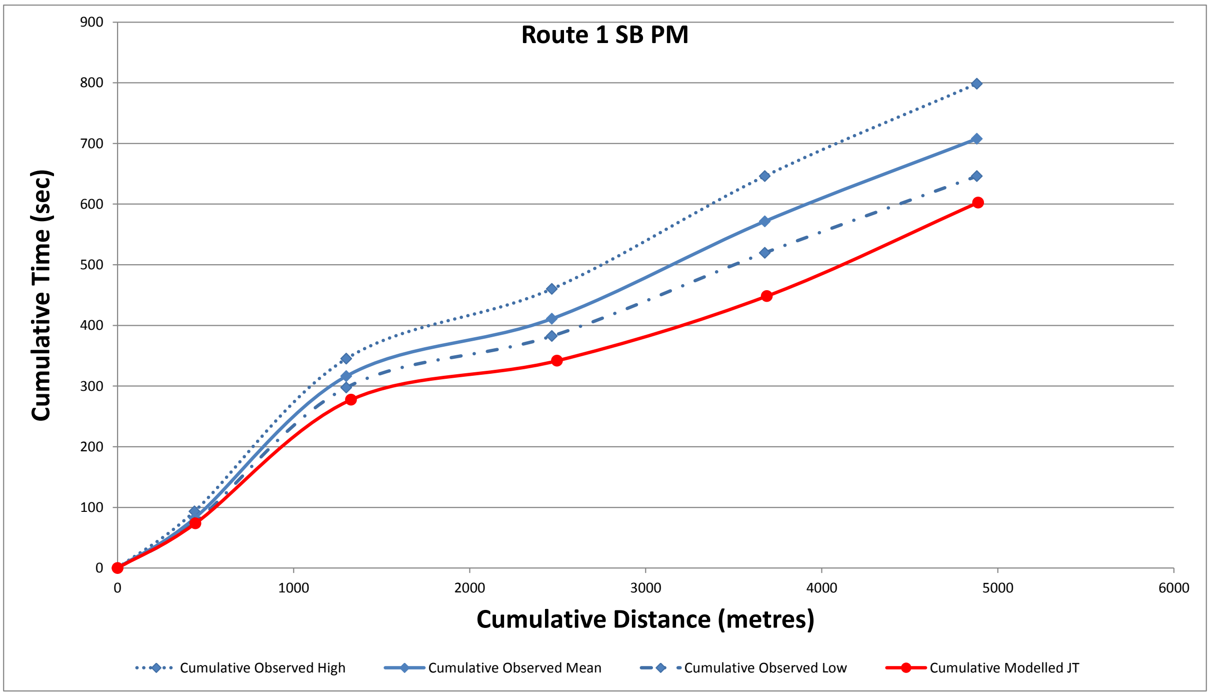
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
1SB	0 to 1	0	0	0	0	0	0			
1SB	1 to 2	437	80	74	66	442	106	32	43.4%	Pass
1SB	2 to 3	1299	181	167	153	1326	217	18	11.0%	Pass
1SB	3 to 4	2466	258	234	214	2496	277	-7	-3.2%	Pass
1SB	4 to 5	3676	413	369	332	3688	369	-43	-11.7%	Pass
1SB	5 to 6	4881	486	439	400	4888	484	45	10.2%	Pass
1SB	Total	4881	486	439	400	4888	484	**45**	**10.1%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
1SB	0 to 1	0	0	0	0	0	0			
1SB	1 to 2	437	74	69	63	442	57	-12	-17.4%	Pass
1SB	2 to 3	1299	204	184	166	1326	179	7	3.9%	Pass
1SB	3 to 4	2466	294	262	238	2496	235	-22	-8.4%	Pass
1SB	4 to 5	3676	486	426	372	3688	347	-52	-12.2%	Pass
1SB	5 to 6	4881	564	498	440	4888	426	8	1.6%	Pass
1SB	Total	4881	564	498	440	4888	426	-71	-14.3%	Pass

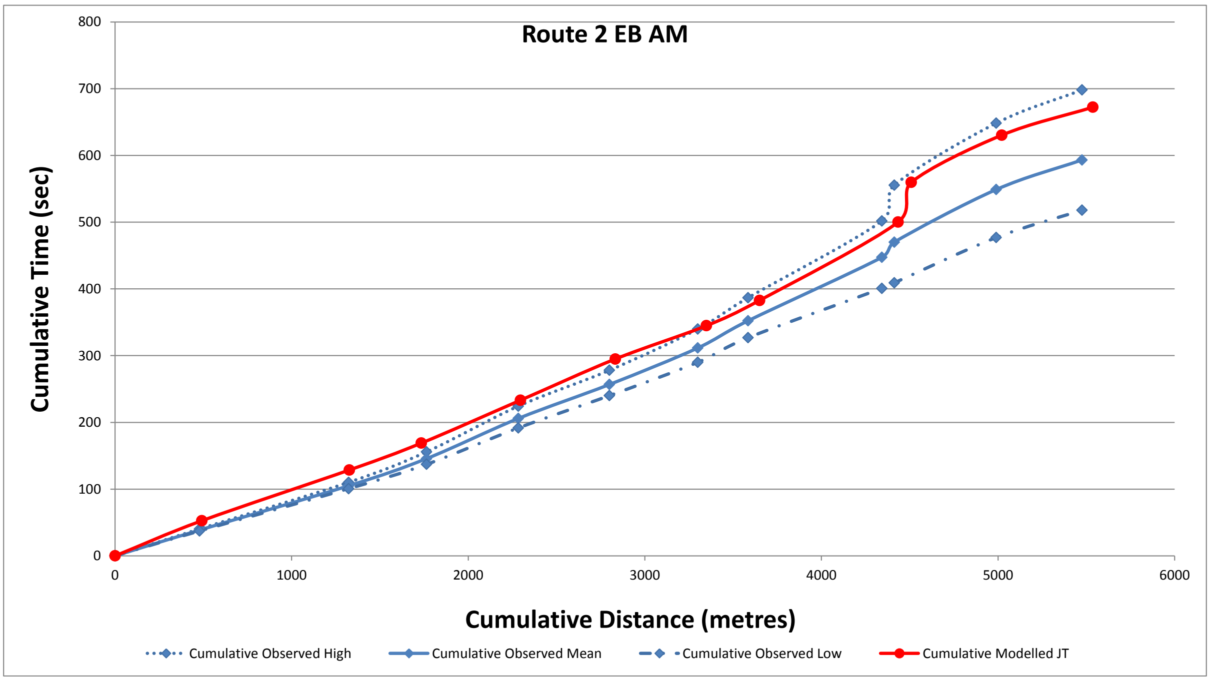


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
1SB	0 to 1	0	0	0	0	0	0			
1SB	1 to 2	437	93	82	75	442	76	-6	-7.1%	Pass
1SB	2 to 3	1299	345	316	297	1326	280	-31	-9.7%	Pass
1SB	3 to 4	2466	460	411	382	2496	344	-30	-7.3%	Pass
1SB	4 to 5	3676	646	572	520	3688	451	-54	-9.4%	Pass
1SB	5 to 6	4881	798	708	646	4888	606	19	2.6%	Pass
1SB	Total	4881	798	708	646	4888	606	-102	-14.4%	Pass

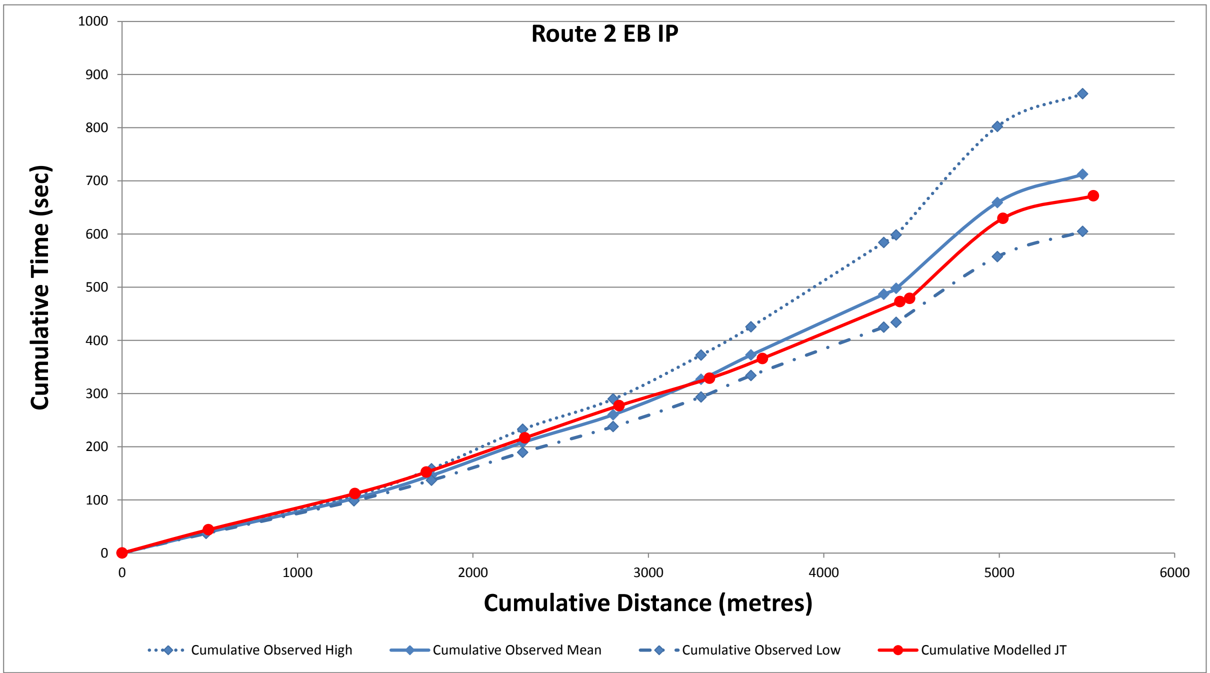


SHEET 2 Route 2 EB

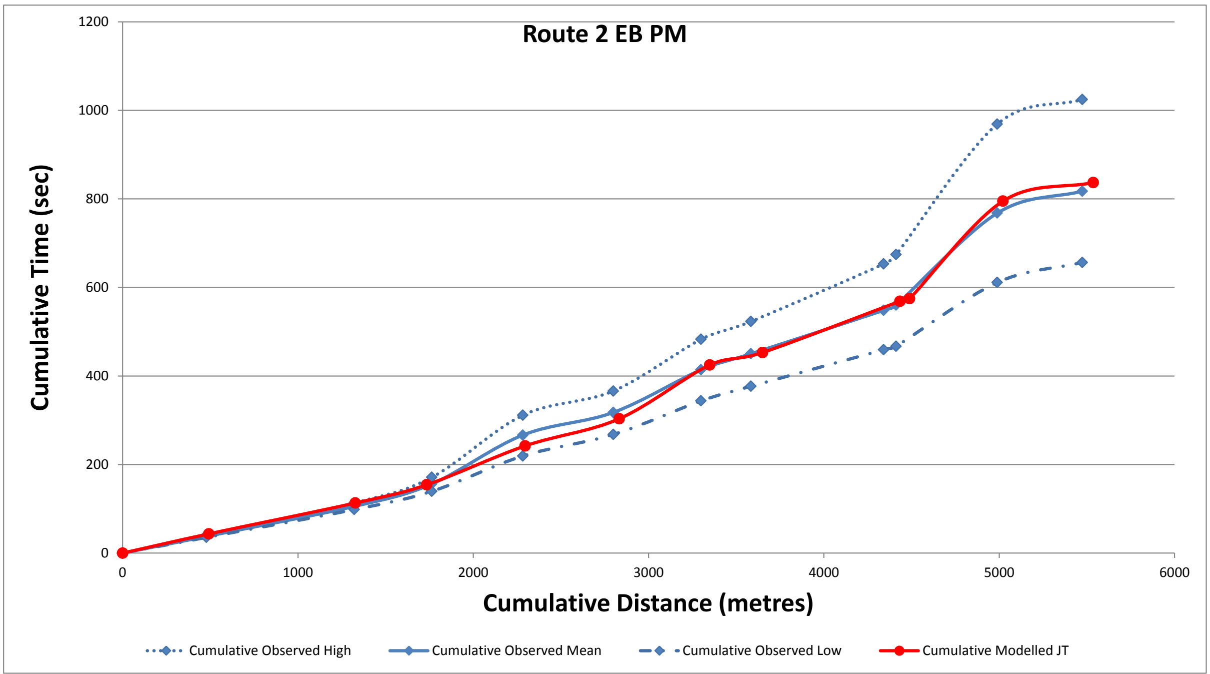
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
2EB	0 to 1	0	0	0	0	0	0			
2EB	1 to 2	479	40	39	37	492	53	14	36.3%	Pass
2EB	2 to 3	1322	110	105	101	1327	129	10	9.2%	Pass
2EB	3 to 4	1764	156	146	137	1734	169	-1	-0.4%	Pass
2EB	4 to 5	2283	224	206	192	2296	233	4	2.0%	Pass
2EB	5 to 6	2800	278	257	240	2833	295	11	4.2%	Pass
2EB	6 to 7	3300	340	312	290	3349	345	-5	-1.5%	Pass
2EB	7 to 8	3585	387	352	327	3650	383	-3	-0.8%	Pass
2EB	8 to 9	4342	502	447	401	4434	500	22	5.0%	Pass
2EB	9 to 10	4412	555	470	409	4509	560	37	7.8%	Pass
2EB	10 to 11	4989	648	549	477	5021	630	-8	-1.5%	Pass
2EB	11 to 12	5476	698	593	518	5537	672	-2	-0.4%	Pass
2EB	Total	5476	698	593	518	5537	672	79	13.3%	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
2EB	0 to 1	0	0	0	0	0	0			
2EB	1 to 2	479	40	38	37	492	44	6	14.7%	Pass
2EB	2 to 3	1322	108	103	98	1327	112	4	3.5%	Pass
2EB	3 to 4	1764	158	146	137	1734	152	-3	-2.1%	Pass
2EB	4 to 5	2283	233	208	189	2296	217	3	1.3%	Pass
2EB	5 to 6	2800	290	260	238	2833	277	8	3.2%	Pass
2EB	6 to 7	3300	372	327	294	3349	329	-15	-4.6%	Pass
2EB	7 to 8	3585	425	372	334	3650	366	-8	-2.3%	Pass
2EB	8 to 9	4342	584	487	425	4434	473	-7	-1.5%	Pass
2EB	9 to 10	4412	598	498	434	4489	479	-5	-1.0%	Pass
2EB	10 to 11	4989	802	659	558	5021	630	-11	-1.7%	Pass
2EB	11 to 12	5476	864	712	605	5537	672	-11	-1.5%	Pass
2EB	Total	5476	864	712	605	5537	672	-40	-5.7%	Pass

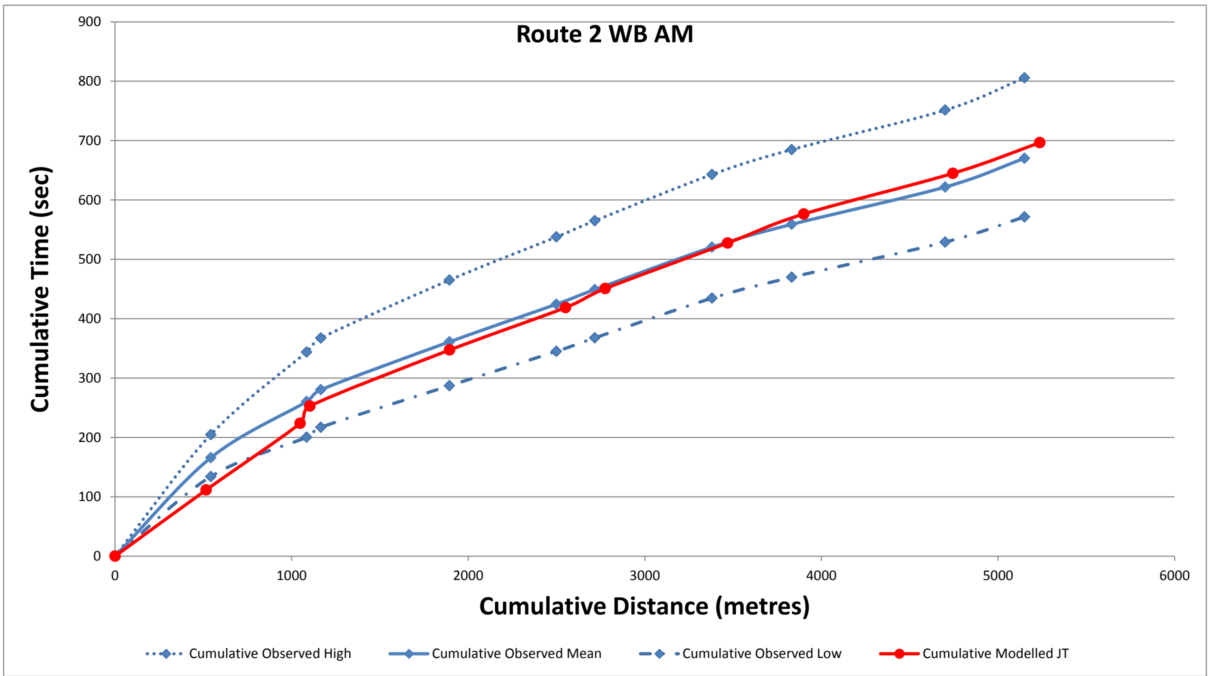


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
2EB	0 to 1	0	0	0	0	0	0			
2EB	1 to 2	479	40	38	36	492	44	6	15.3%	Pass
2EB	2 to 3	1322	113	106	98	1327	113	2	1.7%	Pass
2EB	3 to 4	1764	171	156	140	1734	154	-10	-6.1%	Pass
2EB	4 to 5	2283	311	267	219	2296	242	-22	-8.4%	Pass
2EB	5 to 6	2800	366	318	268	2833	303	10	3.2%	Pass
2EB	6 to 7	3300	483	414	344	3349	425	25	6.0%	Pass
2EB	7 to 8	3585	523	450	377	3650	453	-8	-1.8%	Pass
2EB	8 to 9	4342	653	548	459	4434	569	18	3.2%	Pass
2EB	9 to 10	4412	674	560	467	4489	575	-6	-1.0%	Pass
2EB	10 to 11	4989	969	768	611	5021	795	12	1.6%	Pass
2EB	11 to 12	5476	1025	817	657	5537	837	-7	-0.9%	Pass
2EB	Total	5476	1025	817	657	5537	837	19	2.4%	Pass

