A303 Sparkford to Ilchester Dualling Scheme
TR010036
7.6 Combined Modelling and Appraisal Report

Volume 7.0

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A303 Sparkford to Ilchester Dualling Scheme

Development Consent Order 201[x]

Combined Modelling and Appraisal Report

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1 Introduction

1.1 Scheme objectives

1.1.1 The scheme assessed is part of the Highways England Road Investment Strategy (RIS) to improve England's motorways and major roads, and falls in the 2015 to 2020 road period.

1.1.2 The scheme has been developed as high quality dual, two-lane, all-purpose (D2AP) carriageway making a contribution to the longer-term aspiration of connecting the south-east and south-west via a D2AP carriageway.

1.1.3 The specific transport objectives identified are:

- Supporting economic growth
  - Reducing congestion and ensuring connectivity of businesses in the local area
  - Contribute to the future aspiration to connect London with the south-west, supporting the continued economic growth of the local area and the south west more widely
- A safe and serviceable network
  - Designing to required standards whilst keeping in mind future safety and maintainability requirements
  - Removing at grade junctions (both left and right turns) onto this section of the A303, creating a safer means of access for traffic, including local traffic movements
- A more free-flowing network
  - This section of the A303 currently suffers from congestion at peak times and dualling this section will help to create a more resilient road with a higher capacity
- An improved environment
  - Working closely with statutory environmental bodies to ensure flood risk (of particular local interest) is accurately modelled and appropriately mitigated
  - Liaising closely with Historic England to ensure the protection of a Scheduled Ancient Monument
- An accessible and Integrated Network
  - Working with local non-motorised user groups to help inform a design acceptable to pedestrians, equestrians and cyclists.

1.2 Existing conditions

1.2.1 The A303 forms part of the strategic road network and a strategic link between the south-west peninsula and the rest of the south, south-east and London. The route is comprised of multiple road standards including dual carriageway, single carriageway and single carriageway sections with overtaking lanes. Speed limits also vary between 40mph and 70mph depending on the character of the road and its surroundings.

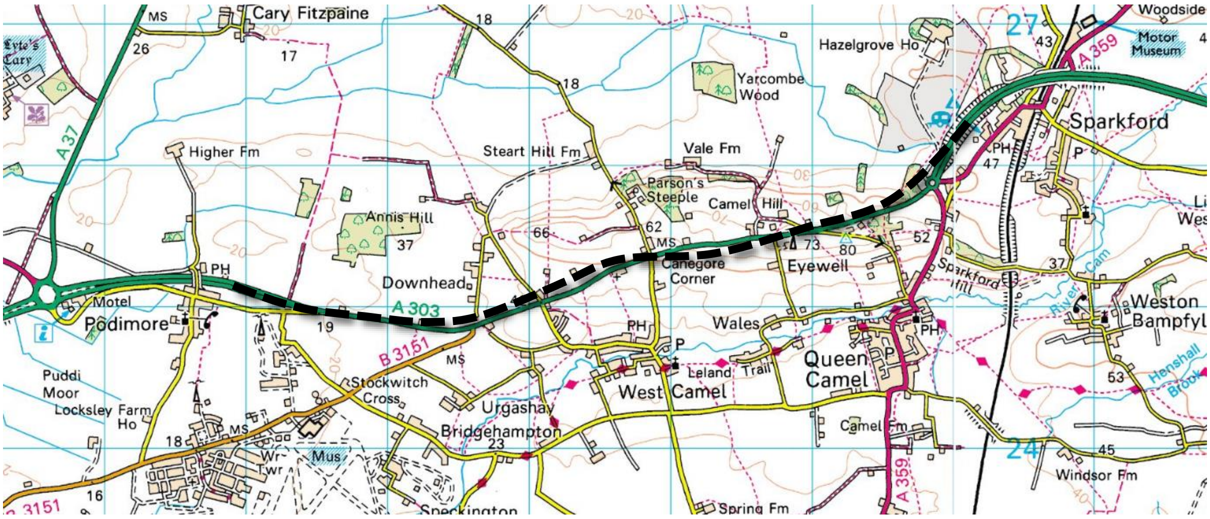
1.2.2 The section of the A303 that is being upgraded as part of this project commences at the eastern limits of the existing dual carriageway Podimore Bypass. Travelling east, the route reaches the junction with the B3151 before bearing north east and rising upwards through Canegore Corner to reach the crest of Camel Hill at Eyewell. This section of the route is characterised by a single lane road, with double white lines negating overtaking and subject to a 50mph speed limit. There are several priority junctions along the route giving access to the settlements of Queen Camel and West Camel to the south and Downhead to the north, as well as several farm accesses and parking laybys.

1.2.3 From the crest of Camel Hill, the route descends to meet the roundabout at the western limit of the dual carriageway Sparkford Bypass ('Hazlegrove Roundabout'). This section comprises two lanes in the westbound direction, one lane in the eastbound direction and is also subject to a 50mph speed limit. Hazlegrove Roundabout forms a junction between the A303 and the A359 which runs south through Queen Camel and north-east through Sparkford. The roundabout also provides access to a service station, and to a school at Hazlegrove House.

1.2.4 The section of the A303 that is to be upgraded is 5.6km long.

1.2.5 The extents of the scheme are illustrated in Figure 1.1. The figure also illustrates the line of the proposed route.

Figure 1.1: Scheme Extents



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1.3 Project definitions / scheme description

A303 Sparkford to Ilchester

- Project Title: A303 Sparkford to Ilchester
- ID Numbers
  - PIN: 551507
  - MS Number: MP - 0258
- Scheme Type (Dual carriageway and junction improvements)
- GO Region: south-west
- Road and/or Geographic Location
  - National or Regional: A303 Trunk Road between Sparkford and Ilchester in Somerset
- Project Description: The proposed Scheme is to provide a continuous dual carriageway on the A303 linking the Podimore Roundabout and the Sparkford Bypass. The Scheme will involve the removal of at-grade junctions and direct accesses. The new junctions will be constructed to grade separated standards, or to compact grade separated standards depending upon anticipated traffic flows.

Figure 1.2: Scheme location

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Figure 1.3: Scheme layout

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1.4 Details of previous analysis / economic assessments

1.4.1 In stage 1 the scheme was progressed using a local traffic model developed for the scheme as the South West Regional Traffic Model (SWRTM) was under development. More details can be found in the following documents.

- A303 Sparkford to Ilchester Traffic Data Collection Report, 363903-90-220-RE-001-P01, March 2016
- A303 Sparkford to Ilchester Local Model Validation Report, 363903-90-220-RE-002-P02, June 2016
- A303 Sparkford to Ilchester Forecasting Report, 363903-90-220-RE-003-P03, October 2016
- A303 Sparkford to Ilchester Economic Appraisal Report, 363903-90-220-RE-003-P04, October 2016
- A303 Sparkford to Ilchester Technical Appraisal Report, 363903-90-060-RE-001-P05, October 2016
- Highways England Business Case A303 Sparkford to Ilchester Dualling, 363903-90-040-RE-001-P04, November 2016
- A303 Sparkford to Ilchester Stage 1 Options Assessment Report, 363903-90-010-RE-001-P02, November 2016

1.4.2 The local traffic model developed for Stage 1 provided necessary information for option identification. However, the model lacked the ability to represent total route costs for long distance movements and therefore was not capable of providing variable demand modelling responses such as redistribution and mode choice.

1.4.3 For stage 2 an adaptation of the SWRTM was used. Due to the close proximity of the schemes a single base model covering both the A303 Sparkford to Ilchester Dualling and the A358 Taunton to Southfields study areas was produced. More details can be found in following documents.

- A303 Sparkford to Ilchester Traffic Data Collection Report, HE551507-MMSJV-TRM-000-RP-TR-0009, February 2017
- A303 Sparkford to Ilchester Local Model Validation Report, HE551507-MMSJV-GEN-000-RP-TR-0007, May 2017
- A303 Sparkford to Ilchester Forecasting Report, HE551507-MMSJV-MTR-000-RP-TR-0005, September 2017
- A303 Sparkford to Ilchester Economic Appraisal Report, HE551507-MMSJV-MTR-000-RP-TR-0009, September 2017
- A303 Sparkford to Ilchester Dualling Scheme Assessment Report, HE551507-MMSJV-GEN-000-RP-UU-0003 P03

- A303 Sparkford to Ilchester Dualling Stage 2 Business case, HE551507-MMSJV-GEN-000-RP-UU-0005 P04
- A303 Sparkford to Ilchester Assessment of Alternative Mode Options, HE551507-MMSJV-MTR-000-RP-TR-0011, September 2017

1.4.4 The stage 2 model provided necessary information for option selection based on variable demand modelling. However, there were significant convergence noise impacts. This required the application of fixed cost functions and masking during economic appraisal to reduce the impact of convergence noise.

1.5 Purpose of the report

1.5.1 The purpose of this report is to document the development of the A303 Sparkford to Ilchester RIS Stage 3 combined modelling and appraisal work. The Stage 3 model has been developed to address the convergence noise issues in the stage 2 model.

1.6 Structure of the report

1.6.1 The remainder of the report is structured as follows:

- Chapter 2 – Local Transport Situation
- Chapter 3 - Summary
- Chapter 4 – Summary and Review of Existing Data
- Chapter 5 – Data Collection
- Chapter 6 – Final Datasets
- Chapter 7 – Model Description / Specification
- Chapter 8 – Model Development
- Chapter 9 – Model Calibration
- Chapter 10 – Model Validation
- Chapter 11 – Forecast Assumptions
- Chapter 12 – Forecast Results
- Chapter 13 – Economic Appraisal Approach
- Chapter 14 – Economic Appraisal Results
- Chapter 15 – Distributional Impact Assessment
- Chapter 16 – Sensitivity Tests

1.6.2 Appendices and annexes are included at the end to provide more detailed information where necessary.

1.7 Glossary

AADT	Annual Average Daily Traffic
%GAP	A measure of convergence to equilibrium
ARCADY	Assessment of Roundabout Capacity And DelaY – junction modelling software
ARCGIS	Geographic Information Software
AST	Appraisal Summary Table
ATC	Automatic Traffic Count
BCR	Benefit to Cost Ratio
CDF	Collaborative Delivery Framework
CO2	Carbon Dioxide
CO2e	Carbon Dioxide equivalent
COBA	Cost and Benefit to Accidents
COBALT	Cost and Benefit to Accidents Light Touch
DF	Design Freeze
DfT	Department for Transport
DI	Distributional Impact
DIADEM	Dynamic Integrated Assignment and DEmand Modelling
DM	Do Minimum – a future year modelled scenario without the scheme
DMRB	Design Manual for Roads and Bridges
DoS	Degree of Saturation
DS	Do Something – a future year modelled scenario with the scheme included
EA	External Area
EB	Employers' business
FCF	Fixed Cost Function
GAP	SATURN Model parameter: Minimum gap (in seconds) accepted by a vehicle which gives way at priority junctions or traffic signals
GEH	Statistic used to compare observed and modelled traffic flows
GFA	Gross Floor Area
GHG	Greenhouse Gases
GIS	Geographic Information System
GPS	Global Positioning System
GV	Goods vehicle
HBEB	Home-Based Employers' business
HBW	Home-Based Work
HEIDI	Highways England's Integrated Demand Interface
HGV	Heavy Goods Vehicle
IP	Inter-peak, the day-time period between the AM and PM peak periods
ITN	Integrated Transport Network: Ordnance Survey Master Map GIS layer of UK road network
JT	Journey time
LGV	Light Goods Vehicle

LINSIG	Linear Signal Analysis – signalised junction modelling software
LMVR	Local Model Validation Report
LSOA	Lower Super Output Area (Census)
MCTC	Manual Classified Turning Count
ME	Matrix Estimation
MMSJV	Mott MacDonald Sweco Joint Venture
MPOD	Mobile Phone Origin Destination
MVR	Model Validation Report
NDC	Nationwide Data Collection
Network Coding Manual	Highways England Regional Traffic Models Network Coding Manual v0.8 - 11 December 2015
NHBEB	Non-Home-Based Employers' business
NHBO	Non-Home-Based Other
NMU	Non-Motorised Users
NO_2	Nitrogen dioxide
NOx	mono-nitrogen oxides
NPV	Net Present Value
NTEM	National Trip End Model
NTS	National Travel Survey
OD	Origin destination
OGV 1	other goods vehicles 1, smaller HGVs, defined in COBA Manual
OGV 2	other goods vehicles 2, larger HGVs, defined in COBA Manual
OP	Off-peak, the time period 19.00-07.00
OS	Ordnance Survey
PA	Production Attraction
PCU	Passenger Car Unit
PICADY	Priority junction Capacity and DelaY – junction modelling software
PM_{10}	particulate matter 10 micrometres or less in diameter
PPK	Pence Per Kilometre
PPM	Pence Per Minute
PT	Public Transport
PVB	Present Value of Benefits
PVC	Present Value of Costs
QUADRO	Queues And Delays at Roadworks
RFC	Ratio of Flow to Capacity
RIS	Road Investment Strategy
RNAS	Royal Naval Air Station
RoF	Region of Focus
RSI	Roadside Interview Survey
RTF	Road Traffic Forecasts
RTM	Regional Traffic Model
SATURN	Simulation and Assignment of Traffic to Urban Road Networks – highway traffic assignment software
Skims	Measures of "cost" between two zones, averaged over all routes
SQRT	Square root
SRN	Strategic Road Network

SWARMMS	The South West Area Multi Modal Study
SWRTM / SWRM	South West Regional (Traffic) Model
TEE	Transport Economic Efficiency
TEMPRO	Software used in connection with NTEM data for processing and extracting the data
TIS	Highways England's Trip Information System database
TRADS	Traffic Flow Data System: Highways Agency repository of Strategic Road Network traffic flows prior to May 2015. Part of HATRIS
Trafficmaster	The Department for Transport's GPS database
TRICS	A national trip generation and analysis database
TUBA	Transport User Benefit Appraisal
UC	User class
VAT	Value Added Tax
VDM	Variable Demand Modelling
VfM	Value for Money
VOC	Vehicle Operating Costs
VOT	Value Of Time
WebTAG	Web-based transport analysis guidance produced by the DfT
WebTRIS	A Highways England TRaffic Information System for storage & dissemination of observed Traffic Flow & Journey Time data on Strategic Road Network (includes TRADS Traffic Flow Data System: Highways England's repository of Strategis Road Network traffic flows prior to May 2015)

2 Local transport situation

Table 2.1: Glossary of terms for chapter 2

ME	Matrix Estimation
MMSJV	Mott MacDonald Sweco Joint Venture
Network Coding Manual	Highways England Regional Traffic Models Network Coding Manual v0.8 - 11 December 2015
NMU	Non-Motorised Users
RNAS	Royal Naval Air Station
SWARMMS	The South West Area Multi Modal Study
WebTAG	Web-based transport analysis guidance produced by the DfT

2.1 Local transport system

Roads

Locality

2.1.1 The existing section of the A303 between Sparkford and Ilchester passes through the civil parishes of Sparkford, Queen Camel, West Camel and Yeovilton, which are located within South Somerset District. The district is situated within Somerset County and is bordered by the counties of Devon, Dorset and Wiltshire to the west, south and east, and by the districts of Taunton Deane, Sedgemoor and Mendip to the north.

2.1.2 South Somerset District is generally rural in character, with substantial levels of arable farming taking place. The district is generally a prosperous area.

2.1.3 There are small collections of agricultural and residential property immediately to the north of the existing A303, and the land further to the north is very sparsely populated until the villages of Babcary and Foddington are reached some 3-4km away. More concentrated settlements are located at Sparkford to the east and Queen Camel and West Camel to the south. The village of Ilchester lies approximately 3km to the south-west of the scheme limits.

2.1.4 The most notable development in the near vicinity of the scheme is the Royal Naval Air Station (RNAS) Yeovilton which lies on the low lying plain of the Rivers Cam and Yeo. The site occupies approximately 2,000 hectares including two runways, numerous operational buildings and the Fleet Air Arm Museum.

Highway network

2.1.5 The A303/A30 forms part of the strategic road network and is a strategic link between the south-west and the south-east and London. The route is comprised of multiple road standards including dual carriageway, single carriageway and single carriageway sections with overtaking lanes together with associated varying speed limits (from 40mph to 70mph).

2.1.6 The main alternative routes for this strategic traffic are via the M4 and M5 from London to the south-west or via the A35 and A31 along the coast from the south-east to the south-west.

2.1.7 Locally, the other significant roads include the A37 and A359 which both lead into Yeovil and continue north of the scheme area and the A372 west of the scheme. The remainder of the roads in vicinity of the scheme serve the local communities.

Public Transport

Rail

2.1.8 The primary alternative mode for the dominant long-distance trips on the A303 corridor would be rail. There are three main rail routes between the south-east and the south-west peninsular (see Figure 2.1) listed below. The first two broadly follow the A303 corridor.

- The London Waterloo to Exeter line via Salisbury, approximately hourly on weekdays
- The Hants and Berks line via Newbury and Westbury, approximately hourly on weekdays
- The Great Western Main Line via Bristol, approximately once or twice hourly on weekdays.

2.1.9 The South West and South Wales Multi-Modal Study (SWARMMS) strategy identified improvements required to these lines, and a number of these have been implemented. Whilst further improvements would deal with existing capacity and speed issues, it would be impossible for a rail improvement to entirely solve the identified problems in the A303 Sparkford to Ilchester Dualling scheme location.

2.1.10 The nearest railway line is between Castle Cary and Charlton Mackrell, approximately 4 kilometres to the north of Sparkford. Castle Cary is the nearest railway station, located approximately 8 kilometres north-east of Sparkford.

Figure 2.1: Rail routes to the south-west

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Bus

2.1.11 Numerous bus and coach services are known to utilise the existing A303 between Sparkford and Ilchester, although there are no scheduled stops along the scheme section of the A303. The following bus services pass through the local area.

- South West Coaches Services 1, 1A and 1B from Oakhill to Yeovil Bus Station via Sparkford inn, Queen Camel, Marston Magna, hourly service in each direction
- Mendip Community Transport Service 665 from Yeovil the Borough to Kingweston via Podimore, Tuesdays and Fridays, one service in each direction
- South West Coaches Service 5 from Babcary, The Red Lion to Yeovil Bus Station via Sparkford Inn, West Camel post office, Wednesdays only, one bus in each direction
- South West Coaches Service 8 from Pilton to Yeovil Bus Station via Podimore Inn, West Camel post office, Fridays only, one bus in each direction

Cycle routes

2.1.12 There are no designated cycle routes that intersect the scheme section of the A303, but SUSTRANS national cycle route 26 runs from Portishead on the Somerset Coast to the Isle of Portland on the Dorset coast via Sparkford.

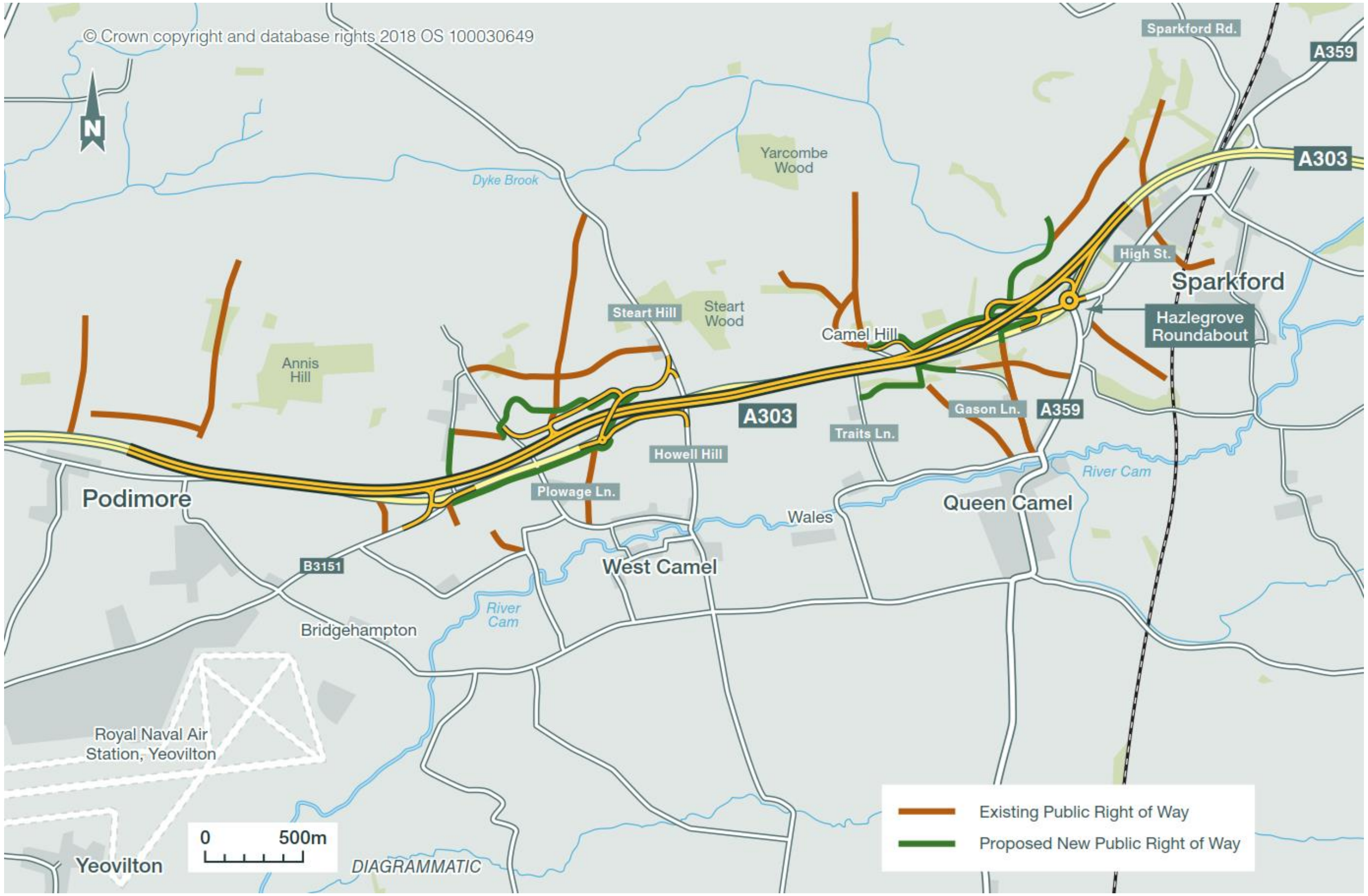
Non-motorised user provision

2.1.13 Existing non-motorised user (NMU) facilities along the proposed route include:

- A footpath crossing of the Podimore Bypass via an existing bridge at Podimore (the Higher Farm Lane Accommodation Bridge)
- A byway, known as Eastmead Lane, which connects with the eastern end of the Podimore Bypass and runs northwards. This appears to be part of a historical north-south route that was severed by the construction of the bypass and, although it can still be accessed from the road, is not likely to be well used due to the difficulty of accessing it
- Various north-south footpath connections across the existing A303 providing links between Downhead and West Camel; Steart Hill and Howell Hill; Traits Lane and Camel Hill Farm; and Gason Lane and the grounds of Hazlegrove House Registered Park and Garden
- Byways known as Downhead Lane and Mead Lane north of Downhead
- A long-distance walking route known as the Celtic Way, which crosses the existing A303 adjacent to Traits Lane, and continues northwards
- An at-grade footpath crossing of the existing dual carriageway Sparkford Bypass which connects Sparkford village with the grounds of Hazlegrove House Registered Park and Garden

2.1.14 The existing and proposed NMU provisions are displayed in Figure 2.2.

Figure 2.2: Map of non-motorised user crossing points



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2.2 Key demands for travel

2.2.1 During the options identification stage of this scheme, data from a Highways England WebTRIS count site on this section of the A303 were obtained for October 2015 and August 2015 to assess the traffic levels in both a neutral (October) and peak month (August), as shown in Table 2.1. School holidays have been excluded from the October averages.

Table 2.1 Two-way daily flows on A303

Location: A303 between Hazlegrove Roundabout and Podimore Roundabout	24-hour 2-way daily flow*	
	October	August
Mon–Thurs Average 2015	22,300	26,100
Friday Average 2015	29,500	34,000
Saturday Average 2015	21,600	29,900
Sunday Average 2015	23,000	26,400

*Counts rounded to nearest 100 vehicles

2.2.2 The average October Friday flow of 29,500 is higher than the average October weekday as well as higher than the October daily average flows for Saturday and Sunday. The flows on October Saturdays and Sundays are, however, of a similar level to those on an average October weekday. During the summer peak month of August, the daily average flows are significantly higher than corresponding October figures. The highest average daily flows on this section occur on Fridays in August. It is considered that the current delays and queues are caused by insufficient capacity on this section of the A303 especially at weekends and during holiday periods.

2.2.3 The stage 2 2015 base model shows that on a neutral weekday between 35% and 45% of the traffic on the existing A303 travels through the local area entirely using the A303 between Cartgate Roundabout and north/south Cadbury, shown in Figure 2.3. The remaining traffic either serves local trip origin and destinations, or is longer distance traffic using routes such as the A37 so only part of their route uses the A303 in the local area. Daily A303 HGV traffic accounts for around 9.4% of the total traffic flow on the single carriageway section.

Figure 2.3: Existing A303 between Cartgate Roundabout and North/South Cadbury

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2.3 Transport problems and contributing factors

2.3.1 The A303 Sparkford to Ilchester is a single carriageway section of the strategic road network between two dual carriageway sections. It currently experiences congestion and poor journey time reliability particularly at weekends and in the summer months consistent with its use as summer holiday route.

2.3.2 The Department for Transport has identified this section of the A303 for improvement to dual carriageway in Part 2 page 17 of the *Road Investment Strategy: for the 2015/16 – 2019/20 Road Period*. This is part of its overall aspiration to achieve a smarter, safer, sustainable strategic road network by 2040 which includes transforming connectivity to and from the south-west as set out in Part 1 page 55 of the *Road Investment Strategy*.

Collisions and journey time reliability

Collisions

2.3.3 Collision data for this section of the A303 was obtained from Somerset County Council and Highways England for the period 1 January 2010 to 31 December 2014. This has been analysed using *KeyAccident v7.2* (software from Keysoft Solutions). Certain cleaning processes were carried out such as removing duplicates of the same collision. A summary of collision numbers is shown in Table 2.2.

Table 2.2: Collisions by severity (1 January 2010 to 31 December 2014)

Section Ref	Location	Fatal	Serious	Slight	Total
FA16-1	A303 single carriageway between A359 Roundabout and the A303 dual carriageway section	1	4	19	24
FA16-2	A303/A359 Sparkford Roundabout	0	3	7	10
	TOTAL	**1**	**7**	**26**	**34**

2.3.4 The collision rate has been calculated for the scheme and is presented in Table 2.3. It shows that the collision rate is higher than the national rate for A class trunk roads.

Table 2.3: Collision rates

Section Ref	Location	Collision rate per billion vehicle km travelled	National Rate for all A trunk roads Collision rate per billion vehicle km travelled *
FA16	A303 Sparkford to Ilchester	162	113

Calculated from: Strategic Road Network Traffic Report TRA41 - Table TRA4112, Reported Road Casualties on the Strategic Network 2013 Report PR67/4 Table B.1

Journey time reliability

2.3.5 Travel time reliability was measured using Trafficmaster (a DfT Global Positioning System (GPS)-based database) data for the existing single carriageway section between Sparkford and Podimore and compared with the reliability of travel time on the adjacent dual carriageway sections. This is measured using the standard deviation of travel times from the data recordings and these are compared in Table 2.4 below (for 2015 data) on a per kilometre basis in seconds. For weekdays, the single carriageway standard deviation is around 10 seconds per kilometre so would amount to around 50 seconds over the 5.6km single carriageway section which would reduce to about 20 seconds for a similar length dual carriageway (taking the inter-peak figure). However, for the summer peak, the variability would increase to around 200 seconds for the single carriageway which would reduce to around 90 seconds for a similar length dual carriageway.

Table 2.4: Reliability of single and dual carriageway sections

	Standard deviation of journey times (sec / km)			
	AM	IP	PM	Summer
Single carriageway	10.6	10.9	10.6	39.6
Dual carriageway	3.5	4.1	6.7	17.7

3 Summary

Table 3.1: Glossary of terms for chapter 3

BCR	Benefit to Cost Ratio
DfT	Department for Transport
ME	Matrix Estimation
MMSJV	Mott MacDonald Sweco Joint Venture
Network Coding Manual	Highways England Regional Traffic Models Network Coding Manual v0.8 - 11 December 2015
NTEM	National Trip End Model
RTF	Road Traffic Forecasts
SWRTM / SWRM	South West Regional (Traffic) Model
TEMPRO	Software used in connection with NTEM data for processing and extracting the data
VfM	Value for Money
WebTAG	Web-based transport analysis guidance produced by the DfT

3.1.1 The network coding for this model has been predominantly adopted from the South West Regional Model but the region of focus has been reduced for the purpose of the appraisal of the A303 Sparkford to Ilchester Dualling and A358 Taunton to Southfields schemes. The areas in close proximity to the schemes have been enhanced with more network detail and smaller zones to better represent local movements. All coding has followed the practices set out in the Network Coding Manual for the Regional Models, and where appropriate coding has been amended during the calibration / validation of the model to better fit the observations.

3.1.2 The model represents an average Monday to Friday weekday in March 2015 (excluding school holidays and bank holidays). To represent the higher traffic flows that occur at weekends and during holiday periods, a separate summer model was also developed to represent these peak traffic periods in the economic appraisal.

3.1.3 Trip matrices have been adapted from the South West Regional Model prior matrices. A matrix estimation (ME) process has been undertaken to better profile the “prior” matrices to fit with observed counts. Detailed checking of the prior and post matrices has been undertaken in order to monitor the levels of prior matrix distortion caused by the ME process. These levels were similar to those of the SWRTM matrices.

3.1.4 The model assignment convergence has been monitored and meets the criteria in WebTAG unit M3.1 in all time periods.

3.1.5 The model achieves traffic flow calibration with the WebTAG unit M3.1 criteria for GEH and flow proximity for screenlines and link and turning counts being met in all time periods.

3.1.6 Traffic flow validation has been undertaken against independent count data and assessment of the validation process shows that the model meets the validation criteria in WebTAG unit M3.1 for most cases and is close to meeting the criteria in other cases.

3.1.7 The modelled journey times are considered to represent well the observed values as the journey time route validation meets the WebTAG criteria across all time periods and the journey time segment validation meets the WebTAG criteria in all three time periods.

3.1.8 The elasticities calculated for realism tests are close to those calculated for the SWRTM.

3.1.9 It is considered that the base year highway assignment model developed for the A303 Sparkford to Ilchester demonstrates a good representation of traffic behaviour in the study area and forms a robust basis from which future year forecasts can be developed.

3.1.10 Traffic forecasts have been prepared for the current estimated opening year for the scheme, 2023, and the scheme design year, 2038. Two additional forecast years, consisting of an intermediate year of 2031 and a final forecast year of 2051, have also been used to support the economic appraisal of the scheme. The forecasts have used the National Trip End Model (NTEM) and TEMPROv7.2 (the software used in connection with NTEM for processing and extracting the data) and Road Traffic Forecasts (RTF) 2015 forecasting data as well as accounting for local developments which have been assessed in an uncertainty log in accordance with WebTAG unit M4.

3.1.11 For the neutral month model, the traffic forecasts have been undertaken using a variable demand modelling approach that is consistent with that applied in the development of SWRTM. For the summer model, a fixed matrix method was used to carry out the forecasting.

3.1.12 Traffic forecasts have been prepared for the scheme as well as a scenario without the scheme.

3.1.13 The Benefit to Cost Ratio (BCR) value is used to assess the value of a transport project by weighing the benefits against the costs to indicate whether it is Value for Money (VfM). In doing this, a wide spectrum of impacts is considered in a detailed appraisal, including various impacts on the economy, the environment and social welfare. The adjusted BCR for the scheme is between 1.5 and 2, which represents medium value for money under the DfT's value for money criteria. However, in the overall value for money assessment of the scheme, other qualitative factors which cannot be monetised are taken into account, such as those reported in the Appraisal Summary Table (see Appendix M). Therefore, the BCR alone does not provide a good measure of value for money and is not used as the sole basis for decisions.

4 Summary and review of existing data

Table 4.1: Glossary of terms for chapter 4

BYFM	Base Year Freight Matrices
COBALT	Cost and Benefit to Accidents Light Touch
DF	Design Freeze
DfT	Department for Transport
IP	Inter-peak, the day-time period between the AM and PM peak periods
ITN	Integrated Transport Network: Ordnance Survey Master Map GIS layer of UK road network
JT	Journey time
LMVR	Local Model Validation Report
MMSJV	Mott MacDonald Sweco Joint Venture
NTS	National Travel Survey
OD	Origin destination
RIS	Road Investment Strategy
RSI	Roadside Interview Survey
SRN	Strategic Road Network
SWRTM / SWRM	South West Regional (Traffic) Model
Trafficmaster	The Department for Transport's GPS database
WebTAG	Web-based transport analysis guidance produced by the DfT

4.1 Network data

4.1.1 Network data were obtained from A303 Sparkford to Ilchester and A358 Taunton to Southfields Stage 2 Traffic Model (see Figure 4.1 for network coverage). This model network includes junction coding details in the region of focus. Network updates were also received from SWRTM Design Freeze 2.3 (DF2.3). Figure 4.2 shows SWRTM network coverage.

Figure 4.1: A303/A358 Stage 2 – Local Network Coverage

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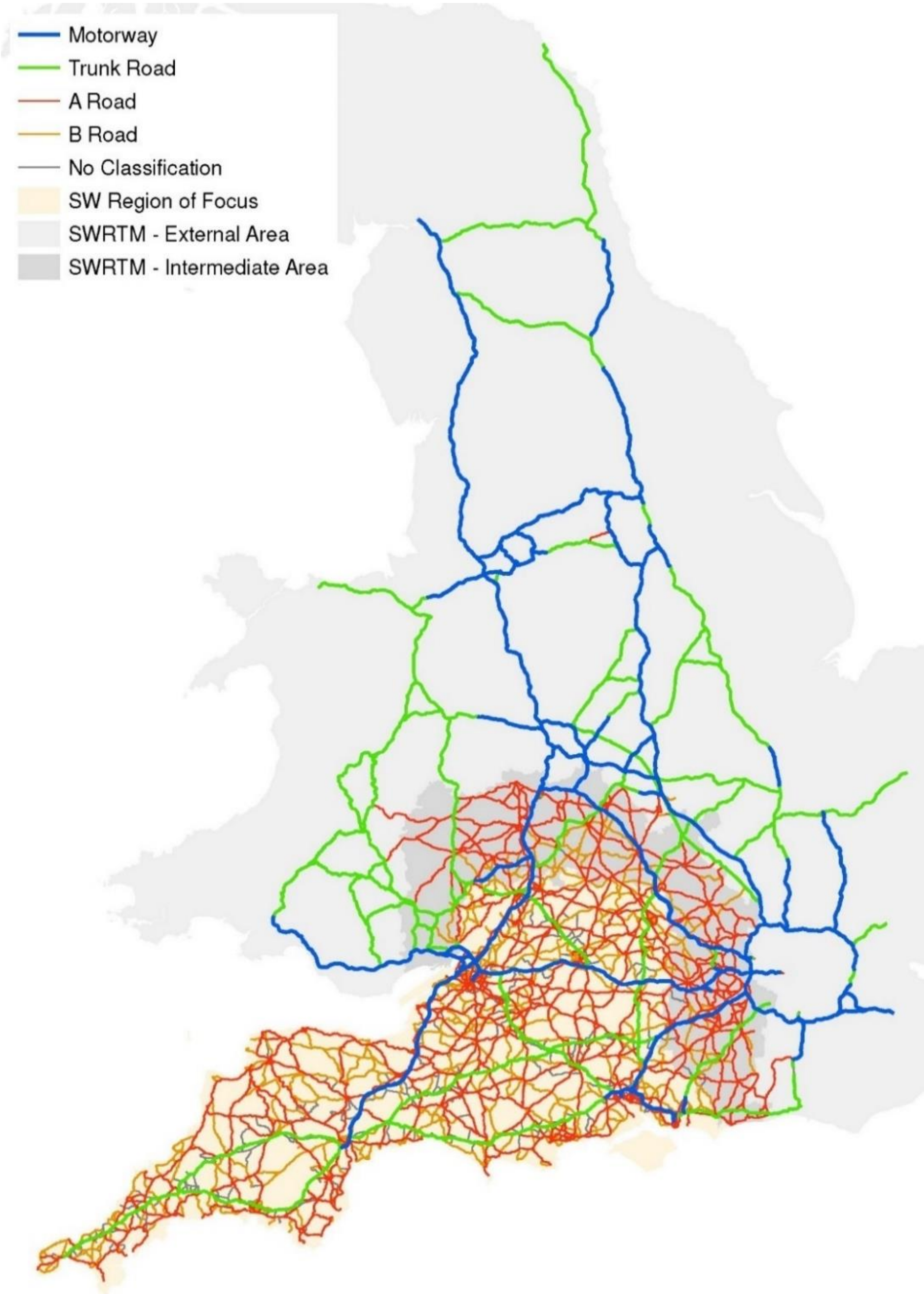
Figure 4.2: South West Regional Model DF3 - Network Coverage Area



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4.2 Matrix data

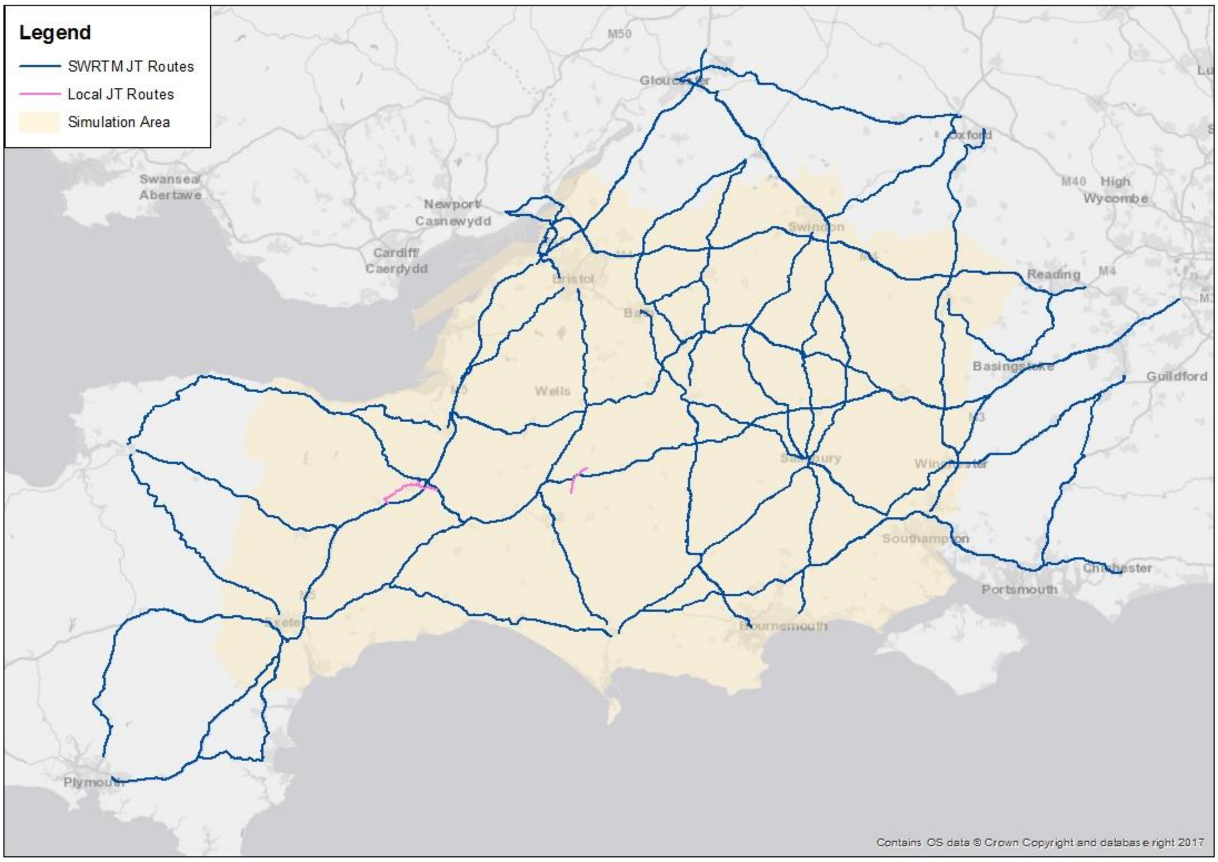
4.2.1 Matrix data for March 2015 were obtained from SWRTM DF3 prior matrices and include matrices derived from different data sources such as mobile phone data/synthetic models, Trafficmaster (The Department for Transport's

(DfT) GPS database), DfT's Base Year Freight Matrices (BYFM) and port and airport data.

4.3 Journey time data

4.3.1 For the A303/A358 stage 2 model, Trafficmaster journey time data for March 2015 were used to validate travel times on the journey time (JT) routes shown in Figure 4.3.

Figure 4.3: RIS stage 2 journey time routes



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4.3.2 Each of the journey time routes is split into segments. More details on the journey time segments can be found in the A303 stage 2 Local Model Validation Report (LMVR).

4.3.3 The performance of both the journey time route and journey time segments is assessed as part of the model calibration and validation process as per the WebTAG criteria.

4.3.4 No journey time data were available for the summer model development during stage 2. This data has since been obtained and included in the stage 3 model development.

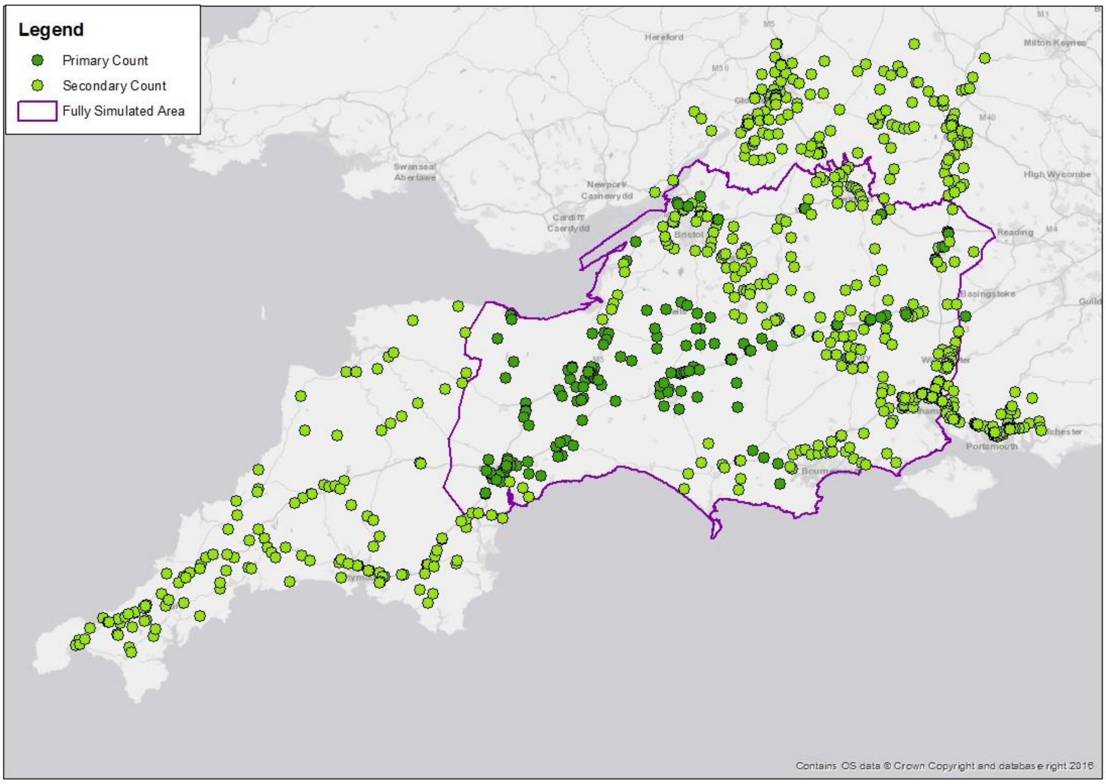
4.4 Volumetric data

Link counts:

4.4.1 Figure 4.4 contains link volumetric count locations used in stage 2. These include counts on screenlines and cordons as well as individual count locations on the Strategic Road Network (SRN) and local roads near A303/A358.

4.4.2 Figure 4.5 contains screenlines/cordons used in stage 2. Counts and screenlines are classed as primary and secondary. Primary counts/screenlines were those located within the stage 2 simulation area that were deemed to be important to the A303 Sparkford to Ilchester and A358 Taunton to Southfields schemes. Counts/screenlines outside the simulation area were classed as secondary.

Figure 4.4: A303/A358 Stage 2 - Calibration and Validation Link Data



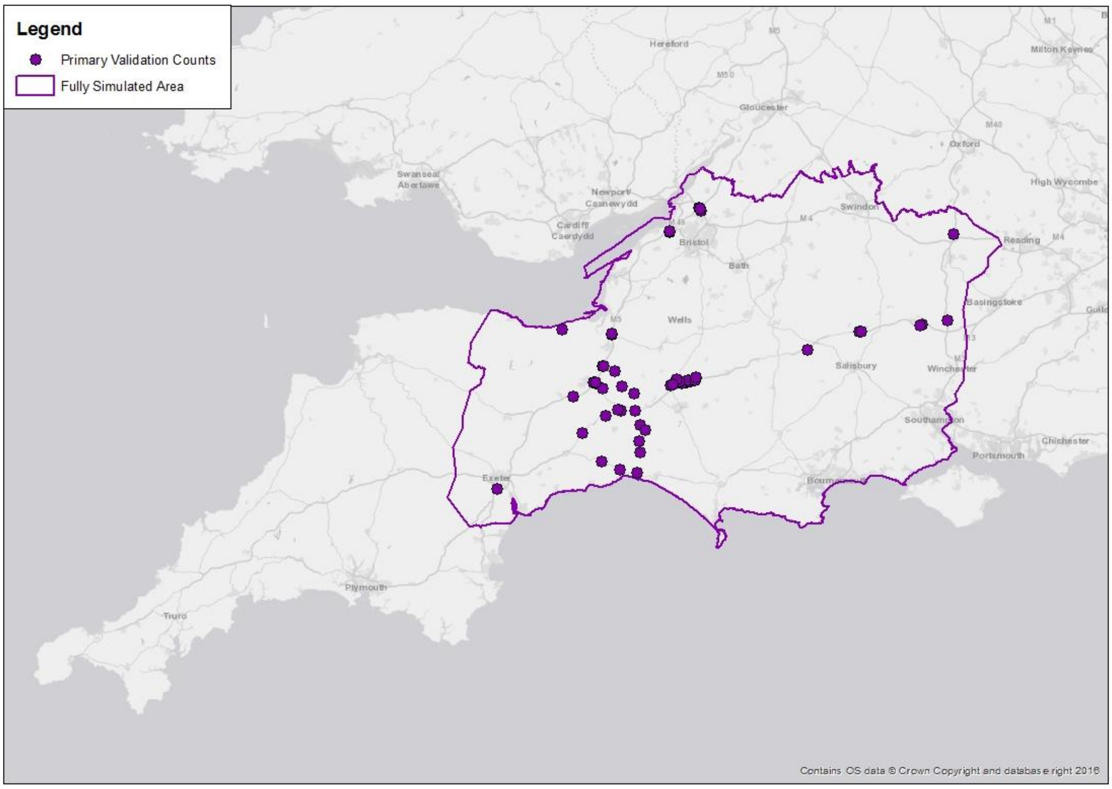


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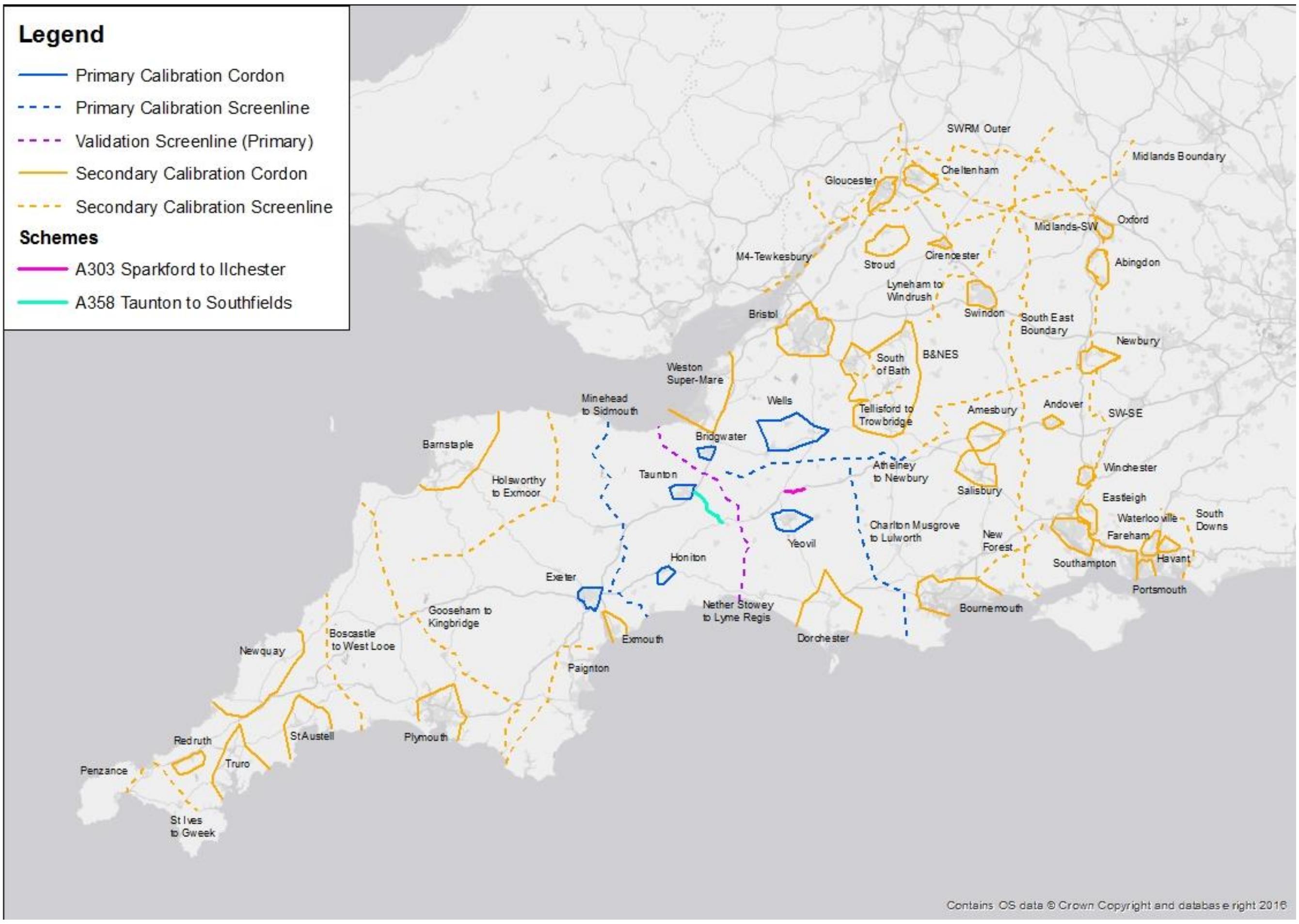
Figure 4.5: A303/A358 Stage 2 Calibration and Validation Screenlines/Cordons



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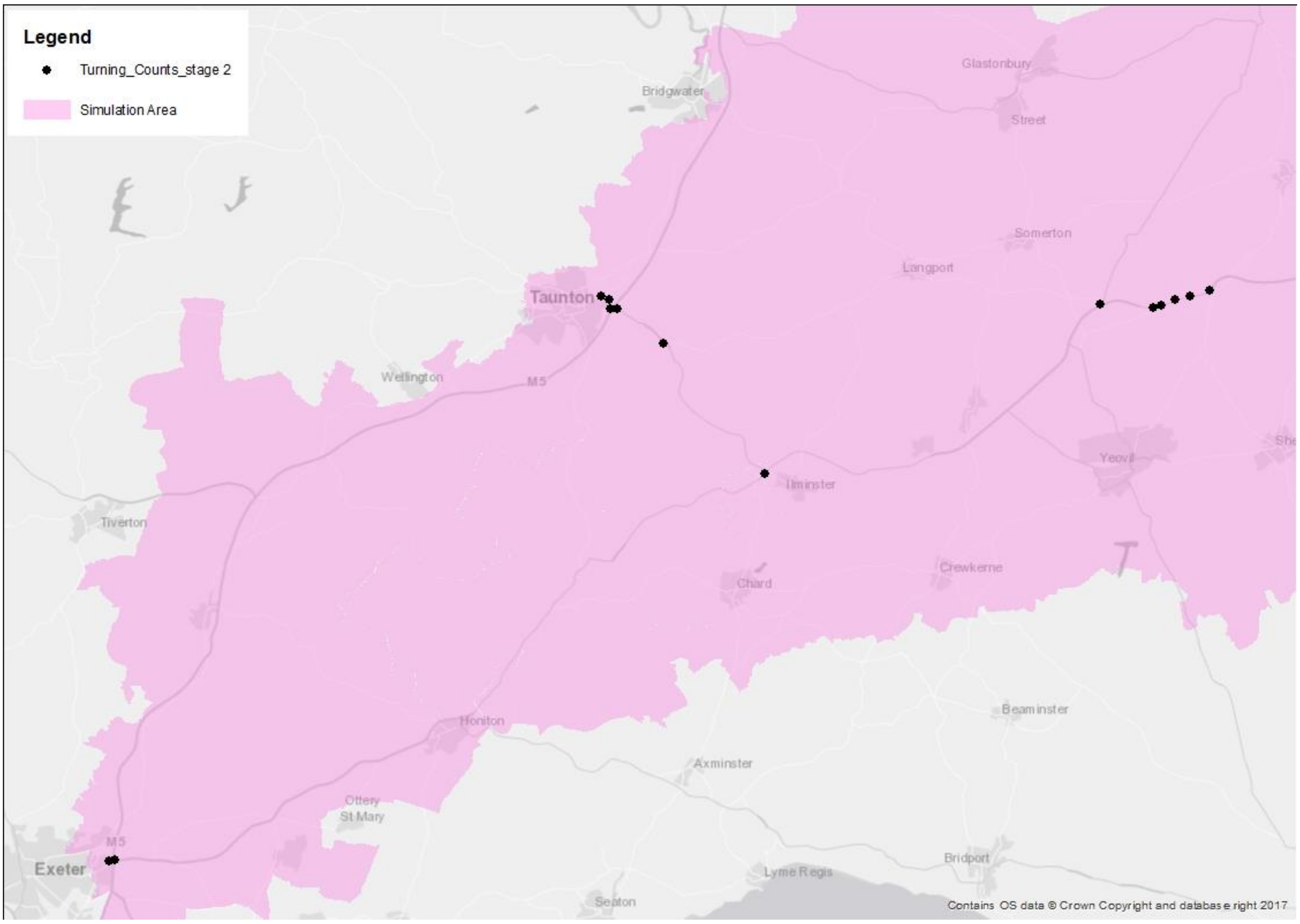
Turning counts

4.4.3 Turning flow data in the vicinity of the schemes (Figure 4.6) are also available from stage 2.

4.4.4 More details on the data used can be found in Stage 2 Traffic Data Collection Report (Highways England, February 2017).

Figure 4.6: A303/A358 Stage 2 – Turning Count Data



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NB: The simulation area shown in Figure 4.6 is the stage 3 simulation area, which is described in section 7.2.

4.5 Collision data

4.5.1 Somerset County Council provided collision data for the years between 2010 and 2014 inclusive and collision data from the Highways England database was also available for the years between 2010 and 2015 inclusive for stage 2.

4.5.2 Observed data can only be applied to existing links and junctions. As a result, any new links or junctions added in the Do Something scheme must take on default rates derived from the COBALT (Cost and Benefit to Accidents – Light Touch software) default collision rates.

4.6 Operational data

4.6.1 Operational data such as signal times and geometric junction data were maintained from the Stage 2 model, having originated from a combination of the A303 Sparkford to Ilchester and A358 Taunton to Southfields Stage 1 local traffic models and the South West Regional Traffic Model (SWRTM).

4.7 Mapping data

4.7.1 Mapping data such as a Geographic Information System (GIS) model network, GIS shapefiles detailing the location of various data and an Integrated Transport Network (ITN) were maintained from the Stage 2 model, having originated from a combination of the A303 Sparkford to Ilchester and A358 Taunton to Southfields Stage 1 local traffic models and the South West Regional Traffic Model (SWRTM).

4.8 Summary of additional data requirements

4.8.1 SWRTM DF3 has been completed which includes several network enhancements to DF2.3. These network updates are required to be incorporated into the stage 3 model.

4.8.2 Trip matrix data for 2016 March/Summer months are required from Highways England's Trip Information System (TIS) database. The TIS data consists of origin/destination (OD) matrices for motorised road or rail trips and has been produced for Highways England by O2 Telefonica using data extracted from its UK mobile phone network. The matrices supplied contain person trips and cover the whole of Great Britain.

4.8.3 Trafficmaster journey time data for 2015 summer months for the same journey time routes mentioned in Section 4.3 are required from DfT to calibrate the stage 3 summer model.

4.8.4 Additional volumetric counts (manual and automatic traffic counts) are required at several locations near A303 and A358 during August to October 2017. These will provide data for both Neutral months and summer models. Additional volumetric data will also be required from Highways England's WebTRIS database for SRN links. Data from DfT traffic stats would be required to calculate goods vehicle matrices for the summer model by applying direct factors to March inter-peak (IP) matrices.

4.8.5 National Travel Survey (NTS) data and or WebTAG weekend data are required to derive summer purpose splits and occupancy. In addition, any Road Side Interview (RSI) carried out in the summer may also be useful in deriving or checking purpose splits, occupancy and vehicle splits for the summer model.

4.8.6 Up to date information on local road schemes and developments that will form the uncertainty log need to be obtained from local authorities. Scheme design information is also required for the A303 Stonehenge scheme (formerly known as the A303 Amesbury to Berwick Down scheme) and the A358 scheme which are included in the Do Minimum scenario as instructed by Highways England.

4.8.7 Scheme drawings for the A303 Sparkford preferred route provided the basis for stage 3 Do Something coding.

4.8.8 Scheme, maintenance and operation costs are also required for the preferred route. In addition, construction and maintenance traffic management plans and associated schedule are also required.

4.8.9 Detailed collision and casualty data (in STATS19 format) for 2010-2014 was obtained from Somerset County Council for use in the distributional impact assessment.

4.8.10 Additional Trafficmaster data was provided by the DfT for the A303 Sparkford to Ilchester single carriageway section and the adjacent dual carriageway sections in order to calculate journey time reliability impacts.

5 Data collection

Table 5.1: Glossary of terms for chapter 5

ArcGIS	Geographic Information Software
ATC	Automatic Traffic Count
DF	Design Freeze
DfT	Department for Transport
GIS	Geographic Information System
IP	Inter-peak, the day-time period between the AM and PM peak periods
MCTC	Manual Classified Turning Count
MMSJV	Mott MacDonald Sweco Joint Venture
SRN	Strategic Road Network
SWRTM / SWRM	South West Regional (Traffic) Model
TIS	Highways England's Trip Information System database
Trafficmaster	The Department for Transport's GPS database
WebTRIS	A Highways England TRaffic Information System for storage & dissemination of observed Traffic Flow & Journey Time data on Strategic Road Network (includes TRADS Traffic Flow Data System: Highways England's repository of Strategis Road Network traffic flows prior to May 2015)

5.1 Network data

5.1.1 SWRTM DF3 which includes several network enhancements to DF2.3 was received from the SWRTM team on 24th October 2017. These network updates were incorporated into stage 3 networks described in Section 8.1.

5.2 Demand data

5.2.1 Trip matrix data for 2016 March/Summer months were obtained from Highways England's Trip Information System (TIS) database. These were used in the derivation of summer matrices described in Section 8.2.

5.3 Journey time data

5.3.1 Trafficmaster journey time data for 2015 summer months were obtained from DfT to develop (to derive fixed speeds for buffer links) and calibrate stage 3 summer model.

5.4 Volumetric data

5.4.1 Additional volumetric counts (manual and automatic traffic counts) were collected at several locations near A303 and A358 during August to November 2017, providing data for the both the neurtral month and summer models. Table 5.2 and Figure 5.1 show locations of August 2017 counts, Table 5.3 and Figure 5.2 show locations of October 2017 counts and Figure 5.3 and Table

5.4 show locations of November 2017 counts near A303 Sparkford to Ilchester.

Table 5.2: August 2017 count locations near A303 Sparkford to Ilchester

Site location	Description
A372	Between Podimore Roundabout and Ilchester Road
A37 N	Next to Podimore Roundabout
A37S	Between A303 and Roundabout with B3151
A359N	Outside Haynes Motor Museum
A359S	Between Sparkford Hill Lane and Blackwell Road
Podimore village	Between Church Street and Podimore services
Sparkford village	Between Sparkford Road and Hazlegrove Roundabout
B3151 E	Between West Camel Road and A303
A303 slip road	Slip road on / off A303 onto A359 at Sparkford
B3151 W	West of Bineham Lane
Howell Hill	Between A303 and Fore Street

Figure 5.1: August 2017 count locations near A303 Sparkford to Ilchester

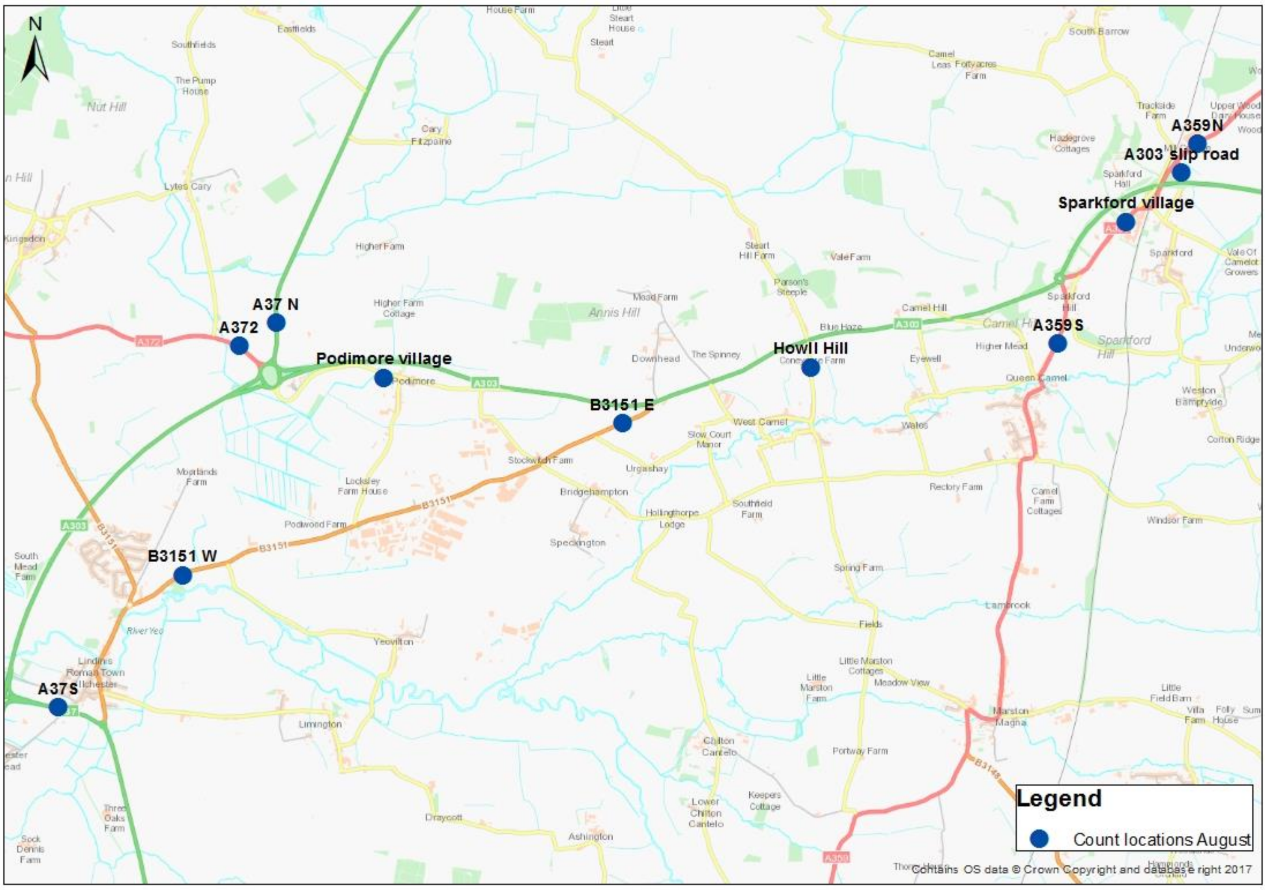

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Table 5.3: October 2017 count locations near A303 Sparkford to Ilchester

Site location	Description
The Avenue, Sparkford	Between High Street and Church Road
Podimore village	Between Church Street and Podimore Services
B3151 S	Between Bineham Lane and Church Street
A37 S	Between A303 and Roundabout with B3151
Ilchester	Between Ilchester and A37
B3151 N	Between overbridge with A303 and A372
Bridgehampton	South of B3151
A303 slip road	On / off-slip at Sparkford / A359

Figure 5.2: October 2017 count locations near A303 Sparkford to Ilchester

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Figure 5.3: November 2017 count locations near A303 Sparkford to Ilchester

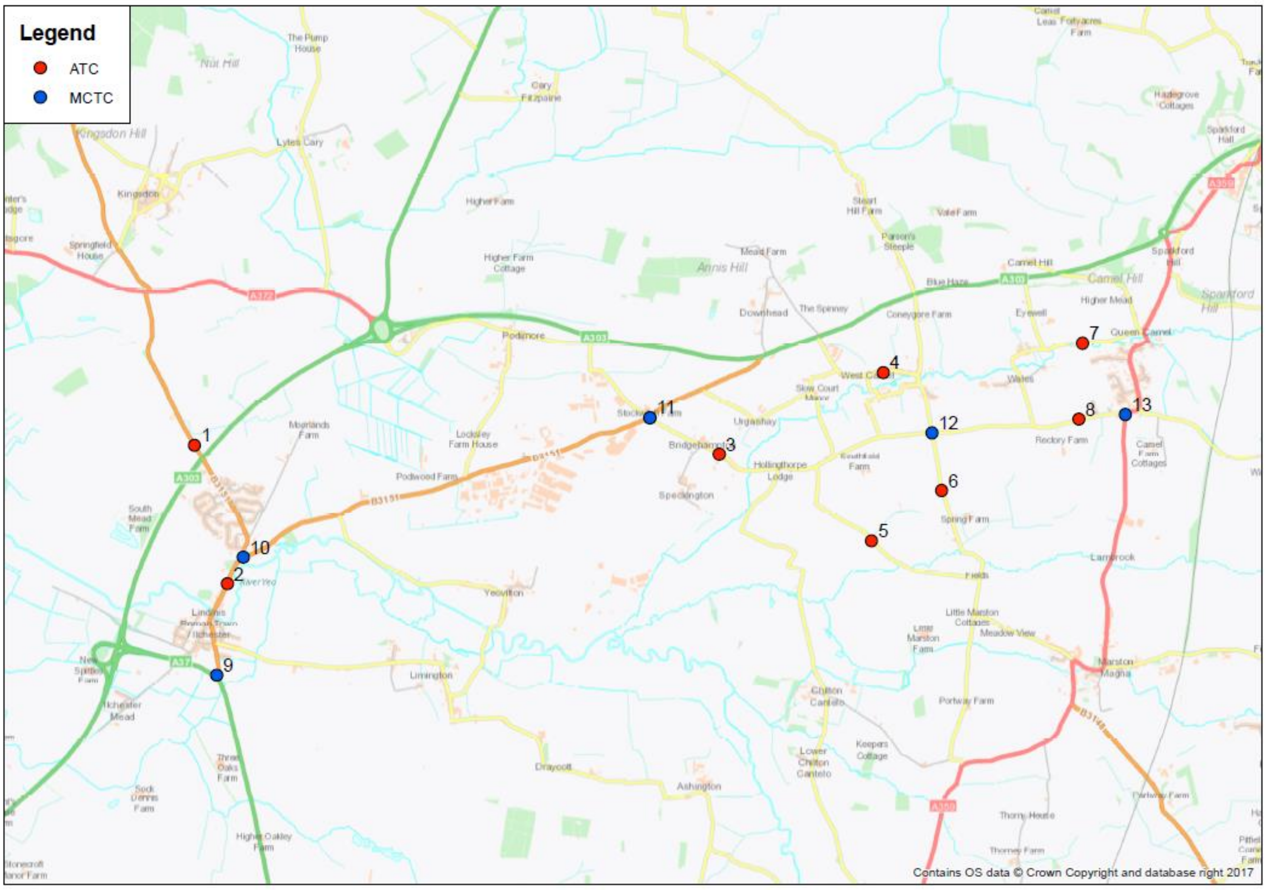

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Table 5.4: November 2017 automatic traffic count (ATC) and manual classified turning count (MCTC) locations near A303 Sparkford to Ilchester

Site location	Description	Count Type
1	B3151 North - North-West of Northover	ATC
2	B3151 South - Between the crossing of the river and the roundabout with Costello Hill	ATC
3	Bridgehampton Road - Between the B3151 and the junction the other side of the river	ATC
4	Fore Street - Between Frog Land and Howell Hill	ATC
5	Road to Marston Magna	ATC
6	Parsonage Road	ATC
7	Blackwell Road - Between Traits Lane and Gason Lane	ATC
8	West Camel Road - Between Wales Lane and the A359	ATC
9	A37 / B3151	MCTC
10	B3151 Junction	MCTC
11	B3151 / Bridgehampton Road	MCTC
12	West Camel Crossroads	MCTC
13	A359/ West Camel roundabout	MCTC

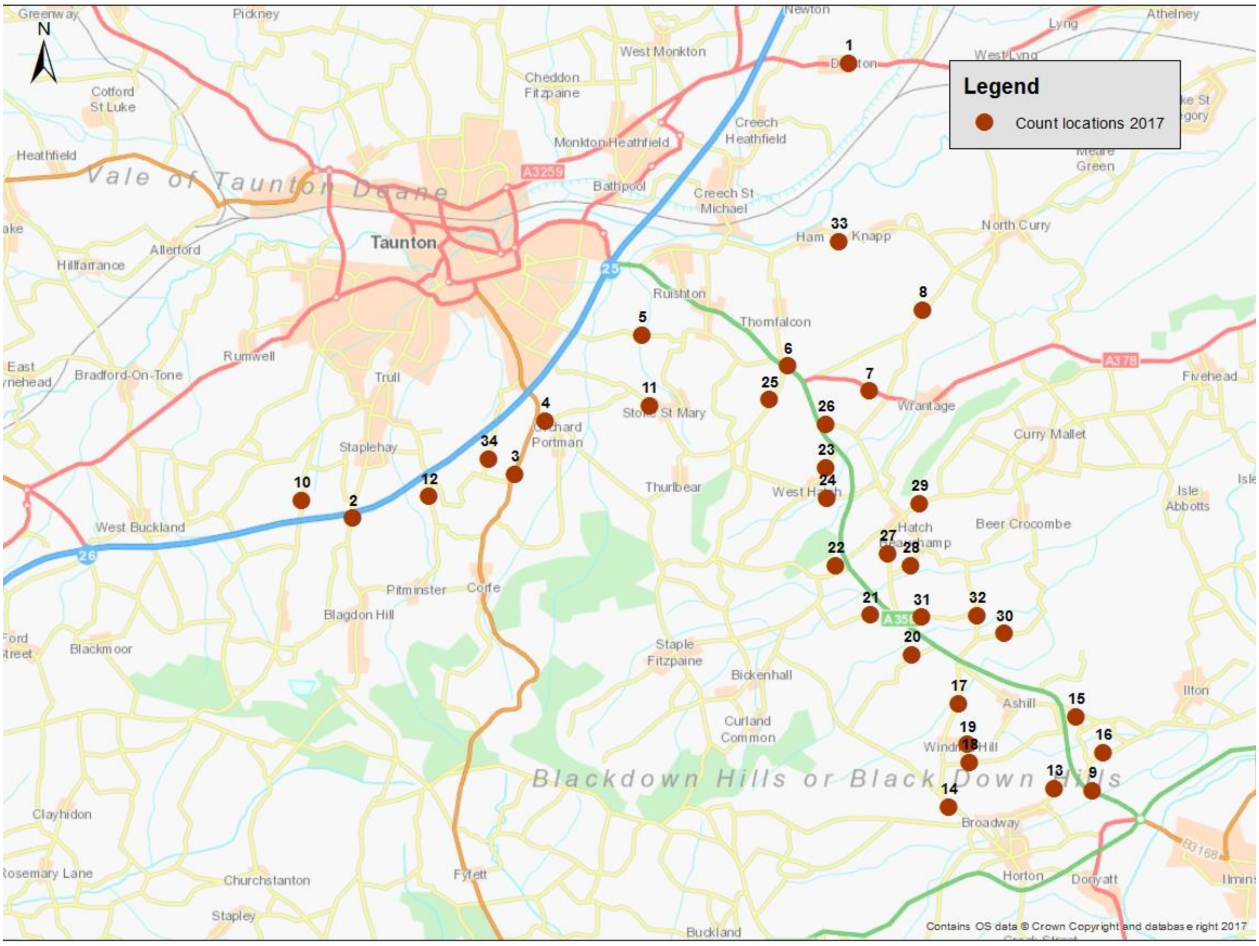
5.4.2 Table 5.5 and Figure 5.4 show location of August / October counts near A358.

Table 5.5: August / October 2017 count locations near A358

Site location	Description
1	Between Curry Lane and Frog Lane
2	Fulwood
3	North of Duddlestone
4	Between Broughton Lane and Netherclay lane
5	Between M5 and Stoke Road
6	Between A378 and Nags Head Tavern
7	Between Soloman's Hollow and Puffers
8	Between A378 and Lillesdon
9	Between Southfields roundabout and Cad Road

Site location	Description
10	Between M5 and Sweethay turn
11	Between Broughton Lane and Stoke St Mary
12	Between Green Lane and Fosgrove Lane
13	Between Snugg's Lane and A358
14	Between Broadway Road and Wood Road
15	Between A358 and Rapps
16	Between Shrybbery Farm and Butts Lane
17	Between A358 and Wood
18	Between Wood Road and Pretty Hayes
19	Between Windmill Hill and Ashill
20	Between A358 and Barrington Hill Road
21	Between A358 and Brass Knocker
22	West of A358
23	Between A358 and West Hatch
24	Between A358 and West Hatch
25	Between A358 and Ashe Farm
26	East of A358, Ashe Lodge
27	Between Hatch Green and Hatch Beauchamp
28	East of Hatch Green
29	Between Belmont Road and Fieldgate Lane
30	Between Stewley and Broadbridge Road
31	Between Capland and Stock's Lane
32	Between Radigan lane and Capland Lane
33	Between Ham and Knapp
34	Between M5 overbridge and Fosgrove Lane

Figure 5.4: August / October 2017 count locations near A358



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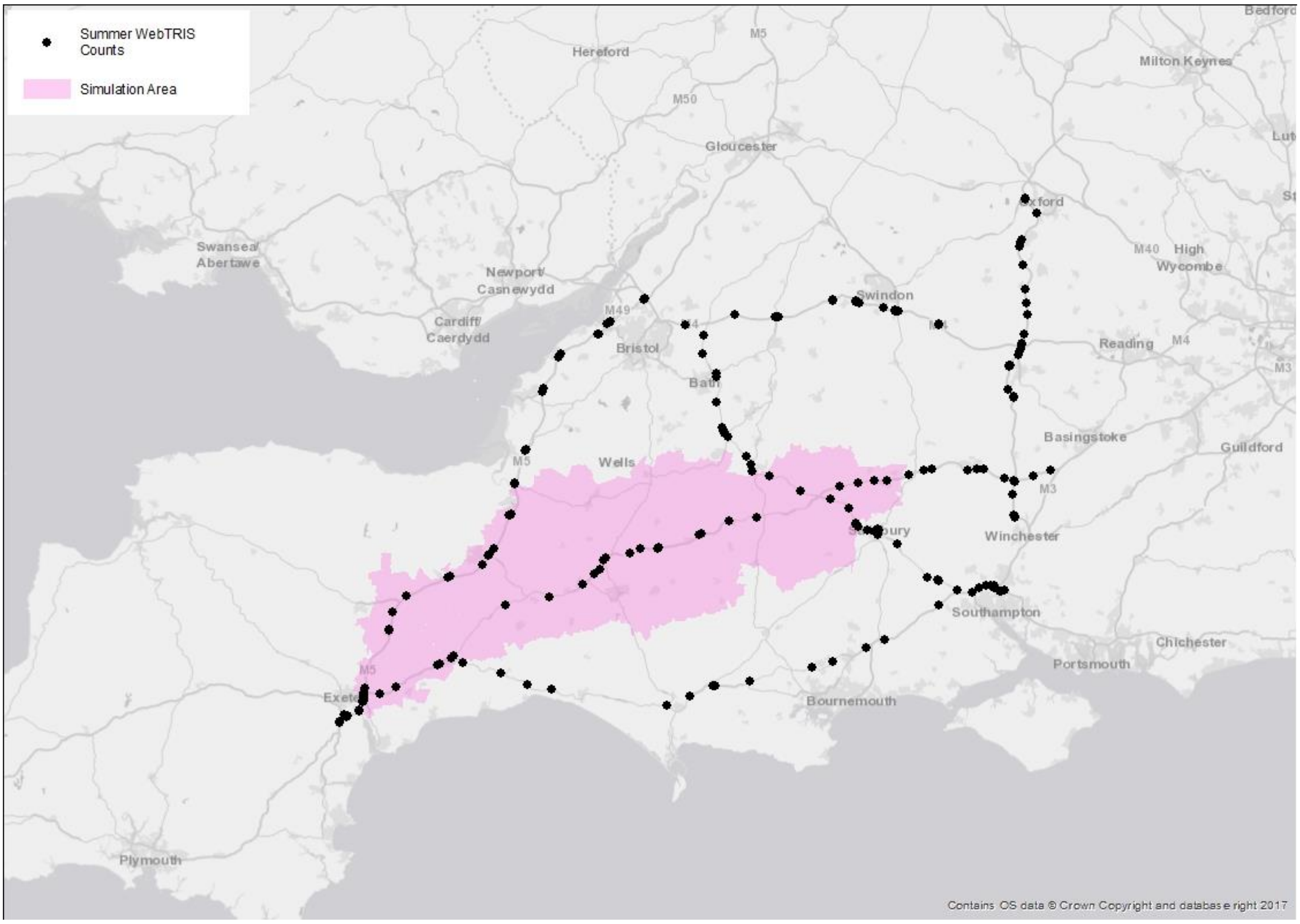
5.4.3 Additional volumetric data for the summer were obtained from WebTRIS (Highways England TRaffic Information System) database for SRN links.

Figure 5.5: Additional volumetric count data for the summer model



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5.5 Goods vehicle matrix data

5.5.1 Data from DfT traffic stats[1] were obtained to calculate goods vehicle matrices for the summer model by applying direct factors to March IP matrices.

5.6 Trafficmaster data

5.6.1 Trafficmaster data was obtained on the A303 between the Wincanton and Ilchester junctions in both directions for use in journey time reliability calculations.

5.7 Mapping data

[1] Table TRA0308: Traffic distribution on all roads by time of day and day of the week, for selected vehicle types, Great Britain: 2016
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/610673/tra0308.ods

5.7.1 Geographic Information System (GIS) files displaying the locations of these counts were created by Mott MacDonald Sweco Joint Venture using Ordnance Survey maps and ArcGIS. The resultant map is displayed in Figure 5.5.

5.8 Collision data

5.8.1 Collision data for 2010-2014 was obtained in a detailed STATS19 format from Somerset County Council for use in the economic appraisal and distributional impact assessment.

5.9 Population data

5.9.1 Population data was obtained for the simulation area from the Office for National Statistics[2] for use in the distributional impact assessment.

[2] R1_4_EW__RT__Table_PHP01__OA_London_v4.xls https://www.ons.gov.uk/file?uri=/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/2011censuspopulationandhouseholdestimatesforwardsandoutputareasinenglandandwales/rft-table-php01-2011-in-london.zip

6 Final datasets

Table 6.1: Glossary of terms for chapter 6

ATC	Automatic Traffic Count
MMSJV	Mott MacDonald Sweco Joint Venture

6.1 Overview of full datasets

Volumetric data – link counts

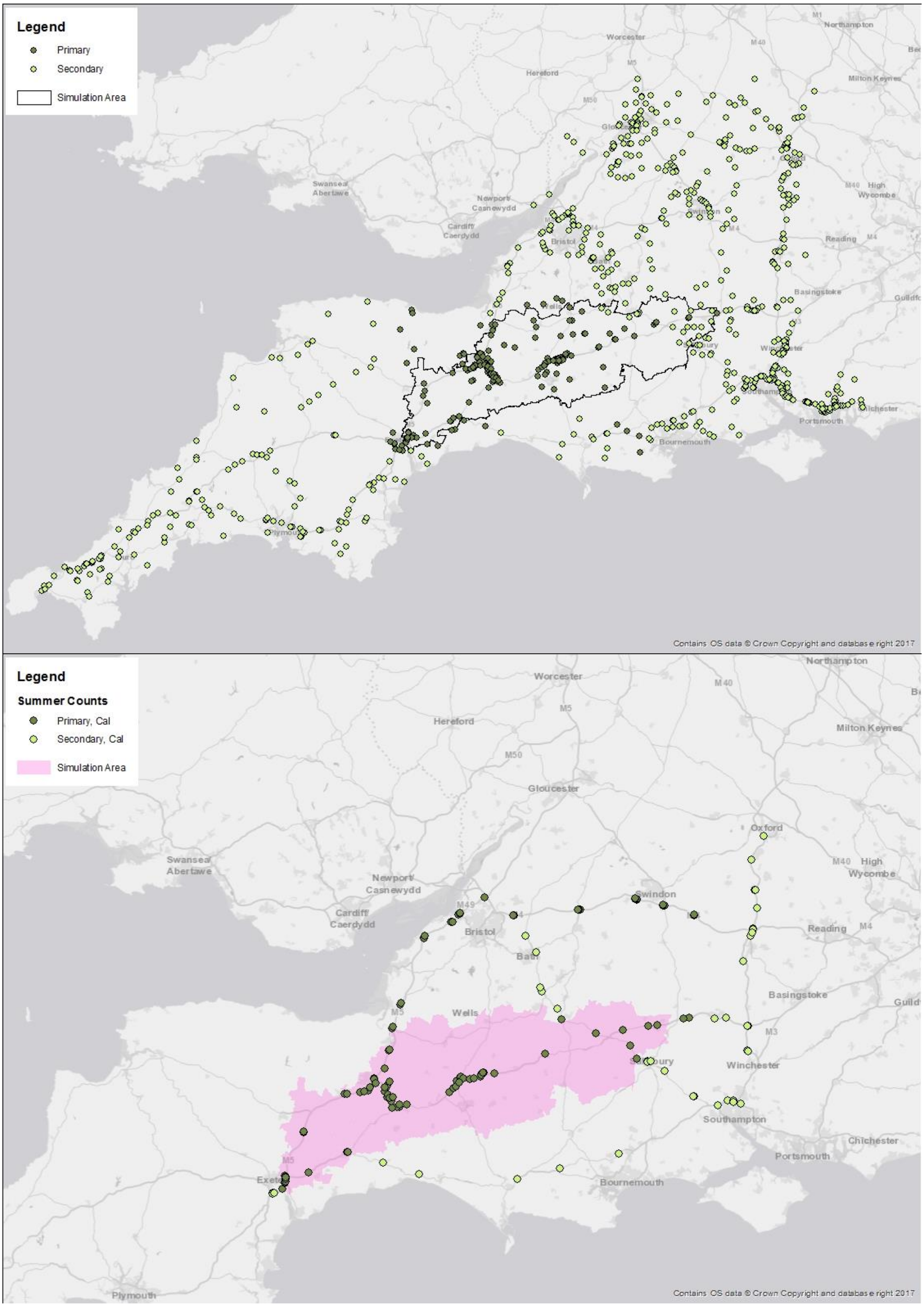
6.1.1 For stage 3, the simulation area from stage 2 was reduced to just cover the main area of impact identified during the stage 2 environmental analysis, as explained in Section 7.2.

6.1.2 The counts mentioned in Chapters 4 and 5 were sorted into primary and secondary counts, where all counts outside of the stage 3 simulation area were classed as secondary unless they were on a key corridor, namely the M4, M5 or A303. The majority of counts within the simulation area were classed as primary. The model's link and turn calibration and validation performance is measured using the primary counts only.

6.1.3 As with the screenlines, the counts were sorted into calibration and validation counts. All turning counts were included in calibration and wherever possible, the ATCs on the links adjacent to junctions for which we had turning counts were included in validation in order to assess the performance of the combined turns to and from each junction arm. Turning counts were adjusted to link ATCs. All calibration counts were included in the matrix estimation process (see Chapter 9.4 for more details on this).

6.1.4 The locations of Stage 3 link counts can be seen in Figure 6.1 and Figure 6.2.

Figure 6.1: Calibration link counts



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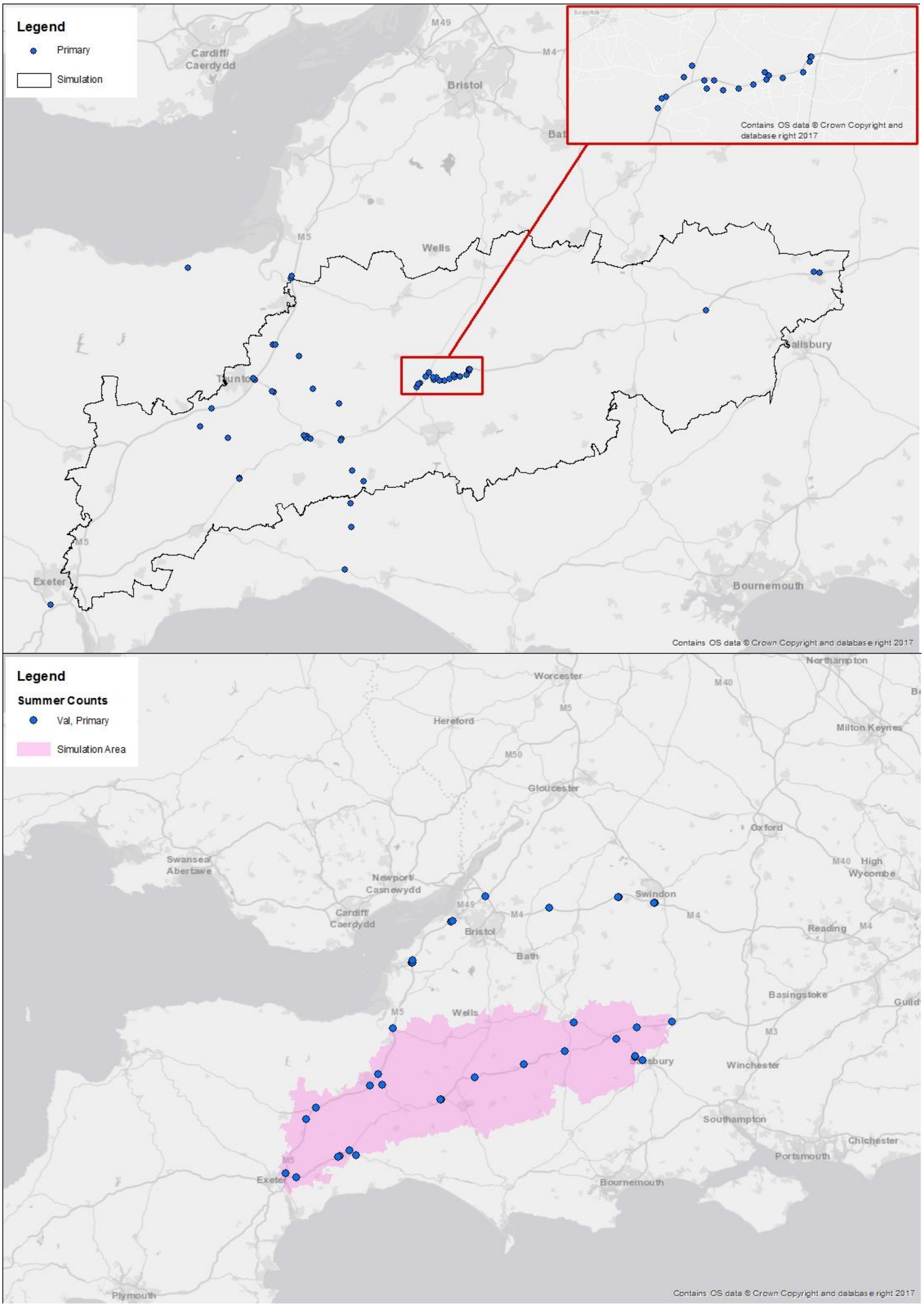
Note: First and second figures contain data for the March and summer models respectively.

Figure 6.2: Validation link counts



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Note: First and second figures contain data for the March and summer models respectively.

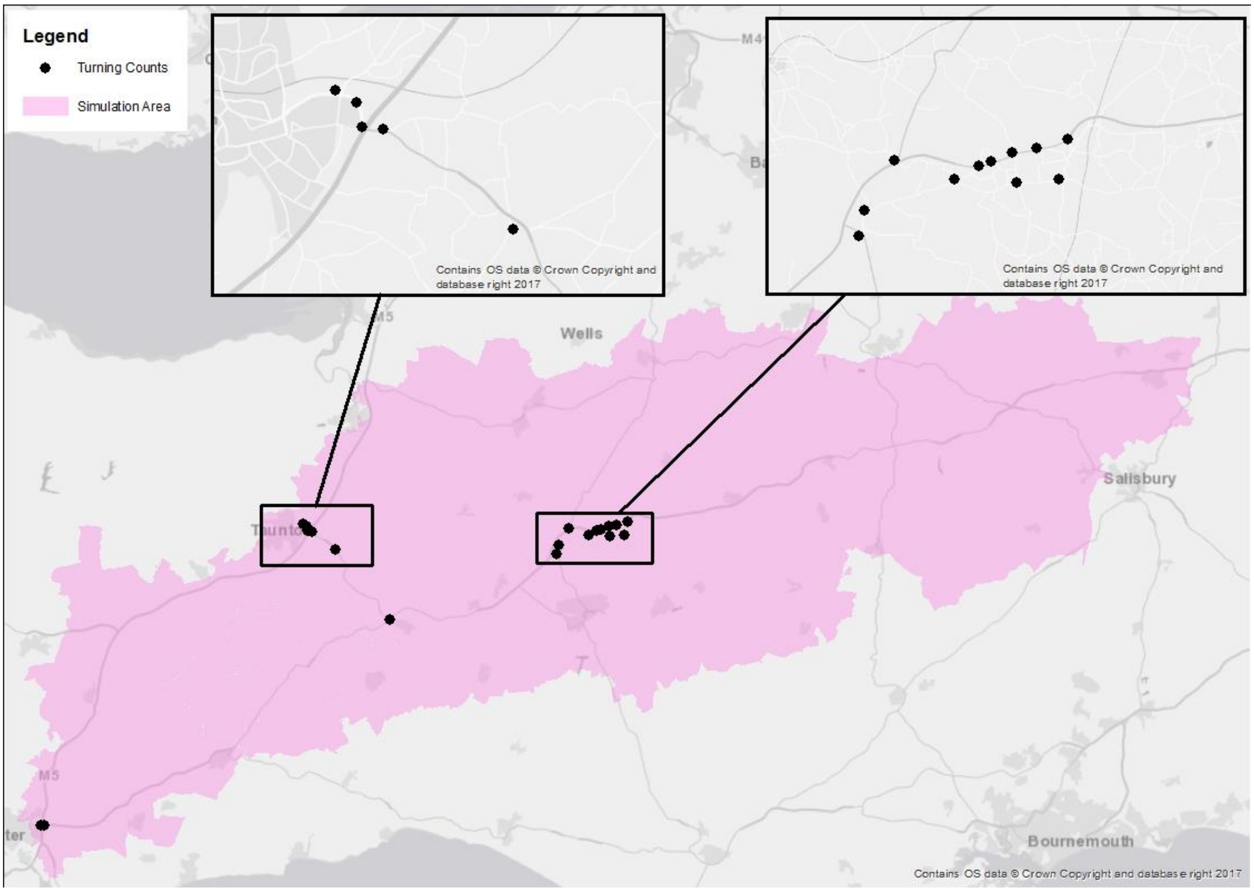
6.1.5 Various checks were carried out on the data collected in 2017 and the following processes were carried out as part of deriving average hourly data:

- Identification and exclusion of outliers
- The counts collected in 2017 were factored down to 2015 March / summer levels using factors calculated from WebTRIS data for selected sites.

Volumetric data – turning counts

6.1.6 Similar to turning counts inherited from Stage 2, the Stage 3 turning counts collected in November 2017 were factored to March 2015 levels and then underwent a furnessing process to match the turning counts to the entry and exit flows observed from the ATC counts on the links to and from the junctions. The locations of Stage 3 turning counts can be seen in Figure 6.3. No turning counts are available for summer.

Figure 6.3: Calibration turning counts



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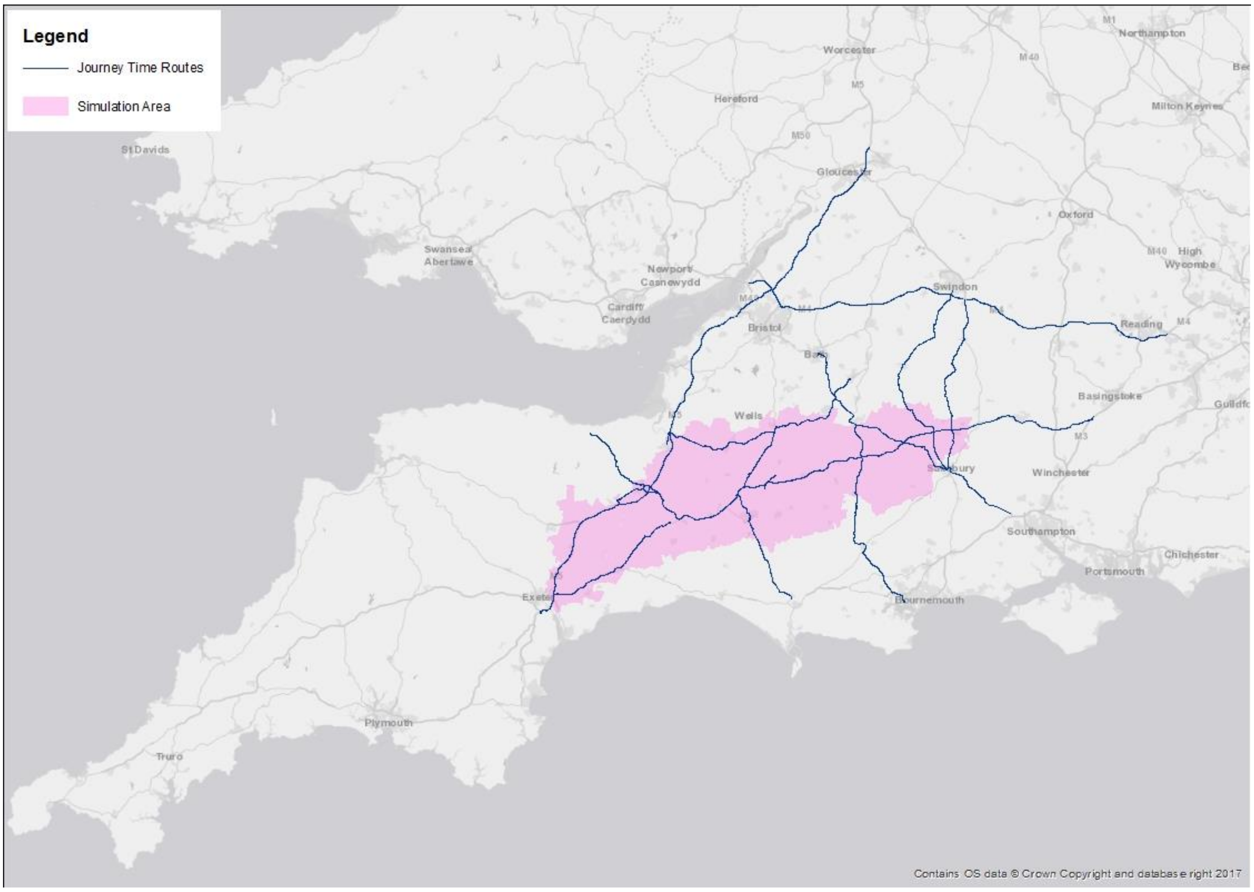
Journey time data

6.1.7 Journey time data for both March and summer models are available for all the routes highlighted below. These journey time routes are either in the simulation area or along one of the key corridors in the south-west.

Figure 6.4: Journey time routes



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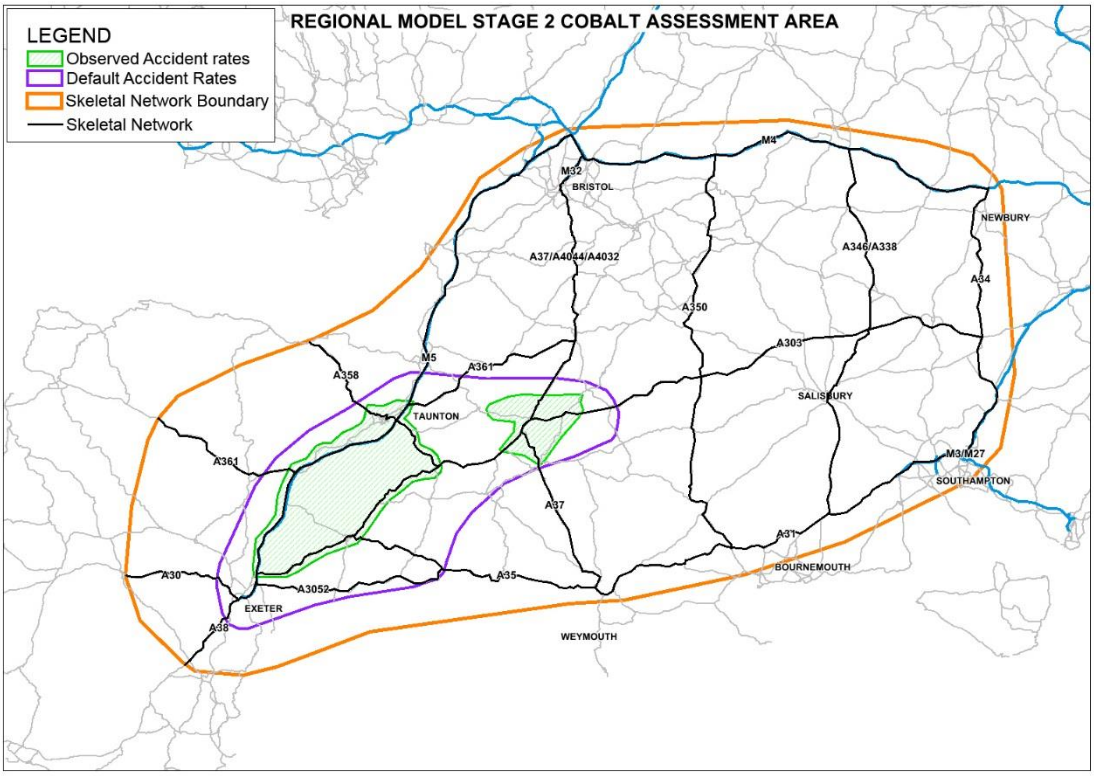
Collision data

6.1.8 shows the area of the road network for which collision data was used in the Stage 3 appraisal. The collision data includes local collision data from 2010 to 2014 that were obtained from Somerset and Devon County Councils as well as detailed casualty data obtained from Somerset County Council.

Figure 6.5: Distribution of collision data



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6.2 Adequacy of datasets

6.2.1 The previous sections highlight that there is sufficient data covering all aspects of modelling which is available for the development of stage 3 modelling and appraisal.

7 Model description / specification

Table 7.1: Glossary of terms for chapter 7

%GAP	A measure of convergence to equilibrium
ArcGIS	Geographic Information Software
ATC	Automatic Traffic Count
DIADEM	Dynamic Integrated Assignment and DEmand Modelling
DM	Do Minimum – a future year modelled scenario without the scheme
DS	Do Something – a future year modelled scenario with the scheme included
EB	Employers' business
GEH	Statistic used to compare observed and modelled traffic flows
GIS	Geographic Information System
HBEB	Home-Based Employers' business
HBO	Home-Based Other
HBW	Home-Based Work
HEIDI	Highways England's Integrated Demand Interface
HGV	Heavy Goods Vehicle
IP	Inter-peak, the day-time period between the AM and PM peak periods
LGV	Light Goods Vehicle
MMSJV	Mott MacDonald Sweco Joint Venture
NTEM	National Trip End Model
OD	Origin destination
OP	Off-peak, the time period 19.00-07.00
PA	Production Attraction
PT	Public Transport
RIS	Road Investment Strategy
RTF	Road Traffic Forecasts
RTM	Regional Traffic Model
SATURN	Simulation and Assignment of Traffic to Urban Road Networks – highway traffic assignment software
SWRTM / SWRM	South West Regional (Traffic) Model
TEMPRO	Software used in connection with NTEM data for processing and extracting the data
Trafficmaster	The Department for Transport's GPS database
VDM	Variable Demand Modelling
WebTAG	Web-based transport analysis guidance produced by the DfT

7.1 Existing models and Guidance

7.1.1 Information is available from the A303 / A358 stage 2 models.

7.1.2 Existing appraisal and assessment methodology and guidance comprises:

- WebTAG Units M1 to M5 on transport modelling and the WebTAG data book

- The guidance on developing the regional models from both the network coding manual and technical notes produced by the Technical Consistency Groups.

7.2 Methodology

Study area

7.2.1 In the application of the Regional Traffic Models (RTMs) on scheme assessment, consideration will need to be given to the likely area of road network affected by the scheme, potential traffic related environmental issues and the extent of more strategic changes in travel demand through the corridor. The RTMs should provide a good starting basis for scheme assessment, but it is likely that for each application some refinement of the model will be necessary. Road widening schemes such as the A303 Sparkford to Ilchester RIS scheme are likely to have a range of local, sub regional and regional impacts depending on their scale.

7.2.2 It was decided to create one base model for the A303 Sparkford to Ilchester and A358 Taunton to Southfields schemes. In stage 2, the area of impact was assessed by assigning the SWRTM base matrices to the SWRTM base network that included the A303 Sparkford to Ilchester and A358 Taunton to Southfields schemes. A flow comparison between the above assignments (Figure 17.1) and the SWRTM base assignments highlighted that the schemes will have an impact on M4, M5 and A303 corridors. Therefore, the stage 2 fully modelled area covered these corridors which is shown in Figure 7.1. The SWRTM simulation area outside the fully modelled area was converted to buffer.

7.2.3 In stage 2, it was found that there was a considerable amount of convergence noise in some parts of the fully modelled area away from the scheme impact corridors. Therefore, the network resolution of the model in stage 3 was maintained similar to stage 2 but the simulation area was reduced to just cover the main area of impact identified during the stage 2 environmental analysis. The stage 3 simulation area is also shown in Figure 7.1.

7.2.4 Detailed local road network contained in the stage 2 traffic model in the vicinity of the schemes were enhanced by adding some more minor roads especially around A358 Taunton to Southfields. Figure 7.2 shows the detailed model area around these two schemes.

Figure 7.1: Fully modelled area for stage 3

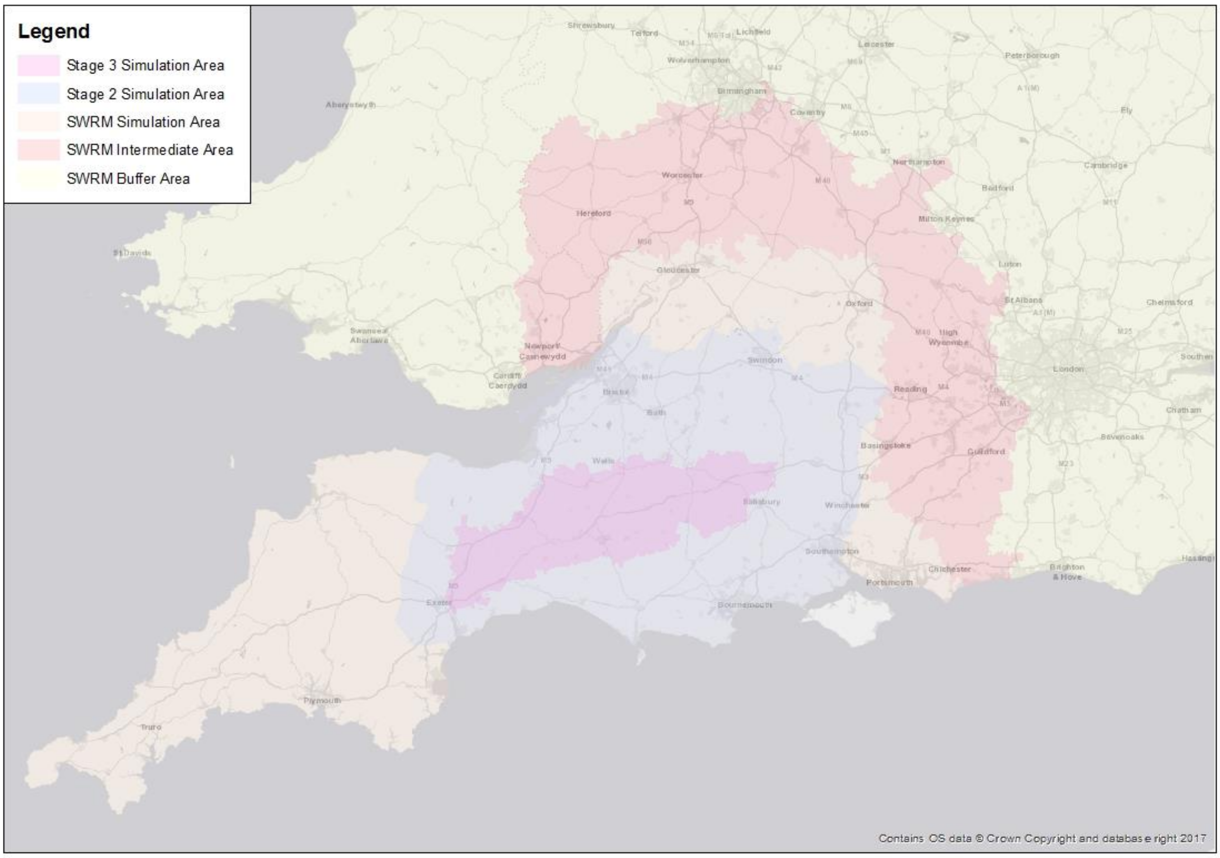

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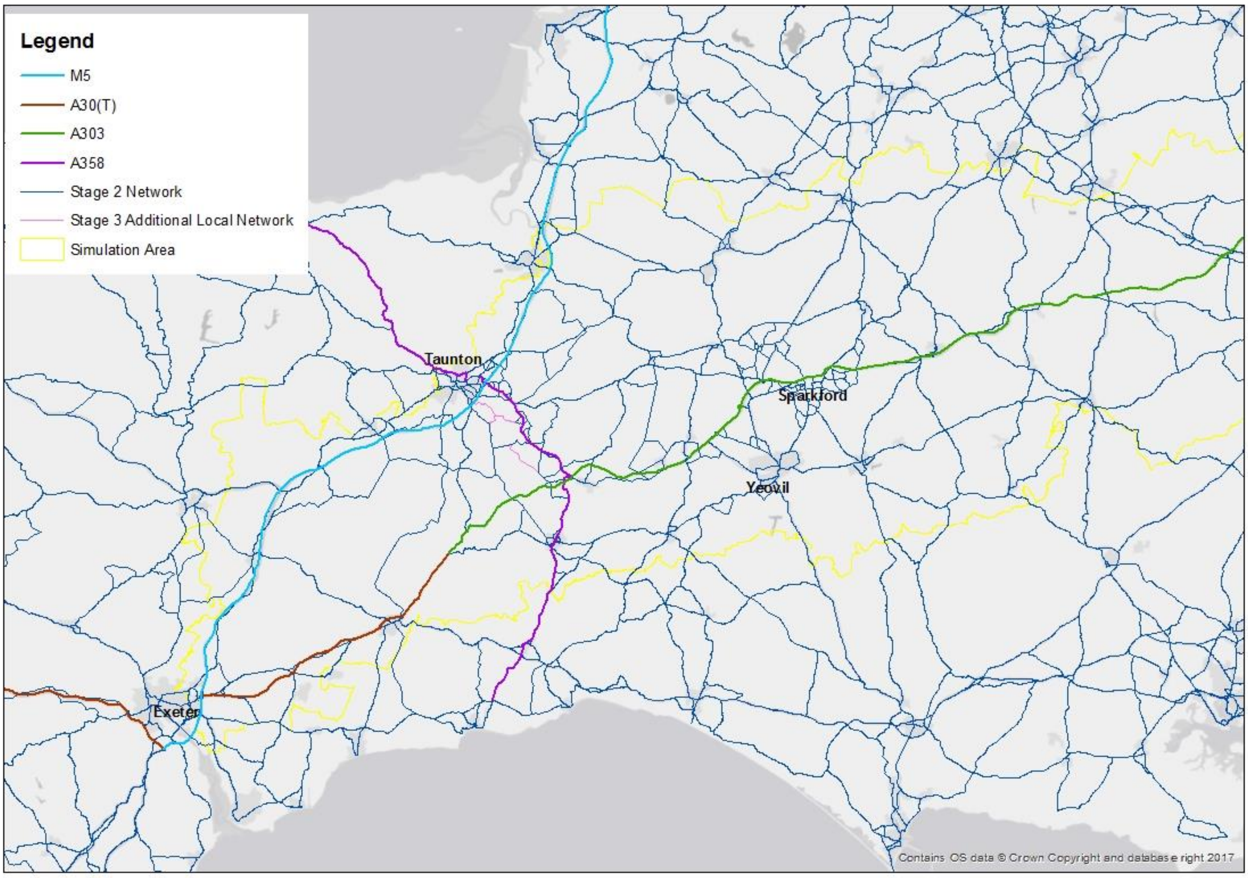
Figure 7.2: Detailed modelled area – stage 3



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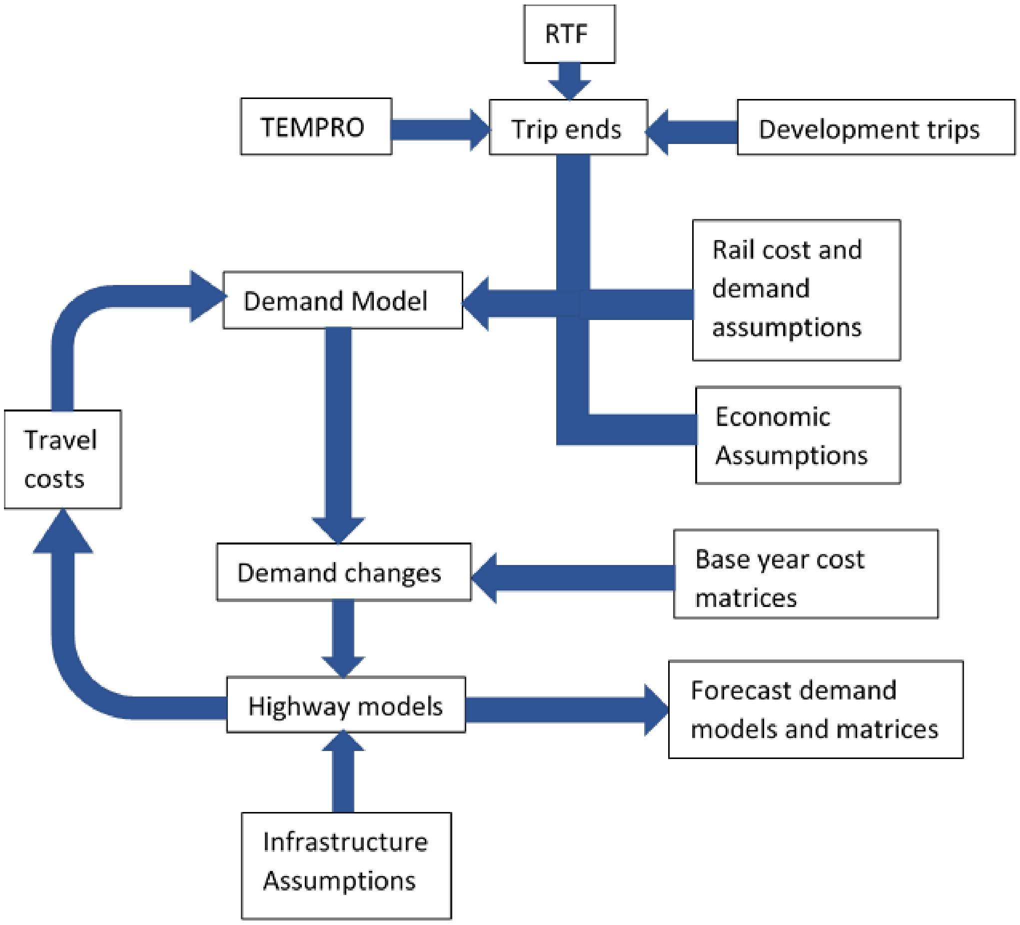
Modelling approach

7.2.5 The model is based on a WebTAG based approach (see Figure 7.3), in accordance with the Regional Traffic Modelling system. This comprises of:

- Trip end model – used for estimating the number of trips generated or attracted by a specific zone
- Demand model – used for estimating how travellers will respond to changes in their travel costs
- Highway assignment model – used for estimating travel costs and identifying the routes travellers may choose through the road network.

Figure 7.3: Modelling approach



Source: MMSJV

Key features of the model

Base year

7.2.6 The model represents an average weekday (Monday to Friday) traffic for March 2015.

Time periods

7.2.7 The assignment models cover a single average hour across four time periods in a March weekday. The modelled time periods are:

- AM Average hour (07:00 to 10:00)
- Inter-Peak (IP) Average hour (10:00 to 16:00)
- PM Average hour (16:00 to 19:00)
- OP Average hour (19:00 to 07:00).

7.2.8 Following the analysis of long-term traffic data on A303 and M5 (see Figure 18.1 to Figure 18.8), it was agreed with the Stonehenge team that additional model(s) are required to better represent traffic conditions on the A303 corridor during peak traffic periods (Fridays and weekends in holiday periods).

Mobile phone data for 2016 March and Summer was obtained from Highways England TIS database. The summer model was calibrated and validated for 2015 summer traffic on the SRN and local locations where August data have been collected and Trafficmaster journey times. It should be noted that the summer model was primarily intended for economic appraisal purposes although it could also provide data for stress testing in operational appraisal.

User and vehicle classes

7.2.9 The following assignment vehicle and purpose classes were included in the highway and demand models:

- Car – Employers' Business (EB)
- Car – Commuting
- Car – Other
- Light Good Vehicles (LGV)
- Heavy Goods Vehicle (HGV)
- Rail – Commuting
- Rail – Other
- Rail – Employers' Business (EB).

7.2.10 LGV demand was assumed to be a mix of freight and personal business trips based on the average proportions set out in the WebTAG databook.

7.2.11 The stage 2 user class structure was retained in the stage 3 model. This includes separate classes for seaports and airports. It is important to note that holiday traffic was not separately identified as such in the Regional Traffic Models but will be part of the 'Car - Other' classification, much of which is considered to be discretionary trip purposes which have different model parameters compared with EB and commuting trips. It will not be possible to disaggregate holiday traffic separately from the core data sources and there is probably a mixture of holiday and commute traffic at many times of the year that are difficult to distinguish.

Software packages used

7.2.12 The software versions adopted for the RTMs and to be used in the development of these local models were:

- ArcGIS Version 10.4 - for GIS analysis supporting model development
- SATURN (Simulation and Assignment of Traffic to Urban Road Networks – highway traffic assignment software) Version 11.3.12W – for highway assignment modelling
- DIADEM (Dynamic Integrated Assignment and DEmand Modelling) Version 6.3.3 – for variable demand modelling

- HEIDI (Highways England's Integrated Demand Interface) Version 5.3 – to support the operation of DIADEM and forecasting for the RTMs.

Model standards

Matrix Verification Standards

7.2.13 As part of the development of SWRTM prior matrices several verification tests were carried out to check the key aspects of the provisional mobile phone data. these include the following verification checks against independent data sources. More details on these checks can be found in SWRTM Model Validation Report (Highways England, March 2017). The verification tests include:

- Trip ends
- Symmetry of the matrix
- Trip rates
- Trip distribution pattern
- Trip length profile
- Trip purpose allocation
- Daily profile of trips
- Level of vehicle flows.

Calibration and Validation Criteria

7.2.14 WebTAG Unit M3.1 sets out acceptability guidelines for highway assignment models and WebTAG Unit M2 sets out guidelines for demand models.

7.2.15 The validation of a highway assignment model includes comparisons of the following:

- 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 and turning movements at junctions as a check on the quality of the assignment
- Modelled and observed journey times along routes, as a check on the quality of the network and the assignment.

7.2.16 Turning movement validation is an important aspect of local model development. They can be used as constraints in matrix estimation if they have been derived from both manual classified counts and ATCs.

7.2.17 For trip matrix validation, comparisons at screenline level provide information on the quality of the trip matrices. The measure used is the absolute differences between modelled flows and counts.

7.2.18 For link flow validation, the measures used are:

- The absolute differences between modelled flows and counts
- The GEH statistic which is a form of the Chi-squared statistic that incorporates both relative and absolute errors, and is defined as follows:

$$GEH = \sqrt{\frac{(M-C)^2}{(0.5 \times (M+C))}}$$

where:

GEH is the GEH statistic
M is the modelled flow
C is the observed flow.

7.2.19 For journey time validation, the measure used is the percentage difference between modelled and observed journey times, subject to an absolute maximum difference.

7.2.20 The validation criteria and acceptability guidelines for each of these measures are discussed below in Table 7.2.

Table 7.2: WebTAG validation criteria

Criteria	Description of criteria	Acceptability guidelines
Screenline flow validation criterion and acceptability guidelines		
	Difference between modelled flows and counts should be less than 5% of the counts	All or nearly all screenlines
Link flow and turning movement validation criterion and acceptability guidelines		
1	Individual flows within100vph for flows < 700vph	>85% of cases
	Individual flows within 15% for flows 700-2700vph	
	Individual flows within 400vph for flows > 2700vph	
2	GEH < 5 for individual flows:	>85% of cases
Journey time validation criterion and acceptability guidelines		
	Modelled journey times along routes should be within 15% of surveyed times (or 1 minute, if higher than 15%)	>85% of routes

Changes Due to Matrix Estimation

7.2.21 WebTAG Unit M3.1 also sets out measures for testing the significance of changes brought about through matrix calibration (estimation). These include the correlation of changes in cell values, trips, scale of sector to sector changes and changes in the mean and standard deviation of trip lengths as highlighted in Table 7.3.

Table 7.3: Significance of matrix estimation changes

Measure	Significance criteria
Matrix zonal cell values	Slope within 0.98 and 1.02 Intercept near zero R^2 in excess of 0.95
Matrix zonal trip ends	Slope within 0.99 and 1.01 Intercept near zero R^2 in excess of 0.98
Trip length distributions	Means within 5% Standard deviations within 5%
Sector to sector level matrices	Differences within 5%

Assignment convergence criteria

7.2.22 WebTAG Unit M3.1 section 3 sets out a set of convergence measures and base model acceptable values (Table 7.4).

Table 7.4: Summary of convergence measures and base model acceptance 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%

*The difference between the costs along the chosen routes and those along the minimum cost routes, summed across the whole network, and expressed as a percentage of the minimum costs

Demand modelling

7.2.23 To support a major scheme such as this throughout the development process and especially for economic appraisal it is required to use variable demand modelling in accordance with WebTAG unit M2. This requires a satisfactory supply model that represents the whole route travel costs as well as wide area reassignment impacts, both of which will be provided by the updated A303 Sparkford to Ilchester stage 3 model.

7.2.24 As per stage 2, variable demand modelling (VDM) for stage 3 is developed with a DIADEM demand model supported by a HEIDI front end and will have the following attributes:

- Segmentation by purpose: commute / employers' business / other
- Vehicle types: car / other
- Home-based (PA) / non-home-based (OD)

- Freight – fixed no VDM
- Hierarchical Incremental model
- Model responses to frequency, time period choice, mode choice (with rail) and distribution
- Use of illustrative parameter values and adjustment using realism testing
- Cost damping for long distance trips
- Monitoring of demand model convergence to achieve WebTAG criteria.

7.2.25 Stage 2 DIADEM / HEIDI set up is used as the basis for the stage 3 demand model set up. Realism testing is to be carried out with the revised model. Parameter values derived through realism testing are to be compared against stage 2 parameter values. It is not expected that these parameter values will be very different.

Demand model realism testing and convergence criteria

7.2.26 Standard WebTAG (Unit M2) realism tests are carried out, involving the calculation of the following out-turn demand elasticities:

- Car vehicle kilometres with respect to fuel cost (matrix-based and network-based versions)
- Public Transport (PT) trips with respect to PT fares.
- Journey time

7.2.27 The following tests of demand model acceptability are to be applied:

- Realism testing has achieved sensible out turn elasticities
- Are the final, calibrated, model parameters within an acceptable tolerance of the initial values (±25% if based on the WebTAG illustrative parameters).

7.2.28 In relation to the demand / supply model convergence, the supply / gap measure is adopted with a target of 0.1% as per WebTAG for the whole model. In addition, a sub-area gap (calculated for all trips that have an origin in the Region of Focus) of 0.2% is adopted as per regional traffic models.

Forecasting

7.2.29 The base model has been updated for the proposed opening year (2023), intermediate year of 2031, 15 years after opening (2038) and a final forecast year of 2051.

7.2.30 Information on network improvements and developments in the local area are categorised in accordance with WebTAG unit M4 in an uncertainty log. Development data sought include number of dwellings for housing development, number of jobs or floor area by industry for commercial developments and % completion by forecast years.

7.2.31 Forecast matrices are produced and controlled to National Trip End Model v7.2 (NTEM7.2) data, making adjustments to account for the local developments to be included in the core scenario. Road Traffic Forecasts 2015 (RTF15) are used for growth of Freight.

7.2.32 Stage 2 coding for 2023, 2031, 2038 and 2051 Do Minimum (DM) forecast schemes were used as the starting point. Any additional DM scheme options identified in the Stage 3 uncertainty log were coded onto above networks and forecast assignments produced. These include A303 Stonehenge and A358 RIS schemes.

7.2.33 A303 Sparkford to Ilchester stage 3 Do Something (DS) network was produced by coding the preferred option onto the DM networks.

7.2.34 Sensitivity forecast tests for low and high growth have been produced.

8 Model development

Table 8.1: Glossary of terms for chapter 8

ARCADY	Assessment of Roundabout Capacity And DelaY – junction modelling software
DF	Design Freeze
EA	External Area
FMA	Fully modelled area
GV	Goods vehicle
HBEB	Home-Based Employers’ business
HBO	Home-Based Other
HBW	Home-Based Work
HGV	Heavy Goods Vehicle
IP	Inter-peak, the day-time period between the AM and PM peak periods
JT	Journey time
LGV	Light Goods Vehicle
MVR	Model Validation Report
NHBEB	Non-Home-Based Employers’ business
NHBO	Non-Home-Based Other
NTS	National Travel Survey
OS	Ordnance Survey
PCU	Passenger Car Unit
PPK	Pence Per Kilometre
PPM	Pence Per Minute
RIS	Road Investment Strategy
RoF	Region of Focus
RTM	Regional Traffic Model
SATURN	Simulation and Assignment of Traffic to Urban Road Networks – highway traffic assignment software
SRN	Strategic Road Network
SWRTM / SWRM	South West Regional (Traffic) Model
TEMPRO	Software used in connection with NTEM data for processing and extracting the data
TIS	Highways England’s Trip Information System database
Trafficmaster	The Department for Transport’s GPS database
VDM	Variable Demand Modelling
WebTAG	Web-based transport analysis guidance produced by the DfT
WebTRIS	A Highways England TRaffic Information System for storage & dissemination of observed Traffic Flow & Journey Time data on Strategic Road Network (includes TRADS Traffic Flow Data System: Highways England’s repository of Strategis Road Network traffic flows prior to May 2015)

8.1 Network building process

Study area

8.1.1 WebTAG unit M3.1 explains in section 2 how to design a highway assignment model and the considerations in dividing the model area into a Fully Modelled Area (FMA) and an External Area (EA). The FMA would represent all trips with small zones, very detailed network and junction modelling in the *detailed* area where the most significant impact of a scheme(s) would be experienced whilst the rest of the FMA would still represent all trips with junctions simulated but would have larger zones and less detailed network. In the EA scheme impacts would be very small or negligible with partial trip representation, and a skeletal network with speed / flow representation or fixed speeds for network costs. This is a conventional type of model design where there is a relatively small detailed area for a scheme. However, the regional traffic models (RTMs) have been developed with important changes to this conventional approach recognising the modelling of a large region with a definition that is detailed for the strategic road network but not for large urban areas within the region. Therefore, in the RTMs, the area which has been mostly fully simulated is referred to as the region of focus (ROF). This definition is somewhat different to a conventional FMA as it will contain 'islands' of fixed speed coding covering large urban areas and whilst most of the main road network is coded down to B class roads, for scheme appraisal a higher definition is required around the local scheme area. Therefore, in this report the reduced ROF area is generally referred to as the simulation area rather than the FMA.

8.1.2 Four main areas have been defined within the model (see Figure 7.1 for more information) as follows:

- Simulation area – this is the area over which proposed intervention has its main strategic and local impact, and includes the area parallel to A303 between Exeter and Taunton to the west and Salisbury and Amesbury to the east.
- Area converted to buffer – this comprises of the network within the SWRTM Region of Focus (RoF) but outside of the A303 stage 3 simulation area. This area of the network has detailed coverage as it still contains all the links, nodes and zones included in the SWRTM but these have been converted to buffer network.
- Intermediate area – this is the same as the intermediate area defined in the SWRTM (see the SWRTM MVR). This area is adjacent to the area converted to buffer and has more detailed network coverage than that of the external area.
- External area – this is the same as the external area defined in the SWRTM. The impacts of the A358 and A303 schemes can be assumed to be negligible here.

8.1.3 The SWRTM network does not include all the local road network around A303 Sparkford and A358 schemes. To produce a detailed representation of the local road network, the SWRTM network was enhanced by adding local road network in stage 2. The local network was further enhanced around the A358 in stage 3 by adding some additional links (Figure 7.2).

Network coding principles

8.1.4 The coding principles used were the same as used in SWRTM (more details can be found in the SWRTM MVR), with the exception of some of the local coding where the Stage 1 models differed from the SWRTM guidance, in which case the local model coding was used. An example of where the models differed is at the Southfields roundabout at the eastern end of the A358 scheme, where detailed analysis was carried out using ARCADY (Assessment of Roundabout Capacity And DelaY, a junction modelling software) in the Stage 1 model and this produced different gap values to the standard ones from the SWRTM coding manual. The main example of these differences were saturation flows. Table 8.2 below contains network coverage information.

Table 8.2: Network coverage

	Region of focus			SWRTM RoF but outside Stage 3 RoF	Intermediate and external area
	Area 1	**Area 2**	**Area 3**	**Area 4**	**Area 5**
Coverage	SRN Roads connected to / parallel with SRN Roads considered important to RIS scheme appraisal	Rural roads that are not connected to SRN	Urban areas outside the influence area of RIS schemes and the SRN network	All roads included in the SWRTM	Roads outside the region of focus (for example, neighbouring regions, Scotland, Wales)
Level of coding	Detailed junction coding (accurate layout, sat flow, signal timing)	Template signalised junction coding Less detailed junction coding (for example, flare lanes may not need to be considered, etc.)	Dummy Nodes	Buffer Network	Buffer Network
Speed flow curves	Links with length greater than 1km for rural roads	Links with length greater than 1km for rural roads	No	No	No
Fixed speeds	No	No	Yes - taken from Trafficmaster JT data	Yes, taken from Trafficmaster JT data where available and from the SWRTM DF3 net speed outputs elsewhere	Yes, taken from Trafficmaster JT Data

8.1.5 The vast majority of the link speeds, link lengths and node locations in the model were used directly from the SWRTM. Where local network was used, this information came from the Stage 1 models. ArcGIS along with Ordnance Survey (OS) mapping was used to calculate or check any node co-ordinates and link lengths that required checking and adjustments.

8.1.6 HGV bans included in the two Stage 1 models were incorporated into the stage 2 model and were retained for Stage 3. These were supplemented by any additional observations using Google maps where necessary.

Process of increasing stage 3 buffer network

8.1.7 As mentioned before, the buffer area from stage 2 has been extended for the stage 3 model. This was done by using a module in SATURN called 'SATCH'. SATCH was used to cordon the desired simulation area, shown in Figure 7.1 and to convert the remainder of the stage 2 simulation area into buffer network. This was used together with the existing SWRTM buffer coding to create the full network. This process resulted in a '3 layered' network, as follows: (1) Simulation area – a cordon (cut down version) of the SWRTM simulation network, the coding in this section was therefore kept consistent; (2) New buffer area – the area converted from SWRTM simulation to buffer area, found between the simulation area and existing SWRTM buffer network; and (3) Existing buffer area – existing buffer network from the SWRTM model, the coding in this section was therefore kept consistent. For layer (2), link distances were obtained from the SWRTM network coding and link speed was based on Trafficmaster data where this was available and SWRTM average speeds where it was not.

User and vehicle classes

8.1.8 The following assignment vehicle and purpose classes were included in the highway models:

- Car – Employer's Business
- Car – Commuting
- Car – Other
- Light Goods Vehicles (LGV)
- Heavy Goods Vehicle (HGV).

8.1.9 There is a distinct representation of seaports and airport trips in these user classes.

8.1.10 LGV demand is assumed to be a mix of freight and personal business trips based on the average proportions outlined in the WebTAG databook.

HGV Passenger Car Unit (PCU) factor

8.1.11 An HGV PCU factor of 2.5 is used as per SWRTM.

Generalised cost formulation

8.1.12 Generalised cost values are calculated based on the vehicle operating costs, values of time and user class splits as outlined within WebTAG Unit A1.3 (July 2017).

Table 8.3: Value of time assumptions - pence per minute, PPM (2010 prices, 2015 values)

		PPM		
		AM	IP	PM
Car	Business	29.81	30.54	30.24
	Commuting	19.99	20.31	20.06
	Other	13.79	14.69	14.44
LGV	Work	21.78	21.78	21.78
	Non-work	15.83	15.83	15.83
	Average	21.07	21.07	21.07
HGV	Other Goods Vehicle (OGV)1	21.39	21.39	21.39
	OGV2	21.39	21.39	21.39
	Wgt Average*	21.39	21.39	21.39

* A 40:60 OGV1:OGV2 split was assumed for all RTMs based on a review of classified count data

Table 8.4: Vehicle operating cost assumptions – pence per kilometre, PPK (2010 prices, 2015 values)

		PPK		
		AM	IP	PM
Car	Business	12.72	12.72	12.72
	Commuting	6.28	6.28	6.28
	Other	6.28	6.28	6.28
LGV	Work	14.52	14.52	14.52
	Non-work	7.72	7.72	7.72
	Average	13.70	13.70	13.70
HGV	OGV1	31.94	31.94	31.94
	OGV2	58.08	58.08	58.08
	Wgt Average*	47.63	47.63	47.63

* A 40:60 OGV1:OGV2 split was assumed for all RTMs based on a review of classified count data

Assignment model convergence

8.1.13 The criteria set out in WebTAG Unit M3.1 (see Table 7.3) were used to assess the assignment convergence of the SATURN models. The assignment procedure used for the highway model is an interaction between an equilibrium assignment and junction delay calculations. This interaction is described below. The highway model uses an equilibrium assignment, distributing demand according to Wardrop's first principle of traffic equilibrium: "Under equilibrium conditions traffic arranges itself in congested networks in such a way that no individual trip makers can reduce his path costs by switching routes".

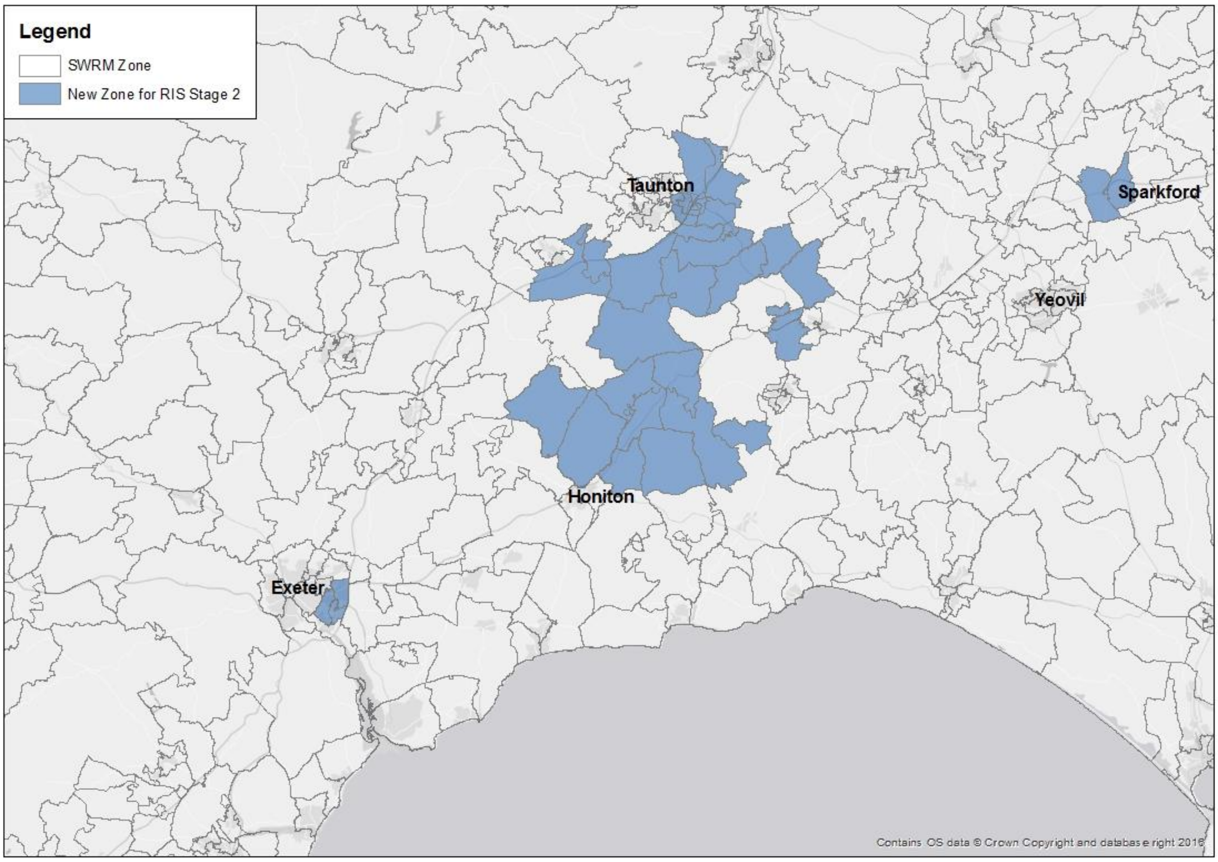
8.1.14 The state of equilibrium is reached by iterating between inner and outer assignment loops. Within the inner assignment loop, alternative routes for an origin-destination pair are brought into a state of equilibrium by shifting traffic from one route to the other until the travel time is the same. The outer loop then checks whether other routes with shorter travel times can be found as a result of the current assignment. This is repeated until no routes with an equal or shorter travel time can be found.

8.1.15 Other key features of the model are contained in Section 7.2.

8.2 Demand model coding process

8.2.1 The stage 2 model contained 1933 zones in total. Figure 8.1 shows a section of the simulation area containing local zoning system. The stage 2 local zoning system was retained in stage 3.

Figure 8.1: Local zoning system enhancements in stage 2



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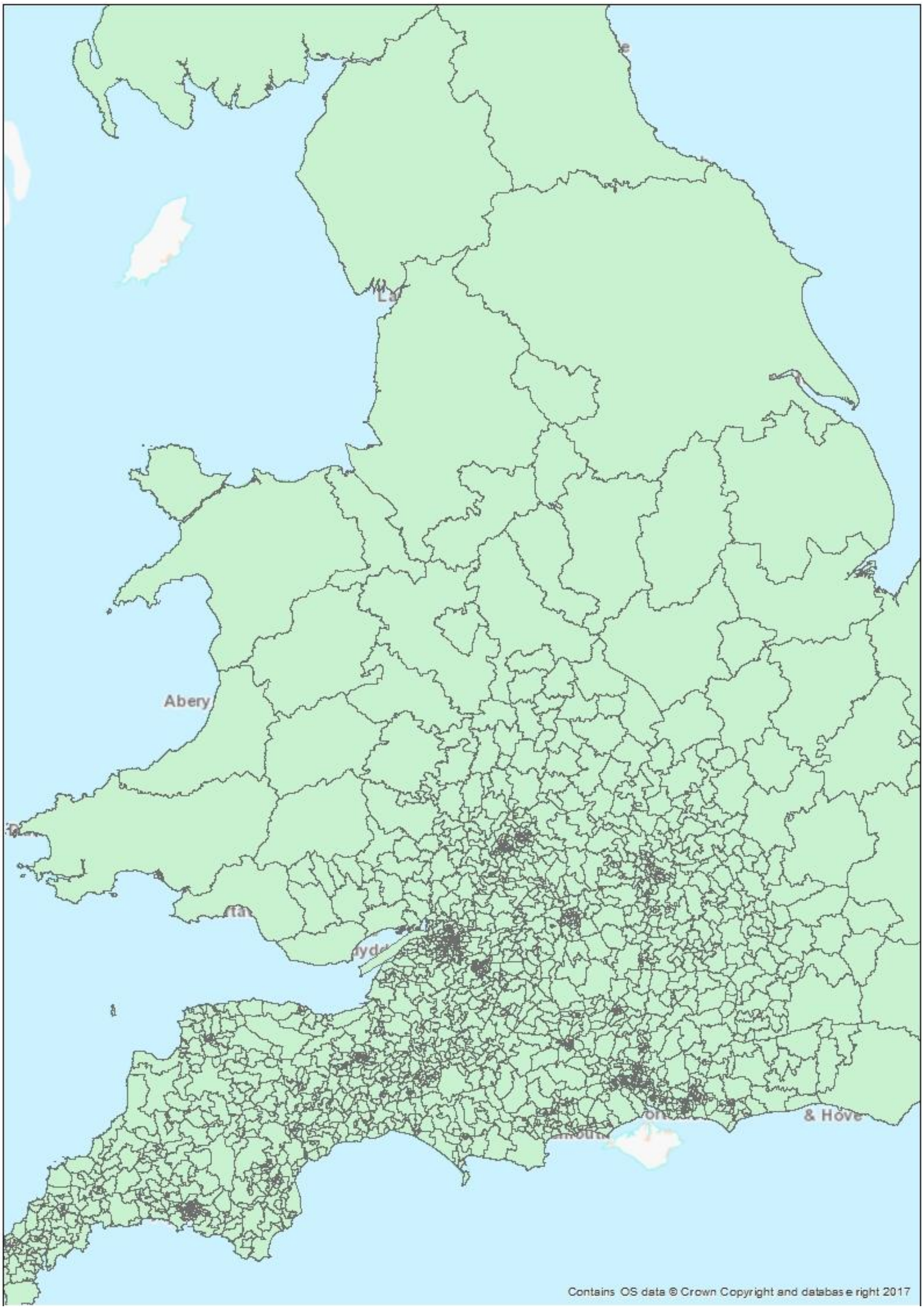
8.2.2 The stage 3 zoning system in Figure 8.2 is aggregated to several sector systems to be used for different purposes during modelling and appraisal. These include presentation of VDM results and economic outputs. These sector systems are defined elsewhere in this report (see Figure 9.2 and Figure 11.8).

Figure 8.2: Stage 3 zoning system



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Demand segmentation and variable demand modelling process

8.2.3 More details on demand segmentation and variable demand modelling process can be found in Section 7.2.

Production of stage 3 weekday prior matrices

8.2.4 The same prior matrix from Stage 2 was used as the Stage 3 prior matrix since no changes are made to the zoning system. The following sections explain how the stage 2 prior matrix was derived from the SWRTM.

8.2.5 The derivation of the A303 Sparkford / A358 stage 2 prior trip matrix involved disaggregating the SWRTM zone system. Where the stage 2 zones are smaller than the SWRTM, 2011 Census population data was used to inform zone splitting factors, as follows:

- Resident population – used to split the home end of Home-Based trips
- Workplace population – used to split the non-home end of Home-Based Work (HBW) and Home-Based Employers' Business (HBEB) trips and both ends of Non-Home-Based Employers' Business (NHBEB), Light Goods Vehicle (LGV) and Heavy Goods Vehicle (HGV) trips
- Resident + Workplace population – used to split the non-home end of Home-Based Other (HBO) trips and both ends of Non-Home-Based Other (NHBO) trips.

8.2.6 The resulting stage 2 prior trip matrix was effectively the same as the SWRTM prior trip matrix in terms of total trips and distribution.

Production of stage 3 summer matrices

Analysis of long-term traffic

8.2.7 Traffic data on the A303 near West Camel and the M5 north of J25 (from WebTRIS) was analysed to understand traffic levels during a March weekend and August weekdays and weekends. This analysis can be seen in Appendix B. The analysis indicated that March weekend flows are not very different to average March weekday traffic flows. However, August weekend flows are much higher than average March weekday flows. It was therefore proposed to derive a separate August weekend model.

Derivation of August weekend average hour prior matrices

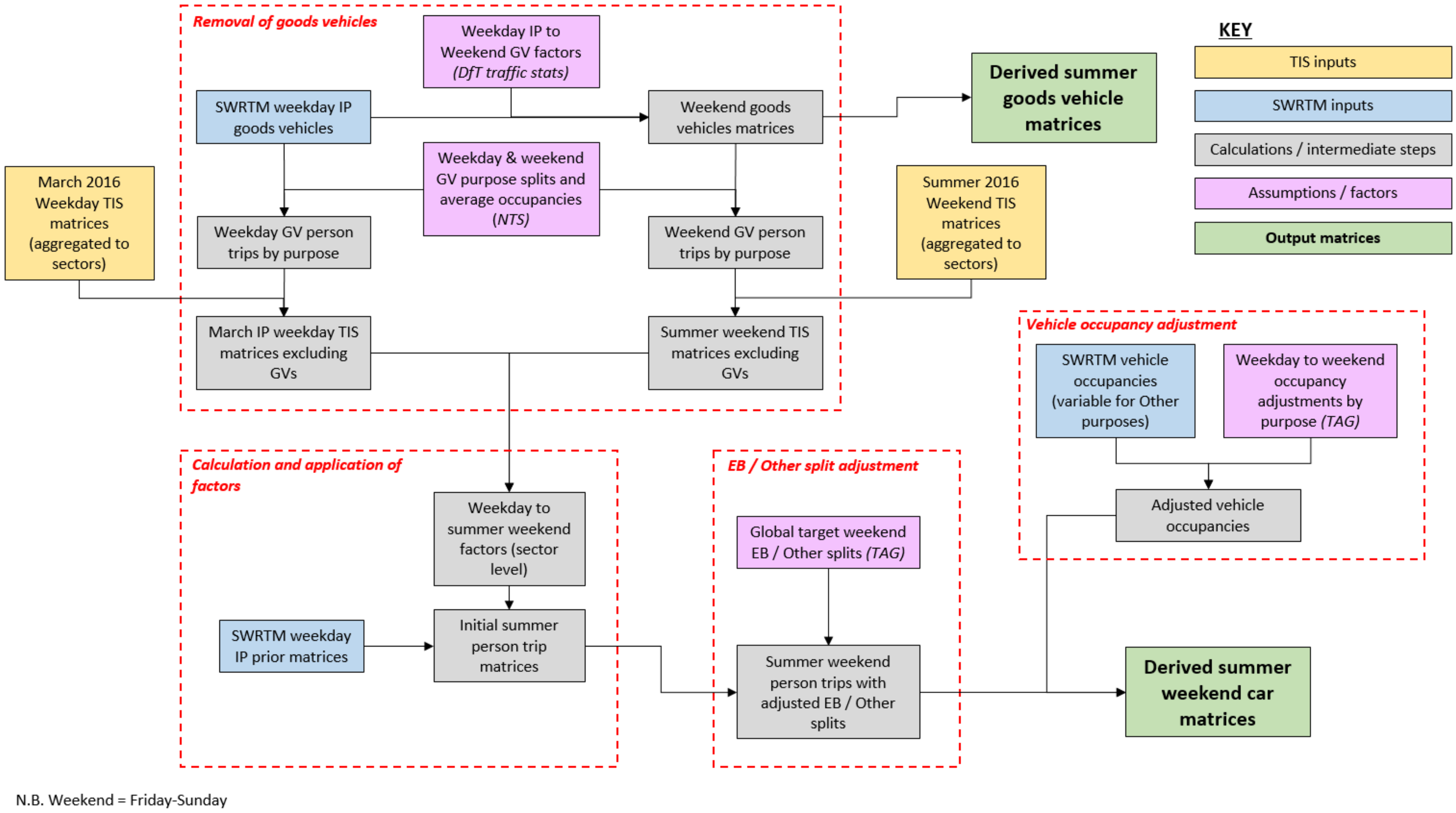
8.2.8 The approach used to derive the August weekend average hour prior matrix involved adjusting the 2015 March weekday inter-peak matrices using factors derived from 2016 Highways England Trip Information System (TIS) data.

8.2.9 Data was obtained from TIS corresponding to March inter-peak and summer weekend (Friday-Sunday) time periods. Factors from WebTAG were used to adjust the employer's business and other purpose splits and occupancy values in the summer data. The car person TIS data for March inter-peak and summer weekend were used to calculate a set of factors. These factors were applied to the SWRTM inter-peak prior car matrix to obtain summer weekend car vehicle matrices. The summer weekend car and goods vehicle matrices were transformed to the A303 Sparkford to Ilchester Dualling model zoning system.

