South East Dorset Urban Mobility Strategy

Modelling Report

Dorset Local Enterprise Partnership
In partnership with BCP Council and Dorset Council

Project number: 60617892

20 November 2020

Quality information

Prepared by	Checked by	Verified by	Approved by

Revision History

Revision	Revision date	Details	Authorized	Name	Position
Vs2.0	20.11.2020	Revisions			

Distribution List

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1. Transport Modelling Overview

1.1 Modelling Review

The following transport models from across the study area have been reviewed to determine which transport models should be used to develop the evidence base for the study:

- South East Dorset Multi-Modal Transport Model – Highway, Public Transport and Variable Demand Model covering the full SEDUMS study area.
- Bournemouth Town Centre VISSIM Model - Micro-simulation model of Bournemouth Town Centre and the A338.
- A348 Ringwood Road Paramics Corridor Model – Micro-simulation model representing the A348 and A3049 corridors.
- Poole Town Centre Paramics Model - Micro-simulation model of Poole Town centre developed to assess re-generation proposals.
- Christchurch Paramics Model - Micro-simulation model of the Christchurch area.

As a result of these reviews, we have concluded that the most appropriate model to use as an evidence base for the study is the South East Dorset Multi-Modal Transport Model. The SE Dorset Transport Model has sufficient area of coverage and the multi-modal nature of the model means it would be suitable for assessing the majority of the interventions defined in Section 2. The limited area of coverage and single mode nature of the micro-simulation models means that they would not be suitable for assessing the majority of the interventions.

Summary

The South East Dorset Multi-Modal Transport Model has been developed in line with Transport Appraisal Guidance (TAG) criteria and demonstrates a good level of calibration and validation. This suggests that the model is robust and is suitable for a strategic appraisal of the strategy interventions. It can be concluded that, overall, the model validation process demonstrates that the base year traffic model provides a good representation of the current traffic demands and travel conditions in the South-East Dorset Study area.

<u>Summary of Calibration and Validation - Highway Model</u>
(The TAG criteria is defined in Table 1.3 and Table 1.4.)

- 97% of calibration screenlines meet the TAG criteria*
- All but 1 of the validation screenlines meets the TAG criteria*
- The journey time validation is within the TAG criteria

* The failure of the remaing screenlines to meet the TAG criteria does not make a material impact on the performance of the model)

<u>Summary of Calibration and Validation – Public Transport Model</u>
(The TAG criteria is defined in Table 1.5.)

- All screenlines meet the TAG criteria
- Bus and rail journey time validation meet the TAG criteria
- Boarding and alighting passenger flows meet the TAG criteria

South East Dorset Multi-Modal Transport Model (Highway)

The Highway model element of SEDMMM is referred to as the SED_H (South East Dorset Highway) model.

Modelled Area

The SED_H model covers the areas of Poole, Bournemouth and Christchurch, extending just short of Blandford Forum and the A354. The modelled area to the south follows the coast line around Poole to Wareham. Figure 1.1 shows the extent of the study area.

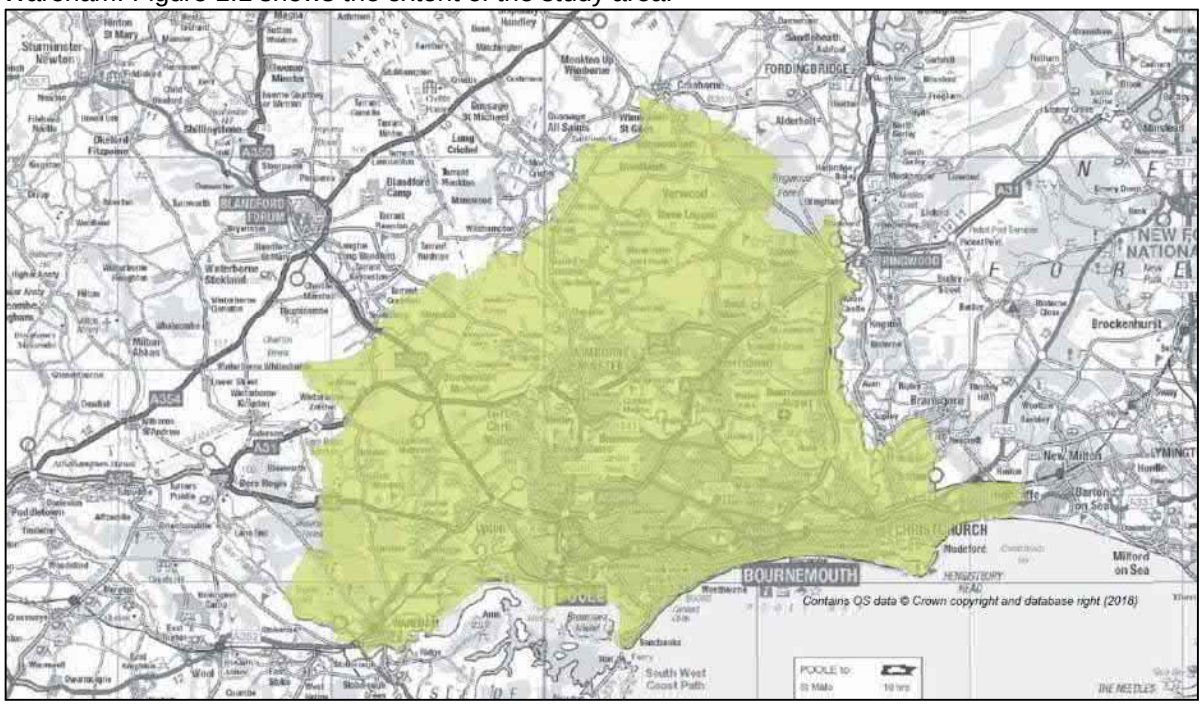

Figure 1.1: Extent of Main Study Area in SEDMMM

A skeletal network covering the rest of the UK provides the highway links between the study area and the rest of the country.

Model Specification and Data (Base Year)

The model has been developed with a Base Year of 2017, and represents an average weekday (Monday-Friday). Data used for the development of SED_H consists of the following:

- Data obtained during a programme of traffic surveys carried out in Poole and Bournemouth in spring 2019;
- Data gathered from permanent automatic traffic count locations in Poole, Bournemouth and Christchurch between a period of 2014 and 2019;
- Data commissioned directly from other parties, including mobile phone network records; and
- Data derived from other sources, such as the DfT's ITN layer and Trafficmaster journey time data.

The following types of data have been used:

- Volumetric data for links and junction turning (used to establish baseline flow volumes);
- Vehicle classification data (used to establish vehicle class splits);
- Telefonica mobile phone data (used to develop observed OD trip matrices, including trip purpose information);

- Origin-Destination data gathered from car park surveys (used to develop observed OD trip matrices, including trip purpose information); and
- Journey time data (used to validate modelled journey times along selected routes)

As these data have been collected for a variety of years between 2015 and 2019, factors have been applied to bring these counts in line with the 2017 base year. These annual factors were calculated using Automatic Traffic Count data from sites with instances of available October survey periods across multiple years, and are displayed in Table 1.1.

Table 1.1:Annual Growth Offset Factors

Year	Factor
2015	1.031
2016	1.029
2017	1.000
2018	0.965
2019	0.952

Zoning System

The model zone system was defined by Dorset Council and is based on the zoning system developed for the SEDMMM. This is aligned to the latest census output area boundaries and is consistent with the NTEM zone boundaries.

Within the urban areas of Poole, Bournemouth and Christchurch, the zoning system is disaggegate, and specific access roads from residential and commercial areas have been used as a basis for connecting zones to the network via centroid connectors.

There are 561 zones in the model, comprising 402 that constitute the study area and 129 external representing the rest of the country. The remaining 30 zones, numbered 900 to 930, are empty and included for forecasting purposes.

Figure 1.2 shows the zoning system within the SED_H model.

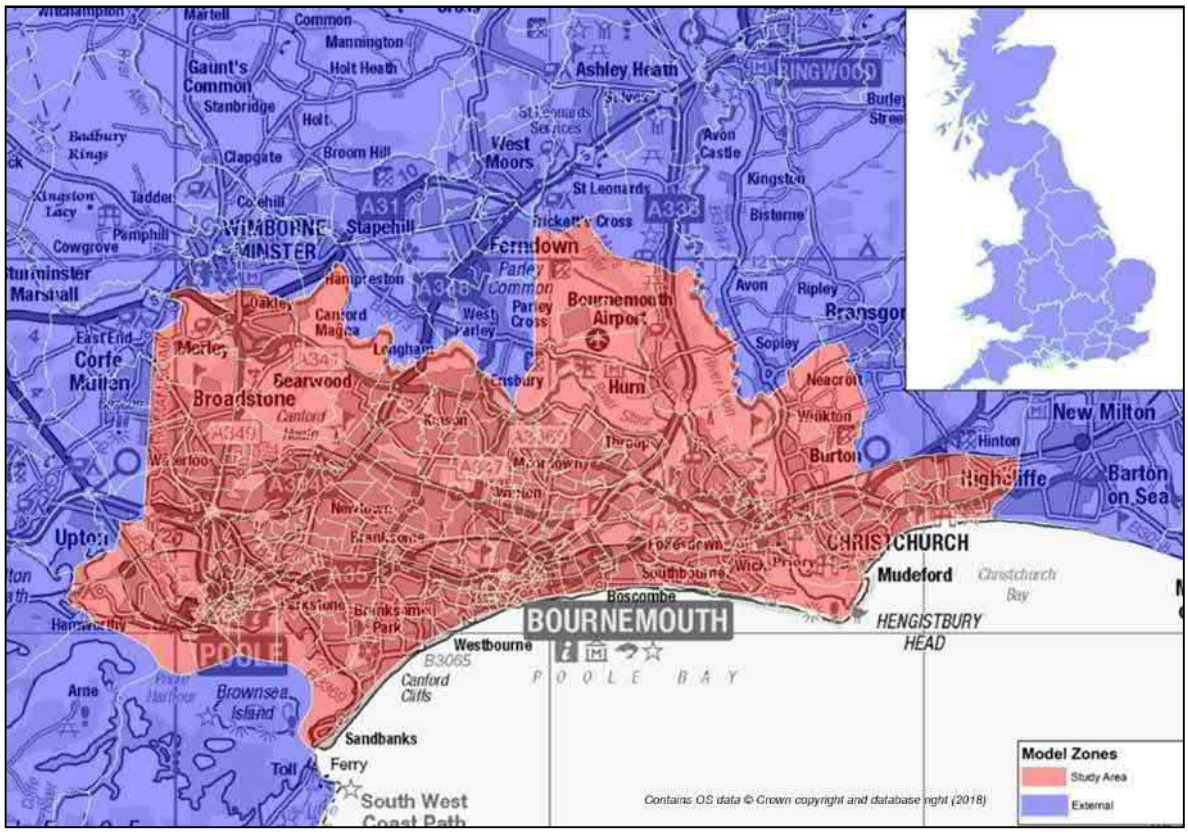

Figure 1.2: Zoning System in SED_H

Time Periods

The model has three time periods, representing conditions on an average weekday (Monday to Friday). These are as follows:

- Morning peak hour 08:00-09:00
- Average interpeak hour 10:00-16:00 (averaged)
- Evening peak hour 17:00-18:00

The model also makes use of the SATURN PASSQ functionality, to feed through any queued flows remaining on the network at the end of the previous hour. An estimate of the pre-peak hour demands was developed based on a proportion of the relevant peak hour demand, using the available survey data. The calculated factors are:

- AM pre-peak factor 81.9% of AM peak
- PM pre-peak factor 86.8% of PM peak

User Classes

SED_H has five modelled user classes:

- Cars: Employers Business;
- Cars: Commute;
- Cars: Other;
- Light Goods Vehicles (LGV); and
- Heavy Goods Vehicles (HGV)- this also includes Medium Goods Vehicles

Buses are represented in SED_H, but have set frequencies, follow pre-defined bus service routes and have no route choice.

The following PCU factors have been applied in SED_H:

- Car: 1.00
- LGV: 1.00
- HGV: 1.85
- Bus: 2.00

Network

The 2012 SEDMMTS highway assignment model provided the starting point for developing the 2017 base highway model network. The highway network was developed by Dorset Council.

The model network incorporates all major and principal routes within the study area, all local roads within the urban areas of Poole, Bournemouth and Christchurch as well as any local routes within the wider study area that are used as rat-runs by traffic coming into and out of the modelled study area.

In line with TAG Unit M3.1 section 2.4, the SED_H has been developed with two levels of detail in the simulation network:

- across the urban areas of Poole, Bournemouth and Christchurch the detail within the highway network and the demand matrices is at its greatest and includes full junction definition and relatively small model zones – this has been referred to as the 'area of detailed modelling'; and
- 'rest of the fully modelled area' covers the rest of the study area, which has increasingly larger zones and correspondingly sparser network detail, but still forms part of the simulation network coding within SATURN.

Within both the 'area of detailed modelling' and the 'rest of the fully modelled area' all junctions have been coded in detail so that traffic interactions at these junctions can be simulated.

Figure 1.3 shows the extent of the simulation coding. The rest of England, Wales and Scotland is represented by skeletal buffer network coding.

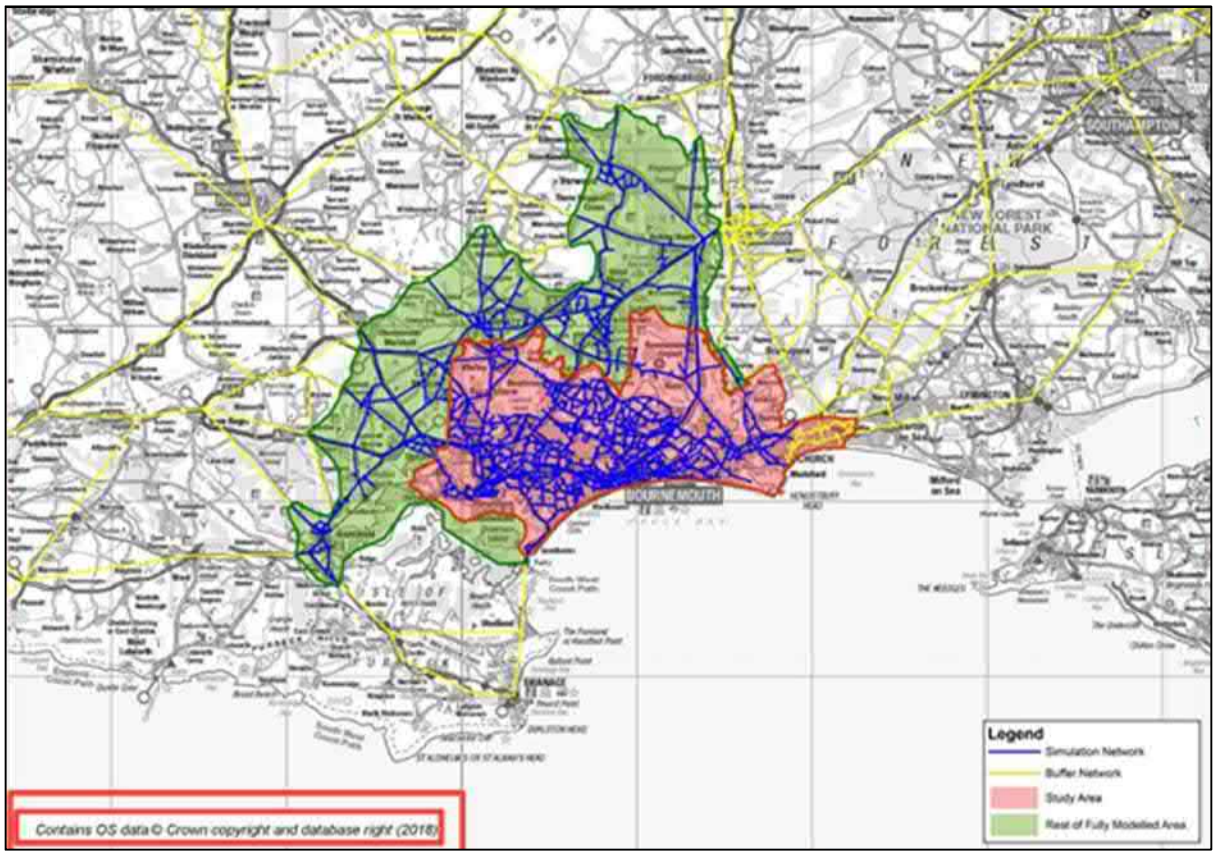

Figure 1.3: Network coding within SED_H

Highway links within the central urban areas were coded with fixed cruise speeds. Speed-flow curves were assigned to all semi-rural and rural routes within the simulation area.

Demand

The data for matrix development used the following data sets.

- Mobile Network Data (MND) from O2 mobile phone records supplied by Telefónica;
- Car Park Interview data from car parks in Bournemouth, Poole and Christchurch collected between 2015 and 2016; and
- Trip end data from TEMPro v7.2 to estimate demand in future years based on projected employment and housing growth in the area.

These matrix-build data sources are illustrated in Figure 1.4.

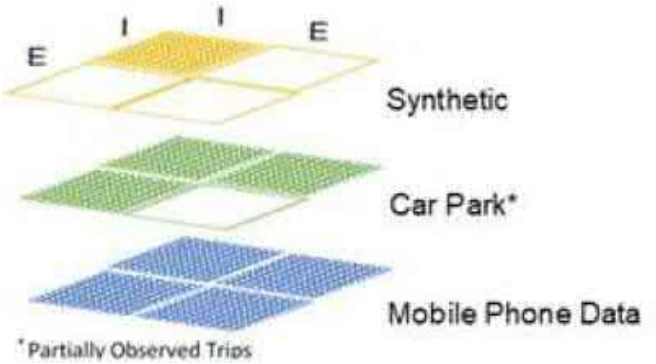

Figure 1.4: Structure of data used to create trip matrix

These three data sources produced the Prior Matrix. Matrix estimation was undertaken as part of the calibration process to further refine the trip matrix and produce the final base matrix.

Checks were then undertaken on the effects of Matrix Estimation to ensure that these were in line with the TAG guidelines.

Generalised Cost Formulations

Generalised Costs are calculated for each user class based on two input values: a Value of Time (VoT) in pence per minute (ppm); and a Vehicle Operating Cost (VOC) in pence per kilometre (ppk). Generalised costs are then calculated using the formula given in

$$GeneralisedCosts_{minutes} = JourneyTime_{minutes} + \left(\frac{ppm}{ppk}\right) \times JourneyDistance_{km} + \left(\frac{1}{ppm}\right) \times Toll_{pence}$$

The values of the ppm and ppk parameters within the assignment are based on TAG data book, released by the DfT in May 2019. In accordance with advice given in TAG Unit M3.1, Section 2 (January 2014), HGV values of time have been increased to account for the influence the owners have on the HGV choice of route. A factor of 2.3 was found to give optimum results in terms of HGV route choice through the network.

Assignment Type and Methodology

The SED_H model was assigned in SATURN using Wardrop's First Principle of Traffic Equilibrium methodology, (i.e. that it is considered converged when the generalised cost for any chosen route is equal or less than the generalised cost on alternative non-chosen routes).

Two criteria are assessed. The first relates to how close the model is to a particular converged situation: the gap. The gap value therefore represents the excess cost incurred by failing to travel on the route with the lowest generalised cost and is expressed relative to that minimum route cost. The second measure relates to the stability indicator. TAG Unit M3-1 (January 2014) provides the convergence criteria that transport models should aim to achieve in order to provide stable, consistent and robust results.

Table 1.2 presents the assignment parameters used.

Table 1.2: SATURN assignment parameters used

Parameter	Function	Value
MASL	Maximum number of assignment-simulation loops within SATALL	120
KONSTP	Control of Stopping Criteria: based on selection	5
RSTOP	Used in convergence of assignment/simulation loops	99%
STPGAP	Critical gap value (%) used to terminate assignment-simulation loops when KONSTP = 1 or 5	0.01%
PCNEAR	Percentage change in flows judged to be "near" in successive assignments	1
NISTOP	The number of successive loops which must satisfy the "ISTOP" criteria in the test for convergence of the assignment/simulation loops.	4

The RSTOP and STPGAP criteria are stricter than the minimum standards dictated in TAG. The SED_H model converges in fewer than or equal to 30 loops for each modelled time period.

Calibration

The following checks were undertaken during calibration:

- Checks to ensure that link speeds, capacities and number of lanes on the network were realistic;
- Checks to ensure that junction attributes matched on-ground conditions and that delay calculations at junctions were realistic;
- Adjustment and checking of the network to ensure plausible routeing of traffic (e.g. HGV restrictions);
- Refinement of network parameters (e.g. capacities) to match modelled data (e.g. traffic flows and journey times) to observed data;

- Use of matrix estimation to adjust the prior trip matrices to match observed traffic flows from link counts.

Table 1.3 summaries the calibration performance of SED_H.

Table 1.3: Summary of calibration performance

	Description of Criteria	Acceptability Guideline	Model performance
1	Individual flows within 100 veh/h of counts for flows less than 700 veh/h	> 85% of cases	Criteria 1 or 2 met for all time periods, for both Car and Total flows
	Individual flows within 15% of counts for flows from 700 veh/h to 2,700 veh/h		
	Individual flows within 400 veh/h of counts for flows more than 2,700 veh/h		
2	GEH < 5 for individual flows	> 85% of cases	
3	Total modelled flows across all links crossing a screenline must be within 5% of the observed totals	All/nearly all screenlines	>97% screenlines meet criteria (one fails but still has a GEH of 3). The GEH is well within the guidelines.

Validation

Table 1.4 summaries the validation performance of the model.

Table 1.4: Summary of validation performance

	Description of Criteria	Acceptability Guideline	Model performance
1	Individual flows within 100 veh/h of counts for flows less than 700 veh/h	> 85% of cases	Criteria 1 or 2 met for all time periods (AM period is equal to 50%)
	Individual flows within 15% of counts for flows from 700 veh/h to 2,700 veh/h		
	Individual flows within 400 veh/h of counts for flows more than 2,700 veh/h		
2	GEH < 5 for individual flows	> 85% of cases	
3	Total modelled flows across all links crossing a screenline must be within 5% of the observed totals	All/nearly all screenlines	All but one screenline meet this criteria
4	Modelled times along routes should be within 15% of surveyed times (or 1 minute, if higher than 15%)	> 85% of routes	85% of routes meet the criteria for all time periods
5	20* OD pairs routeing must be comparable with observed routeing		All routes checked show a close match

*20 is specific to the number of zones and user classes in this model.

Summary

The SED_H highway assignment model has been developed in line with TAG criteria and demonstrates a good level of calibration and validation. This suggests that the model is robust and fit for purpose. It can be concluded that, overall, the model validation process demonstrates that the base year traffic model provides a good representation of the current traffic demands and travel conditions in the South-East Dorset Study area.

Due to the wide coverage of the study area, there were some notable gaps in the availability of observed data across a number of model areas. The model's performance in these areas could not be calibrated nor verified and limitations in usefulness of modell outputs can be expected if the model were to be used to assess the impacts of interventions in these areas. However, the lack of available observed data in these areas, is not expected to make a material difference in the performance of the model across the study area.

South East Dorset Multi-Modal Transport Model (Public Transport)

The Public Transport model element of SEDMMM is referred to as the SED_PT (South East Dorset Public Transport) model.

Modelled Area

The SED model suite covers the areas of Poole, Bournemouth and Christchurch, extending just short of Blandford Forum and the A354. The modelled area to the south follows the coast line around Poole to Wareham.

Figure 1.5 shows the extent of the main study area.

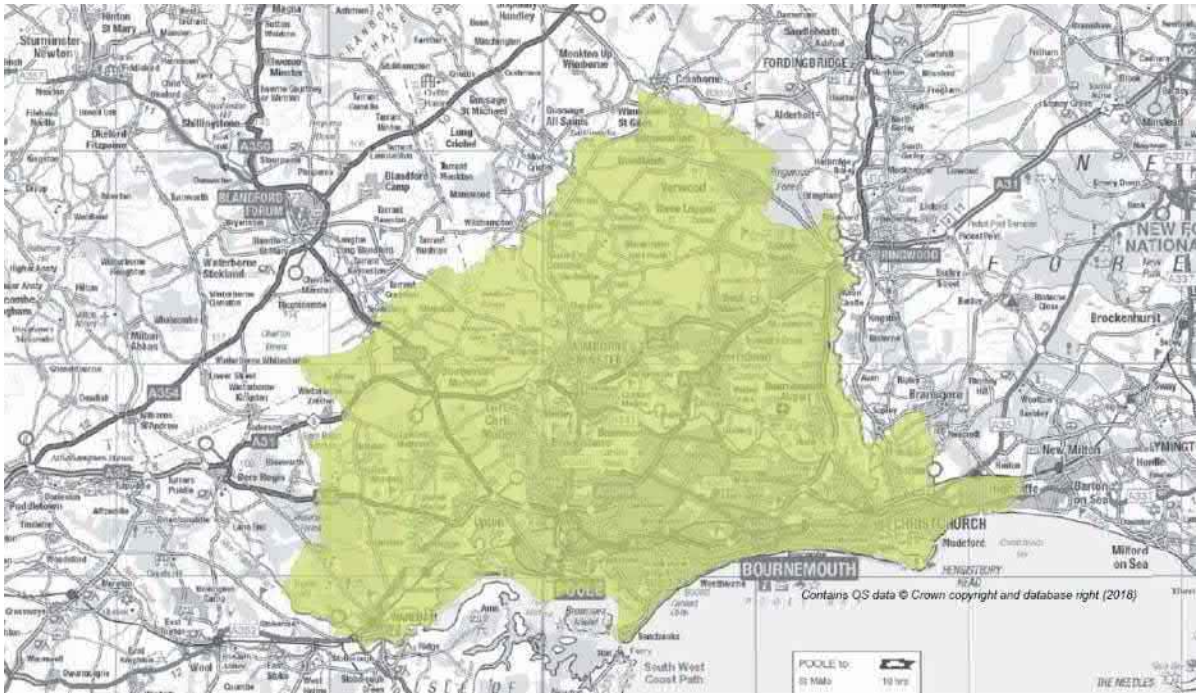

Figure 1.5: Extent of Main Study Area in SEDMMM

The study area of SED_PT is broadly aligned to the study area of the South East Dorset Highway (SED_H) model.

The core of the bus network is located in the area defined by Poole, Bournemouth and Christchurch although there are some bus services with an origin or destination in adjacent areas such as Purbeck, East Dorset and the New Forest e.g. bus services to Wareham, Swanage, Wimborne Minster, Corfe Mullen, Ringwood, Lymington etc.

The rail network covers a wider area, extending from Weymouth in the west to Southampton to the east. Within the model study area, the rail network covers the three key stations: Bournemouth, Poole and Christchurch, however all stations along the main line between Weymouth and Southampton are represented in the SED_PT.

Figure 1.6 shows the extent of the modelled railway within SED_PT.

Figure 1.6: Modelled rail lines

Model Specification and Data (Base Year)

The model has been developed with a Base Year of 2017

Data used for the development of SED_PT consists of the following:

- Onboard bus passenger counts along specific links undertaken by Dorset Council (2017);
- Entry / exit passenger counts at main railway station and passenger interviews undertaken by Dorset Council (2015-2016);
- Data commissioned directly from other parties, including mobile phone network records; and
- Data derived from other sources, such as the NTS data, bus and rail route and frequency information etc.

These data have been collected across different years. No adjustment has been made to bring the counts in line with the consistent 2017 base year; this is a limitation of the model.

Zoning System

The zone system for SED_PT has been kept consistent with SED_H. The model zone system was defined by Dorset Council and is based on the zoning system developed for the SEDMMM. This is aligned to the latest census output area boundaries and is consistent with the NTEM zone boundaries.

Within the urban areas of Poole, Bournemouth and Christchurch, the zoning system is disaggregate, and specific access roads from residential and commercial areas have been used as a basis for connecting zones to the network via centroid connectors.

There are 561 zones in the model, comprising 402 that constitute the study area and 129 external representing the rest of the country. The remaining 30 zones, numbered 900 to 930, are empty and included for forecasting purposes.

Figure 1.7 shows the local zoning system within the SED_H model.

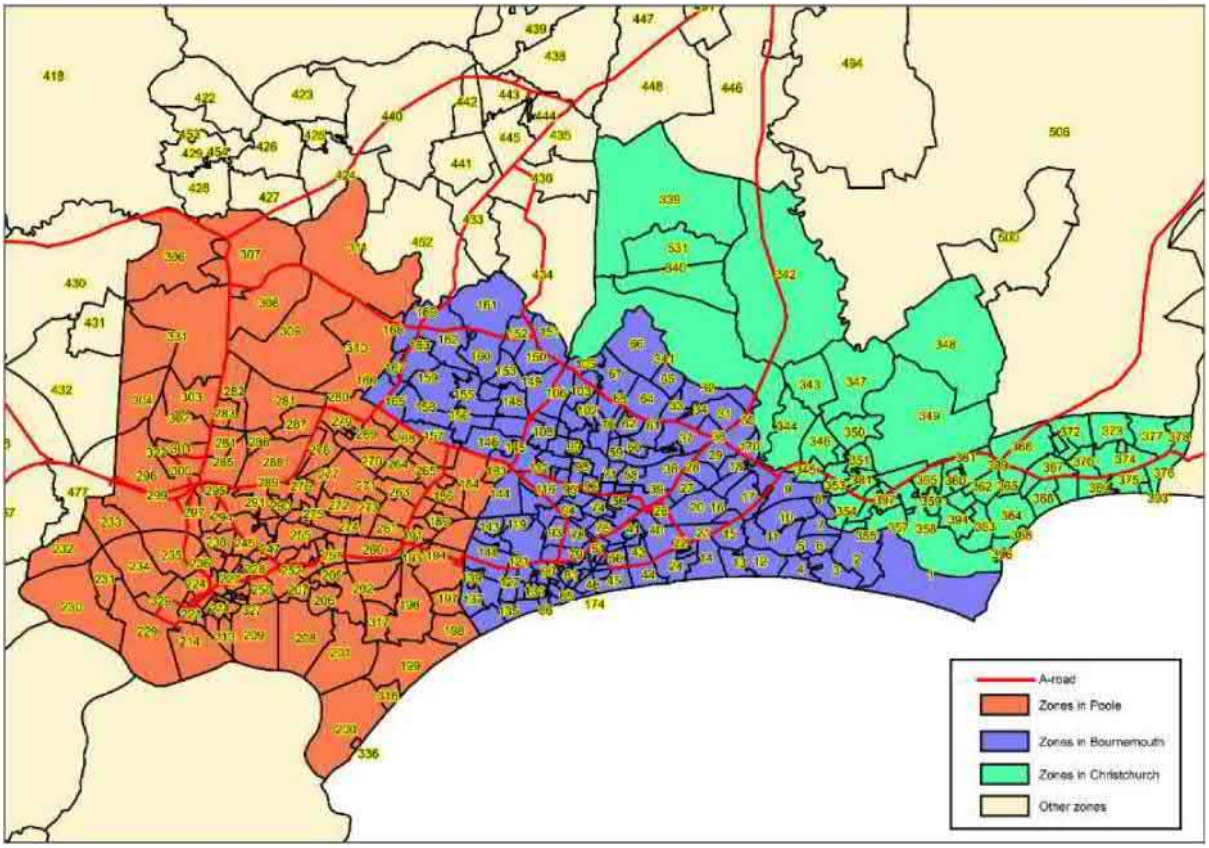

Figure 1.7: Zoning system in SED_PT

The fare system method chosen was zonal fares. Ordnance Survey wards were selected for zonal fare definition, with small 'ward' boundaries used in the main study area around Poole, Bournemouth and Christchurch.

Figure 1.8 illustrates the fare zones used in SED_PT.

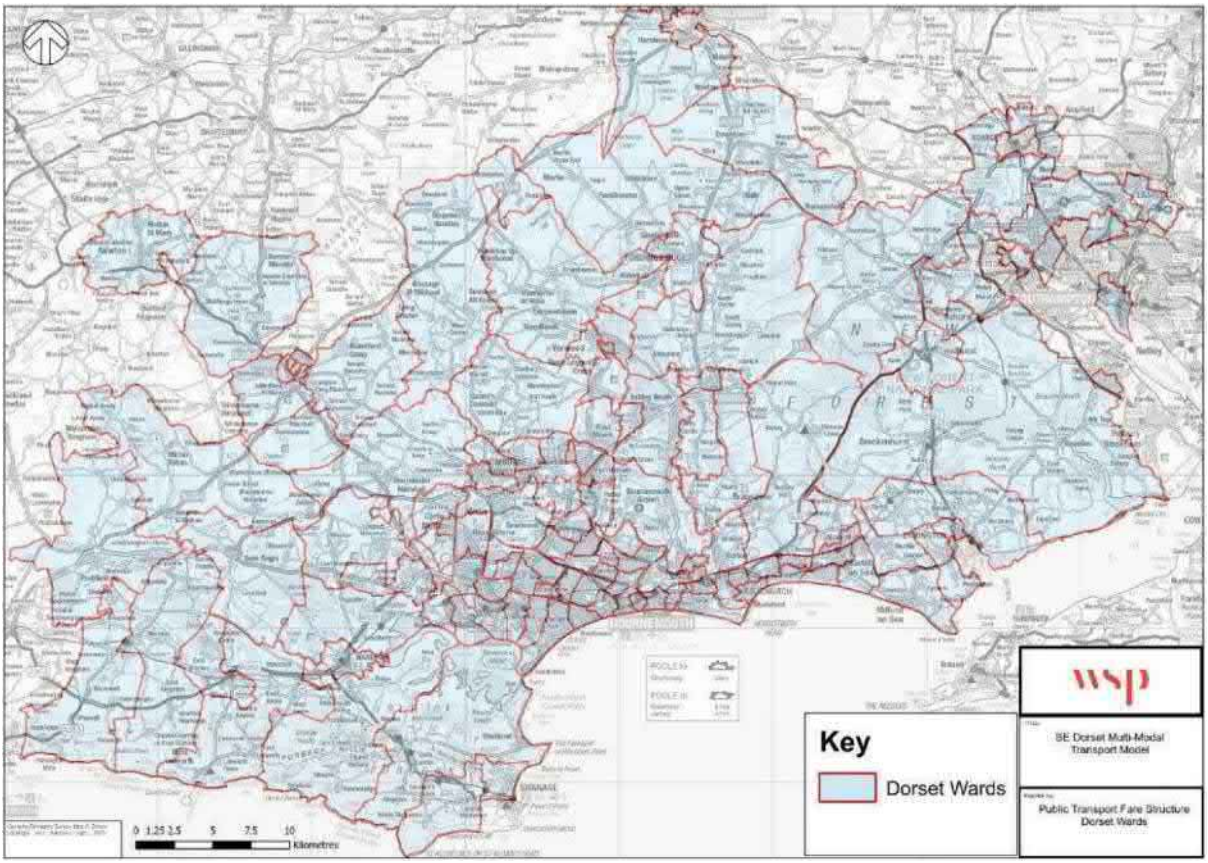

Figure 1.8: Fare zones within the main study area

Time Periods

The model has three time periods, representing conditions on an average weekday (Monday to Friday). These are as follows:

- Morning peak hour 08:00-09:00
- Average interpeak hour 10:00-16:00 (averaged)
- Evening peak hour 17:00-18:00

User Classes

SED_PT has three modelled user classes:

- Employers Business;
- Commute; and
- Other

These are each covered by the modes:

- Rail
- Bus
- Walk

Network

The public transport network, specifically the bus network, is based on the underlying SATURN highway network in SED_H.

The base 2017 highway model network provided the starting point for developing the 2017 base bus network. The highway model network incorporates all major and principal routes within the study area, all local roads within the urban areas of Poole, Bournemouth and Christchurch as well as any local routes within the wider study area.

The initial bus network (year 2017) was provided by Dorset Council in SATURN format which was later converted to the CUBE format. The frequency of the bus services was also obtained from the SATURN files.

Locations of bus stops were obtained from the National Public Transport Access Nodes (NAPTAN)2.

The main rail network extends from Weymouth to Southampton covering the key stations in the Poole, Bournemouth and Christchurch area.

Demand

The data for matrix development used the following data sets.

- Mobile Network Data (MND) from O2 mobile phone records supplied by Telefónica;
- Rail Interview and Count Data; and
- Trip end data from TEMPro v7.2 to supplement the data above.

These three data sources produced the Bus Prior Matrix and Rail Prior Matrix. These were combined to give an overall PT Matrix.

Assignment Type and Methodology

The SED_PT model uses a timetable-based assignment.

Calibration and Validation

The bus and rail assignment models were calibrated by:

- Adjustments to the network particularly the non-transit connections;
- Bus route and frequency checking; and
- Applying specific delays and penalties (Wait time, Transfer penalties etc).

In terms of validation, TAG Unit M3.2 (January 2014) suggests three criteria for a public transport model: matrix, network and assignment validation:

- Trip Matrix validation;
- Network validation; and
- Assignment validation.

Table 1.5 summaries the validation performance of SED_PT.

Table 1.5: Summary of calibration performance

	Description of Criteria	Acceptability Guideline	Model performance
1	Difference between assigned and counted flows should be less than 15%	95% of screenlines	All screenlines meet criteria
2	Journey times within 15% of observed times	90% of services	Conditions met for both bus and rail
3	Boarding/alighting passenger flows	Within criteria (+/- 25% or GEH<5 if Count<150) for 85% of counts	Conditions met for both bus and rail

Summary

The SED_PT public transport model has been developed in line with TAG criteria and demonstrates a good level of calibration and validation. This suggests that the model is robust and fit for purpose. It can be concluded that, overall, the model validation process demonstrates that the base year traffic model provides a good representation of the current demands and travel conditions in the South-East Dorset Study area.

Bournemouth Town Centre VISSIM Model

A micro-simulation model of Bournemouth Town Centre to the present year. This encompasses a large area of Bournemouth town centre extending from the A338 at the north down to the coast at the south, and from the B3066 at the west to the A35 St Swinthun's Road to the east.

Modelled Area

Figure 1.9 identifies the study area used for this model of Bournemouth Town Centre.

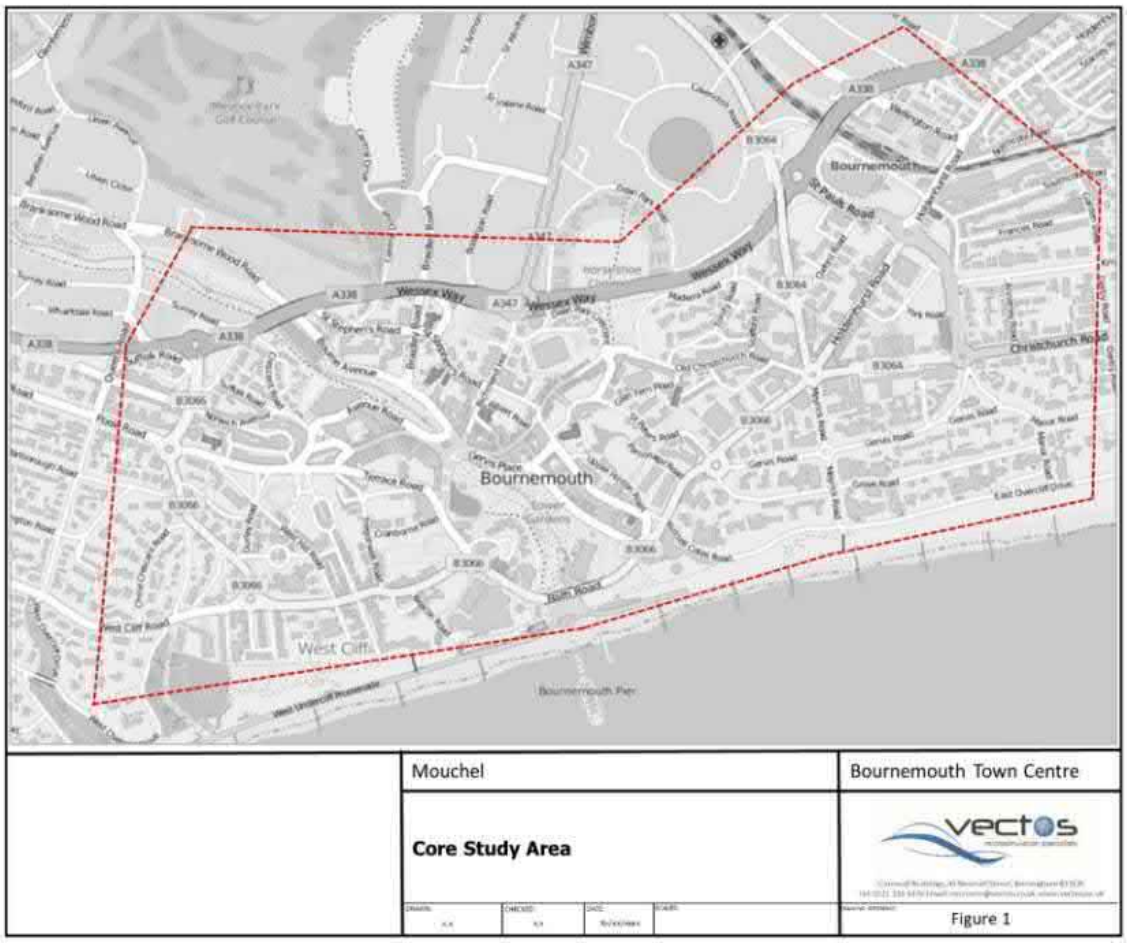

Figure 1.9: Study Area (Bournemouth VISSIM Model)

Model Specification and Data (Base Year)

VISSIM 7.00-15 was used with a base year of 2016. Table 1.6 summaries the data collection for the Bournemouth Town Centre VISSIM Model.

Table 1.6: Data collection summary

Survey Type	Method	Date	Duration	Details
Car Park Utilisation	Car Park Data collection	Thu 16th June 2016 and Sat 18th June 2016	1 hour at peak time	10 car parks

Traffic Counts	MTC	Wed 6th May 2015 to Thu 21st May 2015	1 day – weekdays only	9 locations
Volumetric Count	ATC	Between Sat 16th April and Fri 29th April 2016	14 days	9 sites
Volumetric Turning Count	MCC	Thu 21st April 2016	Collected at 15-minute intervals	21 junctions, 301 turning movements total
Journey Times	2016 Traffic Master data	Unknown – provided by	07:30-09:30 16:30-18:30	6 routes surveyed

Zoning System

There are a total of 72 zones across the modelled area which represent either a specific input or one or more smaller generators/attractors throughout the internal area of the model.