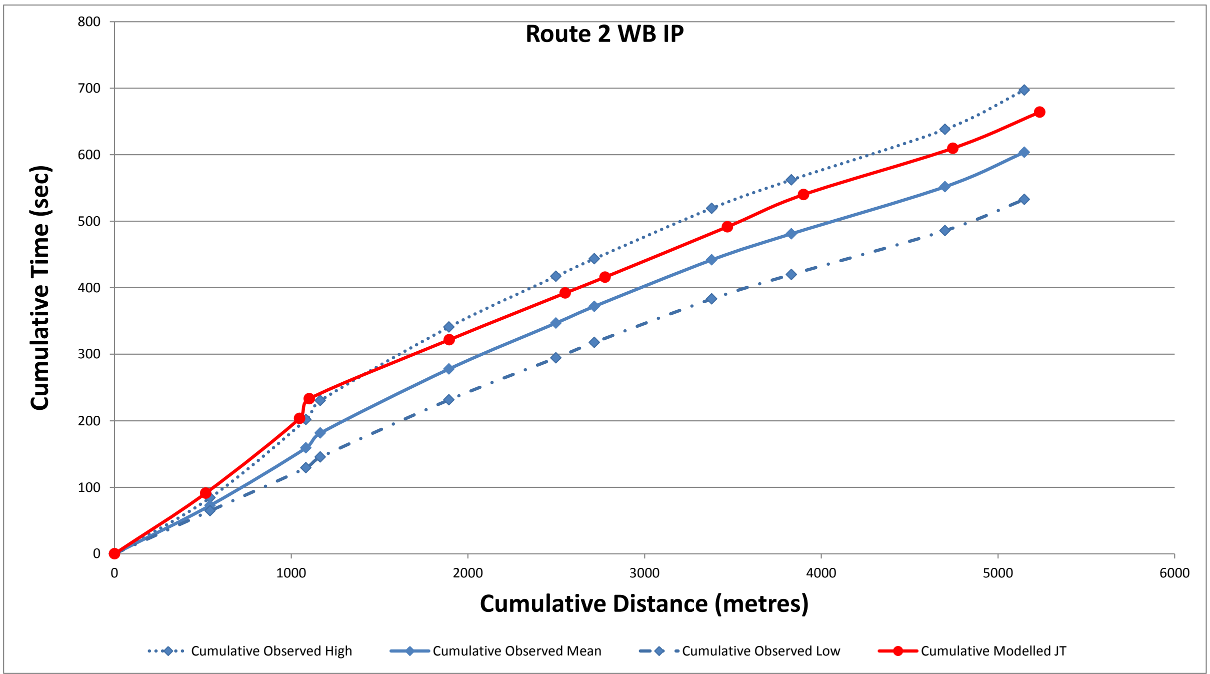


SHEET 3 **Route 2 WB**

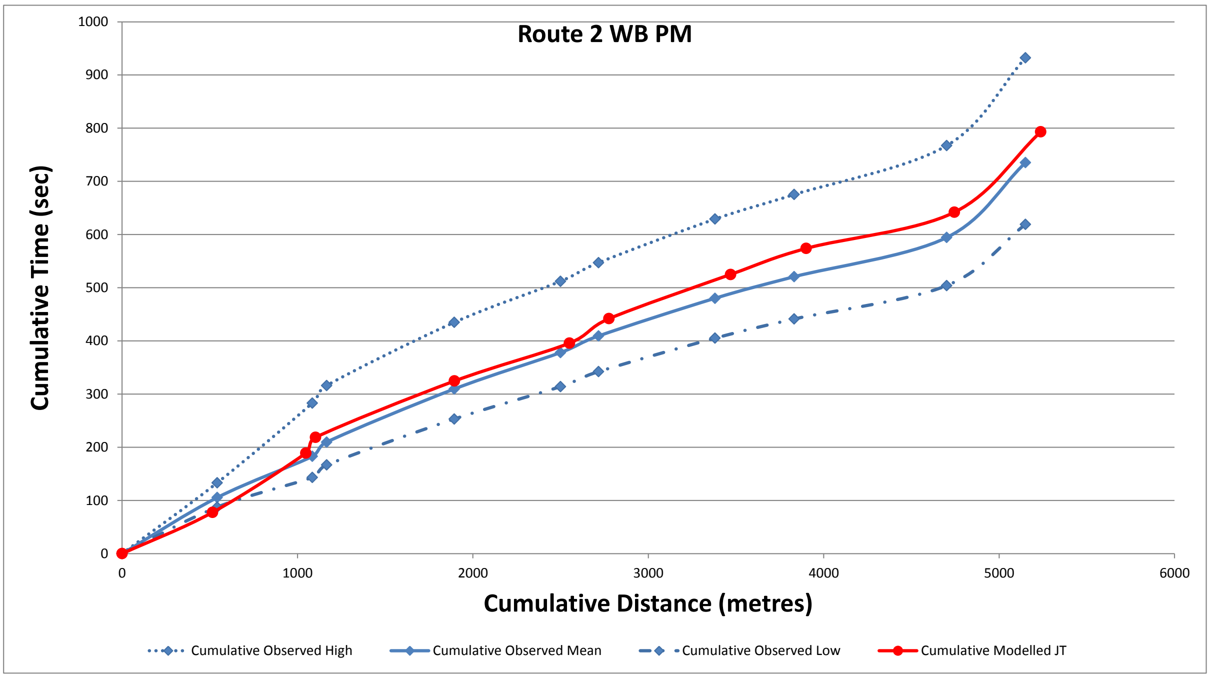
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
2WB	0 to 1	0	0	0	0	0	0			
2WB	1 to 2	542	205	166	134	516	112	-54	-32.7%	Pass
2WB	2 to 3	1085	344	260	200	1048	224	18	6.8%	Pass
2WB	3 to 4	1166	368	280	217	1103	253	9	3.2%	Pass
2WB	4 to 5	1894	465	361	287	1895	347	14	3.8%	Pass
2WB	5 to 6	2499	538	424	345	2551	419	8	1.9%	Pass
2WB	6 to 7	2717	565	449	368	2776	451	7	1.6%	Pass
2WB	7 to 8	3380	643	521	435	3469	528	5	1.0%	Pass
2WB	8 to 9	3831	685	559	470	3900	576	10	1.9%	Pass
2WB	9 to 10	4701	751	622	529	4745	645	6	0.9%	Pass
2WB	10 to 11	5150	806	670	571	5237	697	3	0.5%	Pass
2WB	Total	5150	806	670	571	5237	697	**26**	**3.9%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
2WB	0 to 1	0	0	0	0	0	0			
2WB	1 to 2	542	84	73	65	516	91	18	25.2%	Pass
2WB	2 to 3	1085	202	159	129	1048	204	26	16.3%	Pass
2WB	3 to 4	1166	230	182	145	1103	233	7	4.0%	Pass
2WB	4 to 5	1894	341	278	232	1895	322	-8	-2.8%	Pass
2WB	5 to 6	2499	417	347	294	2551	392	1	0.4%	Pass
2WB	6 to 7	2717	444	372	318	2776	416	-1	-0.4%	Pass
2WB	7 to 8	3380	519	442	383	3469	492	6	1.3%	Pass
2WB	8 to 9	3831	562	481	420	3900	540	9	1.9%	Pass
2WB	9 to 10	4701	638	552	486	4745	610	-1	-0.2%	Pass
2WB	10 to 11	5150	697	604	533	5237	664	3	0.4%	Pass
2WB	Total	5150	697	604	533	5237	664	60	10.0%	Pass

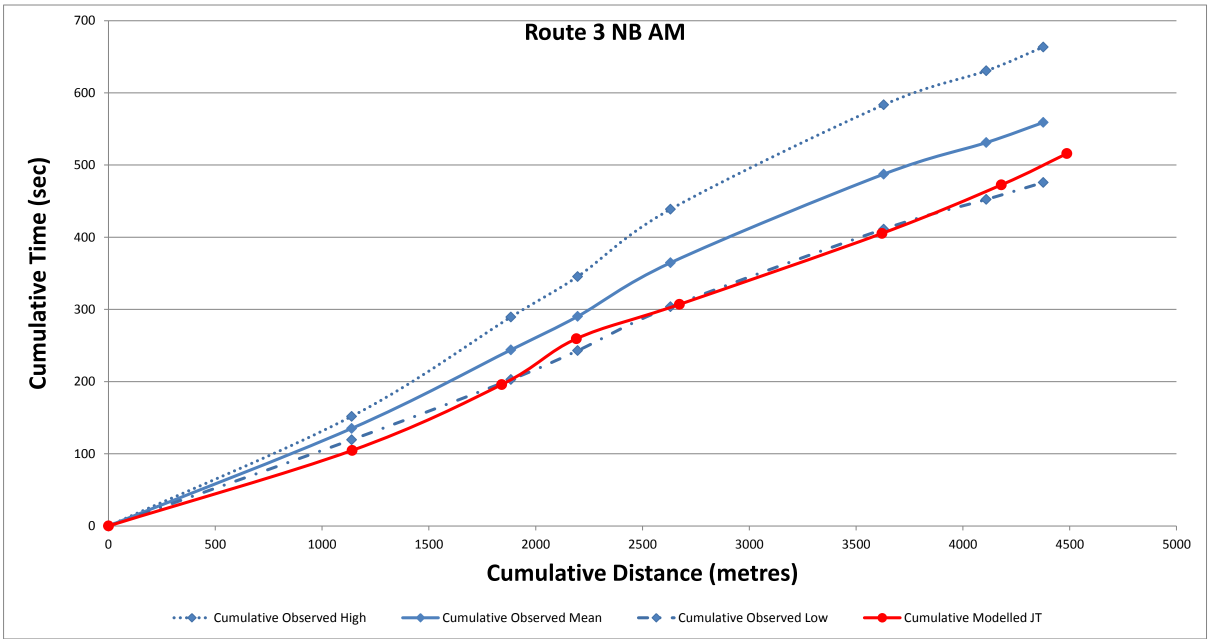


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
2WB	0 to 1	0	0	0	0	0	0			
2WB	1 to 2	542	133	105	88	516	78	-28	-26.3%	Pass
2WB	2 to 3	1085	283	183	143	1048	189	34	18.6%	Pass
2WB	3 to 4	1166	316	210	167	1103	219	3	1.2%	Pass
2WB	4 to 5	1894	435	310	253	1895	325	6	2.0%	Pass
2WB	5 to 6	2499	512	378	314	2551	396	3	0.8%	Pass
2WB	6 to 7	2717	547	409	342	2776	442	15	3.6%	Pass
2WB	7 to 8	3380	629	480	405	3469	525	12	2.6%	Pass
2WB	8 to 9	3831	675	521	441	3900	574	8	1.6%	Pass
2WB	9 to 10	4701	767	594	504	4745	642	-6	-1.0%	Pass
2WB	10 to 11	5150	932	735	619	5237	793	10	1.4%	Pass
2WB	Total	5150	932	735	619	5237	793	58	7.9%	Pass

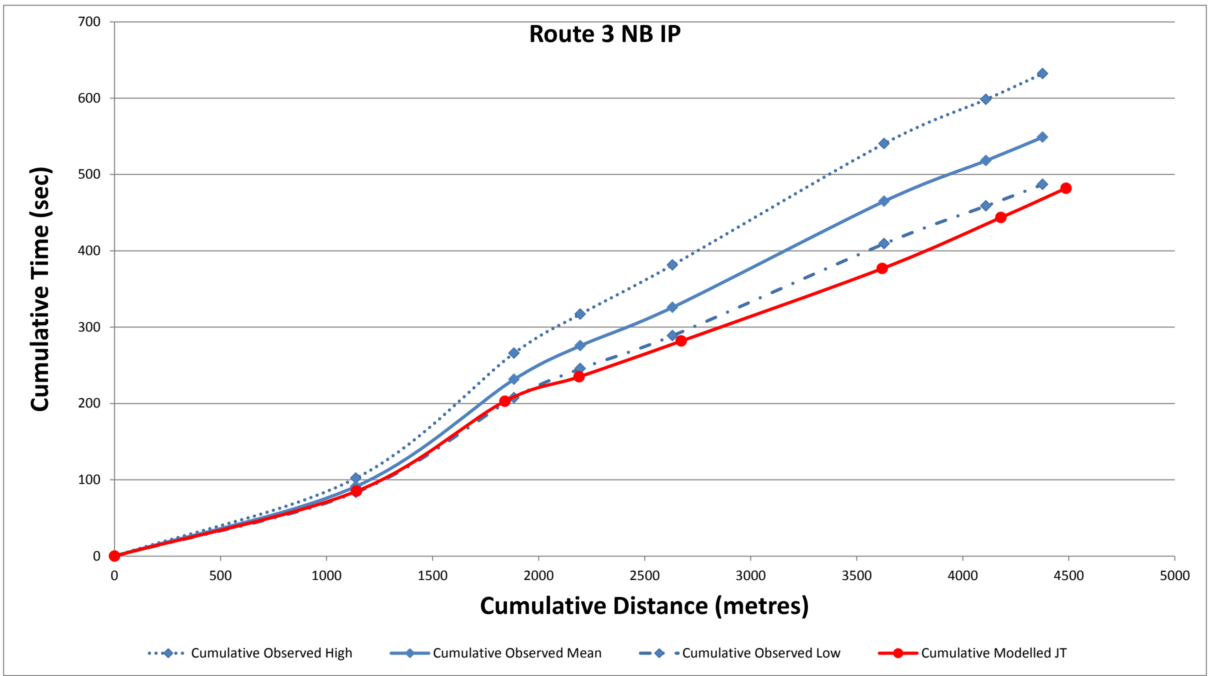


SHEET 4 Route 3 NB

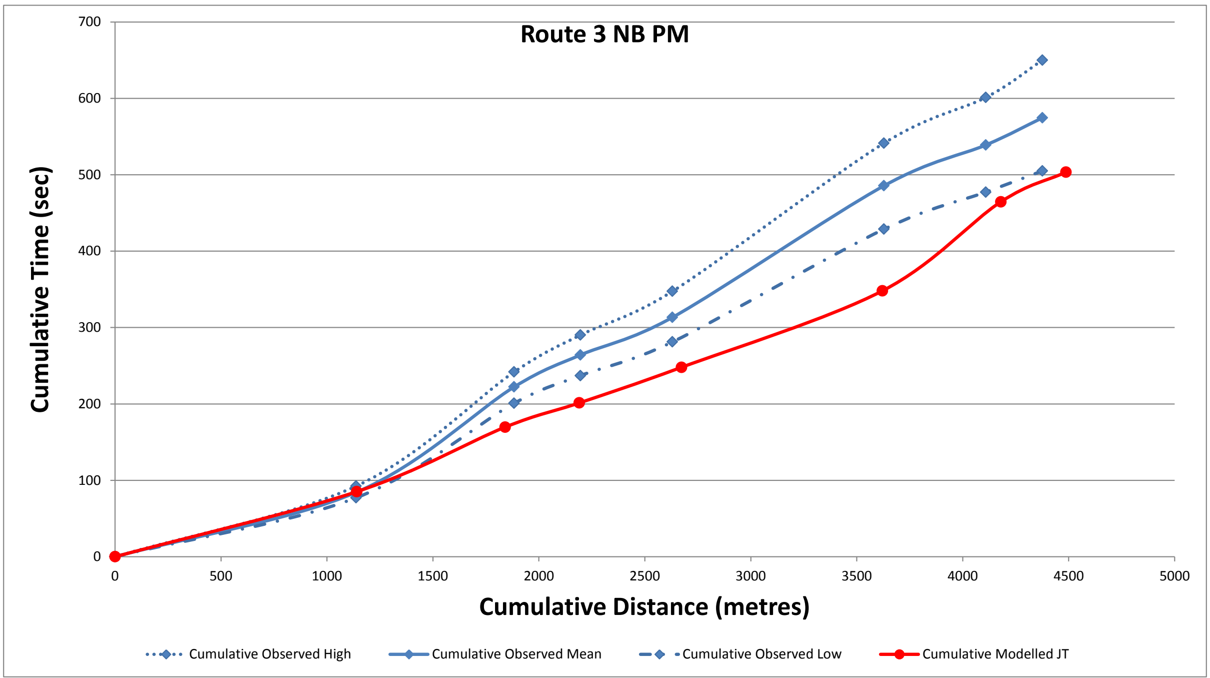
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
3NB	0 to 1	0	0	0	0	0	0			
3NB	1 to 2	1138	152	135	119	1141	105	-30	-22.5%	Pass
3NB	2 to 3	1884	289	244	203	1841	196	-18	-7.2%	Pass
3NB	3 to 4	2196	346	290	243	2191	259	17	5.9%	Pass
3NB	4 to 5	2631	439	365	304	2673	307	-27	-7.3%	Pass
3NB	5 to 6	3629	583	487	411	3621	405	-24	-5.0%	Pass
3NB	6 to 7	4109	631	531	452	4180	473	24	4.4%	Pass
3NB	7 to 8	4377	664	559	476	4487	516	15	2.8%	Pass
3NB	Total	4377	664	559	476	4487	516	**-43**	**-7.7%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
3NB	0 to 1	0	0	0	0	0	0			
3NB	1 to 2	1138	102	91	83	1141	85	-6	-6.8%	Pass
3NB	2 to 3	1884	266	231	207	1841	203	-22	-9.7%	Pass
3NB	3 to 4	2196	317	276	245	2191	235	-12	-4.4%	Pass
3NB	4 to 5	2631	381	326	289	2673	282	-3	-1.0%	Pass
3NB	5 to 6	3629	540	465	409	3621	377	-44	-9.5%	Pass
3NB	6 to 7	4109	598	518	459	4180	444	14	2.6%	Pass
3NB	7 to 8	4377	632	549	487	4487	482	8	1.4%	Pass
3NB	Total	4377	632	549	487	4487	482	-67	-12.2%	Pass