8.2.10 Factors were used to convert the SWRTM inter-peak prior goods vehicle matrices from weekday to summer weekend to obtain summer weekend prior goods vehicle matrices. Goods vehicle (GV) average occupancies were obtained from WebTAG, and purpose splits were obtained from National Travel Survey (NTS) data and applied to both goods vehicle prior matrices to convert from vehicle trips to person trips. The goods vehicle matrices were deducted from the TIS data to obtain car person trip matrices for both March inter-peak and summer weekend.

8.2.11 The process is illustrated in Figure 8.3. It is important to note that the prior matrix produced by the A303 Sparkford team has also been used by the A303 Stonehenge team as the initial input into their August weekend average hour prior matrix.

Figure 8.3: Summer matrix derivation process



Source: MMSJV

9 Model calibration

Table 9.1: Glossary of terms for chapter 9

BYFM	Base Year Freight Matrices
DIADEM	Dynamic Integrated Assignment and DEmand Modelling
EB	Employers' business
GEH	Statistic used to compare observed and modelled traffic flows
HEIDI	Highways England's Integrated Demand Interface
HGV	Heavy Goods Vehicle
IP	Inter-peak, the day-time period between the AM and PM peak periods
LGV	Light Goods Vehicle
ME	Matrix Estimation
MMSJV	Mott MacDonald Sweco Joint Venture
OP	Off-peak, the time period 19.00-07.00
RoF	Region of Focus
SATURN	Simulation and Assignment of Traffic to Urban Road Networks – highway traffic assignment software
SRN	Strategic Road Network
SWRTM / SWRM	South West Regional (Traffic) Model
TUBA	Transport User Benefit Appraisal
UC	User class
VDM	Variable Demand Modelling
WebTAG	Web-based transport analysis guidance produced by the DfT

9.1 Introduction

9.1.1 Journey time and count data used in calibration and validation are detailed in Section 6. As per stage 2, matrix estimation (ME) was carried out for the unconstrained scenario meaning no constraints are applied to ME process. The same ME parameters as stage 2 were used in all ME runs which are also consistent with SWRTM. No journey time and count data were available for off-peak (OP). Therefore, the OP model is not subject to calibration and validation as it is a simple alternative method to factoring from modelled periods to daily levels. However, given the importance of the holiday period, the summer model is subject to limited flow validation on local and SRN links and journey time validation on key routes.

9.1.2 Calibration and validation dashboards were produced for prior and post ME assignments. These were compared against corresponding stage 2 dashboards to see whether the changes are reasonable.

9.2 Network calibration

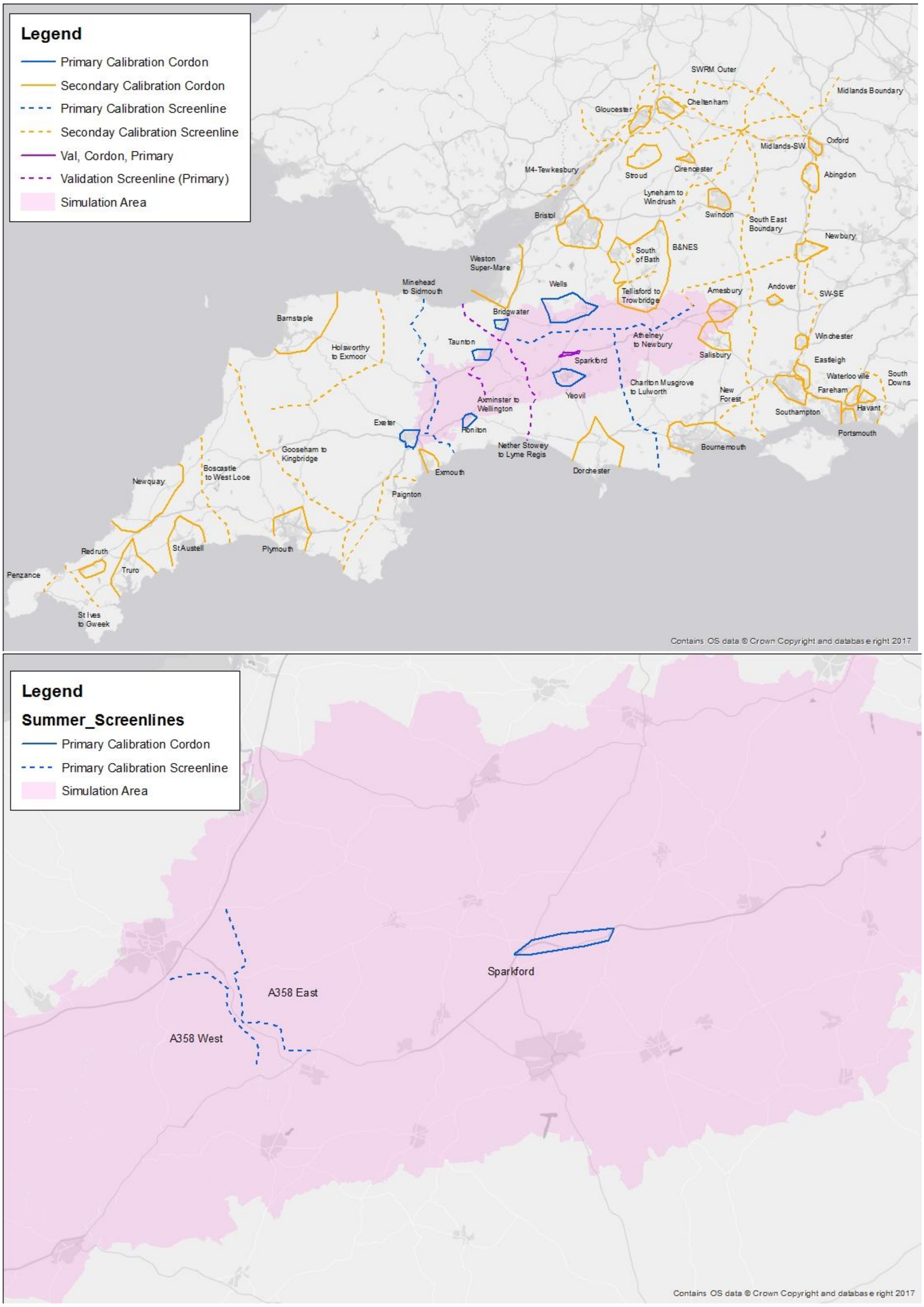
9.2.1 During calibration, various elements of the network were reviewed following comparisons of model data against observations of traffic counts and journey times. A review of all warnings and serious warnings flagged by the software was undertaken, which includes checks by looking at SATURN output files, TUBA (Transport User Benefit Appraisal softrware) warning checks that could highlight network problems, issues found through stress testing of networks with an uplifted matrix etc. Any specific issues identified during this review process were resolved through further network editing.

9.2.2 Network calibration was driven by aiming to achieve a good fit between the modelled and observed journey times and link flows and turning movements at key junctions. As part of this calibration, nodes with unrealistic delays were checked and modified where necessary to achieve realistic journey times. Modifications made to the network included changes to turn saturation flows, number of approaching lanes at nodes, signal timings in each time period, roundabout parameters and revisions to the link speed-flow curves / fixed speeds for achieving the observed link journey times.

9.3 Count data used in calibration and validation

9.3.1 Link count data collected for weekday and summer model development has been organised into calibration and validation screenlines / cordons as illustrated in Figure 9.1. Counts and screenlines are categorised as primary and secondary where primary counts / screenlines / cordons are partially or fully inside the simulation area. The primary calibration counts / screenlines / cordons will receive higher priority during ME. Secondary counts / screenlines / cordons are all used in calibration and located outside the simulation area.

Figure 9.1: Calibration and validation counts, screenlines/cordons



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Note: First and second figures contain data for the March and summer models respectively.

9.4 Matrix calibration

9.4.1 The prior model assignment was compared with both the calibration and validation counts in order to determine whether calibration using a matrix estimation process would be necessary. These results, along with a comparison between the prior assignment and observed journey times routes and segments are presented in Table 9.2.

Table 9.2: Prior model traffic flow comparison

	WebTAG criteria		Number	AM	IP	PM
Primary screenlines within 5%	All or nearly all	Calibration	18	11%	22%	11%
		Validation	6	50%	67%	50%
		Total	24	21%	33%	21%
Primary links and turns passing GEH or flow criteria	>85%	Calibration	538	76%	79%	73%
		Validation	88	74%	80%	69%
		Total	626	75%	79%	73%
Journey time routes within 15%	>85%		35	100%	97%	100%
Journey time segments within 15%	>85%		181	95%	96%	98%

9.4.2 The screenline results are poor, with around 20-30% of primary screenlines and cordons meeting the criteria across all time periods. The link calibration and validation results also fall short of the WebTAG criteria. Both the journey time full routes and route segments show much better results, exceeding the WebTAG criteria in all three time periods.

9.4.3 These results demonstrate the need to undertake a matrix estimation process detailed in Section 9.5.

9.4.4 Following the matrix estimation process, the model calibration significantly improved. A summary of the post-matrix estimation calibration results is given in Chapter 10.6 together with a summary of the validation and journey time results. Full calibration and validation results are given in Appendix C.

9.5 Matrix estimation methodology

9.5.1 The Matrix Estimation (ME) procedure attempts to improve the “prior” matrix built as described in Section 8.2 of the report to achieve a better match between the modelled flows and the observed flows. Matrix Estimation was undertaken within SATURN using the SATPIJA and SATME2 modules and was based on counts by vehicle type (Car, LGV, HGV). To be consistent with the SWRTM / A303 stage 2, the matrix estimation process was run for 6 iterations.

9.5.2 XAMAX is a parameter that defines the maximum balancing factor used to limit excessive changes to the prior matrix. In the SWRTM, a value of two was used for car and a value of five used for the LGV and HGVs. These values reflect the relative confidence in the data used to develop the demand for each of the vehicle classes. No changes were made to these values for the RIS stage 3 model.

9.5.3 The observed counts are input into the ME procedure where some counts are grouped into mini-screenline groups as per the SWRTM methodology. SATURN then attempts to match mini-screenlines totals for different vehicle classes. In the vast majority of cases, the mini-screenlines defined in the SWRTM were maintained. However, to achieve successful calibration in the local area of the model, the way in which some of the primary screenlines were grouped into mini-screenlines was altered. One example of these alterations was to remove the SWRTM convention of SRN roads forming their own mini-screenlines (albeit with just a single count) to better match the total traffic using the SRN and feasible alternative routes.

9.5.4 The ME process was run regularly throughout the calibration stage of the model, each time incorporating any network and matrix changes as well as any changes to the observed counts and mini-screenline groupings.

9.5.5 As per Stage 2, an “unconstrained” ME run was undertaken with all trips (Car, LGV and HGV) being left to change as much/little as the estimation process requires.

9.5.6 The changes made to the prior matrix in the unconstrained scenario are presented in Section 9.6.

9.6 Monitoring matrix estimation changes

9.6.1 To understand and monitor the changes that the matrix estimation process made to the prior matrix, various analyses have been undertaken. These include regression analyses of both cell values and trip ends, comparisons of trip length distributions and comparisons of sector to sector movements.

9.6.2 Table 9.3 sets out the criteria to judge the significance of the changes produced by ME as recommended by WebTAG (M3.1). It is recognised that achieving all these criteria in a large area model such as this could be challenging and therefore the matrix estimation effect should not be considered against strict pass and fail criteria, but the overall model calibration/validation assessed, including the comparison against the observed journey times. Although the analyses explained below are based on the “unconstrained” ME run whereas the SWRTM was based on a 60:40 blended run which is a combination of a constrained and unconstrained runs, the overall changes of the unconstrained runs are comparable with the SWRTM 60:40 blended runs in the AM and IP, with the PM matrix changing more than the SWRTM blended one.

Trip length distributions

9.6.3 A comparison of trip length distribution for all trips with at least one trip end in the SWRTM RoF has been undertaken between the prior and final matrices. Table 9.3 shows that whilst the means and standard deviations are within or close to 5% for the AM peak and the Inter-peak for cars (user classes 1-3) and LGVs (user class 4), the majority of the car user classes (UCs) exceed the 5% means and standard deviation criteria in the PM. HGVs (UC5) do not meet either the mean or standard deviation criteria in any time period, with changes of greater than 10% for the means and between 6.9% and 11.1% in the standard deviation in most cases, showing large reductions in the average trip length. This is due to the fact that demand matrices for HGVs are based on adjustments to the 2006 BYFM matrices, which results in a more ‘lumpy’ matrix, and it is expected that HGV trip patterns will have changed in the last 10 years. Table 9.4 and Table 9.5 show the matrix totals for both “pre” and “post”, which again indicates that HGVs experience the largest changes.

Table 9.3: Trip length changes for trips with a trip end in the RoF

Class	AM		IP		PM	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
UC1	4.7%	5.3%	6.4%	5.8%	13.6%	11.8%
UC2	-0.5%	5.1%	2.2%	5.2%	2.6%	10.6%
UC3	1.0%	5.1%	2.9%	5.7%	4.2%	11.1%
UC4	-7.1%	-9.4%	-5.6%	-6.2%	-3.9%	-2.5%
UC5	-17.2%	-11.1%	-17.8%	-10.2%	-12.8%	-6.9%
Cars	0.9%	5.3%	3.4%	5.7%	5.3%	11.8%
Total	1.2%	1.5%	1.4%	1.2%	4.6%	7.6%

Table 9.4: Matrix totals for trips with a trip end in the RoF

Class	AM		IP		PM	
	Pre	Post	Pre	Post	Pre	Post
UC1	55,258	51,412	43,271	42,542	44,056	42,450
UC2	286,364	264,636	80,912	79,227	262,440	246,343
UC3	320,149	305,779	408,745	402,098	405,224	389,108
UC4	72,021	76,485	59,191	63,797	56,400	60,092
UC5	30,899	40,287	29,745	37,270	19,507	23,516

Table 9.5: Matrix total changes for trips with a trip end in the RoF

Class	AM		IP		PM	
	Dif	%Dif	Dif	%Dif	Dif	%Dif
UC1	-3,846	-7%	-728	-2%	-1,607	-4%
UC2	-21,729	-8%	-1,684	-2%	-16,097	-6%
UC3	-14,370	-4%	-6,647	-2%	-16,116	-4%
UC4	4,464	6%	4,606	8%	3,691	7%
UC5	9,388	30%	7,525	25%	4,009	21%

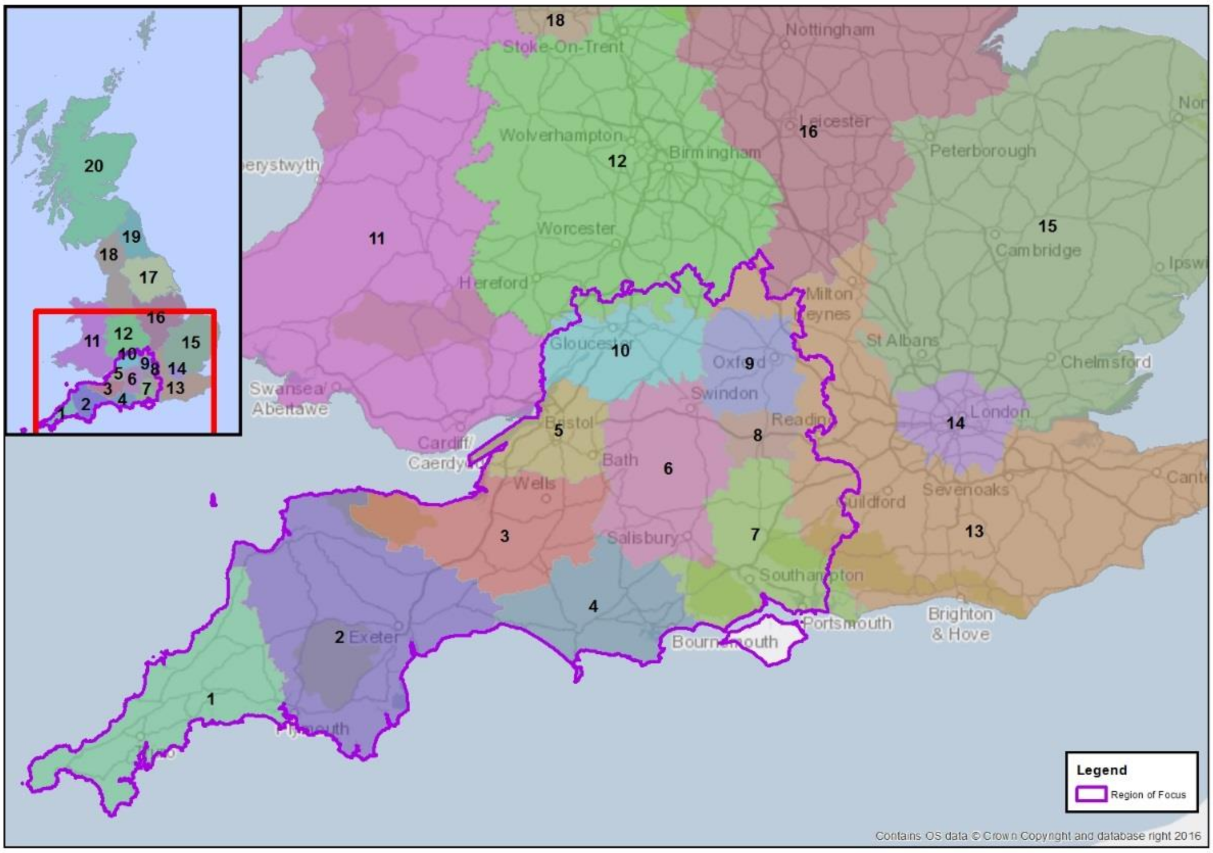
Sector to Sector Changes

9.6.4 Analyses of sector to sector movements before and after matrix estimation are summarised in Table 9.6 with Figure 9.2 showing the spatial coverage of the sectors. To avoid large percentage differences which represent only a small number of trips, sector to sector movements with fewer than 100 trips in the prior matrices have been excluded from this analysis (similar to SWRTM). The GEH statistic has also been used to assess the changes between the post and prior matrices, in addition to considering the proportion of cells. The analysis shows that more than 90% of movements in all time periods have a GEH less than 5 between the prior and post estimation matrices. Close to 70% of all sector to sector movements in all time periods have changed by less than 10% compared to the prior with only PM Car, LGV and HGV being slightly below this. Close to or over 60% of vehicle movements for all peaks have changed by less than 10% compared to the prior.

Table 9.6: Sector to sector summary

Full matrix excluding intra-zonals		No. cells with >100 trips in prior	% of cells with 5% Change (Prior trips >100)	% of cells with 10% Change (Prior trips >100)	% of cells with GEH<5 (Prior trips >100)
Car	AM	168	65.0%	70.0%	91.5%
	IP	175	57.8%	65.0%	96.5%
	PM	170	53.0%	59.5%	91.5%
LGV	AM	104	70.8%	76.0%	92.8%
	IP	96	67.0%	72.3%	94.8%
	PM	90	57.3%	63.5%	93.3%
HGV	AM	81	64.5%	67.8%	95.0%
	IP	80	63.3%	67.5%	95.3%
	PM	62	58.8%	61.0%	97.0%
ALL	AM	210	71.0%	76.0%	92.0%
	IP	209	64.0%	68.8%	96.3%
	PM	194	54.5%	59.8%	91.5%

Figure 9.2: Sectors for ME changes



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Zonal trip ends

9.6.5 Linear regression analysis of the post and prior ME matrices has been undertaken based on the following expression: y=A+Bx. The results of these analyses are presented as the intercept and slope coefficients along with the R-Squared coefficient of determination. These are shown in Table 9.7 and Table 9.8 below by both origins and destinations with at least one trip end in the SWRTM RoF. The results show that the intercept criterion is not met in most cases, with values ranging between -6.61 and 6.52. Cars meet the R-Squared criteria in all three time periods, and are quite close to the slope criteria, with car employer business (EB) furthest out at 0.94 in the AM/PM and car commuters (COM) furthest out at 0.93 in the PM. The LGVs and HGVs do not meet the criteria, with HGV R-Squared values between 0.73 and 0.86. This reflects the uncertainty in the HGV trip patterns from the BYFM matrices.

Table 9.7: Cell values for trip ends - origins

Origins								
AM peak								
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**	**Cars**	**Total**
Slope	Within 0.99 and 1.01	0.94	0.94	0.97	1.02	0.94	0.95	0.97
Intercept	Near Zero	-0.66	-3.22	-3.17	2.01	6.52	-6.61	-2.42
R-Squared	In excess of 0.98	0.97	0.98	0.99	0.93	0.81	0.98	0.98
Inter-peak								
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**	**Cars**	**Total**
Slope	Within 0.99 and 1.01	0.98	0.98	0.99	1.07	0.93	0.99	1.00
Intercept	Near Zero	-0.10	-0.28	-0.64	0.39	5.71	-1.14	1.40
R-Squared	In excess of 0.98	0.98	0.98	0.99	0.96	0.83	0.99	0.98
PM peak								
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**	**Cars**	**Total**
Slope	Within 0.99 and 1.01	0.94	0.93	0.96	1.08	0.94	0.95	0.96
Intercept	Near Zero	0.27	1.19	-0.28	0.18	3.03	1.80	4.09
R-Squared	In excess of 0.98	0.97	0.98	0.98	0.94	0.86	0.98	0.98

Table 9.8: Cell values for trip ends - destinations

Origins								
AM peak								
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**	**Cars**	**Total**
Slope	Within 0.99 and 1.01	0.90	0.92	0.96	1.07	0.90	0.94	0.95
Intercept	Near Zero	0.61	0.39	-1.10	0.03	6.92	0.19	4.52
R-Squared	In excess of 0.98	0.96	0.98	0.99	0.94	0.78	0.98	0.98
Inter-peak								
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**	**Cars**	**Total**
Slope	Within 0.99 and 1.01	0.97	0.98	0.97	1.06	0.82	0.97	0.99
Intercept	Near Zero	0.25	0.11	2.52	0.81	7.16	2.85	6.11
R-Squared	In excess of 0.98	0.98	0.98	0.99	0.96	0.73	0.99	0.98
PM peak								
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**	**Cars**	**Total**
Slope	Within 0.99 and 1.01	0.94	0.93	0.95	1.02	0.81	0.94	0.95
Intercept	Near Zero	0.25	0.15	1.30	1.43	4.08	2.09	5.07
R-Squared	In excess of 0.98	0.98	0.98	0.99	0.94	0.76	0.98	0.98

Zonal cell values

9.6.6 Table 9.9 shows that all user classes across all time periods have an intercept near zero when cell values for trip ends with a trip end in the RoF are considered. Car user classes and LGVs meet the R^2 criteria in all three time periods. HGVs do not meet the criteria, with HGV R^2 values between 0.82 and 0.83. This again reflects the uncertainty in the HGV trip patterns from the BYFM matrices.

Table 9.9: Cell values for trip ends with a trip end in the RoF

Origins						
AM peak						
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**
Slope	Within 0.98 and 1.02	1.01	1.00	1.00	0.98	0.73
Intercept	Near Zero	0.00	0.01	0.00	0.00	0.00
R-Squared	In excess of 0.95	0.99	0.99	1.00	0.99	0.82

Inter-peak						
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**
Slope	Within 0.98 and 1.02	1.00	0.99	1.00	0.99	0.75
Intercept	Near Zero	0.00	0.00	0.00	0.00	0.00
R-Squared	In excess of 0.95	0.99	0.99	1.00	1.00	0.83
PM peak						
Measure	**WebTAG M3.1 Criteria**	**EB**	**COM**	**Other**	**LGV**	**HGV**
Slope	Within 0.98 and 1.02	1.01	1.00	1.00	0.98	0.75
Intercept	Near Zero	0.00	0.00	0.00	0.00	0.00
R-Squared	In excess of 0.95	0.99	0.99	1.00	0.99	0.82

9.7 Variable demand modelling and realism testing

9.7.1 To support a major scheme such as this throughout the development process and especially for economic appraisal it is required to use variable demand modelling in accordance with WebTAG unit M2. This requires a satisfactory supply model that represents the whole route travel costs as well as wide area reassignment impacts, both of which will be provided by the updated A303 Sparkford and Ilchester stage 3 model.

9.7.2 As per SWRTM/A303 stage 2, variable demand modelling for stage 3 was developed with a DIADEM demand model supported by a HEIDI front end and will have the following attributes:

- Segmentation by purpose: commute / employers' business / other
- Vehicle types: car / other
- Home-based (Production Attraction) / non-home-based (Origin Destination)
- Freight – fixed no VDM
- Hierarchical Incremental model
- Model responses to frequency, time period choice, mode choice (with rail) and distribution
- Use of illustrative parameter values and adjustment using realism testing
- Cost damping for long distance trips
- Monitoring of demand model convergence to achieve WebTAG criteria.

9.7.3 The stage 2 DIADEM/HEIDI set up is used as the basis for the demand modelling. Realism testing has been carried out with the revised Stage 3 model. Elasticity results derived through realism testing have been compared against SWRTM/A303 stage 2 results for the same parameter values used in the models. Realism test results can be found in Section 10.7.

9.7.4 Realism testing is not required for the summer model since it will not be subject to VDM.

10 Model validation

Table 10.1: Glossary of terms for chapter 10

%GAP	A measure of convergence to equilibrium
DIADEM	Dynamic Integrated Assignment and DEmand Modelling
GEH	Statistic used to compare observed and modelled traffic flows
IP	Inter-peak, the day-time period between the AM and PM peak periods
ME	Matrix Estimation
MVR	Model Validation Report
NTS	National Travel Survey
PT	Public Transport
RTM	Regional Traffic Model
SATURN	Simulation and Assignment of Traffic to Urban Road Networks – highway traffic assignment software
SWRTM / SWRM	South West Regional (Traffic) Model
Trafficmaster	The Department for Transport’s GPS database
VDM	Variable Demand Modelling
VOT	Value Of Time
WebTAG	Web-based transport analysis guidance produced by the DfT

10.1 Network coding approach

10.1.1 As stated in Section 8.1, this model is an adaptation of the SWRTM. Therefore, the coding principles conform to those of the RTM coding manual. This includes the speed flow curves used and the approach to junction coding, for example the standard saturation flows and signal timings used.

10.2 Ad-hoc network validation

10.2.1 Throughout the validation process, various network checks were carried out as described in Section 9.2. The journey times through the network show a good match with the observed journey times derived from Trafficmaster data which shows that the network coding is sufficiently accurate.

10.3 Examination of route choices/paths

10.3.1 Through the network calibration and validation stages, reviews of routing within the model were undertaken between key centres. This was undertaken to ensure that assigned paths for trips were logical and that major routes were used where relevant. Some representative routings examined in this analysis are London - Exeter, Southampton – Exeter and Oxford – Exeter. A detailed breakdown of these paths and output is provided in Appendix A.

10.3.2 The analysis indicated that in general, the paths predicted by the model appeared logical between key centres. Routes were also compared against internet journey time sources such as Google Maps as a further check. Where localised routing issues were identified, the network was further refined and calibrated accordingly.

10.4 Zone and screenline plan

10.4.1 As discussed in Section 8.2, the zoning system was based on that of the Stage 2. The changes made to the SWRTM zoning system during Stage 2 are displayed in Figure 8.1. The sectors used in this model are identical to those used in the SWRTM – see the SWRTM MVR for more information.

10.4.2 The screenlines used for the calibration and validation process are displayed in Figure 9.1.

10.5 Matrix comparisons

10.5.1 As stated in Chapter 8.2, the prior matrices were based on the SWRTM base prior matrices with changes only made to accommodate the additional local zones as described in Section 10.4. These were created using mobile phone data and enhanced with synthetic trips for short journeys and for deducing trip purposes.

10.5.2 During the building of the SWRTM, demand comparisons were undertaken between the SWRTM demand and National Travel Survey (NTS) / census data. Since the Stage 3 matrices are so similar to the SWRTM matrices, no further comparisons have been carried out.

10.5.3 Various analysis has been carried out on the changes invoked by the matrix estimation process on the prior matrices. Details and results of these tests are given in Chapter 9.6.

10.6 Validation assignment

Introduction

10.6.1 The data not used for the matrix estimation process or for the matrix building exercise provide a set of independent validation data. A map of the validation counts along with a description of how the calibration and validation split were determined is given in Section 6.1.

Parameters

10.6.2 No changes have been made to the SATURN parameters used in the SWRTM – see the RTM Network Coding Manual for further details.

Validation data

10.6.3 These include independent validation counts and journey times. More details on these can be found in Section 6. It is important to note that validation counts are independent of calibration counts and have not been used in the matrix estimation process.

Model convergence, stability and proximity

10.6.4 As mentioned in Section 7.2, the WebTAG criteria displayed in Table 7.4 were used to assess the convergence of the model. The key convergence statistics for the post-matrix estimation model run are given in Table 10.2 for the final four loops of each time period. The results show that each time period converged to a satisfactory level and meets the WebTAG criteria for % flows, % delays and %GAP. These indicators highlight that the model meets stability and proximity requirements set out in WebTAG unit M3.1.

Table 10.2: Assignment model convergence post-ME

Time period	Assignment loop	%Flows	%Delays	%GAP
AM	10	98.7	99.4	0.00007
	11	99.0	99.6	0.00006
	12	99.2	99.6	0.00005
	13	99.3	99.7	0.00005
IP	9	98.8	99.6	0.00055
	10	99.0	99.9	0.0006
	11	98.5	99.5	0.0013
	12	99.5	99.9	0.0014
PM	8	98.6	99.2	0.00029
	9	99.0	99.4	0.00037
	10	99.2	99.4	0.00019
	11	99.1	99.5	0.00011

Model calibration performance

10.6.5 The WebTAG validation criteria set out in Table 7.2 were used to assess the screenline/link flows and journey times in the model. Table 10.3 summarises the calibration results.

Table 10.3: Post-ME calibration link and screenline results

	WebTAG criteria	Number	AM	IP	PM
Primary screenlines within 5%	All or nearly all	18	89%	83%	94%
Primary links and turns passing GEH or flow criteria	>85%	538	92%	95%	91%

10.6.6 Most of the calibration screenlines meet the criteria of being within 5%. In all the time periods the Bridgewater cordon falls outside the criteria at least for one direction. This will not have a significant impact on scheme appraisal due to it being far away from both A303 Sparkford and A358. This is also highlighted by the fact that the part of this cordon is in the buffer area. One of the directions of the Taunton cordon falls outside the criteria in AM and Inter-peak where inter-peak is almost close to meeting the criteria. Figure 10.1 - Figure 10.3 show the screenline results for the post-matrix estimation assignment. Note that these include the validation screenline as well. For detailed results for all screenlines, see appendix C.

Figure 10.1: AM screenline performance

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Figure 10.2: Inter-peak screenline performance

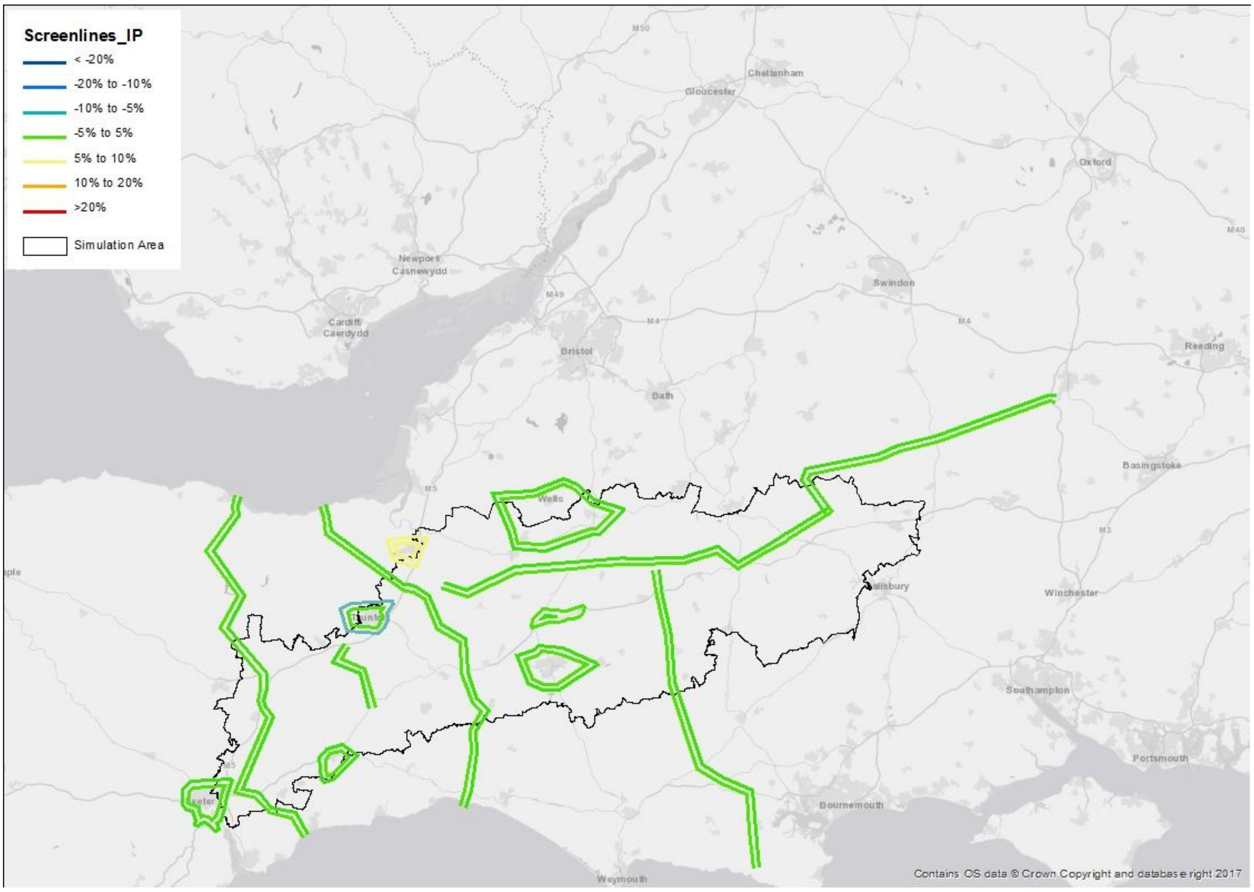

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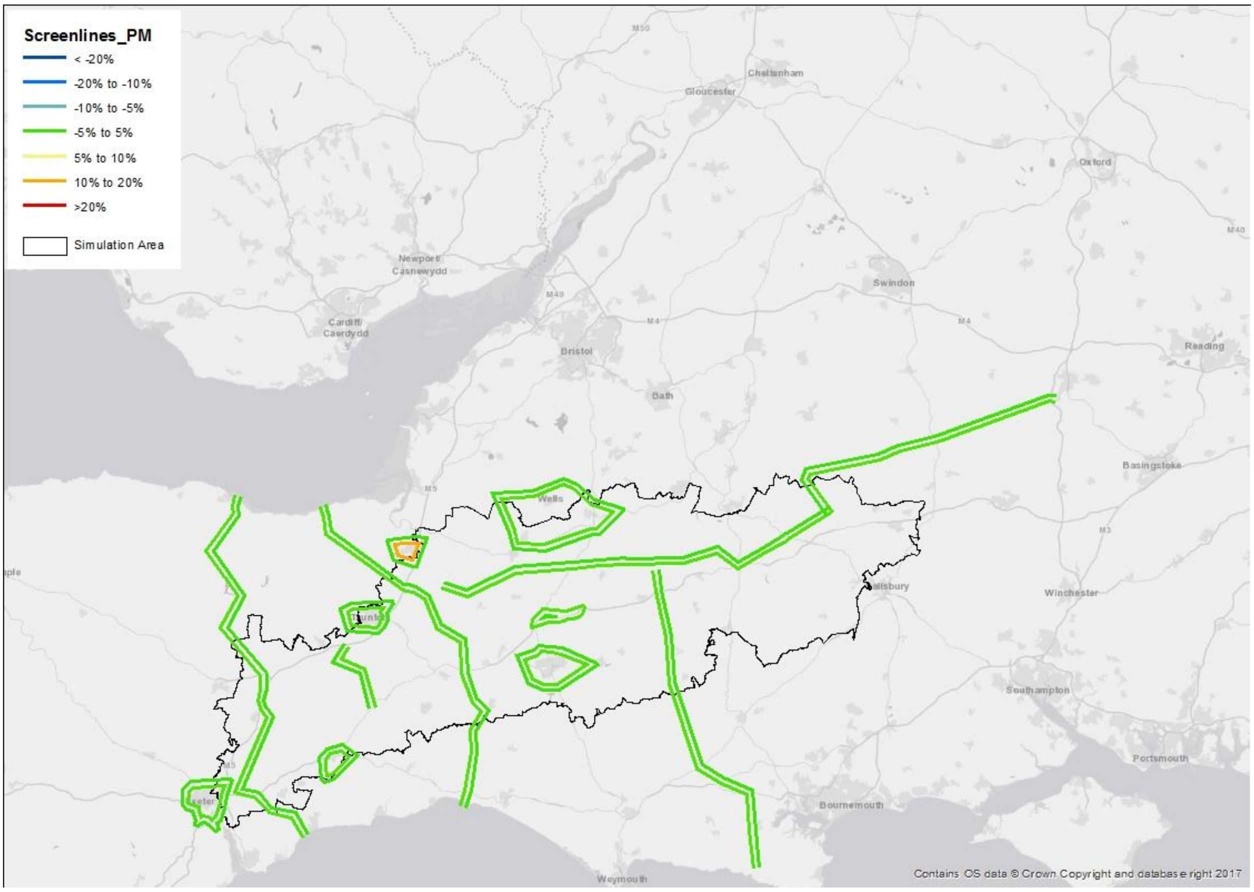
Figure 10.3: PM screenline performance



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10.6.7 Table 10.3 indicates that the number of calibration links and turns passing the WebTAG criteria is in excess of 85% in all peaks.

10.6.8 Turning counts at key junctions have been used in the model calibration. A comparison between the observed and modelled turning counts is shown in Appendix C. Over 90% of the turning counts pass the WebTAG criteria in each time period, despite using the link flow criteria for turning counts which is always a challenging target. Table 10.4 below summarises the comparisons.

10.6.9 Almost all of the eleven turning count sites (sites 1A-6A and CS9-CS13) in the vicinity of the A303 Sparkford to Ilchester dualling scheme achieve WebTAG link criteria, except for three turning movements. The majority of the turning counts along the A358 also achieve 100% of movements meeting the criteria. Of particular note are the turning movements at Southfields and Junction 25 which all calibrate within the criteria. Calibration at the retail park roundabout (Site M4) which is located in between Junction 25 and the A358 / A38 junction is bit weaker in the IP. This junction, at which every movement except one movement in the AM period for the latter meets the WebTAG criteria so its mixed performance is less concerning. The other junction with mixed performance is the M5J29 where two movements fail in the AM and three movements in the PM.

Table 10.4: Calibration turning counts meeting flow criteria

Junction	Site ref.	Turning counts meeting flow criteria		
		AM	IP	PM
M5 Junction 25	M1	All	All	All
M5 Junction 29	M2A	5/6	All	4/6
	M2B	10/11	All	10/11
A358 Henlade P&R jn	M3	All	All	All
A358 retail park rb	M4	8/9	4/9	6/9
A358 / A38	M5	All	All	All
A358 / A378	M6	All	All	All
A303 Sparkford Roundabout (aka Hazlegrove rb)	1A	15/16	All	All
A303 / Traits Lane	2A	All	All	All
A303 / Howell Hill	3A	All	All	All
A303 Plowage Lane	4A	All	All	4/6
A303 / B3151	5A	All	All	All
A303 Podimore Roundabout	6A	All	All	All
Southfields Roundabout	TC1	24/25	All	All
A37 / B3151 Roundabout	CS9	8/9	All	All
B3151 Costello Hill Roundabout	CS10	All	All	All
B3151 / Unnamed Rd	CS11	All	All	All
Parsonage Rd / West Camel Rd	CS12	All	All	All
A359 / West Camel Rd Roundabout	CS13	All	All	All

10.6.10 An analysis of some of the key roads in the model was carried out, showing that at least 97% of the total links of the combined key routes passing in each time period and several key roads where 100% of links pass. The key road results can be found in Section 19.3 in Appendix C.

10.6.11 The performance of all the primary calibration links is displayed in Figure 10.4 - Figure 10.6. Detailed results of the key routes and the other primary link counts are given in Appendix C.

Figure 10.4: AM calibration link performance

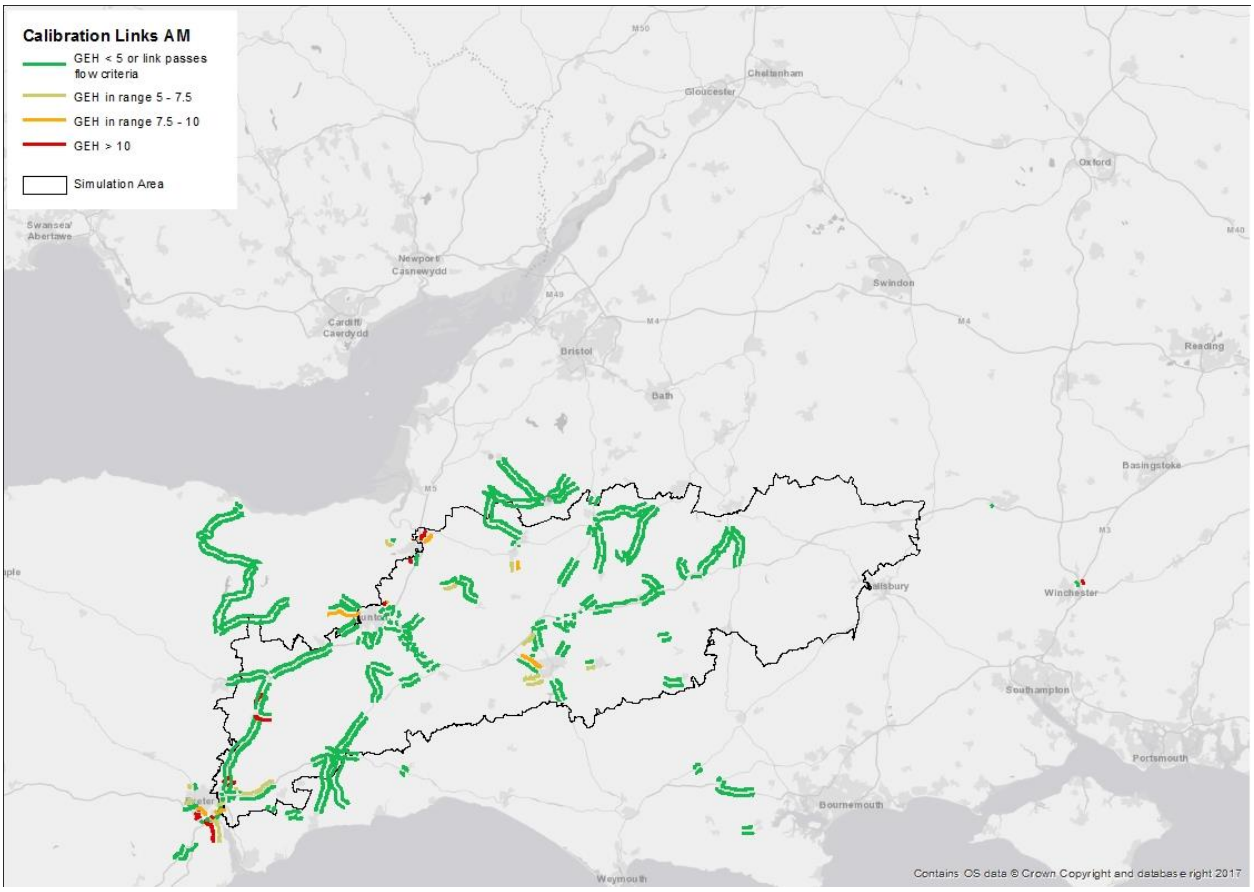

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Figure 10.5: Inter-peak calibration link performance

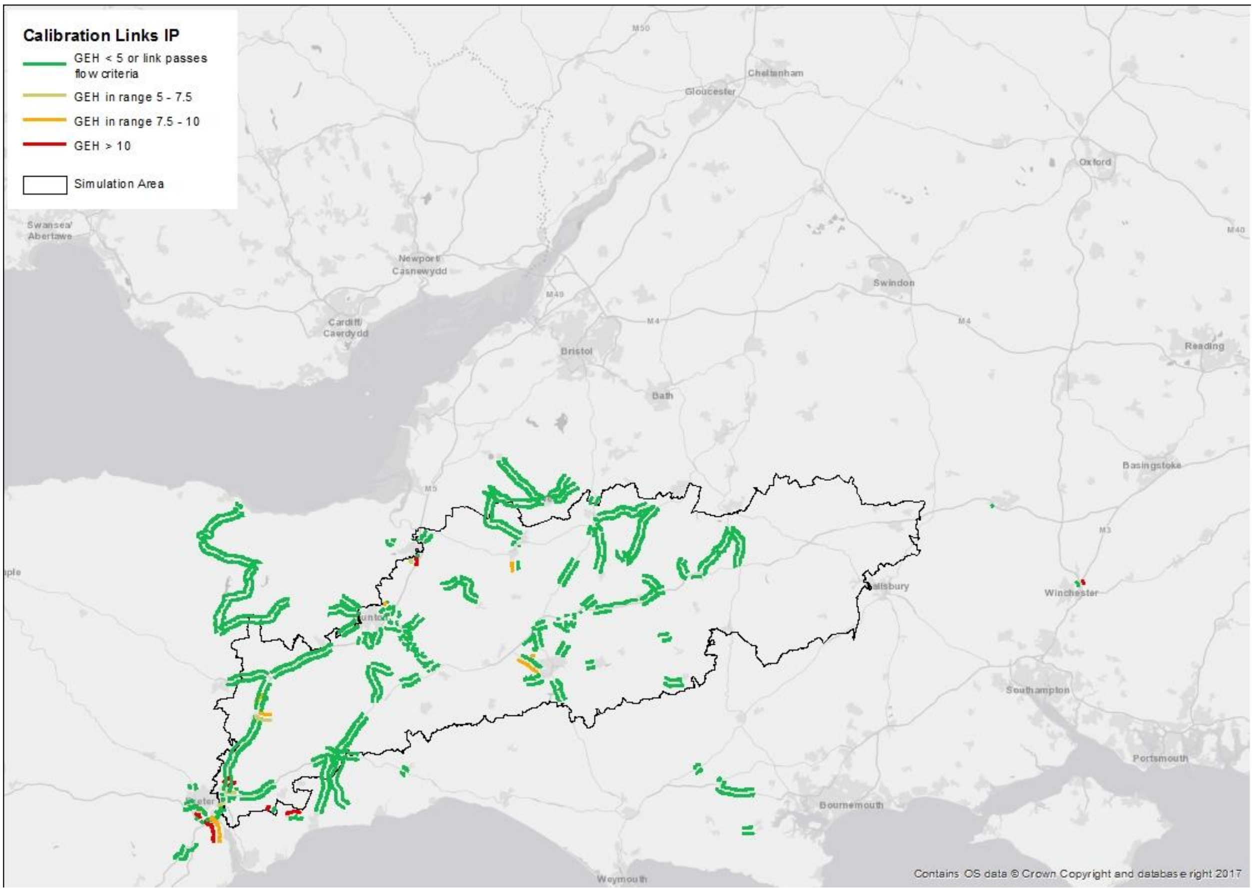

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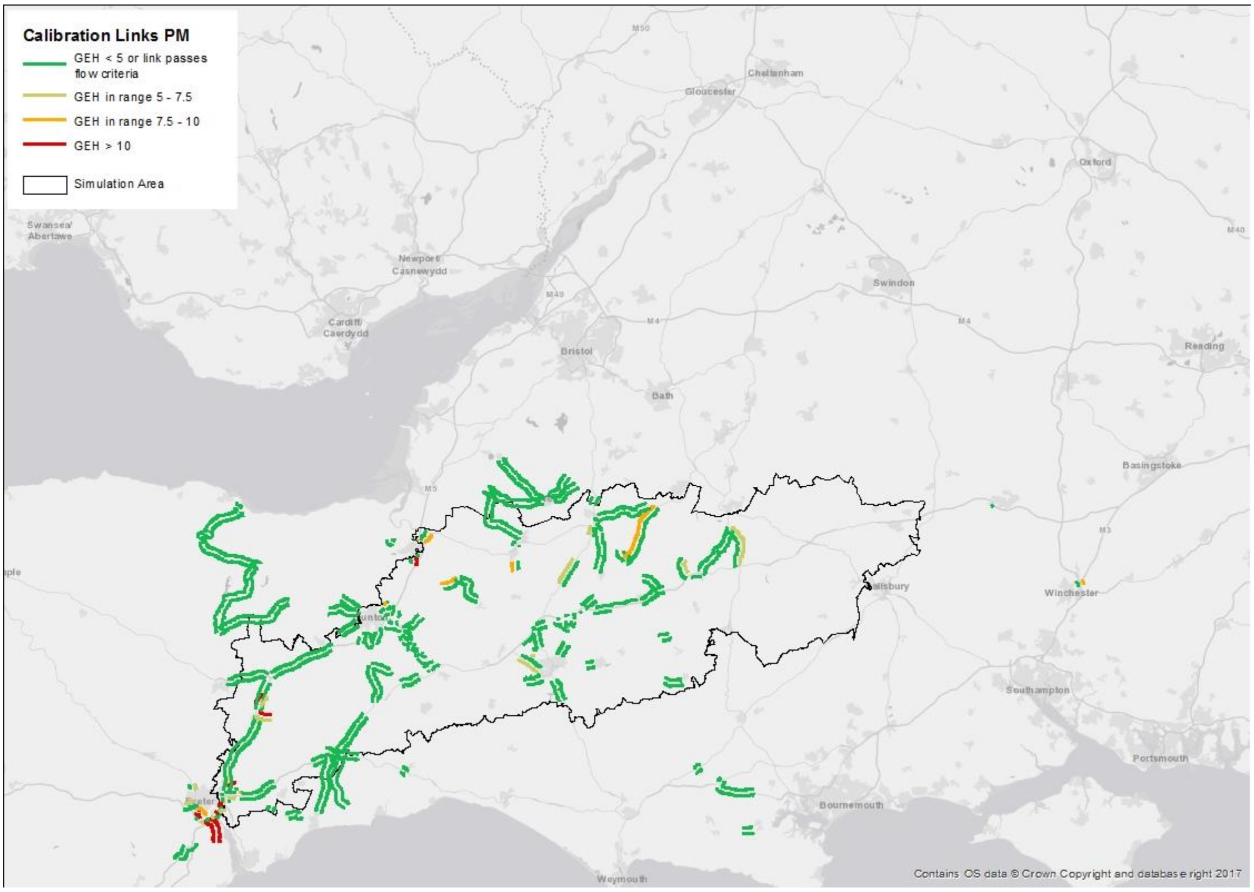
Figure 10.6: PM calibration link performance



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Model validation performance

Table 10.5: Model validation results summary

	WebTAG criteria	Number	AM	IP	PM
Primary screenlines within 5%	All or nearly all	6	100%	100%	100%
Primary links passing GEH or flow criteria	>85%	88	94%	99%	94%
Journey Time Routes within 15%	>85%	35	100%	100 %	100%
Journey Time Segments within 15%	>85%	181	94%	96%	96%

10.6.12 Table 10.5 shows that all validation screenlines meet required WebTAG validation criteria in each time period.

10.6.13 Table 10.5 also shows that the percentage of validation links passing the WebTAG criteria significantly exceeding the 85% target in each time period.

10.6.14 The performance of all the validation links is displayed in Figure 10.7 - Figure 10.9. Detailed results of the key routes and the other primary link counts are given in Appendix C.

Figure 10.7: AM validation link performance

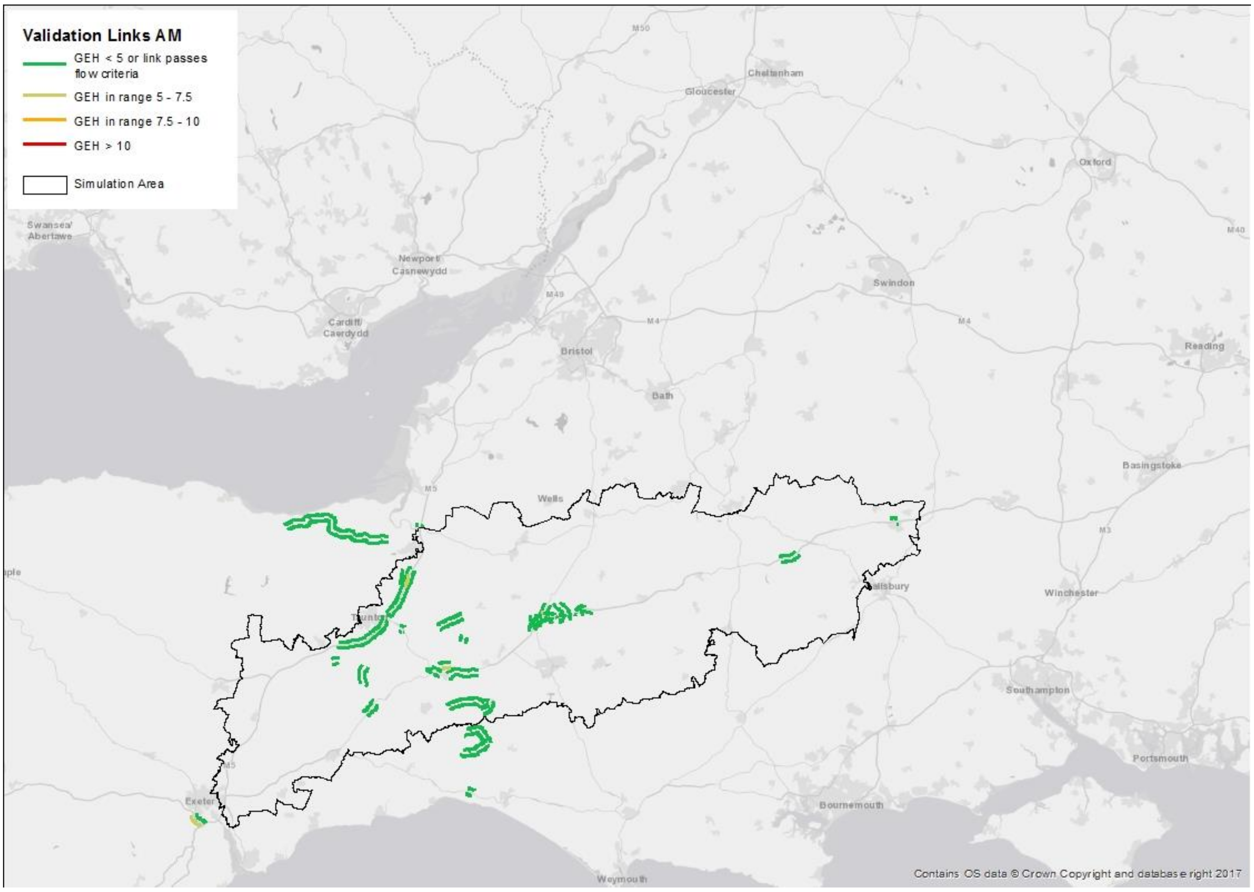

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Figure 10.8: Inter-peak validation link performance

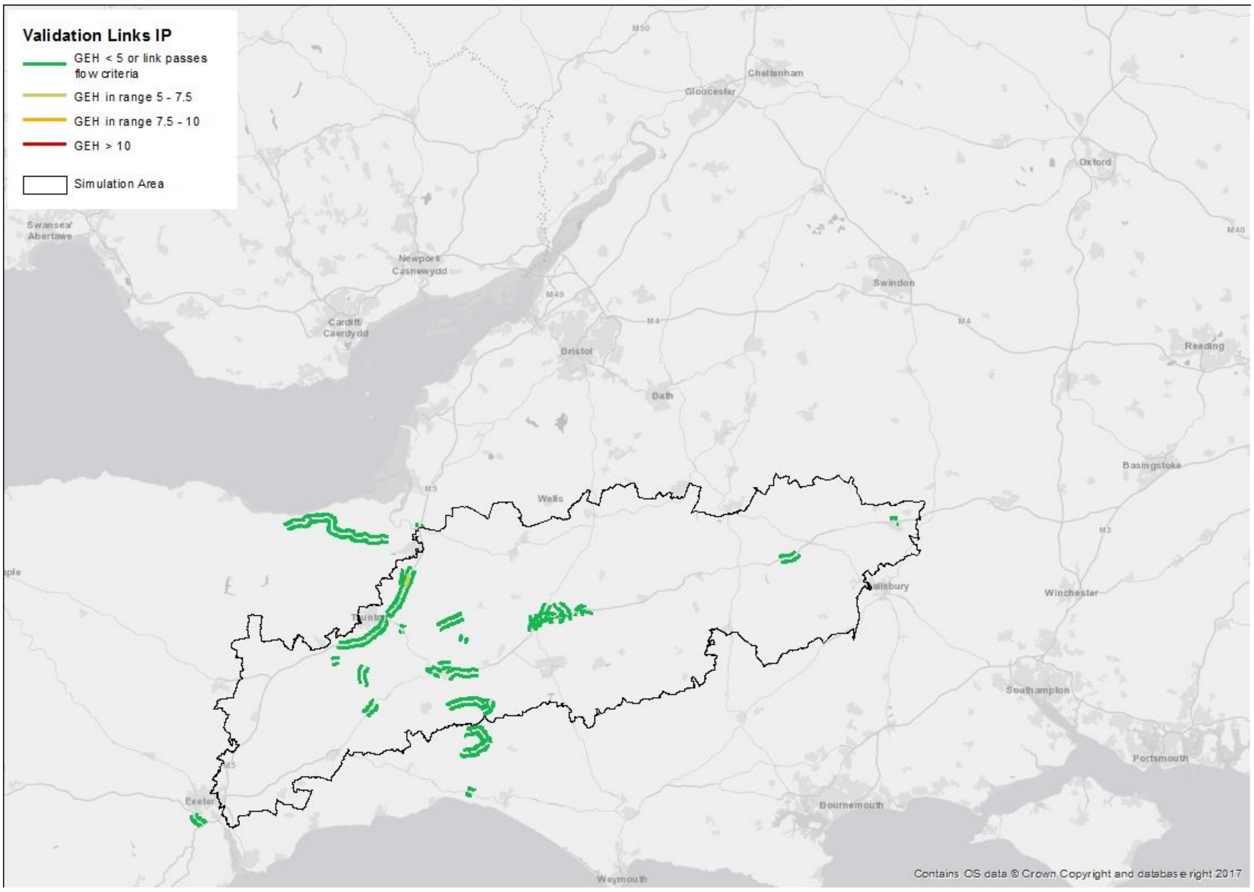

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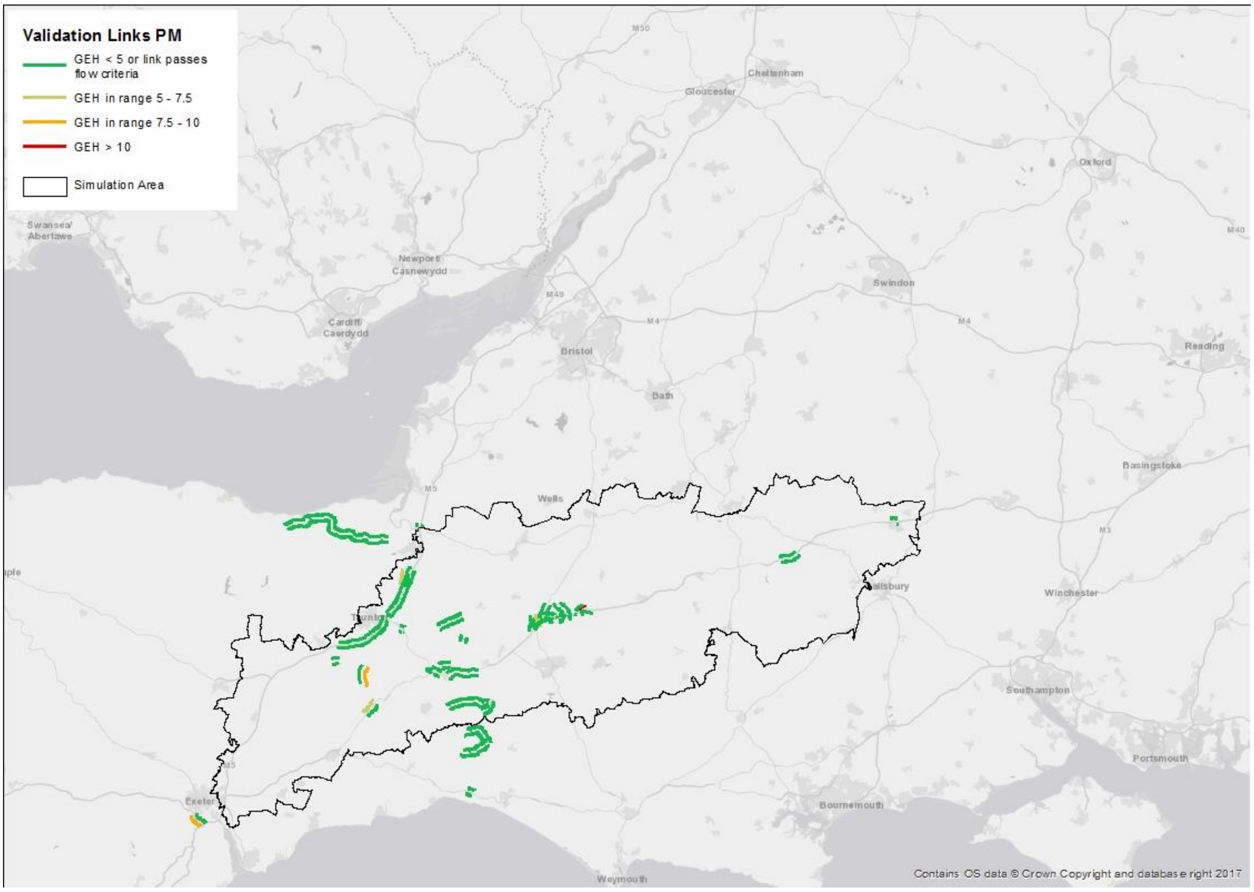
Figure 10.9: PM validation link performance



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10.6.15 The journey time route performance of the model exceeds the 85% WebTAG criteria in each time period. The journey time segment performance also exceeds the criteria in each time period. The journey time segment results are displayed in Figure 10.10 -Figure 10.12. It is evident from these figures that the majority of the journey time segments meet the validation criteria along the A303 and A358 corridors. The journey time route results are detailed in Appendix C (Section 19.5).

Figure 10.10: AM journey time segment performance

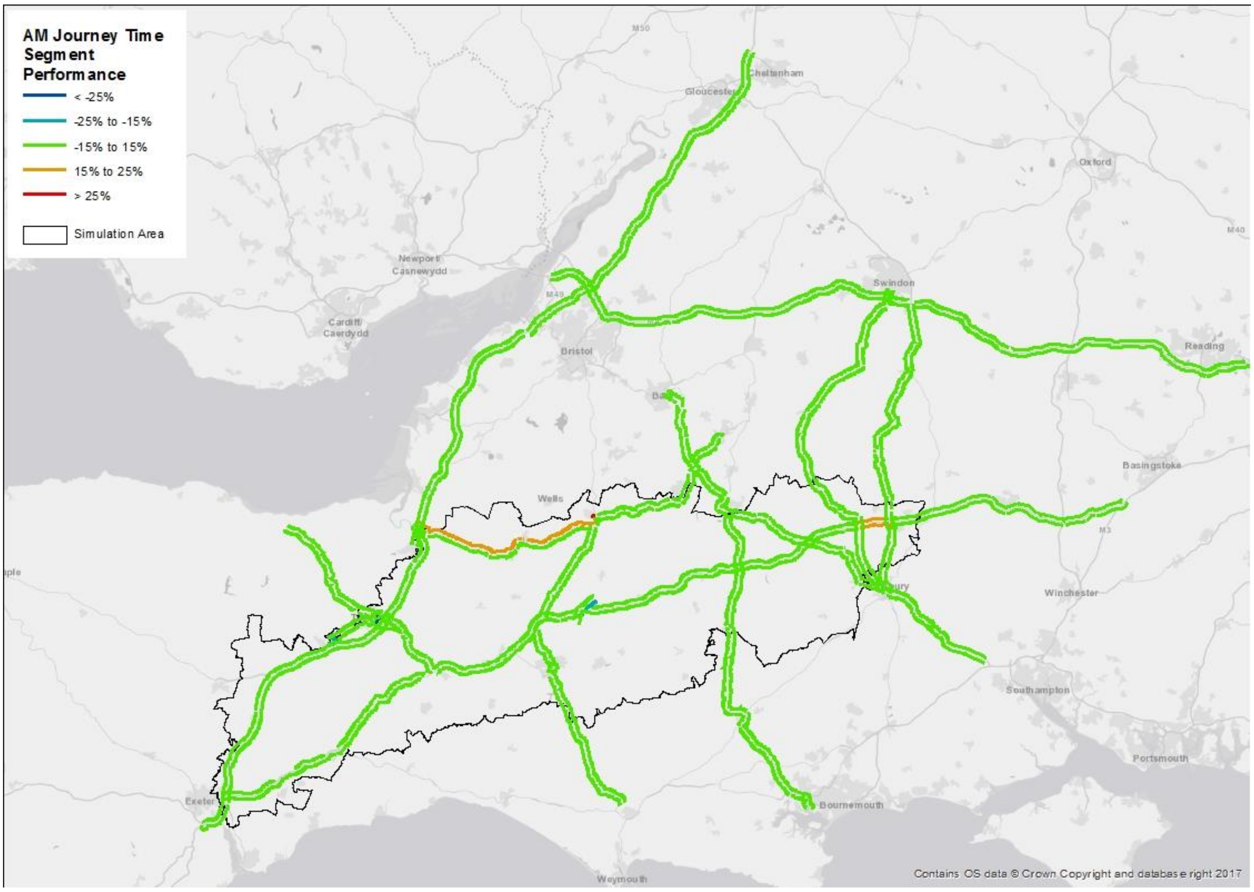

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Figure 10.11: Inter-peak journey time segment performance

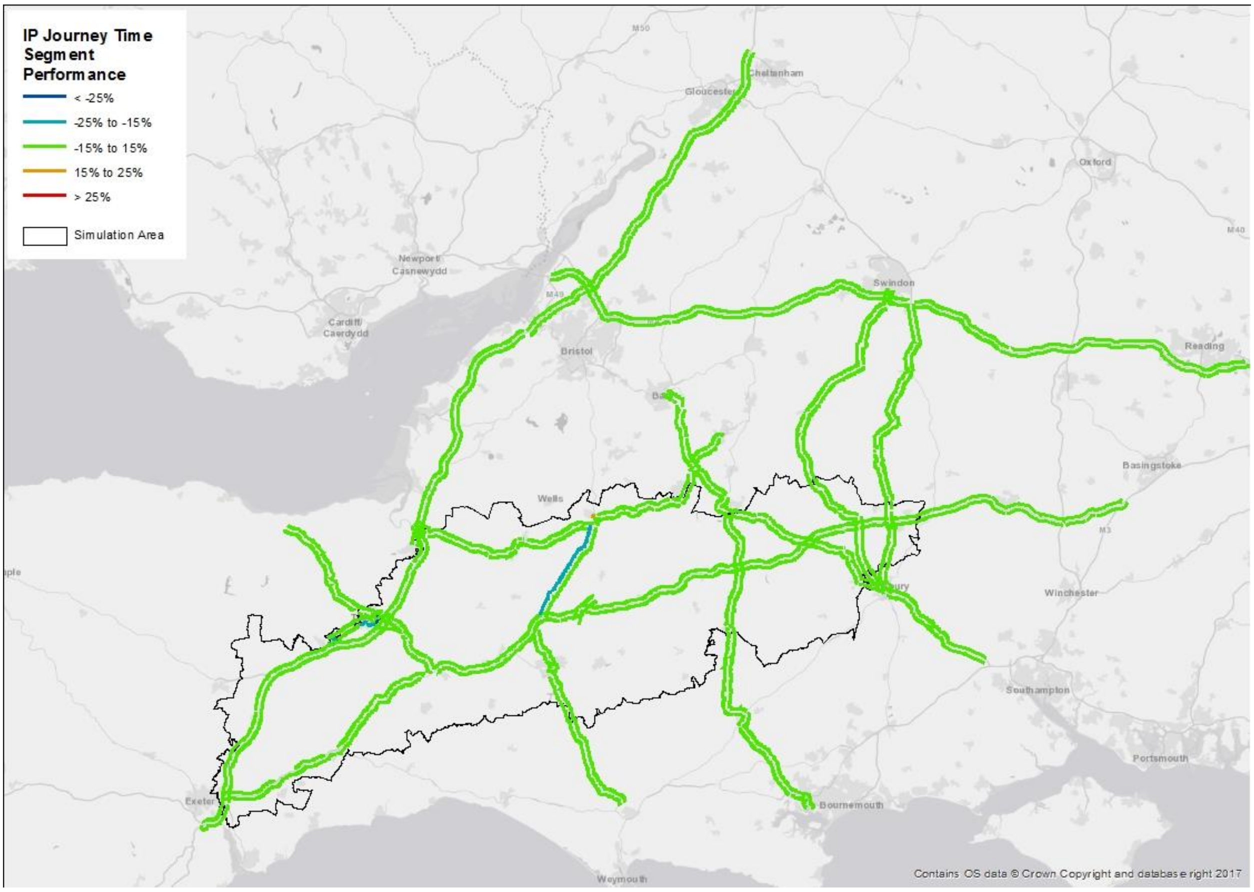

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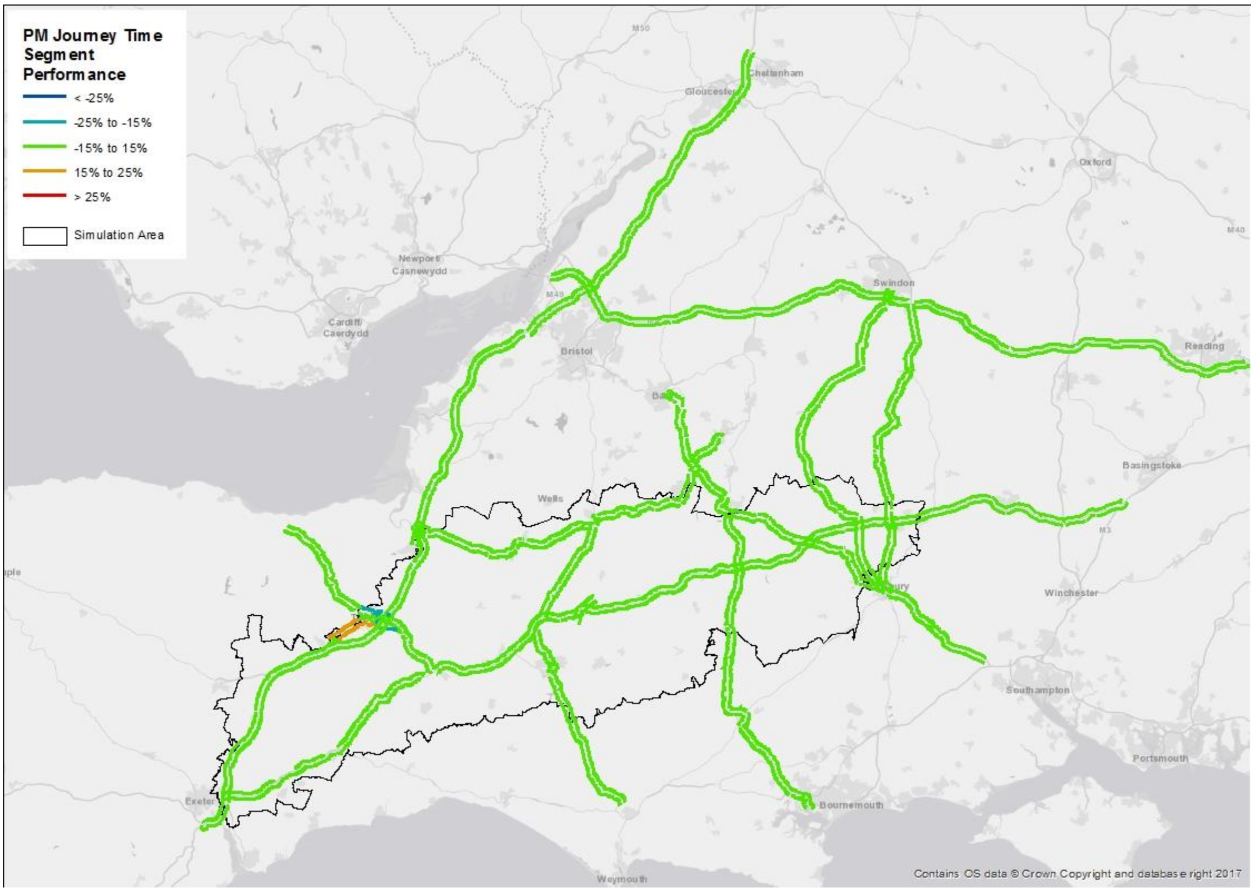
Figure 10.12: PM journey time segment performance



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10.7 Realism test results

Fuel cost realism test results

10.7.1 A fuel cost realism test was carried out on the base year validated model, testing a 20% increase in fuel costs that is consist with the SWRTM test. For SWRTM it was decided that a 20% increase was necessary to obtain plausible results due to the size of the model. The results from the test are shown in Table 10.7, and are very similar to the results calculated for the SWRTM, shown in Table 10.6. The total for all time periods and purposes is the same.

Table 10.6: SWRTM fuel cost realism test elasticities

	Employers' business	Commuting	Other	Total
AM	-0.22	-0.17	-0.55	-0.32
IP	-0.22	-0.21	-0.55	-0.43
PM	-0.20	-0.18	-0.49	-0.32
OP	-0.26	-0.24	-0.57	-0.39
Total	**-0.22**	**-0.19**	**-0.54**	**-0.37**

Table 10.7: A303 stage 3 fuel cost realism test elasticities

	Employers' business	Commuting	Other	Total
AM	-0.28	-0.19	-0.55	-0.34
IP	-0.28	-0.22	-0.55	-0.45
PM	-0.28	-0.21	-0.51	-0.36
OP	-0.26	-0.23	-0.53	-0.37
Total	**-0.28**	**-0.21**	**-0.54**	**-0.39**

10.7.2 The calculated overall fuel cost elasticity (-0.39) is just outside the WebTAG indicated range (-0.25 to -0.35). There is a clear difference between the elasticities by purpose and those suggested by WebTAG.

- Business elasticity (-0.26 to -0.28) is approximately twice as strong as WebTAG (-0.1)
- Commuting elasticity (-0.19 to -0.23) is weaker (sometimes nearly half) than WebTAG (-0.3)
- Other purpose elasticity (-0.51 to -0.55) is somewhat stronger than WebTAG (-0.4).

10.7.3 It is important to note that WebTAG elasticity values are based primarily on research undertaken in 2002. There have been the following changes that are relevant to fuel cost elasticities since the original research work (please refer to the SWRTM MVR for details):

- Car fuel efficiency improvements – 15%
- Fuel pump price increase – 13%
- Value of time (VOT) increase – 13%
- VOT for business is distance dependent.

10.7.4 The regional traffic models concluded that if the above changes were made to the WebTAG elasticity values, they would be similar to the regional model realism test results.

PT fare realism test results

10.7.5 A Public Transport (PT) fare realism test was carried out on the base year validated model, testing a 20% increase in rail fares that is consist with the SWRTM test. The results from the test are shown in Table 10.9, and are very similar to the results calculated for the SWRTM, shown in Table 10.8 and within the PT fare elasticity range recommended by WebTAG (-0.2 to -0.9).

Table 10.8: SWRTM public rail fare realism test elasticities

	Employers' business	Commuting	Other	Total
AM	-0.42	-0.22	-0.85	-0.40
IP	-0.46	-0.19	-0.84	-0.60
PM	-0.41	-0.17	-0.79	-0.41
OP	-0.42	-0.22	-0.78	-0.40
Total	**-0.43**	**-0.20**	**-0.82**	**-0.46**

Table 10.9: A303 stage 3 rail fare realism test elasticities

	Employers' business	Commuting	Other	Total
AM	-0.38	-0.21	-0.78	-0.36
IP	-0.34	-0.18	-0.74	-0.51
PM	-0.33	-0.16	-0.71	-0.34
OP	-0.36	-0.21	-0.73	-0.36
Total	**-0.36**	**-0.20**	**-0.74**	**-0.40**

Journey time elasticity

10.7.6 Due to the limitations of the DIADEM software it is not possible to calculate journey time elasticities exactly. The journey time elasticity can be approximated by using the following approach as set out in the DIADEM manual:

$$E^{time} = E^{fuel} \frac{p^{time}}{p^{fuel}}$$

where p^{time} is the cost of travel as a proportion of total generalised cost, and p^{fuel} is the cost of fuel as a proportion of total generalised cost. The fuel cost elasticity in this case is calculated based on the change in the number of trips rather than the change in vehicle kilometres, as per WebTAG unit M2 6.4.5. This results in a journey time elasticity of -0.164, which meets the WebTAG criteria.

10.7.7 Journey time elasticities were calculated for each of the four possible movements to understand why the overall response is relatively weak, and the results are shown in Table 10.10.

Table 10.10: A303 stage 3 journey time elasticity by movement

Origins	Destinations	
	Internal	External
Internal	0.395	-1.858
External	-1.930	-0.368

10.7.8 This table shows that internal-external and external-internal trips have a stronger journey time response, whereas internal-internal and external-external trips have a weaker response. The reason for this is that as fuel costs increase, redistribution occurs leading to a greater number of shorter distance trips. Therefore, the internal-external and external-internal movements have stronger responses.

10.7.9 Mode shift decreases the number of car trips for internal-internal and external-external movements, but the increase in shorter distance trips due to redistribution masks this leading to weaker internal-internal and external-external elasticities. The greatest proportion of car trips in the model is external-external trips, which explains why the overall journey time elasticity is -0.164.

Realism testing conclusions

10.7.10 The elasticities calculated for realism tests are close to those calculated for the SWRTM. Therefore, as per SWRTM it is concluded that the standard WebTAG VDM parameters can be used without further adjustments.

10.8 Overall performance of the March model

10.8.1 The SATURN model convergence meets WebTAG criteria in all time periods. The model achieves a good level of flow calibration with results indicating a close match to observations on the calibration screenlines and for individual link counts, with the required WebTAG criteria being met in all time periods.

10.8.2 Flow validation has been undertaken against independent data not used in calibration or for the matrix building exercise. An assessment of the validation process shows that the model achieves link flow validation in line with the WebTAG criteria and screenline flow validation close to the WebTAG criteria.

10.8.3 The journey time validation is considered to be good in all time periods with the model recreating journey times that are representative on key routes in the modelled area: the journey time route validation meets WebTAG criteria and the journey time segment validation meets or nearly meets the WebTAG criteria across all time periods.

10.8.4 In conclusion, it is considered that the 2015 base year traffic assignment model developed for the A303 Sparkford to Ilchester and A358 Taunton to Southfields Stage 3 calibrates and validates to within acceptable margins of the WebTAG criteria and therefore demonstrates a good representation of traffic behaviour in the study area and forms a robust basis from which future year forecasts and option testing can be developed.

10.8.5 It is important to note however that the model represents an average hour in the peaks. This may mean that neutral month peak hour conditions are not modelled and consequently there would be an underestimation of scheme benefits.

10.8.6 It should be also noted that along the corridors to the south -west, higher traffic flows occur at weekends and during holiday periods. The summer model developed (see Section 10.9 for more details on model performance) for Stage 3 would capture these impacts for the purpose of economic appraisal.

10.9 Summer model calibration and validation results

Model convergence, stability and proximity

10.9.1 The key convergence statistics for the post-matrix estimation model run are given in Table 10.11 for the final four loops. The results show that the model converged to a satisfactory level and meets the WebTAG criteria for % flows, % delays and %GAP.

Table 10.11: Assignment Convergence Post-ME – Summer Model

Time period	Assignment Loop	%Flows	%Delays	%GAP
Average hour	10	99.0	99.1	0.0038
	11	99.1	99.3	0.0038
	12	99.2	99.3	0.0031
	13	99.5	99.6	0.0013

Model calibration performance

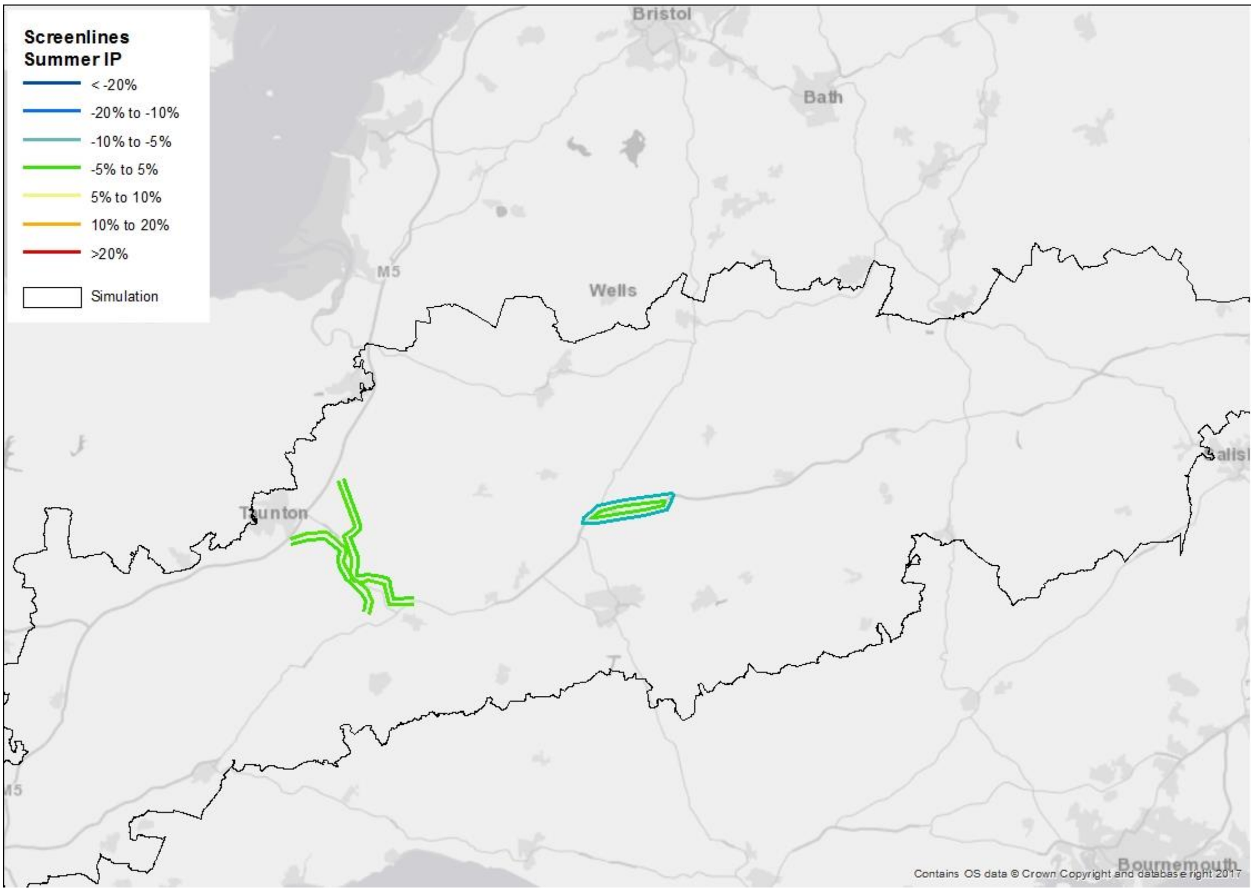
10.9.2 The WebTAG validation criteria set out in Table 7.2 were used to assess the screenline / link flows and journey times in the model. Table 10.12 summarises the calibration results.

Table 10.12: Post-Matrix Estimation Calibration Link and Screenline Results – Summer Model

	WebTAG Criteria	Number	%Pass
Primary screenlines within 5%	All or nearly all	6	83%
Primary links passing GEH or flow criteria	>85%	159	96%

10.9.3 Nearly all calibration screenlines meet the criteria of being within 5%. Figure 10.13 show the screenline results for the post-matrix estimation assignment. Detailed results can be found in Table 20.1 to Table 20.4 in Appendix D.

Figure 10.13: Screenline Performance – Summer Model



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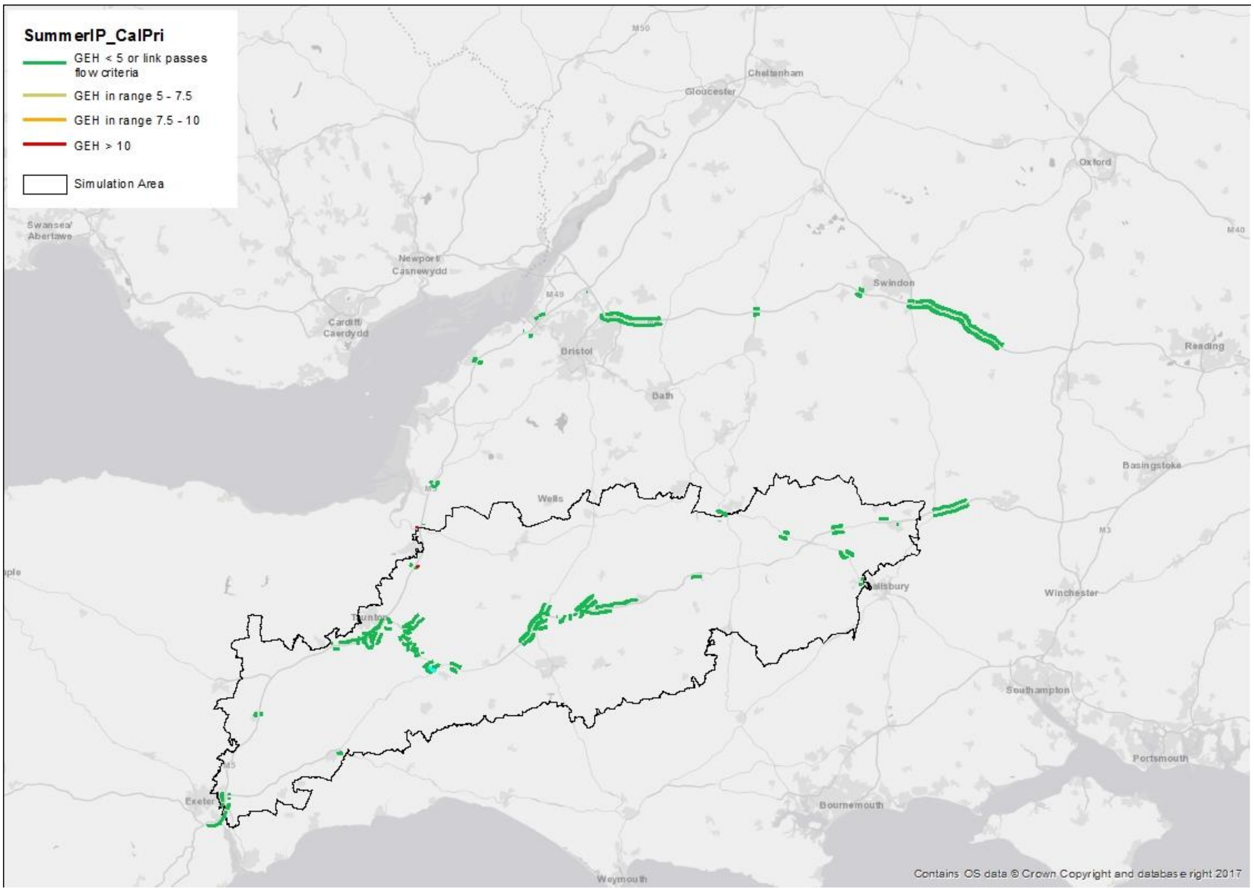
10.9.4 An analysis of some of the key roads in the model was carried out, showing that at least 95% of the total links of the combined key routes passing WebTAG criteria. The performance of all the primary calibration links is displayed in Figure 10.14. Detailed results can be found in Table 20.5 to Table 20.10 in Appendix D.

Figure 10.14: Calibration Link Performance – Summer Model



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Model validation performance

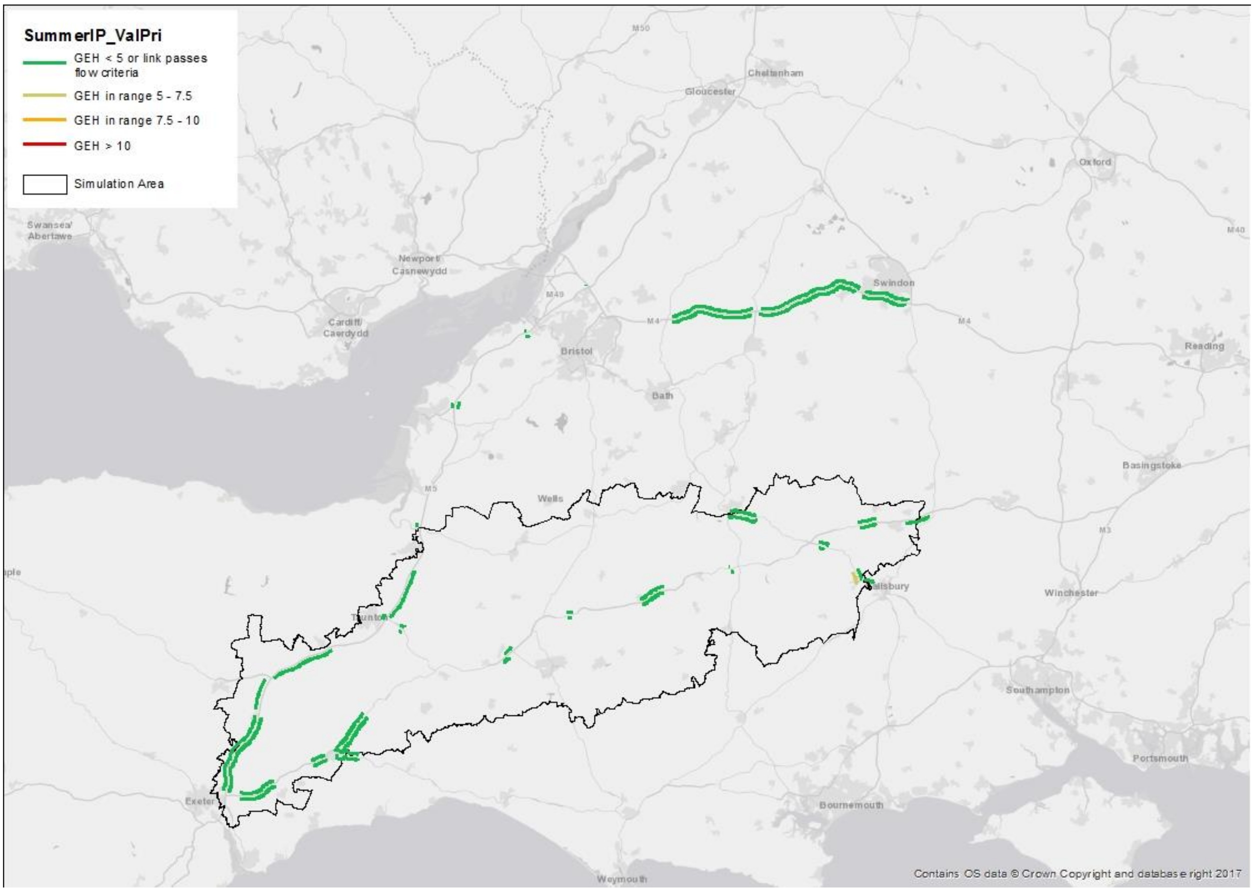
10.9.5 Table 10.13 shows that the percentage of validation links passing the WebTAG criteria significantly exceeding the 85% target.

Table 10.13: Validation Results Summary – Summer Model

	WebTAG Criteria	Number	Average hour
Primary links passing GEH or flow criteria	>85%	51	90%
Journey Time Routes within 15%	>85%	35	94%
Journey Time Segments within 15%	>85%	181	86%

10.9.6 The performance of all the validation links is displayed in Figure 10.15.

Figure 10.15: Validation Link Performance – Summer Model



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10.9.7 The journey time route performance of the model exceeds the 85% WebTAG criteria. The journey time segment performance also exceeds the criteria. The journey time segment results are displayed in Figure 10.16. It is evident from these figures that the majority of the journey time segments meet the validation criteria along the key corridors except for the westbound direction on the A303 between Basingstoke to Mere past Stonehenge and the southbound direction on the A358 between Williton to Ilminster. Several attempts were made by changing speed-flow relationships to generate additional delays on these sections in the summer. These resulted in unacceptable routings and consequently poor flow validation. It is important to note that these sections will be improved in the DM with the inclusion of the A303 Stonehenge and A358 schemes. Also, these two locations are a significant distance away from A303 Sparkford scheme. Therefore, poor journey time validation at these more remote locations will have a very small impact on economic appraisal.

Figure 10.16: Journey Time Segment Performance – Summer Model

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11 Forecast assumptions

Table 11.1: Glossary of terms for chapter 11

%GAP	A measure of convergence to equilibrium
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
ArcGIS	Geographic Information Software
CAA	Civil Aviation Authority
CAD	Computer Aided Design
DfT	Department for Transport
DIADEM	Dynamic Integrated Assignment and DEmand Modelling
DM	Do Minimum – a future year modelled scenario without the scheme
DS	Do Something – a future year modelled scenario with the scheme included
FCF	Fixed Cost Function
GAP	SATURN Model parameter: Minimum gap (in seconds) accepted by a vehicle which gives way at priority junctions or traffic signals
GFA	Gross Floor Area
GIS	Geographic Information System
HBEB	Home-Based Employer's Business
HBO	Home-Based Other
HBW	Home-Based Work
HEIDI	Highways England's Integrated Demand Interface
HGV	Heavy Goods Vehicle
IP	Inter-peak, the day-time period between the AM and PM peak periods
LGV	Light Goods Vehicle
MMSJV	Mott MacDonald Sweco Joint Venture
MOIRA	Model of Inter-Regional Activity
MPD	Mobile Phone Data
MPOD	Mobile Phone Origin Destination
NAPALM	National Air Passenger Allocation Model
NHBEB	Non-Home-Based Employer's Business
NHBO	Non-Home-Based Other
NRTS	National Rail Travel Survey
NTEM	National Trip End Model
NTEM	National Trip End Model
NTS	National Travel Survey
OD	Origin Destination
OGV 1	other goods vehicles 1, smaller HGVs, defined in COBA Manual
OGV 2	other goods vehicles 2, larger HGVs, defined in COBA Manual
OP	Off-peak, the time period 19.00-07.00
PA	Production Attraction

PCU	Passenger Car Unit
PPK	Pence Per Kilometre
PPM	Pence Per Minute
PT	Public Transport
RIS	Road Investment Strategy
RTF	Road Traffic Forecasts
SQRT	Square root
SRN	Strategic Road Network
SWRTM / SWRM	South West Regional (Traffic) Model
TEMPRO	Software used in connection with NTEM data for processing and extracting the data
TRICS	A national trip generation and analysis database
VDM	Variable Demand Modelling
VOT	Value Of Time
WebTAG	Web-based transport analysis guidance produced by the DfT

11.1 Forecasting approach

11.1.1 As discussed in previous chapters, the base model covers an average AM peak period hour (07:00-10:00), an average hour in the inter-peak (IP - 10:00 – 16:00) and an average PM peak period hour (16:00 – 19:00) for an average Monday to Friday weekday in March 2015 (excluding school holidays and bank holidays). In addition to the validated time period models reported, an off-peak (OP) average hour was represented between 19:00-07:00 for the purposes of variable demand modelling and appraisal purposes.

11.1.2 It should also be noted that higher traffic flows occur at weekends and during holiday periods. A summer model covering an average summer peak period hour (Friday-Sunday and bank holidays 10:00-19:00) has been developed to assess this for economic appraisal purposes.

11.1.3 As the base model was developed to represent the network as it was in March 2015, it includes roadworks that were present at the time. For forecasting purposes, these were removed to ensure that the roadworks did not falsely impact on the future network. The base network with the roadworks removed is called the “base minus”.

11.1.4 A representation of the rail network travel costs has been included in the forecasting process. The purpose of this is to model mode choice to rail from highway or vice versa. For this reason, the rail demand only includes car-available rail trips. Time and fare skims (measures of travel cost between two zones, averaged over all routes) for rail trips were derived from a VISUM model of rail travel costs during the SWRTM development.

11.1.5 The opening year for the scheme is programmed for 2023 and the scheme design year is 2038, 15 years after scheme opening. Two additional forecast years are also used in the economic appraisal. These include an intermediate year of 2031 and an horizon forecast year of 2051.

11.1.6 The traffic forecasts account for future proposals for residential and employment developments in the local area as well as corresponding transport network changes. The forecast scenarios comprise the following:

- A set of transport network changes
- Assumptions about changes in values of time and vehicle operating costs over time
- A specific set of development assumptions
- Application of National Trip End Model (NTEM) growth factors extracted from TEMPRO7.2 as a constraint on trip growth for cars and rail
- Application of growth of freight traffic from the DfT Road Transport Forecasts (RTF2015)
- Airport forecasting based on NAPALM and Civil Aviation Authority (CAA) passenger demand forecasts, which were included in addition to NTEM growth, and sea port demand growth based on a combination of different sources such as RTF and DfT sea port forecasts. The approach used to derive the airport and sea port demand growth is consistent with that used for the SWRTM.
- Variable Demand Modelling (VDM) undertaken using Dynamic Integrated Assignment and DEmand Modelling (DIADEM) with an interface developed for use with the Regional Models, Highways England's Integrated Demand Interface (HEIDI). Demand model parameters were derived from realism tests on the calibrated base model. Table 11.2 below contains the VDM parameters / model response and hierarchy. It is important to note that the summer model mentioned earlier was not subject to VDM as this only covers peak time periods in the summer for which parameters for behavioural responses to changes in travel costs are not available. In addition, each VDM run has been carried out by pivoting off from the base minus model, meaning that forecast year cost changes from the base minus were used in the incremental demand model.

Table 11.2: VDM Parameters / Model Response and Hierarchy

<table>
<tr><th>Parameter/Setting</th><th colspan="2">Data Source</th><th>Notes</th></tr>
<tr><td colspan="4">Segmentation</td></tr>
<tr><td>Modelled time periods</td><td colspan="2">AM 07:00-10:00, IP 10:00-16:00, PM 16:00-19:00 hours, OP 19:00-07:00</td><td>AM, IP, PM travel costs derived from average period hour calibrated assignments.
OP travel costs derived from uncalibrated assignment of Mobile Phone Data derived OP matrix to IP network to represent free-flow conditions.</td></tr>
<tr><td>Time period factors</td><td colspan="2">AM=3, IP=6, PM=3, OP=12</td><td>Simple calculation consistent across all movements and purposes as average period demand is assigned</td></tr>
<tr><td>Assigned User classes</td><td colspan="2">From assignment models:
Car Employers’ business,
Car Commute,
Car Other,
Light Good Vehicles,
Heavy Good Vehicles</td><td></td></tr>
<tr><td rowspan="9">VDM Segments</td><td>Segment</td><td>Car Available</td><td rowspan="9">Fixed elements relate to ‘special zones’ which include unique travel patterns that are not subject to VDM response.
This may be a sea port or airport where ‘Other’ (passengers) and Employers’ business are not subject to VDM responses.</td></tr>
<tr><td>Home-Based Employers’ business</td><td>1</td></tr>
<tr><td>Home-Based Commute</td><td>2</td></tr>
<tr><td>Home-Based Other</td><td>3</td></tr>
<tr><td>Non-Home-Based Employer’s Business</td><td>4</td></tr>
<tr><td>Non-Home-Based Other</td><td>5</td></tr>
<tr><td>Fixed – Employers’ business</td><td>6</td></tr>
<tr><td>Fixed – Commute</td><td>7</td></tr>
<tr><td>Fixed - Other</td><td>8</td></tr>
</table>

Parameter/Setting	Data Source		Notes
	Light Good Vehicles	9	
	Heavy Good Vehicles	10	
Sectors	7 sectors defined for the A303 Sparkford - Ilchester Model. 4 Internal and 3 External.		Sectors are used for defining outbound and return factors, which convert Production Attraction (PA) matrices to Origin Destination (OD).
Model Parameters			
Model type	Home-Based	Incremental Production Attraction (PA)	Production attraction matrices define trips in the form of a tour. Trips are produced by homes, and the attraction is the reason for travel. A PA tour captures the outbound and return trips, whereas an OD trip is a single direction trip between an origin and destination.
	Non-Home-Based	Incremental Origin Destination (OD)	
	Goods	Fixed	
	Special Generators	Fixed	
Model responses and hierarchy	(Macro) Time of Day Choice Mode Choice Distribution		Distribution is singly constrained (where trip ends are fixed for one end of the trip, with no constraints at the other end) for Employer's Business and Other, doubly constrained (both ends of the trips are fixed) for Commute.
Logit model parameters: lambda, theta	Median WebTAG		Confirmed through realism testing (see Section 10.7)
Distribution Intra-zonal cost calculation	DIADEM Default values (ρ=0.5, minimum cost=5 minutes)		ρ is a factor that is multiplied by the minimum inter-zonal cost to calculate a value for intra-zonal costs. This is necessary to calculate redistribution of trips from intra-zonal to inter-zonals.

Parameter/Setting	Data Source		Notes
Cost coefficients (VOTs etc.)	WebTAG with distance based VOT		Travellers' sensitivity to cost reduces more rapidly with distance than their sensitivity to time. As a result, distance based VOTs are used.
Cost damping parameters and specification	Damped utility by continuous function of distance – applied to all variable demand trips		Based on a minimum distance skim for the IP as applied in the original SWRTM
Occupancy factors	National Travel Survey (NTS)		NTS data was analysed to derive occupancy factors for the variable demand segments. HBO and NHBO occupancies are influenced by area type and distance travelled, with occupancy increasing with distance.
Demand Matrices			
Road Matrices	Home-based (24hr PA)	NTEM growth factors to calibrated base assignment matrices (split using Mobile Phone Origin Destination (MPOD) data and transposed, then aggregated to 24-hour using PA Outbound and Return proportions as detailed in the PA Data section of this table below)	
	Non-home-based (hourly OD)	NTEM growth factors to calibrated base assignment matrices (split using MPOD data)	
	Goods (hourly OD)	RTF growth factors to calibrated base assignment matrices	

Parameter/Setting	Data Source		Notes
	Special Generators	Specific growth factors to calibrated base assignment matrices (with extraction of demand for specific zones and demand segments)	
Public transport	NTEM growth factors to base matrices (combination of Model of Inter-Regional Activity and National Rail Travel Survey assigned to demand segments)		
Cost Matrices			
Reference SATURN UFS files			Extracted from SATURN road assignment.
Rail costs skims for reference and forecast	Base	VISUM Time Skims	Extracted from National Rail network and then compressed to Model zone system.
	Forecast		
Rail fare skims for reference and forecast	Base	VISUM In Vehicle Time Skim applied to distance-based fare function	
	Forecast		
PA Data			
Outbound proportions	DIADEM Manual (from the National Travel Survey) Proportions applied for Employers' business for all sectors		
Return proportions (by time period for each demand segment, sector movement, and mode)	MPOD derived proportions used for Work and Other for 7 sectors based on origin trip ends Proportions adjusted to reflect assignment matrix proportions with outbound/return split based on initial values for each time period		
Tour proportions	Default values provided in DIADEM from National Travel Survey data, which are then furnessed within DIADEM application to match defined Outbound and Return proportions (see above)		
DIADEM Parameters			
Algorithm	Fixed Step Length (0.5, as per base model calibration)		

Parameter/Setting	Data Source	Notes
Convergence	Target GAP of 0.1% for entire model and 0.2% for simulation area (sub-area)	

11.1.7 The transport supply and development assumptions were determined through a process of identifying potential transport improvements and development proposals and undertaking an assessment of the likelihood of each of these proposals coming forward. More details can be found in later sections.

11.1.8 The following demand forecasts were produced:

- The without scheme forecast, referred to as the Do Minimum forecast, which used forecast year trip matrices and the future transport network that excludes the scheme.
- The with scheme forecast, referred to as the Do Something forecast, which included all highway changes associated with the preferred scheme option and the forecast year trip matrices.

11.2 Forecast network development

Requirements

11.2.1 For forecasting purposes, transport networks representing the supply and cost of transport in future years were required as a basis to assess the impact of the proposed scheme. Future year transport supply and costs relate to changes in the transport networks, for example new transport infrastructure.

11.2.2 Highway networks have been produced for two forecasting scenarios: Do Minimum (DM - without the proposed scheme) and Do Something (DS – with the proposed scheme) and four forecasting years (2023 scheme opening year, 2031 intermediate year, 2038 scheme design year and 2051 final forecast year). The only difference between DM and DS networks is just the proposed scheme.

Uncertainty log

11.2.3 The uncertainty log contains the Highways England RIS schemes as well as local authority network schemes in regions nearby and significant to the model and forecasts for the scheme.

11.2.4 As per WebTAG, the schemes included in the Do Minimum scenarios have a likelihood of at least ‘Near Certain’ or ‘More than Likely’. Table 11.3 provides the WebTAG definitions of the uncertainty log classifications.

Table 11.3: Classification of Future Impacts

Probability of the Input	Local Authority / Development Scheme	Highways England	Network Rail
Near Certain: The outcome will happen or there is a high probability that it will happen.	• Intent announced by proponent to regulatory agencies • Approved development proposals • Projects under construction	Any scheme for which the preferred route has been announced	Stage 5 completed, scheme entering or in Stage 6 (that is, scheme consented)
More than likely: The outcome is likely to happen but there is some uncertainty.	• Submission of planning or consent application imminent • Development application within the consent process • Projects under construction	Any scheme in a published RIS	Stage 3 completed, scheme entering or in Stage 4 (that is, preferred route announced)
Reasonably Foreseeable: The outcome may happen, but there is significant uncertainty.	• Identified within a development plan • Not directly associated with the transport strategy/scheme, but may occur if the strategy/scheme is implemented • Development conditional upon the transport strategy/scheme proceeding • Or, a committed policy goal, subject to tests (for example, of deliverability) whose outcomes are subject to significant uncertainty	Scheme in stage 1 or 2 (that is, option selection	Stage 2 completed, scheme entering or in Stage 3 (that is, option selection
Hypothetical: There is considerable uncertainty whether the outcome will ever happen.	• Conjecture based upon currently available information • Discussed on a conceptual basis • One of a number of possible inputs in an initial consultation process • Or a policy aspiration	Scheme in Stage 0 (that is, major road project initiated)	Scheme in Stage 1 (that is, output definition)

Do Minimum network

11.2.5 The DM schemes included in the simulation area of the forecast models are displayed in Figure 11.1 and Table 11.4. The full list of schemes in the uncertainty log for the entire (simulation and buffer) network is included in Appendix E, split into those included and those excluded from the models.

Figure 11.1: DM Schemes Included in Forecast Models

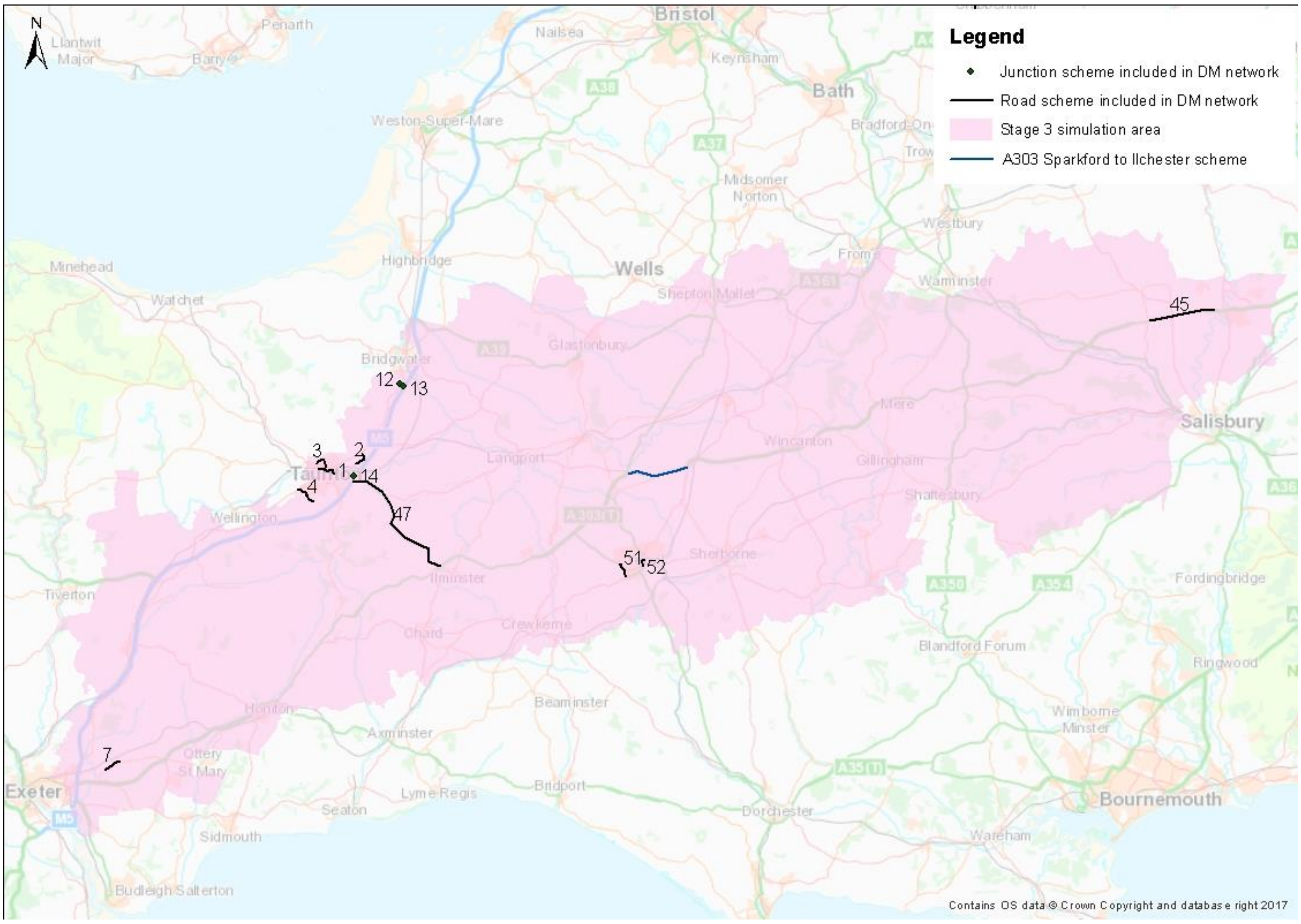

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Table 11.4: DM Schemes included in the simulation area (displayed in Figure 10.1)

Id	Scheme name
1	Northern Inner Distributor Road
2	Monkton Heathfield
3	Staplegrove development site access.
4	Comeytrowe development spine road
7	Cranbrook developments (includes residential, commercial, Science Park and Skypark)
12	M5 J24 Huntworth rab imp
13	M5 J24 HPC Park & Ride
14	M5 J25
45	A303 Amesbury to Berwick Down
47	A358 Taunton to Southfields
51	Yeovil Western Corridor
52	Yeovil Eastern Corridor

11.2.6 All the DM schemes in the simulation area are expected to be built by 2023 so are part of all forecast networks with the exceptions of the A303 Stonehenge and M4 Newport schemes which are both expected to be built by 2031. These have therefore been included in all forecast years from 2031.

11.2.7 Schemes have been excluded if they were too far away, would not have an impact on the study area network, if no opening date for the scheme was available and if they were only hypothetical or reasonably foreseeable. The exception to this is the A358 Taunton to Southfields scheme which is still reasonably foreseeable given that no preferred route[3] has been announced, but the scheme has been included in the Do Minimum as it is part of the first period of the RIS programme. The uncertainty log schemes included in the DM network are detailed in Appendix E along with a justification for their inclusion.

Do Something Network

11.2.8 The route follows the existing corridor of the A303 very closely. It is generally considered to be an online solution although is often deliberately aligned just to the side of the existing carriageway in order to allow re-use of the existing route for local access, avoid property or facilitate construction. At its maximum offset the route is typically 100m either north or south of the existing A303.

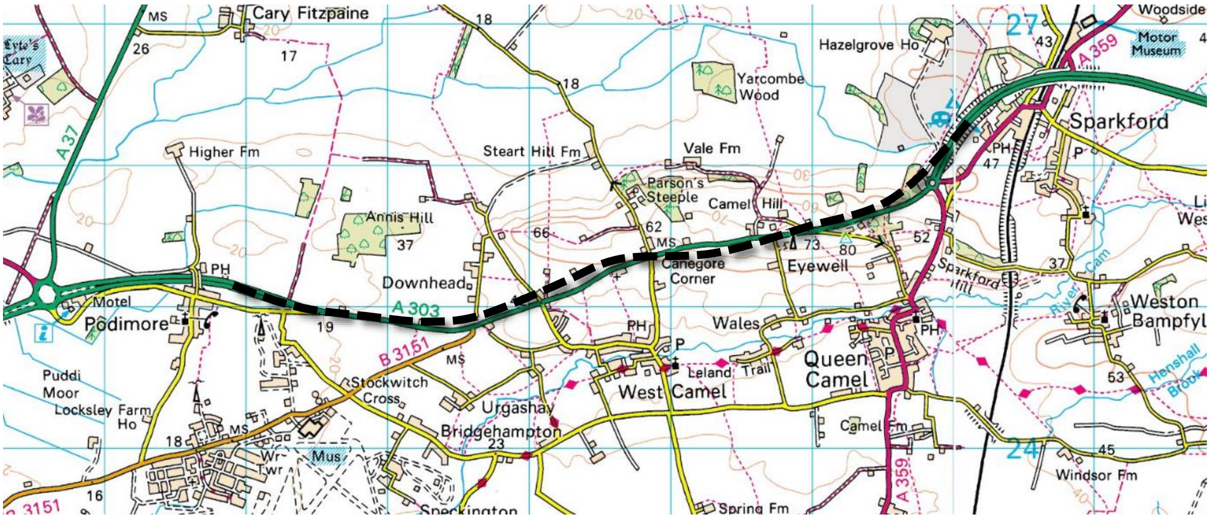
11.2.9 At its western limits the option ties in with the existing dual carriageway A303 Podimore Bypass. Travelling eastwards, the route initially follows the existing A303 closely until the B3151 before moving north of the existing carriageway and rising up just to the south of Downhead before crossing over the existing A303 at Canegore Corner. This passes very close to the Noise Important Area at the West Camel Methodist Church (depicted by a " + " symbol on Figure 11.2 just to the west of Canegore Corner). The route then takes a southerly alignment briefly before meeting up with the existing road again to pass between a Scheduled Ancient Monument and an MOD signal station at the crest of Camel Hill. Finally, the route then bypasses the existing Hazlegrove Roundabout to the north through a registered park and garden associated with Hazlegrove House before tying into the existing A303 north of Sparkford village.

11.2.10 A new all movements grade separated junction will be provided in the vicinity of the Hazlegrove Roundabout. This will enable free flowing passage of traffic on the A303. The junction will incorporate entry and exit slip roads in both directions providing connections to Hazlegrove House, the A359, access to villages south of the route and access to properties at Camel Hill to the north of the route. A limited movements junction comprising eastbound slips only will be provided in the vicinity of Downhead. A limited movement junction will be provided in the vicinity of the junction with the B3151 comprising westbound exit and entry slip roads.

[3] In the absence of a preferred route, it was decided and agreed with the A358 project manager to use the middle of the three options in terms of flows forecast on the A358, which was the pink option. This does not affect the outcome of the A358 consultation or subsequent preferred route announcement.

11.2.11 A connection will be provided between local roads to the north and south of the route in the vicinity of Canegore Corner via an overbridge, incorporating a link to the A303 Eastbound via the junction at Downhead. At the western end of the scheme the existing westbound slip road to Podimore village will be closed. Access to Podimore village will therefore be via the A303/A37 junction ('Podimore Roundabout').

Figure 11.2: Scheme extents



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11.2.12 For the purpose of coding the Do Something network, relevant Computer Aided Design (CAD) drawings were obtained and converted into Geographic Information System (GIS) format. ArcGIS (a GIS software tool) and an Ordnance Survey (OS) map background were then used to code the SATURN highway network, in ArcGIS. From GIS outputs, link lengths were exported to a Microsoft Excel file, which were used in coding the SATURN links in the highway network. This ensured that the characteristics of road network were retained in the model network.

Network checks

11.2.13 On completion of the preliminary forecast networks a significant review process was undertaken on the network structure to:

- Review the completeness of the network around each road scheme to ensure that the modelled and designed representations were appropriate
- Review modelled link lengths vs crow-fly distance using SATURN's in built network checking process
- Reviewed the directionality and connectivity of the proposed network changes around each scheme.

11.2.14 Comparisons were carried out between stage 3 networks and stage 2 networks to check consistency.

11.2.15 A TUBA run was completed and the serious warnings were looked at. Issues identified were rectified by making appropriate changes to the networks.

11.2.16 Further network alterations were made following comparisons between the Do Minimum and Do Something assignments. A sensitivity test was carried out implementing these alterations on the calibrated base year model and as there were no significant flow or delay differences, it was decided to implement those amendments only on the forecast networks. The forecasting assignment calibration process is described in Section 11.7.

Changes to travel costs and tolls

11.2.17 Changes of travel costs in the opening and forecast years are to be expected due to increases in incomes and the value of time, changes in fuel costs and improvements in vehicle efficiency. Therefore, the cost assumptions of the validated base year models have been updated in the future year assignments.

11.2.18 Cost changes have been calculated for each forecast year and are applicable to both the Do Minimum and Do Something scenarios.

11.2.19 The rail fares for forecast years were calculated by applying a factor related to the Retail Price Index to the base year fares in a manner consistent with the SWRTM. The forecast rail times do not vary between DM and DS for any individual year, and are also consistent with the SWRTM.

11.2.20 The highway trip costs are made up of time, distance and charge impacts. The Value Of Time (VOT) and Vehicle Operating Cost (VOC) vary by journey purpose and also vary by forecast year to represent changes in fuel costs and income. Changes in fuel costs, vehicle efficiency and values of time have been taken from the WebTAG data book July 2017. These have been used to calculate the forecast year values of time and operating costs. Table 11.5 details the highway generalised cost coefficients used for 2015, 2023, 2031, 2038 and 2051 in pence per minute (PPM) and pence per kilometre (PPK). The values for cars have additionally been adjusted to take account of the proportion of non-freight LGVs which gives slightly different values for each time period. The PPK values have been calculated using a default speed of 54 kilometres per hour, as they were in the SWRTM.

Table 11.5: Generalised Cost Parameters

Year	Purpose	AM		IP		PM	
		PPM	PPK	PPM	PPK	PPM	PPK
2015	Car Business	29.81	12.72	30.54	12.72	30.24	12.72
	Car Commuting	19.99	6.28	20.31	6.28	20.06	6.28
	Car Other	13.79	6.28	14.69	6.28	14.44	6.28
	LGV	21.07	13.70	21.07	13.70	21.07	13.70
	HGV	49.19	47.63	49.19	47.63	49.19	47.63
2023	Car Business	32.91	12.09	33.72	12.09	33.38	12.09
	Car Commuting	22.07	5.52	22.43	5.52	22.14	5.52
	Car Other	15.23	5.52	16.22	5.52	15.94	5.52
	LGV	23.26	13.56	23.26	13.56	23.26	13.56
	HGV	54.31	48.91	54.31	48.91	54.31	48.91
2031	Car Business	37.95	11.98	38.89	11.98	38.50	11.98
	Car Commuting	25.45	5.37	25.87	5.37	25.54	5.37
	Car Other	17.56	5.37	18.71	5.37	18.39	5.37
	LGV	26.83	13.72	26.83	13.72	26.83	13.72
	HGV	62.64	52.76	62.64	52.76	62.64	52.76
2038	Car Business	43.16	11.92	44.22	11.92	43.78	11.92
	Car Commuting	28.94	5.29	29.41	5.29	29.04	5.29
	Car Other	19.97	5.29	21.27	5.29	20.91	5.29
	LGV	30.50	13.72	30.50	13.72	30.50	13.72
	HGV	71.22	53.73	71.22	53.73	71.22	53.73
2051	Car Business	55.67	12.15	57.05	12.15	56.48	12.15
	Car Commuting	37.33	5.57	37.94	5.57	37.46	5.57
	Car Other	25.76	5.57	27.44	5.57	26.97	5.57
	LGV	39.35	14.06	39.35	14.06	39.35	14.06
	HGV	91.88	55.67	91.88	55.67	91.88	55.67

Note: The OGV1:OGV2 ratio, 40:60, was maintained from the RTMs and an HGV multiplier of 2.5 was adopted as per base year

11.2.21 Except for the Severn Crossing, all tolls were kept fixed in real terms. For the Severn Crossing, based on current policy, the tolls were removed from all forecast networks.

11.2.22 It was necessary to update areas coded with fixed speeds in both simulation and buffer networks. Fixed speeds have been extracted from the base minus model and have then been factored using changes predicted by RTF 2015. The RTF growth factors defined in S1 Road Type Table 2 were used with both interpolation and extrapolation being applied to derive factors for new forecasting years. Speeds have been capped at a maximum of 130kph and a minimum of 5kph in order to ensure that they remain within a realistic range.

11.3 Forecast matrix development – core scenario

11.3.1 This section summarises the approach adopted to produce reference demand for use in each future year forecast (2023, 2031, 2038 and 2051). Traffic generated by planned specific developments has been included in the forecast demand, which has been constrained to forecast National Trip End Model (NTEM) levels of growth at Balancing Area level (see Figure 11.8 for a map of the balancing areas).

Treatment of developments

11.3.2 This section describes how the developments that are planned in the future years of 2023 / 2031 / 2038 and 2051 have been taken into account and how the predicted generations/attractions from/to the developments have been included into the future traffic models. The data required to undertake this task can be summarised as follows:

- Uncertainty log information from Local Authorities (East Devon, Exeter, Sedgemoor, South Somerset, Taunton Deane and Wiltshire)
- Trip rates derived from NTEM v7.2 for cars and rail
- Trip rates derived from TRICS for LGVs and HGVs.

Uncertainty log – developments

11.3.3 The uncertainty log details the local authority development schemes in regions nearby and significant to the model. The uncertainty log from stage 2 was shared with the local authorities of East Devon, Exeter, Sedgemoor, South Somerset, Taunton Deane, and Wiltshire in October 2017, from whom updated information was requested both for the schemes already in the list and any additional ones that ought to be added.

11.3.4 The Strategic Employment Site at Henlade (Nexus 25, located just south of M5 J25) has been considered in the analysis even though at the time of the uncertainty log update, it was regarded in the uncertainty log as “Reasonably Foreseeable”. This was done given its size and importance to the A303 / A358 corridor, the fact that was also included in the Stage 1 and 2 modelling work and that its construction is planned to start in 2019. Since then, the Local Development Order has been adopted.

11.3.5 The uncertainty log provided listed out the type of development (for example, housing, employment, hotel) for each Local Authority and for each of them identified the number of dwellings / housing supply (for housing developments), the employment floorspace (B1, B2 and B8 for employment sites) or the number of predicted development jobs.

11.3.6 Only the residential/employment sites (or mixes of these) have been included in the current forecasts, on the basis that the remaining types of development sites (like hospitals, hotels, theatres, leisure centres) were not deemed to be of sufficient net significance to be included or the pattern of development trips generated/attracted by these was not systematic during the day.

11.3.7 According to WebTAG, developments with a likelihood of at least 'near certain' or 'more than likely' were included in the forecast estimates. Table 11.3 provides the WebTAG definitions of the uncertainty log classifications.

11.3.8 The uncertainty log of developments is given in Appendix E. Figure 11.3 to Figure 11.7 show the locations of the developments included by Local Authority.

Figure 11.3: Included Developments in East Devon and Exeter

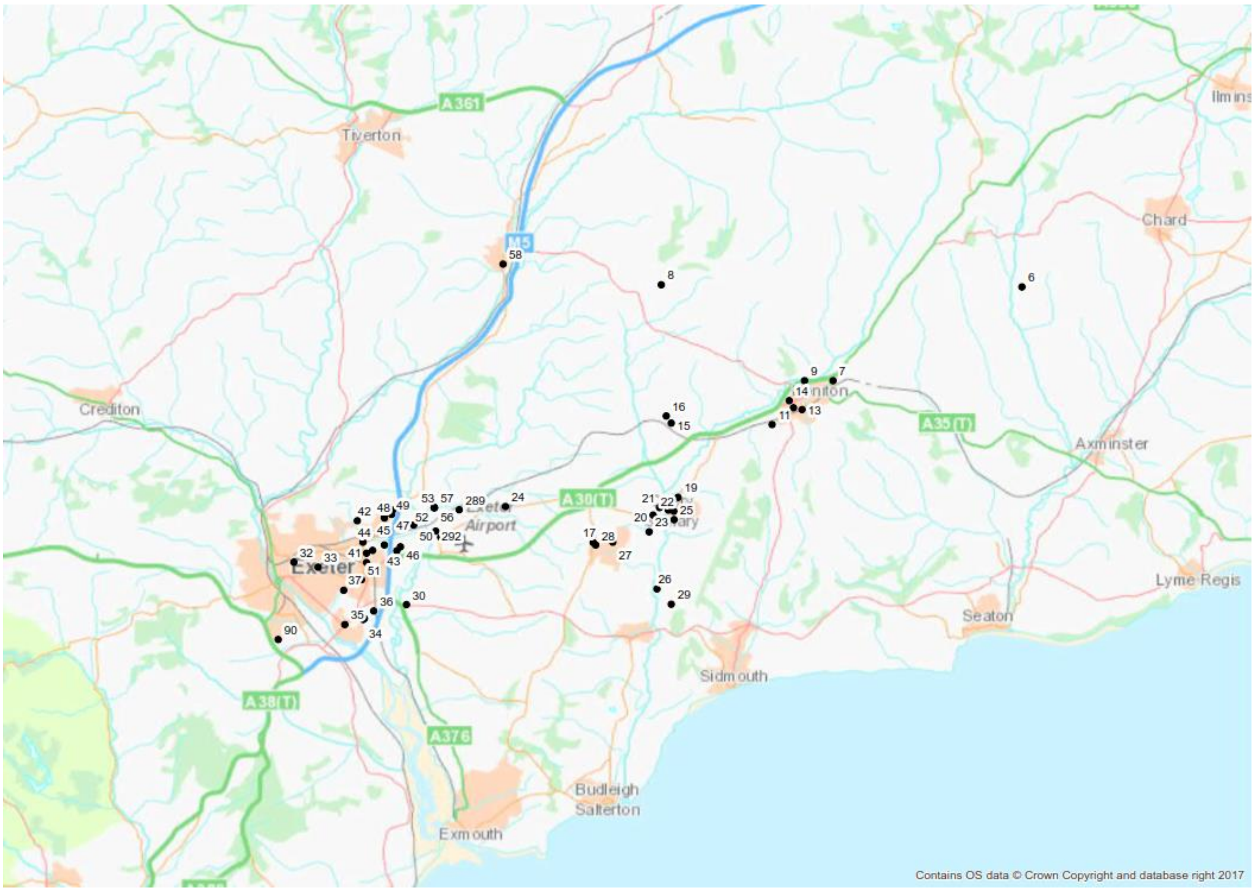

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Figure 11.4: Included Developments in South Somerset

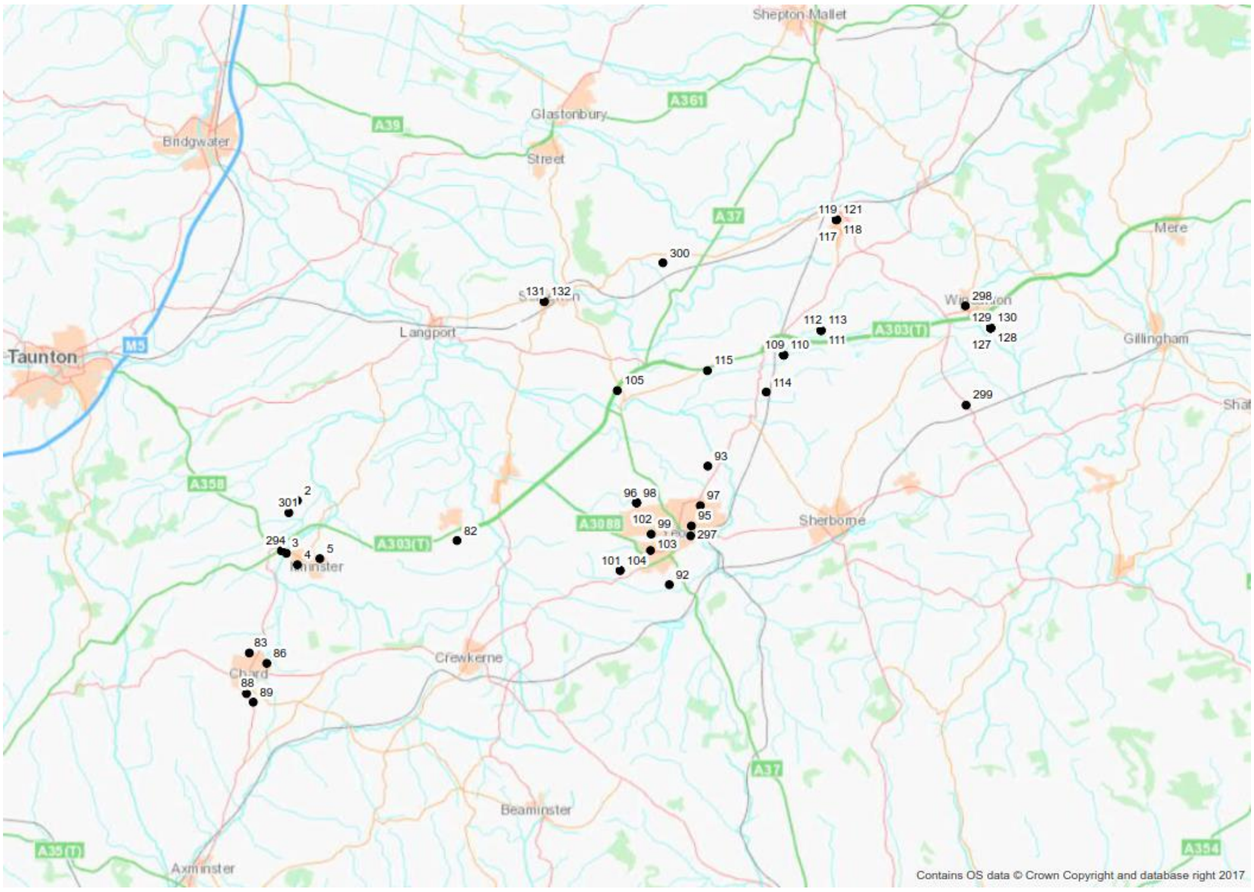

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Figure 11.5: Included Developments in Sedgemoor

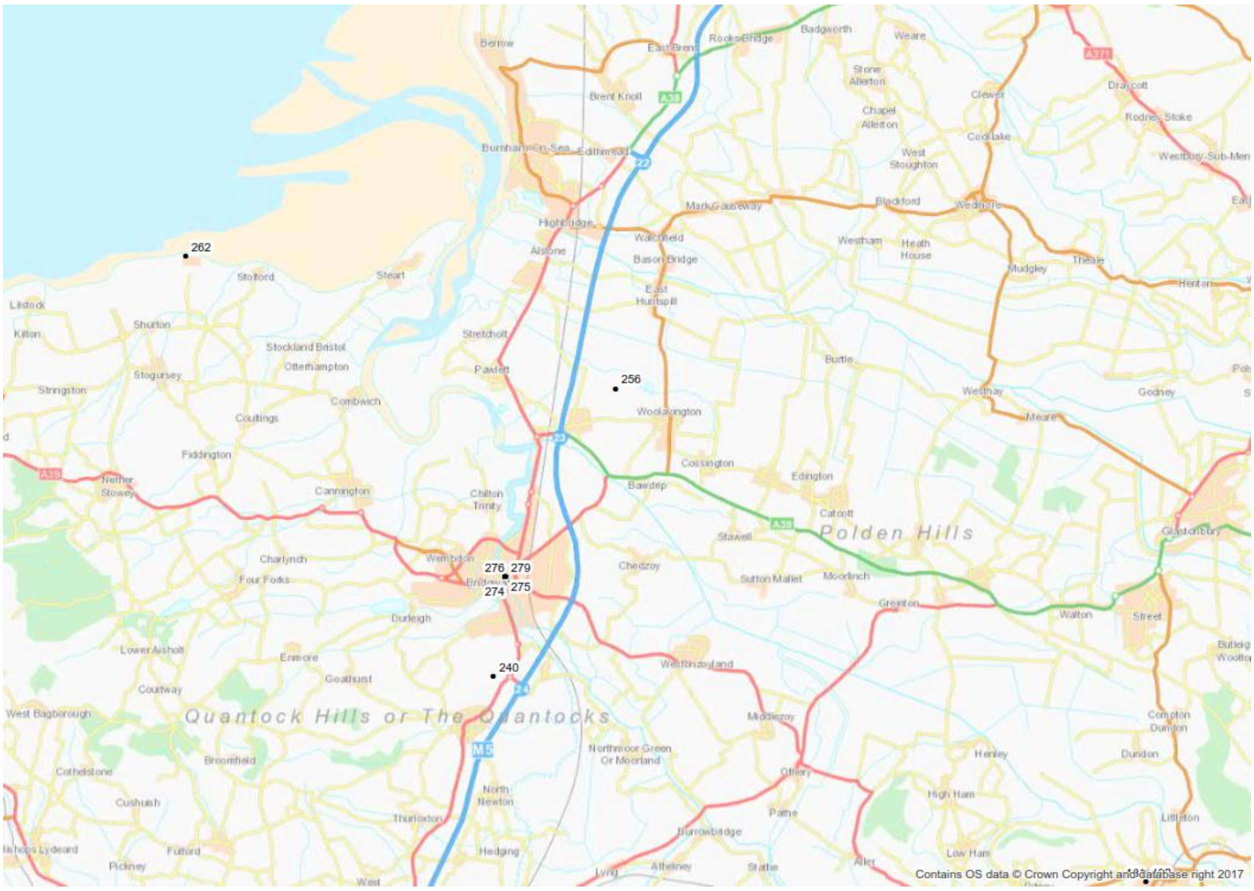

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Figure 11.6: Included Developments in Taunton Deane

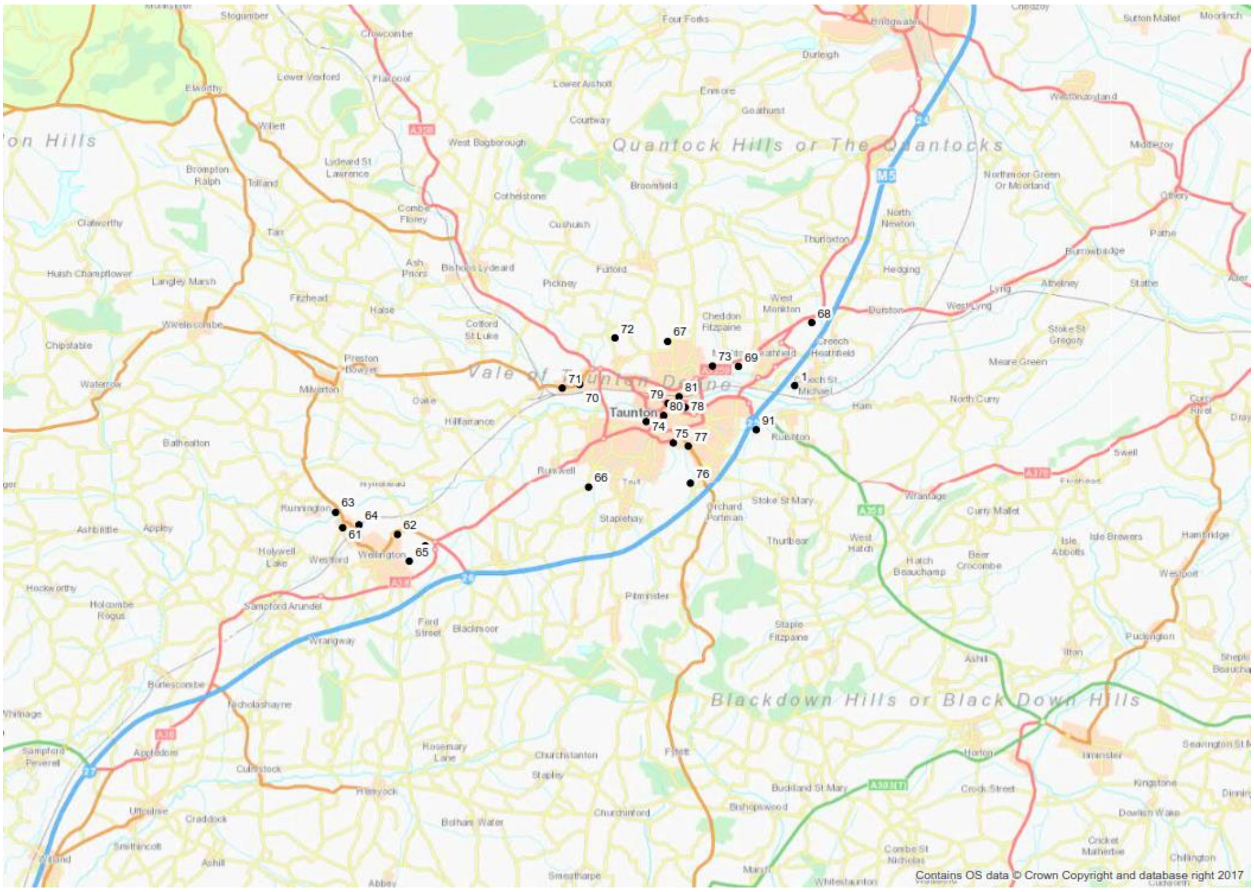

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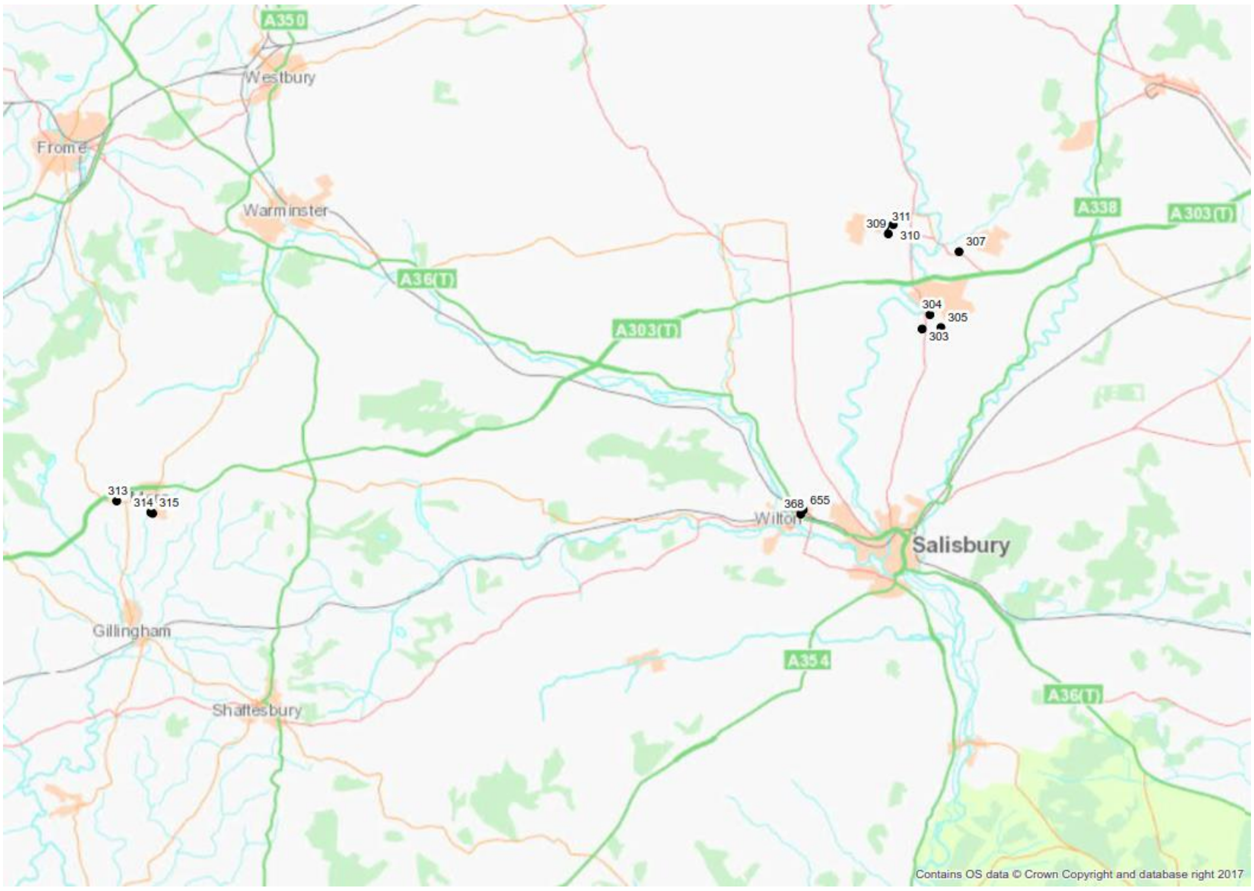
Figure 11.7: Included Developments in Wiltshire



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Development trip generation

11.3.9 Car / Rail trip ends were generated from the identified development schemes based on trip rates derived from NTEM v7.2 using the “alternative forecasting scenario” available in the TEMPRO software. These trip rates are given in Appendix F. For each of the Local Authorities, this approach has been adopted using the 2015 year for:

- each home-based and non-home trip purpose modelled
- an average 24 hours weekday (production/attraction home-based trip purposes, which are employer’s business, commute, other)
- each period (AM, IP, PM and OP) for the origin-destination trip purposes (non-home-based employers’ business and non-home-based other)
- housing and job trip rates separately.

11.3.10 All the developments in the uncertainty log are assumed to be fully built out and occupied by 2038, meaning that the 2038 trip generations coincide with the 2051 ones.

11.3.11 Appendix F shows the car / rail NTEM v7.2 trip rates for the year of 2015, for each purpose, for each period and for each Local Authority where the planned developments are located. These trip rates were then applied to the quantum (housing, number of jobs) in each development for each forecast year.

11.3.12 For the majority of the employment developments listed in the uncertainty log the sqm of floorspace available was provided (rather than the number of jobs as per units of the NTEM v7.2 trip rate). Therefore, a conversion between sqm of floorspace to number of jobs was applied for each of the land uses of B1 (office), B2 (industrial and manufacturing), and B8 (storage and distribution). Table 5 1 shows the number of jobs per 100 sqm of GFA (Gross Floor Area) for the different floorspace usage. The methodology has applied the guidance outlined in the Employment Density Guide (3rd edition).

Table 11.6: Jobs per 100sqm of GFA

User Class	Jobs per 100 sqm of GFA (NIA – Net Internal Area)
B1 (General Offices)	10.07
B2 (Industrial and Manufacturing)	3.03
B8 (Storage and Distribution)	1.45

11.3.13 The proposed employment sites were also expected to generate LGV and HGV trips. For the purpose of calculating trip-ends generated by these, NTEM v7.2 trip rates as shown in Appendix F could not be used as they refer to car and rail. Therefore, TRICS trip rates were used instead.

11.3.14 Average TRICS trip rate per employee were extracted from the software for each of the modelled time periods for the B1, B2 and B8 categories taking into account only those sub-categories likely to be relevant for the developments considered. Table 11.7 to Table 11.9 show the average TRICS trip rates per employee by vehicle type applied to the number of jobs specified or calculated for each of the development employment sites.

Table 11.7: Average TRICS Trip rates B1

Trip Rate/Employee	LGV		HGV	
	Arrivals	Departures	Arrivals	Departures
AM 07:00-10:00	0.010	0.008	0.001	0.001
IP 10:00-16:00	0.009	0.009	0.001	0.001
PM 16:00-19:00	0.004	0.007	0.001	0.001
OP 19:00-07:00	0.000	0.000	0.000	0.000

Table 11.8: Average TRICS Trip rates B2

Trip Rate/Employee	LGV		HGV	
	Arrivals	Departures	Arrivals	Departures
AM 07:00-10:00	0.044	0.038	0.012	0.011
IP 10:00-16:00	0.043	0.043	0.013	0.012
PM 16:00-19:00	0.019	0.028	0.006	0.008
OP 19:00-07:00	0.001	0.000	0.000	0.000

Table 11.9: Average TRICS Trip rates B8

Trip Rate/Employee	LGV		HGV	
	Arrivals	Departures	Arrivals	Departures
AM 07:00-10:00	0.005	0.006	0.080	0.078
IP 10:00-16:00	0.007	0.008	0.083	0.071
PM 16:00-19:00	0.005	0.004	0.077	0.076
OP 19:00-07:00	0.001	0.001	0.014	0.018

11.3.15 The calculated trip ends obtained by applying the NTEM v7.2 and the TRICS trip rates were then distributed using the base demand trip distribution through a SATURN furnessing process to output a set of development matrices for each year of 2023, 2031, 2038 and 2051, for each modelled period (24 hours for the home-based trip purposes), and average period (AM, IP, PM and OP) for the non-home-based trip purposes), and for each mode: highway (cars/LGV/HGV) and PT (rail passenger).

11.3.16 The methodology for distributing future development trip-ends using the base demand matrices requires the base demand at zone level, where the development has been allocated, to be populated with some trips in the base year. For the vast majority of the cases the existing model zones had trips associated with the development trips that were to be distributed. When this did not happen (for instance when a new zone was allocated to represent a new development that did not exist in the base model) then a zone with a similar trip distribution was chosen to distribute the development trips. The same approach has been adopted when development trips for a time period were missing in the base year matrices, and in that case a distribution taken from a nearby similar zone was used.

11.3.17 Another issue that had to be considered during the distribution of the development trips (for a specific purpose and a specific time period) was that, sometimes, the calculated development trips demand when aggregated at NTEM v7.2. balancing areas level (which is the level the demand had to be constrained to in HEIDI) was higher than the balancing areas targets, resulting in HEIDI's failure. When this happened, adjustments were required to bring the development balancing areas trip ends below the HEIDI's balancing areas targets. This was done separately for highway (cars/LGV/HGV) and PT (rail).

National trip end model (NTEM)

11.3.18 Forecast trip ends from Version 7.2 of the National Trip End Model (NTEM) were used to derive trip end growth factors at model zone level, via an NTEM to model zone correspondence list.

11.3.19 The growth factors are derived as Origin and Destination factors (or Production and Attraction factors for Home-Based trips) for each of the demand segments required for input into the Variable Demand Model.