Network Structure

The network structure is shown in Figure 1.10.

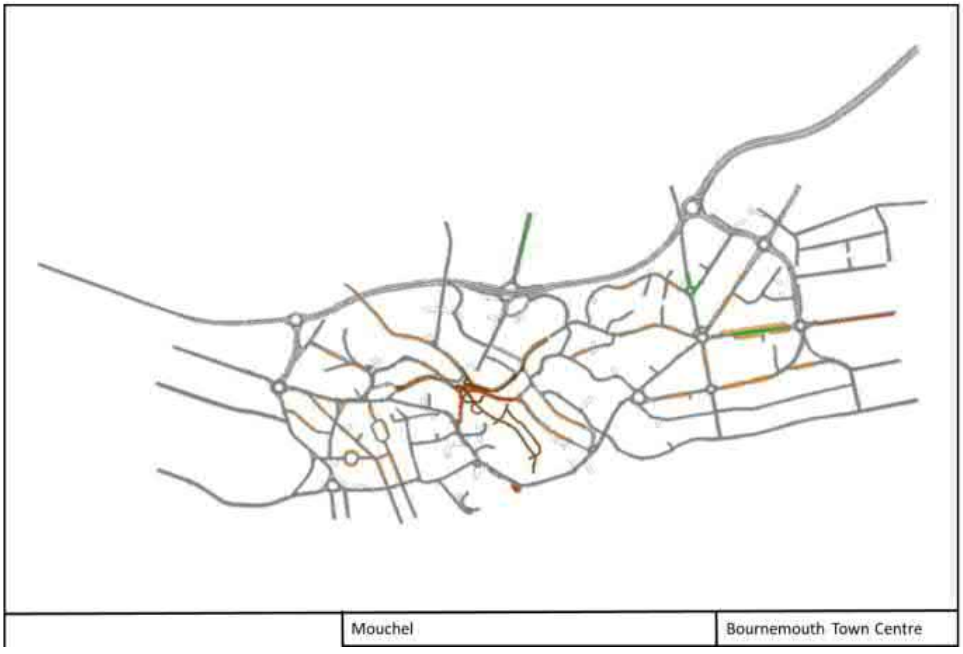

Figure 1.10: Network Structure

Time Periods

The simulation periods include:

- AM: 07:45-9:00 (8:00-9:00)
- PM: 16:45-18:00 (17:00-18:00)
- SAT1: 13:45-15:00 (14:00-15:00)
- SAT2: 17:45-18:30 (17:30-18:30)

SAT1 is a Saturday afternoon and SAT 2 is a Saturday evening. Though not explicitly stated, it is assumed that AM and PM refer to either an average weekday peak hour, or an average Monday-Thursday peak hour.

User Classes

User classes are Light vehicles and Heavy vehicles.

Generalised Cost Formulations

No information on the Generalised Cost Formulations has been documented.

Assignment Type and Methodology

Dynamic assignment has been undertaken.

Model Parameters and Factors

Convergence is the process through which vehicle trips are assigned across the model network in successive iterations. To be consistent with the 2008 model, the evaluation interval was set at 300 seconds.

During each iteration average vehicle travel times and volumes across paths/edges change as vehicles choose different routes based on the calculated costs. Convergence of each model was deemed to be achieved when the percentage change for all paths in all evaluation intervals was below 15%. For example, the model is deemed to have converged when the percentage change in modelled flow is greater than 85% for all paths in all evaluation intervals.

Links to Public Transport/Demand Transport

A review of Public Transport provisions was carried out to ensure all bus routes were represented within the model. Online timetables and bus turn counts were used to calibrate this.

Available Forecasting Years

No information is available stating the forecast year(s) for this model.

Summary

Whilst not meeting the calibration and validation criteria across all time periods, the model has been judged to accurately represent the traffic conditions in Bournemouth town centre. The model covers the majority of Bournemouth town centre along with the A338 access/egress route to the north.

This model would only be suitable for operational modelling of options within the central Bournemouth area.

A348 Ringwood Road Paramics Corridor Model

A Paramics microsimulation model representing the A348 from Dorset Way (Tower Park) to the A347 Wimborne Road, north of Victoria Road/New Road Junction. The model also includes Wallisdown Road (A3049), from the Mountbatten Arms junction to just beyond Talbot Roundabout (A347).

Modelled Area

The modelled area and network is shown in Figure 1.11.

Figure 1.11: Modelled area (A348 Ringwood Road Model)

Model Specification and Data (Base Year)

The base year for the model is 2018 and is built in the software Paramics Discovery version 20.05. Table 1.7 summaries the data collection for the A348 Ringwood Road Paramics Corridor Model.

Table 1.7: Data collection summary

Survey Type	Method	Date	Duration	Details
Turning Counts at junctions	MTC	9th May 2017 to 6th March 2018	15-minute intervals between 7:00-19:00	56 locations
Volumatic Count	ATC	Not stated – provided by BBC and BoP	Not stated – provided by BBC and BoP	7 locations
Journey Times (JT)	DfT Traffic Master Data	1st March 2017 to 30th March 2017	AM: 8:00-9:00 IP: 13:00-14:00 PM: 17:00-18:00 Weekdays only No school holidays	12 routes

For signalised junctions MOVA (Microprocessor Optimised Vehicle Actuation) data was obtained and analysed.

Zoning System

There are 52 zones modelled of which 3 are currently unused.

Network Structure

All major and minor junctions within the study area have been modelled.

Time Periods

The time periods used are as follows:

- AM period: 07:00-10:00
- IP Period: 10:00-16:00
- PM period: 16:00-19:00

User Classes

The modelled user classes are:

- Level 1: Car and Taxis
- Level 2: Light Goods Vehicles – LGV
- Level 3: Heavy Goods Vehicles (OGV 1, OGV 2) – HGV

Generalised Cost Formulations

The Local Model Validation Report (LMVR) explains that default generalised cost equations have been used, the model settings are shown in Appendix A of the LMVR.

Assignment Type and Methodology

Five-minute traffic release profiles were developed to ensure traffic was released on to the network throughout the modelled period.

Model Parameters and Factors

Paramics default parameters and settings have been used. Junction calibration parameters have been applied, including stop line and kerb position amendments. For roundabouts the visibility, gap acceptance, lane merge, lane cross, path cross, and headway factors have been adjusted where necessary.

Links to Public Transport/Demand Modelling

There is no specific public transport model, although buses are modelled as ‘fixed routes’ with a variety of vehicles types as per the data available at the time. All bus stops have been included in the area.

Available Forecasting Years

Forecast year models are available for the years representing 2026 and 2033.

Summary

The model has been built and updated in line with TAG, and meets the calibration and validation criteria. This model could be only used for testing schemes at a microsimulation level in the vicinity of the A348. It is unlikely that the model will be suitable to assess many of the interventions associated with SEDUMS.

Poole Town Centre Paramics Model

A micro-simulation model of Poole Town centre developed to assess re-generation proposals.

Modelled Area

This covers Poole Town Centre as part of the regeneration proposals and accounts for:

- Closure of Kingsland Road in Poole Town Centre
- Conversion of the George Roundabout to a signal junction;
- Improvements to Hunger Hill junction;
- Re-location of Poole Bus Station; and
- Improvements within area of the Bay Hogg Gyratory.

The modelled area is shown in Figure 1.12.

Figure 1.12: Modelled area (Poole Town Centre Model)

Model Specification and Data (Base Year)

The model used is the S-Paramics 2013.1 software, a micro-simulation modelling package. The data is based on data collected from Dorset County Council (Dorset CC) in Autumn 2013. The base year used is October 2013.

A summary of the data collected can be seen in

Table 1.8.

Table 1.8: Summary of data collection

Survey Type	Method	Date	Duration	Details
Origin/Destination	ANPR and manual count	Thu 7th Nov 2013	07:00-19:00	30 sites in town centre including car parks
Car Park Duration	ANPR and parking beat	Sat 7th Dec 2013 Tue 10th Dec 2013 Thu 31st Oct 2013 Sat 2nd Nov 2013	07:00 –18:00	11 locations
Volumetric Count	ATC	Mon 4th Nov to Sun 8th Dec 2013	7 or 14 days per site	16 sites
Volumetric Turning Count	MCC	Thu 24th Oct 2013	07:00-19:00	29 junctions
Journey Times	Moving Observer	Tue 5th Nov 2013 Thu 7th Nov 2013	07:30-09:30 16:30-18:30	6 routes surveyed

Zoning System

A total of 57 model zones were developed from aerial photography reflecting land use patterns representing residential, leisure, retail, employment and education.

Network Structure

Road hierarchy based on road classification was used within the S-Paramics software. All principal roads were included in the model with ‘A’ and ‘B’ being used for major road links and the remaining links as minor.

Time Periods

The time period used for the model includes a 30-minute shoulder before and after the peak hours:

AM Peak 7:30AM to 9:30AM

PM Peak 16:30PM to 18:30PM

User Classes

The matrix was developed for both light vehicles and heavy vehicles, with Public Transport (PT) included.

Generalised Cost Formulations

No generalised cost formula has been documented.

Assignment Type and Methodology

This is a standard S-Paramics micro-simulation model using dynamic assignment.

Model Parameters and Factors

Calibration parameters for individual junctions are listed in the appendices of the Poole S-Paramics LMVR. No global parameters are stated.

Links to Public Transport/Demand Transport

Bus routes and bus stops were coded into the model together with current timetable information. It is implied in the report, though not explicitly stated, that these buses are modelled as fixed flow.

Available Forecasting Years

2026 was selected to represent the 'most likely' future year scenario. The total growth between 2013 and 2026 was controlled by TEMPRO.

Summary

The Poole Town Centre S-Paramics micro-simulation model was developed from data collected as part of an extensive survey programme carried out in Autumn 2013. The performance of the model was tested by comparing observed and modelled link flow and journey time data. Link flow validation comfortably meets TAG criteria; Journey time validation falls just short.

The Poole S-Paramics model would only be useful if detailed operational modelling within Poole was needed to assess an option or package of measures.

Christchurch Paramics Model

A Paramics micro-simulation model of the Christchurch area, originally developed in 2009 and extended in 2010.

Modelled Area

Figure 1.13 identifies the study area of the Christchurch Paramics Model.

Figure 1.13: Study area (Christchurch Paramics Model)

Model Specification and Data (Base Year)

The model was updated to a 2015 base year. The following data collected can be found in Table 1.9 below.

Table 1.9: Data collection

Survey Type	Method	Date	Duration	Details
Volumetric Count	ATC	May 2015 to Sept 2015	7 or 14 days per site	7 sites
Volumetric Turning Count	MTC	22nd Sept 2015 to 22nd Oct 2015	1 day	8 junctions
Journey Times	Strat-e-Gis data base	1st May 2014 to 30th June 2014	2 months	10 routes surveyed

Zoning System

An additional zone was added to the previous base model to extend the area modelled. There are currently a total of 36 zones in the model.

Network Structure

A randomly generated seed number is used in Paramics to randomise release from zones when assessing the output flow. This tests the sensitivity and stability of the model.

Time Periods

The time periods covered in the matrix are:

- AM period 7:00-9:30 (peak 8:00-9:00)
- PM period 16:00-18:30 (peak 17:00-18:00)

User Classes

Modelled traffic is split into cars and light goods (Light vehicles), and heavy goods vehicles (Heavy vehicles).

Generalised Cost Formulations

No information on generalised cost formulations is documented.

Assignment Type and Methodology

No information on assignment type and methodology.

Model Parameters and Factors

No information on model parameters or factors is documented.

Links to Public Transport/Demand Transport

No information on links to public transport modelling or demand modelling is documented.

Summary

The model meets DMRB guidance for both calibration and validation link and turning flows, as well as journey time routes. This model could only be used for operational modelling of options within the Christchurch area.

1.2 Defining Growth Scenarios

Introduction

Specific growth scenarios have been defined for this study to ensure realistic traffic growth forecasts are produced to enable a more realistic assessment of the interventions. The key objective is to avoid producing traffic forecasts that significantly under-estimate or over-estimate traffic flows across the study area.

AADT traffic counts for 2012 and 2017 in the South East Dorset area have been compared to generate a factor representing the growth. The “average day” factor for 2012-2017 growth has been extracted from the National Trip End Model (NTEM) using the TEMPro software. Table 1.10 presents these factors.

Table 1.10: Observed vs Predicted growth rates, 2012-2017

Observed traffic growth from counts: 2012 - 2017	1.0626
Predicted traffic growth from TEMPro: 2012 - 2017	0.976

Observed growth in the South East Dorset area is positive and does not match the decrease predicted by NTEM. This suggests that there is a need to develop a bespoke growth forecasting methodology for the South East Dorset area. This should take into account both the trends predicted by NTEM, and the historical observed growth.

Adjusted Core Growth

Figure 1.14 presents the Core Growth scenario for the South East Dorset area. The growth is forecast as a smooth curve, matching the TEMPro growth at the start and end of the modelled period, and with higher trip levels than TEMPro for the intermediate years. Higher trips levels in the intermediate years reflect the historical trend of the Dorset area experiencing higher growth than that predicted by NTEM.

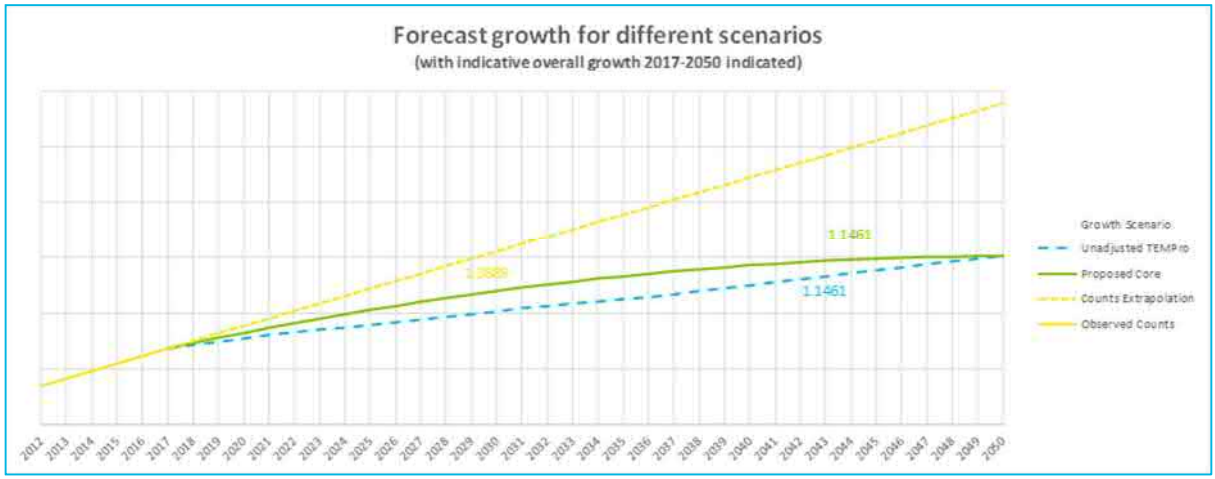

Figure 1.14: Proposed Core Growth Scenario

Key development proposals would also be incorporated into the core growth scenario and the subsequent low and high growth proposals.

High and Low Growth

Transport Appraisal Guidance (TAG) unit M4 (Forecasting and Uncertainty) has guidance for defining the high and low growth scenarios based on the Core and Base demand.

The guidance states that a number of trips should be calculated based on the base demand. This number depends on the forecast year in question. These trips are then added to the Core demand for the High scenario, and subtracted from the Core demand for the Low scenario.

For a forecast year, Yn, where n is the number of years after the base year, the demand is calculated as follows:

$$High/Low\ Demand_{Y_n} = Core\ Demand_{Y_n} \pm (Base\ Demand \times f(n) \times p)$$

Where:

$$f(n) = \begin{cases} 1, for\ n = 1 \\ \sqrt{n}, for\ 1 < n \leq 36 \\ 6, for\ n > 36 \end{cases}$$

TAG states: "*For highway demand at the national level, the value of p is 2.5%, reflecting uncertainty around annual forecasts from the National Transport Model (NTM), based on the macro-economic variables that influence the main drivers of travel demand*." Without evidence to suggest that this value would be different for the Dorset area, it is proposed to leave the value of p as 2.5%.

Figure 1.15 illustrates the High and Low Growth scenarios against the Core. These profiles are non-linear due to the non-linear function of n, in line with TAG guidance, and the non-linear Core scenario that they pivot from.

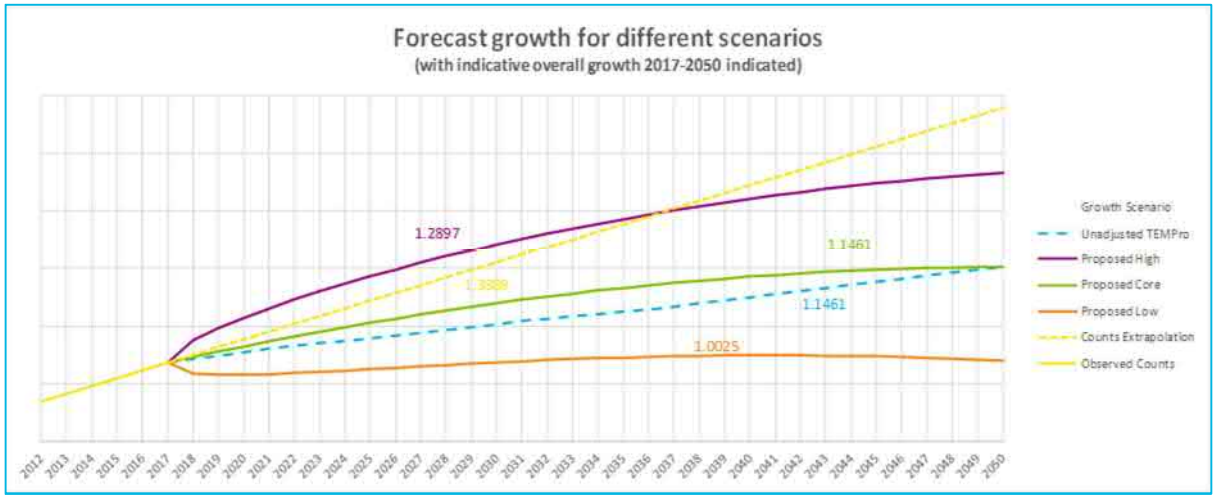

Figure 1.15: Proposed High and Low Growth scenarios, relative to the Core Scenario

1.3 Explanation of Model Outputs

This section contains an explanation of the South East Dorset Transport Model outputs that have been produced for the study. A consistent set of model outputs has been produced for each modelled scenario to enable comparison between the scenarios. The consistent set of model outputs are:

- area based – model outputs are displayed on maps of the study area.
- tabular based statistitics – model outputs are provided in a tabular form.

The model outputs are provided in Section 2 and then the relevant appendix, as signposted.

Map Areas

The areas listed below and shown in Figure 1.16 have been defined for the area based model outputs:

- Overview area (Study area)
- Poole area
- Bournemouth area
- Christchurch area
- North area
- North-West area
- North-East area

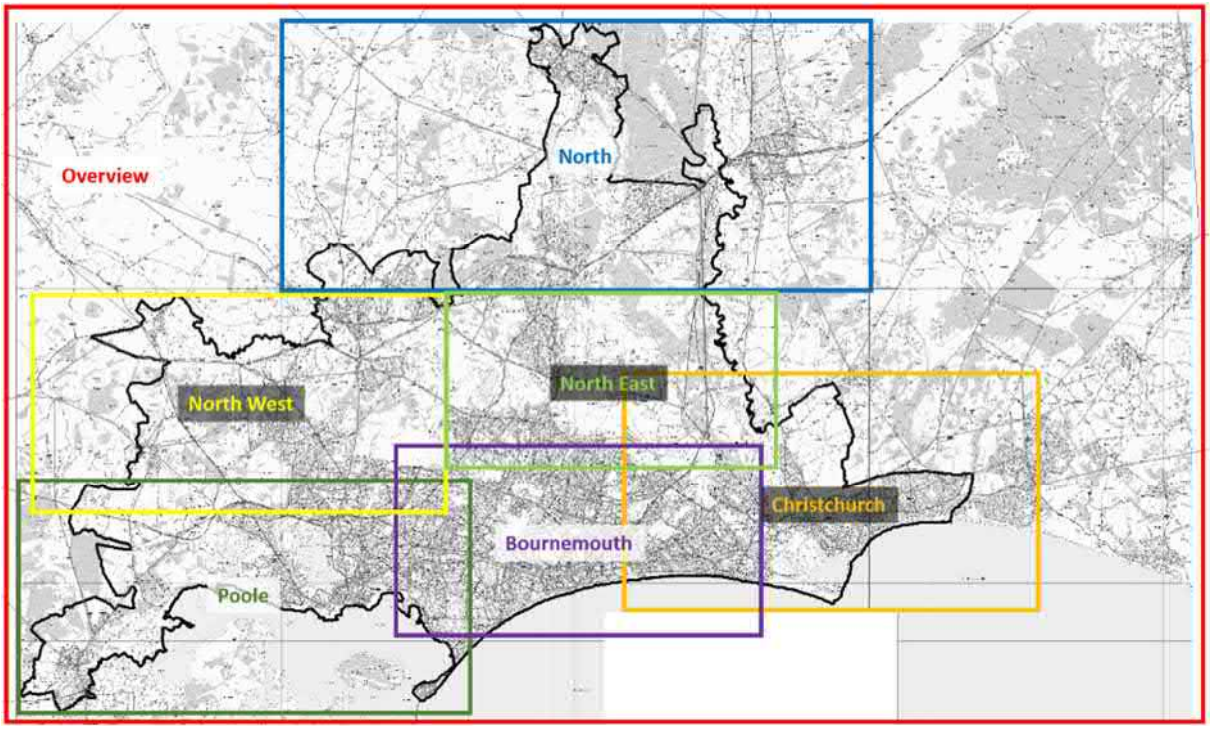

Figure 1.16: Model Output Areas (Overview; Bournemouth; Christchurch; Poole; North; North-East; North-West)

The overview maps are included within this report, whilst the more detailed maps of the specific areas are included in the appendices.

Modelled Time Periods

The modelled time periods that have been used are:

- Morning peak hour (0800-0900) – AM;
- Average Inter-peak hour (1000-1600) – IP;
- Evening peak hour (1700-1800) – PM.

Maps Areas - Model Outputs Metrics

The model outputs listed below have been produced for each scenario for the map areas shown in Figure 1.16:

Highway Model

- Traffic Flows (PCUs): Link based traffic flows
- Link Delays (Seconds): Link based delays

- Link Volume/Capacity Ratio: Link based V/C ratios (although these will not to be produced for difference plots between Do-Minimum and Do-Something scenarios)
- Node Delay (Seconds): Node (junction) based delays – delays at junctions within the model that are formed by several nodes may not be shown.

Public Transport Model

- Bus Flows (Passengers): Link based bus passenger flows
- Rail Flows (Passengers): Link based rail passenger flows

Model Statistics

The model outputs listed below have been produced for each scenario in a tabular form.

Highway Model

- Transient queues: Queues caused by vehicles reducing speeds approaching junctions and by junction waiting times, such as queuing at a red phase at a signalised junction - i.e. queues which dissipate.
- Over-capacity queues: Queues generating as a result of junctions operating over-capacity - i.e. permanent queues.
- Link cruise time: The time spent by vehicles travelling in free flow conditions.
- Total Travel Time: The total travel time of vehicles in the model (the sum of transient queues, over-capacity queues, and the link cruise time).
- Total travel Distance: The total distance travelled by vehicles in the model.
- Overall average speed: The average speed of all vehicles- calculated by dividing total travel distance by total travel time.

Public Transport Model

- Total bus and rail passengers
- Public transport kms

Journey Times

We have defined 12 journey time routes on the key corridors across the study area, these are defined in Figure 1.17.

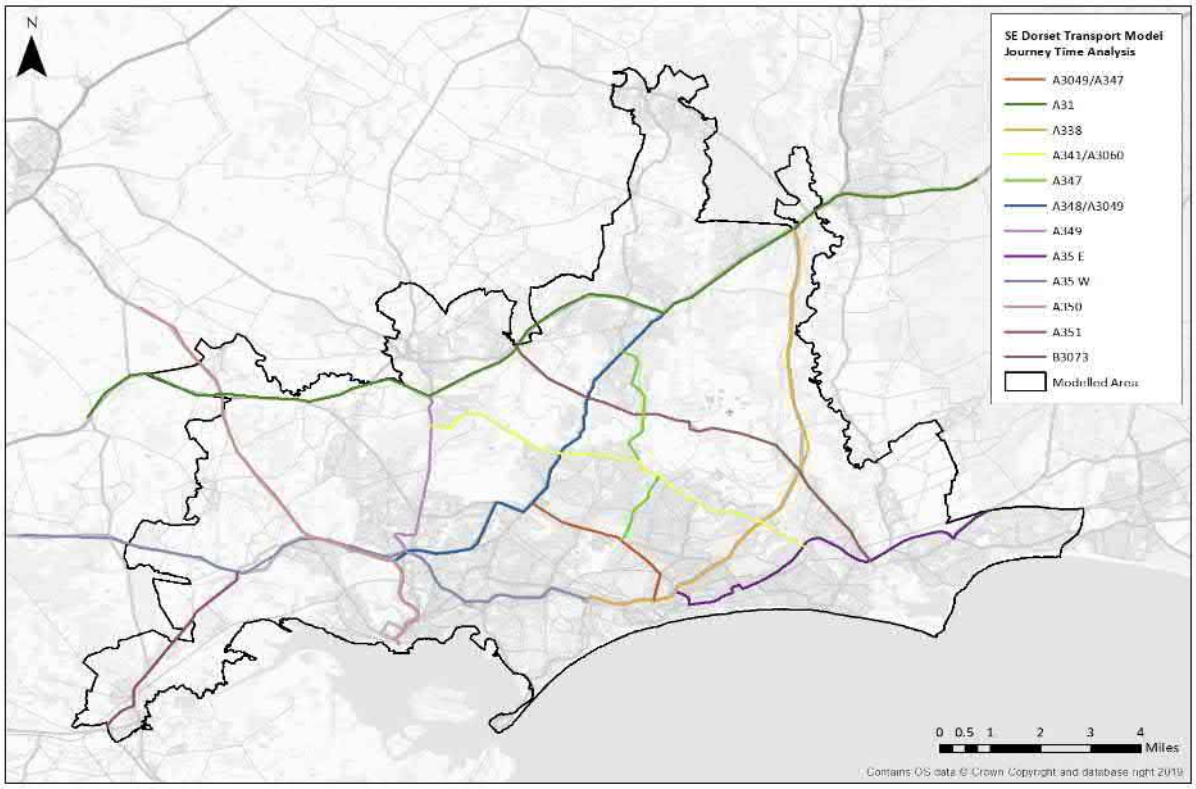

Figure 1.17: Journey Time Routes on Key Corridors

2. Scenario Testing

Overview

The scenario testing described in section has been undertaken using the South East Dorset Multi-Modal Transport Model as detailed in Section 1.1 using the adjusted core growth defined in Section 1.2.

In line with Transport Appraisal Guidance (TAG) unit M4 (Forecasting and Uncertainty) the low and high growth alternative scenarios defined in Section 1.2 have also been used to appraise the scenarios. The low growth scenario results are provided in Appendix G, whilst the high growth scenario results are provided in Appendix H.

A high level summary for the SEDUMS area of the following key outputs are provided in Figure 2.1 to Figure 2.6 for the Do Minimum (DM) and Do Something (DS) scenarios, across the forecast years and growth scenarios.

- Highway Total Travel Time (Vehicle Hours)
- Highway Total Travel Distance (Vehicle Kms)
- Highway Average Speed (km/h)

The graphs indicate that the strategy offers an opportunity to reduce highway travel times and travel distance, whilst increasing average highway speeds. The remainder of this section presents more detailed outputs for the Do Minimum and Do Something scenarios.

Highway Travel Time (Vehicles Hours)

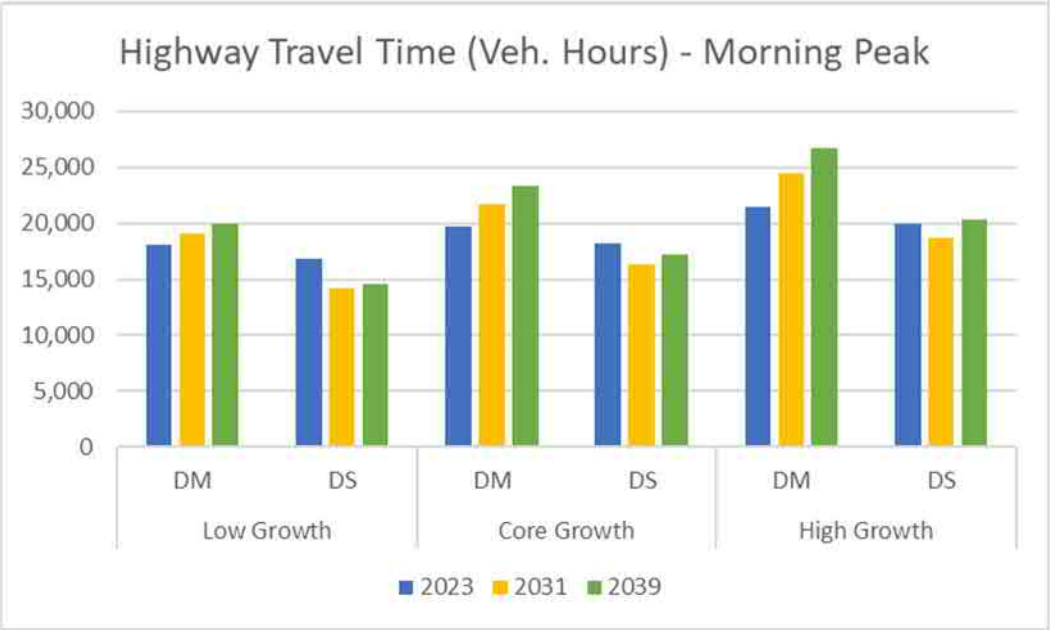

Figure 2.1: Highway Travel Time (Vehicle Hours) – Morning Peak Hour (0800-0900)

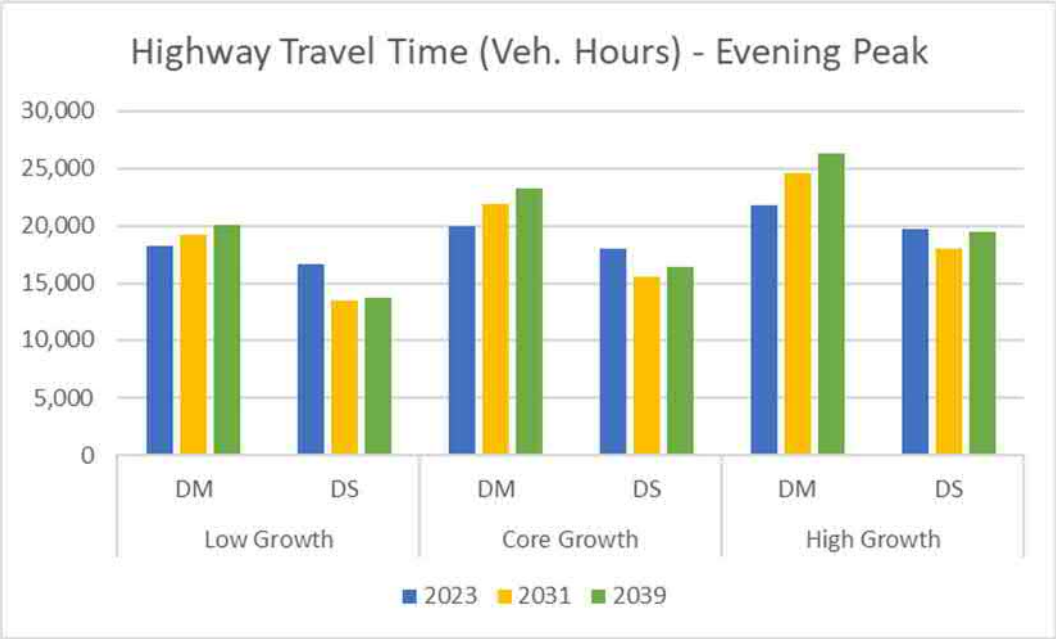

Figure 2.2: Highway Travel Time (Vehicle Hours) – Evening Peak Hour (1700-1800)

Highway Travel Distance (Vehicles Kms)

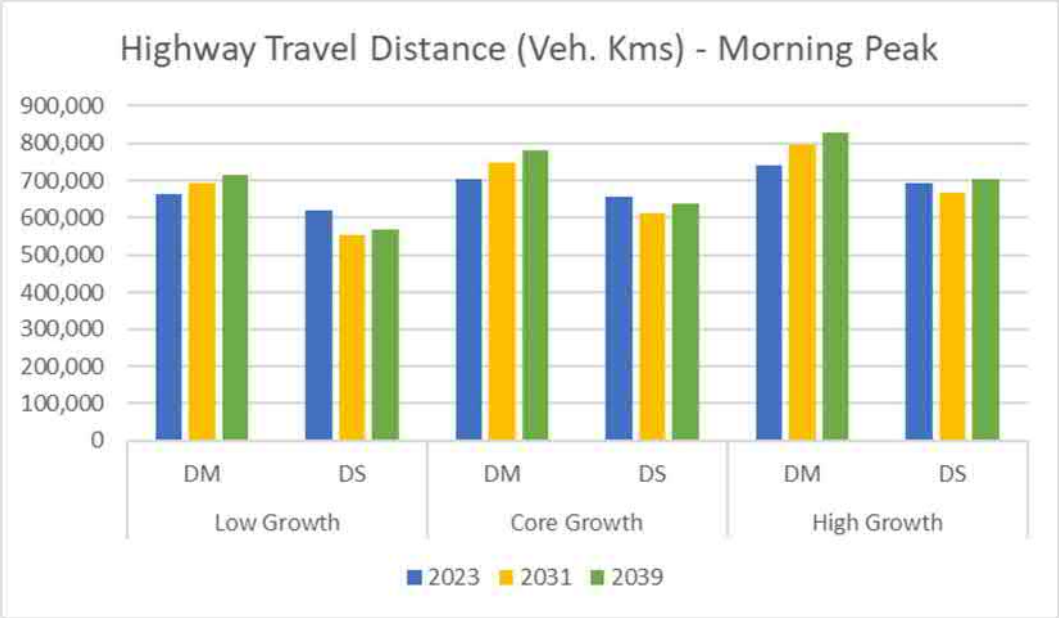

Figure 2.3: Highway Travel Distance (Vehicle Kms) – Morning Peak Hour (0800-0900)

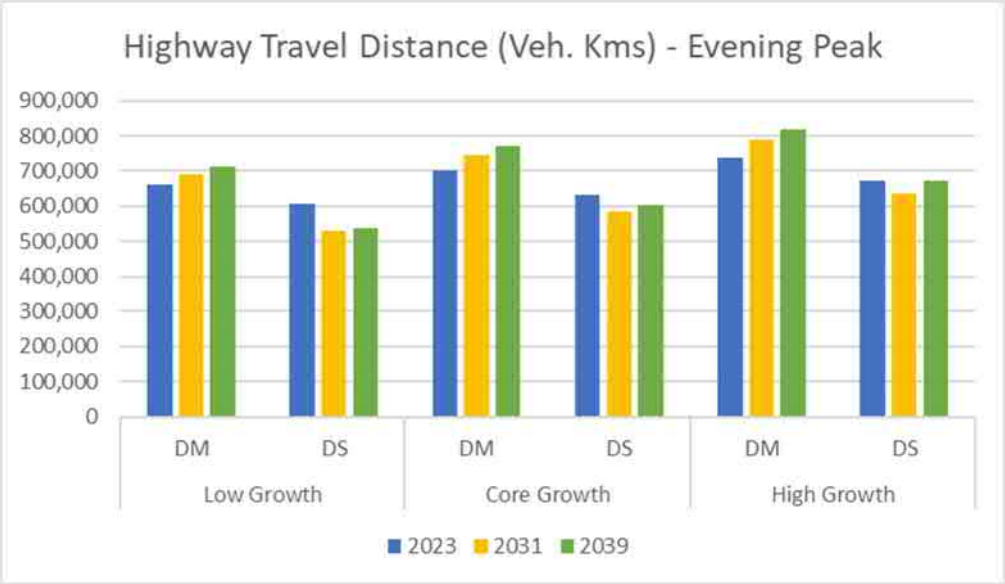

Figure 2.4: Highway Travel Distance (Vehicle Kms) – Evening Peak Hour (1700-1800)

Highway Average Speed (Km/h)

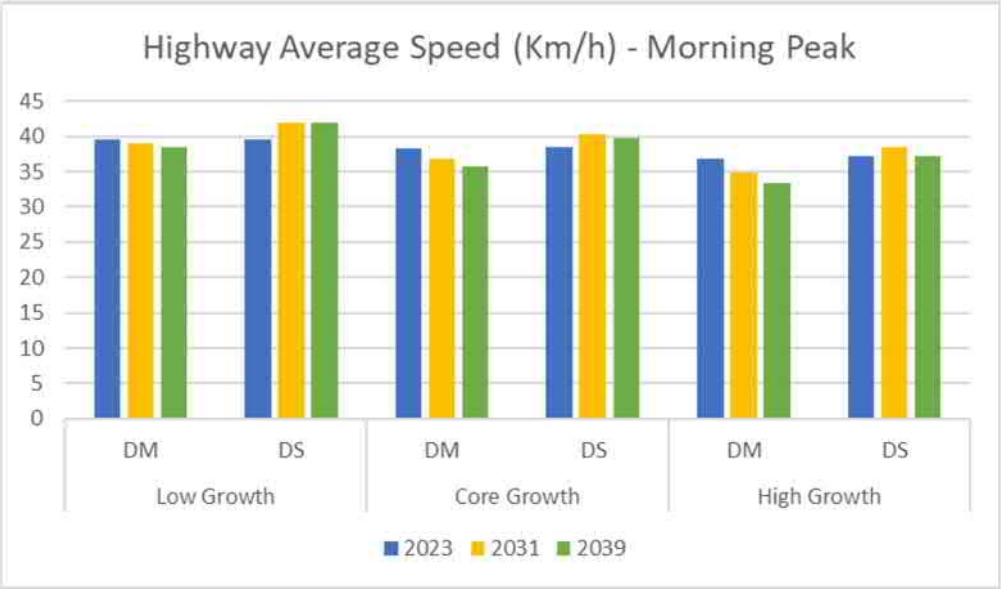

Figure 2.5: Highway Average Speed (km/h) – Morning Peak Hour (0800-0900)

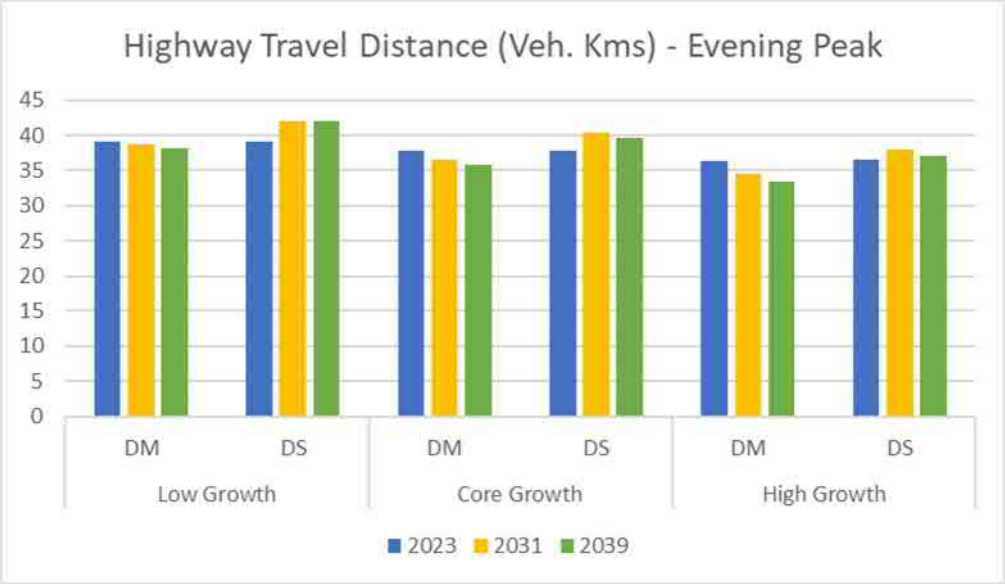

Figure 2.6: Highway Average Speed (km/h) – Evening Peak Hour (1700-1800)

2.1 Do-Minimum Scenarios

Do-Minimum Scenario - Testing of scenarios without mitigation

Initial Model Information and Limitations

This study has been undertaken using the South East Dorset multi-modal model provided by Dorset Council;which have been produced by WSP.

This multi-modal model includes the following components;

- A CUBE/Voyager Forecast trip-end model
- A CUBE/Voyager Multi-modal incremental demand model
- A SATURN Highway Assignment model
- A CUBE/Voyager Public Transport Assignment model

These models have been run using CUBE verson 6.4.4 and SATURN version 11.4.07H MC N4. The models provided have been calibrated to a base year of 2017, and have been forecasted to three different years (2023, 2031 and 2039). For each year, the model covers three peaks: the AM Peak (08:00 to 09:00), the Interpeak (average hour of 10:00 to 16:00) and the PM Peak (17:00 to 18:00). Analysis has been undertaken to ensure that all the transport models used in the study are TAG compliant in terms of model convergence.