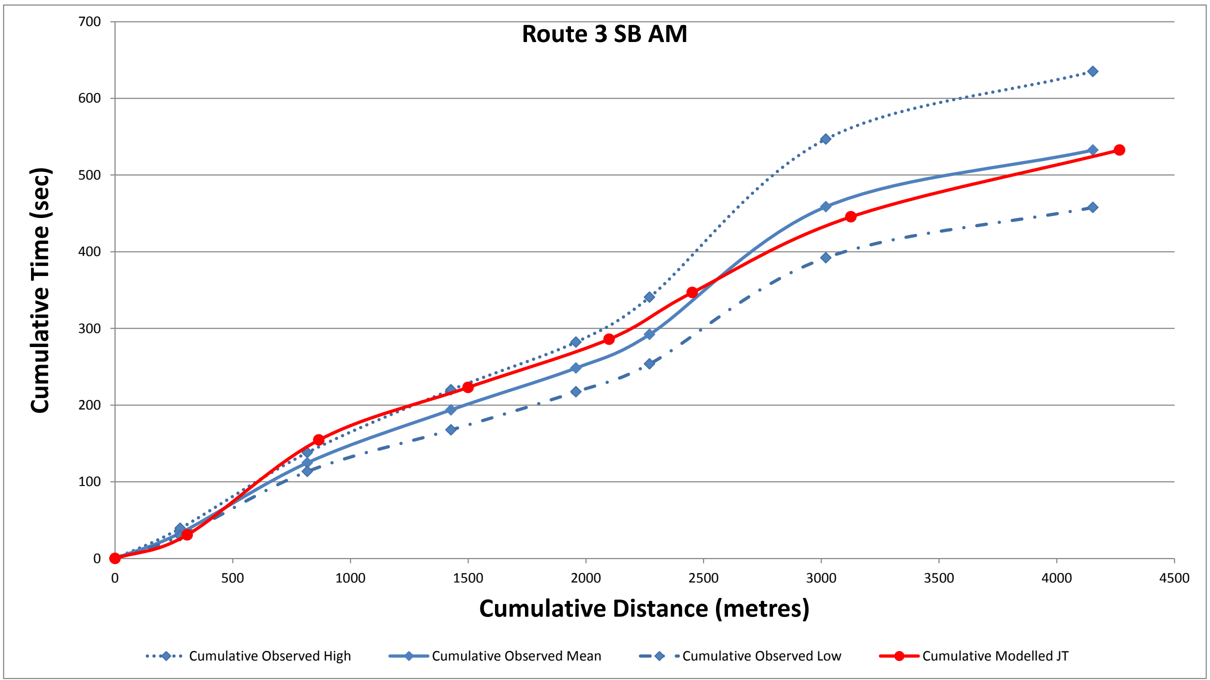


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
3NB	0 to 1	0	0	0	0	0	0			
3NB	1 to 2	1138	92	84	77	1141	85	1	1.1%	Pass
3NB	2 to 3	1884	242	222	201	1841	170	-54	-24.1%	Pass
3NB	3 to 4	2196	290	264	237	2191	201	-10	-3.8%	Pass
3NB	4 to 5	2631	348	313	281	2673	248	-3	-0.9%	Pass
3NB	5 to 6	3629	541	486	429	3621	348	-72	-14.9%	Pass
3NB	6 to 7	4109	601	539	477	4180	465	63	11.7%	Pass
3NB	7 to 8	4377	650	575	505	4487	503	3	0.5%	Pass
3NB	Total	4377	650	575	505	4487	503	-71	-12.4%	Pass

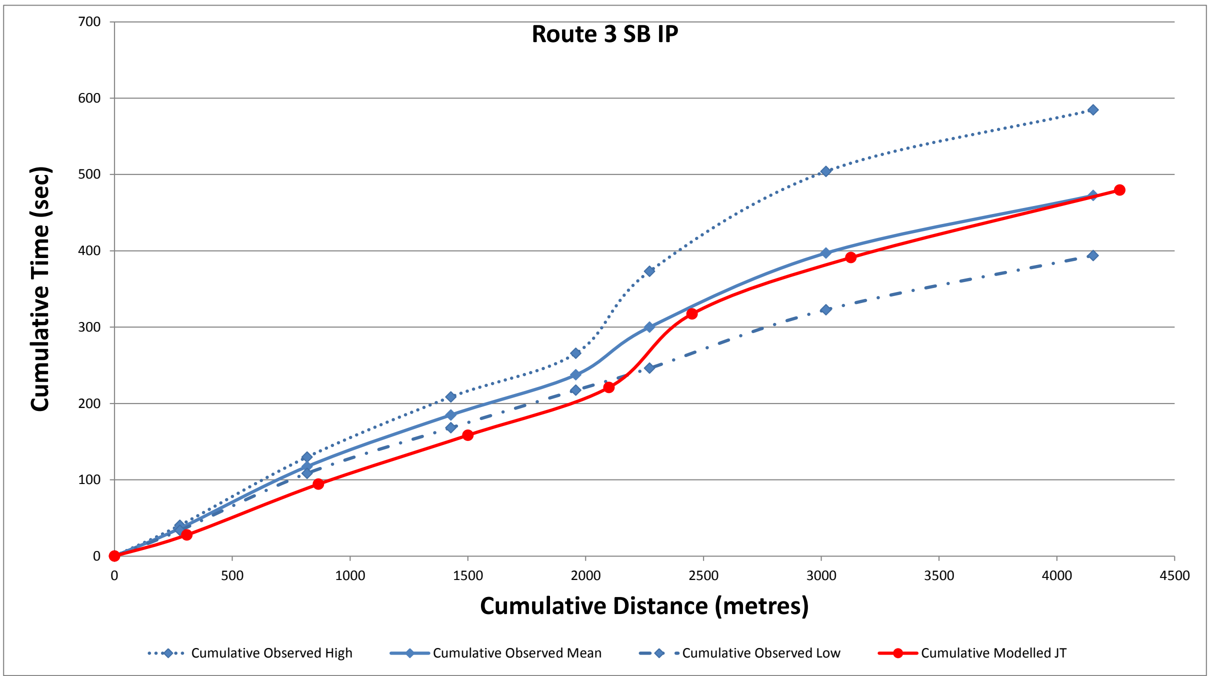


SHEET 5 Route 3 SB

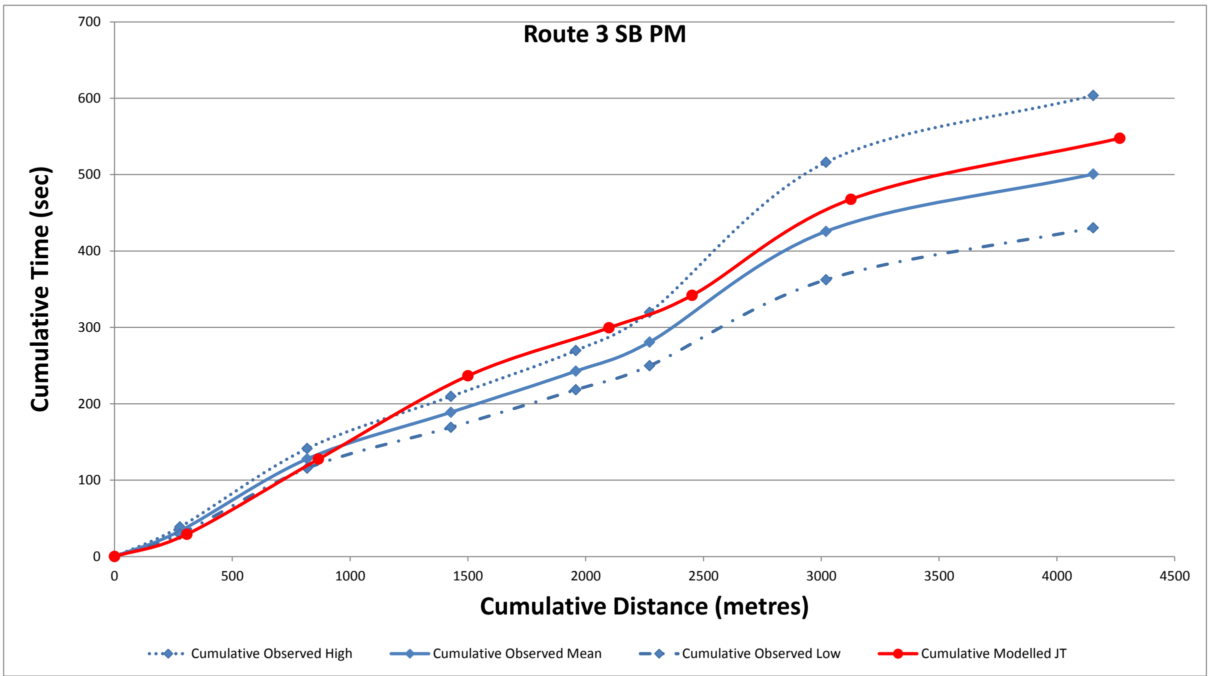
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
3SB	0 to 1	0	0	0	0	0	0			
3SB	1 to 2	277	39	33	29	307	31	-2	-7.3%	Pass
3SB	2 to 3	817	138	125	113	866	154	32	25.7%	Pass
3SB	3 to 4	1428	220	194	168	1500	223	0	-0.2%	Pass
3SB	4 to 5	1958	282	248	217	2099	286	8	3.4%	Pass
3SB	5 to 6	2271	341	292	254	2452	347	17	5.8%	Pass
3SB	6 to 7	3020	547	459	392	3126	446	-68	-14.8%	Pass
3SB	7 to 8	4154	635	533	458	4267	533	13	2.5%	Pass
3SB	Total	4154	635	533	458	4267	533	0	0.0%	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
3SB	0 to 1	0	0	0	0	0	0			
3SB	1 to 2	277	40	36	34	307	28	-9	-23.6%	Pass
3SB	2 to 3	817	130	117	108	866	94	-14	-12.3%	Pass
3SB	3 to 4	1428	209	185	168	1500	158	-3	-1.9%	Pass
3SB	4 to 5	1958	266	237	217	2099	221	10	4.2%	Pass
3SB	5 to 6	2271	373	300	246	2452	317	34	11.3%	Pass
3SB	6 to 7	3020	504	397	323	3126	391	-23	-5.9%	Pass
3SB	7 to 8	4154	585	472	394	4267	480	13	2.7%	Pass
3SB	Total	4154	585	472	394	4267	480	7	1.5%	Pass

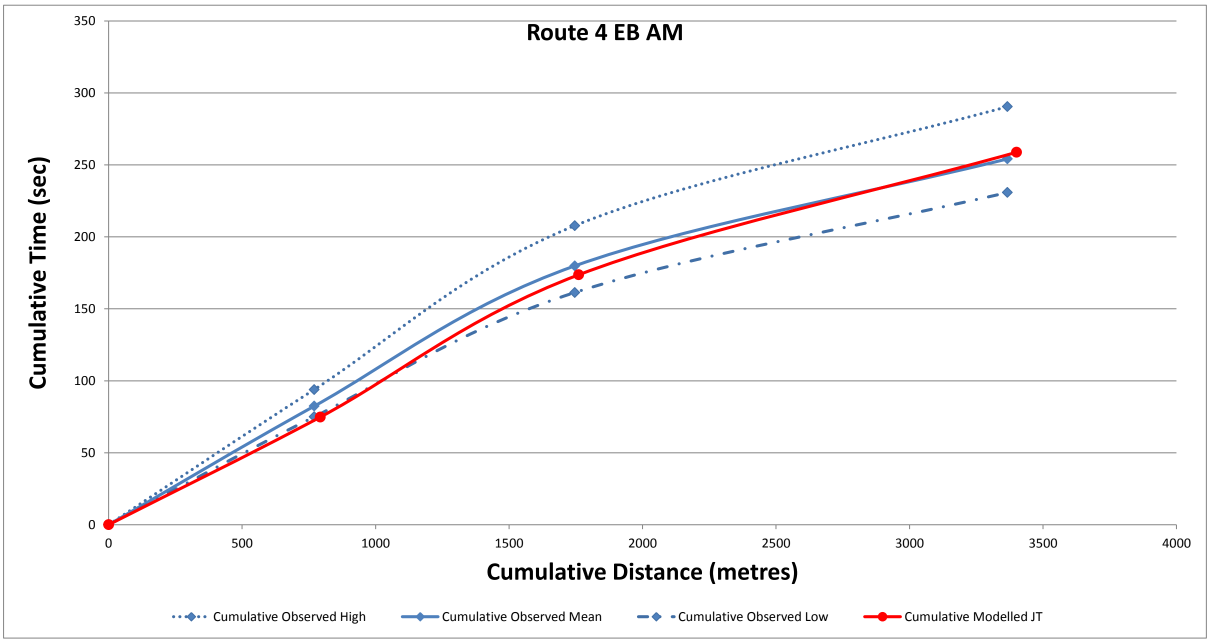


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
3SB	0 to 1	0	0	0	0	0	0			
3SB	1 to 2	277	39	33	29	307	29	-4	-12.8%	Pass
3SB	2 to 3	817	141	128	116	866	128	4	3.2%	Pass
3SB	3 to 4	1428	210	189	169	1500	237	48	25.4%	Pass
3SB	4 to 5	1958	270	243	218	2099	299	9	3.7%	Pass
3SB	5 to 6	2271	320	281	250	2452	342	4	1.6%	Pass
3SB	6 to 7	3020	516	426	362	3126	468	-19	-4.5%	Pass
3SB	7 to 8	4154	604	501	430	4267	548	5	1.0%	Pass
3SB	Total	4154	604	501	430	4267	548	47	9.4%	Pass