11.3.20 Growth factors have been derived for car vehicle trips and rail trips separately and from the 2015 base year to the forecast years. The rail trip end growth factors are derived separately for car available and non-car available trips. Growth factors by balancing area are shown below.

Table 11.10: Balancing Area Definition

Balancing Area	Description
1	Avon
2	Berkshire
3	Cornwall
4	Dorset
5	East Devon
6	Gloucestershire
7	Hampshire
8	Oxfordshire
9	Wiltshire
10	East Midlands
11	East
12	London
13	Mendip
14	North East
15	North West
16	Scotland
17	South East
18	Taunton Deane & Sedgemoor
19	Wales
20	West Devon, North Devon & South Devon
21	West Midlands
22	Yorkshire & The Humber

Figure 11.8: Balancing Areas

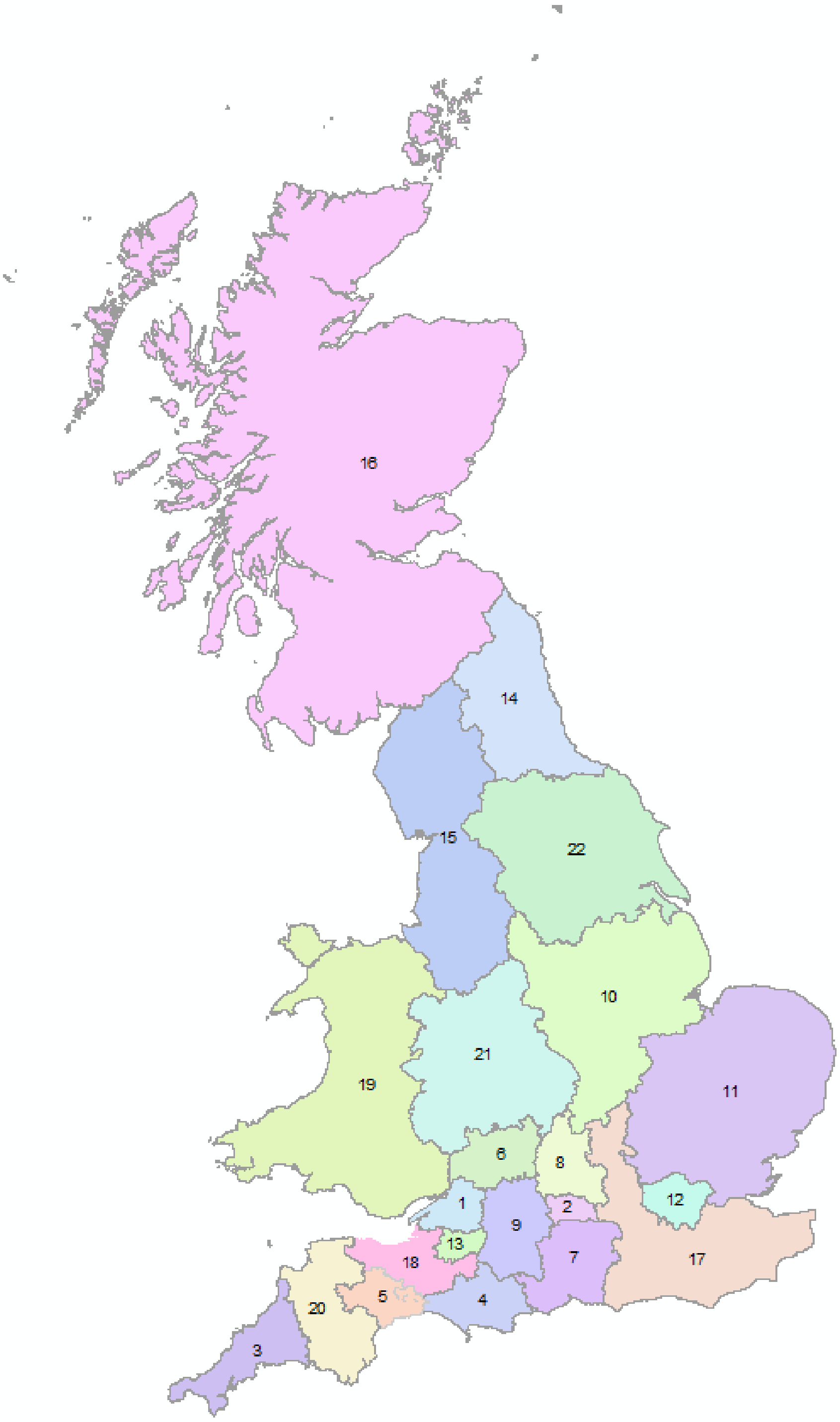

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Table 11.11: 2015 – 2023 Highway Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.079	1.070	1.047	1.041	1.087	1.086	1.051	1.053	1.052	1.052	1.051	1.052	1.051	1.051	1.069	1.069	1.071	1.071	1.071	1.071	1.072	1.071
2	1.043	1.085	1.011	1.057	1.078	1.098	1.067	1.065	1.067	1.066	1.068	1.066	1.068	1.066	1.083	1.083	1.085	1.085	1.086	1.085	1.089	1.086
3	1.075	1.074	1.044	1.043	1.077	1.077	1.054	1.053	1.054	1.054	1.054	1.053	1.053	1.052	1.067	1.066	1.068	1.068	1.069	1.069	1.071	1.072
4	1.067	1.057	1.032	1.029	1.072	1.071	1.040	1.040	1.040	1.039	1.040	1.039	1.040	1.040	1.058	1.058	1.060	1.060	1.060	1.060	1.063	1.062
5	1.099	1.081	1.071	1.052	1.098	1.093	1.061	1.061	1.061	1.062	1.059	1.062	1.061	1.061	1.076	1.078	1.079	1.083	1.078	1.083	1.081	1.084
6	1.094	1.090	1.069	1.061	1.071	1.070	1.067	1.068	1.068	1.067	1.067	1.068	1.067	1.067	1.067	1.068	1.069	1.069	1.069	1.070	1.070	1.071
7	1.093	1.095	1.065	1.065	1.096	1.095	1.073	1.072	1.074	1.073	1.073	1.072	1.071	1.069	1.083	1.085	1.086	1.087	1.086	1.087	1.087	1.088
8	1.127	1.080	1.096	1.049	1.146	1.107	1.061	1.063	1.061	1.063	1.061	1.063	1.062	1.063	1.081	1.084	1.083	1.086	1.083	1.087	1.085	1.087
9	1.062	1.062	1.037	1.033	1.092	1.085	1.046	1.045	1.046	1.045	1.045	1.045	1.045	1.045	1.067	1.068	1.069	1.070	1.069	1.071	1.071	1.073
10	1.067	1.067	1.040	1.039	1.082	1.082	1.050	1.050	1.050	1.050	1.051	1.051	1.051	1.050	1.069	1.068	1.071	1.071	1.071	1.071	1.073	1.073
11	1.066	1.076	1.037	1.046	1.109	1.113	1.063	1.060	1.062	1.060	1.063	1.060	1.064	1.062	1.089	1.092	1.091	1.093	1.092	1.094	1.093	1.096
12	1.123	1.105	1.104	1.075	1.134	1.121	1.085	1.089	1.085	1.089	1.084	1.088	1.084	1.089	1.108	1.106	1.110	1.107	1.109	1.107	1.111	1.110
13	1.048	1.069	1.018	1.042	1.069	1.086	1.050	1.052	1.052	1.052	1.052	1.052	1.051	1.051	1.071	1.074	1.074	1.077	1.075	1.078	1.079	1.081
14	1.095	1.095	1.064	1.064	1.080	1.080	1.070	1.070	1.070	1.070	1.070	1.070	1.070	1.070	1.073	1.073	1.075	1.075	1.075	1.075	1.076	1.076
15	1.084	1.083	1.058	1.057	1.079	1.078	1.062	1.063	1.062	1.062	1.063	1.062	1.062	1.062	1.070	1.070	1.071	1.072	1.072	1.072	1.073	1.073
16	1.075	1.075	1.047	1.047	1.078	1.078	1.054	1.054	1.054	1.054	1.054	1.054	1.054	1.054	1.064	1.064	1.066	1.066	1.067	1.067	1.069	1.069
17	1.076	1.086	1.046	1.056	1.100	1.104	1.068	1.067	1.068	1.067	1.068	1.067	1.068	1.067	1.086	1.087	1.088	1.089	1.088	1.089	1.090	1.092
18	1.083	1.080	1.054	1.051	1.089	1.089	1.062	1.062	1.062	1.062	1.062	1.062	1.061	1.061	1.076	1.077	1.078	1.079	1.079	1.080	1.081	1.083
19	1.066	1.063	1.034	1.033	1.075	1.074	1.045	1.045	1.044	1.045	1.045	1.046	1.045	1.045	1.062	1.062	1.064	1.064	1.065	1.066	1.068	1.068
20	1.077	1.077	1.045	1.048	1.082	1.084	1.057	1.057	1.057	1.057	1.057	1.056	1.056	1.055	1.072	1.073	1.075	1.075	1.074	1.075	1.075	1.075
21	1.074	1.071	1.047	1.044	1.087	1.086	1.055	1.054	1.055	1.055	1.055	1.055	1.055	1.054	1.072	1.072	1.074	1.074	1.074	1.075	1.075	1.076
22	1.095	1.095	1.066	1.067	1.083	1.083	1.072	1.073	1.073	1.073	1.074	1.074	1.073	1.073	1.075	1.075	1.077	1.077	1.078	1.078	1.080	1.080

Table 11.12: 2015 – 2031 Highway Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.139	1.116	1.095	1.080	1.180	1.179	1.095	1.098	1.096	1.097	1.095	1.096	1.094	1.095	1.140	1.141	1.144	1.143	1.143	1.143	1.143	1.143
2	1.064	1.130	1.026	1.096	1.157	1.191	1.111	1.110	1.111	1.110	1.111	1.110	1.112	1.110	1.151	1.156	1.154	1.159	1.155	1.158	1.159	1.160
3	1.132	1.123	1.092	1.082	1.150	1.145	1.097	1.096	1.097	1.097	1.097	1.096	1.096	1.095	1.123	1.123	1.126	1.126	1.127	1.127	1.129	1.131
4	1.119	1.101	1.072	1.065	1.141	1.140	1.080	1.080	1.080	1.079	1.080	1.080	1.080	1.080	1.115	1.115	1.118	1.118	1.118	1.118	1.120	1.120
5	1.152	1.129	1.116	1.092	1.179	1.173	1.104	1.106	1.105	1.107	1.103	1.106	1.104	1.105	1.140	1.143	1.145	1.149	1.144	1.150	1.147	1.151
6	1.139	1.133	1.108	1.096	1.141	1.140	1.106	1.107	1.106	1.106	1.106	1.107	1.105	1.106	1.123	1.123	1.126	1.126	1.126	1.127	1.127	1.128
7	1.142	1.149	1.109	1.111	1.180	1.180	1.122	1.122	1.123	1.123	1.123	1.122	1.120	1.118	1.152	1.156	1.155	1.158	1.156	1.158	1.157	1.160
8	1.192	1.125	1.153	1.089	1.264	1.208	1.106	1.108	1.106	1.109	1.106	1.109	1.107	1.108	1.153	1.157	1.156	1.160	1.156	1.162	1.157	1.161
9	1.101	1.106	1.072	1.071	1.188	1.173	1.088	1.087	1.088	1.087	1.088	1.087	1.087	1.087	1.133	1.135	1.137	1.139	1.137	1.139	1.139	1.141
10	1.117	1.116	1.082	1.081	1.162	1.162	1.096	1.096	1.096	1.096	1.097	1.097	1.097	1.096	1.133	1.133	1.136	1.136	1.137	1.137	1.139	1.139
11	1.100	1.121	1.064	1.082	1.215	1.223	1.108	1.106	1.108	1.106	1.108	1.106	1.109	1.107	1.171	1.176	1.175	1.178	1.175	1.178	1.175	1.180
12	1.187	1.149	1.167	1.111	1.254	1.230	1.131	1.135	1.130	1.135	1.130	1.134	1.130	1.135	1.191	1.187	1.194	1.189	1.192	1.188	1.193	1.191
13	1.055	1.114	1.016	1.079	1.127	1.168	1.092	1.094	1.094	1.094	1.095	1.095	1.093	1.093	1.136	1.141	1.141	1.145	1.142	1.146	1.147	1.149
14	1.157	1.157	1.116	1.116	1.148	1.148	1.123	1.123	1.123	1.123	1.123	1.123	1.123	1.123	1.132	1.132	1.135	1.135	1.135	1.135	1.136	1.136
15	1.139	1.137	1.106	1.104	1.145	1.144	1.111	1.111	1.111	1.111	1.111	1.111	1.110	1.110	1.127	1.127	1.129	1.130	1.130	1.130	1.131	1.131
16	1.138	1.138	1.099	1.099	1.152	1.152	1.107	1.107	1.107	1.107	1.107	1.107	1.108	1.108	1.127	1.127	1.130	1.130	1.131	1.131	1.133	1.133
17	1.114	1.131	1.078	1.094	1.196	1.202	1.113	1.112	1.113	1.112	1.113	1.112	1.113	1.112	1.159	1.162	1.163	1.165	1.163	1.165	1.164	1.167
18	1.136	1.126	1.098	1.090	1.176	1.175	1.105	1.107	1.106	1.106	1.106	1.106	1.105	1.105	1.144	1.146	1.148	1.149	1.148	1.150	1.151	1.154
19	1.119	1.112	1.077	1.075	1.141	1.139	1.089	1.089	1.088	1.089	1.090	1.090	1.089	1.089	1.119	1.118	1.120	1.120	1.122	1.123	1.125	1.126
20	1.119	1.127	1.078	1.088	1.153	1.158	1.102	1.102	1.102	1.101	1.102	1.101	1.101	1.100	1.134	1.135	1.138	1.138	1.137	1.138	1.137	1.138
21	1.127	1.121	1.093	1.087	1.165	1.162	1.102	1.101	1.102	1.102	1.102	1.102	1.102	1.102	1.136	1.136	1.139	1.139	1.140	1.140	1.140	1.141
22	1.151	1.152	1.115	1.115	1.159	1.159	1.123	1.124	1.125	1.125	1.125	1.125	1.124	1.124	1.139	1.139	1.143	1.143	1.143	1.143	1.145	1.145

Table 11.13: 2015 – 2038 Highway Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.198	1.163	1.145	1.122	1.254	1.250	1.139	1.142	1.139	1.141	1.138	1.140	1.138	1.138	1.199	1.200	1.203	1.203	1.202	1.202	1.201	1.202
2	1.089	1.174	1.044	1.132	1.213	1.262	1.151	1.150	1.151	1.151	1.152	1.151	1.152	1.150	1.207	1.213	1.210	1.217	1.211	1.216	1.215	1.217
3	1.185	1.170	1.135	1.120	1.210	1.200	1.137	1.137	1.138	1.137	1.138	1.137	1.137	1.136	1.171	1.172	1.175	1.175	1.175	1.176	1.177	1.180
4	1.168	1.141	1.109	1.098	1.195	1.191	1.116	1.116	1.116	1.115	1.115	1.115	1.115	1.115	1.160	1.160	1.163	1.163	1.163	1.164	1.166	1.166
5	1.204	1.175	1.159	1.131	1.240	1.232	1.145	1.147	1.146	1.148	1.144	1.147	1.145	1.146	1.191	1.195	1.197	1.202	1.195	1.202	1.198	1.203
6	1.171	1.162	1.134	1.119	1.196	1.195	1.132	1.133	1.133	1.132	1.132	1.133	1.131	1.132	1.165	1.166	1.169	1.169	1.169	1.170	1.170	1.171
7	1.181	1.190	1.140	1.143	1.244	1.245	1.158	1.159	1.160	1.159	1.159	1.158	1.156	1.155	1.204	1.209	1.207	1.211	1.208	1.211	1.210	1.213
8	1.253	1.170	1.206	1.127	1.354	1.286	1.147	1.150	1.147	1.150	1.148	1.151	1.149	1.150	1.210	1.216	1.214	1.220	1.215	1.221	1.215	1.219
9	1.140	1.151	1.106	1.109	1.257	1.239	1.129	1.128	1.129	1.128	1.129	1.128	1.129	1.127	1.187	1.190	1.192	1.194	1.192	1.194	1.194	1.196
10	1.166	1.165	1.123	1.121	1.226	1.225	1.140	1.139	1.139	1.140	1.140	1.141	1.140	1.140	1.188	1.187	1.191	1.191	1.192	1.192	1.193	1.193
11	1.139	1.170	1.095	1.120	1.296	1.309	1.153	1.151	1.153	1.151	1.154	1.151	1.154	1.153	1.239	1.245	1.243	1.248	1.243	1.248	1.243	1.249
12	1.251	1.199	1.229	1.152	1.355	1.316	1.177	1.182	1.176	1.182	1.175	1.181	1.176	1.182	1.261	1.256	1.264	1.258	1.261	1.257	1.261	1.259
13	1.076	1.156	1.029	1.115	1.171	1.229	1.131	1.134	1.133	1.134	1.134	1.134	1.132	1.132	1.188	1.194	1.193	1.199	1.194	1.199	1.200	1.202
14	1.220	1.220	1.169	1.169	1.206	1.206	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.176	1.187	1.187	1.191	1.191	1.191	1.191	1.191	1.191
15	1.193	1.190	1.151	1.149	1.203	1.201	1.157	1.157	1.157	1.157	1.157	1.157	1.156	1.156	1.179	1.179	1.181	1.182	1.182	1.182	1.183	1.183
16	1.198	1.198	1.148	1.148	1.209	1.209	1.157	1.157	1.157	1.157	1.157	1.157	1.158	1.158	1.179	1.179	1.183	1.183	1.183	1.183	1.185	1.185
17	1.154	1.178	1.111	1.132	1.269	1.279	1.156	1.155	1.156	1.155	1.156	1.155	1.157	1.155	1.220	1.223	1.224	1.227	1.224	1.226	1.225	1.229
18	1.181	1.168	1.135	1.124	1.239	1.237	1.143	1.145	1.144	1.144	1.144	1.144	1.143	1.143	1.195	1.199	1.200	1.202	1.201	1.203	1.203	1.207
19	1.170	1.160	1.119	1.116	1.189	1.185	1.131	1.131	1.130	1.131	1.131	1.132	1.131	1.131	1.163	1.163	1.164	1.164	1.167	1.167	1.170	1.170
20	1.163	1.174	1.113	1.127	1.208	1.215	1.143	1.144	1.144	1.143	1.144	1.143	1.143	1.141	1.184	1.186	1.189	1.190	1.189	1.189	1.188	1.190
21	1.178	1.170	1.137	1.129	1.231	1.226	1.147	1.146	1.147	1.147	1.148	1.148	1.148	1.147	1.192	1.193	1.196	1.196	1.197	1.198	1.197	1.198
22	1.204	1.204	1.159	1.159	1.223	1.223	1.169	1.169	1.171	1.171	1.172	1.171	1.170	1.170	1.194	1.194	1.198	1.198	1.199	1.199	1.201	1.201

Table 11.14: 2015 – 2051 Highway Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.304	1.259	1.229	1.202	1.387	1.376	1.224	1.228	1.225	1.226	1.223	1.225	1.222	1.223	1.306	1.309	1.309	1.310	1.308	1.309	1.306	1.307
2	1.154	1.267	1.091	1.206	1.293	1.370	1.231	1.230	1.231	1.231	1.232	1.231	1.232	1.230	1.300	1.308	1.302	1.311	1.303	1.310	1.307	1.310
3	1.283	1.263	1.213	1.193	1.320	1.307	1.217	1.217	1.218	1.217	1.218	1.217	1.217	1.215	1.265	1.267	1.268	1.269	1.269	1.271	1.271	1.275
4	1.270	1.233	1.190	1.174	1.299	1.292	1.196	1.196	1.196	1.195	1.196	1.196	1.196	1.196	1.251	1.252	1.254	1.255	1.254	1.255	1.256	1.257
5	1.305	1.269	1.241	1.206	1.352	1.341	1.225	1.227	1.226	1.229	1.223	1.228	1.225	1.226	1.286	1.290	1.292	1.298	1.290	1.298	1.293	1.298
6	1.267	1.254	1.218	1.196	1.293	1.289	1.212	1.214	1.213	1.213	1.212	1.214	1.212	1.212	1.252	1.253	1.256	1.256	1.256	1.257	1.256	1.257
7	1.280	1.290	1.221	1.224	1.347	1.349	1.242	1.243	1.244	1.243	1.244	1.242	1.240	1.238	1.298	1.303	1.301	1.304	1.301	1.304	1.302	1.306
8	1.382	1.265	1.312	1.204	1.497	1.405	1.228	1.232	1.229	1.233	1.230	1.233	1.231	1.232	1.307	1.313	1.310	1.317	1.311	1.318	1.310	1.313
9	1.234	1.243	1.184	1.186	1.377	1.359	1.210	1.210	1.211	1.210	1.211	1.210	1.211	1.209	1.288	1.291	1.293	1.296	1.293	1.296	1.296	1.297
10	1.266	1.264	1.204	1.201	1.347	1.345	1.226	1.226	1.226	1.226	1.227	1.228	1.227	1.226	1.292	1.292	1.296	1.295	1.296	1.296	1.297	1.297
11	1.229	1.272	1.163	1.198	1.423	1.447	1.243	1.240	1.243	1.240	1.243	1.240	1.244	1.241	1.354	1.360	1.358	1.363	1.358	1.362	1.356	1.363
12	1.380	1.309	1.340	1.239	1.516	1.448	1.268	1.279	1.265	1.278	1.263	1.277	1.265	1.277	1.376	1.372	1.378	1.373	1.374	1.370	1.372	1.371
13	1.137	1.244	1.075	1.186	1.253	1.336	1.208	1.211	1.210	1.211	1.211	1.211	1.210	1.210	1.283	1.289	1.288	1.293	1.288	1.292	1.295	1.296
14	1.344	1.344	1.268	1.268	1.345	1.345	1.281	1.281	1.281	1.281	1.281	1.281	1.281	1.281	1.309	1.309	1.312	1.312	1.312	1.312	1.311	1.311
15	1.303	1.299	1.242	1.239	1.332	1.329	1.252	1.252	1.252	1.252	1.253	1.253	1.252	1.251	1.291	1.291	1.293	1.294	1.293	1.294	1.293	1.294
16	1.314	1.314	1.241	1.241	1.308	1.308	1.251	1.251	1.251	1.251	1.251	1.251	1.252	1.252	1.271	1.271	1.275	1.275	1.275	1.275	1.277	1.277
17	1.249	1.281	1.185	1.212	1.377	1.395	1.244	1.242	1.244	1.242	1.243	1.241	1.245	1.242	1.322	1.325	1.325	1.328	1.324	1.327	1.325	1.328
18	1.273	1.254	1.207	1.193	1.346	1.344	1.218	1.221	1.219	1.220	1.219	1.220	1.218	1.218	1.287	1.292	1.292	1.295	1.292	1.295	1.294	1.300
19	1.271	1.258	1.199	1.196	1.264	1.257	1.212	1.212	1.210	1.211	1.212	1.213	1.211	1.211	1.239	1.238	1.238	1.238	1.241	1.242	1.244	1.245
20	1.255	1.269	1.186	1.204	1.315	1.323	1.225	1.226	1.226	1.225	1.226	1.224	1.225	1.222	1.281	1.283	1.285	1.287	1.285	1.286	1.284	1.286
21	1.283	1.272	1.224	1.214	1.359	1.352	1.239	1.238	1.239	1.239	1.240	1.240	1.240	1.239	1.303	1.304	1.307	1.307	1.308	1.308	1.307	1.308
22	1.317	1.317	1.252	1.252	1.353	1.353	1.266	1.267	1.269	1.269	1.270	1.269	1.268	1.268	1.308	1.308	1.312	1.312	1.312	1.312	1.314	1.314

Table 11.15: 2015 – 2023 Rail Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.042	1.070	1.040	1.057	1.034	1.052	1.057	1.076	1.057	1.073	1.061	1.067	1.058	1.079	1.068	1.073	1.063	1.079	1.067	1.070	1.058	1.075
2	1.032	1.073	1.004	1.028	1.024	1.022	1.058	1.047	1.060	1.044	1.060	1.045	1.060	1.039	1.055	1.048	1.060	1.044	1.056	1.043	1.060	1.041
3	1.061	1.070	1.047	1.055	1.022	1.038	1.068	1.083	1.073	1.078	1.080	1.071	1.071	1.068	1.069	1.084	1.070	1.077	1.075	1.074	1.069	1.069
4	1.037	1.043	1.030	1.032	1.007	1.014	1.041	1.040	1.040	1.043	1.039	1.043	1.044	1.040	1.046	1.044	1.048	1.050	1.039	1.050	1.047	1.043
5	1.068	1.106	1.063	1.086	1.042	1.073	1.085	1.084	1.072	1.107	1.067	1.097	1.075	1.102	1.084	1.071	1.070	1.113	1.068	1.090	1.084	1.079
6	1.061	1.075	1.043	1.070	1.007	1.014	1.078	1.073	1.067	1.074	1.061	1.075	1.066	1.071	1.063	1.060	1.051	1.063	1.048	1.060	1.049	1.063
7	1.066	1.097	1.051	1.074	1.038	1.049	1.068	1.074	1.071	1.073	1.069	1.090	1.092	1.077	1.062	1.072	1.067	1.080	1.067	1.073	1.078	1.076
8	1.106	1.149	1.090	1.087	1.097	1.091	1.070	1.118	1.078	1.110	1.087	1.099	1.096	1.127	1.074	1.112	1.091	1.111	1.098	1.109	1.109	1.133
9	1.031	1.043	1.005	1.035	1.035	1.032	1.047	1.050	1.046	1.049	1.044	1.046	1.045	1.047	1.056	1.061	1.056	1.061	1.049	1.055	1.054	1.054
10	1.043	1.043	1.041	1.042	1.030	1.028	1.054	1.052	1.047	1.047	1.051	1.051	1.050	1.055	1.059	1.059	1.059	1.059	1.056	1.056	1.056	1.061
11	1.048	1.071	1.015	1.053	1.041	1.063	1.071	1.064	1.070	1.066	1.069	1.064	1.066	1.065	1.082	1.075	1.086	1.079	1.081	1.075	1.083	1.077
12	1.132	1.144	1.092	1.116	1.076	1.100	1.107	1.121	1.112	1.120	1.117	1.116	1.120	1.116	1.096	1.115	1.108	1.119	1.111	1.110	1.115	1.107
13	1.033	1.050	1.002	1.038	1.013	1.040	1.059	1.056	1.060	1.052	1.063	1.049	1.069	1.056	1.069	1.067	1.074	1.069	1.073	1.066	1.081	1.071
14	1.061	1.061	1.069	1.069	1.025	1.025	1.081	1.081	1.079	1.079	1.080	1.080	1.082	1.082	1.069	1.069	1.070	1.070	1.067	1.067	1.070	1.070
15	1.049	1.055	1.051	1.057	1.020	1.025	1.070	1.071	1.069	1.069	1.069	1.069	1.070	1.071	1.061	1.063	1.063	1.064	1.061	1.060	1.064	1.064
16	1.041	1.041	1.044	1.044	1.022	1.022	1.057	1.057	1.055	1.055	1.055	1.055	1.058	1.058	1.055	1.055	1.058	1.058	1.056	1.056	1.058	1.058
17	1.053	1.075	1.027	1.047	1.034	1.042	1.061	1.058	1.064	1.059	1.063	1.058	1.064	1.059	1.062	1.060	1.067	1.066	1.064	1.061	1.068	1.064
18	1.064	1.057	1.040	1.043	1.035	1.027	1.058	1.058	1.059	1.060	1.061	1.059	1.058	1.057	1.060	1.066	1.068	1.069	1.061	1.071	1.060	1.068
19	1.042	1.035	1.035	1.026	1.020	1.013	1.051	1.047	1.045	1.045	1.041	1.049	1.044	1.050	1.051	1.048	1.050	1.050	1.042	1.050	1.046	1.051
20	1.043	1.069	1.029	1.055	1.015	1.031	1.073	1.074	1.070	1.076	1.068	1.077	1.065	1.080	1.080	1.077	1.078	1.082	1.070	1.078	1.063	1.084
21	1.045	1.065	1.031	1.060	1.035	1.050	1.061	1.072	1.058	1.070	1.059	1.069	1.059	1.067	1.067	1.076	1.069	1.078	1.067	1.068	1.068	1.073
22	1.066	1.068	1.050	1.064	1.035	1.036	1.079	1.076	1.082	1.083	1.084	1.076	1.084	1.079	1.071	1.070	1.072	1.074	1.071	1.067	1.072	1.070

Table 11.16: 2015 – 2031 Rail Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.077	1.123	1.076	1.107	1.101	1.132	1.107	1.138	1.107	1.131	1.113	1.121	1.109	1.142	1.135	1.146	1.125	1.153	1.132	1.138	1.115	1.142
2	1.045	1.108	1.009	1.049	1.075	1.079	1.094	1.081	1.096	1.075	1.098	1.077	1.097	1.065	1.104	1.095	1.112	1.088	1.106	1.087	1.112	1.082
3	1.111	1.117	1.094	1.096	1.064	1.088	1.117	1.141	1.125	1.133	1.135	1.121	1.120	1.116	1.121	1.145	1.123	1.136	1.131	1.130	1.122	1.119
4	1.072	1.080	1.069	1.070	1.049	1.059	1.081	1.082	1.080	1.086	1.079	1.085	1.086	1.082	1.089	1.089	1.093	1.096	1.080	1.097	1.091	1.085
5	1.102	1.152	1.094	1.126	1.093	1.133	1.129	1.128	1.114	1.158	1.105	1.145	1.117	1.153	1.134	1.119	1.117	1.176	1.112	1.145	1.133	1.128
6	1.085	1.107	1.060	1.097	1.044	1.055	1.116	1.110	1.102	1.111	1.094	1.112	1.101	1.107	1.105	1.103	1.090	1.107	1.085	1.101	1.086	1.105
7	1.093	1.149	1.079	1.121	1.091	1.116	1.111	1.123	1.116	1.120	1.112	1.148	1.148	1.126	1.113	1.128	1.120	1.138	1.119	1.129	1.135	1.132
8	1.157	1.212	1.139	1.131	1.184	1.177	1.111	1.177	1.122	1.164	1.133	1.150	1.146	1.188	1.131	1.180	1.153	1.178	1.162	1.173	1.176	1.204
9	1.048	1.076	1.008	1.070	1.087	1.088	1.087	1.093	1.086	1.089	1.082	1.084	1.084	1.088	1.108	1.116	1.108	1.115	1.097	1.105	1.104	1.105
10	1.077	1.079	1.077	1.080	1.076	1.073	1.098	1.096	1.091	1.090	1.095	1.095	1.095	1.102	1.108	1.109	1.109	1.110	1.104	1.104	1.106	1.110
11	1.065	1.111	1.014	1.087	1.102	1.144	1.114	1.106	1.113	1.108	1.112	1.107	1.110	1.108	1.152	1.139	1.157	1.145	1.148	1.136	1.151	1.140
12	1.195	1.211	1.138	1.172	1.165	1.201	1.161	1.182	1.168	1.179	1.175	1.174	1.179	1.174	1.164	1.192	1.179	1.197	1.182	1.181	1.186	1.176
13	1.031	1.079	0.989	1.066	1.036	1.086	1.098	1.093	1.099	1.086	1.104	1.081	1.113	1.092	1.118	1.115	1.128	1.119	1.126	1.113	1.138	1.122
14	1.104	1.104	1.120	1.120	1.056	1.056	1.141	1.141	1.139	1.139	1.139	1.139	1.144	1.144	1.118	1.118	1.119	1.119	1.115	1.115	1.119	1.119
15	1.083	1.093	1.091	1.102	1.052	1.059	1.121	1.124	1.119	1.119	1.120	1.119	1.122	1.124	1.107	1.110	1.108	1.110	1.106	1.104	1.109	1.110
16	1.082	1.082	1.094	1.094	1.054	1.054	1.117	1.117	1.113	1.113	1.113	1.113	1.119	1.119	1.108	1.108	1.113	1.113	1.109	1.109	1.111	1.111
17	1.077	1.115	1.043	1.081	1.091	1.106	1.102	1.100	1.106	1.101	1.104	1.098	1.108	1.101	1.116	1.113	1.123	1.120	1.118	1.112	1.122	1.115
18	1.106	1.091	1.074	1.077	1.093	1.078	1.096	1.097	1.098	1.100	1.101	1.098	1.099	1.096	1.110	1.120	1.123	1.126	1.112	1.127	1.112	1.122
19	1.084	1.071	1.084	1.072	1.053	1.045	1.103	1.097	1.094	1.094	1.089	1.098	1.092	1.101	1.093	1.091	1.094	1.095	1.084	1.094	1.086	1.094
20	1.069	1.112	1.053	1.093	1.054	1.080	1.120	1.121	1.117	1.125	1.115	1.127	1.111	1.133	1.137	1.134	1.134	1.141	1.124	1.137	1.111	1.147
21	1.081	1.114	1.065	1.111	1.080	1.107	1.113	1.129	1.107	1.127	1.109	1.125	1.110	1.121	1.122	1.139	1.126	1.141	1.123	1.124	1.124	1.132
22	1.105	1.107	1.090	1.105	1.081	1.081	1.133	1.130	1.135	1.136	1.137	1.129	1.138	1.133	1.125	1.124	1.125	1.127	1.122	1.118	1.124	1.122

Table 11.17: 2015 – 2038 Rail Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.113	1.177	1.116	1.160	1.162	1.203	1.158	1.200	1.157	1.191	1.165	1.177	1.159	1.206	1.195	1.211	1.180	1.220	1.191	1.197	1.162	1.201
2	1.062	1.141	1.015	1.065	1.106	1.113	1.126	1.111	1.128	1.102	1.131	1.106	1.130	1.090	1.139	1.130	1.150	1.120	1.142	1.119	1.149	1.111
3	1.158	1.162	1.135	1.133	1.101	1.132	1.163	1.196	1.174	1.185	1.186	1.168	1.167	1.161	1.167	1.201	1.169	1.187	1.180	1.178	1.167	1.161
4	1.107	1.117	1.106	1.105	1.087	1.099	1.118	1.120	1.117	1.126	1.116	1.124	1.125	1.119	1.127	1.129	1.131	1.137	1.116	1.139	1.130	1.121
5	1.134	1.205	1.120	1.169	1.132	1.188	1.174	1.173	1.156	1.215	1.144	1.196	1.159	1.207	1.181	1.159	1.157	1.236	1.150	1.192	1.178	1.169
6	1.100	1.127	1.070	1.114	1.078	1.090	1.140	1.134	1.123	1.135	1.114	1.136	1.122	1.129	1.138	1.136	1.119	1.139	1.111	1.131	1.112	1.135
7	1.114	1.185	1.095	1.149	1.128	1.165	1.141	1.158	1.148	1.151	1.144	1.188	1.183	1.160	1.149	1.170	1.157	1.181	1.155	1.168	1.173	1.171
8	1.202	1.279	1.178	1.175	1.247	1.248	1.150	1.237	1.164	1.221	1.177	1.203	1.195	1.253	1.177	1.243	1.205	1.237	1.216	1.230	1.235	1.269
9	1.067	1.111	1.019	1.106	1.124	1.133	1.127	1.137	1.127	1.131	1.121	1.123	1.123	1.129	1.153	1.164	1.152	1.162	1.137	1.147	1.147	1.148
10	1.111	1.115	1.110	1.118	1.114	1.113	1.141	1.140	1.132	1.131	1.139	1.138	1.139	1.147	1.151	1.155	1.152	1.153	1.145	1.145	1.148	1.152
11	1.089	1.150	1.024	1.118	1.150	1.201	1.158	1.147	1.157	1.148	1.155	1.146	1.154	1.150	1.208	1.191	1.213	1.197	1.202	1.185	1.206	1.190
12	1.252	1.273	1.180	1.223	1.234	1.281	1.210	1.239	1.220	1.235	1.228	1.228	1.233	1.228	1.221	1.257	1.239	1.262	1.241	1.241	1.246	1.233
13	1.046	1.107	0.995	1.093	1.052	1.119	1.137	1.129	1.137	1.120	1.145	1.114	1.155	1.127	1.158	1.156	1.171	1.161	1.167	1.151	1.182	1.163
14	1.146	1.146	1.170	1.170	1.085	1.085	1.201	1.201	1.197	1.197	1.198	1.198	1.204	1.204	1.166	1.166	1.165	1.165	1.160	1.160	1.164	1.164
15	1.116	1.130	1.127	1.142	1.083	1.092	1.170	1.174	1.165	1.167	1.168	1.167	1.171	1.173	1.150	1.155	1.150	1.152	1.146	1.145	1.151	1.152
16	1.123	1.123	1.140	1.140	1.079	1.079	1.174	1.174	1.168	1.168	1.169	1.169	1.177	1.177	1.153	1.153	1.156	1.156	1.152	1.152	1.154	1.154
17	1.102	1.153	1.058	1.109	1.134	1.153	1.139	1.137	1.144	1.138	1.142	1.135	1.149	1.140	1.159	1.156	1.166	1.163	1.159	1.152	1.165	1.155
18	1.137	1.120	1.099	1.100	1.130	1.110	1.129	1.129	1.131	1.134	1.135	1.132	1.132	1.129	1.145	1.158	1.160	1.164	1.147	1.166	1.147	1.158
19	1.124	1.107	1.129	1.115	1.084	1.077	1.152	1.145	1.140	1.140	1.133	1.145	1.137	1.150	1.130	1.128	1.130	1.131	1.120	1.129	1.119	1.128
20	1.097	1.159	1.079	1.131	1.085	1.123	1.166	1.169	1.163	1.175	1.162	1.177	1.157	1.188	1.184	1.184	1.181	1.191	1.169	1.185	1.148	1.201
21	1.116	1.161	1.097	1.161	1.121	1.163	1.164	1.185	1.155	1.182	1.158	1.179	1.159	1.174	1.173	1.198	1.177	1.199	1.174	1.175	1.174	1.185
22	1.142	1.144	1.125	1.141	1.121	1.121	1.182	1.179	1.184	1.185	1.186	1.178	1.188	1.183	1.174	1.173	1.173	1.175	1.168	1.164	1.171	1.168

Table 11.18: 2015 – 2051 Rail Car Available Trip End Growth at Balancing Area Level

BA	HBEB 24 hr		HBW 24 hr		HBO 24 hr		NHBEB AM		HBEB IP		NHBEB PM		NHBEB OP		NHBO AM		NHBO IP		NHBO PM		NHBO OP	
	P	A	P	A	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D	O	D
1	1.177	1.291	1.187	1.257	1.256	1.325	1.257	1.324	1.256	1.311	1.269	1.288	1.258	1.335	1.311	1.335	1.284	1.348	1.300	1.315	1.249	1.314
2	1.114	1.209	1.044	1.089	1.134	1.146	1.187	1.165	1.190	1.151	1.194	1.157	1.193	1.137	1.195	1.182	1.207	1.168	1.195	1.165	1.206	1.155
3	1.247	1.254	1.202	1.203	1.162	1.211	1.250	1.304	1.267	1.287	1.288	1.258	1.258	1.249	1.256	1.309	1.259	1.288	1.276	1.272	1.258	1.246
4	1.179	1.195	1.173	1.171	1.149	1.166	1.199	1.199	1.194	1.208	1.193	1.206	1.205	1.198	1.208	1.209	1.208	1.217	1.185	1.219	1.206	1.191
5	1.196	1.315	1.172	1.251	1.202	1.288	1.265	1.263	1.238	1.326	1.221	1.298	1.243	1.314	1.274	1.240	1.235	1.352	1.225	1.287	1.265	1.252
6	1.168	1.206	1.128	1.182	1.133	1.149	1.220	1.213	1.198	1.214	1.185	1.215	1.195	1.204	1.215	1.214	1.187	1.215	1.175	1.203	1.176	1.207
7	1.177	1.281	1.151	1.225	1.171	1.235	1.212	1.241	1.223	1.229	1.217	1.287	1.276	1.243	1.213	1.246	1.223	1.261	1.220	1.242	1.249	1.245
8	1.298	1.431	1.260	1.260	1.335	1.353	1.226	1.365	1.248	1.339	1.268	1.310	1.294	1.390	1.255	1.359	1.294	1.348	1.310	1.332	1.338	1.391
9	1.128	1.183	1.060	1.168	1.189	1.209	1.207	1.220	1.205	1.209	1.199	1.200	1.199	1.212	1.238	1.254	1.232	1.248	1.213	1.226	1.223	1.230
10	1.182	1.187	1.170	1.182	1.181	1.182	1.222	1.222	1.211	1.210	1.221	1.219	1.222	1.233	1.236	1.243	1.235	1.237	1.224	1.224	1.229	1.234
11	1.153	1.230	1.055	1.176	1.199	1.274	1.244	1.223	1.242	1.224	1.240	1.221	1.241	1.229	1.303	1.276	1.306	1.283	1.289	1.264	1.295	1.271
12	1.362	1.394	1.252	1.314	1.316	1.383	1.298	1.343	1.311	1.334	1.322	1.324	1.329	1.327	1.306	1.358	1.330	1.364	1.333	1.333	1.341	1.322
13	1.101	1.171	1.028	1.143	1.089	1.176	1.215	1.202	1.215	1.189	1.228	1.180	1.241	1.199	1.235	1.235	1.255	1.241	1.248	1.224	1.268	1.241
14	1.228	1.228	1.242	1.242	1.161	1.161	1.305	1.305	1.299	1.299	1.300	1.300	1.311	1.311	1.271	1.271	1.265	1.265	1.254	1.254	1.261	1.261
15	1.188	1.207	1.188	1.207	1.153	1.167	1.264	1.269	1.256	1.259	1.260	1.259	1.265	1.268	1.246	1.253	1.242	1.246	1.235	1.232	1.241	1.243
16	1.199	1.199	1.211	1.211	1.116	1.116	1.273	1.273	1.265	1.265	1.265	1.265	1.277	1.277	1.229	1.229	1.229	1.229	1.222	1.222	1.225	1.225
17	1.165	1.231	1.097	1.161	1.176	1.207	1.210	1.208	1.218	1.207	1.214	1.202	1.228	1.212	1.227	1.223	1.234	1.230	1.224	1.213	1.234	1.217
18	1.205	1.185	1.151	1.148	1.189	1.162	1.195	1.196	1.199	1.203	1.204	1.200	1.200	1.196	1.214	1.234	1.232	1.239	1.213	1.241	1.213	1.229
19	1.201	1.177	1.209	1.189	1.121	1.113	1.243	1.234	1.226	1.226	1.215	1.232	1.220	1.240	1.196	1.194	1.191	1.193	1.178	1.191	1.175	1.188
20	1.160	1.263	1.135	1.210	1.141	1.209	1.256	1.265	1.253	1.276	1.254	1.280	1.249	1.305	1.279	1.286	1.273	1.292	1.259	1.282	1.222	1.315
21	1.187	1.257	1.155	1.249	1.194	1.257	1.262	1.294	1.248	1.290	1.252	1.285	1.254	1.278	1.274	1.313	1.276	1.310	1.270	1.272	1.271	1.288
22	1.222	1.224	1.190	1.209	1.200	1.199	1.283	1.279	1.282	1.284	1.285	1.277	1.290	1.285	1.277	1.277	1.272	1.274	1.262	1.258	1.267	1.265

National transport model (NTM)

11.3.21 Trip end growth factors for LGVs and HGVs have been derived using Road Traffic Forecast (2015) data, which is based on output from the DfT's National Transport Model. The RTF15 data only extends to 2040, so for the 2051 forecast year the growth has been extrapolated from the forecast 2035 to 2040 growth rates.

11.3.22 Table 11.19 shows the RTF15 growth factors for LGVs and HGVs. In the absence of RTF15 forecasts for Scotland, growth factors for the north-east region have been adopted as a proxy for Scotland.

Table 11.19: RTF15 Goods Vehicle Growth Rates from 2015

	LGV				HGV			
Region	2023	2031	2038	2051	2023	2031	2038	2051
North East	1.221	1.432	1.597	1.938	1.054	1.108	1.159	1.264
Yorks & Humber	1.222	1.433	1.598	1.937	1.061	1.122	1.181	1.300
East Midlands	1.221	1.433	1.600	1.944	1.060	1.118	1.176	1.297
Eastern England	1.221	1.432	1.598	1.942	1.085	1.169	1.250	1.423
South East	1.220	1.432	1.598	1.939	1.085	1.168	1.249	1.423
London	1.212	1.414	1.569	1.890	1.052	1.103	1.152	1.252
South West	1.222	1.434	1.601	1.946	1.053	1.106	1.158	1.264
West Midlands	1.221	1.433	1.598	1.940	1.061	1.121	1.180	1.300
North West	1.220	1.431	1.595	1.934	1.057	1.116	1.173	1.288
Wales	1.224	1.438	1.605	1.952	1.058	1.115	1.172	1.291

Treatment of airport and ports growth

11.3.23 Future year forecast airport passenger trip matrices for car trips and rail trips were produced using the same methodology used to create the base year matrices for the SWRTM. This utilises DfT National Air Passenger Allocation Model (NAPALM) data, which forecasts (for 2021, 2031 and 2041) the total annual air passenger trips between 455 zones and each of the four airports explicitly included within the SWRTM (Bournemouth Airport, Bristol Airport, Exeter Airport and Southampton Airport). In accordance with the methodology adopted for the RTMs, air passenger demand for 2051 was derived using DfT UK Aviation Forecasts of non-transfer air passenger growth between 2040-2050[4]. Further detail on the derivation of airport passenger trip matrices is set out in the SWRTM Model Validation Report. The future year airport passenger trips are added to the forecast demand after the application of general growth rates discussed above.

[4] UK Aviation Forecasts, DfT – August 2011

11.3.24 Forecast traffic growth at the three sea ports explicitly included in the SWRTM (Bristol/Avonmouth, Portsmouth and Southampton) has been provided from the RTM Forecasting Technical Consistency Group.

11.3.25 As per SWRTM zero growth in car trips at all ports was assumed. In addition, growth in HGV trips of 1.02%, 2.23% and 2.48% per annum were assumed for Bristol, Portsmouth and Southampton. For LGV traffic at the sea ports, an England-wide growth factor derived from Regional Traffic Forecast (2015) data was assumed for each forecast year. These are given in Table 11.20.

Table 11.20: LGV sea port growth factors derived from RTF 2015

Year	LGV sea port growth factor
2023	1.221
2031	1.432
2038	1.596
2051	1.936

11.4 Forecast matrix development – summer

11.4.1 Summer forecast matrix derivation was based on the following approach.

- Variable demand modelling was not required as the standard VDM approach is not capable of representing holiday period demand responses to changes in travel costs. Therefore, forecasting was purely based on reference demand growth and fixed assignments.
- No spatial representation of developments given the difficulty in deriving summer trip patterns for specific developments.
- Summer trip end growth for cars was obtained from NTEM7.2 and distributed using the furnessing process that assumes base trip patterns. These were derived from Saturday and Sunday data only (NTEM doesn't disaggregate by weekday or month, so to include Fridays it would be necessary to assume that a summer Friday is similar to a typical average weekday. Also, Saturday and Sunday growth rates are for the whole day, whereas weekday growth rates are for defined time periods.)
- Summer trip growth for LGVs and HGVs was derived from RTF15 assuming summer growth is similar to weekday inter-peak.

11.5 Forecast matrix development – low and high growth

11.5.1 As per WebTAG Unit M4, uncertainty around the core scenario was tested using low and high growth sensitivity tests. These sensitivity tests reflect uncertainty around annual forecasts from the national transport model.

11.5.2 Low and high growth reference case matrices were derived by adding/subtracting a proportion of base demand from the future year core scenario highway and PT reference matrices. The proportion of base demand to be added/subtracted was calculated using 2.5%*SQRT (forecast year- base year) for both highway and PT. 2.5% was used for both highway and PT in order not to underestimate uncertainty in forecasts.

11.6 Derivation of flows/speeds for other appraisals

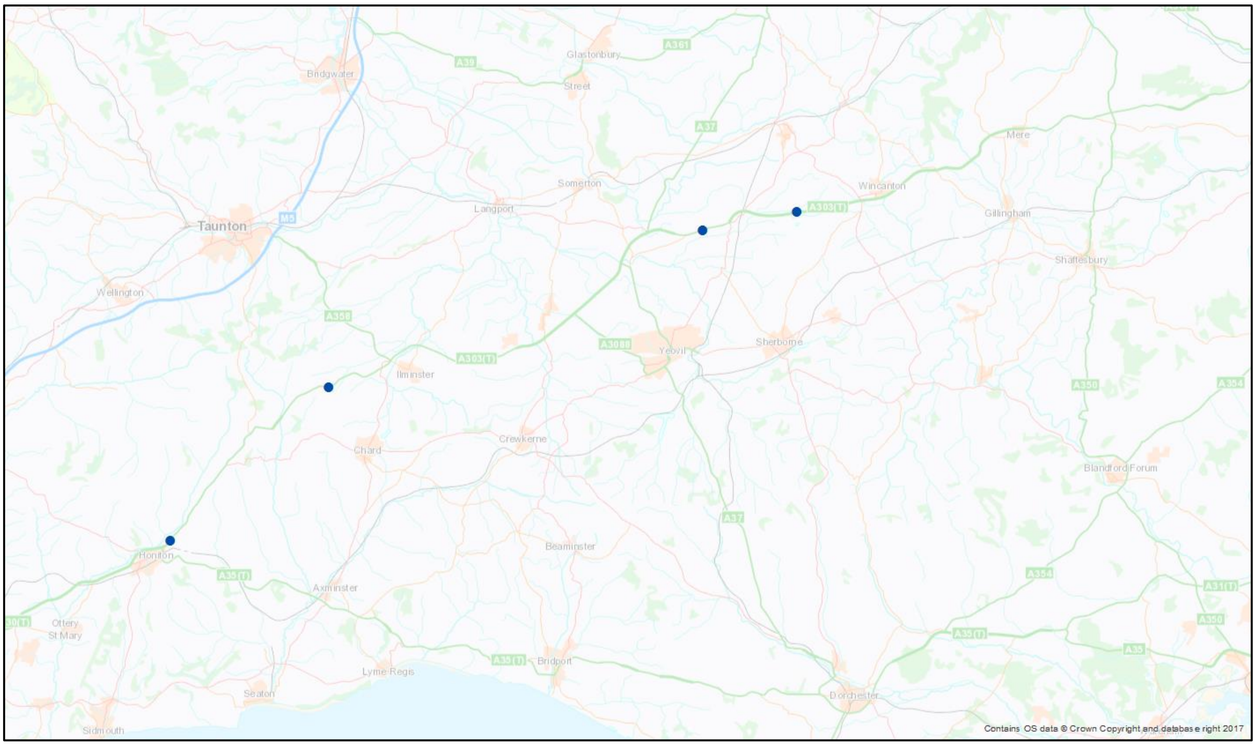
11.6.1 The model produces traffic outputs for an average March weekday base in 2015. For the purposes of scheme appraisal, for example for air quality and noise, traffic forecasts are required for a number of different bases. These include

- Annual Average Daily Traffic – AADT (24 hr daily traffic flow averaged for a whole 365 days in a year).
- Annual Average Weekday Traffic – AAWT
- 18hr AAWT (06:00 – 24:00)
- 12hr AAWT day-time (07:00 – 19:00)
- 8hr AAWT night-time (23:00 – 07:00)
- 4hr AAWT Evening (19:00 – 23:00)

11.6.2 The 24 hr March weekday traffic flows can be compiled by adding traffic flows from the calibrated time-period models (AM, Inter-peak and PM) together with the off-peak flows derived for the purpose of variable demand modelling and appraisal. In doing this the periods are assumed to represent the following time periods so that average hourly flows should be factored accordingly: AM 07:00 – 10:00, IP 10:00 – 16:00, PM 16:00 – 19:00 and OP 19:00 – 07:00.

11.6.3 Table 11.21 provides the factors to convert from average March weekday base to the different bases listed above. These have been derived from a selection of SRN count sites shown in Figure 11.9.

Figure 11.9: SRN count sites



Source: MMSJV. This Map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2016.

Table 11.21: Base Conversion Factors from Average March Weekday

Base	Factor
AADT	1.064
AAWT	1.089
18hr AAWT (06:00 – 24:00)	0.968
12hr AAWT (07:00 – 19:00) – Day-time	0.838
8hr AAWT (23:00 – 07:00) – Night-time	0.070
4hr AAWT (19:00 – 23:00) – Evening	0.092

11.6.4 In addition to traffic flows, pivoted traffic speeds and speed band assignment are also required for environmental appraisals for similar bases as per Interim Advice Note 185/15.

11.6.5 Speed pivoting is a process that calculates the relative difference between the base year speed and observed speed for each link and then factors up the forecast speed by the same amount.

11.6.6 Each link is also classified under a specific speed band. The speed band is dependent on the road type and forecast speed.

11.7 Forecast assignments – neutral month model

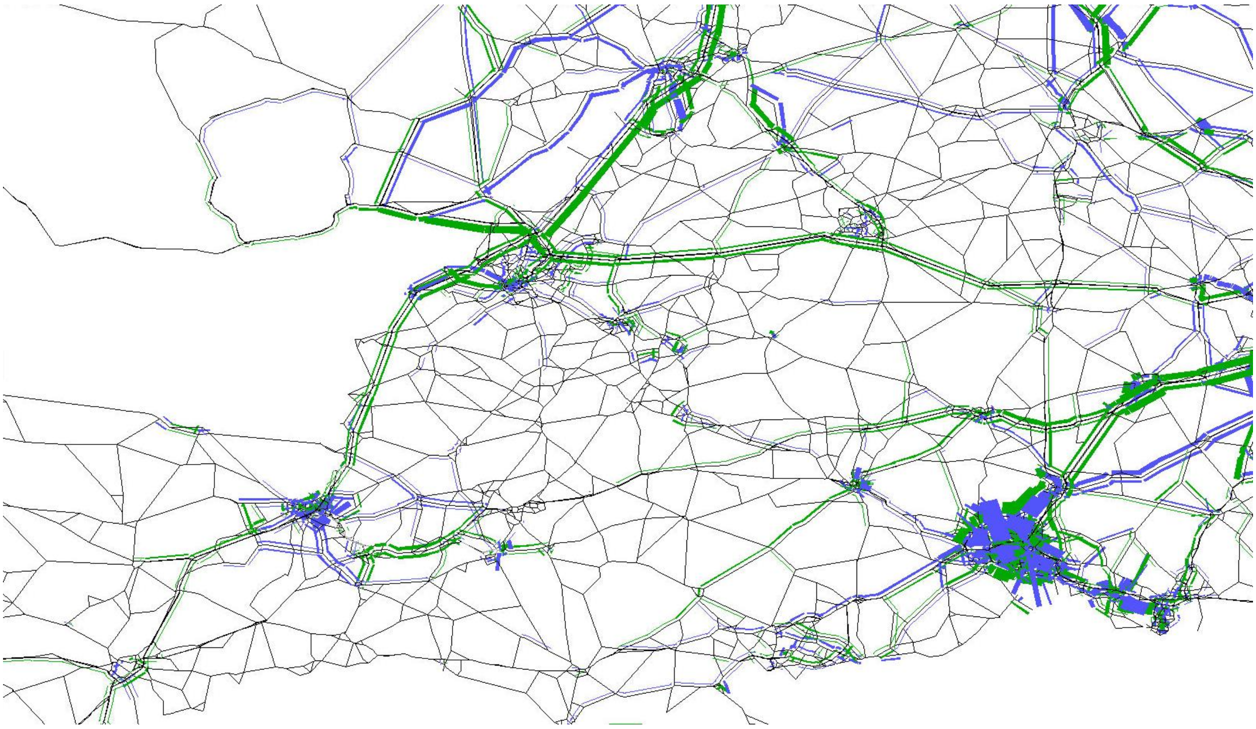
Initial checks from fixed assignments

11.7.1 Early versions of the forecast networks were tested with the base matrices to ensure that the general response to the scheme coding from the assignments appeared plausible. For this purpose, both the 2023 DM and DS networks were assigned with the base year matrices to assess the impact of the network changes.

Comparison of model outputs at network-wide level

11.7.2 Figure 11.10 shows the flow changes between the 2023 DM and the base minus for the AM Peak (using base matrices) in SATURN based on an early version of the forecast network. This showed that at a high level the response to the DM scheme coding was approximately as would be expected, with increases in flows along routes with increased capacity and some rerouting towards these corridors. In addition to DM schemes, the DM network also includes fixed speed adjustments in the buffer area and updates to PPM/PPK parameters. These account for some of the changes especially in the buffer network. However, there were also changes in flow in other locations which could not be explained by the addition of DM schemes, which led to some further assignment checks and additional network amendments later in this section.

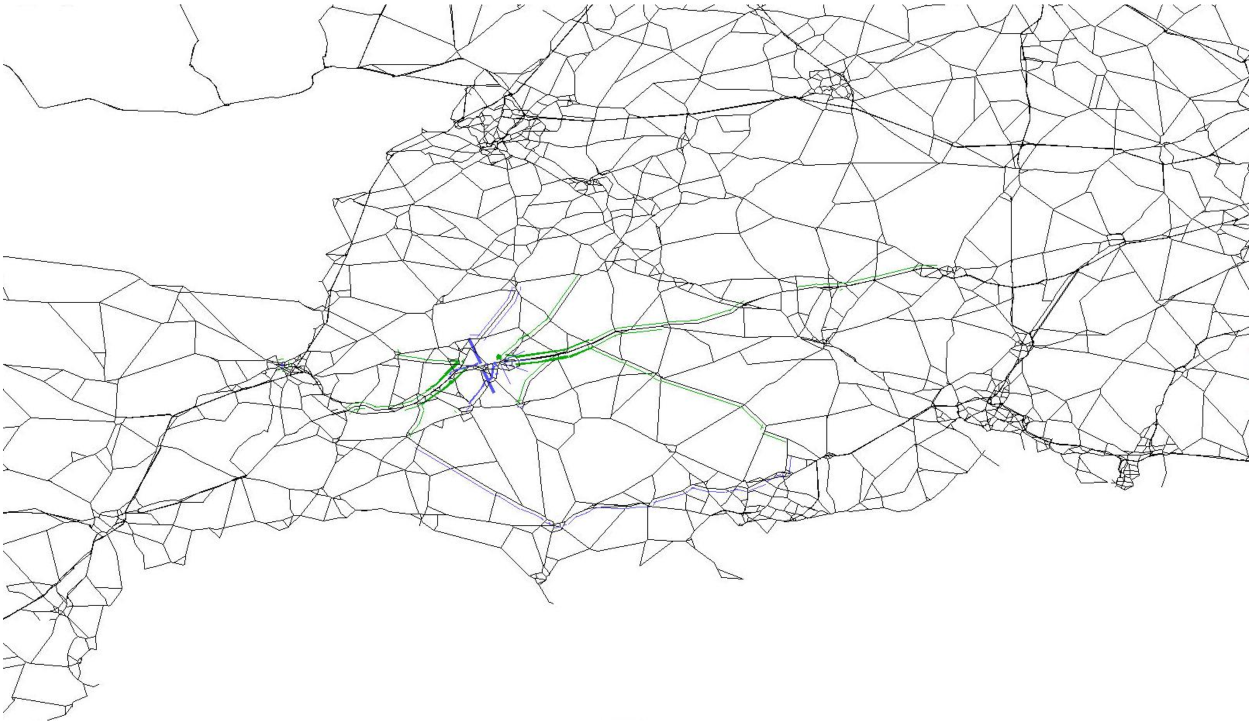
Figure 11.10: 2023 DM with 2015 demand vs base minus, AM flows



Source: MMSJV.

11.7.3 Similarly, Figure 11.11 shows the flow changes between the 2023 DM and DS assignments for the AM Peak in SATURN again using base matrices. The green bandwidths show an increase in the flow, whereas the blue bandwidths show a decrease. From these figures, it is evident that the A303 corridor becomes more attractive to both east–west and west–east direction traffic due to increased capacity. The increased traffic on the new section of the route is not shown due to the background of the network being DM here.

Figure 11.11: 2023 DM with 2015 demand vs 2023 DS with 2015 demand, AM flows

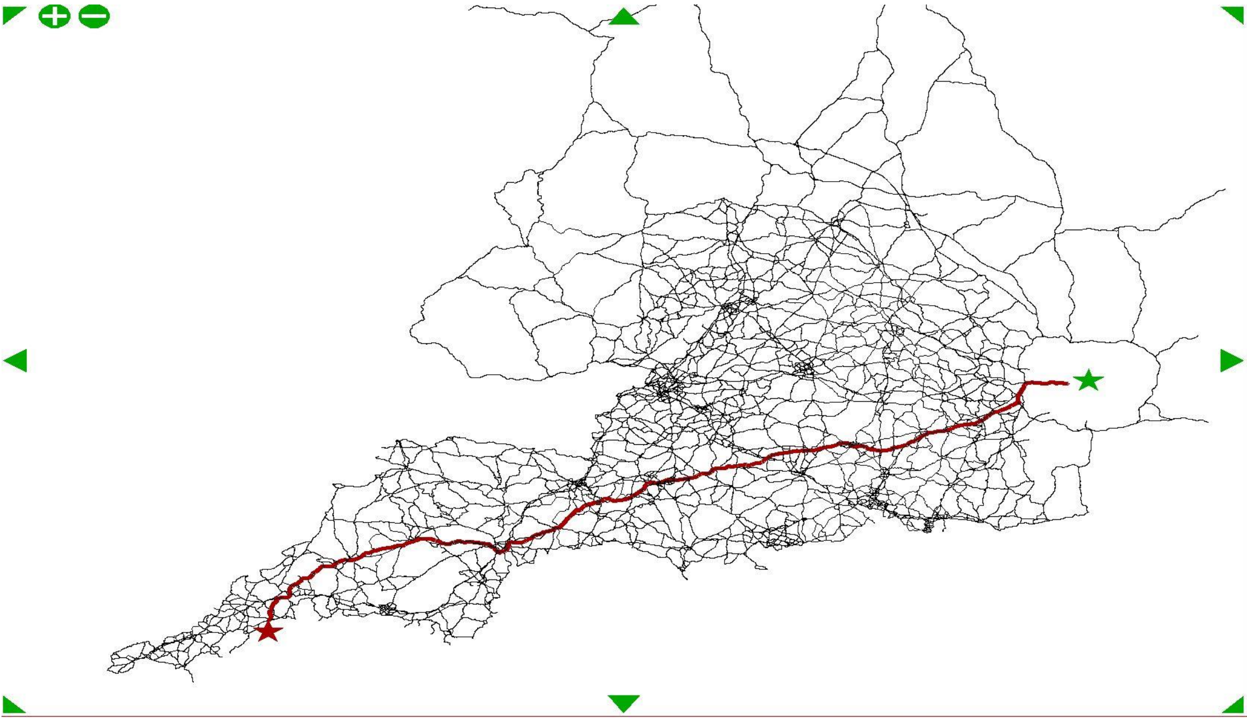


Source: MMSJV.

Comparison of traffic for key movements

11.7.4 On the A303 corridor and for the east-west direction where the route is directly affected by the proposed scheme, route choice analysis was also carried out to ascertain whether the right traffic path has been chosen. Figure 11.12 shows the route choices of a typical origin-destination (OD) pair across the east–west direction for the AM Peak with the scheme for 2023. It is evident that SATURN assigns the traffic to the new scheme.

Figure 11.12: Modelled east-west traffic route – 2023 AM peak flows



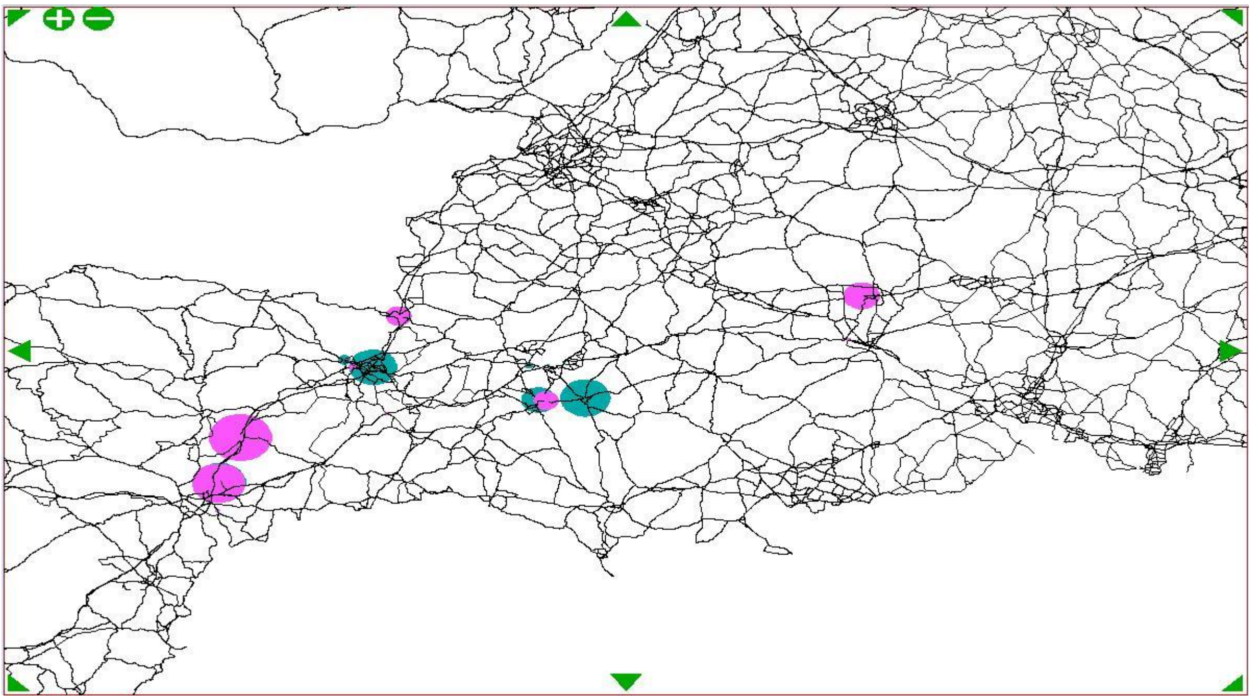
Source: MMSJV.

Further assignment checks and mitigation methods

11.7.5 Due to the presence of unexpected flow changes in some other locations, further assignment checks have been carried out. These model runs are based on corresponding forecast matrices. These found a small number of areas where the network needed some amendments, such as adding signals to M5 J27 and updates to speed-flow relationships on A303 south of Podimore to better represent a single / dual carriageway section. However, a sensitivity test was carried out implementing these alterations on the calibrated base year model and as there were no significant flow or delay differences, it was decided to implement those amendments only on the forecast networks.

11.7.6 Further assignment checks were carried out, including delay benefits (or dis-benefits) at node level between the Do Minimum and Do Something networks. It takes into account both the increase or decrease in delay and the number of vehicles that this affects. The results are displayed in Figure 11.13, where the green circles indicate a benefit in the Do Something compared to the Do Minimum and the pink circles indicate a dis-benefit. A larger circle indicates a larger benefit / dis-benefit.

Figure 11.13: Rule of the half node benefits – 2023 AM pre FCF process



Source: MMSJV.

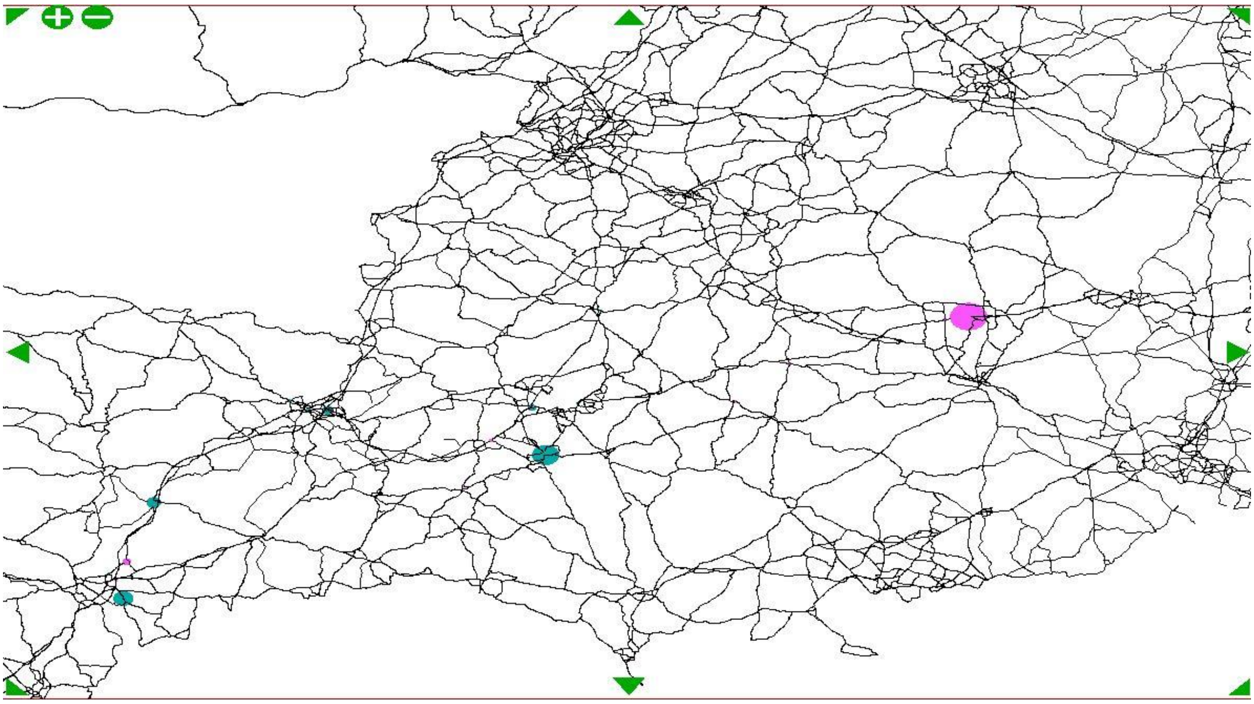
11.7.7 These results reveal that those unexpected flow changes far away from the scheme areas are mainly due to model convergence noise. Several methods have been introduced to tackle the convergence issues. First, the most problematic locations were checked and network refinements made for the forecasting years. Finally, the Fixed Cost Function (FCF) method was implemented as explained below.

11.7.8 The FCF method creates an intermediate network band which geographically sits between the central pure simulation network and the outer buffer network. The FCF transformation retains the essential geometry of the simulation network, still distinguishes between separate turning movements at each node but with fixed cost-flow curves for each turning movement. The "fixed" here means after a certain number of simulation-assignment loops and once a reasonably good level of convergence has been reached - those parameters which are used to update the travel time according the classic flow delay curve is fixed rather than recalculated at the end of each new simulation. Therefore, a useful property of the FCF is that the same network properties may be applied to both DM and DS network to minimise the noise between the two.

11.7.9 In this case, a cordon has been set up around A303 Sparkford to Ilchester scheme. The FCF network was generated in the DM model for each time period and each modelling year, which consequently converted the simulation network outside of the cordon into FCF network whilst leaving the buffer network untouched. This FCF network was then also applied to the DS model.

11.7.10 The Rule of the Half node benefit calculations following the FCF process and some network edits are displayed in Figure 11.14, at the same scale as those shown for the pre-FCF assignment in Figure 11.13. The process helped to reduce the model convergence noise.

Figure 11.14: Rule of the half node benefits – 2023 AM post FCF process and network calibration



Source: MMSJV.

Assignment checks

11.7.11 The overall average speeds extracted from SATURN are displayed in Table 11.22 for the simulation area. The speed differences between the Do Minimum (DM) and Do Something (DS) scenarios are reasonable. The scheme, by removing the single carriageway section, helps to improve the overall speed. The speed increase with scheme is small since it is measured across a large simulation area.

Table 11.22: SATURN Overall Average Speed (Km/hr)

Scenario	AM	IP	PM
Base	68.0	70.0	67.8
2023 DM	66.7	69.3	66.4
2023 DS	67.0	69.8	66.7
2031 DM	65.0	68.4	64.8
2031 DS	65.4	68.9	65.1
2038 DM	63.1	67.1	62.7
2038 DS	63.5	67.4	63.2
2051 DM	60.2	64.8	59.8
2051 DS	60.5	65.1	59.9

11.7.12 The total travel distances across the simulation network extracted from SATURN are displayed in Table 11.23. In all scenarios, there is an increase in travel distance from the Do Minimum (DM) scenario to the Do Something (DS) scenario. This is due to re-routeing to longer routes in terms of distance which incorporate the scheme and are now quicker. The differences in distance between scenarios in Table 11.23 are relatively small compared to the values themselves. This is again due to assessing the changes over the entire simulation area.

Table 11.23: SATURN Total Travel Distance (PCU.kms)

Scenario	AM	IP	PM
Base	1,402,309	1,277,333	1,424,265
2023 DM	1,677,450	1,598,242	1,734,650
2023 DS	1,687,452	1,617,394	1,749,251
2031 DM	1,895,945	1,828,656	1,969,015
2031 DS	1,912,150	1,853,018	1,993,134
2038 DM	2,040,501	1,978,612	2,121,953
2038 DS	2,058,892	2,007,425	2,144,984
2051 DM	2,251,179	2,169,205	2,328,322
2051 DS	2,272,026	2,202,539	2,359,529

11.7.13 The total travel times across the simulation network are displayed in Table 11.24. As with the average speeds and travel distances, the differences are relatively small due to the vast size of the area the times are extracted from. With one exception, each of the scenarios and forecasting years below show an increase in total travel time from the Do Minimum to the Do Something scenarios, which is due to the additional generated traffic in the Do Something compared to the Do Minimum. In other words, if the same fixed demand was assigned to the Do Minimum and Do Something networks then due to the increase in speeds in the simulation area the Do Something would produce lower PCU hrs compared to the Do Minimum.

Table 11.24: SATURN Total Travel Time (PCU.hrs/hr)

Scenario	AM	IP	PM
Base	20,609	18,256	20,996
2023 DM	25,141	23,047	26,116
2023 DS	25,196	23,188	26,233
2031 DM	29,146	26,719	30,383
2031 DS	29,250	26,911	30,607
2038 DM	32,323	29,507	33,836
2038 DS	32,434	29,763	33,920
2051 DM	37,413	33,487	38,937
2051 DS	37,543	33,812	39,423

11.8 Forecast assignments – summer model

11.8.1 Summer model forecast networks were derived by incorporating all calibration enhancements carried out for the neutral month IP model into the base summer model networks. As for the base, the summer forecast models use corresponding neutral month IP PPM and PPK parameters.

Assignment checks

11.8.2 The overall average speeds extracted from SATURN are displayed in Table 11.25 for the simulation area. The speed differences between the Do Minimum (DM) and Do Something (DS) scenarios for the summer model assignments are also reasonable. The scheme, by removing the single carriageway section, helps to improve overall speed. The speed increase with the scheme is small since it is measured across a large simulation area.

Table 11.25: SATURN Overall Average Speed (Km/hr) – summer

Scenario	Summer average peak
Base	70.1
2023 DM	70.4
2023 DS	71.0
2031 DM	70.4
2031 DS	70.9
2038 DM	69.3
2038 DS	70.0
2051 DM	66.7
2051 DS	67.4

11.8.3 The total travel distances across the simulation network extracted from SATURN are displayed in Table 11.26. In all scenarios, as with the neutral month model, there is an increase in travel distance from the Do Minimum (DM) scenario to the Do Something (DS) scenario. This is due to re-routeing to longer routes in terms of distance which incorporate the scheme and are now quicker. The differences in distance between scenarios in Table 11.26 are relatively small compared to the values themselves. This is again due to assessing the changes over the entire simulation area. It should also be noted that different trip patterns occur between summer and neutral months and that VDM was only applied in the neutral month. This results in different network statistics between the two models.

Table 11.26: SATURN Total Travel Distance (PCU.kms) – summer

Scenario	Summer average peak
Base	1,649,152
2023 DM	1,798,324
2023 DS	1,814,884
2031 DM	1,942,499
2031 DS	1,968,199
2038 DM	2,035,890
2038 DS	2,058,329
2051 DM	2,217,202
2051 DS	2,237,605

11.8.4 The total travel times across the simulation network for the summer forecasts are displayed in Table 11.27. As with the average speeds and travel distances, the differences are relatively small due to the vast size of the area the times are extracted from. For each of the scenarios and forecasting years below show an increase in total travel time from the Do Minimum to the Do Something. The combined speed and distance increases with the scheme resulted in slight increases in PCU hrs.

Table 11.27: SATURN Total Travel Time (PCU.hrs/hr)

Scenario	Summer average peak
Base	23,513
2023 DM	25,561
2023 DS	25,569
2031 DM	27,598
2031 DS	27,754
2038 DM	29,366
2038 DS	29,403
2051 DM	33,237
2051 DS	33,195

12 Forecast results

Table 12.1: Glossary of terms for chapter 12

AADT	Annual Average Daily Traffic
ARCADY	Assessment of Roundabout Capacity And DelaY
DIADEM	Dynamic Integrated Assignment and DEmand Modelling
DM	Do Minimum – a future year modelled scenario without the scheme
DoS	Degree of Saturation
DS	Do Something – a future year modelled scenario with the scheme included
GAP	SATURN Model parameter: Minimum gap (in seconds) accepted by a vehicle which gives way at priority junctions or traffic signals
IP	Inter-peak, the day-time period between the AM and PM peak periods
ISTOP	SATURN model parameter regarding stopping criteria of assignment/simulation loops
LINSIG	Linear Signal Analysis
MVR	Model Validation Report
OP	Off-peak, the time period 19.00-07.00
PCU	Passenger Car Unit
PICADY	Priority junction CApacity and DelaY
PPK	Pence Per Kilometre
PPM	Pence Per Minute
RFC	Ratio of Flow to Capacity
RTF	Road Traffic Forecasts
VDM	Variable Demand Modelling

12.1 Forecast assignments

Variable demand modelling approach

Overview

12.1.1 As per RTMs Variable Demand Modelling is undertaken by using DfT’s DIADEM software and HEIDI.

12.1.2 More detail on the VDM methodology is provided in Section 11.1 and can also be found in SWRTM MVR.

12.1.3 DIADEM is a WebTAG compliant incremental model with respect to model form, most notably model hierarchy and incremental nature of the model. The approach makes use of cost changes from incremental differences between base and test scenario operated using a pivot point approach, whereby the model calculates the forecast demand using the cost changes between the forecast scenario and a reference scenario.

Reference travel costs

12.1.4 The reference travel costs from which all Do Minimum forecast scenarios have been pivoted were the 2015 assignments with roadworks removed for AM, IP and PM. The off-peak reference costs were obtained from assigning the base year OP matrix to the base year IP network with roadworks removed. The Do Something models were pivoted from the 2015 base model with roadworks removed.

12.1.5 The generalised costs used for each forecast year are shown in Table 12.2.

Table 12.2: VDM weekday generalised cost parameters

Year	Purpose	Car		Rail
		PPM	PPK	PPM
2015	Business	30.29	12.72	43.48
	Commuting	20.13	6.28	17.65
	Other	14.43	6.28	8.06
2023	Business	33.44	12.09	48.01
	Commuting	22.22	5.52	19.49
	Other	15.93	5.52	8.89
2031	Business	38.57	11.98	55.37
	Commuting	25.63	5.37	22.48
	Other	18.37	5.37	10.26
2038	Business	43.86	11.92	62.96
	Commuting	29.14	5.29	25.56
	Other	20.89	5.29	11.67
2051	Business	53.44	12.15	81.22
	Commuting	35.51	5.57	32.97
	Other	25.45	5.57	15.05

Demand supply convergence

12.1.6 The VDM convergence statistics for each forecast year are shown in Table 12.3.

12.1.7 All scenarios achieve a full model GAP lower than 0.1% and a sub-area gap lower than 0.2% within 9 DIADEM loops. Typical run times are around 2.3 hrs per loop with ISTOP = 99%.

Table 12.3: VDM convergence statistics

Year	Scenario	Full model GAP %	Sub-area GAP %	Cost (%<5%)	Flow (%<5%)	Number of loops
2023	DM	0.04	0.18	100.00	100.00	8
	DS	0.04	0.17	100.00	100.00	8
2031	DM	0.03	0.12	100.00	100.00	9
	DS	0.03	0.12	99.99	99.97	9
2038	DM	0.03	0.14	99.97	100.00	9
	DS	0.03	0.13	99.98	99.96	9
2051	DM	0.04	0.15	99.94	99.95	9
	DS	0.04	0.14	99.98	99.96	9

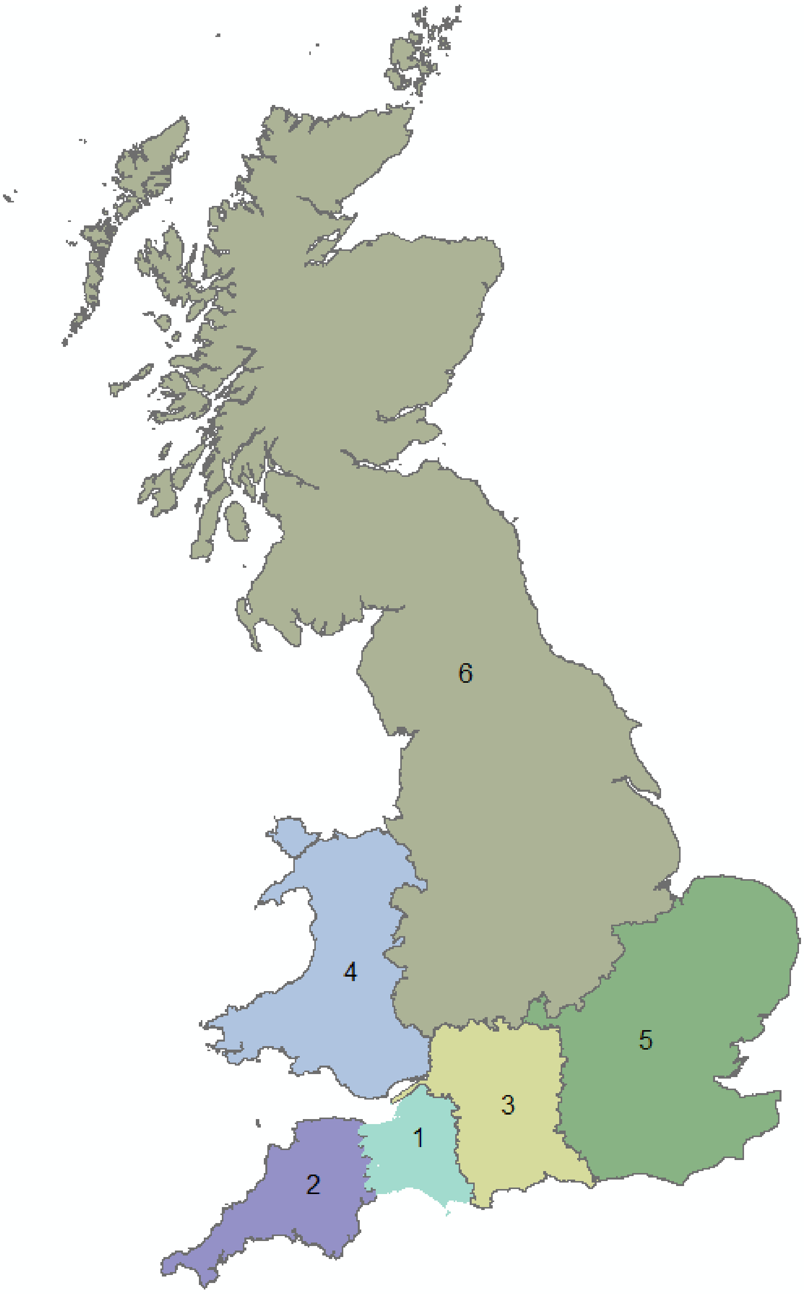
Variable demand impact

Highway demand changes

12.1.8 The impacts of the variable demand model are described using the sector system shown in Figure 12.1

- Sector 1: The main impact area of the scheme.
- Sector 2: Cornwall and the remainder of Devon.
- Sector 3: The remainder of the simulated are to the east.
- Sector 4: Wales.
- Sector 5: South East
- Sector 6: Midlands, North and Scotland.

Figure 12.1: Variable demand impact sector system



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12.1.9 The 2023 AM reference highway demand is shown in Table 12.4. Table 12.5 shows the change between the reference demand and the DM scenario. Table 12.6 shows the change between the reference demand and the DS. These scenarios show a similar redistributive pattern, with an increased number of inter-sectoral highway trips compared to the reference, and a reduction in the number of intra-sectoral highway trips.

12.1.10 Some of the inter-sectoral changes appear very large in percentage terms, for example sector 1 to sector 4, but in these cases the reference demand is relatively small and therefore a small change in demand can result in a significant percentage change. However, the increase in trips going to and from sector 4 is in part a result of the planned removal of the toll on the Second Severn Crossing and is the reason that the increase in trips to Wales is greater than the increase in trips from Wales (because the toll has been applied to traffic travelling into Wales only). Additionally, from 2031 the M4 Newport scheme is included in the DM and DS models which will improve journey times and provide a more attractive route than in the base. The VDM response for Wales is consistent with the SWRTM.

12.1.11 The overall level of demand in the AM remains similar between each of the scenarios. The reduction in intra-sectoral trips is slightly greater in the DS scenarios compared to the DM. Similarly, the increase in the number of longer distance trips is slightly greater in the DS scenarios compared to the DM. The change in trip pattern is due to the changes to the generalised costs between the base and the forecast years, which makes longer distance trips more favourable.

12.1.12 This pattern is repeated for the other peak periods and each forecast year with minor variations. The highway demand for the other peak periods and forecast years can be seen in Appendix G.

Table 12.4: 2023 AM Reference Highway Demand

	1	2	3	4	5	6	Total
1	248,863	10,032	32,127	584	994	964	293,564
2	8,518	454,278	1,839	317	744	1,021	466,717
3	20,866	1,687	1,350,355	5,102	60,191	16,688	1,454,889
4	615	238	8,000	660,264	1,381	26,588	697,086
5	568	373	49,075	920	4,151,955	33,798	4,236,690
6	730	579	19,377	20,219	51,796	6,980,223	7,072,924
Total	280,160	467,187	1,460,773	687,405	4,267,061	7,059,283	14,221,870

Table 12.5: 2023 AM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-1.16%	4.40%	3.95%	106.05%	17.83%	24.89%	-0.05%
2	5.59%	-0.40%	16.17%	55.99%	21.23%	24.79%	-0.09%
3	5.45%	14.90%	-1.01%	101.04%	6.98%	9.50%	-0.09%
4	53.65%	33.99%	49.73%	-1.14%	27.56%	6.14%	-0.16%
5	15.66%	20.83%	5.49%	55.70%	0.18%	15.37%	0.38%
6	19.70%	19.02%	6.47%	9.95%	10.90%	-0.12%	0.01%
Total	-0.25%	-0.18%	-0.28%	0.14%	0.42%	0.01%	0.10%

Table 12.6: 2023 AM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-1.17%	4.35%	4.04%	105.92%	18.74%	24.79%	-0.04%
2	5.51%	-0.41%	16.95%	55.93%	24.37%	24.73%	-0.10%
3	5.61%	15.99%	-1.01%	101.04%	6.97%	9.50%	-0.09%
4	53.65%	34.02%	49.73%	-1.14%	27.55%	6.14%	-0.16%
5	16.74%	24.34%	5.49%	55.70%	0.18%	15.37%	0.38%
6	19.69%	19.04%	6.47%	9.95%	10.90%	-0.12%	0.01%
Total	-0.25%	-0.18%	-0.28%	0.14%	0.42%	0.01%	0.10%

Rail demand changes

12.1.13 Table 12.7 to Table 12.9 show the reference rail (car available) demand for 2023 in the AM period. The changes between the reference and DM and DS are similar, with each scenario showing a reduction in the overall rail demand. This may be due to the inclusion of significant highway improvements along the A303/A358 corridor, brought about by the A303 Stonehenge scheme, the A303 Sparkford to Ilchester scheme and the A358 Taunton to Southfields scheme. This indicates that there is mode shift from rail to highway between the reference and post-VDM demand.

12.1.14 Redistribution is evident here also, with some changes to both shorter and longer distance trips due to the changes in generalised costs and the impact of DM and DS schemes. Again, some of the large percentage changes are a result of small numbers of trips in the reference demand.

12.1.15 Rail demand for the other forecast years and peak periods can be seen in Appendix G.

Table 12.7: 2023 AM Reference Rail Demand

	1	2	3	4	5	6	Total
1	476	266	1,407	46	480	30	2,706
2	155	3,426	188	15	340	45	4,169
3	505	116	14,921	520	14,388	688	31,138
4	24	7	710	7,480	701	943	9,865
5	117	111	4,755	249	491,442	5,604	502,278
6	11	20	559	537	13,249	73,776	88,151
Total	1,289	3,945	22,539	8,847	520,600	81,087	638,307

Table 12.8: 2023 AM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-3.38%	-3.51%	-3.79%	-2.48%	3.23%	-6.48%	-2.45%
2	-3.65%	-3.11%	-5.63%	-4.73%	-0.49%	-6.84%	-3.08%
3	-5.08%	-9.52%	-1.31%	3.33%	2.05%	-2.90%	0.19%

	1	2	3	4	5	6	Total
4	-14.43%	-10.41%	-15.16%	-2.42%	6.19%	1.53%	-2.38%
5	-1.06%	-2.82%	3.98%	10.33%	-1.38%	-4.37%	-1.36%
6	-9.92%	-9.43%	-0.94%	4.58%	-6.70%	2.36%	0.99%
Total	-4.13%	-3.36%	-0.81%	-1.30%	-1.41%	1.83%	-0.99%

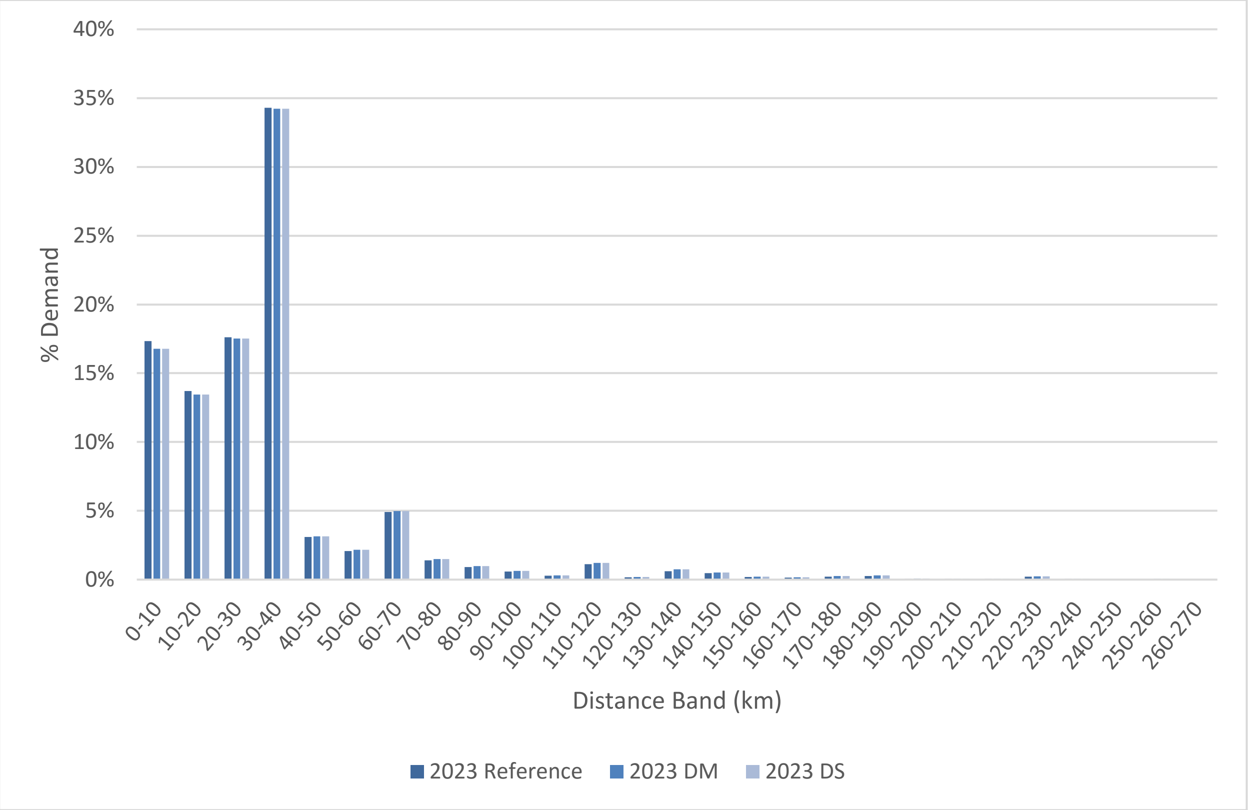
Table 12.9: 2023 AM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-3.38%	-3.50%	-3.81%	-2.49%	3.19%	-6.51%	-2.47%
2	-3.64%	-3.11%	-5.67%	-4.74%	-0.51%	-6.85%	-3.08%
3	-5.07%	-9.50%	-1.31%	3.33%	2.05%	-2.90%	0.19%
4	-14.42%	-10.39%	-15.16%	-2.42%	6.19%	1.53%	-2.38%
5	-1.07%	-2.83%	3.98%	10.33%	-1.38%	-4.37%	-1.36%
6	-9.90%	-9.40%	-0.94%	4.58%	-6.70%	2.36%	0.99%
Total	-4.13%	-3.36%	-0.82%	-1.30%	-1.41%	1.84%	-0.99%

Trip length distribution changes

12.1.16 Figure 12.2 shows the highway trip length distribution for 2023. Between the reference and the DM and DS scenarios, there is a reduction in the number of trips in shorter distance bands (trips 50km or shorter) and an increase in the number of trips in longer distance bands (trips greater than 50km).

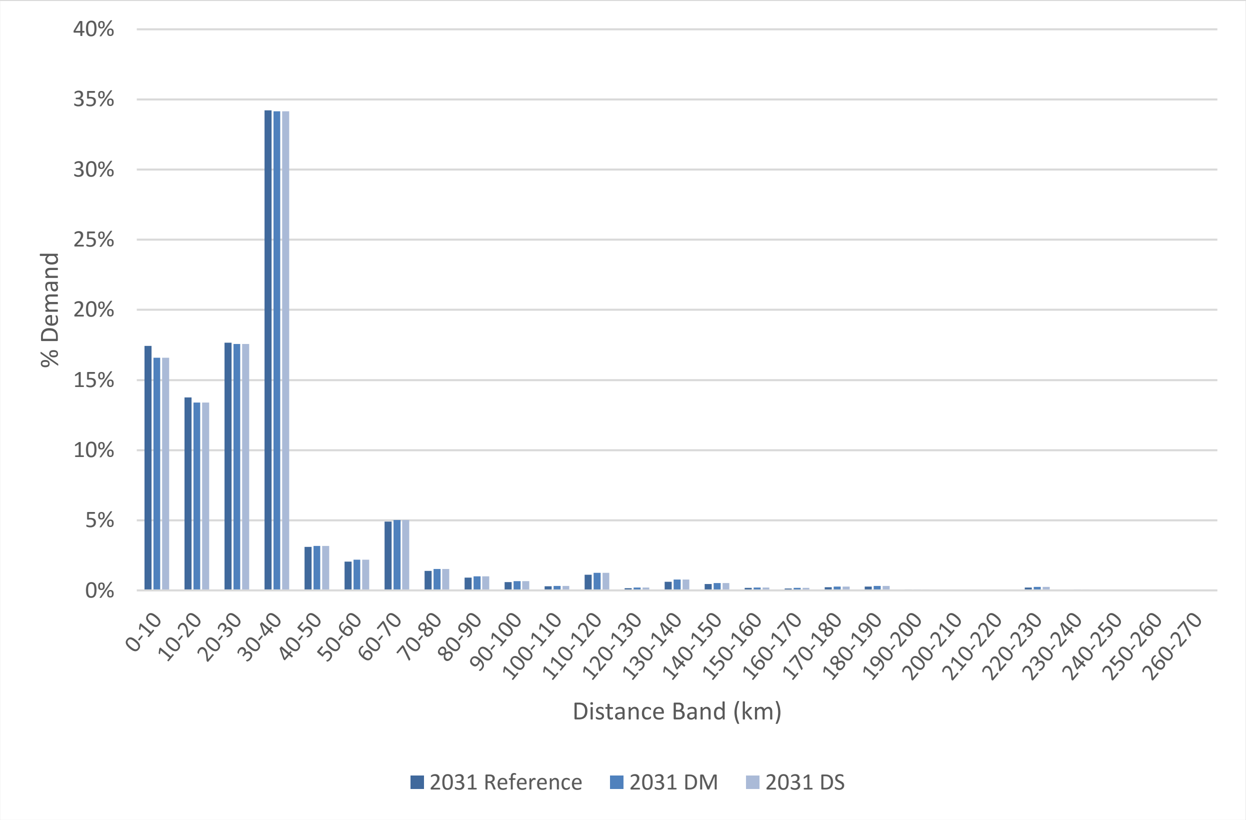
Figure 12.2: 2023 Highway Trip Length Distribution



Source: MMSJV.

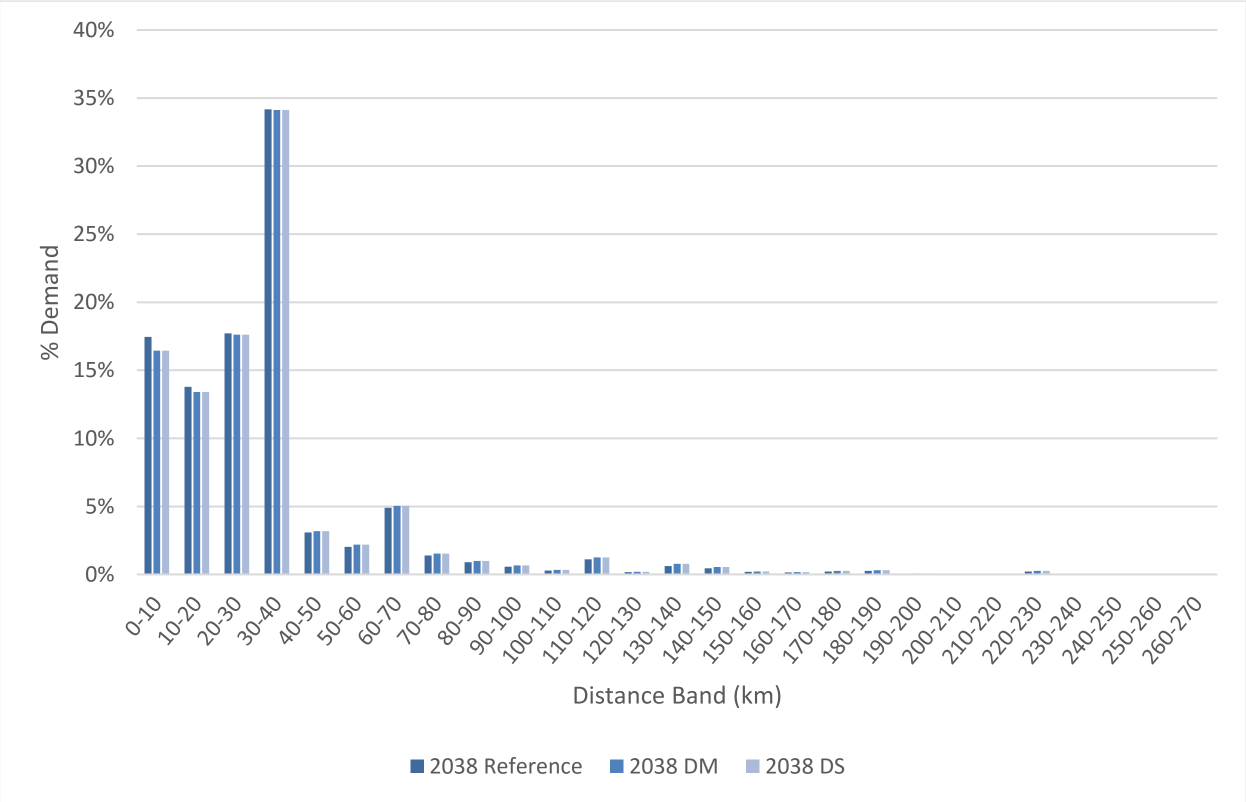
12.1.17 This pattern is also evident for 2031, 2038 and 2051 as can be seen from Figure 12.3 to Figure 12.5 respectively.

Figure 12.3: 2031 Highway Trip Length Distribution



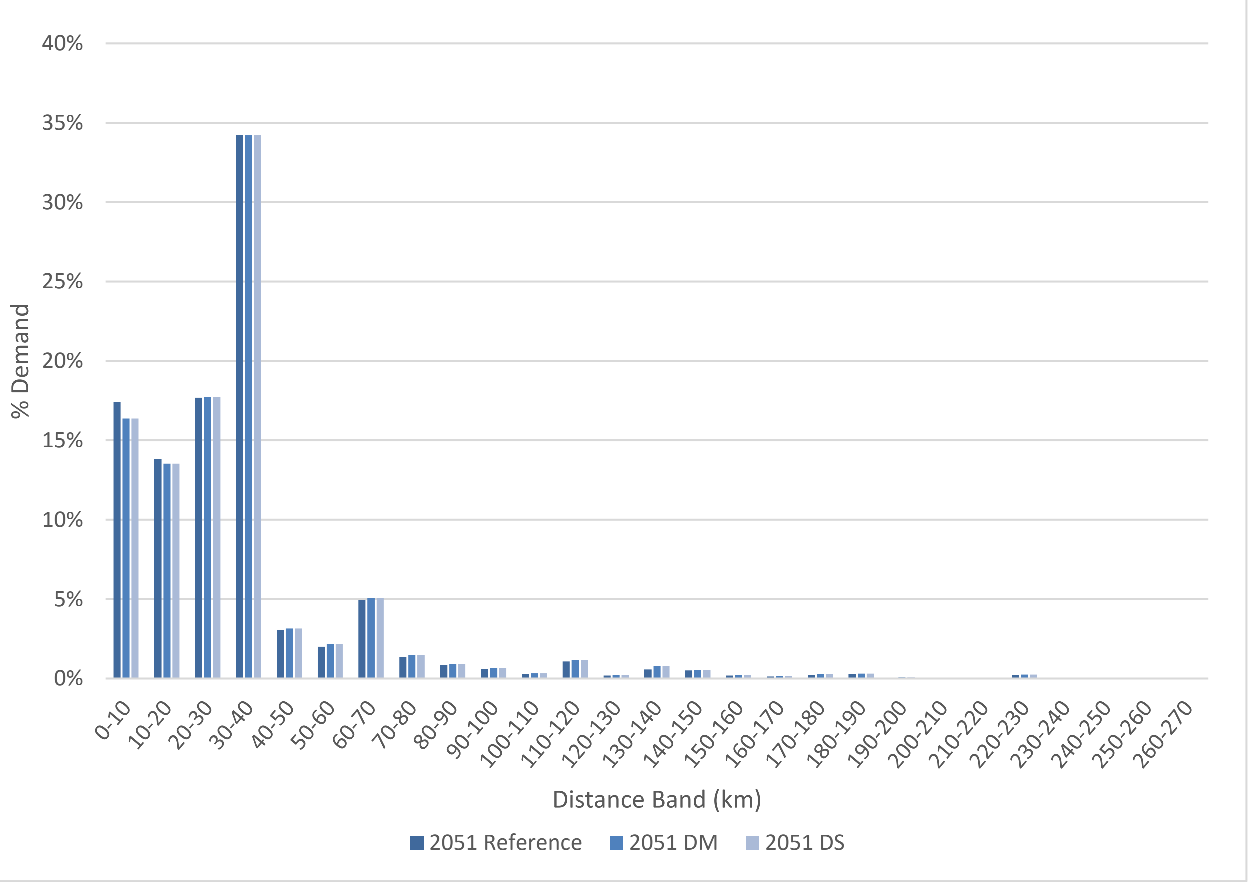
Source: MMSJV.

Figure 12.4: 2038 Highway Trip Length Distribution



Source: MMSJV.

Figure 12.5: 2051 Highway Trip Length Distribution

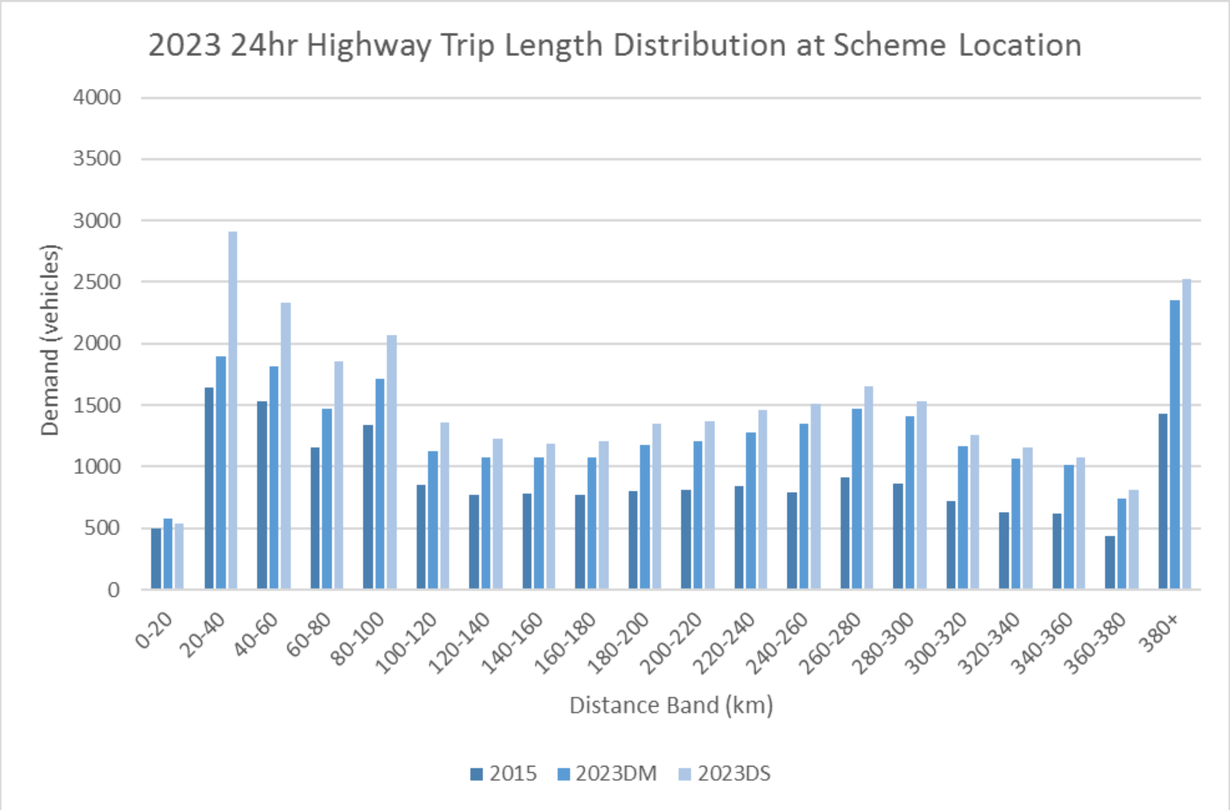


Source: MMSJV.

12.1.18 Trip length distributions were also calculated for traffic passing through the scheme for 2023 and 2038. These can be seen in Figure 12.6 and Figure 12.7. In general, the scheme has a lower proportion of trips in the 0-20km distance band, and a greater proportion of trips in the rest of the distance bands.

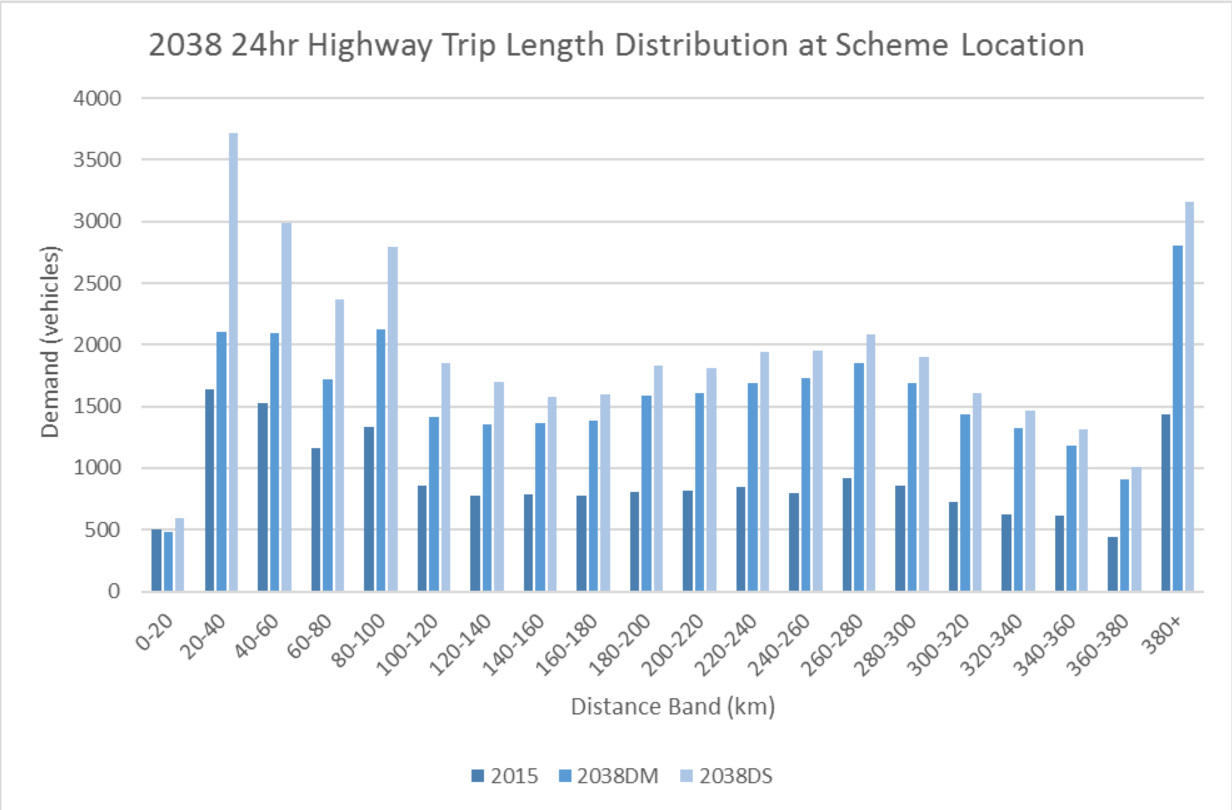
12.1.19 Variable demand modelling has not been applied to the summer model. As a result, a strong redistribution response is not expected as the forecast summer matrices are not altered due to the changes in generalised costs over time.

Figure 12.6: 2023 Highway Trip Length Distribution at the scheme



Source: MMSJV.

Figure 12.7: 2038 Highway Trip Length Distribution at the scheme



Source: MMSJV.

Post VDM assignment model convergence

12.1.20 For all time period models, forecasting years and scenarios, the assignment model convergence 'gap' is below the recommended WebTAG value of 0.1% by a substantial margin (values lower than this target mean that the model has better convergence). The measurements of flow and cost changes also exceed the 98% target in all cases (in these cases values higher than the target show that the model has better converged). The 'gap' measures the proximity to an equilibrium solution for the iterative assignment process and the flow and cost changes measure the stability of the solution from one iteration to another.

12.1.21 Table 12.10 contains convergence statistics for the base year. The convergence measures for forecast years (Table 12.11 and Table 12.12) show that the assignment models converge well within the WebTAG targets. To pass the criteria set by WebTAG (see Table 7.4), at least 4 consecutive iterations must exceed the Flow and Cost targets of 98%, which was achieved by all scenarios, as well as achieve a Gap of less than 0.1%. The tables below give the convergence statistics for the final loop of each run and also include the number of iterations (Ite) it took for these criteria to be met. The statistics show that WebTAG targets are bettered in all cases.

Table 12.10: Assignment Convergence Statistics - Base Minus

Year	AM				IP				PM				Summer			
	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite
2015	0.00005	99.4	99.8	13	0.0012	99.6	99.9	12	0.00017	99.1	99.6	12	0.0018	99.5	99.3	13

Table 12.11: Assignment Convergence Statistics - DM

Year	AM				IP				PM				Summer			
	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite
2023	0.00019	99.9	99.9	11	0.00092	99.5	100.0	12	0.00004	99.9	100.0	10	0.0013	98.7	99.7	8
2031	0.00060	99.5	99.9	9	0.00028	99.4	100.0	13	0.00028	99.6	99.8	9	0.00034	99.9	99.6	11
2038	0.00027	99.8	99.9	13	0.00056	99.6	99.8	12	0.00071	99.7	99.9	11	0.00032	99.9	99.5	11
2051	0.00021	99.8	99.9	13	0.00039	99.0	98.9	16	0.00062	99.5	99.6	13	0.0012	99.1	99.3	9

Table 12.12: Assignment Convergence Statistics – DS

Year	AM				IP				PM				Summer			
	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite	%GAP	% Flow	% Cost	Ite
2023	0.00047	99.4	99.8	8	0.00027	99.7	100.0	12	0.00008	99.8	100.0	10	0.00084	99.8	99.8	13
2031	0.00045	99.3	99.8	11	0.0010	99.1	100.0	13	0.00017	99.9	100.0	10	0.00050	99.8	99.8	13
2038	0.00024	99.8	99.9	11	0.00046	99.8	100.0	10	0.00037	99.6	99.8	11	0.00083	99.6	99.8	10
2051	0.00027	99.9	99.9	10	0.00056	99.6	99.8	11	0.00048	99.7	99.7	10	0.0012	99.8	99.6	15

12.2 Scheme impacts

Traffic flow impacts

12.2.1 The forecast traffic flows on the A303 and surrounding area are shown in Figure 12.8 at annual average daily traffic (AADT) level to the nearest 100 vehicles for each forecast scenario. Time period level flows are given in Appendix H.

12.2.2 The AADT flows on the main A303 carriageway (site 9) are forecast to increase from 23,400 in the base scenario (2015) to 29,400 in the opening year (2023) and 36,300 in 2038 in the Do Minimum scenario. This is approximately a 55% increase from 2015 to 2038, which is slightly higher but of a similar order to the 36% growth on south-west trunk roads predicted in RTF15. The higher growth predicted in the vicinity of the scheme is due to the spatial allocation of development trips being focused in this area. For more information on the future year trip generation, see Section 11.3.

12.2.3 For the scheme, these flows are expected to increase to 33,700 in 2023 and 43,600 in 2038 (see Figure 12.8), indicating 15% and 20% increases on the Do Minimum flows respectively.

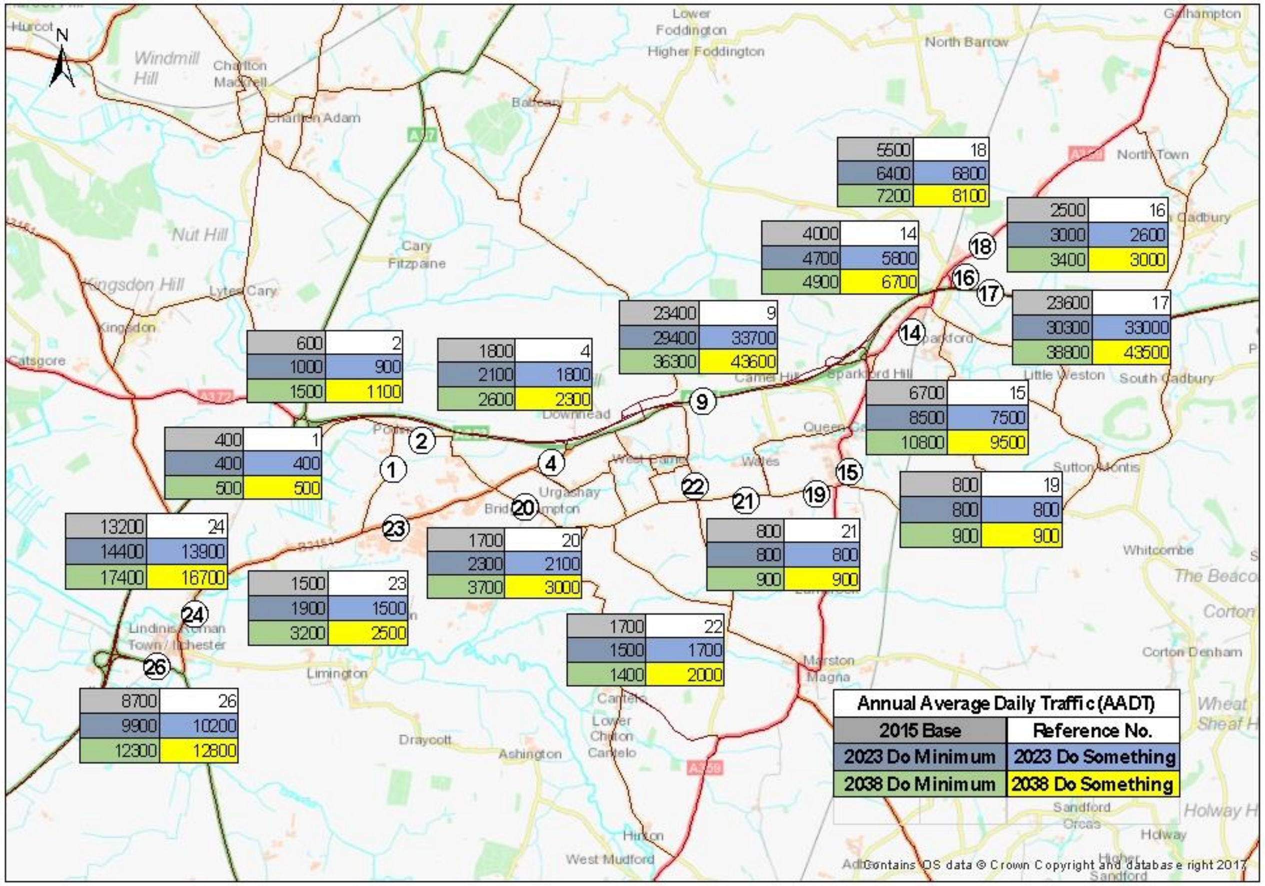
12.2.4 The majority of the local road network experiences a decrease in traffic with the inclusion of the scheme.

12.2.5 One of the locations where this is not the case is Sparkford High Street (site 14) which sees a 37% increase in traffic from 4,900 in the Do Minimum 2038 to 6,700 in the Do Something 2038. The increase in the southbound direction is due to a re-routing of traffic from the A37 to the A359 and the scheme, as is evident in Figure 12.9 and Figure 12.11. There is no westbound access to the A303 at the Camelot junction (site 16 in Figure 12.8) so the traffic joins the A303 at Hazlegrove, having travelled down Sparkford High Street. The increase in the northbound direction is traffic travelling from the south (particularly Yeovil) and continuing on the A359 to the north rather than using the A303 for the short stretch from Hazlegrove to Camelot.

12.2.6 West Camel village also experiences an increase in traffic from the Do Minimum to the Do Something. The increase at this location is due to more traffic travelling via the scheme and the A359 rather than the A37 to and from the A303 at Podimore, as is evident from the flow difference plots, Figure 12.9 and Figure 12.10. In addition to this, traffic travelling north on the A359 to Hazlegrove and continuing on the A359 uses Sparkford High Street in the Do Something model whereas in the Do Minimum model it uses the A303.

12.2.7 Another location which experiences an increase in traffic due to the scheme is Parsonage Road (site 22), which is forecast to increase by 43% from the Do Minimum 2038 to the Do Something 2038 is modelled. However, the increase from the base to the Do Something 2038 is lower at 18%. This is due to route changes of traffic travelling between the south-east (Marston Magna and Sherborne) and the north-west of the scheme: in the base model, this traffic travels through West Camel village to access the A303, but in the 2038 Do Minimum, due to higher flows on the A303 causing more difficulty turning onto it from the local roads, the traffic re-routes through Podimore, accessing the A303 at Podimore roundabout instead. In the Do Something, with the Scheme, there is a junction near West Camel village, providing easier access to the A303 again, so the re-routed traffic reverts back to the route via West Camel.

Figure 12.8: Two-way AADTs in local area (to the nearest 100 vehicles)



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12.2.8 Figure 12.9 and Figure 12.10 show the flow differences on the local network between the Do Minimum and Do Something, where green bars indicate a higher flow in the Do Something and blue bars indicate a lower flow.

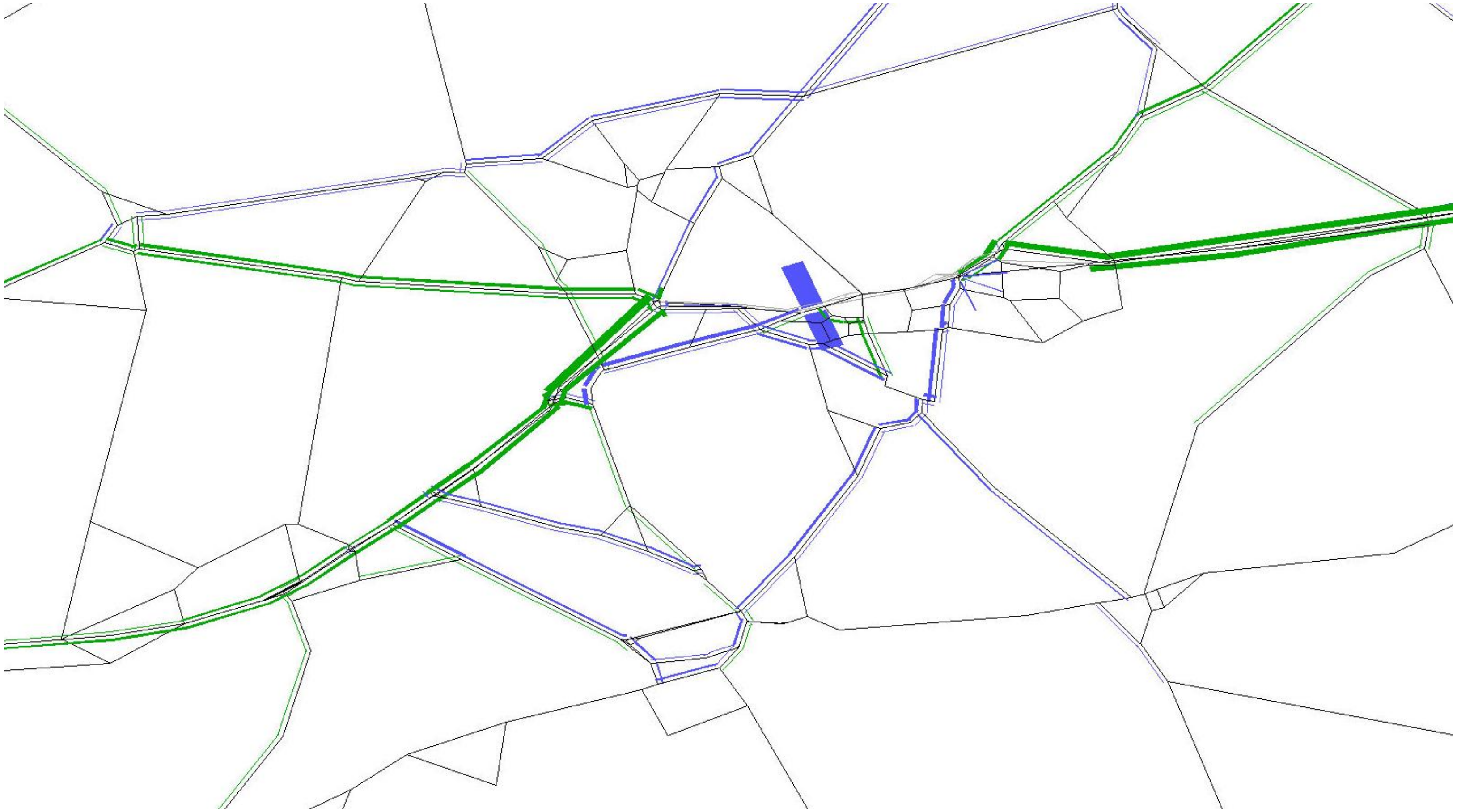
12.2.9 compares two-way traffic flows on the scheme section for the opening and design years. It can be seen that summer flows are generally higher than neutral month periods. Also, DS flows are higher than DM flows across all time periods.

Table 12.13: Comparison of hourly two-way traffic flows (veh/hr)

Section	Scenario	2023				2038			
		AM	IP	PM	Summer	AM	IP	PM	Summer
A303 Sparkford to Ilchester	DM	1,698	1,811	1,949	2,329	2,072	2,194	2,296	2,360
	DS	1,932	2,121	2,269	2,947	2,485	2,717	2,864	3,405

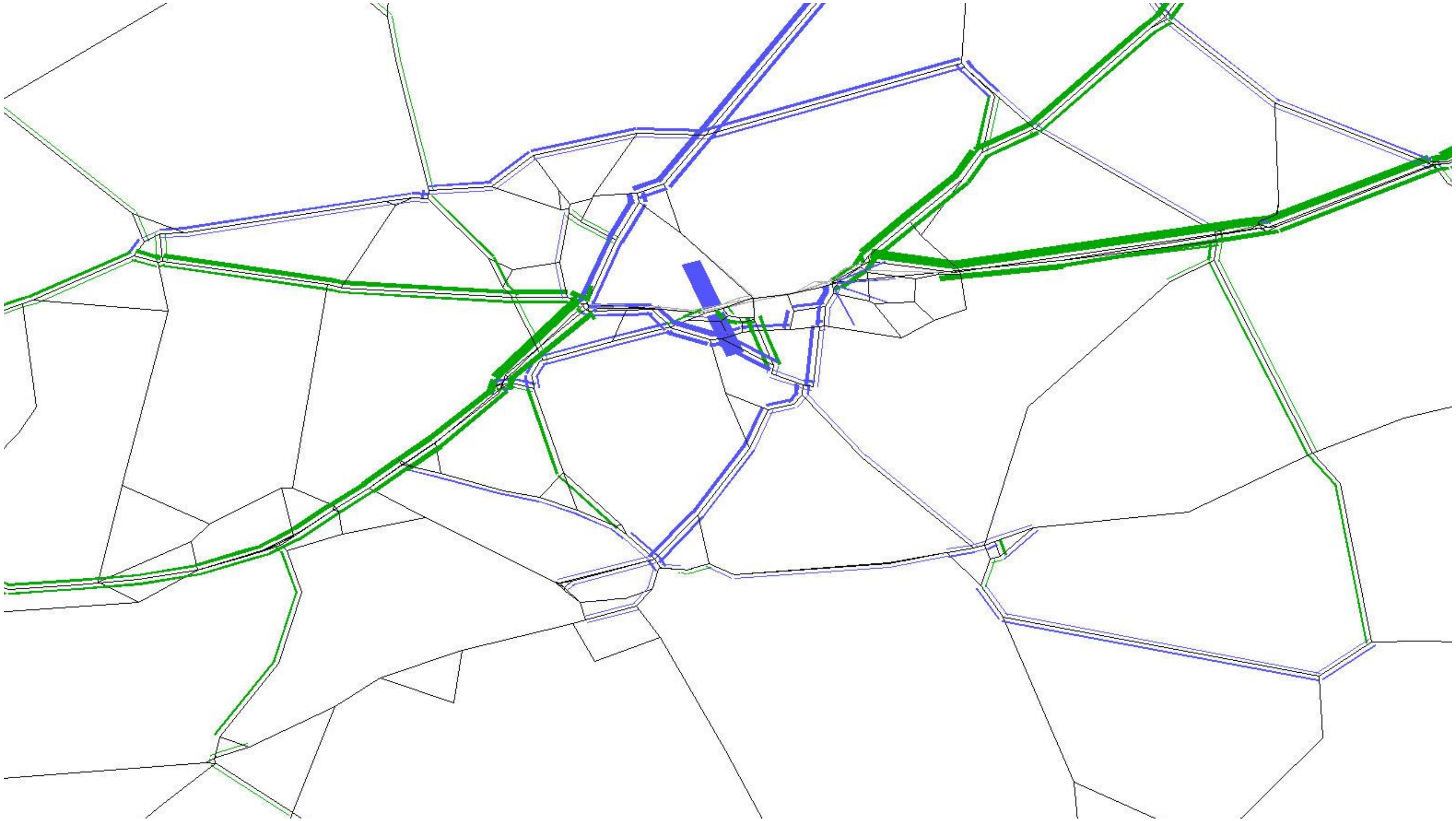
12.2.10 Time period level versions of Figure 12.8 are given in Appendix H.

Figure 12.9: Local flow differences between Do Minimum and Do Something, AM 2038



Source: MMSJV

Figure 12.10: Local flow differences between Do Minimum and Do Something, summer 2038

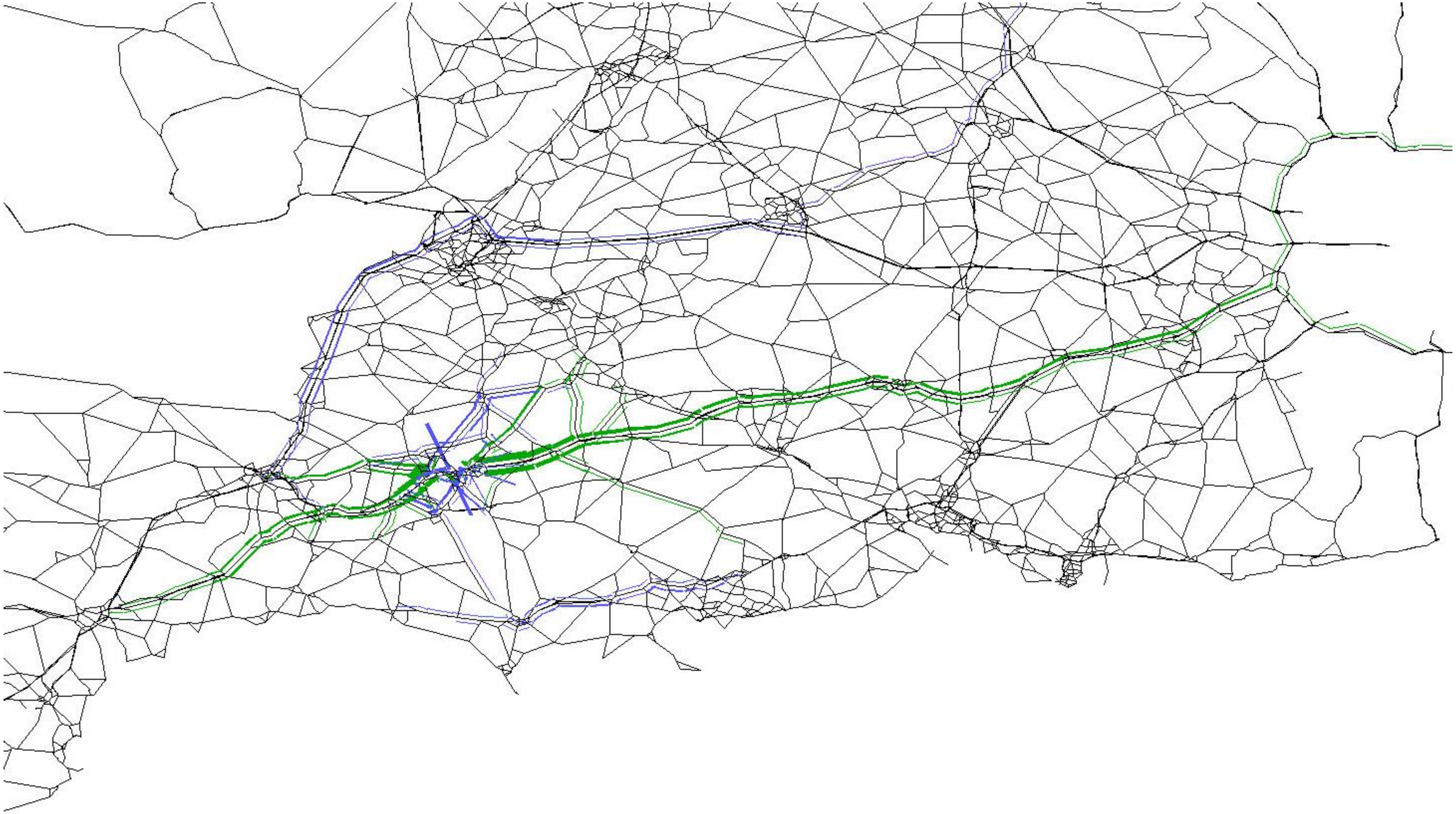


Source: MMSJV

Routing impacts

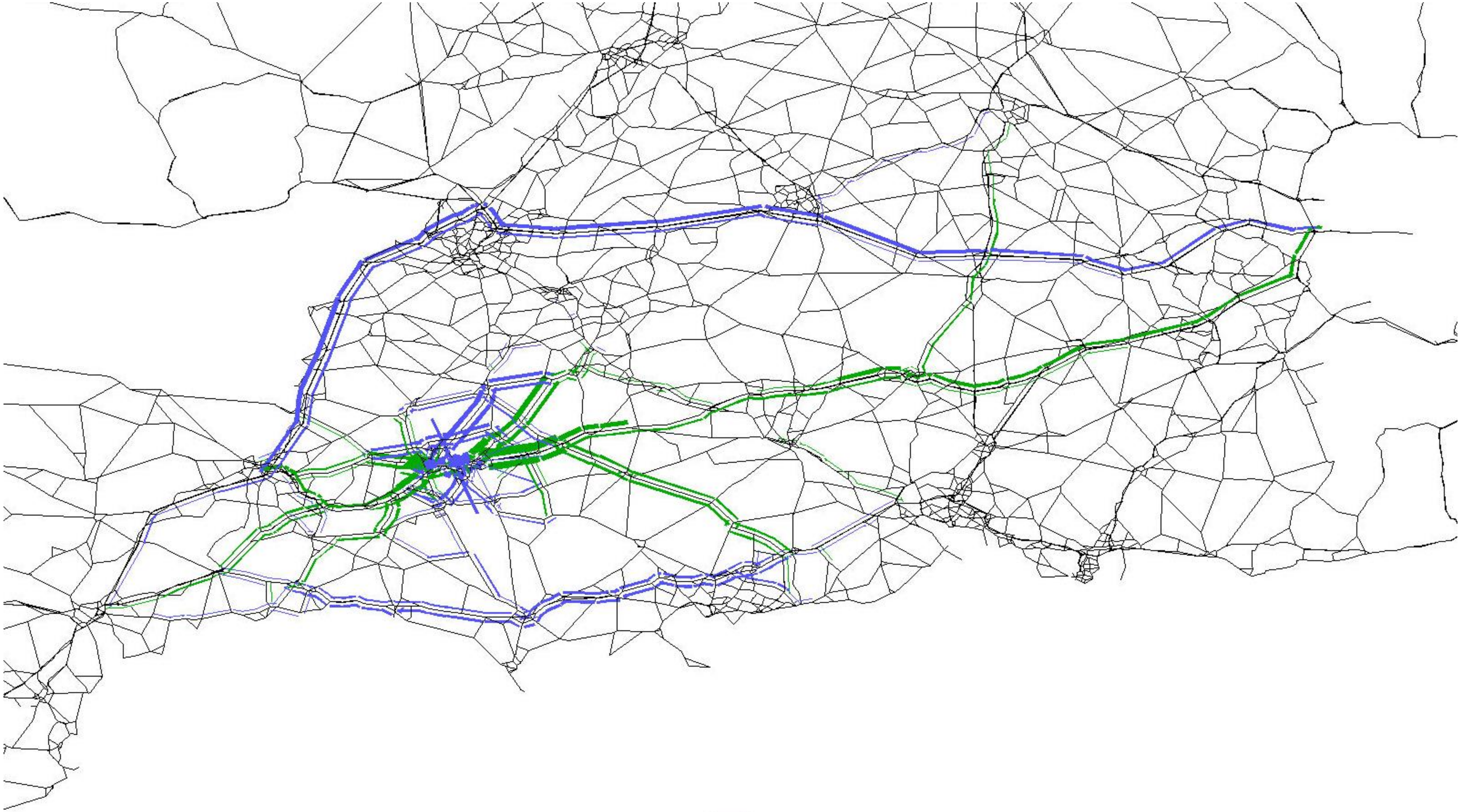
12.2.11 As well as local re-routing, the scheme causes some re-routing from the M4/M5 and A31/A35 routes to the A303. Figure 12.11 and Figure 12.12 show the flow differences between the Do Minimum assignments and the Do Something assignments, where green bars indicate higher traffic in the Do Something scenario and blue bars indicate lower traffic in the Do Something scenario. The AADT flows (to the nearest 100 vehicles) for selected sections of these key corridors is displayed in Figure 12.13.

Figure 12.11: Wider-scale flow differences between Do Minimum and Do Something, AM 2038



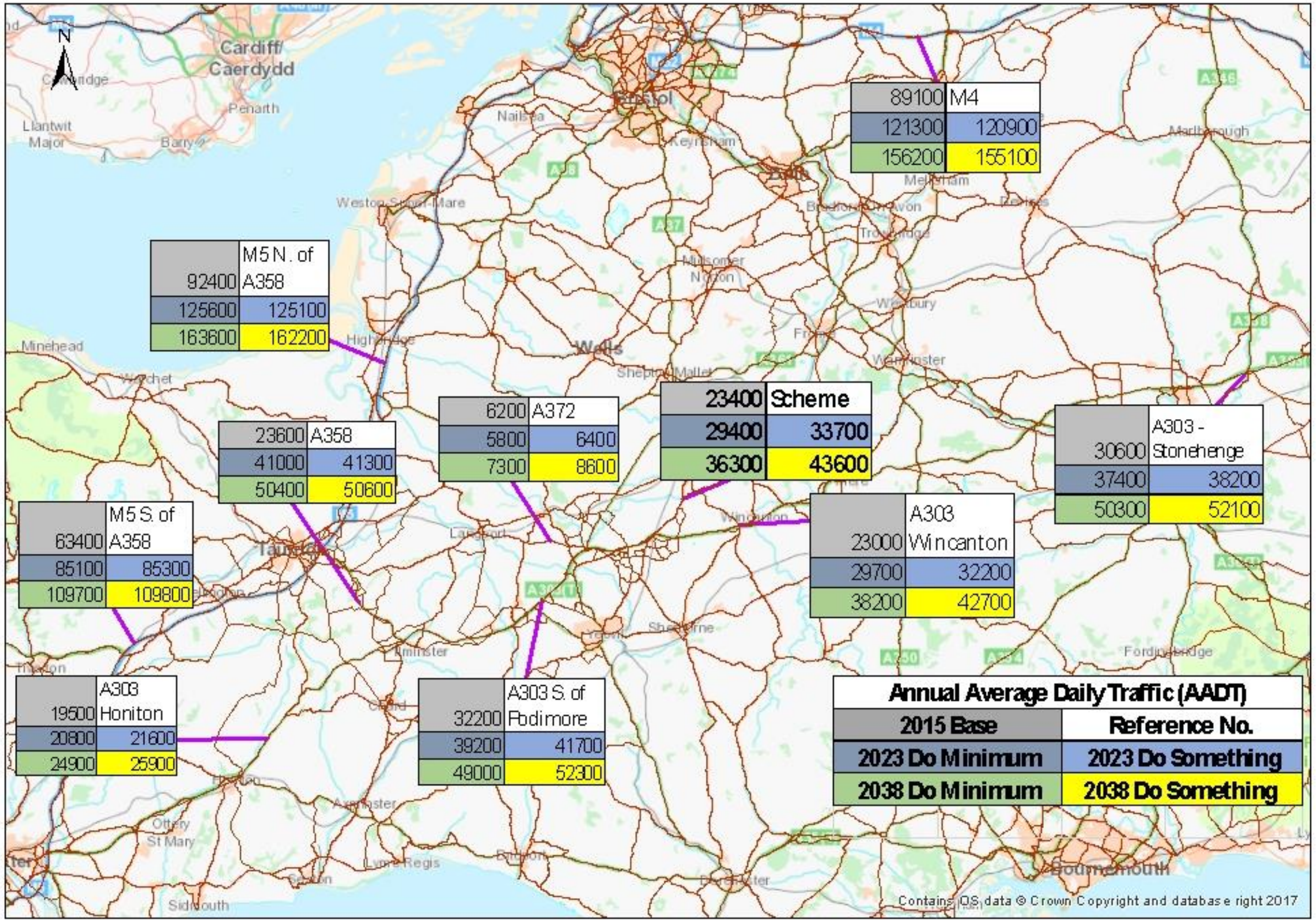
Source: MMSJV

Figure 12.12: Wider-scale flow differences between Do Minimum and Do Something, summer 2038



Source: MMSJV

Figure 12.13: Two-way AADTs for wider impact area (to the nearest 100 vehicles)



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12.2.12 Figure 12.13 indicates that there is some re-routeing between the M4/M5 corridor and the A303 corridor for traffic travelling between London and the south-west, as expected. Figure 12.13 shows (from the M4 flows) that the number of vehicles making this route switch on average per day is approximately 400 in 2023 and 1,000 in 2038. The re-routeing between the A31/A35 corridor and the A303 corridor for traffic travelling between the south-east and the south-west is about 700 in both 2023 and 2038.

12.2.13 From Figure 12.13, it is also clear that a large portion of the additional traffic using the scheme is local traffic, as the difference in flows on the scheme itself is 7,300 in the design year whereas further east at Wincanton, the difference is only 4,500 and further west (combining the flows on the A372 and the A303 South of Podimore), the difference is 4,600. This local re-routeing is a combination of traffic from the nearby villages to the south of the A303 using the scheme rather than the local poorer quality roads and some traffic from North of the scheme choosing to use the scheme combined with the A359 rather than the A37, as is visible in Figure 12.9 and Figure 12.10.

12.2.14 The results shown in this section suggest that the scheme makes the A303 corridor more attractive to traffic from zones near London and south-east travelling to zones in Devon and Cornwall and vice versa.

Journey time impacts

12.2.15 The A303 from Sparkford to Ilchester forms part of journey time route 22, lminster to Mere. Therefore, the modelled journey times for route 22 for the base, Do Minimum and Do Something scenarios are displayed in Table 12.14.

Table 12.14: Modelled Journey Times at Route Level (mm:ss)

Direction	Scenario	2023				2038			
		AM	IP	PM	Summer	AM	IP	PM	Summer
A - A303 Ilminster to Mere	Base	40:25	40:20	40:24	45:52	40:25	40:20	40:24	45:52
	DM	41:47	42:25	41:47	48:11	44:53	45:12	43:51	54:26
	DS	39:33	40:12	39:38	42:57	42:06	42:44	41:22	50:29
B - A303 Mere to Ilminster	Base	40:18	40:40	41:18	44:58	40:18	40:40	41:18	44:58
	DM	41:16	42:17	42:50	45:55	43:16	45:19	46:52	49:41
	DS	39:47	40:55	41:04	42:38	41:15	43:06	44:19	45:41

12.2.16 There is an increase in journey times from the base to the Do Minimum scenario across both years and all time periods. This is due to an increased level of traffic in the future years. There is a decrease in journey times from the Do Minimum to both Do Something options across both years and all time periods. This indicates that the scheme is providing shorter journeys along the whole A303 corridor from Ilminster to Mere in both directions despite the fact that the scheme attracts higher flows which would be likely to have a negative impact on journey times along the other sections of the route, particularly the other single carriageway sections.

12.2.17 In the eastbound direction (direction A in Table 12.13), the average savings provided by the scheme across the three time periods in the March model are 02:12 (mm:ss) in 2023 and 02:33 (mm:ss) in 2038. In the summer, the savings are 05:14 (mm:ss) in 2023 and 03:58 (mm:ss) in 2038. The summer journey time route savings are higher in 2023 than in 2038 because higher traffic flows along the A303 in 2038 cause longer delay increases in other locations, which can be deduced by observing the journey time savings at segment level (Table 12.15 and paragraphs 12.2.21 - 12.2.22) as the savings are higher over the segment than for the whole route (06:43 mm:ss savings over the segment compared to 03:58 mm:ss over the route for 2038 direction A).

12.2.18 In the westbound direction (direction B), the scheme saves an average of 01:30 (mm:ss) in 2023 and 02:15 (mm:ss) in 2038 across the three time periods in the March model, while in the summer model, the savings are 03:17 (mm:ss) in 2023 and 04:00 (mm:ss) in 2038.

12.2.19 To assess the journey time savings along the section of the A303 where the scheme would be implemented, analysis has also been carried out on segment 3 of route 22 – the A303 between Podimore roundabout and Wincanton. These results are displayed in Table 12.15.

Table 12.15: Modelled Journey Times at Segment Level (minutes)

Direction	Scenario	2023				2038			
		AM	IP	PM	Summer	AM	IP	PM	Summer
A - A303 Podimore to Wincanton	Base	11:52	11:44	11:48	14:38	11:52	11:44	11:48	14:38
	DM	12:22	12:33	12:19	16:13	13:48	13:52	13:11	17:25
	DS	09:58	09:57	09:56	10:19	10:12	10:10	10:06	10:42
B - A303 Wincanton to Podimore	Base	12:15	12:16	12:40	14:22	12:15	12:16	12:40	14:22
	DM	12:38	12:52	13:21	15:07	13:27	14:15	15:25	17:12
	DS	11:00	11:06	11:13	11:34	11:08	11:26	12:05	12:33

12.2.20 The journey time savings at segment level are significantly higher than those at route level. This is to be expected as the increased traffic levels attracted by the scheme would cause higher delays along the other sections of the A303. Also, the savings are larger in the eastbound direction than the westbound direction, which could be partly due to increased delays at Podimore roundabout having a larger impact for westbound traffic, which can be seen in Figure 12.14 - Figure 12.17.

12.2.21 In the eastbound direction (direction A in Table 12.15), the average savings across the three time periods for this segment of the journey time route are 02:29 (mm:ss) in 2023 and 03:31 (mm:ss) in 2038 for the scheme. In the summer, the savings are 05:54 (mm:ss) in 2023 and 06:43 (mm:ss) in 2038.

12.2.22 In the westbound direction (direction B), the scheme saves an average of 01:49 (mm:ss) in 2023 and 02:49 (mm:ss) in 2038 in the March model and 03:33 (mm:ss) in summer 2023 and 04:39 (mm:ss) in summer 2038. It should be noted that, as the summer model represents an average hour between 10:00 and 19:00 on Fridays to Sundays (and bank holidays) during the summer, the journey times and consequential savings will not match the highest values that will occur during these periods.