Therefore, the Do-Minimum scenarios are taken directly from the forecast models from this multi-modal model however there is a slight adjustment to demand forecasts, this is detailed in Section 1.2

Information on the models have been taken from a number of reports provided. These are;

- South East Dorset Multi Modal Study – Local Model Validation Report (September 2019)
- South East Dorset Multi Modal Study – Public Transport (September 2019)
- South East Dorset Multi Modal Study – Demand Model Development Report (September 2019)
- South East Dorset Multi Modal Study – Traffic Forecasting Report (December 2019)

As part of this study, there has been a review of the model to understand how to effectively modelling the list of interventions. From this, a number of limitations have been identified. These include;

- **Exploded roundabouts/junctions in reporting** – one limitation of the model is that a number of larger junctions and roundabouts e.g. those that are generally more complicated to model or are roundabouts with traffic signals on the approaches, are built using a number of nodes. Therefore as the outputs are based on separate links and nodes, the impact of the junction as a whole will not be accuracy represented.
- **Speed flow curves** – the Highway Assignment Model currently has a limited number of speed flow curves allocated to the network. Speed flow curves are generally used to reflect constraint on demand in line with available network capacity. Free flow speeds on the network, especially in the urban area, have been allocated free-flow speeds at the speed limit of the road. Therefore, speeds on the network are likely to be modelled faster than reality and do not take into consideration speed change due to more or less traffic on the specified link.
- **Zone system / parking zones –** a number of interventions include an element of parking changes e.g. a parking pricing strategy, opening of park and ride sites, and congestion charging. There is some limitations in the highway zone system in that car parks are generally included within larger zones rather than having standalone parking zones, making modelling these interventions more difficult.

- **PT limitations** – a number of limitations will be outlined within the modelling reports listed above however one important limitation that should be outlined is that the model does not include analysis on capacity therefore any model calcuations for modal shift will not include a calculation on how much capacity there is on the bus or rail network, it will just calculate an absolute shift which may not be accurate.

It should be noted that any modelling outputs should only be taken as a strategic guide to the impact of the interventions across the BCP Council area.

Do-Minimum Model Outputs

For each of the three forecast years, a number of outputs have been produced and are outlined in this section, with more details in Table 2.1. The model outputs chosen to be outlined in this study are detailed in Section 1.3.

More detailed area maps are outlined in Appendix A. The highway model statistics are outlined in Appendix B and information on the Do-Minimum journey times are attached in Appendix C.

2023 Do Minimum: AM Peak

The model outputs for the 2023 Do Minimum: AM Peak are shown below. Figure 2.7 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.1.

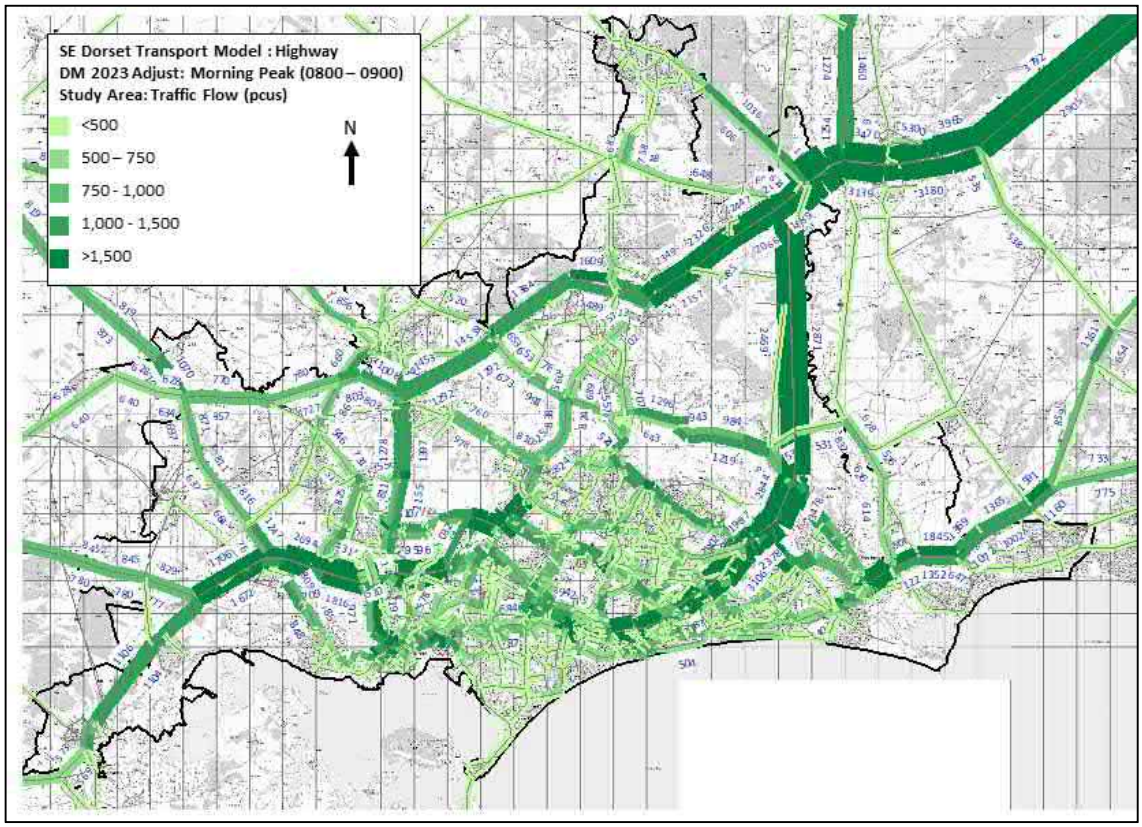

Figure 2.7: Actual Flows (vehicles) – 2023 Do Minimum, AM Peak

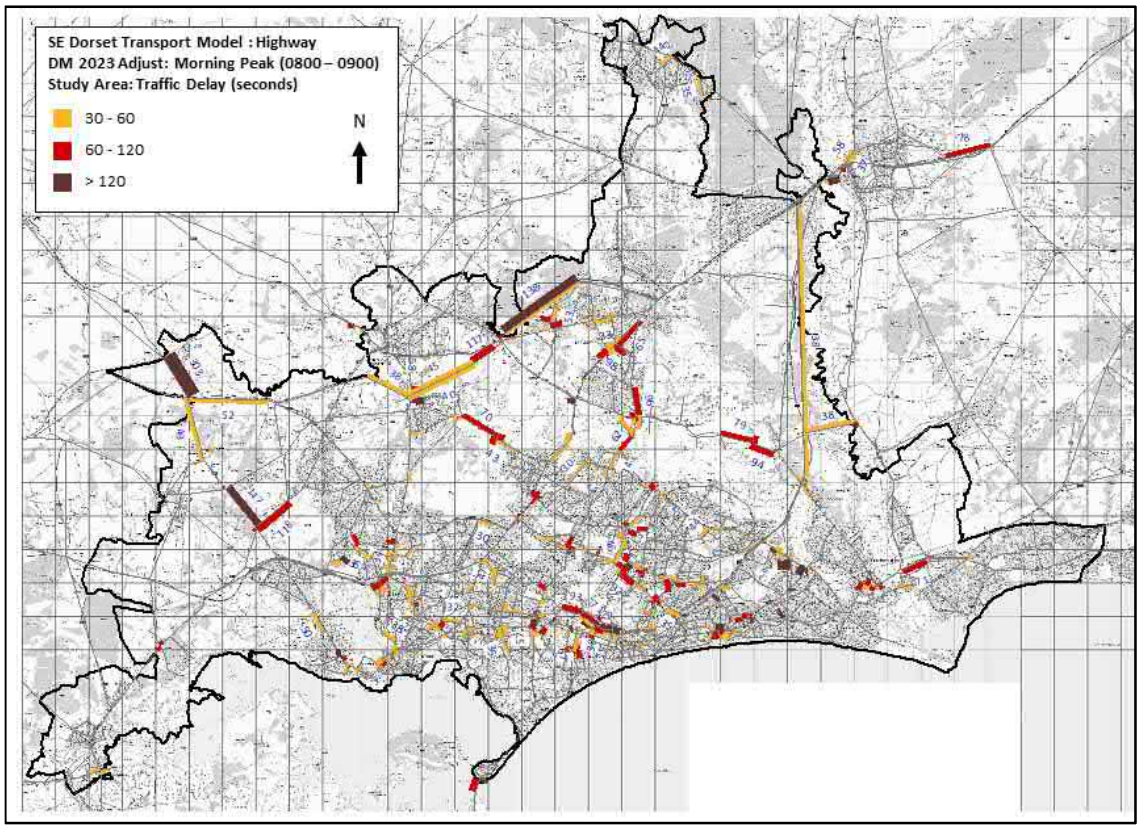

Figure 2.8: Link Delays (seconds) – 2023 Do Minimum, AM Peak

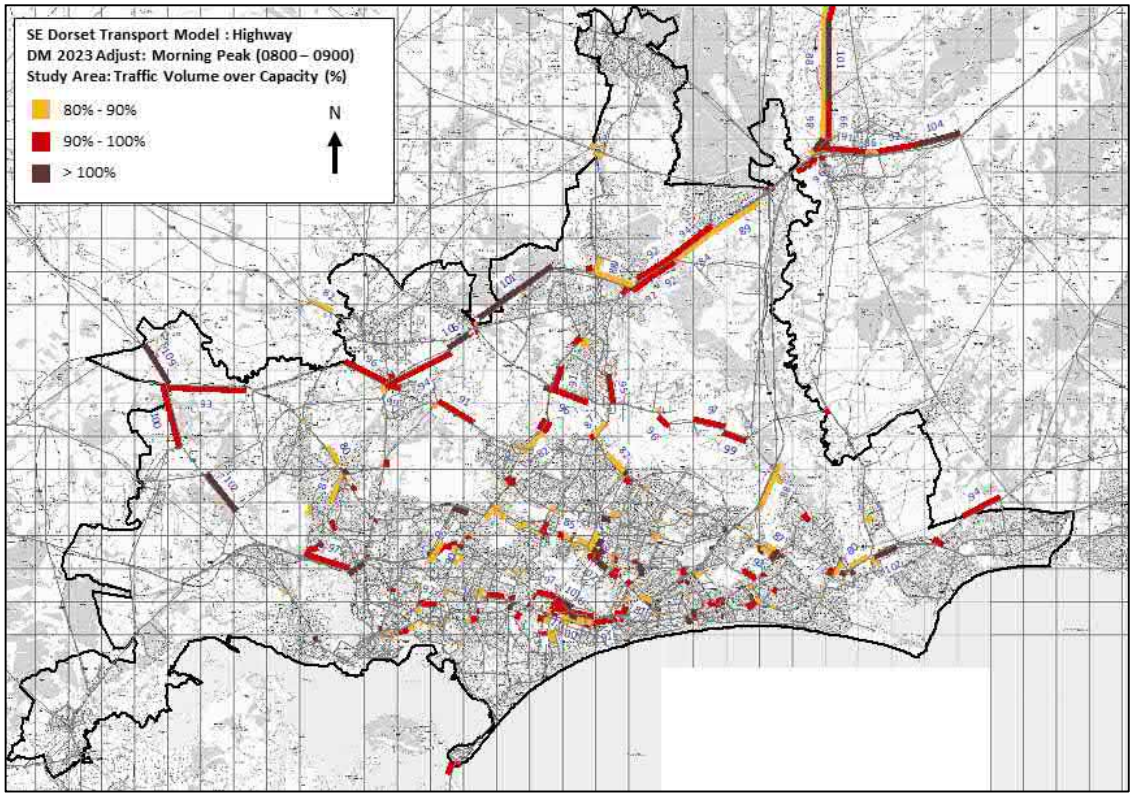

Figure 2.9: Link V/C (%) – 2023 Do Minimum, AM Peak

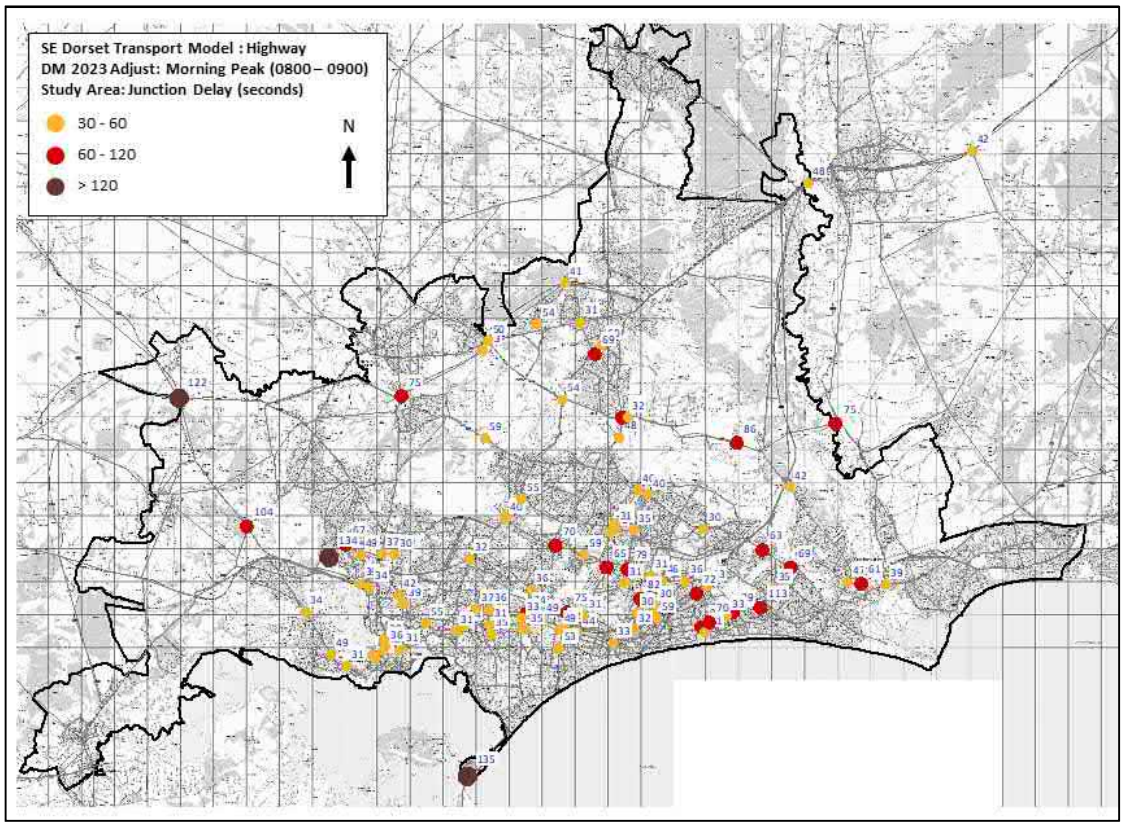

Figure 2.10: Node Delay (seconds) – 2023 Do Minimum, AM Peak

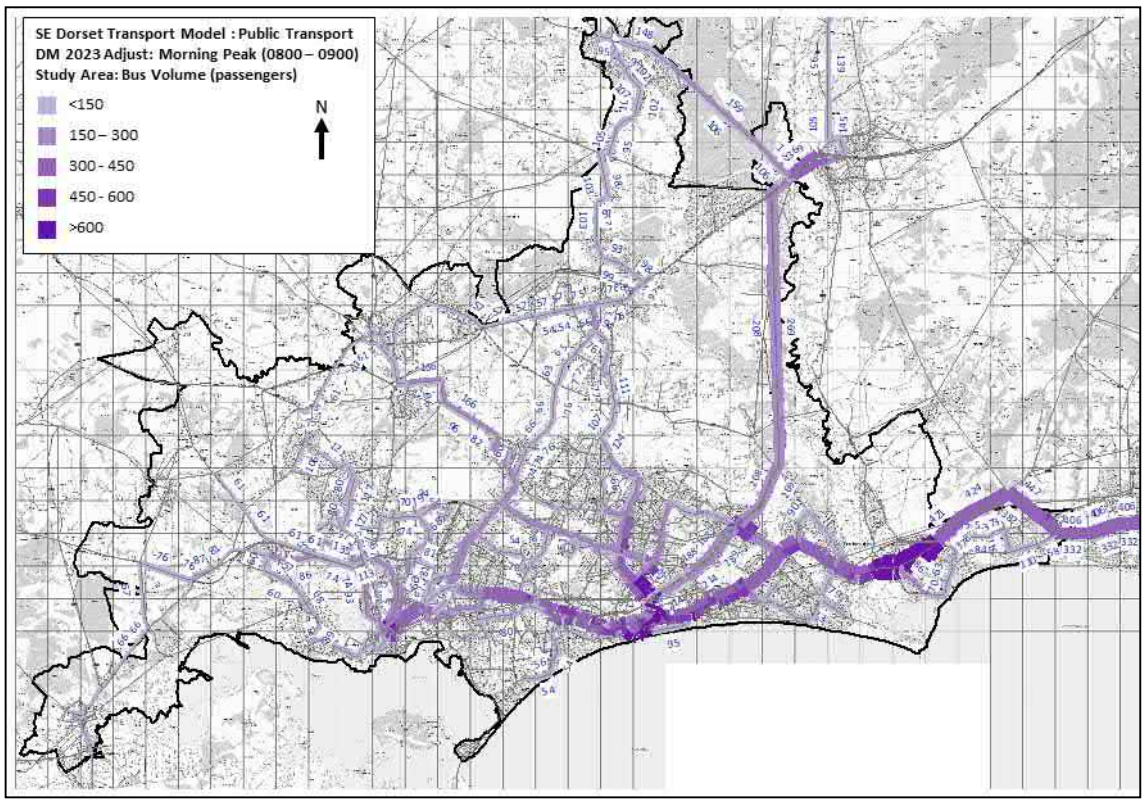

Figure 2.11: Bus Flows (passengers) - 2023 Do Minimum, AM Peak

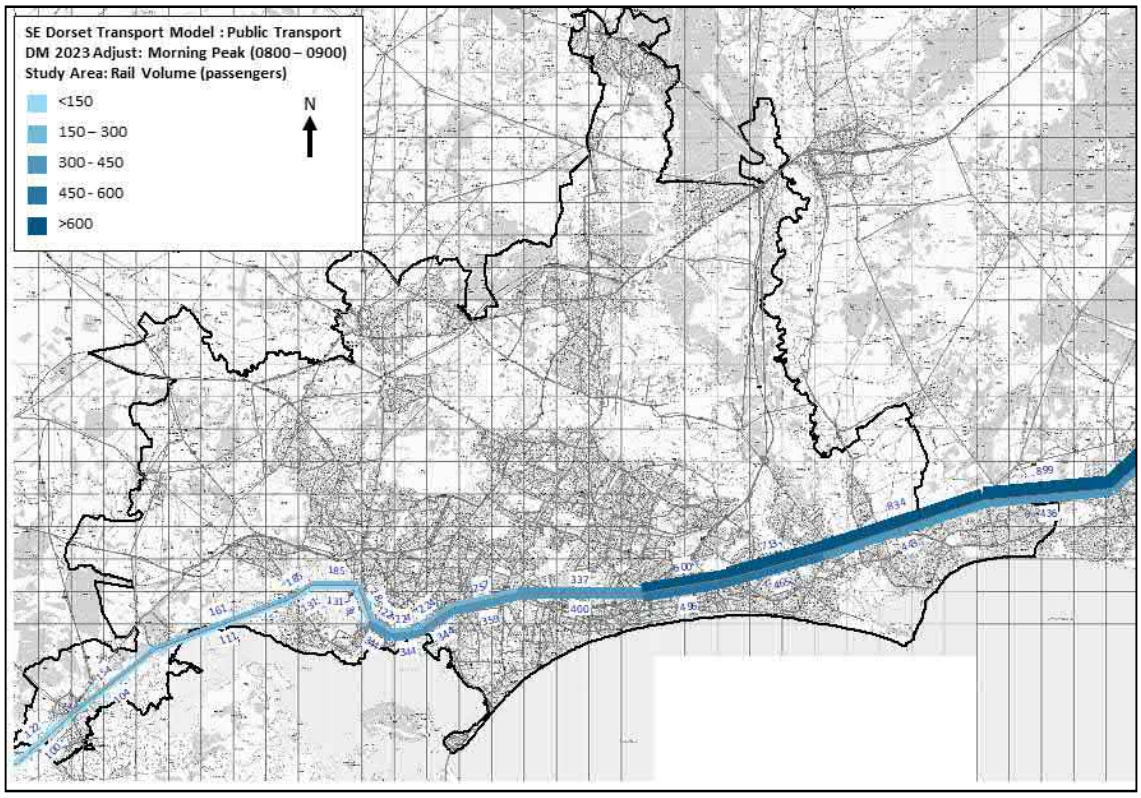

Figure 2.12: Rail Flows (passengers) - 2023 Do Minimum, AM Peak

2023 Do Minimum: Interpeak

The model outputs for the 2023 Do Minimum: Interpeak are shown below. Figure 2.13 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.2.

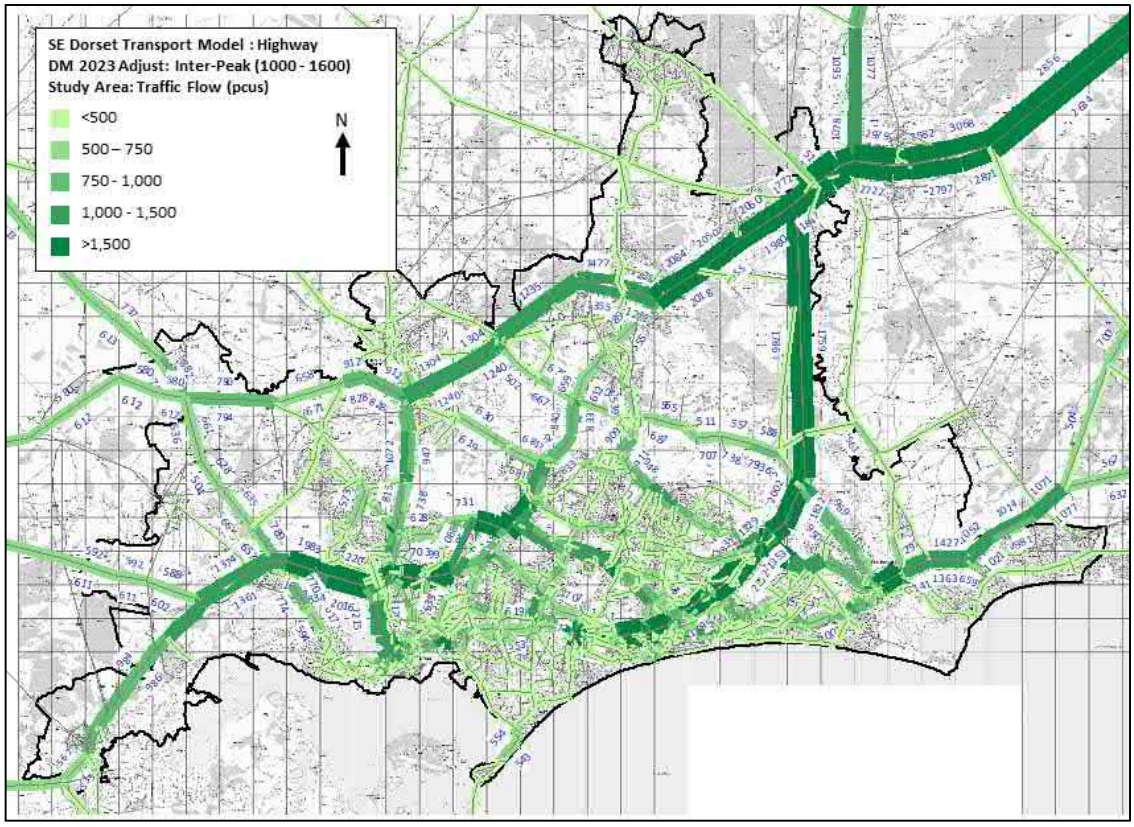

Figure 2.13: Actual Flows (vehicles) – 2023 Do Minimum, Interpeak

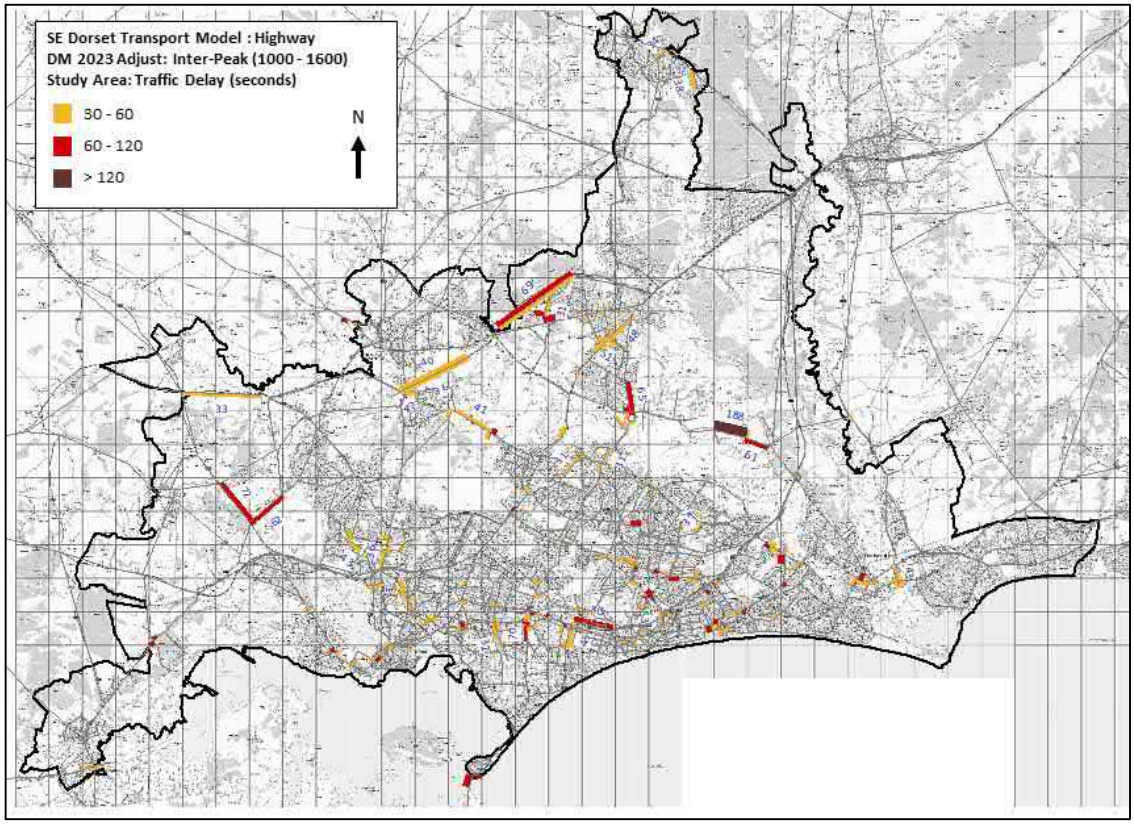

Figure 2.14: Link Delays (seconds) – 2023 Do Minimum, Interpeak

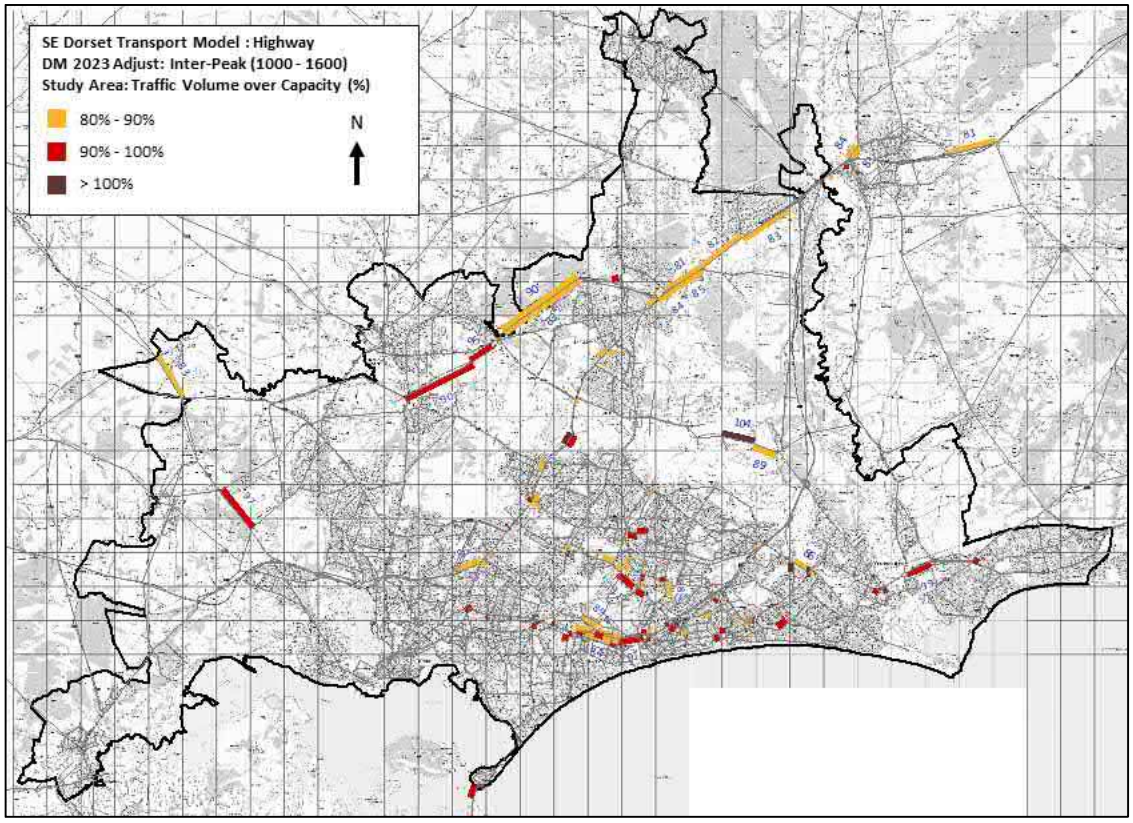

Figure 2.15: Link V/C (%) – 2023 Do Minimum, Interpeak

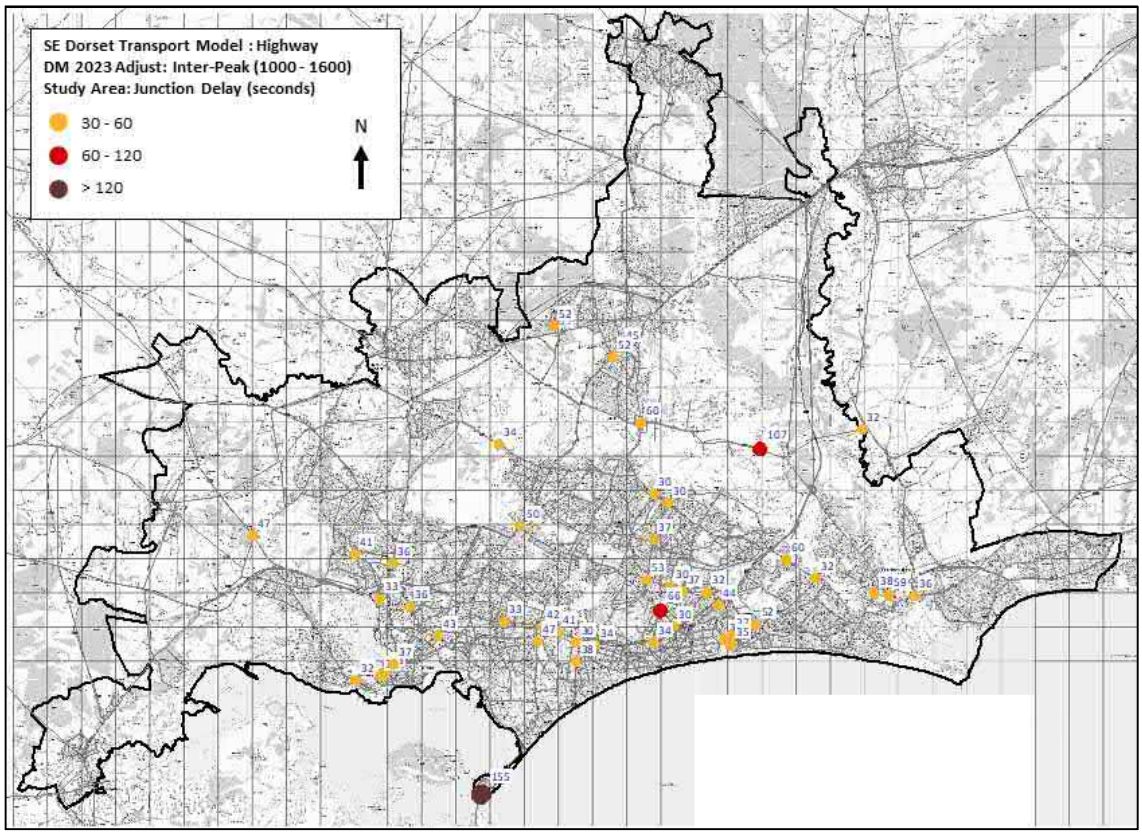

Figure 2.16: Node Delay (seconds) – 2023 Do Minimum, Interpeak

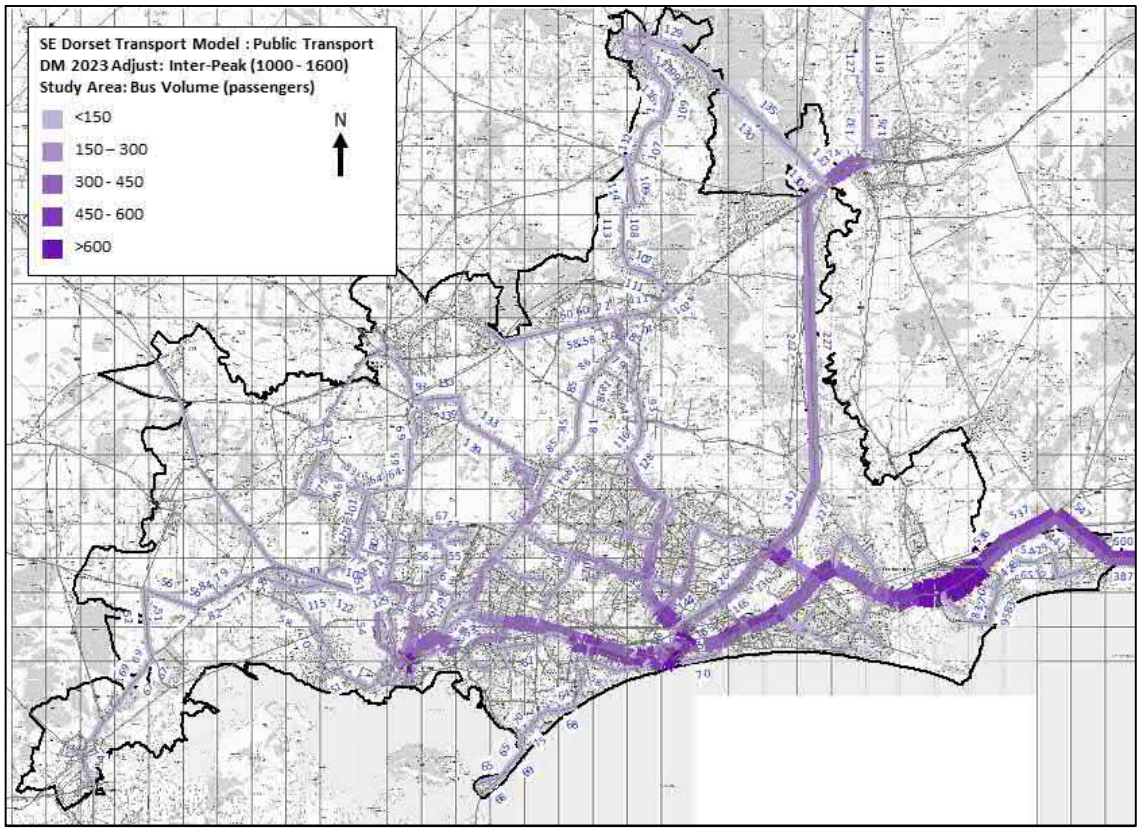

Figure 2.17: Bus Flows (passengers) - 2023 Do Minimum, Interpeak

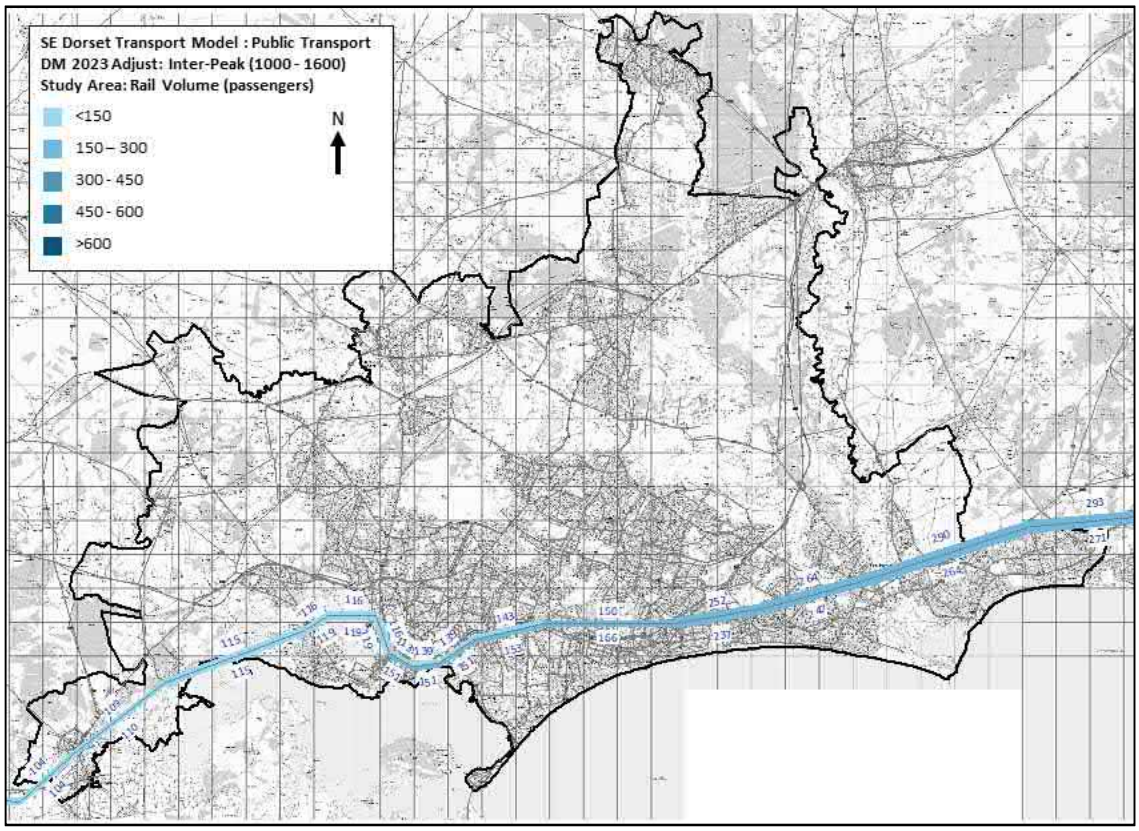

Figure 2.18: Rail Flows (passengers) - 2023 Do Minimum, Interpeak

2023 Do Minimum: PM Peak

The model outputs for the 2023 Do Minimum: PM Peak are shown below. Figure 2.19 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.3.