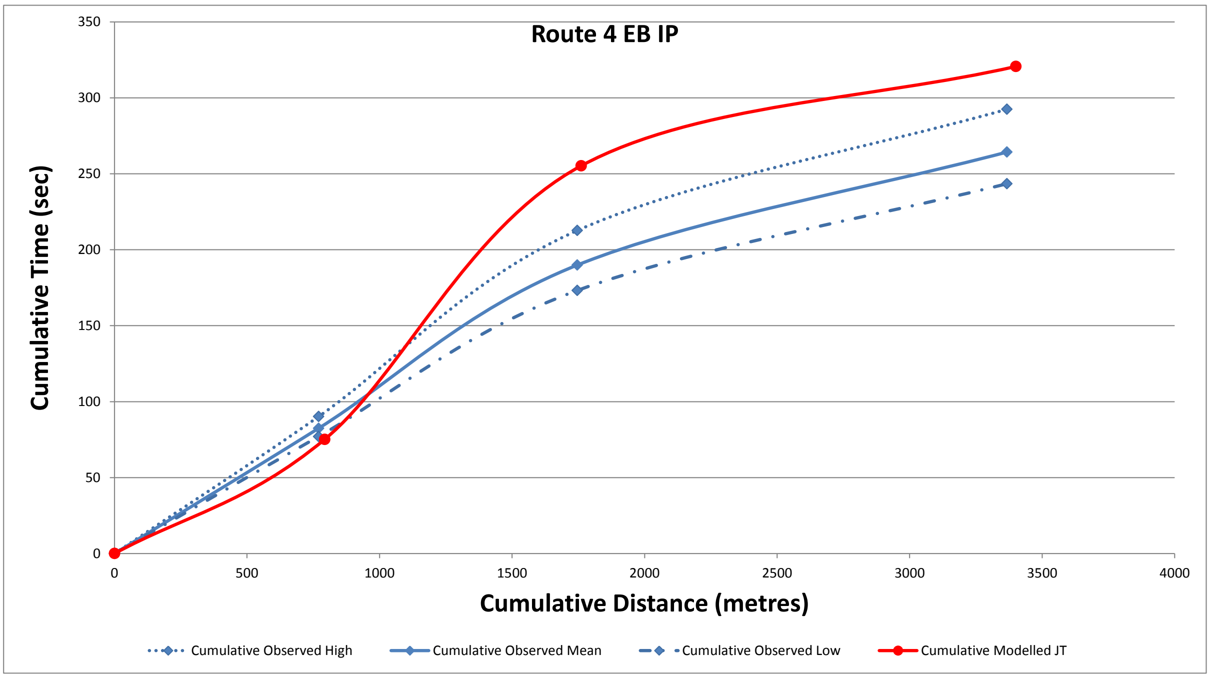


SHEET 6 **Route 4 EB**

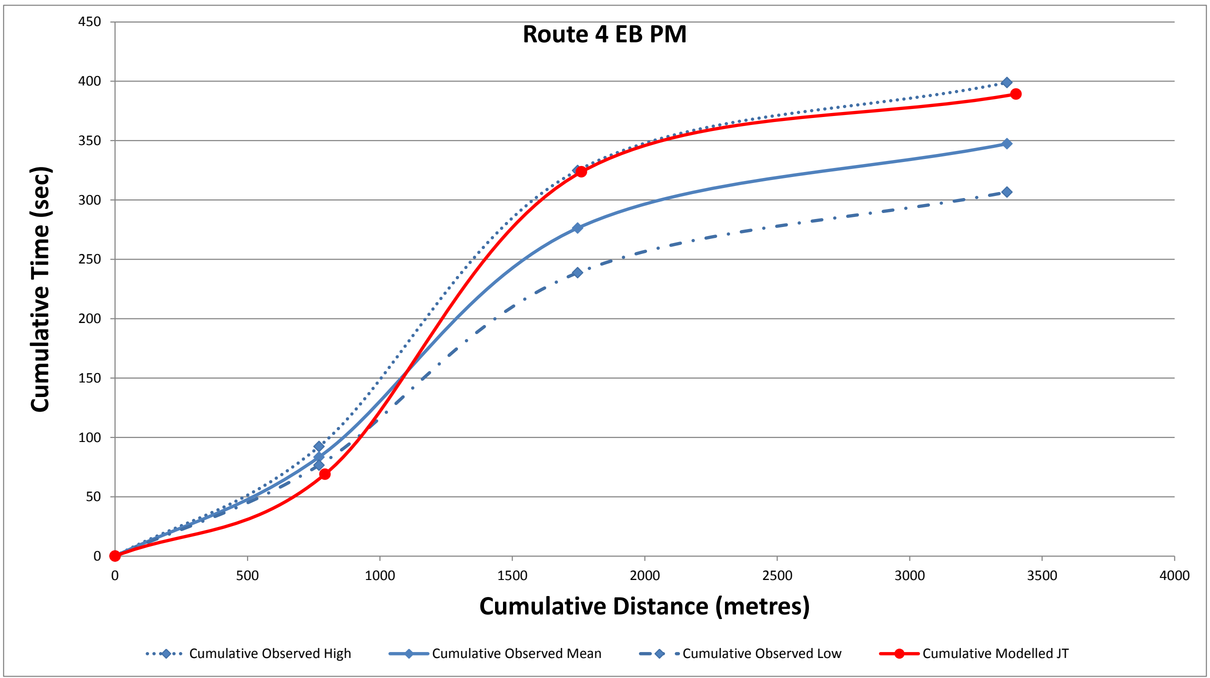
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
4EB	0 to 1	0	0	0	0	0	0			
4EB	1 to 2	770	94	82	75	793	75	-8	-9.2%	Pass
4EB	2 to 3	1746	208	180	161	1761	174	1	0.8%	Pass
4EB	3 to 4	3367	290	254	231	3401	259	11	4.2%	Pass
4EB	Total	3367	290	254	231	3401	259	5	1.8%	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
4EB	0 to 1	0	0	0	0	0	0			
4EB	1 to 2	770	90	82	77	793	75	-7	-8.8%	Pass
4EB	2 to 3	1746	213	190	173	1761	255	73	38.2%	Fail
4EB	3 to 4	3367	292	264	243	3401	321	-9	-3.4%	Pass
4EB	Total	3367	292	264	243	3401	321	56	21.3%	Pass

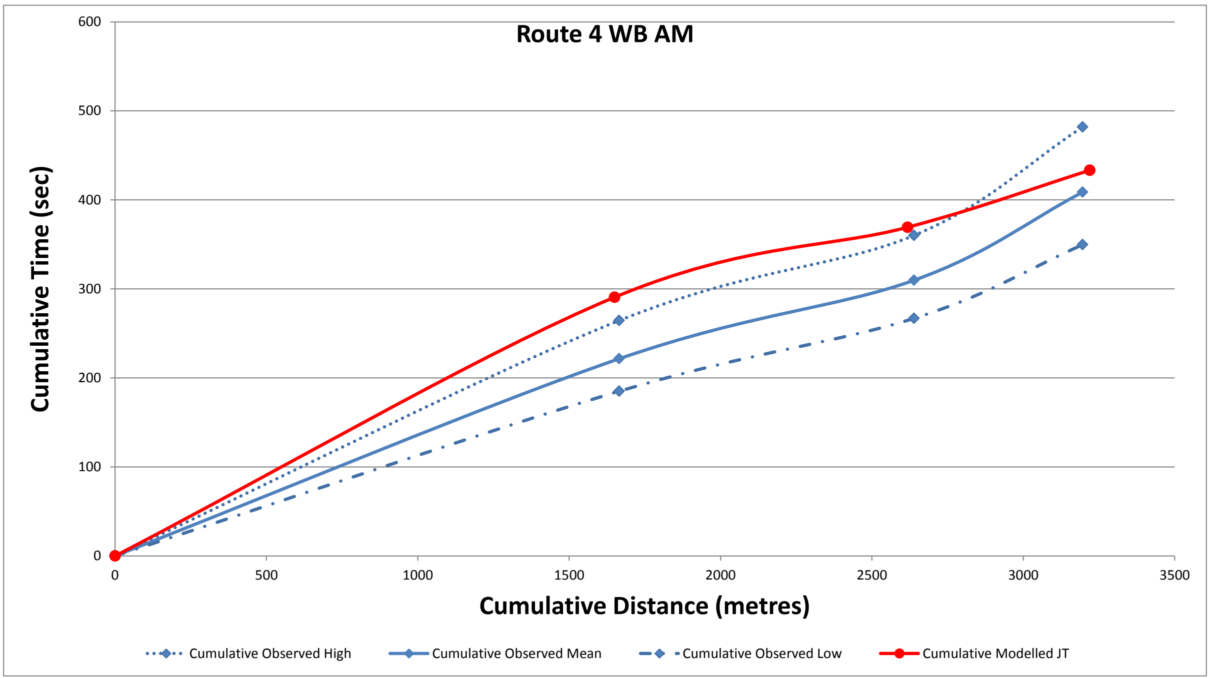


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
4EB	0 to 1	0	0	0	0	0	0			
4EB	1 to 2	770	92	83	77	793	69	-14	-17.2%	Pass
4EB	2 to 3	1746	325	276	239	1761	324	62	22.3%	Fail
4EB	3 to 4	3367	399	347	307	3401	389	-5	-1.6%	Pass
4EB	Total	3367	399	347	307	3401	389	42	12.1%	Pass

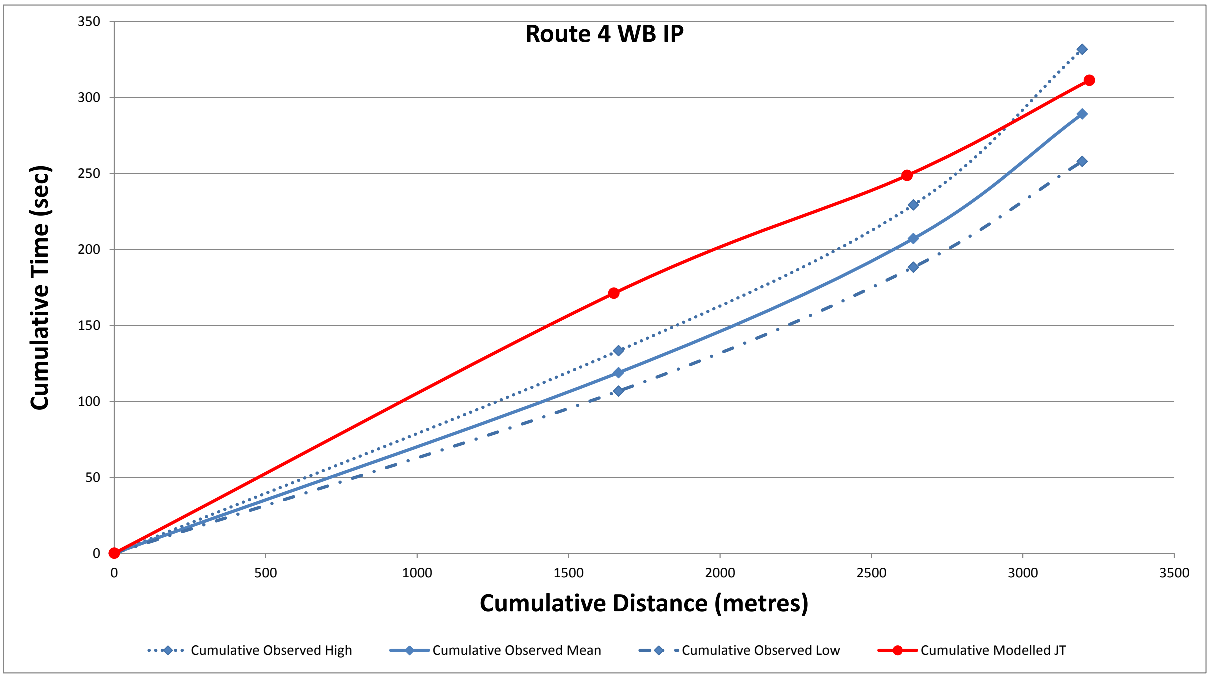


SHEET 7 Route 4 WB

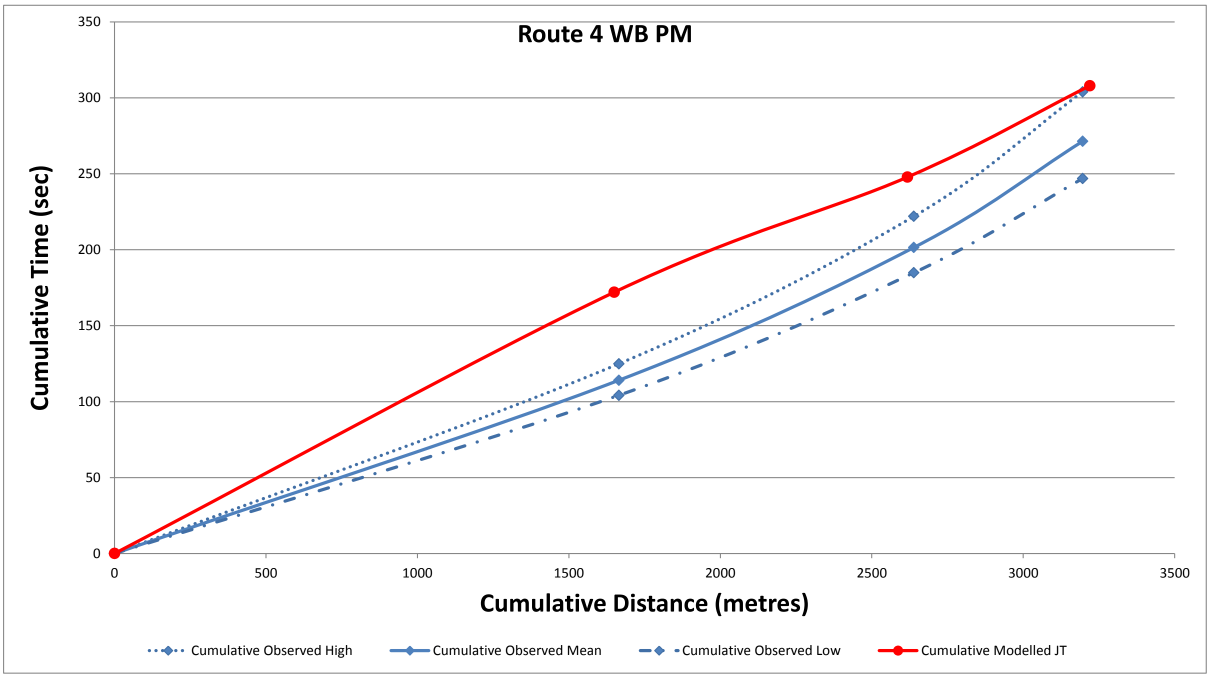
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
4WB	0 to 1	0	0	0	0	0	0			
4WB	1 to 2	1665	264	222	185	1650	291	69	31.2%	Fail
4WB	2 to 3	2639	360	310	267	2618	369	-10	-3.1%	Pass
4WB	3 to 4	3196	482	409	350	3220	433	-35	-8.6%	Pass
4WB	Total	3196	482	409	350	3220	433	25	6.0%	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
4WB	0 to 1	0	0	0	0	0	0			
4WB	1 to 2	1665	133	119	107	1650	171	52	43.9%	Pass
4WB	2 to 3	2639	229	207	188	2618	249	-11	-5.2%	Pass
4WB	3 to 4	3196	332	289	258	3220	311	-19	-6.7%	Pass
4WB	Total	3196	332	289	258	3220	311	22	7.7%	Pass

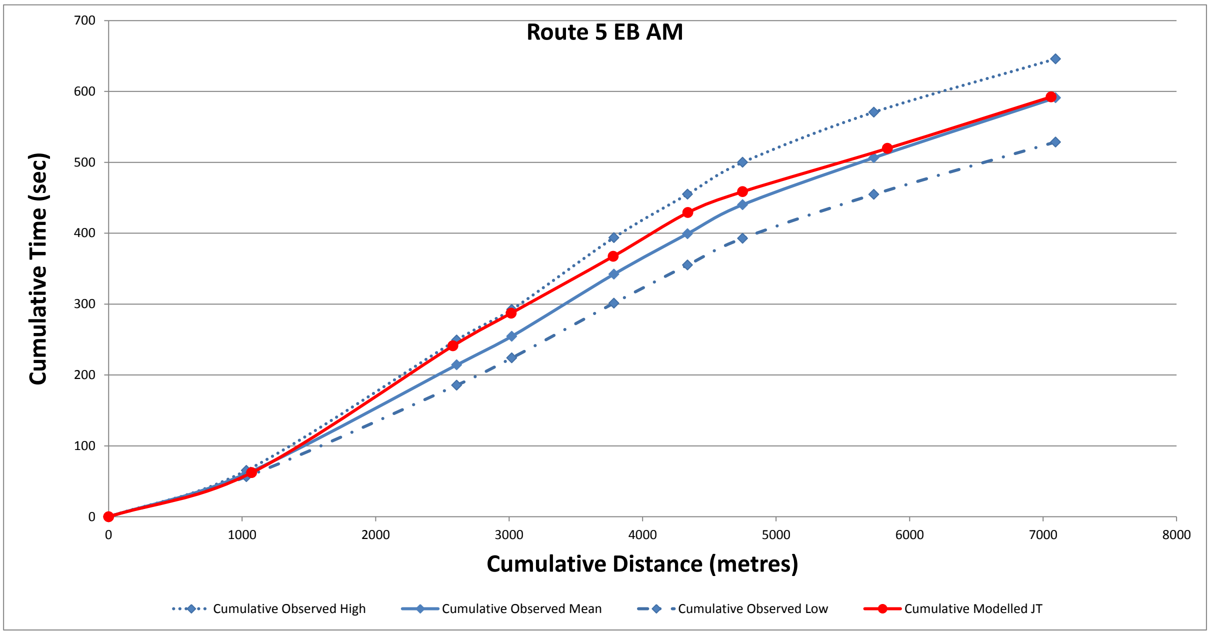


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
4WB	0 to 1	0	0	0	0	0	0			
4WB	1 to 2	1665	125	114	104	1650	172	58	50.8%	Pass
4WB	2 to 3	2639	222	201	185	2618	248	-12	-5.8%	Pass
4WB	3 to 4	3196	304	271	247	3220	308	-10	-3.6%	Pass
4WB	Total	3196	304	271	247	3220	308	37	13.5%	Pass