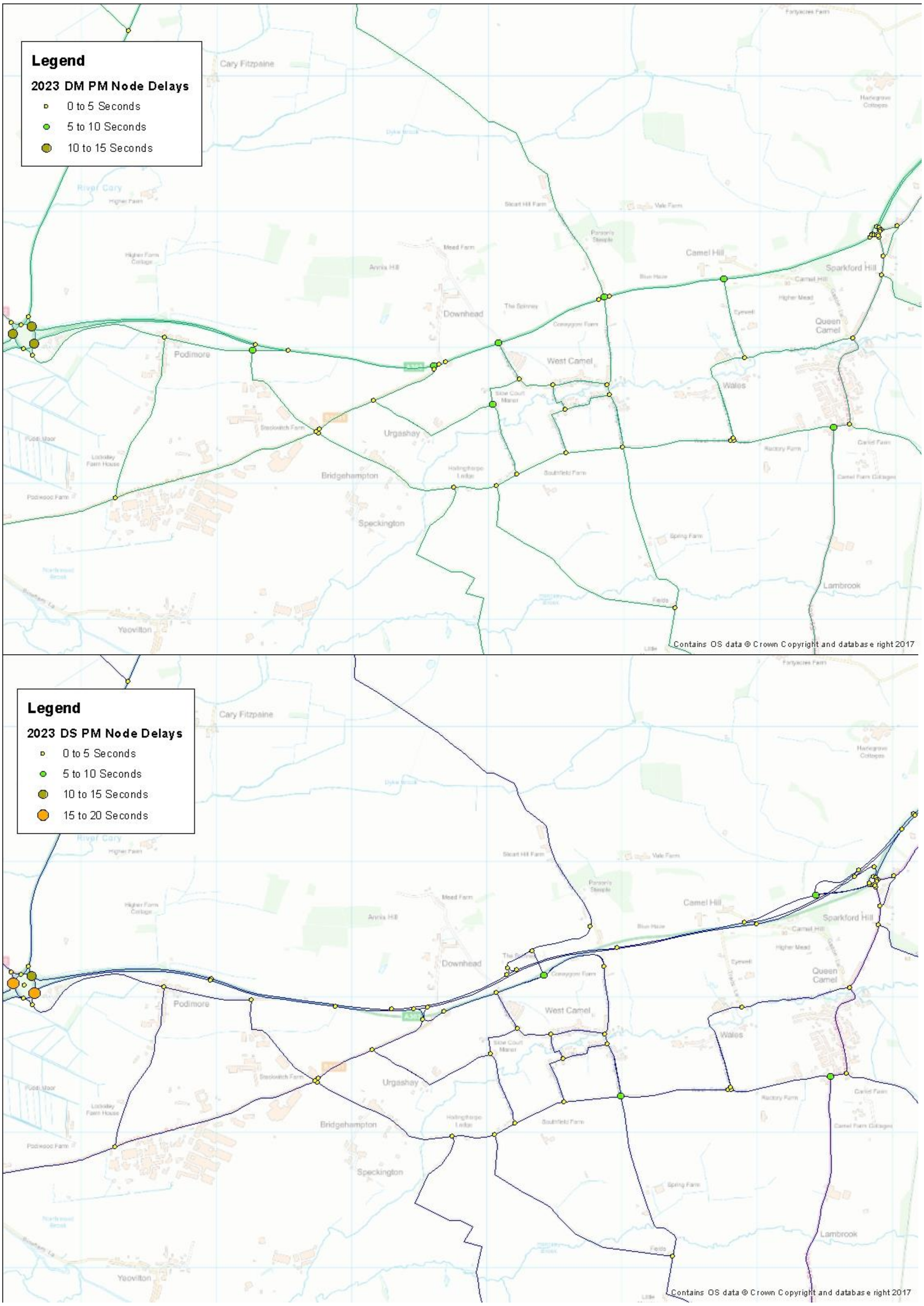
Local delay impacts

12.2.23 The scheme aims to reduce delays along the A303 between the Podimore and Hazlegrove roundabouts.

12.2.24 The scheme generally shows some improvement to delays along the A303 main carriageway. The changes in delays between the Do Minimum and the Do Something scenarios are similar in each of the time periods, but the most noticeable of these are the PM period and the summer model. The plots in Figure 12.14 - Figure 12.17 shows the node delays in the vicinity of the scheme for these two scenarios, with the Do Minimum node delays displayed in the top half of each figure and the Do Something in the bottom half. In both the PM and summer models, the delays at the junctions between the A303 and the local minor roads in the Do Minimum scenario have increased significantly from those in 2023, whereas with scheme in 2038, the delays along the scheme are significantly improved.

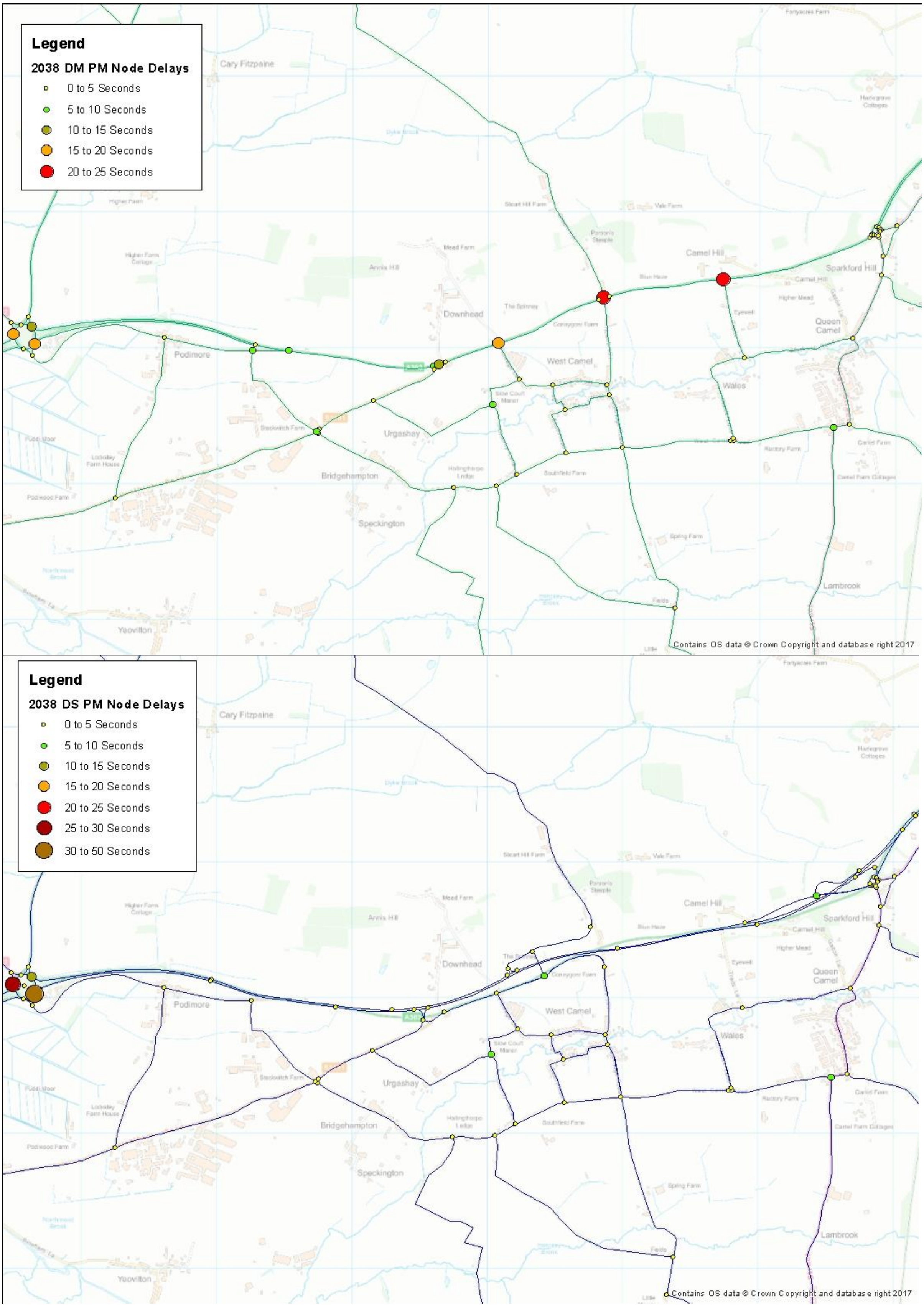
12.2.25 However, in the diagrams below, but especially in 2038, there is an increase in delay for some arms at the Podimore roundabout. This was to be expected as that additional traffic would be using the roundabout with the implementation of the scheme but there are no planned improvements to the roundabout with the scheme. It should be noted that the signal timings at Podimore roundabout were optimised for the Do Something models to accommodate the higher traffic flows, which may be done in reality to maximise the benefits of the scheme.

Figure 12.14: Node Delay Differences – 2023PM



Source: MMSJV.

Figure 12.15: Node Delay Differences – 2038PM

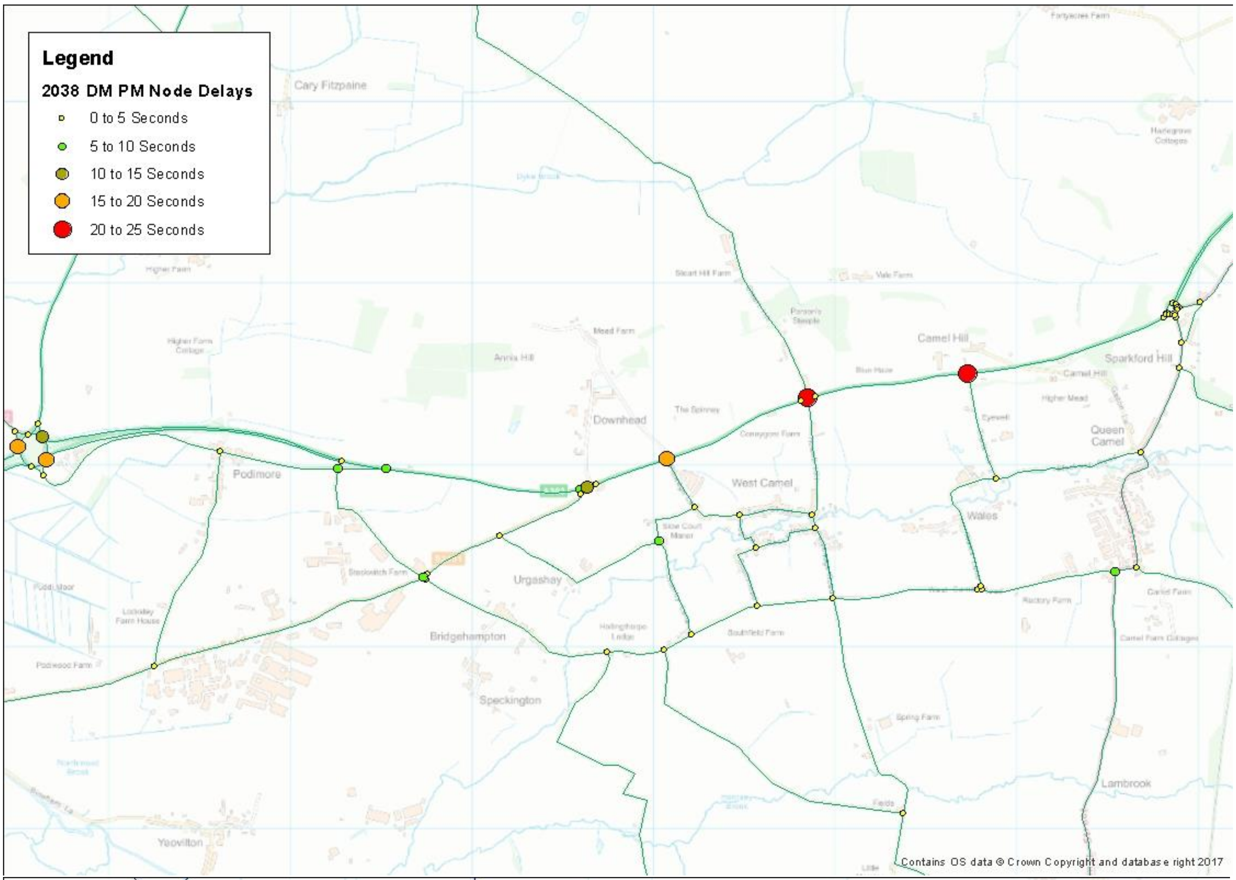


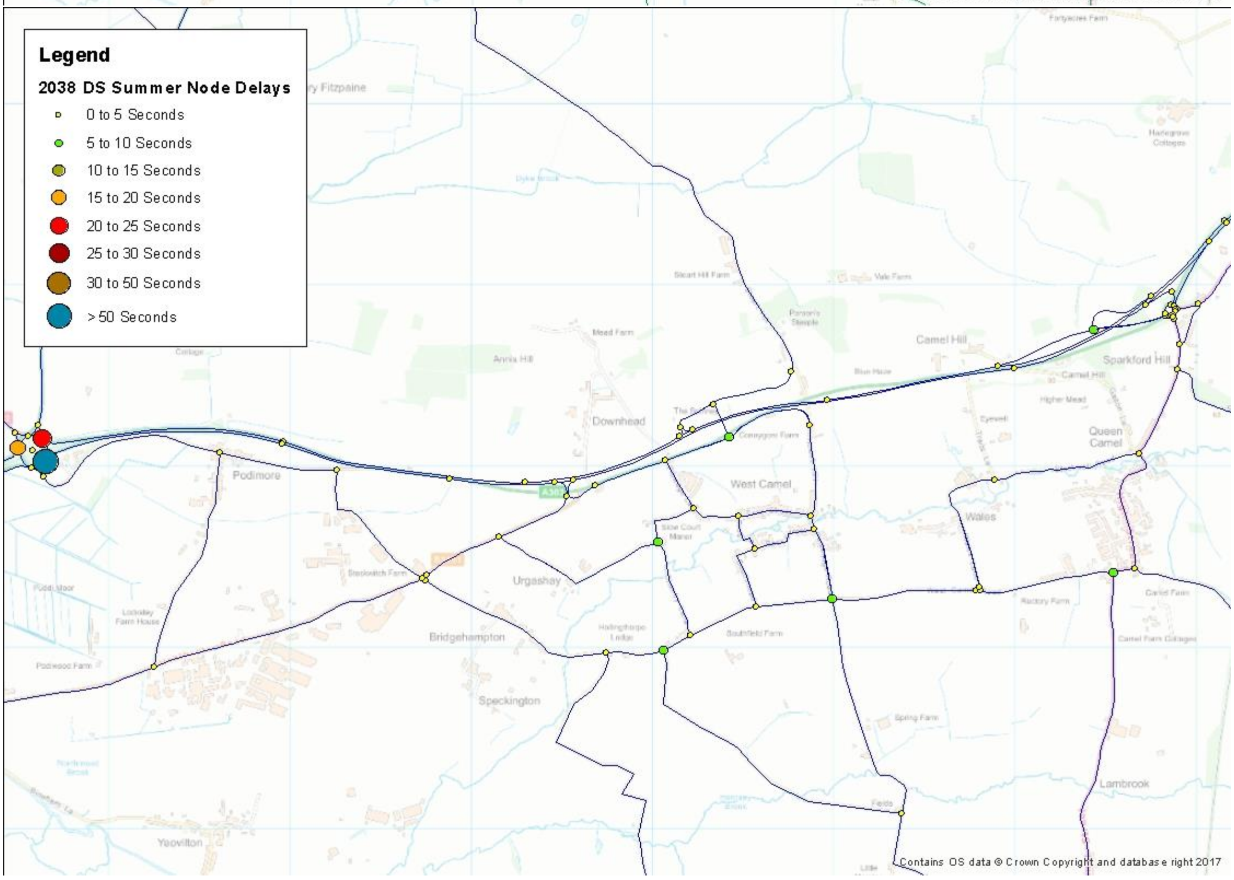
Source: MMSJV.

Figure 12.16: Node Delay Differences – 2023 Summer

Source: MMSJV.

Figure 12.17: Node Delay Differences – 2038 Summer





Source: MMSJV.

12.3 Key non-highway impacts

12.3.1 There is very little change in the DS rail demand when compared to the DM at a sectoral level. This implies that the scheme does not cause mode shift to or from rail. This is true for all time periods and forecast years.

12.4 Operational assessment

12.4.1 Operational assessments were carried out at some of the key junctions on the A303 using modelled flows from the neutral month model. The junctions assessed are displayed in Figure 12.18 and Figure 12.19. For the roundabouts and priority junctions, Junctions 9 was used, which comprises of Assessment of Roundabout Capacity And DelaY (ARCADY) and Priority junction CApacity and DelaY (PICADY). For signalised junctions, Linear Signal Analysis (LINSIG) Version 3.2.38 was used.

Figure 12.18: Do Minimum Operational Assessment Junctions

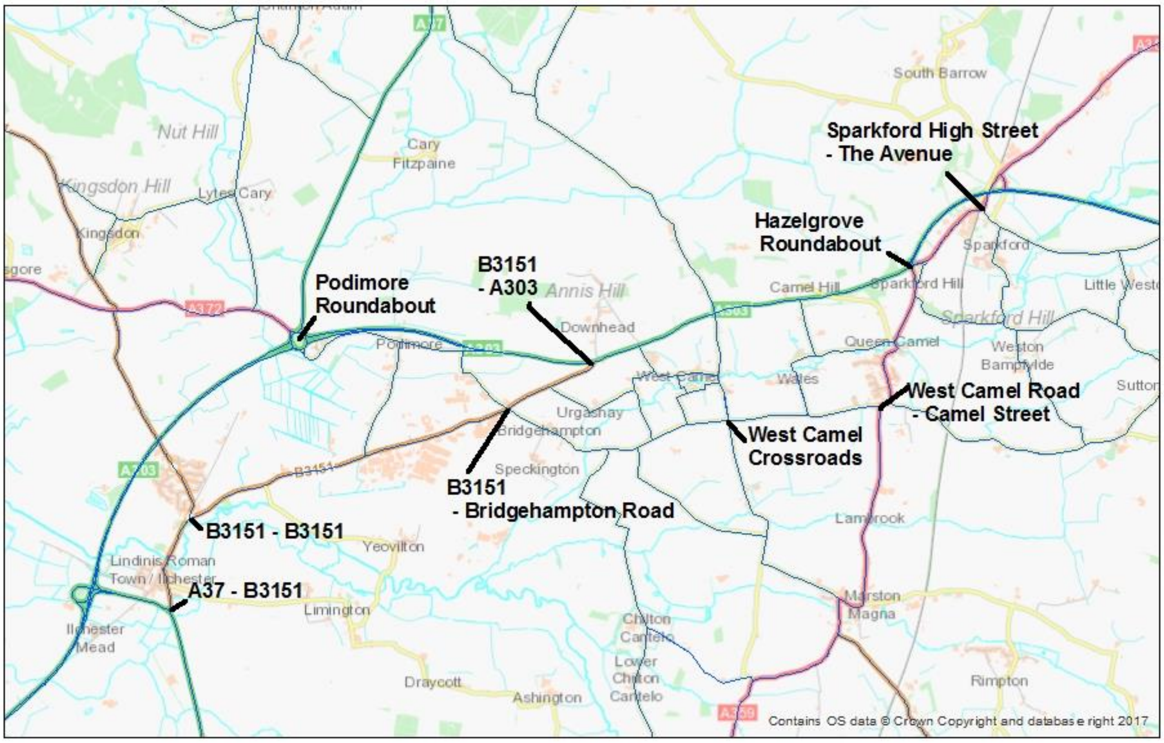


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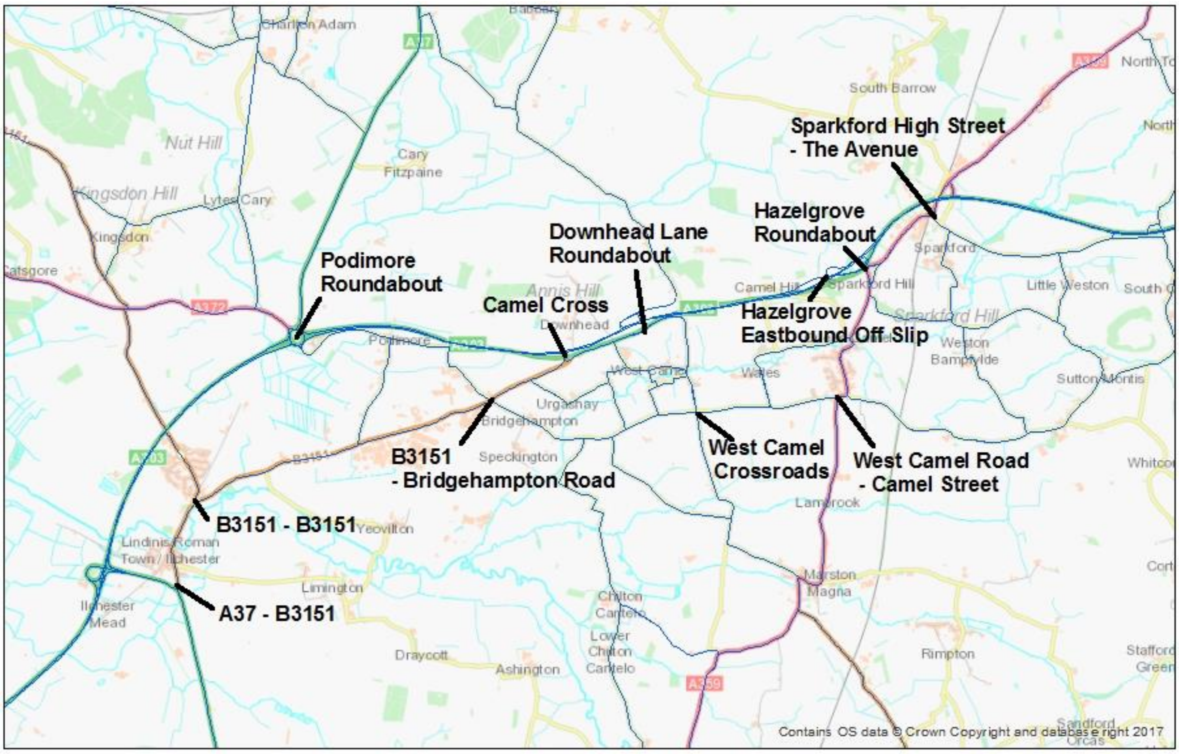
Figure 12.19: Do Something Operational Assessment Junctions



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12.4.2 The Ratio of Flow to Capacity (RFC) is an output from Junctions 9 and is the primary measure of an arm's performance for roundabouts and priority junctions. An RFC below 0.85 suggests a junction will operate within capacity; an RFC between 0.85 and 1.0 suggests the junction is over its desired capacity but below theoretical capacity; and an RFC in excess of 1.0 suggests a junction will be in excess of its theoretical capacity.

12.4.3 The Degree of Saturation (DoS) is the equivalent output from LinSig and is therefore the primary measure of an arm's performance for signalised junctions. A DoS of below 0.9 suggests a junction will operate within capacity; a DoS between 0.9 and 1.0 suggests the junction is over the desired capacity but within its theoretical capacity; and a DoS exceeding 1.0 suggests the junction will be in excess of its theoretical capacity. The only signalised junction included in the operational assessment is Podimore Roundabout.

12.4.4 The maximum RFC or DoS outputs for each assessed junction are given in Table 12.16 - Table 12.18. In some of the Do Minimum scenarios, particularly in 2038, the B3151 - A303 junction exceeds its capacity. None of the junctions exceed their capacity in the Do Something scenarios. There is a decrease in the RFC or DoS and therefore an increase in performance between the Do Minimum and Do Something scenarios in all cases except for Podimore, Sparkford High Street – The Avenue and the West Camel Crossroads, for which there is sometimes an increase. This is because there would be no changes made to these junctions with the implementation of the scheme and the higher flows mean a higher degree of saturation.

Table 12.16: Maximum AM RFC or DoS

	AM - Max RFC or DoS			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	0.64	0.81	0.36	0.42
Podimore Roundabout	0.55	0.7	0.63	0.79
B3151 - A303	0.52	1.53	N/A	N/A
Camel Cross	N/A	N/A	0.18	0.21
Downhead Lane Junction Roundabout	N/A	N/A	0.05	0.06
A37 - B3151	0.48	0.54	0.47	0.54
B3151 - B3151	0.4	0.48	0.37	0.43
B3151 Bridgehampton Road	0.19	0.28	0.15	0.21
Sparkford High Street - The Avenue	0.51	0.53	0.55	0.59
West Camel Crossroads	0.17	0.13	0.15	0.18
West Camel Road- Camel Street	0.47	0.57	0.46	0.55
Hazlegrove Eastbound sliproads	N/A	N/A	0.34	0.47

Table 12.17: Maximum IP RFC or DoS

	IP - Max RFC or DoS			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	0.67	0.81	0.32	0.41
Podimore Roundabout	0.56	0.66	0.62	0.76
B3151 - A303	0.46	2.03	N/A	N/A
Camel Cross	N/A	N/A	0.1	0.14
Downhead Lane Junction Roundabout	N/A	N/A	0.04	0.05
A37 - B3151	0.37	0.45	0.36	0.44
B3151 - B3151	0.28	0.37	0.27	0.34
B3151 Bridgehampton Road	0.15	0.27	0.12	0.17
Sparkford High Street - The Avenue	0.45	0.48	0.48	0.6
West Camel Crossroads	0.11	0.08	0.1	0.16
West Camel Road - Camel Street	0.41	0.5	0.4	0.47
Hazlegrove Eastbound sliproads	N/A	N/A	0.35	0.53

Table 12.18: Maximum PM RFC or DoS

	PM - Max RFC or DoS			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	0.64	0.79	0.38	0.48
Podimore Roundabout	0.64	0.75	0.65	0.87
B3151 - A303	0.71	5.34	N/A	N/A
Camel Cross	N/A	N/A	0.15	0.21
Downhead Lane Junction Roundabout	N/A	N/A	0.05	0.06
A37 - B3151	0.51	0.58	0.5	0.58
B3151 - B3151	0.47	0.56	0.42	0.58
B3151 Bridgehampton Road	0.32	0.45	0.23	0.37
Sparkford High Street - The Avenue	0.62	0.53	0.69	0.78
West Camel Crossroads	0.13	0.13	0.17	0.13
West Camel Road- Camel Street	0.57	0.71	0.54	0.68
Hazlegrove Eastbound sliproads	N/A	N/A	0.44	0.62

12.4.5 Table 12.19 - Table 12.21 show the maximum queues at each of the junctions. The queues are no longer than 2 PCUs at any of the junctions in each Do Something scenario with the exception of Podimore, which shows similar or higher queues to the Do Minimum scenarios due to no changes being made at this junction.

Table 12.19: Maximum AM Queues

	AM - Max queue (PCU)			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	2	5	1	1
Podimore Roundabout	10	14	9	13
B3151 - A303	1	23	N/A	N/A
Camel Cross	N/A	N/A	0	0
Downhead Lane Junction Roundabout	N/A	N/A	0	0
A37 - B3151	1	1	1	1
B3151 - B3151	1	1	1	1
B3151 Bridgehampton Road	0	0	0	0
Sparkford High Street - The Avenue	1	1	1	2
West Camel Crossroads	0	0	0	0
West Camel Road- Camel Street	1	1	1	1
Hazlegrove Eastbound sliproads	N/A	N/A	1	1

Table 12.20: Maximum IP Queues

	IP - Max queue (PCU)			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	2	5	1	1
Podimore Roundabout	10	13	11	18
B3151 - A303	1	17	N/A	N/A
Camel Cross	N/A	N/A	0	0
Downhead Lane Junction Roundabout	N/A	N/A	0	0
A37 - B3151	1	1	1	1
B3151 - B3151	0	1	0	1
B3151 Bridgehampton Road	0	0	0	0
Sparkford High Street - The Avenue	1	1	1	2
West Camel Crossroads	0	0	0	0
West Camel Road- Camel Street	1	1	1	1
Hazlegrove Eastbound sliproads	N/A	N/A	1	1

Table 12.21: Maximum PM Queues

	PM - Max queue (PCU)			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	2	4	1	1
Podimore Roundabout	9	14	12	22
B3151 - A303	2	36	N/A	N/A
Camel Cross	N/A	N/A	0	0
Downhead Lane Junction Roundabout	N/A	N/A	0	0
A37 - B3151	1	2	1	2
B3151 - B3151	1	1	1	2
B3151 Bridgehampton Road	1	1	0	1
Sparkford High Street - The Avenue	2	1	2	2
West Camel Crossroads	0	0	0	0
West Camel Road- Camel Street	1	3	1	2
Hazlegrove Eastbound sliproads	N/A	N/A	1	2

12.4.6 Table 12.22 to Table 12.24 give the maximum delay in seconds for each of the junctions. As with the queue length and degree of saturation, the delays remain similar or higher for the Podimore roundabout and the Sparkford High Street – The Avenue junction. For the remainder of the junctions, delays are very low, not exceeding 15 seconds in any of the Do Something scenarios.

12.4.7 For the B3151 priority junction with the A303, the high Do Minimum flows along the A303 in 2038 (all time periods) cause the junction to operate over capacity, as can be seen in Table 12.16 - Table 12.18. This caused PICADY to produce unrealistically high delays for the traffic turning onto the A303 from the B3151 so the delays have not been reported. These missing values have instead been marked with a * symbol.

Table 12.22: Maximum AM Delay (seconds)

	AM - Max delay (s)			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	7	13	4	5
Podimore Roundabout	40	75	39	40
B3151 - A303	49	*	N/A	N/A
Camel Cross	N/A	N/A	7	7
Downhead Lane Junction Roundabout	N/A	N/A	5	5
A37 - B3151	6	7	6	7
B3151 - B3151	7	7	7	7
B3151 Bridgehampton Road	10	11	10	10
Sparkford High Street - The Avenue	18	19	20	23
West Camel Crossroads	9	9	9	9
West Camel Road- Camel Street	9	11	9	11
Hazlegrove Eastbound sliproads	N/A	N/A	9	12

Table 12.23: Maximum IP Delay (seconds)

	IP - Max delay (s)			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	7	13	4	4
Podimore Roundabout	37	49	42	52
B3151 - A303	65	*	N/A	N/A
Camel Cross	N/A	N/A	6	6
Downhead Lane Junction Roundabout	N/A	N/A	5	5
A37 - B3151	5	5	5	5
B3151 - B3151	7	8	7	8
B3151 Bridgehampton Road	9	10	9	9
Sparkford High Street - The Avenue	15	17	17	22
West Camel Crossroads	9	8	9	9
West Camel Road- Camel Street	8	10	8	9
Hazlegrove Eastbound sliproads	N/A	N/A	9	13

Table 12.24: Maximum PM Delay (seconds)

	PM - Max delay (s)			
	DM		DS	
	2023	2038	2023	2038
Hazlegrove Junction	7	12	4	5
Podimore Roundabout	40	47	46	51
B3151 - A303	112	*	N/A	N/A
Camel Cross	N/A	N/A	6	7
Downhead Lane Junction Roundabout	N/A	N/A	4	4
A37 - B3151	6	7	6	7
B3151 - B3151	9	11	8	11
B3151 Bridgehampton Road	11	14	10	12
Sparkford High Street - The Avenue	22	18	28	39
West Camel Crossroads	9	9	9	9
West Camel Road- Camel Street	11	16	10	15
Hazlegrove Eastbound sliproads	N/A	N/A	10	15

13 Economic appraisal approach

Table 13.1: Glossary of terms for chapter 13

AADT	Annual Average Daily Traffic
CDF	Collaborative Delivery Framework
CO2e	Carbon Dioxide equivalent
COBA	Cost and Benefit to Accidents
COBALT	Cost and Benefit to Accidents Light Touch
DfT	Department for Transport
DM	Do Minimum – a future year modelled scenario without the scheme
DMRB	Design Manual for Roads and Bridges
DS	Do Something – a future year modelled scenario with the scheme included
GHG	Greenhouse Gases
GIS	Geographic Information System
HGV	Heavy Goods Vehicle
IP	Inter-peak, the day-time period between the AM and PM peak periods
LGV	Light Goods Vehicle
NPV	Net Present Value
OGV 1	other goods vehicles 1, smaller HGVs, defined in COBA Manual
OGV 2	other goods vehicles 2, larger HGVs, defined in COBA Manual
OP	Off-peak, the time period 19.00-07.00
QUADRO	Queues And Delays at Roadworks
SATURN	Simulation and Assignment of Traffic to Urban Road Networks – highway traffic assignment software
SWRTM / SWRM	South West Regional (Traffic) Model
Trafficmaster	The Department for Transport's GPS database
TUBA	Transport User Benefit Appraisal
VAT	Value Added Tax
VOC	Vehicle Operating Costs
WebTAG	Web-based transport analysis guidance produced by the DfT

13.1 Assessment process and modelling framework

Assessment process

13.1.1 The transport economic appraisal has been undertaken using the TUBA (Transport Users Benefit Appraisal) program Version 1.9.9 and associated economics file (corresponding to WebTAG July 2017). Using trip and cost matrices from the traffic model, TUBA calculates user benefits and produces results for various degrees of disaggregation and summarises the outputs. Four forecasting years (2023, 2031, 2038 and 2051) were used in the economic appraisal.

13.1.2 The economic assessment of collisions has been undertaken using COBALT 2013.2 (COst and Benefit to Accidents – Light Touch) with economic parameters consistent with WebTAG July 2017.

13.1.3 The economic assessment of delays during construction has been undertaken using QUADRO2017 (QUeues And Delays at ROadworks). Construction information has been obtained through collaboration with Mott MacDonald Sweco Joint Venture highway design team and a Highways England Collaborative Delivery Framework (CDF) contractor.

13.1.4 The economic assessment of delays during maintenance was carried out using QUADRO2017. The maintenance plan was not available so the assumptions listed in 13.3.25 were made.

13.1.5 Journey time reliability methodology assumes that journey time reliability benefits experienced by the users of single carriageway section between Sparkford to Podimore would be altered by the scheme to be similar to those experienced on the dual carriageway sections either side (Wincanton to Hazlegrove and Podimore to Ilchester).

13.1.6 The wider economic impact that is related to output change in imperfectly competitive markets as a result of the scheme has been assessed using a simplified approach based on the recommendation set out in WebTAG 2.1 Section 4.1. Agglomeration effects were not calculated at this stage.

13.1.7 The changes in noise, air quality and greenhouse gases as a result of the scheme have also been assessed and monetised. Details of the approach taken and methodology used can be found in later sections.

Modelling framework

13.1.8 As discussed in Section 7.2, the base highway traffic model for the scheme was based on an adapted and re-validated version of the South West Regional Traffic Model (SWRTM). The model is representative of an average weekday (Monday to Friday) traffic for March 2015 and has been validated in accordance with WebTAG unit M3.1.

13.1.9 The model represents three weekday time periods that are consistent with the SWRTM model time periods. These are an average AM peak period hour (07:00-10:00), an average hour in the inter-peak (10:00 – 16:00) and an average PM peak period hour (16:00 – 19:00) covering an average Monday to Friday weekday in March 2015 (excluding school holidays and bank holidays).

13.1.10 In addition to the validated time period models reported in Section 10.6, an off-peak average hour (19:00 - 07:00) model was also developed for the purposes of appraisal.

13.1.11 It should also be noted that higher traffic flows occur at weekends and during holiday periods. Therefore, an adapted model that represents average summer peak hour (covering Friday to Sunday from 10:00 to 19:00) has also been developed for economic appraisal purposes (see Section 10.9 for more details).

13.2 Estimation of costs

13.2.1 Costs for the scheme assume that construction is expected to start in 2020 and continue until 2023.

13.2.2 The cost profiles supplied were based upon cost estimates for each financial year prepared in 2016 Q1 prices and then inflated to outturn costs using projected construction related inflation. These costs supplied have then been rebased to 2010 calendar year profiles for economic calculations, using the GDP-deflator series as published in the WebTAG Databook. The costs exclude all recoverable Value added tax (VAT) with all historic costs removed as required by WebTAG.

13.2.3 Table 13.2 summarises the costs. The costs are in 2010 prices, undiscounted.

Table 13.2: Scheme Cost Summary (2010 prices, undiscounted)

Cost Type	Scheme Costs (£)
Preparation	7,461,808
Supervision	2,956,247
Works	109,153,687
Land	10,895,483
TOTAL	**130,467,224**

Source: Highways England Estimate (May 2018)

13.2.4 These costs already allow for risk and contingencies, so optimism bias has not been added to the costs shown in Table 13.2 above. The detailed cost profiles for the scheme is included in Appendix I

13.2.5 The maintenance costs for the scheme were not available at the time of economic assessment, so the standard values from COBA2017 (given in Table 13.3) were used as an approximation. With a scheme length of 5.6km and an appraisal period of 60 years, this gave a total incremental maintenance cost (new dual carriageway cost – old single carriageway cost) for the scheme of the 60-year appraisal period of £1,243,200 (in 2010 values and prices).

Table 13.3: COBA maintenance costs (2010 values and prices)

Carriageway standard	Cost (£/km/year)
Single	9,000
Dual	12,700

13.3 Estimation of benefits

Transport user benefits

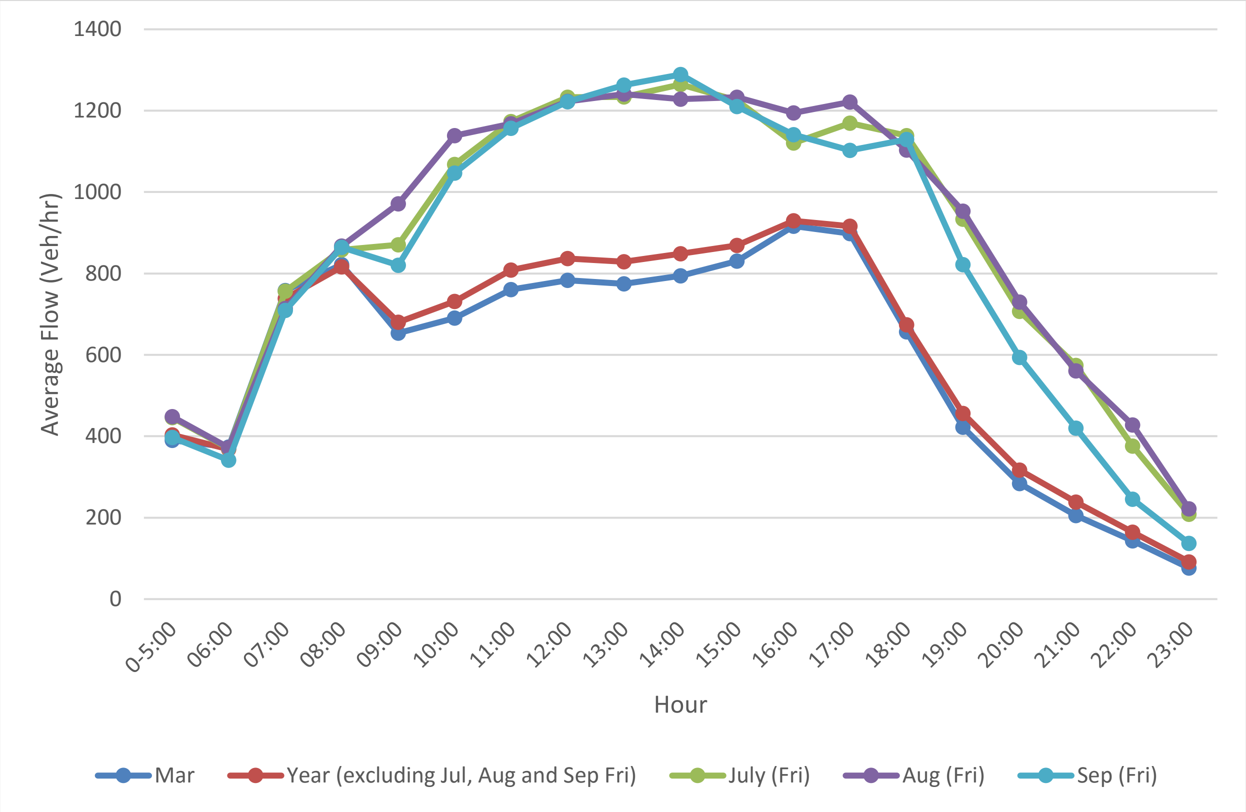
13.3.1 The DfT economic appraisal software TUBA program version 1.9.9 has been used to calculate the transport user benefits for the scheme in accordance with published DfT guidance. The appraisal is based on matrices of trips and costs extracted from the transport model. From these, TUBA calculates the user benefits in time, fuel vehicle operating costs (VOC), non-fuel VOC and charge. Both the benefits and the scheme costs are discounted to the present value year, 2010. As per WebTAG unit A1.3 car and rail employers' business values of time are assumed to vary with distance which is represented by a continuous function.

13.3.2 Fully converged trip matrices for each time period and assignment user class have been extracted from the traffic forecasts. Total HGV trip matrices have been split into OGV1 (47%) and OGV2 (53%) matrices as per the RTF15 splits and in consistency with the COBA and QUADRO manuals. The split of the LGV matrices into personal and freight trips uses the standard WebTAG data book proportions of 88% freight and 12% personal.

Annualisation factors

13.3.3 Annualisation factors are used to uplift the results produced for the modelled periods (2015 March weekday) to represent all hours during the year as far as possible. March is a neutral month in the year so as a consequence the annualisation factors applied within TUBA have been flow weighted. Weekday annualisation factors are calculated by multiplying the number of hours in each weekday period (3 hours in AM and PM, 6 hours in inter-peak and 12 hours in off-peak) by 240 working days in the year and by the ratio of average annual peak hourly flow over the average weekday March peak hourly flow. Due to the higher volumes of traffic (Figure 13.1) on Fridays between July and September, they have not been counted as weekdays here so the total number of weekdays during the year is 240 rather than 253.

Figure 13.1: Average A303 (West Camel) weekday flow profile, 2015



Source: MMSJV.

13.3.4 Derivation of weekday annualisation factors can be summarised by the equation below.

$$\frac{(\#\text{ of peak hours}) * (\#\text{ working days in a year}) * (\text{average annual peak hourly flow})}{\text{average hourly peak March flow}}$$

13.3.5 Calculation of weekend (including bank holidays) annualisation factors are slightly different. This is because a neutral month weekend model is not available. For the purpose of calculating annualisation factors it was assumed that weekday inter-peak and off-peak models can be used to represent travel conditions in the weekend.

13.3.6 In addition to the March weekday models, a model has also been prepared to represent the increased flows and congestion levels during August Friday - Sunday day-time hours (1000-1900). Further analysis on the weekend traffic profiles showed that the levels of weekend day-time traffic in August is similar to that in July and September, as well as for bank holidays in April, May and August. Therefore, the number of weekend days that are applicable to the August day-time model has been counted as the number of Fridays (13 no), Saturdays (13 no) and Sundays (13 no) plus the number of bank holidays (5 no) in April, May and August in 2015.

Figure 13.2: Average A303 (West Camel) weekend flow profile, 2015

Source: MMSJV.

13.3.7 Table 13.4 shows the number of days by day type in 2015 and a table of March, August and annual 2015 flows is contained in Appendix J along with the designated peak periods.

Table 13.4: Number of Days by Day Type in 2015

Day Type	Inclusion	Number of days	Model Applicable
Weekday	Mon – Fri (excluding Fri between Jul and Sep)	240	March Weekday
Summer Fridays and Weekends	Fri – Sun (Jul, Aug and Sep) + Bank Holidays (Apr, May and Aug)	44	Summer
Rest of the Year Weekend	Sat – Sun + Rest of the Bank Holidays	81	March Weekday

13.3.8 For summer weekends including some of the bank holidays as indicated above, 9 hours (10:00-19:00) was aligned with the August day-time period modelling, and the rest of the day was aligned with weekday off-peak modelling. For the rest of the year weekends and bank holidays, hours have been allocated according to whether they align most with the weekday inter-peak or off-peak hours based on an examination of flow profiles. On this basis, 8 hours (10:00-18:00) were considered to represent peak conditions which would be aligned with weekday inter-peak modelling, and the rest of the day would be aligned with weekday off-peak modelling.

13.3.9 Table 13.5 provides peak hour flows for average March/August/Annual 2015 and the annualisation factors in each peak are summarised in Table 13.6.

Table 13.5: Average Directional Hourly Flows 2015 used for Annualisation Derivation (veh/hr)

Time Period	March Weekday	August Weekend	Annual Weekday	Annual Weekend	Summer Weekend
AM	745	-	745	-	-
IP	772	1,092	821	812	1,066
PM	824	-	840	-	-
OP	271	-	291	322	471

Table 13.6: Annualisation Factors

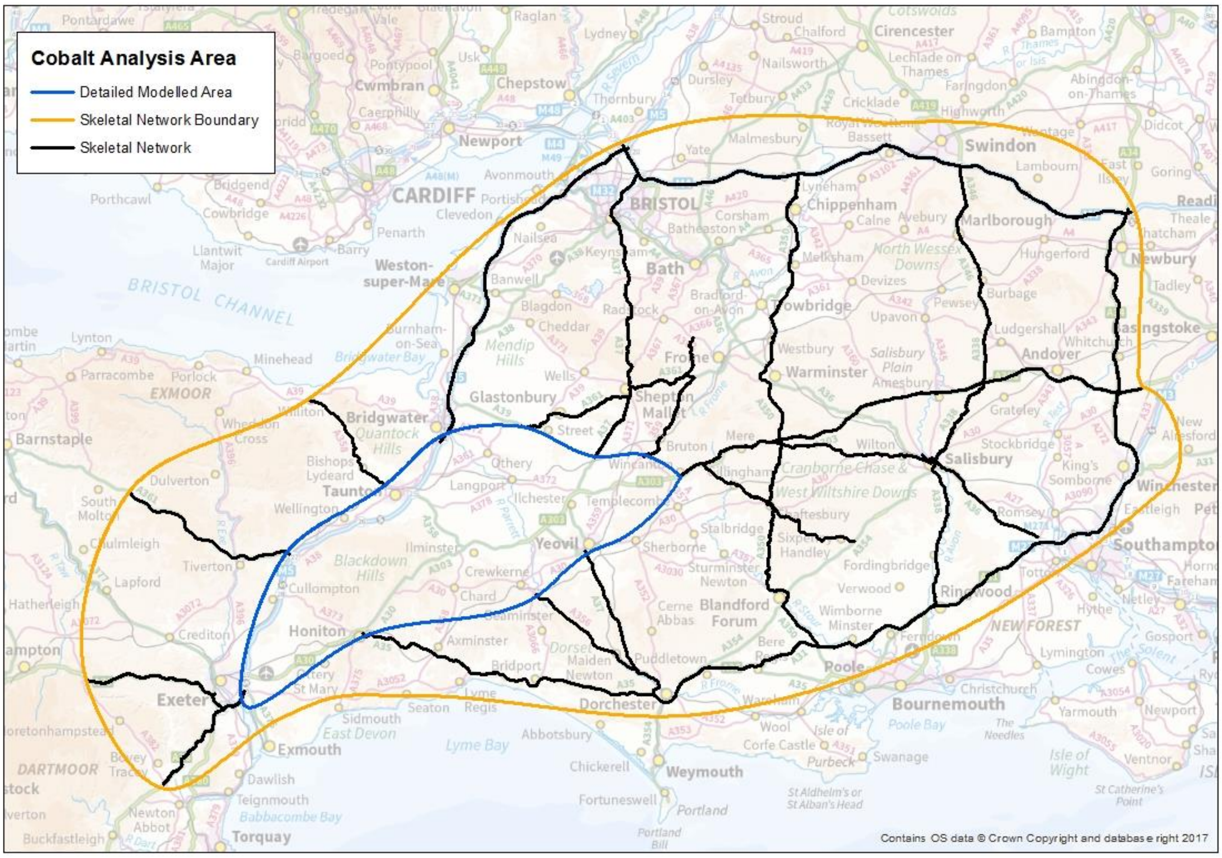
Time Period	Calculation	Annualisation
AM	3*240*745/745	720
Weekday IP	6*240*821/772	1,530
PM	3*240*840/824	734
Weekday OP	12*240*291/271	3,098
Rest of the Year Weekend IP	8*81*812/772	681
Rest of the Year Weekend OP	16*81*322/271	1,540
Summer Weekend IP	9*44*1066/1092	386
Summer Weekend OP	15*44*4719/271	1,149

Collision cost savings

13.3.10 Data was extracted from the highway model for the model years of 2023 and 2038 for input into the COBALT assessment. This data included network structure and forecast traffic flows. In the Do Something (DS), network restructuring was applied to the network as defined for the Do Minimum(DM) to make sure the common links / nodes between DM and DS SATURN networks correspond with the same COBALT links / nodes.

13.3.11 The model was calculated in 2 parts. The fully assessed area which assesses links and junction separately and included all network links within this area, and the skeletal network which assesses links and junction combined. The skeletal network only included a select number of key routes that feed into the fully assessed area, with the aim to capture any shift in traffic on the wider network and the accompanying collision benefits/dis-benefits. Figure 13.3 shows the boundaries of these assessment areas.

Figure 13.3: Stage 3 COBALT Assessment Area



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13.3.12 For the scheme, Somerset County Council provided collision data for the years between 2010 and 2014 inclusive and collision data for the years between 2010 and 2015 inclusive covering the area of detailed modelling were obtained from the Highways England database. The observed collisions were allocated to the nearest modelled links / junctions within 20 metres of the collision using a GIS tool. These data were used by COBALT to calculate observed link and junction collision rates. Collision data were not obtained for the area outside the detailed model area hence default collision rates have been used.

13.3.13 Observed data can only be applied to existing links and junctions. As a result, any new links or junctions added in the Do Something scheme were assigned rates derived from the COBALT default collision rates presented in COBALT 2017.1. A review of the observed collision data revealed that 84% of all the current links in the area of simulation modelling had no collisions recorded on them over the five-year period, and will therefore be assumed to be free of collisions over the entire 60-year appraisal period. On this basis, the relative propensity for collisions on the scheme (default data) compared against the rest of the detailed modelled area (observed data) may be distorted.

13.3.14 The COBALT assessment used the compound annual growth in vehicle-kilometres between the two forecast years 2023 and 2038. No further traffic growth is assumed post-2038. The 2015-2023 traffic growth rates are 19.7% for light vehicles and 4.9% for HGVs and the 2015-2038 traffic growth rates are 58.0% for light vehicles and 15.5% for HGVs.

13.3.15 Link numbers were allocated to the SATURN A-B node references so that A-B and B-A had the same link number with zone connector links excluded from the assessment. Links were assigned COBALT link types and given appropriate collision classifications. In the assessment with local collision rates, observed collision rates were calculated from the observed 5 years of collision data which were applied to the existing links and junctions within the area of detailed modelling, and for future year scheme links in the Do Minimum and Do Something scenarios, default collision rates were applied.

13.3.16 Link traffic flows were coded in the data files as two-way AADT flows for both assessment years of 2023 and 2038. The conversion from model period (AM, Inter-Peak, PM and Off-Peak) hourly March flows to AADT used factors discussed in Section 11.6.

13.3.17 Links that were common to both the Do Minimum and Do Something scenarios were given the same link numbers so that link attributes and observed data could be accurately transferred from the DM to DS data files. New links were given unused link numbers. Link attributes were allocated on a case by case basis for new links.

13.3.18 COBALT requires all roundabouts to be represented by a single junction. However, as the coding of certain roundabouts within the SATURN traffic model involved exploding the nodes to represent each approach and separate links for circulation links, the COBALT coding had to be manipulated. In COBALT, each roundabout was represented by a single node across all scheme options with all junction and link classifications changed appropriately.

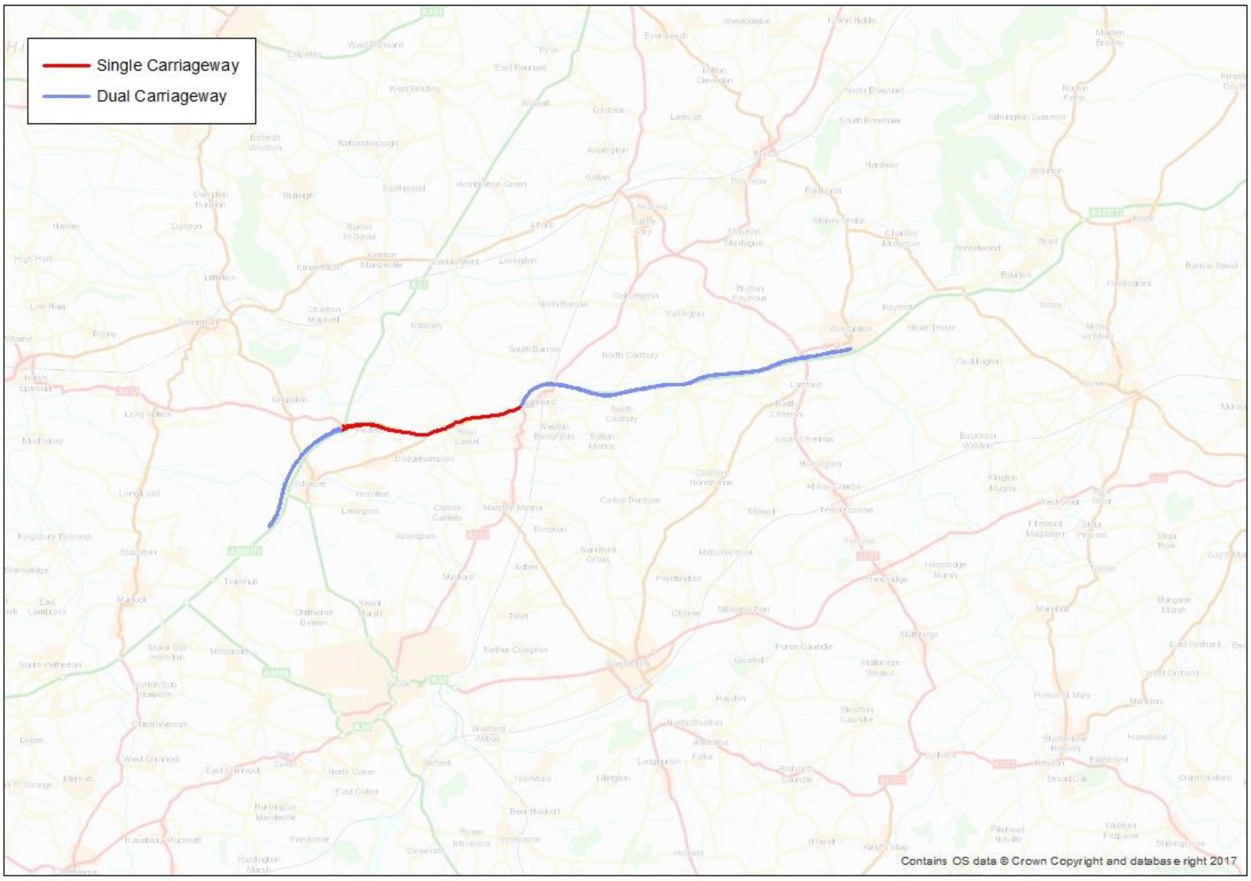
Journey time reliability benefits

13.3.19 ‘Reliable journeys’ is one of the sub-objectives within the ‘Economy’ section of scheme appraisal and the estimate provided in this Section is aimed at addressing this sub-objective for the Scheme. The term ‘reliability’ is often used interchangeably with ‘travel time variability’ or ‘journey time variability’.

13.3.20 This section describes the method used to calculate and monetise the benefits of improved reliability of the A303 Sparkford to Ilchester scheme. Here, reliability refers to variability in journey times after accounting for predictable variations and variability due to incidents. As recommended in WebTAG, reliability is measured as the standard deviation of journey time. It is important to note that there is no established approach to appraise reliability impacts for single carriageways. Therefore, the methodology described in the following section has been implemented.

13.3.21 The reliability of the single and dual carriageway sections has been measured using journey time observations from Trafficmaster for 2015 and 2016. The sections of the dual and single carriageway sections for which Trafficmaster data was obtained are illustrated in the Figure 13.4 below.

Figure 13.4: Trafficmaster links used in reliability calculations



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13.3.22 The main assumptions in the methodology are:

- With the scheme, users of the current single carriageway section will experience the same level of variability as that experienced by the users of the adjacent dual carriageway sections.
- There are no changes in reliability due to demand growth. This is a conservative assumption that would result in an underestimation of benefits.
- Variability is the same for all journeys regardless of the length of the journey. This could result in an overestimation of reliability benefits. However, the combination of this and the second assumption above would help to neutralise these impacts.

13.3.23 The overall methodology is summarised below:

- Disaggregate data by time of the day (AM 07:00 - 10:00, IP 10:00 - 16:00, PM 16:00 - 19:00 and OP 19:00 - 07:00), day of the week (Monday to Thursday, Friday, Saturday and Sunday) and month of year (summer - July and August and neutral months - other months) in order to exclude predictable variations.
- Calculate the standard deviation of journey times in sec/km for single and dual carriageway sections for the above time slices.
- Use neutral month AM, IP, PM and summer IP standard deviations to calculate reliability benefits. Assume no reliability benefits during other time periods (neutral month weekday/weekend OP and summer OP).
- Apply the rule of the half method using standard devitions from the above and corresponding traffic flows together with the value of reliability to calculate reliability benefits for the opening year.
- Calculate benefits over the 60-year appraisal period in 2010 prices discounted to 2010 by applying an appropriate capitalisation factor.

Delays during construction and maintenance

13.3.24 The construction of the A303 Scheme will create some delays in the local road network. Consequently, a QUADRO based economic assessment was produced to assess the potential construction impact due to the implementation of the improvements. This assessment evaluated the dis-benefits due to the roadworks during the construction of the scheme, which consist of delays to traffic (both due to physical presence of the works and any delays caused by breakdowns or collisions occurring within the works), leading to impacts on travel times, vehicle operating costs, carbon emissions and collision costs. The construction assumptions used in the appraisal are based on an assessment of the possible traffic management arrangements which were provided by the contractor and are set out in Appendix L.

13.3.25 The maintenance costs and plans were not available at the time the assessment was undertaken. As stated in 13.2.5, standard values for the maintenance costs were included. In order to assess the differences in impact due to maintenance between the Do Minimum and the Do Something, QUADRO assessments were undertaken for both scenarios using the following assumptions.

Do Minimum single carriageway:

- All work would be carried out during the night (22:00 – 06:00) and work would be carried out on all days (Monday – Sunday)
- The single carriageway would require resurfacing every 12 years, starting in 2023
- Resurfacing would be carried out using signalised shuttle working with a reduced speed limit of 40mph over a distance of 500m per shift

- The total duration of a resurfacing would therefore be 22 nights (5,600*2/500)
- It would need to undergo partial reconstruction every 20 years, starting in 2026
- Reconstruction will be carried out using signalised shuttle working with a reduced speed limit of 40mph over a distance of 300m per shift
- The total duration of a reconstruction would therefore be 38 nights (5,600*2/300)

Do Something dual carriageway:

- All work would be carried out during the night (22:00 – 06:00) and work would be carried out on all days (Monday – Sunday)
- The dual carriageway would require resurfacing every 12 years, starting in 2023
- Resurfacing would be carried out using contraflow with a reduced speed limit of 50mph and no capacity adjustments (such as narrow lanes)
- 1km of 2 lanes would be completed per shift
- The total duration of a resurfacing would therefore be 10 nights (5,600*2/1,000)

Air quality

13.3.26 The air quality appraisal has been undertaken in accordance with WebTAG Unit A3 Chapter 3. Net Present Values (NPVs) have been calculated based upon local and regional changes in air quality. Roads in the traffic model that meet the DMRB (Design Manual for Roads and Bridges) local and regional air quality screening criteria have been used to derive the air quality study area and NPVs. Changes in air quality have been appraised using the DfT's 'Local Air Quality Workbook' and 'Air Quality Valuation Workbook'.

Greenhouse gases

13.3.27 The greenhouse gases (GHG) appraisal has been undertaken in order to determine the carbon dioxide equivalent (CO2e) emissions for each option, and derive the NPV of each option in terms of GHGs. This appraisal was undertaken using WebTAG Greenhouse Gases Workbook – Worksheet 1. WebTAG used data published by DfT and the traffic model to estimate the emissions from each option, and the NPV of these emissions.

Noise

13.3.28 The noise appraisal has been undertaken in accordance with WebTAG Unit A3 Chapter 2. Net present values (NPV) have been calculated for changes in noise, amenity and several specific health issues. In order to derive the NPVs, calculated values for each house within the option study area required independent entries in the WebTAG Noise Worksheets for 'with' and 'without' scheme in both opening and design years. The study area used in the calculation was consistent with the DMRB approach, which in broad terms has been determined by minimum changes of 1dB in a comparison between 'with' and without' scheme scenarios in the year of Opening, or the equivalent in the Design Year of 3dB.

13.3.29 Night-time noise has been calculated on the basis of conversion from day-time to night-time using the relationship between day-time and night-time traffic flows identified within a Transport Research Laboratory report as discussed in the DMRB. Mitigation in the form of low noise road surface, noise bunds and barriers has been incorporated into the design to reduce noise from the scheme impacting on noise sensitive receptors.

13.3.30 To provide a worst-case assessment for the impact of the scheme in the local area, the forecasts have accounted for potential wider area reassignment as explained in Section 12.2.

14 Economic appraisal results

Table 14.1: Glossary of terms for chapter 14

AST	Appraisal Summary Table
BCR	Benefit to Cost Ratio
CO2	Carbon Dioxide
COBALT	Cost and Benefit to Accidents Light Touch
DfT	Department for Transport
DM	Do Minimum – a future year modelled scenario without the scheme
DS	Do Something – a future year modelled scenario with the scheme included
MMSJV	Mott MacDonald Sweco Joint Venture
NO_2	Nitrogen dioxide
NOx	mono-nitrogen oxides
NPV	Net Present Value
OD	Origin destination
PM_{10}	particulate matter 10 micrometres or less in diameter
PVB	Present Value of Benefits
PVC	Present Value of Costs
QUADRO	Queues And Delays at Roadworks
TEE	Transport Economic Efficiency
TUBA	Transport User Benefit Appraisal
VDM	Variable Demand Modelling
VOC	Vehicle Operating Costs
WebTAG	Web-based transport analysis guidance produced by the DfT

14.1 Core scenario

Analysis of monetised costs and benefits

14.1.1 Table 14.2 shows Analysis of Monetised Costs and Benefits which includes economic assessment results from the TUBA, COBALT, QUADRO, wider economic and reliability analysis. As per WebTAG all costs and benefits reported in this section are in 2010 prices discounted to 2010.

Table 14.2: Analysis of Monetised Costs and Benefits – Collisions included (£000s)

Item	Monetary value (£000s)
Collisions (not assessed by TUBA)*	10,957
Roadworks (not assessed by TUBA)**	-24,324
Greenhouse Gases (assessed by TUBA)***	-27,927
Noise (not assessed by TUBA)****	-66
Air Quality (not assessed by TUBA)*****	-360
Economic Efficiency: Consumer Users (Commuting)	9,910
Economic Efficiency: Consumer Users (Other)	17,084
Economic Efficiency: Business Users and Providers	121,544
Wider Public Finances (Indirect Taxation Revenues)	49,613
Present Value of Benefits (PVB)	156,431
Broad Transport Budget Present Value of Costs (PVC)	108,079
OVERALL IMPACTS	
Net Present Value (NPV)	48,352
Initial Benefit to Cost Ratio (BCR)	**1.45**
Reliability Benefits	16,446
Wider Economic Benefits	12,154
Adjusted BCR	**1.71**

Notes: *from COBALT, ** from QUADRO,***WebTAG Unit A3 Chapter 2,**** WebTAG Unit A3 Chapter 3,***** WebTAG Unit A3 Chapter 4, All monetary values are expressed in 2010 prices discounted to 2010

14.1.2 The Net Present Value (NPV) results indicate that the scheme provides an initial BCR of 1.45. The adjusted BCR that includes wider economic and reliability benefits is 1.71. Under the DfT's value for money criteria, the adjusted BCR represents medium value for money as it is between 1.5 and 2. However, in the overall value for money assessment of the scheme, other qualitative factors which cannot be monetised are taken into account, such as those reported in the Appraisal Summary Table (see appendix M). Therefore, the BCR alone does not provide a good measure of value for money and is not used as the sole basis for decisions. It is important to note that benefits reported by TUBA are conservative estimates since average hour models are used instead of peak hour models.

14.1.3 The following sections contain the TUBA Transport Economic Efficiency (TEE) table, TUBA Public Accounts table, COBALT, QUADRO, wider economic and reliability results respectively. There are also sections containing the results for the monetisation of the environmental impacts of noise, air quality and greenhouse gasses. Appendix K contains the analysis carried out to demonstrate the reliability and robustness of the economic appraisal results.

Transport economic efficiency (TEE)

14.1.4 The results of the assessment of TUBA user benefits are shown in the TEE table of TUBA output file which is presented in Table 14.3. The TEE table shows that the scheme achieves total transport economic efficiency benefits of £148.5m in 2010 prices discounted to 2010 over the 60-year assessment period.

14.1.5 The results of the Transport Economic Efficiency assessment show efficiency benefits for all trip purposes. As compared to consumer trips, business trips constitute the highest proportion of the reported user benefits mainly due to the relatively higher value of time for business users.

Table 14.3: Transport Economic Efficiency (TEE) – Benefits (£000s)

Item	Monetary value (£000s)
Consumer – Commuting User benefits	**All Modes**
Travel Time	17,837
Vehicle operating costs	-7,927
User charges	0
During Construction & Maintenance	0
NET CONSUMER - COMMUTING BENEFITS	9,910
Consumer - Other user benefits	**All Modes**
Travel Time	56,711
Vehicle operating costs	-39,628
User charges	2
During Construction & Maintenance	0
NET CONSUMER - OTHER BENEFITS	17,085
Business Impacts	**All Modes**
Travel Time	122,221
Vehicle operating costs	-676
User charges	0
During Construction & Maintenance	0
Sub Total	121,545
Private Sector Provider Impacts	
Revenue	0
Operating costs	0
Investment costs	0
Grant/subsidy	0
Sub Total	0
Other business Impacts	
Developer contributions	0
NET BUSINESS IMPACT	121,545
TOTAL	
Present Value of Transport Economic Efficiency Benefits (TEE)	**148,540**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Public accounts

14.1.6 Table 14.4 provides the public accounts summary in 2010 prices discounted to 2010 (costs appear as positive numbers, while “Revenue” and “Developer Contributions” appear as negative numbers). The scheme has a £108.0m impact on the Broad Transport Budget. The impact on Wider Public Finances is £49.6m.

Table 14.4: Summary of Public Accounts – Cost (£000s)

Item	Monetary value (£000s)
Local Government Funding	**All Modes**
Revenue	0
Operating Costs	0
Investment Costs	0
Developer Contributions	0
Grant/Subsidy Payments	0
NET IMPACT	0
Central Government Funding: Transport	**All Modes**
Revenue	-14
Operating costs	418
Investment costs	107,676
Developer Contributions	0
Grant/Subsidy Payments	0
NET IMPACT	108,080
Central Government Funding: Non-Transport	
Indirect Tax Revenues	-49,613
TOTALS	
Broad Transport Budget	**108,080**
Wider Public Finances	**-49,613**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Collision savings

14.1.7 Table 14.5 summarises the results of the COBALT collision assessment for a 60-year appraisal period. This shows that the scheme reduces the number of collisions in the Sparkford area.

Table 14.5: Collision assessment with local collision rates

		60-Year Appraisal Period
	Do Minimum	
Number of Personal Injury Casualties	Fatal	1,539
	Serious	15,638
	Slight	165,616
Collision Costs (£000s in 2010 prices discounted to 2010)		5,855,546
	Scheme	
Number of Personal Injury Casualties	Fatal	1,535
	Serious	15,612
	Slight	165,387
Collision Costs (£000s in 2010 prices discounted to 2010)		5,844,589
Number of Personal Injury Casualties saved by scheme	Fatal	5
	Serious	26
	Slight	230
Collision Savings (£000s in 2010 prices discounted to 2010)	**Total**	**10,957**

Note: All monetary values are expressed in 2010 prices discounted to 2010

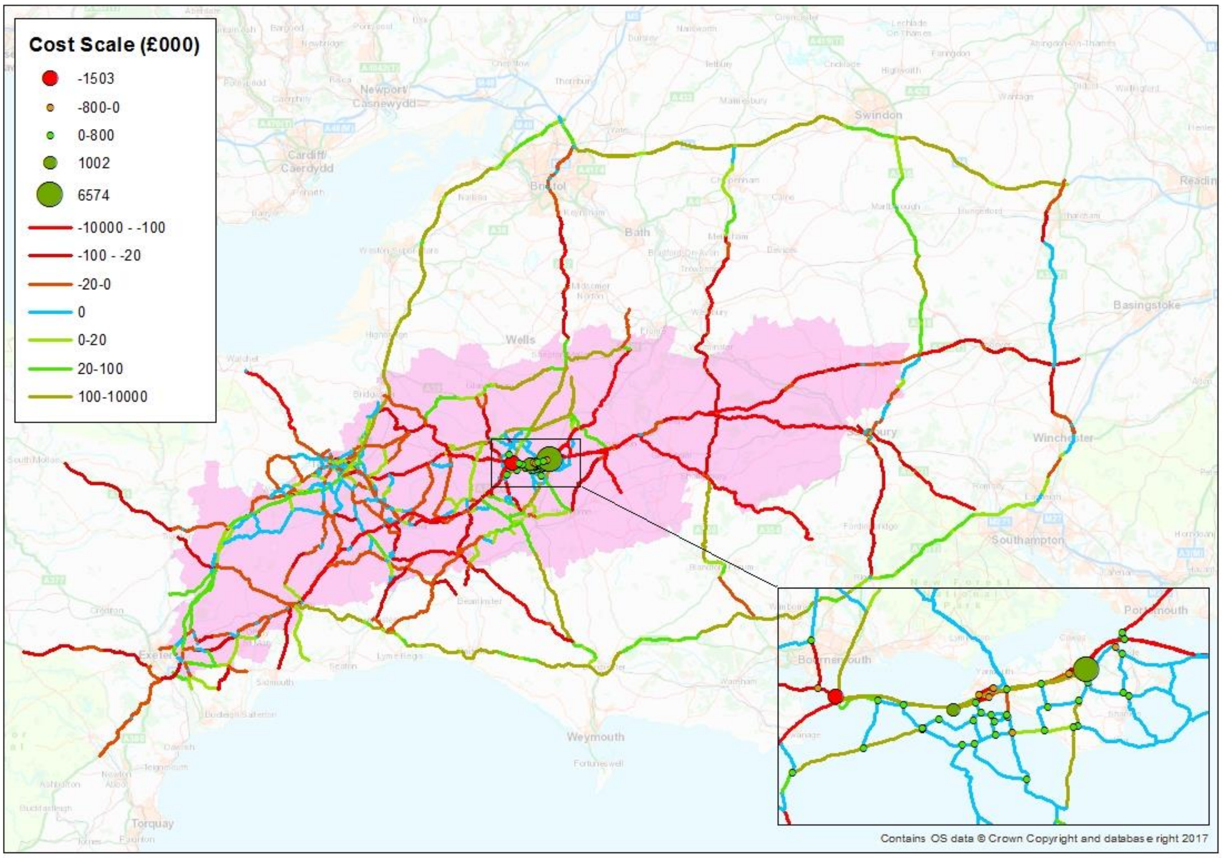
14.1.8 Figure 14.1 shows the COBALT collision benefits for links and junctions. The links are colour coded in terms of magnitude of benefit and dis-benefit as listed in the key. With regards to junctions, the size of the circles representing each junction is related to the colour and magnitude of the junction benefit (green circles) and dis-benefit (red circles) as listed in the key.

14.1.9 The results indicate that the scheme provides a collision saving, reducing the number of collisions and the cost of collisions within the network (with a total saving of £11m).

14.1.10 The benefits were generated by traffic flows shifting from poorer quality links and junctions to higher quality, and therefore safer, links and junctions in the fully assessed area, predominantly around the scheme.

14.1.11 The skeletal network links can contribute benefits or dis-benefits depending on whether traffic flows decrease or increase with the scheme. For example, a dis-benefit can be seen on the A303 / A30 corridor where traffic has re-routed from the M4 / M5. The overall dis-benefits and benefits caused by such rerouteings would not necessarily cancel each other out, as there could be higher benefits or dis-benefits depending on the differences in the corresponding default collision rates.

Figure 14.1: Link and Junction Collision Benefits (COBALT)



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Delays during construction

14.1.12 Appendix L contains the information used in setting up and running QUADRO for the scheme. Table 14.6 and Table 14.7 summarise the QUADRO outputs. There is a loss of £16,000 in indirect tax revenues to the central government. The total non-exchequer impact for the proposals is £24.4m in terms of the costs (which includes travel time and vehicle operating costs) imposed on road users while the roadworks are being carried out.

14.1.13 Unlike the TUBA results in Table 14.3, where business benefits constitute the highest proportion, the net impact of delay on consumers from QUADRO (commuting & other) is significantly larger than its impact on business users here. This is due to the differences in appraisal methods in TUBA and QUADRO. TUBA benefits are based on OD level inputs using DM and DS trips and costs which were subject to VDM, whereas QUADRO is based on a link based appraisal using DM flows on the scheme link. Both time and VOC benefits by purpose are significantly impacted depending which of these approaches is used.

Table 14.6: QUADRO Results (£000s)

Impact	(Monetary values £000s)
Consumers: user costs	
Travel time	14,280
Vehicle operating costs	275
Net consumer Impact	**14,555**
Business users: user costs	
Travel time	9,547
Vehicle operating costs	247
Sub total	9,794
Private sector provider impacts	
Operating costs	44
Net business Impact	**9,838**
Collision costs	**0**
Fuel carbon emission costs	**-5**
Total non-exchequer impacts	**24,388**
Government funding	
Investment costs: maintenance works costs	0
Indirect tax revenues	16
Present Value of Costs	**16**
Overall impact	**24,404**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 14.7: QUADRO Results – Summary (£000s)

Impact	Monetary values £000s
Non-Exchequer Impacts:	
Net Consumer Impact	14,555
Net Business Impact	9,838
Collision Costs	0
Fuel carbon Emission Costs	-5
Total Non-Exchequer Impacts	**24,388**
Government Funding	
Present Value of Costs	**16**
Overall Impact	**24,404**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Delays during maintenance

14.1.14 Paragraph 13.1.4 contains the information used in setting up and running QUADRO for the maintenance of the Do Minimum and Do Something scenarios. scheme.

14.1.15 Table 14.8 and Table 14.11 summarise the DM QUADRO outputs. There is a loss of £4,000 in indirect tax revenues to the central government. The total non-exchequer impact for the proposals is £94,000 in terms of the costs (which includes travel time and vehicle operating costs) imposed on road users while the roadworks are being carried out.

Table 14.8: Do Minimum Maintenance QUADRO Results (£000s)

Impact	(Monetary values £000s)
Consumers: user costs	
Travel time	49
Vehicle operating costs	4
Net consumer Impact	**53**
Business users: user costs	0
Travel time	34
Vehicle operating costs	7
Sub total	41
Private sector provider impacts	0
Operating costs	0
Net business Impact	**41**
Collision costs	**0**
Fuel carbon emission costs	**0**
Total non-exchequer impacts	**94**
Government funding	0
Investment costs: maintenance works costs	0
Indirect tax revenues	-4
Present Value of Costs	**-4**
Overall impact	**90**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 14.9: Do Minimum Maintenance QUADRO Results – Summary (£000s)

Impact	Monetary values £000s
Non-Exchequer Impacts:	
Net Consumer Impact	53
Net Business Impact	41
Collision Costs	0
Fuel carbon Emission Costs	0
Total Non-Exchequer Impacts	**94**
Government Funding	
Present Value of Costs	**-4**
Overall Impact	**90**

Note: All monetary values are expressed in 2010 prices discounted to 2010

14.1.16 Table 14.10 and Table 14.11 summarise the DS QUADRO outputs. There is a loss of £2,000 in indirect tax revenues to the central government. The total non-exchequer impact for the proposals is £9,000 in terms of the costs (which includes travel time and vehicle operating costs) imposed on road users while the roadworks are being carried out.

Table 14.10: Do Something Maintenance QUADRO Results (£000s)

Impact	(Monetary values £000s)
Consumers: user costs	
Travel time	7
Vehicle operating costs	-2
Net consumer Impact	**6**
Business users: user costs	0
Travel time	5
Vehicle operating costs	-2
Sub total	3
Private sector provider impacts	0
Operating costs	0
Net business Impact	**3**
Collision costs	**0**
Fuel carbon emission costs	**0**
Total non-exchequer impacts	**9**
Government funding	0
Investment costs: maintenance works costs	0
Indirect tax revenues	2
Present Value of Costs	**2**
Overall impact	**10**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 14.11: Do Something Maintenance QUADRO Results – Summary (£000s)

Impact	Monetary values £000s
Non-Exchequer Impacts:	
Net Consumer Impact	6
Net Business Impact	3
Collision Costs	0
Fuel carbon Emission Costs	0
Total Non-Exchequer Impacts	**9**
Government Funding	
Present Value of Costs	**2**
Overall Impact	**10**

Note: All monetary values are expressed in 2010 prices discounted to 2010

14.1.17 The net maintenance impact is a benefit is £80,000 (to the nearest £1,000) with the inclusion of the scheme compared to the Do Minimum scenario. The overall construction and maintenance impact of the scheme is therefore a dis-benefit of £24,324,000 (to the nearest £1,000).

Reliability benefits

14.1.18 The following table contains reliability by time slice for both single and dual carriageway sections. It is evident that dual carriageway sections are more reliable than single carriageway sections since the standard deviation of journey time per km is much lower for dual carriageway sections. For both carriageway sections, the highest variability is observed during summer peaks.

14.1.19 The table also contains opening year and 60-year reliability benefits. The A303 Sparkford to Ilchester reliability benefits (£14.7m) are about 9% of the TUBA present value of benefits. This compares well with Stonehenge results calculated in stage 2 where two tunnel options produced reliability benefits of 10% and 11% of the corresponding TUBA present value of benefits.

Table 14.12: Reliability results – summary (£000s)

Time period		AM	IP*	PM	Summer
Standard deviation (s/km)	Single carriageway	10.6	10.9	10.6	39.6
	Dual carriageway	3.5	4.1	6.7	17.7
Opening year reliability benefits (£000s in 2010 prices discounted to 2010)		56	175	36	133
60-year reliability benefits (£000s in 2010 prices discounted to 2010)		**16,446**			

*includes both weekday and weekend IP

Wider economic benefits

14.1.20 The wider economic impact that is related to output change in imperfectly competitive markets as a result of the scheme is £12.2m as per WebTAG 2.1 Section 4.1.

Noise

14.1.21 Noise decreases and increases are summed in WebTAG using recognised dose-response relationships which relate annoyance to noise level, and with the latest revision, using relationships between noise levels and health effects. Since traffic noise is a function of traffic volume and distance to receptor (other aspects being equal), the overall impacts for each option are a result of traffic increases and decreases across the area, coupled with density of housing.

14.1.22 Table 14.13 below shows the number of households predicted to experience benefits and dis-benefits in day-time and night-time noise in the forecast year. These figures in Table 14.13 correspond to the overall NPV values in Table 14.14. The scheme has an overall dis-benefit. Table 14.14 below provides a breakdown of the NPVs that have been calculated for impacts on annoyance, sleep disturbance and health, from which the overall NPVs were derived from.

Table 14.13: Quantitative results for changes in noise

Quantitative results	
Households experiencing increased day-time noise in forecast year:	128
Households experiencing reduced day-time noise in forecast year:	63
Households experiencing increased night-time noise in forecast year:	42
Households experiencing reduced night-time noise in forecast year:	67

Table 14.14: Predicted noise benefits (£s)

Overall Assessment Scores	Monetary values (£s)
Net present value of impact on sleep disturbance (£):	£22,184
Net present value of impact on amenity (£):	-£58,131
Net present value of impact on AMI (£):	-£11,490
Net present value of impact on stroke (£):	-£7,431
Net present value of impact on dementia (£):	-£11,253
Net Present Value of Change in Noise	**-£66,121**

Air quality

14.1.23 The economic appraisal of air quality is based on the quantification of both local (change in concentrations at properties within 200m of affected roads) and regional (change in annual total emissions from affected roads) air quality.

14.1.24 The Net Present Values (NPV) of these changes is calculated using damage costs derived from analysis by the Interdepartmental Group on Costs and Benefits air quality subject group (IGCB(A)) of the typical health impacts arising from changes in emissions of nitrogen oxides (NOx) and particulate matter (PM_{10}) concentrations. Monetary values for NOx emissions have a unit of £s per tonne so the change in NPV caused by NOx is based on the regional air quality assessment. Monetary values for PM_{10} have a unit of £s per household per 1µg/m3 so the change in NPV caused by PM_{10} is based on the local air quality assessment.

14.1.25 presents the results of the local assessment for PM_{10}. As changes in local air quality caused by NOx and Nitrogen dioxide (NO_2) concentrations are not used to generate the NPV, they have not been presented here. Local results for NO_2 have been presented in the Appraisal Summary Table (AST), see appendix M. As presented in the Table below, the scheme is predicted to cause a marginal negative local air quality effect for PM_{10} in the Opening Year and Forecast Year.

Table 14.15: Quantitative results for change in air quality

Assessment results	Year	
	Opening year (2023)	Forecast year (2038)
Net total route assessment score for PM_{10} (from local assessment) (difference between 'with scheme' and 'without scheme' scenarios)	19.3	25.9

14.1.26 Table 14.16 presents the results of the regional assessment for NOx. Regional changes in PM_{10} emissions are not used to generate the NPV so they have not been presented here, they are presented in the Appraisal Summary Table (AST, see appendix M). As presented in the Table below, the scheme is predicted to cause a net increase in regional NOx emissions in the Opening Year and Forecast Year, as the scheme leads to increases in the number of vehicles on the affected road network.

Table 14.16: Regional air quality emissions as a result of the Scheme

				Impact
NOx emissions in tonnes per year	Areas not exceeding limit value	Without Scheme	Opening Year	4061.8
			Forecast Year	3336.7
		With Scheme	Opening Year	4074.5
			Forecast Year	3346.4
		Change in emissions	**Opening Year**	**12.6**
			Forecast Year	**9.7**
	Areas exceeding limit value	**With/without Scheme and change in emissions in Opening Year and Forecast Year**		**0**

14.1.27 Table 14.17 presents the NPVs derived from changes in regional NOx emissions and local PM_{10} concentrations. Overall, the scheme has a negative NPV, which represents a net deterioration in air quality when considering both local and regional effects. The negative effect is primarily caused by increases in regional NOx emissions as described above.

Table 14.17: Predicted air quality impacts (£s)

Overall Assessment Scores	Monetary value (£s)
Present value of change in NOx emissions (£):	-£292,732
Present value of change in PM_{10} concentrations (£):	-£66,900
Total value of change in air quality (£):	**-£359,632**

Greenhouse gases

14.1.28 The WebTAG greenhouse gas appraisal indicates that the scheme will lead to an increase in greenhouse gas emissions. The difference between ‘with-’ and ‘without Scheme’ emissions is greater in 2023 than in 2038 for the scheme.

14.1.29 Table 14.18 shows that there is a net increase in Carbon Dioxide (CO2) emissions over the 60-year appraisal period. As shown in Table 14.19, greenhouse gases dis-benefits have been predicted for the scheme due to increased vehicle km and changes in speed.

Table 14.18: Quantitative assessment for greenhouse gases

	Impact
Change in carbon dioxide equivalent emissions over 60-year appraisal period (tonnes): (between 'with scheme' and 'without scheme' scenarios)	631,167 (traded+untraded)
Of which Traded	5,972
Change in carbon dioxide equivalent emissions in opening year (tonnes): (between 'with scheme' and 'without scheme' scenarios)	9,874 (traded + untraded)

Table 14.19: Predicted greenhouse gases impacts (£000s)

	Monetary value (£000s)
Total value of change in greenhouse gases (£):	**-27,927**

Notes: All monetary values are expressed in 2010 prices discounted to 2010

15 Distributional Impact Assessment

Table 15.1: Glossary of terms for chapter 15

AST	Appraisal Summary Table
COBALT	Cost and Benefit to Accidents Light Touch
DI	Distributional Impact
DM	Do Minimum – a future year modelled scenario without the scheme
DS	Do Something – a future year modelled scenario with the scheme included
GIS	Geographic Information System
LSOA	Lower Super Output Area (Census)
MMSJV	Mott MacDonald Sweco Joint Venture
TUBA	Transport User Benefit Appraisal
WebTAG	Web-based transport analysis guidance produced by the DfT

15.1 Introduction

15.1.1 As stated in WebTAGA4.2, Distributional Impacts (DI) consider the variance of transport intervention impacts across different social groups. In effect the distributional impact analysis aims to compare the distribution of scheme benefits or disbenefits against several sensitive social groups.

15.1.2 DI screening was carried out and is included in Appendix N. Following this user benefits, affordability and collisions have been taken forward for detailed analysis.

15.1.3 As mentioned in Section 14, both employers' business users and consumers experience benefits or disbenefits as a result of the scheme. The scheme also results in network links with significant changes in traffic flows and speeds. Consequently, the analysis reported here looks at consumer user benefits and collision impacts on social groups. These include population in income quintiles, children (aged <16), young adults (aged 16-25), older people (aged 70+), pedestrians, cyclists and motorcyclists.

15.2 **User benefits**

15.2.1 As per WebTAG A4.2, the distributional impacts on (non-business) consumers journeys were analysed. As suggested in the unit, DI analysis of business journeys are not carried out since these impacts are experienced by businesses and not individuals.

15.2.2 The user benefit distributional impact analysis was undertaken for the simulation area (see Figure 7.1).

15.2.3 Consumer benefits over the 60-year appraisal period were extracted from the TUBA analysis by origin zone in the AM peak, by destination zone for the PM peak and average of origin and destination zones for the other periods. It should be noted that only benefits and disbenefits for the simulation area were included in the user benefit analysis.

15.2.4 2015 income deprivation data from the Indices of Deprivation[5] was mapped at Lower Super Output Area (LSOA) level and used to identify the distribution of incomes in line with the national quintiles for each model zone. Mapping of the spatial distribution of benefits was undertaken in GIS using a point aggregation method with residential point data. This allowed for the share of population and share of benefit values to be calculated for each of the income deprivation quintiles.

15.2.5 Table 15.2 below details the summary of the proportion of benefits experienced by each income quintile of population in the simulation area.

Table 15.2: Proportion of benefits experienced by each income quintile of population in the simulation area

	Income quintile					
	<- Most deprived areas			Least deprived areas ->		
	0-20%	20-40%	40-60%	60-80%	80-100%	Total
Total population	16,326	66,670	120,264	178,141	108,200	489,601
Share of population	3%	14%	25%	36%	22%	100%
Total benefits (£, 2010 prices discounted to 2010)	914,982	2,317,181	3,547,238	4,132,631	4,596,086	15,508,119
Share of benefits	6%	15%	23%	27%	30%	100%
Assessment	✓✓ Moderate beneficial	✓✓ Moderate beneficial	✓✓ Moderate beneficial	✓ Slight beneficial	✓✓✓ Large beneficial	

15.2.6 The results indicate that three out of five income quintiles experience moderate beneficial impacts, one experiences large beneficial impacts and one experiences slight beneficial impacts, based on the Appraisal Summary Table (AST) seven-point distributional impact scale in WebTAG. Therefore, the overall score is given as moderate beneficial.

15.3 Affordability

15.3.1 The distributional impacts on affordability were also analysed over the simulation area and in a manner consistent with the analysis of user benefits. Vehicle operating cost (fuel and non-fuel) impacts for consumers were analysed and mapped to LSOAs. The results are shown in Table 15.3.

[5] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015

Table 15.3: Vehicle operating cost impacts for consumers

	Income quintile					
	<- Most deprived areas			Least deprived areas ->		
	0-20%	20-40%	40-60%	60-80%	80-100%	Total
Total population	16,326	66,670	120,264	178,141	108,200	489,601
Share of population	3%	14%	25%	36%	22%	100%
Total decrease in operating costs (£, 2010 prices discounted to 2010)	-269, 281					-269, 281
Total increase in operating costs (£, 2010 prices discounted to 2010)		1,478,150	3,522,356	5,770,157	3,647,217	-14,417,880
Share of operating costs decrease	100%					100%
Share of operating costs increase		10%	24%	40%	25%	100%
Assessment	✓✓✓ Large beneficial	×× Moderate adverse	×× Moderate adverse	×× Moderate adverse	×× Moderate adverse	

15.3.2 The results indicate that the most deprived income quintile experiences a large beneficial impact due to a reduction in vehicle operating costs according to the grading criteria given in WebTAG. The other four quintiles experience moderate adverse impacts due to increased vehicle operating costs. Therefore, the overall AST seven-point distributional impact scale score is given as moderate adverse.

15.4 Collision benefits

15.4.1 The scheme will change the road alignment between Sparkford and Ilchester along the A303. Also, model forecasts indicate that there is more than a 10% change in traffic flows on sections along the scheme and the surrounding area's road network. COBALT analysis identified that overall there would be safety benefits from the scheme. Therefore, as suggested by WebTAG, a full assessment of the distributional impact of collisions has been carried out.

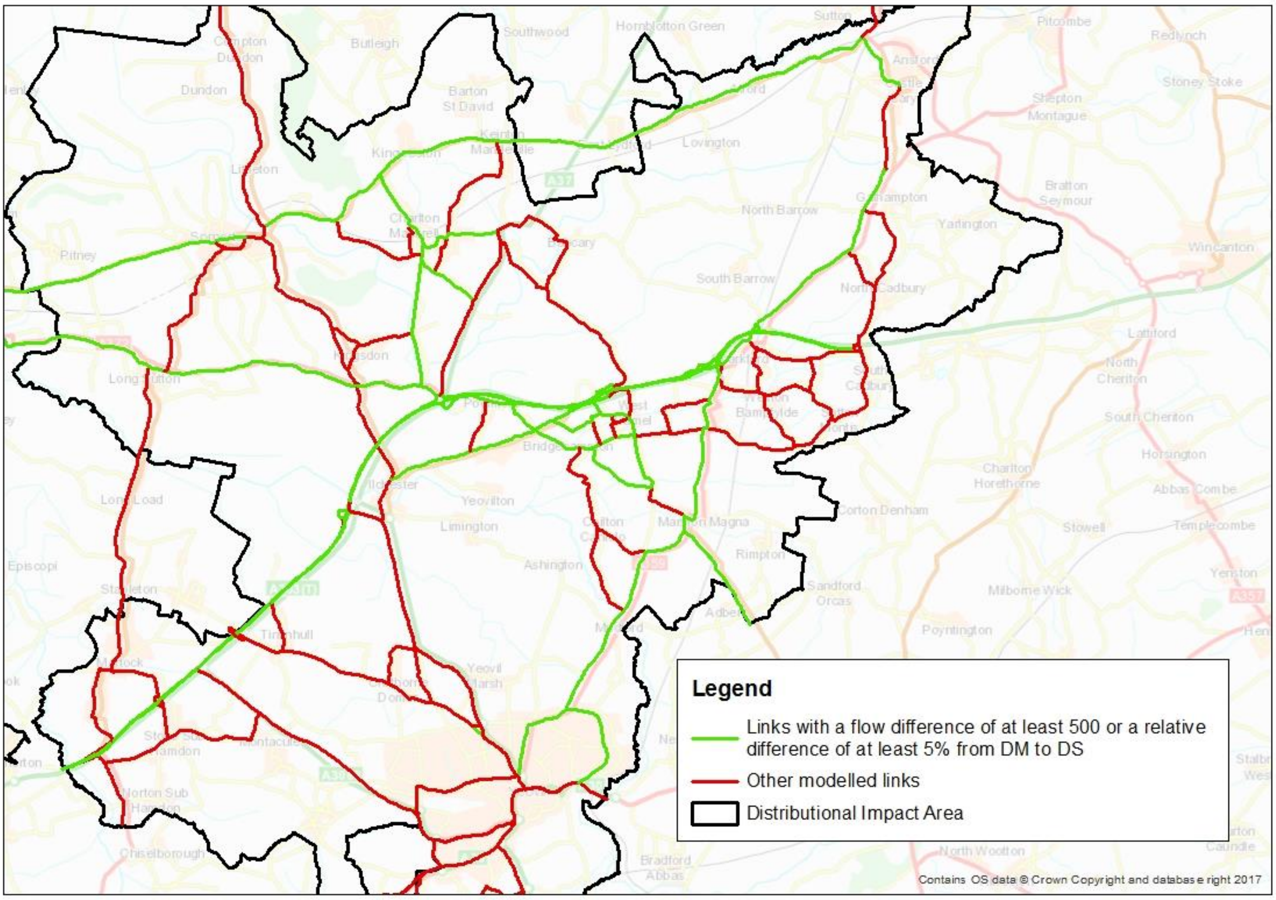
15.4.2 The local area highlighted in Figure 15.1 below has a resident population of 83,000 as of 2011 (Census). Table 15.4 below shows the proportion of casualties by vulnerable user groups within the local area. The table also contains national average casualty figures (Reported road casualties Great Britain, annual reports, 2015) by the same vulnerable groups for comparison purposes. The table highlights that casualty rates for children, pedestrians and cyclists are much lower than the national average. On the other hand, older people casualty rates are higher than the national average. Young males and motorcyclists casualty rates are similar to national average.

Table 15.4: Proportion of casualties by vulnerable user groups

Population group	% of casualties by local area population	National average
Children under 16	2%	9%
Young males aged 16-25	14%	16%
Older People aged 70+	14%	6%
Pedestrians	3%	13%
Cyclists	5%	10%
Motorcyclists	11%	10%

15.4.3 The local collision data collected from 01/01/2010 to 31/12/2014 and used in the COBALT collision analysis was mapped to the model network links. Those links with collisions and more than an absolute flow difference of 500veh/day or relative difference of 5% were then taken forward into collision DI analysis (see Figure 15.1 for more details). This process identified 126 links meeting the flow threshold. Out of these 126 links, 81 links had no change, 25 links had a reduction and 20 had an increase in the numbers of collisions.

Figure 15.1: Local area selected for collision DI analysis and associated links



Source: MMSJV. This Map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2016.

15.4.4 The following criteria was used to assign a DI score for each link in the above 126 sample. Since changes in collisions are directly proportional to changes in traffic flows, WebTAG A4.2 Table 11 has been slightly modified in the Table 15.5 below (change in traffic flow/speed has been replaced with change in number of collisions).

Table 15.5: Collisions DI appraisal score matrix

Change (DM-DS) in number of collisions on each link	**Existing casualty rate for vulnerable users**		
	Low	**Medium**	**High**
Significant reduction (>15% decrease)	Moderate beneficial	Moderate beneficial	Large beneficial
Slight reduction (>5%, <15% decrease)	Slight beneficial	Slight beneficial	Moderate beneficial
Neutral (<5% increase or decrease)	Neutral	Neutral	Neutral

Change (DM-DS) in number of collisions on each link	Existing casualty rate for vulnerable users		
	Low	Medium	High
Slight increase (>5%, <10% decrease)	Slight adverse	Slight adverse	Moderate adverse
Significant increase (>10% decrease)	Moderate adverse	Moderate adverse	Large adverse

15.4.5 Table 15.6 below summarises number of links by collision impact DI score for vulnerable users.

Table 15.6: Number of links meeting collisions DI score by vulnerable users

Count of links by impact score	Vulnerable users					
	Children (Low)	Young males (Medium)	Older people (High)	Pedestrians (Low)	Cyclists (Low)	Motorcyclists (Medium)
Large beneficial	0	0	7	0	0	0
Moderate beneficial	7	7	18	7	7	7
Slight beneficial	18	18	0	18	18	18
Neutral	81	81	81	81	81	81
Slight adverse	5	5	0	5	5	5
Moderate adverse	15	15	5	15	15	15
Large adverse	0	0	15	0	0	0
Total links	126	126	126	126	126	126
Overall DI score	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

15.4.6 The beneficial and adverse impacts for all six vulnerable groups balance out and therefore experience neutral impacts in the local area. Therefore, the overall AST seven-point distributional impact scale score is given as neutral for the vulnerable groups in the local area. However, the COBALT assessment, which assesses a larger road network and all collision types (not just vulnerable users), indicates a reasonable collision benefit.

16 Sensitivity tests

Table 16.1: Glossary of terms for chapter 16

BCR	Benefit to Cost Ratio
COBALT	Cost and Benefit to Accidents Light Touch
DfT	Department for Transport
NPV	Net Present Value
PVB	Present Value of Benefits
PVC	Present Value of Costs
QUADRO	Queues And Delays at Roadworks
TEE	Transport Economic Efficiency
TUBA	Transport User Benefit Appraisal
WebTAG	Web-based transport analysis guidance produced by the DfT

Low and high growth

16.1.1 Table 16.2 below shows Analysis of Monetised Costs and Benefits for low and high growth scenarios. These include economic assessment results from the TUBA, COBALT, QUADRO, wider economic, reliability and environmental appraisals. As per WebTAG, all costs and benefits reported in this section are in 2010 prices discounted to 2010. The adjusted BCRs that include wider economic and reliability benefits are 1.64 and 2.13 for low and high growth scenarios respectively. Under the DfT's value for money criteria, the low growth scenario represents medium value for money (with the adjusted BCR between 1.5 and 2) and the high growth scenario represents high value for money (with the adjusted BCR between 2 and 4). However, in the overall value for money assessment of the scheme, other qualitative factors which cannot be monetised are taken into account, such as those reported in the Appraisal Summary Table (see appendix M). Therefore, the BCR alone does not provide a good measure of value for money and is not used as the sole basis for decisions. It is important to note again that the benefits reported by TUBA are conservative estimates since average hour models are used instead of peak hour models. Other supporting information (TEE, Public Accounts, QUADRO, COBALT and reliability results) are contained in Table 16.3 to Table 16.9.

16.1.2 The results show that overall benefits are reduced with low growth and increased with high growth. Therefore, the adjusted BCRs follow the usual pattern where the core scenario BCR sits in between low and high growth BCRs.

Table 16.2: Analysis of monetised costs and benefits (£000s) – low and high growth

	Monetary value (£000s)	
	Low	**High**
Collisions (not assessed by TUBA)*	15,972	15,163
Roadworks (not assessed by TUBA)**	-19,965	-30,303
Greenhouse Gases (assessed by TUBA)***	-32,678	-30,380
Noise (not assessed by TUBA)****	-66	-66
Air Quality (not assessed by TUBA)****	-360	-360
Economic Efficiency: Consumer Users (Commuting)	9,872	13,529
Economic Efficiency: Consumer Users (Other)	13,368	4,373
Economic Efficiency: Business Users and Providers	113,710	148,583
Wider Public Finances (Indirect Taxation Revenues)	50,087	77,160
Present Value of Benefits (PVB)	149,940	197,699
Broad Transport Budget Present Value of Costs (PVC)	108,076	107,943
OVERALL IMPACTS		
Net Present Value (NPV)	41,864	89,756
Initial Benefit to Cost Ratio (BCR)	**1.39**	**1.83**
Reliability Benefits	15,787	17,628
Wider Economic Benefits	11,371	14,858
Adjusted BCR	**1.64**	**2.13**

Notes: *from COBALT, ** from QUADRO,***WebTAG Unit A3 Chapter 2,**** core scenario values, All monetary values are expressed in 2010 prices discounted to 2010

Table 16.3: Transport Economic Efficiency (£000s) – low and high growth

Item	**Monetary value (£000s)**	
	Low	**High**
Consumer – Commuting User benefits	**All Modes**	**All Modes**
Travel Time	16,583	23,750
Vehicle operating costs	-6,711	-10,220
User charges	0	0
During Construction & Maintenance	0	0
NET CONSUMER - COMMUTING BENEFITS	9,872	13,530
Consumer - Other user benefits	**All Modes**	**All Modes**
Travel Time	57,478	69,506
Vehicle operating costs	-44,112	-65,133
User charges	1	0
During Construction & Maintenance	0	0
NET CONSUMER - OTHER BENEFITS	13,367	4,373
Business Impacts	**All Modes**	**All Modes**
Travel Time	114,249	147,539
Vehicle operating costs	-539	1,044
User charges	0	0
During Construction & Maintenance	0	0
Sub Total	113,710	148,583
Private Sector Provider Impacts		
Revenue	0	0
Operating costs	0	0
Investment costs	0	0
Grant/subsidy	0	0
Sub Total	0	0
Other business Impacts		
Developer contributions	0	0
NET BUSINESS IMPACT	113,710	148,583
TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	**136,949**	**166,486**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 16.4: Public Accounts (£000s) – low and high growth

Item	Monetary value (£000s)	
	Low	High
Local Government Funding	**All Modes**	**All Modes**
Revenue	0	0
Operating Costs	0	0
Investment Costs	0	0
Developer Contributions	0	0
Grant/Subsidy Payments	0	0
NET IMPACT	0	0
Central Government Funding: Transport	**All Modes**	**All Modes**
Revenue	-18	-151
Operating costs	418	418
Investment costs	107,676	107,676
Developer Contributions	0	0
Grant/Subsidy Payments	0	0
NET IMPACT	108,076	107,943
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-50,087	-77,160
TOTALS		
Broad Transport Budget	**108,076**	**107,943**
Wider Public Finances	**-50,087**	**-77,160**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 16.5: Summary COBALT results (£000s) – low and high growth

		Monetary values £000s	
		Low	**High**
Number of Personal Injury Collisions	**Do Minimum**		
Casualties	Fatal	1,420.0	1,592.2
	Serious	14,313.9	16,289.7
	Slight	151,427.2	171,625.0
Collision Costs (£000s in 2010 prices discounted to 2010)		5,365,918.0	6,081,010.0
Number of Personal Injury Collisions	**Scheme**		
Casualties	Fatal	1,414.6	1,586.3
	Serious	14,267.3	16,248.1
	Slight	151,095.2	171,320.3
Collision Costs (£000s in 2010 prices discounted to 2010)		5,349,946.5	6,065,847.5
Number of Personal Injury Collisions savings			
Casualties	Fatal	5.4	5.9
	Serious	46.6	41.6
	Slight	332.1	304.7
Collision Savings (£000s in 2010 prices discounted to 2010)	**Total**	**15,971.8**	**15,162.9**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 16.6: Summary Construction QUADRO results (£000s) – low and high growth

Impact	**Monetary values £000s**	
	Low	**High**
Non-Exchequer Impacts:		
Net Consumer Impact	12,011	18,065
Net Business Impact	7,812	12,642
Collision Costs	0	0
Fuel carbon Emission Costs	-3	-7
Total Non-Exchequer Impacts	**19,819**	**30,700**
Government Funding:		
Present Value of Costs	**221**	**-312**
Overall Impact	**20,040**	**30,387**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 16.7: Summary Do Minimum Maintenance QUADRO results (£000s) – low and high growth

Impact	**Monetary values £000s**	
	Low	**High**
Non-Exchequer Impacts:		
Net Consumer Impact	50	56
Net Business Impact	39	44
Collision Costs	0	0
Fuel carbon Emission Costs	0	0
Total Non-Exchequer Impacts	**89**	**99**
Government Funding:		
Present Value of Costs	**-4**	**-4**
Overall Impact	**85**	**95**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 16.8: Summary Do Something Maintenance QUADRO results (£000s) – low and high growth

Impact	**Monetary values £000s**	
	Low	**High**
Non-Exchequer Impacts:		
Net Consumer Impact	6	6
Net Business Impact	3	3
Collision Costs	0	0
Fuel carbon Emission Costs	0	0
Total Non-Exchequer Impacts	**8**	**9**
Government Funding:		
Present Value of Costs	**2**	**2**
Overall Impact	**10**	**11**

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 16.9: Summary reliability results (£000s) – low and high growth

Impact	**Monetary values £000s**	
	Low	**High**
Non-Exchequer Impacts:	**15,787**	**17,628**

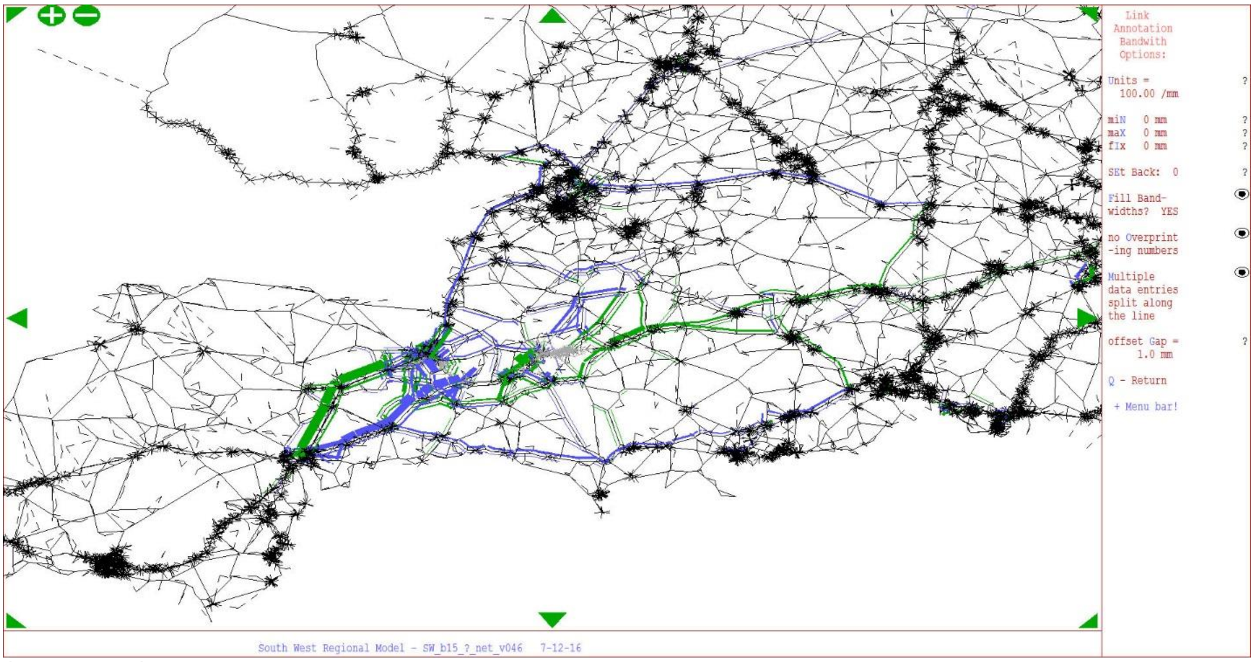
Note: All monetary values are expressed in 2010 prices discounted to 2010

17 Appendix A

17.1 Flow Comparison

17.1.1 Figure 17.1 illustrates the traffic rerouting impact as a result of adding two RIS schemes (A303 Sparkford to Ilchester and A358 Taunton to Southfields) into the SWRTM base AM Peak network. The green bandwidth indicates an increase of traffic on the respective link and the blue bandwidth indicates the opposite.

Figure 17.1: Traffic Rerouting Impact – AM Peak

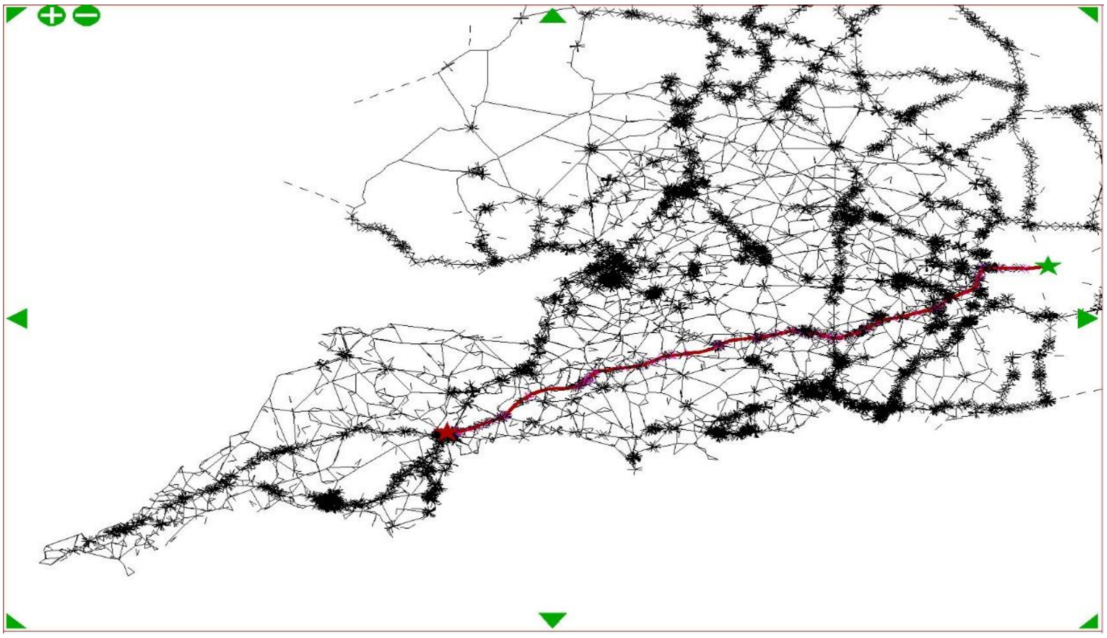


Source: MMSJV

17.2 Routing Analysis Examples

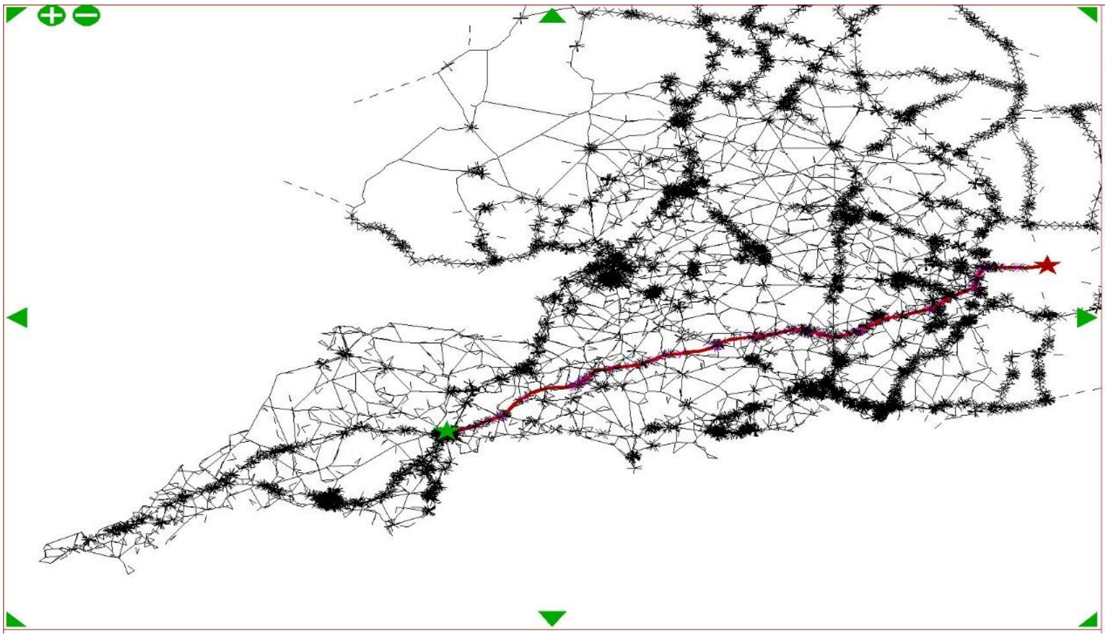
17.2.1 Figure 17.2 – Figure 17.7 shows the breakdown of paths for London – Exeter, Southampton – Exeter and Oxford – Exeter in the AM peak.

Figure 17.2: Route Analysis Example – London - Exeter



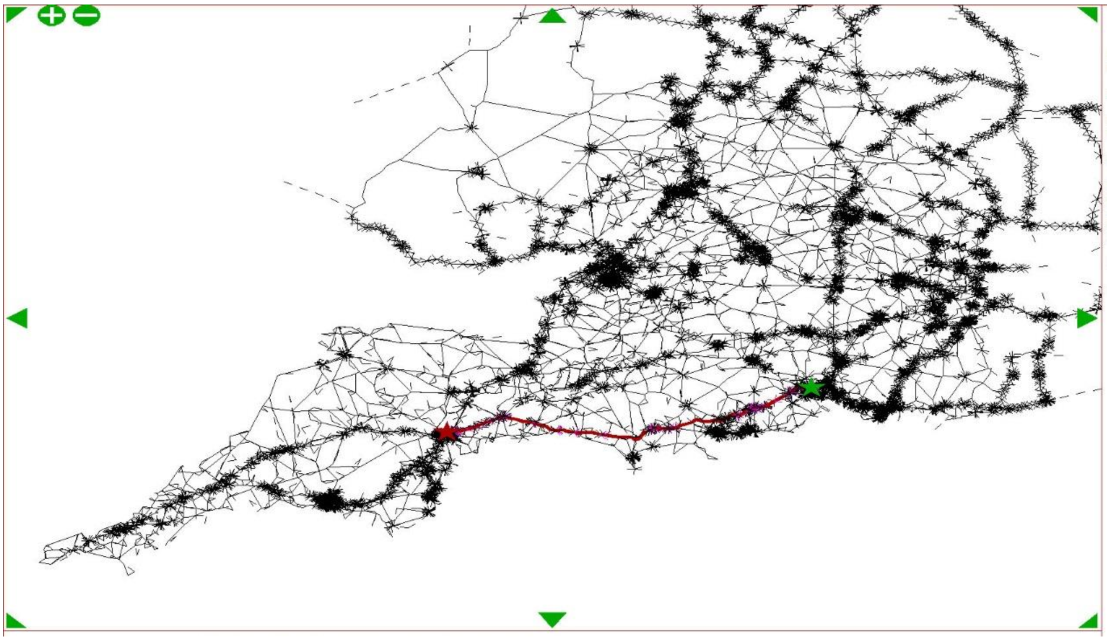
Source: MMSJV

Figure 17.3: Route Analysis Example – Exeter - London



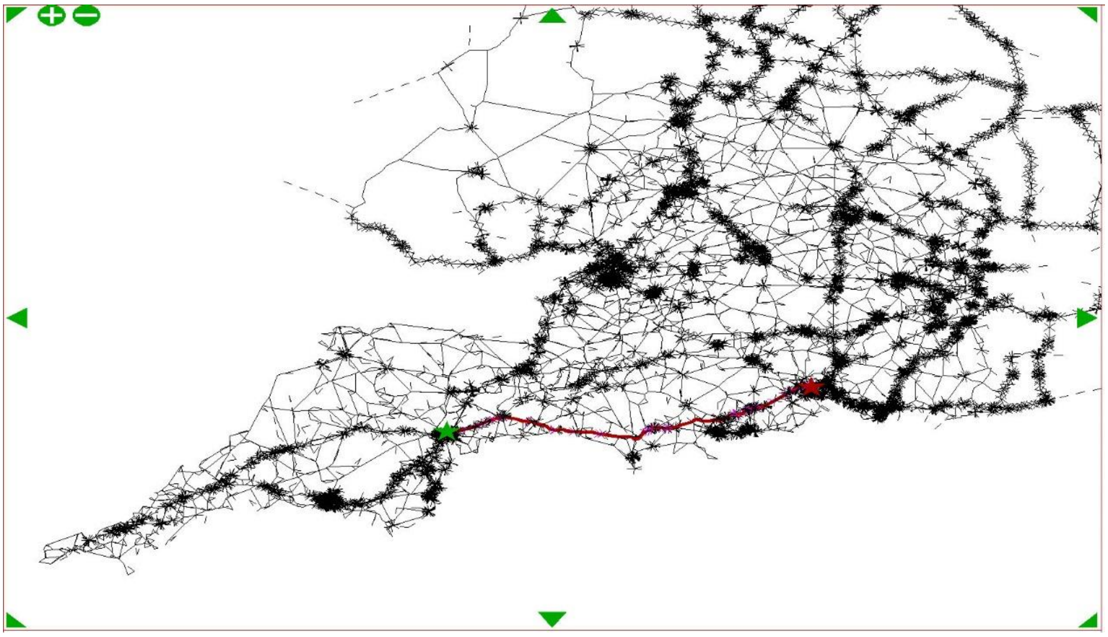
Source: MMSJV

Figure 17.4: Route Analysis Example – Southampton - Exeter



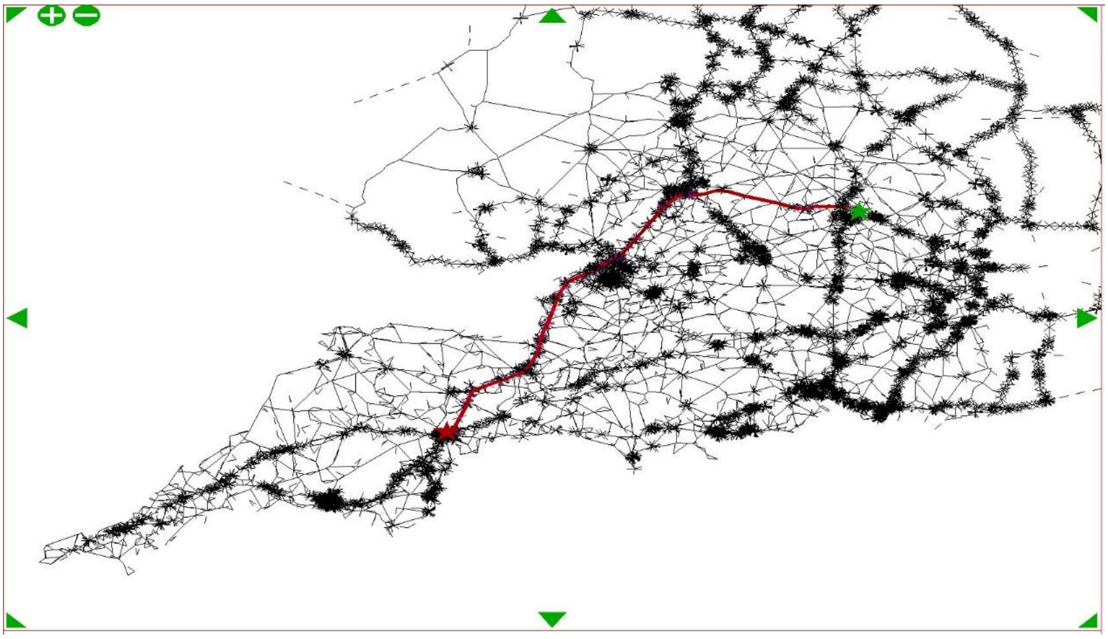
Source: MMSJV

Figure 17.5: Route Analysis Example – Exeter - Southampton



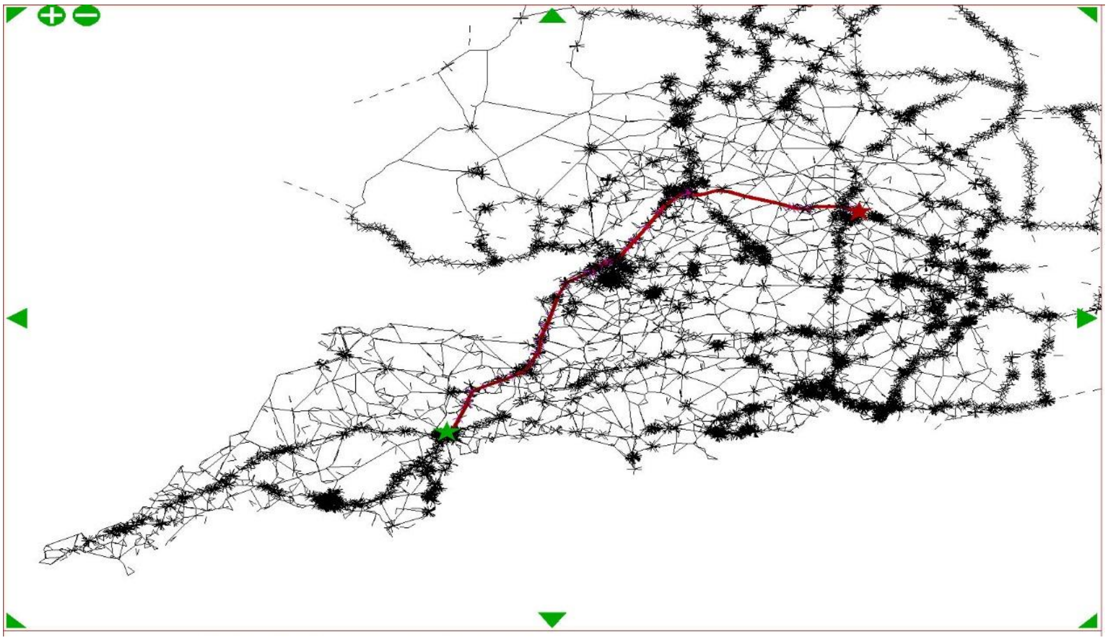
Source: MMSJV

Figure 17.6: Route Analysis Example – Oxford - Exeter



Source: MMSJV

Figure 17.7: Route Analysis Example – Exeter - Oxford



Source: MMSJV

17.3 Prior Matrix Comparisons

17.3.1 Figure 17.8 shows the locations where roadside interviews (RSI) were compared with the SWRTM prior matrix. These locations are:

- Site 1: A303 between A37 and Higher Farm Lane
- Site 2: A30 Monkton
- Site 3: A358 Henlade.

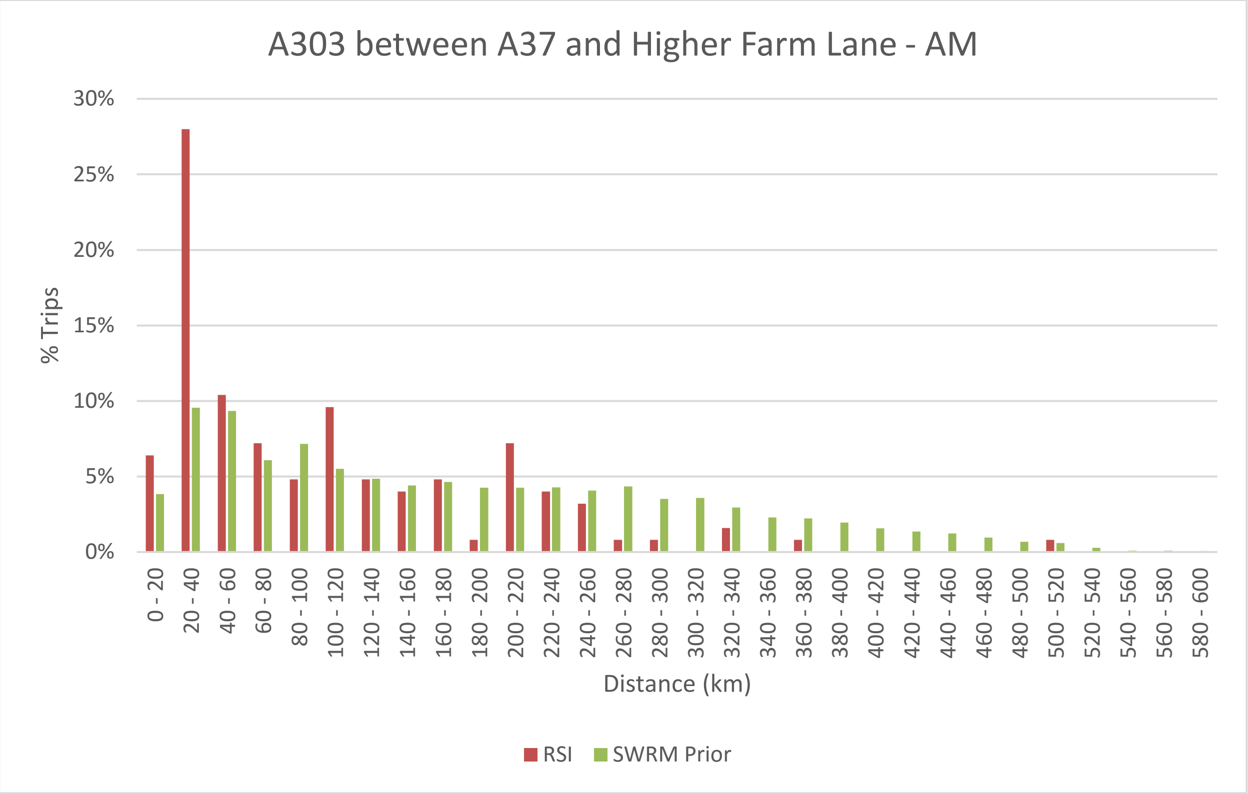
Figure 17.8: Locations of RSI and SWRTM Prior Matrix Comparison

Source: MMSJV. This Map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2016.

17.3.2 The figures below show a comparison of the trip length distributions between the SWRT< prior matrices and the RSIs. These show a mixed picture but are considered to give a good match in a number of cases, for example on the A358. In examining these distributions it needs to be remembered that the sample rate for a roadside interview site, especially when it is extracted for only a peak period of 3 hours, will be relatively small.

17.3.3 Figure 17.9, Figure 17.10 and Figure 17.11 show the trip length distributions for site 1.

Figure 17.9: Site 1 Trip Length Distribution - AM



Source: MMSJV

Figure 17.10: Site 1 Trip Length Distribution - IP

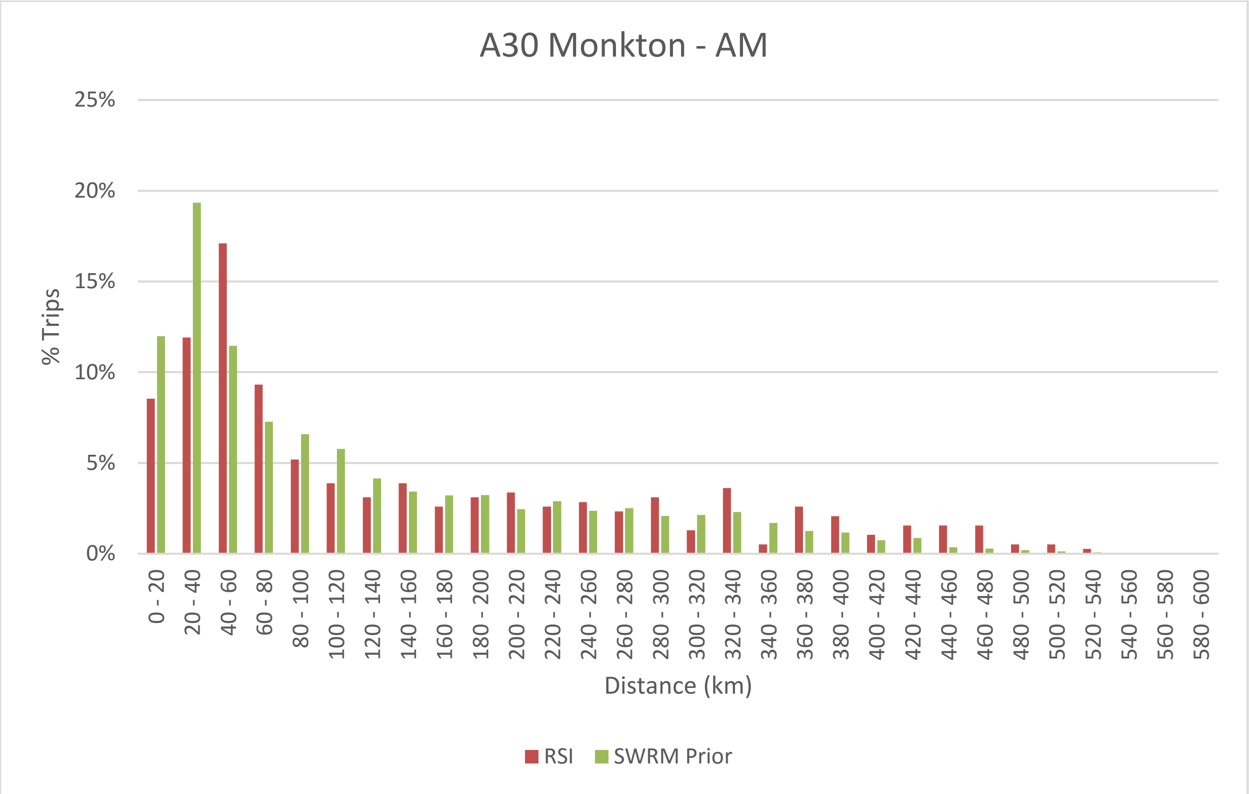
Source: MMSJV

Figure 17.11: Site 1 Trip Length Distribution - PM

Source: MMSJV

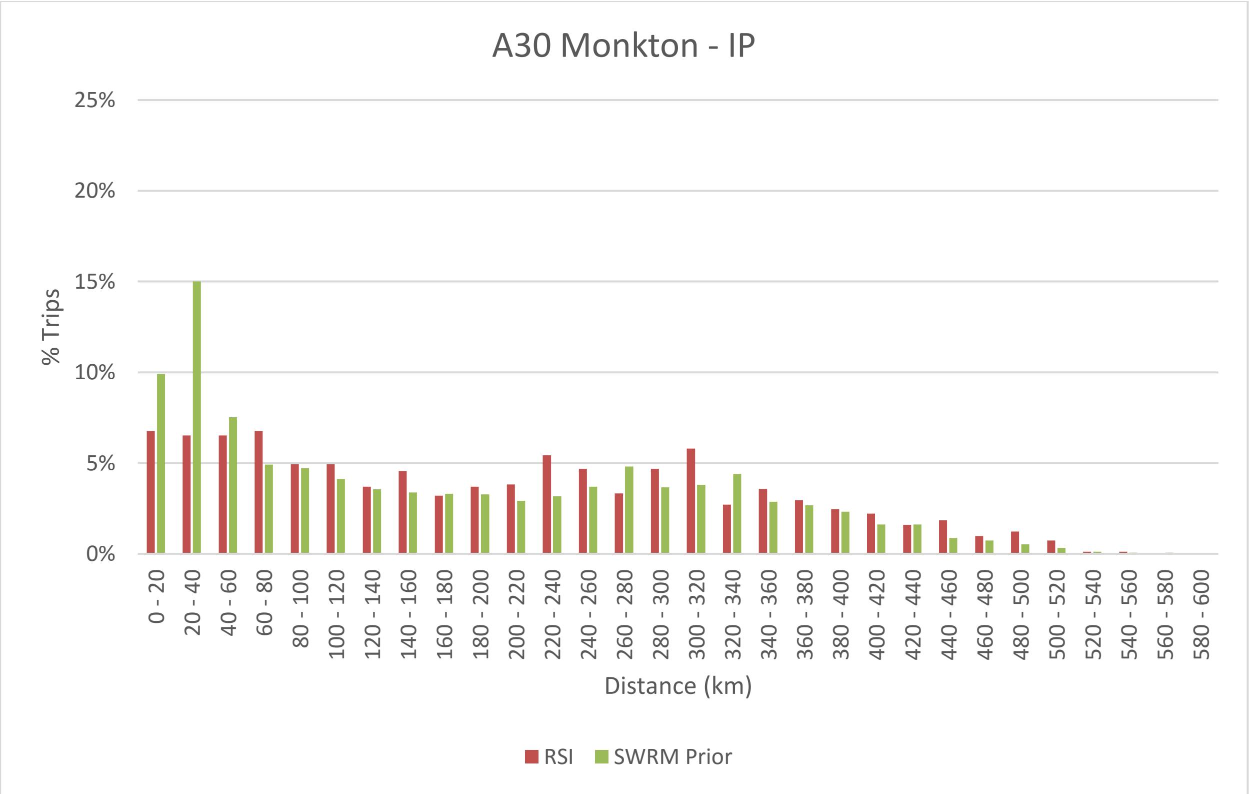
17.3.4 Figure 17.12, Figure 17.13 and Figure 17.14 show the trip length distributions for site 2.

Figure 17.12: Site 2 Trip Length Distribution - AM



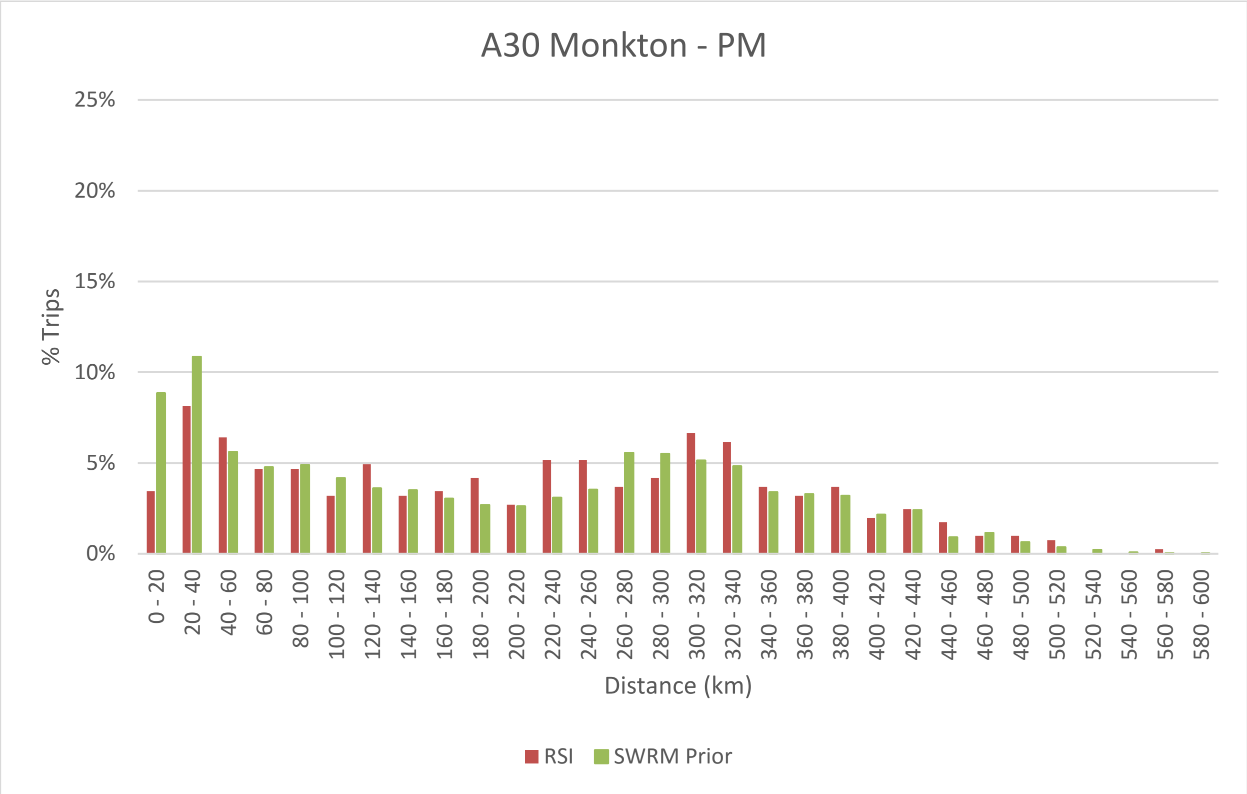
Source: MMSJV

Figure 17.13: Site 2 Trip Length Distribution - IP



Source: MMSJV

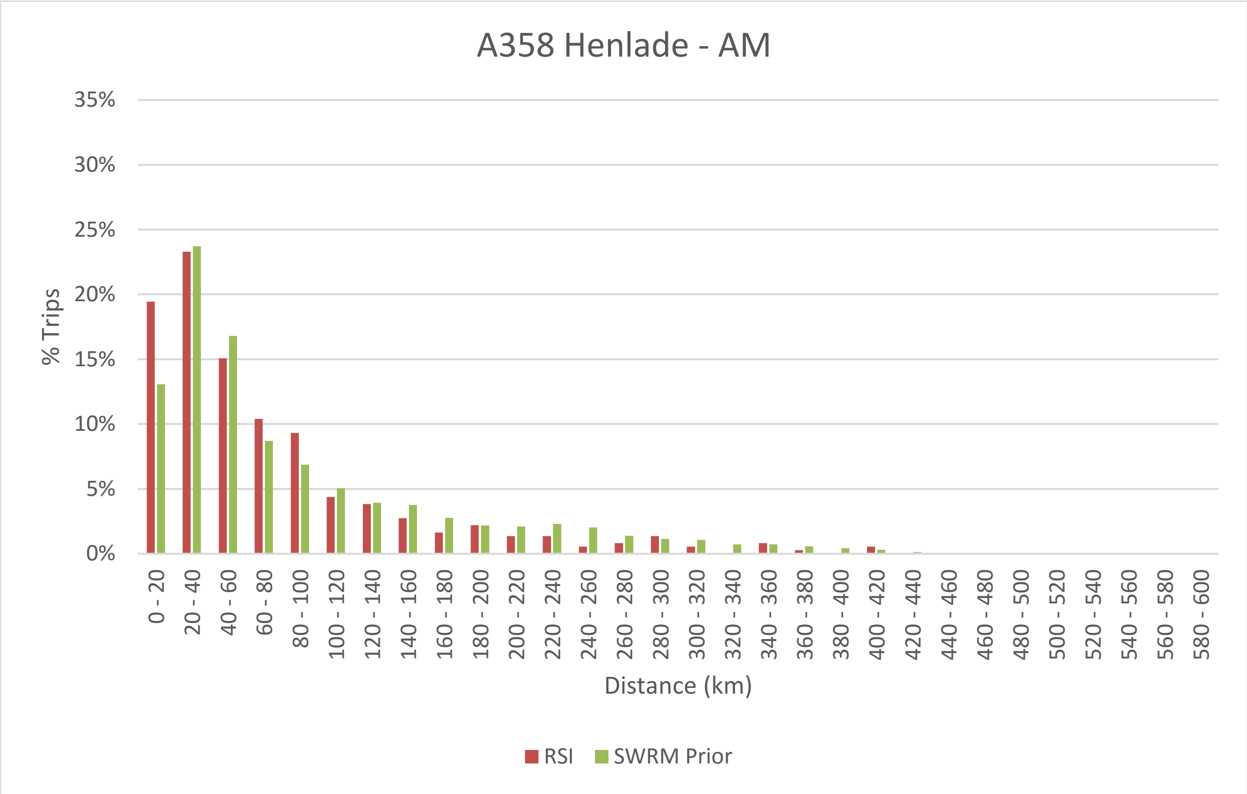
Figure 17.14: Site 2 Trip Length Distribution - PM



Source: MMSJV

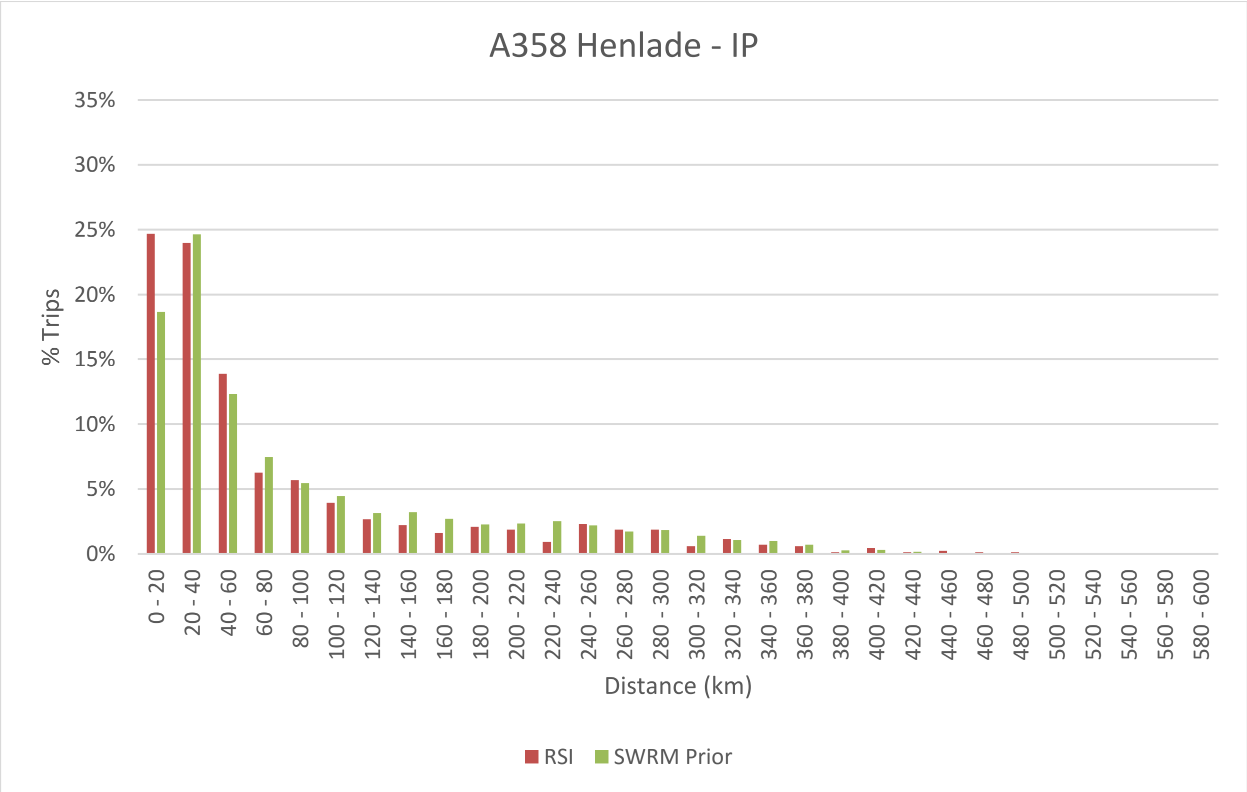
17.3.5 Figure 17.15, Figure 17.16 and Figure 17.17 show the trip length distributions for site 3.

Figure 17.15: Site 3 Trip Length Distribution - AM



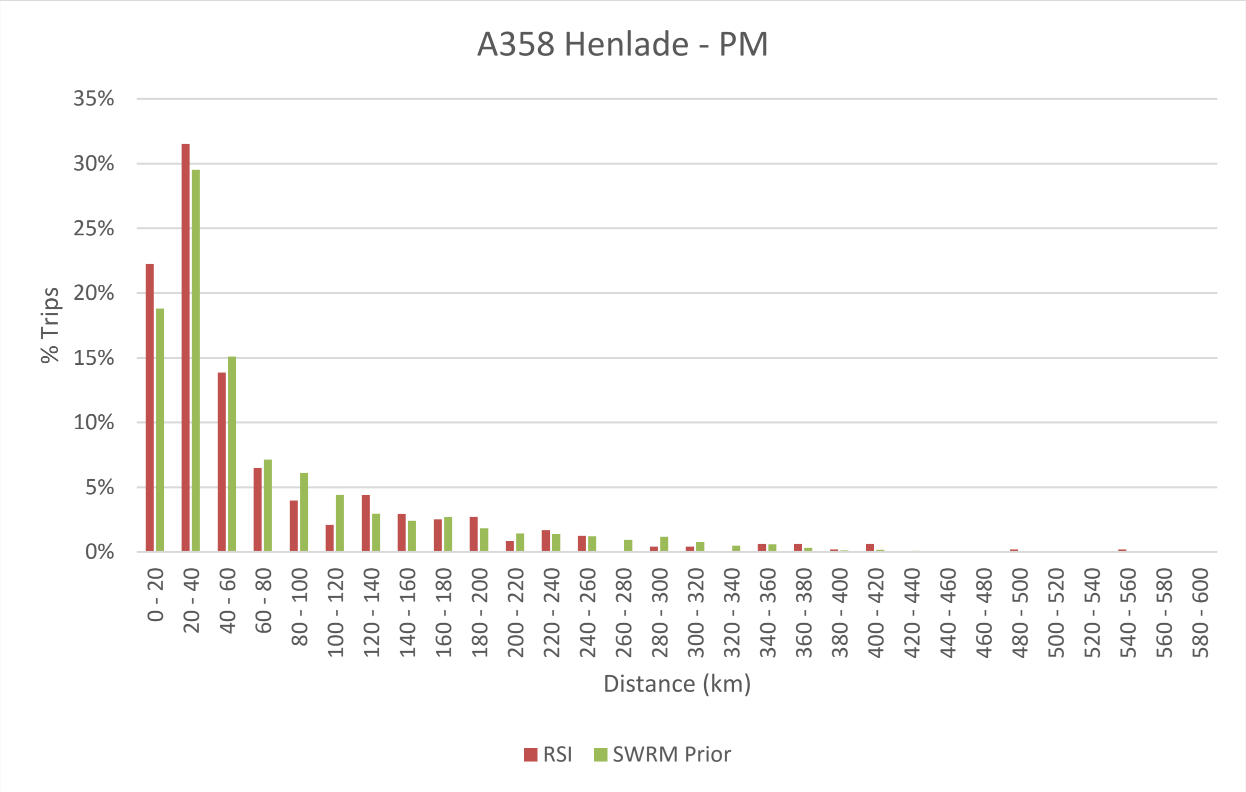
Source: MMSJV

Figure 17.16: Site 3 Trip Length Distribution - IP



Source: MMSJV

Figure 17.17: Site 3 Trip Length Distribution - PM



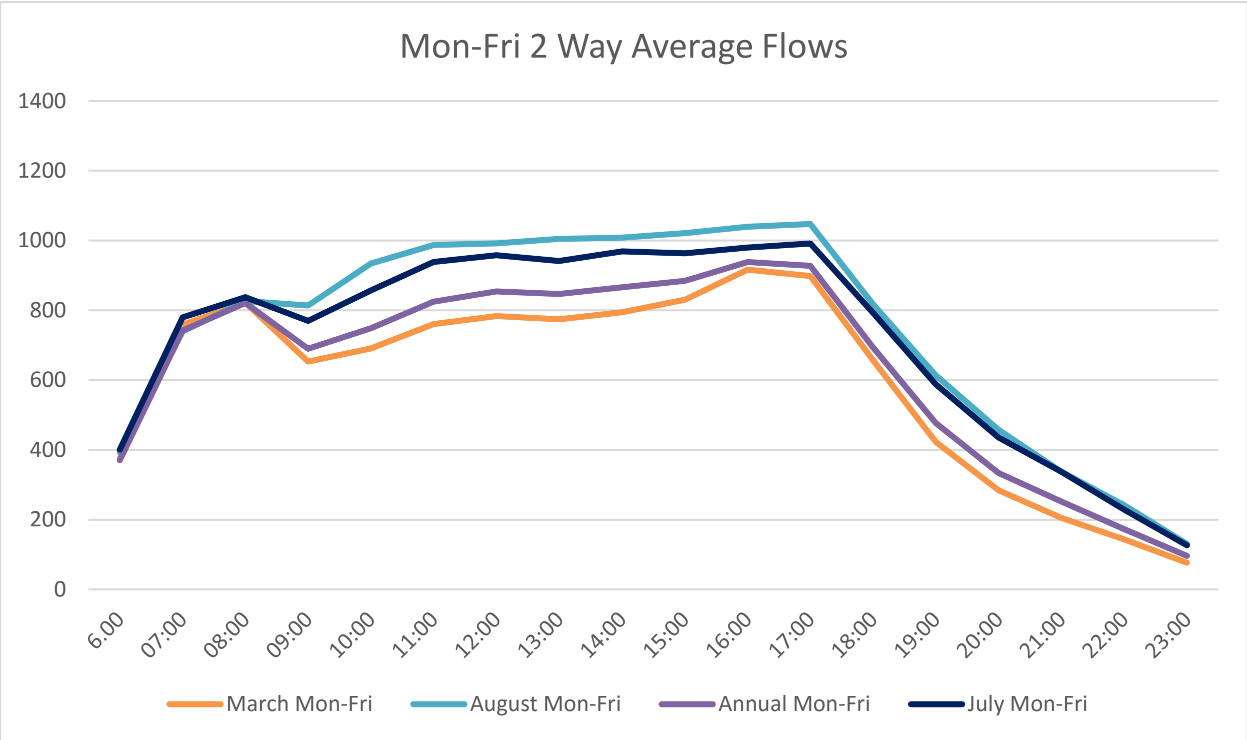
Source: MMSJV

18 Appendix B

18.1 Long Term Traffic Analysis

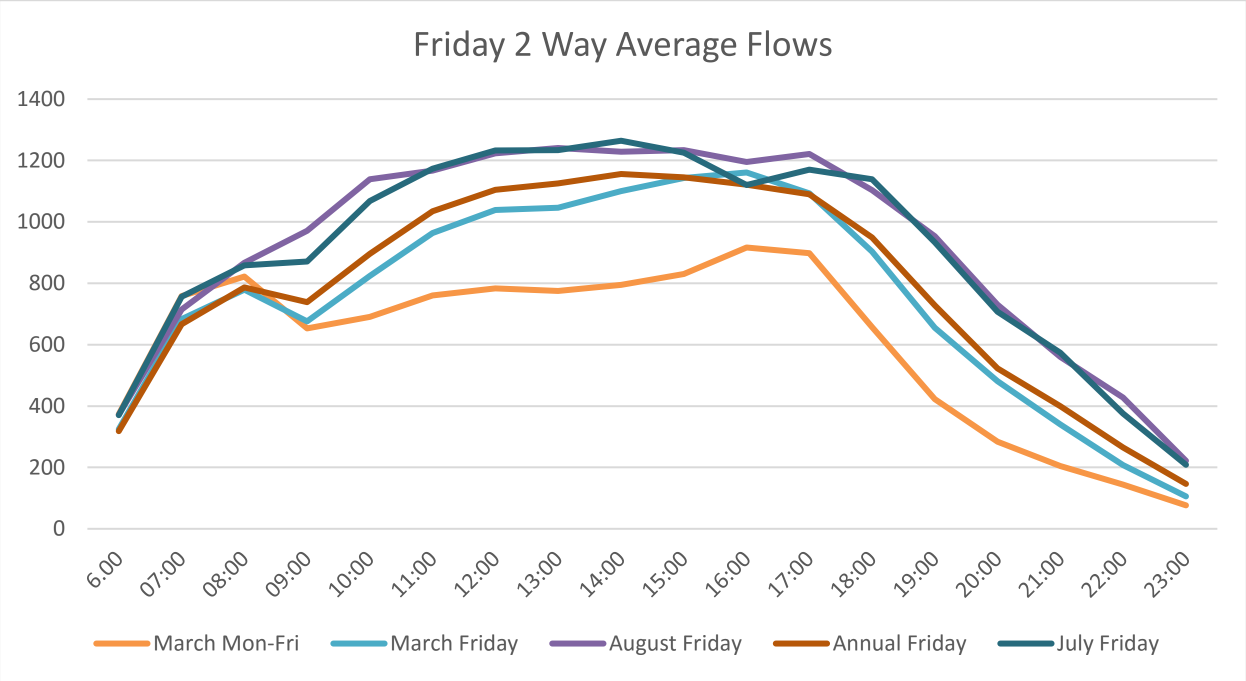
18.1.1 Two-way average flows were calculated for March and August for two sites to understand how they differ. The traffic profiles for the A303 near West Camel can be seen in the following figures.