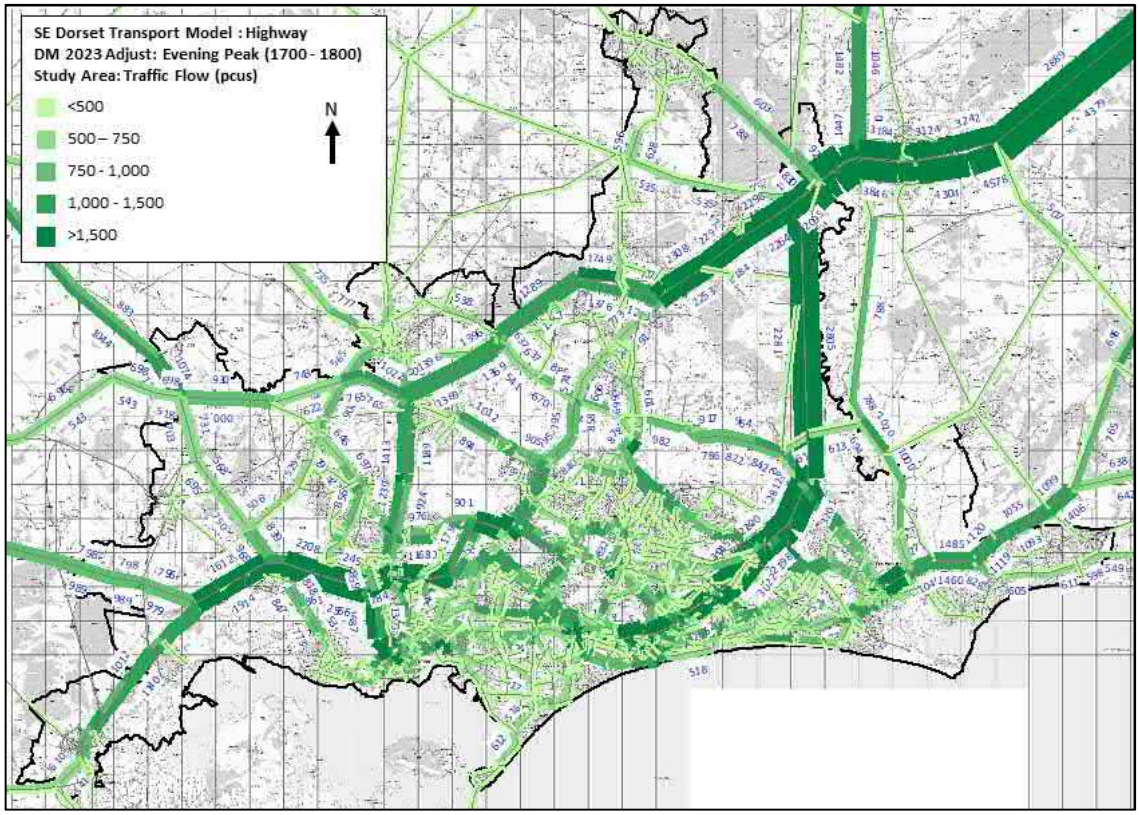

Figure 2.19: Actual Flows (vehicles) – 2023 Do Minimum, PM Peak

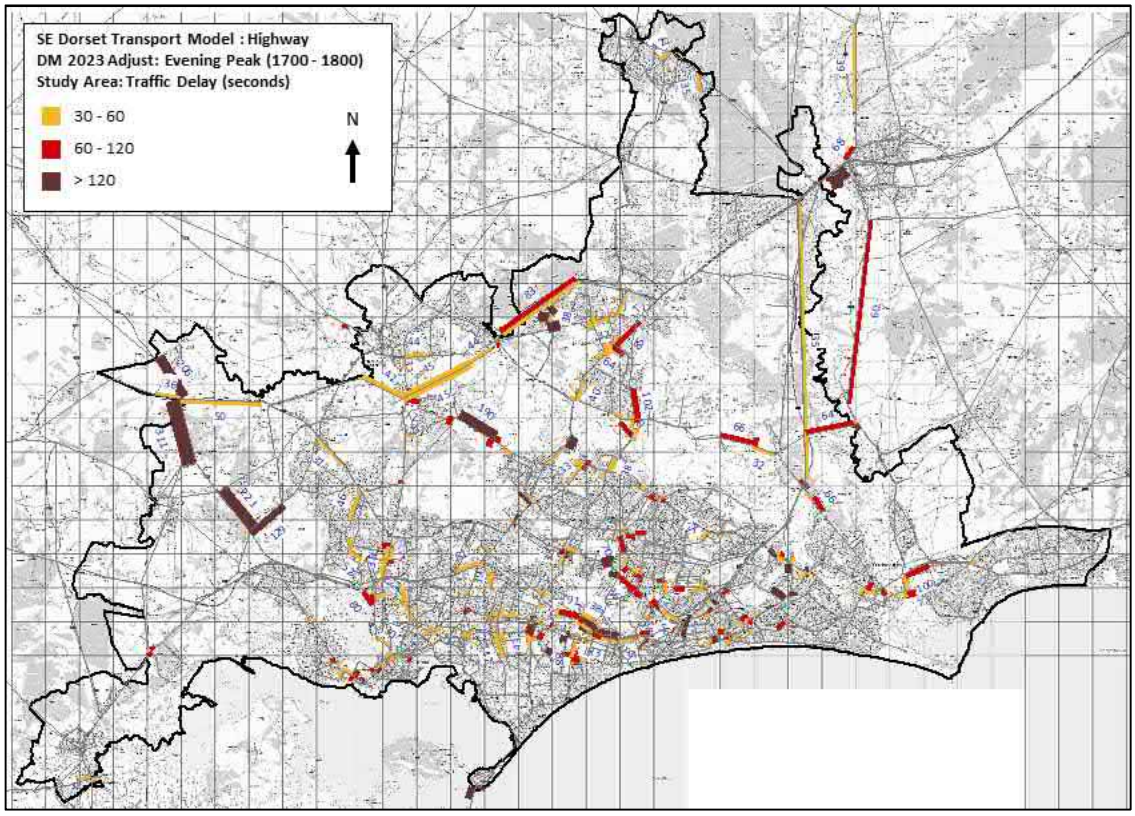

Figure 2.20: Link Delays (seconds) – 2023 Do Minimum, PM Peak

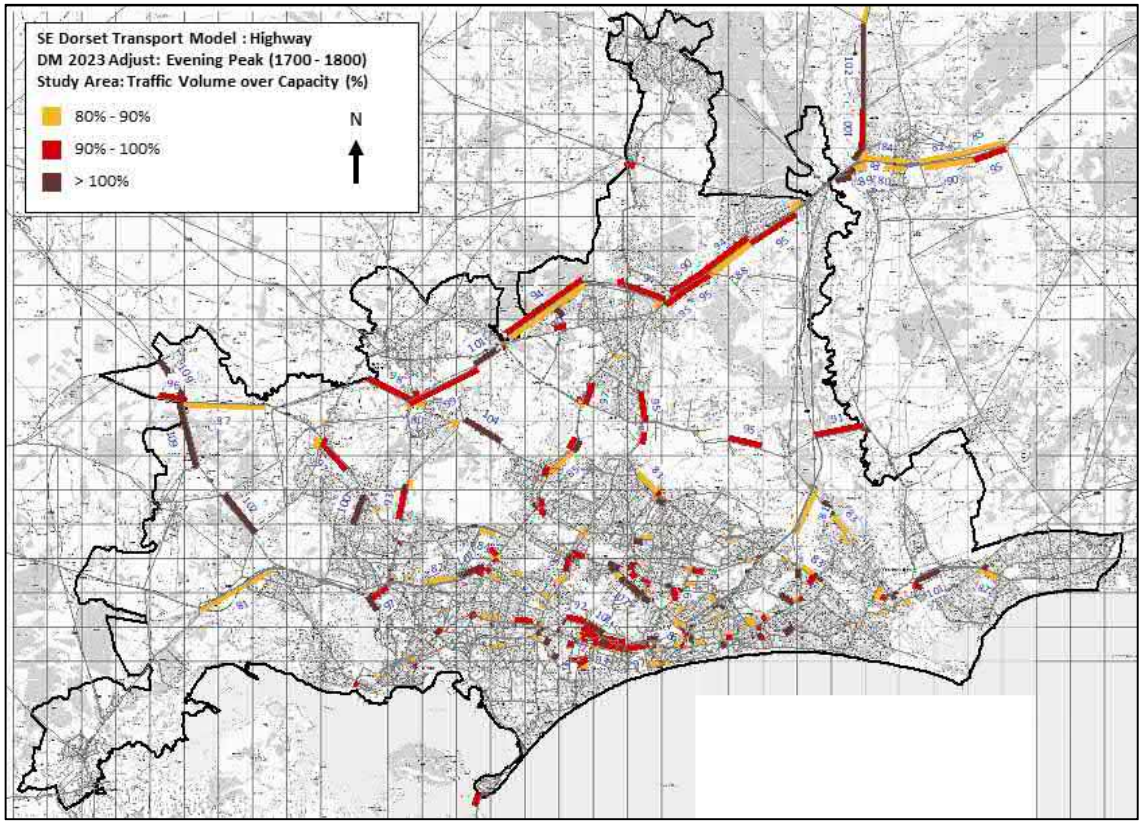

Figure 2.21: Link V/C (%) – 2023 Do Minimum, PM Peak

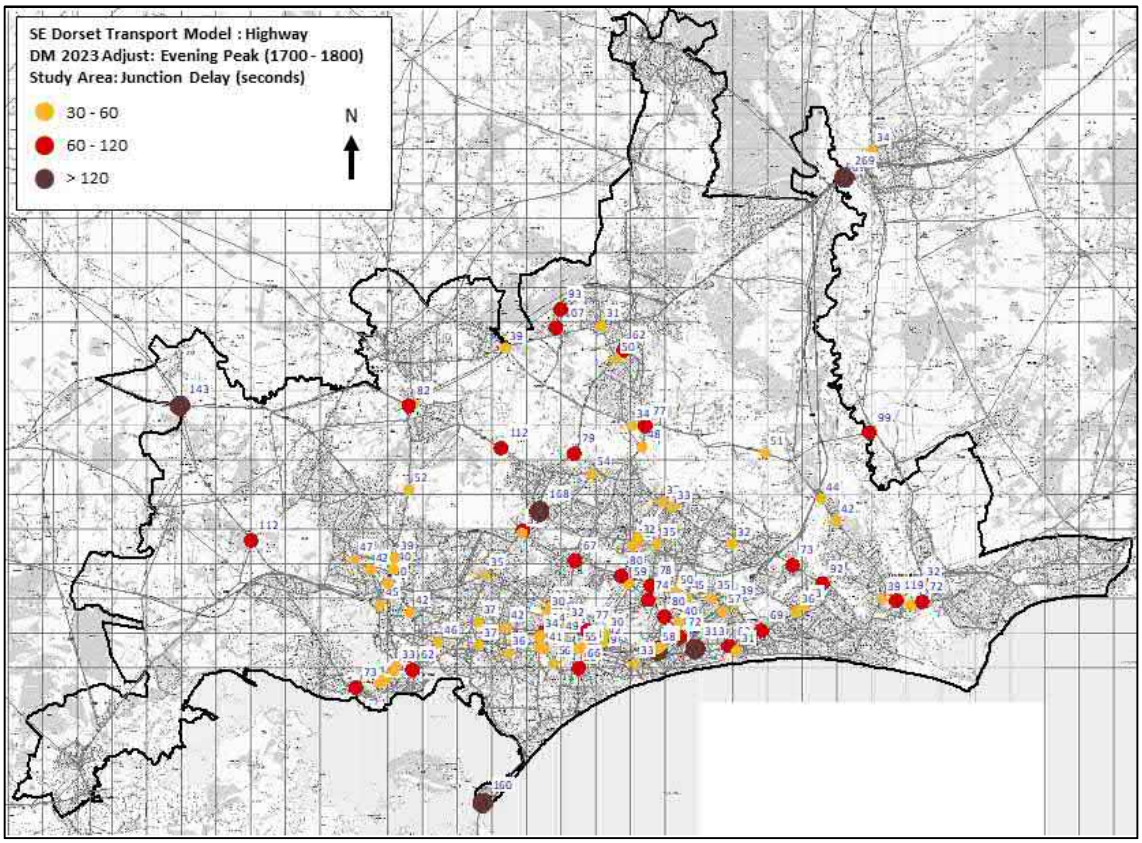

Figure 2.22: Node Delay (seconds) – 2023 Do Minimum, PM Peak

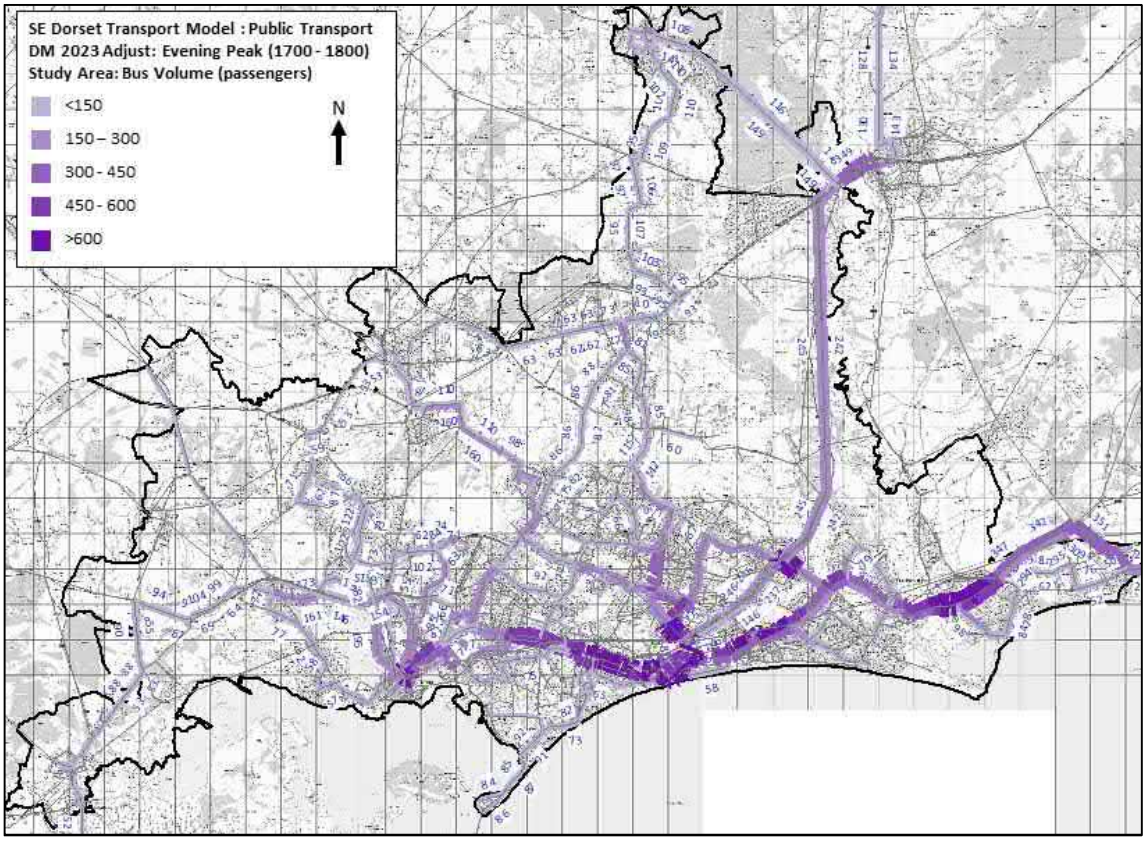

Figure 2.23: Bus Flows (passengers) - 2023 Do Minimum, PM Peak

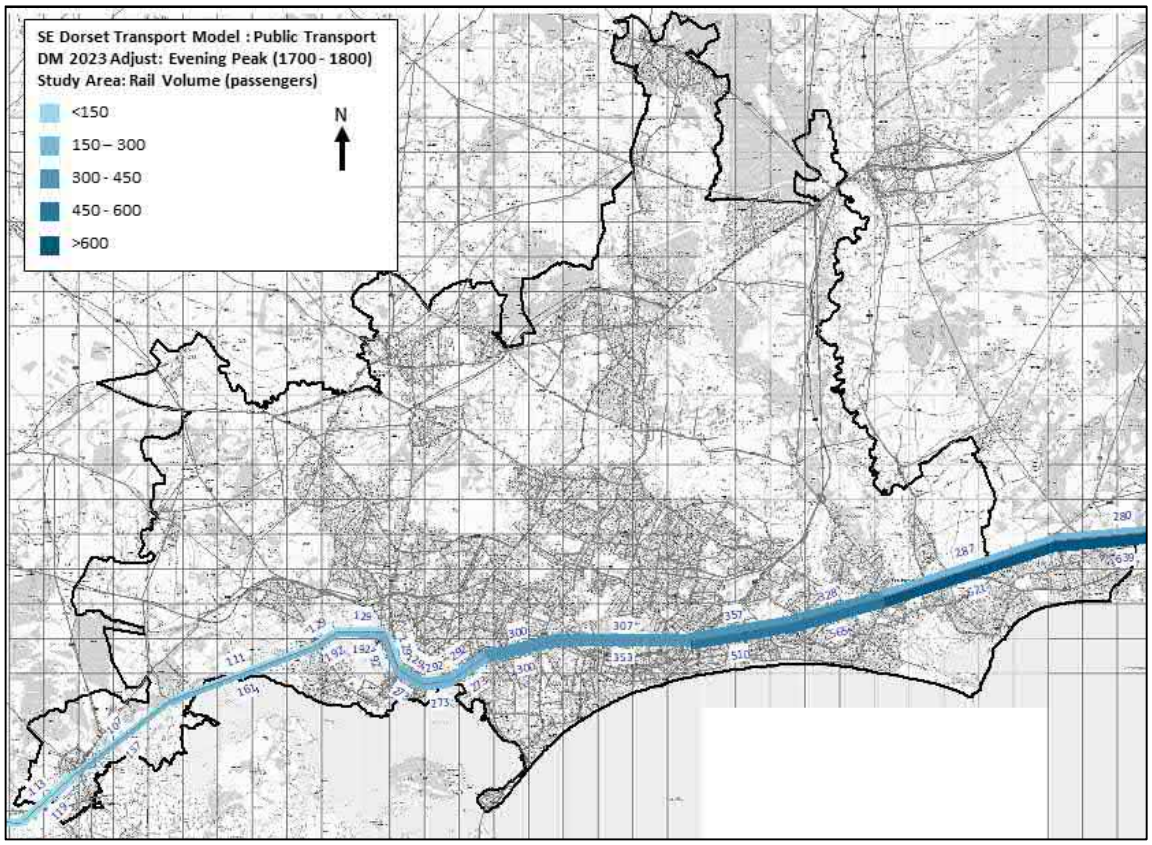

Figure 2.24: Rail Flows (passengers) - 2023 Do Minimum, PM Peak

2031 Do Minimum: AM Peak

The model outputs for the 2031 Do Minimum: AM Peak are shown below. Figure 2.25 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.4.

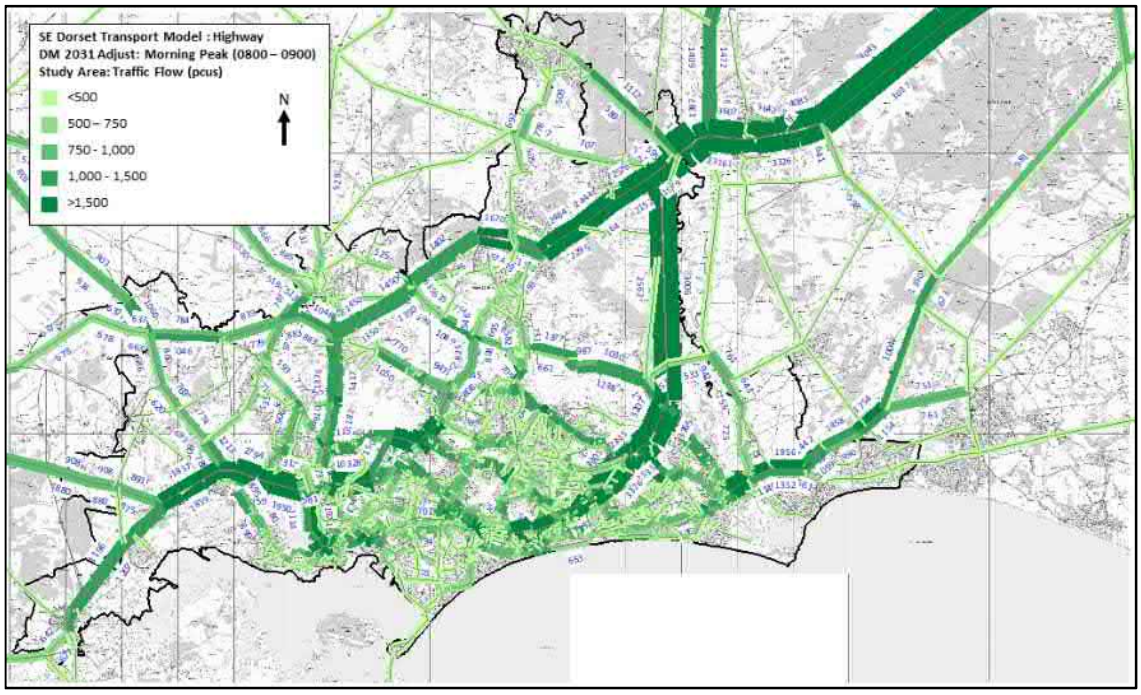

Figure 2.25: Actual Flows (vehicles) – 2031 Do Minimum, AM Peak

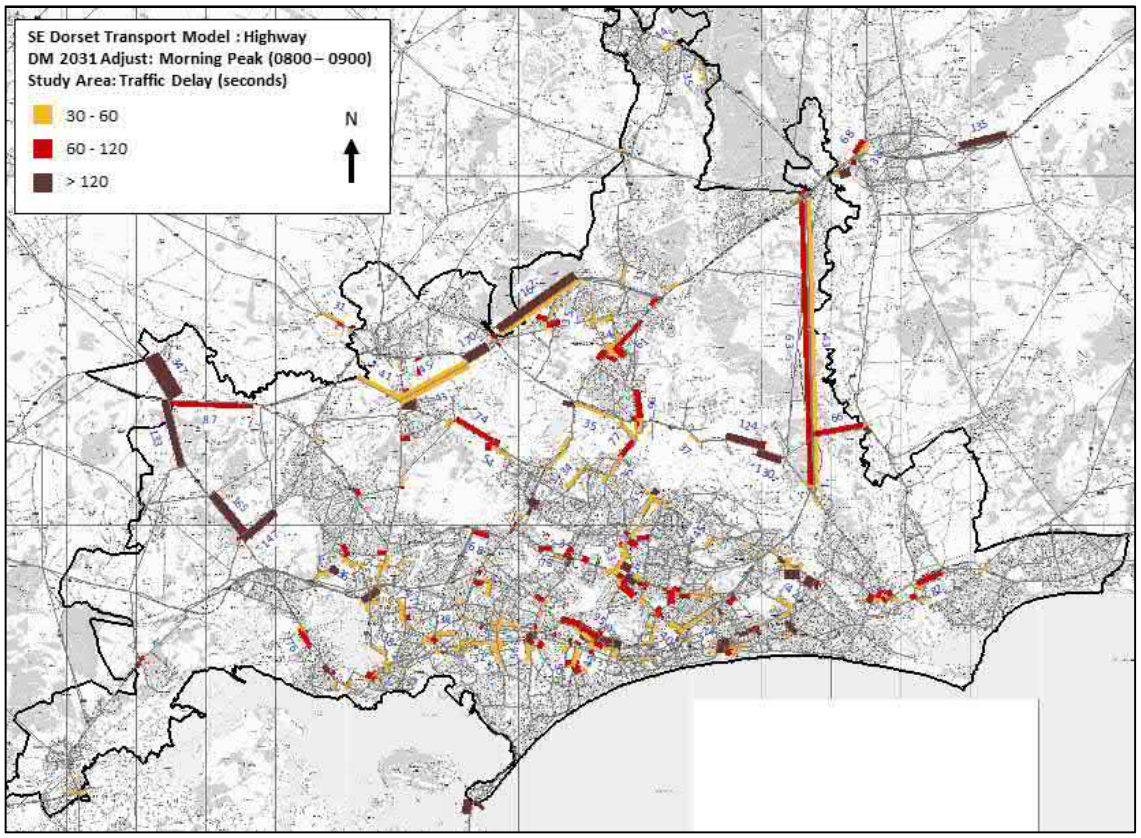

Figure 2.26: Link Delays (seconds) – 2031 Do Minimum, AM Peak

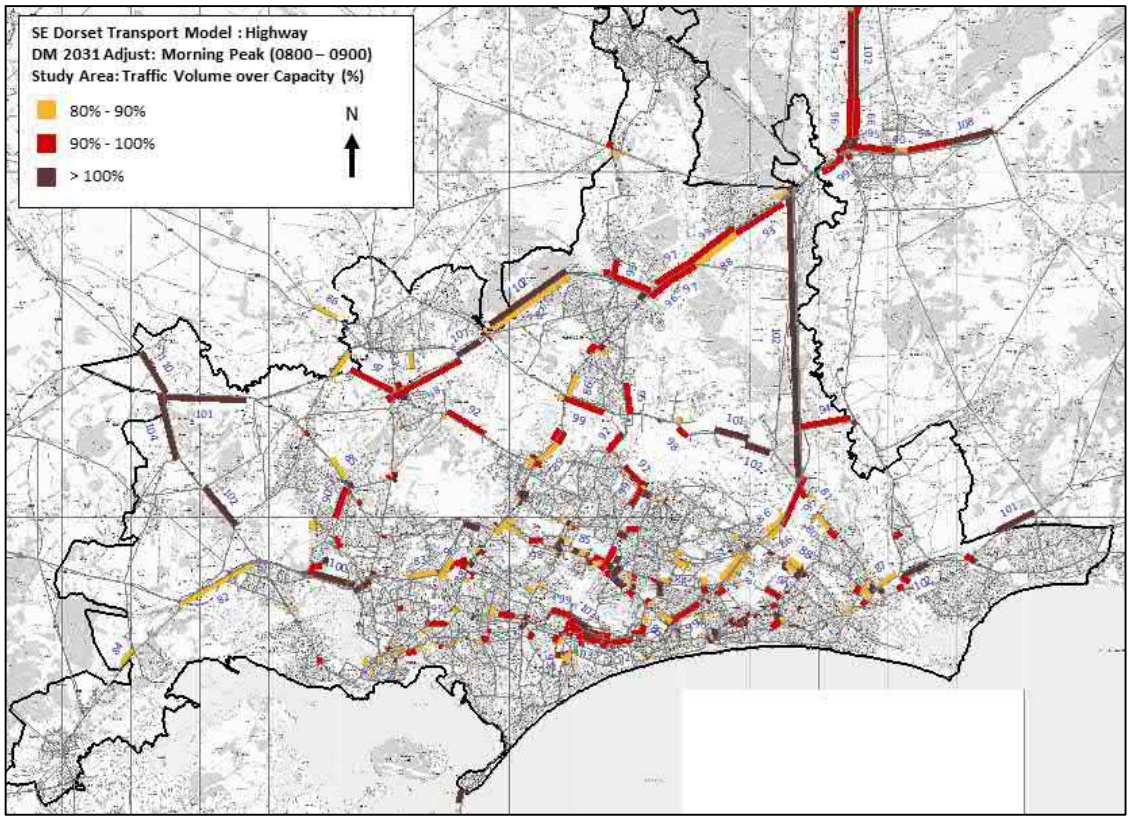

Figure 2.27: Link V/C (%) – 2031 Do Minimum, AM Peak

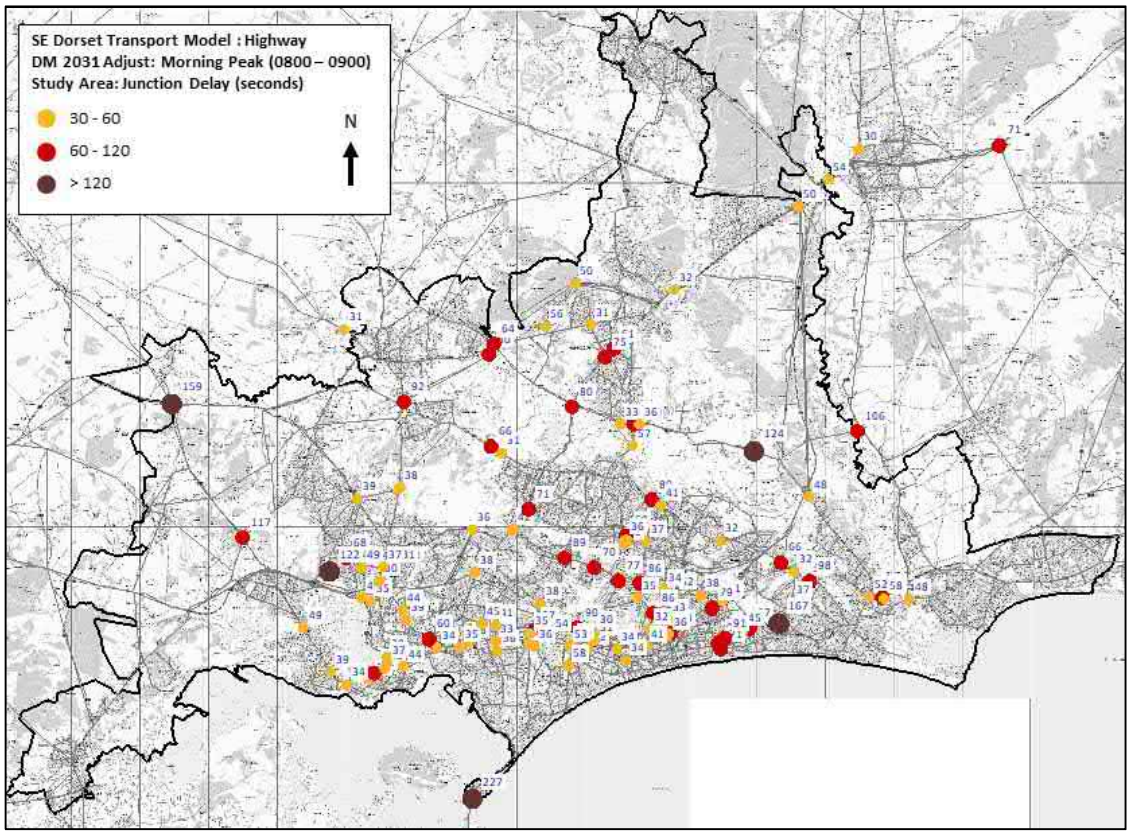

Figure 2.28: Node Delay (seconds) – 2031 Do Minimum, AM Peak

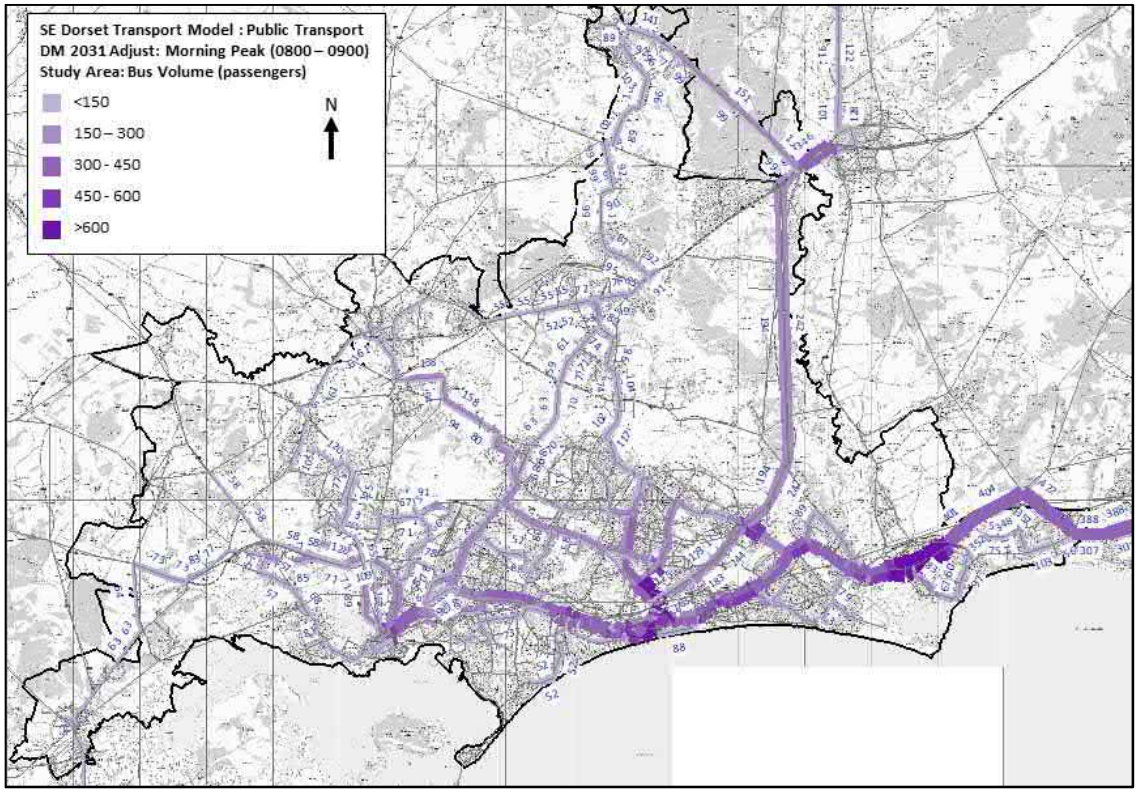

Figure 2.29: Bus Flows (passengers) - 2031 Do Minimum, AM Peak

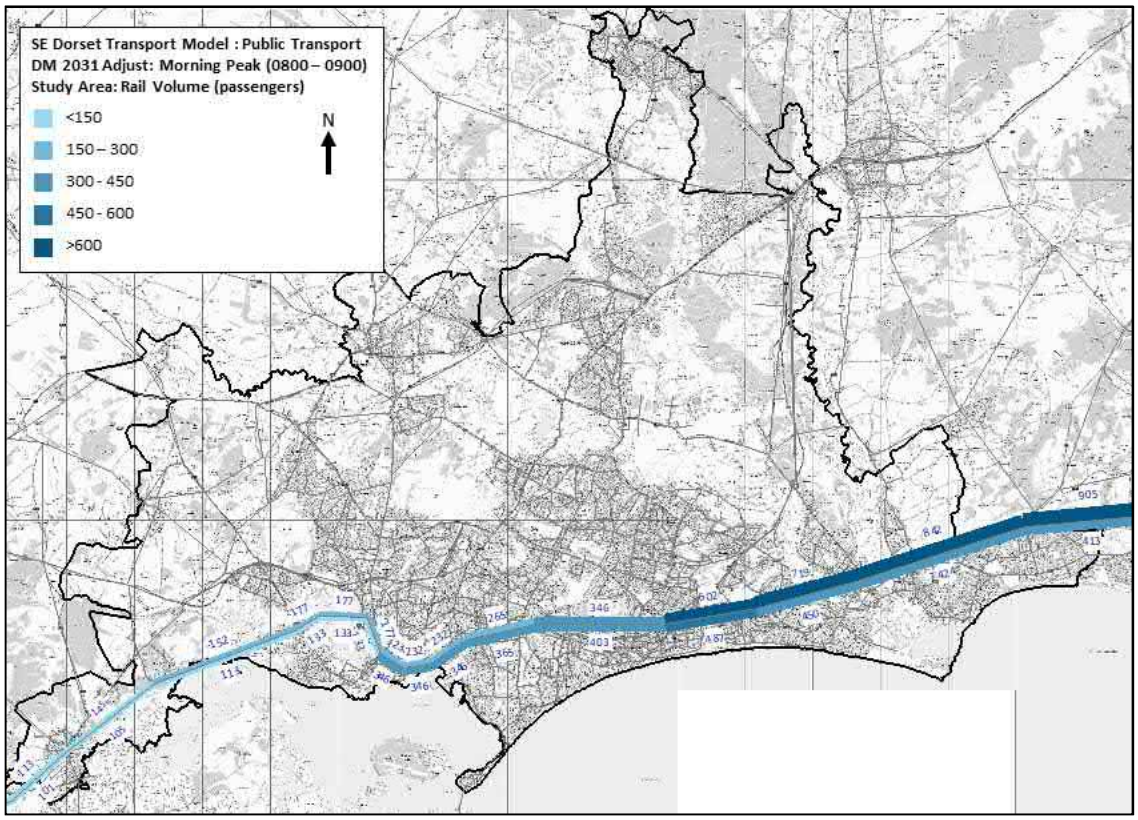

Figure 2.30: Rail Flows (passengers) - 2031 Do Minimum, AM Peak

2031 Do Minimum: Interpeak

The model outputs for the 2031 Do Minimum: Interpeak are shown below. Figure 2.31 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.5.