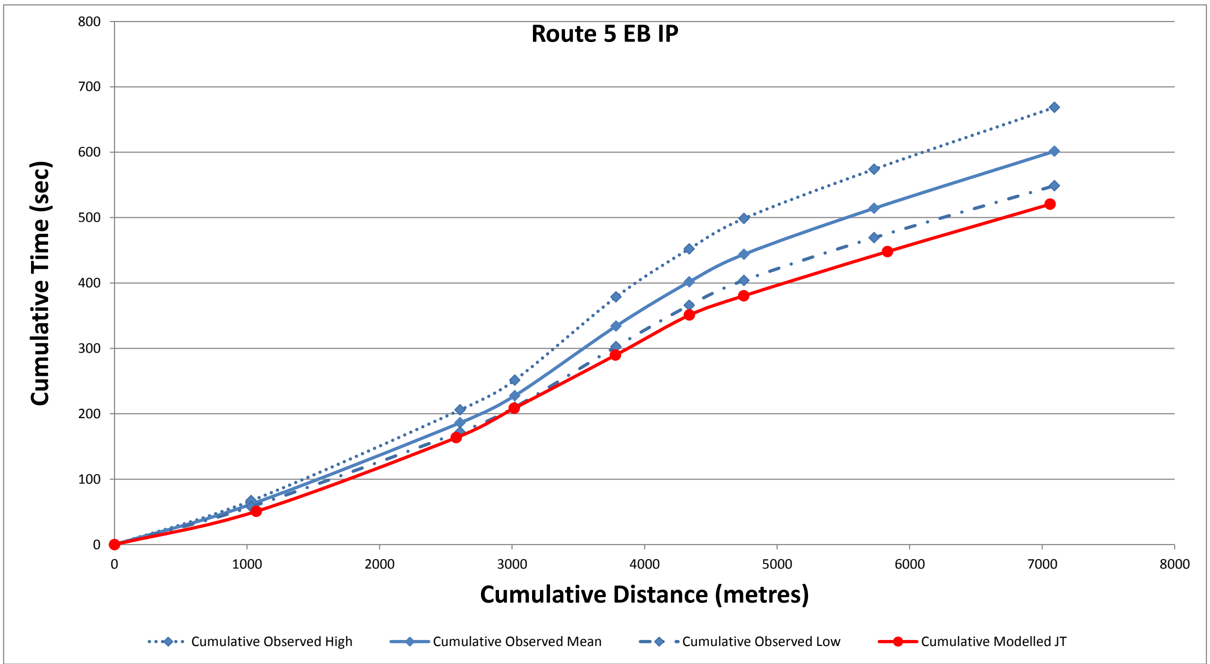


SHEET 8 **Route 5 EB**

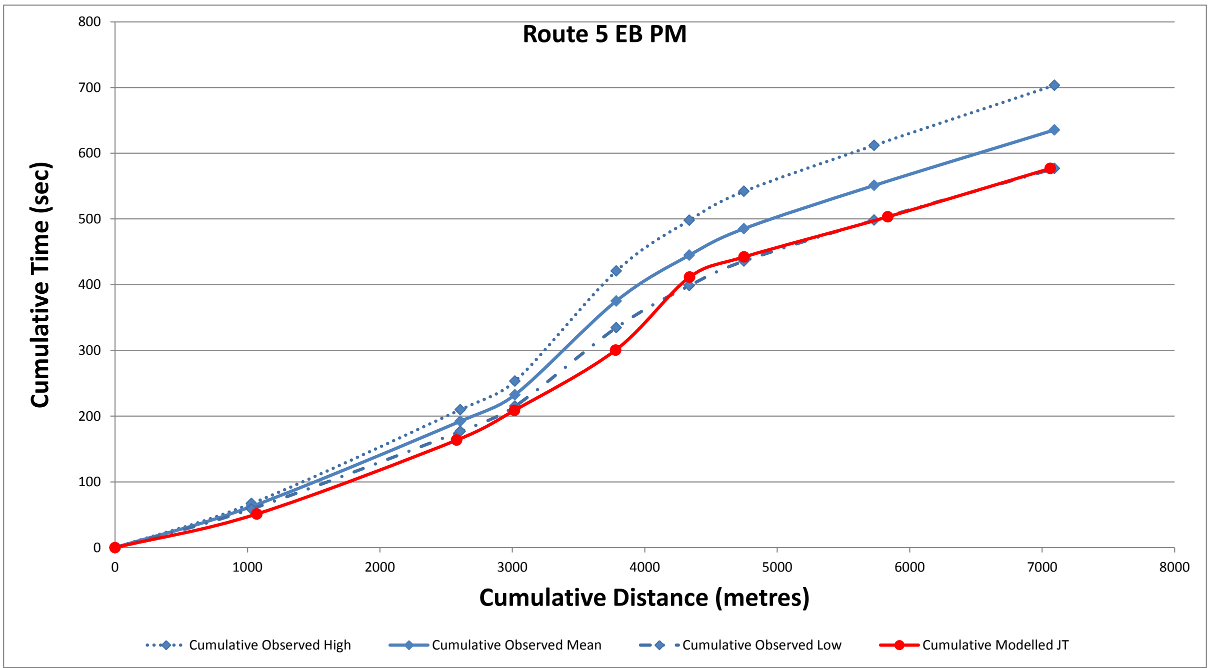
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
5EB	0 to 1	0	0	0	0	0	0			
5EB	1 to 2	1032	65	61	56	1071	62	1	2.0%	Pass
5EB	2 to 3	2608	249	214	186	2579	241	26	12.0%	Pass
5EB	3 to 4	3020	292	255	224	3016	287	6	2.3%	Pass
5EB	4 to 5	3785	394	342	301	3780	367	-7	-2.2%	Pass
5EB	5 to 6	4337	455	399	355	4339	429	5	1.2%	Pass
5EB	6 to 7	4750	500	440	393	4749	459	-11	-2.6%	Pass
5EB	7 to 8	5733	571	506	455	5834	520	-5	-1.0%	Pass
5EB	8 to 9	7093	646	591	529	7061	592	-12	-2.0%	Pass
5EB	Total	7093	646	591	529	7061	592	1	0.2%	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
5EB	0 to 1	0	0	0	0	0	0			
5EB	1 to 2	1032	67	62	58	1071	51	-11	-17.7%	Pass
5EB	2 to 3	2608	206	186	172	2579	163	-12	-6.3%	Pass
5EB	3 to 4	3020	252	228	210	3016	208	3	1.5%	Pass
5EB	4 to 5	3785	379	334	303	3780	290	-25	-7.5%	Pass
5EB	5 to 6	4337	452	402	366	4339	351	-6	-1.6%	Pass
5EB	6 to 7	4750	499	444	404	4749	380	-13	-2.9%	Pass
5EB	7 to 8	5733	574	514	469	5834	448	-3	-0.5%	Pass
5EB	8 to 9	7093	669	601	549	7061	521	-15	-2.5%	Pass
5EB	Total	7093	669	601	549	7061	521	-81	-13.5%	Pass

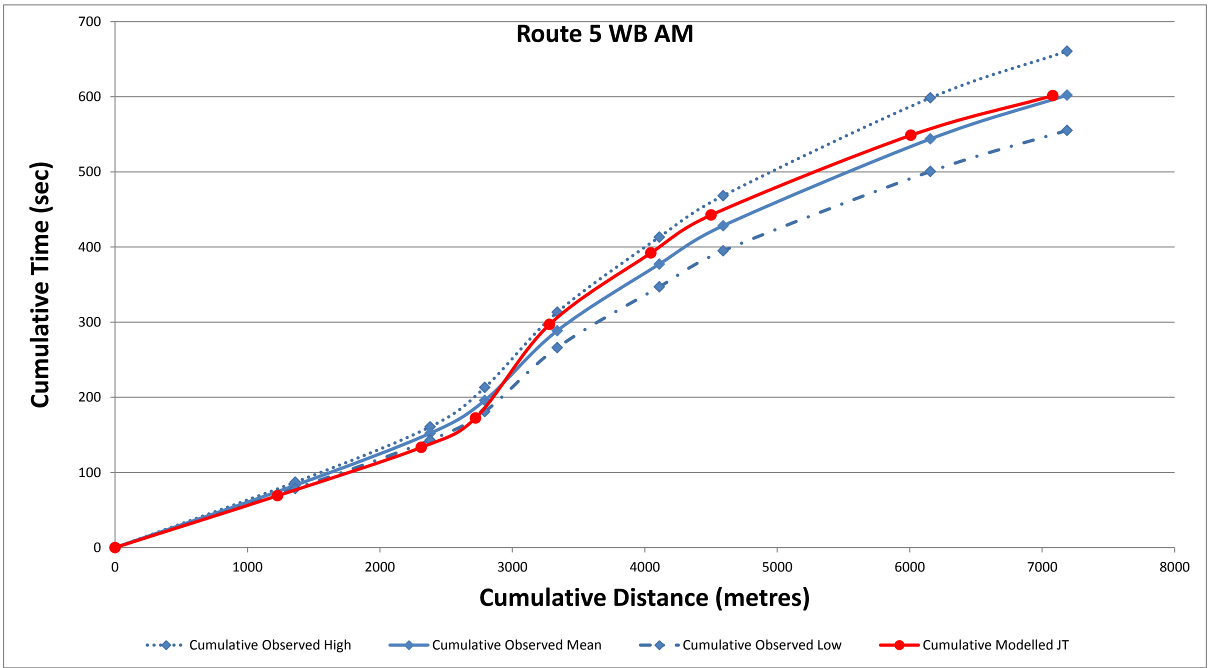


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
5EB	0 to 1	0	0	0	0	0	0			
5EB	1 to 2	1032	67	63	59	1071	51	-11	-18.3%	Pass
5EB	2 to 3	2608	210	192	177	2579	163	-17	-9.0%	Pass
5EB	3 to 4	3020	253	233	215	3016	209	5	2.2%	Pass
5EB	4 to 5	3785	421	375	335	3780	301	-51	-13.6%	Pass
5EB	5 to 6	4337	498	445	399	4339	412	41	9.3%	Pass
5EB	6 to 7	4750	542	485	436	4749	442	-10	-2.0%	Pass
5EB	7 to 8	5733	612	551	498	5834	503	-5	-0.9%	Pass
5EB	8 to 9	7093	703	635	577	7061	577	-11	-1.7%	Pass
5EB	Total	7093	703	635	577	7061	577	-59	-9.2%	Pass

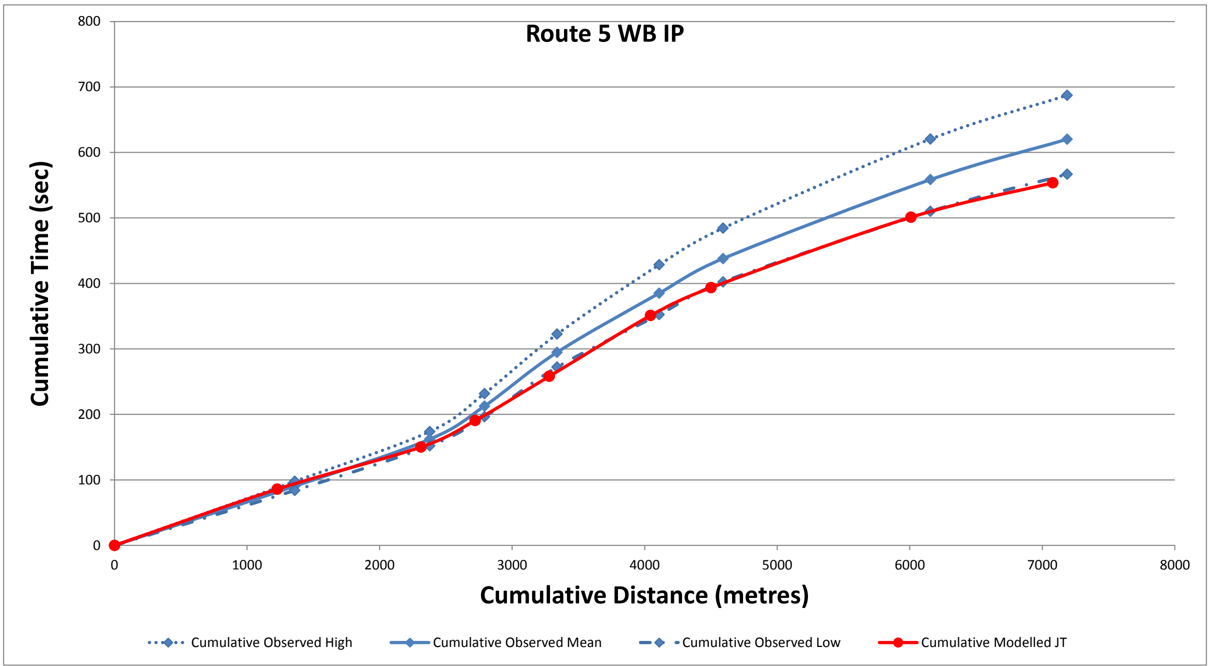


SHEET 9 Route 5 WB

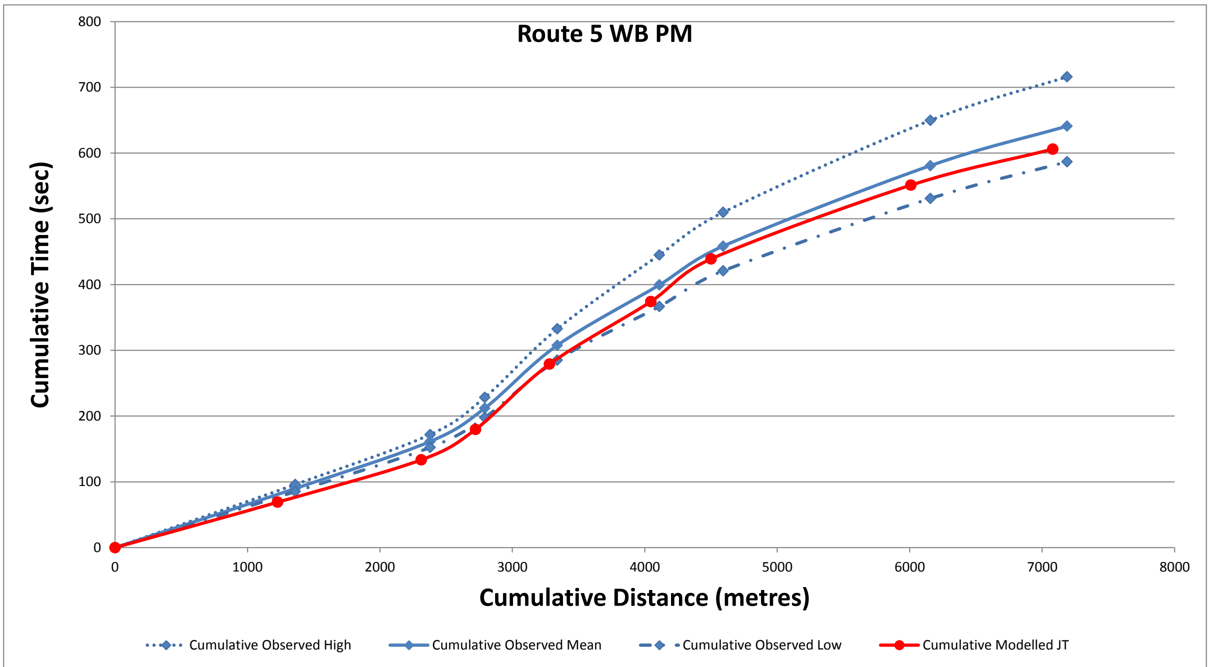
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
5WB	0 to 1	0	0	0	0	0	0			
5WB	1 to 2	1361	87	83	79	1227	69	-14	-16.8%	Pass
5WB	2 to 3	2379	161	152	143	2312	133	-5	-3.2%	Pass
5WB	3 to 4	2792	213	196	181	2722	172	-5	-2.4%	Pass
5WB	4 to 5	3339	313	289	266	3281	297	32	11.0%	Pass
5WB	5 to 6	4109	413	377	347	4045	392	6	1.7%	Pass
5WB	6 to 7	4591	468	428	395	4501	443	0	-0.1%	Pass
5WB	7 to 8	6156	598	544	500	6009	549	-9	-1.7%	Pass
5WB	8 to 9	7188	661	602	555	7080	601	-6	-0.9%	Pass
5WB	Total	7188	661	602	555	7080	601	**-1**	**-0.1%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
5WB	0 to 1	0	0	0	0	0	0			
5WB	1 to 2	1361	98	91	84	1227	86	-5	-5.1%	Pass
5WB	2 to 3	2379	174	162	152	2312	150	-7	-4.5%	Pass
5WB	3 to 4	2792	232	213	196	2722	191	-10	-4.7%	Pass
5WB	4 to 5	3339	323	295	272	3281	258	-15	-5.0%	Pass
5WB	5 to 6	4109	428	385	352	4045	351	3	0.7%	Pass
5WB	6 to 7	4591	484	438	402	4501	394	-10	-2.4%	Pass
5WB	7 to 8	6156	620	558	510	6009	501	-13	-2.4%	Pass
5WB	8 to 9	7188	687	620	567	7080	554	-9	-1.4%	Pass
5WB	Total	7188	687	620	567	7080	554	-66	-10.7%	Pass

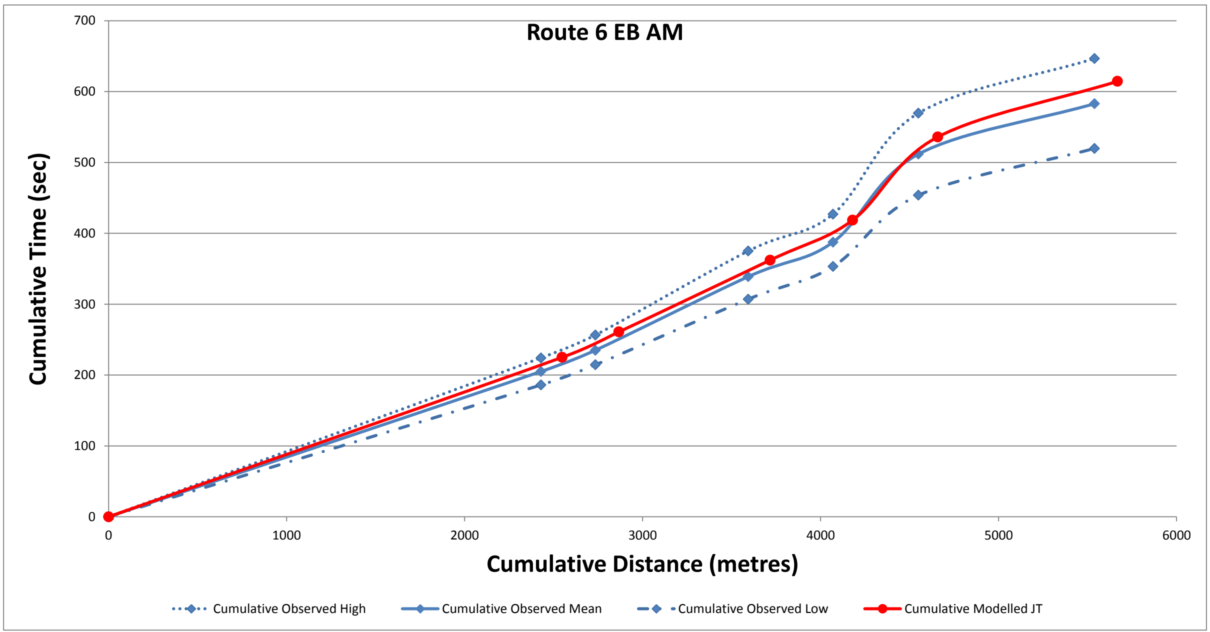


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
5WB	0 to 1	0	0	0	0	0	0			
5WB	1 to 2	1361	96	90	85	1227	69	-21	-23.3%	Pass
5WB	2 to 3	2379	172	161	152	2312	133	-7	-4.3%	Pass
5WB	3 to 4	2792	228	212	198	2722	180	-4	-2.1%	Pass
5WB	4 to 5	3339	333	308	285	3281	279	4	1.2%	Pass
5WB	5 to 6	4109	445	399	367	4045	374	3	0.8%	Pass
5WB	6 to 7	4591	510	458	421	4501	439	6	1.3%	Pass
5WB	7 to 8	6156	650	581	531	6009	551	-10	-1.8%	Pass
5WB	8 to 9	7188	716	641	587	7080	606	-5	-0.8%	Pass
5WB	Total	7188	716	641	587	7080	606	-35	-5.5%	Pass