Figure 18.1: A303 Monday-Friday Traffic Profiles



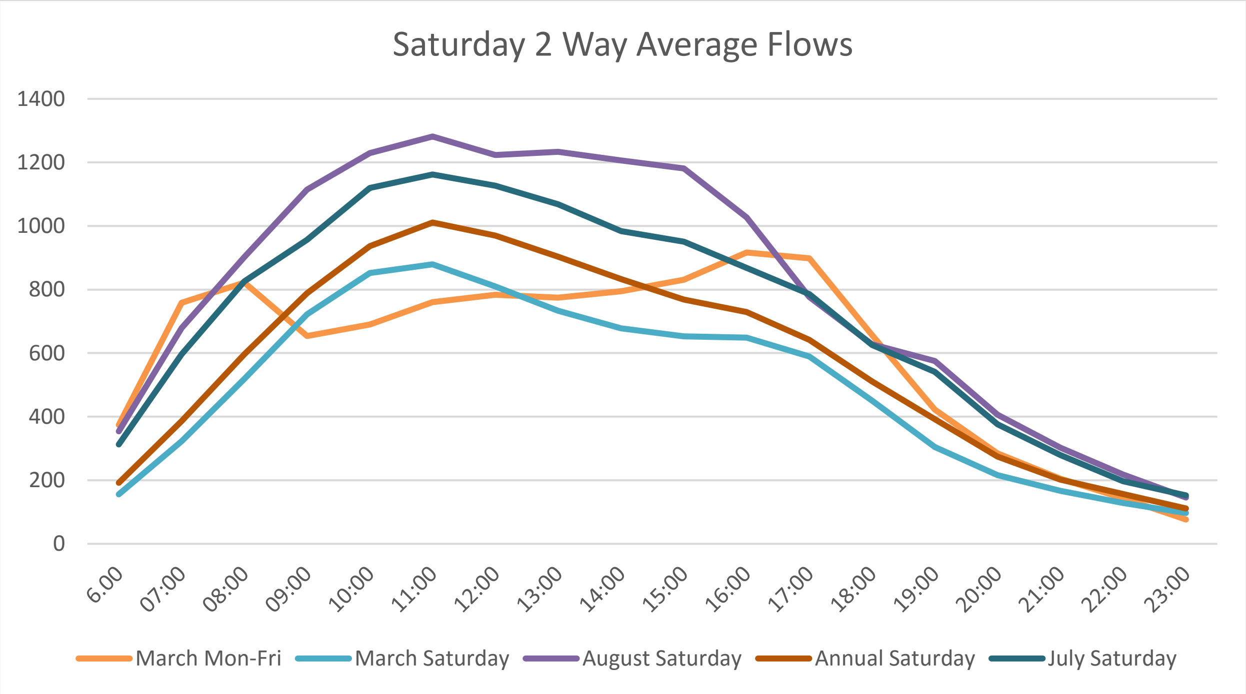
Source: MMSJV

Figure 18.2: A303 Friday Traffic Profiles



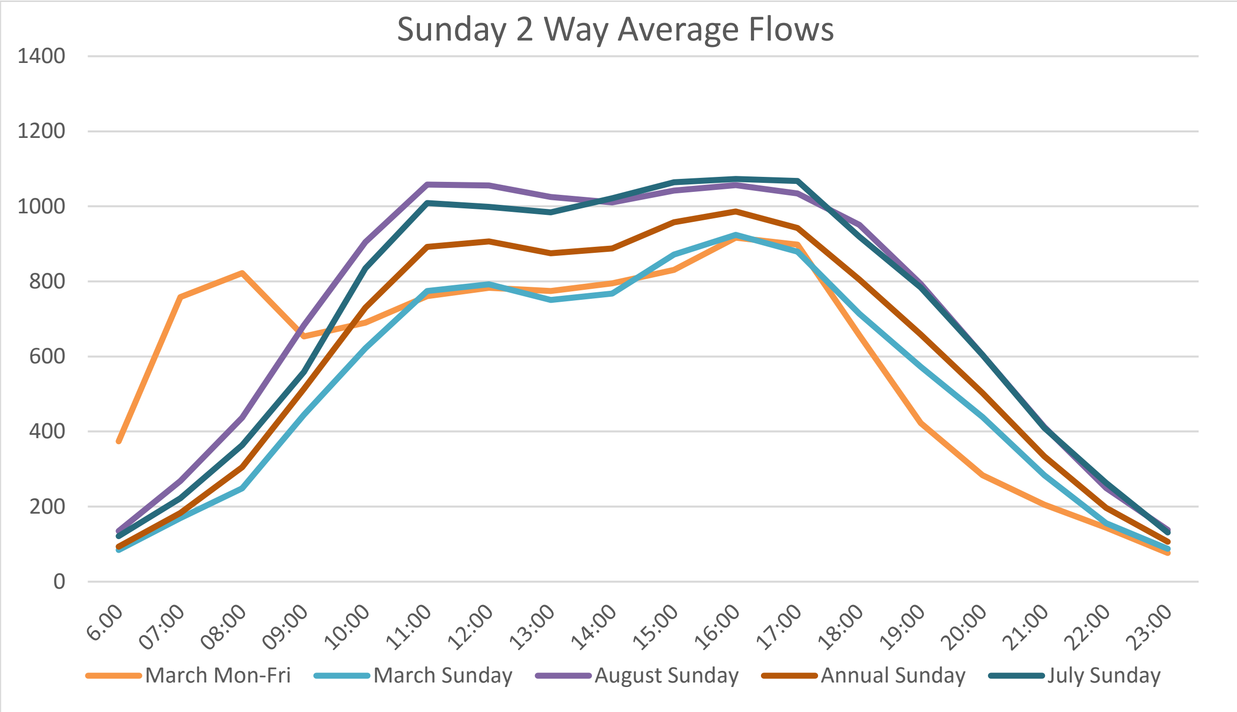
Source: MMSJV

Figure 18.3: A303 Saturday Traffic Profiles



Source: MMSJV

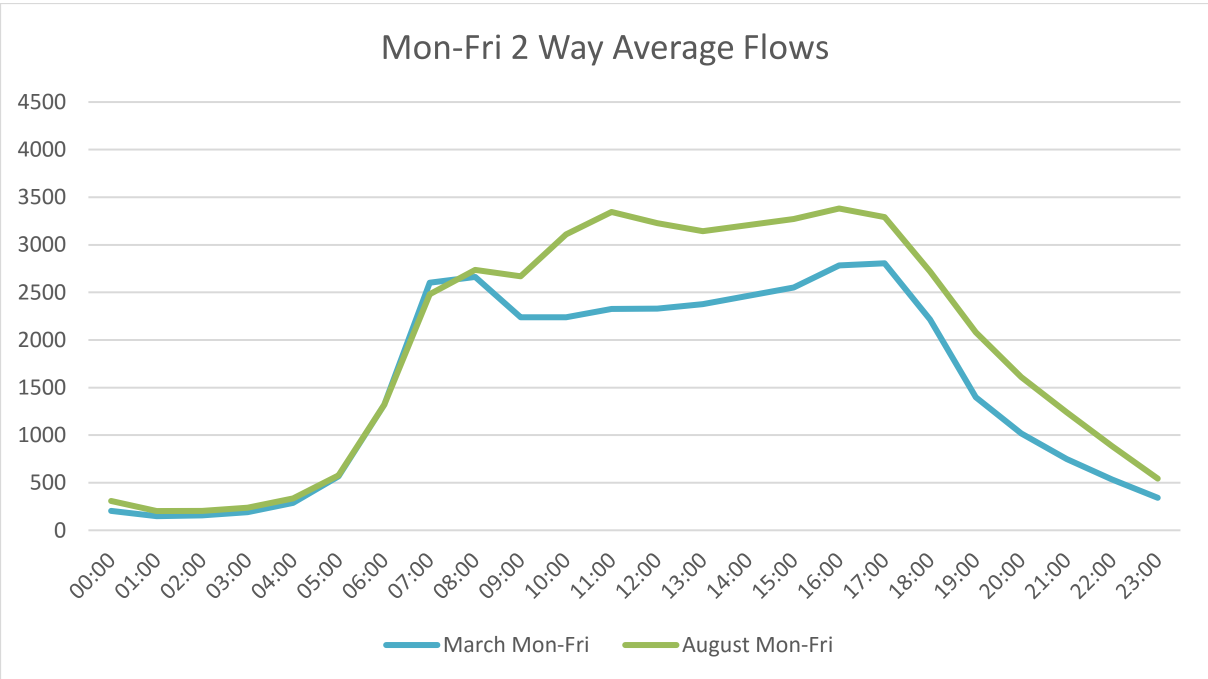
Figure 18.4: A303 Sunday Traffic Profiles



Source: MMSJV

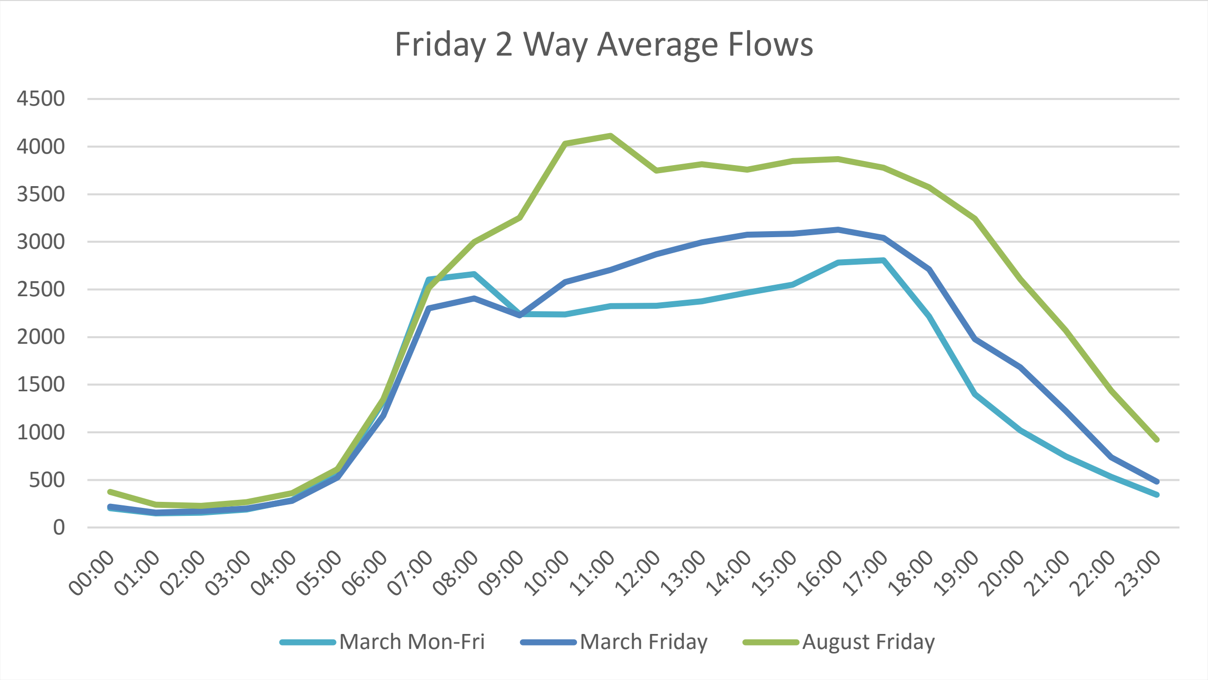
18.1.2 This analysis was also carried out for a site on the M5 north of J25. The traffic profiles can be seen in the following figures.

Figure 18.5: M5 Monday-Friday Traffic Profiles



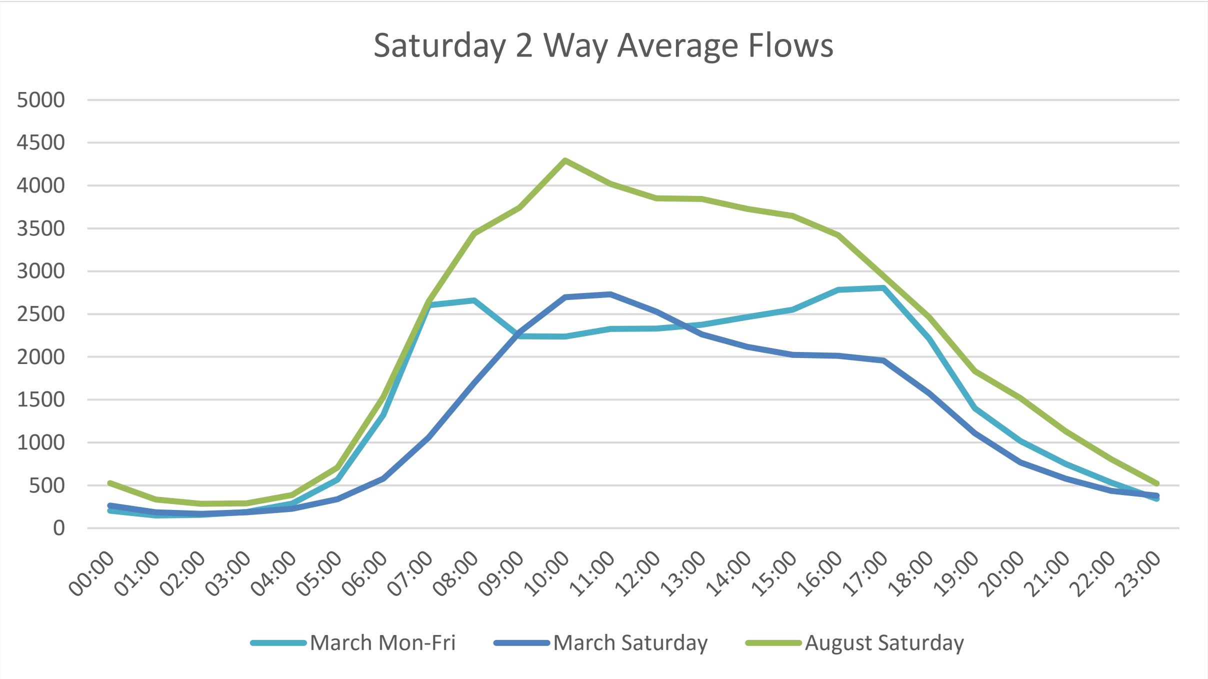
Source: MMSJV

Figure 18.6: M5 Friday Traffic Profiles



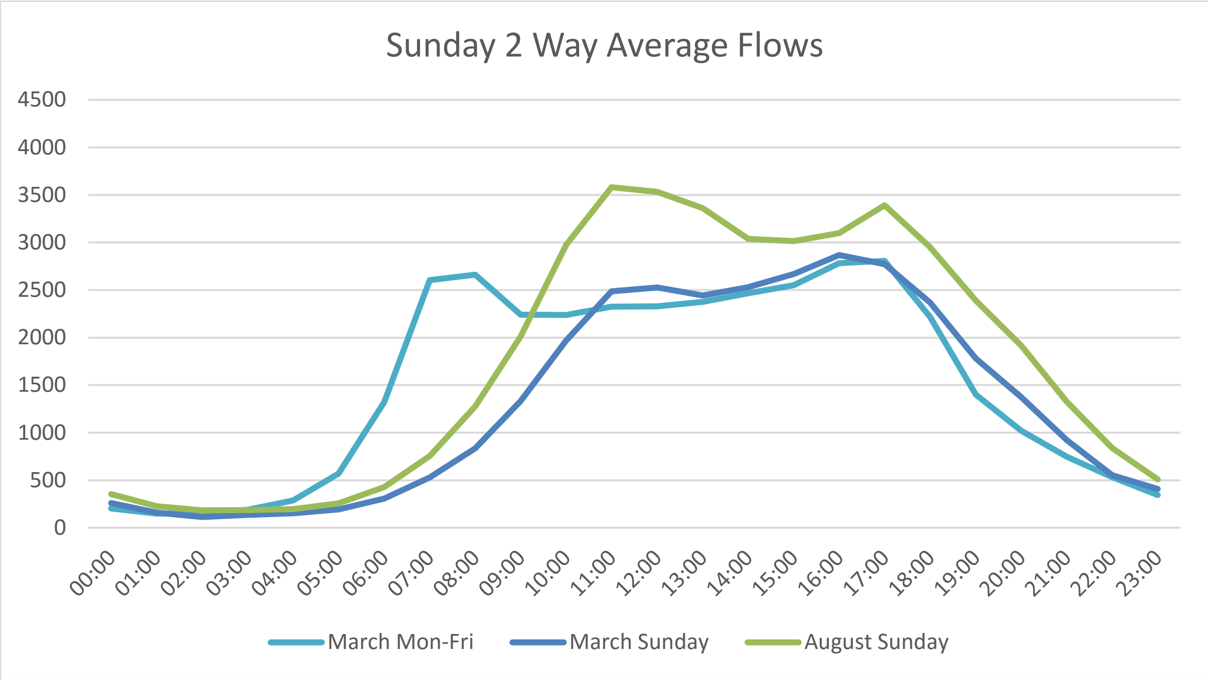
Source: MMSJV

Figure 18.7: M5 Saturday Traffic Profiles



Source: MMSJV

Figure 18.8: M5 Sunday Traffic Profiles



Source: MMSJV

19 Appendix C

19.1 Screenline Results

Table 19.1: Screenline Results - AM

Screenline	Direction	No of counts	Total traffic (veh)			Cars (veh)		
			Observed Flow	Modelled Flow	% Diff	Observed Flow	Modelled Flow	% Diff
Nether Stowey to Lyme Regis	Eastbound	13	5558	5448	-1.97%	4275	4140	-3.17%
	Westbound	13	5939	6044	1.77%	4566	4610	0.96%
Athelney to Newbury (Primary Section)	Northbound	10	1945	1967	1.15%	1564	1581	1.11%
	Southbound	10	2108	2133	1.17%	1694	1699	0.31%
Charlton Musgrove to Lulworth	Eastbound	8	3313	3294	-0.57%	2580	2578	-0.09%
	Westbound	8	3140	3151	0.36%	2426	2438	0.48%
Minehead to Sidmouth	Eastbound	13	6282	6086	-3.11%	4674	4616	-1.24%
	Westbound	13	7196	7112	-1.17%	5491	5421	-1.27%
Taunton	Inbound	7	4952	4823	-2.62%	3947	3853	-2.39%
	Outbound	7	3968	3653	-7.94%	3062	2767	-9.65%
Exeter	Inbound	11	9143	9177	0.36%	7347	7380	0.45%
	Outbound	11	5857	5935	1.33%	4687	4800	2.41%
Yeovil	Inbound	7	3868	4020	3.94%	3109	3280	5.49%
	Outbound	7	2828	2735	-3.28%	2270	2178	-4.04%
Honiton	Inbound	6	2391	2387	-0.19%	1794	1792	-0.15%
	Outbound	6	2588	2612	0.94%	2039	2037	-0.08%
Bridgwater	Inbound	5	2905	3218	10.78%	2268	2590	14.19%
	Outbound	5	2504	2428	-3.02%	1906	1829	-4.06%
Axminster to Wellington	Eastbound	4	2828	2940	3.94%	2253	2313	2.66%
	Westbound	4	2597	2572	-0.97%	1864	1836	-1.49%
Sparkford	Inbound	14	3000	2986	-0.48%	2488	2284	-8.21%

Screenline	Direction	No of counts	Total traffic (veh)			Cars (veh)		
			Observed Flow	Modelled Flow	% Diff	Observed Flow	Modelled Flow	% Diff
	Outbound	14	3035	2997	-1.25%	2499	2268	-9.23%
Wells	Inbound	10	3460	3426	-0.97%	2571	2538	-1.29%
	Outbound	10	3389	3355	-1.01%	2536	2502	-1.34%

Table 19.2: Screenline Results - Inter-peak

Screenline	Direction	No of counts	Total traffic (veh)			Cars (veh)		
			Observed Flow	Modelled Flow	% Diff	Observed Flow	Modelled Flow	% Diff
Nether Stowey to Lyme Regis	Eastbound	13	5697	5612	-1.49%	4366	4378	0.28%
	Westbound	13	5253	5173	-1.51%	4018	4073	1.37%
Athelney to Newbury (Primary Section)	Northbound	10	1847	1878	1.70%	1492	1512	1.35%
	Southbound	10	1729	1738	0.54%	1391	1393	0.16%
Charlton Musgrove to Lulworth	Eastbound	8	2913	2910	-0.10%	2271	2269	-0.09%
	Westbound	8	2875	2881	0.22%	2246	2251	0.21%
Minehead to Sidmouth	Eastbound	13	6161	5938	-3.62%	4674	4577	-2.08%
	Westbound	13	5771	5677	-1.63%	4448	4421	-0.60%
Taunton	Inbound	7	4075	3869	-5.06%	3307	3103	-6.19%
	Outbound	7	4054	3896	-3.88%	3263	3117	-4.50%
Exeter	Inbound	11	5967	5953	-0.23%	4808	4796	-0.25%
	Outbound	11	6332	6317	-0.23%	5094	5081	-0.25%
Yeovil	Inbound	7	2775	2762	-0.48%	2235	2227	-0.36%
	Outbound	7	2935	2898	-1.27%	2363	2331	-1.36%
Honiton	Inbound	6	2503	2533	1.17%	1961	2003	2.12%
	Outbound	6	2585	2560	-0.99%	2061	2043	-0.88%
Bridgwater	Inbound	5	2655	2794	5.23%	2028	2167	6.87%
	Outbound	5	2674	2876	7.55%	2047	2250	9.94%
Axminster to Wellington	Eastbound	4	2854	2789	-2.29%	2275	2190	-3.72%
	Westbound	4	2580	2587	0.30%	2130	2083	-2.22%
Sparkford	Inbound	14	2927	2799	-4.38%	2418	2157	-10.79%
	Outbound	14	2907	2814	-3.20%	2397	2172	-9.37%

Screenline	Direction	No of counts	Total traffic (veh)			Cars (veh)		
			Observed Flow	Modelled Flow	% Diff	Observed Flow	Modelled Flow	% Diff
Wells	Inbound	10	3302	3304	0.08%	2505	2507	0.09%
	Outbound	10	3306	3254	-1.58%	2506	2453	-2.10%

Table 19.3: Screenline Results - PM

Screenline	Direction	No of counts	Total traffic (veh)			Cars (veh)		
			Observed Flow	Modelled Flow	% Diff	Observed Flow	Modelled Flow	% Diff
Nether Stowey to Lyme Regis	Eastbound	13	6193	6258	1.06%	5187	5213	0.50%
	Westbound	13	5987	5884	-1.72%	5023	4925	-1.94%
Athelney to Newbury (Primary Section)	Northbound	10	2291	2349	2.54%	1974	2031	2.91%
	Southbound	10	2116	2102	-0.66%	1830	1817	-0.72%
Charlton Musgrove to Lulworth	Eastbound	8	3228	3244	0.51%	2736	2752	0.58%
	Westbound	8	3445	3448	0.10%	2925	2928	0.11%
Minehead to Sidmouth	Eastbound	13	7234	7123	-1.53%	5967	5895	-1.21%
	Westbound	13	6677	6679	0.02%	5544	5543	-0.02%
Taunton	Inbound	7	4315	4103	-4.92%	3690	3478	-5.73%
	Outbound	7	4993	4816	-3.53%	4342	4182	-3.68%
Exeter	Inbound	11	6031	6182	2.51%	5160	5312	2.96%
	Outbound	11	9034	9021	-0.15%	7819	7818	0.00%
Yeovil	Inbound	7	3056	3031	-0.83%	2653	2630	-0.88%
	Outbound	7	3747	3733	-0.36%	3251	3241	-0.31%
Honiton	Inbound	6	2766	2771	0.20%	2339	2339	-0.01%
	Outbound	6	2664	2666	0.07%	2244	2248	0.21%
Bridgwater	Inbound	5	2971	2992	0.72%	2494	2515	0.83%
	Outbound	5	3224	3571	10.75%	2730	3083	12.94%
Axminster to Wellington	Eastbound	4	2892	2865	-0.94%	2371	2349	-0.93%
	Westbound	4	3041	3148	3.52%	2511	2625	4.53%
Sparkford	Inbound	14	3792	3628	-4.33%	3332	3008	-9.71%
	Outbound	14	3755	3638	-3.12%	3296	3021	-8.33%

Screenline	Direction	No of counts	Total traffic (veh) Observed Flow	Modelled Flow	% Diff	Cars (veh) Observed Flow	Modelled Flow	% Diff
Wells	Inbound	10	3936	3932	-0.10%	3313	3308	-0.15%
	Outbound	10	3814	3810	-0.12%	3161	3156	-0.16%

19.2 Screenline Link Results

Table 19.4: Nether Stowey to Lyme Regis - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_424	A39	EB	169	241	42.59%	5.03	PASS	135	178	31.65%	3.42	PASS
New_37	A38	EB	403	346	-14.09%	2.93	PASS	323	260	-19.41%	3.67	PASS
Agg_M5 J25->J24	M5	EB	2274	2383	4.78%	2.25	PASS	1732	1845	6.52%	2.67	PASS
Somerset_CountLoc_269	A361	EB	399	254	-36.42%	8.04	FAIL	320	200	-37.43%	7.43	FAIL
Somerset_CountLoc_204	A378	EB	132	165	25.12%	2.72	PASS	106	122	14.62%	1.45	PASS
Somerset_CountLoc_24	B3168	EB	58	75	28.85%	2.05	PASS	48	64	33.90%	2.17	PASS
TRADS 2_30012614	A303	EB	903	833	-7.74%	2.37	PASS	649	607	-6.50%	1.68	PASS
Somerset_CountLoc_457	Unnamed	EB	190	200	5.09%	0.69	PASS	158	133	-15.92%	2.09	PASS
Somerset_CountLoc_20	A30	EB	357	338	-5.33%	1.02	PASS	285	255	-10.53%	1.83	PASS
Somerset_CountLoc_11	B3165	EB	120	99	-17.71%	2.03	PASS	98	82	-16.34%	1.69	PASS
New_178	B3162	EB	33	37	11.65%	0.65	PASS	27	27	0.44%	0.02	PASS
New_179	B3164	EB	27	41	52.93%	2.45	PASS	22	31	41.86%	1.79	PASS
TRADS 32_30012549	A35	EB	493	437	-11.32%	2.59	PASS	372	336	-9.80%	1.94	PASS
Somerset_CountLoc_424	A39	WB	147	190	29.32%	3.32	PASS	118	123	4.23%	0.45	PASS
New_37	A38	WB	501	675	34.73%	7.18	FAIL	401	595	48.48%	8.71	FAIL
TRADS M5 J24->J25	M5	WB	2650	2475	-6.60%	3.46	PASS	2018	1793	-11.17%	5.17	PASS
Somerset_CountLoc_269	A361	WB	312	333	6.67%	1.16	PASS	250	265	5.86%	0.91	PASS
Somerset_CountLoc_204	A378	WB	205	182	-11.31%	1.67	PASS	165	148	-10.50%	1.39	PASS
Somerset_CountLoc_24	B3168	WB	51	80	57.09%	3.60	PASS	42	64	53.43%	3.08	PASS
TRADS 2_30012615	A303	WB	988	814	-17.56%	5.78	FAIL	712	570	-19.91%	5.60	FAIL

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_457	Unnamed	WB	212	216	2.03%	0.29	PASS	176	170	-3.41%	0.46	PASS
Somerset_CountLoc_20	A30	WB	307	406	32.17%	5.23	PASS	246	333	35.43%	5.12	PASS
Somerset_CountLoc_11	B3165	WB	87	78	-9.82%	0.94	PASS	71	69	-3.28%	0.28	PASS
New_178	B3162	WB	29	73	150.52%	6.12	PASS	24	68	181.79%	6.45	PASS
New_179	B3164	WB	29	51	76.85%	3.52	PASS	24	43	78.75%	3.27	PASS
TRADS 32_30012550	A35	WB	421	470	11.67%	2.33	PASS	319	369	15.81%	2.72	PASS

Table 19.5: Nether Stowey to Lyme Regis - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_424	A39	EB	237	241	1.69%	0.26	PASS	191	166	-13.25%	1.90	PASS
New_37	A38	EB	400	460	14.93%	2.88	PASS	321	381	18.72%	3.21	PASS
Agg_M5 J25->J24	M5	EB	2493	2403	-3.59%	1.81	PASS	1852	1858	0.30%	0.13	PASS
Somerset_CountLoc_269	A361	EB	338	297	-12.22%	2.32	PASS	272	251	-7.66%	1.29	PASS
Somerset_CountLoc_204	A378	EB	157	177	12.86%	1.56	PASS	126	147	16.41%	1.77	PASS
Somerset_CountLoc_24	B3168	EB	44	67	52.63%	3.11	PASS	36	57	57.50%	3.04	PASS
TRADS 2_30012614	A303	EB	919	873	-4.97%	1.52	PASS	684	653	-4.58%	1.21	PASS
Somerset_CountLoc_457	Unnamed	EB	152	154	1.50%	0.18	PASS	126	117	-7.29%	0.83	PASS
Somerset_CountLoc_20	A30	EB	280	304	8.73%	1.43	PASS	225	244	8.50%	1.25	PASS
Somerset_CountLoc_11	B3165	EB	98	73	-25.20%	2.67	PASS	80	63	-21.84%	2.07	PASS
New_178	B3162	EB	28	51	81.23%	3.62	PASS	23	43	88.96%	3.55	PASS
New_179	B3164	EB	20	40	98.64%	3.61	PASS	16	33	105.06%	3.40	PASS
TRADS 32_30012549	A35	EB	531	471	-11.31%	2.68	PASS	414	367	-11.33%	2.37	PASS
Somerset_CountLoc_424	A39	WB	256	213	-16.87%	2.82	PASS	206	155	-24.59%	3.77	PASS
New_37	A38	WB	377	495	31.27%	5.65	FAIL	302	418	38.57%	6.14	FAIL
TRADS M5 J24->J25	M5	WB	2152	2135	-0.81%	0.38	PASS	1599	1705	6.62%	2.61	PASS
Somerset_CountLoc_269	A361	WB	226	188	-17.00%	2.67	PASS	181	149	-17.43%	2.45	PASS
Somerset_CountLoc_204	A378	WB	158	144	-8.79%	1.13	PASS	127	117	-7.54%	0.87	PASS
Somerset_CountLoc_24	B3168	WB	43	69	61.55%	3.53	PASS	35	57	63.71%	3.28	PASS
TRADS 2_30012615	A303	WB	894	841	-5.94%	1.80	PASS	653	611	-6.41%	1.66	PASS
Somerset_CountLoc_457	Unnamed	WB	176	163	-7.35%	0.99	PASS	146	125	-14.71%	1.85	PASS
Somerset_CountLoc_20	A30	WB	274	304	10.85%	1.75	PASS	220	241	9.60%	1.39	PASS

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_11	B3165	WB	100	76	-24.03%	2.56	PASS	81	64	-20.54%	1.95	PASS
New_178	B3162	WB	31	46	46.90%	2.35	PASS	26	40	53.50%	2.42	PASS
New_179	B3164	WB	19	47	146.66%	4.86	PASS	15	39	162.47%	4.67	PASS
TRADS 32_30012550	A35	WB	547	454	-16.97%	4.15	PASS	427	350	-18.10%	3.92	PASS

Table 19.6: Nether Stowey to Lyme Regis - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_424	A39	EB	186	259	39.34%	4.90	PASS	161	202	25.44%	3.04	PASS
New_37	A38	EB	506	637	25.98%	5.50	FAIL	438	567	29.52%	5.77	FAIL
Agg_M5 J25->J24	M5	EB	2628	2458	-6.47%	3.37	PASS	2171	2003	-7.73%	3.67	PASS
Somerset_CountLoc_269	A361	EB	427	393	-7.95%	1.68	PASS	370	342	-7.46%	1.46	PASS
Somerset_CountLoc_204	A378	EB	206	199	-3.44%	0.50	PASS	179	169	-5.44%	0.74	PASS
Somerset_CountLoc_24	B3168	EB	57	84	48.01%	3.25	PASS	50	72	44.98%	2.87	PASS
TRADS 2_30012614	A303	EB	1013	938	-7.37%	2.39	PASS	814	766	-5.97%	1.73	PASS
Somerset_CountLoc_457	Unnamed	EB	209	246	17.49%	2.42	PASS	183	200	9.31%	1.23	PASS
Somerset_CountLoc_20	A30	EB	337	385	14.25%	2.53	PASS	292	328	12.26%	2.03	PASS
Somerset_CountLoc_11	B3165	EB	101	82	-18.79%	1.98	PASS	88	73	-16.64%	1.63	PASS
New_178	B3162	EB	23	85	270.61%	8.46	PASS	21	80	282.48%	8.33	PASS
New_179	B3164	EB	25	54	114.79%	4.57	PASS	22	46	111.14%	4.18	PASS
TRADS 32_30012549	A35	EB	475	438	-7.87%	1.75	PASS	398	363	-8.82%	1.80	PASS
Somerset_CountLoc_424	A39	WB	231	234	1.15%	0.17	PASS	200	201	0.65%	0.09	PASS
New_37	A38	WB	431	514	19.33%	3.83	PASS	374	460	22.91%	4.20	PASS
TRADS M5 J24->J25	M5	WB	2588	2605	0.67%	0.34	PASS	2136	2163	1.25%	0.57	PASS
Somerset_CountLoc_269	A361	WB	259	232	-10.34%	1.71	PASS	224	200	-10.86%	1.67	PASS
Somerset_CountLoc_204	A378	WB	157	150	-4.18%	0.53	PASS	136	127	-6.85%	0.81	PASS
Somerset_CountLoc_24	B3168	WB	60	89	48.39%	3.36	PASS	53	79	49.34%	3.22	PASS
TRADS 2_30012615	A303	WB	943	913	-3.17%	0.98	PASS	773	744	-3.77%	1.06	PASS
Somerset_CountLoc_457	Unnamed	WB	252	207	-18.00%	2.99	PASS	221	158	-28.45%	4.57	PASS
Somerset_CountLoc_20	A30	WB	362	358	-1.18%	0.22	PASS	313	301	-3.84%	0.69	PASS

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_11	B3165	WB	126	85	-32.33%	3.96	PASS	111	78	-29.82%	3.41	PASS
New_178	B3162	WB	29	39	32.90%	1.64	PASS	25	34	36.40%	1.67	PASS
New_179	B3164	WB	25	30	19.86%	0.95	PASS	22	25	14.14%	0.64	PASS
TRADS 32_30012550	A35	WB	524	428	-18.41%	4.42	PASS	435	356	-18.13%	3.97	PASS

Table 19.7: Athelney to Newbury (Primary Section) - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_364	A361	NB	142	221	55.57%	5.86	PASS	114	175	53.25%	5.05	PASS
Somerset_CountLoc_243	A372	NB	140	222	58.38%	6.08	PASS	112	164	46.84%	4.46	PASS
Somerset_CountLoc_368	B3151	NB	404	268	-33.74%	7.44	FAIL	330	236	-28.45%	5.58	PASS
New_181	A37	NB	330	347	5.02%	0.90	PASS	264	272	2.92%	0.47	PASS
Somerset_CountLoc_37	A371	NB	219	203	-7.32%	1.10	PASS	176	165	-6.38%	0.86	PASS
Somerset_CountLoc_190	B3081	NB	56	74	31.79%	2.21	PASS	46	61	32.50%	2.04	PASS
Somerset_CountLoc_189	A359	NB	138	118	-14.79%	1.81	PASS	105	92	-12.68%	1.34	PASS
Wiltshire_CountLoc_133	B3092	NB	165	249	51.01%	5.85	PASS	135	221	63.68%	6.44	PASS
Wiltshire_CountLoc_132	B3095	NB	58	66	14.31%	1.05	PASS	48	52	9.02%	0.61	PASS
Wiltshire_CountLoc_130	A350	NB	293	201	-31.52%	5.88	PASS	234	144	-38.60%	6.57	PASS
Somerset_CountLoc_364	A361	SB	219	343	56.72%	7.41	FAIL	176	274	55.48%	6.51	PASS
Somerset_CountLoc_243	A372	SB	149	175	17.17%	2.01	PASS	120	146	21.43%	2.23	PASS
Somerset_CountLoc_368	B3151	SB	316	187	-40.81%	8.13	FAIL	258	149	-42.32%	7.66	FAIL
New_181	A37	SB	338	353	4.51%	0.82	PASS	271	257	-5.00%	0.83	PASS
Somerset_CountLoc_37	A371	SB	250	220	-12.14%	1.98	PASS	200	177	-11.39%	1.66	PASS
Somerset_CountLoc_190	B3081	SB	90	166	84.79%	6.74	PASS	73	141	93.22%	6.58	PASS
Somerset_CountLoc_189	A359	SB	210	149	-28.91%	4.53	PASS	163	122	-25.12%	3.43	PASS
Wiltshire_CountLoc_133	B3092	SB	168	237	41.01%	4.84	PASS	137	198	44.69%	4.73	PASS
Wiltshire_CountLoc_132	B3095	SB	57	61	7.72%	0.57	PASS	47	44	-6.98%	0.49	PASS
Wiltshire_CountLoc_130	A350	SB	311	241	-22.54%	4.22	PASS	249	191	-23.18%	3.89	PASS

Table 19.8: Athelney to Newbury (Primary Section) - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_364	A361	NB	176	269	52.87%	6.24	PASS	141	226	60.08%	6.26	PASS
Somerset_CountLoc_243	A372	NB	106	174	64.22%	5.75	PASS	85	133	56.87%	4.63	PASS
Somerset_CountLoc_368	B3151	NB	383	249	-34.97%	7.53	FAIL	313	203	-35.28%	6.88	FAIL
New_181	A37	NB	292	324	10.85%	1.81	PASS	235	242	3.11%	0.47	PASS
Somerset_CountLoc_37	A371	NB	222	212	-4.44%	0.67	PASS	178	179	0.72%	0.10	PASS
Somerset_CountLoc_190	B3081	NB	53	89	67.49%	4.25	PASS	44	76	72.00%	4.10	PASS
Somerset_CountLoc_189	A359	NB	149	96	-35.35%	4.76	PASS	119	77	-35.48%	4.27	PASS
Wiltshire_CountLoc_133	B3092	NB	144	235	63.06%	6.60	PASS	118	202	71.29%	6.65	PASS
Wiltshire_CountLoc_132	B3095	NB	49	54	10.42%	0.71	PASS	40	40	0.77%	0.05	PASS
Wiltshire_CountLoc_130	A350	NB	273	176	-35.42%	6.45	PASS	219	134	-38.78%	6.39	PASS
Somerset_CountLoc_364	A361	SB	183	202	10.14%	1.34	PASS	147	160	9.14%	1.08	PASS
Somerset_CountLoc_243	A372	SB	100	166	66.23%	5.74	PASS	80	131	63.20%	4.93	PASS
Somerset_CountLoc_368	B3151	SB	315	233	-26.16%	4.98	PASS	257	197	-23.38%	3.99	PASS
New_181	A37	SB	259	298	15.22%	2.36	PASS	208	218	4.69%	0.67	PASS
Somerset_CountLoc_37	A371	SB	202	167	-17.16%	2.55	PASS	162	148	-8.82%	1.15	PASS
Somerset_CountLoc_190	B3081	SB	67	105	56.48%	4.08	PASS	55	87	58.71%	3.83	PASS
Somerset_CountLoc_189	A359	SB	141	103	-26.90%	3.43	PASS	108	79	-27.23%	3.04	PASS
Wiltshire_CountLoc_133	B3092	SB	138	222	61.07%	6.28	PASS	113	191	69.44%	6.36	PASS
Wiltshire_CountLoc_132	B3095	SB	51	68	34.06%	2.25	PASS	42	54	28.74%	1.74	PASS
Wiltshire_CountLoc_130	A350	SB	273	174	-36.41%	6.65	PASS	219	128	-41.37%	6.87	PASS

Table 19.9: Athelney to Newbury (Primary Section) - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_364	A361	NB	263	448	70.35%	9.81	FAIL	228	408	79.15%	10.12	FAIL
Somerset_CountLoc_243	A372	NB	170	190	11.76%	1.49	PASS	148	159	7.64%	0.91	PASS
Somerset_CountLoc_368	B3151	NB	426	284	-33.38%	7.55	FAIL	372	243	-34.75%	7.37	FAIL
New_181	A37	NB	336	437	30.18%	5.16	FAIL	291	363	24.88%	4.00	PASS
Somerset_CountLoc_37	A371	NB	261	232	-11.21%	1.86	PASS	226	207	-8.42%	1.29	PASS
Somerset_CountLoc_190	B3081	NB	86	113	30.92%	2.67	PASS	75	96	27.83%	2.26	PASS
Somerset_CountLoc_189	A359	NB	218	115	-47.25%	7.98	FAIL	172	93	-46.03%	6.88	PASS
Wiltshire_CountLoc_133	B3092	NB	170	260	52.68%	6.11	PASS	148	235	58.89%	6.30	PASS
Wiltshire_CountLoc_132	B3095	NB	51	51	-0.78%	0.06	PASS	45	37	-16.80%	1.18	PASS
Wiltshire_CountLoc_130	A350	NB	310	220	-28.88%	5.50	PASS	269	189	-29.64%	5.27	PASS
Somerset_CountLoc_364	A361	SB	221	245	10.65%	1.54	PASS	191	210	9.96%	1.34	PASS
Somerset_CountLoc_243	A372	SB	163	205	25.62%	3.08	PASS	142	174	22.32%	2.52	PASS
Somerset_CountLoc_368	B3151	SB	379	304	-19.91%	4.09	PASS	331	272	-17.96%	3.43	PASS
New_181	A37	SB	330	386	17.03%	2.97	PASS	287	324	13.05%	2.14	PASS
Somerset_CountLoc_37	A371	SB	231	197	-14.66%	2.31	PASS	200	179	-10.68%	1.55	PASS
Somerset_CountLoc_190	B3081	SB	89	107	20.40%	1.83	PASS	78	95	21.81%	1.83	PASS
Somerset_CountLoc_189	A359	SB	173	128	-26.17%	3.69	PASS	140	103	-26.59%	3.38	PASS
Wiltshire_CountLoc_133	B3092	SB	166	273	64.39%	7.22	FAIL	145	252	73.57%	7.57	FAIL
Wiltshire_CountLoc_132	B3095	SB	73	78	7.21%	0.61	PASS	64	63	-1.89%	0.15	PASS
Wiltshire_CountLoc_130	A350	SB	291	180	-38.18%	7.24	FAIL	252	146	-41.95%	7.49	FAIL

Table 19.10: Charlton Musgrove to Lulworth - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_111	B3081	EB	88	88	-0.15%	0.01	PASS	72	72	0.33%	0.03	PASS
TRADS 2_3216	A303	EB	794	774	-2.51%	0.71	PASS	584	582	-0.36%	0.09	PASS
Dorset_CountLoc_14	A30	EB	216	147	-32.12%	5.15	PASS	173	122	-29.35%	4.18	PASS
New_34	A357	EB	276	345	25.08%	3.93	PASS	221	270	22.33%	3.15	PASS
Dorset_CountLoc_18	A354	EB	233	233	0.18%	0.03	PASS	187	187	0.19%	0.03	PASS
TRADS 3_30012834	A31	EB	608	609	0.13%	0.03	PASS	464	465	0.14%	0.03	PASS
Dorset_CountLoc_66	A35	EB	655	574	-12.30%	3.25	PASS	524	450	-14.17%	3.36	PASS
Dorset_CountLoc_74	A352	EB	443	524	18.22%	3.67	PASS	355	429	20.90%	3.75	PASS
Somerset_CountLoc_111	B3081	WB	82	96	16.61%	1.45	PASS	67	81	20.21%	1.58	PASS
TRADS 2_3215	A303	WB	774	771	-0.40%	0.11	PASS	566	564	-0.44%	0.11	PASS
Dorset_CountLoc_14	A30	WB	217	140	-35.34%	5.74	PASS	174	117	-32.80%	4.73	PASS
New_34	A357	WB	227	304	33.76%	4.70	PASS	182	239	31.33%	3.93	PASS
Dorset_CountLoc_18	A354	WB	255	255	-0.05%	0.01	PASS	204	204	0.00%	0.00	PASS
TRADS 3_30012835	A31	WB	675	675	0.07%	0.02	PASS	504	505	0.12%	0.03	PASS
Dorset_CountLoc_66	A35	WB	530	522	-1.49%	0.34	PASS	425	409	-3.71%	0.77	PASS
Dorset_CountLoc_74	A352	WB	380	388	2.17%	0.42	PASS	304	320	5.18%	0.89	PASS

Table 19.11: Charlton Musgrove to Lulworth - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_111	B3081	EB	73	80	10.20%	0.85	PASS	59	67	13.29%	0.99	PASS
TRADS 2_3216	A303	EB	817	800	-2.05%	0.59	PASS	611	595	-2.64%	0.66	PASS
Dorset_CountLoc_14	A30	EB	188	138	-26.60%	3.92	PASS	152	118	-22.16%	2.90	PASS
New_34	A357	EB	206	255	23.84%	3.23	PASS	165	198	20.18%	2.47	PASS
Dorset_CountLoc_18	A354	EB	193	193	0.21%	0.03	PASS	155	155	0.14%	0.02	PASS
TRADS 3_30012834	A31	EB	624	631	1.12%	0.28	PASS	478	484	1.31%	0.29	PASS
Dorset_CountLoc_66	A35	EB	436	392	-10.04%	2.15	PASS	350	302	-13.65%	2.65	PASS
Dorset_CountLoc_74	A352	EB	376	420	11.60%	2.19	PASS	301	349	15.90%	2.66	PASS
Somerset_CountLoc_111	B3081	WB	76	84	10.26%	0.87	PASS	62	70	12.45%	0.95	PASS
TRADS 2_3215	A303	WB	830	826	-0.43%	0.12	PASS	619	614	-0.83%	0.21	PASS
Dorset_CountLoc_14	A30	WB	184	135	-26.70%	3.89	PASS	148	116	-21.59%	2.78	PASS
New_34	A357	WB	215	264	22.72%	3.16	PASS	173	205	18.26%	2.30	PASS
Dorset_CountLoc_18	A354	WB	207	207	0.19%	0.03	PASS	166	166	0.25%	0.03	PASS
TRADS 3_30012835	A31	WB	536	538	0.36%	0.08	PASS	414	416	0.46%	0.09	PASS
Dorset_CountLoc_66	A35	WB	436	447	2.43%	0.50	PASS	350	352	0.68%	0.13	PASS
Dorset_CountLoc_74	A352	WB	391	381	-2.69%	0.53	PASS	314	312	-0.68%	0.12	PASS

Table 19.12: Charlton Musgrove to Lulworth - PM

Count ID	Road Name	Screenline Direction	Total vehicles Obs	Total vehicles Mod	Total vehicles % Diff	Total vehicles GEH	Total vehicles Pass	Cars Obs	Cars Mod	Cars % Diff	Cars GEH	Cars Pass
Somerset_CountLoc_111	B3081	EB	87	106	22.00%	1.95	PASS	76	95	25.18%	2.07	PASS
TRADS 2_3216	A303	EB	833	828	-0.63%	0.18	PASS	682	677	-0.69%	0.18	PASS
Dorset_CountLoc_14	A30	EB	230	166	-27.92%	4.57	PASS	199	151	-23.98%	3.61	PASS
New_34	A357	EB	218	282	29.54%	4.07	PASS	189	237	25.39%	3.29	PASS
Dorset_CountLoc_18	A354	EB	227	228	0.56%	0.08	PASS	197	198	0.44%	0.06	PASS
TRADS 3_30012834	A31	EB	662	663	0.09%	0.02	PASS	551	551	0.05%	0.01	PASS
Dorset_CountLoc_66	A35	EB	574	506	-11.79%	2.91	PASS	498	423	-14.99%	3.48	PASS
Dorset_CountLoc_74	A352	EB	397	465	17.15%	3.28	PASS	344	419	21.71%	3.82	PASS
Somerset_CountLoc_111	B3081	WB	90	90	0.24%	0.02	PASS	79	79	0.11%	0.01	PASS
TRADS 2_3215	A303	WB	945	944	-0.09%	0.03	PASS	773	772	-0.09%	0.03	PASS
Dorset_CountLoc_14	A30	WB	222	170	-23.44%	3.72	PASS	192	150	-21.90%	3.22	PASS
New_34	A357	WB	253	305	20.54%	3.11	PASS	219	261	19.05%	2.69	PASS
Dorset_CountLoc_18	A354	WB	256	256	0.11%	0.02	PASS	222	222	0.02%	0.00	PASS
TRADS 3_30012835	A31	WB	602	606	0.67%	0.16	PASS	507	511	0.79%	0.18	PASS
Dorset_CountLoc_66	A35	WB	631	612	-2.93%	0.74	PASS	547	519	-5.16%	1.22	PASS
Dorset_CountLoc_74	A352	WB	446	464	4.11%	0.86	PASS	386	414	7.32%	1.41	PASS

Table 19.13: Minehead to Sidmouth - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_523	A39	EB	457	433	-5.32%	1.15	PASS	366	342	-6.43%	1.25	PASS
Somerset_CountLoc_279	A396	EB	103	148	43.35%	3.99	PASS	82	127	54.46%	4.37	PASS
Somerset_CountLoc_59	B3224	EB	56	36	-36.11%	2.99	PASS	46	25	-45.67%	3.53	PASS
Somerset_CountLoc_522	B3190	EB	19	16	-17.04%	0.78	PASS	15	11	-26.60%	1.11	PASS
Devon_CountLoc_3587	B3227	EB	59	63	5.77%	0.44	PASS	43	47	9.69%	0.62	PASS
Devon_CountLoc_3496	A361	EB	996	995	-0.11%	0.03	PASS	725	724	-0.11%	0.03	PASS
TRADS M5 J28->J27	M5	EB	2093	2095	0.09%	0.04	PASS	1488	1624	9.16%	3.46	PASS
New_36	B3181	EB	291	119	-59.08%	12.01	FAIL	231	94	-59.36%	10.76	FAIL
Devon_CountLoc_3566	A373	EB	276	312	12.97%	2.09	PASS	206	212	2.80%	0.40	PASS
Devon_CountLoc_3532	Unnamed	EB	357	490	37.36%	6.48	FAIL	298	393	31.73%	5.09	PASS
TRADS 32_30012535	A30	EB	947	752	-20.55%	6.68	FAIL	709	552	-22.19%	6.27	FAIL
Devon_CountLoc_3428	B3180	EB	178	209	17.24%	2.21	PASS	146	151	3.56%	0.43	PASS
Devon_CountLoc_3413	A3052	EB	449	419	-6.71%	1.45	PASS	319	314	-1.51%	0.27	PASS
Somerset_CountLoc_523	A39	WB	527	528	0.26%	0.06	PASS	422	438	3.72%	0.76	PASS
Somerset_CountLoc_278	A396	WB	82	108	31.30%	2.64	PASS	66	82	24.97%	1.91	PASS
Somerset_CountLoc_59	B3224	WB	48	20	-57.40%	4.71	PASS	39	7	-82.67%	6.74	PASS
Somerset_CountLoc_522	B3190	WB	21	29	36.33%	1.53	PASS	17	23	35.53%	1.35	PASS
Devon_CountLoc_3587	B3227	WB	57	49	-13.54%	1.06	PASS	37	31	-15.89%	1.01	PASS
Devon_CountLoc_3497	A361	WB	951	937	-1.49%	0.46	PASS	626	627	0.21%	0.05	PASS
Agg_M5 J27->J28	M5	WB	2240	1934	-13.66%	6.70	PASS	1706	1384	-18.87%	8.19	FAIL
New_36	B3181	WB	346	421	21.57%	3.81	PASS	263	380	44.49%	6.53	FAIL
Devon_CountLoc_3566	A373	WB	246	477	94.38%	12.19	FAIL	182	387	112.40%	12.13	FAIL

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Devon_CountLoc_3532	Unnamed	WB	530	499	-5.87%	1.37	PASS	442	420	-4.97%	1.06	PASS
TRADS 32_30012534	A30	WB	1443	1405	-2.66%	1.02	PASS	1121	1073	-4.32%	1.46	PASS
Devon_CountLoc_3428	B3180	WB	175	255	45.44%	5.43	PASS	143	215	50.27%	5.37	PASS
Devon_CountLoc_3413	A3052	WB	531	451	-15.02%	3.60	PASS	427	355	-16.93%	3.66	PASS

Table 19.14: Minehead to Sidmouth - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_523	A39	EB	559	538	-3.75%	0.90	PASS	449	435	-3.05%	0.65	PASS
Somerset_CountLoc_279	A396	EB	98	155	58.18%	5.07	PASS	78	129	64.82%	4.98	PASS
Somerset_CountLoc_59	B3224	EB	57	21	-63.10%	5.76	PASS	47	10	-78.32%	6.88	PASS
Somerset_CountLoc_522	B3190	EB	18	20	12.16%	0.50	PASS	15	15	1.13%	0.04	PASS
Devon_CountLoc_3587	B3227	EB	56	55	-1.02%	0.08	PASS	39	39	1.09%	0.07	PASS
Devon_CountLoc_3496	A361	EB	839	797	-4.97%	1.46	PASS	585	583	-0.29%	0.07	PASS
TRADS M5 J28->J27	M5	EB	2092	2014	-3.72%	1.72	PASS	1504	1550	3.05%	1.18	PASS
New_36	B3181	EB	295	150	-49.21%	9.73	FAIL	238	116	-51.09%	9.13	FAIL
Devon_CountLoc_3566	A373	EB	219	382	74.49%	9.41	FAIL	178	262	47.29%	5.68	PASS
Devon_CountLoc_3532	Unnamed	EB	286	216	-24.49%	4.42	PASS	238	168	-29.48%	4.93	PASS
TRADS 32_30012535	A30	EB	1033	937	-9.32%	3.07	PASS	798	734	-7.99%	2.30	PASS
Devon_CountLoc_3428	B3180	EB	147	407	177.10%	15.64	FAIL	121	358	195.68%	15.30	FAIL
Devon_CountLoc_3413	A3052	EB	462	245	-46.98%	11.55	FAIL	384	177	-54.02%	12.39	FAIL
Somerset_CountLoc_523	A39	WB	498	506	1.56%	0.35	PASS	400	416	4.05%	0.80	PASS
Somerset_CountLoc_278	A396	WB	95	120	25.91%	2.38	PASS	76	91	19.09%	1.59	PASS
Somerset_CountLoc_59	B3224	WB	49	17	-66.17%	5.66	PASS	40	9	-76.85%	6.19	PASS
Somerset_CountLoc_522	B3190	WB	20	17	-13.60%	0.63	PASS	16	13	-20.56%	0.87	PASS
Devon_CountLoc_3587	B3227	WB	48	51	4.92%	0.34	PASS	34	37	8.78%	0.50	PASS
Devon_CountLoc_3497	A361	WB	730	732	0.25%	0.07	PASS	518	519	0.12%	0.03	PASS
Agg_M5 J27->J28	M5	WB	1870	1754	-6.23%	2.74	PASS	1389	1409	1.41%	0.52	PASS
New_36	B3181	WB	294	228	-22.61%	4.12	PASS	238	178	-25.17%	4.15	PASS
Devon_CountLoc_3566	A373	WB	213	325	52.93%	6.87	FAIL	175	212	21.04%	2.65	PASS

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Devon_CountLoc_3532	Unnamed	WB	286	299	4.53%	0.76	PASS	238	246	3.45%	0.53	PASS
TRADS 32_30012534	A30	WB	1046	1008	-3.65%	1.19	PASS	810	778	-3.90%	1.12	PASS
Devon_CountLoc_3428	B3180	WB	159	229	44.12%	5.04	PASS	130	200	53.47%	5.42	PASS
Devon_CountLoc_3413	A3052	WB	463	393	-15.12%	3.38	PASS	384	314	-18.19%	3.74	PASS

Table 19.15: Minehead to Sidmouth - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_523	A39	EB	521	512	-1.68%	0.38	PASS	451	455	0.96%	0.20	PASS
Somerset_CountLoc_279	A396	EB	83	120	44.75%	3.69	PASS	71	98	37.52%	2.90	PASS
Somerset_CountLoc_59	B3224	EB	55	27	-51.35%	4.42	PASS	48	17	-64.15%	5.39	PASS
Somerset_CountLoc_522	B3190	EB	22	29	32.20%	1.40	PASS	20	25	26.30%	1.11	PASS
Devon_CountLoc_3587	B3227	EB	55	48	-12.10%	0.92	PASS	42	37	-13.22%	0.89	PASS
Devon_CountLoc_3496	A361	EB	899	877	-2.50%	0.75	PASS	695	694	-0.11%	0.03	PASS
TRADS M5 J28->J27	M5	EB	2316	2283	-1.44%	0.69	PASS	1842	1828	-0.74%	0.32	PASS
New_36	B3181	EB	371	183	-50.71%	11.31	FAIL	317	163	-48.45%	9.91	FAIL
Devon_CountLoc_3566	A373	EB	271	482	77.90%	10.88	FAIL	227	400	75.99%	9.75	FAIL
Devon_CountLoc_3532	Unnamed	EB	530	470	-11.32%	2.68	PASS	463	398	-14.14%	3.16	PASS
TRADS 32_30012535	A30	EB	1369	1351	-1.34%	0.50	PASS	1154	1143	-0.96%	0.33	PASS
Devon_CountLoc_3428	B3180	EB	174	259	48.75%	5.77	PASS	152	236	55.57%	6.06	PASS
Devon_CountLoc_3413	A3052	EB	568	483	-14.95%	3.70	PASS	484	400	-17.45%	4.02	PASS
Somerset_CountLoc_523	A39	WB	488	494	1.22%	0.27	PASS	423	431	1.81%	0.37	PASS
Somerset_CountLoc_278	A396	WB	100	123	23.35%	2.21	PASS	86	106	22.99%	2.02	PASS
Somerset_CountLoc_59	B3224	WB	59	29	-50.12%	4.45	PASS	52	25	-52.87%	4.44	PASS
Somerset_CountLoc_522	B3190	WB	21	14	-31.87%	1.59	PASS	19	11	-41.58%	2.04	PASS
Devon_CountLoc_3587	B3227	WB	63	67	6.70%	0.52	PASS	50	55	9.42%	0.65	PASS
Devon_CountLoc_3497	A361	WB	1035	1039	0.37%	0.12	PASS	824	828	0.44%	0.13	PASS
Agg_M5 J27->J28	M5	WB	2202	1972	-10.43%	5.03	PASS	1818	1586	-12.77%	5.63	PASS
New_36	B3181	WB	344	450	30.79%	5.32	FAIL	292	415	42.07%	6.53	FAIL
Devon_CountLoc_3566	A373	WB	255	379	48.42%	6.94	FAIL	215	324	50.70%	6.64	FAIL

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Devon_CountLoc_3532	Unnamed	WB	356	512	43.90%	7.50	FAIL	312	456	46.03%	7.33	FAIL
TRADS 32_30012534	A30	WB	1119	963	-13.92%	4.83	PASS	924	779	-15.68%	4.96	PASS
Devon_CountLoc_3428	B3180	WB	184	235	27.53%	3.50	PASS	160	192	19.93%	2.40	PASS
Devon_CountLoc_3413	A3052	WB	451	400	-11.26%	2.46	PASS	369	337	-8.67%	1.70	PASS

Table 19.16: Taunton - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_21	A3259	IB	526	562	6.91%	1.56	PASS	421	435	3.44%	0.70	PASS
Somerset_CountLoc_30	A38	IB	718	683	-4.88%	1.32	PASS	575	560	-2.55%	0.62	PASS
Somerset_CountLoc_530	A358	IB	1607	1488	-7.42%	3.03	PASS	1227	1154	-5.99%	2.13	PASS
Somerset_CountLoc_261	B3170	IB	390	397	1.70%	0.33	PASS	318	320	0.53%	0.09	PASS
Somerset_CountLoc_36	A38	IB	778	756	-2.86%	0.80	PASS	632	607	-4.03%	1.02	PASS
New_50	B3227	IB	383	383	-0.08%	0.02	PASS	313	313	-0.07%	0.01	PASS
Somerset_CountLoc_252	A358	IB	550	554	0.76%	0.18	PASS	461	464	0.72%	0.15	PASS
Somerset_CountLoc_21	A3259	OB	429	241	-43.87%	10.28	FAIL	343	193	-43.71%	9.16	FAIL
Somerset_CountLoc_30	A38	OB	422	458	8.43%	1.70	PASS	338	353	4.35%	0.79	PASS
Somerset_CountLoc_530	A358	OB	1656	1601	-3.35%	1.38	PASS	1272	1217	-4.30%	1.55	PASS
Somerset_CountLoc_261	B3170	OB	305	296	-2.93%	0.52	PASS	249	241	-3.37%	0.54	PASS
Somerset_CountLoc_36	A38	OB	582	588	1.01%	0.24	PASS	433	438	1.23%	0.25	PASS
New_50	B3227	OB	194	91	-52.98%	8.61	FAIL	158	55	-64.91%	9.93	FAIL
Somerset_CountLoc_251	A358	OB	380	379	-0.26%	0.05	PASS	269	269	-0.02%	0.00	PASS

Table 19.17: Taunton - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_21	A3259	IB	393	400	1.74%	0.34	PASS	316	306	-3.06%	0.55	PASS
Somerset_CountLoc_30	A38	IB	545	528	-3.18%	0.75	PASS	438	427	-2.44%	0.51	PASS
Somerset_CountLoc_530	A358	IB	1563	1407	-9.97%	4.04	PASS	1278	1139	-10.88%	4.00	PASS
Somerset_CountLoc_261	B3170	IB	260	259	-0.24%	0.04	PASS	212	211	-0.42%	0.06	PASS
Somerset_CountLoc_36	A38	IB	586	591	0.90%	0.22	PASS	454	457	0.56%	0.12	PASS
New_50	B3227	IB	224	178	-20.71%	3.27	PASS	183	136	-25.66%	3.72	PASS
Somerset_CountLoc_252	A358	IB	504	506	0.38%	0.09	PASS	426	426	0.04%	0.01	PASS
Somerset_CountLoc_21	A3259	OB	451	291	-35.56%	8.33	FAIL	362	223	-38.40%	8.13	FAIL
Somerset_CountLoc_30	A38	OB	534	609	14.06%	3.14	PASS	429	500	16.48%	3.28	PASS
Somerset_CountLoc_530	A358	OB	1484	1441	-2.87%	1.11	PASS	1178	1129	-4.17%	1.45	PASS
Somerset_CountLoc_261	B3170	OB	282	265	-5.90%	1.01	PASS	231	214	-7.40%	1.15	PASS
Somerset_CountLoc_36	A38	OB	612	620	1.36%	0.33	PASS	474	482	1.75%	0.38	PASS
New_50	B3227	OB	205	185	-9.81%	1.44	PASS	167	147	-12.05%	1.61	PASS
Somerset_CountLoc_251	A358	OB	486	485	-0.17%	0.04	PASS	422	422	-0.09%	0.02	PASS

Table 19.18: Taunton - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_21	A3259	IB	467	437	-6.52%	1.43	PASS	405	362	-10.54%	2.18	PASS
Somerset_CountLoc_30	A38	IB	568	525	-7.63%	1.85	PASS	492	457	-7.14%	1.61	PASS
Somerset_CountLoc_530	A358	IB	1708	1596	-6.53%	2.74	PASS	1459	1354	-7.19%	2.80	PASS
Somerset_CountLoc_261	B3170	IB	287	302	5.11%	0.85	PASS	250	264	5.40%	0.84	PASS
Somerset_CountLoc_36	A38	IB	621	631	1.60%	0.40	PASS	516	526	1.85%	0.42	PASS
New_50	B3227	IB	214	162	-24.14%	3.77	PASS	187	135	-27.62%	4.07	PASS
Somerset_CountLoc_252	A358	IB	450	450	0.06%	0.01	PASS	381	381	0.02%	0.00	PASS
Somerset_CountLoc_21	A3259	OB	562	391	-30.50%	7.85	FAIL	487	321	-34.05%	8.25	FAIL
Somerset_CountLoc_30	A38	OB	665	740	11.22%	2.82	PASS	576	657	14.01%	3.25	PASS
Somerset_CountLoc_530	A358	OB	1578	1531	-2.96%	1.19	PASS	1365	1320	-3.30%	1.23	PASS
Somerset_CountLoc_261	B3170	OB	398	401	0.79%	0.16	PASS	347	354	1.91%	0.35	PASS
Somerset_CountLoc_36	A38	OB	826	838	1.40%	0.40	PASS	710	721	1.61%	0.43	PASS
New_50	B3227	OB	298	251	-15.83%	2.85	PASS	260	213	-18.27%	3.09	PASS
Somerset_CountLoc_251	A358	OB	666	666	-0.06%	0.02	PASS	597	597	-0.03%	0.01	PASS

Table 19.19: Exeter - AM

Count ID	Road Name	Screenline Direction	Total vehicles Obs	Mod	% Diff	GEH	Pass	Cars Obs	Mod	% Diff	GEH	Pass
Devon_CountLoc_3477	B3181	IB	469	736	56.88%	10.87	FAIL	383	623	62.55%	10.68	FAIL
Devon_CountLoc_3509	A3015	IB	1770	1573	-11.14%	4.82	PASS	1508	1325	-12.17%	4.88	PASS
Devon_CountLoc_2359	C557	IB	618	846	36.87%	8.42	FAIL	514	731	42.15%	8.68	FAIL
New_27	A379	IB	1465	1166	-20.43%	8.25	FAIL	1146	871	-23.97%	8.65	FAIL
Devon_CountLoc_3591	C527	IB	611	1306	113.67%	22.44	FAIL	509	1084	112.95%	20.37	FAIL
Devon_CountLoc_3473	A379	IB	486	289	-40.57%	10.02	FAIL	387	200	-48.30%	10.91	FAIL
Devon_CountLoc_3487	A379	IB	1177	680	-42.20%	16.30	FAIL	883	495	-43.91%	14.77	FAIL
SL_Gap_ChurchRd_Exeter	Unnamed	IB	335	181	-45.83%	9.55	FAIL	279	153	-45.29%	8.60	FAIL
Devon_CountLoc_3505	A377	IB	1006	1303	29.55%	8.75	FAIL	779	1012	29.95%	7.80	FAIL
Devon_CountLoc_3548	B3212	IB	446	313	-29.76%	6.81	FAIL	364	266	-26.81%	5.50	PASS
Devon_CountLoc_3467	A377	IB	760	784	3.10%	0.85	PASS	595	620	4.25%	1.03	PASS
Devon_CountLoc_3477	B3181	OB	272	617	126.76%	16.36	FAIL	222	519	133.62%	15.41	FAIL
Devon_CountLoc_3509	A3015	OB	860	870	1.18%	0.34	PASS	679	678	-0.14%	0.04	PASS
Devon_CountLoc_2359	C557	OB	960	704	-26.67%	8.88	FAIL	800	593	-25.93%	7.86	FAIL
New_27	A379	OB	811	669	-17.47%	5.21	FAIL	635	543	-14.55%	3.81	PASS
Devon_CountLoc_3591	C527	OB	462	656	41.94%	8.20	FAIL	385	569	47.86%	8.44	FAIL
Devon_CountLoc_3473	A379	OB	243	142	-41.54%	7.27	FAIL	189	83	-56.05%	9.08	FAIL
Devon_CountLoc_3487	A379	OB	411	318	-22.70%	4.89	PASS	310	232	-25.29%	4.76	PASS
Devon_CountLoc_3528	Unnamed	OB	526	169	-67.86%	19.15	FAIL	439	133	-69.69%	18.09	FAIL
Devon_CountLoc_3505	A377	OB	697	1109	59.08%	13.70	FAIL	536	888	65.70%	13.20	FAIL
Devon_CountLoc_3548	B3212	OB	266	217	-18.42%	3.15	PASS	218	173	-20.50%	3.19	PASS
Devon_CountLoc_3467	A377	OB	349	465	33.12%	5.73	FAIL	274	390	42.26%	6.36	FAIL

Table 19.20: Exeter - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Devon_CountLoc_3477	B3181	IB	291	493	69.25%	10.18	FAIL	238	407	71.16%	9.43	FAIL
Devon_CountLoc_3509	A3015	IB	873	743	-14.84%	4.56	PASS	734	609	-17.12%	4.85	PASS
Devon_CountLoc_2359	C557	IB	565	360	-36.35%	9.55	FAIL	470	304	-35.22%	8.41	FAIL
New_27	A379	IB	882	1014	15.00%	4.30	PASS	678	800	17.99%	4.49	PASS
Devon_CountLoc_3591	C527	IB	607	817	34.55%	7.86	FAIL	506	673	32.98%	6.87	FAIL
Devon_CountLoc_3473	A379	IB	324	154	-52.36%	10.97	FAIL	258	109	-57.70%	10.99	FAIL
Devon_CountLoc_3487	A379	IB	626	576	-8.00%	2.04	PASS	477	448	-6.03%	1.34	PASS
SL_Gap_ChurchRd_Exeter	Unnamed	IB	226	282	24.93%	3.53	PASS	188	236	25.45%	3.29	PASS
Devon_CountLoc_3505	A377	IB	859	760	-11.54%	3.48	PASS	681	603	-11.38%	3.06	PASS
Devon_CountLoc_3548	B3212	IB	260	301	15.67%	2.43	PASS	212	241	13.49%	1.90	PASS
Devon_CountLoc_3467	A377	IB	454	454	-0.10%	0.02	PASS	366	366	-0.14%	0.03	PASS
Devon_CountLoc_3477	B3181	OB	319	624	95.64%	14.05	FAIL	260	525	101.77%	13.36	FAIL
Devon_CountLoc_3509	A3015	OB	870	955	9.75%	2.81	PASS	732	746	2.00%	0.54	PASS
Devon_CountLoc_2359	C557	OB	689	518	-24.79%	6.95	FAIL	574	418	-27.22%	7.02	FAIL
New_27	A379	OB	951	735	-22.68%	7.43	FAIL	730	609	-16.61%	4.69	PASS
Devon_CountLoc_3591	C527	OB	633	743	17.44%	4.21	PASS	527	640	21.46%	4.68	PASS
Devon_CountLoc_3473	A379	OB	327	170	-48.02%	9.96	FAIL	255	115	-54.92%	10.30	FAIL
Devon_CountLoc_3487	A379	OB	530	560	5.69%	1.29	PASS	391	403	3.08%	0.61	PASS
Devon_CountLoc_3528	Unnamed	OB	460	95	-79.31%	21.90	FAIL	383	72	-81.30%	20.65	FAIL
Devon_CountLoc_3505	A377	OB	855	1145	33.90%	9.16	FAIL	677	914	34.99%	8.40	FAIL
Devon_CountLoc_3548	B3212	OB	217	290	33.77%	4.60	PASS	177	252	42.36%	5.12	PASS
Devon_CountLoc_3467	A377	OB	481	481	-0.02%	0.01	PASS	388	388	0.02%	0.00	PASS

Table 19.21: Exeter - PM

Count ID	Road Name	Screenline Direction	Total vehicles Obs	Mod	% Diff	GEH	Pass	Cars Obs	Mod	% Diff	GEH	Pass
Devon_CountLoc_3477	B3181	IB	293	642	119.18%	16.15	FAIL	255	577	126.42%	15.80	FAIL
Devon_CountLoc_3509	A3015	IB	998	782	-21.62%	7.23	FAIL	853	671	-21.31%	6.58	FAIL
Devon_CountLoc_2359	C557	IB	807	461	-42.81%	13.72	FAIL	706	411	-41.83%	12.50	FAIL
New_27	A379	IB	893	1103	23.53%	6.65	FAIL	774	929	19.97%	5.30	FAIL
Devon_CountLoc_3591	C527	IB	503	635	26.21%	5.53	FAIL	440	546	24.04%	4.77	PASS
Devon_CountLoc_3473	A379	IB	298	133	-55.51%	11.27	FAIL	237	99	-58.38%	10.68	FAIL
Devon_CountLoc_3487	A379	IB	589	622	5.61%	1.34	PASS	486	518	6.63%	1.44	PASS
SL_Gap_ChurchRd_Exeter	Unnamed	IB	195	355	82.02%	9.65	FAIL	171	303	77.30%	8.58	FAIL
Devon_CountLoc_3505	A377	IB	693	637	-8.11%	2.18	PASS	583	550	-5.65%	1.38	PASS
Devon_CountLoc_3548	B3212	IB	379	277	-27.02%	5.66	FAIL	331	232	-29.98%	5.92	PASS
Devon_CountLoc_3467	A377	IB	383	536	39.86%	7.12	FAIL	324	477	47.21%	7.64	FAIL
Devon_CountLoc_3477	B3181	OB	497	652	31.23%	6.48	FAIL	433	581	34.18%	6.57	FAIL
Devon_CountLoc_3509	A3015	OB	1608	1804	12.16%	4.74	PASS	1419	1569	10.58%	3.88	PASS
Devon_CountLoc_2359	C557	OB	854	1120	31.20%	8.48	FAIL	747	1008	34.97%	8.82	FAIL
New_27	A379	OB	1372	748	-45.51%	19.18	FAIL	1190	626	-47.42%	18.73	FAIL
Devon_CountLoc_3591	C527	OB	736	1120	52.21%	12.61	FAIL	644	1021	58.48%	13.05	FAIL
Devon_CountLoc_3473	A379	OB	486	250	-48.59%	12.31	FAIL	379	188	-50.39%	11.34	FAIL
Devon_CountLoc_3487	A379	OB	761	600	-21.18%	6.18	FAIL	641	454	-29.12%	7.98	FAIL
Devon_CountLoc_3528	Unnamed	OB	671	116	-82.73%	27.98	FAIL	587	100	-82.95%	26.27	FAIL
Devon_CountLoc_3505	A377	OB	996	1587	59.33%	16.44	FAIL	878	1392	58.52%	15.25	FAIL
Devon_CountLoc_3548	B3212	OB	331	302	-8.77%	1.63	PASS	289	268	-7.27%	1.26	PASS
Devon_CountLoc_3467	A377	OB	722	722	-0.03%	0.01	PASS	612	612	0.01%	0.00	PASS

Table 19.22: Yeovil - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
New_53	A37	IB	749	646	-13.82%	3.92	PASS	600	510	-14.94%	3.81	PASS
Somerset_CountLoc_528	A359	IB	348	433	24.54%	4.32	PASS	279	370	32.57%	5.04	PASS
Dorset_CountLoc_51	A30	IB	584	767	31.39%	7.05	FAIL	468	651	39.10%	7.74	FAIL
Somerset_CountLoc_527	A37	IB	490	484	-1.24%	0.28	PASS	392	387	-1.33%	0.26	PASS
Somerset_CountLoc_121	A30	IB	407	564	38.68%	7.14	FAIL	326	467	43.17%	7.07	FAIL
New_52	A3088	IB	964	734	-23.85%	7.89	FAIL	772	560	-27.50%	8.23	FAIL
New_541	Unnamed	IB	326	392	20.13%	3.46	PASS	272	335	23.22%	3.62	PASS
New_53	A37	OB	582	599	2.88%	0.69	PASS	466	485	4.10%	0.88	PASS
Somerset_CountLoc_528	A359	OB	258	239	-7.27%	1.19	PASS	207	186	-10.22%	1.51	PASS
Dorset_CountLoc_51	A30	OB	561	562	0.09%	0.02	PASS	449	448	-0.17%	0.04	PASS
Somerset_CountLoc_527	A37	OB	446	357	-20.03%	4.46	PASS	357	269	-24.70%	4.98	PASS
Somerset_CountLoc_121	A30	OB	203	307	51.41%	6.53	FAIL	163	255	56.39%	6.36	PASS
New_52	A3088	OB	616	515	-16.36%	4.24	PASS	493	422	-14.45%	3.33	PASS
New_541	Unnamed	OB	162	157	-3.35%	0.43	PASS	135	114	-15.90%	1.93	PASS

Table 19.23: Yeovil - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
New_53	A37	IB	549	534	-2.78%	0.66	PASS	441	433	-1.77%	0.37	PASS
Somerset_CountLoc_528	A359	IB	257	275	6.85%	1.08	PASS	207	221	6.77%	0.96	PASS
Dorset_CountLoc_51	A30	IB	557	559	0.42%	0.10	PASS	447	448	0.25%	0.05	PASS
Somerset_CountLoc_527	A37	IB	382	368	-3.55%	0.70	PASS	307	296	-3.48%	0.61	PASS
Somerset_CountLoc_121	A30	IB	267	278	4.13%	0.67	PASS	215	225	4.70%	0.68	PASS
New_52	A3088	IB	580	543	-6.31%	1.55	PASS	466	440	-5.62%	1.23	PASS
New_541	Unnamed	IB	183	204	11.50%	1.51	PASS	152	163	7.47%	0.90	PASS
New_53	A37	OB	519	496	-4.50%	1.04	PASS	417	401	-3.77%	0.78	PASS
Somerset_CountLoc_528	A359	OB	263	274	4.23%	0.68	PASS	211	221	4.51%	0.65	PASS
Dorset_CountLoc_51	A30	OB	554	554	0.06%	0.01	PASS	445	445	0.07%	0.01	PASS
Somerset_CountLoc_527	A37	OB	380	358	-5.92%	1.17	PASS	305	283	-7.29%	1.30	PASS
Somerset_CountLoc_121	A30	OB	290	341	17.60%	2.87	PASS	233	283	21.52%	3.12	PASS
New_52	A3088	OB	745	538	-27.77%	8.17	FAIL	599	445	-25.79%	6.76	FAIL
New_541	Unnamed	OB	184	337	83.09%	9.47	FAIL	153	253	65.60%	7.04	FAIL

Table 19.24: Yeovil - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
New_53	A37	IB	676	640	-5.28%	1.39	PASS	586	547	-6.62%	1.63	PASS
Somerset_CountLoc_528	A359	IB	327	354	8.31%	1.47	PASS	284	316	11.19%	1.84	PASS
Dorset_CountLoc_51	A30	IB	584	583	-0.10%	0.02	PASS	507	506	-0.18%	0.04	PASS
Somerset_CountLoc_527	A37	IB	468	441	-5.78%	1.27	PASS	406	381	-6.06%	1.24	PASS
Somerset_CountLoc_121	A30	IB	257	309	20.16%	3.08	PASS	223	267	19.90%	2.83	PASS
New_52	A3088	IB	545	530	-2.83%	0.67	PASS	472	458	-3.06%	0.67	PASS
New_541	Unnamed	IB	199	173	-12.90%	1.88	PASS	175	154	-11.85%	1.62	PASS
New_53	A37	OB	660	671	1.71%	0.44	PASS	572	578	1.03%	0.25	PASS
Somerset_CountLoc_528	A359	OB	338	322	-4.82%	0.90	PASS	293	285	-2.90%	0.50	PASS
Dorset_CountLoc_51	A30	OB	644	650	0.87%	0.22	PASS	558	563	0.89%	0.21	PASS
Somerset_CountLoc_527	A37	OB	489	486	-0.57%	0.13	PASS	424	423	-0.31%	0.06	PASS
Somerset_CountLoc_121	A30	OB	406	466	14.74%	2.87	PASS	352	414	17.68%	3.18	PASS
New_52	A3088	OB	937	728	-22.32%	7.25	FAIL	812	621	-23.56%	7.15	FAIL
New_541	Unnamed	OB	273	411	50.54%	7.46	FAIL	240	358	49.09%	6.81	FAIL

Table 19.25: Honiton - AM

Count ID	Road Name	Screenline Direction	Total vehicles Obs	Total vehicles Mod	Total vehicles % Diff	Total vehicles GEH	Total vehicles Pass	Cars Obs	Cars Mod	Cars % Diff	Cars GEH	Cars Pass
TRADS 2_30012610	A30	IB	525	561	6.79%	1.53	PASS	375	405	7.85%	1.49	PASS
TRADS 2_30015275	A35	IB	500	463	-7.32%	1.67	PASS	386	354	-8.31%	1.67	PASS
New_218	Unnamed	IB	60	47	-20.91%	1.71	PASS	50	37	-25.98%	1.97	PASS
Devon_CountLoc_3567	A375	IB	137	144	5.34%	0.62	PASS	103	116	12.98%	1.27	PASS
TRADS 32_30012541	A30	IB	1008	1008	0.01%	0.00	PASS	760	759	-0.18%	0.05	PASS
New_28	A373	IB	161	163	0.95%	0.12	PASS	120	121	0.83%	0.09	PASS
TRADS 2_30012611	A30	OB	532	551	3.60%	0.82	PASS	468	444	-4.96%	1.09	PASS
TRADS 2_30015276	A35	OB	470	476	1.18%	0.26	PASS	352	375	6.59%	1.22	PASS
New_218	Unnamed	OB	57	41	-28.51%	2.32	PASS	47	30	-36.68%	2.78	PASS
Devon_CountLoc_3567	A375	OB	146	160	9.64%	1.14	PASS	113	130	15.03%	1.54	PASS
TRADS 32_30012540	A30	OB	1240	1242	0.13%	0.04	PASS	954	952	-0.17%	0.05	PASS
New_28	A373	OB	143	143	0.15%	0.02	PASS	106	106	0.20%	0.02	PASS

Table 19.26: Honiton - IP

Count ID	Road Name	Screenline Direction	Total vehicles Obs	Total vehicles Mod	Total vehicles % Diff	Total vehicles GEH	Total vehicles Pass	Cars Obs	Cars Mod	Cars % Diff	Cars GEH	Cars Pass
TRADS 2_30012610	A30	IB	573	578	0.93%	0.22	PASS	455	456	0.27%	0.06	PASS
TRADS 2_30015275	A35	IB	518	512	-1.21%	0.28	PASS	403	401	-0.61%	0.12	PASS
New_218	Unnamed	IB	53	52	-2.64%	0.19	PASS	44	39	-11.61%	0.79	PASS
Devon_CountLoc_3567	A375	IB	151	152	0.70%	0.09	PASS	117	122	4.07%	0.44	PASS
TRADS 32_30012541	A30	IB	1070	1100	2.83%	0.92	PASS	829	872	5.16%	1.47	PASS
New_28	A373	IB	139	139	0.22%	0.03	PASS	113	113	0.31%	0.03	PASS
TRADS 2_30012611	A30	OB	630	591	-6.12%	1.56	PASS	533	472	-11.53%	2.74	PASS
TRADS 2_30015276	A35	OB	502	516	2.89%	0.64	PASS	391	439	12.25%	2.35	PASS
New_218	Unnamed	OB	52	56	8.07%	0.57	PASS	43	46	7.26%	0.47	PASS
Devon_CountLoc_3567	A375	OB	155	146	-6.05%	0.77	PASS	121	115	-4.57%	0.51	PASS
TRADS 32_30012540	A30	OB	1111	1109	-0.14%	0.05	PASS	862	861	-0.17%	0.05	PASS
New_28	A373	OB	135	140	3.79%	0.44	PASS	111	110	-0.68%	0.07	PASS

Table 19.27: Honiton - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS 2_30012610	A30	IB	651	626	-3.89%	1.00	PASS	568	538	-5.19%	1.25	PASS
TRADS 2_30015275	A35	IB	505	535	5.96%	1.32	PASS	417	447	7.20%	1.44	PASS
New_218	Unnamed	IB	48	44	-7.64%	0.54	PASS	42	38	-10.29%	0.68	PASS
Devon_CountLoc_3567	A375	IB	165	168	2.15%	0.28	PASS	139	143	3.47%	0.40	PASS
TRADS 32_30012541	A30	IB	1242	1241	-0.06%	0.02	PASS	1044	1042	-0.16%	0.05	PASS
New_28	A373	IB	155	157	1.03%	0.13	PASS	130	130	0.26%	0.03	PASS
TRADS 2_30012611	A30	OB	621	631	1.69%	0.42	PASS	545	535	-1.77%	0.41	PASS
TRADS 2_30015276	A35	OB	510	498	-2.42%	0.55	PASS	429	437	1.84%	0.38	PASS
New_218	Unnamed	OB	46	72	55.92%	3.35	PASS	40	61	51.98%	2.93	PASS
Devon_CountLoc_3567	A375	OB	163	135	-17.45%	2.33	PASS	135	114	-15.24%	1.84	PASS
TRADS 32_30012540	A30	OB	1178	1178	0.00%	0.00	PASS	972	972	-0.01%	0.00	PASS
New_28	A373	OB	146	152	4.38%	0.52	PASS	123	129	5.07%	0.55	PASS

Table 19.28: Bridgwater - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_525	A38	IB	657	859	30.82%	7.35	FAIL	469	644	37.24%	7.41	FAIL
Somerset_CountLoc_526	A39	IB	587	386	-34.20%	9.10	FAIL	470	297	-36.83%	8.84	FAIL
Somerset_CountLoc_373	A372	IB	751	741	-1.28%	0.35	PASS	601	599	-0.29%	0.07	PASS
Somerset_CountLoc_524	A38	IB	281	607	116.14%	15.48	FAIL	225	551	145.10%	16.57	FAIL
Somerset_CountLoc_366	A39	IB	629	624	-0.86%	0.22	PASS	503	499	-0.87%	0.20	PASS
Somerset_CountLoc_525	A38	OB	688	953	38.51%	9.25	FAIL	451	691	53.22%	10.04	FAIL
Somerset_CountLoc_526	A39	OB	501	249	-50.27%	13.01	FAIL	401	168	-58.03%	13.79	FAIL
Somerset_CountLoc_373	A372	OB	394	374	-5.11%	1.03	PASS	316	301	-4.81%	0.86	PASS
Somerset_CountLoc_524	A38	OB	393	476	21.02%	3.96	PASS	315	397	26.06%	4.35	PASS
Somerset_CountLoc_366	A39	OB	528	377	-28.66%	7.12	FAIL	423	271	-35.82%	8.13	FAIL

Table 19.29: Bridgwater - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_525	A38	IB	864	859	-0.58%	0.17	PASS	590	611	3.48%	0.84	PASS
Somerset_CountLoc_526	A39	IB	439	448	1.95%	0.41	PASS	353	335	-4.98%	0.95	PASS
Somerset_CountLoc_373	A372	IB	468	467	-0.27%	0.06	PASS	376	374	-0.54%	0.10	PASS
Somerset_CountLoc_524	A38	IB	322	461	43.05%	7.01	FAIL	258	397	53.72%	7.66	FAIL
Somerset_CountLoc_366	A39	IB	562	560	-0.38%	0.09	PASS	451	451	-0.03%	0.01	PASS
Somerset_CountLoc_525	A38	OB	895	934	4.39%	1.30	PASS	616	692	12.28%	2.96	PASS
Somerset_CountLoc_526	A39	OB	471	432	-8.21%	1.82	PASS	379	305	-19.56%	4.01	PASS
Somerset_CountLoc_373	A372	OB	551	527	-4.37%	1.04	PASS	443	423	-4.55%	0.97	PASS
Somerset_CountLoc_524	A38	OB	291	516	77.22%	11.19	FAIL	234	456	94.77%	11.94	FAIL
Somerset_CountLoc_366	A39	OB	466	467	0.11%	0.02	PASS	375	375	0.08%	0.02	PASS

Table 19.30: Bridgwater - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_525	A38	IB	806	606	-24.82%	7.53	FAIL	619	428	-30.92%	8.37	FAIL
Somerset_CountLoc_526	A39	IB	541	738	36.40%	7.79	FAIL	469	657	40.11%	7.93	FAIL
Somerset_CountLoc_373	A372	IB	495	500	0.94%	0.21	PASS	428	432	0.92%	0.19	PASS
Somerset_CountLoc_524	A38	IB	455	498	9.48%	1.98	PASS	394	437	11.02%	2.13	PASS
Somerset_CountLoc_366	A39	IB	674	651	-3.46%	0.91	PASS	584	561	-3.99%	0.97	PASS
Somerset_CountLoc_525	A38	OB	963	1051	9.13%	2.77	PASS	771	884	14.65%	3.93	PASS
Somerset_CountLoc_526	A39	OB	578	503	-12.93%	3.21	PASS	501	399	-20.34%	4.80	PASS
Somerset_CountLoc_373	A372	OB	820	704	-14.14%	4.20	PASS	710	605	-14.84%	4.11	PASS
Somerset_CountLoc_524	A38	OB	302	751	148.65%	19.57	FAIL	262	710	170.82%	20.31	FAIL
Somerset_CountLoc_366	A39	OB	561	561	0.07%	0.02	PASS	486	486	0.00%	0.00	PASS

Table 19.31: Wells - AM

Count ID	Road Name	Screenline Direction	Total vehicles Obs	Mod	% Diff	GEH	Pass	Cars Obs	Mod	% Diff	GEH	Pass
New_184	A39	IB	310	265	-14.64%	2.68	PASS	248	193	-22.00%	3.67	PASS
New_185	B3139	IB	108	66	-39.19%	4.54	PASS	88	46	-47.68%	5.13	PASS
Somerset_CountLoc_65	A37	IB	610	697	14.34%	3.42	PASS	385	482	25.24%	4.67	PASS
Somerset_CountLoc_58	A361	IB	405	352	-13.11%	2.73	PASS	324	193	-40.37%	8.13	FAIL
Somerset_CountLoc_233	A371	IB	395	397	0.55%	0.11	PASS	260	314	20.73%	3.18	PASS
New_182	A37	IB	342	397	15.96%	2.84	PASS	231	311	34.63%	4.86	PASS
New_183	A39	IB	764	762	-0.24%	0.07	PASS	611	609	-0.26%	0.06	PASS
Somerset_CountLoc_61	B3151	IB	206	167	-19.04%	2.87	PASS	168	116	-31.10%	4.39	PASS
Somerset_CountLoc_38	B3139	IB	84	175	108.12%	7.98	PASS	68	150	120.91%	7.87	PASS
Somerset_CountLoc_49	A371	IB	236	149	-36.73%	6.24	PASS	188	123	-34.78%	5.25	PASS
New_184	A39	OB	259	261	0.84%	0.14	PASS	208	185	-11.22%	1.67	PASS
New_185	B3139	OB	116	83	-28.40%	3.30	PASS	95	71	-24.84%	2.59	PASS
Somerset_CountLoc_65	A37	OB	554	582	5.09%	1.18	PASS	383	428	11.68%	2.22	PASS
Somerset_CountLoc_58	A361	OB	419	391	-6.76%	1.41	PASS	335	224	-33.04%	6.62	FAIL
Somerset_CountLoc_233	A371	OB	480	488	1.70%	0.37	PASS	309	385	24.61%	4.08	PASS
New_182	A37	OB	373	388	4.10%	0.78	PASS	252	281	11.63%	1.79	PASS
New_183	A39	OB	808	819	1.35%	0.38	PASS	647	658	1.70%	0.43	PASS
Somerset_CountLoc_61	B3151	OB	131	157	20.05%	2.19	PASS	107	123	15.30%	1.53	PASS
Somerset_CountLoc_38	B3139	OB	80	67	-16.84%	1.57	PASS	65	43	-33.29%	2.94	PASS
Somerset_CountLoc_49	A371	OB	169	118	-29.90%	4.22	PASS	135	103	-23.96%	2.97	PASS

Table 19.32: Wells - IP

Count ID	Road Name	Screenline Direction	Total vehicles Obs	Mod	% Diff	GEH	Pass	Cars Obs	Mod	% Diff	GEH	Pass
New_184	A39	IB	241	226	-6.02%	0.95	PASS	194	164	-15.31%	2.22	PASS
New_185	B3139	IB	111	70	-36.75%	4.29	PASS	91	55	-39.73%	4.23	PASS
Somerset_CountLoc_65	A37	IB	496	548	10.48%	2.27	PASS	325	389	19.58%	3.37	PASS
Somerset_CountLoc_58	A361	IB	359	332	-7.58%	1.46	PASS	289	198	-31.53%	5.84	PASS
Somerset_CountLoc_233	A371	IB	394	389	-1.18%	0.23	PASS	277	323	16.62%	2.66	PASS
New_182	A37	IB	329	361	9.70%	1.72	PASS	223	269	20.42%	2.90	PASS
New_183	A39	IB	977	981	0.46%	0.14	PASS	785	788	0.39%	0.11	PASS
Somerset_CountLoc_61	B3151	IB	140	157	12.24%	1.41	PASS	115	120	4.68%	0.50	PASS
Somerset_CountLoc_38	B3139	IB	64	100	56.92%	4.02	PASS	52	86	64.71%	4.06	PASS
Somerset_CountLoc_49	A371	IB	191	139	-27.38%	4.07	PASS	154	116	-24.68%	3.27	PASS
New_184	A39	OB	262	240	-8.26%	1.37	PASS	210	171	-18.66%	2.84	PASS
New_185	B3139	OB	94	68	-27.38%	2.86	PASS	77	52	-32.86%	3.15	PASS
Somerset_CountLoc_65	A37	OB	533	580	8.77%	1.98	PASS	342	405	18.56%	3.28	PASS
Somerset_CountLoc_58	A361	OB	343	328	-4.38%	0.82	PASS	276	199	-27.95%	5.01	PASS
Somerset_CountLoc_233	A371	OB	388	376	-3.08%	0.61	PASS	283	319	12.69%	2.07	PASS
New_182	A37	OB	307	335	9.24%	1.58	PASS	208	249	19.70%	2.71	PASS
New_183	A39	OB	962	962	0.01%	0.00	PASS	773	775	0.27%	0.08	PASS
Somerset_CountLoc_61	B3151	OB	151	141	-6.54%	0.82	PASS	123	103	-15.97%	1.85	PASS
Somerset_CountLoc_38	B3139	OB	69	102	47.93%	3.58	PASS	56	78	38.89%	2.66	PASS
Somerset_CountLoc_49	A371	OB	197	121	-38.68%	6.04	PASS	158	102	-35.26%	4.88	PASS

Table 19.33: Wells - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
New_184	A39	IB	280	282	0.57%	0.10	PASS	243	223	-8.14%	1.29	PASS
New_185	B3139	IB	132	86	-35.00%	4.43	PASS	115	78	-32.13%	3.76	PASS
Somerset_CountLoc_65	A37	IB	587	626	6.65%	1.59	PASS	461	512	11.03%	2.31	PASS
Somerset_CountLoc_58	A361	IB	419	352	-16.11%	3.44	PASS	363	263	-27.50%	5.64	PASS
Somerset_CountLoc_233	A371	IB	509	461	-9.43%	2.18	PASS	412	405	-1.62%	0.33	PASS
New_182	A37	IB	358	471	31.67%	5.57	FAIL	287	390	36.01%	5.62	FAIL
New_183	A39	IB	1215	1218	0.21%	0.07	PASS	1052	1055	0.32%	0.10	PASS
Somerset_CountLoc_61	B3151	IB	152	193	27.18%	3.14	PASS	133	165	24.13%	2.63	PASS
Somerset_CountLoc_38	B3139	IB	85	98	15.40%	1.37	PASS	74	78	5.45%	0.46	PASS
Somerset_CountLoc_49	A371	IB	199	146	-26.88%	4.08	PASS	173	138	-20.46%	2.84	PASS
New_184	A39	OB	293	271	-7.67%	1.34	PASS	254	207	-18.63%	3.12	PASS
New_185	B3139	OB	107	70	-34.25%	3.89	PASS	94	51	-45.66%	5.04	PASS
Somerset_CountLoc_65	A37	OB	649	707	8.93%	2.23	PASS	461	550	19.38%	3.97	PASS
Somerset_CountLoc_58	A361	OB	413	347	-15.94%	3.38	PASS	358	251	-29.85%	6.12	FAIL
Somerset_CountLoc_233	A371	OB	424	409	-3.48%	0.72	PASS	344	366	6.39%	1.17	PASS
New_182	A37	OB	336	411	22.36%	3.89	PASS	269	348	29.49%	4.52	PASS
New_183	A39	OB	1057	1059	0.17%	0.06	PASS	916	917	0.14%	0.04	PASS
Somerset_CountLoc_61	B3151	OB	205	207	0.98%	0.14	PASS	179	179	-0.06%	0.01	PASS
Somerset_CountLoc_38	B3139	OB	87	155	78.32%	6.19	PASS	76	132	73.04%	5.45	PASS
Somerset_CountLoc_49	A371	OB	243	173	-28.72%	4.84	PASS	210	155	-26.30%	4.09	PASS

Table 19.34: Axminster to Wellington - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS 2_5019	A303	EB	449	533	18.69%	3.79	PASS	339	427	25.93%	4.49	PASS
ATC32	Honiton Road	EB	92	181	96.61%	7.62	PASS	84	148	75.74%	5.92	PASS
ATC33	Wangcombe Road	EB	129	103	-20.22%	2.43	PASS	116	87	-25.11%	2.90	PASS
ATC21	M5	EB	2158	2122	-1.64%	0.76	PASS	1714	1651	-3.65%	1.52	PASS
TRADS 2_5018	A303	WB	435	538	23.66%	4.67	PASS	323	387	19.87%	3.41	PASS
ATC32	Honiton Road	WB	120	137	14.85%	1.57	PASS	110	106	-3.59%	0.38	PASS
ATC33	Wangcombe Road	WB	107	104	-3.14%	0.33	PASS	96	88	-7.84%	0.78	PASS
ATC21	M5	WB	1935	1792	-7.37%	3.30	PASS	1335	1255	-6.03%	2.24	PASS

Table 19.35: Axminster to Wellington - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS 2_5019	A303	EB	481	566	17.59%	3.70	PASS	366	447	22.18%	4.03	PASS
ATC32	Honiton Road	EB	61	131	114.46%	7.15	PASS	53	107	102.75%	6.05	PASS
ATC33	Wangcombe Road	EB	66	60	-9.22%	0.77	PASS	56	47	-15.23%	1.18	PASS
ATC21	M5	EB	2245	2032	-9.53%	4.63	PASS	1801	1589	-11.73%	5.13	PASS
TRADS 2_5018	A303	WB	478	539	12.79%	2.71	PASS	368	421	14.42%	2.67	PASS
ATC32	Honiton Road	WB	62	128	105.72%	6.73	PASS	54	104	93.74%	5.67	PASS
ATC33	Wangcombe Road	WB	69	60	-12.13%	1.04	PASS	60	50	-15.91%	1.28	PASS
ATC21	M5	WB	1971	1860	-5.62%	2.53	PASS	1649	1508	-8.57%	3.56	PASS

Table 19.36: Axminster to Wellington - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS 2_5019	A303	EB	475	614	29.31%	5.97	FAIL	391	519	32.76%	6.01	FAIL
ATC32	Honiton Road	EB	114	159	39.30%	3.84	PASS	108	134	23.75%	2.34	PASS
ATC33	Wangcombe Road	EB	104	101	-3.37%	0.35	PASS	99	89	-9.57%	0.97	PASS
ATC21	M5	EB	2199	1991	-9.45%	4.54	PASS	1773	1607	-9.38%	4.05	PASS
TRADS 2_5018	A303	WB	542	594	9.50%	2.16	PASS	449	508	13.08%	2.69	PASS
ATC32	Honiton Road	WB	95	210	122.23%	9.37	FAIL	89	183	105.86%	8.08	PASS
ATC33	Wangcombe Road	WB	132	102	-22.79%	2.78	PASS	121	88	-27.15%	3.21	PASS
ATC21	M5	WB	2272	2242	-1.33%	0.64	PASS	1852	1845	-0.35%	0.15	PASS

Table 19.37: Sparkford - AM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC S2	A37	IB	361	390	8.03%	1.50	PASS	309	296	-4.20%	0.75	PASS
ATC S3	A359	IB	166	208	25.02%	3.04	PASS	150	159	5.90%	0.71	PASS
B10	Steart Hill	IB	9	0	-100.00%	4.13	PASS	7	0	-100.00%	3.66	PASS
B2	A359 Sparkford High Street	IB	244	229	-6.23%	0.99	PASS	225	189	-16.22%	2.54	PASS
B3	Trait Lane	IB	1	0	-100.00%	1.33	PASS	1	0	-100.00%	1.28	PASS
B4	Howell Hill	IB	29	8	-73.09%	4.91	PASS	26	7	-72.82%	4.64	PASS
B5	Plowage Lane	IB	22	21	-6.57%	0.32	PASS	20	20	-4.71%	0.22	PASS
B6	B3151	IB	33	63	90.02%	4.29	PASS	26	51	101.22%	4.17	PASS
B7	West Camel	IB	46	15	-66.66%	5.55	PASS	43	11	-74.15%	6.14	PASS
B8	Church Road	IB	9	9	-4.27%	0.13	PASS	8	7	-16.55%	0.49	PASS
B9	A372	IB	330	209	-36.80%	7.40	FAIL	281	144	-48.94%	9.45	FAIL
TRADS 2_5247	A303	IB	654	655	0.03%	0.01	PASS	533	482	-9.50%	2.25	PASS
TRADS 2_30012620	A303	IB	873	912	4.47%	1.31	PASS	697	695	-0.33%	0.09	PASS
ATC S2	A37	OB	302	325	7.80%	1.33	PASS	269	251	-6.64%	1.11	PASS
ATC S3	A359	OB	202	232	15.26%	2.09	PASS	186	195	5.12%	0.69	PASS
B10	Steart Hill	OB	13	0	-100.00%	5.12	PASS	12	0	-100.00%	4.80	PASS
B2	A359 Sparkford High Street	OB	130	56	-57.03%	7.68	PASS	115	36	-68.67%	9.08	PASS
B3	Trait Lane	OB	1	0	-100.00%	1.71	PASS	1	0	-100.00%	1.54	PASS
B4	Howell Hill	OB	36	9	-74.03%	5.62	PASS	31	9	-71.98%	5.03	PASS

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B5	Plowage Lane	OB	29	29	-0.23%	0.01	PASS	25	24	-5.22%	0.27	PASS
B6	B3151	OB	118	101	-14.41%	1.62	PASS	106	85	-19.91%	2.16	PASS
B7	West Camel	OB	25	25	-0.94%	0.05	PASS	23	17	-27.25%	1.41	PASS
B8	Church Road	OB	48	23	-52.83%	4.29	PASS	45	19	-57.45%	4.55	PASS
B9	A372	OB	237	242	1.90%	0.29	PASS	195	196	0.39%	0.05	PASS
TRADS 2_5246	A303	OB	756	892	18.05%	4.75	PASS	627	672	7.16%	1.76	PASS
TRADS 2_30012621	A303	OB	842	785	-6.78%	2.00	PASS	647	555	-14.14%	3.73	PASS
Consultation Site 1	B3151	IB	221	267	20.72%	2.93	PASS	162	224	38.26%	4.46	PASS
Consultation Site 1	B3151	OB	296	279	-5.94%	1.04	PASS	217	209	-3.71%	0.55	PASS

Table 19.38: Sparkford - IP

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC S2	A37	IB	314	327	4.18%	0.73	PASS	274	246	-10.06%	1.71	PASS
ATC S3	A359	IB	198	202	1.80%	0.25	PASS	184	165	-10.39%	1.45	PASS
B10	Steart Hill	IB	10	0	-100.00%	4.44	PASS	9	0	-100.00%	4.14	PASS
B2	A359 Sparkford High Street	IB	190	183	-3.64%	0.51	PASS	168	154	-8.41%	1.11	PASS
B3	Trait Lane	IB	1	0	-100.00%	1.21	PASS	1	0	-100.00%	1.16	PASS
B4	Howell Hill	IB	19	6	-68.03%	3.66	PASS	17	4	-75.35%	3.88	PASS
B5	Plowage Lane	IB	17	22	28.96%	1.13	PASS	15	20	34.96%	1.24	PASS
B6	B3151	IB	50	39	-21.94%	1.65	PASS	41	32	-21.00%	1.41	PASS
B7	West Camel	IB	19	17	-10.28%	0.46	PASS	17	13	-23.82%	1.05	PASS
B8	Church Road	IB	26	7	-73.70%	4.76	PASS	24	5	-77.22%	4.80	PASS
B9	A372	IB	218	186	-14.89%	2.28	PASS	182	148	-19.13%	2.72	PASS
TRADS 2_5247	A303	IB	735	688	-6.48%	1.79	PASS	606	515	-15.04%	3.85	PASS
TRADS 2_30012620	A303	IB	920	872	-5.20%	1.60	PASS	726	652	-10.22%	2.83	PASS
ATC S2	A37	OB	328	298	-9.07%	1.68	PASS	285	213	-25.40%	4.59	PASS
ATC S3	A359	OB	194	179	-7.76%	1.10	PASS	182	144	-20.52%	2.92	PASS
B10	Steart Hill	OB	8	0	-100.00%	4.05	PASS	7	0	-100.00%	3.71	PASS
B2	A359 Sparkford High Street	OB	125	43	-65.73%	8.98	PASS	114	30	-73.75%	9.89	PASS
B3	Trait Lane	OB	1	0	-100.00%	1.42	PASS	1	0	-100.00%	1.35	PASS
B4	Howell Hill	OB	23	8	-64.84%	3.76	PASS	19	6	-69.00%	3.75	PASS

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B5	Plowage Lane	OB	15	22	45.17%	1.60	PASS	13	20	47.95%	1.58	PASS
B6	B3151	OB	58	49	-16.30%	1.30	PASS	48	39	-18.51%	1.34	PASS
B7	West Camel	OB	23	10	-56.25%	3.19	PASS	21	9	-55.94%	3.04	PASS
B8	Church Road	OB	14	11	-19.54%	0.76	PASS	12	8	-33.79%	1.29	PASS
B9	A372	OB	237	229	-3.58%	0.56	PASS	194	186	-4.22%	0.59	PASS
TRADS 2_5246	A303	OB	782	831	6.35%	1.75	PASS	643	641	-0.29%	0.07	PASS
TRADS 2_30012621	A303	OB	914	869	-5.02%	1.54	PASS	720	657	-8.76%	2.40	PASS
Consultation Site 1	B3151	IB	209	250	19.68%	2.71	PASS	156	204	30.40%	3.54	PASS
Consultation Site 1	B3151	OB	184	265	44.04%	5.41	PASS	138	219	59.19%	6.11	PASS

Table 19.39: Sparkford - PM

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC S2	A37	IB	404	426	5.42%	1.07	PASS	378	371	-2.00%	0.39	PASS
ATC S3	A359	IB	278	284	2.17%	0.36	PASS	263	242	-7.97%	1.32	PASS
B10	Steart Hill	IB	13	0	-100.00%	5.19	PASS	12	0	-100.00%	4.85	PASS
B2	A359 Sparkford High Street	IB	265	265	-0.06%	0.01	PASS	244	238	-2.19%	0.34	PASS
B3	Trait Lane	IB	1	0	-100.00%	1.68	PASS	1	0	-100.00%	1.59	PASS
B4	Howell Hill	IB	35	3	-92.65%	7.51	PASS	32	2	-93.82%	7.32	PASS
B5	Plowage Lane	IB	29	17	-42.89%	2.62	PASS	26	13	-50.34%	2.97	PASS
B6	B3151	IB	69	59	-15.11%	1.31	PASS	66	53	-19.34%	1.65	PASS
B7	West Camel	IB	35	49	39.24%	2.13	PASS	32	38	16.23%	0.89	PASS
B8	Church Road	IB	52	24	-53.16%	4.46	PASS	49	19	-61.80%	5.23	PASS
B9	A372	IB	277	194	-30.07%	5.43	PASS	247	161	-34.67%	5.99	PASS
TRADS 2_5247	A303	IB	929	938	0.96%	0.29	PASS	801	740	-7.64%	2.21	PASS
TRADS 2_30012620	A303	IB	1113	1055	-5.15%	1.74	PASS	946	862	-8.85%	2.78	PASS
ATC S2	A37	OB	457	420	-8.04%	1.75	PASS	421	350	-16.82%	3.61	PASS
ATC S3	A359	OB	242	320	31.95%	4.62	PASS	230	261	13.38%	1.97	PASS
B10	Steart Hill	OB	11	0	-100.00%	4.67	PASS	10	0	-100.00%	4.41	PASS
B2	A359 Sparkford High Street	OB	196	53	-72.82%	12.79	FAIL	186	42	-77.54%	13.51	FAIL
B3	Trait Lane	OB	1	0	-100.00%	1.45	PASS	1	0	-100.00%	1.36	PASS
B4	Howell Hill	OB	37	24	-34.13%	2.27	PASS	33	24	-27.75%	1.72	PASS

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B5	Plowage Lane	OB	27	21	-21.47%	1.18	PASS	25	19	-22.26%	1.18	PASS
B6	B3151	OB	65	74	14.23%	1.11	PASS	58	64	10.02%	0.75	PASS
B7	West Camel	OB	61	24	-59.76%	5.56	PASS	57	20	-64.15%	5.88	PASS
B8	Church Road	OB	12	15	24.36%	0.80	PASS	11	13	18.51%	0.59	PASS
B9	A372	OB	380	369	-3.09%	0.61	PASS	332	295	-11.28%	2.12	PASS
TRADS 2_5246	A303	OB	915	970	6.03%	1.80	PASS	796	802	0.75%	0.21	PASS
TRADS 2_30012621	A303	OB	1136	1023	-9.97%	3.45	PASS	962	848	-11.80%	3.77	PASS
Consultation Site 1	B3151	IB	290	314	8.26%	1.38	PASS	234	269	15.23%	2.24	PASS
Consultation Site 1	B3151	OB	215	325	50.65%	6.64	FAIL	173	282	62.79%	7.21	FAIL

19.3 Key Route Flow Results

19.3.1 Five roads were deemed “Key Routes” for this model: these are the A358, A303, M4, M5 and the section of the A30 between the A303 and Exeter. These are all part of the Strategic Road Network (SRN) with the exception of the A358 and together form the main corridors into the South West peninsula. The flow validation results for the link counts along these key routes are given in Table 19.40 -Table 19.54 below with corresponding maps also included. These counts have not been filtered by screenline so some will be duplicates of results given in Chapter 19.2. The flow validation results for the other primary counts that do not lie on a screenline are then given in Figure 19.6 - Figure 19.8 and Table 19.55 -Table 19.57.

Figure 19.1: A358 Primary Link Count Locations

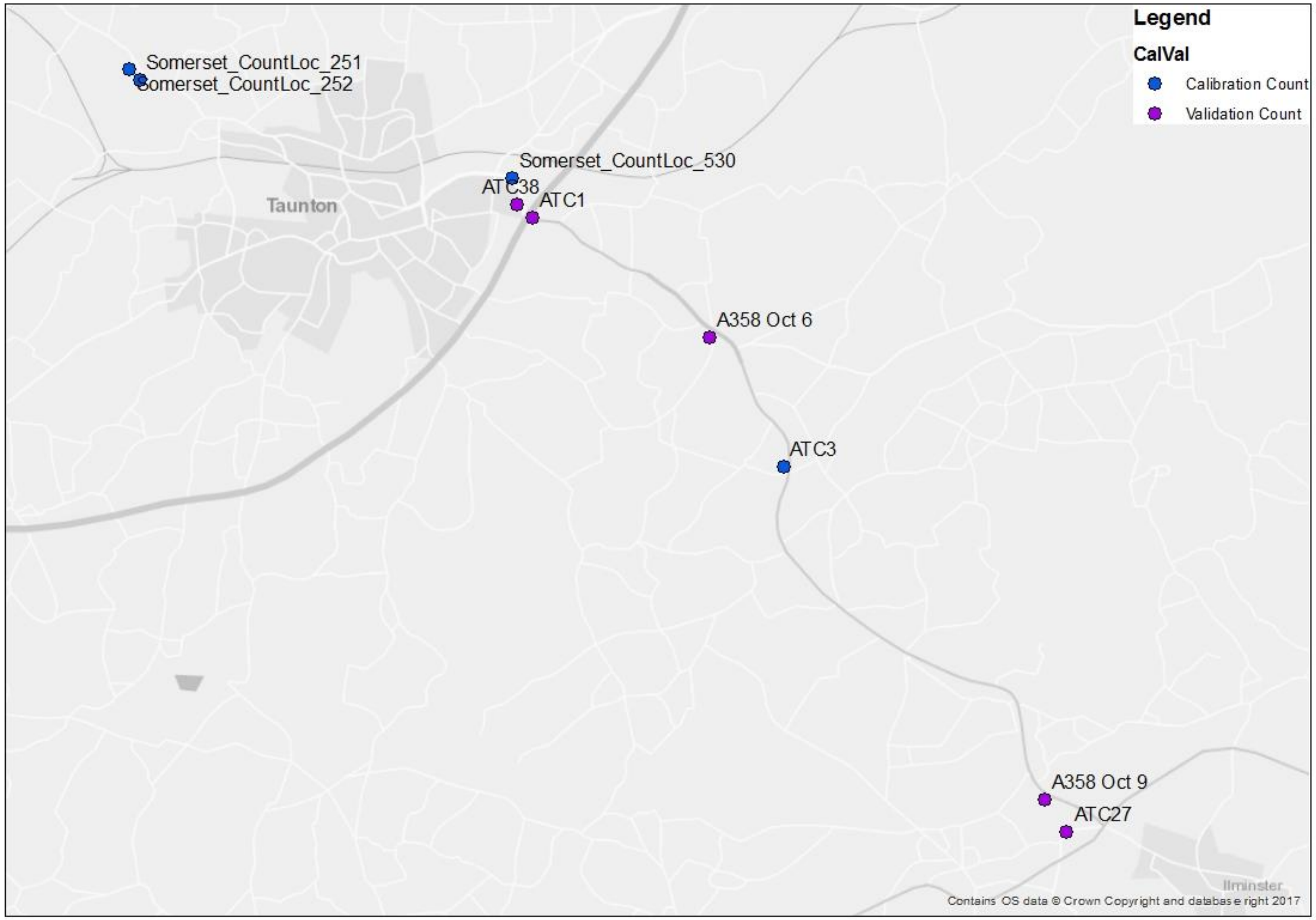


Table 19.40: A358 Primary Link Flow Results - AM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_530	WB	Calibration	1607	1488	-7.42%	3.03	PASS	1227	1154	-5.99%	2.13	PASS
Somerset_CountLoc_252	EB	Calibration	550	554	0.76%	0.18	PASS	461	464	0.72%	0.15	PASS
Somerset_CountLoc_530	EB	Calibration	1656	1601	-3.35%	1.38	PASS	1272	1217	-4.30%	1.55	PASS
Somerset_CountLoc_251	WB	Calibration	380	379	-0.26%	0.05	PASS	269	269	-0.02%	0.00	PASS
ATC3	NB	Calibration	845	847	0.20%	0.06	PASS	648	642	-0.88%	0.22	PASS
ATC3	SB	Calibration	898	798	-11.19%	3.45	PASS	682	544	-20.24%	5.58	FAIL
A358 OCT 9	EB	Validation	807	792	-1.83%	0.52	PASS	607	544	-10.42%	2.64	PASS
A358 OCT 6	NB	Validation	1094	1086	-0.73%	0.24	PASS	822	838	1.94%	0.55	PASS
ATC1	WB	Validation	995	911	-8.48%	2.73	PASS	749	697	-7.05%	1.97	PASS
A358 OCT 6	SB	Validation	1073	954	-11.06%	3.73	PASS	806	642	-20.36%	6.10	FAIL
ATC1	EB	Validation	1009	941	-6.72%	2.17	PASS	659	609	-7.62%	2.00	PASS
A358 OCT 9	WB	Validation	884	817	-7.55%	2.29	PASS	664	611	-8.03%	2.11	PASS
ATC27	EB	Validation	420	407	-3.16%	0.65	PASS	324	316	-2.59%	0.47	PASS
ATC38	SB	Validation	1492	1347	-9.76%	3.87	PASS	1157	1018	-11.97%	4.20	PASS
ATC38	NB	Validation	1584	1465	-7.49%	3.04	PASS	1252	1182	-5.63%	2.02	PASS
ATC27	WB	Validation	387	362	-6.43%	1.29	PASS	272	253	-7.03%	1.18	PASS

Table 19.41: A358 Primary Link Flow Results - IP

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_530	WB	Calibration	1563	1407	-9.97%	4.04	PASS	1278	1139	-10.88%	4.00	PASS
Somerset_CountLoc_252	EB	Calibration	504	506	0.38%	0.09	PASS	426	426	0.04%	0.01	PASS
Somerset_CountLoc_530	EB	Calibration	1484	1441	-2.87%	1.11	PASS	1178	1129	-4.17%	1.45	PASS
Somerset_CountLoc_251	WB	Calibration	486	485	-0.17%	0.04	PASS	422	422	-0.09%	0.02	PASS
ATC3	NB	Calibration	733	691	-5.66%	1.55	PASS	518	506	-2.32%	0.53	PASS
ATC3	SB	Calibration	697	683	-1.98%	0.53	PASS	488	489	0.07%	0.02	PASS
A358 OCT 9	EB	Validation	759	673	-11.41%	3.24	PASS	602	486	-19.23%	4.96	PASS
A358 OCT 6	NB	Validation	918	933	1.58%	0.48	PASS	728	707	-2.94%	0.80	PASS
ATC1	WB	Validation	866	801	-7.44%	2.23	PASS	654	600	-8.25%	2.16	PASS
A358 OCT 6	SB	Validation	922	927	0.55%	0.17	PASS	731	691	-5.59%	1.53	PASS
ATC1	EB	Validation	908	867	-4.51%	1.38	PASS	688	644	-6.36%	1.70	PASS
A358 OCT 9	WB	Validation	734	687	-6.45%	1.78	PASS	582	502	-13.82%	3.46	PASS
ATC27	EB	Validation	334	350	4.88%	0.88	PASS	250	257	2.88%	0.45	PASS
ATC38	SB	Validation	1274	1241	-2.61%	0.94	PASS	1046	996	-4.83%	1.58	PASS
ATC38	NB	Validation	1214	1117	-7.99%	2.84	PASS	1005	915	-9.01%	2.92	PASS
ATC27	WB	Validation	318	299	-5.87%	1.06	PASS	206	196	-4.89%	0.71	PASS

Table 19.42: A358 Primary Link Flow Results - PM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Somerset_CountLoc_530	WB	Calibration	1708	1596	-6.53%	2.74	PASS	1459	1354	-7.19%	2.80	PASS
Somerset_CountLoc_252	EB	Calibration	450	450	0.06%	0.01	PASS	381	381	0.02%	0.00	PASS
Somerset_CountLoc_530	EB	Calibration	1578	1531	-2.96%	1.19	PASS	1365	1320	-3.30%	1.23	PASS
Somerset_CountLoc_251	WB	Calibration	666	666	-0.06%	0.02	PASS	597	597	-0.03%	0.01	PASS
ATC3	NB	Calibration	870	852	-2.05%	0.61	PASS	675	657	-2.67%	0.70	PASS
ATC3	SB	Calibration	804	767	-4.60%	1.32	PASS	624	619	-0.90%	0.22	PASS
A358 OCT 9	EB	Validation	887	757	-14.72%	4.55	PASS	753	627	-16.70%	4.79	PASS
A358 OCT 6	NB	Validation	1050	1004	-4.43%	1.45	PASS	892	778	-12.79%	3.95	PASS
ATC1	WB	Validation	914	844	-7.66%	2.36	PASS	704	639	-9.18%	2.49	PASS
A358 OCT 6	SB	Validation	1067	991	-7.19%	2.39	PASS	906	827	-8.69%	2.68	PASS
ATC1	EB	Validation	938	915	-2.40%	0.74	PASS	798	776	-2.77%	0.79	PASS
A358 OCT 9	WB	Validation	801	830	3.55%	0.99	PASS	680	642	-5.64%	1.49	PASS
ATC27	EB	Validation	392	447	13.78%	2.64	PASS	321	346	8.00%	1.40	PASS
ATC38	SB	Validation	1407	1354	-3.73%	1.41	PASS	1233	1186	-3.75%	1.33	PASS
ATC38	NB	Validation	1552	1390	-10.45%	4.23	PASS	1331	1176	-11.66%	4.38	PASS
ATC27	WB	Validation	374	342	-8.58%	1.70	PASS	314	285	-9.28%	1.69	PASS

Figure 19.2: A303 Primary Link Count Locations

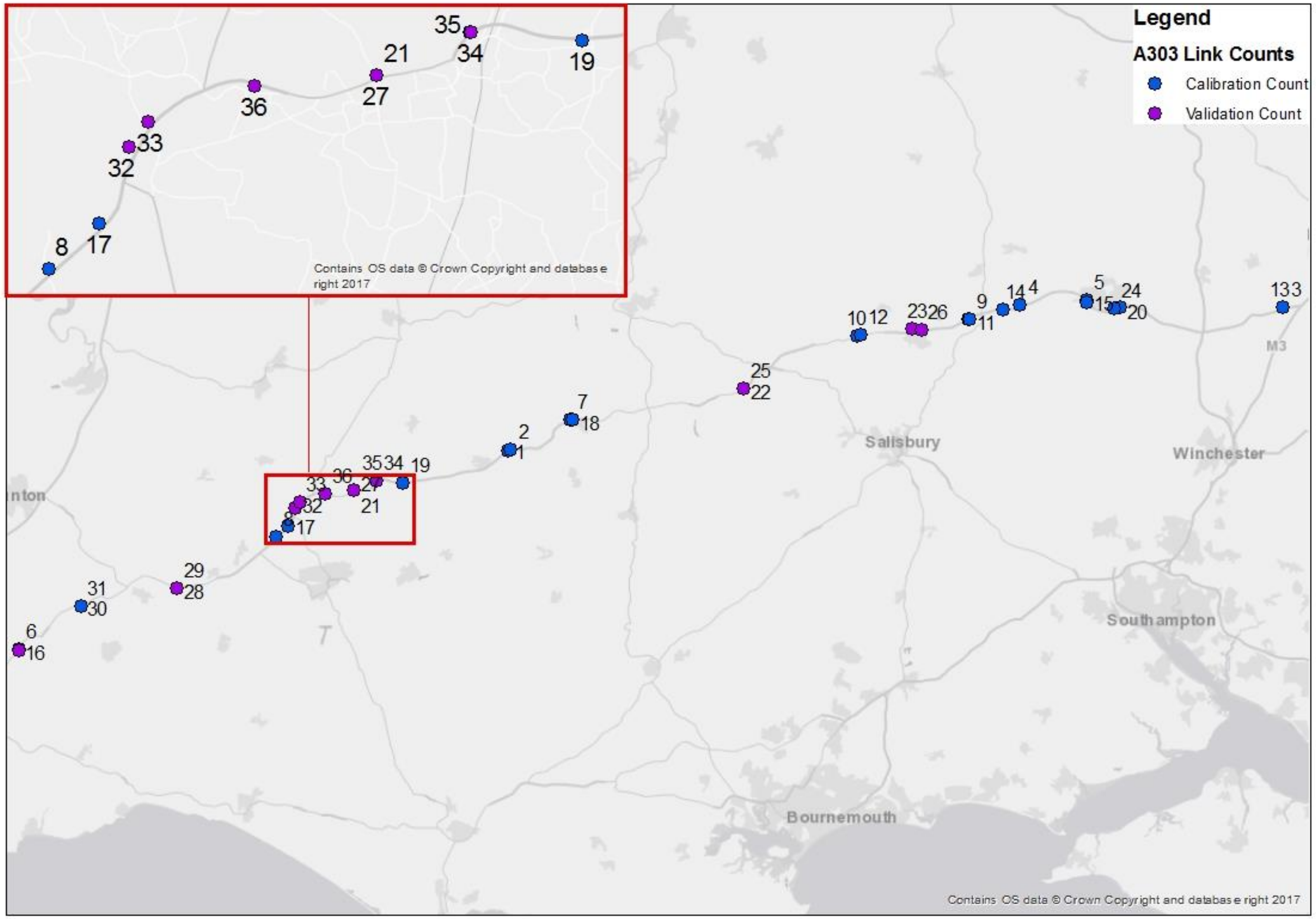


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Table 19.43: A303 Primary Link Flow Results - AM

Ref No	Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
				Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
1	TRADS 3_30015280	EB	Calibration	2041	2013	-1.36%	0.62	PASS	1544	1542	-0.13%	0.05	PASS
2	TRADS 3_5245	WB	Calibration	1574	1500	-4.71%	1.89	PASS	1164	1163	-0.12%	0.04	PASS
3	TRADS 2_3216	EB	Calibration	794	774	-2.51%	0.71	PASS	584	582	-0.36%	0.09	PASS
4	TRADS 2_3215	WB	Calibration	774	771	-0.40%	0.11	PASS	566	564	-0.44%	0.11	PASS
5	New_556	EB	Calibration	1606	1604	-0.10%	0.04	PASS	1231	1229	-0.16%	0.05	PASS
6	TRADS 3_30012830	EB	Calibration	1346	1344	-0.14%	0.05	PASS	1039	1037	-0.22%	0.07	PASS
7	TRADS 3_3046	EB	Calibration	1650	1648	-0.09%	0.04	PASS	1264	1262	-0.15%	0.05	PASS
8	TRADS 2_3206	EB	Calibration	623	631	1.23%	0.31	PASS	478	476	-0.49%	0.11	PASS
9	TRADS 2_30012618	EB	Calibration	920	834	-9.34%	2.90	PASS	680	615	-9.56%	2.56	PASS
10	TRADS 2_30012824	WB	Calibration	995	978	-1.75%	0.55	PASS	723	722	-0.18%	0.05	PASS
11	TRADS 2_3090	EB	Calibration	1094	1092	-0.14%	0.05	PASS	835	833	-0.22%	0.06	PASS
12	TRADS 2_30012825	EB	Calibration	1382	1272	-7.96%	3.02	PASS	976	974	-0.23%	0.07	PASS
13	TRADS 2_3091	WB	Calibration	775	773	-0.22%	0.06	PASS	564	562	-0.27%	0.06	PASS
14	TRADS 3_30012826	WB	Calibration	1216	1215	-0.11%	0.04	PASS	921	920	-0.13%	0.04	PASS
15	TRADS 3_30012831	WB	Calibration	954	952	-0.17%	0.05	PASS	703	702	-0.19%	0.05	PASS
16	TRADS 3_3047	WB	Calibration	1477	1450	-1.84%	0.71	PASS	1131	1104	-2.39%	0.81	PASS
17	TRADS 2_30012619	WB	Calibration	786	649	-17.44%	5.12	FAIL	569	445	-21.72%	5.49	FAIL
18	TRADS 2_3207	WB	Calibration	491	491	-0.06%	0.01	PASS	349	347	-0.57%	0.11	PASS
19	RSI ATC 4	EB	Calibration	696	694	-0.31%	0.08	PASS	507	505	-0.48%	0.11	PASS
19	RSI ATC 4	WB	Calibration	584	628	7.49%	1.78	PASS	427	459	7.50%	1.52	PASS
20	TRADS 2_30012612	EB	Calibration	440	439	-0.26%	0.05	PASS	329	328	-0.16%	0.03	PASS

Ref No	Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
				Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
21	TRADS 2_30012613	WB	Calibration	418	443	5.88%	1.19	PASS	314	313	-0.26%	0.05	PASS
22	TRADS 2_30012622	EB	Validation	762	762	-0.02%	0.00	PASS	562	566	0.73%	0.17	PASS
23	TRADS 2_30012628	EB	Validation	692	612	-11.49%	3.11	PASS	529	439	-17.07%	4.10	PASS
24	TRADS 2_30012823	EB	Validation	1251	1195	-4.44%	1.59	PASS	951	935	-1.72%	0.53	PASS
25	TRADS 2_30012623	WB	Validation	731	664	-9.10%	2.52	PASS	538	486	-9.69%	2.30	PASS
26	TRADS 2_30012629	WB	Validation	513	478	-6.79%	1.56	PASS	367	322	-12.38%	2.45	PASS
27	TRADS 2_30012822	WB	Validation	752	736	-2.12%	0.58	PASS	534	538	0.68%	0.16	PASS
28	TRADS 2_30012614	EB	Validation	903	833	-7.74%	2.37	PASS	649	607	-6.50%	1.68	PASS
29	TRADS 2_30012615	WB	Validation	988	814	-17.56%	5.78	FAIL	712	570	-19.91%	5.60	FAIL
30	TRADS 2_5019	EB	Validation	449	533	18.69%	3.79	PASS	339	427	25.93%	4.49	PASS
31	TRADS 2_5018	WB	Validation	435	538	23.66%	4.67	PASS	323	387	19.87%	3.41	PASS
32	TRADS 2_5247	WB	Validation	654	655	0.03%	0.01	PASS	533	482	-9.50%	2.25	PASS
33	TRADS 2_30012620	EB	Validation	873	912	4.47%	1.31	PASS	697	695	-0.33%	0.09	PASS
34	TRADS 2_5246	EB	Validation	756	892	18.05%	4.75	PASS	627	672	7.16%	1.76	PASS
35	TRADS 2_30012621	WB	Validation	842	785	-6.78%	2.00	PASS	647	555	-14.14%	3.73	PASS
36	ATC S1	EB	Validation	701	700	-0.13%	0.03	PASS	602	515	-14.56%	3.71	PASS
37	ATC S1	WB	Validation	562	564	0.28%	0.07	PASS	463	401	-13.37%	2.98	PASS

Table 19.44: A303 Primary Link Flow Results - IP

Ref No	Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
				Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
1	TRADS 3_30015280	EB	Calibration	1490	1476	-0.96%	0.37	PASS	1126	1112	-1.21%	0.41	PASS
2	TRADS 3_5245	WB	Calibration	1508	1445	-4.16%	1.63	PASS	1118	1115	-0.27%	0.09	PASS
3	TRADS 2_3216	EB	Calibration	817	800	-2.05%	0.59	PASS	611	595	-2.64%	0.66	PASS
4	TRADS 2_3215	WB	Calibration	830	826	-0.43%	0.12	PASS	619	614	-0.83%	0.21	PASS
5	New_556	EB	Calibration	960	947	-1.36%	0.42	PASS	729	717	-1.70%	0.46	PASS
6	TRADS 3_30012830	EB	Calibration	1006	992	-1.34%	0.43	PASS	767	754	-1.69%	0.47	PASS
7	TRADS 3_3046	EB	Calibration	1512	1500	-0.81%	0.32	PASS	1148	1136	-1.04%	0.35	PASS
8	TRADS 2_3206	EB	Calibration	663	649	-2.06%	0.53	PASS	504	488	-3.23%	0.73	PASS
9	TRADS 2_30012618	EB	Calibration	849	719	-15.30%	4.64	PASS	631	533	-15.49%	4.05	PASS
10	TRADS 2_30012824	WB	Calibration	1098	1085	-1.16%	0.39	PASS	824	821	-0.40%	0.12	PASS
11	TRADS 2_3090	EB	Calibration	830	817	-1.58%	0.46	PASS	627	614	-2.00%	0.50	PASS
12	TRADS 2_30012825	EB	Calibration	1014	939	-7.44%	2.42	PASS	714	709	-0.67%	0.18	PASS
13	TRADS 2_3091	WB	Calibration	865	866	0.17%	0.05	PASS	651	650	-0.17%	0.04	PASS
14	TRADS 3_30012826	WB	Calibration	1174	1173	-0.08%	0.03	PASS	890	888	-0.28%	0.08	PASS
15	TRADS 3_30012831	WB	Calibration	1051	1049	-0.15%	0.05	PASS	796	793	-0.42%	0.12	PASS
16	TRADS 3_3047	WB	Calibration	1553	1433	-7.74%	3.11	PASS	1179	1057	-10.31%	3.64	PASS
17	TRADS 2_30012619	WB	Calibration	851	741	-12.92%	3.90	PASS	641	560	-12.65%	3.31	PASS
18	TRADS 2_3207	WB	Calibration	673	669	-0.66%	0.17	PASS	502	497	-0.97%	0.22	PASS
19	RSI ATC 4	EB	Calibration	726	695	-4.32%	1.18	PASS	545	523	-3.99%	0.94	PASS
19	RSI ATC 4	WB	Calibration	669	667	-0.25%	0.06	PASS	504	497	-1.44%	0.32	PASS
20	TRADS 2_30012612	EB	Calibration	469	462	-1.49%	0.32	PASS	362	349	-3.72%	0.72	PASS

Ref No	Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
				Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
21	TRADS 2_30012613	WB	Calibration	455	453	-0.34%	0.07	PASS	344	342	-0.50%	0.09	PASS
22	TRADS 2_30012622	EB	Validation	734	688	-6.21%	1.71	PASS	565	522	-7.71%	1.87	PASS
23	TRADS 2_30012628	EB	Validation	649	588	-9.40%	2.45	PASS	494	433	-12.27%	2.81	PASS
24	TRADS 2_30012823	EB	Validation	920	867	-5.73%	1.76	PASS	689	665	-3.56%	0.94	PASS
25	TRADS 2_30012623	WB	Validation	764	706	-7.56%	2.13	PASS	591	538	-8.99%	2.24	PASS
26	TRADS 2_30012629	WB	Validation	698	634	-9.20%	2.49	PASS	525	459	-12.61%	2.98	PASS
27	TRADS 2_30012822	WB	Validation	953	913	-4.20%	1.31	PASS	713	696	-2.36%	0.63	PASS
28	TRADS 2_30012614	EB	Validation	919	873	-4.97%	1.52	PASS	684	653	-4.58%	1.21	PASS
29	TRADS 2_30012615	WB	Validation	894	841	-5.94%	1.80	PASS	653	611	-6.41%	1.66	PASS
30	TRADS 2_5019	EB	Validation	481	566	17.59%	3.70	PASS	366	447	22.18%	4.03	PASS
31	TRADS 2_5018	WB	Validation	478	539	12.79%	2.71	PASS	368	421	14.42%	2.67	PASS
32	TRADS 2_5247	WB	Validation	735	688	-6.48%	1.79	PASS	606	515	-15.04%	3.85	PASS
33	TRADS 2_30012620	EB	Validation	920	872	-5.20%	1.60	PASS	726	652	-10.22%	2.83	PASS
34	TRADS 2_5246	EB	Validation	782	831	6.35%	1.75	PASS	643	641	-0.29%	0.07	PASS
35	TRADS 2_30012621	WB	Validation	914	869	-5.02%	1.54	PASS	720	657	-8.76%	2.40	PASS
36	ATC S1	EB	Validation	685	650	-5.13%	1.36	PASS	583	490	-15.94%	4.01	PASS
37	ATC S1	WB	Validation	685	658	-3.97%	1.05	PASS	581	499	-14.11%	3.53	PASS

Table 19.45: A303 Primary Link Flow Results - PM

Ref No	Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
				Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
1	TRADS 3_30015280	EB	Calibration	1665	1645	-1.22%	0.50	PASS	1378	1375	-0.22%	0.08	PASS
2	TRADS 3_5245	WB	Calibration	2008	1975	-1.65%	0.74	PASS	1662	1663	0.03%	0.01	PASS
3	TRADS 2_3216	EB	Calibration	833	828	-0.63%	0.18	PASS	682	677	-0.69%	0.18	PASS
4	TRADS 2_3215	WB	Calibration	945	944	-0.09%	0.03	PASS	773	772	-0.09%	0.03	PASS
5	New_556	EB	Calibration	1254	1251	-0.23%	0.08	PASS	1047	1044	-0.28%	0.09	PASS
6	TRADS 3_30012830	EB	Calibration	1039	1036	-0.27%	0.09	PASS	859	856	-0.36%	0.11	PASS
7	TRADS 3_3046	EB	Calibration	1610	1607	-0.18%	0.07	PASS	1344	1341	-0.22%	0.08	PASS
8	TRADS 2_3206	EB	Calibration	608	620	1.99%	0.49	PASS	508	506	-0.42%	0.09	PASS
9	TRADS 2_30012618	EB	Calibration	876	856	-2.31%	0.69	PASS	716	697	-2.67%	0.72	PASS
10	TRADS 2_30012824	WB	Calibration	1437	1435	-0.17%	0.06	PASS	1199	1201	0.15%	0.05	PASS
11	TRADS 2_3090	EB	Calibration	816	812	-0.51%	0.15	PASS	669	665	-0.60%	0.16	PASS
12	TRADS 2_30012825	EB	Calibration	1056	1029	-2.60%	0.85	PASS	852	849	-0.40%	0.12	PASS
13	TRADS 2_3091	WB	Calibration	1012	1018	0.60%	0.19	PASS	839	841	0.26%	0.07	PASS
14	TRADS 3_30012826	WB	Calibration	1642	1643	0.09%	0.03	PASS	1378	1379	0.10%	0.04	PASS
15	TRADS 3_30012831	WB	Calibration	1410	1412	0.17%	0.06	PASS	1181	1183	0.16%	0.06	PASS
16	TRADS 3_3047	WB	Calibration	1773	1774	0.08%	0.04	PASS	1480	1481	0.10%	0.04	PASS
17	TRADS 2_30012619	WB	Calibration	1002	952	-4.98%	1.60	PASS	825	784	-5.00%	1.45	PASS
18	TRADS 2_3207	WB	Calibration	766	765	-0.14%	0.04	PASS	625	625	-0.08%	0.02	PASS
19	RSI ATC 4	EB	Calibration	958	823	-14.15%	4.54	PASS	755	656	-13.17%	3.74	PASS
19	RSI ATC 4	WB	Calibration	1029	959	-6.74%	2.20	PASS	782	742	-5.03%	1.42	PASS
20	TRADS 2_30012612	EB	Calibration	514	518	0.72%	0.16	PASS	426	425	-0.29%	0.06	PASS

Ref No	Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
				Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
21	TRADS 2_30012613	WB	Calibration	473	478	1.11%	0.24	PASS	388	392	1.09%	0.21	PASS
22	TRADS 2_30012622	EB	Validation	767	757	-1.29%	0.36	PASS	624	619	-0.92%	0.23	PASS
23	TRADS 2_30012628	EB	Validation	593	557	-6.15%	1.52	PASS	486	440	-9.41%	2.12	PASS
24	TRADS 2_30012823	EB	Validation	891	894	0.29%	0.09	PASS	727	740	1.77%	0.48	PASS
25	TRADS 2_30012623	WB	Validation	896	874	-2.50%	0.75	PASS	727	706	-2.90%	0.79	PASS
26	TRADS 2_30012629	WB	Validation	812	720	-11.29%	3.31	PASS	665	570	-14.27%	3.82	PASS
27	TRADS 2_30012822	WB	Validation	1107	1103	-0.34%	0.11	PASS	917	939	2.38%	0.72	PASS
28	TRADS 2_30012614	EB	Validation	1013	938	-7.37%	2.39	PASS	814	766	-5.97%	1.73	PASS
29	TRADS 2_30012615	WB	Validation	943	913	-3.17%	0.98	PASS	773	744	-3.77%	1.06	PASS
30	TRADS 2_5019	EB	Validation	475	614	29.31%	5.97	FAIL	391	519	32.76%	6.01	FAIL
31	TRADS 2_5018	WB	Validation	542	594	9.50%	2.16	PASS	449	508	13.08%	2.69	PASS
32	TRADS 2_5247	WB	Validation	929	938	0.96%	0.29	PASS	801	740	-7.64%	2.21	PASS
33	TRADS 2_30012620	EB	Validation	1113	1055	-5.15%	1.74	PASS	946	862	-8.85%	2.78	PASS
34	TRADS 2_5246	EB	Validation	915	970	6.03%	1.80	PASS	796	802	0.75%	0.21	PASS
35	TRADS 2_30012621	WB	Validation	1136	1023	-9.97%	3.45	PASS	962	848	-11.80%	3.77	PASS
36	ATC S1	EB	Validation	730	698	-4.39%	1.20	PASS	654	566	-13.57%	3.59	PASS
37	ATC S1	WB	Validation	837	801	-4.34%	1.27	PASS	744	642	-13.74%	3.88	PASS

Figure 19.3: M4 Primary Link Count Locations

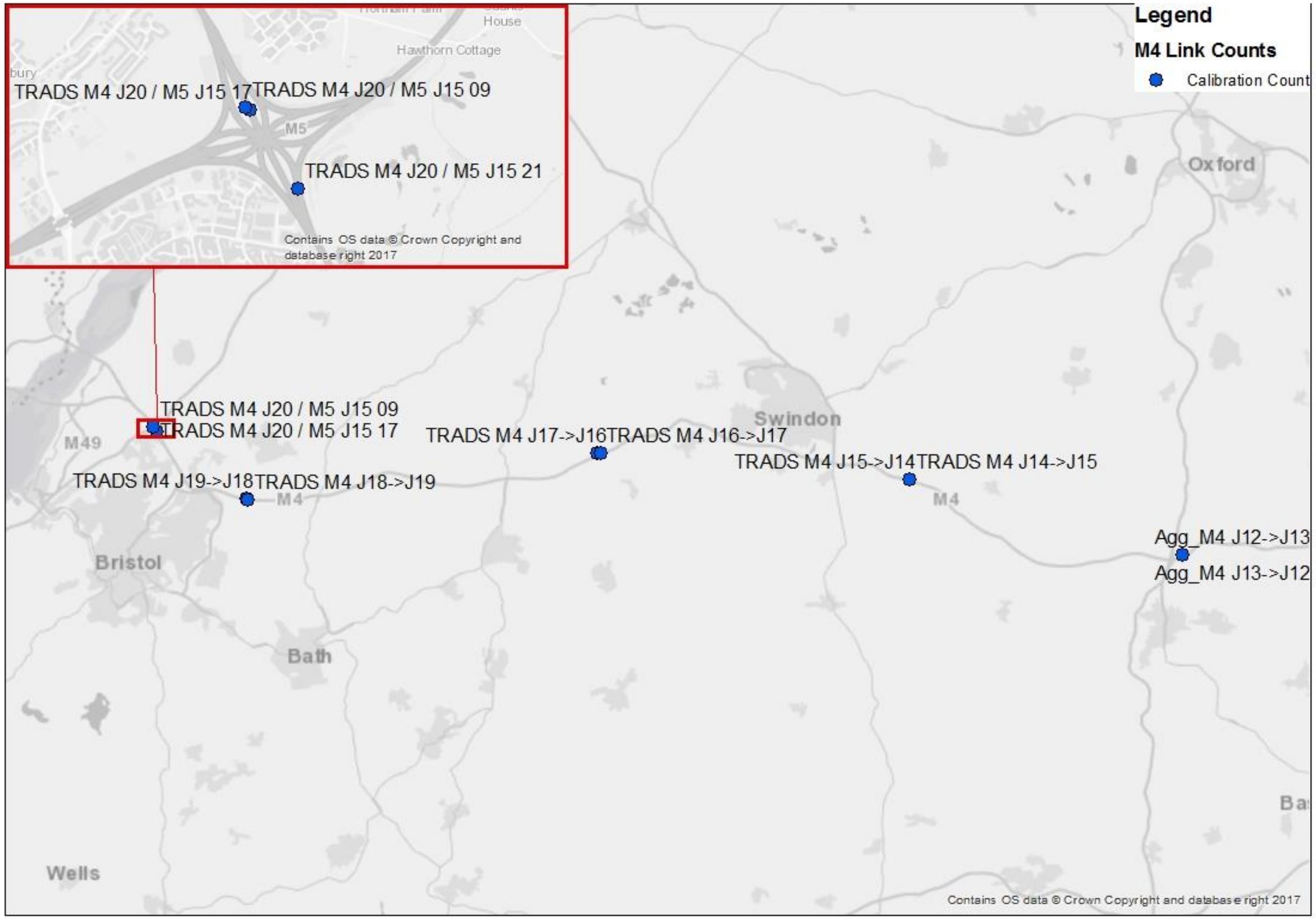

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Table 19.46: M4 Primary Link Flow Results - AM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS M4 J20 / M5 J15 21	EB	Calibration	2752	2754	0.08%	0.04	PASS	2096	2098	0.11%	0.05	PASS
TRADS M4 J20 / M5 J15 17	EB	Calibration	1734	1734	-0.01%	0.00	PASS	1321	1321	-0.01%	0.00	PASS
TRADS M4 J20 / M5 J15 09	WB	Calibration	1139	1119	-1.75%	0.59	PASS	867	847	-2.32%	0.69	PASS
Agg_M4 J13->J12	EB	Calibration	3425	3425	0.01%	0.01	PASS	2609	2610	0.04%	0.02	PASS
TRADS M4 J17->J16	EB	Calibration	3463	3464	0.04%	0.02	PASS	2576	2578	0.08%	0.04	PASS
TRADS M4 J15->J14	EB	Calibration	3497	3497	0.01%	0.01	PASS	2535	2536	0.02%	0.01	PASS
TRADS M4 J19->J18	EB	Calibration	3423	3417	-0.18%	0.10	PASS	2476	2479	0.11%	0.06	PASS
Agg_M4 J12->J13	WB	Calibration	3067	3068	0.02%	0.01	PASS	2335	2336	0.04%	0.02	PASS
TRADS M4 J16->J17	WB	Calibration	2413	2414	0.06%	0.03	PASS	1728	1729	0.09%	0.04	PASS
TRADS M4 J14->J15	WB	Calibration	2586	2587	0.04%	0.02	PASS	1877	1878	0.06%	0.02	PASS
TRADS M4 J18->J19	WB	Calibration	3472	3472	-0.01%	0.00	PASS	2582	2582	-0.01%	0.01	PASS