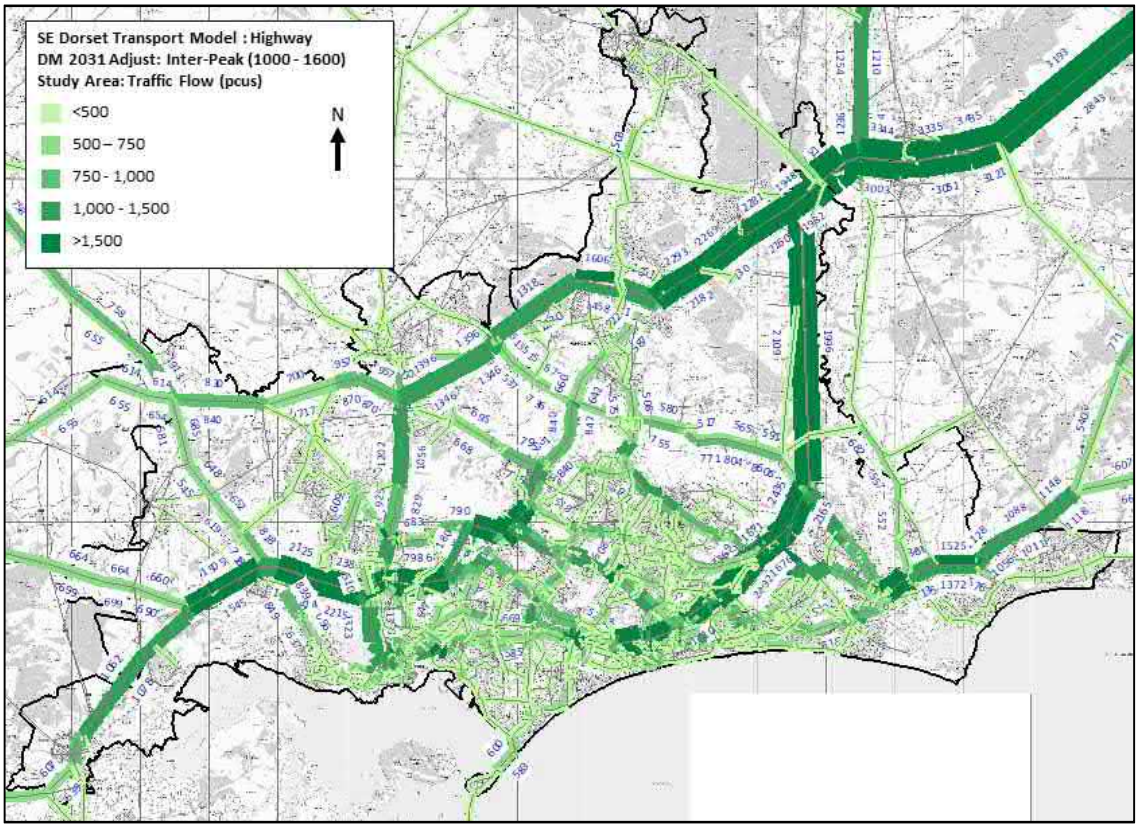

Figure 2.31: Actual Flows (vehicles) – 2031 Do Minimum, Interpeak

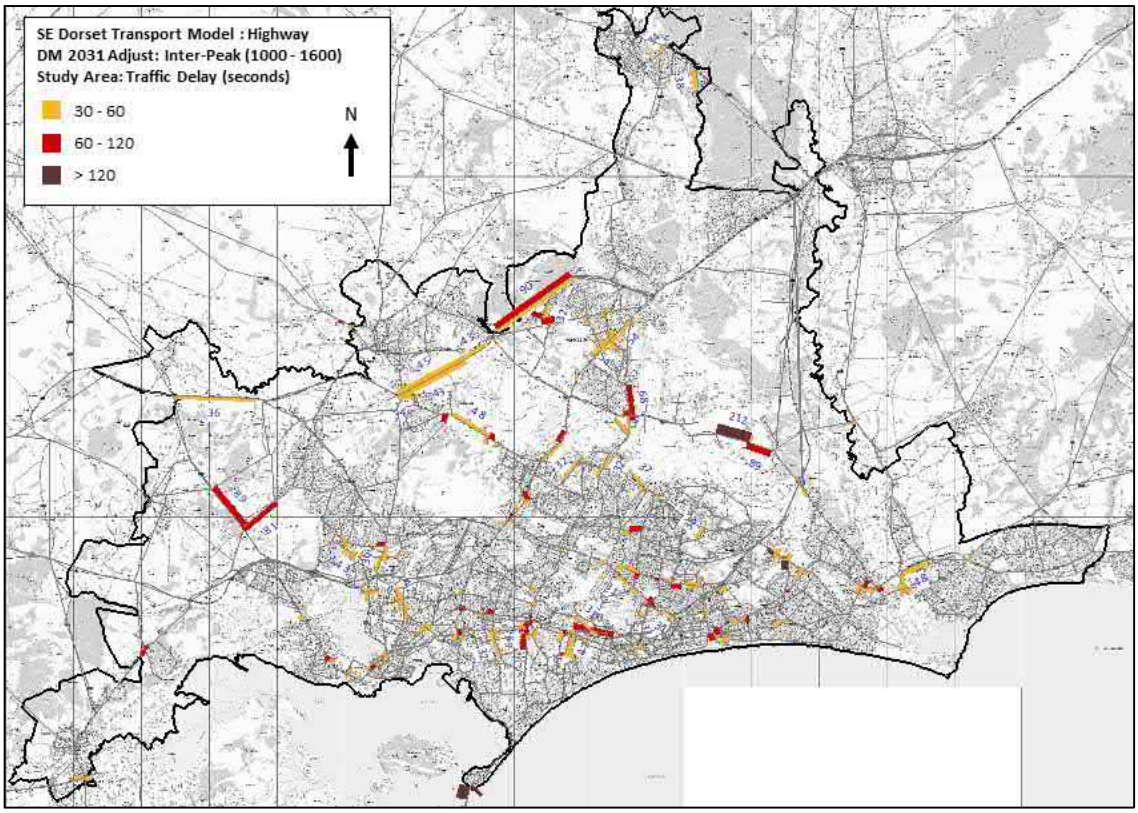

Figure 2.32: Link Delays (seconds) – 2031 Do Minimum, Interpeak

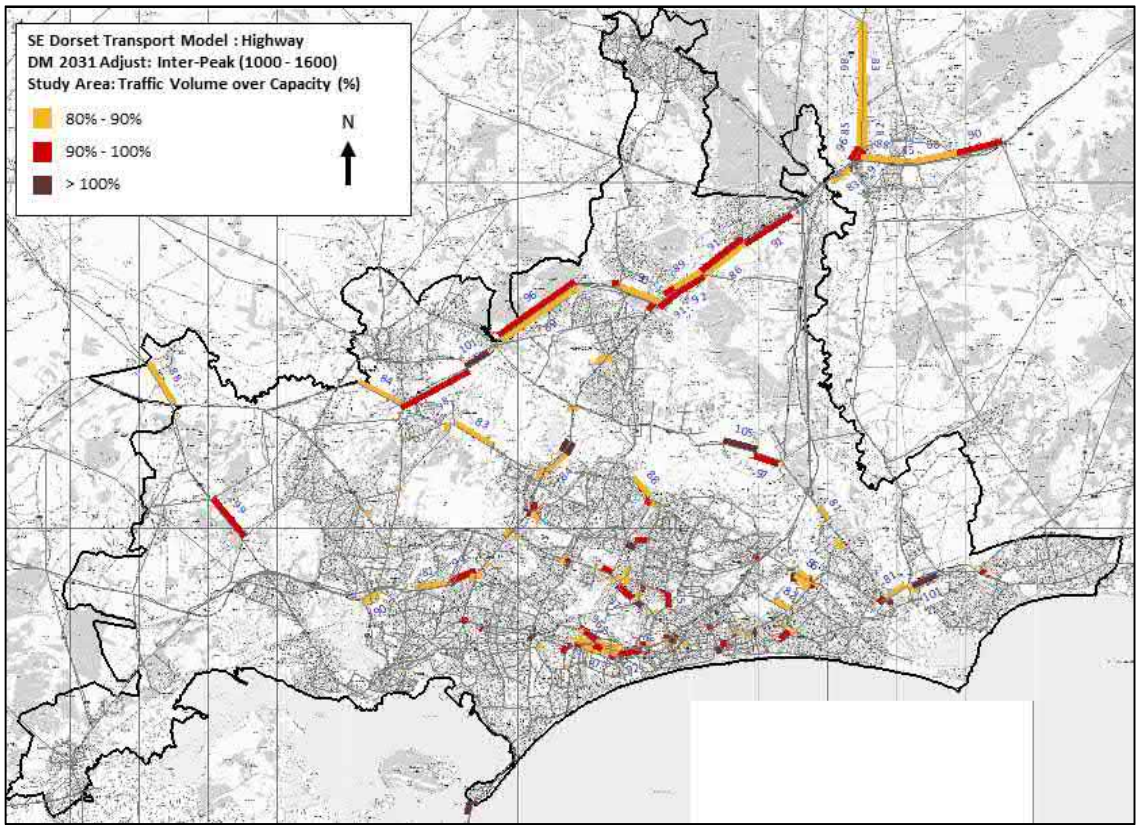

Figure 2.33: Link V/C (%) – 2031 Do Minimum, Interpeak

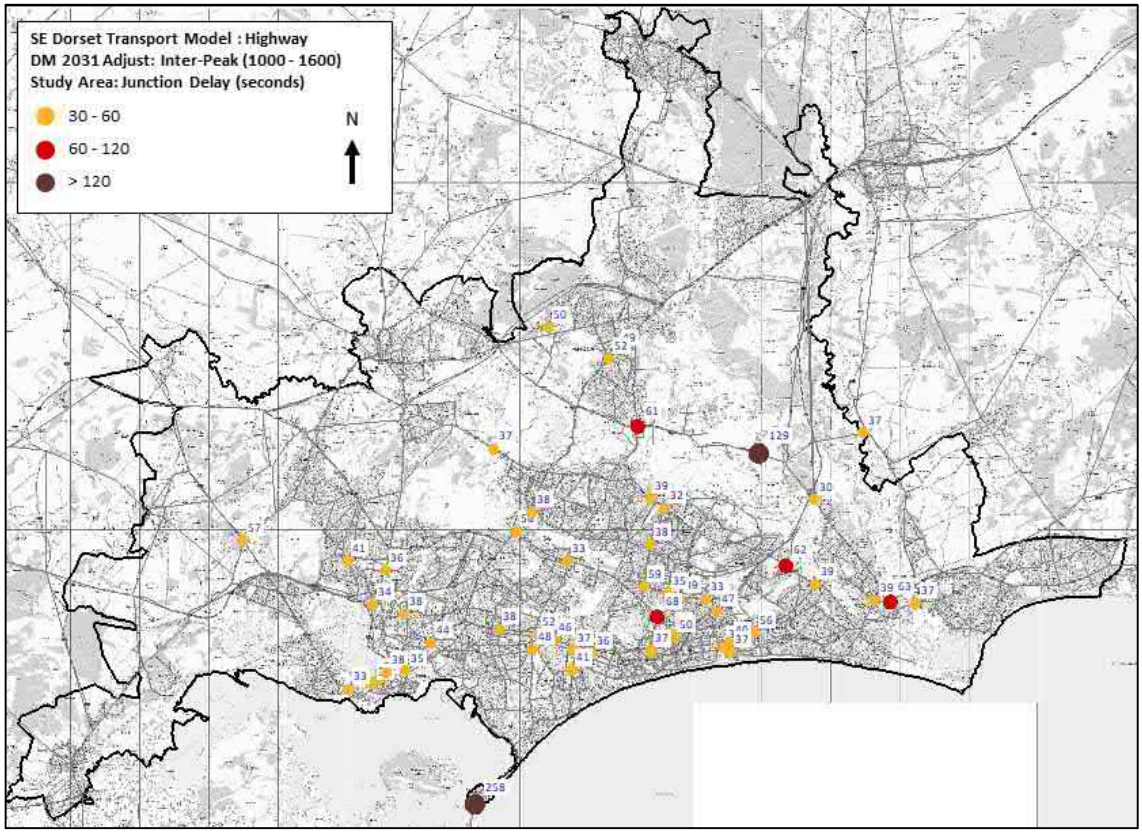

Figure 2.34: Node Delay (seconds) – 2031 Do Minimum, Interpeak

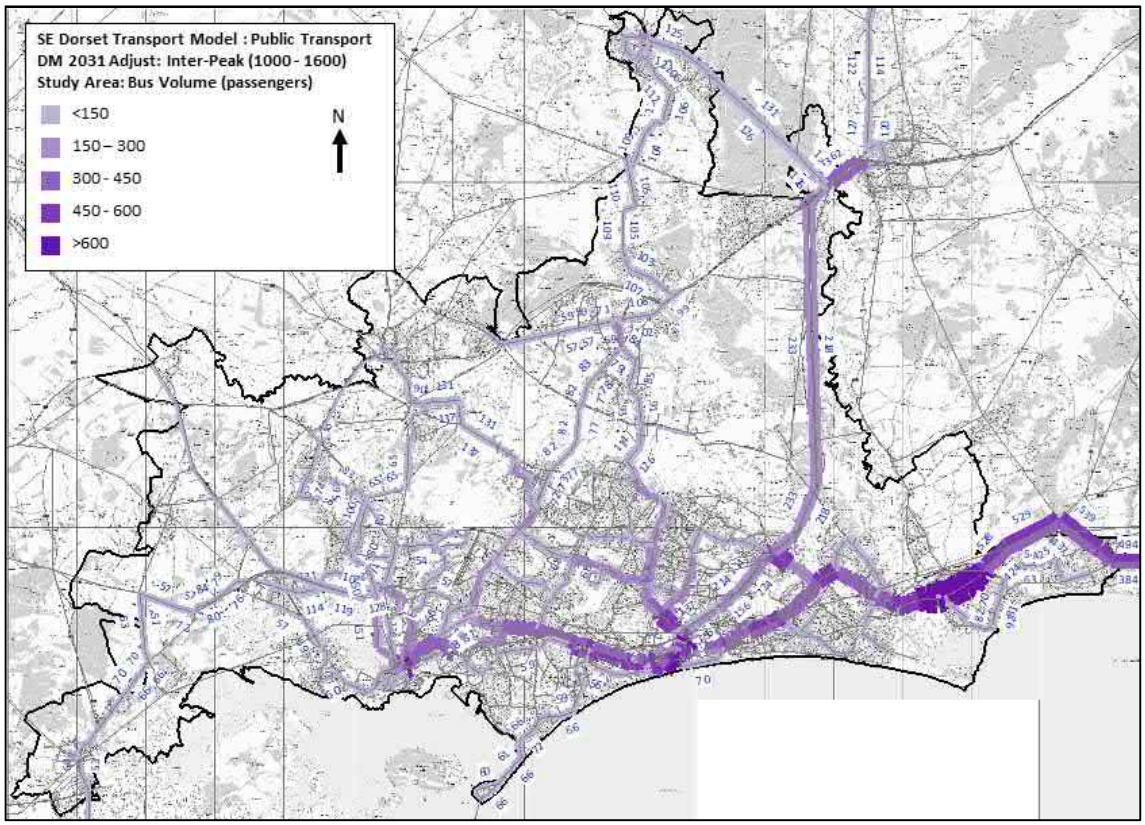

Figure 2.35: Bus Flows (passengers) - 2031 Do Minimum, Interpeak

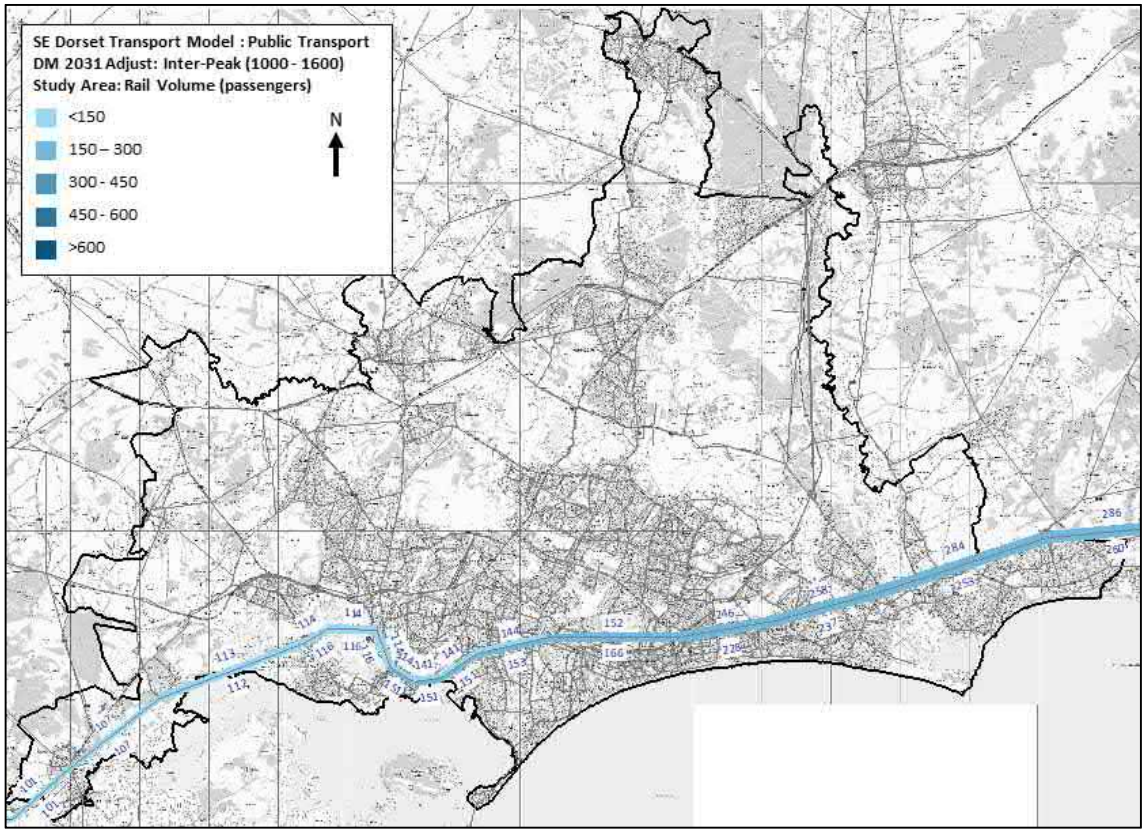

Figure 2.36: Rail Flows (passengers) - 2031 Do Minimum, Interpeak

2031 Do Minimum: PM Peak

The model outputs for the 2031 Do Minimum: PM Peak are shown below. Figure 2.37 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.6.

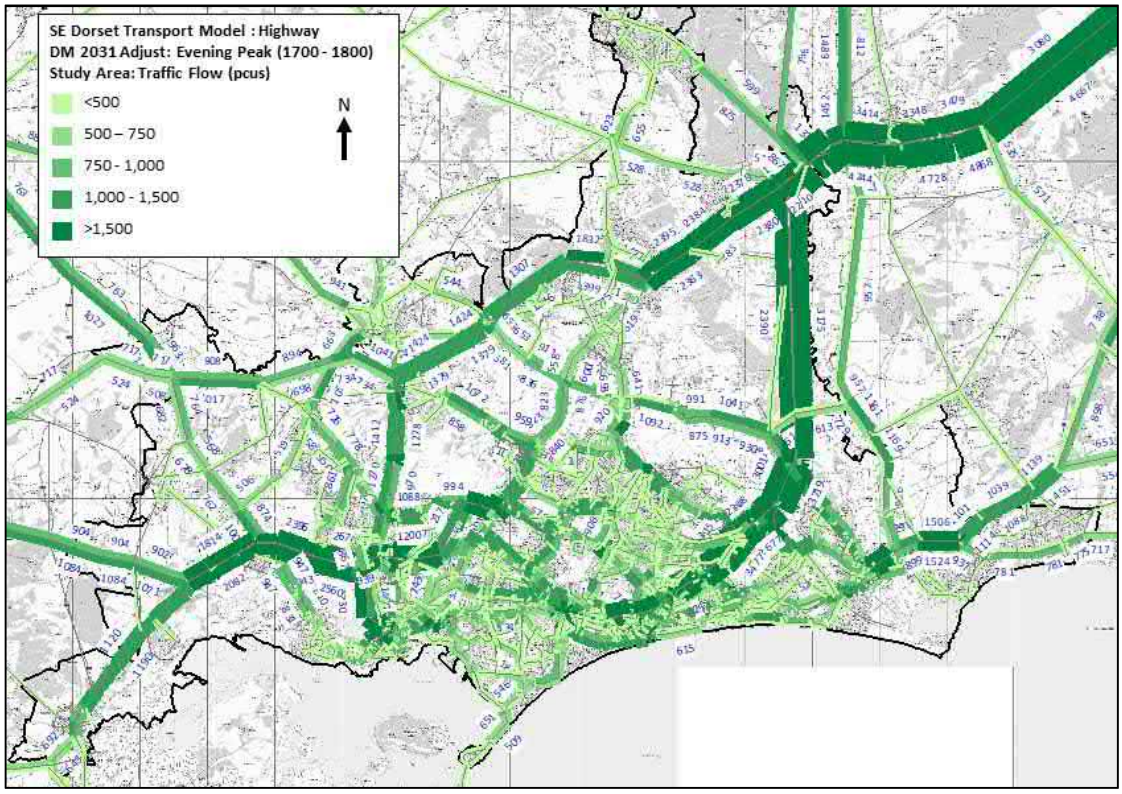

Figure 2.37: Actual Flows (vehicles) – 2031 Do Minimum, PM Peak

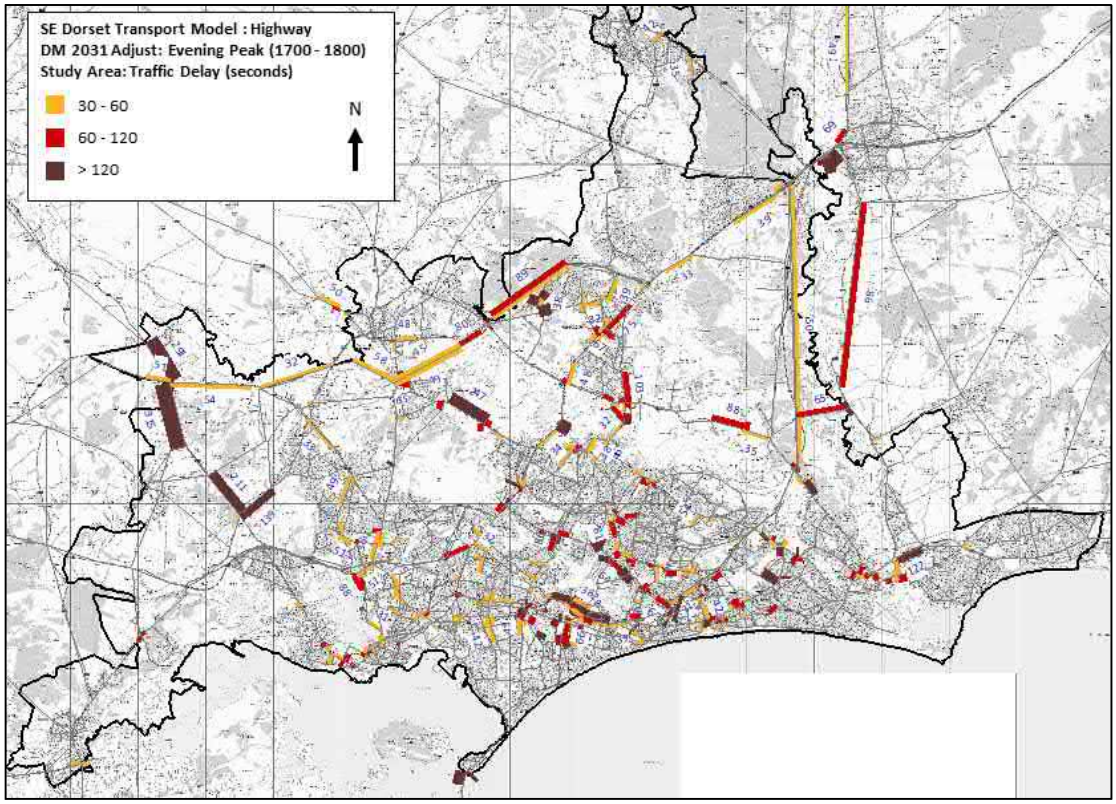

Figure 2.38: Link Delays (seconds) – 2031 Do Minimum, PM Peak

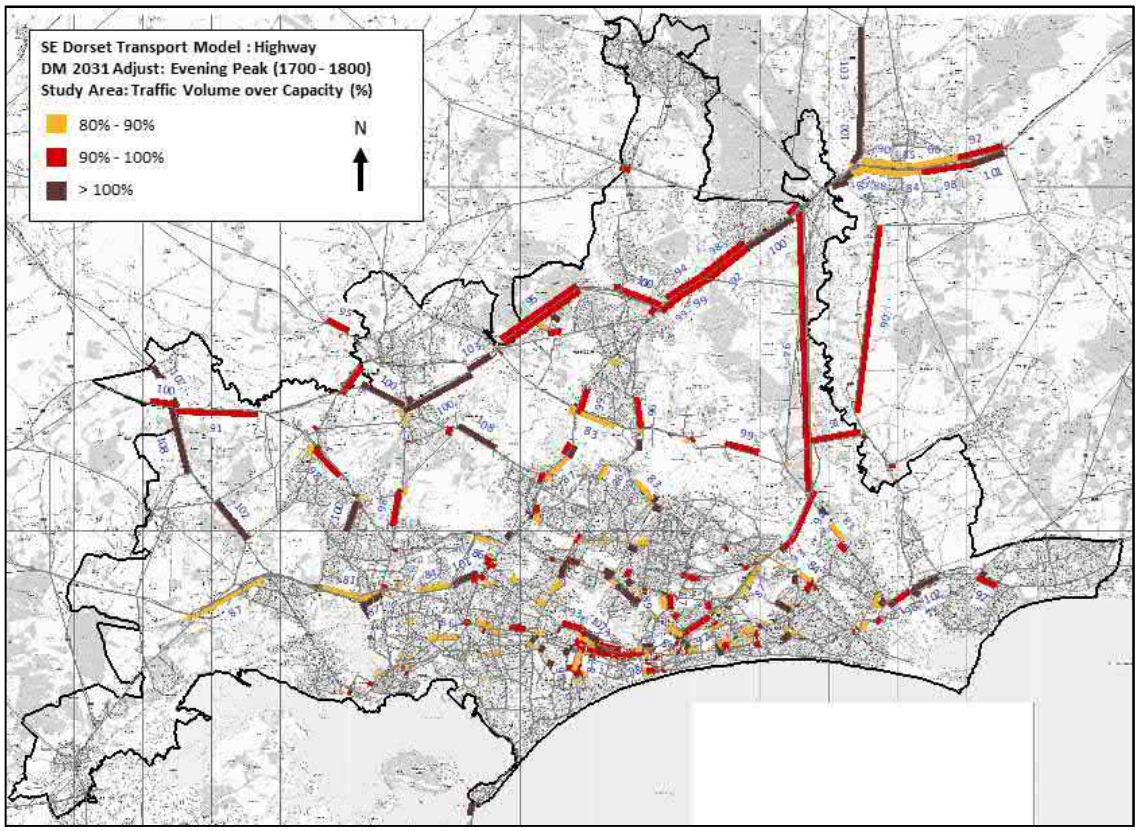

Figure 2.39: Link V/C (%) – 2031 Do Minimum, PM Peak

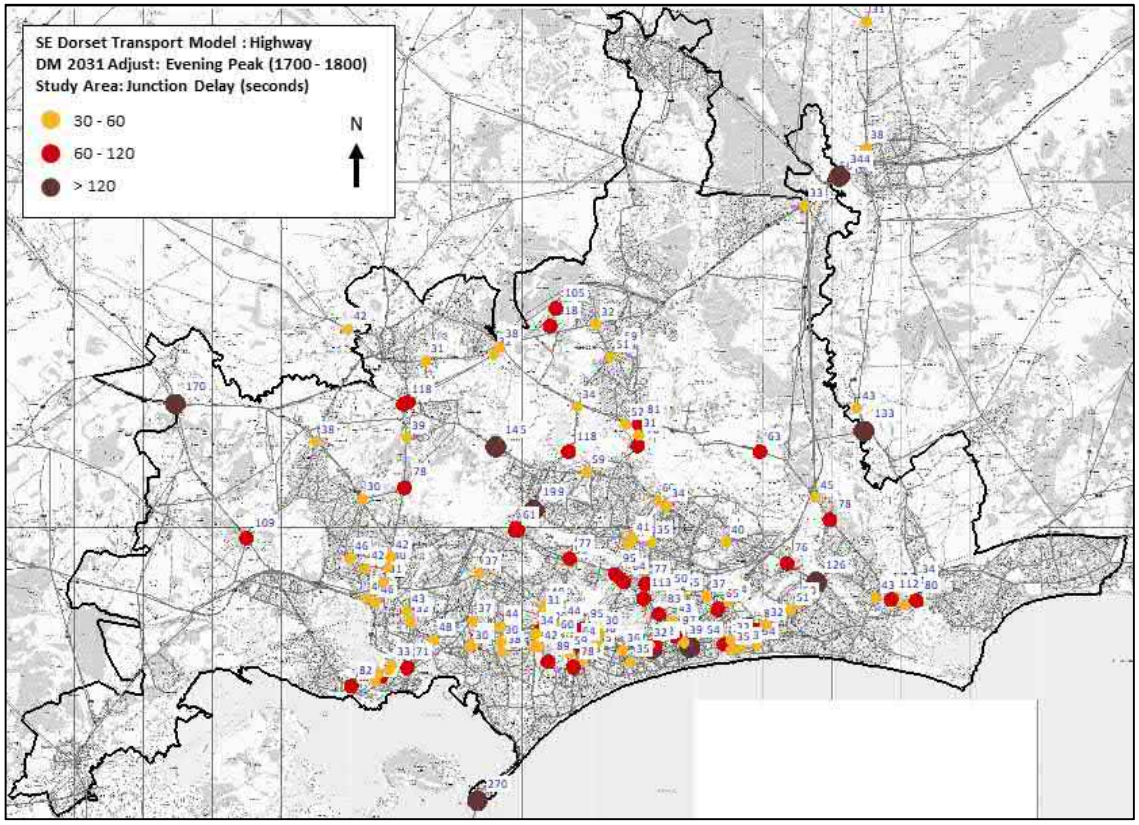

Figure 2.40: Node Delay (seconds) – 2031 Do Minimum, PM Peak

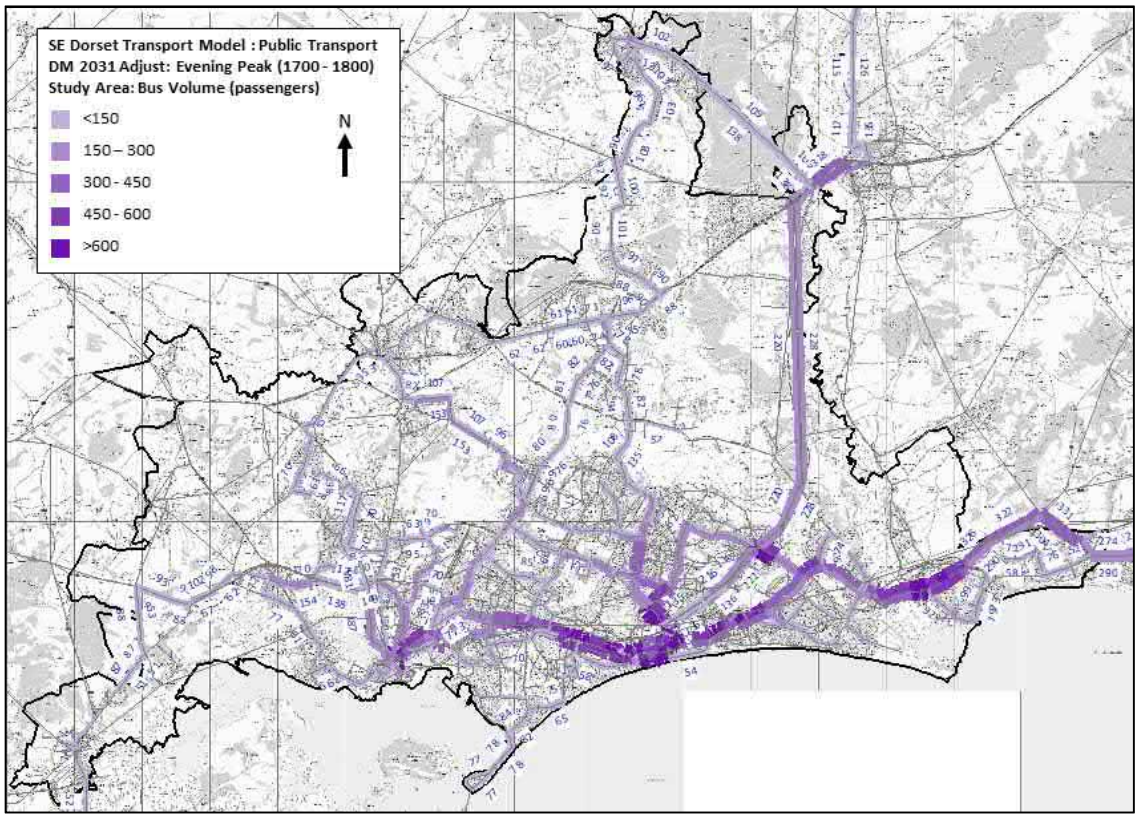

Figure 2.41: Bus Flows (passengers) - 2031 Do Minimum, PM Peak

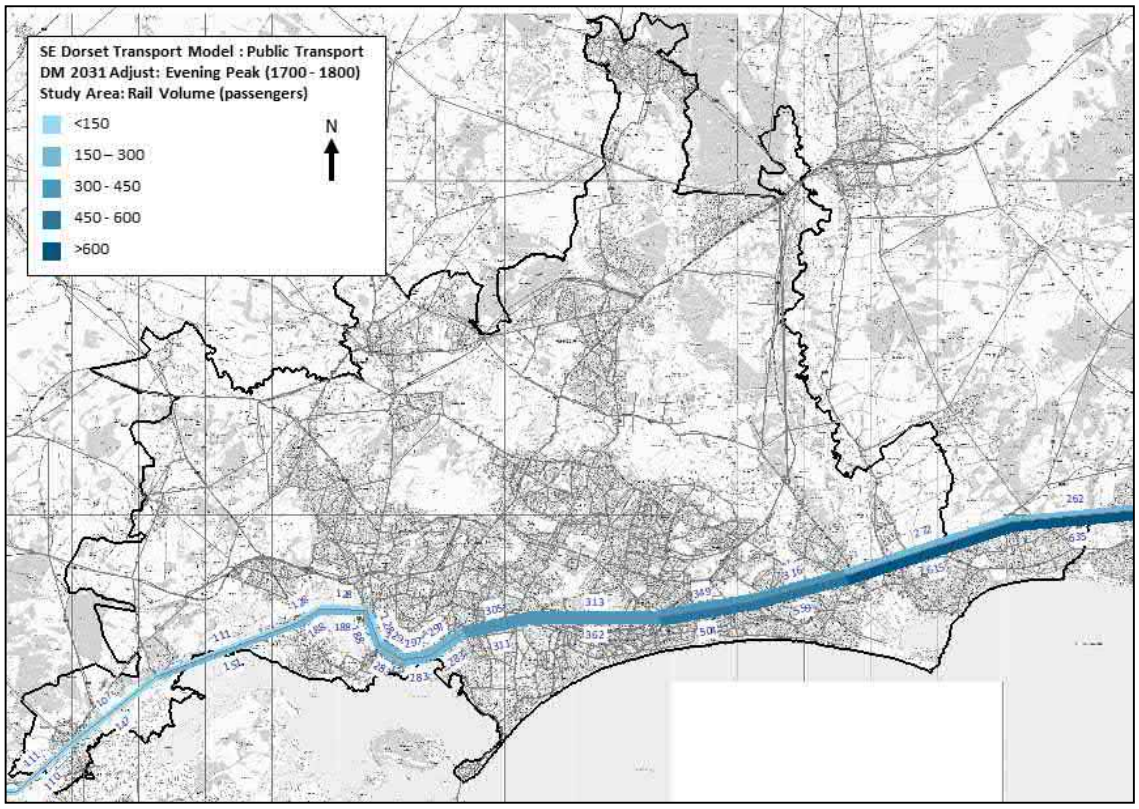

Figure 2.42: Rail Flows (passengers) - 2031 Do Minimum, PM Peak

2039 Do Minimum: AM Peak

The model outputs for the 2039 Do Minimum: AM Peak are shown below. Figure 2.43 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.7.