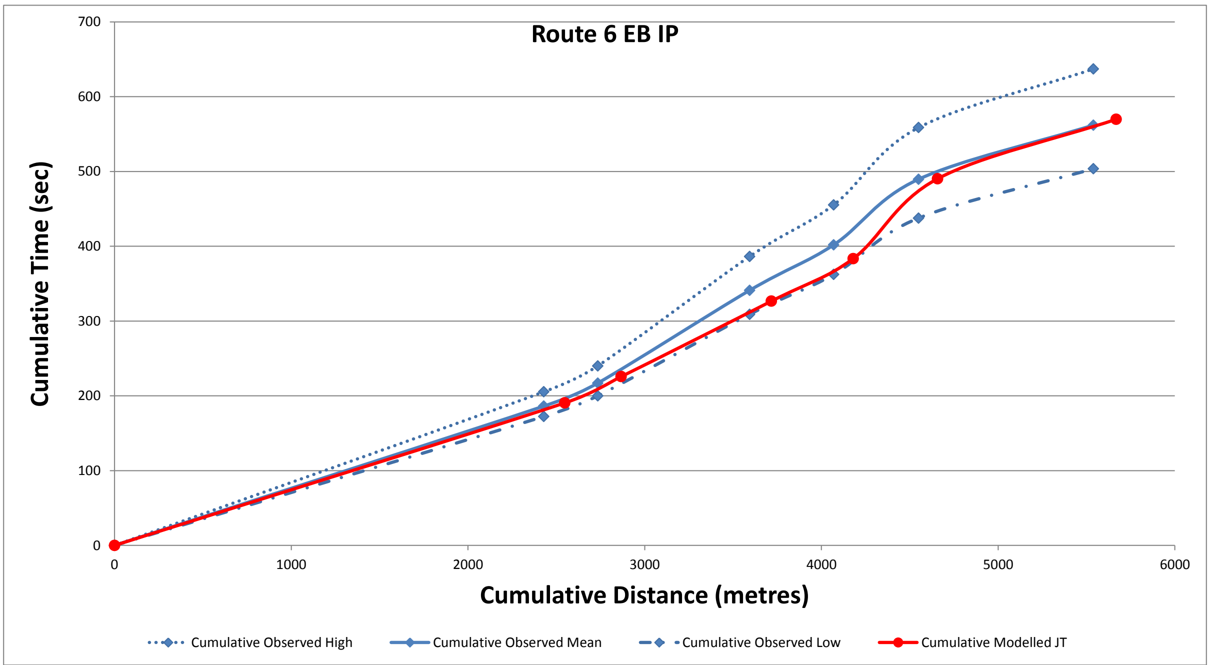


SHEET 10 Route 6 EB

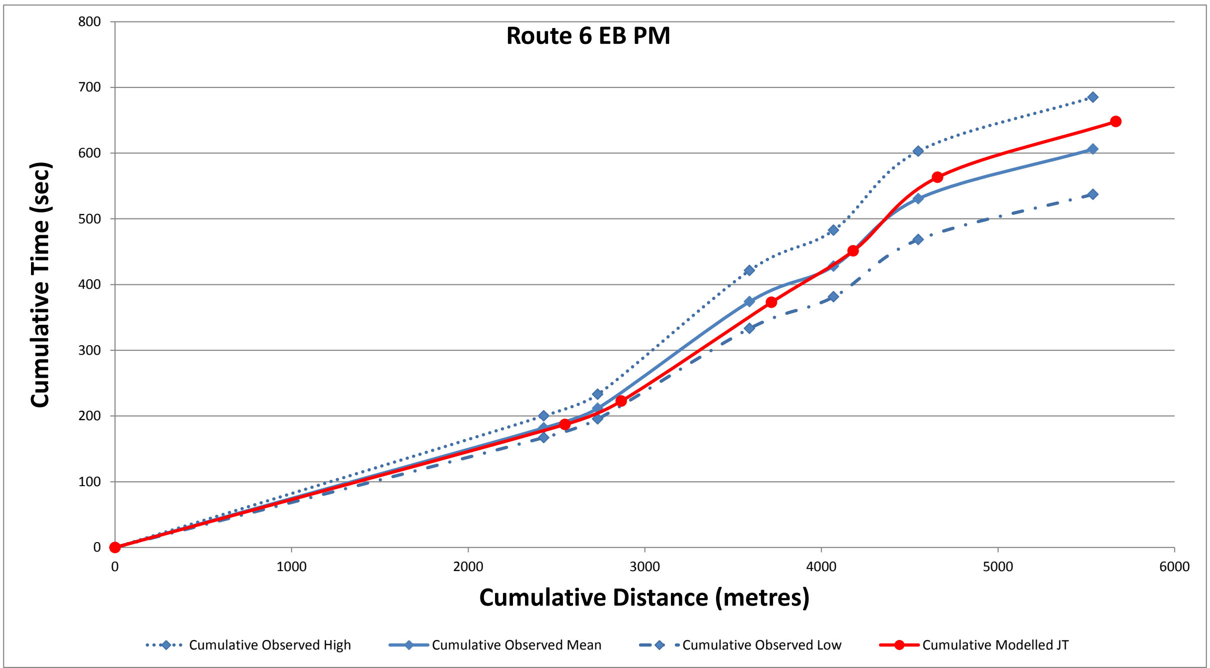
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
6EB	0 to 1	0	0	0	0	0	0			
6EB	1 to 2	2429	224	205	186	2548	225	20	9.8%	Pass
6EB	2 to 3	2734	256	235	214	2867	261	6	2.5%	Pass
6EB	3 to 4	3594	375	339	307	3717	362	-3	-0.8%	Pass
6EB	4 to 5	4070	427	388	353	4180	419	8	2.0%	Pass
6EB	5 to 6	4550	570	512	454	4658	536	-7	-1.3%	Pass
6EB	6 to 7	5539	647	583	520	5668	614	7	1.3%	Pass
6EB	Total	5539	647	583	520	5668	614	**32**	**5.4%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
6EB	0 to 1	0	0	0	0	0	0			
6EB	1 to 2	2429	205	186	172	2548	191	4	2.3%	Pass
6EB	2 to 3	2734	240	217	200	2867	226	4	2.0%	Pass
6EB	3 to 4	3594	386	341	309	3717	327	-23	-6.8%	Pass
6EB	4 to 5	4070	455	402	362	4180	383	-4	-1.0%	Pass
6EB	5 to 6	4550	559	490	438	4658	490	19	3.9%	Pass
6EB	6 to 7	5539	637	562	504	5668	570	7	1.3%	Pass
6EB	Total	5539	637	562	504	5668	570	8	1.4%	Pass

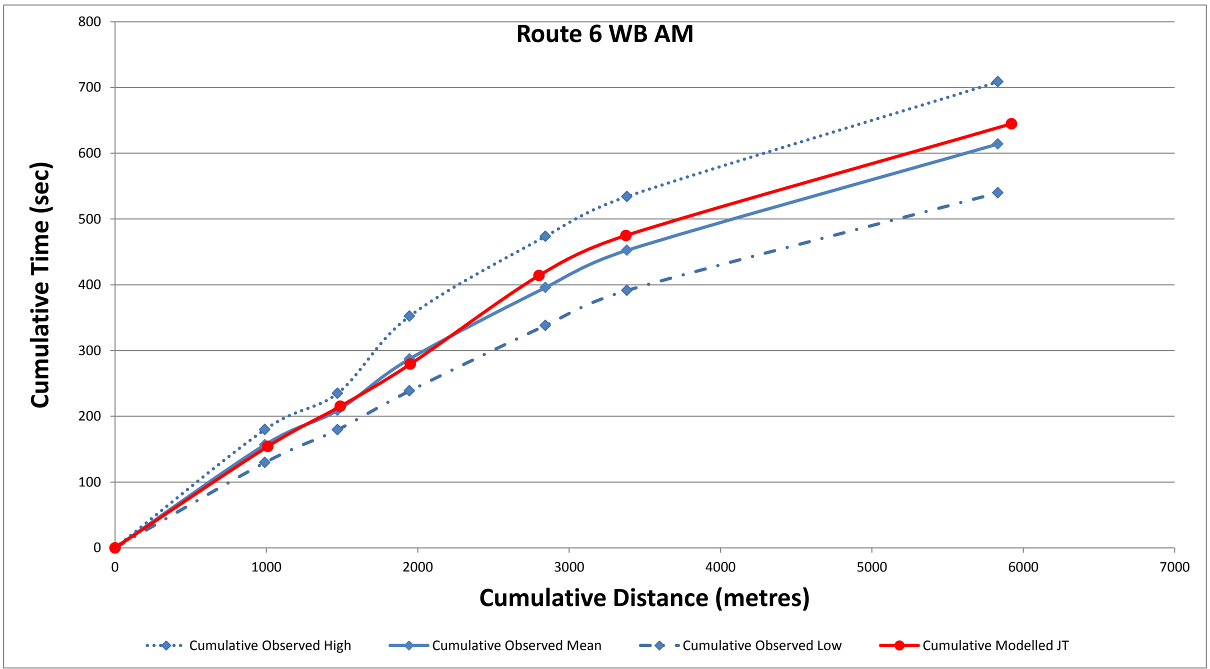


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
6EB	0 to 1	0	0	0	0	0	0			
6EB	1 to 2	2429	200	182	167	2548	187	5	2.9%	Pass
6EB	2 to 3	2734	233	212	196	2867	223	6	2.7%	Pass
6EB	3 to 4	3594	422	374	333	3717	373	-12	-3.2%	Pass
6EB	4 to 5	4070	483	428	381	4180	451	24	5.6%	Pass
6EB	5 to 6	4550	603	531	468	4658	563	9	1.8%	Pass
6EB	6 to 7	5539	685	606	537	5668	648	10	1.6%	Pass
6EB	Total	5539	685	606	537	5668	648	42	6.9%	Pass

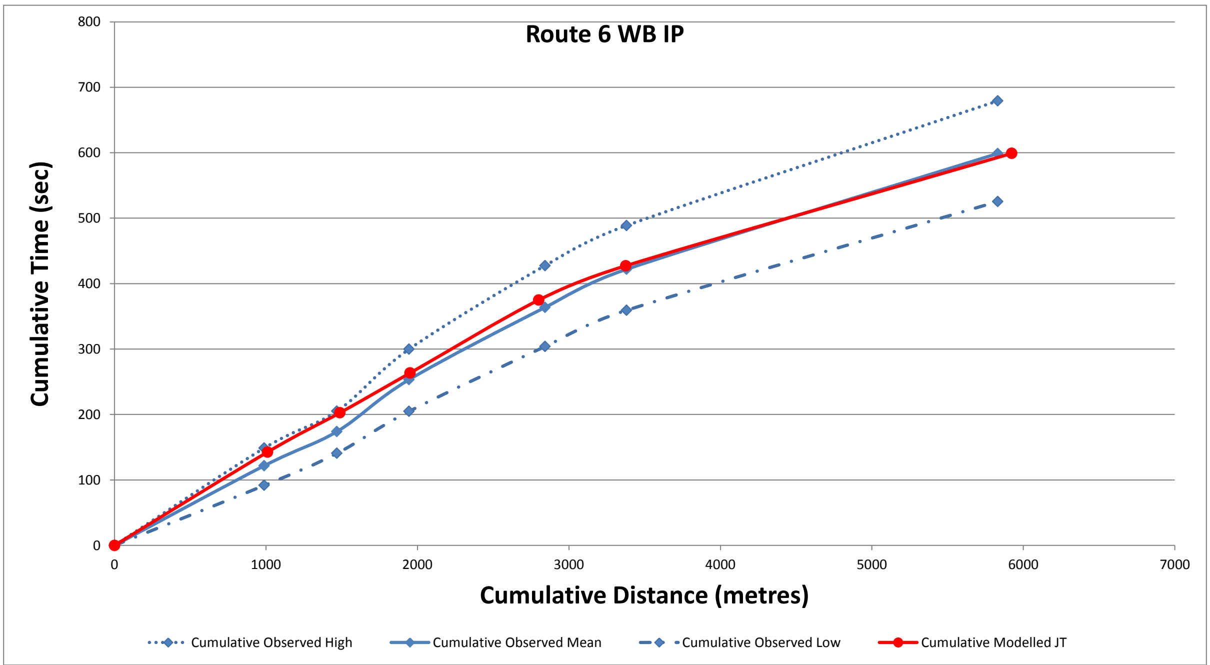


SHEET 11 **Route 6 WB**

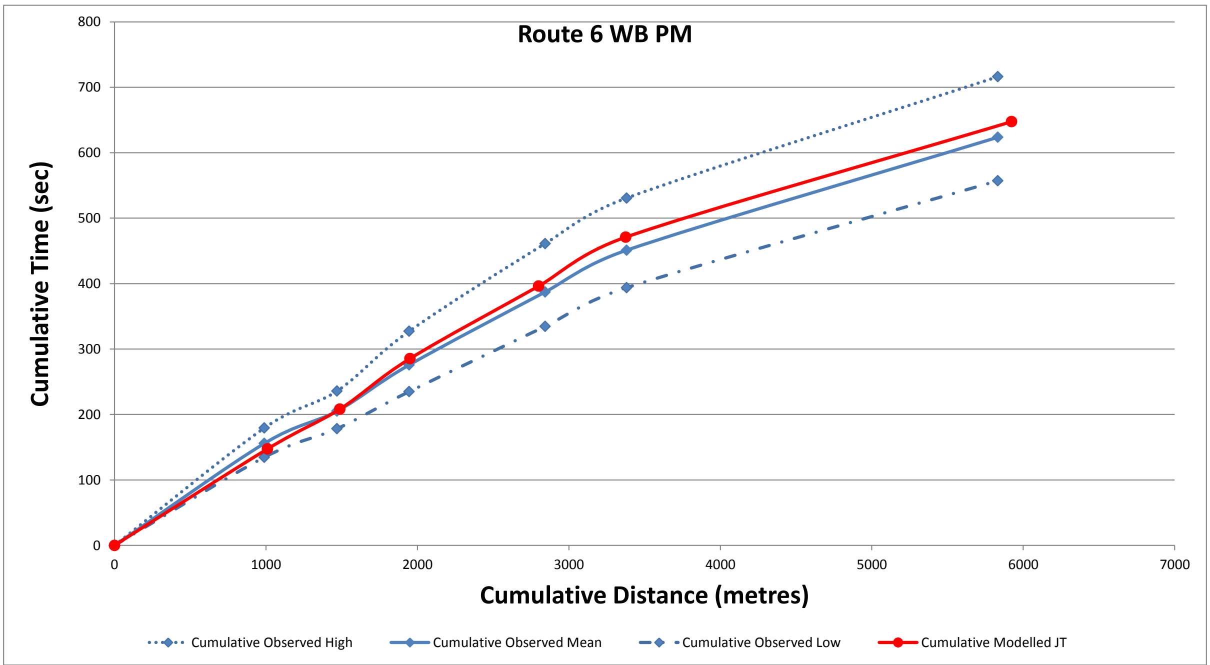
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
6WB	0 to 1	0	0	0	0	0	0			
6WB	1 to 2	989	180	157	130	1010	154	-2	-1.5%	Pass
6WB	2 to 3	1469	235	209	179	1488	215	9	4.1%	Pass
6WB	3 to 4	1945	352	287	238	1951	279	-14	-4.9%	Pass
6WB	4 to 5	2843	474	396	338	2801	414	26	6.6%	Pass
6WB	5 to 6	3381	534	452	391	3375	475	4	1.0%	Pass
6WB	6 to 7	5832	708	614	540	5923	645	8	1.3%	Pass
6WB	Total	5832	708	614	540	5923	645	**31**	**5.0%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
6WB	0 to 1	0	0	0	0	0	0			
6WB	1 to 2	989	149	122	92	1010	143	21	17.0%	Pass
6WB	2 to 3	1469	205	174	141	1488	203	8	4.5%	Pass
6WB	3 to 4	1945	300	253	205	1951	263	-19	-7.3%	Pass
6WB	4 to 5	2843	428	364	304	2801	375	1	0.3%	Pass
6WB	5 to 6	3381	489	422	359	3375	427	-6	-1.4%	Pass
6WB	6 to 7	5832	679	599	525	5923	599	-5	-0.9%	Pass
6WB	Total	5832	679	599	525	5923	599	0	0.0%	Pass