Table 19.47: M4 Primary Link Flow Results - IP

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS M4 J20 / M5 J15 21	EB	Calibration	2382	2396	0.58%	0.28	PASS	1769	1782	0.73%	0.31	PASS
TRADS M4 J20 / M5 J15 17	EB	Calibration	1284	1284	-0.01%	0.00	PASS	953	953	0.01%	0.00	PASS
TRADS M4 J20 / M5 J15 09	WB	Calibration	1327	1355	2.10%	0.76	PASS	985	1013	2.83%	0.88	PASS
Agg_M4 J13->J12	EB	Calibration	2528	2540	0.49%	0.25	PASS	1877	1890	0.67%	0.29	PASS
TRADS M4 J17->J16	EB	Calibration	2486	2500	0.56%	0.28	PASS	1820	1834	0.77%	0.33	PASS
TRADS M4 J15->J14	EB	Calibration	2653	2667	0.53%	0.27	PASS	1897	1911	0.72%	0.31	PASS
TRADS M4 J19->J18	EB	Calibration	2812	2827	0.52%	0.27	PASS	2057	2071	0.68%	0.31	PASS
Agg_M4 J12->J13	WB	Calibration	2689	2712	0.86%	0.45	PASS	1997	2000	0.13%	0.06	PASS
TRADS M4 J16->J17	WB	Calibration	2606	2609	0.13%	0.07	PASS	1871	1874	0.17%	0.07	PASS
TRADS M4 J14->J15	WB	Calibration	2816	2819	0.11%	0.06	PASS	2033	2036	0.14%	0.06	PASS
TRADS M4 J18->J19	WB	Calibration	2835	2838	0.11%	0.06	PASS	2047	2050	0.15%	0.07	PASS

Table 19.48: M4 Primary Link Flow Results - PM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS M4 J20 / M5 J15 21	EB	Calibration	3241	3243	0.05%	0.03	PASS	2677	2679	0.07%	0.04	PASS
TRADS M4 J20 / M5 J15 17	EB	Calibration	1345	1345	-0.01%	0.00	PASS	1111	1111	0.00%	0.00	PASS
TRADS M4 J20 / M5 J15 09	WB	Calibration	1789	1723	-3.69%	1.58	PASS	1477	1477	0.00%	0.00	PASS
Agg_M4 J13->J12	EB	Calibration	3235	3238	0.10%	0.05	PASS	2671	2674	0.11%	0.06	PASS
TRADS M4 J17->J16	EB	Calibration	2710	2713	0.12%	0.06	PASS	2173	2176	0.14%	0.07	PASS
TRADS M4 J15->J14	EB	Calibration	2901	2904	0.11%	0.06	PASS	2290	2293	0.13%	0.06	PASS
TRADS M4 J19->J18	EB	Calibration	3538	3541	0.09%	0.06	PASS	2878	2881	0.11%	0.06	PASS
Agg_M4 J12->J13	WB	Calibration	3754	3776	0.60%	0.37	PASS	3100	3100	0.01%	0.00	PASS
TRADS M4 J16->J17	WB	Calibration	3278	3278	-0.01%	0.00	PASS	2637	2637	0.00%	0.00	PASS
TRADS M4 J14->J15	WB	Calibration	3722	3713	-0.25%	0.15	PASS	3007	3007	0.00%	0.00	PASS
TRADS M4 J18->J19	WB	Calibration	3574	3574	-0.01%	0.01	PASS	2875	2875	-0.01%	0.00	PASS

Figure 19.4: M5 Primary Link Count Locations

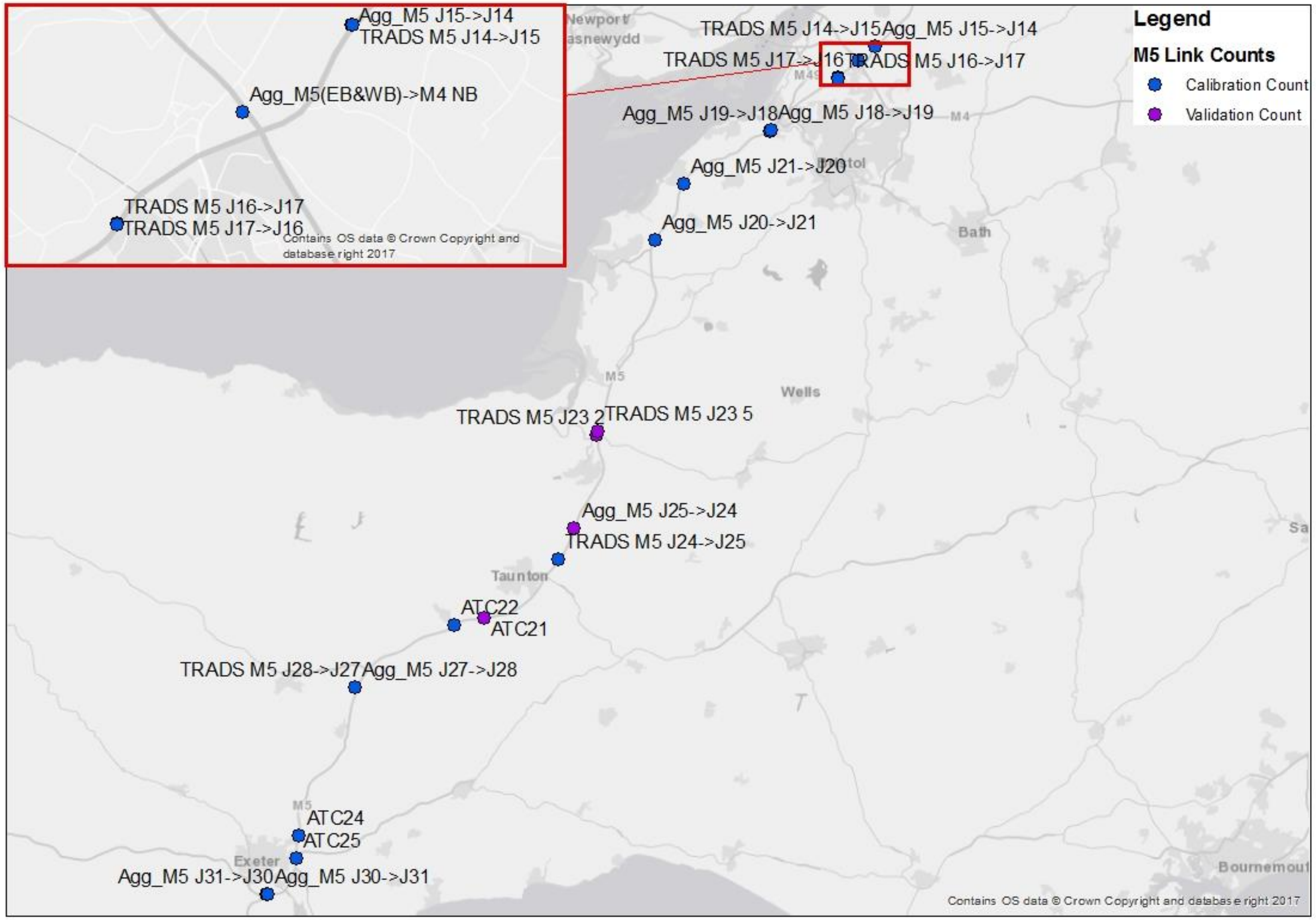

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Table 19.49: M5 Primary Link Flow Results - AM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Agg_M5 J19->J18	NB	Calibration	4943	4946	0.06%	0.04	PASS	3764	3767	0.07%	0.04	PASS
Agg_M5(EB&WB)->M4 NB	NB	Calibration	552	540	-2.10%	0.50	PASS	420	419	-0.19%	0.04	PASS
TRADS M5 J18->J19	SB	Calibration	3457	3394	-1.82%	1.07	PASS	2461	2462	0.02%	0.01	PASS
TRADS M5 J28->J27	NB	Calibration	2093	2095	0.09%	0.04	PASS	1488	1624	9.16%	3.46	PASS
Agg_M5 J27->J28	SB	Calibration	2240	1934	-13.66%	6.70	PASS	1706	1384	-18.87%	8.19	FAIL
Agg_M5 J31->J30	EB	Calibration	3806	3728	-2.05%	1.27	PASS	2898	2898	0.01%	0.01	PASS
Agg_M5 J21->J20	NB	Calibration	3870	3872	0.06%	0.03	PASS	2947	2949	0.08%	0.04	PASS
TRADS M5 J17->J16	NB	Calibration	3848	3851	0.08%	0.05	PASS	2931	2934	0.09%	0.05	PASS
Agg_M5 J15->J14	NB	Calibration	2932	2932	0.00%	0.00	PASS	2233	2233	0.00%	0.00	PASS
Agg_M5 J20->J21	SB	Calibration	2990	2991	0.02%	0.01	PASS	2277	2278	0.03%	0.01	PASS
TRADS M5 J16->J17	SB	Calibration	3845	3845	0.01%	0.01	PASS	2928	2928	0.01%	0.01	PASS
TRADS M5 J14->J15	SB	Calibration	3202	3202	-0.01%	0.00	PASS	2438	2438	0.01%	0.00	PASS
Agg_M5 J30->J31	WB	Calibration	2500	2549	1.96%	0.98	PASS	1904	1908	0.19%	0.08	PASS
ATC22	NB	Calibration	2132	2146	0.67%	0.31	PASS	1693	1693	-0.05%	0.02	PASS
ATC22	SB	Calibration	1917	1920	0.12%	0.05	PASS	1323	1331	0.58%	0.21	PASS
ATC24	NB	Calibration	1960	1985	1.32%	0.58	PASS	1556	1558	0.09%	0.03	PASS
ATC24	SB	Calibration	2195	2100	-4.35%	2.06	PASS	1515	1516	0.09%	0.03	PASS
ATC25	NB	Calibration	2788	2743	-1.62%	0.86	PASS	2214	2155	-2.67%	1.26	PASS
ATC25	SB	Calibration	2429	2477	1.96%	0.96	PASS	1676	1679	0.15%	0.06	PASS
TRADS M5 J23 2	NB	Validation	1845	2042	10.68%	4.47	PASS	1345	1527	13.54%	4.80	PASS
TRADS M5 J23 5	SB	Validation	2090	2157	3.21%	1.46	PASS	1592	1562	-1.86%	0.75	PASS
Agg_M5 J25->J24	NB	Validation	2274	2383	4.78%	2.25	PASS	1732	1845	6.52%	2.67	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS M5 J24->J25	SB	Validation	2650	2475	-6.60%	3.46	PASS	2018	1793	-11.17%	5.17	PASS
ATC21	NB	Validation	2158	2122	-1.64%	0.76	PASS	1714	1651	-3.65%	1.52	PASS
ATC21	SB	Validation	1935	1792	-7.37%	3.30	PASS	1335	1255	-6.03%	2.24	PASS

Table 19.50: M5 Primary Link Flow Results - IP

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Agg_M5 J19->J18	NB	Calibration	3643	3659	0.43%	0.26	PASS	2706	2721	0.54%	0.28	PASS
Agg_M5(EB&WB)->M4 NB	NB	Calibration	566	544	-3.85%	0.92	PASS	420	420	0.00%	0.00	PASS
TRADS M5 J18->J19	SB	Calibration	3434	3438	0.10%	0.06	PASS	2570	2573	0.11%	0.06	PASS
TRADS M5 J28->J27	NB	Calibration	2092	2014	-3.72%	1.72	PASS	1504	1550	3.05%	1.18	PASS
Agg_M5 J27->J28	SB	Calibration	1870	1754	-6.23%	2.74	PASS	1389	1409	1.41%	0.52	PASS
Agg_M5 J31->J30	EB	Calibration	2530	2537	0.27%	0.14	PASS	1879	1892	0.71%	0.31	PASS
Agg_M5 J21->J20	NB	Calibration	3074	3090	0.51%	0.28	PASS	2283	2298	0.64%	0.31	PASS
TRADS M5 J17->J16	NB	Calibration	3531	3443	-2.50%	1.49	PASS	2623	2534	-3.40%	1.76	PASS
Agg_M5 J15->J14	NB	Calibration	2745	2746	0.04%	0.02	PASS	2040	2041	0.03%	0.01	PASS
Agg_M5 J20->J21	SB	Calibration	2991	2995	0.13%	0.07	PASS	2222	2225	0.15%	0.07	PASS
TRADS M5 J16->J17	SB	Calibration	3489	3493	0.11%	0.07	PASS	2592	2595	0.13%	0.07	PASS
TRADS M5 J14->J15	SB	Calibration	2412	2412	-0.01%	0.01	PASS	1791	1791	-0.02%	0.01	PASS
Agg_M5 J30->J31	WB	Calibration	2465	2398	-2.70%	1.35	PASS	1831	1837	0.34%	0.14	PASS
ATC22	NB	Calibration	2063	2085	1.07%	0.48	PASS	1654	1660	0.32%	0.13	PASS
ATC22	SB	Calibration	1902	1933	1.58%	0.69	PASS	1592	1593	0.04%	0.02	PASS
ATC24	NB	Calibration	2077	1973	-5.03%	2.32	PASS	1666	1559	-6.40%	2.65	PASS
ATC24	SB	Calibration	1807	1807	-0.02%	0.01	PASS	1512	1512	0.01%	0.00	PASS
ATC25	NB	Calibration	2299	2325	1.16%	0.55	PASS	1843	1827	-0.90%	0.39	PASS
ATC25	SB	Calibration	2278	2297	0.85%	0.41	PASS	1906	1900	-0.33%	0.15	PASS
TRADS M5 J23 2	NB	Validation	2121	2128	0.31%	0.14	PASS	1541	1618	4.98%	1.93	PASS
TRADS M5 J23 5	SB	Validation	1850	1857	0.36%	0.16	PASS	1374	1436	4.50%	1.65	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Agg_M5 J25->J24	NB	Validation	2493	2403	-3.59%	1.81	PASS	1852	1858	0.30%	0.13	PASS
TRADS M5 J24->J25	SB	Validation	2152	2135	-0.81%	0.38	PASS	1599	1705	6.62%	2.61	PASS
ATC21	NB	Validation	2245	2032	-9.53%	4.63	PASS	1801	1589	-11.73%	5.13	PASS
ATC21	SB	Validation	1971	1860	-5.62%	2.53	PASS	1649	1508	-8.57%	3.56	PASS

Table 19.51: M5 Primary Link Flow Results - PM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Agg_M5 J19->J18	NB	Calibration	3951	3955	0.09%	0.06	PASS	3262	3266	0.12%	0.07	PASS
Agg_M5(EB&WB)->M4 NB	NB	Calibration	985	954	-3.16%	1.00	PASS	813	813	0.00%	0.00	PASS
TRADS M5 J18->J19	SB	Calibration	4050	4410	8.90%	5.54	PASS	3265	3625	11.03%	6.14	PASS
TRADS M5 J28->J27	NB	Calibration	2316	2283	-1.44%	0.69	PASS	1842	1828	-0.74%	0.32	PASS
Agg_M5 J27->J28	SB	Calibration	2202	1972	-10.43%	5.03	PASS	1818	1586	-12.77%	5.63	PASS
Agg_M5 J31->J30	EB	Calibration	2566	2587	0.80%	0.41	PASS	2119	2118	-0.03%	0.01	PASS
Agg_M5 J21->J20	NB	Calibration	3179	3183	0.12%	0.07	PASS	2625	2629	0.14%	0.07	PASS
TRADS M5 J17->J16	NB	Calibration	4302	4305	0.08%	0.05	PASS	3552	3555	0.09%	0.05	PASS
Agg_M5 J15->J14	NB	Calibration	3201	3201	-0.01%	0.01	PASS	2642	2642	0.00%	0.00	PASS
Agg_M5 J20->J21	SB	Calibration	4122	4124	0.05%	0.03	PASS	3404	3405	0.04%	0.02	PASS
TRADS M5 J16->J17	SB	Calibration	4145	4146	0.03%	0.02	PASS	3423	3424	0.03%	0.02	PASS
TRADS M5 J14->J15	SB	Calibration	2959	2959	0.00%	0.00	PASS	2444	2444	0.01%	0.00	PASS
Agg_M5 J30->J31	WB	Calibration	3915	3874	-1.06%	0.66	PASS	3233	3235	0.08%	0.04	PASS
ATC22	NB	Calibration	1992	1993	0.06%	0.03	PASS	1607	1609	0.11%	0.05	PASS
ATC22	SB	Calibration	2289	2294	0.23%	0.11	PASS	1865	1870	0.29%	0.13	PASS
ATC24	NB	Calibration	2374	2372	-0.07%	0.03	PASS	1914	1913	-0.09%	0.04	PASS
ATC24	SB	Calibration	1947	1988	2.13%	0.93	PASS	1586	1587	0.06%	0.02	PASS
ATC25	NB	Calibration	2277	2421	6.32%	2.97	PASS	1837	1932	5.17%	2.19	PASS
ATC25	SB	Calibration	3035	3030	-0.15%	0.08	PASS	2473	2475	0.09%	0.04	PASS
TRADS M5 J23 2	NB	Validation	2151	2165	0.65%	0.30	PASS	1716	1751	2.03%	0.84	PASS
TRADS M5 J23 5	SB	Validation	2119	2244	5.91%	2.68	PASS	1750	1816	3.74%	1.55	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
Agg_M5 J25->J24	NB	Validation	2628	2458	-6.47%	3.37	PASS	2171	2003	-7.73%	3.67	PASS
TRADS M5 J24->J25	SB	Validation	2588	2605	0.67%	0.34	PASS	2136	2163	1.25%	0.57	PASS
ATC21	NB	Validation	2199	1991	-9.45%	4.54	PASS	1773	1607	-9.38%	4.05	PASS
ATC21	SB	Validation	2272	2242	-1.33%	0.64	PASS	1852	1845	-0.35%	0.15	PASS

Figure 19.5: Primary Link Count Locations Along Key Section of A30

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Table 19.52: Calibration Results for Primary Link Counts Along Key Section of A30 - AM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC10	WB	Calibration	525	561	6.8%	1.5	PASS	375	405	7.8%	1.5	PASS
TRADS 32_30012541	EB	Calibration	1,008	1,008	0.0%	0.0	PASS	760	759	-0.2%	0.0	PASS
ATC10	EB	Calibration	532	551	3.6%	0.8	PASS	468	444	-5.0%	1.1	PASS
TRADS 32_30012540	WB	Calibration	1,240	1,242	0.1%	0.0	PASS	954	952	-0.2%	0.1	PASS
TRADS 32_30012535	EB	Calibration	947	752	-20.6%	6.7	FAIL	709	552	-22.2%	6.3	FAIL
TRADS 32_30012534	WB	Calibration	1,443	1,405	-2.7%	1.0	PASS	1,121	1,073	-4.3%	1.5	PASS
ATC13	EB	Calibration	947	1,043	10.2%	3.1	PASS	659	753	14.4%	3.6	PASS
ATC13	WB	Calibration	1,478	1,476	-0.2%	0.1	PASS	1,028	1,027	-0.1%	0.0	PASS

Table 19.53: Calibration Results for Primary Link Counts Along Key Section of A30 - IP

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC10	WB	Calibration	573	578	0.9%	0.2	PASS	455	456	0.3%	0.1	PASS
TRADS 32_30012541	EB	Calibration	1,070	1,100	2.8%	0.9	PASS	829	872	5.2%	1.5	PASS
ATC10	EB	Calibration	630	591	-6.1%	1.6	PASS	533	472	-11.5%	2.7	PASS
TRADS 32_30012540	WB	Calibration	1,111	1,109	-0.1%	0.0	PASS	862	861	-0.2%	0.0	PASS
TRADS 32_30012535	EB	Calibration	1,033	937	-9.3%	3.1	PASS	798	734	-8.0%	2.3	PASS
TRADS 32_30012534	WB	Calibration	1,046	1,008	-3.7%	1.2	PASS	810	778	-3.9%	1.1	PASS
ATC13	EB	Calibration	1,043	840	-19.5%	6.6	FAIL	788	643	-18.4%	5.4	FAIL
ATC13	WB	Calibration	1,068	1,123	5.1%	1.7	PASS	807	863	6.9%	1.9	PASS

Table 19.54: Calibration Results for Primary Link Counts Along Key Section of A30 - PM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC10	WB	Calibration	651	626	-3.9%	1.0	PASS	568	538	-5.2%	1.3	PASS
TRADS 32_30012541	EB	Calibration	1,242	1,241	-0.1%	0.0	PASS	1,044	1,042	-0.2%	0.1	PASS
ATC10	EB	Calibration	621	631	1.7%	0.4	PASS	545	535	-1.8%	0.4	PASS
TRADS 32_30012540	WB	Calibration	1,178	1,178	0.0%	0.0	PASS	972	972	0.0%	0.0	PASS
TRADS 32_30012535	EB	Calibration	1,369	1,351	-1.3%	0.5	PASS	1,154	1,143	-1.0%	0.3	PASS
TRADS 32_30012534	WB	Calibration	1,119	963	-13.9%	4.8	PASS	924	779	-15.7%	5.0	PASS
ATC13	EB	Calibration	1,359	1,350	-0.7%	0.2	PASS	1,143	1,135	-0.7%	0.3	PASS
ATC13	WB	Calibration	1,144	1,356	18.5%	6.0	FAIL	963	1,152	19.6%	5.8	FAIL

Figure 19.6: Other Primary Link Count Locations - Image 1

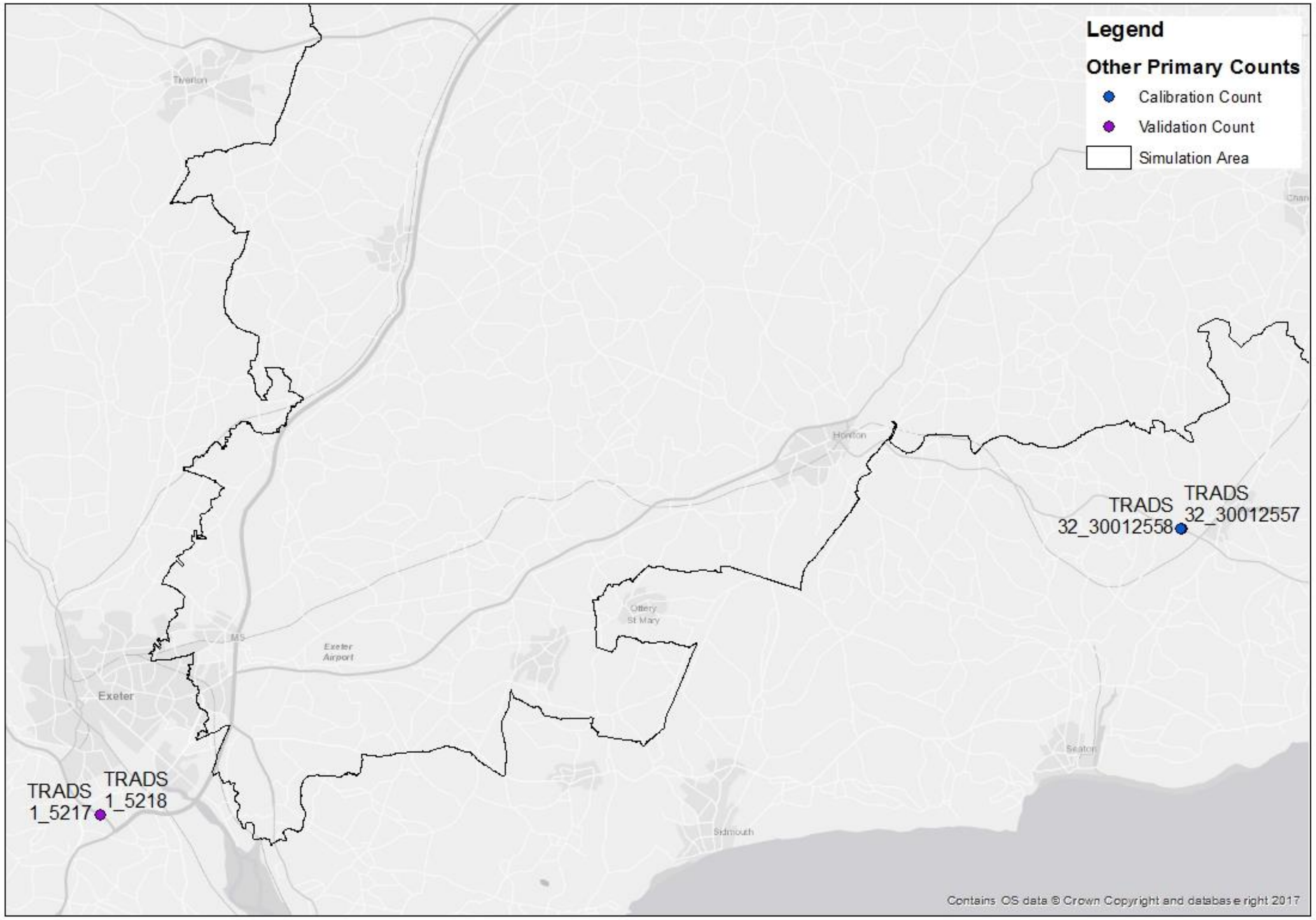

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Figure 19.7: Other Primary Link Count Locations - Image 2

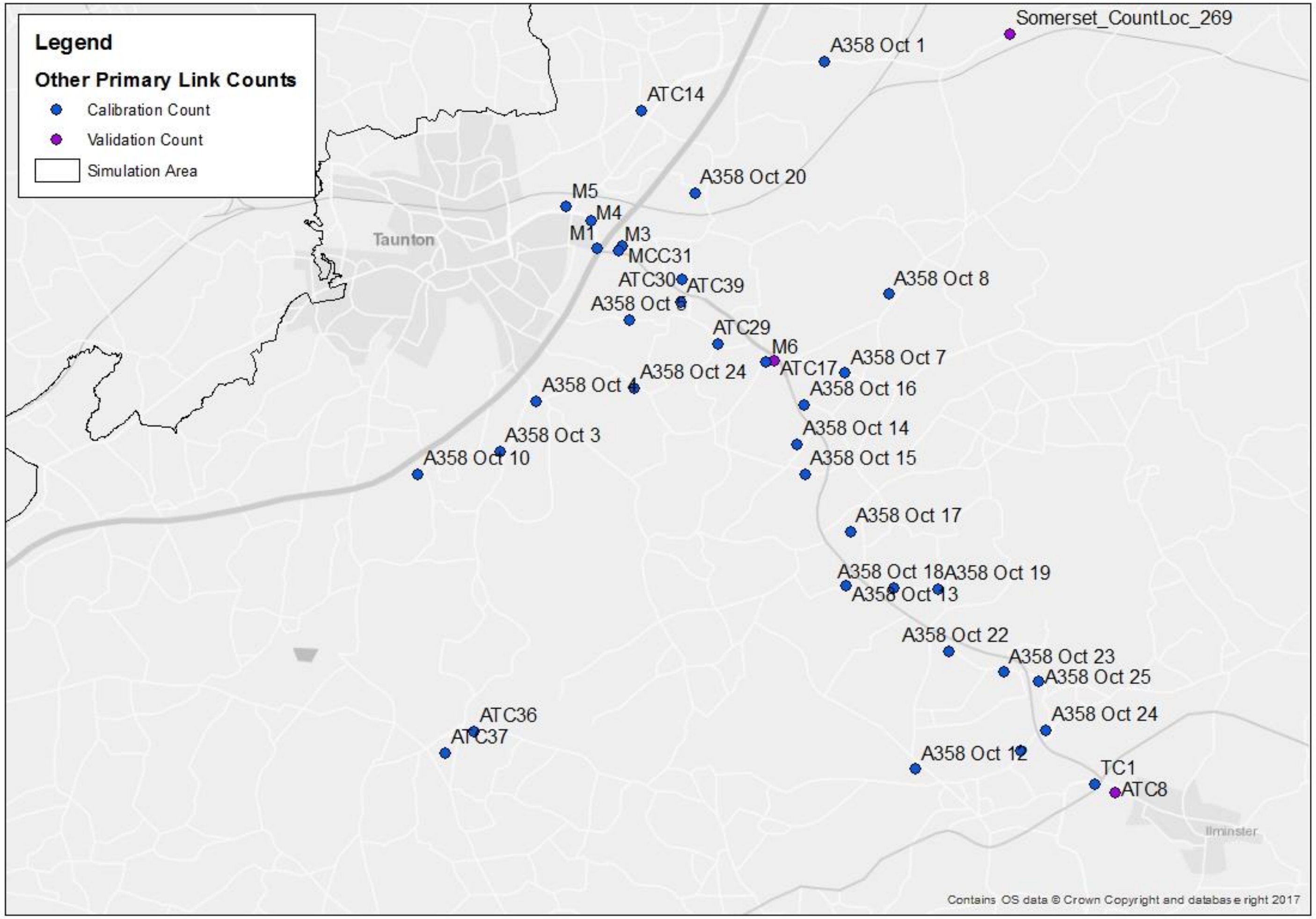

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Figure 19.8: Other Primary Link Count Locations - Image 3

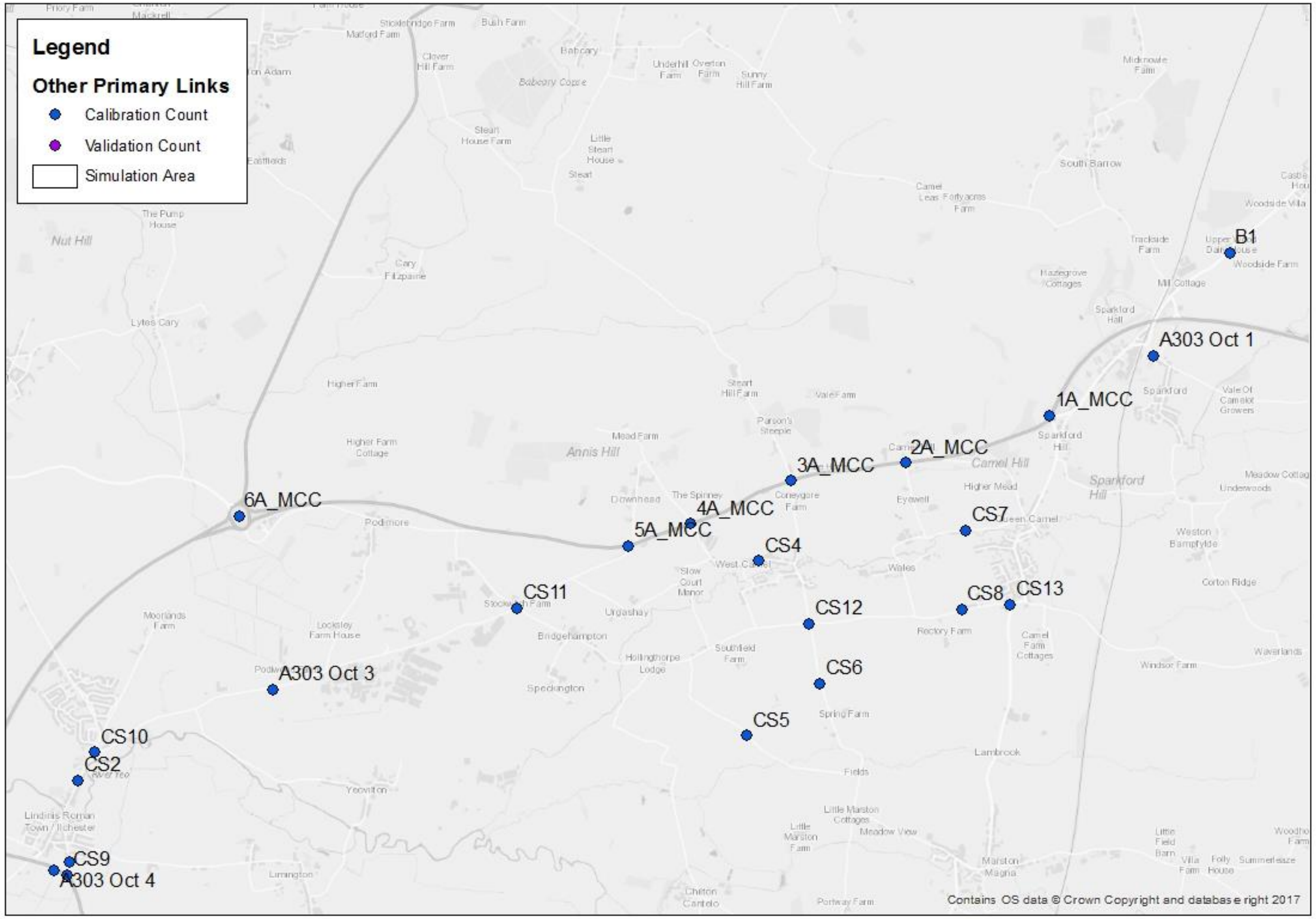

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Table 19.55: Flow Validation Results for Other Primary Link Counts - AM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS 1_5218	EB	Validation	1,855	1,633	-12.0%	5.3	PASS	1,395	1,270	-9.0%	3.4	PASS
TRADS 1_5217	WB	Validation	1,326	1,550	16.9%	5.9	FAIL	950	1,172	23.4%	6.8	FAIL
TRADS 32_30012557	EB	Calibration	334	335	0.2%	0.0	PASS	244	244	0.2%	0.0	PASS
TRADS 32_30012558	WB	Calibration	350	350	0.1%	0.0	PASS	265	265	0.1%	0.0	PASS
B1	NB	Calibration	202	212	5.3%	0.7	PASS	179	182	1.9%	0.2	PASS
B1	SB	Calibration	177	176	-0.5%	0.1	PASS	154	150	-2.6%	0.3	PASS
ATC8	EB	Validation	358	329	-8.2%	1.6	PASS	267	248	-7.0%	1.2	PASS
ATC8	WB	Validation	409	364	-11.0%	2.3	PASS	322	297	-8.0%	1.5	PASS
ATC14	EB	Calibration	517	358	-30.9%	7.6	FAIL	412	266	-35.6%	8.0	FAIL
ATC14	WB	Calibration	597	603	1.1%	0.3	PASS	530	537	1.4%	0.3	PASS
ATC17	WB	Validation	338	328	-3.0%	0.6	PASS	278	265	-5.0%	0.8	PASS
ATC17	EB	Validation	207	196	-5.2%	0.8	PASS	145	136	-6.6%	0.8	PASS
ATC30	NB	Calibration	99	136	36.6%	3.4	PASS	74	104	40.5%	3.2	PASS
ATC30	SB	Calibration	99	122	23.1%	2.2	PASS	71	95	34.0%	2.6	PASS
ATC36	EB	Calibration	113	117	3.3%	0.4	PASS	104	105	0.6%	0.1	PASS
ATC36	WB	Calibration	143	143	-0.3%	0.0	PASS	130	130	-0.3%	0.0	PASS
ATC37	NB	Calibration	59	82	39.4%	2.8	PASS	52	72	36.7%	2.4	PASS
ATC37	SB	Calibration	103	110	7.1%	0.7	PASS	98	97	-1.0%	0.1	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC29	EB	Calibration	5	0	-100.0%	3.0	PASS	4	0	-100.0%	2.9	PASS
ATC29	WB	Calibration	198	264	33.4%	4.3	PASS	189	221	16.9%	2.2	PASS
ATC39	NB	Calibration	71	88	23.6%	1.9	PASS	58	76	31.9%	2.3	PASS
ATC39	SB	Calibration	51	54	5.0%	0.4	PASS	40	44	10.1%	0.6	PASS
Somerset_CountLoc_269	EB	Validation	399	254	-36.4%	8.0	FAIL	320	200	-37.4%	7.4	FAIL
Somerset_CountLoc_269	WB	Validation	312	333	6.7%	1.2	PASS	250	265	5.9%	0.9	PASS
A358 OCT 1	WB	Calibration	357	364	1.7%	0.3	PASS	269	277	3.2%	0.5	PASS
A358 OCT 1	EB	Calibration	198	220	11.2%	1.5	PASS	149	170	14.0%	1.7	PASS
A358 OCT 3	NB	Calibration	203	190	-6.6%	1.0	PASS	153	154	0.8%	0.1	PASS
A358 OCT 3	SB	Calibration	153	151	-1.3%	0.2	PASS	115	114	-0.9%	0.1	PASS
A358 OCT 4	WB	Calibration	202	226	11.9%	1.6	PASS	152	176	15.7%	1.9	PASS
A358 OCT 4	EB	Calibration	129	164	27.2%	2.9	PASS	97	137	40.8%	3.7	PASS
A358 OCT 5	WB	Calibration	262	318	21.4%	3.3	PASS	197	265	34.6%	4.5	PASS
A358 OCT 5	EB	Calibration	49	88	77.1%	4.6	PASS	37	76	104.9%	5.2	PASS
A358 OCT 7	EB	Calibration	170	183	8.0%	1.0	PASS	128	127	-0.4%	0.0	PASS
A358 OCT 7	WB	Calibration	254	282	10.9%	1.7	PASS	191	225	17.5%	2.3	PASS
A358 OCT 8	NB	Calibration	61	42	-30.6%	2.6	PASS	46	31	-33.2%	2.5	PASS
A358 OCT 8	SB	Calibration	89	76	-15.0%	1.5	PASS	67	62	-7.8%	0.6	PASS
A358 OCT 10	NB	Calibration	28	22	-20.3%	1.1	PASS	21	15	-29.4%	1.5	PASS
A358 OCT 10	SB	Calibration	20	38	85.3%	3.2	PASS	15	33	115.6%	3.6	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A358 OCT 24	WB	Calibration	53	35	-34.8%	2.8	PASS	40	13	-66.7%	5.2	PASS
A358 OCT 24	EB	Calibration	29	16	-44.0%	2.7	PASS	22	6	-73.8%	4.4	PASS
A358 OCT 11	NB	Calibration	39	27	-30.7%	2.1	PASS	29	20	-32.5%	1.9	PASS
A358 OCT 11	SB	Calibration	27	18	-35.3%	2.0	PASS	20	12	-38.9%	2.0	PASS
A358 OCT 12	NB	Calibration	87	69	-20.7%	2.0	PASS	66	52	-21.3%	1.8	PASS
A358 OCT 12	SB	Calibration	63	40	-36.9%	3.2	PASS	48	24	-49.6%	3.9	PASS
A358 OCT 13	EB	Calibration	8	20	136.5%	3.0	PASS	6	18	184.8%	3.3	PASS
A358 OCT 13	WB	Calibration	10	23	142.6%	3.4	PASS	7	21	183.4%	3.6	PASS
A358 OCT 14	NB	Calibration	4	18	313.2%	4.1	PASS	3	14	330.7%	3.7	PASS
A358 OCT 14	SB	Calibration	3	51	1379.5%	9.1	PASS	3	33	1183.2%	7.2	PASS
A358 OCT 15	NB	Calibration	1	12	1029.8%	4.3	PASS	1	6	609.3%	2.7	PASS
A358 OCT 15	SB	Calibration	2	13	705.0%	4.3	PASS	1	4	233.8%	1.8	PASS
A358 OCT 16	NB	Calibration	44	45	3.3%	0.2	PASS	33	33	-0.3%	0.0	PASS
A358 OCT 16	SB	Calibration	28	28	0.5%	0.0	PASS	21	21	-1.1%	0.0	PASS
A358 OCT 17	NB	Calibration	24	23	-3.8%	0.2	PASS	18	18	-1.6%	0.1	PASS
A358 OCT 17	SB	Calibration	22	24	8.2%	0.4	PASS	17	15	-9.8%	0.4	PASS
A358 OCT 18	NB	Calibration	2	1	-37.7%	0.6	PASS	2	1	-21.0%	0.3	PASS
A358 OCT 18	SB	Calibration	4	3	-33.4%	0.7	PASS	3	2	-16.3%	0.3	PASS
A358 OCT 19	NB	Calibration	2	15	516.1%	4.2	PASS	2	9	397.5%	3.1	PASS
A358 OCT 19	SB	Calibration	4	10	171.3%	2.4	PASS	3	9	210.3%	2.4	PASS
A358 OCT 20	NB	Calibration	218	232	6.5%	0.9	PASS	164	174	6.4%	0.8	PASS
A358 OCT 20	SB	Calibration	222	138	-37.9%	6.3	PASS	167	114	-31.5%	4.4	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A358 OCT 25	EB	Calibration	58	58	0.7%	0.1	PASS	44	44	1.1%	0.1	PASS
A358 OCT 25	WB	Calibration	59	59	0.2%	0.0	PASS	45	45	0.5%	0.0	PASS
A358 OCT 22	EB	Calibration	21	20	-4.4%	0.2	PASS	15	15	-2.7%	0.1	PASS
A358 OCT 22	WB	Calibration	11	15	39.8%	1.2	PASS	8	13	52.3%	1.3	PASS
A358 OCT 23	EB	Calibration	15	30	100.4%	3.2	PASS	11	26	129.1%	3.4	PASS
A358 OCT 23	WB	Calibration	12	27	112.9%	3.2	PASS	9	20	115.6%	2.8	PASS
A358 OCT 24	WB	Calibration	53	35	-34.8%	2.8	PASS	40	13	-66.7%	5.2	PASS
A358 OCT 24	EB	Calibration	29	16	-44.0%	2.7	PASS	22	6	-73.8%	4.4	PASS
A303 OCT 1	EB	Calibration	34	62	82.0%	4.0	PASS	25	42	68.2%	2.9	PASS
A303 OCT 1	WB	Calibration	84	79	-6.1%	0.6	PASS	61	61	-1.1%	0.1	PASS
A303 OCT 3	EB	Validation	74	47	-35.6%	3.4	PASS	54	36	-33.7%	2.7	PASS
A303 OCT 3	WB	Validation	44	24	-45.1%	3.4	PASS	32	18	-44.4%	2.9	PASS
A303 OCT 4	EB	Calibration	317	326	2.7%	0.5	PASS	232	246	6.0%	0.9	PASS
A303 OCT 4	WB	Calibration	87	120	38.8%	3.3	PASS	64	93	46.1%	3.3	PASS
A303 OCT 5	EB	Calibration	419	371	-11.4%	2.4	PASS	307	260	-15.4%	2.8	PASS
A303 OCT 5	WB	Calibration	297	314	5.8%	1.0	PASS	217	230	5.7%	0.8	PASS
CS 4	EB	Calibration	40	27	-32.9%	2.3	PASS	29	22	-24.8%	1.4	PASS
CS 4	WB	Calibration	23	17	-27.7%	1.4	PASS	17	15	-9.3%	0.4	PASS
CS 5	EB	Calibration	10	16	61.1%	1.7	PASS	7	12	75.3%	1.7	PASS
CS 5	WB	Calibration	36	36	-1.1%	0.1	PASS	26	29	8.8%	0.4	PASS
CS 6	NB	Calibration	66	34	-48.4%	4.5	PASS	49	28	-42.9%	3.4	PASS
CS 6	SB	Calibration	94	56	-40.7%	4.4	PASS	69	42	-39.0%	3.6	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
CS 2	NB	Calibration	557	536	-3.7%	0.9	PASS	408	417	2.4%	0.5	PASS
CS 2	SB	Calibration	452	460	1.6%	0.3	PASS	331	359	8.4%	1.5	PASS
CS 8	EB	Calibration	48	39	-19.2%	1.4	PASS	35	34	-3.7%	0.2	PASS
CS 8	WB	Calibration	34	28	-18.8%	1.2	PASS	25	25	-0.7%	0.0	PASS
CS 7	EB	Calibration	4	0	-100.0%	2.7	PASS	3	0	-100.0%	2.3	PASS
CS 7	WB	Calibration	2	0	-100.0%	2.1	PASS	2	0	-100.0%	1.8	PASS

Table 19.56: Flow Validation Results for Other Primary Link Counts - IP

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS 1_5218	EB	Validation	1487	1549	4.1%	1.6	PASS	1117	1171	4.9%	1.6	PASS
TRADS 1_5217	WB	Validation	1239	1277	3.0%	1.1	PASS	940	977	3.9%	1.2	PASS
TRADS 32_30012557	EB	Calibration	358	348	-2.9%	0.5	PASS	274	281	2.4%	0.4	PASS
TRADS 32_30012558	WB	Calibration	390	392	0.6%	0.1	PASS	298	300	0.7%	0.1	PASS
B1	NB	Calibration	148	150	1.3%	0.2	PASS	128	127	-1.2%	0.1	PASS
B1	SB	Calibration	145	148	2.1%	0.3	PASS	125	124	-0.1%	0.0	PASS
ATC8	EB	Validation	299	277	-7.5%	1.3	PASS	244	229	-5.9%	0.9	PASS
ATC8	WB	Validation	305	275	-9.8%	1.8	PASS	245	227	-7.4%	1.2	PASS
ATC14	EB	Calibration	464	467	0.8%	0.2	PASS	398	401	0.9%	0.2	PASS
ATC14	WB	Calibration	386	384	-0.5%	0.1	PASS	333	332	-0.3%	0.1	PASS
ATC17	WB	Validation	229	223	-2.8%	0.4	PASS	182	182	0.1%	0.0	PASS
ATC17	EB	Validation	235	225	-4.6%	0.7	PASS	194	186	-4.3%	0.6	PASS
ATC30	NB	Calibration	73	146	100.7%	7.0	PASS	53	116	118.5%	6.8	PASS
ATC30	SB	Calibration	64	88	38.7%	2.8	PASS	44	69	56.7%	3.3	PASS
ATC36	EB	Calibration	70	73	4.4%	0.4	PASS	63	64	1.8%	0.1	PASS
ATC36	WB	Calibration	69	68	-1.0%	0.1	PASS	62	61	-1.3%	0.1	PASS
ATC37	NB	Calibration	55	59	7.0%	0.5	PASS	52	52	0.2%	0.0	PASS
ATC37	SB	Calibration	62	65	4.6%	0.4	PASS	57	55	-2.6%	0.2	PASS
ATC29	EB	Calibration	8	0	-100.0%	4.0	PASS	7	0	-100.0%	3.8	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC29	WB	Calibration	47	101	114.7%	6.3	PASS	44	94	115.2%	6.1	PASS
ATC39	NB	Calibration	53	92	75.4%	4.7	PASS	44	84	92.3%	5.0	PASS
ATC39	SB	Calibration	40	42	5.3%	0.3	PASS	33	36	9.2%	0.5	PASS
Somerset_CountLoc_269	EB	Validation	338	297	-12.2%	2.3	PASS	272	251	-7.7%	1.3	PASS
Somerset_CountLoc_269	WB	Validation	226	188	-17.0%	2.7	PASS	181	149	-17.4%	2.5	PASS
A358 OCT 1	WB	Calibration	210	210	0.3%	0.0	PASS	166	168	0.7%	0.1	PASS
A358 OCT 1	EB	Calibration	210	275	31.1%	4.2	PASS	167	232	38.9%	4.6	PASS
A358 OCT 3	NB	Calibration	134	130	-3.0%	0.3	PASS	106	105	-1.3%	0.1	PASS
A358 OCT 3	SB	Calibration	126	123	-2.9%	0.3	PASS	100	99	-1.4%	0.1	PASS
A358 OCT 4	WB	Calibration	93	140	50.4%	4.3	PASS	74	115	55.0%	4.2	PASS
A358 OCT 4	EB	Calibration	110	154	40.0%	3.8	PASS	87	124	42.0%	3.6	PASS
A358 OCT 5	WB	Calibration	80	143	78.0%	5.9	PASS	64	130	104.0%	6.7	PASS
A358 OCT 5	EB	Calibration	54	92	70.6%	4.5	PASS	43	84	96.3%	5.2	PASS
A358 OCT 7	EB	Calibration	162	227	40.3%	4.7	PASS	129	191	48.9%	5.0	PASS
A358 OCT 7	WB	Calibration	170	196	15.5%	1.9	PASS	135	162	19.9%	2.2	PASS
A358 OCT 8	NB	Calibration	62	25	-59.9%	5.6	PASS	49	20	-60.2%	5.1	PASS
A358 OCT 8	SB	Calibration	58	54	-5.8%	0.4	PASS	46	46	0.6%	0.0	PASS
A358 OCT 10	NB	Calibration	13	13	1.3%	0.0	PASS	11	11	4.1%	0.1	PASS
A358 OCT 10	SB	Calibration	17	18	6.2%	0.2	PASS	13	14	7.7%	0.3	PASS
A358 OCT 24	WB	Calibration	30	28	-8.8%	0.5	PASS	24	16	-33.4%	1.8	PASS
A358 OCT 24	EB	Calibration	28	23	-17.5%	1.0	PASS	22	11	-52.5%	2.9	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A358 OCT 11	NB	Calibration	27	17	-36.3%	2.1	PASS	21	13	-39.6%	2.0	PASS
A358 OCT 11	SB	Calibration	22	18	-18.1%	0.9	PASS	17	15	-14.6%	0.6	PASS
A358 OCT 12	NB	Calibration	45	35	-22.6%	1.6	PASS	35	27	-22.4%	1.4	PASS
A358 OCT 12	SB	Calibration	60	32	-46.3%	4.1	PASS	48	21	-57.2%	4.7	PASS
A358 OCT 13	EB	Calibration	7	18	164.1%	3.2	PASS	5	16	206.4%	3.3	PASS
A358 OCT 13	WB	Calibration	9	15	68.3%	1.8	PASS	7	13	86.3%	1.9	PASS
A358 OCT 14	NB	Calibration	4	41	1000.2%	7.9	PASS	3	21	612.4%	5.2	PASS
A358 OCT 14	SB	Calibration	3	39	1034.7%	7.7	PASS	3	19	589.1%	4.9	PASS
A358 OCT 15	NB	Calibration	2	6	320.8%	2.5	PASS	1	5	299.0%	2.1	PASS
A358 OCT 15	SB	Calibration	2	8	413.3%	2.9	PASS	1	5	343.8%	2.3	PASS
A358 OCT 16	NB	Calibration	41	41	-1.1%	0.1	PASS	33	33	-0.1%	0.0	PASS
A358 OCT 16	SB	Calibration	25	38	54.9%	2.4	PASS	20	33	68.9%	2.6	PASS
A358 OCT 17	NB	Calibration	21	21	0.9%	0.0	PASS	17	17	0.3%	0.0	PASS
A358 OCT 17	SB	Calibration	21	22	3.3%	0.1	PASS	17	17	2.8%	0.1	PASS
A358 OCT 18	NB	Calibration	3	2	-22.4%	0.4	PASS	2	2	-5.1%	0.1	PASS
A358 OCT 18	SB	Calibration	3	1	-62.4%	1.2	PASS	2	1	-55.0%	0.9	PASS
A358 OCT 19	NB	Calibration	3	8	168.1%	2.2	PASS	2	6	153.6%	1.8	PASS
A358 OCT 19	SB	Calibration	2	7	180.7%	2.1	PASS	2	5	179.1%	1.8	PASS
A358 OCT 20	NB	Calibration	143	151	5.6%	0.7	PASS	113	113	0.1%	0.0	PASS
A358 OCT 20	SB	Calibration	142	117	-17.6%	2.2	PASS	113	91	-19.6%	2.2	PASS
A358 OCT 25	EB	Calibration	41	40	-4.3%	0.3	PASS	33	31	-4.2%	0.2	PASS
A358 OCT 25	WB	Calibration	40	40	0.2%	0.0	PASS	32	32	0.6%	0.0	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A358 OCT 22	EB	Calibration	14	14	0.9%	0.0	PASS	11	11	-1.0%	0.0	PASS
A358 OCT 22	WB	Calibration	11	11	-3.1%	0.1	PASS	9	9	1.9%	0.1	PASS
A358 OCT 23	EB	Calibration	11	16	50.5%	1.5	PASS	9	14	68.5%	1.7	PASS
A358 OCT 23	WB	Calibration	14	20	43.3%	1.5	PASS	11	17	51.9%	1.5	PASS
A358 OCT 24	WB	Calibration	30	28	-8.8%	0.5	PASS	24	16	-33.4%	1.8	PASS
A358 OCT 24	EB	Calibration	28	23	-17.5%	1.0	PASS	22	11	-52.5%	2.9	PASS
A303 OCT 1	EB	Calibration	43	47	10.3%	0.7	PASS	32	33	3.8%	0.2	PASS
A303 OCT 1	WB	Calibration	63	58	-8.1%	0.7	PASS	47	47	-0.4%	0.0	PASS
A303 OCT 3	EB	Validation	31	21	-31.2%	1.9	PASS	23	17	-24.6%	1.3	PASS
A303 OCT 3	WB	Validation	48	24	-49.9%	4.0	PASS	36	19	-48.8%	3.4	PASS
A303 OCT 4	EB	Calibration	91	106	16.2%	1.5	PASS	69	84	22.0%	1.7	PASS
A303 OCT 4	WB	Calibration	149	167	11.8%	1.4	PASS	112	133	18.7%	1.9	PASS
A303 OCT 5	EB	Calibration	246	240	-2.6%	0.4	PASS	184	179	-2.8%	0.4	PASS
A303 OCT 5	WB	Calibration	259	265	2.1%	0.3	PASS	194	200	3.1%	0.4	PASS
CS 4	EB	Calibration	26	20	-21.8%	1.2	PASS	19	18	-7.5%	0.3	PASS
CS 4	WB	Calibration	27	19	-27.5%	1.5	PASS	20	18	-11.6%	0.5	PASS
CS 5	EB	Calibration	14	12	-15.8%	0.6	PASS	10	10	-0.2%	0.0	PASS
CS 5	WB	Calibration	11	12	15.2%	0.5	PASS	8	10	28.5%	0.8	PASS
CS 6	NB	Calibration	55	31	-43.2%	3.6	PASS	41	26	-37.9%	2.7	PASS
CS 6	SB	Calibration	58	36	-36.9%	3.1	PASS	43	30	-31.1%	2.2	PASS
CS 2	NB	Calibration	379	343	-9.5%	1.9	PASS	284	282	-0.8%	0.1	PASS
CS 2	SB	Calibration	432	421	-2.5%	0.5	PASS	324	347	7.1%	1.3	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
CS 8	EB	Calibration	40	20	-49.2%	3.6	PASS	30	18	-41.9%	2.6	PASS
CS 8	WB	Calibration	31	24	-23.2%	1.4	PASS	23	20	-14.6%	0.7	PASS
CS 7	EB	Calibration	3	0	-100.0%	2.5	PASS	2	0	-100.0%	2.2	PASS
CS 7	WB	Calibration	3	0	-100.0%	2.3	PASS	2	0	-100.0%	2.0	PASS

Table 19.57: Flow Validation Results for Other Primary Link Counts – PM

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
TRADS 1_5218	EB	Validation	1708	1732	1.4%	0.6	PASS	1396	1463	4.8%	1.8	PASS
TRADS 1_5217	WB	Validation	1804	1427	-20.9%	9.4	FAIL	1480	1187	-19.8%	8.0	FAIL
TRADS 32_30012557	EB	Calibration	352	352	0.1%	0.0	PASS	294	294	0.1%	0.0	PASS
TRADS 32_30012558	WB	Calibration	370	372	0.6%	0.1	PASS	302	306	1.2%	0.2	PASS
B1	NB	Calibration	223	201	-9.8%	1.5	PASS	206	181	-12.3%	1.8	PASS
B1	SB	Calibration	228	239	4.9%	0.7	PASS	212	219	3.2%	0.5	PASS
ATC8	EB	Validation	412	387	-6.0%	1.2	PASS	351	336	-4.4%	0.8	PASS
ATC8	WB	Validation	372	339	-8.9%	1.8	PASS	319	292	-8.7%	1.6	PASS
ATC14	EB	Calibration	628	637	1.4%	0.4	PASS	570	578	1.3%	0.3	PASS
ATC14	WB	Calibration	485	421	-13.3%	3.0	PASS	448	383	-14.4%	3.2	PASS
ATC17	WB	Validation	245	220	-10.0%	1.6	PASS	204	178	-12.8%	1.9	PASS
ATC17	EB	Validation	328	292	-11.2%	2.1	PASS	284	251	-11.8%	2.0	PASS
ATC30	NB	Calibration	103	165	59.3%	5.3	PASS	85	142	67.1%	5.4	PASS
ATC30	SB	Calibration	92	99	7.7%	0.7	PASS	77	84	9.6%	0.8	PASS
ATC36	EB	Calibration	131	142	8.1%	0.9	PASS	125	134	7.8%	0.8	PASS
ATC36	WB	Calibration	119	119	-0.5%	0.1	PASS	111	111	-0.2%	0.0	PASS
ATC37	NB	Calibration	97	101	4.7%	0.5	PASS	94	95	1.0%	0.1	PASS
ATC37	SB	Calibration	69	100	44.8%	3.4	PASS	64	91	41.7%	3.0	PASS
ATC29	EB	Calibration	18	0	-100.0%	6.0	PASS	17	0	-100.0%	5.8	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
ATC29	WB	Calibration	86	135	56.7%	4.6	PASS	83	121	46.3%	3.8	PASS
ATC39	NB	Calibration	104	138	33.5%	3.2	PASS	98	124	26.7%	2.5	PASS
ATC39	SB	Calibration	55	49	-11.0%	0.8	PASS	51	46	-9.8%	0.7	PASS
Somerset_CountLoc_269	EB	Validation	427	393	-7.9%	1.7	PASS	370	342	-7.5%	1.5	PASS
Somerset_CountLoc_269	WB	Validation	259	232	-10.3%	1.7	PASS	224	200	-10.9%	1.7	PASS
A358 OCT 1	WB	Calibration	239	247	3.4%	0.5	PASS	203	211	3.8%	0.5	PASS
A358 OCT 1	EB	Calibration	321	360	12.2%	2.1	PASS	272	311	14.2%	2.3	PASS
A358 OCT 3	NB	Calibration	170	171	0.6%	0.1	PASS	144	146	1.1%	0.1	PASS
A358 OCT 3	SB	Calibration	189	189	0.0%	0.0	PASS	161	162	0.6%	0.1	PASS
A358 OCT 4	WB	Calibration	109	143	31.1%	3.0	PASS	92	126	36.0%	3.2	PASS
A358 OCT 4	EB	Calibration	179	224	24.8%	3.1	PASS	152	200	31.4%	3.6	PASS
A358 OCT 5	WB	Calibration	131	184	40.7%	4.2	PASS	111	166	50.1%	4.7	PASS
A358 OCT 5	EB	Calibration	120	138	15.4%	1.6	PASS	102	124	21.4%	2.0	PASS
A358 OCT 7	EB	Calibration	217	262	20.6%	2.9	PASS	185	229	24.1%	3.1	PASS
A358 OCT 7	WB	Calibration	185	194	5.1%	0.7	PASS	157	158	0.5%	0.1	PASS
A358 OCT 8	NB	Calibration	86	64	-26.4%	2.6	PASS	73	53	-27.5%	2.5	PASS
A358 OCT 8	SB	Calibration	60	60	0.9%	0.1	PASS	51	51	1.3%	0.1	PASS
A358 OCT 10	NB	Calibration	18	19	8.2%	0.3	PASS	15	16	8.4%	0.3	PASS
A358 OCT 10	SB	Calibration	28	33	17.6%	0.9	PASS	24	29	21.9%	1.0	PASS
A358 OCT 24	WB	Calibration	34	26	-23.4%	1.5	PASS	29	17	-41.1%	2.5	PASS
A358 OCT 24	EB	Calibration	38	33	-13.6%	0.9	PASS	32	23	-28.6%	1.7	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A358 OCT 11	NB	Calibration	33	23	-28.4%	1.8	PASS	28	19	-30.5%	1.7	PASS
A358 OCT 11	SB	Calibration	21	20	-3.8%	0.2	PASS	18	18	1.5%	0.1	PASS
A358 OCT 12	NB	Calibration	53	44	-18.2%	1.4	PASS	45	36	-21.4%	1.5	PASS
A358 OCT 12	SB	Calibration	109	53	-51.9%	6.3	PASS	93	35	-62.3%	7.2	PASS
A358 OCT 13	EB	Calibration	10	31	219.2%	4.7	PASS	8	29	252.6%	4.8	PASS
A358 OCT 13	WB	Calibration	12	16	35.1%	1.1	PASS	10	14	44.6%	1.3	PASS
A358 OCT 14	NB	Calibration	4	56	1312.1%	9.5	PASS	3	28	751.0%	6.3	PASS
A358 OCT 14	SB	Calibration	4	40	844.1%	7.6	PASS	4	31	759.2%	6.6	PASS
A358 OCT 15	NB	Calibration	1	7	391.3%	2.7	PASS	1	5	354.3%	2.3	PASS
A358 OCT 15	SB	Calibration	2	11	397.5%	3.4	PASS	2	8	330.0%	2.8	PASS
A358 OCT 16	NB	Calibration	55	54	-1.4%	0.1	PASS	47	47	0.2%	0.0	PASS
A358 OCT 16	SB	Calibration	23	38	62.6%	2.6	PASS	20	34	71.3%	2.7	PASS
A358 OCT 17	NB	Calibration	28	28	0.1%	0.0	PASS	24	24	1.7%	0.1	PASS
A358 OCT 17	SB	Calibration	22	22	0.7%	0.0	PASS	19	19	2.0%	0.1	PASS
A358 OCT 18	NB	Calibration	3	3	-18.4%	0.4	PASS	3	3	-6.3%	0.1	PASS
A358 OCT 18	SB	Calibration	3	2	-39.5%	0.7	PASS	2	1	-32.9%	0.5	PASS
A358 OCT 19	NB	Calibration	4	8	98.9%	1.6	PASS	3	7	104.1%	1.5	PASS
A358 OCT 19	SB	Calibration	3	9	215.8%	2.5	PASS	2	8	228.3%	2.4	PASS
A358 OCT 20	NB	Calibration	196	202	2.9%	0.4	PASS	167	171	2.4%	0.3	PASS
A358 OCT 20	SB	Calibration	192	146	-24.2%	3.6	PASS	163	124	-24.3%	3.3	PASS
A358 OCT 25	EB	Calibration	51	51	0.0%	0.0	PASS	43	43	-0.6%	0.0	PASS
A358 OCT 25	WB	Calibration	52	52	0.0%	0.0	PASS	44	44	-0.4%	0.0	PASS

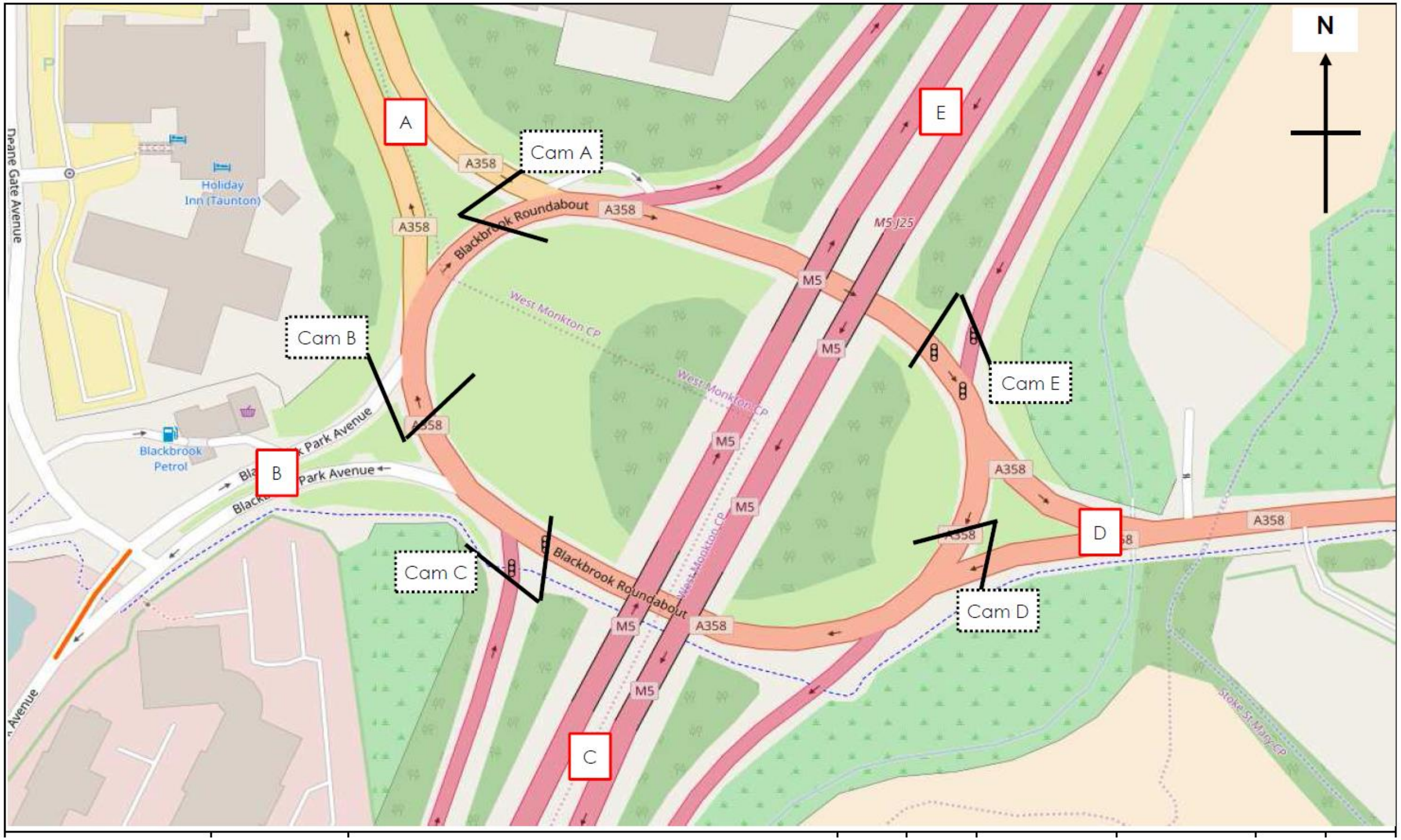
Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A358 OCT 22	EB	Calibration	14	16	9.3%	0.3	PASS	12	12	-1.0%	0.0	PASS
A358 OCT 22	WB	Calibration	13	17	29.9%	1.0	PASS	11	14	23.5%	0.7	PASS
A358 OCT 23	EB	Calibration	8	25	220.3%	4.3	PASS	7	24	256.5%	4.4	PASS
A358 OCT 23	WB	Calibration	17	25	47.7%	1.8	PASS	14	22	54.6%	1.8	PASS
A358 OCT 24	WB	Calibration	34	26	-23.4%	1.5	PASS	29	17	-41.1%	2.5	PASS
A358 OCT 24	EB	Calibration	38	33	-13.6%	0.9	PASS	32	23	-28.6%	1.7	PASS
A303 OCT 1	EB	Calibration	63	63	-0.2%	0.0	PASS	51	51	0.7%	0.0	PASS
A303 OCT 1	WB	Calibration	68	66	-3.0%	0.2	PASS	55	55	0.2%	0.0	PASS
A303 OCT 3	EB	Validation	46	39	-14.7%	1.0	PASS	37	34	-9.8%	0.6	PASS
A303 OCT 3	WB	Validation	107	73	-31.6%	3.6	PASS	86	57	-34.3%	3.5	PASS
A303 OCT 4	EB	Calibration	102	120	17.7%	1.7	PASS	82	100	21.9%	1.9	PASS
A303 OCT 4	WB	Calibration	291	293	0.9%	0.2	PASS	234	240	2.7%	0.4	PASS
A303 OCT 5	EB	Calibration	330	320	-3.1%	0.6	PASS	266	265	-0.1%	0.0	PASS
A303 OCT 5	WB	Calibration	425	449	5.6%	1.1	PASS	342	366	7.0%	1.3	PASS
CS 4	EB	Calibration	28	19	-33.1%	1.9	PASS	22	17	-24.3%	1.2	PASS
CS 4	WB	Calibration	33	12	-62.9%	4.4	PASS	26	11	-59.3%	3.6	PASS
CS 5	EB	Calibration	30	32	6.6%	0.4	PASS	24	28	15.2%	0.7	PASS
CS 5	WB	Calibration	12	35	182.9%	4.6	PASS	10	30	200.8%	4.5	PASS
CS 6	NB	Calibration	90	37	-58.7%	6.6	PASS	72	33	-54.6%	5.4	PASS
CS 6	SB	Calibration	74	43	-42.0%	4.1	PASS	60	41	-31.3%	2.6	PASS
CS 2	NB	Calibration	472	456	-3.3%	0.7	PASS	380	394	3.7%	0.7	PASS
CS 2	SB	Calibration	566	591	4.3%	1.0	PASS	455	497	9.1%	1.9	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
CS 8	EB	Calibration	43	37	-14.3%	1.0	PASS	35	35	0.9%	0.1	PASS
CS 8	WB	Calibration	39	30	-23.0%	1.5	PASS	31	25	-20.2%	1.2	PASS
CS 7	EB	Calibration	4	0	-100.0%	2.8	PASS	3	0	-100.0%	2.5	PASS
CS 7	WB	Calibration	4	0	-100.0%	2.9	PASS	3	0	-100.0%	2.6	PASS

19.4 Turning Count Flow Validation Results

19.4.1 The flow validation results for the junctions at which turning count data was collected are displayed in this chapter. For each site, a diagram is provided with each arm labelled for reference purposes.

Figure 19.9: Site M1 - M5 J25



Source: Nationwide Data Collection (NDC) – South West Additional Report. This Map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 100030649 2016.

Table 19.58: Turning Count Results for M5 J25 (Site M1) - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	0	0	-100.00%	0.79	PASS	0	0	-100.00%	0.79	PASS
A	B	213	128	-39.64%	6.46	PASS	190	107	-43.73%	6.83	PASS
A	C	294	282	-3.97%	0.69	PASS	205	196	-4.20%	0.61	PASS
A	D	344	296	-13.83%	2.66	PASS	269	223	-17.17%	2.94	PASS
A	E	641	640	-0.28%	0.07	PASS	492	492	0.01%	0.00	PASS
B	A	71	72	2.32%	0.19	PASS	54	56	3.41%	0.25	PASS
B	B	1	0	-100.00%	1.37	PASS	0	0	-100.00%	0.79	PASS
B	C	22	10	-54.14%	2.95	PASS	15	5	-68.97%	3.27	PASS
B	D	20	20	0.05%	0.00	PASS	15	15	-1.34%	0.05	PASS
B	E	35	20	-42.85%	2.87	PASS	27	12	-53.99%	3.28	PASS
C	A	402	375	-6.62%	1.35	PASS	305	297	-2.76%	0.48	PASS
C	B	109	74	-31.87%	3.62	PASS	96	64	-33.20%	3.56	PASS
C	C	2	0	-100.00%	1.81	PASS	1	0	-100.00%	1.14	PASS
C	D	263	251	-4.41%	0.72	PASS	165	160	-3.29%	0.43	PASS
C	E	0	0	-100.00%	0.81	PASS	0	0	-100.00%	0.81	PASS
D	A	377	311	-17.58%	3.57	PASS	309	265	-14.33%	2.61	PASS
D	B	85	86	1.29%	0.12	PASS	82	82	0.50%	0.05	PASS
D	C	213	212	-0.20%	0.03	PASS	139	139	-0.44%	0.05	PASS
D	D	1	0	-100.00%	1.37	PASS	0	0	-100.00%	0.79	PASS
D	E	320	302	-5.67%	1.03	PASS	219	211	-3.68%	0.55	PASS
E	A	734	706	-3.81%	1.04	PASS	583	564	-3.21%	0.78	PASS
E	B	109	108	-0.34%	0.04	PASS	102	102	-0.43%	0.04	PASS
E	C	0	0	-100.00%	0.78	PASS	0	0	-100.00%	0.78	PASS
E	D	381	371	-2.52%	0.50	PASS	210	211	0.19%	0.03	PASS
E	E	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

Table 19.59: Turning Count Results for M5 J25 (Site M1) - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	1	0	-100.00%	1.26	PASS	0	0	-100.00%	0.97	PASS
A	B	97	98	0.79%	0.08	PASS	86	85	-0.33%	0.03	PASS
A	C	249	228	-8.41%	1.36	PASS	192	176	-8.28%	1.17	PASS
A	D	404	379	-6.18%	1.26	PASS	363	328	-9.47%	1.85	PASS
A	E	523	526	0.45%	0.10	PASS	405	407	0.42%	0.08	PASS
B	A	116	121	5.00%	0.53	PASS	104	106	2.21%	0.22	PASS
B	B	1	0	-100.00%	1.26	PASS	1	0	-100.00%	1.12	PASS
B	C	26	23	-12.24%	0.65	PASS	20	20	0.09%	0.00	PASS
B	D	26	26	0.83%	0.04	PASS	24	24	-1.50%	0.07	PASS
B	E	45	40	-11.09%	0.77	PASS	34	32	-5.70%	0.34	PASS
C	A	267	255	-4.57%	0.76	PASS	198	197	-0.73%	0.10	PASS
C	B	30	19	-36.27%	2.18	PASS	21	13	-39.79%	2.05	PASS
C	C	4	0	-100.00%	2.67	PASS	0	0	-100.00%	0.81	PASS
C	D	207	190	-8.41%	1.24	PASS	137	124	-9.26%	1.11	PASS
C	E	0	0	-100.00%	0.81	PASS	0	0	0.00%	0.00	PASS
D	A	361	316	-12.53%	2.46	PASS	324	277	-14.59%	2.73	PASS
D	B	35	34	-0.26%	0.02	PASS	31	31	-0.82%	0.05	PASS
D	C	191	193	0.81%	0.11	PASS	130	129	-0.65%	0.07	PASS
D	D	1	0	-100.00%	1.38	PASS	1	0	-100.00%	1.26	PASS
D	E	278	258	-7.17%	1.22	PASS	167	163	-2.86%	0.37	PASS
E	A	469	425	-9.40%	2.08	PASS	379	335	-11.43%	2.29	PASS
E	B	22	21	-2.79%	0.13	PASS	18	18	-0.84%	0.04	PASS
E	C	0	0	-100.00%	0.79	PASS	0	0	-100.00%	0.79	PASS
E	D	270	268	-0.74%	0.12	PASS	163	164	0.43%	0.05	PASS
E	E	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

Table 19.60: Turning Count Results for M5 J25 (Site M1) - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	0	0	-100.00%	0.79	PASS	0	0	-100.00%	0.79	PASS
A	B	70	69	-0.81%	0.07	PASS	58	58	0.11%	0.01	PASS
A	C	342	304	-11.10%	2.11	PASS	293	258	-12.13%	2.14	PASS
A	D	365	343	-6.02%	1.17	PASS	334	314	-6.11%	1.13	PASS
A	E	629	638	1.36%	0.34	PASS	547	557	1.89%	0.44	PASS
B	A	196	144	-26.83%	4.04	PASS	181	128	-29.54%	4.30	PASS
B	B	1	0	-100.00%	1.36	PASS	0	0	-100.00%	0.79	PASS
B	C	65	64	-1.64%	0.13	PASS	60	60	0.11%	0.01	PASS
B	D	65	63	-2.95%	0.24	PASS	61	60	-2.71%	0.21	PASS
B	E	114	85	-25.76%	2.95	PASS	108	79	-26.61%	2.97	PASS
C	A	338	326	-3.35%	0.62	PASS	267	257	-3.70%	0.61	PASS
C	B	24	16	-32.82%	1.76	PASS	19	11	-42.35%	2.08	PASS
C	C	0	0	-100.00%	0.79	PASS	0	0	-100.00%	0.79	PASS
C	D	207	193	-6.98%	1.02	PASS	168	155	-7.69%	1.02	PASS
C	E	0	0	-100.00%	0.79	PASS	0	0	-100.00%	0.79	PASS
D	A	337	280	-16.88%	3.24	PASS	293	238	-18.67%	3.36	PASS
D	B	35	36	1.25%	0.07	PASS	33	33	-0.62%	0.04	PASS
D	C	237	241	1.77%	0.27	PASS	173	177	2.50%	0.33	PASS
D	D	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
D	E	305	287	-5.73%	1.01	PASS	205	191	-6.64%	0.97	PASS
E	A	680	633	-6.99%	1.85	PASS	590	547	-7.29%	1.80	PASS
E	B	31	24	-23.83%	1.42	PASS	27	19	-29.38%	1.64	PASS
E	C	0	0	-100.00%	0.79	PASS	0	0	-100.00%	0.79	PASS
E	D	301	305	1.55%	0.27	PASS	234	237	1.54%	0.23	PASS
E	E	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

Figure 19.10: Site M2 – M5 J29

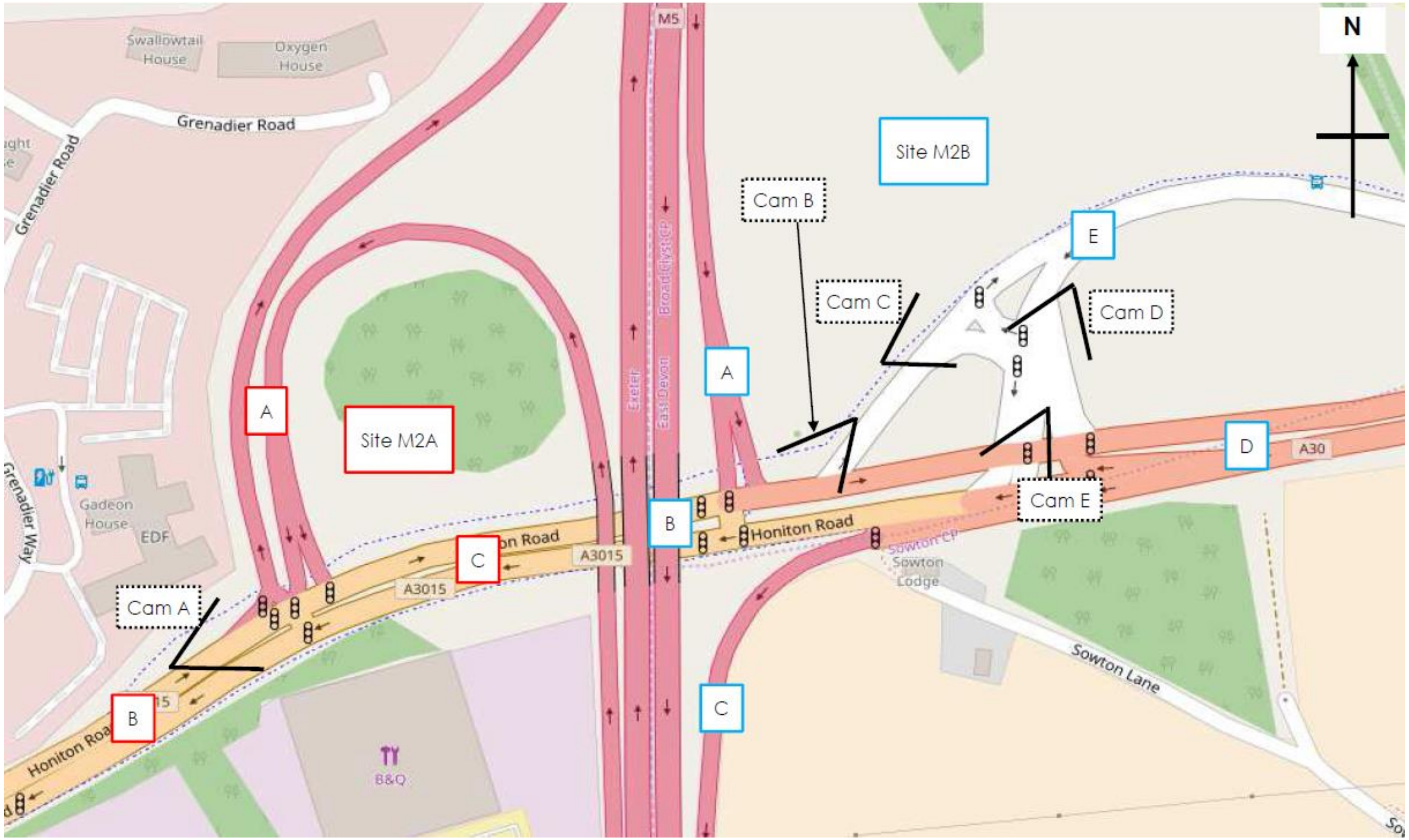


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Table 19.61: Turning Count Results for Site M5 J29 M2A - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	C	456	242	-46.94%	11.46	FAIL	406	227	-44.03%	10.05	FAIL
A	B	942	884	-6.13%	1.91	PASS	588	598	1.64%	0.40	PASS
C	A	295	306	3.80%	0.65	PASS	217	218	0.17%	0.03	PASS
B	B	565	564	-0.19%	0.04	PASS	462	460	-0.29%	0.06	PASS
B	A	113	63	-44.27%	5.33	PASS	60	10	-82.53%	8.35	PASS
B	C	1314	1332	1.30%	0.47	PASS	1102	1097	-0.40%	0.13	PASS

Table 19.62: Turning Count Results for Site M5 J29 M2A - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	C	130	58	-55.51%	7.45	PASS	125	56	-55.46%	7.30	PASS
A	B	788	711	-9.75%	2.81	PASS	540	511	-5.46%	1.29	PASS
C	A	272	358	31.80%	4.87	PASS	225	267	18.68%	2.68	PASS
B	B	598	597	-0.27%	0.07	PASS	506	479	-5.43%	1.24	PASS
B	A	88	59	-33.12%	3.40	PASS	33	32	-3.58%	0.21	PASS
B	C	743	685	-7.71%	2.14	PASS	609	553	-9.23%	2.33	PASS

Table 19.63: Turning Count Results for Site M5 J29 M2A - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	C	164	28	-83.08%	13.93	FAIL	136	24	-82.50%	12.55	FAIL
A	B	893	810	-9.29%	2.84	PASS	716	651	-9.16%	2.51	PASS
C	A	472	674	42.90%	8.46	FAIL	408	562	37.67%	6.98	FAIL
B	B	1137	1130	-0.59%	0.20	PASS	1010	1007	-0.37%	0.12	PASS
B	A	126	115	-9.11%	1.05	PASS	94	94	-0.06%	0.01	PASS
B	C	833	754	-9.50%	2.81	PASS	717	647	-9.70%	2.66	PASS

Table 19.64: Turning Count Results for Site M5 J29 M2B - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	792	794	0.26%	0.07	PASS	501	502	0.20%	0.05	PASS
D	A	669	682	1.81%	0.47	PASS	513	525	2.45%	0.55	PASS
D	E	17	0	-100.00%	5.77	PASS	14	0	-100.00%	5.36	PASS
A	B	559	561	0.30%	0.07	PASS	446	448	0.41%	0.09	PASS
A	D	80	76	-4.70%	0.43	PASS	54	54	1.63%	0.12	PASS
A	E	33	33	0.02%	0.00	PASS	22	22	-0.38%	0.02	PASS
B	D	862	967	12.13%	3.46	PASS	602	699	16.02%	3.78	PASS
B	E	354	481	36.08%	6.25	FAIL	227	359	57.92%	7.69	FAIL
E	E	4	0	-100.00%	2.99	PASS	3	0	-100.00%	2.28	PASS
E	E	291	292	0.23%	0.04	PASS	250	251	0.50%	0.08	PASS
E	C	255	254	-0.69%	0.11	PASS	187	185	-1.28%	0.18	PASS

Table 19.65: Turning Count Results for Site M5 J29 M2B - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	624	686	9.98%	2.43	PASS	455	517	13.77%	2.84	PASS
D	A	441	437	-0.92%	0.19	PASS	349	346	-1.06%	0.20	PASS
D	E	3	0	-100.00%	2.61	PASS	3	0	-100.00%	2.45	PASS
A	B	238	239	0.58%	0.09	PASS	180	180	0.12%	0.02	PASS
A	D	57	62	9.76%	0.72	PASS	37	37	0.81%	0.05	PASS
A	E	17	17	-1.59%	0.07	PASS	11	11	-7.18%	0.25	PASS
B	D	982	938	-4.51%	1.43	PASS	748	729	-2.58%	0.71	PASS
B	E	283	370	30.61%	4.80	PASS	207	260	25.78%	3.49	PASS
E	E	4	0	-100.00%	2.92	PASS	3	0	-100.00%	2.56	PASS
E	E	134	191	42.48%	4.46	PASS	100	157	57.32%	5.04	PASS
E	C	154	123	-20.60%	2.70	PASS	100	98	-2.07%	0.21	PASS

Table 19.66: Turning Count Results for Site M5 J29 M2B - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	737	884	19.88%	5.15	FAIL	612	735	20.07%	4.73	PASS
D	A	401	472	17.83%	3.42	PASS	345	417	20.58%	3.64	PASS
D	E	6	0	-100.00%	3.50	PASS	6	0	-100.00%	3.32	PASS
A	B	271	271	0.17%	0.03	PASS	224	224	-0.09%	0.01	PASS
A	D	51	47	-6.90%	0.50	PASS	35	35	1.31%	0.08	PASS
A	E	30	19	-37.37%	2.28	PASS	23	15	-35.83%	1.91	PASS
B	D	1298	1302	0.33%	0.12	PASS	1101	1100	-0.13%	0.04	PASS
B	E	714	638	-10.65%	2.92	PASS	636	558	-12.31%	3.20	PASS
E	E	10	0	-100.00%	4.40	PASS	8	0	-100.00%	3.89	PASS
E	E	219	261	19.50%	2.75	PASS	175	214	22.50%	2.82	PASS
E	C	495	495	0.03%	0.01	PASS	427	427	-0.16%	0.03	PASS

Figure 19.11: Site M3 - A358/Henlade Park & Ride/Ruishton Lane

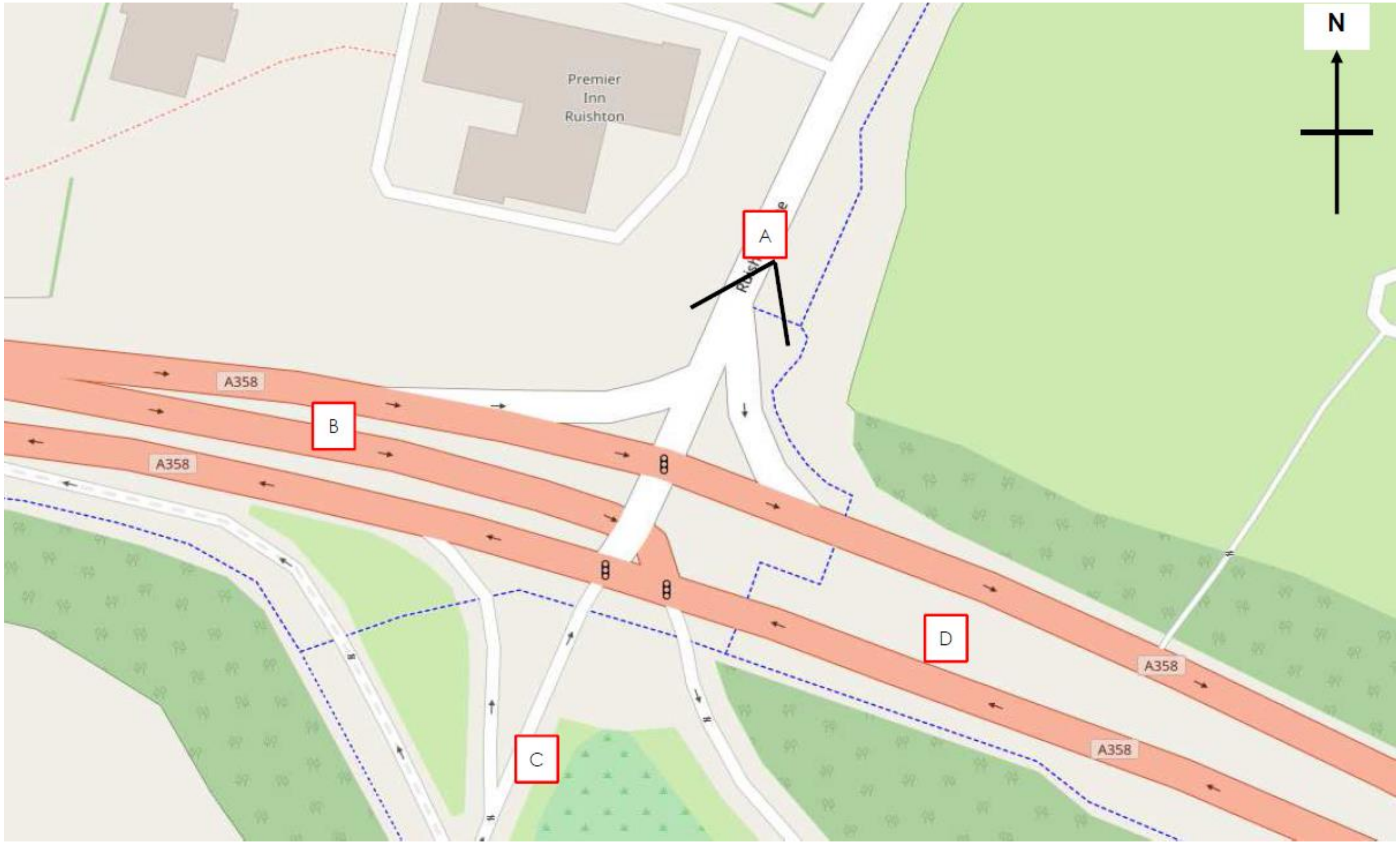

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Table 19.67: Turning Count Results for Site M3 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	86	81	-5.22%	0.49	PASS	62	61	-1.49%	0.12	PASS
B	D	883	821	-6.99%	2.12	PASS	559	510	-8.71%	2.11	PASS
A	B	162	156	-3.49%	0.45	PASS	139	134	-3.44%	0.41	PASS
A	D	6	0	-100.00%	3.50	PASS	4	0	-100.00%	2.84	PASS
D	B	828	751	-9.31%	2.74	PASS	607	559	-7.89%	1.98	PASS
B	C	40	38	-4.00%	0.26	PASS	39	38	-1.81%	0.11	PASS
D	C	29	29	-2.04%	0.11	PASS	28	29	1.50%	0.08	PASS
A	C	13	2	-83.07%	3.91	PASS	12	2	-82.05%	3.73	PASS
C	B	5	3	-35.96%	0.86	PASS	3	3	-7.29%	0.13	PASS
C	A	1	0	-93.22%	1.10	PASS	1	0	-93.22%	1.10	PASS
C	D	3	1	-54.19%	1.12	PASS	2	1	-41.10%	0.72	PASS

Table 19.68: Turning Count Results for Site M3 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	84	71	-15.59%	1.49	PASS	70	58	-17.03%	1.49	PASS
B	D	818	791	-3.33%	0.96	PASS	613	581	-5.22%	1.31	PASS
A	B	92	91	-0.48%	0.05	PASS	79	75	-4.49%	0.40	PASS
A	D	4	0	-100.00%	2.66	PASS	2	0	-100.00%	1.88	PASS
D	B	764	701	-8.27%	2.34	PASS	566	516	-8.92%	2.17	PASS
B	C	6	5	-11.03%	0.27	PASS	5	5	3.26%	0.07	PASS
D	C	8	6	-25.76%	0.79	PASS	8	6	-24.11%	0.72	PASS
A	C	2	1	-75.37%	1.44	PASS	2	1	-75.37%	1.44	PASS
C	B	10	9	-6.50%	0.20	PASS	9	9	2.32%	0.07	PASS
C	A	2	1	-76.25%	1.46	PASS	2	1	-74.27%	1.36	PASS
C	D	8	4	-48.42%	1.58	PASS	8	4	-47.27%	1.52	PASS

Table 19.69: Turning Count Results for Site M3 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	139	129	-7.56%	0.91	PASS	122	115	-6.22%	0.70	PASS
B	D	796	783	-1.55%	0.44	PASS	673	658	-2.21%	0.58	PASS
A	B	86	79	-7.91%	0.75	PASS	69	62	-9.14%	0.78	PASS
A	D	3	0	-100.00%	2.34	PASS	2	0	-100.00%	2.02	PASS
D	B	797	735	-7.76%	2.23	PASS	605	548	-9.54%	2.41	PASS
B	C	3	3	17.33%	0.27	PASS	3	3	17.33%	0.27	PASS
D	C	0	1	12200.00%	1.57	PASS	0	1	12200.00%	1.57	PASS
A	C	2	0	-91.47%	1.80	PASS	2	0	-91.47%	1.80	PASS
C	B	31	29	-4.63%	0.26	PASS	30	29	-2.04%	0.11	PASS
C	A	9	2	-80.95%	3.23	PASS	9	2	-79.42%	3.03	PASS
C	D	29	28	-4.57%	0.25	PASS	28	28	-1.12%	0.06	PASS

Figure 19.12: Site M4 - A358/Retail Park/Herons Gate Roundabout

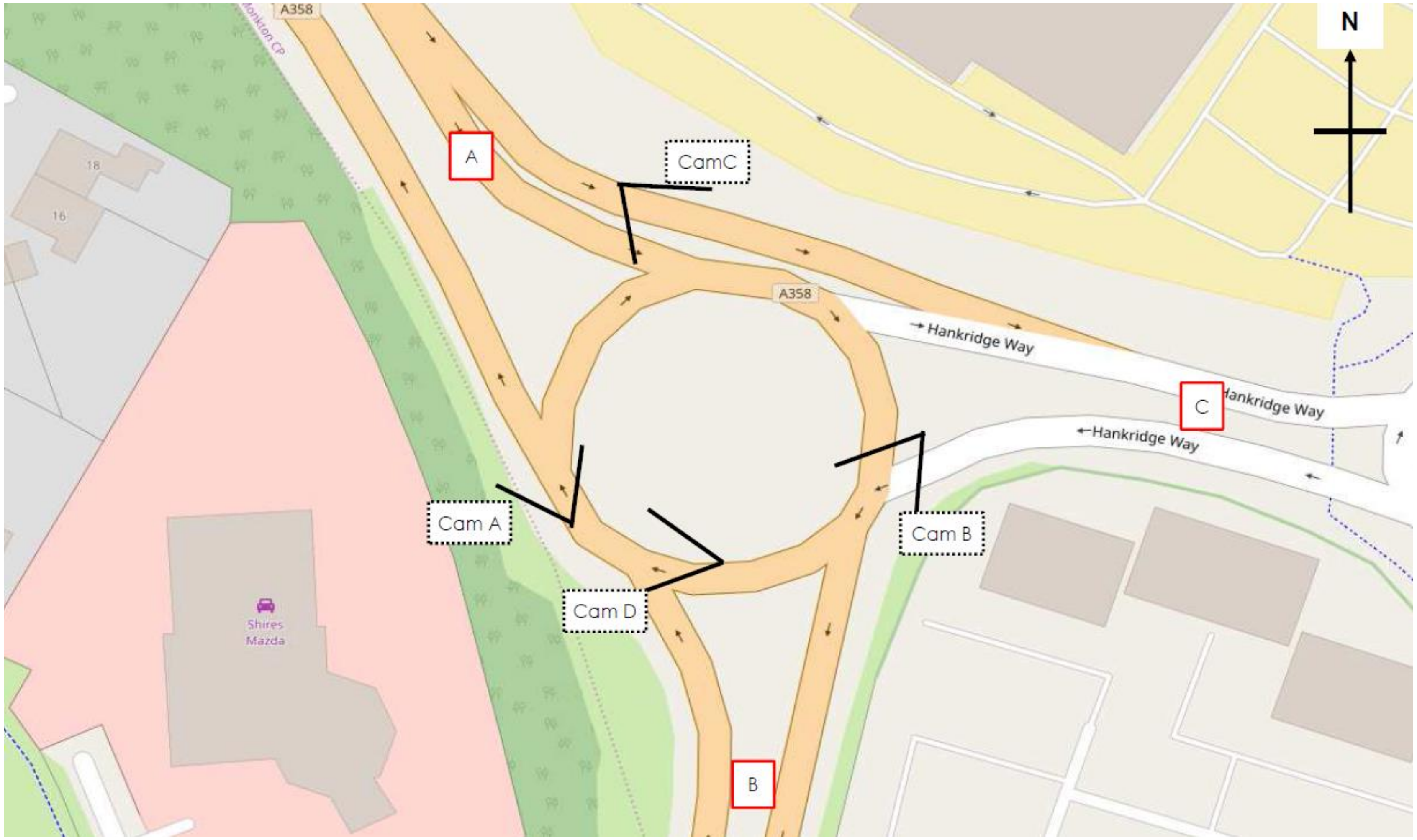

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Table 19.70: Turning Count Results for Site M4 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	1385	1274	-8.07%	3.07	PASS	1080	1015	-6.04%	2.02	PASS
B	B	3	0	-100.00%	2.35	PASS	3	0	-100.00%	2.35	PASS
B	C	189	191	1.25%	0.17	PASS	170	167	-1.50%	0.20	PASS
A	A	3	0	-100.00%	2.48	PASS	2	0	-100.00%	2.07	PASS
A	B	1277	1268	-0.69%	0.25	PASS	981	974	-0.77%	0.24	PASS
A	C	376	332	-11.61%	2.32	PASS	289	244	-15.55%	2.75	PASS
C	A	219	215	-2.00%	0.30	PASS	145	139	-4.28%	0.52	PASS
C	B	206	78	-61.96%	10.71	FAIL	173	45	-74.22%	12.30	FAIL
C	C	2	0	-100.00%	1.75	PASS	2	0	-100.00%	1.75	PASS

Table 19.71: Turning Count Results for Site M4 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	942	1010	7.22%	2.18	PASS	731	815	11.39%	3.00	PASS
B	B	4	0	-100.00%	2.88	PASS	2	0	-100.00%	2.22	PASS
B	C	274	107	-60.85%	12.08	FAIL	272	100	-63.14%	12.58	FAIL
A	A	8	0	-100.00%	3.98	PASS	6	0	-100.00%	3.52	PASS
A	B	866	1118	29.13%	8.01	FAIL	638	882	38.22%	8.85	FAIL
A	C	610	323	-47.02%	13.28	FAIL	534	247	-53.71%	14.51	FAIL
C	A	614	398	-35.17%	9.60	FAIL	541	325	-39.96%	10.39	FAIL
C	B	410	123	-70.02%	17.59	FAIL	406	114	-71.99%	18.12	FAIL
C	C	1	0	-100.00%	1.24	PASS	1	0	-100.00%	1.24	PASS

Table 19.72: Turning Count Results for Site M4 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	1322	1271	-3.89%	1.43	PASS	1113	1069	-3.93%	1.32	PASS
B	B	7	0	-100.00%	3.69	PASS	5	0	-100.00%	3.14	PASS
B	C	222	119	-46.36%	7.87	FAIL	214	107	-49.87%	8.41	FAIL
A	A	2	0	-100.00%	1.81	PASS	2	0	-100.00%	1.81	PASS
A	B	1133	1227	8.23%	2.72	PASS	972	1068	9.88%	3.01	PASS
A	C	443	305	-31.24%	7.16	FAIL	391	252	-35.66%	7.78	FAIL
C	A	384	326	-15.23%	3.11	PASS	344	285	-17.29%	3.36	PASS
C	B	266	128	-51.92%	9.83	FAIL	256	118	-53.77%	10.05	FAIL
C	C	0	0	-100.00%	0.79	PASS	0	0	-100.00%	0.79	PASS

Figure 19.13: Site M5 - A358/A38

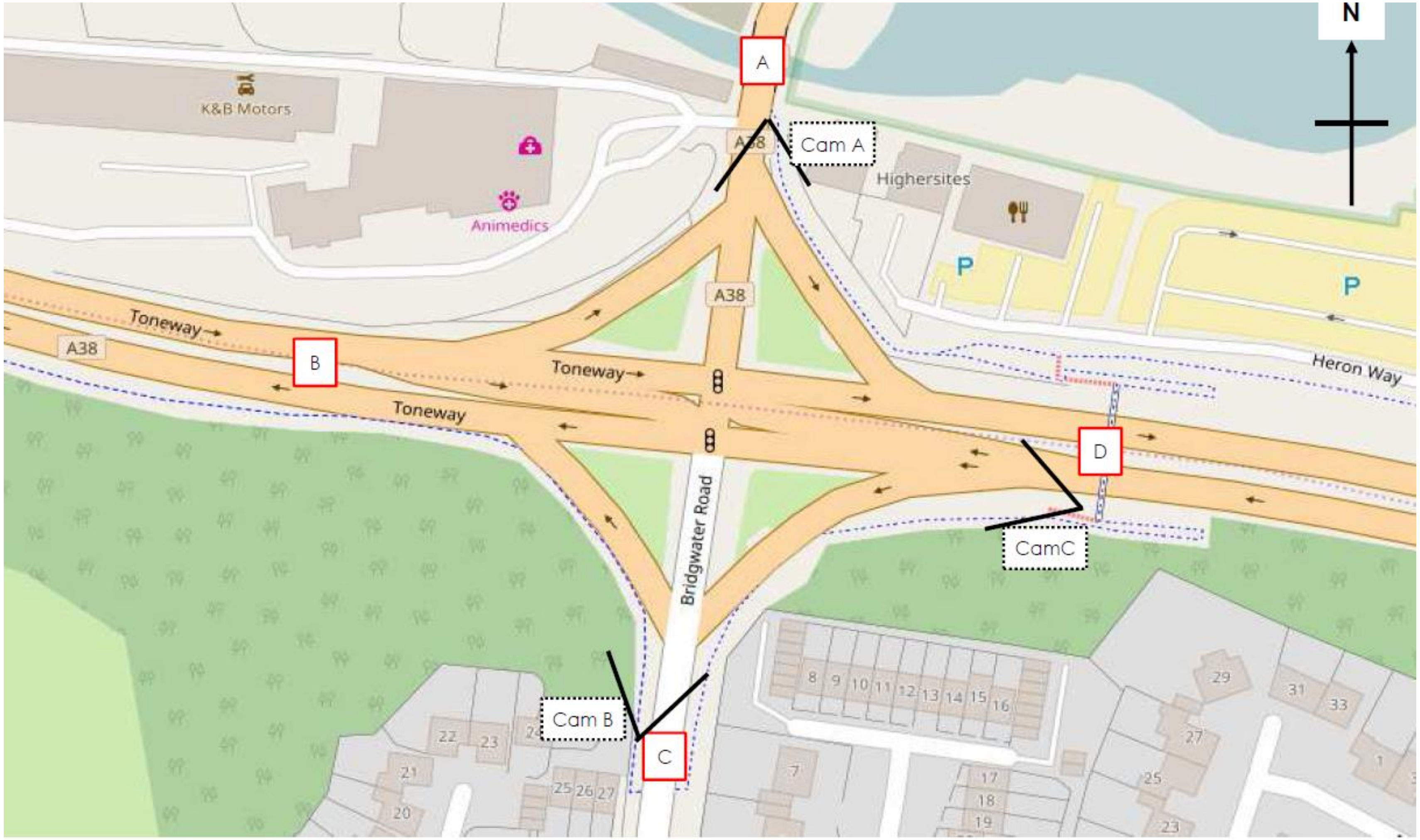

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Table 19.73: Turning Count Results for Site M5 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	C	1077	1024	-4.91%	1.63	PASS	808	782	-3.15%	0.90	PASS
B	C	29	0	-99.35%	7.60	PASS	25	0	-100.00%	7.05	PASS
B	A	169	167	-1.50%	0.20	PASS	125	125	-0.04%	0.00	PASS
A	B	333	317	-4.68%	0.86	PASS	293	282	-3.54%	0.61	PASS
A	C	139	140	0.54%	0.06	PASS	122	123	0.63%	0.07	PASS
A	D	210	226	7.68%	1.09	PASS	174	155	-11.04%	1.50	PASS
D	A	143	155	8.73%	1.02	PASS	101	110	8.88%	0.87	PASS
D	B	1207	1064	-11.86%	4.25	PASS	928	841	-9.34%	2.91	PASS
D	C	252	269	6.68%	1.04	PASS	213	203	-4.68%	0.69	PASS
C	C	362	350	-3.19%	0.61	PASS	303	280	-7.48%	1.33	PASS
C	A	139	136	-2.48%	0.29	PASS	119	117	-1.81%	0.20	PASS
C	B	53	52	-2.04%	0.15	PASS	42	42	-0.65%	0.04	PASS

Table 19.74: Turning Count Results for Site M5 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	C	1098	963	-12.29%	4.20	PASS	890	768	-13.77%	4.26	PASS
B	C	39	0	-99.54%	8.73	PASS	32	0	-100.00%	8.06	PASS
B	A	231	228	-1.30%	0.20	PASS	193	191	-0.99%	0.14	PASS
A	B	278	207	-25.46%	4.54	PASS	236	187	-21.09%	3.43	PASS
A	C	119	120	0.52%	0.06	PASS	105	106	0.44%	0.04	PASS
A	D	181	201	11.16%	1.46	PASS	142	135	-4.98%	0.60	PASS
D	A	206	233	12.84%	1.79	PASS	169	174	2.69%	0.35	PASS
D	B	1037	952	-8.24%	2.71	PASS	843	791	-6.26%	1.85	PASS
D	C	250	223	-10.69%	1.74	PASS	216	175	-19.00%	2.94	PASS
C	C	280	277	-0.85%	0.14	PASS	247	227	-8.12%	1.30	PASS
C	A	150	149	-1.12%	0.14	PASS	135	135	0.29%	0.03	PASS
C	B	58	60	4.39%	0.33	PASS	48	51	6.67%	0.45	PASS

Table 19.75: Turning Count Results for Site M5 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	C	1142	1059	-7.33%	2.52	PASS	988	917	-7.18%	2.30	PASS
B	C	42	0	-99.63%	9.15	PASS	39	0	-100.00%	8.83	PASS
B	A	286	287	0.23%	0.04	PASS	261	261	0.04%	0.01	PASS
A	B	241	221	-8.38%	1.33	PASS	213	207	-3.17%	0.47	PASS
A	C	140	138	-1.00%	0.12	PASS	122	122	0.06%	0.01	PASS
A	D	168	166	-1.45%	0.19	PASS	140	128	-8.74%	1.06	PASS
D	A	255	271	6.01%	0.95	PASS	224	228	1.39%	0.21	PASS
D	B	1033	962	-6.90%	2.26	PASS	888	823	-7.30%	2.22	PASS
D	C	367	364	-0.76%	0.14	PASS	327	303	-7.32%	1.35	PASS
C	C	318	307	-3.38%	0.61	PASS	284	275	-3.08%	0.52	PASS
C	A	183	182	-0.29%	0.04	PASS	168	168	-0.01%	0.00	PASS
C	B	27	44	63.07%	2.84	PASS	24	40	67.52%	2.84	PASS

Figure 19.14: Site M6 - A358/A378

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Table 19.76: Turning Count Results for Site M6 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	255	263	3.08%	0.49	PASS	216	215	-0.33%	0.05	PASS
B	C	79	65	-17.20%	1.60	PASS	55	49	-10.53%	0.80	PASS
A	C	857	796	-7.15%	2.13	PASS	543	533	-1.78%	0.42	PASS
A	B	163	158	-2.94%	0.38	PASS	114	109	-4.62%	0.50	PASS
C	A	817	823	0.74%	0.21	PASS	609	623	2.29%	0.56	PASS
C	B	43	38	-11.60%	0.78	PASS	27	27	0.19%	0.01	PASS

Table 19.77: Turning Count Results for Site M6 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	215	208	-3.28%	0.49	PASS	172	171	-0.41%	0.05	PASS
B	C	13	15	14.42%	0.50	PASS	9	11	24.33%	0.69	PASS
A	C	819	717	-12.44%	3.67	PASS	600	515	-14.11%	3.59	PASS
A	B	234	210	-10.28%	1.61	PASS	193	175	-9.21%	1.31	PASS
C	A	800	725	-9.40%	2.72	PASS	567	536	-5.51%	1.33	PASS
C	B	11	15	33.00%	1.01	PASS	7	11	53.86%	1.26	PASS

Table 19.78: Turning Count Results for Site M6 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	A	153	157	2.33%	0.29	PASS	128	129	0.53%	0.06	PASS
B	C	91	64	-29.75%	3.08	PASS	68	49	-28.06%	2.50	PASS
A	C	794	766	-3.49%	0.99	PASS	657	631	-4.00%	1.03	PASS
A	B	228	224	-1.63%	0.25	PASS	200	197	-1.68%	0.24	PASS
C	A	868	847	-2.38%	0.71	PASS	669	649	-2.99%	0.78	PASS
C	B	100	67	-32.57%	3.56	PASS	81	54	-33.40%	3.29	PASS

Figure 19.15: Site 1A - A303 Sparkford Roundabout

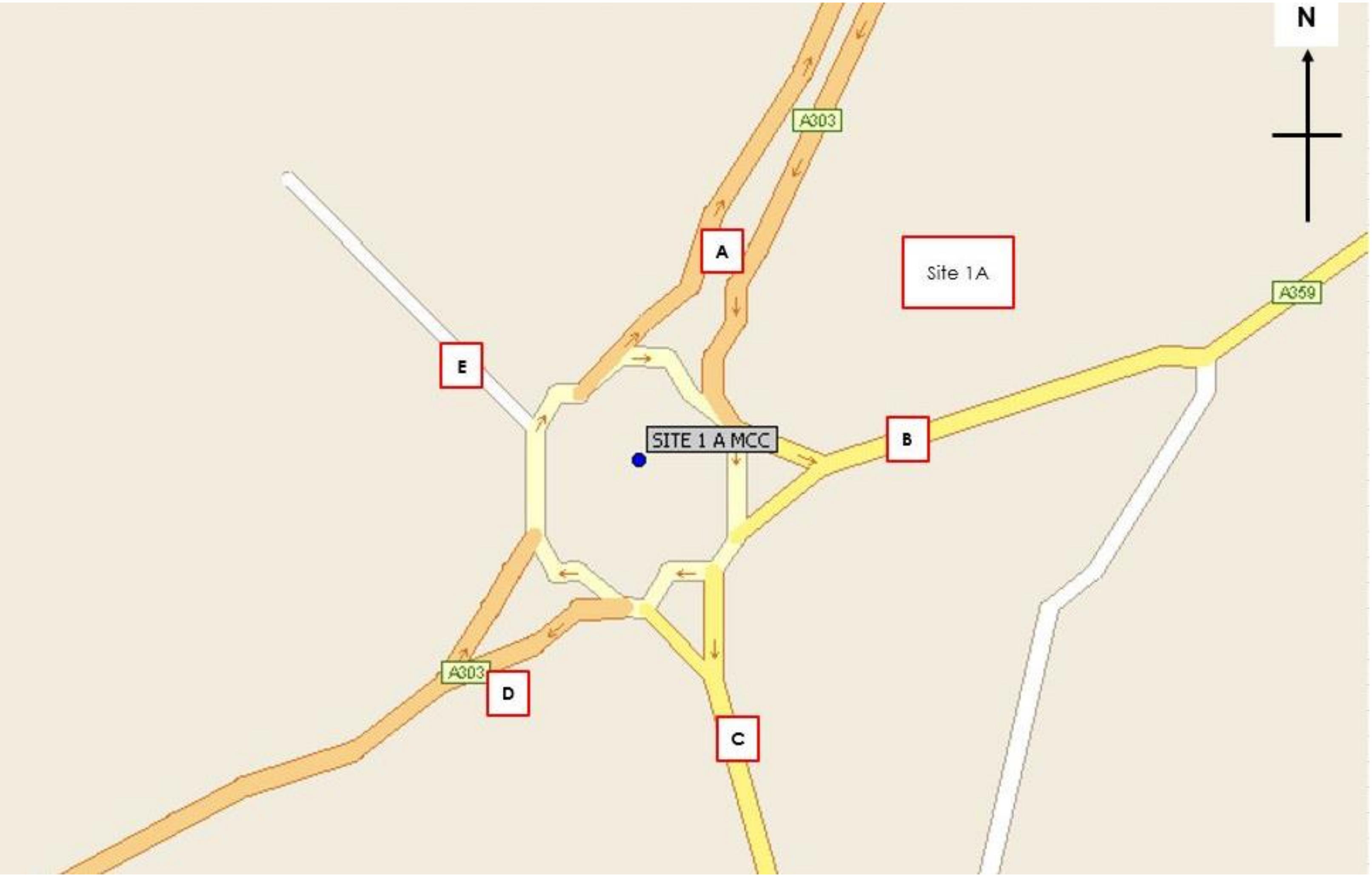

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Table 19.79: Turning Count Results for Site 1A - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	2	0	-100.00%	2.00	PASS	2	0	-100.00%	1.80	PASS
A	B	49	0	-99.52%	9.79	PASS	47	0	-100.00%	9.72	PASS
A	C	136	157	15.48%	1.74	PASS	135	136	0.56%	0.06	PASS
A	D	468	498	6.30%	1.34	PASS	349	346	-0.65%	0.12	PASS
B	A	73	0	-100.00%	12.12	PASS	71	0	-100.00%	11.95	PASS
B	B	0	0	-100.00%	0.74	PASS	0	0	0.00%	0.00	PASS
B	C	42	74	77.43%	4.25	PASS	41	59	43.60%	2.54	PASS
B	D	129	155	20.55%	2.22	PASS	113	130	15.04%	1.54	PASS
C	A	140	196	39.41%	4.27	PASS	136	152	11.42%	1.30	PASS
C	B	1	12	1082.83%	4.26	PASS	1	7	604.48%	3.00	PASS
C	C	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
C	D	25	1	-96.90%	6.77	PASS	13	0	-100.00%	5.04	PASS
D	A	540	696	28.90%	6.28	FAIL	418	520	24.38%	4.71	PASS
D	B	80	44	-45.25%	4.59	PASS	66	29	-56.52%	5.44	PASS
D	C	24	2	-92.89%	6.23	PASS	9	0	-100.00%	4.28	PASS
D	D	32	0	-100.00%	8.04	PASS	1	0	-100.00%	1.60	PASS

Table 19.80: Turning Count Results for Site 1A - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	1	0	-99.98%	1.45	PASS	1	0	-100.00%	1.45	PASS
A	B	38	1	-98.40%	8.56	PASS	38	0	-100.00%	8.77	PASS
A	C	131	112	-14.58%	1.74	PASS	131	88	-32.72%	4.10	PASS
A	D	565	575	1.83%	0.43	PASS	435	427	-2.00%	0.42	PASS
B	A	35	0	-100.00%	8.34	PASS	33	0	-100.00%	8.07	PASS
B	B	0	0	-100.00%	0.76	PASS	0	0	0.00%	0.00	PASS
B	C	37	67	80.88%	4.14	PASS	35	56	58.71%	3.07	PASS
B	D	118	117	-1.35%	0.15	PASS	100	97	-2.36%	0.24	PASS
C	A	158	191	21.01%	2.51	PASS	157	156	-0.95%	0.12	PASS
C	B	10	11	13.34%	0.40	PASS	9	9	0.00%	0.00	PASS
C	C	0	0	-100.00%	0.56	PASS	0	0	0.00%	0.00	PASS
C	D	31	0	-99.02%	7.75	PASS	18	0	-100.00%	5.93	PASS
D	A	588	641	8.94%	2.12	PASS	452	485	7.41%	1.55	PASS
D	B	77	31	-59.38%	6.21	PASS	66	21	-68.51%	6.87	PASS
D	C	26	0	-99.57%	7.11	PASS	15	0	-100.00%	5.51	PASS
D	D	20	0	-100.00%	6.29	PASS	2	0	-100.00%	2.20	PASS

Table 19.81: Turning Count Results for Site 1A - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	9	0	-99.98%	4.35	PASS	1	0	-100.00%	1.48	PASS
A	B	51	1	-97.69%	9.74	PASS	49	0	-100.00%	9.95	PASS
A	C	172	223	29.28%	3.59	PASS	171	171	-0.12%	0.02	PASS
A	D	696	713	2.48%	0.65	PASS	579	569	-1.79%	0.43	PASS
B	A	55	0	-100.00%	10.48	PASS	52	0	-100.00%	10.25	PASS
B	B	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
B	C	45	97	114.88%	6.15	PASS	45	90	99.75%	5.47	PASS
B	D	165	168	1.76%	0.23	PASS	146	148	1.49%	0.18	PASS
C	A	229	267	16.52%	2.40	PASS	228	227	-0.16%	0.02	PASS
C	B	15	17	12.25%	0.46	PASS	15	15	-0.14%	0.01	PASS
C	C	0	0	-100.00%	0.23	PASS	0	0	0.00%	0.00	PASS
C	D	34	0	-99.93%	8.20	PASS	21	0	-100.00%	6.41	PASS
D	A	621	703	13.11%	3.17	PASS	515	574	11.62%	2.56	PASS
D	B	130	35	-73.01%	10.46	PASS	121	27	-78.03%	11.01	PASS
D	C	25	0	-99.95%	7.04	PASS	14	0	-100.00%	5.28	PASS
D	D	38	0	-100.00%	8.76	PASS	2	0	-100.00%	1.76	PASS

Figure 19.16: Site 2A - A303/Traits Lane Junction

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Table 19.82: Turning Count Results for Site 2A - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	A	750	741	-1.17%	0.32	PASS	553	549	-0.70%	0.16	PASS
C	B	1	0	-100.00%	1.61	PASS	1	0	-100.00%	1.54	PASS
A	C	725	653	-9.93%	2.74	PASS	534	475	-11.04%	2.63	PASS
A	B	0	0	-100.00%	0.58	PASS	0	0	0.00%	0.00	PASS
B	C	1	0	-100.00%	1.30	PASS	1	0	-100.00%	1.28	PASS
B	A	0	0	-100.00%	0.28	PASS	0	0	0.00%	0.00	PASS

Table 19.83: Turning Count Results for Site 2A - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	A	728	672	-7.63%	2.10	PASS	562	506	-9.96%	2.42	PASS
C	B	1	0	-100.00%	1.20	PASS	1	0	-100.00%	1.12	PASS
A	C	760	692	-8.93%	2.52	PASS	586	524	-10.67%	2.66	PASS
A	B	0	0	-100.00%	0.77	PASS	0	0	-100.00%	0.77	PASS
B	C	1	0	-100.00%	1.15	PASS	1	0	-100.00%	1.10	PASS
B	A	0	0	-100.00%	0.36	PASS	0	0	-100.00%	0.36	PASS

Table 19.84: Turning Count Results for Site 2A - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	A	747	738	-1.12%	0.31	PASS	609	601	-1.30%	0.32	PASS
C	B	1	0	-100.00%	1.43	PASS	1	0	-100.00%	1.36	PASS
A	C	883	882	-0.15%	0.04	PASS	717	717	0.00%	0.00	PASS
A	B	0	0	-100.00%	0.25	PASS	0	0	0.00%	0.00	PASS
B	C	1	0	-100.00%	1.64	PASS	1	0	-100.00%	1.59	PASS
B	A	0	0	-100.00%	0.37	PASS	0	0	0.00%	0.00	PASS

Figure 19.17: Site 3A - A303/Howell Hill Junction

Table 19.85: Turning Count Results for Site 3A - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	D	1	0	-100.00%	1.68	PASS	0	0	-100.00%	0.87	PASS
C	B	17	0	-100.00%	5.82	PASS	13	0	-100.00%	5.11	PASS
C	A	744	733	-1.47%	0.40	PASS	548	542	-1.20%	0.28	PASS
D	C	2	0	-100.00%	2.13	PASS	1	0	-100.00%	1.48	PASS
D	B	3	0	-100.00%	2.48	PASS	2	0	-100.00%	2.20	PASS
D	A	3	0	-100.00%	2.52	PASS	3	0	-100.00%	2.52	PASS
B	C	20	0	-100.00%	6.35	PASS	17	0	-100.00%	5.90	PASS
B	D	2	0	-100.00%	1.97	PASS	2	0	-100.00%	1.97	PASS
B	A	7	8	18.17%	0.44	PASS	7	7	7.74%	0.19	PASS
A	C	708	643	-9.19%	2.50	PASS	520	467	-10.23%	2.39	PASS
A	D	10	0	-100.00%	4.42	PASS	9	0	-100.00%	4.30	PASS
A	B	16	9	-42.18%	1.92	PASS	16	9	-44.46%	2.00	PASS

Table 19.86: Turning Count Results for Site 3A - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	D	1	0	-100.00%	1.64	PASS	1	0	-100.00%	1.25	PASS
C	B	13	0	-100.00%	5.08	PASS	11	0	-100.00%	4.76	PASS
C	A	720	666	-7.44%	2.04	PASS	553	502	-9.29%	2.24	PASS
D	C	1	0	-100.00%	1.71	PASS	1	0	-100.00%	1.55	PASS
D	B	2	0	-100.00%	2.02	PASS	2	0	-100.00%	2.02	PASS
D	A	6	0	-100.00%	3.56	PASS	5	0	-100.00%	3.27	PASS
B	C	11	0	-100.00%	4.74	PASS	11	0	-100.00%	4.66	PASS
B	D	2	0	-100.00%	2.04	PASS	2	0	-100.00%	2.04	PASS
B	A	6	6	6.09%	0.14	PASS	4	4	12.85%	0.24	PASS
A	C	751	684	-8.96%	2.51	PASS	579	518	-10.52%	2.60	PASS
A	D	5	0	-100.00%	3.09	PASS	4	0	-100.00%	2.84	PASS
A	B	8	8	2.28%	0.06	PASS	6	6	0.32%	0.01	PASS

Table 19.87: Turning Count Results for Site 3A - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	D	3	0	-100.00%	2.46	PASS	2	0	-100.00%	1.91	PASS
C	B	5	0	-100.00%	3.13	PASS	2	0	-100.00%	1.85	PASS
C	A	759	736	-3.05%	0.85	PASS	621	599	-3.48%	0.87	PASS
D	C	2	0	-100.00%	1.93	PASS	0	0	-100.00%	0.88	PASS
D	B	4	0	-100.00%	2.69	PASS	3	0	-100.00%	2.60	PASS
D	A	8	0	-100.00%	3.99	PASS	8	0	-100.00%	3.99	PASS
B	C	31	0	-100.00%	7.83	PASS	28	0	-100.00%	7.45	PASS
B	D	3	0	-100.00%	2.42	PASS	3	0	-100.00%	2.42	PASS
B	A	2	3	56.23%	0.64	PASS	2	2	20.64%	0.25	PASS
A	C	864	857	-0.77%	0.23	PASS	699	693	-0.84%	0.22	PASS
A	D	5	0	-100.00%	3.16	PASS	5	0	-100.00%	3.16	PASS
A	B	28	24	-14.35%	0.79	PASS	28	24	-14.66%	0.81	PASS

Figure 19.18: Site 4A - A303/Plowage Lane Junction

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Table 19.88: Turning Count Results for Site 4A - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	27	29	6.73%	0.35	PASS	22	24	11.54%	0.52	PASS
D	B	745	733	-1.58%	0.43	PASS	539	542	0.46%	0.11	PASS
C	D	22	21	-4.90%	0.23	PASS	17	20	12.39%	0.50	PASS
C	B	0	0	-100.00%	0.89	PASS	0	0	-100.00%	0.89	PASS
B	D	696	643	-7.58%	2.04	PASS	512	467	-8.94%	2.07	PASS
B	C	2	0	-100.00%	1.95	PASS	1	0	-100.00%	1.60	PASS

Table 19.89: Turning Count Results for Site 4A - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	12	22	79.55%	2.37	PASS	10	20	90.60%	2.43	PASS
D	B	695	666	-4.17%	1.11	PASS	523	502	-4.09%	0.95	PASS
C	D	16	22	39.17%	1.43	PASS	13	20	58.53%	1.82	PASS
C	B	1	0	-100.00%	1.49	PASS	1	0	-100.00%	1.13	PASS
B	D	695	684	-1.56%	0.41	PASS	525	518	-1.30%	0.30	PASS
B	C	3	0	-100.00%	2.28	PASS	2	0	-100.00%	1.98	PASS

Table 19.90: Turning Count Results for Site 4A - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	25	21	-13.94%	0.72	PASS	23	19	-14.24%	0.70	PASS
D	B	910	736	-19.18%	6.08	FAIL	725	599	-17.41%	4.91	PASS
C	D	27	17	-37.47%	2.15	PASS	21	13	-39.65%	2.05	PASS
C	B	3	0	-100.00%	2.25	PASS	2	0	-100.00%	2.13	PASS
B	D	1149	857	-25.39%	9.21	FAIL	917	693	-24.45%	7.90	FAIL
B	C	2	0	-100.00%	1.84	PASS	1	0	-100.00%	1.42	PASS

Figure 19.19: Site 5A - A303/B3151

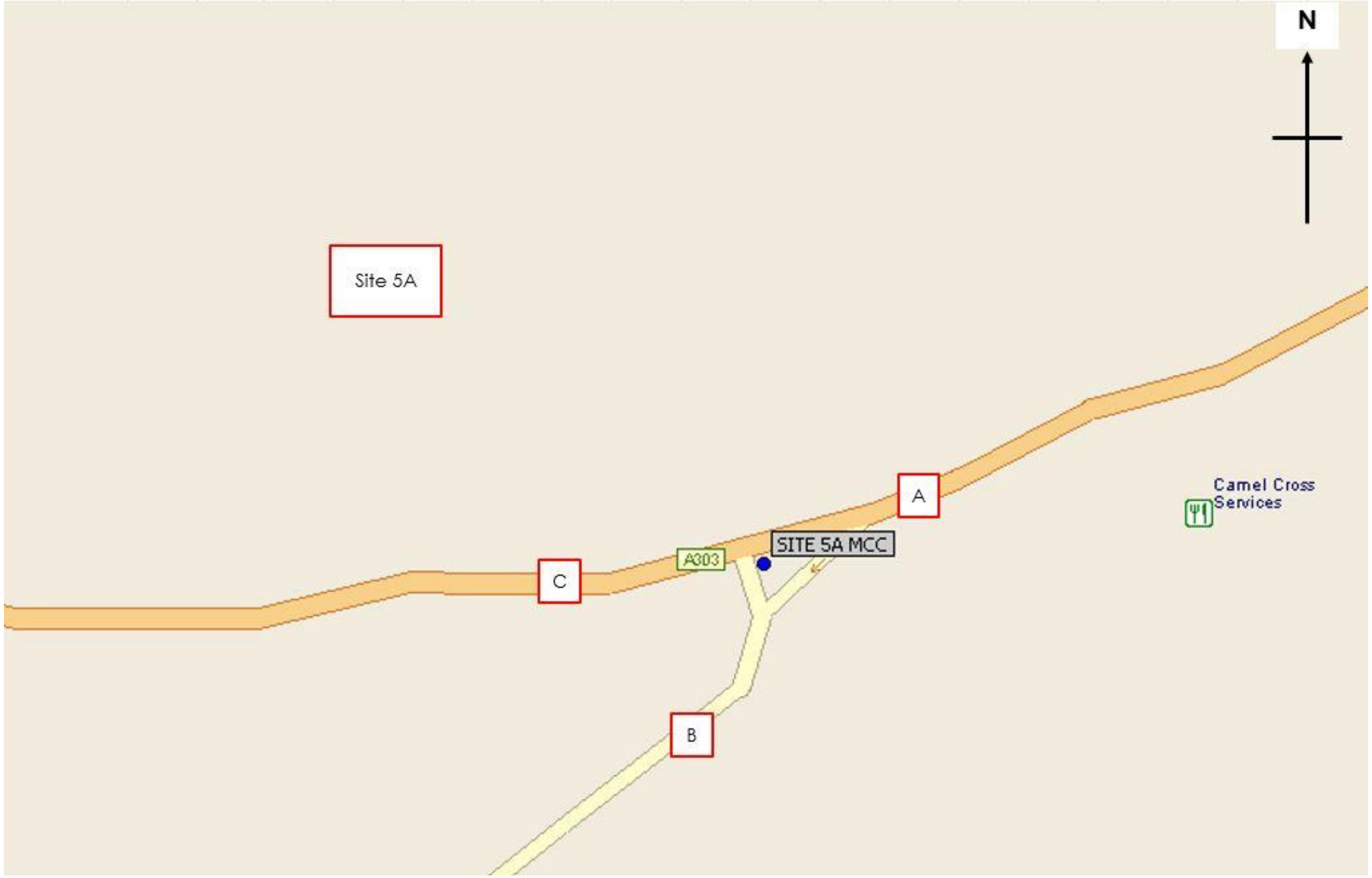

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Table 19.91: Turning Count Results for Site 5A - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	C	548	564	2.94%	0.68	PASS	389	401	3.12%	0.61	PASS
A	B	98	100	2.41%	0.24	PASS	85	85	0.27%	0.02	PASS
C	A	673	700	3.95%	1.02	PASS	487	515	5.69%	1.24	PASS
C	B	20	1	-97.19%	6.05	PASS	10	0	-100.00%	4.53	PASS
B	A	27	62	132.66%	5.33	PASS	23	51	126.18%	4.71	PASS
B	C	6	0	-98.49%	3.41	PASS	3	0	-100.00%	2.26	PASS

Table 19.92: Turning Count Results for Site 5A - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	C	611	658	7.72%	1.87	PASS	460	499	8.43%	1.77	PASS
A	B	48	48	1.48%	0.10	PASS	38	39	1.70%	0.10	PASS
C	A	610	649	6.46%	1.57	PASS	453	490	8.01%	1.67	PASS
C	B	11	0	-95.87%	4.34	PASS	7	0	-100.00%	3.82	PASS
B	A	37	39	6.07%	0.36	PASS	31	32	2.79%	0.15	PASS
B	C	13	0	-98.72%	5.08	PASS	7	0	-100.00%	3.84	PASS

Table 19.93: Turning Count Results for Site 5A - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	C	790	801	1.35%	0.38	PASS	629	642	2.09%	0.52	PASS
A	B	60	73	22.88%	1.68	PASS	51	64	25.87%	1.74	PASS
C	A	618	698	12.97%	3.12	PASS	491	566	15.19%	3.24	PASS
C	B	5	0	-91.89%	2.76	PASS	4	0	-100.00%	2.92	PASS
B	A	59	59	-0.33%	0.03	PASS	53	53	0.26%	0.02	PASS
B	C	10	0	-99.69%	4.52	PASS	8	0	-100.00%	3.88	PASS

Figure 19.20: Site 6A - A303 Podimore Roundabout

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Table 19.94: Turning Count Results for Site 6A - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	B	461	508	10.13%	2.12	PASS	326	372	14.06%	2.45	PASS
D	D	1	0	-100.00%	1.56	PASS	1	0	-100.00%	1.56	PASS
D	A	272	303	11.58%	1.86	PASS	209	236	13.19%	1.85	PASS
D	E	113	102	-9.58%	1.04	PASS	83	87	4.78%	0.43	PASS
D	C	24	0	-100.00%	6.87	PASS	19	0	-100.00%	6.21	PASS
B	B	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
B	D	435	437	0.58%	0.12	PASS	306	302	-1.55%	0.27	PASS
B	A	9	4	-56.86%	1.96	PASS	6	3	-57.95%	1.68	PASS
B	E	109	123	12.61%	1.28	PASS	81	97	20.00%	1.71	PASS
B	C	6	0	-100.00%	3.60	PASS	3	0	-100.00%	2.52	PASS
A	B	57	25	-55.93%	4.95	PASS	39	18	-53.44%	3.90	PASS
A	D	273	335	22.45%	3.52	PASS	205	253	23.33%	3.16	PASS
A	A	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
A	E	6	1	-82.01%	2.71	PASS	2	0	-77.90%	1.45	PASS
A	C	23	30	27.75%	1.25	PASS	17	24	42.15%	1.58	PASS
E	B	186	168	-9.22%	1.29	PASS	139	125	-10.52%	1.28	PASS
E	D	108	12	-88.46%	12.32	PASS	79	0	-99.46%	12.49	PASS
E	A	16	10	-35.52%	1.55	PASS	10	7	-34.47%	1.23	PASS
E	E	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
E	C	20	18	-8.93%	0.40	PASS	14	12	-18.45%	0.73	PASS
C	B	5	0	-100.00%	3.15	PASS	3	0	-100.00%	2.50	PASS
C	D	22	0	-100.00%	6.56	PASS	13	0	-100.00%	5.11	PASS
C	A	9	8	-3.14%	0.09	PASS	7	6	-7.97%	0.21	PASS
C	E	10	16	64.86%	1.75	PASS	7	12	63.14%	1.48	PASS
C	C	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

Table 19.95: Turning Count Results for Site 6A - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
A	B	43	21	-50.91%	3.85	PASS	29	15	-46.99%	2.89	PASS
A	C	10	12	25.64%	0.76	PASS	6	9	62.16%	1.29	PASS
A	D	260	293	12.63%	1.98	PASS	194	221	13.80%	1.86	PASS
A	E	2	1	-55.57%	0.83	PASS	2	0	-74.23%	1.19	PASS
B	A	15	5	-67.89%	3.21	PASS	7	4	-38.09%	1.12	PASS
B	B	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
B	C	7	0	-100.00%	3.69	PASS	4	0	-100.00%	2.72	PASS
B	D	551	543	-1.54%	0.36	PASS	412	409	-0.70%	0.14	PASS
B	E	116	111	-4.87%	0.53	PASS	85	85	0.79%	0.07	PASS
C	A	8	6	-25.54%	0.78	PASS	5	4	-25.38%	0.64	PASS
C	B	6	0	-100.00%	3.42	PASS	4	0	-100.00%	2.78	PASS
C	C	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
C	D	23	0	-100.00%	6.86	PASS	16	0	-100.00%	5.69	PASS
C	E	10	18	73.72%	2.03	PASS	8	14	91.26%	2.08	PASS
D	A	291	277	-4.85%	0.84	PASS	210	196	-6.76%	1.00	PASS
D	B	512	495	-3.27%	0.75	PASS	381	370	-2.88%	0.57	PASS
D	C	10	0	-100.00%	4.40	PASS	9	0	-100.00%	4.19	PASS
D	D	1	0	-100.00%	1.52	PASS	1	0	-100.00%	1.52	PASS
D	E	108	100	-7.44%	0.79	PASS	80	86	7.19%	0.63	PASS
E	A	17	11	-35.69%	1.62	PASS	10	8	-23.38%	0.80	PASS
E	B	126	134	6.26%	0.69	PASS	96	105	9.24%	0.88	PASS
E	C	4	9	130.34%	1.97	PASS	3	8	148.05%	2.05	PASS
E	D	71	33	-53.63%	5.27	PASS	51	27	-46.88%	3.82	PASS
E	E	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

Table 19.96: Turning Count Results for Site 6A - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
A	B	37	19	-47.21%	3.28	PASS	31	17	-43.07%	2.69	PASS
A	C	19	21	8.50%	0.36	PASS	17	19	12.64%	0.50	PASS
A	D	347	384	10.63%	1.93	PASS	296	334	13.03%	2.17	PASS
A	E	1	1	85.64%	0.61	PASS	1	0	-57.87%	0.59	PASS
B	A	13	4	-71.78%	3.20	PASS	7	2	-67.49%	2.27	PASS
B	B	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
B	C	8	0	-100.00%	4.12	PASS	5	0	-100.00%	3.12	PASS
B	D	624	618	-0.91%	0.23	PASS	503	503	-0.14%	0.03	PASS
B	E	193	179	-7.27%	1.03	PASS	147	137	-6.74%	0.83	PASS
C	A	25	24	-4.20%	0.21	PASS	19	19	-0.39%	0.02	PASS
C	B	9	0	-100.00%	4.31	PASS	6	0	-100.00%	3.57	PASS
C	C	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
C	D	36	0	-98.88%	8.37	PASS	30	0	-98.66%	7.62	PASS
C	E	36	49	34.46%	1.92	PASS	28	37	31.94%	1.58	PASS
D	A	399	385	-3.65%	0.74	PASS	335	322	-3.82%	0.71	PASS
D	B	551	531	-3.64%	0.86	PASS	430	419	-2.45%	0.51	PASS
D	C	16	0	-100.00%	5.67	PASS	15	0	-100.00%	5.44	PASS
D	D	1	0	-100.00%	1.59	PASS	1	0	-100.00%	1.59	PASS
D	E	147	139	-5.22%	0.64	PASS	124	120	-3.26%	0.37	PASS
E	A	21	8	-61.98%	3.39	PASS	14	7	-50.11%	2.18	PASS
E	B	135	148	9.70%	1.10	PASS	115	129	11.91%	1.24	PASS
E	C	2	19	754.42%	5.09	PASS	2	15	582.39%	4.34	PASS
E	D	120	20	-83.33%	11.94	PASS	102	11	-89.29%	12.14	PASS
E	E	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

Figure 19.21: Site TC1 - A303/A357/Station Road (Southfields Roundabout)

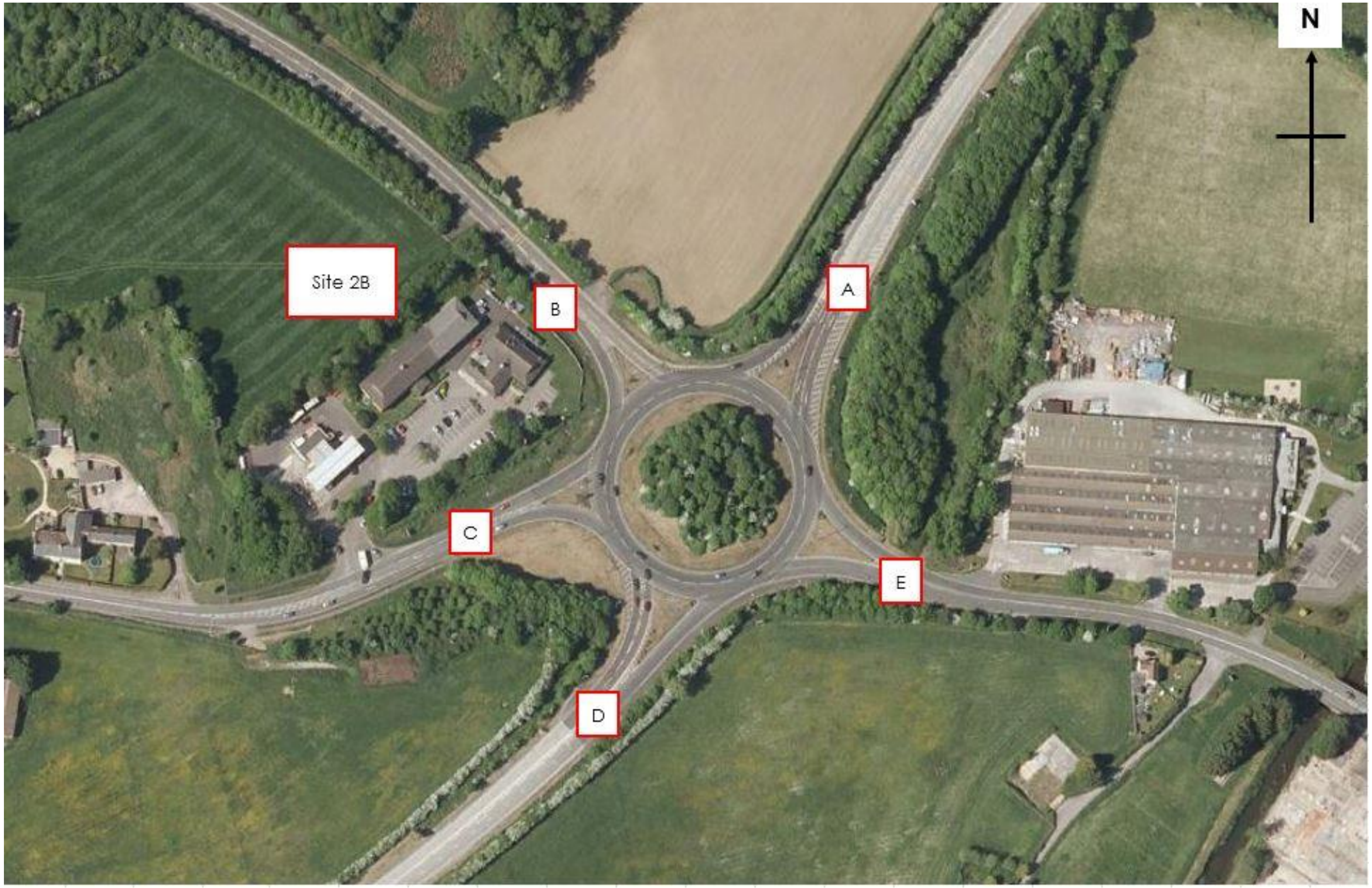

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Table 19.97: Turning Count Results for Site TC1 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	2	0	-100.00%	2.17	PASS	1	0	-100.00%	1.42	PASS
B	D	30	13	-55.58%	3.59	PASS	13	10	-24.80%	0.97	PASS
B	A	524	421	-19.78%	4.77	PASS	362	291	-19.64%	3.93	PASS
B	E	177	176	-0.80%	0.11	PASS	126	124	-1.22%	0.14	PASS
B	C	193	181	-5.95%	0.84	PASS	128	118	-8.18%	0.95	PASS
D	B	27	21	-24.15%	1.34	PASS	14	14	0.29%	0.01	PASS
D	D	1	0	-100.00%	1.42	PASS	1	0	-100.00%	1.16	PASS
D	A	269	327	21.37%	3.33	PASS	204	248	21.30%	2.89	PASS
D	E	43	43	0.07%	0.00	PASS	34	34	-0.05%	0.00	PASS
D	C	15	0	-100.00%	5.45	PASS	11	0	-100.00%	4.70	PASS
A	B	481	373	-22.49%	5.23	FAIL	356	271	-23.78%	4.78	PASS
A	D	407	369	-9.36%	1.93	PASS	296	257	-13.30%	2.37	PASS
A	A	0	0	-100.00%	0.93	PASS	0	0	-100.00%	0.93	PASS
A	E	26	0	-100.00%	7.24	PASS	16	0	-100.00%	5.65	PASS
A	C	73	71	-3.70%	0.32	PASS	44	43	-2.10%	0.14	PASS
E	B	212	209	-1.24%	0.18	PASS	169	169	-0.46%	0.06	PASS
E	D	69	45	-34.12%	3.11	PASS	52	37	-28.91%	2.25	PASS
E	A	24	0	-100.00%	6.91	PASS	15	0	-100.00%	5.40	PASS
E	E	1	0	-100.00%	1.16	PASS	0	0	-100.00%	0.82	PASS
E	C	104	110	5.47%	0.55	PASS	86	91	5.86%	0.54	PASS
C	B	211	214	1.58%	0.23	PASS	158	158	-0.37%	0.05	PASS
C	D	12	0	-100.00%	4.80	PASS	5	0	-100.00%	3.17	PASS
C	A	84	85	0.36%	0.03	PASS	68	68	0.16%	0.01	PASS
C	E	111	110	-0.87%	0.09	PASS	90	90	-0.95%	0.09	PASS
C	C	2	0	-100.00%	2.00	PASS	2	0	-100.00%	2.00	PASS

Table 19.98: Turning Count Results for Site TC1 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	1	0	-100.00%	1.57	PASS	1	0	-100.00%	1.45	PASS
B	D	19	12	-39.34%	1.93	PASS	13	9	-32.63%	1.29	PASS
B	A	432	382	-11.60%	2.48	PASS	323	278	-14.01%	2.61	PASS
B	E	135	134	-0.28%	0.03	PASS	115	114	-0.39%	0.04	PASS
B	C	129	140	9.05%	1.00	PASS	69	82	18.98%	1.50	PASS
D	B	28	19	-31.35%	1.82	PASS	13	14	7.67%	0.27	PASS
D	D	1	0	-100.00%	1.03	PASS	1	0	-100.00%	1.03	PASS
D	A	368	381	3.61%	0.69	PASS	277	292	5.55%	0.91	PASS
D	E	33	32	-3.77%	0.22	PASS	27	27	-2.29%	0.12	PASS
D	C	22	0	-100.00%	6.57	PASS	18	0	-100.00%	5.96	PASS
A	B	432	398	-7.95%	1.69	PASS	304	279	-8.05%	1.43	PASS
A	D	378	384	1.67%	0.32	PASS	298	296	-0.57%	0.10	PASS
A	A	1	0	-100.00%	1.45	PASS	1	0	-100.00%	1.32	PASS
A	E	21	0	-100.00%	6.43	PASS	13	0	-100.00%	5.09	PASS
A	C	62	59	-5.07%	0.40	PASS	37	35	-4.66%	0.29	PASS
E	B	133	131	-1.57%	0.18	PASS	114	114	-0.60%	0.06	PASS
E	D	44	40	-7.74%	0.52	PASS	35	32	-9.04%	0.55	PASS
E	A	24	0	-100.00%	6.97	PASS	14	0	-100.00%	5.31	PASS
E	E	1	0	-100.00%	1.03	PASS	0	0	-100.00%	0.59	PASS
E	C	104	104	0.27%	0.03	PASS	81	81	0.10%	0.01	PASS
C	B	118	146	24.51%	2.51	PASS	84	101	20.29%	1.77	PASS
C	D	10	0	-100.00%	4.40	PASS	7	0	-100.00%	3.85	PASS
C	A	94	94	0.02%	0.00	PASS	69	70	0.61%	0.05	PASS
C	E	111	110	-0.84%	0.09	PASS	88	87	-1.56%	0.15	PASS
C	C	2	0	-100.00%	2.06	PASS	1	0	-100.00%	1.68	PASS