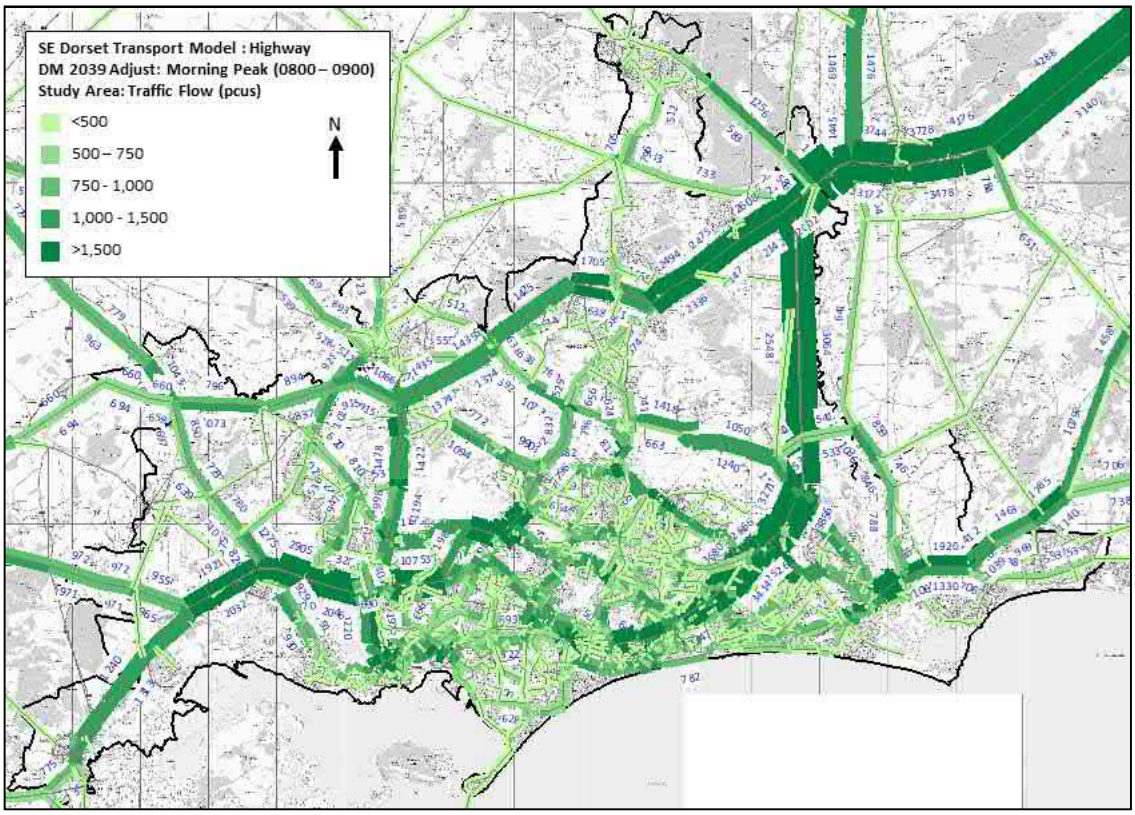

Figure 2.43: Actual Flows (vehicles) – 2039 Do Minimum, AM Peak

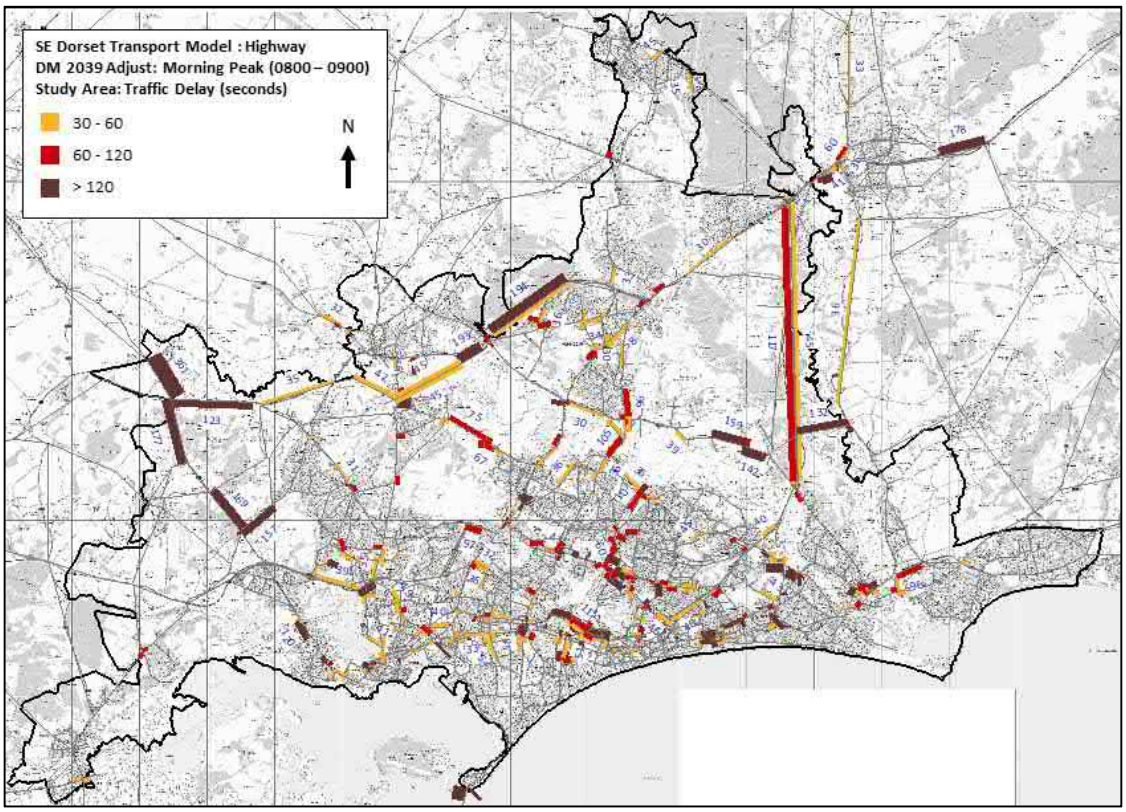

Figure 2.44: Link Delays (seconds) – 2039 Do Minimum, AM Peak

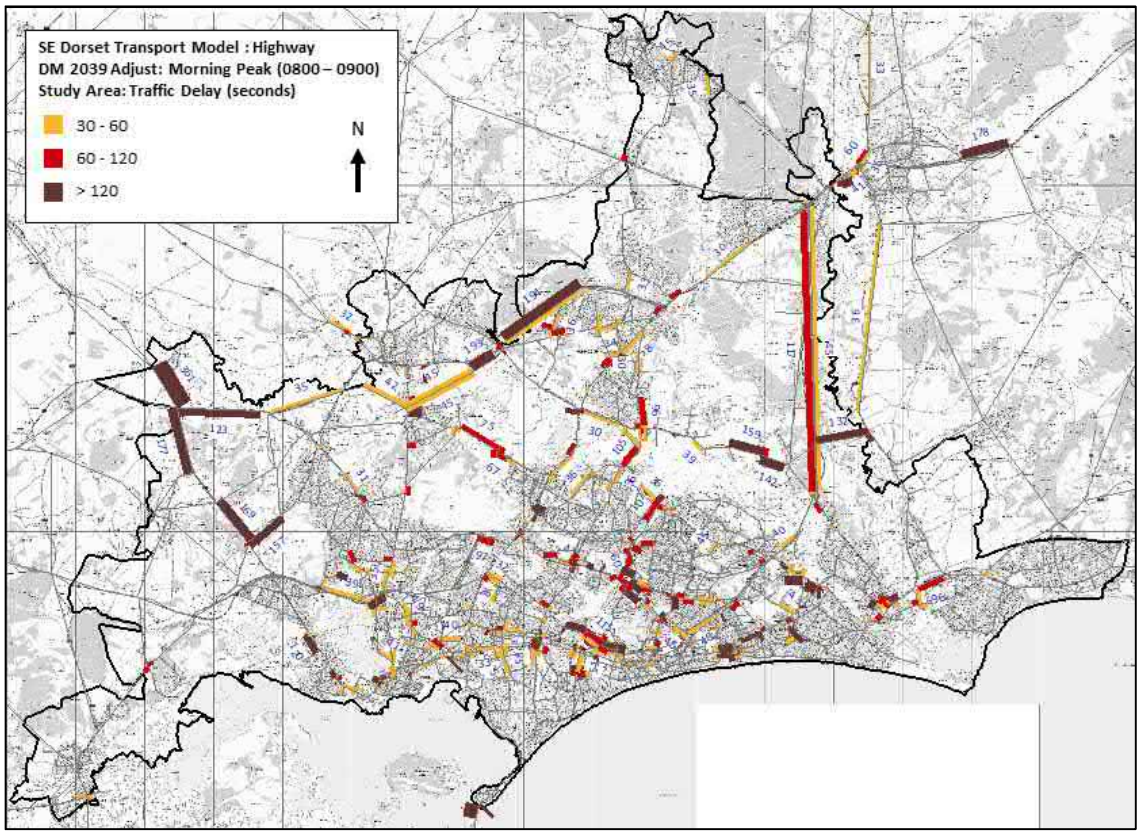

Figure 2.45: Link Delays (seconds) – 2039 Do Minimum, AM Peak

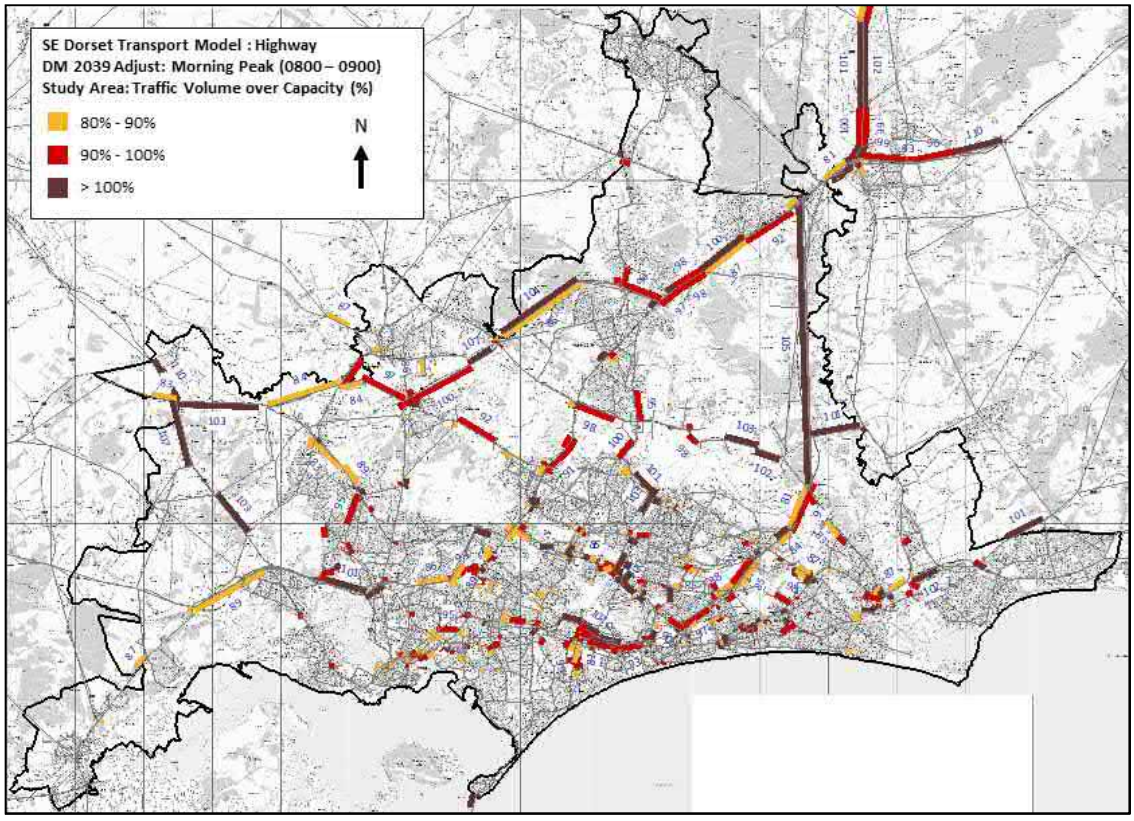

Figure 2.46: Link V/C (%) – 2039 Do Minimum, AM Peak

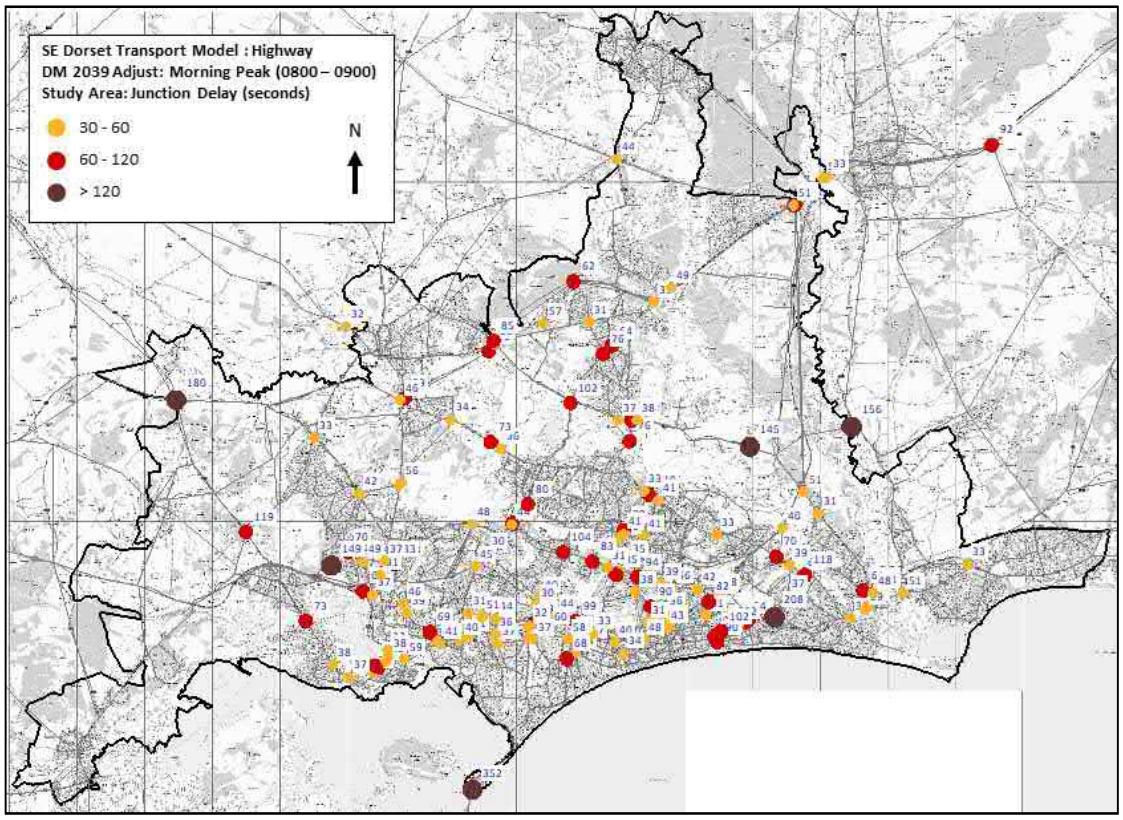

Figure 2.47: Node Delay (seconds) – 2039 Do Minimum, AM Peak

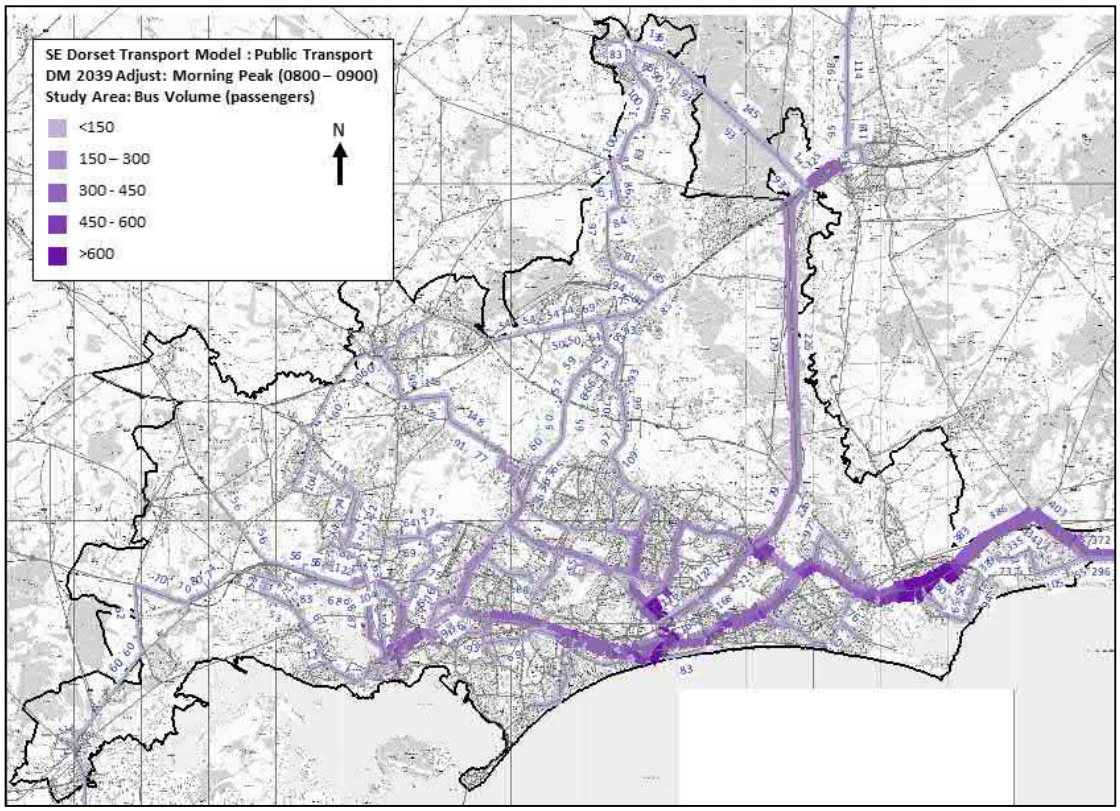

Figure 2.48: Bus Flows (passengers) - 2039 Do Minimum, AM Peak

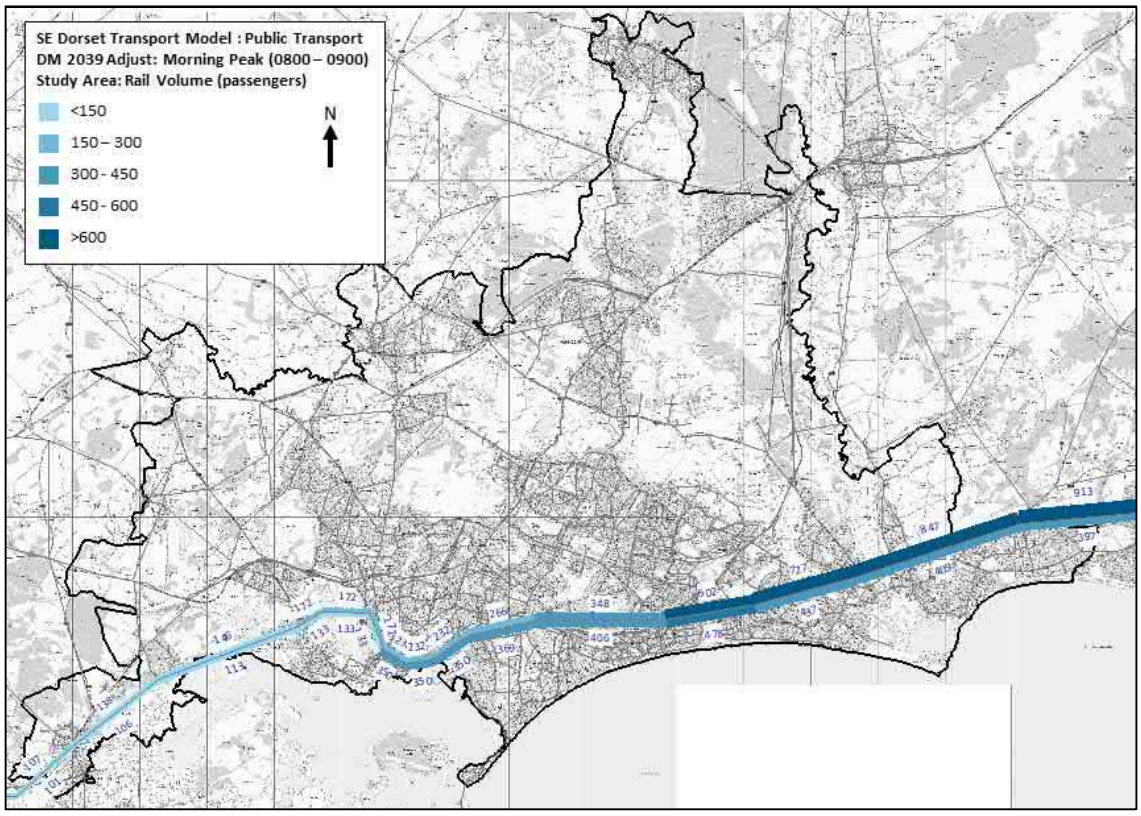

Figure 2.49: Rail Flows (passengers) - 2039 Do Minimum, AM Peak

2039 Do Minimum: Interpeak

The model outputs for the 2039 Do Minimum: Interpeak are shown below. Figure 2.50 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.8.

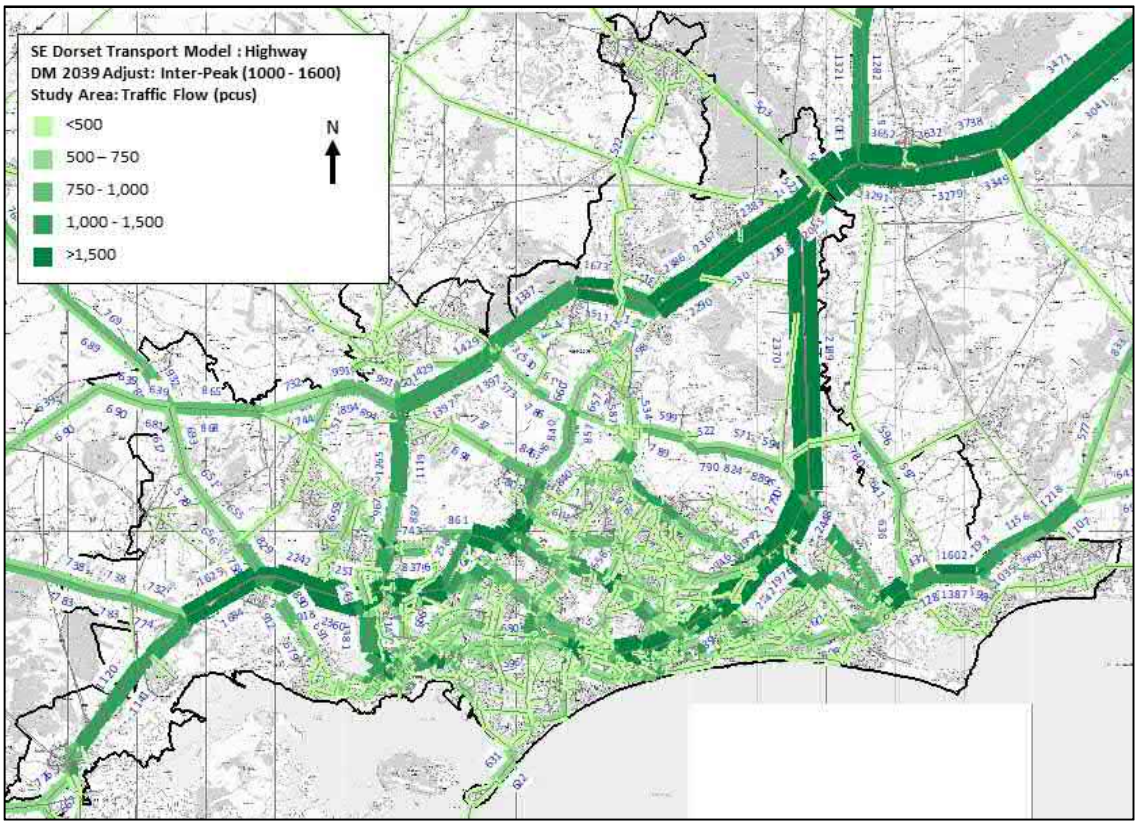

Figure 2.50: Actual Flows (vehicles) – 2039 Do Minimum, Interpeak

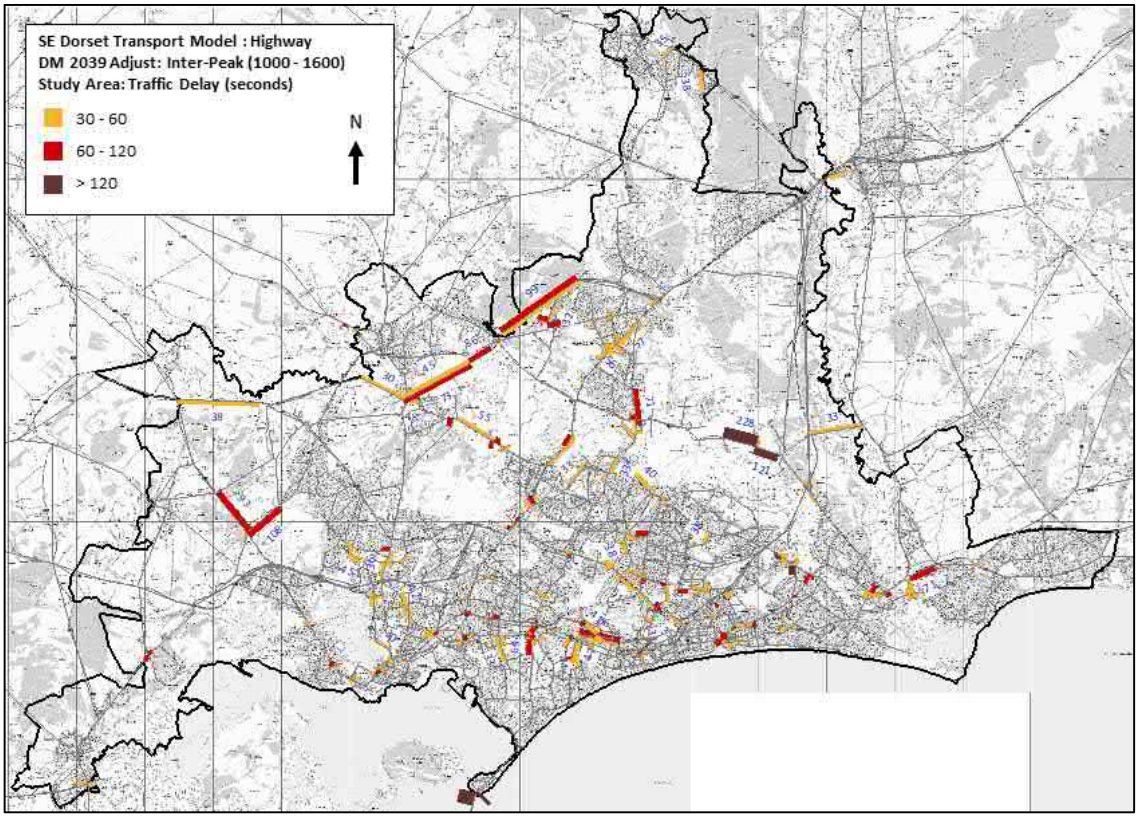

Figure 2.51: Link Delays (seconds) – 2039 Do Minimum, Interpeak

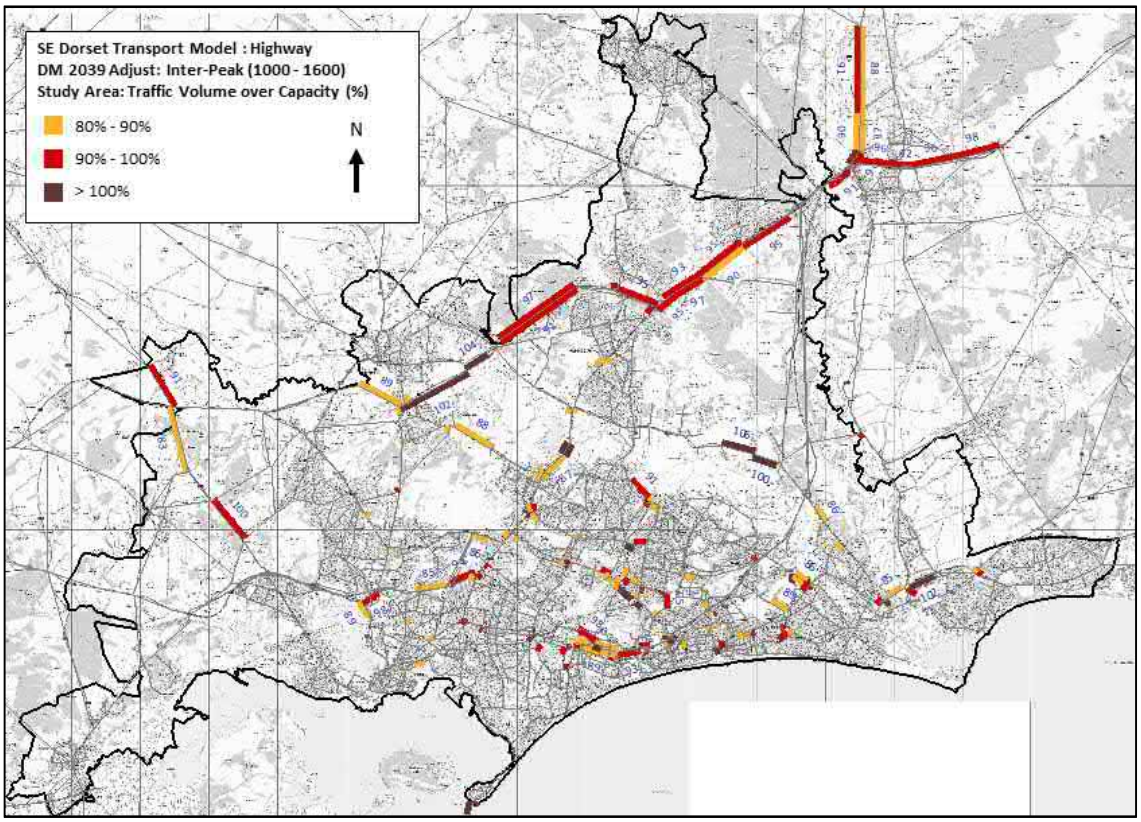

Figure 2.52: Link V/C (%) – 2039 Do Minimum, Interpeak

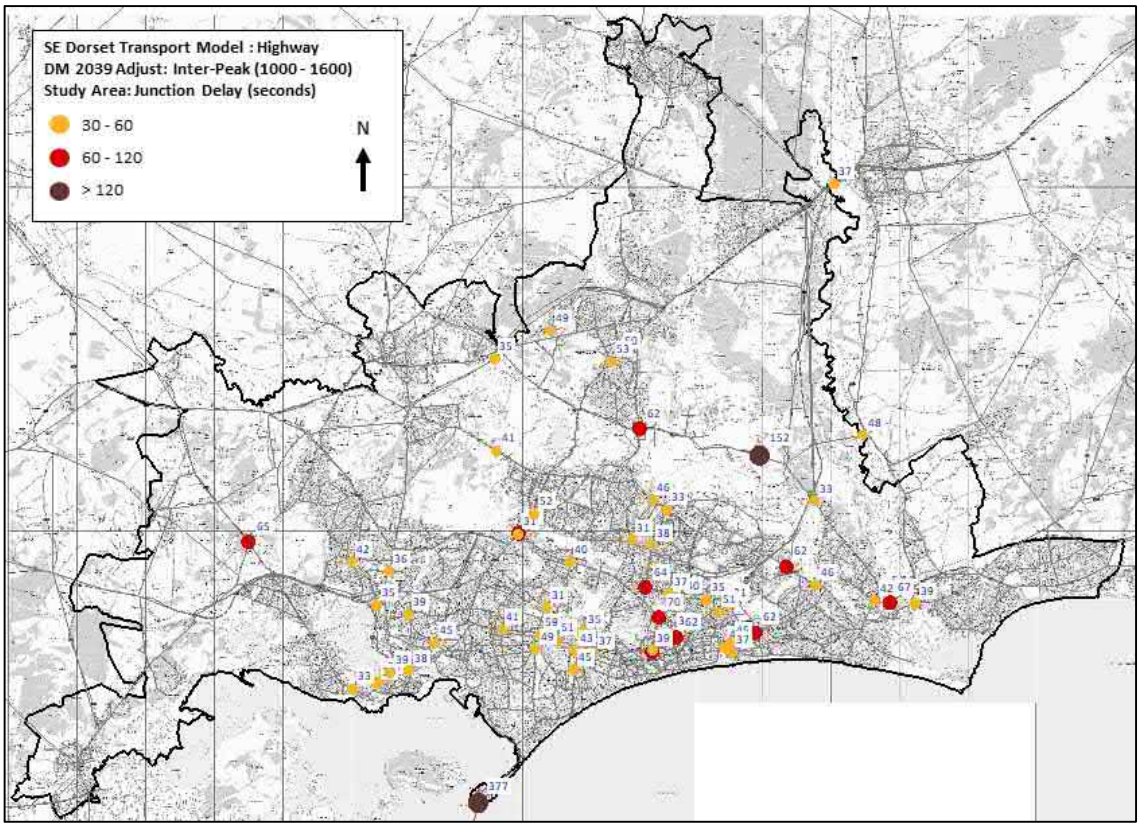

Figure 2.53: Node Delay (seconds) – 2039 Do Minimum, Interpeak

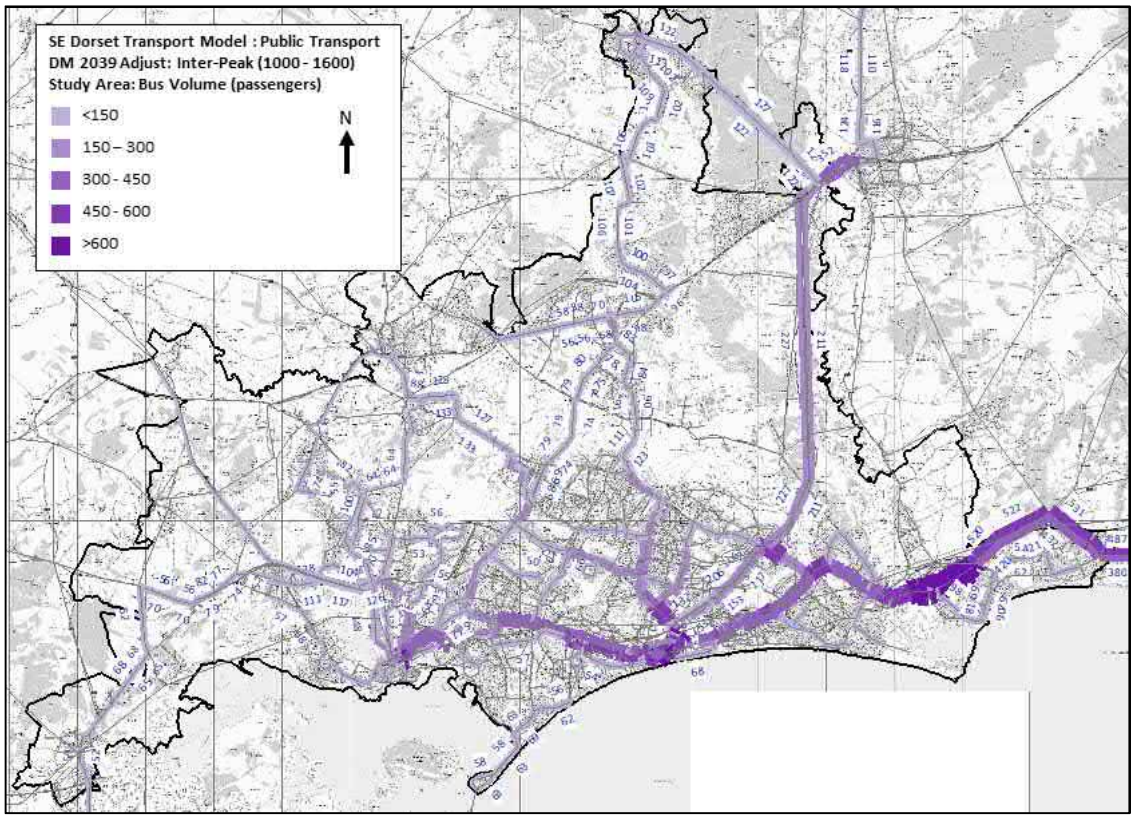

Figure 2.54: Bus Flows (passengers) - 2039 Do Minimum, Interpeak

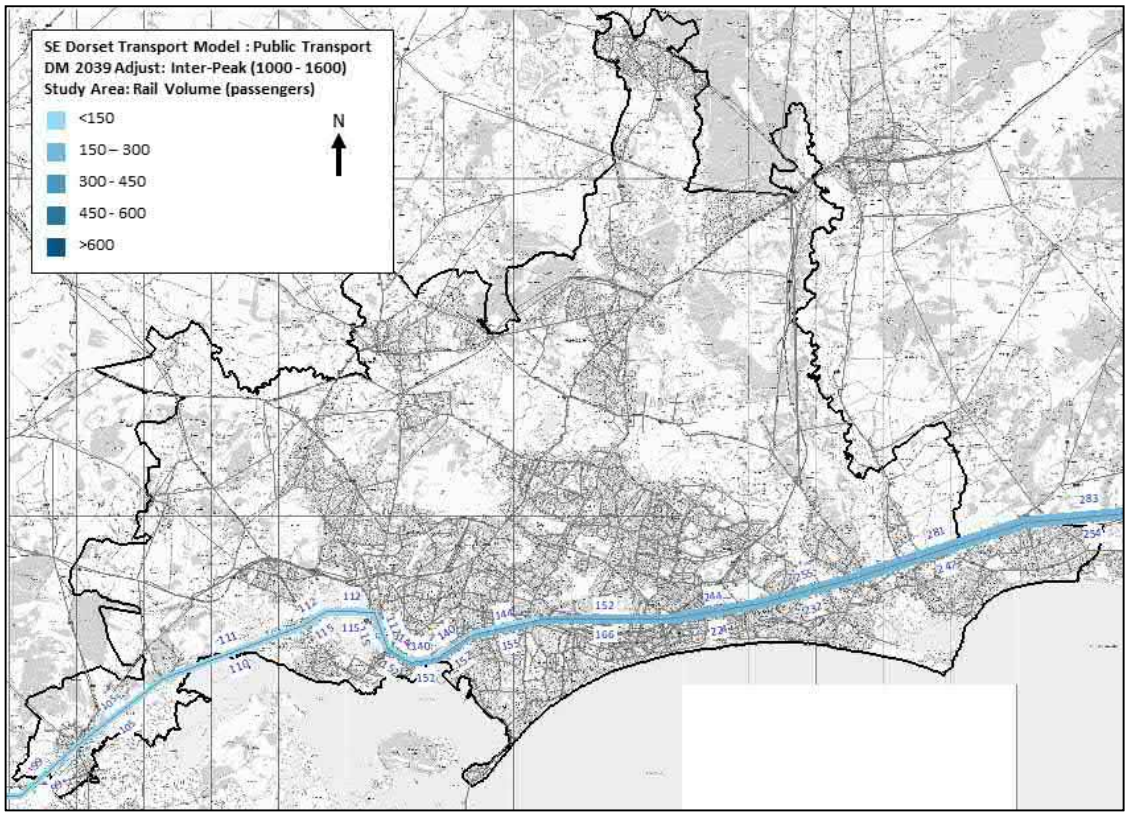

Figure 2.55: Rail Flows (passengers) - 2039 Do Minimum, Interpeak

2039 Do Minimum: PM Peak

The model outputs for the 2039 Do Minimum: PM Peak are shown below. Figure 2.56 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.9.

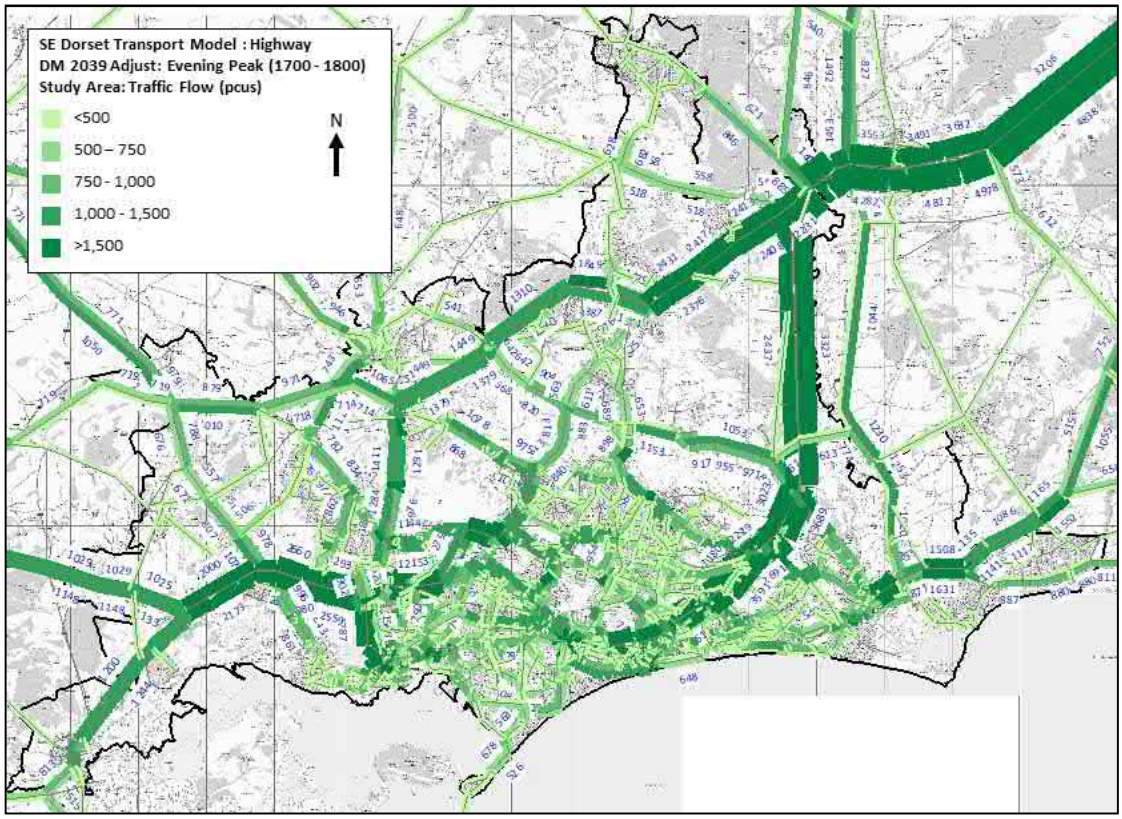

Figure 2.56: Actual Flows (vehicles) – 2039 Do Minimum, PM Peak

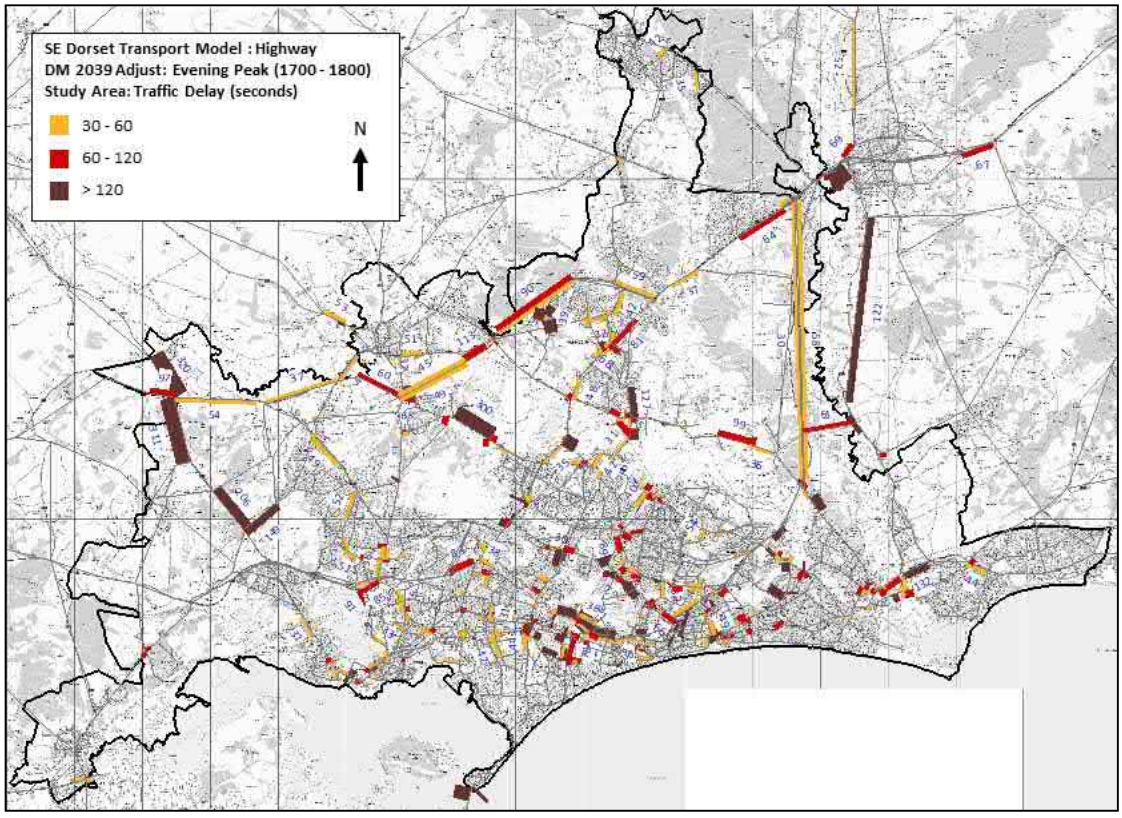

Figure 2.57: Link Delays (seconds) – 2039 Do Minimum, PM Peak

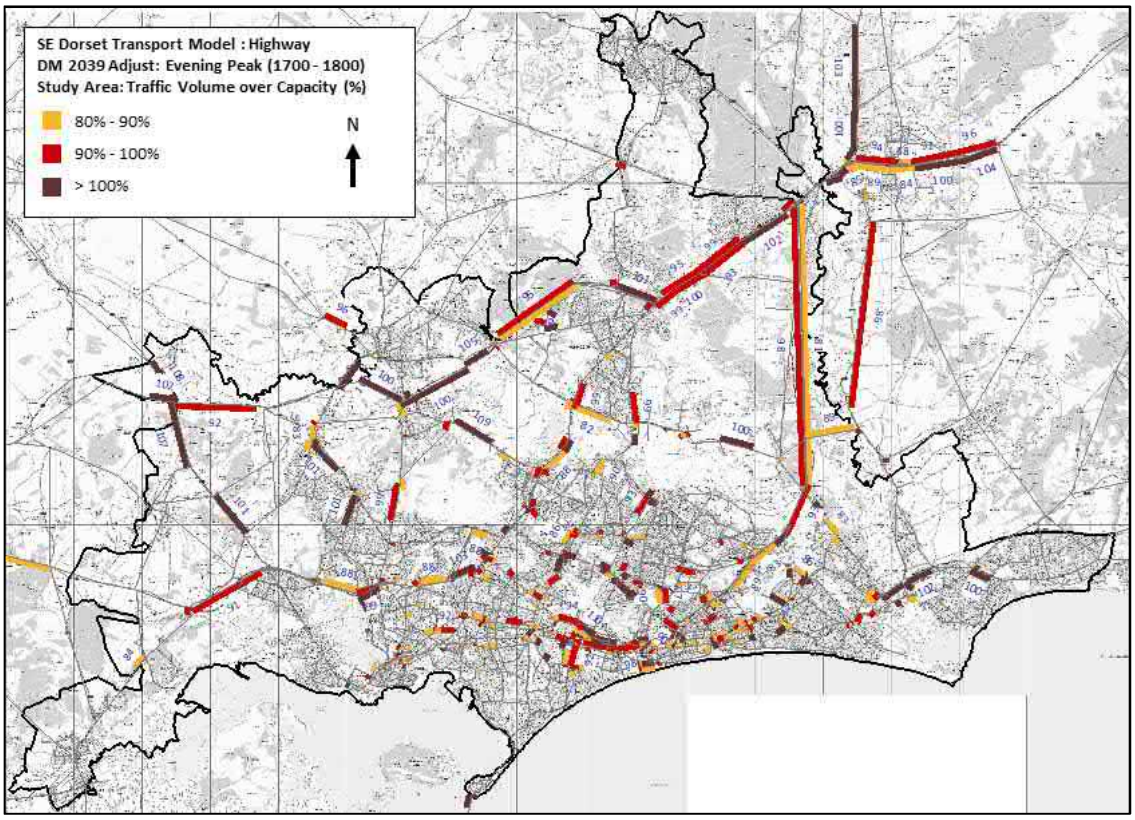

Figure 2.58: Link V/C (%) – 2039 Do Minimum, PM Peak

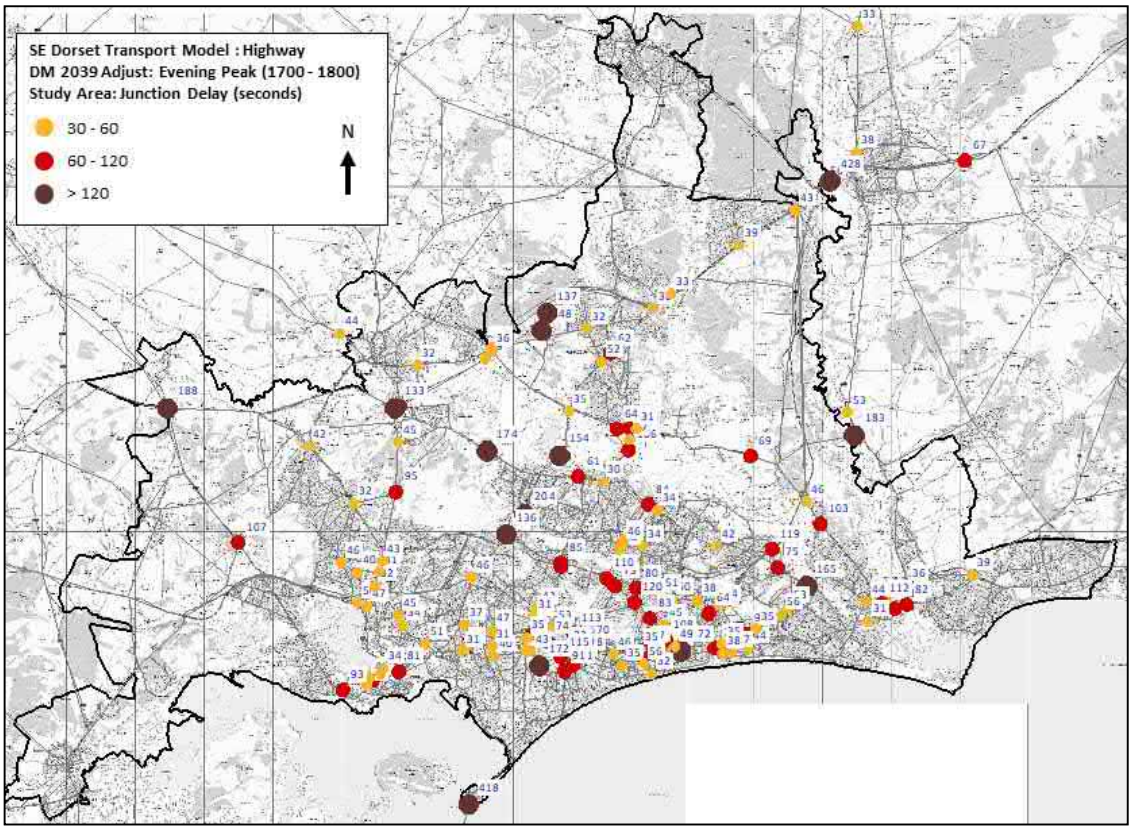

Figure 2.59: Node Delay (seconds) – 2039 Do Minimum, PM Peak

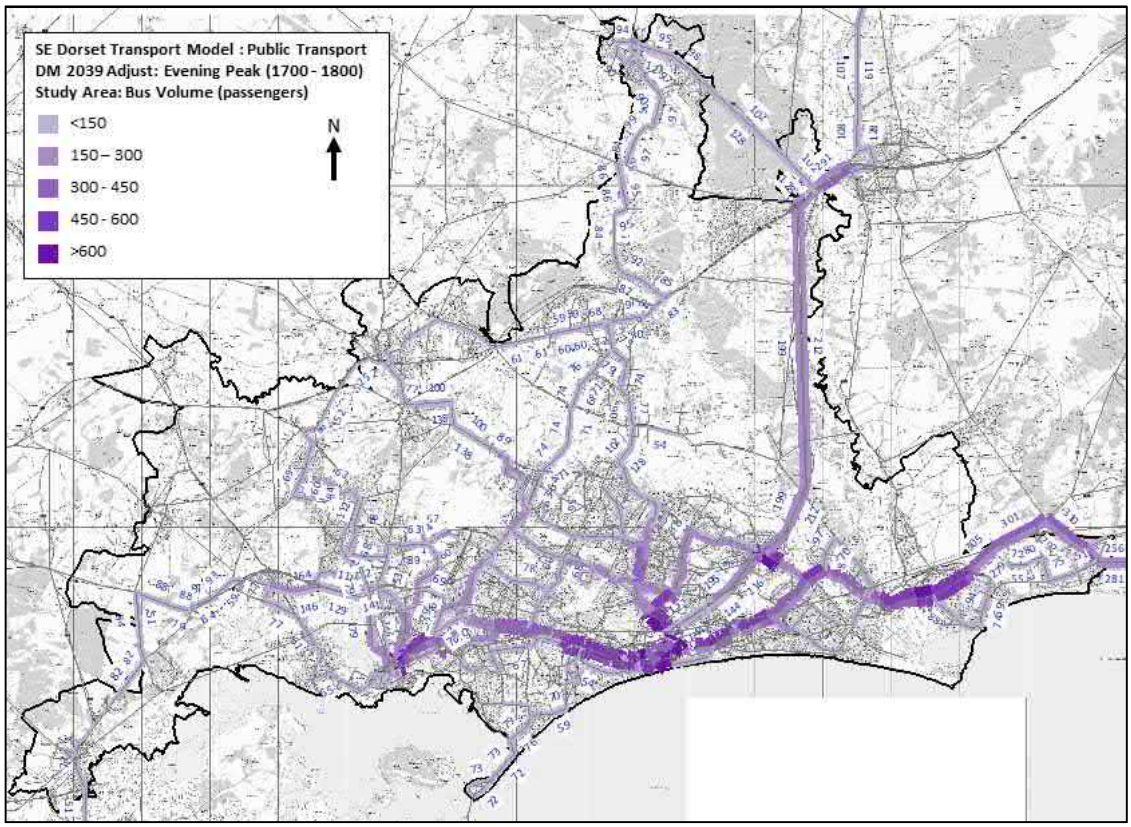

Figure 2.60: Bus Flows (passengers) - 2039 Do Minimum, PM Peak

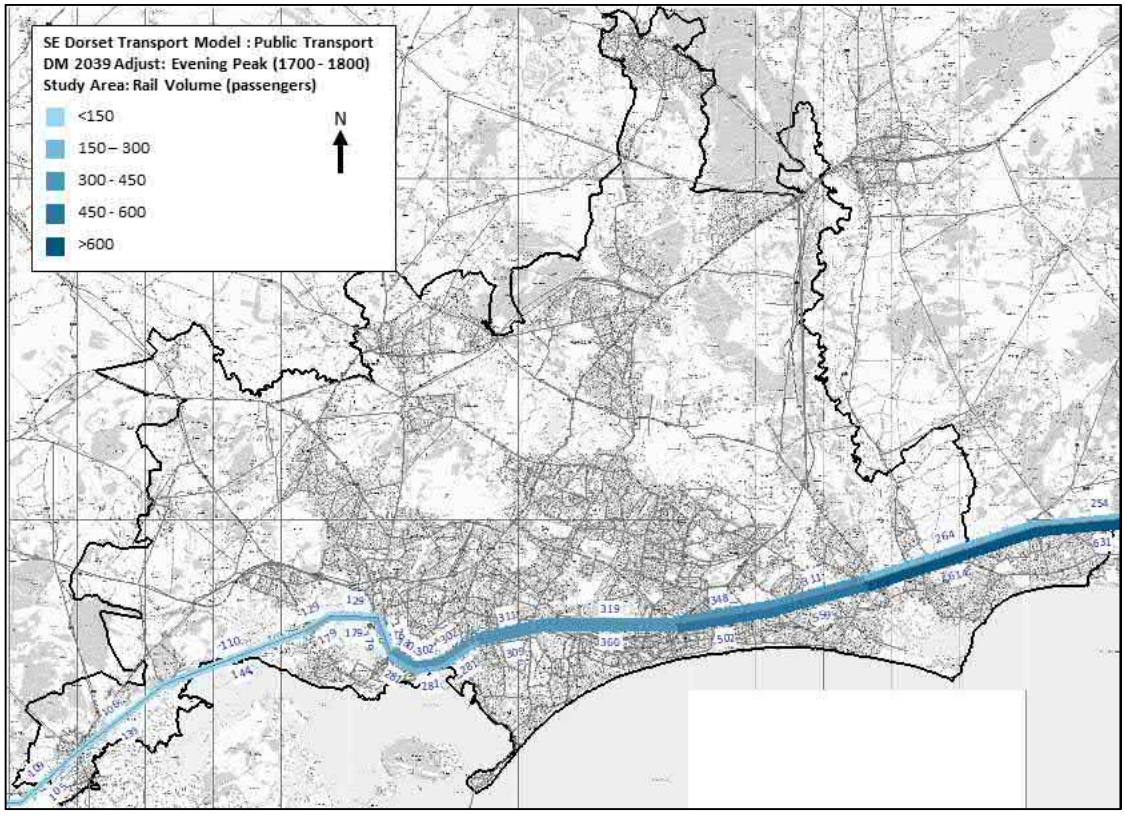

Figure 2.61: Rail Flows (passengers) - 2039 Do Minimum, PM Peak

Explanation of Do-Minimum Model Outputs

2023 Do Minimum: AM Peak

Table 2.1 below outlines the key details from the model outputs for the 2023 Do-Minimum forecast year for the AM Peak.