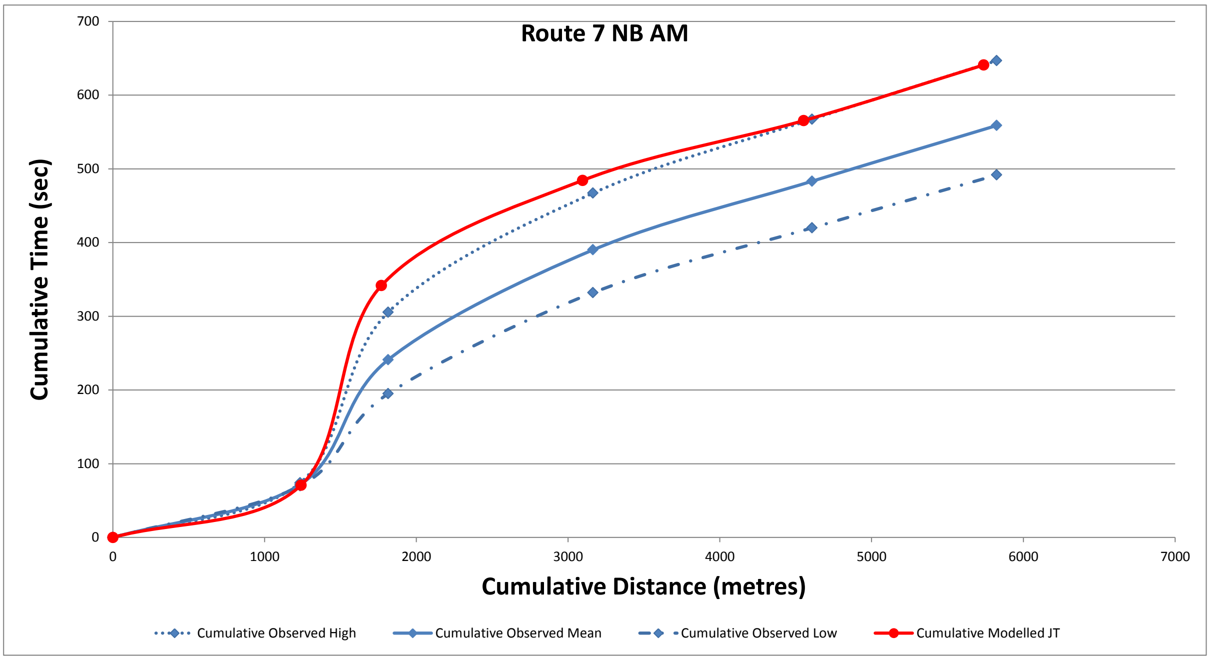


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
6WB	0 to 1	0	0	0	0	0	0			
6WB	1 to 2	989	179	156	135	1010	147	-8	-5.4%	Pass
6WB	2 to 3	1469	236	205	178	1488	208	12	5.6%	Pass
6WB	3 to 4	1945	327	276	235	1951	285	7	2.4%	Pass
6WB	4 to 5	2843	461	387	335	2801	396	-1	-0.2%	Pass
6WB	5 to 6	3381	531	451	394	3375	471	11	2.4%	Pass
6WB	6 to 7	5832	716	624	557	5923	647	4	0.6%	Pass
6WB	Total	5832	716	624	557	5923	647	24	3.8%	Pass

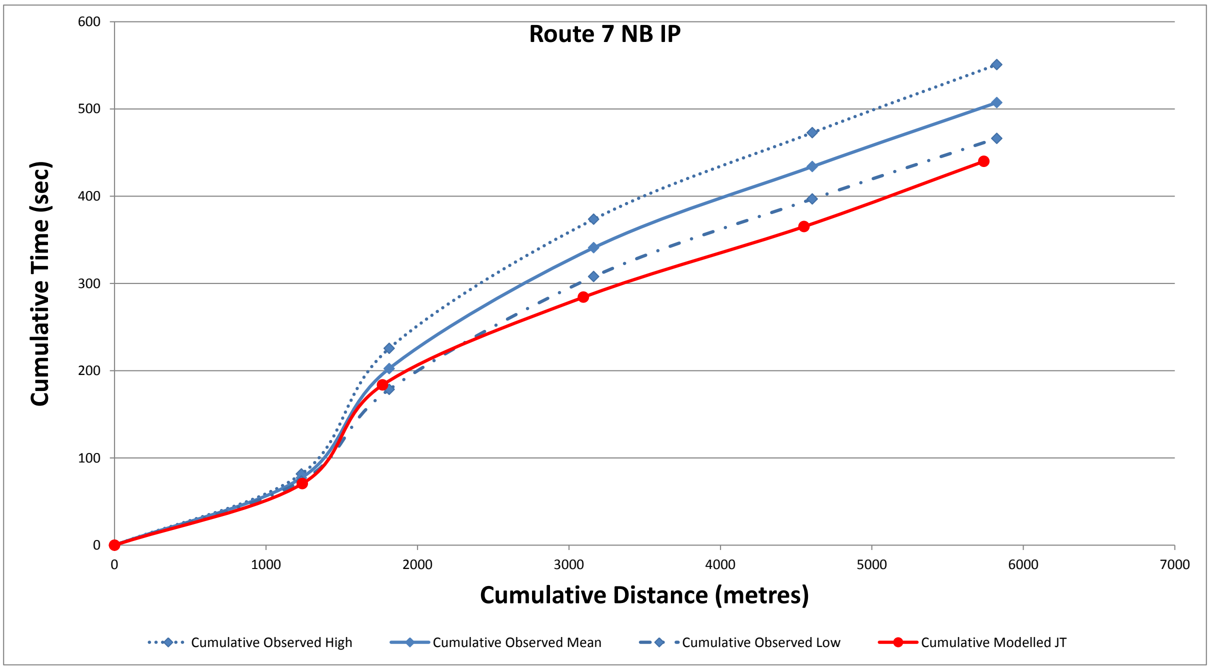


SHEET 12 **Route 7 NB**

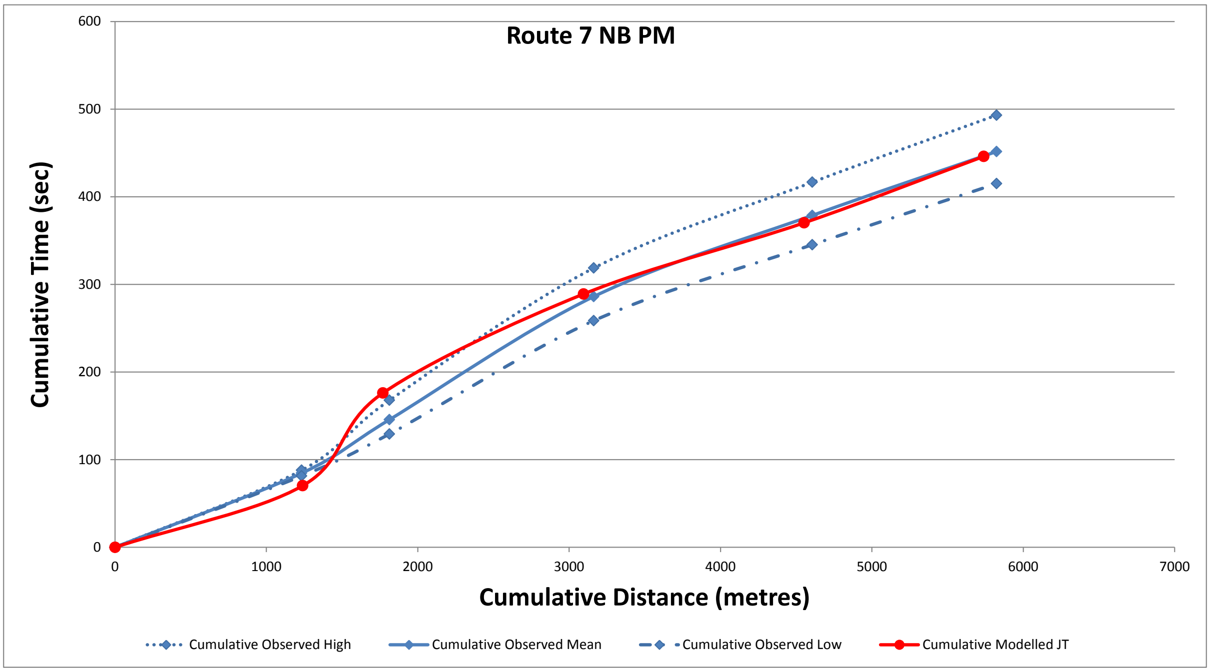
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
7NB	0 to 1	0	0	0	0	0	0			
7NB	1 to 3	1234	74	72	70	1240	71	-1	-1.2%	Pass
7NB	3 to 4	1813	305	241	195	1770	342	102	42.2%	Fail
7NB	4 to 5	3164	467	390	332	3096	484	-6	-1.7%	Pass
7NB	5 to 6	4607	567	483	420	4552	565	-12	-2.5%	Pass
7NB	6 to 7	5824	647	559	492	5739	641	0	0.0%	Pass
7NB	Total	5824	647	559	492	5739	641	**82**	**14.7%**	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
7NB	0 to 1	0	0	0	0	0	0			
7NB	1 to 3	1234	82	77	73	1240	71	-7	-8.6%	Pass
7NB	3 to 4	1813	226	202	178	1770	184	-12	-6.0%	Pass
7NB	4 to 5	3164	374	341	308	3096	284	-38	-11.1%	Pass
7NB	5 to 6	4607	473	434	397	4552	365	-12	-2.8%	Pass
7NB	6 to 7	5824	551	507	466	5739	440	1	0.3%	Pass
7NB	Total	5824	551	507	466	5739	440	-67	-13.3%	Pass

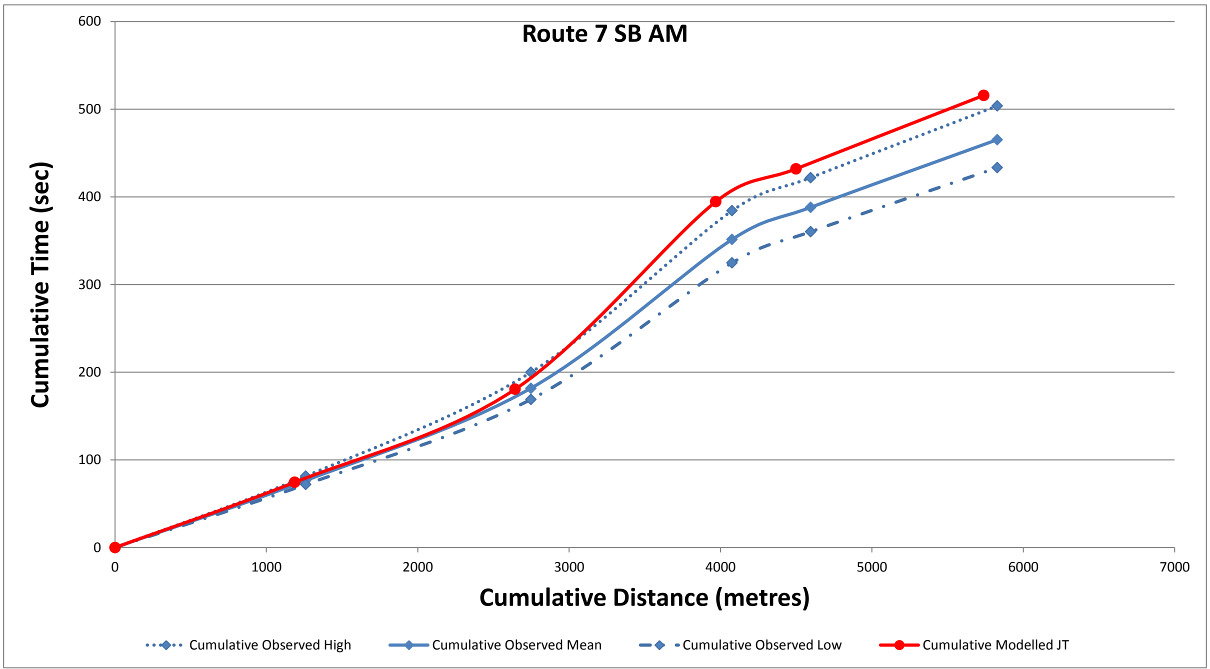


		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
7NB	0 to 1	0	0	0	0	0	0			
7NB	1 to 3	1234	88	85	81	1240	70	-14	-16.9%	Pass
7NB	3 to 4	1813	168	146	129	1770	176	45	30.7%	Pass
7NB	4 to 5	3164	319	286	259	3096	289	-27	-9.6%	Pass
7NB	5 to 6	4607	417	379	345	4552	370	-11	-3.0%	Pass
7NB	6 to 7	5824	493	452	415	5739	446	3	0.6%	Pass
7NB	Total	5824	493	452	415	5739	446	-6	-1.2%	Pass

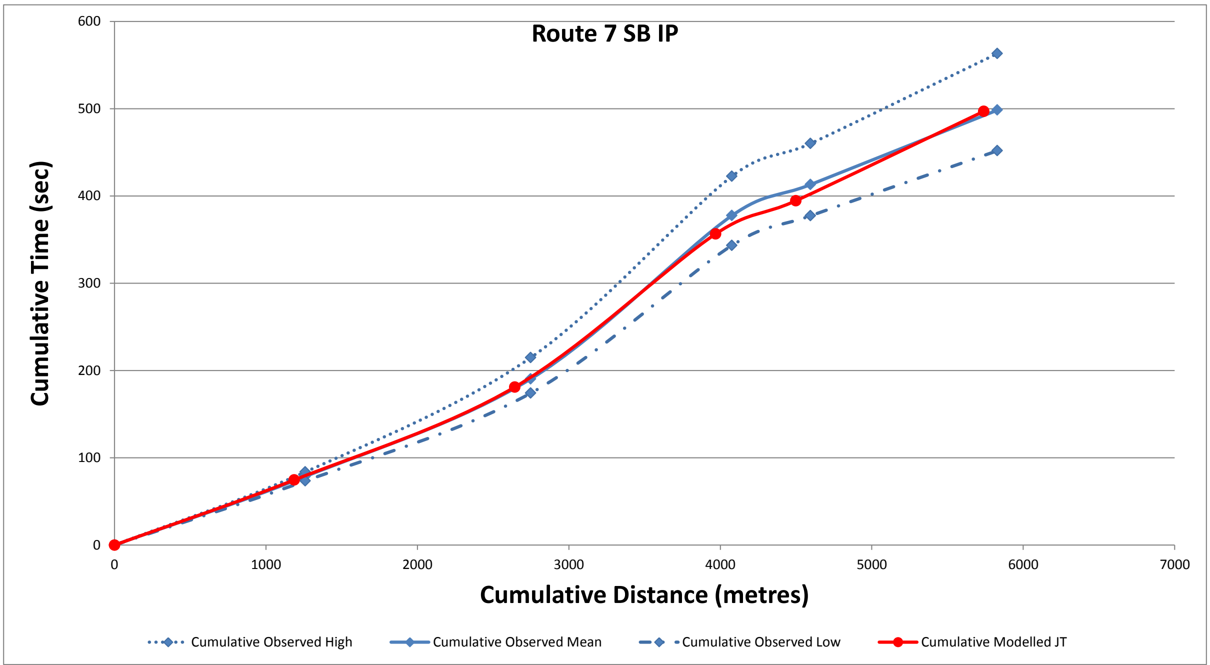


SHEET 13 **Route 7 SB**

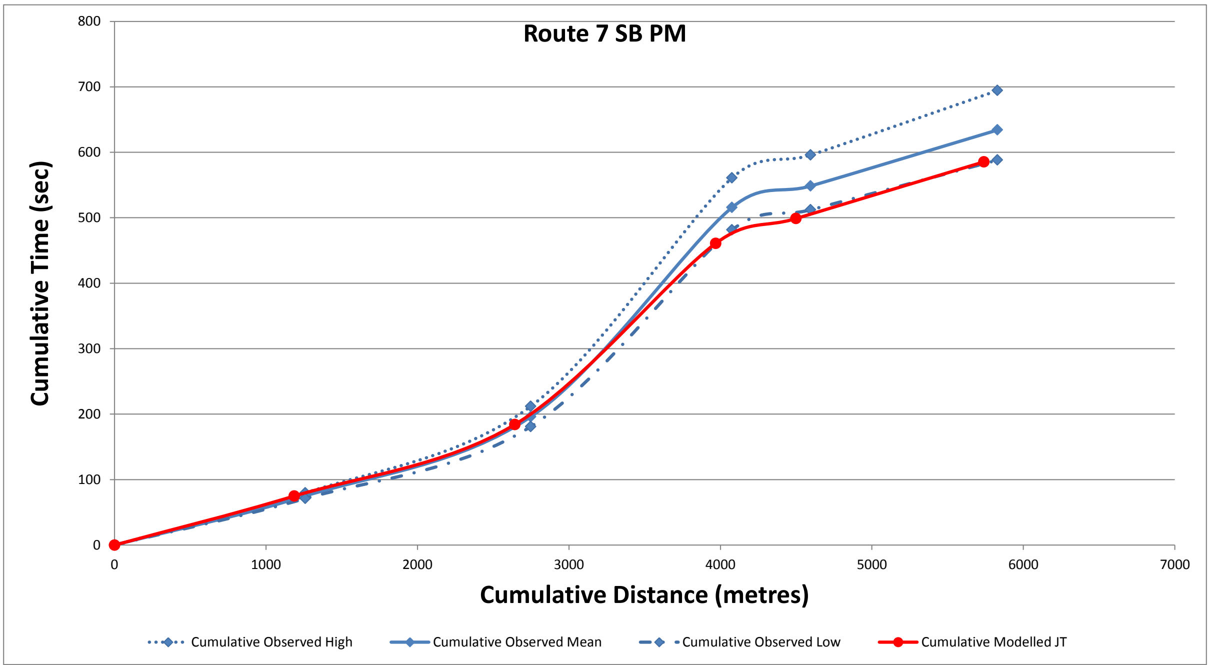
		AM						AM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
7SB	0 to 1	0	0	0	0	0	0			
7SB	1 to 2	1260	81	76	72	1187	74	-2	-2.6%	Pass
7SB	2 to 3	2747	200	182	169	2643	180	1	0.4%	Pass
7SB	3 to 4	4076	384	351	325	3969	394	44	12.6%	Pass
7SB	4 to 5	4595	422	388	360	4499	432	1	0.2%	Pass
7SB	5 to 7	5829	504	465	433	5739	516	7	1.4%	Pass
7SB	Total	5829	504	465	433	5739	516	51	10.9%	Pass