Table 19.99: Turning Count Results for Site TC1 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	1	0	-100.00%	1.65	PASS	1	0	-100.00%	1.43	PASS
B	D	22	14	-36.04%	1.87	PASS	15	12	-18.47%	0.74	PASS
B	A	449	391	-12.73%	2.79	PASS	364	322	-11.52%	2.26	PASS
B	E	213	208	-2.20%	0.32	PASS	184	180	-2.24%	0.31	PASS
B	C	142	134	-5.69%	0.69	PASS	115	106	-8.23%	0.90	PASS
D	B	28	22	-22.59%	1.27	PASS	19	19	-1.18%	0.05	PASS
D	D	1	0	-100.00%	1.43	PASS	0	0	0.00%	0.00	PASS
D	A	413	414	0.35%	0.07	PASS	323	331	2.73%	0.49	PASS
D	E	58	56	-3.45%	0.26	PASS	48	51	4.77%	0.33	PASS
D	C	23	0	-100.00%	6.84	PASS	18	0	-100.00%	6.07	PASS
A	B	475	458	-3.59%	0.79	PASS	374	361	-3.54%	0.69	PASS
A	D	383	386	0.80%	0.16	PASS	332	328	-0.98%	0.18	PASS
A	A	0	0	-100.00%	0.74	PASS	0	0	-100.00%	0.74	PASS
A	E	16	0	-100.00%	5.65	PASS	13	0	-100.00%	5.06	PASS
A	C	68	68	0.32%	0.03	PASS	54	54	0.82%	0.06	PASS
E	B	152	151	-1.12%	0.14	PASS	126	126	-0.56%	0.06	PASS
E	D	56	49	-13.01%	1.01	PASS	49	41	-15.78%	1.15	PASS
E	A	24	0	-100.00%	6.90	PASS	19	0	-100.00%	6.12	PASS
E	E	1	0	-100.00%	1.17	PASS	0	0	-100.00%	0.82	PASS
E	C	139	140	0.58%	0.07	PASS	125	125	0.14%	0.02	PASS
C	B	126	199	57.48%	5.69	PASS	95	136	42.90%	3.80	PASS
C	D	12	0	-100.00%	4.88	PASS	10	0	-100.00%	4.38	PASS
C	A	127	124	-2.31%	0.26	PASS	108	105	-3.15%	0.33	PASS
C	E	125	123	-0.96%	0.11	PASS	106	106	-0.08%	0.01	PASS
C	C	2	0	-100.00%	2.18	PASS	2	0	-100.00%	2.02	PASS

Figure 19.22: Site CS9 - A37 / B3151 Roundabout

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Table 19.100: Turning Count Results for Site CS9 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	2	0	-100.00%	2.10	PASS	1	0	-100.00%	1.43	PASS
B	A	93	142	52.37%	4.50	PASS	83	91	10.01%	0.89	PASS
B	C	338	229	-32.15%	6.45	FAIL	258	168	-34.83%	6.16	PASS
A	B	48	95	96.44%	5.50	PASS	38	60	56.84%	3.09	PASS
A	A	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
A	C	378	416	10.10%	1.92	PASS	331	342	3.45%	0.62	PASS
C	B	238	219	-7.77%	1.22	PASS	174	170	-2.24%	0.30	PASS
C	A	366	379	3.55%	0.67	PASS	319	315	-1.31%	0.23	PASS
C	C	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

Table 19.101: Turning Count Results for Site CS9 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	1	0	-100.00%	1.49	PASS	1	0	-100.00%	1.10	PASS
B	A	26	46	76.39%	3.31	PASS	21	33	59.55%	2.39	PASS
B	C	220	194	-11.72%	1.79	PASS	155	146	-6.22%	0.79	PASS
A	B	28	67	141.84%	5.72	PASS	23	49	116.40%	4.41	PASS
A	A	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
A	C	317	340	7.06%	1.24	PASS	273	288	5.16%	0.84	PASS
C	B	231	197	-14.40%	2.27	PASS	166	151	-8.83%	1.16	PASS
C	A	291	298	2.61%	0.44	PASS	248	250	0.73%	0.11	PASS
C	C	2	0	-100.00%	2.13	PASS	2	0	-100.00%	2.13	PASS

Table 19.102: Turning Count Results for Site CS9 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
B	A	71	78	10.39%	0.85	PASS	61	65	6.75%	0.52	PASS
B	C	267	242	-9.58%	1.61	PASS	215	200	-6.91%	1.03	PASS
A	B	111	178	60.58%	5.59	PASS	97	139	43.39%	3.88	PASS
A	A	2	0	-100.00%	1.76	PASS	1	0	-100.00%	1.24	PASS
A	C	388	399	2.69%	0.53	PASS	349	347	-0.56%	0.10	PASS
C	B	303	270	-10.66%	1.91	PASS	264	226	-14.11%	2.38	PASS
C	A	371	401	7.96%	1.51	PASS	344	352	2.08%	0.38	PASS
C	C	2	0	-100.00%	2.23	PASS	2	0	-100.00%	1.95	PASS

Figure 19.23: Site CS10 - B3151 Costello Hill Roundabout

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Table 19.103: Turning Count Results for Site CS10 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	3	0	-100.00%	2.35	PASS	2	0	-100.00%	2.08	PASS
B	A	267	268	0.32%	0.05	PASS	223	224	0.31%	0.05	PASS
B	C	251	269	7.13%	1.11	PASS	232	194	-16.31%	2.59	PASS
A	B	344	367	6.73%	1.23	PASS	294	289	-1.77%	0.31	PASS
A	A	0	0	-100.00%	0.78	PASS	0	0	-100.00%	0.78	PASS
A	C	89	57	-35.22%	3.65	PASS	84	52	-37.43%	3.80	PASS
C	B	80	93	16.04%	1.38	PASS	67	69	3.62%	0.29	PASS
C	A	26	28	7.61%	0.38	PASS	22	24	7.47%	0.34	PASS
C	C	1	0	-100.00%	1.36	PASS	0	0	0.00%	0.00	PASS

Table 19.104: Turning Count Results for Site CS10 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	2	0	-100.00%	2.01	PASS	1	0	-100.00%	1.31	PASS
B	A	258	261	1.42%	0.23	PASS	217	219	0.49%	0.07	PASS
B	C	70	81	15.71%	1.27	PASS	63	63	0.27%	0.02	PASS
A	B	252	288	14.19%	2.18	PASS	215	242	12.82%	1.82	PASS
A	A	0	0	-100.00%	0.54	PASS	0	0	0.00%	0.00	PASS
A	C	24	25	2.78%	0.14	PASS	20	20	2.24%	0.10	PASS
C	B	111	133	19.82%	1.99	PASS	102	104	2.53%	0.25	PASS
C	A	32	33	3.29%	0.19	PASS	27	29	3.96%	0.21	PASS
C	C	0	0	-100.00%	0.93	PASS	0	0	-100.00%	0.54	PASS

Table 19.105: Turning Count Results for Site CS10 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
B	B	3	0	-100.00%	2.35	PASS	2	0	-100.00%	2.07	PASS
B	A	406	360	-11.25%	2.33	PASS	363	315	-13.07%	2.57	PASS
B	C	79	96	20.72%	1.76	PASS	74	78	5.44%	0.46	PASS
A	B	303	349	15.40%	2.58	PASS	264	301	14.31%	2.24	PASS
A	A	1	0	-100.00%	1.11	PASS	0	0	-100.00%	0.78	PASS
A	C	24	24	1.56%	0.08	PASS	21	22	3.45%	0.16	PASS
C	B	255	241	-5.45%	0.88	PASS	238	196	-17.68%	2.86	PASS
C	A	86	52	-39.68%	4.12	PASS	81	45	-44.64%	4.55	PASS
C	C	1	0	-100.00%	1.57	PASS	1	0	-100.00%	1.36	PASS

Figure 19.24: Site CS11 - B3151 / Unnamed Rd

Table 19.106: Turning Count Results for Site CS11 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	B	2	0	-100.00%	2.08	PASS	1	0	-100.00%	1.57	PASS
C	A	27	63	130.77%	5.29	PASS	21	51	148.67%	5.11	PASS
C	D	23	55	134.56%	5.03	PASS	21	49	136.22%	4.77	PASS
B	C	15	0	-100.00%	5.49	PASS	11	0	-100.00%	4.71	PASS
B	A	2	0	-100.00%	1.75	PASS	1	0	-100.00%	1.36	PASS
B	D	34	25	-27.26%	1.71	PASS	26	17	-34.51%	1.92	PASS
A	C	98	101	2.79%	0.27	PASS	84	85	1.11%	0.10	PASS
A	B	2	0	-100.00%	1.75	PASS	2	0	-100.00%	1.75	PASS
A	D	3	0	-100.00%	2.35	PASS	1	0	-100.00%	1.57	PASS
D	C	53	53	-0.32%	0.02	PASS	50	47	-6.15%	0.44	PASS
D	B	24	15	-35.02%	1.88	PASS	22	11	-48.28%	2.57	PASS
D	A	2	0	-100.00%	1.92	PASS	1	0	-100.00%	1.11	PASS

Table 19.107: Turning Count Results for Site CS11 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	B	7	0	-100.00%	3.79	PASS	6	0	-100.00%	3.60	PASS
C	A	39	39	-0.22%	0.01	PASS	32	32	-0.90%	0.05	PASS
C	D	23	23	-2.49%	0.12	PASS	20	20	-3.50%	0.16	PASS
B	C	4	0	-100.00%	2.94	PASS	3	0	-100.00%	2.52	PASS
B	A	1	0	-100.00%	1.20	PASS	1	0	-100.00%	1.20	PASS
B	D	16	10	-35.58%	1.55	PASS	12	9	-23.36%	0.87	PASS
A	C	47	49	3.68%	0.25	PASS	38	39	1.11%	0.07	PASS
A	B	1	0	-100.00%	1.31	PASS	1	0	-100.00%	1.20	PASS
A	D	3	0	-100.00%	2.40	PASS	2	0	-100.00%	2.01	PASS
D	C	19	27	38.43%	1.55	PASS	16	24	51.31%	1.82	PASS
D	B	16	17	6.71%	0.26	PASS	13	13	-0.07%	0.00	PASS
D	A	0	0	-100.00%	0.93	PASS	0	0	-100.00%	0.93	PASS

Table 19.108: Turning Count Results for Site CS11- PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
C	B	11	0	-100.00%	4.77	PASS	9	0	-100.00%	4.22	PASS
C	A	54	59	9.38%	0.67	PASS	50	53	6.88%	0.48	PASS
C	D	61	62	0.95%	0.07	PASS	57	56	-1.68%	0.13	PASS
B	C	4	0	-100.00%	2.93	PASS	4	0	-100.00%	2.72	PASS
B	A	2	0	-100.00%	1.75	PASS	1	0	-100.00%	1.36	PASS
B	D	26	24	-4.24%	0.22	PASS	21	20	-3.66%	0.17	PASS
A	C	60	74	23.21%	1.70	PASS	53	64	21.25%	1.47	PASS
A	B	2	0	-100.00%	1.75	PASS	1	0	-100.00%	1.36	PASS
A	D	2	0	-100.00%	1.92	PASS	2	0	-100.00%	1.75	PASS
D	C	25	46	84.05%	3.52	PASS	22	41	92.53%	3.55	PASS
D	B	38	49	28.35%	1.64	PASS	28	38	36.12%	1.75	PASS
D	A	1	0	-100.00%	1.36	PASS	1	0	-100.00%	1.11	PASS

Figure 19.25: Site CS12 - Parsonage Rd / West Camel Rd

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Table 19.109: Turning Count Results for Site CS12 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	2	0	-100.00%	1.75	PASS	2	0	-100.00%	1.75	PASS
D	B	18	17	-5.17%	0.22	PASS	17	16	-4.18%	0.17	PASS
D	A	11	11	-3.22%	0.11	PASS	9	9	-1.80%	0.05	PASS
C	D	3	0	-100.00%	2.35	PASS	2	0	-100.00%	2.22	PASS
C	B	19	0	-100.00%	6.13	PASS	17	0	-100.00%	5.77	PASS
C	A	41	34	-16.21%	1.08	PASS	31	28	-9.80%	0.56	PASS
B	D	20	19	-3.55%	0.16	PASS	17	17	0.42%	0.02	PASS
B	C	18	0	-100.00%	6.08	PASS	14	0	-100.00%	5.26	PASS
B	A	2	0	-100.00%	1.75	PASS	1	0	-100.00%	1.57	PASS
A	D	21	20	-4.54%	0.21	PASS	17	17	-1.48%	0.06	PASS
A	C	72	56	-23.04%	2.08	PASS	49	42	-14.99%	1.09	PASS
A	B	1	0	-100.00%	1.57	PASS	1	0	-100.00%	1.57	PASS

Table 19.110: Turning Count Results for Site CS12 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	3	0	-100.00%	2.34	PASS	2	0	-100.00%	2.21	PASS
D	B	14	13	-7.27%	0.27	PASS	11	11	-0.68%	0.02	PASS
D	A	11	11	0.90%	0.03	PASS	9	9	-0.79%	0.02	PASS
C	D	3	0	-100.00%	2.52	PASS	3	0	-100.00%	2.34	PASS
C	B	8	0	-100.00%	3.98	PASS	7	0	-100.00%	3.64	PASS
C	A	37	31	-14.30%	0.90	PASS	28	26	-7.12%	0.38	PASS
B	D	15	9	-41.99%	1.81	PASS	13	8	-42.94%	1.76	PASS
B	C	12	0	-100.00%	4.92	PASS	9	0	-100.00%	4.26	PASS
B	A	2	0	-100.00%	2.21	PASS	2	0	-100.00%	1.93	PASS
A	D	12	12	-0.84%	0.03	PASS	10	10	-0.78%	0.02	PASS
A	C	37	36	-0.59%	0.04	PASS	27	30	9.16%	0.47	PASS
A	B	1	0	-100.00%	1.42	PASS	1	0	-100.00%	1.31	PASS

Table 19.111: Turning Count Results for Site CS12 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
D	C	2	0	-100.00%	2.22	PASS	2	0	-100.00%	2.22	PASS
D	B	19	18	-5.58%	0.25	PASS	15	15	-2.44%	0.10	PASS
D	A	12	12	2.78%	0.09	PASS	10	10	-1.35%	0.04	PASS
C	D	2	0	-100.00%	2.22	PASS	2	0	-100.00%	2.22	PASS
C	B	22	0	-100.00%	6.70	PASS	19	0	-100.00%	6.22	PASS
C	A	58	37	-35.55%	2.97	PASS	48	33	-32.10%	2.43	PASS
B	D	26	23	-8.94%	0.46	PASS	25	22	-9.59%	0.49	PASS
B	C	22	0	-100.00%	6.56	PASS	19	0	-100.00%	6.12	PASS
B	A	2	0	-100.00%	2.22	PASS	2	0	-100.00%	1.92	PASS
A	D	14	14	-5.00%	0.19	PASS	14	13	-9.79%	0.38	PASS
A	C	49	43	-12.17%	0.88	PASS	46	41	-10.62%	0.74	PASS
A	B	0	0	-100.00%	0.78	PASS	0	0	-100.00%	0.78	PASS

Figure 19.26: Site CS13 - A359 / West Camel Rd Roundabout

Table 19.112: Turning Count Results for Site CS13 - AM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
A	B	40	28	-30.72%	2.12	PASS	38	25	-35.08%	2.40	PASS
A	C	276	277	0.53%	0.09	PASS	230	232	0.92%	0.14	PASS
B	A	43	39	-10.21%	0.69	PASS	38	34	-9.53%	0.60	PASS
B	B	1	0	-100.00%	1.11	PASS	0	0	-100.00%	0.78	PASS
B	C	29	0	-100.00%	7.57	PASS	26	0	-100.00%	7.28	PASS
C	A	223	228	2.21%	0.33	PASS	165	171	3.18%	0.41	PASS
C	B	22	0	-100.00%	6.71	PASS	20	0	-100.00%	6.38	PASS
C	C	0	0	-100.00%	0.78	PASS	0	0	0.00%	0.00	PASS

Table 19.113: Turning Count Results for Site CS13 - IP

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	0	0	-100.00%	0.76	PASS	0	0	0.00%	0.00	PASS
A	B	33	24	-27.83%	1.73	PASS	28	20	-29.45%	1.70	PASS
A	C	201	201	0.10%	0.01	PASS	162	162	0.03%	0.00	PASS
B	A	40	20	-49.12%	3.59	PASS	36	18	-51.77%	3.63	PASS
B	B	0	0	-100.00%	0.54	PASS	0	0	0.00%	0.00	PASS
B	C	17	0	-100.00%	5.83	PASS	15	0	-100.00%	5.42	PASS
C	A	208	208	0.06%	0.01	PASS	168	168	0.05%	0.01	PASS
C	B	19	0	-100.00%	6.12	PASS	16	0	-100.00%	5.65	PASS
C	C	0	0	-100.00%	0.76	PASS	0	0	-100.00%	0.54	PASS

Table 19.114: Turning Count Results for Site CS13 - PM

From	To	Total vehicles					Cars				
		Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
A	A	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
A	B	30	30	-1.48%	0.08	PASS	26	25	-2.04%	0.10	PASS
A	C	283	299	5.48%	0.91	PASS	236	252	6.64%	1.00	PASS
B	A	43	37	-14.71%	1.01	PASS	41	35	-15.03%	1.00	PASS
B	B	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS
B	C	19	0	-100.00%	6.12	PASS	17	0	-100.00%	5.82	PASS
C	A	265	266	0.36%	0.06	PASS	232	231	-0.42%	0.06	PASS
C	B	24	0	-100.00%	6.88	PASS	22	0	-100.00%	6.56	PASS
C	C	0	0	0.00%	0.00	PASS	0	0	0.00%	0.00	PASS

19.5 Journey Time Route Performance

Table 19.115: Journey Time Route Performance – AM

Route ID	Route Description	Route class	No. of links	Obs JT	Mod JT	% Diff
15A	A30 Exeter to A303 Ilminster	SRN	29	00:31:35	00:31:56	1.12%
15B	A303 Ilminster to A30 Exeter	SRN	30	00:32:19	00:32:27	0.39%
16A	M5 Exeter to M5 Bridgwater	SRN	26	00:38:10	00:40:07	5.10%
16B	M5 Bridgwater to M5 Exeter	SRN	24	00:38:19	00:40:26	5.53%
19A	A358 Williton to A358 Ilminster	Non-SRN	55	00:45:29	00:44:51	-1.41%
19B	A358 Ilminster to A358 Williton	Non-SRN	53	00:44:06	00:44:45	1.47%
21A	A37 Dorchester to A37 Shepton Mallet	Non-SRN	30	00:51:31	00:51:47	0.53%
21B	A37 Shepton Mallet to A37 Dorchester	Non-SRN	30	00:51:58	00:51:43	-0.50%
22A	A303 Ilminster to A303 Mere	SRN	49	00:38:53	00:40:25	3.95%
22B	A303 Mere to A303 Ilminster	SRN	52	00:38:43	00:40:18	4.12%
23A	A38 Bridgwater to A361 Trowbridge	Non-SRN	46	01:13:51	01:21:48	10.77%
23B	A361 Trowbridge to A38 Bridgwater	Non-SRN	46	01:13:53	01:14:57	1.45%
25A	M5 Bridgwater to M5 Bristol	SRN	10	00:22:23	00:22:22	-0.08%
25B	M5 Bristol to M5 Bridgwater	SRN	11	00:22:21	00:22:20	-0.03%
28A	A350 Poole to A350 Warminster	Non-SRN	34	01:02:30	01:01:29	-1.64%
28B	A350 Warminster to A350 Poole	Non-SRN	31	01:03:52	01:00:44	-4.90%
32A	A36 Southampton to A36 Bath	SRN	79	01:24:26	01:23:25	-1.22%
32B	A36 Bath to A36 Southampton	SRN	81	01:23:32	01:23:17	-0.30%
37A	A345 Salisbury to A346 Swindon	Non-SRN	32	00:55:45	00:55:30	-0.45%
37B	A346 Swindon to A345 Salisbury	Non-SRN	33	00:58:03	00:59:25	2.33%
38A	A360 Salisbury to A4361 Swindon	Non-SRN	31	01:05:14	01:02:33	-4.11%

Route ID	Route Description	Route class	No. of links	Obs JT	Mod JT	% Diff
38B	A4361 Swindon to A360 Salisbury	Non-SRN	31	01:05:06	01:01:28	-5.57%
39A	A303 Mere to M3 South of Basingstoke	SRN	48	00:45:07	00:46:42	3.53%
39B	M3 South of Basingstoke to A303 Mere	SRN	48	00:45:34	00:45:31	-0.14%
42A	M4 Wokingham to M4 Swindon	SRN	13	00:37:47	00:37:45	-0.12%
42B	M4 Swindon to M4 Wokingham	SRN	15	00:39:26	00:39:20	-0.25%
49A	M4 Swindon to M4 Pilning	SRN	20	00:37:30	00:37:30	0.00%
49B	M4 Pilning to M4 Swindon	SRN	22	00:39:50	00:39:47	-0.09%
50A	M5 Portbury to M5 Cheltenham	SRN	35	00:35:52	00:35:50	-0.10%
50B	M5 Cheltenham to M5 Portbury	SRN	32	00:36:35	00:36:37	0.04%
53A	A38/M5J26 to A358/A3038	Non-SRN	19	00:18:52	00:17:36	-6.68%
53B	A38/M5J26 to A358/A3038	Non-SRN	20	00:16:58	00:16:17	-3.93%
54A	A358 Mattock's Tree Hill to A3027 WB	Non-SRN	9	00:09:11	00:08:07	-11.55%
55A	A359 Sparkford NB	Non-SRN	13	00:06:33	00:06:00	-8.38%
55B	A359 Sparkford SB	Non-SRN	12	00:07:26	00:06:50	-8.01%

Table 19.116: Journey Time Route Performance – IP

Route ID	Route Description	Route class	No. of links	Obs JT	Mod JT	% Diff
15A	A30 Exeter to A303 Ilminster	SRN	29	00:32:26	00:32:14	-0.58%
15B	A303 Ilminster to A30 Exeter	SRN	30	00:33:14	00:32:16	-2.94%
16A	M5 Exeter to M5 Bridgwater	SRN	26	00:38:04	00:40:04	5.27%
16B	M5 Bridgwater to M5 Exeter	SRN	24	00:38:46	00:40:04	3.38%
19A	A358 Williton to A358 Ilminster	Non-SRN	55	00:43:58	00:44:17	0.73%
19B	A358 Ilminster to A358 Williton	Non-SRN	53	00:43:14	00:44:42	3.40%
21A	A37 Dorchester to A37 Shepton Mallet	Non-SRN	30	00:52:47	00:51:04	-3.26%
21B	A37 Shepton Mallet to A37 Dorchester	Non-SRN	30	00:51:43	00:51:07	-1.15%
22A	A303 Ilminster to A303 Mere	SRN	49	00:39:22	00:40:20	2.49%
22B	A303 Mere to A303 Ilminster	SRN	52	00:39:23	00:40:40	3.25%
23A	A38 Bridgwater to A361 Trowbridge	Non-SRN	46	01:13:54	01:16:59	4.18%
23B	A361 Trowbridge to A38 Bridgwater	Non-SRN	46	01:15:08	01:15:08	0.00%
25A	M5 Bridgwater to M5 Bristol	SRN	10	00:22:50	00:22:53	0.17%
25B	M5 Bristol to M5 Bridgwater	SRN	11	00:23:04	00:23:02	-0.08%
28A	A350 Poole to A350 Warminster	Non-SRN	34	01:03:35	01:00:10	-5.37%
28B	A350 Warminster to A350 Poole	Non-SRN	31	01:03:29	00:59:50	-5.75%
32A	A36 Southampton to A36 Bath	SRN	79	01:26:49	01:24:48	-2.33%
32B	A36 Bath to A36 Southampton	SRN	81	01:26:05	01:24:13	-2.17%
37A	A345 Salisbury to A346 Swindon	Non-SRN	32	00:56:40	00:56:06	-0.99%
37B	A346 Swindon to A345 Salisbury	Non-SRN	33	00:56:29	00:56:37	0.22%
38A	A360 Salisbury to A4361 Swindon	Non-SRN	31	01:04:50	01:01:28	-5.20%
38B	A4361 Swindon to A360 Salisbury	Non-SRN	31	01:05:23	01:01:16	-6.30%
39A	A303 Mere to M3 South of Basingstoke	SRN	48	00:45:43	00:46:04	0.73%

Route ID	Route Description	Route class	No. of links	Obs JT	Mod JT	% Diff
39B	M3 South of Basingstoke to A303 Mere	SRN	48	00:48:01	00:46:26	-3.30%
42A	M4 Wokingham to M4 Swindon	SRN	13	00:38:05	00:38:04	-0.06%
42B	M4 Swindon to M4 Wokingham	SRN	15	00:37:46	00:37:43	-0.17%
49A	M4 Swindon to M4 Pilning	SRN	20	00:38:10	00:38:07	-0.13%
49B	M4 Pilning to M4 Swindon	SRN	22	00:37:27	00:37:26	-0.02%
50A	M5 Portbury to M5 Cheltenham	SRN	35	00:35:53	00:35:52	-0.04%
50B	M5 Cheltenham to M5 Portbury	SRN	32	00:36:46	00:36:43	-0.14%
53A	A38/M5J26 to A358/A3038	Non-SRN	19	00:18:32	00:16:59	-8.35%
53B	A38/M5J26 to A358/A3038	Non-SRN	20	00:18:06	00:16:11	-10.56%
54A	A358 Mattock's Tree Hill to A3027 WB	Non-SRN	9	00:08:33	00:08:01	-6.28%
55A	A359 Sparkford NB	Non-SRN	13	00:06:22	00:05:58	-6.28%
55B	A359 Sparkford SB	Non-SRN	12	00:06:53	00:06:44	-1.98%

Table 19.117: Journey Time Route Performance – PM

Route ID	Route Description	Route class	No. of links	Obs JT	Mod JT	% Diff
15A	A30 Exeter to A303 Ilminster	SRN	29	00:31:13	00:32:28	4.03%
15B	A303 Ilminster to A30 Exeter	SRN	30	00:32:25	00:32:23	-0.10%
16A	M5 Exeter to M5 Bridgwater	SRN	26	00:37:12	00:40:01	7.55%
16B	M5 Bridgwater to M5 Exeter	SRN	24	00:38:07	00:40:32	6.38%
19A	A358 Williton to A358 Ilminster	Non-SRN	55	00:45:26	00:43:54	-3.39%
19B	A358 Ilminster to A358 Williton	Non-SRN	53	00:44:45	00:45:04	0.73%
21A	A37 Dorchester to A37 Shepton Mallet	Non-SRN	30	00:52:34	00:51:53	-1.32%
21B	A37 Shepton Mallet to A37 Dorchester	Non-SRN	30	00:50:02	00:51:46	3.48%
22A	A303 Ilminster to A303 Mere	SRN	49	00:38:01	00:40:24	6.30%
22B	A303 Mere to A303 Ilminster	SRN	52	00:38:34	00:41:19	7.09%
23A	A38 Bridgwater to A361 Trowbridge	Non-SRN	46	01:13:21	01:18:24	6.87%
23B	A361 Trowbridge to A38 Bridgwater	Non-SRN	46	01:14:40	01:16:20	2.26%
25A	M5 Bridgwater to M5 Bristol	SRN	10	00:22:02	00:22:02	-0.01%
25B	M5 Bristol to M5 Bridgwater	SRN	11	00:22:49	00:22:46	-0.20%
28A	A350 Poole to A350 Warminster	Non-SRN	34	01:03:13	01:01:00	-3.51%
28B	A350 Warminster to A350 Poole	Non-SRN	31	01:01:55	01:00:08	-2.87%
32A	A36 Southampton to A36 Bath	SRN	79	01:29:51	01:27:57	-2.11%
32B	A36 Bath to A36 Southampton	SRN	81	01:28:16	01:27:46	-0.56%
37A	A345 Salisbury to A346 Swindon	Non-SRN	32	00:59:32	00:59:57	0.70%
37B	A346 Swindon to A345 Salisbury	Non-SRN	33	00:55:06	00:56:11	1.98%
38A	A360 Salisbury to A4361 Swindon	Non-SRN	31	01:04:04	01:01:43	-3.66%
38B	A4361 Swindon to A360 Salisbury	Non-SRN	31	01:06:12	01:02:30	-5.59%
39A	A303 Mere to M3 South of Basingstoke	SRN	48	00:44:05	00:45:08	2.39%

Route ID	Route Description	Route class	No. of links	Obs JT	Mod JT	% Diff
39B	M3 South of Basingstoke to A303 Mere	SRN	48	00:46:23	00:46:11	-0.44%
42A	M4 Wokingham to M4 Swindon	SRN	13	00:38:47	00:38:46	-0.03%
42B	M4 Swindon to M4 Wokingham	SRN	15	00:37:46	00:37:44	-0.11%
49A	M4 Swindon to M4 Pilning	SRN	20	00:37:47	00:37:45	-0.09%
49B	M4 Pilning to M4 Swindon	SRN	22	00:37:38	00:37:36	-0.11%
50A	M5 Portbury to M5 Cheltenham	SRN	35	00:35:36	00:35:35	-0.05%
50B	M5 Cheltenham to M5 Portbury	SRN	32	00:36:29	00:36:31	0.10%
53A	A38/M5J26 to A358/A3038	Non-SRN	19	00:18:00	00:17:40	-1.90%
53B	A38/M5J26 to A358/A3038	Non-SRN	20	00:16:20	00:17:53	9.60%
54A	A358 Mattock's Tree Hill to A3027 WB	Non-SRN	9	00:08:52	00:08:04	-8.97%
55A	A359 Sparkford NB	Non-SRN	13	00:06:32	00:06:05	-7.11%
55B	A359 Sparkford SB	Non-SRN	12	00:06:54	00:06:58	1.00%

20 Appendix D

20.1 Screenline Results – Summer Model

Table 20.1: Screenline Results – Summer Model

Screenline	Direction	No of counts	Total traffic (veh)			Cars (veh)		
			Observed Flow	Modelled Flow	% Diff	Observed Flow	Modelled Flow	% Diff
A358 West	Eastbound	7	1,766	1,816	2.8%	1,546	1,593	3.0%
	Westbound	7	1,758	1,803	2.5%	1,545	1,589	2.8%
A358 East	Northbound	6	207	214	3.4%	179	178	-0.6%
	Southbound	6	209	214	2.5%	181	178	-1.4%
Sparkford	Northbound	8	3,719	3,708	-0.3%	3,304	3,282	-0.7%
	Southbound	8	3,925	3,716	-5.3%	3,472	3,286	-5.4%

20.1 Screenline Link Results - Summer

Table 20.2: A358 East – Summer Model

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_68	A303	EB	1,242	1,167	-6.1%	2.2	PASS	1,092	1,018	-6.8%	2.3	PASS
S_NDC_A358_16A	Cad Road	EB	48	6	-86.6%	8.0	PASS	41	5	-87.1%	7.5	PASS
S_NDC_A358_32A	Stocks Lane	EB	4	11	171.8%	2.5	PASS	3	8	142.9%	2.0	PASS
S_NDC_A358_31A	Capland Lane	EB	2	1	-64.9%	1.2	PASS	2	1	-63.6%	1.1	PASS
S_NDC_A358_7A	A378	EB	154	357	131.8%	12.7	FAIL	133	325	143.3%	12.6	FAIL
S_NDC_A358_8A	Windmill Hill	EB	63	12	-81.0%	8.4	PASS	55	10	-81.2%	7.8	PASS
S_NDC_A358_1A	A361	EB	252	262	3.9%	0.6	PASS	218	226	3.3%	0.5	PASS
S_WebTRIS_69	A303	WB	1,231	1,238	0.6%	0.2	PASS	1,089	1,095	0.6%	0.2	PASS
S_NDC_A358_16B	Cad Road	WB	28	7	-76.0%	5.1	PASS	25	6	-75.9%	4.8	PASS
S_NDC_A358_32B	Stocks Lane	WB	3	11	231.7%	2.9	PASS	3	10	245.9%	2.8	PASS
S_NDC_A358_31B	Capland Lane	WB	2	0	-79.4%	1.6	PASS	2	0	-78.1%	1.4	PASS
S_NDC_A358_7B	A378	WB	134	220	64.7%	6.5	PASS	116	194	67.7%	6.3	PASS
S_NDC_A358_8B	Windmill Hill	WB	55	21	-61.6%	5.5	PASS	48	19	-60.3%	5.0	PASS
S_NDC_A358_1B	A361	WB	305	305	0.0%	0.0	PASS	264	264	0.1%	0.0	PASS

Table 20.3: A358 West – Summer Model

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_NDC_A358_23A	West Hatch Lane	EB	4	51	1309.8%	9.0	PASS	3	44	1306.4%	8.4	PASS
S_NDC_A358_24B	Griffin Road	EB	2	11	590.2%	3.8	PASS	1	10	571.9%	3.5	PASS
S_NDC_A358_21A	Unnamed Road	EB	7	33	398.6%	6.0	PASS	6	30	418.0%	5.7	PASS
S_NDC_A358_17A	Wood Road	EB	23	6	-72.1%	4.3	PASS	20	5	-76.7%	4.4	PASS
S_NDC_A358_14B	Pound Road	EB	68	12	-83.1%	9.0	PASS	59	8	-86.2%	8.8	PASS
S_NDC_A358_4B	Shoreditch Road	EB	104	101	-3.1%	0.3	PASS	90	82	-8.8%	0.9	PASS
S_NDC_A358_23B	West Hatch Lane	WB	4	47	1083.7%	8.5	PASS	3	34	890.7%	7.1	PASS
S_NDC_A358_24A	Griffin Road	WB	1	14	939.6%	4.6	PASS	1	13	961.7%	4.4	PASS
S_NDC_A358_21B	Unnamed Road	WB	9	26	200.4%	4.2	PASS	7	24	219.8%	4.1	PASS
S_NDC_A358_17B	Wood Road	WB	29	9	-70.1%	4.7	PASS	25	6	-77.1%	4.9	PASS
S_NDC_A358_14A	Pound Road	WB	54	8	-85.4%	8.3	PASS	47	6	-87.4%	8.0	PASS
S_NDC_A358_4A	Shoreditch Road	WB	112	110	-1.8%	0.2	PASS	97	96	-1.1%	0.1	PASS

Table 20.4: Sparkford – Summer Model

Count ID	Road Name	Screenline Direction	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_NDC_A303_8B	B3151	NB	47	62	31.8%	2.0	PASS	41	48	18.5%	1.1	PASS
S_WebTRIS_75	A303	NB	1,261	1,257	-0.3%	0.1	PASS	1,124	1,131	0.6%	0.2	PASS
S_NDC_A303_1B	A372	NB	275	358	30.0%	4.6	PASS	238	306	28.4%	4.1	PASS
S_NDC_A303_2A	A37N	NB	452	371	-17.9%	4.0	PASS	391	321	-18.0%	3.7	PASS
S_WebTRIS_257	A303	NB	1,257	1,339	6.6%	2.3	PASS	1,140	1,203	5.5%	1.8	PASS
S_NDC_A303_7A	Sparkford Village	NB	136	34	-75.3%	11.1	FAIL	118	28	-76.1%	10.5	PASS
S_NDC_A303_5B	A359	NB	268	281	4.9%	0.8	PASS	232	239	3.1%	0.5	PASS
S_NDC_A303_11B	Howell Hill	NB	23	7	-69.3%	4.1	PASS	20	6	-69.8%	3.9	PASS
S_NDC_A303_8A	B3151	SB	54	28	-48.3%	4.1	PASS	47	23	-49.8%	3.9	PASS
S_WebTRIS_74	A303	SB	1,467	1,293	-11.8%	4.7	PASS	1,297	1,145	-11.7%	4.4	PASS
S_NDC_A303_1A	A372	SB	271	372	37.4%	5.7	FAIL	234	344	46.6%	6.4	FAIL
S_NDC_A303_2B	A37N	SB	455	409	-10.1%	2.2	PASS	394	332	-15.8%	3.3	PASS
S_WebTRIS_258	A303	SB	1,171	1,204	2.8%	1.0	PASS	1,060	1,088	2.7%	0.9	PASS
S_NDC_A303_7B	Sparkford Village	SB	214	196	-8.6%	1.3	PASS	186	170	-8.2%	1.1	PASS
S_NDC_A303_5A	A359	SB	262	208	-20.5%	3.5	PASS	227	179	-21.2%	3.4	PASS
S_NDC_A303_11A	Howell Hill	SB	31	6	-82.4%	6.0	PASS	27	5	-82.4%	5.6	PASS

20.1 Key Route Flow Results

20.1.1 Five roads were deemed “Key Routes” for this model: these are the A358, A303, M4, M5 and the section of the A30 between the A303 and Exeter. These are all part of the Strategic Road Network (SRN) with the exception of the A358 and together form the main corridors into the South West peninsula. The flow validation results for the link counts along these key routes are given in Table 20.5 - Table 20.9 below with corresponding maps also included. The flow validation results for the other primary counts that do not lie on a screenline are then given in Figure 20.6 and Table 20.10.

Figure 20.1: A358 Primary Link Count Locations

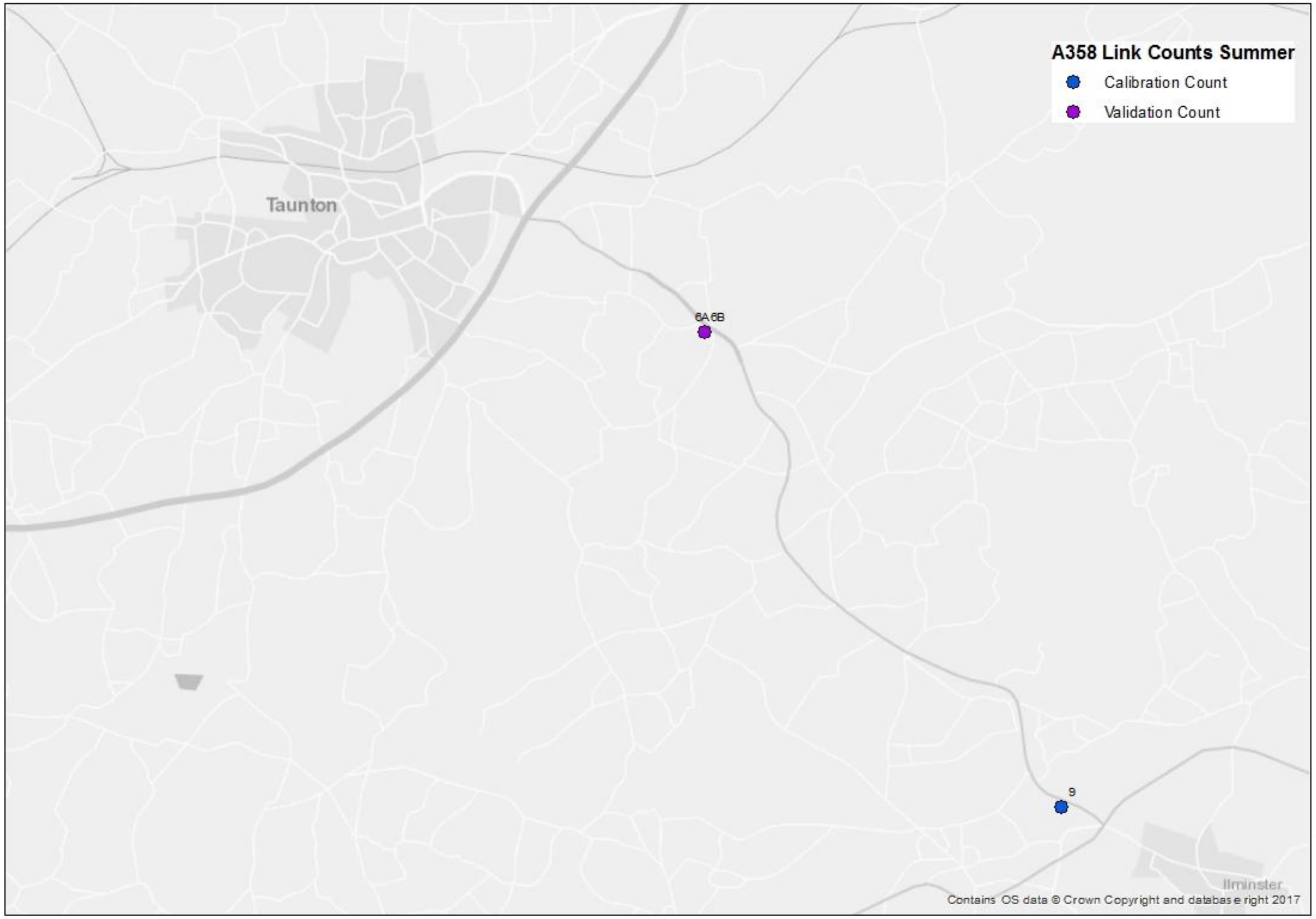

Table 20.5: A358 Primary Link Flow Results – Summer Model

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_NDC_A358_9B	SB	Calibration	776	665	-14.3%	4.1	PASS	672	560	-16.6%	4.5	PASS
S_NDC_A358_9A	NB	Calibration	756	756	0.0%	0.0	PASS	655	655	0.0%	0.0	PASS
S_NDC_A358_6A	NB	Validation	964	922	-4.4%	1.4	PASS	835	809	-3.0%	0.9	PASS
S_NDC_A358_6B	SB	Validation	981	941	-4.1%	1.3	PASS	850	804	-5.4%	1.6	PASS

Figure 20.2: A303 Primary Link Count Locations

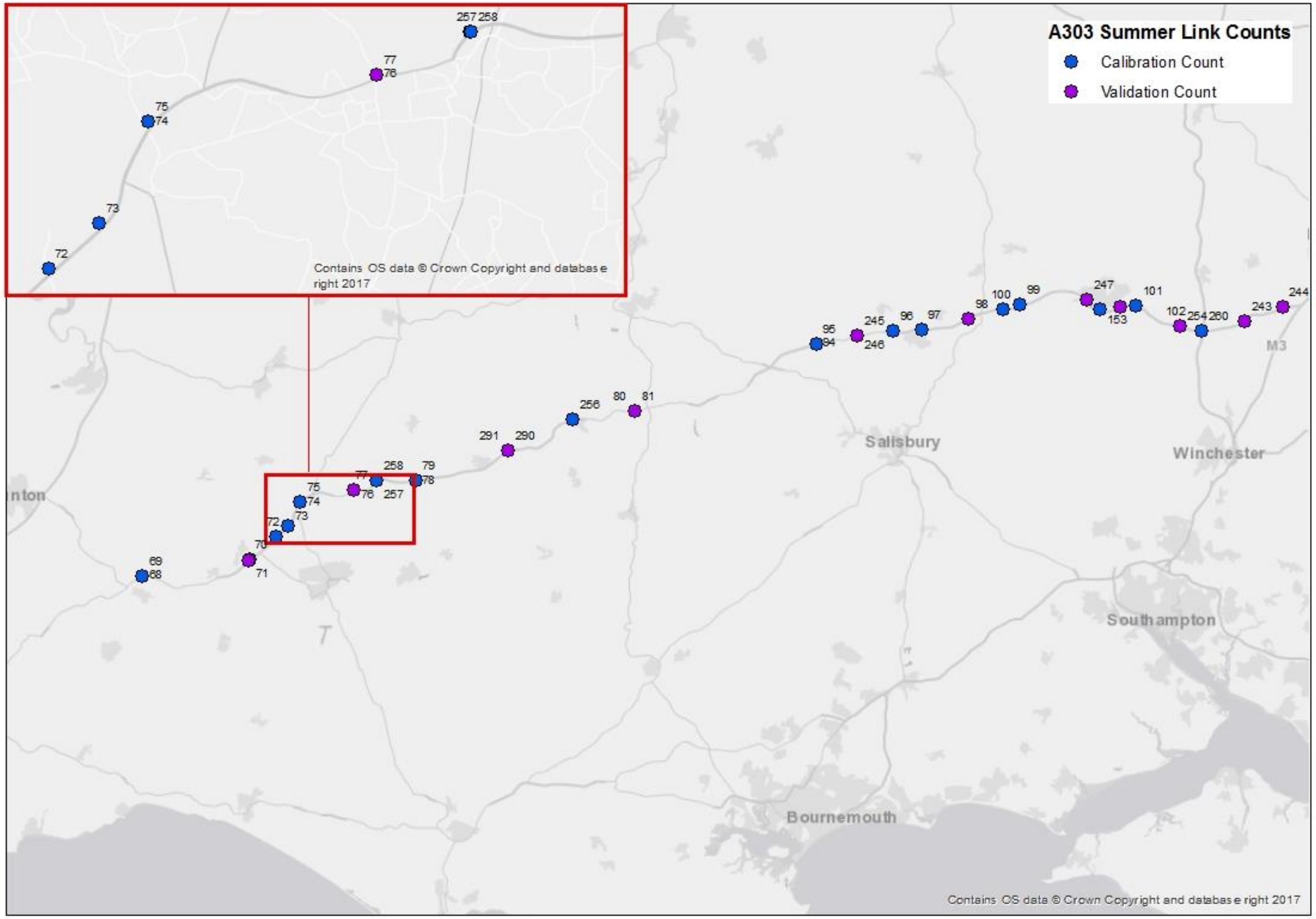

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Table 20.6: A303 Primary Link Flow Results – Summer Model

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_99	EB	Calibration	1,398	1,395	-0.2%	0.1	PASS	1,279	1,261	-1.5%	0.5	PASS
S_WebTRIS_100	WB	Calibration	1,370	1,375	0.4%	0.1	PASS	1,243	1,247	0.3%	0.1	PASS
S_WebTRIS_102	WB	Calibration	1,997	2,000	0.1%	0.1	PASS	1,791	1,793	0.1%	0.1	PASS
S_WebTRIS_256	WB	Calibration	1,024	1,028	0.4%	0.1	PASS	916	918	0.2%	0.1	PASS
S_WebTRIS_97	WB	Calibration	1,068	1,094	2.4%	0.8	PASS	963	979	1.7%	0.5	PASS
S_WebTRIS_254	EB	Calibration	646	439	-32.0%	8.9	FAIL	562	371	-33.9%	8.8	FAIL
S_WebTRIS_101	EB	Calibration	2,046	2,031	-0.7%	0.3	PASS	1,846	1,832	-0.8%	0.3	PASS
S_WebTRIS_95	EB	Calibration	1,022	896	-12.4%	4.1	PASS	922	806	-12.6%	4.0	PASS
S_WebTRIS_96	EB	Calibration	1,012	901	-10.9%	3.6	PASS	916	810	-11.6%	3.6	PASS
S_WebTRIS_72	EB	Calibration	1,313	1,234	-6.0%	2.2	PASS	1,167	1,088	-6.8%	2.3	PASS
S_WebTRIS_78	EB	Calibration	1,248	1,224	-2.0%	0.7	PASS	1,120	1,094	-2.3%	0.8	PASS
S_WebTRIS_263	NB	Calibration	1,917	1,917	0.0%	0.0	PASS	1,646	1,644	-0.1%	0.1	PASS
S_WebTRIS_79	WB	Calibration	1,205	1,214	0.7%	0.2	PASS	1,089	1,096	0.6%	0.2	PASS
S_WebTRIS_153	WB	Calibration	1,883	1,889	0.3%	0.1	PASS	1,690	1,696	0.4%	0.1	PASS
S_WebTRIS_73	WB	Calibration	1,259	1,242	-1.3%	0.5	PASS	1,121	1,128	0.6%	0.2	PASS
S_WebTRIS_94	WB	Calibration	964	885	-8.2%	2.6	PASS	874	794	-9.1%	2.8	PASS
S_WebTRIS_264	WB	Calibration	498	498	-0.1%	0.0	PASS	444	444	-0.1%	0.0	PASS
S_WebTRIS_68	WB	Calibration	1,242	1,167	-6.1%	2.2	PASS	1,092	1,018	-6.8%	2.3	PASS
S_WebTRIS_69	EB	Calibration	1,231	1,238	0.6%	0.2	PASS	1,089	1,095	0.6%	0.2	PASS
S_WebTRIS_75	EB	Calibration	1,261	1,257	-0.3%	0.1	PASS	1,124	1,131	0.6%	0.2	PASS
S_WebTRIS_257	EB	Calibration	1,257	1,339	6.6%	2.3	PASS	1,140	1,203	5.5%	1.8	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_74	EB	Calibration	1,467	1,293	-11.8%	4.7	PASS	1,297	1,145	-11.7%	4.4	PASS
S_WebTRIS_258	WB	Calibration	1,171	1,204	2.8%	1.0	PASS	1,060	1,088	2.7%	0.9	PASS
S_WebTRIS_152	EB	Validation	1,901	1,723	-9.4%	4.2	PASS	1,729	1,564	-9.5%	4.1	PASS
S_WebTRIS_243	EB	Validation	1,523	1,529	0.4%	0.2	PASS	1,388	1,384	-0.3%	0.1	PASS
S_WebTRIS_262	EB	Validation	2,436	2,414	-0.9%	0.4	PASS	2,113	2,088	-1.2%	0.6	PASS
S_WebTRIS_245	EB	Validation	999	949	-5.0%	1.6	PASS	914	853	-6.7%	2.1	PASS
S_WebTRIS_70	EB	Validation	1,596	1,770	10.9%	4.3	PASS	1,414	1,546	9.3%	3.4	PASS
S_WebTRIS_77	EB	Validation	1,147	1,167	1.7%	0.6	PASS	1,021	1,054	3.2%	1.0	PASS
S_WebTRIS_244	WB	Validation	1,562	1,642	5.1%	2.0	PASS	1,422	1,454	2.3%	0.8	PASS
S_WebTRIS_246	WB	Validation	911	884	-2.9%	0.9	PASS	836	781	-6.6%	1.9	PASS
S_WebTRIS_261	WB	Validation	2,095	2,057	-1.8%	0.8	PASS	1,785	1,813	1.6%	0.7	PASS
S_WebTRIS_71	WB	Validation	1,628	1,528	-6.2%	2.5	PASS	1,450	1,337	-7.8%	3.0	PASS
S_WebTRIS_76	WB	Validation	1,106	1,120	1.2%	0.4	PASS	967	1,020	5.4%	1.7	PASS
S_WebTRIS_291	EB	Validation	1,174	1,348	14.8%	4.9	PASS	1,047	1,215	16.0%	5.0	PASS
S_WebTRIS_80	EB	Validation	1,049	1,013	-3.4%	1.1	PASS	944	913	-3.3%	1.0	PASS
S_WebTRIS_290	WB	Validation	1,203	1,258	4.6%	1.6	PASS	1,068	1,137	6.5%	2.1	PASS
S_WebTRIS_81	WB	Validation	946	812	-14.2%	4.5	PASS	853	720	-15.6%	4.8	PASS
S_WebTRIS_98	WB	Validation	1,398	1,359	-2.8%	1.0	PASS	1,266	1,224	-3.3%	1.2	PASS

Figure 20.3: M4 Primary Link Count Locations

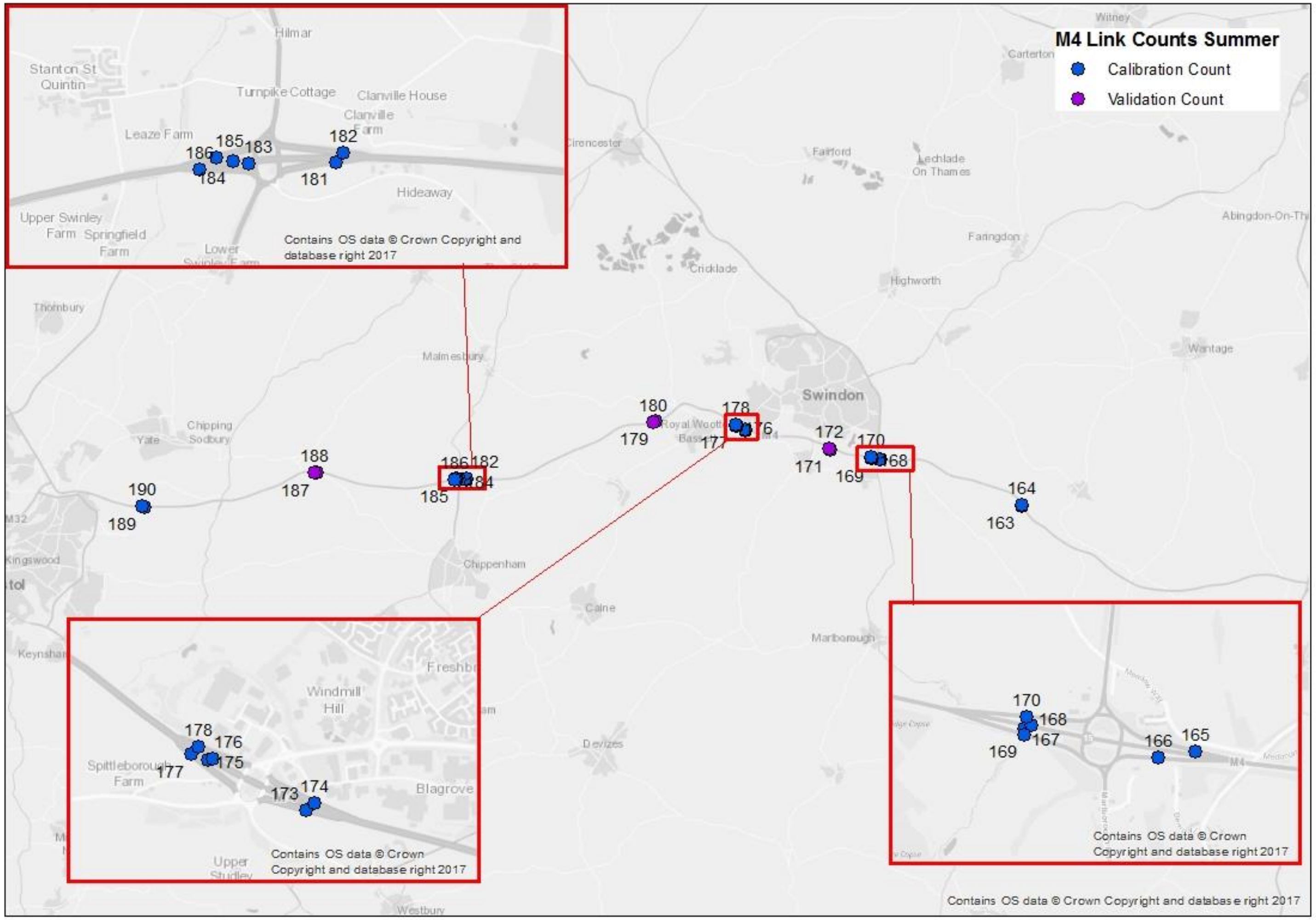

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Table 20.7: M4 Primary Link Flow Results – Summer Model

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_164	EB	Calibration	3,550	3,479	-2.0%	1.2	PASS	2,610	2,610	0.0%	0.0	PASS
S_WebTRIS_163	WB	Calibration	3,425	3,408	-0.5%	0.3	PASS	2,763	2,433	-11.9%	6.5	PASS
S_WebTRIS_184	EB	Calibration	2,957	2,773	-6.2%	3.4	PASS	1,547	1,669	7.9%	3.0	PASS
S_WebTRIS_185	EB	Calibration	430	428	-0.5%	0.1	PASS	267	292	9.4%	1.5	PASS
S_WebTRIS_182	EB	Calibration	475	487	2.6%	0.6	PASS	415	417	0.5%	0.1	PASS
S_WebTRIS_168	EB	Calibration	2,655	2,511	-5.4%	2.8	PASS	1,397	1,567	12.2%	4.4	PASS
S_WebTRIS_170	EB	Calibration	793	781	-1.5%	0.4	PASS	555	558	0.6%	0.1	PASS
S_WebTRIS_165	EB	Calibration	898	897	-0.1%	0.0	PASS	866	866	0.0%	0.0	PASS
S_WebTRIS_176	EB	Calibration	2,921	2,774	-5.0%	2.8	PASS	1,696	1,711	0.9%	0.4	PASS
S_WebTRIS_178	EB	Calibration	486	486	0.0%	0.0	PASS	375	375	0.0%	0.0	PASS
S_WebTRIS_174	EB	Calibration	519	518	-0.2%	0.0	PASS	414	414	0.1%	0.0	PASS
S_WebTRIS_190	EB	Calibration	3,631	3,233	-11.0%	6.8	PASS	3,214	2,446	-23.9%	14.4	FAIL
S_WebTRIS_186	WB	Calibration	433	433	0.0%	0.0	PASS	367	367	0.0%	0.0	PASS
S_WebTRIS_183	WB	Calibration	2,757	2,757	0.0%	0.0	PASS	2,238	2,238	0.0%	0.0	PASS
S_WebTRIS_181	WB	Calibration	502	502	0.0%	0.0	PASS	344	344	-0.1%	0.0	PASS
S_WebTRIS_175	WB	Calibration	2,680	2,776	3.6%	1.8	PASS	2,376	2,131	-10.3%	5.1	PASS
S_WebTRIS_173	WB	Calibration	489	535	9.4%	2.0	PASS	384	384	0.0%	0.0	PASS
S_WebTRIS_169	WB	Calibration	749	846	13.0%	3.5	PASS	597	743	24.5%	5.7	FAIL
S_WebTRIS_167	WB	Calibration	2,528	2,465	-2.5%	1.3	PASS	1,471	1,773	20.5%	7.5	FAIL
S_WebTRIS_166	WB	Calibration	910	1,014	11.5%	3.4	PASS	837	837	0.0%	0.0	PASS
S_WebTRIS_177	WB	Calibration	475	483	1.5%	0.3	PASS	451	451	0.0%	0.0	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_189	WB	Calibration	3,442	3,505	1.8%	1.1	PASS	3,104	3,104	0.0%	0.0	PASS
S_WebTRIS_188	EB	Validation	3,261	3,201	-1.8%	1.1	PASS	3,052	1,961	-35.8%	21.8	FAIL
S_WebTRIS_180	EB	Validation	3,406	3,260	-4.3%	2.5	PASS	1,680	2,086	24.2%	9.4	FAIL
S_WebTRIS_172	EB	Validation	3,454	3,292	-4.7%	2.8	PASS	1,628	2,125	30.5%	11.5	FAIL
S_WebTRIS_187	WB	Validation	3,178	3,190	0.4%	0.2	PASS	2,854	2,605	-8.7%	4.8	PASS
S_WebTRIS_179	WB	Validation	3,239	3,259	0.6%	0.3	PASS	2,473	2,582	4.4%	2.2	PASS
S_WebTRIS_171	WB	Validation	3,235	3,311	2.3%	1.3	PASS	2,488	2,516	1.1%	0.6	PASS

Figure 20.4: M5 Primary Link Count Locations

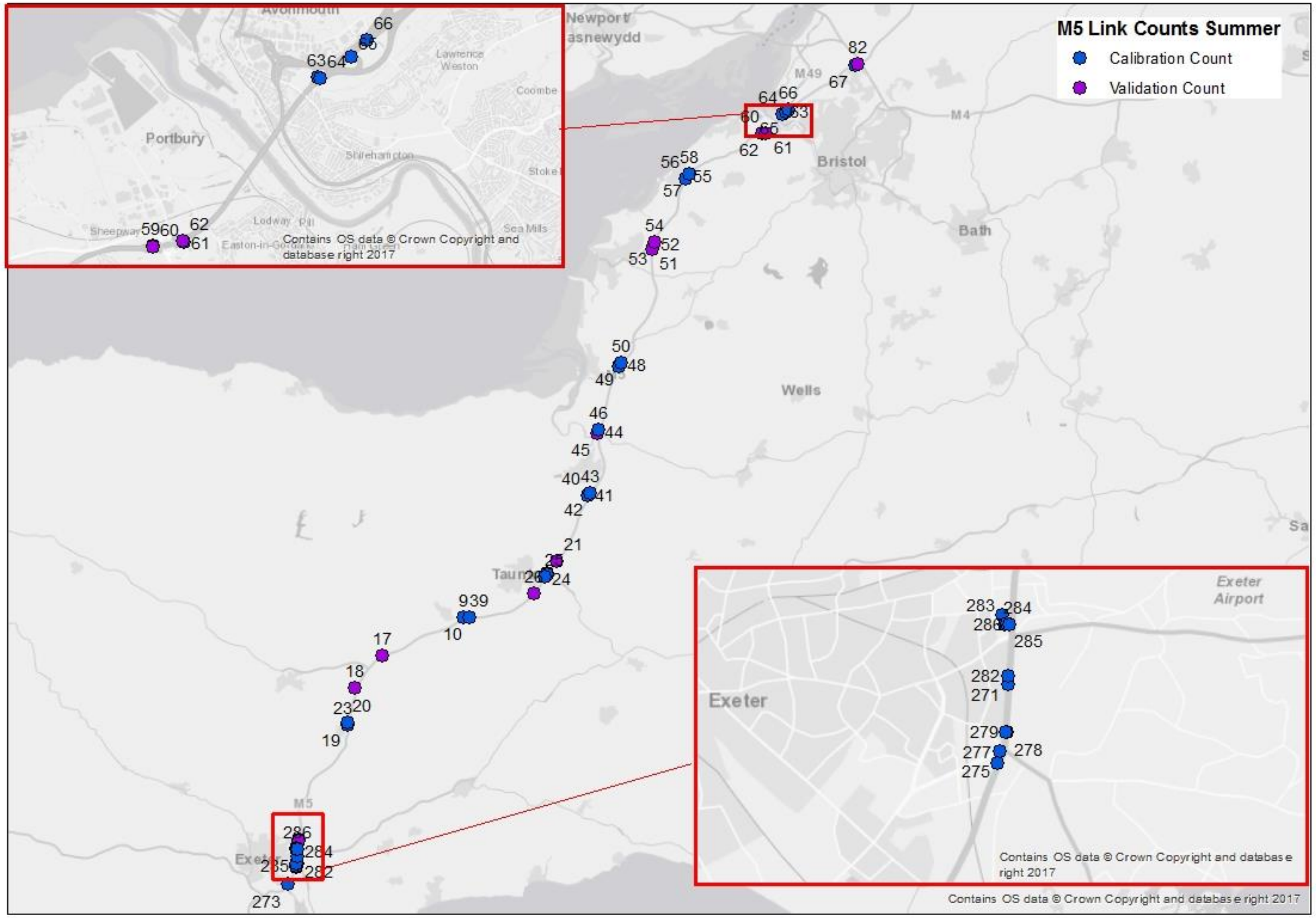

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Table 20.8: M5 Primary Link Flow Results – Summer Model

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_44	NB	Calibration	339	140	-58.6%	12.8	FAIL	290	119	-58.9%	12.0	FAIL
S_WebTRIS_59	NB	Calibration	525	498	-5.1%	1.2	PASS	457	457	0.0%	0.0	PASS
S_WebTRIS_277	NB	Calibration	3,057	3,191	4.4%	2.4	PASS	2,297	2,746	19.6%	9.0	FAIL
S_WebTRIS_284	NB	Calibration	1,306	1,102	-15.6%	5.9	FAIL	1,143	978	-14.5%	5.1	PASS
S_WebTRIS_285	NB	Calibration	2,902	2,856	-1.6%	0.9	PASS	2,527	2,478	-1.9%	1.0	PASS
S_WebTRIS_26	NB	Calibration	3,428	3,192	-6.9%	4.1	PASS	2,024	2,567	26.8%	11.3	FAIL
S_WebTRIS_46	SB	Calibration	553	578	4.5%	1.0	PASS	487	487	-0.1%	0.0	PASS
S_WebTRIS_61	SB	Calibration	1,151	1,145	-0.5%	0.2	PASS	1,046	1,046	0.0%	0.0	PASS
S_WebTRIS_67	SB	Calibration	2,258	2,418	7.1%	3.3	PASS	2,024	2,184	7.9%	3.5	PASS
S_WebTRIS_279	SB	Calibration	2,929	2,984	1.9%	1.0	PASS	1,952	2,615	34.0%	13.9	FAIL
S_WebTRIS_278	SB	Calibration	974	966	-0.9%	0.3	PASS	854	850	-0.5%	0.1	PASS
S_WebTRIS_282	SB	Calibration	4,097	3,950	-3.6%	2.3	PASS	3,624	3,465	-4.4%	2.7	PASS
S_WebTRIS_286	SB	Calibration	316	328	3.8%	0.7	PASS	274	275	0.3%	0.0	PASS
S_WebTRIS_273	SB	Calibration	4,041	4,011	-0.7%	0.5	PASS	3,571	3,524	-1.3%	0.8	PASS
S_WebTRIS_2	NB	Calibration	467	455	-2.6%	0.6	PASS	403	400	-0.8%	0.2	PASS
S_WebTRIS_3	NB	Calibration	2,640	2,722	3.1%	1.6	PASS	2,294	2,356	2.7%	1.3	PASS
S_WebTRIS_9	NB	Calibration	220	221	0.6%	0.1	PASS	182	183	0.6%	0.1	PASS
S_WebTRIS_40	NB	Calibration	466	442	-5.3%	1.2	PASS	396	392	-1.0%	0.2	PASS
S_WebTRIS_41	NB	Calibration	3,212	3,226	0.5%	0.3	PASS	2,773	2,787	0.5%	0.3	PASS
S_WebTRIS_47	NB	Calibration	496	507	2.2%	0.5	PASS	431	431	0.0%	0.0	PASS
S_WebTRIS_48	NB	Calibration	3,462	3,477	0.4%	0.3	PASS	2,993	3,008	0.5%	0.3	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_55	NB	Calibration	356	356	0.0%	0.0	PASS	323	323	0.0%	0.0	PASS
S_WebTRIS_56	NB	Calibration	4,188	4,202	0.3%	0.2	PASS	3,627	3,642	0.4%	0.3	PASS
S_WebTRIS_63	NB	Calibration	447	446	0.0%	0.0	PASS	376	376	0.0%	0.0	PASS
S_WebTRIS_64	NB	Calibration	4,602	4,616	0.3%	0.2	PASS	4,000	4,015	0.4%	0.2	PASS
S_WebTRIS_66	NB	Calibration	3,981	4,011	0.7%	0.5	PASS	3,502	3,517	0.4%	0.3	PASS
S_WebTRIS_283	NB	Calibration	314	321	2.2%	0.4	PASS	275	277	0.8%	0.1	PASS
S_WebTRIS_271	NB	Calibration	4,277	3,958	-7.5%	5.0	PASS	3,774	3,456	-8.4%	5.3	PASS
S_WebTRIS_20	SB	Calibration	2,686	2,674	-0.4%	0.2	PASS	2,307	2,309	0.1%	0.0	PASS
S_WebTRIS_19	SB	Calibration	269	223	-17.2%	3.0	PASS	233	206	-11.5%	1.8	PASS
S_WebTRIS_39	SB	Calibration	3,114	3,110	-0.1%	0.1	PASS	2,742	2,738	-0.2%	0.1	PASS
S_WebTRIS_10	SB	Calibration	293	294	0.3%	0.0	PASS	256	256	0.1%	0.0	PASS
S_WebTRIS_22	SB	Calibration	2,649	2,716	2.5%	1.3	PASS	1,302	2,374	82.3%	25.0	FAIL
S_WebTRIS_23	SB	Calibration	758	739	-2.5%	0.7	PASS	472	509	8.0%	1.7	PASS
S_WebTRIS_43	SB	Calibration	3,053	3,025	-0.9%	0.5	PASS	2,692	2,536	-5.8%	3.1	PASS
S_WebTRIS_42	SB	Calibration	411	172	-58.2%	14.0	FAIL	359	150	-58.2%	13.1	FAIL
S_WebTRIS_49	SB	Calibration	443	443	0.0%	0.0	PASS	365	365	-0.1%	0.0	PASS
S_WebTRIS_50	SB	Calibration	3,136	2,949	-6.0%	3.4	PASS	2,405	2,459	2.2%	1.1	PASS
S_WebTRIS_57	SB	Calibration	291	291	-0.1%	0.0	PASS	264	264	0.0%	0.0	PASS
S_WebTRIS_58	SB	Calibration	3,555	3,313	-6.8%	4.1	PASS	3,141	2,900	-7.7%	4.4	PASS
S_WebTRIS_65	SB	Calibration	514	514	0.1%	0.0	PASS	456	456	0.0%	0.0	PASS
S_WebTRIS_275	SB	Calibration	1,031	1,014	-1.7%	0.5	PASS	898	898	-0.1%	0.0	PASS
S_WebTRIS_45	NB	Validation	3,375	3,204	-5.1%	3.0	PASS	2,916	2,765	-5.2%	2.8	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_51	NB	Validation	298	216	-27.5%	5.1	PASS	261	180	-31.0%	5.4	PASS
S_WebTRIS_52	NB	Validation	3,583	3,494	-2.5%	1.5	PASS	3,078	3,032	-1.5%	0.8	PASS
S_WebTRIS_60	NB	Validation	3,949	4,170	5.6%	3.5	PASS	3,425	3,602	5.2%	3.0	PASS
S_WebTRIS_82	NB	Validation	2,322	2,485	7.0%	3.3	PASS	2,095	2,069	-1.3%	0.6	PASS
S_WebTRIS_280	NB	Validation	3,300	3,177	-3.7%	2.2	PASS	2,902	2,756	-5.1%	2.8	PASS
S_WebTRIS_18	NB	Validation	3,110	3,065	-1.4%	0.8	PASS	2,576	2,636	2.3%	1.2	PASS
S_WebTRIS_54	SB	Validation	3,252	2,850	-12.4%	7.3	FAIL	2,856	2,430	-14.9%	8.3	FAIL
S_WebTRIS_53	SB	Validation	949	952	0.4%	0.1	PASS	869	859	-1.2%	0.4	PASS
S_WebTRIS_62	SB	Validation	3,515	3,414	-2.9%	1.7	PASS	3,101	2,986	-3.7%	2.1	PASS
S_WebTRIS_281	SB	Validation	2,979	3,000	0.7%	0.4	PASS	2,612	2,615	0.1%	0.1	PASS
S_WebTRIS_17	SB	Validation	3,160	3,451	9.2%	5.1	PASS	1,718	3,005	74.9%	26.5	FAIL
S_WebTRIS_21	SB	Validation	3,383	3,455	2.1%	1.2	PASS	1,490	2,884	93.6%	29.8	FAIL
S_WebTRIS_25	NB	Validation	591	635	7.4%	1.8	PASS	516	444	-14.0%	3.3	PASS
S_WebTRIS_24	NB	Validation	2,863	2,557	-10.7%	5.9	PASS	2,024	2,123	4.9%	2.2	PASS

Figure 20.5: A30 Primary Link Count Locations

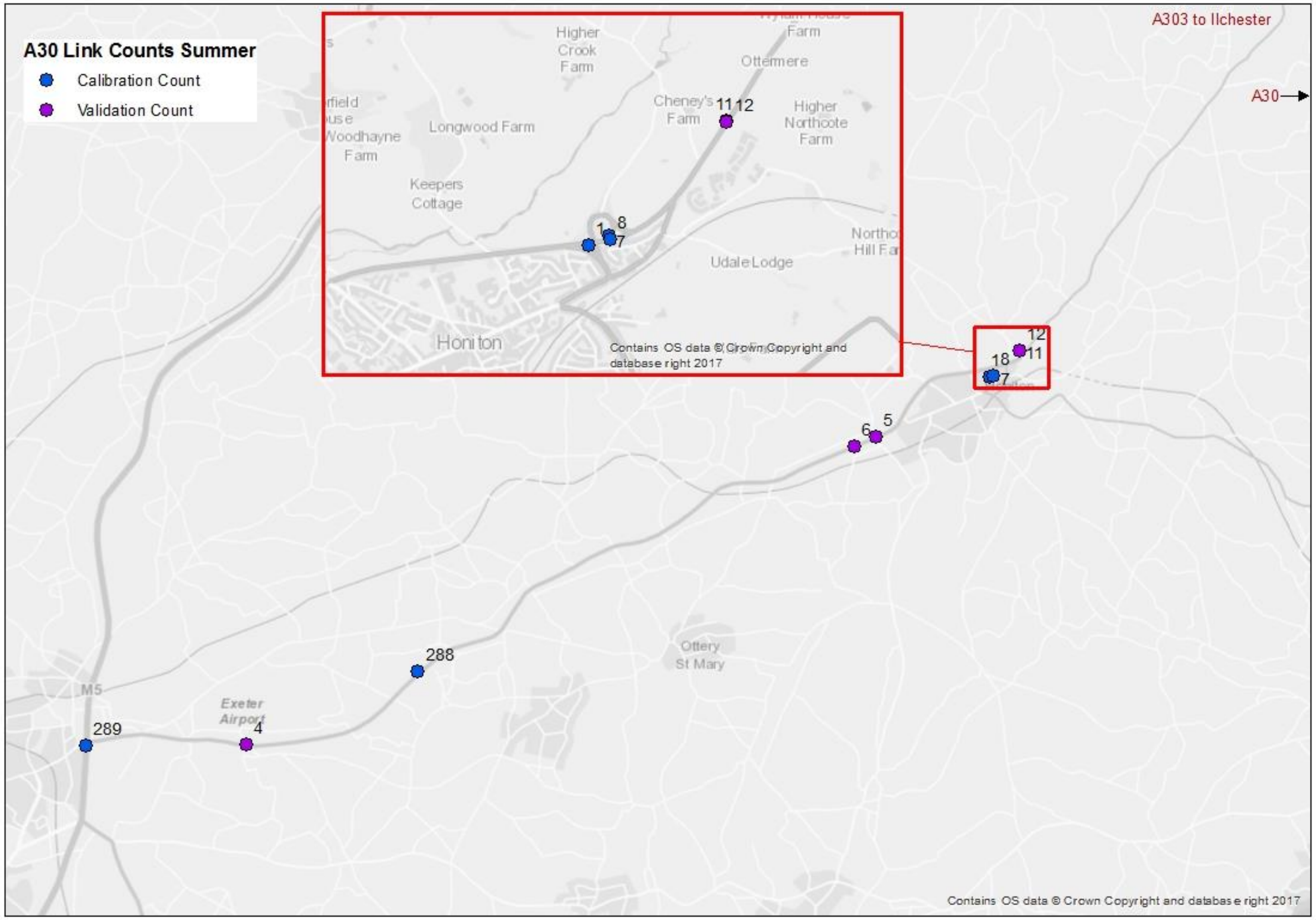

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Table 20.9: A30 Primary Link Flow Results – Summer Model

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_WebTRIS_8	EB	Calibration	815	754	-7.5%	2.2	PASS	730	669	-8.3%	2.3	PASS
S_WebTRIS_7	EB	Calibration	562	525	-6.5%	1.6	PASS	489	495	1.3%	0.3	PASS
S_WebTRIS_267	SB	Calibration	1,750	1,737	-0.8%	0.3	PASS	1,531	1,530	-0.1%	0.0	PASS
S_WebTRIS_289	SB	Calibration	1,276	1,277	0.1%	0.0	PASS	1,124	1,124	0.1%	0.0	PASS
S_WebTRIS_1	WB	Calibration	765	773	1.0%	0.3	PASS	706	711	0.7%	0.2	PASS
S_WebTRIS_11	EB	Validation	928	1,035	11.5%	3.4	PASS	825	934	13.2%	3.7	PASS
S_WebTRIS_4	EB	Validation	1,473	1,032	-29.9%	12.5	FAIL	1,291	924	-28.4%	11.0	FAIL
S_WebTRIS_5	EB	Validation	1,541	1,711	11.0%	4.2	PASS	1,379	1,541	11.8%	4.2	PASS
S_WebTRIS_6	WB	Validation	1,502	1,621	7.9%	3.0	PASS	1,337	1,441	7.8%	2.8	PASS
S_WebTRIS_12	WB	Validation	889	1,044	17.4%	5.0	PASS	794	970	22.0%	5.9	FAIL
S_WebTRIS_288	WB	Validation	1,376	1,314	-4.5%	1.7	PASS	1,161	1,158	-0.3%	0.1	PASS

Figure 20.6: Other Primary Link Count Locations Area 1

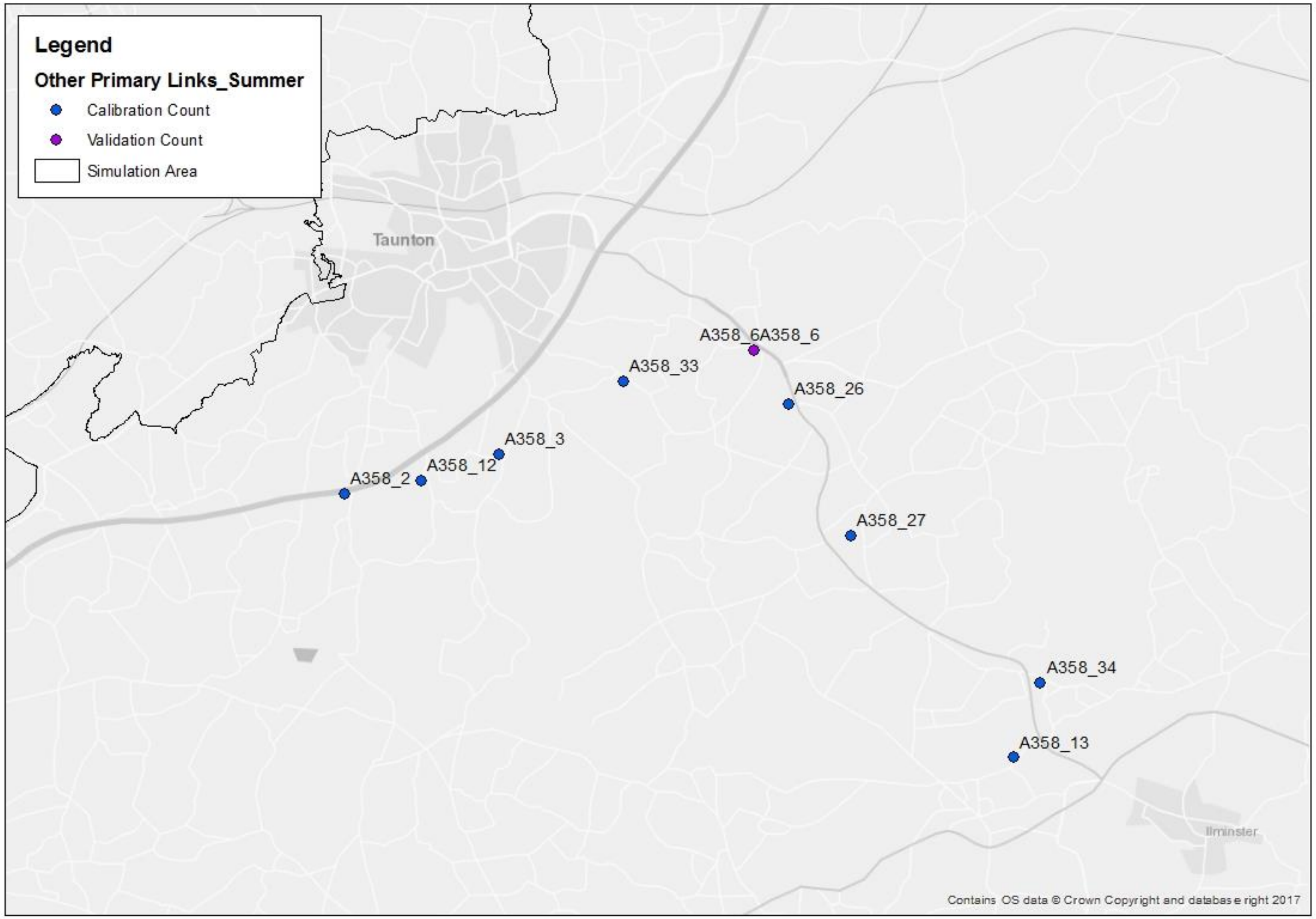

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Figure 20.7: Other Primary Link Count Locations Area 2

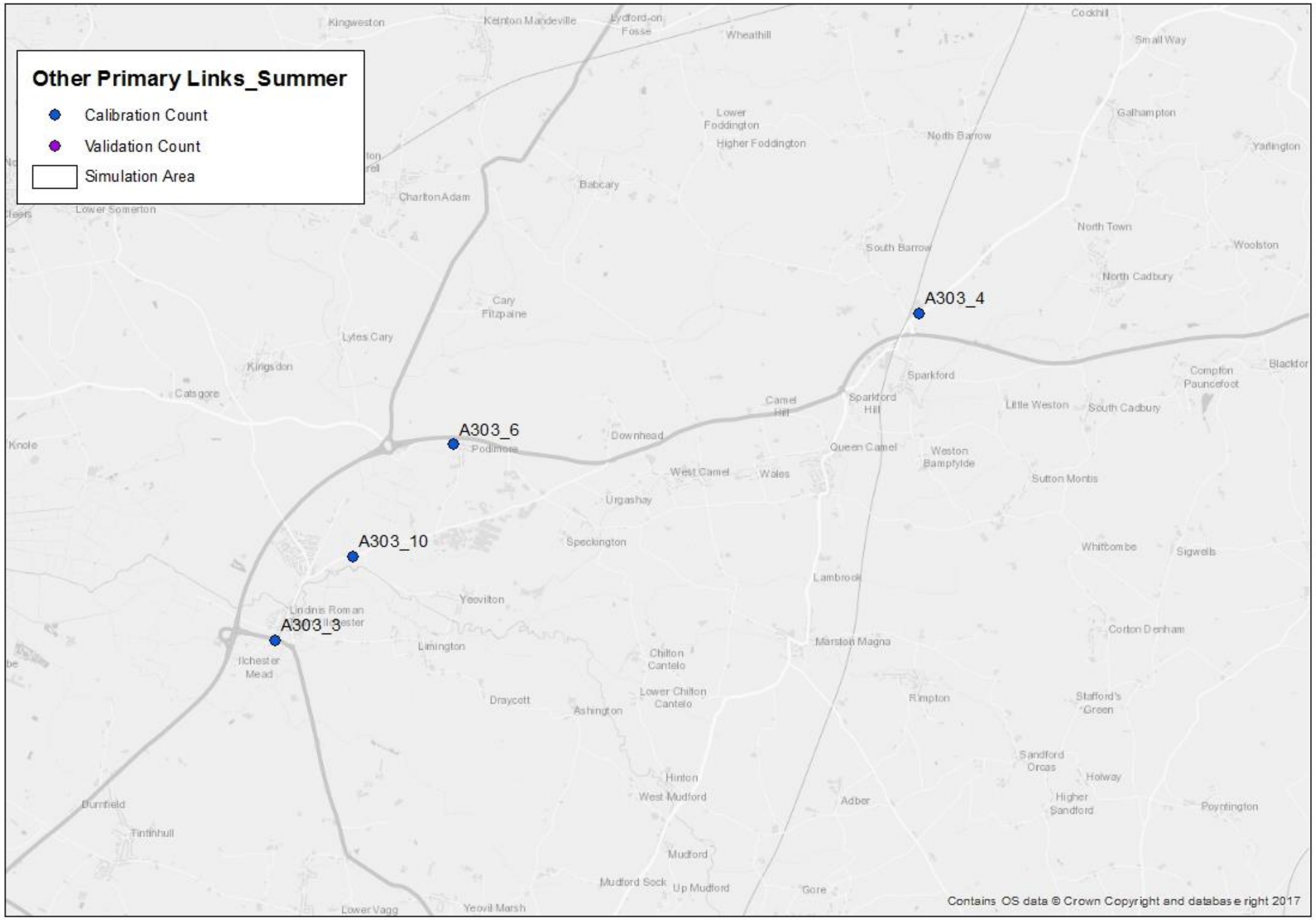

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Figure 20.8: Other Primary Link Count Locations Area 3

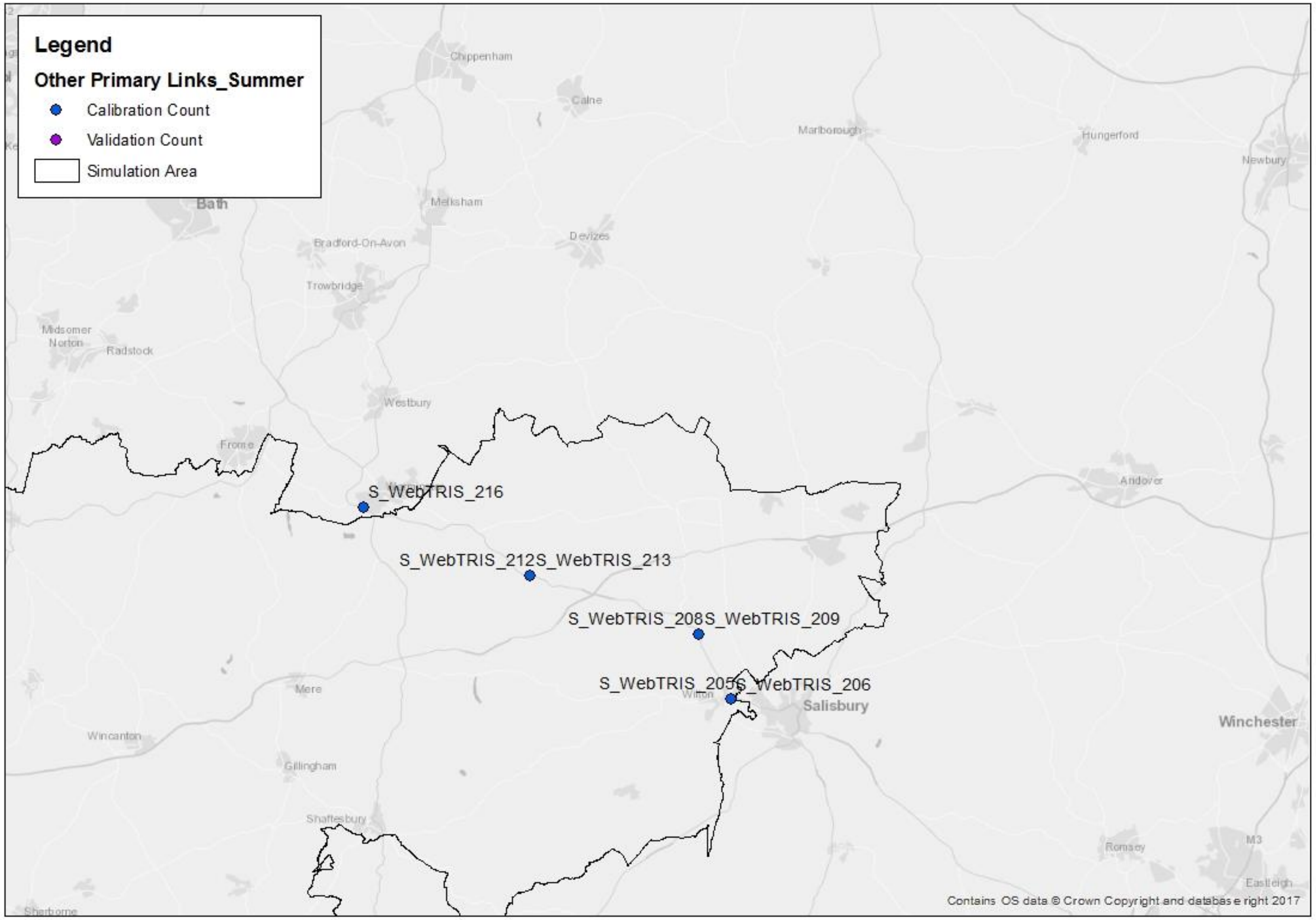

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Table 20.10: Other Primary Link Flow Results – Summer Model

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_NDC_A358_34A	EB	Calibration	57	50	-13.1%	1.0	PASS	49	43	-12.2%	0.9	PASS
S_NDC_A358_5A	EB	Calibration	53	102	91.4%	5.5	PASS	46	98	112.0%	6.1	PASS
S_NDC_A358_26A	SB	Calibration	41	41	-1.8%	0.1	PASS	36	36	0.7%	0.0	PASS
S_NDC_A303_3A	EB	Calibration	308	235	-23.6%	4.4	PASS	267	194	-27.4%	4.8	PASS
S_NDC_A303_6A	EB	Calibration	65	70	7.2%	0.6	PASS	56	61	7.8%	0.6	PASS
S_NDC_A358_2A	NB	Calibration	101	98	-3.0%	0.3	PASS	88	88	0.7%	0.1	PASS
S_NDC_A303_10B	WB	Calibration	111	128	15.5%	1.6	PASS	96	111	15.3%	1.4	PASS
S_NDC_A358_12A	NB	Calibration	13	13	-2.3%	0.1	PASS	11	11	-3.0%	0.1	PASS
S_NDC_A358_3A	NB	Calibration	163	162	-0.8%	0.1	PASS	141	142	0.5%	0.1	PASS
S_NDC_A303_4A	NB	Calibration	155	140	-9.5%	1.2	PASS	134	124	-7.6%	0.9	PASS
S_NDC_A358_27A	NB	Calibration	19	20	6.7%	0.3	PASS	16	17	3.9%	0.2	PASS
S_NDC_A358_13A	NB	Calibration	24	21	-11.1%	0.6	PASS	20	19	-7.8%	0.4	PASS
S_WebTRIS_216	NB	Calibration	850	819	-3.6%	1.1	PASS	766	738	-3.7%	1.0	PASS
S_WebTRIS_206	NB	Calibration	974	952	-2.2%	0.7	PASS	873	873	0.0%	0.0	PASS
S_WebTRIS_208	NB	Calibration	489	470	-3.9%	0.9	PASS	366	366	-0.1%	0.0	PASS
S_WebTRIS_213	NB	Calibration	453	436	-3.7%	0.8	PASS	396	369	-6.8%	1.4	PASS
S_NDC_A303_10A	EB	Calibration	94	95	1.1%	0.1	PASS	82	82	0.6%	0.1	PASS
S_NDC_A358_2B	SB	Calibration	99	96	-2.6%	0.3	PASS	86	86	0.3%	0.0	PASS
S_NDC_A358_12B	SB	Calibration	14	16	10.1%	0.4	PASS	13	14	12.9%	0.4	PASS
S_NDC_A358_3B	SB	Calibration	163	161	-1.0%	0.1	PASS	141	141	0.0%	0.0	PASS
S_NDC_A303_4B	SB	Calibration	164	169	3.2%	0.4	PASS	142	147	3.9%	0.5	PASS
S_NDC_A358_13B	SB	Calibration	32	20	-36.3%	2.3	PASS	28	17	-37.9%	2.2	PASS

Count ID	Count Direction	CAL/VAL	Total vehicles					Cars				
			Obs	Mod	% Diff	GEH	Pass	Obs	Mod	% Diff	GEH	Pass
S_NDC_A358_27B	SB	Calibration	19	24	25.3%	1.0	PASS	17	21	25.5%	1.0	PASS
S_WebTRIS_205	SB	Calibration	975	980	0.5%	0.2	PASS	878	895	1.9%	0.6	PASS
S_WebTRIS_209	SB	Calibration	463	458	-1.1%	0.2	PASS	354	373	5.3%	1.0	PASS
S_WebTRIS_212	SB	Calibration	446	394	-11.7%	2.5	PASS	400	336	-15.9%	3.3	PASS
S_NDC_A358_26B	NB	Calibration	24	24	1.2%	0.1	PASS	21	21	1.5%	0.1	PASS
S_NDC_A358_5B	WB	Calibration	76	125	64.2%	4.9	PASS	66	119	80.5%	5.5	PASS
S_NDC_A358_34B	WB	Calibration	43	41	-5.0%	0.3	PASS	37	37	-0.8%	0.1	PASS
S_NDC_A303_3B	WB	Calibration	287	280	-2.6%	0.4	PASS	249	248	-0.2%	0.0	PASS
S_NDC_A303_6B	WB	Calibration	59	56	-4.3%	0.3	PASS	51	51	0.4%	0.0	PASS
S_NDC_A358_33B	WB	Validation	22	28	26.7%	1.2	PASS	19	19	2.2%	0.1	PASS
S_NDC_A358_33A	EB	Validation	23	22	-3.3%	0.2	PASS	20	15	-21.6%	1.0	PASS

21 Appendix E

21.1 Uncertainty log for included Do Minimum network schemes

Table 21.1: Included DM network schemes

ID	Scheme/Site Name	Summary Description	Justification of Inclusion
1	Northern Inner Distributor Road	New road connecting Priory Bridge Road to Staplegrove Road.	Near Certain
2	Monkton Heathfield	Eastern development spine road and western relief road. Associated with Monkton Heathfield development.	Near certain
3	Staplegrove development site access.	Access link off Staplegrove Road to the east of Cross Keys/Silk Mills roundabouts. Includes conversion of existing Silk Mills Road/Staplegrove Road roundabout to traffic signals	More than likely
4	Comeytrowe development spine road	Road linking A38 and Trull Road through the Comeytrowe development site.	More than likely
7	Cranbrook developments (includes residential, commercial, Science Park and Skypark)	Junction improvements to cater for the Development traffic.	Near Certain
12	M5 J24 Huntworth rab imp	Improvement to roundabout required to mitigate the impact of several developments.	Under construction
13	M5 J24 HPC Park & Ride	700 space park & ride site to serve HPC construction only	More than likely
14	M5 J25	Major junction improvement with new arm and access to a proposed Strategic Employment site to the S.E of the junction. Proposed and designed by Somerset CC with funding from developer, local growth fund and potentially HE H&GF.	More than Likely
15	M5 J30/J31 - A379 Bridge Road Widening Exeter	Local Highway Scheme to widen A379 road providing increased highway capacity. Scheme works restrict highway capacity during 14 month construction period causing diversion of traffic to M5 Exe Viaduct J30 to J31.	Completed
18	A350 Chippenham Improvements	The A350 S-bound from M4 j17 bypasses Chippenham to the W, and heads S to Melksham, Trowbridge and eventually to Poole in Dorset. Wilts C have delivered a £2m package of improvements to the Chippenham bypass section, including the golf course and Bumpers Farm roundabouts and dualling sections of road immediately to the N of both junctions.	Completed
23	A38 M5 Jn16 to Aztec West	Widening S-bound to 5 lanes	More than likely

ID	Scheme/Site Name	Summary Description	Justification of Inclusion
32	A30 Temple to Higher Carblake	The A30 Temple to Higher Carblake scheme will dual the last section of single carriageway on the A30 between the M5 at Exeter and the Carland Cross junction with the A39 north of Truro (approx. 2.8 miles or 4.5km).	Under construction
40	M27 Junctions 4-11: Smart Motorways	Smart motorway scheme	More than likely
41	M3 Junctions 9-14: Smart Motorways	Smart motorway scheme	More than likely
44	M3 J2-4a	M3: Jn 2 (M25 interchange) to Jn 4a (A327 Farnborough): upgrading the M3 to Smart Motorway including hard shoulder running.	Under construction
45	A303 Stonehenge (formerly known as the A303 Amesbury to Berwick Down scheme)	Construction of a twin-bored tunnel of at least 1.8 miles as the road passes Stonehenge, coupled with a dual carriageway bypass for Winterbourne Stoke to link the existing dual carriageway section around Amesbury with the dual carriageway at Berwick Down.	More than likely and RIS1 scheme in simulation area
47	A358 Taunton to Southfields	Dualling of a single carriageway section of the A303, linking together the Sparkford and Ilchester bypasses.	RIS1 scheme in simulation area
51	Yeovil Western Corridor	Major road improvement scheme in Yeovil (circa £15m) - see website for detailed drawings: http://www.somerset.gov.uk/policies-and-plans/schemes-and-initiatives/yeovil-western-corridor/	Near Certain
52	Yeovil Eastern Corridor	Major road improvement scheme in Yeovil (circa £4m)	Complete
61	M4 Junctions 3-12 Smart Motorways	M4: Jn 3 (Uxbridge) to Jn 12 (Reading west): upgrading to Smart Motorway, linking Reading to Heathrow.	More than likely
62	M23 Junctions 8-10: Smart Motorways	M23: Jn 8 (M25 interchange) to Jn 10 (Crawley): upgrading to Smart Motorway, improving connections to Gatwick Airport.	More than likely
66	M6 Junctions 10a-13: Smart Motorway	M6: Jn 10a (M54) to Jn 13 (Stafford): upgrading to Smart Motorway including hard shoulder running	Near Certain
67	M5 junctions 4a-6: Smart Motorway	M5: Jn 4a (M42 interchange) to Jn 6 (Worcester): upgrading to Smart Motorway including hard shoulder running	Near Certain
69	M1 Junctions 28-31: Smart Motorway	M1: Jn 28 (Mansfield) to Jn 31 (Sheffield): upgrading to Smart Motorway including hard shoulder running	Near Certain
70	M6 Junctions 13-15: Smart Motorway	M6: Jn 13 (Stafford south) to Jn 15 (Stoke south): upgrading to Smart Motorway including hard shoulder running	Near Certain
71	M1 Junctions 16-19: SMP	M1: Jn 16 to Jn 19 (Catthorpe Interchange with M6/A14): upgrading to Smart Motorway, including hard shoulder running	Near Certain
72	M1 Junctions 13-16: SMP	M1: Jn 13 (Milton Keynes south) to Jn 16: upgrading to Smart Motorway, including hard shoulder running	Near Certain
73	M6 Junctions 2-4: Smart Motorway	M6: Jn 2 (M69 interchange) to Jn 4 (M42 interchange): upgrading to Smart Motorway including hard shoulder running	More than likely

ID	Scheme/Site Name	Summary Description	Justification of Inclusion
74	M4 Corridor around Newport	New section of motorway to be built around the opposite side of Newport to the current M4	Included in SWRTM DM
75	A465 Gilwern to Brynmawr	Dualling rural single carriageway	Included in SWRTM DM
76	A465 Brynmawr to Tredegar	Dualling rural single carriageway	Included in SWRTM DM

21.2 Uncertainty log for omitted Do Minimum network schemes

Table 21.2: Omitted DM network schemes

ID	Scheme/Site Name	Summary Description	Justification of Omission
5	Comeytrowe Park and Bus	New Park & Bus site on a38. Associated with Comeytrowe development. Accessed via a new roundabout off A38.	This area is not fully modelled in the base model
8	Southfield roundabout	Improvements to Southfield Roundabout to mitigate impact of delivering the strategic employment site off Station Road Ilminster.	The saturation flow has already been revised in the base model
9	M5 J23 Signalisation	Signalisation of 3 arms to mitigate impact of HPC construction. Third party funded scheme.	Junction scheme in buffer area
10	M5 J23 HPC Park & Ride	1300 space park & ride site to serve HPC construction only	Junction scheme in buffer area
11	M5 J23 Dunball rab imp	Improvement to Dunball rab junction with A38 as requirement for Huntspill Energy Park development. A third party scheme	Junction scheme in buffer area
16	A38 Deep Lane Junction East of Plymouth	Improved junction capacity with associated Park and Ride mode interchange facility. Scheme required to provide additional junction capacity to enable development of Sherford New Town 5,500 new homes, schools, healthcare facilities, jobs etc.	Junction scheme in buffer area
17	A380 South Devon Highway (Kingskerswell By-Pass)	The South Devon Link Road is a 5.5km dual carriageway, providing a bypass for Kingskerswell. The road bypasses the former A380 between Newton Abbot and Torbay. The major new road, now called the South Devon Highway, was opened to traffic in December 2015 with significant reduction in journey times to/from Torbay.	Local authority scheme in the buffer area
19	M4 j17 Partial Signalization	Partial MOVA signalization of junction. Required to mitigate effects of housing and business growth at Chippenham. Also, to improve safety, by preventing queues on slip roads backing onto main line.	Junction scheme in buffer area
20	M4 j16 Improvement	Upgrading capacity and changing layout of gyratory at J16 (Swindon West). £7.2m 3rd party (s6) scheme required to accommodate nearby urban extension of Swindon at Wichelstowe.	Junction scheme in buffer area
21	M4 j15 Improvement	Upgrading capacity and changing layout of gyratory at J15 (Swindon West). £4.5m 3rd party scheme required to accommodate nearby urban extension of Swindon at Commonhead. Additional lane on gyratory, additional lane on A419 S-bound approach, and dedicated turning lane onto E-bound M4 slip. Enhanced £8.7m scheme with additional improvements to approach roads the subject of bid for Growth & Housing Fund.	Junction scheme in buffer area

ID	Scheme/Site Name	Summary Description	Justification of Omission
22	A419 White Hart junction improvement	Remodelling and upgrading of gyratory below A419. Required to accommodate New Eastern Villages urban extension E of A419.	Junction scheme in buffer area
24	A40 Elmbridge Court rbt	Hamburger' throughabout junction, widen approach roads, and signalize.	Junction scheme in buffer area
25	Blackwater junction	Widening the A338 from Blackwater south to Cooper Dean junction with A3060. A new junction is to be built at Wessex Fields just north of Bournemouth Hospital linking the A338 with development land north of the hospital.	Junction scheme in buffer area
26	Dunyeat's rbt and Queen Anne Drive jns	Improvements to Dunyeat’s roundabout and Queen Anne Drive junctions on A349 to reduce congestion and improve journey times on major commuter route, including improvements for pedestrians and cyclists.	Junction scheme in buffer area
27	A349 major imp	Major improvement works to A349 (Gravel Hill), stabilising and strengthening embankments, increasing capacity for motor vehicles and delivering improvements to sustainable transport options.	Duplicate of 25 and 26
30	A34 Milton Interchange Improvement	Increased capacity at this roundabout junction by adding a 'hamburger lane' dedicated left turn lanes, and widening. A34 is SRN.	Junction scheme in buffer area
31	A34 Chilton Interchange Improvement	Adding two north facing slip roads to connect the A34 with the A4185 Newbury Road and Hagbourne Hill. A34 is SRN.	Junction scheme in buffer area
33	M49 Avonmouth Junction	M49: new junction to provide strategic access to Severnside and Avonmouth; this will support the Enterprise Zone and local growth in the Bristol area	Junction scheme in buffer area
34	M5 Bridgwater Junctions	M5: Jn 23 (A39 interchange): upgrading of the junction to provide better access to Hinkley Point and Huntspill Energy Park	Likelihood is only reasonably foreseeable
35	A30 Chiverton to Carland Cross	A30: Chiverton to Carland Cross: upgrading the A30 to dual carriageway north of Truro, linking existing dual carriageways around Bodmin with the Redruth bypass; coupled with the Temple to Higher Carblake scheme with will improve the A30 to high quality two-lane dual carriageway standard between Camborne and the M5	Scheme in buffer area that was not included in stage 2
36	M27 Southampton Junctions 5-8	M27: Jn 5 (Southampton Airport) to Jn 8 (A3024): widening and signalisation of slip roads and access routes to junction 8, and replacement of rail bridges in Southampton (on local road network) to reduce pressure on the motorway	Scheme in buffer area that was not included in stage 2
37	M271 / A35 Redbridge roundabout upgrade	M271/A35: junction improvements to provide a dedicated left turn lane for traffic leaving the M271 for Southampton Port and free flow traffic from the Port onto the M271 (a 'hamburger' roundabout)	Junction scheme in buffer area
38	A31 Ringwood	A31: Ringwood: widening to three lanes and junction improvements providing more capacity for local traffic; adjustments to nearby road network to provide improvements for pedestrians and address safety	Scheme in buffer area that was not included in stage 2

ID	Scheme/Site Name	Summary Description	Justification of Omission
39	A34 Oxford Junctions	A34: Oxford: improvements at Peartree and Botley interchanges	Likelihood is only reasonably foreseeable
42	M3 Junction 10-11 improved slip roads	M3 Jn 10 to Jn 11 (Winchester south): improvements for merging traffic to include technology, widening and lane realignment; lane gain and lane drop will smooth flow of traffic onto the M3 and assist flow to Southampton port	Now part of M3 SMP scheme
43	M3 Junctions 12-14 improved slip roads	M3: Jn 14 (M27 interchange) to Jn 12 (Eastleigh) northbound: carriageway widening and junction reconfiguration to improve capacity through the junction	Now part of M3 SMP scheme
49	M3 Junction 9 improvement	M3: Jn 9 (A34): comprehensive package of improvements, to include new links and widening and remodelling of junction 9 to allow more free flowing connections and reduce congestion	Junction scheme in buffer area
50	A417 Missing link at Air Balloon	Connection of the two dual carriageway sections of the A417 near Birdlip in Gloucestershire, taking account of both the environmental sensitivity of the site and the importance of the route to the local economy.	Likelihood is only reasonably foreseeable
53	Bus measures for South Yeovil Sustainable Urban Extension	Bus service improvements, re-routing and bus gate	Bus improvements will not affect network
54	Bus measures for North East Yeovil Sustainable Urban Extension	Bus service improvements, re-routing and bus gate	Bus improvements will not affect network
55	Upgrade to A37 Dorchester Road Roundabout (Redhouse Roundabout)	Upgrades as part of South Yeovil Sustainable Urban Extension	Insufficient information – no opening date
56	Construction of roundabout on the A359	Provide main access point into North East Yeovil Sustainable Urban Extension	Insufficient information – no opening date
57	New primary school at Queen Camel	New primary school provided in conjunction with new residential development	Does not affect network (only moved to other side of village within same zone)
58	Yeovilton Noise Exposure Categories: Re-mapped	The noise exposure categories associated with RNAS Yeovilton base have been re-mapped. This, in general terms, facilitates more development possibilities in and around Yeovilton.	Would not affect network
59	Dedicated left-hand exits from Cartgate Roundabout on A303 to A3088 (Yeovil)	Potential Highways England scheme facilitating dedicated access to A3088 from Cartgate Roundabout. Previously identified and funding allocated.	Likelihood is only hypothetical
63	M25 Junctions 10-16 Smart Motorway	M25: Jn 10 (A3) to Jn 16 (M40 interchange): upgrading Smart Motorway and substantial widening of Jn 11 (Chertsey); this provides for four lane running through junctions on the M25 between junction 10 and junction 16 leading to five lane Smart Motorway	Scheme in buffer area that was not included in stage 2

ID	Scheme/Site Name	Summary Description	Justification of Omission
64	Arundel Bypass	A27 Arundel: new dual carriageway bypass, subject to consultation with the National Parks Authority, local authorities and the publication of this and alternative options	Scheme in buffer area that was not included in stage 2
65	A27 Chichester Bypass	A package of improvements for a section of the A27 near Chichester and likely to be a bypass	Scheme cancelled
68	M1 Junctions 23a-25: Smart Motorway	M1: Jn 23a (A42) to Jn 24 (A453, East Midlands Airport): upgrading to Smart Motorway including hard shoulder running	Scheme in buffer area that was not included in stage 2
77	M27 J9	Junction improvements	Junction scheme in buffer area
78	M27 J10	Junction improvements - making this a full junction rather than just on and off in one direction as it currently is	Junction scheme in buffer area

21.3 Uncertainty log for development schemes

Table 21.3: Development schemes

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
1	Hyde Lane	Yes	Certainty level at least 'More than likely'
2	Land south of Ilton Business Park (15/04905/FUL)	Yes	Certainty level at least 'More than likely'
3	Land off Station Road (ME/ILMI/4)	Yes	Certainty level at least 'More than likely'
4	Land at Canal Way 16/05500/OUT	Yes	Certainty level at least 'More than likely'
5	Former Powermatic site, Winterhay Lane 13/04935/OUT	Yes	Certainty level at least 'More than likely'
6	Land at North Grays Farm, Membury	Yes	Certainty level at least 'More than likely'
7	The Cedars, Otter Valley Park	Yes	Certainty level at least 'More than likely'
8	Hembury Court Cottages, Broadhembury	Yes	Certainty level at least 'More than likely'
9	Land off Clapper Lane	Yes	Certainty level at least 'More than likely'
10	Heathfield House, Rosemount Lane	Yes	Certainty level at least 'More than likely'
11	Land West of Hayne Lane	Yes	Certainty level at least 'More than likely'
12	Northcote Lane	Yes	Certainty level at least 'More than likely'
13	Small sites	Yes	Certainty level at least 'More than likely'
14	Ottery Moor Lane	Yes	Certainty level at least 'More than likely'
15	Land adjacent to Louvigny Close, Feniton	Yes	Certainty level at least 'More than likely'
16	Land North of Acland Park, Feniton	Yes	Certainty level at least 'More than likely'
17	West Hayes, West Hill	Yes	Certainty level at least 'More than likely'
18	Marist Convent	Yes	Certainty level at least 'More than likely'
19	Land East of Butts Road	Yes	Certainty level at least 'More than likely'
20	Land South of Exeter Road (Island Farm)	Yes	Certainty level at least 'More than likely'
21	Land adjoining the Tumbling Wier Hotel (Cutler Hammer)	Yes	Certainty level at least 'More than likely'
22	Small Sites	Yes	Certainty level at least 'More than likely'
23	Salston Manor Hotel, Ottery St Mary	Yes	Certainty level at least 'More than likely'
24	Land Opposite Oriental Promise, Cranbrook	Yes	Certainty level at least 'More than likely'
25	Former Gerway Nurseries	Yes	Certainty level at least 'More than likely'
26	Land at Barton Orchard, Tipton St John	Yes	Certainty level at least 'More than likely'
27	Corner Croft and Wrenswood, West Hill	Yes	Certainty level at least 'More than likely'
28	Land North of Eastfield, West Hill	Yes	Certainty level at least 'More than likely'
29	Small sites	Yes	Certainty level at least 'More than likely'

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
30	Land to the East of Village Hall, Clyst St Mary	Yes	Certainty level at least 'More than likely'
31	Other Sites (that is, St Bridgets)	No	Certainty level below 'More than likely'
32	Gretian Quarter Regeneration Area	Yes	Certainty level at least 'More than likely'
33	Other Specific Sites within Urban Area	Yes	Certainty level at least 'More than likely'
34	Land East of Newcourt Drive, Old Rydon Lane	Yes	Certainty level at least 'More than likely'
35	Exeter Golf and Country Club Practice Ground, Topsham Rd	Yes	Certainty level at least 'More than likely'
36	Land East of the Railway, Old Rydon Lane (North)	Yes	Certainty level at least 'More than likely'
37	Other Commitments	Yes	Certainty level at least 'More than likely'
38	Land Adj to Higher Furlong, Hollow Lane	Yes	Certainty level at least 'More than likely'
39	Hessary, Hollow Lane	Yes	Certainty level at least 'More than likely'
40	Hill Barton Farm, Hill Barton Road	No	Development completed
41	Commitments	Yes	Certainty level at least 'More than likely'
42	Pinhoe / Ibstock	Yes	Certainty level at least 'More than likely'
43	Land at junction of Tithebarn Lane and Gypsy Lane	Yes	Certainty level at least 'More than likely'
44	Land West of Pilton Lane	Yes	Certainty level at least 'More than likely'
45	Old Park Farm, Pinhoe	Yes	Certainty level at least 'More than likely'
46	Tithebarn Green, Blackhorse	Yes	Certainty level at least 'More than likely'
47	Land South of Moonhill Copse, Pinhoe	Yes	Certainty level at least 'More than likely'
48	Old Park Farm, Pinhoe (Phase 2)	Yes	Certainty level at least 'More than likely'
49	Pinn Court Farm, Pinhoe	Yes	Certainty level at least 'More than likely'
50	Mosshayne, Blackhorse	Yes	Certainty level at least 'More than likely'
51	Middlemoor Police HQ, Rydon Lane etc.	Yes	Certainty level at least 'More than likely'
52	Cranbrook Care / Extra Care Home	Yes	Certainty level at least 'More than likely'
53	Cranbrook (18.4ha)	Yes	Certainty level at least 'More than likely'
54	Skypark (40ha)	No	Duplicated Entry
55	Science Park (25ha)	No	Duplicated Entry
56	Cranbrook	Yes	Certainty level at least 'More than likely'
57	Jack in the Green, Cranbrook	Yes	Certainty level at least 'More than likely'
58	Commitments Cullompton	Yes	Certainty level at least 'More than likely'
59	West Park	Yes	Certainty level at least 'More than likely'
60	Chelston House Farm	No	Duplicated with ID 59 West Park development
61	Tonedale Business Park	Yes	Certainty level at least 'More than likely'
62	Cades Farm	Yes	Certainty level at least 'More than likely'
63	Wellington Greaseworks	Yes	Certainty level at least 'More than likely'

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
64	Longforth Farm	Yes	Certainty level at least 'More than likely'
65	Jurston Farm	Yes	Certainty level at least 'More than likely'
66	Comeytrowe/Trull	Yes	Certainty level at least 'More than likely'
67	Ladymead School	Yes	Certainty level at least 'More than likely'
68	Monkton Heathfield Urban Extension	Yes	Certainty level at least 'More than likely'
69	Aginghills Farm	Yes	Certainty level at least 'More than likely'
70	Taunton Trading Estate	Yes	Certainty level at least 'More than likely'
71	Old Cider Works	Yes	Certainty level at least 'More than likely'
72	Staplegrove	Yes	Certainty level at least 'More than likely'
73	Nerrols Drive	Yes	Certainty level at least 'More than likely'
74	Gas Storage Site, Tangier	Yes	Certainty level at least 'More than likely'
75	Mount Street	Yes	Certainty level at least 'More than likely'
76	Killams Drive	Yes	Certainty level at least 'More than likely'
77	Kings College	Yes	Certainty level at least 'More than likely'
78	Priory Bridge Road Car park	Yes	Certainty level at least 'More than likely'
79	Firepool	Yes	Certainty level at least 'More than likely'
80	Coal Orchard	Yes	Certainty level at least 'More than likely'
81	Firepool (East Goods Yard)	Yes	Certainty level at least 'More than likely'
82	Lopen Head Nursery (12/00951/FUL)	Yes	Certainty level at least 'More than likely'
83	Erection of 5 units, Chard Business Park (12/03677/FUL)	Yes	Certainty level at least 'More than likely'
84	Former gas depot, Furnham Road (13/03954/FUL)	No	Scheme for self storage units. Assumed no trips generated
85	Erection of replacement building	No	Insufficient information
86	Land off Oaklands Avenue (15/02165/REM)	Yes	Certainty level at least 'More than likely'
87	Land adjoining Fordham Grange, south of A30	No	Application for scheme refused
88	Land between Forton Road and Tatworth Road (north) (15/04772/OUT)	Yes	Certainty level at least 'More than likely'
89	Land between Forton Road and Tatworth Road (south) (16/02874/FUL)	Yes	Certainty level at least 'More than likely'
90	SW Alphington Strategic Allocation Sites	Yes	Certainty level at least 'More than likely'
91	Strategic Employment Site	Yes	Certainty level only Reasonably Foreseeable but included as per instruction from Highways England
92	South Yeovil Sustainable Urban Extension (15/01000/OUT)	Yes	Certainty level at least 'More than likely'
93	Northern Yeovil Sustainable Urban Extension (14/02554/OUT)	Yes	Certainty level at least 'More than likely'
94	Summerhouse Village	No	Certainty level below 'More than likely'
95	Cattle Market Redevelopment	Yes	Certainty level at least 'More than likely'
96	Lufton Key Site (10/01875/REM)	Yes	Certainty level at least 'More than likely'

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
97	Lyde Road (06/01050/OUT)	Yes	Certainty level at least 'More than likely'
98	Brimsmore (16/00978/REM & 05/00753/OUT)	Yes	Certainty level at least 'More than likely'
99	Former Seatons Garage (05/00677/OUT)	Yes	Development completed
100	Former Western Gazette Building (14/00663/FUL)	Yes	Development completed
101	Land at Bunford Hollow (13/01869/OUT)	Yes	Certainty level at least 'More than likely'
102	Lufton Key Site (KS/BRYM/1)	Yes	Certainty level at least 'More than likely'
103	Land South of Yeovil Airfield (ME/YEOV/4)	Yes	Certainty level at least 'More than likely'
104	Land off Bunford Lane	Yes	Certainty level at least 'More than likely'
105	Dragonfly Chase (15/00024/OUT)	Yes	Certainty level at least 'More than likely'
106	The Old Coal Yard (15/03345/S73A)	Yes	Certainty level at least 'More than likely'
107	Longhazel Farm (14/01958/FUL)	Yes	Certainty level at least 'More than likely'
108	Land Rear of the Burrows (14/05052/FUL)	Yes	Certainty level at least 'More than likely'
109	The Avenue	Yes	Development completed
110	Haynes Publishing (16/00725/OUT)	Yes	Certainty level at least 'More than likely'
111	Unit G, Cadbury Business Park	Yes	Certainty level at least 'More than likely'
112	Unit C, Cadbury Business Park	Yes	Certainty level at least 'More than likely'
113	Cadbury Business Park	Yes	Certainty level at least 'More than likely'
114	Land at Queen Camel	Yes	Certainty level at least 'More than likely'
115	Land at South Street	Yes	Certainty level at least 'More than likely'
116	Land Between Station Road & Torbay Road (15/02347/OUT)	Yes	Certainty level at least 'More than likely'
117	Land East of Station Road (15/00519/OUT)	Yes	Certainty level at least 'More than likely'
118	Land West of Station Road (15/02388/OUT)	Yes	Certainty level at least 'More than likely'
119	Land at Wayside Farm (14/01704/OUT)	Yes	Certainty level at least 'More than likely'
120	Land at Station Road, Ansford	No	Certainty level below 'More than likely'
121	Well Farm (13/03593/OUT)	Yes	Certainty level at least 'More than likely'
122	Former BMI Site	No	Certainty level below 'More than likely'
123	Castle Cary Employment Sites (ME/CACA/3 (i))	No	Duplicated entry
124	New Barns Farm (11/00639/FUL)	Yes	Certainty level at least 'More than likely'
125	Dancing Lane (14/01704/OUT)	Yes	Certainty level at least 'More than likely'
126	Verrington Hospital (14/00838/OUT)	Yes	Certainty level at least 'More than likely'
127	Land at Bayford Hill (13/03318/OUT)	Yes	Certainty level at least 'More than likely'
128	Wincanton Employment Area 1	Yes	Certainty level at least 'More than likely'
129	Wincanton Employment Area 2	Yes	Certainty level at least 'More than likely'
130	Wincanton Direction of Growth	Yes	Certainty level at least 'More than likely'

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
131	Northfield Farm (10/03704/FUL)	Yes	Certainty level at least 'More than likely'
132	Land South of Langport Road (13/03272/OUT)	Yes	Certainty level at least 'More than likely'
133	Swindon Central Area (Houses)	No	Insufficient Information
134	Swindon Central Area (Offices)	No	Insufficient Information
135	Eastern Villages (Offices)	No	Insufficient Information
136	Eastern Villages (Houses)	No	Insufficient Information
137	Eastern Villages (Employment)	No	Insufficient Information
138	Wichelstowe (Houses)	No	Insufficient Information
139	Wichelstowe (Employment)	No	Insufficient Information
140	Commonhead (Houses)	No	Insufficient Information
141	Commonhead (Employment)	No	Insufficient Information
142	Tadpole Farm (Houses)	No	Insufficient Information
143	Tadpole Farm (Employment)	No	Insufficient Information
144	Kingsdown	No	Insufficient Information
145	Chippenham M4 Junction 17 development	No	Insufficient Information
146	Land at North Chippenham, Hill Corner (Houses)	No	Insufficient Information
147	Land at North Chippenham, Hill Corner (Employment)	No	Insufficient Information
148	Rowden Park (Houses)	No	Insufficient Information
149	Rowden Park (Employment)	No	Insufficient Information
150	The Range	No	Insufficient Information
151	Rawlings Green	No	Insufficient Information
152	Land at Showell Farm	No	Insufficient Information
153	Hunters Moon, Easton Lane (Houses)	No	Insufficient Information
154	Hunters Moon, Easton Lane (Employment)	No	Insufficient Information
155	Chippenham 2020 site (Houses)	No	Insufficient Information
156	Chippenham 2020 site (Employment)	No	Insufficient Information
157	Forder Valley Link Road (Houses)	No	Insufficient Information
158	Forder Valley Link Road (Employment)	No	Insufficient Information
159	A386 Northern Corridor (Houses)	No	Insufficient Information
160	A386 Northern Corridor (Employment)	No	Insufficient Information
161	Saltram Meadow/Plymstock Quarry	No	Insufficient Information
162	South Plymouth	No	Insufficient Information
163	North Plymouth	No	Insufficient Information
164	East Plymouth	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
165	Sherford (in South Hams)	No	Insufficient Information
166	Cranbrook. Exeter & East Devon Growth Point. (Houses)	No	Insufficient Information
167	Cranbrook. Exeter & East Devon Growth Point. (Employment)	No	Insufficient Information
168	Cranbrook, Exeter	No	Insufficient Information
169	Exeter Science Park	No	Insufficient Information
170	Skypark Business Park	No	Insufficient Information
171	Intermodal Freight Terminal	No	Insufficient Information
172	Newcourt (Houses)	No	Insufficient Information
173	Newcourt (Employment)	No	Insufficient Information
174	Cranbrook Expansion Area	No	Insufficient Information
175	Tiverton Eastern Urban Extension	No	Insufficient Information
176	Cullompton	No	Insufficient Information
177	North Devon SSAs (Barnstaple and Ilfracombe)	No	Insufficient Information
178	Houghton Baton	No	Insufficient Information
179	Wolborough	No	Insufficient Information
180	Alphington	No	Insufficient Information
181	NW Cheltenham (Houses)	No	Insufficient Information
182	NW Cheltenham (Employment)	No	Insufficient Information
183	MOD Ashchurch (Houses)	No	Insufficient Information
184	MOD Ashchurch (Employment)	No	Insufficient Information
185	Ashchurch	No	Insufficient Information
186	Brockworth, Perrybrook	No	Insufficient Information
187	Innsworth (Houses)	No	Insufficient Information
188	Innsworth (Employment)	No	Insufficient Information
189	South Churchdown (Houses)	No	Insufficient Information
190	South Churchdown (Employment)	No	Insufficient Information
191	Cirencester Urban Extension	No	Insufficient Information
192	Land south of Chesterton Cirencester	No	Insufficient Information
193	Cribbs Patchway New Neighbourhood	No	Insufficient Information
194	Emersons Green East	No	Insufficient Information
195	North Yate	No	Insufficient Information
196	Land at Sharpness	No	Insufficient Information
197	West of Twerton	No	Insufficient Information
198	UWE Site (former Hewlett Packard Site)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
199	Weston-super-Mare M5 J21 (Houses)	No	Insufficient Information
200	Weston-super-Mare M5 J21 (Employment)	No	Insufficient Information
201	Weston urban area (excluding Weston Villages) (Houses)	No	Insufficient Information
202	Weston urban area (excluding Weston Villages) (Employment)	No	Insufficient Information
203	Clevedon, Nailsea and Portishead (Houses)	No	Insufficient Information
204	Clevedon, Nailsea and Portishead (Employment)	No	Insufficient Information
205	Service villages (Houses)	No	Insufficient Information
206	Service villages (Employment)	No	Insufficient Information
207	Other settlements (Houses)	No	Insufficient Information
208	Other settlements (Employment)	No	Insufficient Information
209	Royal Ordnance Factory Site (Puriton site)	No	Duplicated Entry
210	Bridgwater Gateway - Land to the south of Bridgwater, adjacent to the A38	No	Duplicated Entry
211	12.5 ha of land at Somerset Bridge, Bridgwater allocated in Core Strategy for industrial warehouse or business use	No	Duplicated Entry
212	Hinkley Point C	No	Duplicated Entry
213	Comeytrowe / Trull urban extension	No	Duplicated with ID 66
214	Monkton Heathfield	No	Duplicated with ID 68
215	Monkton Heathfield	No	Duplicated with ID 68
216	Staplegrove Urban Extension	No	Duplicated with ID 72
217	Holes Bay Basin - Lower Hamworthy (Power Station)	No	Insufficient Information
218	Port of Poole	No	Insufficient Information
219	Christchurch Roeshot Hill urban extension	No	Insufficient information
220	Gillingham Urban Extension (Houses)	No	Insufficient Information
221	Gillingham Urban Extension (Employment)	No	Insufficient Information
222	Truro Cornwall TR4 9AN (Houses)	No	Insufficient Information
223	Truro Cornwall TR4 9AN (Employment)	No	Insufficient Information
224	Carclaze Eco-community	No	Insufficient Information
225	Old Taunton Road Industrial Estate	Yes	Certainty level at least 'More than likely'
226	Monmouth Street	Yes	Certainty level at least 'More than likely'
227	South Bridgwater	Yes	Certainty level at least 'More than likely'
228	Wilstock Phase 3	Yes	Certainty level at least 'More than likely'
229	North East Bridgwater	Yes	Certainty level at least 'More than likely'
230	Federal Mogul	No	Insufficient Information (Also mostly completed by 2015)
231	Bigwood and Staples	Yes	Certainty level at least 'More than likely'

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
232	Former Bridgwater Livestock Market	Yes	Certainty level at least 'More than likely'
233	Gerber, Wembdon	Yes	Certainty level at least 'More than likely'
234	Land South of Durleigh Road	Yes	Certainty level at least 'More than likely'
235	Land South of Haygrove Road	Yes	Certainty level at least 'More than likely'
236	Former Police Station	Yes	Certainty level at least 'More than likely'
237	Former Paragon Laundry Site	Yes	Certainty level at least 'More than likely'
238	Bridgwater Retail Park	Yes	Certainty level at least 'More than likely'
239	Northgate	No	Assumed trips already included in matrix
240	Bridgwater Gateway	Yes	Certainty level at least 'More than likely'
241	Bristol Road	Yes	Certainty level at least 'More than likely'
242	RRBC Hotel	No	Assume hotel would not generate regular trips
243	Eastover	No	Assume hotel would not generate regular trips
244	Bridgwater College	No	Exclude theatres
245	West Bridgwater - land at Cokerhurst, Wemdon, and south of Quantock Road - Brief Option 1	Yes	Certainty level at least 'More than likely'
246	Land north of Chilton Trinity - Brief Option 3	No	Certainty level below 'More than likely'
247	Land at East Bridgwater (east of Bower Lane, Plum Lane) - Brief Option 2	Yes	Certainty level at least 'More than likely'
248	Land at South Bridgwater (west of Gateway employment site) - Brief Option 4	No	Certainty level below 'More than likely'
249	Stockmoor, South Bridgwater	No	Certainty level below 'More than likely'
250	Haygrove School, Durleigh Road	No	Certainty level below 'More than likely'
251	East of Bristol Road, north of former cattle market	No	Certainty level below 'More than likely'
252	Huntworth - Brief Option 5	No	Certainty level below 'More than likely'
253	Somerset Bridge	No	Certainty level below 'More than likely'
254	Former Wellworths, Colley Lane	No	Certainty level below 'More than likely'
255	Bristol Road North (three possible sites)	No	Certainty level below 'More than likely'
256	Former ROF Site - Huntspill Energy Park, Puriton	Yes	Certainty level at least 'More than likely'
257	Bower Lane - new hospital	No	Exclude Hospital
258	Bower Lane - new nursing home	No	Assume nursing home would not generate regular trips
259	Police operations base and custody centre - Express Park	No	Assume police base would not generate regular trips
260	Chilton Trinity Brickworks	Yes	Certainty level at least 'More than likely'
261	Chilton Trinity Leisure Centre	No	Assume leisure centre would not generate regular trips
262	Hinkley Point C (HPC) - Operational Phase	Yes	Certainty level at least 'More than likely'
263	Isleport Phase 2	Yes	Certainty level at least 'More than likely'
264	Bridgwater College - Advanced Energy Centre	No	Assume student accommodation would not generate regular trips

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
265	National College for Nuclear	No	Assume student accommodation would not generate regular trips
266	Food Innovation Centre	No	Assume student accommodation would not generate regular trips
267	Student Accommodation Block	No	Assume student accommodation would not generate regular trips
268	Land north of Dunball Rbt	No	Exclude hotels – not employment or residential
269	Land at Brue Farm, Highbridge (in West Huntspill parish)	Yes	Certainty level at least 'More than likely'
270	Land at Iselport Lane, Highbridge	Yes	Certainty level at least 'More than likely'
271	Land at Puriton Hill, Puriton	No	Exclude due to small size
272	Land at Riverton Road, Puriton	No	Exclude due to small size
273	Land at Crockers Hill, Woolavington	Yes	Certainty level at least 'More than likely'
274	Puriton	Yes	Certainty level at least 'More than likely'
275	Woolavington	Yes	Certainty level at least 'More than likely'
276	Former Pig & Whistle Pub, Parkway, Sydenham	Yes	Certainty level at least 'More than likely'
277	Former Bridgwater Hospital, East Quay, Bridgwater	No	Assume hospital would not generate regular trips
278	Former Black Hose Pub, Rhode Lane, Hamp	No	Certainty level below 'More than likely'
279	Former Hope Inn, Taunton Rd, Bridgwater	Yes	Certainty level at least 'More than likely'
280	Premier Inn, Express Park, Bristol Rd, Bridgwater	No	Assume hotel would not generate regular trips
281	Land SE of Trowbridge, Wiltshire	No	Outside simulation area
282	Land at North Chippenham, Hill Corner	No	Outside simulation area
283	Rowden Park	No	Outside simulation area
284	The Range	No	Cancelled
285	Rawlings Green	No	Outside simulation area
286	Land at Showell Farm	No	Outside simulation area
287	Hunters Moon, Easton Lane	No	Outside simulation area
288	Chippenham 2020 site (Chippenham Riverside)	No	Out of stage 3 simulation zone
289	Cranbrook	Yes	Certainty level at least 'More than likely'
290	Exeter Science Park	Yes	Certainty level at least 'More than likely'
291	Skypark Business Park	Yes	Certainty level at least 'More than likely'
292	Intermodal Freight Terminal	Yes	Certainty level at least 'More than likely'
293	Newcourt	Yes	Certainty level at least 'More than likely'
294	Land West of Horlicks Ltd, Hort Bridge (ME/ILMI/3)	Yes	Certainty level at least 'More than likely'
295	Land off Station Road (ME/ILMI/5)	No	Certainty level below 'More than likely'

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
296	Shudrick Lane, Ilminster (14/02474/OUT)	No	Application for scheme refused
297	Warehouse, 3 Newton Road (16/04661/FUL)	Yes	Certainty level at least 'More than likely'
298	Land South of Cemetery, Cemetery Lane, Wincanton (16/01659/OUT)	Yes	Certainty level at least 'More than likely'
299	Land at Slades Hill, Templecombe (16/04551/REM)	Yes	Certainty level at least 'More than likely'
300	Land at Lake View Quarry, Chistles Lane, Keinton Mandeville (16/01832/REM)	Yes	Certainty level at least 'More than likely'
301	Land at Court Farm, Ilton (14/04158/OUT)	Yes	Certainty level at least 'More than likely'
302	Sunrise Way, Amersbury (14/06691/FUL)	No	Outside simulation area
303	west of the Archers Gate Housing Development, Amesbury (15/02530/OUT)	Yes	Certainty level at least 'More than likely'
304	Kings Gate, Amersbury (S/2012/0497)	Yes	Certainty level at least 'More than likely'
305	Archers Gate Housing Development, Amesbury (13/06181/OUT)	Yes	Certainty level at least 'More than likely'
306	Kiwi, Picton, Wing and Ward Barracks Bulford Garrison Salisbury Wiltshire SP4 9NA(15/05950/FUL)	No	Insufficient information
307	Double Hedges Bulford Wiltshire Residentail Development (15/04006/FUL)	Yes	Certainty level at least 'More than likely'
308	Alanbrooke, Stirling, Roberts and Home Barracks Larkhill Garrison Salisbury Wiltshire SP4 8QT (15/06682/FUL)	No	Outside simulation area
309	Land north of The Packway and east of Larkhill Wiltshire (15/05540/FUL)	Yes	Certainty level at least 'More than likely'
310	Land North of the Packway and East of Larkhill Wiltshire SP4 8PY (17/06370/FUL)	Yes	Certainty level at least 'More than likely'
311	Land North of the Packway and East of Larkhill, Wiltshire SP4 8PY (17/03959/FUL)	Yes	Certainty level at least 'More than likely'
312	Land at Castle Street Mere Wiltshire (16/12217/OUT)	No	Certainty level below 'More than likely'
313	Land adjacent to Quarryfields Industrial Estate Mere BA12 6LA (14/06624/FUL)	Yes	Certainty level at least 'More than likely'
314	Mere(14/06780/OUT)	Yes	Certainty level at least 'More than likely'
315	Mere(17/00085/REM)	Yes	Certainty level at least 'More than likely'
316	Salisbury(16/02151/FUL)	No	Outside simulation area
317	Salisbury(15/12526/REM)	No	Insufficient Information
318	Tidworth(K/59795/O)	No	Outside simulation area
319	Tidworth(17/02572/REM)	No	Insufficient Information
320	Tidworth(E/2012/0361/OUT)	No	Outside simulation area

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
321	Tidworth(E/2012/1447/REM)	No	Outside simulation area
322	Tidworth(15/03313/FUL)	No	Insufficient Information
323	Marlborough(15/02026/OUT)	No	Outside simulation area
324	Marlborough(17/03219/REM)	No	Outside simulation area
325	Marlborough(16/11539/FUL)	No	Insufficient Information
326	Marlborough(14/01649/FUL)	No	Outside simulation area
327	Warminster(17/01124/OUT)	No	Insufficient Information
328	Warminster(14/09146/OUT)	No	Insufficient Information
329	Warminster(16/10502/OUT)	No	Outside simulation area
330	Warminster(15/01800/OUT)	No	Outside simulation area
331	Warminster(15/02079/FUL)	No	Outside simulation area
332	Warminster(16/01323/MAS)	No	Insufficient Information
333	Warminster(17/05360/FUL)	No	Outside simulation area
334	Warminster(17/05947/FUL)	No	Outside simulation area
335	Warminster(14/06562/FUL)	No	Outside simulation area
336	Warminster(16/10502/OUT)	No	Outside simulation area
337	Warminster(17/01124/OUT)	No	Outside simulation area
338	Warminster(17/01463/FUL)	No	Outside simulation area
339	Westbury(14/03118/OUT)	No	Outside simulation area
340	Westbury(15/12551/OUT)	No	Outside simulation area
341	Westbury(15/11604/OUT)	No	Outside simulation area
342	Westbury(13/03568/OUT)	No	Outside simulation area
343	Devizes(13/01243/OUT)	No	Outside simulation area
344	Devizes(E/2012/0954/FUL)	No	Insufficient Information
345	Devizes(13/00715/FUL)	No	Outside simulation area
346	Devizes(16/12285/OUT)	No	Insufficient Information
347	Devizes(15/01388/OUT)	No	Outside simulation area
348	Devizes(16/04371/FUL)	No	Outside simulation area
349	Devizes(16/05341/OUT)	No	Outside simulation area
350	Devizes(16/11230/FUL)	No	Outside simulation area

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
351	Melksham(16/04468/OUT)	No	Outside simulation area
352	Salisbury(14/12175/FUL)	No	Insufficient Information
353	Salisbury(16/10838/FUL)	No	Outside simulation area
354	Salisbury(16/12244/FUL)	No	Outside simulation area
355	Salisbury(15/09465/FUL)	No	Insufficient Information
356	Salisbury(17/01881/FUL)	No	Outside simulation area
357	Salisbury(S/2012/1282)	No	Outside simulation area
358	Salisbury(13/01494/FUL)	No	Insufficient Information
359	Bradford on Avon (17/03844/REM)	No	Outside simulation area
360	Bradford on Avon (W/13/00643/FUL)	No	Outside simulation area
361	South Wiltshire(14/06561/FUL)	No	Outside simulation area
362	South Wiltshire(17/04001/OUT)	No	Outside simulation area
363	South Wiltshire(14/05997/FUL)	No	Outside simulation area
364	South Wiltshire(14/04756/FUL)	No	Outside simulation area
365	South Wiltshire(14/06858/FUL)	No	Insufficient Information
366	South Wiltshire(15/04004/OUT)	No	Outside simulation area
367	South Wiltshire(13/00673/OUT)	No	Outside simulation area
368	South West Wiltshire(13/04870/OUT)	Yes	Certainty level at least 'More than likely'
369	Corsham(13/05269/FUL)	No	Outside simulation area
370	Corsham(13/05724/FUL)	No	Outside simulation area
371	Corsham(14/11354/OUT)	No	Outside simulation area
372	Corsham(13/05188/OUT)	No	Outside simulation area
373	Corsham(N/12/00718/FUL)	No	Outside simulation area
374	Corsham(N/12/00836/OUT)	No	Outside simulation area
375	Corsham(13/05724/OUT)	No	Outside simulation area
376	Corsham(14/05686/OUT)	No	Outside simulation area
377	Corsham(15/10519/OUT)	No	Outside simulation area
378	Corsham(16/07938/FUL)	No	Outside simulation area
379	Corsham(17/08760/FUL)	No	Outside simulation area
380	Corsham(17/08554/OUT)	No	Outside simulation area

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
381	Corsham(N/13/00308/OUT)	No	Outside simulation area
382	Calne(15/10457/OUT)	No	Outside simulation area
383	Calne(14/08305/FUL)	No	Outside simulation area
384	Calne(15/10682/FUL)	No	Outside simulation area
385	Calne(16/04124/FUL)	No	Outside simulation area
386	Calne(N/12/04038/FUL)	No	Insufficient Information
387	Calne(17/00679/OUT)	No	Outside simulation area
388	Calne(15/05254/REM)	No	Outside simulation area
389	Calne(N/12/02137/FUL)	No	Outside simulation area
390	Chippenham(17/03417/OUT)	No	Outside simulation area
391	Melksham(14/11295/REM)	No	Outside simulation area
392	Melksham(W/12/00906/REM)	No	Outside simulation area
393	Melksham(14/10461/OUT)	No	Outside simulation area
394	Melksham(17/01096/REM)	No	Outside simulation area
395	Melksham(15/12454/OUT)	No	Outside simulation area
396	Melksham(14/11295/REM)	No	Outside simulation area
397	Melksham(W/12/00906/REM)	No	Outside simulation area
398	Melksham(16/09699/FUL)	No	Insufficient Information
399	Melksham(16/05717/OUT)	No	Insufficient Information
400	Melksham(16/01123/OUT)	No	Outside simulation area
401	Melksham(16/00497/OUT)	No	Outside simulation area
402	Melksham(15/09014/FUL)	No	Insufficient Information
403	Melksham(15/00420/FUL)	No	Insufficient Information
404	Melksham(14/04846/OUT)	No	Insufficient Information
405	Melksham(14/03464/FUL)	No	Insufficient Information
406	Melksham(W/12/02298/FUL)	No	Insufficient Information
407	Melksham(W/12/01256/FUL)	No	Insufficient Information
408	Melksham(W/12/00467/FUL)	No	Insufficient Information
409	Melksham(W/12/00361/REM)	No	Insufficient Information
410	Melksham(17/07951/OUT)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
411	Melksham(16/11901/OUT)	No	Insufficient Information
412	Melksham(17/03187/FUL)	No	Insufficient Information
413	Melksham(W/12/02072/FUL)	No	Insufficient Information
414	Wootton Bassett & Cricklade(17/07929/REM)	No	Insufficient Information
415	Wootton Bassett & Cricklade(14/04326/FUL)	No	Insufficient Information
416	Wootton Bassett & Cricklade(13/03502/FUL)	No	Insufficient Information
417	Wootton Bassett & Cricklade(N/13/00623/FUL)	No	Insufficient Information
418	Wootton Bassett & Cricklade(13/04872/FUL)	No	Insufficient Information
419	Wootton Bassett & Cricklade(16/09372/FUL)	No	Insufficient Information
420	Wootton Bassett & Cricklade(16/01953/FUL)	No	Insufficient Information
421	Wootton Bassett & Cricklade(15/09960/FUL)	No	Insufficient Information
422	Wootton Bassett & Cricklade(17/09620/REM)	No	Insufficient Information
423	Wootton Bassett & Cricklade(14/06794/FUL)	No	Insufficient Information
424	Wootton Bassett & Cricklade(13/07071/FUL)	No	Insufficient Information
425	Wootton Bassett & Cricklade(16/09511/FUL)	No	Insufficient Information
426	Wootton Bassett & Cricklade(17/04117/FUL)	No	Insufficient Information
427	Wootton Bassett & Cricklade(16/06978/FUL)	No	Insufficient Information
428	Wootton Bassett & Cricklade(15/11732/FUL)	No	Insufficient Information
429	Wootton Bassett & Cricklade(15/11348/FUL)	No	Insufficient Information
430	Wootton Bassett & Cricklade(14/02508/FUL)	No	Insufficient Information
431	Wootton Bassett & Cricklade(13/02191/FUL)	No	Insufficient Information
432	Wootton Bassett & Cricklade(17/08735/FUL)	No	Insufficient Information
433	Wootton Bassett & Cricklade(15/08696/FUL)	No	Insufficient Information
434	Wootton Bassett & Cricklade(17/08188/OUT)	No	Outside simulation area
435	Wootton Bassett & Cricklade(16/07507/FUL)	No	Insufficient Information
436	Wootton Bassett & Cricklade(17/03069/FUL)	No	Insufficient Information
437	Wootton Bassett & Cricklade(16/10143/FUL)	No	Insufficient Information
438	Wootton Bassett & Cricklade(16/10513/FUL)	No	Insufficient Information
439	Wootton Bassett & Cricklade(16/03625/FUL)	No	Insufficient Information
440	Wootton Bassett & Cricklade(15/12096/FUL)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
441	Wootton Bassett & Cricklade(14/10200/REM)	No	Outside simulation area
442	Wootton Bassett & Cricklade(14/07664/FUL)	No	Insufficient Information
443	Wootton Bassett & Cricklade(14/05859/REM)	No	Insufficient Information
444	Wootton Bassett & Cricklade(13/02558/FUL)	No	Insufficient Information
445	Wootton Bassett & Cricklade(N/13/01723/FUL)	No	Insufficient Information
446	Wootton Bassett & Cricklade(N/13/01615/REM)	No	Outside simulation area
447	Wootton Bassett & Cricklade(N/13/00983/FUL)	No	Insufficient Information
448	Wootton Bassett & Cricklade(17/09914/FUL)	No	Insufficient Information
449	Wootton Bassett & Cricklade(17/07111/OUT)	No	Insufficient Information
450	Wootton Bassett & Cricklade(17/03586/REM)	No	Outside simulation area
451	Wootton Bassett & Cricklade(15/08666/FUL)	No	Outside simulation area
452	Wootton Bassett & Cricklade(15/01159/OUT)	No	Insufficient Information
453	Wootton Bassett & Cricklade(14/10601/FUL)	No	Insufficient Information
454	Wootton Bassett & Cricklade(13/07132/OUT)	No	Outside simulation area
455	Malmesbury(17/06974/FUL)	No	Insufficient Information
456	Malmesbury(16/02609/OUT)	No	Outside simulation area
457	Malmesbury(14/11978/OUT)	No	Insufficient Information
458	Malmesbury(14/03493/FUL)	No	Insufficient Information
459	Malmesbury(13/05914/FUL)	No	Insufficient Information
460	Malmesbury(13/05613/FUL)	No	Insufficient Information
461	Malmesbury(13/02911/FUL)	No	Insufficient Information
462	Malmesbury(16/06310/FUL)	No	Insufficient Information
463	Malmesbury(16/03001/WCM)	No	Insufficient Information
464	Malmesbury(17/00752/OUT)	No	Insufficient Information
465	Malmesbury(15/09143/OUT)	No	Insufficient Information
466	Malmesbury(N/13/00054/FUL)	No	Insufficient Information
467	Malmesbury(N/12/03304/FUL)	No	Insufficient Information
468	Malmesbury(16/04578/FUL)	No	Insufficient Information
469	Malmesbury(13/02092/FUL)	No	Insufficient Information
470	Malmesbury(17/03941/FUL)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
471	Malmesbury(17/03936/FUL)	No	Insufficient Information
472	Malmesbury(17/02595/FUL)	No	Insufficient Information
473	Malmesbury(15/08832/FUL)	No	Insufficient Information
474	Malmesbury(16/09797/REM)	No	Insufficient Information
475	Malmesbury(15/11887/FUL)	No	Insufficient Information
476	Malmesbury(N/13/01561/FUL)	No	Insufficient Information
477	Malmesbury(N/12/02104/FUL)	No	Insufficient Information
478	Malmesbury(17/07985/FUL)	No	Insufficient Information
479	Malmesbury(16/03206/FUL)	No	Insufficient Information
480	Malmesbury(17/03545/FUL)	No	Insufficient Information
481	Malmesbury(17/02820/OUT)	No	Insufficient Information
482	Malmesbury(13/05915/VAR)	No	Insufficient Information
483	Malmesbury(N/12/02184/FUL)	No	Insufficient Information
484	Malmesbury(17/04351/FUL)	No	Insufficient Information
485	Malmesbury(16/07622/OUT)	No	Insufficient Information
486	Malmesbury(15/07234/FUL)	No	Insufficient Information
487	Malmesbury(15/07373/FUL)	No	Insufficient Information
488	Malmesbury(13/05538/FUL)	No	Insufficient Information
489	Malmesbury(N/12/00827/FUL)	No	Insufficient Information
490	Malmesbury(N/12/00072/FUL)	No	Insufficient Information
491	Malmesbury(17/05004/FUL)	No	Insufficient Information
492	Malmesbury(16/11603/OUT)	No	Outside simulation area
493	Malmesbury(16/02737/FUL)	No	Insufficient Information
494	Malmesbury(15/05015/REM)	No	Outside simulation area
495	Malmesbury(14/05470/FUL)	No	Insufficient Information
496	Malmesbury(13/04122/REM)	No	Insufficient Information
497	Malmesbury(N/12/01122/FUL)	No	Insufficient Information
498	Malmesbury(N/12/01425/FUL)	No	Insufficient Information
499	Malmesbury(N/12/00095/FUL)	No	Insufficient Information
500	Malmesbury(13/03799/FUL)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
501	Malmesbury(17/05267/REM)	No	Insufficient Information
502	Malmesbury(17/04983/FUL)	No	Insufficient Information
503	Malmesbury(15/05255/FUL)	No	Insufficient Information
504	Malmesbury(15/05015/REM)	No	Outside simulation area
505	Malmesbury(14/11242/LBC)	No	Insufficient Information
506	Malmesbury(14/04282/REM)	No	Insufficient Information
507	Malmesbury(14/04281/FUL)	No	Outside simulation area
508	Malmesbury(N/13/01868/FUL)	No	Insufficient Information
509	Salisbury(S/2012/1654)	No	Insufficient Information
510	Salisbury(16/11599/FUL)	No	Insufficient Information
511	Salisbury(14/05235/FUL)	No	Insufficient Information
512	Salisbury(17/03957/FUL)	No	Insufficient Information
513	Salisbury(16/07363/FUL)	No	Insufficient Information
514	Salisbury(15/11114/FUL)	No	Insufficient Information
515	Salisbury(16/03966/FUL)	No	Insufficient Information
516	Salisbury(13/00466/FUL)	No	Insufficient Information
517	Salisbury(14/05997/FUL)	No	Outside simulation area
518	Salisbury(14/06650/OUT)	No	Certainty level below 'More than likely'
519	Salisbury(17/01702/FUL)	No	Insufficient Information
520	Salisbury(16/04126/OUT)	No	Insufficient Information
521	Salisbury(15/00119/FUL)	No	Insufficient Information
522	Salisbury(S/2013/0090)	No	Insufficient Information
523	Salisbury(17/07226/FUL)	No	Insufficient Information
524	Salisbury(17/09299/OUT)	No	Insufficient Information
525	Salisbury(17/04675/FUL)	No	Insufficient Information
526	Salisbury(13/02939/FUL)	No	Insufficient Information
527	Salisbury(16/05957/FUL)	No	Insufficient Information
528	Salisbury(S/2012/0814)	No	Outside simulation area
529	Salisbury(17/04897/FUL)	No	Insufficient Information
530	Chippenham(17/03417/OUT)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
531	Chippenham(14/03544/FUL)	No	Insufficient Information
532	Chippenham(14/12070/FUL)	No	Insufficient Information
533	Chippenham(16/04961/OUT)	No	Insufficient Information
534	Chippenham(16/11427/FUL)	No	Insufficient Information
535	Chippenham(N/12/04072/REM)	No	Outside simulation area
536	Chippenham(N/13/00011/FUL)	No	Insufficient Information
537	Chippenham(17/09786/LBC)	No	Insufficient Information
538	Chippenham(14/10433/OUT)	No	Insufficient Information
539	Chippenham(N/12/00560/OUT)	No	Outside simulation area
540	Chippenham(14/10828/FUL)	No	Insufficient Information
541	Chippenham(15/12351/OUT)	No	Outside simulation area
542	Chippenham(14/04658/FUL)	No	Insufficient Information
543	Chippenham(14/06619/FUL)	No	Insufficient Information
544	Chippenham(14/11382/FUL)	No	Insufficient Information
545	Chippenham(14/11384/OUT)	No	Insufficient Information
546	Chippenham(15/04763/FUL)	No	Insufficient Information
547	Chippenham(16/03515/OUT)	No	Outside simulation area
548	Chippenham(16/07697/FUL)	No	Insufficient Information
549	Chippenham(17/04461/FUL)	No	Insufficient Information
550	Chippenham(17/07793/FUL)	No	Insufficient Information
551	Chippenham(13/06704/FUL)	No	Insufficient Information
552	Chippenham(14/12118/OUT)	No	Insufficient Information
553	Chippenham(15/03759/FUL)	No	Insufficient Information
554	Chippenham(15/10712/FUL)	No	Insufficient Information
555	Chippenham(15/12198/FUL)	No	Insufficient Information
556	Chippenham(15/12363/OUT)	No	Outside simulation area
557	Chippenham(16/04269/FUL)	No	Insufficient Information
558	Chippenham(16/04273/FUL)	No	Insufficient Information
559	Chippenham(16/092008/FUL)	No	Insufficient Information
560	Chippenham(19/11758/FUL)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
561	Chippenham(17/05828/FUL)	No	Outside simulation area
562	Chippenham(17/06371/FUL)	No	Insufficient Information
563	Chippenham(17/09217/FUL)	No	Outside simulation area
564	Chippenham(N/12/00638/FUL)	No	Outside simulation area
565	Chippenham(N/12/01714/FUL)	No	Insufficient Information
566	Chippenham(N/12/04160/FUL)	No	Outside simulation area
567	Chippenham(N/13/01501/FUL)	No	Outside simulation area
568	Chippenham(15/11153/OUT)	No	Insufficient Information
569	Chippenham(19/09277/OUT)	No	Certainty level below 'More than likely'
570	Chippenham(17/06409/PNCOU)	No	Outside simulation area
571	Chippenham(N/12/00968/FUL)	No	Insufficient Information
572	Chippenham(N/13/01018/FUL)	No	Insufficient Information
573	Chippenham(N/13/01747/FUL)	No	Outside simulation area
574	Calne(N/13/00330/FUL)	No	Insufficient Information
575	Wootton Basset & Cricklade(13/04983/FUL)	No	Insufficient Information
576	Wootton Basset & Cricklade(17/03547/WCM)	No	Insufficient Information
577	Wootton Basset & Cricklade(17/05120/FUL)	No	Insufficient Information
578	Wootton Basset & Cricklade(N/12/00975/FUL)	No	Insufficient Information
579	Wootton Basset & Cricklade(13/03592/FUL)	No	Outside simulation area
580	Wootton Basset & Cricklade(13/03892/FUL)	No	Insufficient Information
581	Wootton Basset & Cricklade(13/05400/FUL)	No	Insufficient Information
582	Wootton Basset & Cricklade(13/05863/FUL)	No	Insufficient Information
583	Wootton Basset & Cricklade(14/03343/FUL)	No	Outside simulation area
584	Wootton Basset & Cricklade(14/07458/FUL)	No	Insufficient Information
585	Wootton Basset & Cricklade(14/09105/FUL)	No	Insufficient Information
586	Wootton Basset & Cricklade(15/03679/FUL)	No	Insufficient Information
587	Wootton Basset & Cricklade(15/10486/FUL)	No	Outside simulation area
588	Wootton Basset & Cricklade(16/08833/FUL)	No	Insufficient Information
589	Wootton Basset & Cricklade(17/02703/FUL)	No	Insufficient Information
590	Wootton Basset & Cricklade(N/12/00551/FUL)	No	Outside simulation area