Table 2.1: Model Output Details: 2023 Do Minimum, AM Peak

Scenario and Year	**Do-Minimum – 2023 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected. Vehicle flow tends to be higher on routes heading into the BCP area: e.g. • 1915 trips inbound on the A350 heading into Poole, with 971 heading northbound. • 3477 vehicles heading inbound on the A338 compared with 2844 heading outbound (near Holdenhurst) • 1233 vehicles heading westbound on the A35 on Iford Bridge compared with 1009 heading eastbound
Link Delays (Seconds)	Largest delays are located around: • The A350 north of Poole • The A31(near Wimborne Minster) • The A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 90% and 97%) • Surrey Road WB to Prince of Wales Road junction (101%) • Talbot Roundabout (102% on both A347 approaches) and 95-99% on Talbot Road and Glenfurness Avenue • WB approach on Parkstone Road to Mount Pleasant Roundabout (96%) • On the approaches to Bournemouth Airport (97-99%)
Node Delay (Seconds)	• There are a number of junctions with node delays of between one and two minutes within the Bournemouth area including along the A35 in Boscombe and Pokesdown, as well as the A3049 Talbot Road. • Within Poole, most junctions have a delay of less than one minute. • Junctions with greater than two minute delay are on the edges of the modelled area, e.g Sandbanks (the connection to the ferry), near Creekmoor and at the A351/A350 junction near Sturminster Marshall
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including the; • A338 near Westbourne of around 450 in each direction • B3064 Lansdowne Road with around 850 heading southbound into Bournemouth and 350 heading northbound • A35 through Boscombe of around 500 westbound and 350 eastbound (west of Sovereign Shopping Centre) • Around 1000 westbound and 850 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35

Rail Flows (Passengers)	• Rail flows show around 500 passengers travelling westbound in Bournemouth and 600 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 350 westbound and 200 eastbound.
Statistics (Highway Model)	
Transient queues (pcu hrs)	5,763 across model area and 4,862 within the BCP area.
Over-capacity queues (pcu hrs)	259 across model area and 182 within the BCP area.
Link cruise time (pcu hrs)	12,334 across model area and 9,242 within the BCP area.
Total Travel Time (pcu hours)	18,357 across model area and 14,286 within the BCP area.
Total travel Distance (pcu kms)	702,785 across model area and 496,386 within the BCP area.
Overall average speed (kph)	38.3kph across model area and 34.7kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	7636
Total PT passenger kms	235495
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2023 Do Minimum: Interpeak

Table 2.2 below outlines the key details from the model outputs for the 2023 Do-Minimum forecast year for the Interpeak.

Table 2.2 - Model Output Details: 2023 Do Minimum, Interpeak

Scenario and Year	**Do-Minimum – 2023 Forecast Year**
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected e.g. • 1296 trips inbound on the A350 heading into Poole, with 1215 heading northbound. • 1822 vehicles heading inbound on the A338 compared with 2002 heading outbound (near Holdenhurst) • 1427 vehicles heading eastbound on the A35 Christchurch Bypass, 1363 vehicles heading westbound.
Link Delays (Seconds)	The largest delays are located around: • Both approaches on the B3073 to Bournemouth Airport main entrance • The A350 around Old Wareham Road • The A338 in Westbourne (EB approach to Bournemouth West Roundabout)

Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the Bournemouth West roundabout (between 84% and 91%) • A35 WB approach to Stony Lane/Bypass roundabout (99%) • On the B3073 approaches to Bournemouth Airport (89-104%) • A347 approaches to Boundary Roundabout (83-91%)
Node Delay (Seconds)	Only two junctions show a delay of greater than one minute in the Interpeak period (excluding the delay at the Sandbanks ferry crossing). These are; • A347/B3063 junction • B3073/Bournemouth Airport junction
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including • A338 near Westbourne of around 450 in each direction • B3064 Lansdowne Road with around 550 heading southbound into Bournemouth and 500 heading northbound • A35 through Boscombe of around 300 westbound and 400 eastbound (west of Sovereign Shopping Centre) • Around 1000 in each direction through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35
Rail Flows (Passengers)	• Rail flows show around 240 passengers travelling westbound in Bournemouth and 260 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 150 westbound and 140 eastbound.
Statistics (Highway Model)	
Transient queues (pcu hrs)	3,578 across model area and 3,047 within the BCP area.
Over-capacity queues (pcu hrs)	13 across model area and 13 within the BCP area.
Link cruise time (pcu hrs)	9,481 across model area and 7,121 within the BCP area.
Total Travel Time (pcu hours)	13,071 across model area and 10,181 within the BCP area.
Total travel Distance (pcu kms)	546,466 across model area and 385,838 within the BCP area.
Overall average speed (kph)	41.8kph across model area and 37.9kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	6393
Total PT passenger kms	187894
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2023 Do Minimum: PM Peak

Table 2.3 below outlines the key details from the model outputs for the 2023 Do-Minimum forecast year for the PM Peak.

Table 2.3 - Model Output Details: 2023 Do Minimum, PM Peak

Scenario and Year	**Do-Minimum – 2023 Forecast Year**
Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected. • 1343 trips inbound on the A350 heading into Poole, with 1687 heading northbound. • 3201 vehicles heading inbound on the A338 compared with 2812 heading outbound (near Holdenhurst) • 1261 vehicles heading westbound on the A35 on Iford Bridge compared with 1064 heading eastbound
Link Delays (Seconds)	Largest delays are located around: • The A350 north of Poole • The A31(near Wimborne Minster) • The A338 in Westbourne (EB approach to Bournemouth West Roundabout) • B3073 WB approach to the Bournemouth Airport main access junction
Link V/C Ratio (%)	There are a number of junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 85% and 98%) • At some locations along A347 Talbot Avenue (greater than 100%) • A350/A3049 junction, on the A350 approach (101%) and A3049 EB approach (97%)
Node Delay (Seconds)	• There are a number of junctions with node delays of between (with a delay of between one and two minutes) within the Bournemouth area including along the A35 in Boscombe and Pokesdown, as well as the A3049 Talbot Road. • Within Poole, most junctions have a delay of less than one minute. • Junctions with greater than two minute delay are on the edges of the modelled area, e.g Sandbanks (the connection to the ferry), near Richmond Hill Roundabout and at the A31/A350 junction near Sturmister Marshall
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas and the corridors between the three urban areas, including • A338 near Westbourne of around 600 in each direction • B3064 Lansdowne Road with around 600 heading southbound into Bournemouth and 800 heading northbound • A35 through Boscombe of around 350 westbound and 600 eastbound (west of Sovereign Shopping Centre) • Around 650 westbound and 800 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35

Rail Flows (Passengers)	• Rail flows show around 500 passengers travelling westbound in Bournemouth and 350 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 300 in each direction.
Statistics (Highway Model)	
Transient queues (pcu hrs)	5,798 across model area and 4,946 within the BCP area.
Over-capacity queues (pcu hrs)	368 across model area and 292 within the BCP area.
Link cruise time (pcu hrs)	12,375 across model area and 9,418 within the BCP area.
Total Travel Time (pcu hours)	18,541 across model area and 14,656 within the BCP area.
Total travel Distance (pcu kms)	700,492 across model area and 501,617 within the BCP area.
Overall average speed (kph)	37.8kph across model area and 34.2kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	7346
Total PT passenger kms	216834
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2031 Do Minimum: AM Peak

Table 2.4 below outlines the key details from the model outputs for the 2031 Do-Minimum forecast year for the AM Peak.

Table 2.4 - Model Output Details: 2031 Do Minimum, AM Peak

Scenario and Year	**Do-Minimum – 2031 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected, and higher than in 2023. Vehicle flow tends to be higher on routes heading into the BCP area: e.g. • 1921 trips inbound on the A350 heading into Poole, with 1114 heading northbound. • 3718 vehicles heading inbound on the A338 compared with 3396 heading outbound (near Holdenhurst) • 983 vehicles heading westbound on the A35 on Iford Bridge compared with 1193 heading eastbound
Link Delays (Seconds)	Links with higher delay include: • The A350 north of Poole • The A31(near Wimborne Minster) • The A338 in Westbourne (EB approach to Bournemouth West Roundabout)

Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (greater than 100%) • Surrey Road EB to Prince of Wales Road junction (101%) • Talbot Roundabout (73% on the EB approach and 115 on the WB approach) and on Talbot Road there is a V/C of 75% • At Iford Roundabout, the A35 NB approach has a V/C of over 190% • In Boscombe, the approaches to the A35 from Boscombe Spa Road and Wharncliffe Road is higher than 100% • On the approaches to Bournemouth Airport (101/102%)
Node Delay (Seconds)	• The delays are slightly higher than 2023 AM • There are a number of junctions with node delays of between (with a delay of between one and two minutes) within the Bournemouth area including along the A35 in Boscombe and Pokesdown, as well as the A3049 Talbot Road. • Within Poole, most junctions have a delay of less than one minute. • Junctions with greater than two minute delay are on the edges of the modelled area, e.g Sandbanks (the connection to the ferry) and at the A351/A350 junction near Sturminster Marshall
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including: • The A338 near Westbourne of around 400 in each direction • The B3064 Lansdowne Road with around 850 heading southbound into Bournemouth and 350 heading northbound • The A35 through Boscombe of around 500 westbound and 350 eastbound (west of Sovereign Shopping Centre) • Around 850 westbound and 800 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35. Compared with 2023, some bus routes have very slight differences in bus flows – this can be attributed to increased queuing in 2031 with higher overall traffic numbers, therefore a minor impact on some bus routes.
Rail Flows (Passengers)	• Rail flows show around 500 passengers travelling westbound in Bournemouth and 600 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 350 westbound and 250 eastbound.
Statistics (Highway Model)	
Transient queues (pcu hrs)	6,628 across model area and 5,575 within the BCP area.
Over-capacity queues (pcu hrs)	455 across model area and 323 within the BCP area.
Link cruise time (pcu hrs)	13,170 across model area and 9,882 within the BCP area.
Total Travel Time (pcu hours)	20,253 across model area and 15,780 within the BCP area.
Total travel Distance (pcu kms)	746,772 across model area and 528,160 within the BCP area.
Overall average speed (kph)	36.9kph across model area and 33.5kph within the BCP area.
Statistics (Public Transport Model)	

Total PT passengers	7473
Total PT passenger kms	228861
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2031 Do Minimum: Interpeak

Table 2.5 below outlines the key details from the model outputs for the 2031 Do-Minimum forecast year for the Interpeak.

Table 2.5 - Model Output Details: 2031 Do Minimum, Interpeak

Scenario and Year	**Do-Minimum – 2031 Forecast Year**
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected, • 1398 trips inbound on the A350 heading into Poole, with 1323 heading northbound. • 2149 vehicles heading inbound on the A338 compared with 2416 heading outbound (near Holdenhurst) • 1525 vehicles heading eastbound on the A35 Christchurch Bypass, 1372 vehicles heading westbound.
Link Delays (Seconds)	The links with higher delay include: • Both approaches on the B3073 to Bournemouth Airport main entrance • The A350 around Old Wareham Road • The A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the Bournemouth West roundabout (between 87% and 93%) • A35 WB approach to Stony Lane/Bypass roundabout (101%) and noticeable increase in V/C's on other arms • On the approaches to Bournemouth Airport (97-105%) • A347 approaches to Boundary Roundabout (86-97%)
Node Delay (Seconds)	Only five junctions show a delay of greater than one minute in the Interpeak period (excluding the delay at the Sandbanks ferry crossing). These are; • A347/B3063 junction • B3063 junction north of West Hurn • B3073/Bournemouth Airport junction • A3060 / Deansleigh Road junction • A35 Fountain Roundabout in Christchurch
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas and the corridors between the three urban areas, including • A338 near Westbourne of around 450 in each direction • B3064 Lansdowne Road with around 360 heading southbound into Bournemouth and 500 heading northbound

	• A35 through Boscombe of around 300 westbound and 400 eastbound (west of Sovereign Shopping Centre) • Around 1000 in each direction through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35 Compared with 2023, some bus routes have very slight differences in bus flows – this can be attributed to increased queuing in 2031 with higher overall traffic numbers, therefore a minor impact on some bus routes.
Rail Flows (Passengers)	• Rail flows show around 230 passengers travelling westbound in Bournemouth and 250 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 150 westbound and 140 eastbound. These are similar to 2023 numbers.
Statistics (Highway Model)	
Transient queues (pcu hrs)	4,118 across model area and 3,502 within the BCP area.
Over-capacity queues (pcu hrs)	34 across model area and 34 within the BCP area.
Link cruise time (pcu hrs)	10,358 across model area and 11,343 within the BCP area.
Total Travel Time (pcu hours)	14,510 across model area and 11,343 within the BCP area.
Total travel Distance (pcu kms)	596,167 across model area and 422,736 within the BCP area.
Overall average speed (kph)	41.1kph across model area and 37.3kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	6330
Total PT passenger kms	182405
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2031 Do Minimum: PM Peak

Table 2.6 below outlines the key details from the model outputs for the 2031 Do-Minimum forecast year for the PM Peak.

Table 2.6 - Model Output Details: 2031 Do Minimum, PM Peak

Scenario and Year	**Do-Minimum – 2031 Forecast Year**
Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected, and in most cases higher than in 2023. • 1749 trips inbound on the A350 heading into Poole, with 1730 heading northbound. • 3862 vehicles heading inbound on the A338 compared with 2964 heading outbound (near Holdenhurst) • 1266 vehicles heading westbound on the A35 on Iford Bridge compared with 1058 heading eastbound
Link Delays (Seconds)	Slightly higher delays than 2023, links with higher delay include: • The A350 north of Poole • The A31(near Wimborne Minster) • The A338 in Westbourne (EB approach to Bournemouth West Roundabout) • WB approach along the B3073 to Bournemouth Airport main entrance
Link V/C Ratio (%)	There are a number of junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 85% and 100%) • At some locations along the A347 Talbot Avenue (101%) • At the A350/A3049 junction, on the A350 approach (102%) and A3049 EB approach (101%)
Node Delay (Seconds)	• There are a number of junctions with node delays of between (with a delay of between one and two minutes) within the Bournemouth area including along the A35 in Boscombe and Pokesdown, as well as along the A3047. • Within Poole, most junctions have a delay of less than one minute. • Junctions with greater than two minute delay are generally on the edge of the modelled area, e.g Sandbanks (the connection to the ferry), approaches to the Richmond Hill Roundabout, at the A31/A350 junction near Sturmister Marshall and Iford Bridge,
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, and higher than the other peaks, including • A338 near Westbourne of around 600 in each direction • B3064 Lansdowne Road with around 600 heading southbound into Bournemouth and 750 heading northbound • A35 through Boscombe of around 350 westbound and 600 eastbound (west of Sovereign Shopping Centre) • Around 600 westbound and 750 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35

	Compared with 2023, some bus routes have very slight differences in bus flows – this can be attributed to increased queuing in 2031 with higher overall traffic numbers, therefore a minor impact on some bus routes.
Rail Flows (Passengers)	• Rail flows show around 500 passengers travelling westbound in Bournemouth and 350 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 300 in each direction.
Statistics (Highway Model)	
Transient queues (pcu hrs)	6,681 across model area and 5,669 within the BCP area.
Over-capacity queues (pcu hrs)	527 across model area and 449 within the BCP area.
Link cruise time (pcu hrs)	13,229 across model area and 10,063 within the BCP area.
Total Travel Time (pcu hours)	20,437 across model area and 16,181 within the BCP area.
Total travel Distance (pcu kms)	746,750 across model area and 534,189 within the BCP area.
Overall average speed (kph)	36.5kph across model area and 33.0kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	7172
Total PT passenger kms	208804
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2039 Do Minimum: AM Peak

Table 2.7 below outlines the key details from the model outputs for the 2039 Do-Minimum forecast year for the AM Peak.

Table 2.7 - Model Output Details: 2039 Do Minimum, AM Peak

Scenario and Year	**Do-Minimum – 2039 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected, and higher than in 2031. Vehicle flow tends to be higher on routes heading into the BCP area: e.g. • 1972 trips inbound on the A350 heading into Poole, with 1220 heading northbound. • 3607 vehicles heading inbound on the A338 compared with 3197 heading outbound (near Holdenhurst) • 1099 vehicles heading westbound on the A35 on Iford Bridge compared with 1325 heading eastbound

Link Delays (Seconds)	Slightly higher delays than 2031, links with higher delay include: • The A350 north of Poole • The A31(near Wimborne Minster) • The A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (greater than 93%) • Surrey Road EB to Prince of Wales Road junction (101%) • Talbot Roundabout and Boundary Roundabouts (the former has a V/C on all arms of over 100%) • At Iford Roundabout, the A35 NB approach has a V/C of over 109% • In Boscombe, the approaches to the A35 from Boscombe Spa Road and Wharncliffe Road is higher than 100% • On the approaches to Bournemouth Airport (102/103%)
Node Delay (Seconds)	• The delays are slightly higher than 2031 AM • There are a number of junctions with node delays of between (with a delay of between one and two minutes) within the Bournemouth area including along the A35 in Boscombe and Pokesdown, as well as the A3049 Talbot Road. • Within Poole, most junctions have a delay of less than one minute. • Junctions with greater than two minute delay are generally on the edges of the study area, e.g Sandbanks (the connection to the ferry), the A351/A350 junction near Sturminster Marshall and the Avon Causeway/B3347 Ringwood Road junction
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including • A338 near Westbourne of around 400 in each direction • B3064 Lansdowne Road with around 850 heading southbound into Bournemouth and 350 heading northbound • A35 through Boscombe of around 500 westbound and 350 eastbound (west of Sovereign Shopping Centre) • Around 850 westbound and 800 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35. Compared with 2023, some bus routes have very slight differences in bus flows – this can be attributed to increased queuing in 2031 with higher overall traffic numbers, therefore a minor impact on some bus routes.
Rail Flows (Passengers)	• Rail flows show around 500 passengers travelling westbound in Bournemouth and 600 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 350 westbound and 250 eastbound.
Statistics (Highway Model)	
Transient queues (pcu hrs)	7,287 across model area and 6,160 within the BCP area.
Over-capacity queues (pcu hrs)	681 across model area and 465 within the BCP area.
Link cruise time (pcu hrs)	13,776 across model area and 10,321 within the BCP area.
Total Travel Time (pcu hours)	21,744 across model area and 16,946 within the BCP area.

Total travel Distance (pcu kms)	778,432 across model area and 549,310 within the BCP area.
Overall average speed (kph)	35.8kph across model area and 32.4kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	7288
Total PT passenger kms	223960
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2039 Do Minimum: Interpeak

Table 2.8 below outlines the key details from the model outputs for the 2039 Do-Minimum forecast year for the Interpeak.

Table 2.8 - Model Output Details: 2039 Do Minimum, Interpeak

Scenario and Year	**Do-Minimum – 2039 Forecast Year**
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected, • 1452 trips inbound on the A350 heading into Poole, with 1381 heading northbound. • 2388 vehicles heading inbound towards Bournemouth on the A338 compared with 2718 heading outbound (near Holdenhurst) • 1602 vehicles heading eastbound on the A35 Christchurch Bypass, 1387 vehicles heading westbound.
Link Delays (Seconds)	Slightly higher delays than 2031, links with higher delay include: • Both approaches on the B3073 to Bournemouth Airport main entrance • The A350 around Old Wareham Road • The A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the Bournemouth West roundabout (between 89 and 93%) • A35 WB approach to Stony Lane/Bypass roundabout (102%) and noticeable increase in V/C's on other arms • On the B3073 approaches to Bournemouth Airport (100-106%) • A347 approaches to Boundary Roundabout (86% WB approach, 100% EB approach)
Node Delay (Seconds)	Only five junctions show a delay of greater than one minute in the Interpeak period (excluding the delay at the Sandbanks ferry crossing). These are; • A347/B3063 junction • B3063 junction north of West Hurn • B3073/Bournemouth Airport junction

	• A3060 / Deansleigh Road junction • A35 Fountain Roundabout in Christchurch
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas and the corridors between the three urban areas, including • A338 near Westbourne of around 450 in each direction • B3064 Lansdowne Road with around 500 heading southbound into Bournemouth and 500 heading northbound • A35 through Boscombe of around 350 westbound and 450 eastbound (west of Sovereign Shopping Centre) • Around 1000 in each direction through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35 Compared with 2023, some bus routes have very slight differences in bus flows – this can be attributed to increased queuing in 2031 with higher overall traffic numbers, therefore a minor impact on some bus routes.
Rail Flows (Passengers)	• Rail flows show around 230 passengers travelling westbound in Bournemouth and 250 passengers on the train from Bournemouth heading east. • Rail flows are lower around Poole, reaching around 150 westbound and 140 eastbound. These are similar to 2023 numbers.
Statistics (Highway Model)	
Transient queues (pcu hrs)	4,568 across model area and 3,871 within the BCP area.
Over-capacity queues (pcu hrs)	59 across model area and 59 within the BCP area.
Link cruise time (pcu hrs)	11,052 across model area and 8,356 within the BCP area.
Total Travel Time (pcu hours)	15,678 across model area and 12,287 within the BCP area.
Total travel Distance (pcu kms)	635,154 across model area and 452,114 within the BCP area.
Overall average speed (kph)	40.5kph across model area and 36.8kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	6253
Total PT passenger kms	178425
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2039 Do Minimum: PM Peak

Table 2.9 below outlines the key details from the model outputs for the 2039 Do-Minimum forecast year for the PM Peak.

Table 2.9 - Model Output Details: 2039 Do Minimum, PM Peak

Scenario and Year	Do-Minimum – 2039 Forecast Year

Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	The highest traffic flows are experienced on main routes (A31, A338, A3049 and A35) as would be expected, and in most cases higher than in 2031. • 1568 trips inbound on the A350 heading into Poole, with 1787 heading northbound. • 3677 vehicles heading inbound on the A338 compared with 2850 heading outbound (near Holdenhurst) • 1314 vehicles heading westbound on the A35 on Iford Bridge compared with 1056 heading eastbound
Link Delays (Seconds)	Slightly higher delays than 2023, links with higher delay include: • The A350 north of Poole • The A31(near Wimborne Minster) • The A338 in Westbourne (EB approach to Bournemouth West Roundabout) • WB approach along the B3073 to Bournemouth Airport main entrance
Link V/C Ratio (%)	There are a number of junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 84% and 101%) • At some locations along A347 Talbot Avenue (greater than 100%) • A350/A3049 junction, on the A350 approach (103%) and A3049 EB approach (102%)
Node Delay (Seconds)	• There is increase node delay in 2039 compared with 2031. • There are a number of junctions with node delays of between (with a delay of between one and two minutes) within the Bournemouth area including along the A35 in Boscombe and Pokesdown, as well as along the A3047. • Within Poole, no junctions experience a modelled delay higher than 120 seconds. • A number of junctions with greater than two minute delay are on the edge of the modelled area, e.g Sandbanks (the connection to the ferry), or along the A31. There are a couple of junctions along the A3047 near, but not including, Bear Cross as well as Iford Roundabout
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, and higher than the other peaks, including • A338 near Westbourne of around 500-600 in each direction • B3064 Lansdowne Road with around 600 heading southbound into Bournemouth and 700 heading northbound • A35 through Boscombe of around 300 westbound and 550 eastbound (west of Sovereign Shopping Centre) • Around 600 westbound and 700 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35 Compared with 2031, some bus routes have very slight differences in bus flows – this can be attributed to increased queuing in 2031 with higher overall traffic numbers, therefore a minor impact on some bus routes.
Rail Flows (Passengers)	• Rail flows show around 500 passengers travelling westbound in Bournemouth and 350 passengers on the train from Bournemouth heading east.

	• Rail flows are lower around Poole, reaching around 300 in each direction.
Statistics (Highway Model)	
Transient queues (pcu hrs)	7,180 across model area and 6,081 within the BCP area.
Over-capacity queues (pcu hrs)	711 across model area and 590 within the BCP area.
Link cruise time (pcu hrs)	13,719 across model area and 10,424 within the BCP area.
Total Travel Time (pcu hours)	21,609 across model area and 17,094 within the BCP area.
Total travel Distance (pcu kms)	772,531 across model area and 551,458 within the BCP area.
Overall average speed (kph)	35.7kph across model area and 32.3kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	6944
Total PT passenger kms	202063
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Something scenarios in Section 2.3

2.2 Do-Something Scenarios

Do-Something Scenarios – Testing of scenarios with interventions

For the Do-Something scenarios, the list of interventions were initially analysed and categorised for use in the model. The list of interventions are outlined in Appendix D and were initially categorised based on three steps;

1. Whether the interventions can be modelled explicitly; those that cannot be modelled have been removed from the modelling process.
2. Whether there is enough information to model the intervention; where there was not were also removed from the process
3. Each process was allocated a colour based on information available for modelling the interventions; as shown in Appendix D
    - **Grey** – interventions that cannot be modelled – reasons why are explained in the appendix.
    - **Red** – interventions where there was not enough information to explicitly model therefore have not been modelled (NB there are no red interventions)
    - **Amber/Green** – interventions where some information was available but allocated amber where some professional judgement/assumptions were used

For the amber and green interventions left, a grouping exercise was undertaken. This is where similar interventions would have a cumulative impact on the model e.g. those based around school travel planning or workplace travel planning.

In addition, and where it was applicable, the impact of the interventions have been allocated an estimated mode demand shift. Following the relevant guidance in TAG (Unit M5.2 – Modelling Smarter Choices), this shift has been calculated using evidence where available. This evidence has been gathered from across the UK and Europe with professional judgement used to apply the evidence to the BCP area. It should be noted that these shifts are intended to be challenging as we are trying to show what can be achieved rather than using a 'business as usual' approach. This approach has been outlined in the objectives defined at the start of the project.

Appendix D outlines the full list of interventions and the results of the first analysis for their inclusion of the modelling scenarios, including a description why some have been omitted from the process and information on the group which they are allocated to.

From this reduced list, further research was undertaken to detail the specific modelling for each intervention. These have then been modelled and packaged together into the three Do-Something scenarios (2023, 2031 and 2039).

As the modelled forecast years do not match up neatly with the intervention years, the table below shows how the interventions have been packaged into the modelled forecast years.

Table 2.10: Intervention Packages allocated to SEDUMS Forecast Years

Intervention Years from 2020	5 years (2025)	10 years (2030)	15 years (2035)	20 years (2040)
Allocated SEDUMS Model years	2023	2031	2039	2039

Do Something Scenario 1: 2023

Table 2.11 outlines the grouped interventions and further details on how they have been modelled. All of these have been included within the 2023 Do-Something scenario. All interventions outlined for the 5 year period have been included.

Table 2.11: 2023 Interventions

Group	**Details on Modelling**
5 years - 20mph limits	A number of locations have been outlined as potential 20mph zones in Poole which have been modelled by reducing speed limits in these areas. A map of these are detailed in Appendix D
5 years - School Travel Planning	2.25% decrease in trips across the model for car other trips - assuming a switch to walking and cycling
5 years - Cycling Infrastructure Improvements	3% decrease in trips across the model for private car trips - assuming a switch to cycling
5 years - Modal Filters on Side Roads	BCP Council supplied a list of proposed junction changes across the area. These are detailed in Appendix D
5 years - Workplace Travel Planning	2% decrease in trips across the model for car commuting trips - assuming a switch to walking/cycling
5 years - Bournemouth Airport and Aviation Travel Plan	
5 years - Ferndown Industrial Estate Travel Plan	
5 years - Cycling Corridors	2% decrease in trips across the model for private car trips - assuming a switch to cycling
5 years - Reduction in LGVs	2% decrease of all LGV trips in central areas (Poole Peninsula, Bournemouth Central, Christchurch Central)
5 years - Lansdowne Roundabout	Highway network changes as agreed with BCP Council - A bus gate on Holdenhurst Road (closure to non-bus vehicles in both directions) and Meyrick Road closed at the roundabout to all vehicles

5 years - Improvements to Key Junctions	General signal optimisation across junctions with a V/C of more than 90%
5 years - Tourist Travel Planning	2.25% decrease in trips across the model for car other trips and shift to bus
5 years - Private Car Ban on The Quay	Cars are banned on the The Quay during the interpeak only
5 years - Road Closures	BCP Council outlined a number of road closures which have been put into the model. These are detailed in Appendix D
5 years - Holes Bay Walkway	Pedestrian crossing has been added to the network to the south of the A350 Holes Bay Roundabout

Do Something Scenario 1: 2031

Table 2.12 below outlines the grouped interventions and further details on how they have been modelled. All of these have been included within the 2031 Do-Something scenario, in addition to the 2023 interventions. All interventions outlined for the 10 year period have been included.

Table 2.12: 2031 Interventions

Group	Details on Modelling
10 years - Bus Improvements	2% decrease in trips across the model for private car trips - assuming a switch to bus. 10-minute frequency bus service on the main artery routes across the BCP area (X1, X2 ,X3, X6, X8)
10 years - Parking Strategy	2% decrease in trips across the model for private car trips - assuming a switch to bus
10 years - Creekmoor to Upton Park Bridge	2% decrease in trips across the model for private car trips - assuming a switch to cycling/walking
10 years - Ferndown to West Moors Trailway	2% decrease in trips across the model for private car trips - assuming a switch to cycling/walking
10 years - Sustainable Transport Corridors	2% decrease in trips across the model for private car trips - assuming a switch to bus. Bus services added along transport corridors.
10 years - Bus Services Outside BCP	2% decrease in trips across the model for private car trips - assuming a switch to bus. Express bus services added (every 30 minutes) added between Poole to Shaftesbury, Poole to Bere Regis, Milborne St Andrew and Puddletown
10 years - Express Bus Services within BCP	2% decrease in trips across the model for private car trips - assuming a switch to bus. Express bus services added (every 30 minutes) added from centre of Bournemouth to Verwood via Airport, Ferndown and West Moors. Additional service added from centre of Poole to Verwood via Airport, Ferndown and West Moors.
10 years – New Park and Rides	Six park and rides have been modelled: Creekmoor, Mannings Heath and Wimborne (for Poole) and Blackwater, Northbourne Roundabout and Bournemouth Airport (for Bournemouth). Assumptions are details below. Only the Car Other and Car Commuting user classes have been affected. 15 minute frequency bus services added between P&R sites and centre of town.
10 years - Park and Ride Creekmoor	
10 years -Public Transport improvement between port/airport	Existing X3 and X6 rerouted to travel via airport.
10 years - Freight Hubs	2% decrease of freight trips (UC4, UC5) from Poole Port only
10 years - Bath Road CP Closure	Bath Road Car Park has been closed within the model with 80% of trips shifted to an adjacent car park zone (z182) and 20% shifted to bus
10 years - Lansdowne Travel Interchange	Additional bus stops have been added to existing services through the area

For the Park and Ride sites, a Select Link Analysis along each park and ride route to ascertain which vehicles may use the proposed site. For each site, trips between the centre of Poole or Bournemouth (dependant on the site) and zones in which vehicles may realistically pass and switch to the Park and Ride. Of these vehicles, it has been assumed that 30% will switch to the Park and Ride. This has

been done for all peaks and forecast years separately to account for changes to the matrices due to other interventions. In the AM Peak, changes have been made to trips travelling into the centre, in the PM Peak, the shift affects trips leaving the centre. In the Interpeak the shift has been applied in both directions.

Due to the limitations of the model, the model is only focused on the highway changes rather than the PT change with the addition of the sites. But, the variable demand model does include services between the park and ride sites and the centre of Poole/Bournemouth.

Do Something Scenario 1: 2039

Table 3 below outlines the grouped interventions and further details on how they have been modelled. All of these have been included within the 2039 Do-Something scenario, in addition to the 2023 and 2031 interventions. All interventions outlined for the 15 and 20 year period have been included in this forecast year.

Table 2.13: 2039 Interventions

Group	Details on Modelling
15 years - Rail improvements - Reduced journey time to circa 1 hour 45 mins from Poole / 1 hour 30 from Bournemouth	Added once every 30 minute service from Poole - Southampton (also calling at Bournemouth and Christchurch)
15 years - More frequent rail service between Poole and Bournemouth	Headway of trains changed from an hour to 30 minutes.
15 years - Rail improvements - Reduce journey times on services between Weymouth and London	Journey times have been reduced on rail services between Weymouth and London. Bournemouth to London in 90 minutes
20 years - Rail improvements - New journey opportunities from south Dorset to major destinations	Addition of a Bournemouth to Bristol service, calling at Weymouth, Exeter and Plymouth. Once every 60 minutes.
20 years - Rail improvements - Dorset Metro	Start and end of services moved from Poole to Holton Heath
20 years - Rail improvements - New/ improved journey opportunities in areas not served by rail (north Bournemouth/ north Poole/ Ferndown/ Bournemouth Airport/ Verwood/ Wimborne	Added new stations at Bournemouth Aiport and Ringwood. Added once every 30 minute service from Bournemouth to Ringwood calling at Pokesdown, Christchurch and Bournemouth Airport
20 years - Rail improvements - DARTS	Added once every 15 minute service from New Milton to Wareham
20 years - Rail improvements - New Railway Station at Talbot Heath	Added a new station here and added a 10-min frequency service through area stopping at this station

Do-Something Model Outputs

For each of the three forecast years, a number of outputs have been produced and are outlined in this section. The model outputs chosen to be outlined in this study are detailed in Section 1.3.

More detailed area maps are outlined in Appendix E. The highway model statistics are outlined in Appendix B and information on the Do-Something journey times are attached in Appendix C

2023 Do Something: AM Peak

The model outputs for the 2023 Do Something: AM Peak are shown below. Figure 2.62 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.14.