		IP						IP		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
7SB	0 to 1	0	0	0	0	0	0			
7SB	1 to 2	1260	84	79	73	1187	75	-4	-4.9%	Pass
7SB	2 to 3	2747	215	190	174	2643	181	-5	-2.8%	Pass
7SB	3 to 4	4076	422	377	343	3969	356	-12	-3.1%	Pass
7SB	4 to 5	4595	460	413	377	4499	395	2	0.6%	Pass
7SB	5 to 7	5829	563	498	452	5739	497	17	3.4%	Pass
7SB	Total	5829	563	498	452	5739	497	-1	-0.3%	Pass



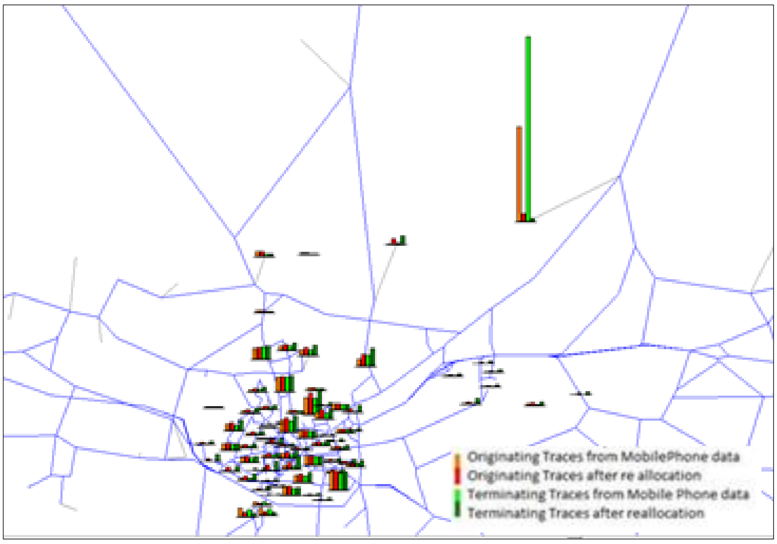
		PM						PM		
Route	Section	Cumulative Distance	Cumulative Observed High	Cumulative Observed Mean	Cumulative Observed Low	Modelled Distance	Cumulative Modelled JT	Difference (seconds)	Difference (%)	DMRB
7SB	0 to 1	0	0	0	0	0	0			
7SB	1 to 2	1260	80	75	71	1187	75	0	-0.2%	Pass
7SB	2 to 3	2747	212	196	181	2643	184	-12	-5.9%	Pass
7SB	3 to 4	4076	561	516	481	3969	461	-43	-8.3%	Pass
7SB	4 to 5	4595	596	548	512	4499	499	5	0.9%	Pass
7SB	5 to 7	5829	694	634	588	5739	585	1	0.2%	Pass
7SB	Total	5829	694	634	588	5739	585	-49	-7.7%	Pass



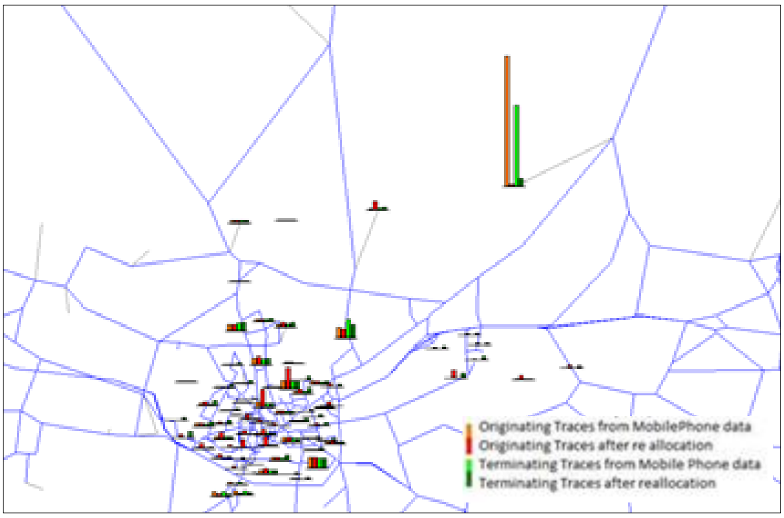
APPENDIX H RE-ALLOCATION OF TRIP-ENDS FROM DATA SPIKE ZONES

The morning peak figure for the Chichester data spikes is shown as Figure 5-2. Chichester plots for the other time periods, together with Birdham, Bognor, and Barnham / Yapton data spikes are presented below.

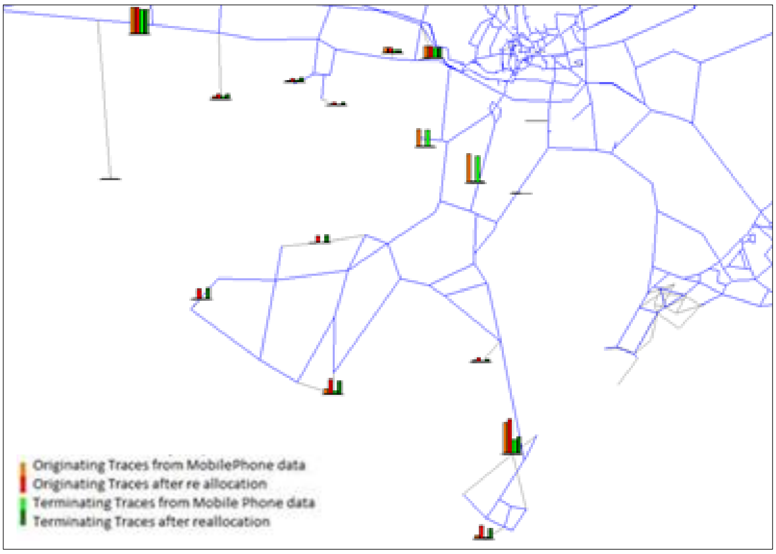
Chichester data spikes – IP



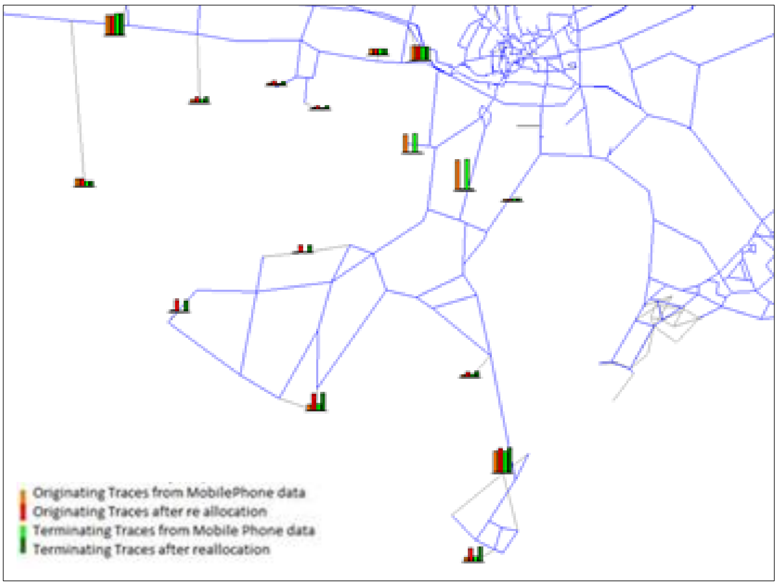
Chichester data spikes – PM



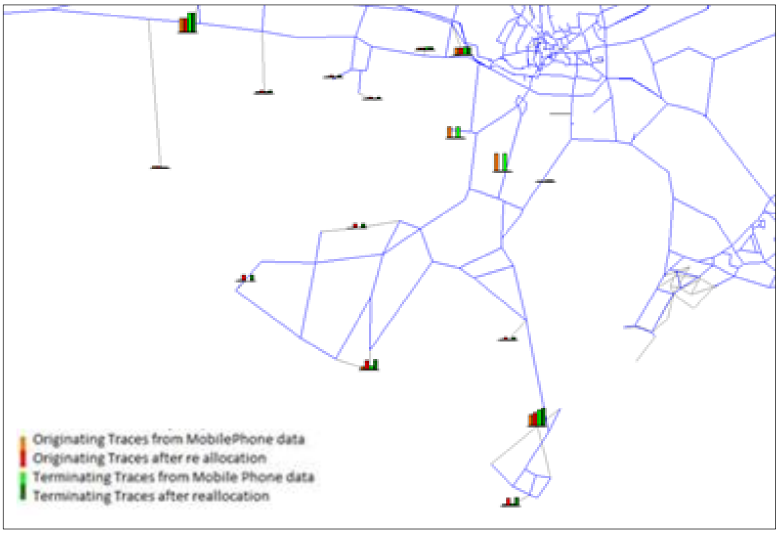
Birdham data spike – AM



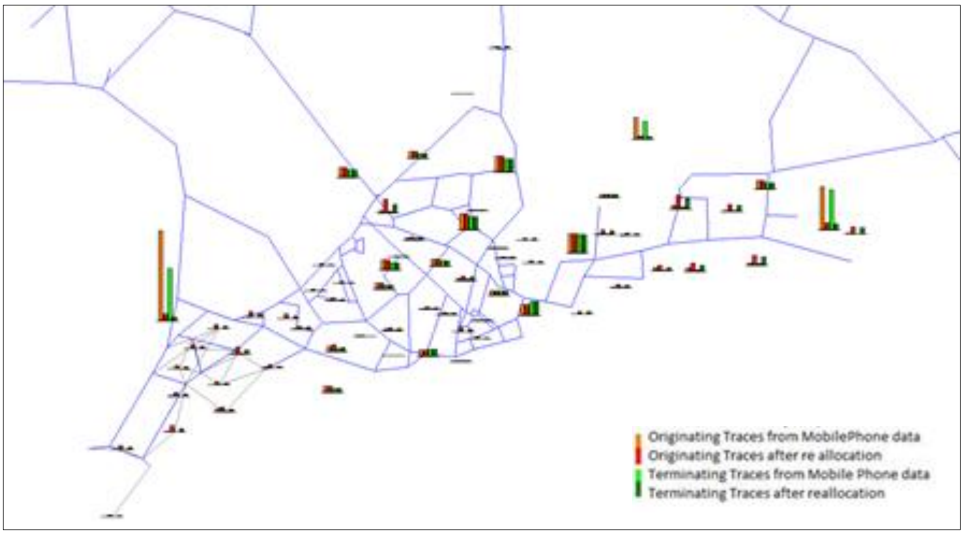
Birdham data spike – IP



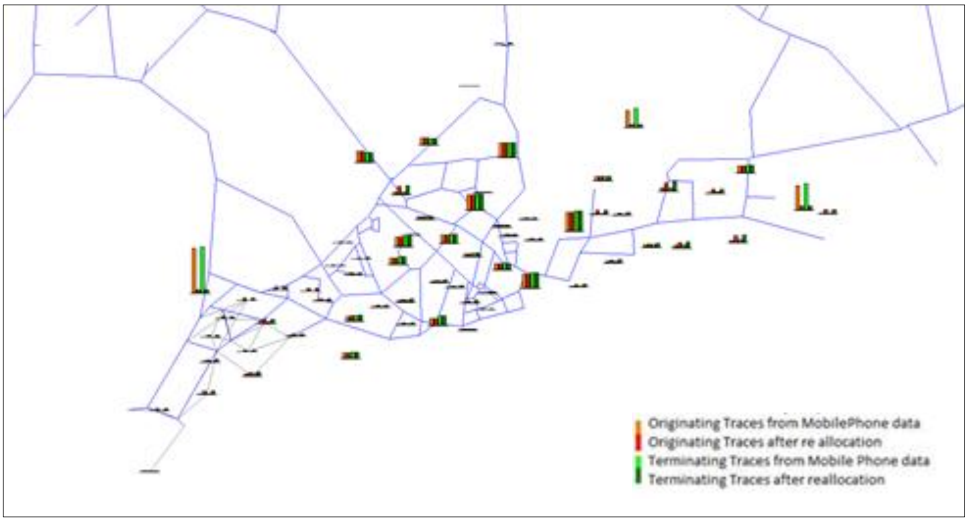
Birdham data spike – PM



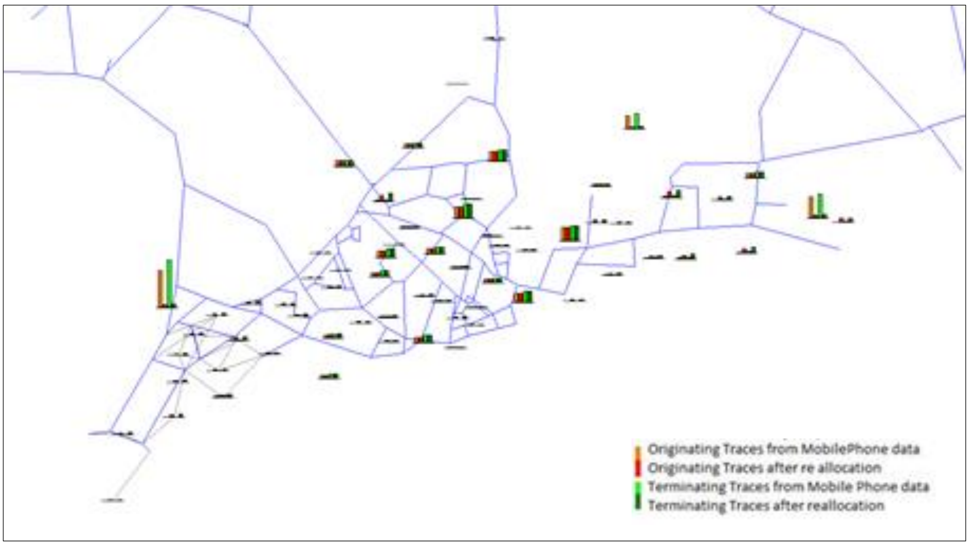
Bognor data spikes – AM



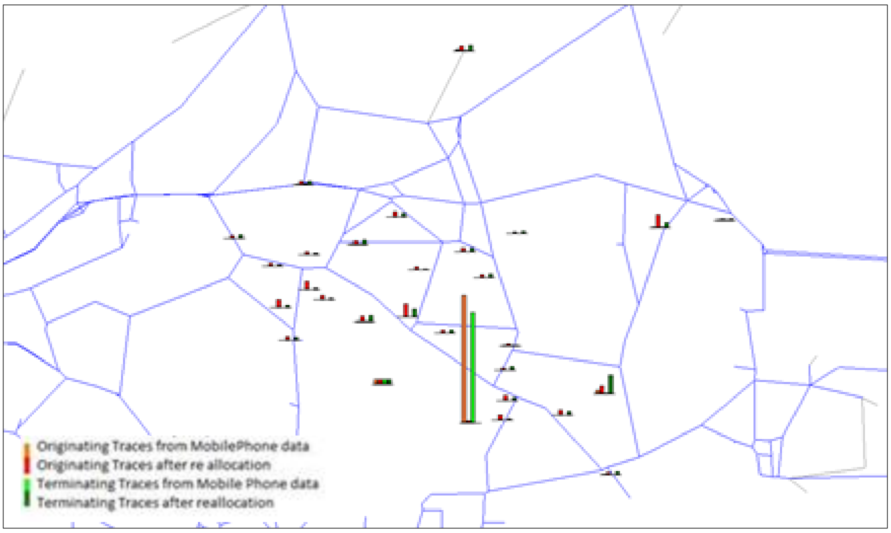
Bognor data spikes – IP



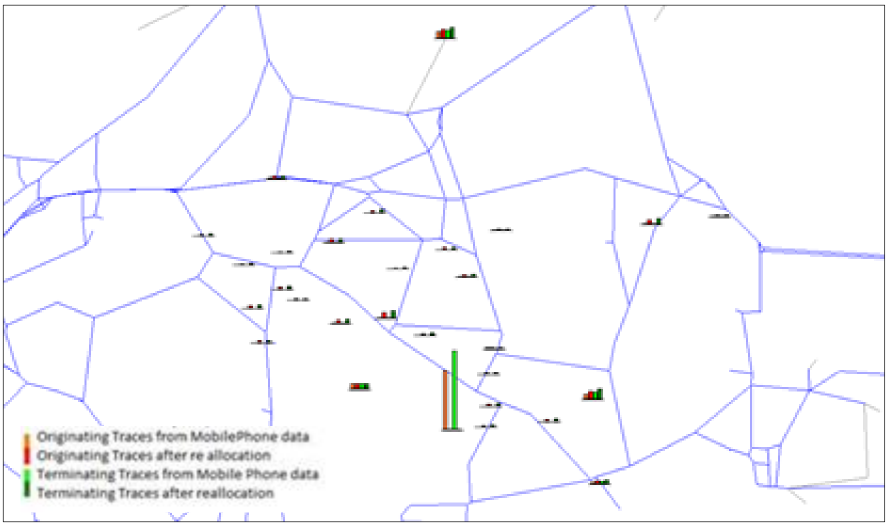
Bognor data spikes – PM



Barnham / Yapton data spike – AM



Barnham / Yapton data spike – IP



Barnham / Yapton data spike – PM