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
591	Wootton Basset & Cricklade(N/12/01202/FUL)	No	Insufficient Information
592	Wootton Basset & Cricklade(N/12/03386/FUL)	No	Insufficient Information
593	Wootton Basset & Cricklade(N/12/03421/FUL)	No	Outside simulation area
594	Wootton Basset & Cricklade(N/12/03602/FUL)	No	Insufficient Information
595	Wootton Basset & Cricklade(N/12/03941/FUL)	No	Outside simulation area
596	Wootton Basset & Cricklade(N/12/04026/FUL)	No	Insufficient Information
597	Wootton Basset & Cricklade(N/13/00261/FUL)	No	Insufficient Information
598	Trowbridge(13/04699/FUL)	No	Insufficient Information
599	Trowbridge(17/03269/OUT)	No	Insufficient Information
600	Trowbridge(W/13/00896/FUL)	No	Insufficient Information
601	Trowbridge(16/00587/FUL)	No	Insufficient Information
602	Trowbridge(15/04736/OUT)	No	Outside simulation area
603	Trowbridge(16/12347/FUL)	No	Outside simulation area
604	Trowbridge(W/12/01121/FUL)	No	Outside simulation area
605	Trowbridge(14/04748/FUL)	No	Outside simulation area
606	Trowbridge(16/02602/PNCOU)	No	Outside simulation area
607	Trowbridge(17/05497/PNCOU)	No	Outside simulation area
608	Trowbridge(16/00672/OUT)	No	Outside simulation area
609	Trowbridge(17/04354/FUL)	No	Insufficient Information
610	Trowbridge(W/12/01169/FUL)	No	Insufficient Information
611	Trowbridge(17/03392/FUL)	No	Insufficient Information
612	Trowbridge(13/03058/FUL)	No	Insufficient Information
613	Trowbridge(15/04948/FUL)	No	Insufficient Information
614	Trowbridge(15/06836/OUT)	No	Insufficient Information
615	Trowbridge(15/12282/FUL)	No	Insufficient Information
616	Trowbridge(16/03974/FUL)	No	Insufficient Information
617	Trowbridge(16/05078/FUL)	No	Insufficient Information
618	Trowbridge(16/07872/FUL)	No	Insufficient Information
619	Trowbridge(17/07522/FUL)	No	Insufficient Information
620	Trowbridge(W/12/00538/FUL)	No	Insufficient Information

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
621	Trowbridge(W/12/01818/WCM)	No	Insufficient Information
622	Trowbridge(W/13/00078/FUL)	No	Insufficient Information
623	Trowbridge(14/01797/FUL)	No	Insufficient Information
624	Trowbridge(14/06682/FUL)	No	Insufficient Information
625	Trowbridge(15/03044/FUL)	No	Insufficient Information
626	Trowbridge(15/04355/FUL)	No	Insufficient Information
627	Trowbridge(15/04948/FUL)	No	Insufficient Information
628	Trowbridge(15/10074/FUL)	No	Insufficient Information
629	Trowbridge(15/11267/FUL)	No	Insufficient Information
630	Trowbridge(16/05154/FUL)	No	Outside simulation area
631	Trowbridge(16/05686/FUL)	No	Insufficient Information
632	Trowbridge(13/07198/FUL)	No	Insufficient Information
633	Trowbridge(16/10046/FUL)	No	Insufficient Information
634	Trowbridge(16/12263/FUL)	No	Insufficient Information
635	Trowbridge(17/00200/FUL)	No	Insufficient Information
636	Trowbridge(17/07693/OUT)	No	Outside simulation area
637	Trowbridge(17/09961/OUT)	No	Outside simulation area
638	Trowbridge(W/12/01393/REM)	No	Outside simulation area
639	Trowbridge(W/12/01477/REM)	No	Insufficient Information
640	Trowbridge(W/12/02299/FUL)	No	Insufficient Information
641	Trowbridge(W/13/00014/FUL)	No	Insufficient Information
642	Trowbridge(17/05669/FUL)	No	Outside simulation area
643	Trowbridge(W/12/00105/FUL)	No	Insufficient Information
644	Trowbridge(W/13/00805/FUL)	No	Insufficient Information
645	Trowbridge(13/03926/DP3)	No	Insufficient Information
646	Trowbridge(15/00636/FUL)	No	Insufficient Information
647	Bradford on Avon(14/07689/OUT)	No	Outside simulation area
648	Tidworth(14/05846/FUL)	No	Outside simulation area
649	Westbury(17/07548/FUL)	No	Outside simulation area
650	Tidworth(14/06522/FUL)	No	Outside simulation area

Stage 3 ID	Scheme/Site Name	Include?	Justification of Inclusion
651	Malmesbury(16/06401/FUL)	No	Outside simulation area
652	Devizes(15/12095/REM)	No	Outside simulation area
653	Wootton Bassett & Cricklade(17/03292/OUT)	No	Outside simulation area
654	Tidworth(14/09262/OUT)	No	Outside simulation area
655	Wilton (S/2011/0517)	Yes	Certainty level at least 'More than likely'
656	Land at Horton Road	No	Outside simulation area
657	Land at Drummond Park (MSA) Depot, Ludgershall	No	Certainty level below 'More than likely'
658	Hampton Park, Salisbury	No	Certainty level below 'More than likely'
659	Former Imerys Quarry, Salisbury	No	Certainty level below 'More than likely'
660	Boscombe Downs	No	Certainty level below 'More than likely'
661	Land at Cloakham Lawns	No	Outside simulation area
662	Land adjacent Harbour Road Seaton	No	Outside simulation area
663	Land adjacent to Buckingham Close (Plumb Park)	No	Outside simulation area
664	Land North and East of Axminster	No	Certainty level below 'More than likely'
665	Winslade Park	No	Certainty level below 'More than likely'
666	Goodmores Farm, Exmouth	No	Certainty level below 'More than likely'
667	Cranbrook Expansion Areas	No	Certainty level below 'More than likely'

22 Appendix F

22.1 NTEM trip rates

Table 22.1: 2015 Car trip rates (Trips/Household) - 24 hour PA

Area Description		HBEB		HBW		HBO	
Level	Name	Production	Attraction	Production	Attraction	Production	Attraction
Authority	East Devon	0.058	-	0.370	-	0.729	-
Authority	Exeter	0.051	-	0.398	-	0.611	-
Authority	Sedgemoor	0.064	-	0.411	-	0.738	-
Authority	South Somerset	0.066	-	0.417	-	0.742	-
Authority	Taunton Deane	0.063	-	0.416	-	0.715	-
Authority	Wiltshire	0.072	-	0.464	-	0.742	-

Table 22.2: 2015 Car trip rates (Trips/Job) - 24 hour PA

Area Description		HBEB		HBW		HBO	
Level	Name	Production	Attraction	Production	Attraction	Production	Attraction
Authority	East Devon	-	0.052	-	0.344	-	0.547
Authority	Exeter	-	0.044	-	0.306	-	0.434
Authority	Sedgemoor	-	0.056	-	0.351	-	0.503
Authority	South Somerset	-	0.055	-	0.353	-	0.461
Authority	Taunton Deane	-	0.051	-	0.333	-	0.542
Authority	Wiltshire	-	0.051	-	0.356	-	0.473

Table 22.3: 2015 Car trip rates (Trips/Job) - AM

Area Description		NHBEB		NHBO	
Level	Name	Origin	Destination	Origin	Destination
Authority	East Devon	0.004	0.004	0.014	0.015
Authority	Exeter	0.004	0.003	0.013	0.013
Authority	Sedgemoor	0.004	0.004	0.014	0.014
Authority	South Somerset	0.004	0.004	0.013	0.014
Authority	Taunton Deane	0.004	0.004	0.014	0.014
Authority	Wiltshire	0.004	0.004	0.014	0.014

Table 22.4: 2015 Car trip rates (Trips/Job) - IP

Area Description		NHBEB		NHBO	
Level	Name	Origin	Destination	Origin	Destination
Authority	East Devon	0.007	0.007	0.020	0.021
Authority	Exeter	0.006	0.006	0.016	0.016
Authority	Sedgemoor	0.007	0.008	0.020	0.019
Authority	South Somerset	0.007	0.007	0.018	0.018
Authority	Taunton Deane	0.007	0.007	0.020	0.020
Authority	Wiltshire	0.007	0.007	0.019	0.018

Table 22.5: 2015 Car trip rates (Trips/Job) - PM

Area Description		NHBEB		NHBO	
Level	**Name**	**Origin**	**Destination**	**Origin**	**Destination**
Authority	East Devon	0.004	0.004	0.016	0.016
Authority	Exeter	0.004	0.003	0.012	0.012
Authority	Sedgemoor	0.004	0.004	0.015	0.015
Authority	South Somerset	0.004	0.004	0.014	0.013
Authority	Taunton Deane	0.004	0.004	0.015	0.015
Authority	Wiltshire	0.004	0.004	0.015	0.015

Table 22.6: 2015 Car trip rates (Trips/Job) - OP

Area Description		NHBEB		NHBO	
Level	**Name**	**Origin**	**Destination**	**Origin**	**Destination**
Authority	East Devon	0.000	0.000	0.001	0.002
Authority	Exeter	0.000	0.000	0.001	0.001
Authority	Sedgemoor	0.000	0.000	0.001	0.001
Authority	South Somerset	0.000	0.000	0.001	0.001
Authority	Taunton Deane	0.000	0.000	0.001	0.001
Authority	Wiltshire	0.000	0.000	0.001	0.001

Table 22.7: 2015 Rail trip rates (Trips/Household) - 24 hour PA

Area Description		HBEB		HBW		HBO	
Level	Name	Production	Attraction	Production	Attraction	Production	Attraction
Authority	East Devon	0.004	-	0.016	-	0.013	-
Authority	Exeter	0.005	-	0.027	-	0.018	-
Authority	Sedgemoor	0.005	-	0.018	-	0.013	-
Authority	South Somerset	0.005	-	0.018	-	0.013	-
Authority	Taunton Deane	0.005	-	0.020	-	0.013	-
Authority	Wiltshire	0.005	-	0.020	-	0.014	-

Table 22.8: 2015 Rail trip rates (Trips/Job) - 24 hour PA

Area Description		HBEB		HBW		HBO	
Level	Name	Production	Attraction	Production	Attraction	Production	Attraction
Authority	East Devon	-	0.003	-	0.014	-	0.011
Authority	Exeter	-	0.012	-	0.043	-	0.017
Authority	Sedgemoor	-	0.004	-	0.014	-	0.010
Authority	South Somerset	-	0.002	-	0.010	-	0.008
Authority	Taunton Deane	-	0.007	-	0.024	-	0.010
Authority	Wiltshire	-	0.003	-	0.014	-	0.012

Table 22.9: 2015 Rail trip rates (Trips/Job) - AM

Area Description		NHBEB		NHBO	
Level	**Name**	**Origin**	**Destination**	**Origin**	**Destination**
Authority	East Devon	0.000	0.000	0.000	0.000
Authority	Exeter	0.000	0.001	0.000	0.001
Authority	Sedgemoor	0.000	0.000	0.000	0.000
Authority	South Somerset	0.000	0.000	0.000	0.000
Authority	Taunton Deane	0.000	0.000	0.000	0.000
Authority	Wiltshire	0.000	0.000	0.000	0.000

Table 22.10: 2015 Rail trip rates (Trips/Job) - IP

Area Description		NHBEB		NHBO	
Level	**Name**	**Origin**	**Destination**	**Origin**	**Destination**
Authority	East Devon	0.000	0.000	0.001	0.001
Authority	Exeter	0.001	0.001	0.001	0.001
Authority	Sedgemoor	0.000	0.000	0.001	0.001
Authority	South Somerset	0.000	0.000	0.000	0.000
Authority	Taunton Deane	0.000	0.000	0.001	0.001
Authority	Wiltshire	0.000	0.000	0.001	0.001

Table 22.11: 2015 Rail trip rates (Trips/Job) - PM

Area Description		NHBEB		NHBO	
Level	Name	Origin	Destination	Origin	Destination
Authority	East Devon	0.000	0.000	0.001	0.001
Authority	Exeter	0.000	0.001	0.001	0.002
Authority	Sedgemoor	0.000	0.000	0.001	0.001
Authority	South Somerset	0.000	0.000	0.001	0.000
Authority	Taunton Deane	0.000	0.000	0.001	0.001
Authority	Wiltshire	0.000	0.000	0.001	0.001

Table 22.12: 2015 Rail trip rates (Trips/Job) - OP

Area Description		NHBEB		NHBO	
Level	Name	Origin	Destination	Origin	Destination
Authority	East Devon	0.000	0.000	0.000	0.000
Authority	Exeter	0.000	0.000	0.000	0.000
Authority	Sedgemoor	0.000	0.000	0.000	0.000
Authority	South Somerset	0.000	0.000	0.000	0.000
Authority	Taunton Deane	0.000	0.000	0.000	0.000
Authority	Wiltshire	0.000	0.000	0.000	0.000

23 Appendix G

23.1 Highway demand

Table 23.1: 2023 IP Reference Highway Demand

	1	2	3	4	5	6	Total
1	464,894	16,183	38,148	1,258	2,004	2,269	524,756
2	16,916	901,211	3,264	747	1,919	2,137	926,194
3	39,581	3,197	2,159,098	10,843	80,006	30,896	2,323,621
4	1,077	627	9,537	1,220,233	2,027	34,937	1,268,439
5	1,898	1,607	82,958	2,606	7,130,158	70,454	7,289,679
6	1,973	1,869	29,902	35,250	58,847	13,271,157	13,398,997
Total	526,338	924,695	2,322,907	1,270,937	7,274,961	13,411,849	25,731,687

Table 23.2: 2023 IP Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-1.30%	6.55%	6.08%	103.25%	18.64%	26.44%	-0.08%
2	6.42%	-0.35%	19.45%	55.90%	25.13%	25.15%	0.01%
3	5.07%	17.40%	-1.29%	142.92%	7.78%	10.65%	-0.01%
4	81.48%	46.75%	72.69%	-1.11%	34.84%	9.69%	-0.10%
5	18.76%	22.45%	8.15%	57.27%	-0.48%	16.26%	-0.18%
6	25.41%	24.98%	10.69%	9.86%	16.55%	-0.21%	-0.08%
Total	-0.24%	-0.04%	-0.34%	0.68%	-0.22%	-0.06%	-0.10%

Table 23.3: 2023 IP Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-1.31%	6.47%	6.21%	103.17%	19.91%	26.38%	-0.07%
2	6.09%	-0.35%	20.89%	55.83%	28.54%	25.10%	0.01%
3	5.22%	18.55%	-1.30%	142.91%	7.78%	10.65%	-0.01%
4	81.40%	46.72%	72.68%	-1.11%	34.83%	9.69%	-0.10%
5	19.98%	25.85%	8.14%	57.26%	-0.48%	16.26%	-0.18%
6	25.36%	24.95%	10.68%	9.86%	16.55%	-0.21%	-0.08%
Total	-0.24%	-0.04%	-0.35%	0.68%	-0.22%	-0.06%	-0.10%

Table 23.4: 2023 PM Reference Highway Demand

	1	2	3	4	5	6	Total
1	275,128	9,667	24,096	734	1,089	1,003	311,718
2	10,843	524,569	1,730	322	1,121	955	539,541
3	32,189	1,933	1,422,120	8,920	56,722	22,054	1,543,938
4	668	390	5,505	850,663	1,034	23,249	881,509
5	1,394	1,243	65,987	1,764	4,996,675	59,887	5,126,951
6	1,180	1,232	19,065	29,357	39,039	8,819,654	8,909,528
Total	321,403	539,035	1,538,504	891,761	5,095,680	8,926,801	17,313,185

Table 23.5: 2023 PM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-1.31%	5.21%	5.80%	86.77%	17.15%	22.72%	-0.21%
2	4.34%	-0.34%	17.04%	47.08%	20.54%	21.96%	-0.08%
3	3.71%	15.33%	-1.01%	108.43%	6.10%	7.96%	0.13%
4	85.42%	47.63%	69.51%	-0.92%	37.47%	9.73%	-0.07%
5	18.24%	22.19%	7.12%	51.51%	0.13%	11.80%	0.38%
6	25.13%	23.75%	9.93%	7.36%	14.70%	-0.12%	0.00%
Total	-0.26%	-0.04%	-0.15%	0.64%	0.32%	0.01%	0.12%

Table 23.6: 2023 PM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-1.34%	5.08%	5.94%	86.72%	18.26%	22.65%	-0.22%
2	4.30%	-0.34%	17.95%	47.14%	22.43%	21.97%	-0.08%
3	3.84%	16.24%	-1.02%	108.43%	6.09%	7.96%	0.13%
4	85.30%	47.61%	69.51%	-0.92%	37.48%	9.73%	-0.07%
5	19.43%	24.27%	7.11%	51.50%	0.13%	11.80%	0.38%
6	25.05%	23.72%	9.93%	7.36%	14.70%	-0.12%	0.00%
Total	-0.26%	-0.04%	-0.15%	0.64%	0.32%	0.01%	0.12%

Table 23.7: 2031 AM reference highway demand

	1	2	3	4	5	6	Total
1	263,955	10,466	33,569	621	1,068	1,045	310,724
2	8,927	479,949	1,966	335	806	1,090	493,072
3	22,148	1,813	1,431,180	5,378	64,242	17,584	1,542,345
4	651	258	8,262	613,915	1,463	27,664	732,212
5	608	398	51,475	965	4,406,928	35,669	4,496,044
6	780	620	20,099	21,155	54,462	7,368,085	7,465,201
Total	297,068	493,505	1,546,553	722,367	4,528,969	7,451,136	15,039,597

Table 23.8: 2031 AM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-1.98%	6.20%	7.09%	118.91%	32.55%	37.78%	-0.23%
2	8.38%	-0.70%	27.48%	70.44%	36.38%	38.66%	-0.23%
3	9.59%	25.81%	-1.36%	110.98%	10.32%	14.77%	-0.11%
4	60.20%	43.26%	55.19%	-1.58%	36.44%	9.73%	-0.36%
5	28.46%	35.70%	8.58%	66.53%	0.13%	20.77%	0.41%
6	29.66%	30.21%	10.15%	14.76%	13.21%	-0.19%	-0.01%
Total	-0.52%	-0.37%	-0.36%	-0.03%	0.46%	0.00%	0.08%

Table 23.9: 2031 AM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.01%	6.18%	7.22%	118.52%	34.40%	37.52%	-0.23%
2	8.24%	-0.72%	28.53%	70.40%	41.34%	38.61%	-0.24%
3	9.79%	27.14%	-1.37%	110.97%	10.31%	14.76%	-0.11%
4	60.20%	43.33%	55.19%	-1.58%	36.43%	9.73%	-0.36%
5	30.15%	40.59%	8.57%	66.53%	0.13%	20.77%	0.41%
6	29.63%	30.24%	10.15%	14.76%	13.20%	-0.19%	-0.01%
Total	-0.53%	-0.37%	-0.36%	-0. 03%	0.46%	0.00%	0.08%

Table 23.10: 2031 IP Reference Highway Demand

	1	2	3	4	5	6	Total
1	497,065	17,128	40,570	1,346	2,172	2,449	560,731
2	17,852	956,490	3,507	803	2,058	2,294	983,004
3	41,973	3,445	2,304,382	11,362	85,622	32,469	2,479,254
4	1,153	674	10,031	1,286,280	2,140	36,553	1,336,832
5	2,057	1,740	89,083	2,775	7,646,963	74,790	7,817,409
6	2,135	2,008	31,499	36,884	62,654	14,059,947	14,195,127
Total	562,235	981,485	2,479,074	1,339,450	7,801,611	14,208,502	27,372,356

Table 23.11: 2031 IP Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-2.00%	10.23%	10.61%	119.21%	32.55%	39.90%	-0.10%
2	9.24%	-0.47%	31.64%	70.76%	40.61%	38.77%	0.05%
3	9.66%	29.25%	-1.68%	158.71%	11.61%	16.29%	-0.01%
4	95.81%	60.85%	83.94%	-1.23%	45.80%	14.94%	0.04%
5	32.58%	37.07%	12.21%	70.23%	-0.59%	21.49%	-0.19%
6	38.51%	38.17%	16.22%	15.56%	21.91%	-0.28%	-0.09%
Total	-0.29%	0.01%	-0.36%	0.90%	-0.24%	-0.07%	-0.10%

Table 23.12: 2031 IP Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.01%	10.22%	10.78%	119.08%	34.74%	39.80%	-0.10%
2	9.27%	-0.49%	33.40%	70.55%	45.86%	38.62%	0.06%
3	9.90%	30.77%	-1.68%	158.71%	11.60%	16.28%	-0.01%
4	95.65%	60.79%	83.93%	-1.23%	45.80%	14.94%	0.04%
5	34.90%	42.64%	12.20%	70.22%	-0.59%	21.49%	-0.19%
6	38.39%	38.10%	16.21%	15.56%	21.91%	-0.28%	-0.09%
Total	-0.28%	0.00%	-0.36%	0.90%	-0.24%	-0.07%	-0.10%

Table 23.13: 2031 PM Reference Highway Demand

	1	2	3	4	5	6	Total
1	292,581	10,175	25,595	777	1,174	1,075	331,376
2	11,349	554,977	1,858	345	1,202	1,019	570,750
3	33,704	2,079	1,509,586	9,237	59,871	22,940	1,637,416
4	712	415	5,801	895,559	1,087	24,330	927,904
5	1,498	1,344	70,356	1,870	5,331,746	63,055	5,469,869
6	1,280	1,322	20,096	30,596	41,247	9,330,356	9,424,898
Total	341,125	570,312	1,633,292	938,384	5,436,327	9,442,773	18,362,214

Table 23.14: 2031 PM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-2.12%	7.68%	9.94%	95.90%	30.90%	34.20%	-0.43%
2	5.72%	-0.61%	28.35%	57.42%	35.02%	33.76%	-0.22%
3	7.03%	25.44%	-1.37%	117.04%	9.33%	12.15%	0.09%
4	97.48%	59.87%	78.30%	-1.30%	48.17%	14.00%	-0.24%
5	31.01%	35.17%	10.07%	58.86%	0.21%	14.99%	0.54%
6	37.86%	36.47%	15.01%	11.46%	19.59%	-0.15%	0.01%
Total	-0.46%	-0.15%	-0.18%	0.51%	0.48%	0.02%	0.15%

Table 23.15: 2031 PM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.15%	7.65%	10.11%	95.83%	32.50%	34.09%	-0.43%
2	5.97%	-0.62%	29.60%	57.82%	37.65%	33.97%	-0.21%
3	7.20%	26.67%	-1.37%	117.04%	9.32%	12.15%	0.09%
4	97.26%	59.97%	78.29%	-1.30%	48.18%	14.01%	-0.24%
5	32.93%	38.31%	10.06%	58.85%	0.21%	14.99%	0.54%
6	37.70%	36.51%	15.01%	11.46%	19.59%	-0.15%	0.01%
Total	-0.44%	-0.15%	-0.18%	0.51%	0.48%	0.02%	0.15%

Table 23.16: 2038 AM Reference Highway Demand

	1	2	3	4	5	6	Total
1	275,764	10,755	34,721	646	1,124	1,095	324,105
2	9,237	501,450	2,057	346	853	1,139	515,082
3	23,276	1,904	1,495,221	5,600	67,565	18,287	1,611,852
4	677	274	8,494	721,722	1,538	28,655	761,359
5	638	416	53,488	1,004	4,629,790	37,210	4,722,547
6	815	651	20,678	21,990	56,974	7,713,457	7,814,566
Total	310,406	515,451	1,614,659	751,308	4,757,844	7,799,844	15,749,511

Table 23.17: 2038 AM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-2.55%	7.85%	9.28%	126.00%	34.89%	45.61%	-0.39%
2	10.30%	-0.89%	34.70%	78.57%	38.54%	46.75%	-0.32%
3	12.43%	32.95%	-1.56%	117.22%	11.54%	17.76%	-0.13%
4	64.12%	48.83%	58.31%	-1.96%	37.20%	11.70%	-0.62%
5	31.84%	39.71%	10.15%	70.83%	0.04%	23.64%	0.36%
6	35.96%	37.19%	12.65%	17.86%	13.68%	-0.21%	-0.02%
Total	-0.73%	-0.47%	-0.39%	-0.25%	0.39%	0.00%	0.04%

Table 23.18: 2038 AM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.58%	7.69%	9.43%	125.83%	36.74%	45.45%	-0.40%
2	10.20%	-0.90%	35.90%	78.64%	43.80%	46.76%	-0.32%
3	12.62%	34.29%	-1.56%	117.22%	11.53%	17.75%	-0.13%
4	64.00%	48.84%	58.31%	-1.96%	37.19%	11.70%	-0.62%
5	33.53%	44.77%	10.14%	70.84%	0.04%	23.64%	0.36%
6	35.78%	37.22%	12.65%	17.87%	13.67%	-0.21%	-0.02%
Total	-0.74%	-0.48%	-0.39%	-0.25%	0.39%	0.00%	0.04%

Table 23.19: 2038 IP Reference Highway Demand

	1	2	3	4	5	6	Total
1	521,344	17,769	42,426	1,402	2,288	2,555	587,785
2	18,499	1,001,345	3,677	844	2,159	2,406	1,028,930
3	43,780	3,613	2,418,315	11,778	90,080	33,724	2,601,290
4	1,202	706	10,418	1,337,717	2,236	37,946	1,390,225
5	2,167	1,836	93,944	2,917	8,077,769	78,618	8,257,250
6	2,231	2,106	32,770	38,303	65,862	14,745,028	14,886,300
Total	589,223	1,027,375	2,601,549	1,392,960	8,240,395	14,900,277	28,751,779

Table 23.20: 2038 IP Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-2.47%	13.10%	13.77%	130.86%	36.42%	48.21%	-0.13%
2	11.37%	-0.55%	39.08%	79.78%	44.85%	46.50%	0.08%
3	12.97%	36.91%	-1.90%	170.51%	13.31%	19.68%	-0.01%
4	105.64%	69.56%	91.86%	-1.22%	50.62%	18.11%	0.22%
5	35.99%	40.35%	14.14%	76.70%	-0.59%	23.77%	-0.15%
6	46.79%	45.99%	19.59%	19.21%	24.37%	-0.30%	-0.09%
Total	-0.34%	0.03%	-0.36%	1.14%	-0.21%	-0.07%	-0.08%

Table 23.21: 2038 IP Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.47%	12.97%	13.93%	130.72%	38.29%	48.05%	-0.12%
2	11.41%	-0.56%	40.84%	79.72%	49.45%	46.48%	0.08%
3	13.21%	38.47%	-1.90%	170.51%	13.30%	19.68%	-0.01%
4	105.51%	69.58%	91.86%	-1.22%	50.62%	18.11%	0.22%
5	38.01%	45.42%	14.13%	76.70%	-0.59%	23.77%	-0.15%
6	46.57%	46.01%	19.59%	19.21%	24.37%	-0.30%	-0.09%
Total	-0.32%	0.04%	-0.36%	1.14%	-0.21%	-0.07%	-0.08%

Table 23.22: 2038 PM Reference Highway Demand

	1	2	3	4	5	6	Total
1	305,969	10,536	26,847	807	1,234	1,122	346,514
2	11,682	580,226	1,950	363	1,266	1,068	596,554
3	34,924	2,182	1,579,119	9,511	62,472	23,653	1,711,860
4	741	431	6,038	931,971	1,134	25,280	965,094
5	1,569	1,418	73,922	1,961	5,616,638	65,958	5,761,466
6	1,338	1,384	20,907	31,718	43,116	9,778,480	9,876,943
Total	356,223	596,177	1,708,781	975,830	5,725,860	9,895,560	19,258,431

Table 23.23: 2038 PM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-2.70%	9.33%	12.78%	100.16%	33.83%	41.35%	-0.62%
2	8.30%	-0.76%	36.10%	63.18%	39.15%	41.30%	-0.27%
3	9.39%	31.39%	-1.55%	120.96%	10.83%	14.79%	0.07%
4	104.27%	65.95%	83.83%	-1.58%	50.01%	16.48%	-0.40%
5	33.92%	38.27%	11.32%	59.54%	0.14%	16.29%	0.51%
6	45.26%	43.20%	17.89%	13.84%	21.67%	-0.21%	-0.01%
Total	-0.59%	-0.22%	-0.19%	0.35%	0.44%	-0.01%	0.11%

Table 23.24: 2038 PM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.71%	9.05%	12.96%	100.04%	35.61%	41.20%	-0.62%
2	7.45%	-0.78%	37.11%	62.96%	41.97%	41.13%	-0.29%
3	9.59%	32.64%	-1.55%	120.96%	10.83%	14.79%	0.07%
4	104.08%	65.91%	83.83%	-1.58%	50.02%	16.48%	-0.40%
5	35.95%	41.76%	11.31%	59.53%	0.14%	16.28%	0.51%
6	45.10%	43.16%	17.88%	13.84%	21.67%	-0.21%	-0.01%
Total	-0.60%	-0.24%	-0.19%	0.35%	0.44%	-0.01%	0.11%

Table 23.25: 2051 AM reference highway demand

	1	2	3	4	5	6	Total
1	297,809	11,466	37,027	691	1,231	1,188	349,412
2	9,959	542,181	2,206	369	938	1,231	556,884
3	25,285	2,058	1,618,330	6,034	74,049	19,898	1,745,653
4	728	298	9,055	770,454	1,682	30,602	812,818
5	689	445	57,091	1,075	5,022,332	40,265	5,121,897
6	882	704	21,949	23,669	61,783	8,401,459	8,510,446
Total	335,351	557,152	1,745,658	802,292	5,162,015	8,494,643	17,097,111

Table 23.26: 2051 AM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-2.92%	8.18%	10.60%	123.18%	23.93%	49.16%	-0.60%
2	11.04%	-0.94%	37.97%	77.15%	29.60%	48.71%	-0.36%
3	14.06%	35.74%	-1.46%	116.42%	7.20%	17.51%	-0.20%
4	63.37%	47.59%	57.73%	-2.59%	19.90%	11.75%	-1.26%
5	25.51%	33.28%	8.24%	60.80%	-0.24%	21.25%	0.04%
6	38.25%	38.51%	13.62%	18.24%	7.39%	-0.09%	0.06%
Total	-0.91%	-0.52%	-0.34%	-0.85%	-0.03%	0.11%	-0.06%

Table 23.27: 2051 AM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.94%	8.30%	10.76%	122.79%	25.88%	48.83%	-0.60%
2	10.74%	-0.97%	39.27%	77.14%	34.87%	48.67%	-0.37%
3	14.30%	37.35%	-1.47%	116.41%	7.19%	17.50%	-0.20%
4	63.49%	47.96%	57.73%	-2.59%	19.88%	11.75%	-1.26%
5	27.30%	38.09%	8.23%	60.81%	-0.24%	21.25%	0.04%
6	38.33%	38.72%	13.62%	18.24%	7.38%	-0.09%	0.06%
Total	-0.92%	-0.53%	-0.34%	-0.85%	-0.03%	0.11%	-0.06%

Table 23.28: 2051 IP Reference Highway Demand

	1	2	3	4	5	6	Total
1	565,088	19,118	45,821	1,506	2,487	2,765	636,785
2	19,907	1,086,418	3,972	911	2,329	2,603	1,116,141
3	47,139	3,890	2,625,019	12,614	97,689	36,245	2,822,596
4	1,288	758	11,157	1,424,785	2,412	40,674	1,481,073
5	2,357	1,989	102,270	3,166	8,798,022	85,747	8,993,551
6	2,418	2,281	35,357	41,106	71,845	16,114,737	16,267,744
Total	638,197	1,114,454	2,823,596	1,484,086	8,974,785	16,282,771	31,317,889

Table 23.29: 2051 IP Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-2.71%	14.12%	15.75%	137.72%	31.08%	50.52%	-0.18%
2	10.69%	-0.56%	39.07%	79.38%	39.78%	45.65%	0.04%
3	15.09%	38.58%	-1.81%	179.72%	10.09%	19.60%	0.02%
4	109.77%	70.15%	96.10%	-0.82%	44.80%	18.46%	0.65%
5	29.83%	35.30%	11.45%	71.17%	-0.50%	20.23%	-0.13%
6	49.17%	46.16%	19.38%	20.48%	19.98%	-0.30%	-0.10%
Total	-0.43%	0.03%	-0.34%	1.65%	-0.19%	-0.08%	-0.06%

Table 23.30: 2051 IP Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-2.73%	14.22%	15.92%	137.72%	32.51%	50.51%	-0.17%
2	10.49%	-0.58%	40.87%	79.90%	42.25%	45.95%	0.03%
3	15.33%	40.37%	-1.82%	179.71%	10.07%	19.59%	0.02%
4	109.57%	70.76%	96.09%	-0.82%	44.80%	18.46%	0.65%
5	31.43%	38.54%	11.43%	71.17%	-0.50%	20.22%	-0.13%
6	49.01%	46.53%	19.37%	20.48%	19.98%	-0.30%	-0.10%
Total	-0.43%	0.03%	-0.34%	1.65%	-0.19%	-0.08%	-0.06%

Table 23.31: 2051 PM Reference Highway Demand

	1	2	3	4	5	6	Total
1	330,776	11,341	29,066	864	1,340	1,212	374,599
2	12,494	628,003	2,110	392	1,379	1,156	645,534
3	37,330	2,337	1,710,188	10,145	67,093	25,195	1,852,287
4	793	460	6,496	993,185	1,220	27,157	1,029,311
5	1,700	1,539	80,692	2,128	6,104,568	71,407	6,262,035
6	1,447	1,497	22,705	33,927	46,792	10,671,377	10,777,744
Total	384,540	645,176	1,851,256	1,040,641	6,222,393	10,797,504	20,941,510

Table 23.32: 2051 PM Highway Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-3.06%	9.57%	14.33%	95.14%	26.62%	44.16%	-0.84%
2	9.03%	-0.82%	39.49%	60.18%	33.26%	43.86%	-0.31%
3	10.78%	32.86%	-1.49%	115.88%	9.22%	15.25%	0.06%
4	102.35%	62.92%	83.62%	-1.98%	36.86%	16.22%	-0.81%
5	27.06%	31.69%	8.50%	45.24%	0.11%	10.42%	0.36%
6	47.74%	43.59%	17.33%	13.94%	17.66%	-0.21%	-0.04%
Total	-0.78%	-0.29%	-0.23%	-0.11%	0.36%	-0.05%	0.03%

Table 23.33: 2051 PM Highway Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-3.11%	9.75%	14.51%	95.05%	28.30%	44.02%	-0.87%
2	10.83%	-0.83%	41.35%	61.11%	36.32%	44.38%	-0.27%
3	10.97%	34.35%	-1.50%	115.88%	9.21%	15.26%	0.06%
4	102.04%	63.16%	83.61%	-1.98%	36.87%	16.22%	-0.81%
5	28.80%	34.79%	8.49%	45.22%	0.11%	10.42%	0.36%
6	47.48%	43.69%	17.33%	13.94%	17.66%	-0.21%	-0.04%
Total	-0.75%	-0.28%	-0.23%	-0.11%	0.36%	-0.05%	0.03%

23.2 Rail demand

Table 23.34: 2023 IP Reference Rail Demand

	1	2	3	4	5	6	Total
1	609	261	923	66	574	49	2,482
2	270	5,502	268	31	660	105	6,837
3	1,089	259	15,540	778	9,649	1,123	28,438
4	69	26	788	10,282	695	1,192	13,051
5	569	574	11,381	825	516,049	20,013	549,411
6	47	89	1,054	1,214	14,011	110,152	126,568
Total	2,653	6,710	29,953	13,197	541,639	132,635	726,787

Table 23.35: 2023 IP Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-4.48%	-4.24%	-4.91%	-7.81%	0.18%	-8.74%	-3.71%
2	-4.08%	-3.74%	-7.11%	-8.39%	-1.69%	-8.15%	-3.78%
3	-4.87%	-7.36%	-2.27%	-10.31%	3.34%	-4.45%	-0.82%
4	-5.59%	-6.60%	-6.28%	-3.52%	9.44%	3.34%	-2.39%
5	0.98%	-2.35%	2.24%	7.17%	-1.75%	-6.46%	-1.82%
6	-9.17%	-8.76%	-4.58%	2.11%	-7.03%	2.45%	1.33%
Total	-3.54%	-3.86%	-0.87%	-2.77%	-1.78%	1.04%	-1.27%

Table 23.36: 2023 IP Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-4.49%	-4.24%	-4.92%	-7.81%	0.14%	-8.74%	-3.72%
2	-4.08%	-3.74%	-7.11%	-8.38%	-1.70%	-8.14%	-3.78%
3	-4.88%	-7.37%	-2.27%	-10.31%	3.34%	-4.45%	-0.82%
4	-5.60%	-6.59%	-6.27%	-3.52%	9.44%	3.34%	-2.39%
5	0.94%	-2.36%	2.24%	7.17%	-1.75%	-6.46%	-1.82%
6	-9.18%	-8.76%	-4.58%	2.11%	-7.03%	2.45%	1.33%
Total	-3.56%	-3.86%	-0.87%	-2.77%	-1.78%	1.04%	-1.27%

Table 23.37: 2023 PM Reference Rail Demand

	1	2	3	4	5	6	Total
1	518	169	618	39	353	27	1,724
2	248	3,875	140	12	473	46	4,795
3	1,409	221	15,094	807	6,031	732	24,294
4	48	19	622	8,612	382	756	10,440
5	549	507	15,653	667	513,163	13,990	544,529
6	38	56	855	1,085	7,478	88,313	97,826
Total	2,811	4,847	32,982	11,222	527,880	103,864	683,607

Table 23.38: 2023 PM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-3.56%	-3.84%	-4.83%	-10.40%	0.64%	-8.20%	-3.41%
2	-3.33%	-3.35%	-7.71%	-7.52%	-0.49%	-8.05%	-3.25%
3	-4.08%	-7.24%	-1.61%	-13.72%	3.14%	-2.37%	-1.05%
4	-2.33%	-4.33%	1.88%	-2.72%	9.60%	4.48%	-1.47%
5	1.70%	-2.09%	2.06%	6.94%	-1.53%	-6.12%	-1.53%
6	-6.80%	-6.96%	-3.21%	1.04%	-5.62%	2.39%	1.71%
Total	-2.79%	-3.46%	0.07%	-2.60%	-1.53%	1.22%	-1.07%

Table 23.39: 2023 PM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-3.56%	-3.83%	-4.83%	-10.40%	0.58%	-8.21%	-3.42%
2	-3.31%	-3.35%	-7.69%	-7.52%	-0.50%	-8.03%	-3.25%
3	-4.10%	-7.28%	-1.61%	-13.72%	3.14%	-2.37%	-1.05%
4	-2.33%	-4.33%	1.88%	-2.72%	9.60%	4.48%	-1.47%
5	1.66%	-2.11%	2.06%	6.93%	-1.53%	-6.12%	-1.53%
6	-6.82%	-6.96%	-3.21%	1.04%	-5.62%	2.39%	1.71%
Total	-2.81%	-3.47%	0.07%	-2.60%	-1.53%	1.22%	-1.07%

Table 23.40: 2031 AM Reference Rail Demand

	1	2	3	4	5	6	Total
1	487	266	1,460	47	503	31	2,793
2	158	3,532	198	15	363	47	4,313
3	516	121	15,350	511	15,076	706	32,280
4	25	8	776	7,684	768	967	10,227
5	122	118	4,944	258	508,093	5,855	519,390
6	12	20	579	543	14,130	75,695	90,979
Total	1,320	4,065	23,308	9,058	538,932	83,300	659,983

Table 23.41: 2031 AM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-4.57%	-4.49%	-4.86%	-4.53%	2.19%	-3.19%	-3.48%
2	-4.54%	-4.37%	-7.28%	-6.21%	0.23%	-4.81%	-4.14%
3	-6.37%	-11.24%	-2.18%	1.47%	2.33%	-0.56%	-0.08%
4	-16.60%	-13.10%	-16.74%	-4.31%	13.89%	0.23%	-3.49%
5	-2.62%	-2.83%	4.23%	14.82%	-2.35%	8.70%	-2.15%
6	-9.98%	-11.12%	-1.69%	1.94%	2.79%	0.78%	1.08%
Total	-5.37%	-4.59%	-1.51%	-3.07%	-2.05%	1.31%	-1.65%

Table 23.42: 2031 AM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-4.56%	-4.52%	-4.88%	-4.54%	2.12%	-3.23%	-3.51%
2	-4.52%	-4.39%	-7.34%	-6.25%	0.18%	-4.84%	-4.15%
3	-6.36%	-11.23%	-2.18%	1.47%	2.33%	-0.56%	-0.08%
4	-16.58%	-13.08%	-16.73%	-4.31%	13.88%	0.23%	-3.49%
5	-2.65%	-2.85%	4.23%	14.82%	-2.35%	8.70%	-2.15%
6	-9.96%	-11.09%	-1.69%	1.94%	2.78%	0.78%	1.08%
Total	-5.36%	-4.60%	-1.51%	-3.07%	-2.05%	1.31%	-1.65%

Table 23.43: 2031 IP Reference Rail Demand

	1	2	3	4	5	6	Total
1	628	264	959	68	603	50	2,573
2	272	5,697	283	33	704	109	7,099
3	1,131	274	16,115	824	10,172	1,167	29,684
4	71	27	820	10,546	741	1,211	13,416
5	597	615	11,995	896	537,253	21,458	572,815
6	49	92	1,096	1,233	14,833	113,105	130,407
Total	2,749	6,970	31,268	13,599	564,307	137,100	755,994

Table 23.44: 2031 IP Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-5.89%	-5.42%	-6.28%	-9.87%	-0.33%	-7.09%	-4.81%
2	-5.17%	-5.17%	-8.68%	-10.17%	-1.35%	-7.67%	-4.99%
3	-6.15%	-9.16%	-3.44%	-12.28%	4.73%	-3.43%	-1.04%
4	-7.66%	-8.19%	-8.47%	-5.85%	18.96%	0.63%	-4.07%
5	0.26%	-1.69%	2.16%	13.01%	-3.06%	4.59%	-2.63%
6	-6.72%	-7.76%	-3.30%	0.08%	5.67%	0.39%	0.95%
Total	-4.65%	-5.07%	-1.55%	-4.49%	-2.66%	1.00%	-2.01%

Table 23.45: 2031 IP Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-5.90%	-5.43%	-6.29%	-9.87%	-0.39%	-7.10%	-4.84%
2	-5.20%	-5.18%	-8.71%	-10.18%	-1.37%	-7.67%	-5.01%
3	-6.17%	-9.19%	-3.44%	-12.28%	4.73%	-3.43%	-1.04%
4	-7.66%	-8.20%	-8.46%	-5.85%	18.96%	0.63%	-4.07%
5	0.20%	-1.72%	2.16%	13.01%	-3.06%	4.58%	-2.63%
6	-6.74%	-7.77%	-3.30%	0.08%	5.67%	0.39%	0.95%
Total	-4.68%	-5.09%	-1.56%	-4.49%	-2.66%	1.00%	-2.01%

Table 23.46: 2031 PM Reference Rail Demand

	1	2	3	4	5	6	Total
1	531	171	635	41	368	27	1,774
2	249	3,999	148	13	501	48	4,958
3	1,462	234	15,550	874	6,296	759	25,175
4	49	20	620	8,839	403	767	10,697
5	576	543	16,415	730	531,759	14,922	564,944
6	39	58	881	1,110	7,846	90,645	100,580
Total	2,905	5,025	34,249	11,606	547,174	107,167	708,128

Table 23.47: 2031 PM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-4.75%	-4.90%	-6.14%	-12.41%	-0.15%	-7.03%	-4.52%
2	-4.19%	-4.68%	-9.30%	-9.61%	-0.53%	-7.85%	-4.42%
3	-5.13%	-9.02%	-2.54%	-15.33%	4.30%	-1.93%	-1.47%
4	-4.42%	-6.01%	-0.39%	-4.70%	18.92%	2.23%	-3.06%
5	0.62%	-1.59%	1.84%	10.84%	-2.62%	3.58%	-2.31%
6	-3.76%	-5.19%	-1.68%	-0.45%	6.71%	0.70%	1.13%
Total	-3.81%	-4.57%	-0.48%	-4.15%	-2.39%	1.08%	-1.82%

Table 23.48: 2031 PM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-4.74%	-4.88%	-6.14%	-12.40%	-0.22%	-7.04%	-4.53%
2	-4.22%	-4.69%	-9.30%	-9.62%	-0.57%	-7.86%	-4.43%
3	-5.15%	-9.07%	-2.54%	-15.33%	4.30%	-1.93%	-1.47%
4	-4.44%	-6.04%	-0.39%	-4.70%	18.92%	2.23%	-3.06%
5	0.56%	-1.63%	1.84%	10.83%	-2.62%	3.57%	-2.31%
6	-3.80%	-5.22%	-1.68%	-0.45%	6.71%	0.70%	1.13%
Total	-3.84%	-4.58%	-0.48%	-4.15%	-2.39%	1.08%	-1.82%

Table 23.49: 2038 AM Reference Rail Demand

	1	2	3	4	5	6	Total
1	494	269	1,508	47	520	32	2,869
2	159	3,639	207	16	381	48	4,451
3	529	128	15,688	510	15,603	722	33,179
4	26	9	838	7,899	827	990	10,589
5	126	124	5,099	267	523,382	6,084	535,082
6	12	21	601	551	14,882	77,622	93,689
Total	1,346	4,189	23,940	9,289	555,596	85,499	679,859

Table 23.50: 2038 AM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-5.25%	-4.88%	-5.41%	-5.82%	2.30%	1.72%	-3.86%
2	-4.69%	-5.09%	-7.58%	-6.60%	0.88%	0.72%	-4.62%
3	-7.07%	-11.65%	-2.77%	0.25%	2.37%	4.37%	-0.25%
4	-17.49%	-13.84%	-17.15%	-5.23%	13.30%	-0.78%	-4.35%
5	-2.12%	-1.76%	4.12%	14.46%	-2.51%	12.37%	-2.27%
6	-4.40%	-7.50%	1.91%	0.98%	4.78%	0.22%	0.96%
Total	-5.84%	-5.21%	-1.90%	-4.00%	-2.15%	1.11%	-1.78%

Table 23.51: 2038 AM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-5.25%	-4.86%	-5.43%	-5.84%	2.23%	1.67%	-3.89%
2	-4.67%	-5.09%	-7.64%	-6.59%	0.86%	0.71%	-4.63%
3	-7.07%	-11.60%	-2.77%	0.25%	2.37%	4.36%	-0.25%
4	-17.47%	-13.80%	-17.15%	-5.23%	13.30%	-0.78%	-4.35%
5	-2.16%	-1.77%	4.12%	14.46%	-2.51%	12.37%	-2.27%
6	-4.38%	-7.45%	1.91%	0.98%	4.78%	0.22%	0.96%
Total	-5.84%	-5.20%	-1.90%	-4.00%	-2.15%	1.11%	-1.78%

Table 23.52: 2038 IP Reference Rail Demand

	1	2	3	4	5	6	Total
1	641	267	990	70	623	51	2,643
2	276	5,879	298	35	741	114	7,343
3	1,168	287	16,565	870	10,576	1,211	30,678
4	73	28	856	10,843	784	1,232	13,817
5	617	649	12,464	957	555,460	22,712	592,859
6	50	96	1,137	1,254	15,567	116,211	134,315
Total	2,825	7,208	32,311	14,029	583,750	141,531	781,655

Table 23.53: 2038 IP Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-6.66%	-5.84%	-6.87%	-10.87%	0.30%	0.86%	-4.98%
2	-5.57%	-6.00%	-8.86%	-10.52%	-0.25%	-0.74%	-5.46%
3	-6.77%	-9.51%	-4.14%	-13.14%	4.74%	5.22%	-1.11%
4	-8.65%	-8.48%	-9.56%	-7.05%	18.85%	0.10%	-5.11%
5	0.83%	-0.69%	2.29%	12.48%	-3.41%	8.26%	-2.81%
6	0.65%	-1.03%	3.70%	-0.27%	10.01%	-0.24%	0.98%
Total	-4.89%	-5.60%	-1.65%	-5.52%	-2.86%	1.17%	-2.16%

Table 23.54: 2038 IP Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-6.68%	-5.84%	-6.88%	-10.87%	0.23%	0.84%	-5.01%
2	-5.57%	-6.00%	-8.84%	-10.50%	-0.26%	-0.72%	-5.46%
3	-6.79%	-9.54%	-4.14%	-13.14%	4.74%	5.22%	-1.12%
4	-8.65%	-8.46%	-9.56%	-7.05%	18.85%	0.10%	-5.11%
5	0.77%	-0.71%	2.29%	12.48%	-3.41%	8.26%	-2.81%
6	0.64%	-1.02%	3.70%	-0.27%	10.01%	-0.24%	0.98%
Total	-4.91%	-5.60%	-1.65%	-5.52%	-2.86%	1.17%	-2.16%

Table 23.55: 2038 PM Reference Rail Demand

	1	2	3	4	5	6	Total
1	540	172	652	43	379	28	1,814
2	251	4,120	156	14	526	49	5,115
3	1,509	245	15,912	937	6,507	785	25,896
4	49	21	624	9,076	423	779	10,971
5	595	572	17,002	785	548,439	15,716	583,108
6	40	61	906	1,134	8,178	93,009	103,328
Total	2,984	5,190	35,251	11,989	564,452	110,366	730,232

Table 23.56: 2038 PM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-5.42%	-5.21%	-6.83%	-13.37%	0.01%	0.51%	-4.87%
2	-4.50%	-5.44%	-9.60%	-10.22%	-0.24%	-2.81%	-4.97%
3	-5.68%	-9.50%	-3.18%	-15.84%	4.15%	4.12%	-1.78%
4	-5.67%	-6.49%	-1.84%	-5.68%	18.65%	1.96%	-3.98%
5	1.00%	-0.91%	1.98%	10.25%	-2.85%	5.69%	-2.45%
6	1.97%	0.81%	3.98%	-1.20%	10.88%	0.09%	0.96%
Total	-4.10%	-5.06%	-0.58%	-5.04%	-2.55%	0.93%	-1.99%

Table 23.57: 2038 PM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-5.42%	-5.21%	-6.83%	-13.36%	-0.07%	0.49%	-4.89%
2	-4.47%	-5.43%	-9.55%	-10.19%	-0.26%	-2.78%	-4.97%
3	-5.70%	-9.57%	-3.18%	-15.83%	4.15%	4.12%	-1.78%
4	-5.68%	-6.49%	-1.84%	-5.68%	18.65%	1.97%	-3.98%
5	0.93%	-0.94%	1.98%	10.24%	-2.85%	5.69%	-2.45%
6	1.93%	0.80%	3.98%	-1.20%	10.88%	0.09%	0.96%
Total	-4.12%	-5.06%	-0.58%	-5.04%	-2.55%	0.93%	-1.99%

Table 23.58: 2051 AM Reference Rail Demand

	1	2	3		5	6	Total
1	510	279	1,592	48	550	34	3,012
2	165	3,853	221	16	407	51	4,714
3	552	141	16,529	513	16,635	766	35,136
4	28	10	947	8,256	922	1,038	11,201
5	132	133	5,411	281	550,607	6,508	563,072
6	12	23	646	568	16,144	81,564	98,958
Total	1,400	4,439	25,346	9,682	585,264	89,961	716,093

Table 23.59: 2051 AM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-4.97%	-3.88%	-4.81%	-5.79%	6.84%	4.28%	-2.54%
2	-3.36%	-4.74%	-5.78%	-4.18%	8.21%	5.28%	-3.51%
3	-6.76%	-10.07%	-2.55%	-0.06%	5.52%	6.31%	1.40%
4	-16.32%	-11.10%	-15.35%	-4.68%	17.37%	-1.00%	-3.46%
5	3.69%	6.51%	7.02%	18.61%	-1.07%	15.57%	-0.79%
6	-0.30%	-2.77%	5.02%	1.30%	8.48%	0.29%	1.66%
Total	-4.86%	-4.52%	-0.96%	-3.41%	-0.57%	1.44%	-0.41%

Table 23.60: 2051 AM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-4.97%	-3.92%	-4.85%	-5.82%	6.75%	4.20%	-2.58%
2	-3.32%	-4.75%	-5.84%	-4.25%	8.14%	5.24%	-3.53%
3	-6.75%	-10.07%	-2.55%	-0.06%	5.52%	6.30%	1.40%
4	-16.28%	-11.10%	-15.34%	-4.68%	17.36%	-1.00%	-3.46%
5	3.64%	6.48%	7.02%	18.61%	-1.07%	15.58%	-0.79%
6	-0.27%	-2.75%	5.02%	1.30%	8.47%	0.29%	1.66%
Total	-4.86%	-4.53%	-0.96%	-3.41%	-0.58%	1.44%	-0.41%

Table 23.61: 2051 IP Reference Rail Demand

	1	2	3	4	5	6	Total
1	666	279	1,048	73	655	53	2,775
2	288	6,248	323	37	796	123	7,815
3	1,234	310	17,484	948	11,257	1,299	32,531
4	76	31	921	11,286	848	1,274	14,435
5	649	697	13,273	1,048	585,067	24,811	625,545
6	52	104	1,224	1,296	16,841	122,549	142,066
Total	2,966	7,669	34,272	14,688	615,463	150,108	825,166

Table 23.62: 2051 IP Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-6.24%	-4.63%	-5.88%	-9.81%	6.40%	5.50%	-2.82%
2	-4.39%	-5.57%	-6.33%	-7.36%	8.36%	4.94%	-3.98%
3	-5.97%	-7.39%	-3.52%	-11.85%	9.02%	9.61%	0.97%
4	-7.42%	-5.25%	-8.38%	-6.55%	24.29%	0.57%	-4.23%
5	6.67%	7.35%	6.22%	17.32%	-1.91%	12.53%	-1.12%
6	5.48%	4.80%	7.77%	0.25%	14.36%	-0.05%	1.73%
Total	-2.94%	-4.29%	0.43%	-4.61%	-1.21%	2.12%	-0.63%

Table 23.63: 2051 IP Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-6.26%	-4.64%	-5.90%	-9.81%	6.31%	5.48%	-2.86%
2	-4.43%	-5.57%	-6.40%	-7.38%	8.31%	4.91%	-4.00%
3	-6.00%	-7.42%	-3.52%	-11.85%	9.02%	9.61%	0.97%
4	-7.42%	-5.28%	-8.38%	-6.55%	24.29%	0.57%	-4.23%
5	6.59%	7.30%	6.22%	17.31%	-1.92%	12.53%	-1.12%
6	5.46%	4.78%	7.77%	0.25%	14.36%	-0.05%	1.73%
Total	-2.98%	-4.30%	0.43%	-4.61%	-1.21%	2.12%	-0.63%

Table 23.64: 2051 PM Reference Rail Demand

	1	2	3	4	5	6	Total
1	557	178	685	45	398	29	1,893
2	261	4,366	171	15	564	53	5,429
3	1,592	264	16,781	1,049	6,897	839	27,422
4	50	22	637	9,476	452	805	11,442
5	628	614	18,147	873	577,082	17,032	614,375
6	42	64	968	1,184	8,780	97,896	108,935
Total	3,130	5,508	37,389	12,642	594,173	116,655	769,496

Table 23.65: 2051 PM Rail Demand Change between Reference and DM

	1	2	3	4	5	6	Total
1	-5.11%	-4.24%	-6.32%	-12.52%	4.78%	4.27%	-3.41%
2	-3.45%	-5.08%	-7.73%	-7.91%	5.73%	1.34%	-3.91%
3	-5.07%	-7.77%	-2.96%	-14.17%	7.30%	7.66%	-0.65%
4	-5.37%	-3.88%	-1.81%	-5.08%	23.04%	2.39%	-3.26%
5	6.22%	6.32%	5.30%	15.16%	-1.41%	9.70%	-0.86%
6	4.96%	5.49%	6.47%	-1.01%	14.13%	0.23%	1.40%
Total	-2.55%	-3.79%	1.23%	-4.09%	-1.05%	1.68%	-0.60%

Table 23.66: 2051 PM Rail Demand Change between Reference and DS

	1	2	3	4	5	6	Total
1	-5.11%	-4.20%	-6.32%	-12.51%	4.68%	4.26%	-3.43%
2	-3.49%	-5.09%	-7.76%	-7.94%	5.66%	1.30%	-3.93%
3	-5.11%	-7.80%	-2.96%	-14.17%	7.30%	7.66%	-0.65%
4	-5.39%	-3.92%	-1.81%	-5.08%	23.03%	2.39%	-3.26%
5	6.13%	6.26%	5.30%	15.14%	-1.41%	9.69%	-0.86%
6	4.90%	5.45%	6.47%	-1.02%	14.13%	0.23%	1.40%
Total	-2.59%	-3.80%	1.23%	-4.09%	-1.05%	1.68%	-0.60%

24 Appendix H

24.1 Time period level flows

Figure 24.1: Time period level flows (veh/hr including HGV %)

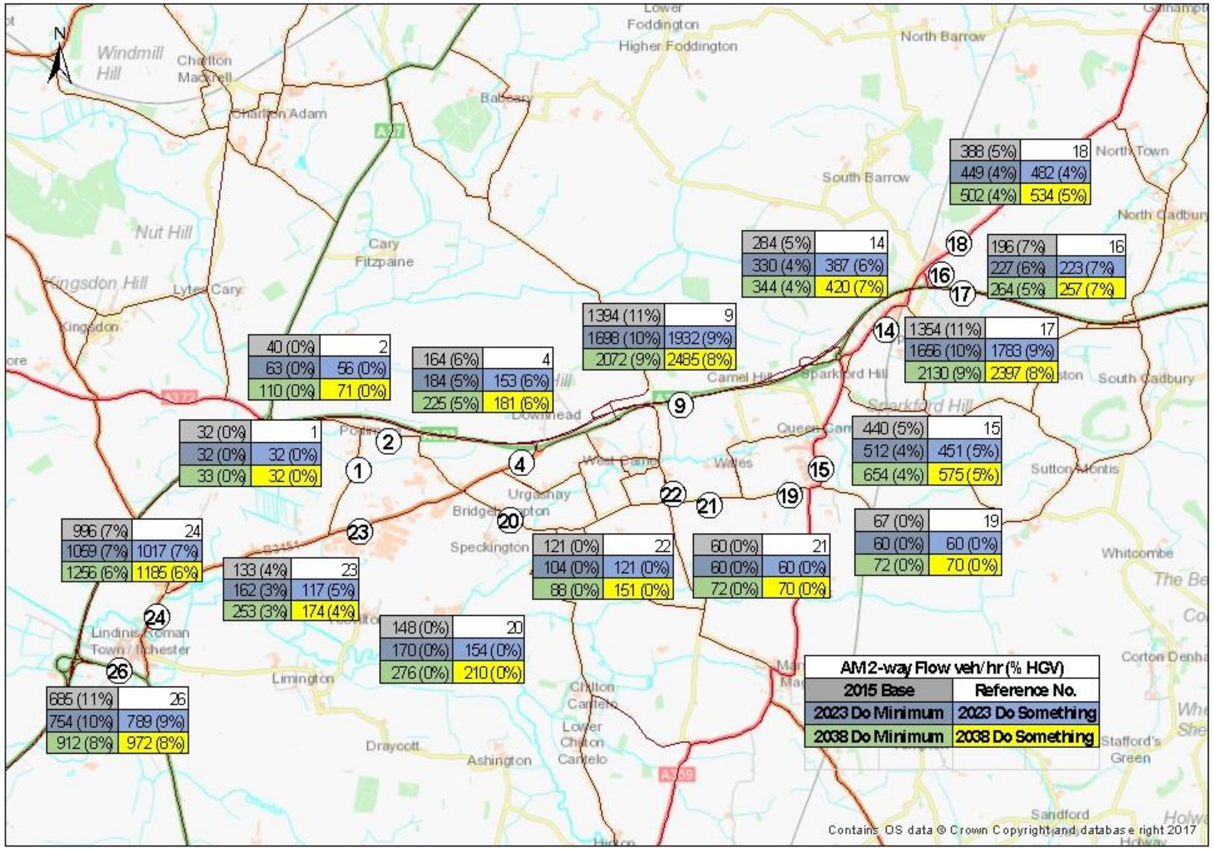

Figure 24.2: Time period level flows (veh/hr including HGV %)

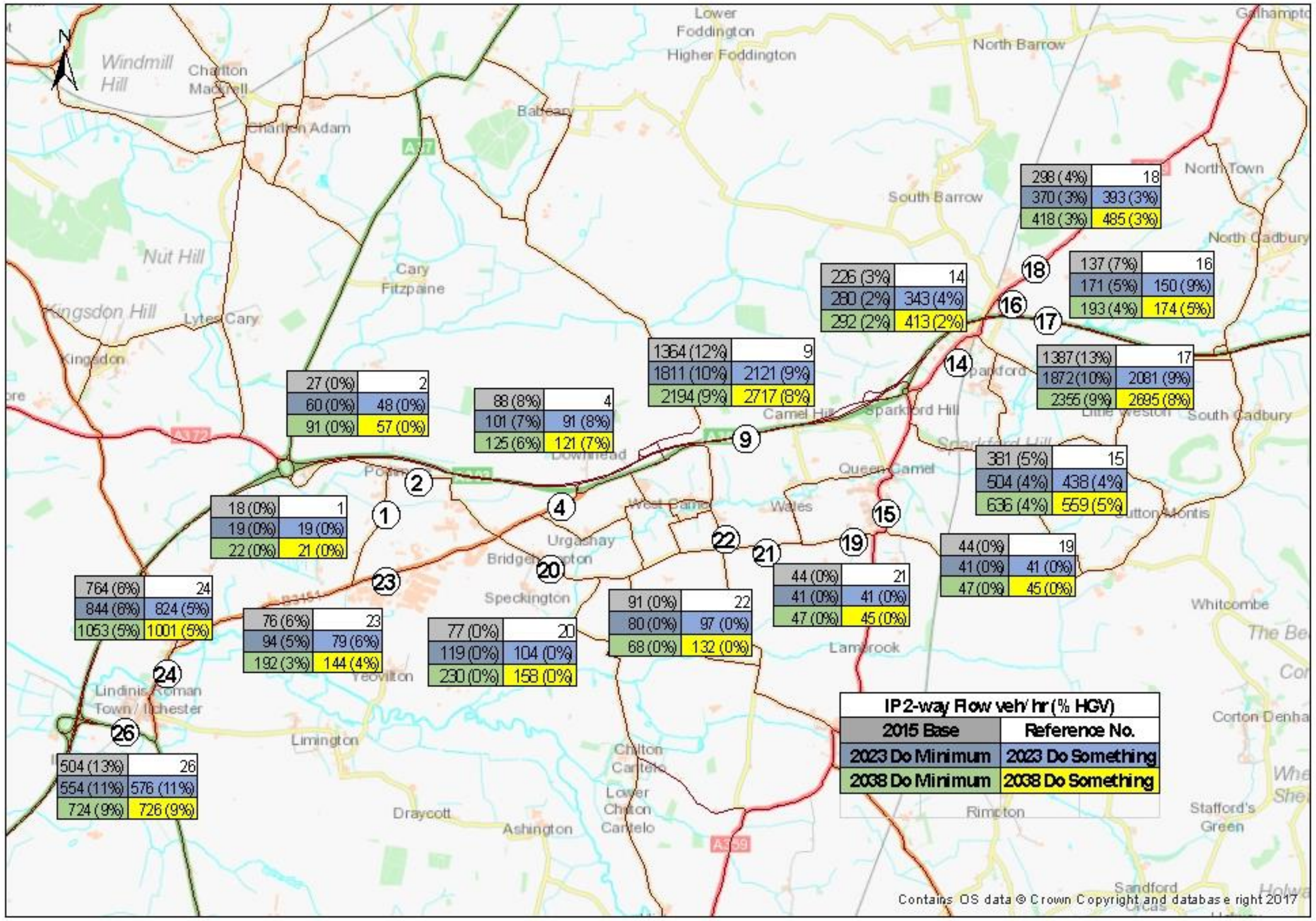

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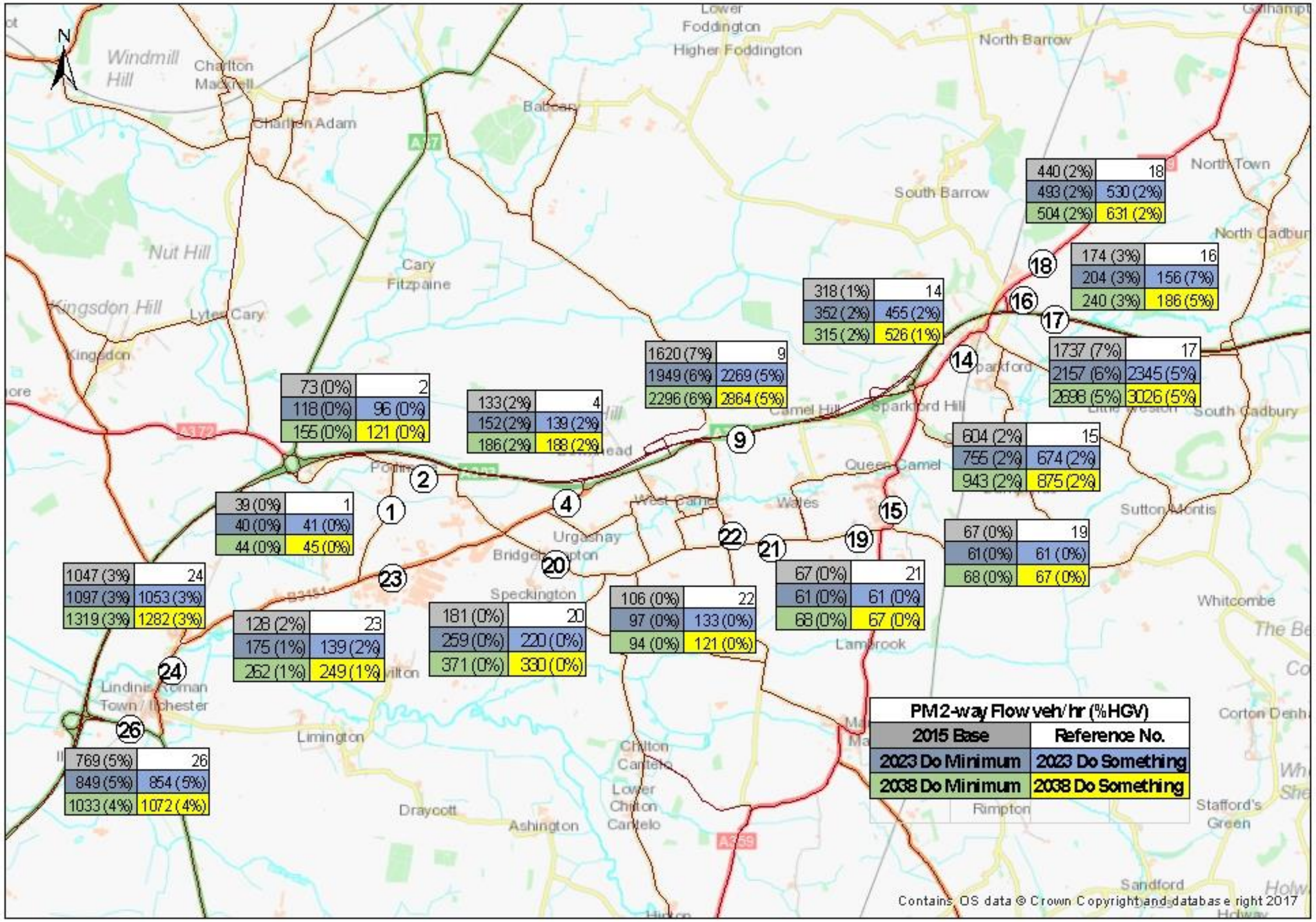
Figure 24.3: Time period level flows (veh/hr including HGV %)



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25 Appendix I

Figure 25.1: Scheme ad-hoc cost profile

ECONOMICS INFORMATION FOR THE WHOLE PACKAGE

PROJECT NAME:	A303 Sparkford to Ilchester
PROJECT STAGE:	3. Development - Preliminary Design
PROJECT SCOPE:	
0	

IF YOU HAVE ANY QUESTIONS REGARDING THE INFORMATION PROVIDED PLEASE CONTACT CommercialServicesDivision@highwaysengland.co.uk

REBASED 2010 CALENDAR YEAR PROFILES FOR ECONOMIC CALCULATIONS - ALL COSTS ARE IN THE FACTOR COST UNIT OF ACCOUNT

The expenditure profiles are based upon cost estimates for each financial year prepared in Q1 2016 prices and then inflated to outturn costs using HE projected construction related inflation. These costs have then been rebased to 2010 calendar year profiles for economic calculations, using the GDP-deflator series as published in the WebTAG Databook.

The costs exclude all recoverable VAT. All historic costs have been removed - previous years and an approximate of this years spend that occurs in the past.

	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total (Excl Hist)
PREPARATION EXPENDITURE PROFILE	£0	£0	£0	£2,887,978	£4,441,488	£132,341	£0	£0	£0	£7,461,808
SUPERVISION EXPENDITURE PROFILE	£0	£0	£0	£0	£0	£605,091	£1,759,830	£586,064	£5,263	£2,956,247
WORKS EXPENDITURE PROFILE	£0	£0	£0	£0	£0	£30,762,461	£59,355,612	£18,717,763	£317,852	£109,153,687
LANDS EXPENDITURE PROFILE	£0	£0	£0	£2,644,995	£0	£8,250,488	£0	£0	£0	£10,895,483
TOTAL EXPENDITURE FORECAST	**£0**	**£0**	**£0**	**£5,532,973**	**£4,441,488**	**£39,750,381**	**£61,115,441**	**£19,303,826**	**£323,114**	**£130,467,224**

PREPARATION EXPENDITURE PROFILE	0%	0%	0%	39%	60%	2%	0%	0%	0%	100%
SUPERVISION EXPENDITURE PROFILE	0%	0%	0%	0%	0%	20%	60%	20%	0%	100%
WORKS EXPENDITURE PROFILE	0%	0%	0%	0%	0%	28%	54%	17%	0%	100%
LANDS EXPENDITURE PROFILE	0%	0%	0%	24%	0%	76%	0%	0%	0%	100%
TOTAL EXPENDITURE FORECAST (ALL COSTS INCLUDED)	**0.0%**	**0.0%**	**0.0%**	**4.2%**	**3.4%**	**30.5%**	**46.8%**	**14.8%**	**0.2%**	**100.0%**

Source: Highways England

26 Appendix J

Figure 26.1: Designation of weekday and weekend hours

			0-5:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
Flow	Mar	Weekday	390	374	758	822	653	690	761	783	775	795	830	917	898	657	423	284	205	144	76
	Aug	Fri-Sun	422	281	542	726	919	1088	1169	1163	1161	1143	1146	1086	996	879	761	569	416	290	165
	Year	Weekday	403	368	738	816	680	732	809	837	829	848	869	929	917	674	457	317	239	164	92
		Weekend	271	119	239	392	587	768	889	876	824	794	800	804	739	607	475	353	241	159	99
	Summer	Fri-Sun	390	248	492	662	825	1034	1140	1146	1126	1114	1088	1041	1005	898	738	551	399	260	148
Designation	Mar	Weekday	OP	OP	AM	AM	AM	IP	IP	IP	IP	IP	IP	PM	PM	PM	OP	OP	OP	OP	OP
	Aug	Fri-Sun	OP	OP	OP	OP	OP	IP	IP	IP	IP	IP	IP	IP	IP	IP	OP	OP	OP	OP	OP
	Year	Weekday	OP	OP	AM	AM	AM	IP	IP	IP	IP	IP	IP	PM	PM	PM	OP	OP	OP	OP	OP
		Weekend	OP	OP	OP	OP	OP	IP	IP	IP	IP	IP	IP	IP	IP	PM	OP	OP	OP	OP	OP
	Summer	Fri-Sun	OP	OP	OP	OP	OP	IP	IP	IP	IP	IP	IP	IP	IP	IP	OP	OP	OP	OP	OP

AM Peak
Inter-Peak
PM Peak
Off-Peak

Source: MMSJV

27 Appendix K

27.1 Total user benefits by time period

27.1.1 Table 27.1 shows total user benefits by time period. The results show that the scheme has a large impact across all time periods. The scheme will provide significant benefits to traffic movements in the inter-peak and at weekends as well as in peak periods. The ratio of benefits per hour is similar in the AM, inter-peak and PM periods. Weekend and off-peak hourly benefits are small compared to other peaks. These are consistent with traffic profiles observed (see Section 13 for more details). Therefore, the profile of the benefits matches expectations for a scheme such as Sparkford.

Table 27.1: Total user benefit by time period

	Total User Benefits (£000s)	Annualisation
AM Peak	29,830	720
PM Peak	27,419	734
Inter-peak	82,742	1,916
Off-Peak	18,196	3,098
Weekends	39,980	3,370

Note: All monetary values are expressed in 2010 prices discounted to 2010

27.1.2 Weekend (excluding off-peak) benefits are derived from outputs from March weekday and summer models. The allocation of weekend hours to the inter-peak and off-peak modelled time periods is presented in appendix J.

27.2 User benefits by type of benefit

27.2.1 Table 27.2 shows total user benefits by benefit type. As expected, the scheme provides significant journey time benefits by moving from an old single carriageway type to a modern dual carriageway type. It is also expected that the scheme will result in vehicle operating cost disbenefits.

Table 27.2: Total user benefit by type of benefit

	Total User Benefits (£000s)
Travel Time	196,768
Vehicle Operating Costs	-48,230

Note: All monetary values are expressed in 2010 prices discounted to 2010

27.2.2 For the opening year of 2023 and in each direction, the scheme is predicted to generate an average of 2-minute time saving per trip during a neutral weekday and a 5-minute saving per trip during summer weekend. Table 27.3 and Table 27.4 below summarise the journey time benefits by time bands for both business users and consumer over the 60-year period. It is worth noting that the small negative figures for >5 min category for consumer users are to do with possible longer rerouting impacts of the scheme for a small proportion of trpis.

Table 27.3: Journey time benefit by time band – business user (£000s)

	Value of journey time changes			
	0-2min	**2-5min**	**>5min**	**Total**
Business user	32,285	89,426	511	122,222

Note: All monetary values are expressed in 2010 prices discounted to 2010

Table 27.4: Journey time benefit by time band – consumer (£million)

	Value of journey time changes			
	0-2min	**2-5min**	**>5min**	**Total**
Comsumer	9,716	65,166	-335	74,547

Note: All monetary values are expressed in 2010 prices discounted to 2010

27.3 Profile of benefits

27.3.1 Table 27.5 shows the benefits (excluding greenhouse gases) profile over the appraisal period. Annual benefits increase between years 2023 to 2038 and reduce thereafter. The reduction of benefits from 2038 to 2051 is due to additional delays at significant bottlenecks in 2051; TUBA interpolating benefits from 2038 and 2051 and extrapolating years beyond 2051; and the application of discounting. On average, about 50% of the total benefits are accrued during first 30 years of the 60-year appraisal period.

Table 27.5: Profile of benefits over the assessment period (£000)

Year	Benefits (£'000)	Year	Benefits (£'000)
2023	3,652	2053	3,334
2024	3,654	2054	3,304
2025	3,647	2055	3,275
2026	3,650	2056	3,246
2027	3,652	2057	3,215
2028	3,649	2058	3,186
2029	3,649	2059	3,156
2030	3,649	2060	3,129
2031	3,647	2061	3,103
2032	3,689	2062	3,077
2033	3,732	2063	3,050
2034	3,766	2064	3,024
2035	3,807	2065	2,998
2036	3,857	2066	2,971

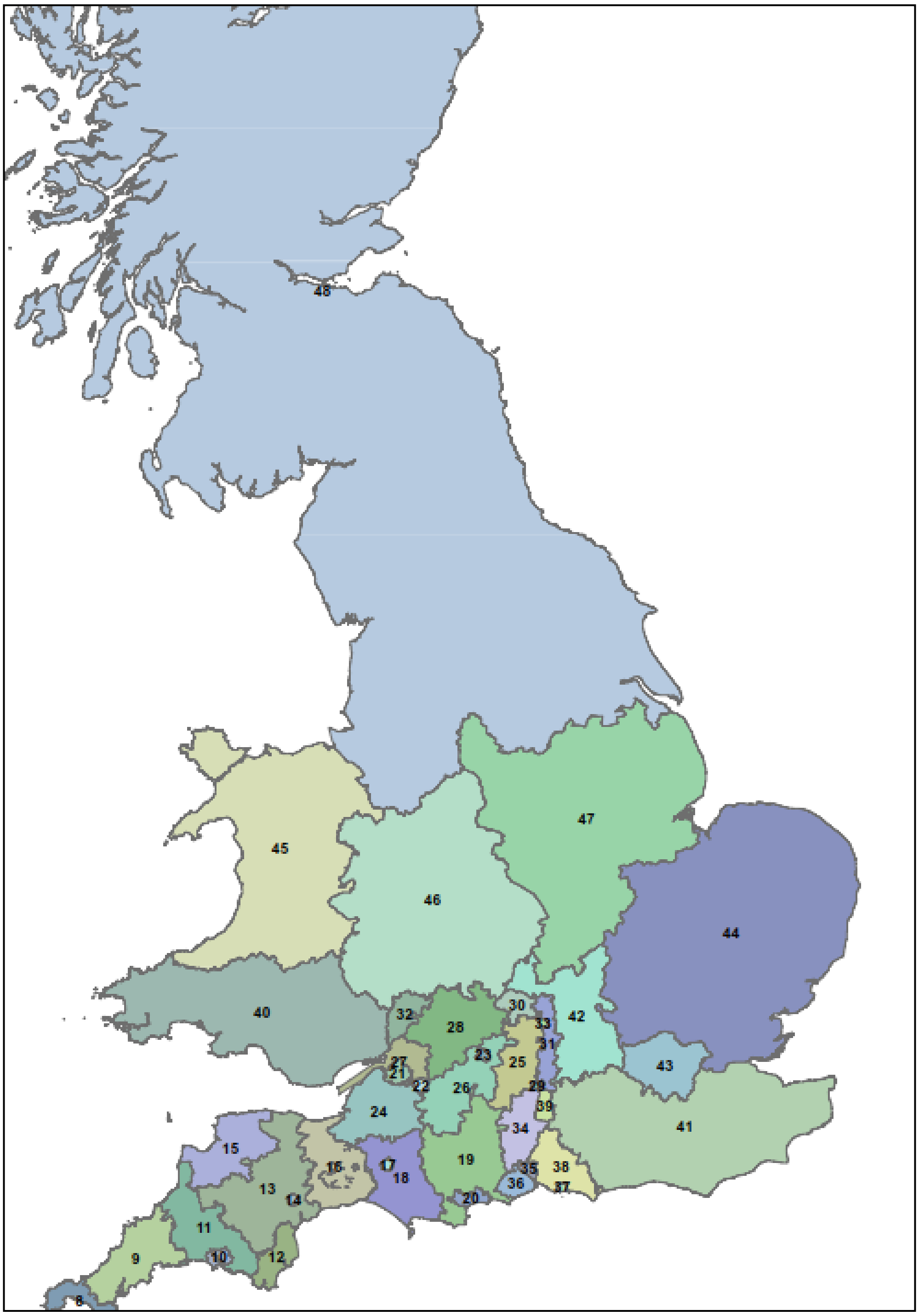
Year	Benefits (£'000)	Year	Benefits (£'000)
2037	3,905	2067	2,944
2038	3,954	2068	2,917
2039	3,906	2069	2,891
2040	3,860	2070	2,864
2041	3,813	2071	2,838
2042	3,767	2072	2,811
2043	3,719	2073	2,785
2044	3,670	2074	2,760
2045	3,622	2075	2,732
2046	3,574	2076	2,707
2047	3,524	2077	2,682
2048	3,490	2078	2,655
2049	3,458	2079	2,630
2050	3,424	2080	2,604
2051	3,391	2081	2,580
2052	3,361	2082	2,556
Total			**198,162**

Note: All monetary values are expressed in 2010 prices discounted to 2010

27.4 Geographical sectorisation of user benefits

27.4.1 To confirm that the distribution of user benefits for the scheme is sensible and that the economic user benefits of the scheme are reliable and robust, a sector to sector analysis of user time benefits has been carried out. To do this, the study area and the surrounding areas covered by the transport model were split into 41 geographical sectors as shown in Figure 27.1 below.

Figure 27.1: Sector diagram



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27.4.2 Figure 27.2 and Figure 27.3 contain sector to sector analysis of journey time benefits. The results are presented for the opening year of 2023 and the design year of 2038. The results indicate that majority of benefits are related to primary movements through the scheme, such as movements associated with sectors 13, 14, 16, 18 and 41. It is also evident that benefits / disbenefits increase for most sector movements between 2023 and 2038 as the traffic levels go up. Some sector movements show a reduction in benefits as the demand increases. This is due to increased delays at some of the bottlenecks along the A303.

Figure 27.2: Sector to sector journey time benefits – 2023 (£000s, 2010 prices, discounted to 2010)

Sum Co																																									
Ro	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	Grand
8	0	0	0	0	0	1	0	0	0	0	1	3	0	0	0	0	0	0	2	0	0	0		0	0	0	4	2	3	0	5	0	0	14	0	6	4	0	0	0	0	47
9	0	0	0	0	0	4	0	0	0	0	3	17	1	0	0	0	0	0	7	0	0	0	0	0	0	0	10	5	6	3	14	1	0	66	1	25	15	0	-1	0	0	176
10	0	0	0	0	0	7	0	0	0	0	3	12	0	0	0	0	0	0	7	0	0	0	0	0	0	0	8	4	4	3	14	0	0	36	0	21	13	0	0	0	0	131
11	0	0	0	0	0	7	0	0	0	0	4	12	3	0	0	0	0	0	7	0	0	0	0	0	0	0	8	3	4	3	12	1	0	42	0	16	10	0	0	0	0	129
12	0	0	0	0	0	19	0	0	2	-1	4	16	4	0	0	0	0	0	7	0	0	0	0	0	0	0	9	4	6	2	12	1	0	47	0	29	8	0	-1	0	0	168
13	0	1	1	2	4	41	9	0	17	-3	11	31	3	0	1	0	1	-1	18	0	0	1	0	0	0	0	20	6	5	4	17	1	0	69	-2	33	11	0	0	0	1	302
14	0	0	0	0	0	81	1	0	25	-1	7	25	1	-1	1	0	0	0	14	0	0	1	0	-1	0	0	17	19	6	10	31	1	0	66	0	48	12	0	-1	0	0	358
15	0	0	0	0	0	0	0	0	0	-1	1	6	0	0	0	0	1	0	4	0	0	0	0	0	0	0	3	1	1	0	5	0	0	17	1	6	-1	0	0	0	0	45
16	0	0	-1	-1	-2	-5	-6	0	-15	-20	47	105	-1	0	2	0	6	3	64	0	0	1	0	2	0	1	26	6	4	3	17	2	0	78	17	43	23	0	0	0	0	402
17	0	0	0	0	-1	-4	-1	-1	-17	52	7	-11	0	1	0	-1	-1	-1	-4	0	0	-1	0	0	0	0	-6	0	0	0	-1	-3	0	-8	-2	-4	-3	0	0	0	0	-11
18	1	3	3	2	3	10	2	2	46	48	213	57	1	4	2	2	29	1	26	0	1	0	0	1	0	0	5	1	0	0	2	0	1	13	4	6	4	0	-1	0	0	491
19	3	10	6	9	11	27	12	7	76	5	87	-92	-1	-1	0	0	26	-1	-6	0	0	0	0	0	0	0	-9	-1	0	0	-2	0	0	-9	-1	-5	-2	0	0	-1	0	146
20	0	0	0	0	0	1	0	0	0	0	1	-1	0	0	0		6	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
21	0	0	0	0	0	0	0	0	0	1	0	-1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
22	0	1	0	0	1	1	1	0	2	1	2	-1	0	0	0	0	0	0	0	0	0				0		0	0	0	0	0	0	0	-1	0	0	0		0		0	7
23	0	0	0	0	0	0	0	0	0	-6	1	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		0	-4
24	0	0	0	0	0	-1	-1	0	2	-1	34	22	3	1	0	0	42	1	16	0	0	0	0	0	0	0	6	3	1	1	7	0	0	18	2	3	0	0	0	0	0	162
25	0	-1	0	-1	0	0	0	0	2	0	2	-1	0	0		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	2
26	2	5	5	7	9	19	9	7	65	5	33	-12	-1	0	0	0	17	0	-2	0	0	0	0	0	0	0	-3	0	0	0	0	0	0	-4	0	-2	-1	0	0	0	0	157
27	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	1	0	0	0	0			0	0		0	0	0	0	0		0	0	0	0	0	0	0	0	0	-1
28	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	4
29	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	0	0	0	0	0	0	0	0	0	1
30	0	0	0	0	0	0	0	0	0	0	1	0	0	0		0	0	0	0	0	0		0	0		0	0		0		0		0	0	0	0	0		0		0	1
31	0	-1	0	0	0	0	0	0	1	0	1	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	0	0
32	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	0		0	0	0	0
33	0	0	0	0	0	0	0	0	1	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
34	2	6	3	6	5	14	10	2	23	-1	8	-9	0	0	0	0	6	0	-2	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
35	1	3	3	2	3	4	6	1	8	0	2	-1	0	0	0	0	4	0	0	0	0	0		0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
36	0	1	0	1	1	3	1	1	3	0	1	-1	0	0	0		2	0	0	0	0			0			0	0	0	0	0		0	0	0	0	0	0	0	0	0	11
37	1	1	2	1	1	2	2	1	3	0	1	0	0	0	0		2	0	0	0	0			0			0	0	0	0	0		0	0	0	0	0	0	0	0	0	17
38	2	6	6	5	5	10	6	3	17	-1	3	-2	0	0	0	0	7	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
39	0	1	0	1	1	1	0	1	2	-1	1	0	0	0	0	0	1	0	0			0		0			0	0		0	0	0	0	0	0	0	0	0	0	0	0	9
40	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	1	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
41	13	61	31	39	41	69	46	20	89	-4	22	-12	0	0	-1	0	20	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	439
42	-1	-11	-5	-3	-7	-3	-3	1	11	0	4	-2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-15
43	8	26	19	18	24	39	28	12	47	-2	9	-7	0	0	0	0	3	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	220
44	5	21	13	12	12	19	10	8	31	-1	7	-3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	135
45	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	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	1	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
47	0	0	0	0	0	0	0	0	1	0	1	-1	0	0	0	0	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	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
Gran	**37**	**135**	**89**	**102**	**114**	**369**	**128**	**67**	**445**	**69**	**518**	**150**	**13**	**3**	**6**	**1**	**182**	**2**	**152**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**97**	**53**	**38**	**29**	**131**	**6**	**-1**	**444**	**19**	**227**	**93**	**0**	**-3**	**-2**	**0**	**3717**

Source: MMSJV

Figure 27.3: Sector to sector journey time benefits – 2038 (£000s, 2010 prices, discounted to 2010)

Sum Co																																									
Ro	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**Granc**
8	0	0	0	0	0	0	0	0	1	0	1	3	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	2	2	1	6	0	0	15	0	4	3	0	0	0	0	44
9	0	0	0	0	0	-1	0	0	4	-1	4	16	2	0	0	0	0	-1	7	0	0	0	0	0	0	0	10	5	4	3	17	1	0	72	1	17	12	0	0	0	0	168
10	0	0	0	0	0	-4	0	0	4	-1	2	12	2	0	0	0	0	0	7	0	0	0	0	0	0	0	8	5	2	4	17	0	0	42	1	12	10	0	0	0	0	122
11	0	0	0	0	0	-2	0	0	3	-1	5	12	4	0	0	0	0	0	7	0	0	0	0	0	0	0	10	3	2	3	14	1	0	44	1	12	7	0	0	0	0	122
12	0	0	0	0	0	-3	0	0	7	-2	5	16	5	0	0	0	0	0	7	0	0	0	0	0	0	0	8	5	3	2	16	1	0	54	1	18	6	0	-1	0	0	146
13	0	0	0	0	0	36	16	2	17	-9	6	28	3	0	0	0	-1	0	19	0	0	-1	0	0	0	0	19	6	4	3	17	1	0	78	0	23	13	0	0	0	1	281
14	0	0	0	0	0	3	5	0	9	-3	5	22	1	0	0	0	0	0	12	0	0	1	0	0	0	0	14	10	5	5	17	1	0	68	-2	32	6	0	0	0	0	213
15	0	0	0	0	0	2	0	0	0	-3	-1	5	1	0	0	0	1	0	5	0	0	0	0	0	0	0	3	1	0	0	5	0	0	19	0	5	5	0	0	0	0	52
16	0	-1	-1	-1	-3	-1	-10	0	-14	-58	13	101	0	5	2	0	10	3	67	1	1	1	1	2	0	1	27	4	2	2	15	3	2	83	17	34	25	0	2	1	1	338
17	0	0	0	0	-1	-6	-2	-1	-31	42	25	-5	1	1	1	0	-3	-1	-2	0	0	-1	0	0	0	0	-6	0	0	0	0	-3	-1	-7	-2	-3	-3	0	0	-1	0	-9
18	1	3	3	3	4	12	5	2	50	41	267	79	3	4	4	2	33	1	36	0	1	0	1	1	0	0	8	0	0	0	1	0	1	23	6	8	5	0	-1	1	0	608
19	4	13	8	11	15	35	15	10	100	13	105	-104	-2	-1	-1	-1	31	-1	-9	0	-1	0	0	0	0	0	-10	-1	-1	0	-3	0	-1	-10	-2	-6	-2	0	-1	-1	0	199
20	0	0	0	0	0	1	0	0	4	1	1	-3	0	0	0	0	6	0	-1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
21	0	1	1	1	1	2	1	0	4	0	-1	-1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
22	0	0	0	0	0	0	0	0	4	4	4	-1	0	0	0		0		0	0	0				0		0	0	0	0	0	0	0	-1	0	0	0		0	0	0	9
23	0	0	0	0	0	0	0	0	0	0	2	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	0	0	3
24	0	1	1	1	2	3	1	1	26	-7	32	21	5	1	0	0	48	1	18	0	0	0	0	0	0	0	9	3	1	1	7	0	0	23	2	5	2	0	0	0	0	208
25	0	-1	0	0	0	0	0	0	3	0	2	-1	0	0		0	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	4
26	3	8	6	9	11	24	11	6	75	7	40	-11	-1	0	0	0	20	0	-7	0	0	0	0	0	0	0	-2	-1	0	0	-1	0	0	-2	0	-1	0	0	0	0	0	191
27	0	0	0	0	0	1	0	0	1	-2	-2	0	0	0	0	0	1	0	0	0	0			0	0		0	0	0	0	0		0	0	0	0	0	0	0	0	0	-1
28	0	1	0	0	1	2	0	0	2	-5	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
29	0	0	0	0	0	0	0	0	1	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	0	0	2
30	0	0	0	0	0	0	0	0	0	0	1	0		0		0	0	0	0	0	0	0	0	0		0	0				0		0	0	0	0	0		0		0	1
31	0	0	0	0	0	0	0	0	2	0	1	0	0	0		0	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	3
32	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	0		0	0	0	0
33	0	0	0	0	0	0	0	0	1	0	1	0	0	0		0	0	0	0		0		0	0		0	0				0		0	0	0	0	0	0	0	0	0	2
34	3	8	5	8	7	20	14	3	32	-1	12	-9	0	0	-1	0	8	0	-2	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	106
35	0	2	2	2	2	4	5	2	9	0	3	0	0	0	0	0	5	0	0	0	0	0		0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
36	0	1	1	1	1	3	2	1	3	0	1	0	0	0	0	0	2	0	0	0	0						0	0	0	0	0		0	0	0	0	0		0	0	0	16
37	0	1	1	1	1	2	1	1	4	0	1	0	0	0	0		2	0	0	0	0						0	0	0	0	0		0	0	0	0	0	0	0	0	0	15
38	2	7	5	5	5	11	5	4	21	0	5	-2	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78
39	0	1	0	1	1	2	1	1	4	-1	1	0	0	0	0	0	1	0	0			0		0			0	0			0	0	0	0	0	0	0	0	0	0	0	12
40	0	1	1	1	1	2	1	0	2	-3	-4	0	0	0	0	0	1	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
41	18	76	39	52	51	92	59	25	116	-5	31	-11	0	0	-1	0	28	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	567
42	0	-7	-1	-2	-3	0	-2	-1	15	0	6	-2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
43	10	31	23	21	28	47	50	16	54	-1	13	-7	0	0	0	0	2	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	287
44	5	24	15	13	13	21	15	9	34	0	10	-3	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	0	0	0	0	155
45	0	0	0	0	0	0	0	0	0	0	-1	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
46	1	2	1	1	2	3	1	0	2	-8	-4	0	0	0	0	0	1	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
47	0	1	0	0	0	1	0	0	1	-1	0	-1	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	0	0	0	4
48	0	1	1	1	1	2	0	0	0	-4	-1	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	0	0	0	0	2
Gran	**48**	**173**	**110**	**127**	**140**	**316**	**193**	**83**	**573**	**-8**	**591**	**152**	**25**	**8**	**4**	**1**	**214**	**1**	**162**	**0**	**1**	**1**	**1**	**2**	**0**	**1**	**101**	**41**	**23**	**24**	**126**	**6**	**0**	**501**	**24**	**161**	**88**	**0**	**-2**	**0**	**2**	**4014**

Source: MMSJV

27.5 Analysis of TUBA warning messages

27.5.1 During the model calibration and validation stage, a TUBA run was carried out comparing the base model against the base model with the scheme coded in. The warning messages that arose from this run were investigated as a means of checking and, where necessary, amending the transport models. Subsequently, another TUBA run was carried out when the Do Minimum networks were ready in order to see if any additional warnings occurred. Any issues from these warnings were also implemented. Any outstanding warning messages that occur in the final TUBA run are due to legitimate reasons.

27.5.2 Table 27.6 below provides a summary of the warnings produced by the final TUBA run. The warnings produced by TUBA have been fully checked as a part of checking the SATURN models. In most of the cases the warnings related to traffic using the new scheme with longer distances travelled but with time savings associated due to higher speeds. Overall, the origin-destination route patterns were as expected given the location of the proposed new dual carriageway, so the warnings highlighted by TUBA were "genuine" traffic re-routings taking place in the models.

Table 27.6: TUBA warning numbers

Warning Type	Number of warnings
Ratio of DM to DS travel time lower than limit	14
Ratio of DM to DS travel time higher than limit	434
Ratio of DM to DS travel distance lower than limit	502
Ratio of DM to DS travel distance higher than limit	68
DM speeds less than limit	1,292
DS speeds less than limit	1,361

27.6 Reliability and stability of the economic appraisal results

27.6.1 TUBA sensitivity analysis highlights total user benefits for model years as a percentage of total DM user costs. Given the size of the model TUBA sensitivity percentages are negligible. As mentioned in Section 11.7, possible convergence noise impacts have been eliminated through the use of FCFs.

28 Appendix L

Traffic management information

Highways England – CDF Buildability Support Contract

A303 Sparkford to Ilchester

QUADRO information
26th April 2017

Introduction

A considered review of the available drawings and information has been undertaken to develop the following suggested traffic management arrangements for the two scheme options under consideration.

General Note

For Option 1 & 2 the eastbound departure from Podimore Roundabout will be reduced to single lane after approximately 100m. This may require box markings on the roundabout circulatory to prevent queuing across exit and entry arms. At west and east tie-ins a section of the westbound carriageway will include a 1+1 contraflow to take west and eastbound traffic on one carriageway.

Option 1.

The length of the new dual carriageway is 5600m with approx. 1600m being on line construction at various locations.

It is suggested that traffic will be in single file for the entire length of the works plus the approach and departure on each carriageway. Single lane traffic will be on each carriageway or as 1+1 contraflow on existing, new or temporary carriageway. Single lane running will be in place from Podimore Roundabout to the bridge over the Castle Cary to Yeovil railway, a distance of 7400m. The A303 is currently single carriageway for c4600m.

- Minimum lane widths of 3.5m should be maintained

There is a significant level difference between the existing and proposed carriageways on the rise from Sparkford Roundabout towards Ch4200. One new carriageway needs to be constructed while keeping the traffic on the existing A303 carriageway running in narrow lanes.

- The Speed limit should be reduced to 40mph from Podimore Roundabout to the bridge over Castle Cary to Yeovil railway a distance of 7400m.
- On the A303 westbound there should be a 50mph speed limit for 1000m in advance of the 40mph.

DURATION
It is estimated that the above Traffic Management measures will be in place for an estimated 85% of the overall construction programme.

Option 2.

The A303 will remain as single lane running at the existing speed limit on both carriageways for c5km between the West and East Tie Ins.

WEST TIE IN
It is suggested that Traffic Management is installed from Podimore Roundabout to c800m east of Higher Farm Lane overbridge. On the A303, EB traffic to be kept in one lane from Podimore Roundabout giving 1800m of single lane running. The A303 WB traffic will remain in single file for c800m. Traffic will run either in single lane on the existing carriageways or in 1+1 contraflow at different stages of the works.

- Lane widths will be 3.5m minimum.
- Speed limit to be reduced to 50mph.

EAST TIE IN
Traffic in both directions will be in single file for c800m either as single lane in each carriageway or in 1+1 contraflow. This is from Hazelgrove Roundabout east for c800m.

- Lane widths will be 3.5m minimum.
- Speed limit to be reduced to 50mph.

DURATION
Each tie-in is anticipated to take a maximum of 9 months to construct and may run concurrent with one another within the delivery programme. The actual duration will be dependent on the detailed design and logistical complexity of the associated construction.

Closures & Diversion Routes

In the event of carriageway closures, the diversion routes are likely to be of significant length and would require extensive resources in both labour and equipment to install and maintain.

- Any closures would have to be overnight say 2100hrs to 0600hrs or perhaps 0800hrs on a Sunday morning. To keep traffic on A Class roads there are two possible routes, one to the north (A37, A361, A36 & A350) and to the south (A37, A35, A354 & A350).

- Extensive advance notice, advice and signing would be necessary to encourage traffic to use M4 & M5 or M3 and A31/A35 to bypass the closed section of the A303. There are also numerous access points on to the A303 which would all require localised traffic management measures.

Design and Buildability Considerations to Reduce Traffic Management Durations

The durations of the Traffic Management measures identified above could be reduced if the design can be developed to accommodate various buildability considerations, two examples of which are:

- Significant overlay or full depth construction below existing levels should be avoided at the tie-ins, and the new carriageways tie-ins should be at or just above existing levels.
- Carriageway closures may be required depending on the design details of structures, temporary works and construction of final tie-ins. During the ongoing buildability review work, consideration will be given to how the design can be developed to reduce or eliminate the need for carriageway closures in order to avoid the logistically difficult issue of managing diverted traffic.

29 Appendix M

Appraisal Summary Table

Appraisal Summary Table

Date produced:	Jun-18	**Contact:**	
Name of scheme:	A303 Sparkford to Ilchester Dualling	**Name**	Elliot Hayes
Description of scheme:	The scheme would provide a dual carriageway on the A303 between Sparkford and Podimore in Somerset, connecting the existing dual carriageway sections from Sparkford to Ilchester. The scheme follows the existing corridor of the A303 very closely. It is generally considered to be an online solution although is often deliberately aligned just to the side of the existing carriageway to allow re-use of the existing route for local access, avoid property or facilitate construction. At its maximum off-set, the route is typically 100 metres either north or south of the existing A303.	**Organisation**	Highways England
		Role	Promoter/Official

Impacts		Summary of key impacts	Assessment: Quantitative	Assessment: Qualitative	Assessment: Monetary £(NPV)	Assessment: Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Journey time benefits by converting old single carriageway section to modern dual carriageway with associated junction improvements. Net journey time changes is the net of positive and negatives in a given time band. Monetary (NPV) includes both journey times and vehicle operating cost impacts.	Value of journey time changes(£): 122.2m Net journey time changes (£): 0 to 2min: 32.3m 2 to 5min: 89.4m > 5min: 0.5m	N/A	121.5m	N/A
Economy	Reliability impact on Business users	Reliability benefits by converting old single carriageway section to modern dual carriageway with associated junction improvements.	N/A	N/A	10.2m	
Economy	Regeneration	N/A	N/A	N/A	N/A	
Economy	Wider Impacts	Wider economic benefits associated with output change in imperfectly competitive markets by converting old single carriageway section to modern dual carriageway with associated junction improvements.	N/A	N/A	12.2m	
Environmental	Noise	Results indicate an overall dis-benefit due to a greater number of households experiencing daytime traffic noise increases than decreases, within the calculation area. Mitigation measures have been implemented along the alignment and within close proximity to protect nearby residential properties from noise impacts due to the scheme.	Households experiencing increased daytime noise in forecast year: 128. Households experiencing reduced daytime noise in forecast year: 63. Households experiencing increased night time noise in forecast year: 42. Households experiencing reduced night time noise in forecast year: 67.	N/A	-0.1m	N/A
Environmental	Air Quality	Overall there would be a net worsening in local air quality within the study area. The scheme would not result in a new exceedance of the NO2 or PM10 annual mean air quality objectives. There are no Pollution Climate Mapping (PCM) links which overlap with the scheme's Affected Road Network (ARN) in scheme opening year. There are no Air Quality Management Areas (AQMAs) within the scheme ARN in the opening year. The regional assessment predicts an increase in emissions of NOx and PM10 primarily as a result of an increase in the number of vehicles travelling on the A303. Overall, the total change in NPV is negative indicating a net worsening in air quality when considering both local and regional effects.	Local Air quality effects at properties (Improvements / No effect / Deterioration) NO2 2023 (1721 / 2964 / 2990) PM10 2023 (284 / 5702 / 1689) Overall Assessment Score (negative score reflect benefit) NO2: (2023): 52.21 PM10: (2023): 19.30 Change in Regional Emissions NOx (2023): 12.6 t/year PM10 (2023): 1.2 t/year	N/A	Value of change in PM concentrations: NPV: -0.07m Value of change in NOx emissions: NPV: -0.29m Total value of change in air quality NPV: -0.36m	N/A
Environmental	Greenhouse gases	The scheme is estimated to cause an increase of 625,195tCO2e in non-traded emissions and increase by 5,972tCO2e in traded emissions over 60 years. The increase in greenhouse gases (GHGs) has been caused by an increase in the vehicles using the new road, and therefore more vehicle kilometres are travelled between the opening year of 2023 and the forecast year of 2038 as well as an increase between the Do-Minimum (DM) and Do-Something (DS).	Change in non-traded carbon over 60y (CO2e): 625,195t Change in traded carbon over 60y (CO2e): 5,972t	N/A	-27.9m	

	Landscape	The proposed scheme is set within the Yeovil Scarplands National Character Area (NCA), characterised by its remote rural nature, steep Scarplands, broad ridges, and the pattern characterised by historic Roman and Neolithic settlements, medieval open field patterns, manor houses with surrounding parklands. The proposed route would be either online or very close to the existing A303 route corridor, minimising impacts upon landscape character and nearby visual receptors. The expansion to dual carriageway would however be at odds with the local landscape pattern and scale. There would be a direct impact upon the designated Hazlegrove House Registered Park and Garden (RPG) and the scheme would also be in proximity to Conservation Areas at West Camel and Queen Camel, however they would not be directly affected by the scheme. This scheme would be visible from local visual receptors including residential properties and Public Rights of Way, however views would be limited in some areas where the route would pass in cutting, aiding its visual integration, and limiting views of associated traffic in some areas. Proposed mitigation would include the construction of bunds to create false cuttings and replacement planting. Whilst this mitigation would aid the scheme's integration, the route would not quite fit the landform and scale of the landscape. The overall effect on landscape would be Slight Adverse with mitigation in place.	N/A	Slight adverse	N/A	
	Townscape	The scheme runs through a rural environment and therefore just landscape has been assessed for this scheme. The built environment is limited to small-scale settlements which are not directly impacts by the scheme and therefore it is considered there would be limited value in undertaking a townscape assessment.	N/A	N/A	N/A	
	Historic Environment	The proposed scheme would require large areas of medium value unknown archaeological buried remains to be excavated during construction, resulting in potential damage. Agricultural earthwork remains within the proposed scheme boundary would be fully removed by the scheme, however these are considered of low value. Archaeological remains would be evaluated and, where necessary, recorded and excavated. The scheme would pass through the southern section of Hazlegrove House Registered Park and Garden (RPG), which would result in the removal of elements of the historic parkland. The junction is condensed towards the woodland and arable fields in the south western corner of the park to reduce the land take and impact on the historic parkland. Archaeological monitoring of the remains of the driveways would be undertaken. Replacement planting to would aid the screening of the scheme from heritage assets, as well as screening the existing services at Camel Hill from the house. The scheme would result in a Moderate Adverse effect with mitigation and therefore an overall worsening of the historic environment.	N/A	Moderate adverse	N/A	
	Biodiversity	The scheme is located adjacent to Camel Hill Transmitter Site Local Wildlife Site (LWS) and Gason Lane Field LWS and within Hazlegrove Park LWS. Small scale direct loss of broad-leaved woodland, parkland, calcareous grassland and hedgerows is anticipated as a result of the scheme. These are listed as Priority Habitats. Wildlife using these habitats such as bats, breeding birds, barn owls, reptiles, great crested newts and badger are likely to be subject to increased disturbance and loss of habitat. The loss of any habitat of conservation value would be replaced like-for-like as a minimum requirement. New planting would be connected to existing habitat within the landscape to compensate for the loss of wildlife corridors and reduce the fragmentation impact of the scheme. The overall effect on biodiversity would be Slight Adverse with mitigation in place.	N/A	Slight Adverse	N/A	

	Water Environment	The principle receptors include the River Cam - Lower and the River Yeo downstream of Overcompton to the south and the River Cary - Source to confluence with King's Sedgemoor Drain (KSD) to the north-west, both of which are Water Framework Directive (WFD) waterbodies. In addition, Dyke Brook runs to the north and Park Brook to the north west. The scheme would be unlikely to affect waterbodies during the construction phase as works would include standard mitigation measures. The scheme would also be unlikely to affect waterbodies once operational as Sustainable Drainage Systems (SuDS) and pollution control measures have been incorporated in the drainage design. These measures would prevent adverse effects from pollutants / contaminants / excess sediments from routine runoff (or from accidental spillage incidents) during operation reaching the downstream waterbodies. Some parts of drainage ditches and ponds would be lost as they would be infilled to accommodate the new carriageway. New drainage ditches and ponds would be created to compensate for any losses. The scheme would be located within Flood Zone 1 and would not affect / or be affected by areas within Flood Zones 3 and 2. The overall impact on the water environment would be Neutral with mitigation in place.	N/A	Neutral	N/A	
Social	Commuting and Other users	Journey time benefits by converting old single carriageway section to modern dual carriageway with associated junction improvements. Net journey time changes is the net of positives and negatives in a given time band. Monetary (NPV) includes both journey times and vehicle operating cost impacts.	**Value of journey time changes(£)**: 74.6m **Net journey time changes (£)** 0 to 2min: 9.7m 2 to 5min: 65.2m > 5min: -0.3m	N/A	27m	Moderate beneficial
	Reliability impact on Commuting and Other users	Reliability benefits by converting old single carriageway section to modern dual carriageway with associated junction improvements.	N/A	N/A	6.2m	
	Physical activity	A Slight Beneficial effect is anticipated on physical activity once the scheme is in operation. This weighs up Neutral effects resulting from changes to journey length for non-motorised users (NMUs), provision of new facilities for NMUs and a Moderate Beneficial effect due to changes in amenity. NMU counts were undertaken for the scheme in 2016 and indicate relatively low usage by NMUs in the area. The scheme would require the permanent diversion of all at-grade crossings of the A303 between Hazlegrove and Podimore, to separate NMUs from traffic, and the diversion of several other routes. This would result in journey length increases of more than 500m for 8 journeys and 0 - 250m for 2 journeys. The provision of a new overbridge and underbridge primarily for vehicle travellers, but with adjoining NMU facilities would be substantially safer than for the current baseline for NMUs and have the potential to increase usage of NMU facilities within the local area and therefore the physical activity of NMUs. This could have a positive role in preventing obesity and improving the health and wellbeing of NMUs.	N/A	Slight beneficial	N/A	
	Journey quality	The scheme is anticipated to improve traveller care through the provision of new signage and gantries. Travellers views would become more restricted with sections of the scheme in false cutting and vegetated earth bunds provided. Traveller stress is anticipated to reduce on the whole, through a reduction in congestion along the A303 and an improvement to journey time reliability. The provision of road lighting, clear road markings with cat's eyes and studs, hard strips of varying widths for the mainline and slip roads would improve driver frustration. The provision of new NMU routes would ensure that pedestrians do not encroach onto the carriageways which would reduce travellers fear of potential accidents, and would also improve journey quality for NMUs.	N/A	Moderate beneficial	N/A	
	Accidents	Reduction in the number of personal injury accidents (collisions) and casualties by converting the old single carriageway section with at grade crossings to a modern dual carriageway with associated junction improvements.	Reduction in casualties over a 60 year appraisal period Fatal = 5 Serious = 26 Slight = 230	N/A	11m	Neutral
	Security	Effects on security as a result of the scheme would be Neutral as there are not anticipated to be any changes to security indicators.	N/A	Neutral	N/A	N/A
	Access to services	Access to public transport services is not anticipated to be affected as a result of the scheme and a Neutral effect is anticipated.	N/A	Neutral	N/A	N/A
	Affordability	Scheme would not affect traveller costs such as fares. Drivers may choose different routes to optimise journey costs.	N/A	Moderate adverse	N/A	Moderate adverse

	Severance	A total of 14 public rights of way (PRoW) within the Local Impact Area of the scheme would be affected and a total of 29 pedestrians were counted using these PRoW. Very few community facilities are likely to be accessed by these PRoW, and low levels of usage are highlighted in the 2016 NMU survey, with less than 200 users per day. Because of this, an on balance Slight Adverse effect is predicted in terms of severance as a result of the scheme.	N/A	Slight adverse	N/A	N/A
	Option and non-use values	The scheme is expected to have little or no impact on option and non-use values.	N/A	Neutral	N/A	
Public Account	Cost to Broad Transport Budget	The scheme will be funded through Central Government Funds	Central Government Funding: 107.7m	N/A	108.1m	
	Indirect Tax Revenues	There would be some increase in the tax being paid to the Exchequer	Central Government Funding: Wider Public Finances = -49.6m	N/A	-49.6m	

30 Appendix N

Distributional Impact Screening

Distributional Impact Appraisal Screening Proforma

Scheme description: The scheme would provide a dual carriageway on the A303 between Sparkford and Podimore in Somerset, connecting the existing dual carriageway sections from Sparkford to Ilchester. The scheme follows the existing corridor of the A303 very closely. It is generally considered to be an online solution although is often deliberately aligned just to the side of the existing carriageway to allow re-use of the existing route for local access, avoid property or facilitate construction. At its maximum off-set, the route is typically 100 metres either north or south of the existing A303.

Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive/negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
User benefits	The TUBA user benefit analysis software or an equivalent process has been used in the appraisal.	Yes, positive.	Economic Efficiency of the Transport System by converting old single carriageway section to modern dual carriageway with associated junction improvements.	Yes
Noise	Any change in alignment of transport corridor or any links with significant changes (>25% or <-20%) in vehicle flow, speed or %HDV content. Also note comment in TAG Unit A3.	Yes, positive and negative	A greater proportion of households within the study area will experience an increase in noise level rather a decrease in noise level, and therefore the WebTAG results indicate that the scheme will result in a small net dis-benefit. This is due to changes to the horizontal and vertical alignment of the scheme and changes in traffic flow on the surrounding Affected Road Network. For areas where the re-alignment of the scheme comes closer to residences, mitigation measures have been implemented as part of the design in order to avoid adversely affecting sensitive receptors. Although increases in noise are predicted at a number of receptors, it can be concluded that the overall impacts of the scheme would be sufficiently minor. Additionally, the study area does not exhibit large disparities in terms of Indices of Multiple Deprivation. Therefore, a detailed DI appraisal would be disproportionate to the potential impacts.	No
Air quality	Any change in alignment of transport corridor or any links with significant changes in vehicle flow, speed or %HDV content: • Change in 24 hour AADT of 1000 vehicles or more • Change in 24 hour AADT of HDV of 200 HDV vehicles or more • Change in daily average speed of 10kph or more • Change in peak hour speed of 20kph or more • Change in road alignment of 5m or more	Yes, negative and positive.	The WebTAG local air quality results indicate that there would be a net improvement in air quality within the study area and the Scheme does not result in any new exceedances of the NO2 or PM10 annual mean air quality objectives. On an individual human health receptor level, as background concentrations of these pollutants are low across the study area and the increases in vehicle numbers as a result of the Scheme are modest, any increases in pollutant concentrations are unlikely to be significant. In addition, the study area does not exhibit large disparities in terms of the Indices of Multiple Deprivation. Therefore, it can be concluded that the impacts of the scheme would be sufficiently minor and spatially dispersed such that a detailed DI appraisal would be disproportionate to the potential impacts.	No

Accidents	Any change in alignment of transport corridor (or road layout) that may have positive or negative safety impacts, or any links with significant changes in vehicle flow, speed, %HGV content or any significant change (>10%) in the number of pedestrians, cyclists or motorcyclists using road network.	Yes, positive.	Reduction in the number of PIAs and casualties by converting old single carriageway section to modern dual carriageway with associated junction improvements.	Yes
Security	Any change in public transport waiting/interchange facilities including pedestrian access expected to affect user perceptions of personal security.	No	Effects on security as a result of the scheme would be Neutral as there are not anticipated to be any changes to security indicators.	No
Severance	Introduction or removal of barriers to pedestrian movement, either through changes to road crossing provision, or through introduction of new public transport or road corridors. Any areas with significant changes (>10%) in vehicle flow, speed, %HGV content.	Yes, positive.	A total of 14 public rights of way (PRoW) within 250m of the scheme would be affected and a total of 29 pedestrians were counted using these PRoW. Very few community facilities are likely to be accessed by these PRoW, and low levels of usage are highlighted in the 2016 non-motorised user (NMU) survey, with less than 200 users per day (which is described as a low number of people in TAG Unit A4.1 Chapter 5). Because of this, an on balance Slight Adverse effect is predicted in terms of severance as a result of the scheme.	No
Accessibility	Changes in routings or timings of current public transport services, any changes to public transport provision, including routing, frequencies, waiting facilities (bus stops / rail stations) and rolling stock, or any indirect impacts on accessibility to services (e.g. demolition & re-location of a school).	No	Access to public transport services is not anticipated to be affected as a result of the scheme and a Neutral effect is anticipated.	No
Affordability	In cases where the following charges would occur; Parking charges (including where changes in the allocation of free or reduced fee spaces may occur); Car fuel and non-fuel operating costs (where, for example, rerouting or changes in journey speeds and congestion occur resulting in changes in costs); Road user charges (including discounts and exemptions for different groups of travellers); Public transport fare changes (where, for example premium fares are set on new or existing modes or where multi-modal discounted travel tickets become available due to new ticketing technologies); or Public transport concession availability (where, for example concession arrangements vary as a result of a move in service provision from bus to light rail or heavy rail, where	Yes, negative and positive.	There would be no changes to parking charges, road user charges, public transport fares or public transport concession availability. There would be some impact on car fuel and non-fuel operating costs.	Yes

31 Annex 1: ComMA Summary Annex

Summary

High level benefits and costs

Present Value of Benefits (initial)	156,431
Present Value of Benefits (adjusted)	185,032
Present Value of Costs	108,079
Initial BCR	1.45
Adjusted BCR	1.71

All monetised values are in £000s expressed in 2010 prices discounted to 2010.

Sources of Costs

Capital costs of the scheme, which include construction, land, preparation and supervision costs, were provided by the Commercial Services Division of Highways England. Total capital cost is £103.5 million in 2010 prices. These assume that construction is expected to start in 2020 and continue until 2023.

The incremental maintenance costs for the scheme (that is, DM maintenance costs minus DS maintenance costs) were not available at the time of economic assessment, so the standard values from COBA were used as an approximation. Total incremental maintenance costs for the scheme over the 60year appraisal period is £1.2 million in 2010 prices.

No allowance has been made for operation costs since this information is not available from any of the sources at the time of economic assessment.

The net present value of costs is £108.1 million in 2010 prices discounted to 2010.

Sources of Benefits

The scheme links existing dual carriageway sections and will include grade separated interchanges and the removal of direct access junctions from private property, which will support the free flow movement of traffic. There are journey time, safety, reliability and wider economic benefits related to imperfectly competitive market impacts due to the scheme. The scheme results in vehicle operating cost, construction and maintenance cost, greenhouse gases, noise and air quality disbenefits. The net present value benefit of the scheme is £185.0 million in 2010 prices discounted to 2010 over the 60year appraisal period.

The benefits associated with the scheme are due to the provision of a dual carriageway with grade separated interchanges at Hazlegrove and Downhead in place of existing 50mph single carriageway section and associated at grade crossings. The remaining single carriageway sections and at grade crossings along the A303 would act as possible bottlenecks contributing delays to journeys specially during summer holidays.

Demand Growth along the Route (Do Minimum)

Link	**AADT (opening year)**	**AADT (design year)**	**AADT change (%)**
Hazlegrove to Downhead	29,397	36,273	23%
Downhead to Podimore	27,747	33,974	22%
Distance-weighted Average	28,614	35,182	23%

Demand Growth along the Route (Do Something)

Link	**AADT (opening year)**	**AADT (design year)**	**AADT change (%)**
Hazlegrove to Downhead	33,653	43,567	29%
Downhead to Podimore	32,533	42,158	30%
Distance-weighted Average	33,121	42,899	30%

Key Monetised Benefits and Costs

Category	Benefits and costs in £'000 (PV)
Business Users	
Journey Time Savings	122,221
Vehicle Operating Costs	-676
Non-Business users	
Journey Time Savings	74,548
Vehicle Operating Costs	-47,555
Reliability	
Business Reliability	10,216
Non-business Reliability	6,231
Safety	
Safety	10,957
Environmental Impacts	
Noise	-66
Local Air Quality	-360
Greenhouse Gases	-27,927
Landscape	
Wider Economic Impacts	
Agglomeration	
Market Competition	12,154
Dependent Development	
Labour Supply	
Customer Impact	
Traffic delays due to Construction	-24,404
Traffic impacts due to Maintenance	80
Journey Quality	
Developer contributions	
Developer contributions	
Other Impacts	
Indirect tax Revenues	49,613
[Other - please specify]	
Costs	
Cost to Broad Transport Budget	108,079
Cost savings (where relevant)*	

*The cost savings row should only be completed where the option being considered will deliver financial savings to Highways England'

All monetised values are expressed in 2010 prices discounted to 2010.

Key quantified benefits / costs

Category	Quantified impacts	*Units*
Journey times		
Journey Time Savings	2.16	*(average saving per journey in the opening year on scheme sections in minutes)**
Safety		
Accidents	153	*(total number saved – appraisal period)*
Fatalities	5	*(total number saved – appraisal period)*
Seriously injured	26	*(total number saved – appraisal period)*
Slightly injured	230	*(total number saved – appraisal period)*
Environmental Impacts		
Number of Noise important areas affected	2	*(number)*
Names of AQMAs	Not applicable	*(names)*
Change in NOx emissions	603	*(tonnes – appraisal period)*
Change in PM10 emissions	98	*(tonnes – appraisal period)*
Change in greenhouse gas emissions	631,167	*(tonnes CO2e – appraisal period)*
Customer Impact: Totals		
Traffic delays due to Construction	Not directly available from QUADRO	*(total loss on scheme sections in hours)*
Traffic impacts due to Maintenance	Not directly available from QUADRO	*(total impact on scheme sections in hours)*
Customer Impact: Per journey		
Traffic delays due to Construction (cars)	Not directly available from QUADRO	*(average loss per journey on scheme sections in minutes) **
Traffic delays due to Construction (LGVs)	Not directly available from QUADRO	*(average loss per journey on scheme sections in minutes) **
Traffic delays due to Construction (HGVs)	Not directly available from QUADRO	*(average loss per journey on scheme sections in minutes) **
Traffic impacts due to Maintenance (cars)	Not directly available from QUADRO	*(average impact per journey on scheme sections in minutes) **
Traffic impacts due to Maintenance (LGVs)	Not directly available from QUADRO	*(average impact per journey on scheme sections in minutes) **
Traffic impacts due to Maintenance (HGVs)	Not directly available from QUADRO	*(average impact per journey on scheme sections in minutes) **

**Defined as total saving or loss on all scheme sections per day divided by distance-weighted AADT on scheme sections*

Strategic Outcome	KPI	Scheme Contribution – Qualitative	Scheme Contribution - Quantitative
Making the network safer	The number of KSIs on the SRN.	Reduction in the number of incidents and casualties by converting old single carriageway section to modern dual carriageway with associated junction improvements.	Reduction of 153 accidents
Delivery of better environmental outcomes	Noise: Number of Noise Important Areas (NIA) mitigated. Biodiversity: Delivery of improved biodiversity, as set out in the Company's Biodiversity Action Plan	The scheme would not result in any adverse effects to the 2 NIAs within the study area. The scheme would not result in a new exceedance of the NO2 or PM10 annual mean air quality objectives. The loss of any habitat of conservation value would be replaced like-for-like as a minimum requirement, and new planting would be connected to existing habitat within the landscape to compensate for the loss of wildlife corridors and reduce the fragmentation impact of the scheme. With best practice pollution control measures and Sustainable Drainage Systems in place, no changes to the water quality would be anticipated. The drainage design incorporated into the scheme has included an allowance for the effects of climate change by allowing for a 40% increase, and therefore the scheme would not result in any adverse effects to flooding.	Not applicable
Helping cyclists / walkers and other vulnerable users	The number of new and upgraded crossings	- Comprehensive west-east NMU route along the new dual carriageway corridor. - Connection of the west-east route to the severed rights of way network. - Connection of the west-east route with the two proposed segregated crossings - Improved connectivity from Sparkford village to Hazlegrove Registered Park and Gardens and land to the north of the A303 via new footways	- 5.7km of new public right of way (mainly bridleway) (against a loss of approximately 1.5km of existing right of way) - Two new crossings of the A303 via shared use facilities in the verges of proposed local roads as they cross over/under the new dual carriageway (currently there are no segregated crossings)

32 Annex 2: ComMA Data Annex

Required Data Annex for ComMA

Scheme costs

Table 1: Scheme investment cost profile in 2010 prices

Year	2010 factor prices (not discounted)	2010 market prices (discounted)
2018	6,587	5,002
2019	5,283	3,877
2020	47,326	33,550
2021	72,755	49,833
2022	22,909	15,160
2023	397	253

Table 2: Scheme Incremental Maintenance cost profile in 2010 prices

Year	2010 factor prices (not discounted)	2010 market prices (discounted)
2023	25	16
2024	25	15
2025	25	15
2026	25	14
2027	25	14
2028	25	13
2029	25	13
2030	25	12
2031	25	12
2032	25	12
2033	25	11
2034	25	11
2035	25	10
2036	25	10
2037	25	10
2038	25	9
2039	25	9
2040	25	9
2041	25	9
2042	25	8
2043	25	8
2044	25	8
2045	25	7
2046	25	7
2047	25	7
2048	25	7
2049	25	7
2050	25	6
2051	25	6
2052	25	6
2053	25	6
2054	25	6
2055	25	5

2056	25	5
2057	25	5
2058	25	5
2059	25	5
2060	25	5
2061	25	5
2062	25	4
2063	25	4
2064	25	4
2065	25	4
2066	25	4
2067	25	4
2068	25	4
2069	25	4
2070	25	4
2071	25	3
2072	25	3
2073	25	3
2074	25	3
2075	25	3
2076	25	3
2077	25	3
2078	25	3
2079	25	3
2080	25	3
2081	25	3
2082	22	2

Scheme benefits / disbenefits

Journey times

Table 3: Average journey times during construction period along route by phase (minutes)

	Construction phase
Without scheme	12.70
With scheme	13.97

Journey time section between Podimore and Wincanton on the A303, 40mph speed enforcement during construction

Table 4: Average journey times along route (minutes)

	Opening year	Design year	Change (%)
Without scheme	12.70	15.00	18%
With scheme	10.53	11.16	6%

Journey time section between Podimore and Wincanton on the A303

Safety

Table 5: Number of accidents by year

Year	Without scheme	With scheme	Difference
2023	2176.2	2169.9	6.3
2024	2164.6	2158.6	6.0
2025	2152.7	2147.2	5.5
2026	2140.7	2135.5	5.2
2027	2128.5	2123.5	5.0
2028	2116.1	2111.4	4.7
2029	2103.5	2099.1	4.4
2030	2110.0	2105.9	4.1
2031	2117.1	2113.2	3.9
2032	2123.9	2120.3	3.6
2033	2130.5	2127.1	3.4
2034	2136.9	2133.7	3.2
2035	2143.0	2140.0	3.0
2036	2148.9	2146.0	2.9
2037	2154.5	2151.9	2.6
2038	2173.7	2171.7	2.0
2039	2154.3	2152.3	2.0
2040	2154.3	2152.3	2.0
2041	2154.3	2152.3	2.0
2042	2154.3	2152.3	2.0
2043	2154.3	2152.3	2.0
2044	2154.3	2152.3	2.0
2045	2154.3	2152.3	2.0
2046	2154.3	2152.3	2.0
2047	2154.3	2152.3	2.0
2048	2154.3	2152.3	2.0
2049	2154.3	2152.3	2.0
2050	2154.3	2152.3	2.0
2051	2154.3	2152.3	2.0
2052	2154.3	2152.3	2.0
2053	2154.3	2152.3	2.0
2054	2154.3	2152.3	2.0
2055	2154.3	2152.3	2.0
2056	2154.3	2152.3	2.0
2057	2154.3	2152.3	2.0
2058	2154.3	2152.3	2.0
2059	2154.3	2152.3	2.0
2060	2154.3	2152.3	2.0
2061	2154.3	2152.3	2.0
2062	2154.3	2152.3	2.0
2063	2154.3	2152.3	2.0
2064	2154.3	2152.3	2.0
2065	2154.3	2152.3	2.0
2066	2154.3	2152.3	2.0
2067	2154.3	2152.3	2.0
2068	2154.3	2152.3	2.0
2069	2154.3	2152.3	2.0
2070	2154.3	2152.3	2.0
2071	2154.3	2152.3	2.0
2072	2154.3	2152.3	2.0
2073	2154.3	2152.3	2.0
2074	2154.3	2152.3	2.0

Year	Without scheme	With scheme	Difference
2075	2154.3	2152.3	2.0
2076	2154.3	2152.3	2.0
2077	2154.3	2152.3	2.0
2078	2154.3	2152.3	2.0
2079	2154.3	2152.3	2.0
2080	2154.3	2152.3	2.0
2081	2154.3	2152.3	2.0
2082	2154.3	2152.3	2.0

Table 6: Number of Fatal casualties by year

Year	Without scheme	With scheme	Difference
2023	26.4	26.3	0.1
2024	26.2	26.1	0.1
2025	26.0	25.9	0.1
2026	25.8	25.7	0.1
2027	25.6	25.5	0.1
2028	25.4	25.3	0.1
2029	25.2	25.1	0.1
2030	25.3	25.2	0.1
2031	25.3	25.2	0.1
2032	25.4	25.3	0.1
2033	25.4	25.3	0.1
2034	25.5	25.4	0.1
2035	25.5	25.4	0.1
2036	25.6	25.5	0.1
2037	25.6	25.5	0.1
2038	25.9	25.9	0.0
2039	25.7	25.6	0.1
2040	25.7	25.6	0.1
2041	25.7	25.6	0.1
2042	25.7	25.6	0.1
2043	25.7	25.6	0.1
2044	25.7	25.6	0.1
2045	25.7	25.6	0.1
2046	25.7	25.6	0.1
2047	25.7	25.6	0.1
2048	25.7	25.6	0.1
2049	25.7	25.6	0.1
2050	25.7	25.6	0.1
2051	25.7	25.6	0.1
2052	25.7	25.6	0.1
2053	25.7	25.6	0.1
2054	25.7	25.6	0.1
2055	25.7	25.6	0.1
2056	25.7	25.6	0.1
2057	25.7	25.6	0.1
2058	25.7	25.6	0.1
2059	25.7	25.6	0.1
2060	25.7	25.6	0.1
2061	25.7	25.6	0.1
2062	25.7	25.6	0.1
2063	25.7	25.6	0.1
2064	25.7	25.6	0.1
2065	25.7	25.6	0.1
2066	25.7	25.6	0.1
2067	25.7	25.6	0.1

Year	Without scheme	With scheme	Difference
2068	25.7	25.6	0.1
2069	25.7	25.6	0.1
2070	25.7	25.6	0.1
2071	25.7	25.6	0.1
2072	25.7	25.6	0.1
2073	25.7	25.6	0.1
2074	25.7	25.6	0.1
2075	25.7	25.6	0.1
2076	25.7	25.6	0.1
2077	25.7	25.6	0.1
2078	25.7	25.6	0.1
2079	25.7	25.6	0.1
2080	25.7	25.6	0.1
2081	25.7	25.6	0.1
2082	25.7	25.6	0.1

Table 7: Number of Serious casualties by year

Year	Without scheme	With scheme	Difference
2023	268.2	267.2	1.0
2024	266.4	265.4	1.0
2025	264.5	263.6	0.9
2026	262.6	261.7	0.9
2027	260.7	259.9	0.8
2028	258.8	258.0	0.8
2029	256.8	256.1	0.7
2030	257.4	256.7	0.7
2031	258.0	257.3	0.7
2032	258.5	257.9	0.6
2033	259.0	258.5	0.5
2034	259.5	259.0	0.5
2035	260.0	259.5	0.5
2036	260.4	259.9	0.5
2037	260.8	260.4	0.4
2038	263.1	262.7	0.4
2039	260.5	260.2	0.3
2040	260.5	260.2	0.3
2041	260.5	260.2	0.3
2042	260.5	260.2	0.3
2043	260.5	260.2	0.3
2044	260.5	260.2	0.3
2045	260.5	260.2	0.3
2046	260.5	260.2	0.3
2047	260.5	260.2	0.3
2048	260.5	260.2	0.3
2049	260.5	260.2	0.3
2050	260.5	260.2	0.3
2051	260.5	260.2	0.3
2052	260.5	260.2	0.3
2053	260.5	260.2	0.3
2054	260.5	260.2	0.3
2055	260.5	260.2	0.3
2056	260.5	260.2	0.3
2057	260.5	260.2	0.3
2058	260.5	260.2	0.3
2059	260.5	260.2	0.3
2060	260.5	260.2	0.3

Year	Without scheme	With scheme	Difference
2061	260.5	260.2	0.3
2062	260.5	260.2	0.3
2063	260.5	260.2	0.3
2064	260.5	260.2	0.3
2065	260.5	260.2	0.3
2066	260.5	260.2	0.3
2067	260.5	260.2	0.3
2068	260.5	260.2	0.3
2069	260.5	260.2	0.3
2070	260.5	260.2	0.3
2071	260.5	260.2	0.3
2072	260.5	260.2	0.3
2073	260.5	260.2	0.3
2074	260.5	260.2	0.3
2075	260.5	260.2	0.3
2076	260.5	260.2	0.3
2077	260.5	260.2	0.3
2078	260.5	260.2	0.3
2079	260.5	260.2	0.3
2080	260.5	260.2	0.3
2081	260.5	260.2	0.3
2082	260.5	260.2	0.3

Table 8: Number of Slight casualties by year

Year	Without scheme	With scheme	Difference
2023	2785.0	2777.4	7.6
2024	2771.0	2763.7	7.3
2025	2756.6	2749.7	6.9
2026	2742.0	2735.4	6.6
2027	2727.1	2720.8	6.3
2028	2711.9	2706.0	5.9
2029	2696.5	2690.9	5.6
2030	2705.4	2699.9	5.5
2031	2715.0	2709.8	5.2
2032	2724.4	2719.4	5.0
2033	2733.4	2728.6	4.8
2034	2742.0	2737.5	4.5
2035	2750.4	2746.0	4.4
2036	2758.4	2754.3	4.1
2037	2766.2	2762.2	4.0
2038	2791.5	2788.2	3.3
2039	2766.8	2763.6	3.2
2040	2766.8	2763.6	3.2
2041	2766.8	2763.6	3.2
2042	2766.8	2763.6	3.2
2043	2766.8	2763.6	3.2
2044	2766.8	2763.6	3.2
2045	2766.8	2763.6	3.2
2046	2766.8	2763.6	3.2
2047	2766.8	2763.6	3.2
2048	2766.8	2763.6	3.2
2049	2766.8	2763.6	3.2
2050	2766.8	2763.6	3.2
2051	2766.8	2763.6	3.2
2052	2766.8	2763.6	3.2
2053	2766.8	2763.6	3.2

Year	Without scheme	With scheme	Difference
2054	2766.8	2763.6	3.2
2055	2766.8	2763.6	3.2
2056	2766.8	2763.6	3.2
2057	2766.8	2763.6	3.2
2058	2766.8	2763.6	3.2
2059	2766.8	2763.6	3.2
2060	2766.8	2763.6	3.2
2061	2766.8	2763.6	3.2
2062	2766.8	2763.6	3.2
2063	2766.8	2763.6	3.2
2064	2766.8	2763.6	3.2
2065	2766.8	2763.6	3.2
2066	2766.8	2763.6	3.2
2067	2766.8	2763.6	3.2
2068	2766.8	2763.6	3.2
2069	2766.8	2763.6	3.2
2070	2766.8	2763.6	3.2
2071	2766.8	2763.6	3.2
2072	2766.8	2763.6	3.2
2073	2766.8	2763.6	3.2
2074	2766.8	2763.6	3.2
2075	2766.8	2763.6	3.2
2076	2766.8	2763.6	3.2
2077	2766.8	2763.6	3.2
2078	2766.8	2763.6	3.2
2079	2766.8	2763.6	3.2
2080	2766.8	2763.6	3.2
2081	2766.8	2763.6	3.2
2082	2766.8	2763.6	3.2

Environment

Table 9: NOx emissions (tonnes)

Year	Without scheme	With scheme	Difference
2023	4,061.8	4,074.5	12.6
2024	4,013.5	4,025.9	12.4
2025	3,965.1	3,977.4	12.2
2026	3,916.8	3,928.8	12.0
2027	3,868.5	3,880.3	11.8
2028	3,820.1	3,831.8	11.6
2029	3,771.8	3,783.2	11.4
2030	3,723.4	3,734.7	11.2
2031	3,675.1	3,686.1	11.0
2032	3,626.8	3,637.6	10.8
2033	3,578.4	3,589.1	10.6
2034	3,530.1	3,540.5	10.4
2035	3,481.7	3,492.0	10.2
2036	3,433.4	3,443.5	10.0
2037	3,385.1	3,394.9	9.8
2038	3,336.7	3,346.4	9.6
2039	3,336.7	3,346.4	9.6
2040	3,336.7	3,346.4	9.6
2041	3,336.7	3,346.4	9.6
2042	3,336.7	3,346.4	9.6
2043	3,336.7	3,346.4	9.6
2044	3,336.7	3,346.4	9.6
2045	3,336.7	3,346.4	9.6
2046	3,336.7	3,346.4	9.6
2047	3,336.7	3,346.4	9.6
2048	3,336.7	3,346.4	9.6
2049	3,336.7	3,346.4	9.6
2050	3,336.7	3,346.4	9.6
2051	3,336.7	3,346.4	9.6
2052	3,336.7	3,346.4	9.6
2053	3,336.7	3,346.4	9.6
2054	3,336.7	3,346.4	9.6
2055	3,336.7	3,346.4	9.6
2056	3,336.7	3,346.4	9.6
2057	3,336.7	3,346.4	9.6
2058	3,336.7	3,346.4	9.6
2059	3,336.7	3,346.4	9.6
2060	3,336.7	3,346.4	9.6
2061	3,336.7	3,346.4	9.6
2062	3,336.7	3,346.4	9.6
2063	3,336.7	3,346.4	9.6
2064	3,336.7	3,346.4	9.6
2065	3,336.7	3,346.4	9.6
2066	3,336.7	3,346.4	9.6
2067	3,336.7	3,346.4	9.6
2068	3,336.7	3,346.4	9.6
2069	3,336.7	3,346.4	9.6
2070	3,336.7	3,346.4	9.6
2071	3,336.7	3,346.4	9.6
2072	3,336.7	3,346.4	9.6
2073	3,336.7	3,346.4	9.6

Year	Without scheme	With scheme	Difference
2074	3,336.7	3,346.4	9.6
2075	3,336.7	3,346.4	9.6
2076	3,336.7	3,346.4	9.6
2077	3,336.7	3,346.4	9.6
2078	3,336.7	3,346.4	9.6
2079	3,336.7	3,346.4	9.6
2080	3,336.7	3,346.4	9.6
2081	3,336.7	3,346.4	9.6
2082	3,336.7	3,346.4	9.6

Table 10:PM10 emissions (tonnes)

Year	Without scheme	With scheme	Difference
2023	348.4	349.6	1.2
2024	356.0	357.3	1.3
2025	363.7	365.0	1.3
2026	371.4	372.7	1.3
2027	379.0	380.4	1.4
2028	386.7	388.1	1.4
2029	394.4	395.8	1.4
2030	402.0	403.5	1.5
2031	409.7	411.2	1.5
2032	417.4	418.9	1.5
2033	425.0	426.6	1.5
2034	432.7	434.3	1.6
2035	440.3	442.0	1.6
2036	448.0	449.7	1.6
2037	455.7	457.4	1.7
2038	463.3	465.0	1.7
2039	463.3	465.0	1.7
2040	463.3	465.0	1.7
2041	463.3	465.0	1.7
2042	463.3	465.0	1.7
2043	463.3	465.0	1.7
2044	463.3	465.0	1.7
2045	463.3	465.0	1.7
2046	463.3	465.0	1.7
2047	463.3	465.0	1.7
2048	463.3	465.0	1.7
2049	463.3	465.0	1.7
2050	463.3	465.0	1.7
2051	463.3	465.0	1.7
2052	463.3	465.0	1.7
2053	463.3	465.0	1.7
2054	463.3	465.0	1.7
2055	463.3	465.0	1.7
2056	463.3	465.0	1.7
2057	463.3	465.0	1.7
2058	463.3	465.0	1.7
2059	463.3	465.0	1.7
2060	463.3	465.0	1.7
2061	463.3	465.0	1.7
2062	463.3	465.0	1.7
2063	463.3	465.0	1.7
2064	463.3	465.0	1.7
2065	463.3	465.0	1.7

Year	Without scheme	With scheme	Difference
2066	463.3	465.0	1.7
2067	463.3	465.0	1.7
2068	463.3	465.0	1.7
2069	463.3	465.0	1.7
2070	463.3	465.0	1.7
2071	463.3	465.0	1.7
2072	463.3	465.0	1.7
2073	463.3	465.0	1.7
2074	463.3	465.0	1.7
2075	463.3	465.0	1.7
2076	463.3	465.0	1.7
2077	463.3	465.0	1.7
2078	463.3	465.0	1.7
2079	463.3	465.0	1.7
2080	463.3	465.0	1.7
2081	463.3	465.0	1.7
2082	463.3	465.0	1.7

Table 11: Greenhouse gas emissions (tonnes CO2e)

Year	Without scheme	With scheme	Difference
2023	76,724,808	76,734,682	9,874
2024	76,828,534	76,838,457	9,923
2025	76,932,259	76,942,232	9,973
2026	77,035,985	77,046,008	10,023
2027	77,139,711	77,149,783	10,072
2028	77,243,436	77,253,558	10,122
2029	77,347,162	77,357,334	10,172
2030	77,450,888	77,461,109	10,221
2031	77,554,613	77,564,884	10,271
2032	77,658,339	77,668,660	10,321
2033	77,762,065	77,772,435	10,370
2034	77,865,790	77,876,210	10,420
2035	77,969,516	77,979,986	10,470
2036	78,073,242	78,083,761	10,519
2037	78,176,967	78,187,536	10,569
2038	78,280,693	78,291,312	10,619
2039	78,280,693	78,291,312	10,619
2040	78,280,693	78,291,312	10,619
2041	78,280,693	78,291,312	10,619
2042	78,280,693	78,291,312	10,619
2043	78,280,693	78,291,312	10,619
2044	78,280,693	78,291,312	10,619
2045	78,280,693	78,291,312	10,619
2046	78,280,693	78,291,312	10,619
2047	78,280,693	78,291,312	10,619
2048	78,280,693	78,291,312	10,619
2049	78,280,693	78,291,312	10,619
2050	78,280,693	78,291,312	10,619
2051	78,280,693	78,291,312	10,619
2052	78,280,693	78,291,312	10,619
2053	78,280,693	78,291,312	10,619
2054	78,280,693	78,291,312	10,619
2055	78,280,693	78,291,312	10,619
2056	78,280,693	78,291,312	10,619
2057	78,280,693	78,291,312	10,619

Year	Without scheme	With scheme	Difference
2058	78,280,693	78,291,312	10,619
2059	78,280,693	78,291,312	10,619
2060	78,280,693	78,291,312	10,619
2061	78,280,693	78,291,312	10,619
2062	78,280,693	78,291,312	10,619
2063	78,280,693	78,291,312	10,619
2064	78,280,693	78,291,312	10,619
2065	78,280,693	78,291,312	10,619
2066	78,280,693	78,291,312	10,619
2067	78,280,693	78,291,312	10,619
2068	78,280,693	78,291,312	10,619
2069	78,280,693	78,291,312	10,619
2070	78,280,693	78,291,312	10,619
2071	78,280,693	78,291,312	10,619
2072	78,280,693	78,291,312	10,619
2073	78,280,693	78,291,312	10,619
2074	78,280,693	78,291,312	10,619
2075	78,280,693	78,291,312	10,619
2076	78,280,693	78,291,312	10,619
2077	78,280,693	78,291,312	10,619
2078	78,280,693	78,291,312	10,619
2079	78,280,693	78,291,312	10,619
2080	78,280,693	78,291,312	10,619
2081	78,280,693	78,291,312	10,619
2082	78,280,693	78,291,312	10,619