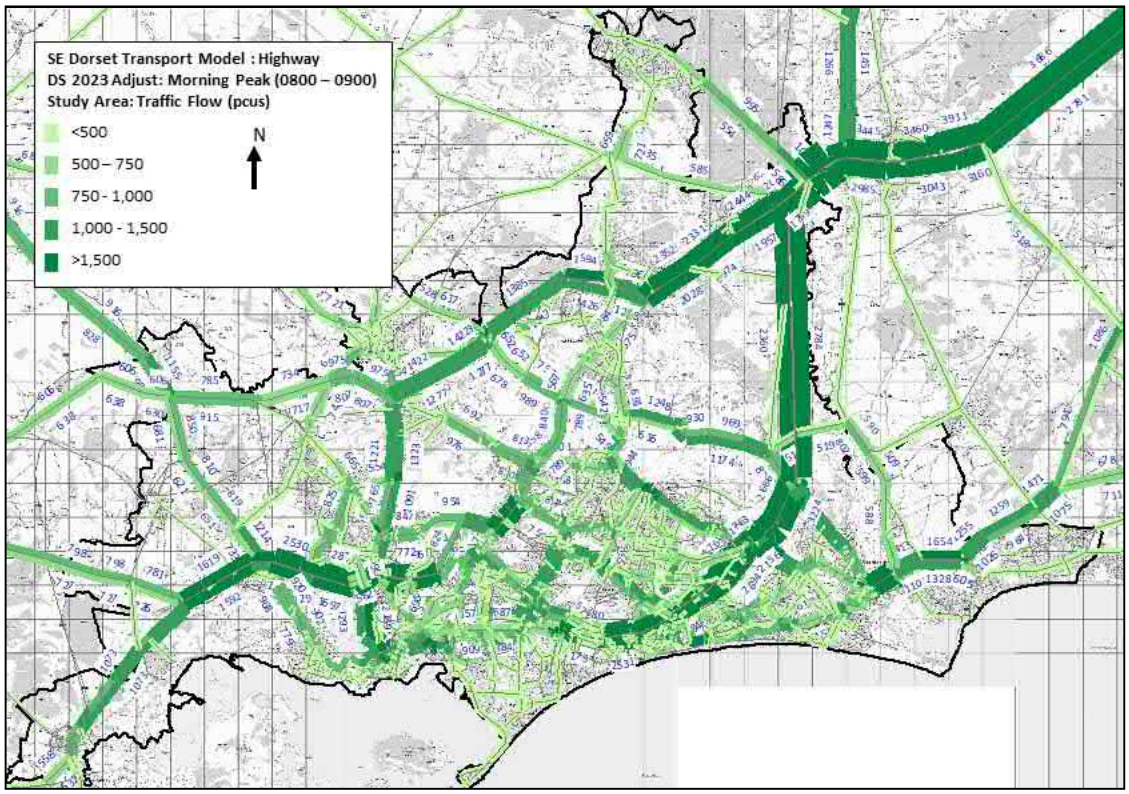

Figure 2.62: Actual Flows (vehicles) – 2021 Do Something, AM Peak

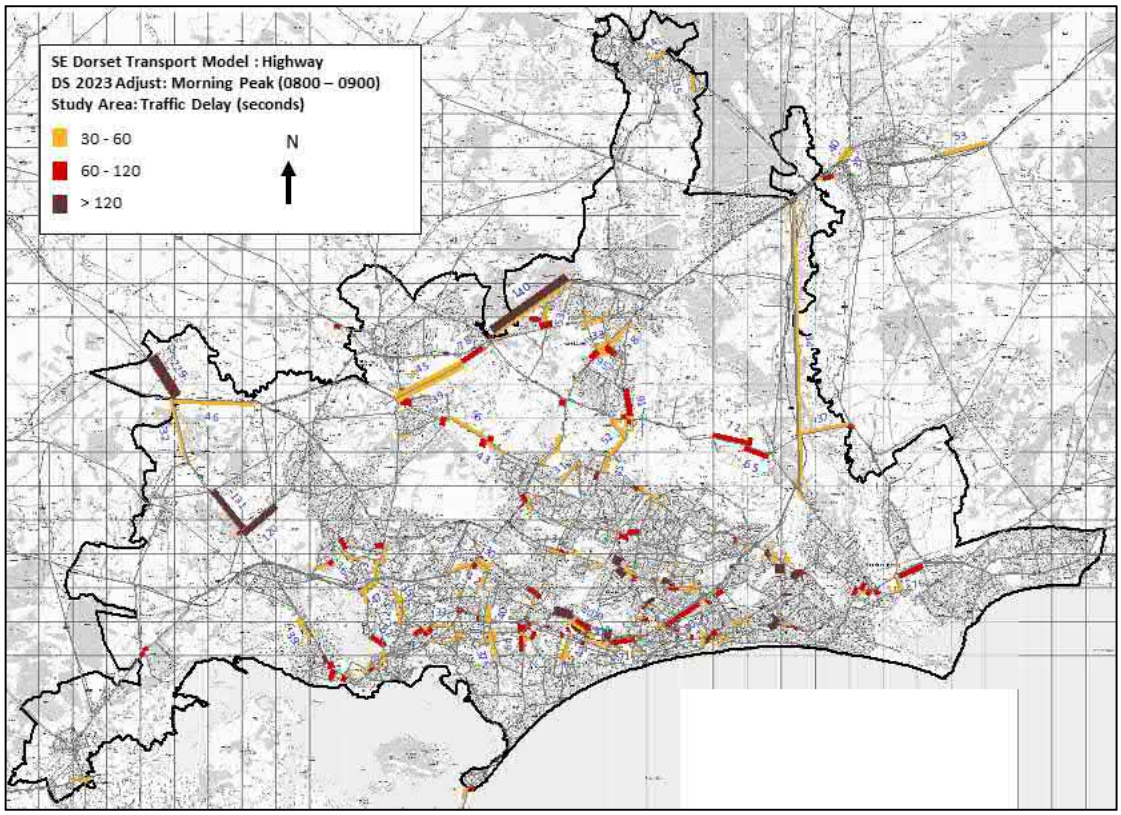

Figure 2.63: Link Delays (seconds) – 2023 Do Something, AM Peak

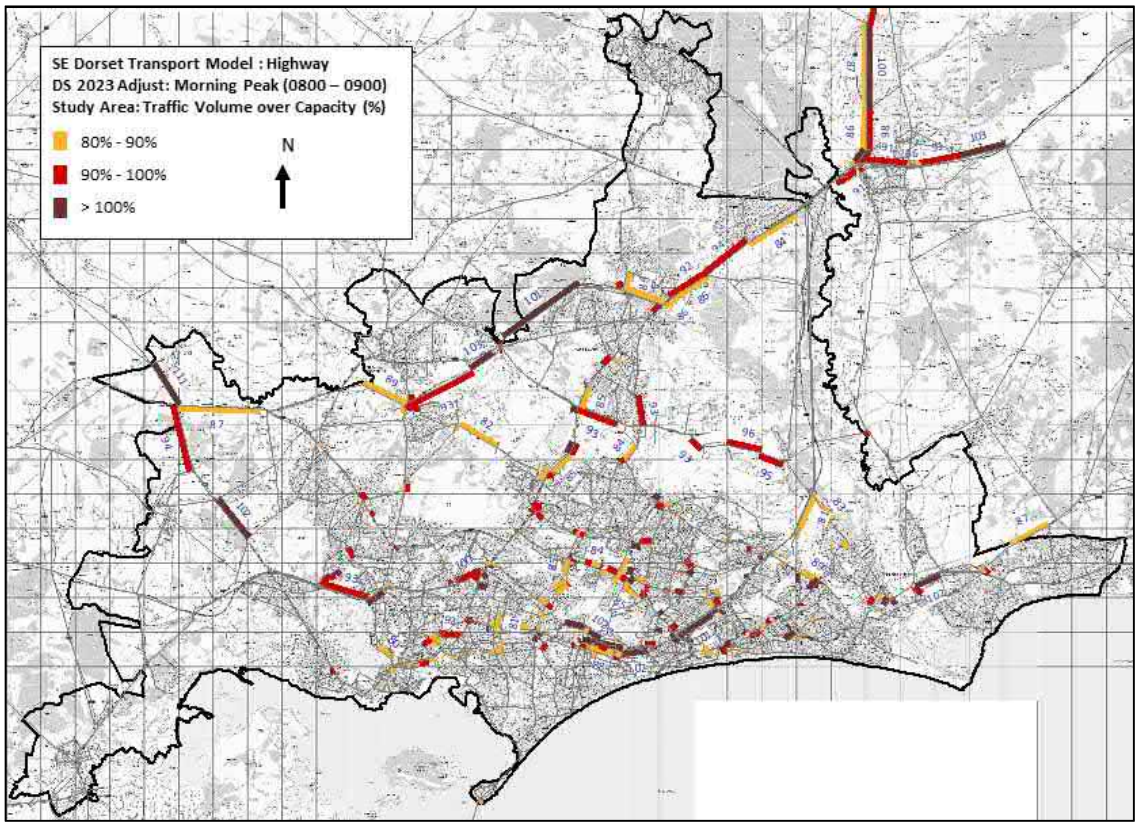

Figure 2.64: Link V/C (%) – 2023 Do Something, AM Peak

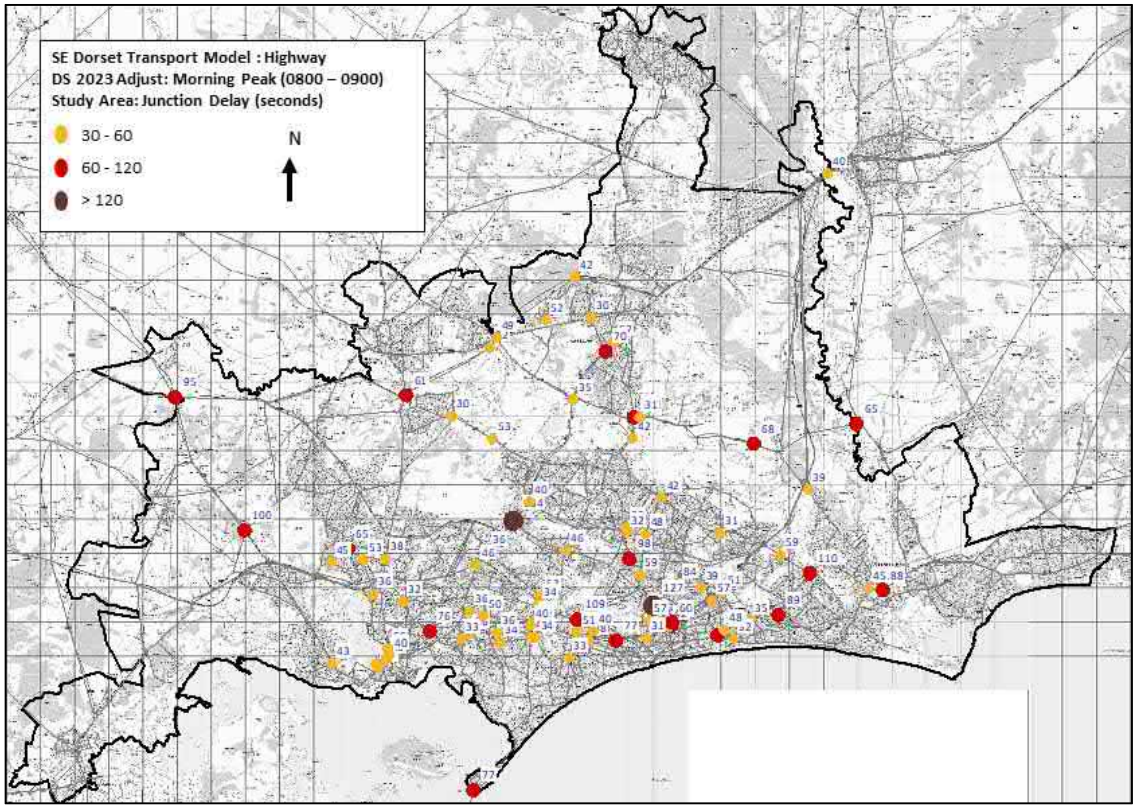

Figure 2.65: Node Delay (seconds) – 2023 Do Something, AM Peak

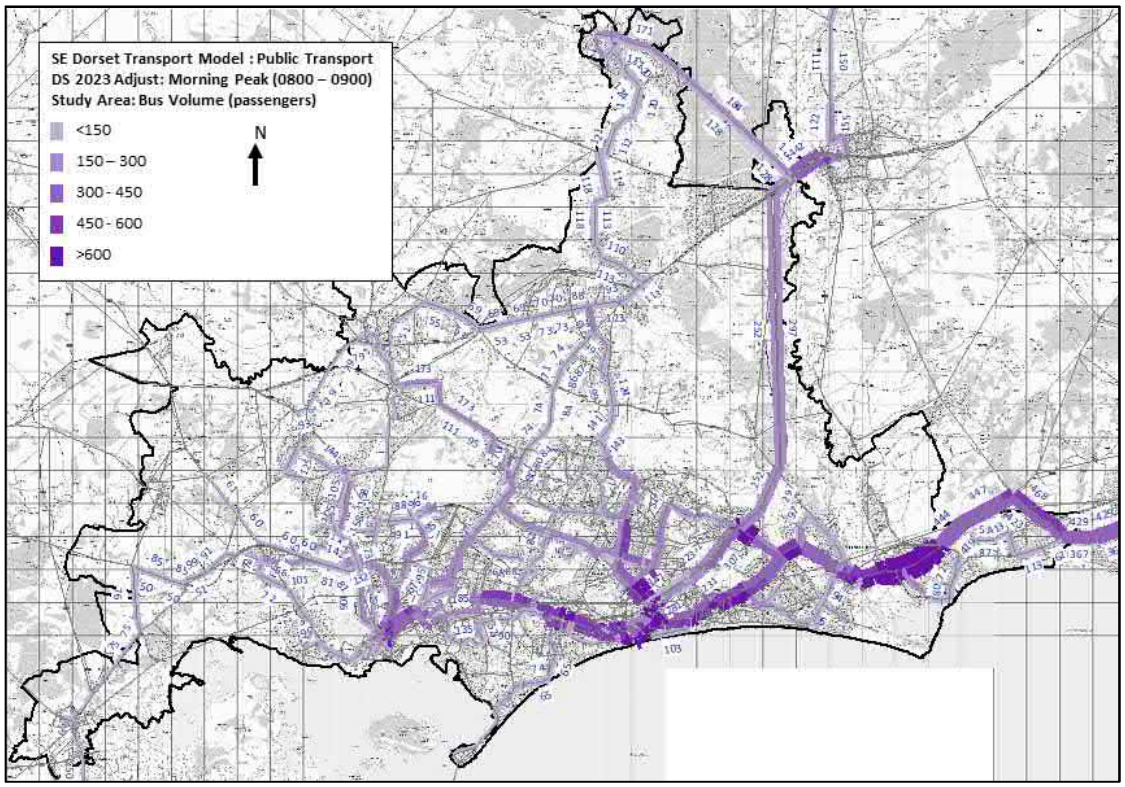

Figure 2.66: Bus Flows (passengers) - 2023 Do Something, AM Peak

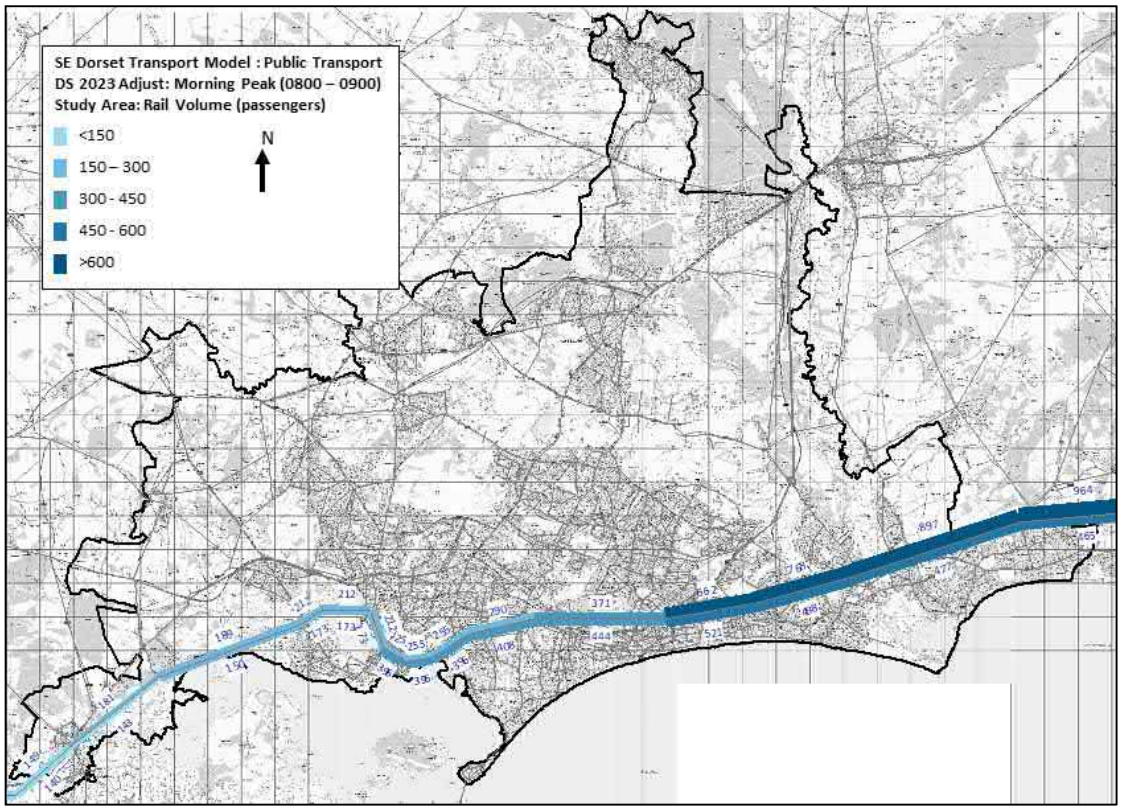

Figure 2.67: Rail Flows (passengers) - 2023 Do Something, AM Peak

2023 Do Something: Interpeak

The model outputs for the 2023 Do Something: Interpeak are shown below. Figure 2.68 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.15.

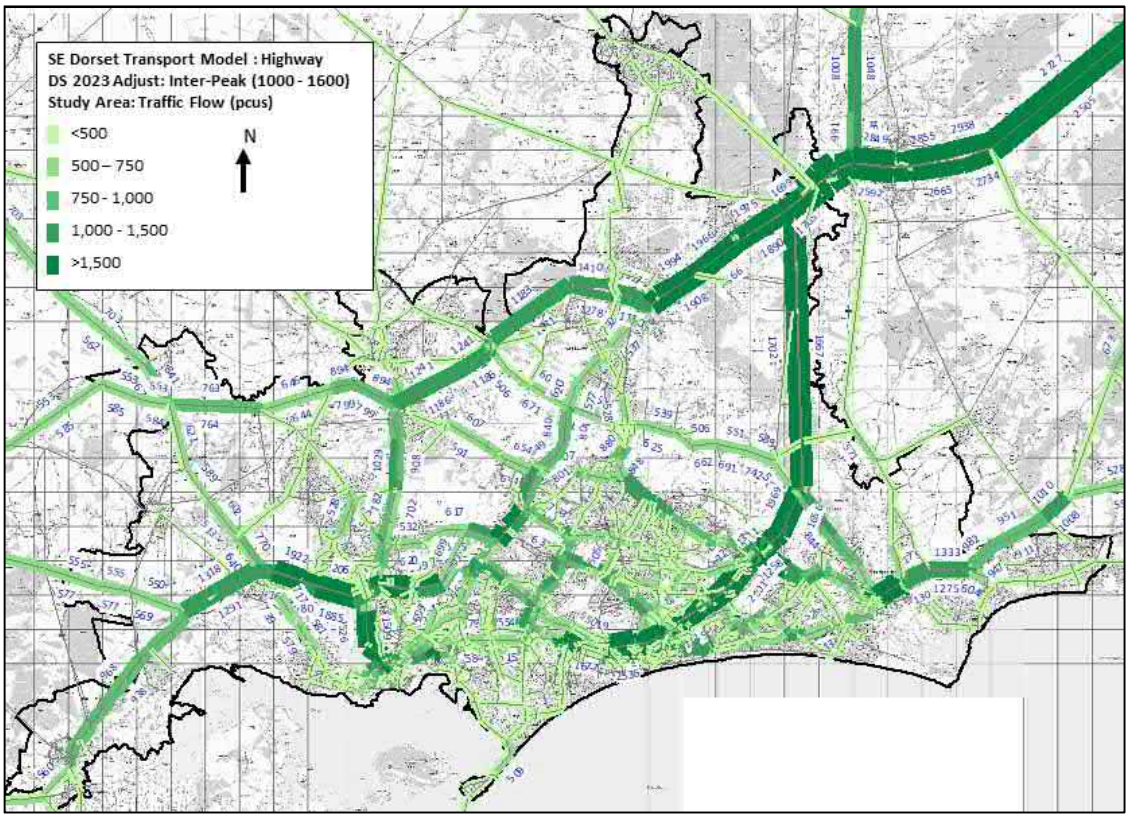

Figure 2.68: Actual Flows (vehicles) – 2023 Do Something, Interpeak

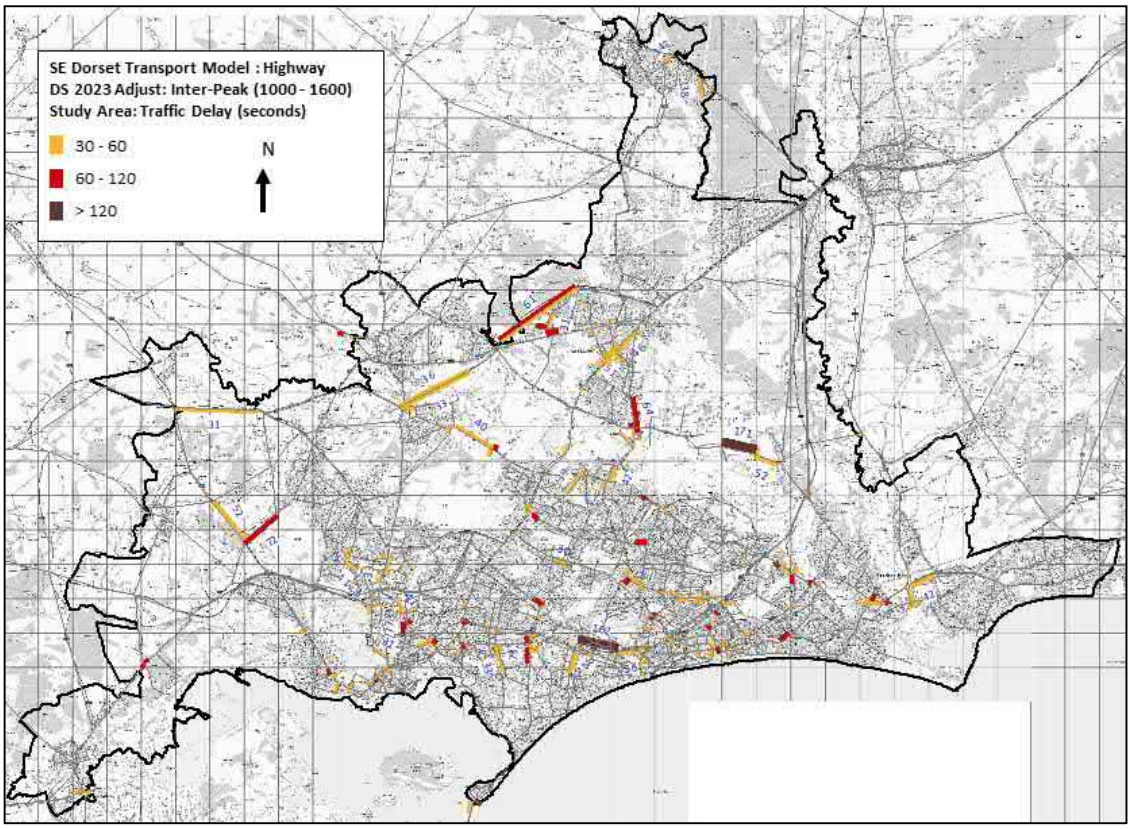

Figure 2.69: Link Delays (seconds) – 2023 Do Something, Interpeak

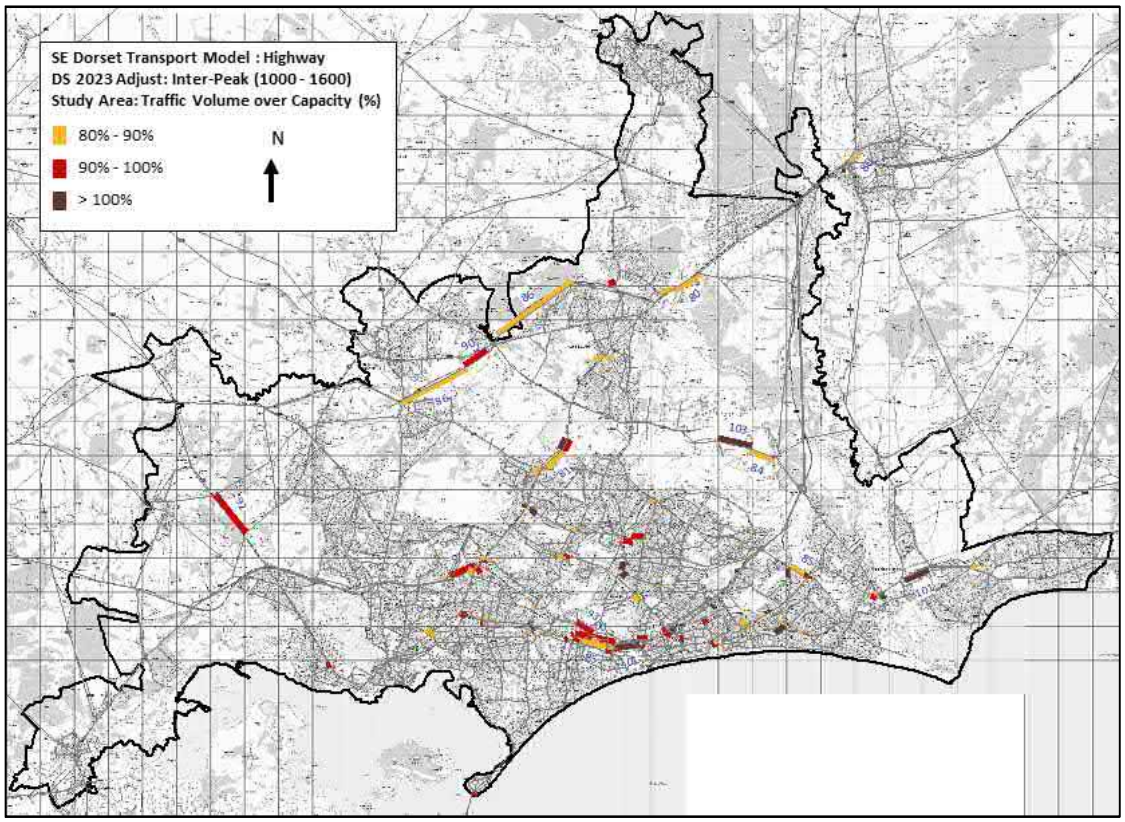

Figure 2.70: Link V/C (%) – 2023 Do Something, Interpeak

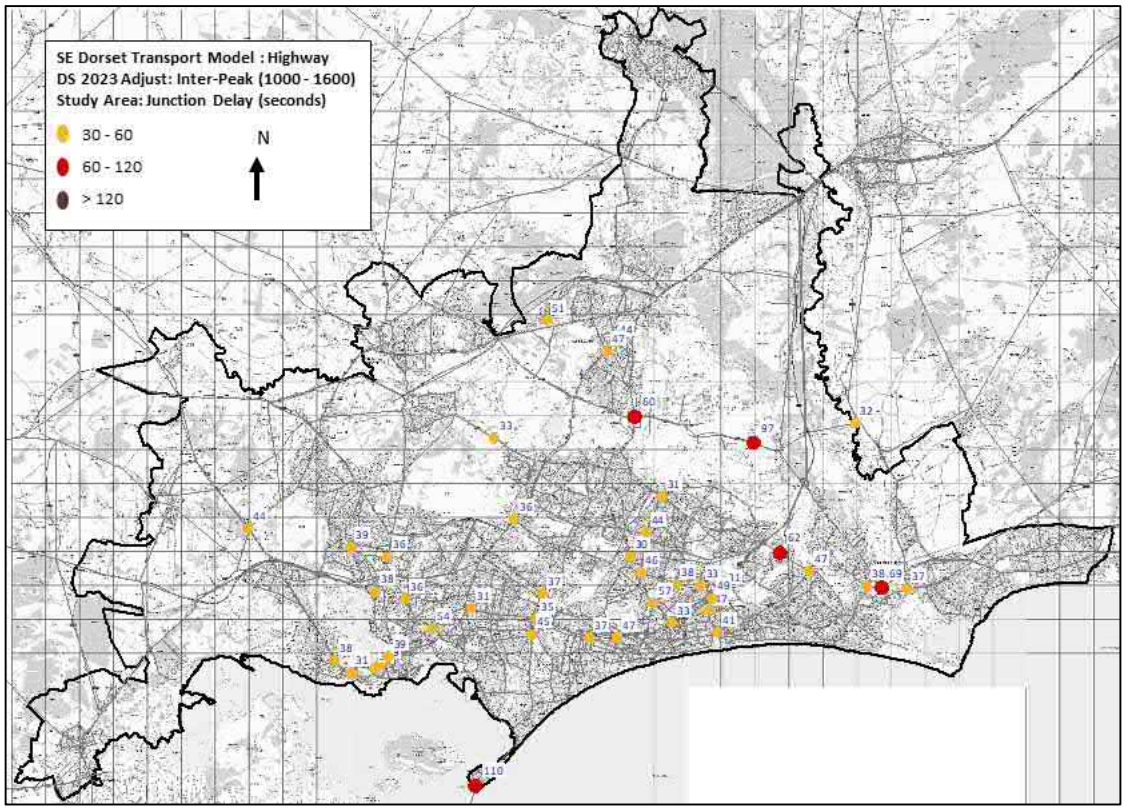

Figure 2.71: Node Delay (seconds) – 2023 Do Something, Interpeak

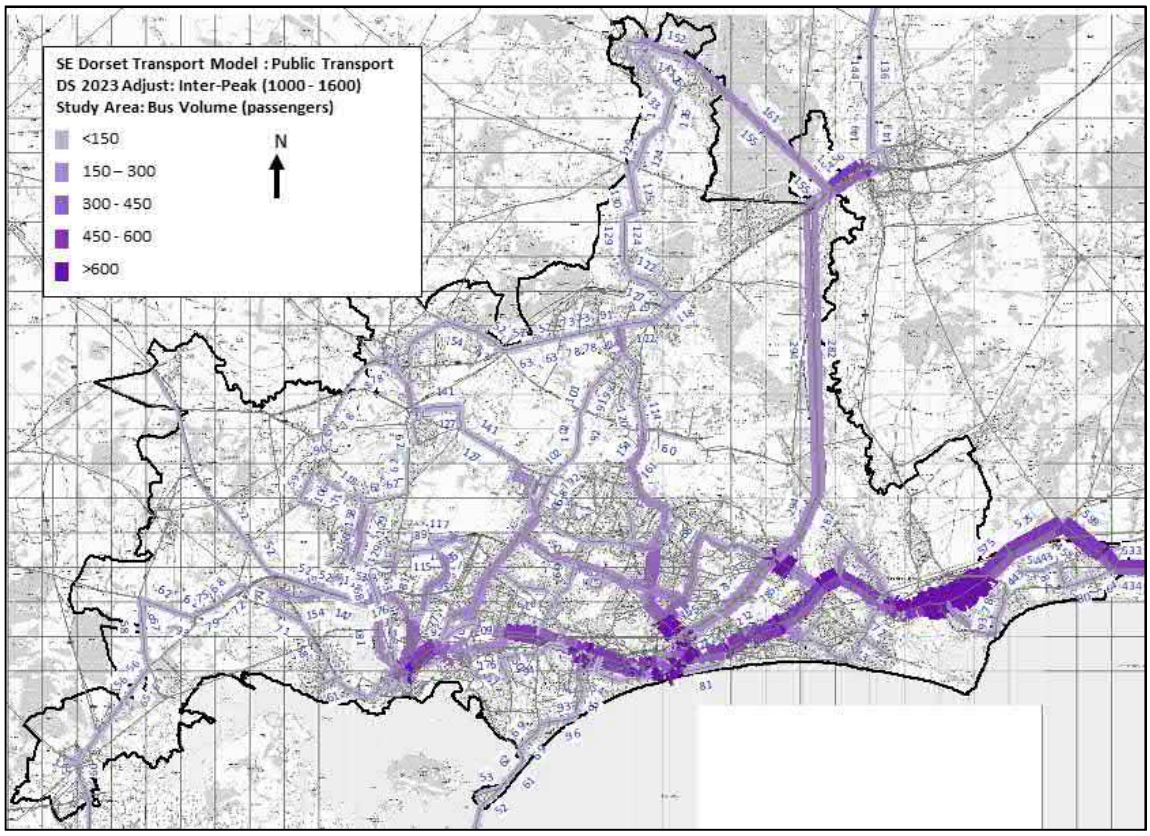

Figure 2.72: Bus Flows (passengers) - 2023 Do Something, Interpeak

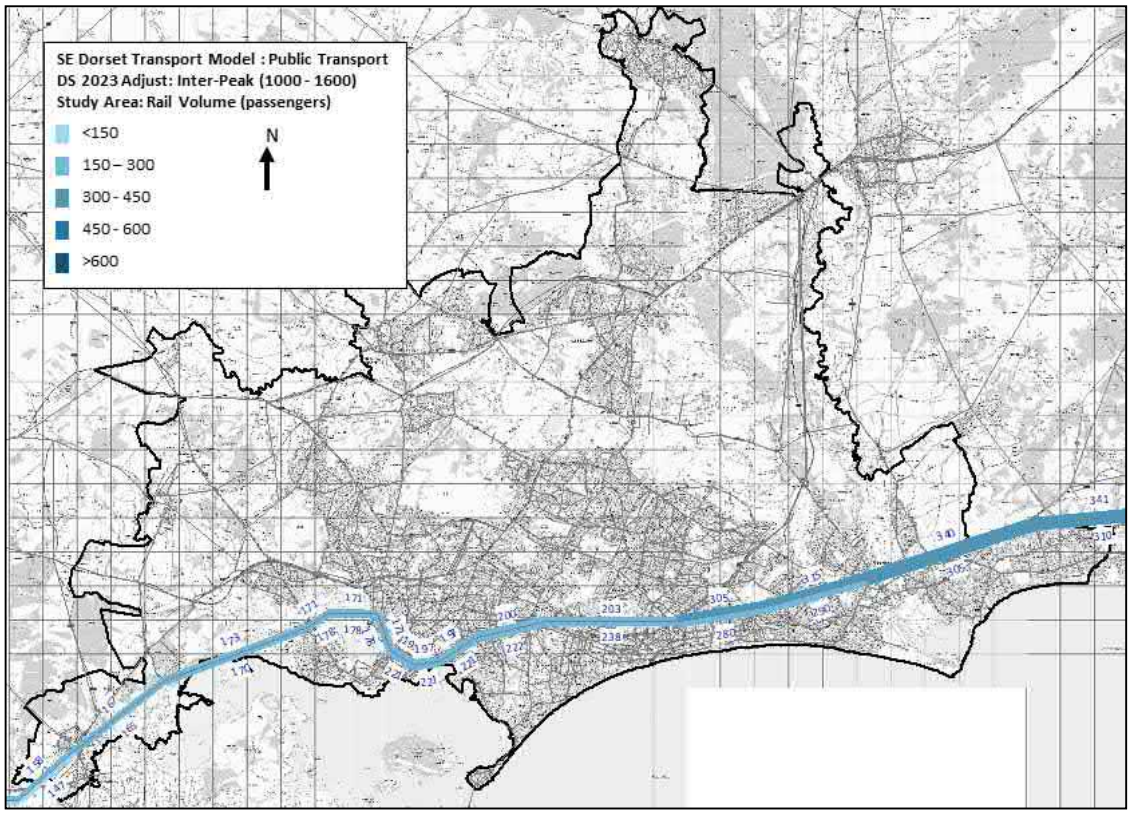

Figure 2.73: Rail Flows (passengers) - 2023 Do Something, Interpeak

2023 Do Something: PM Peak

The model outputs for the 2023 Do Something: PM Peak are shown below. Figure 2.74 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.16.

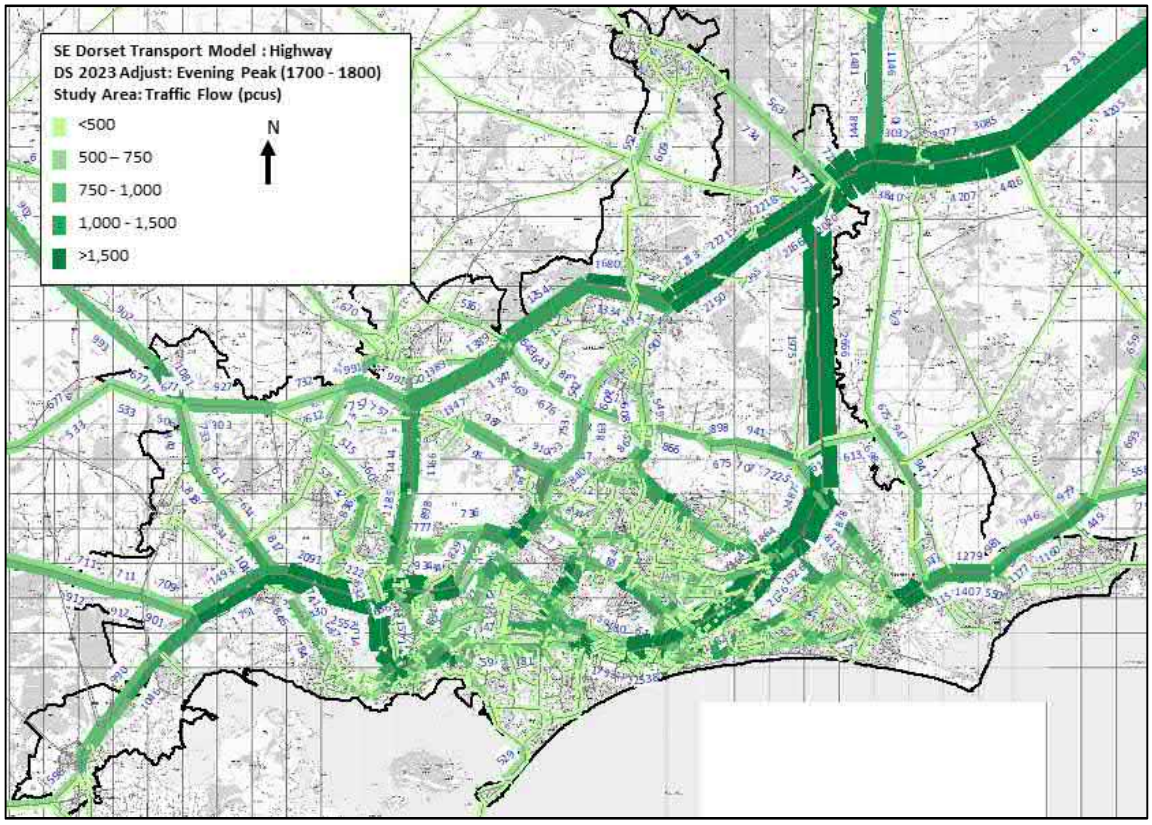

Figure 2.74: Actual Flows (vehicles) – 2023 Do Something, PM Peak

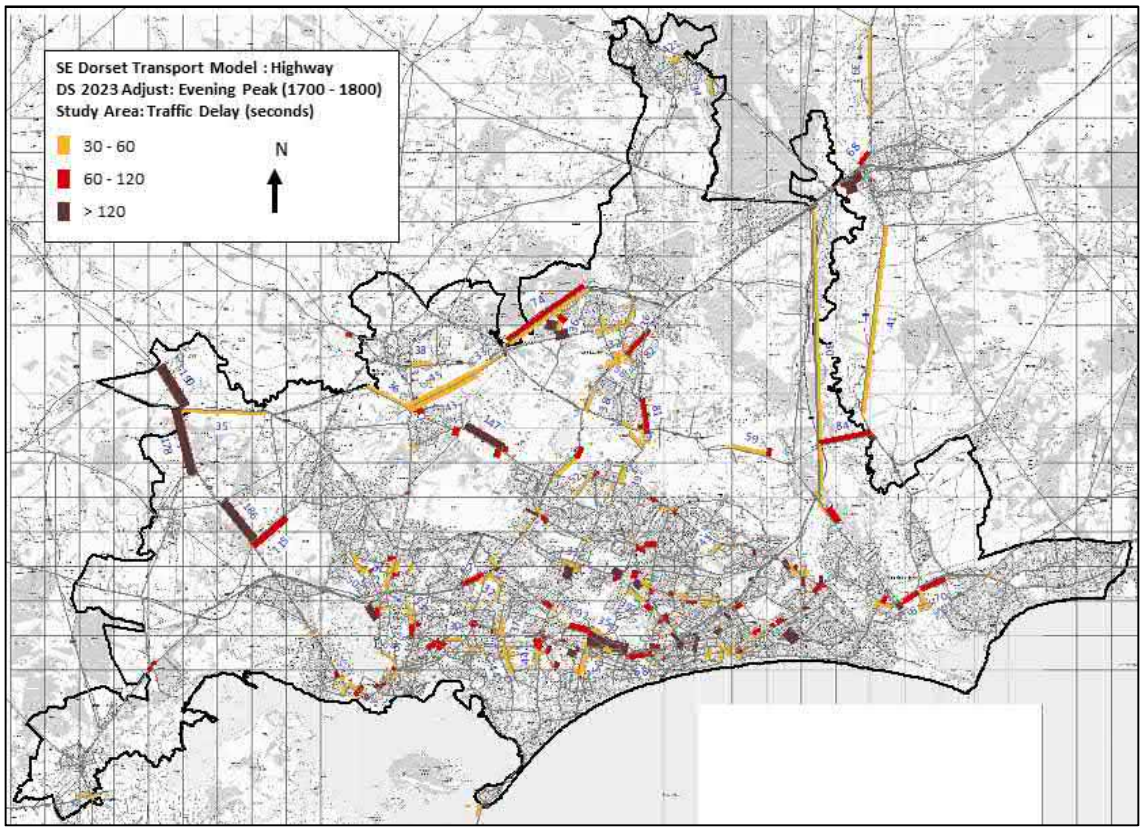

Figure 2.75: Link Delays (seconds) – 2023 Do Something, PM Peak

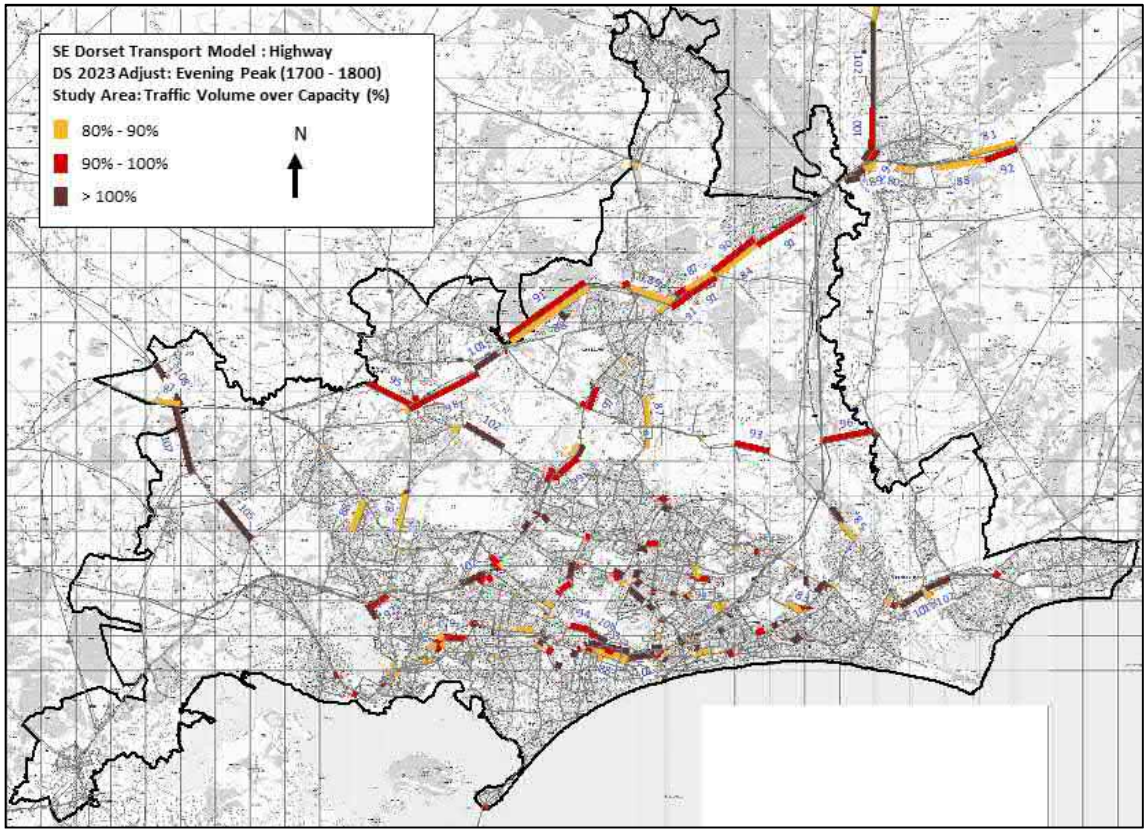

Figure 2.76: Link V/C (%) – 2023 Do Something, PM Peak

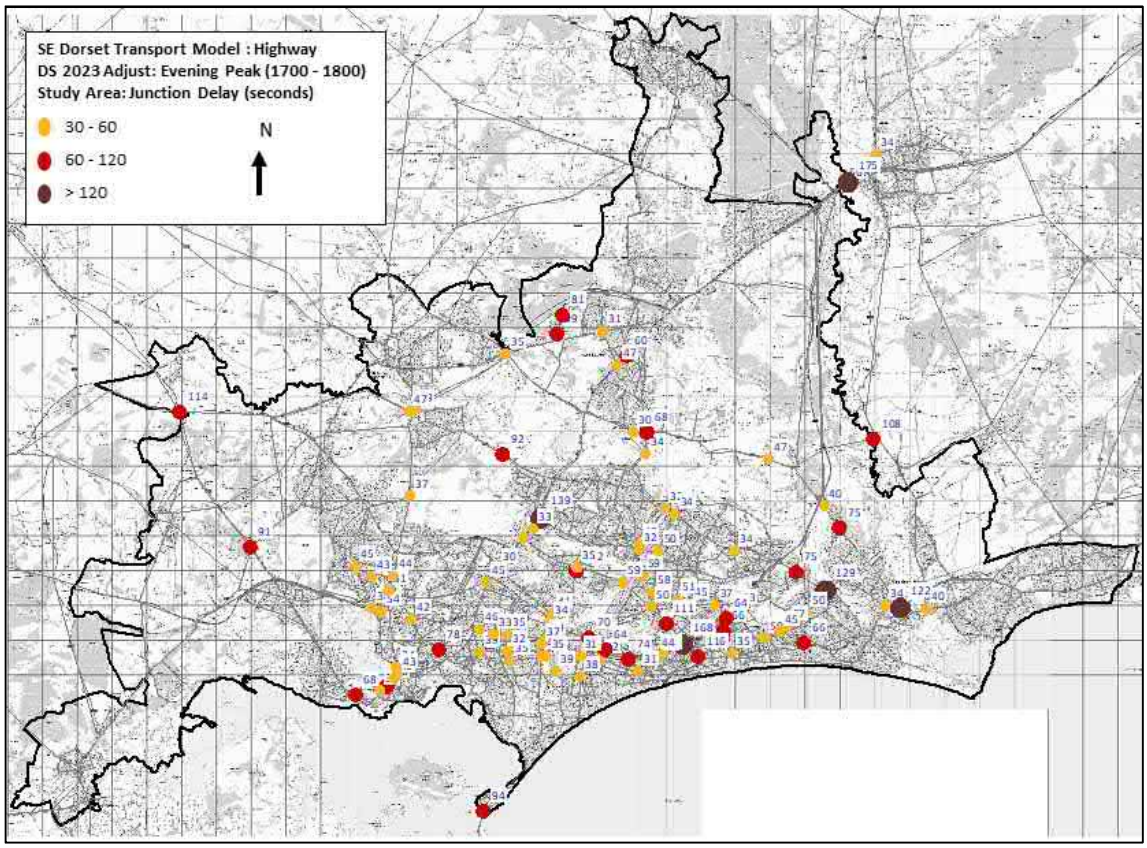

Figure 2.77: Node Delay (seconds) – 2023 Do Something, PM Peak

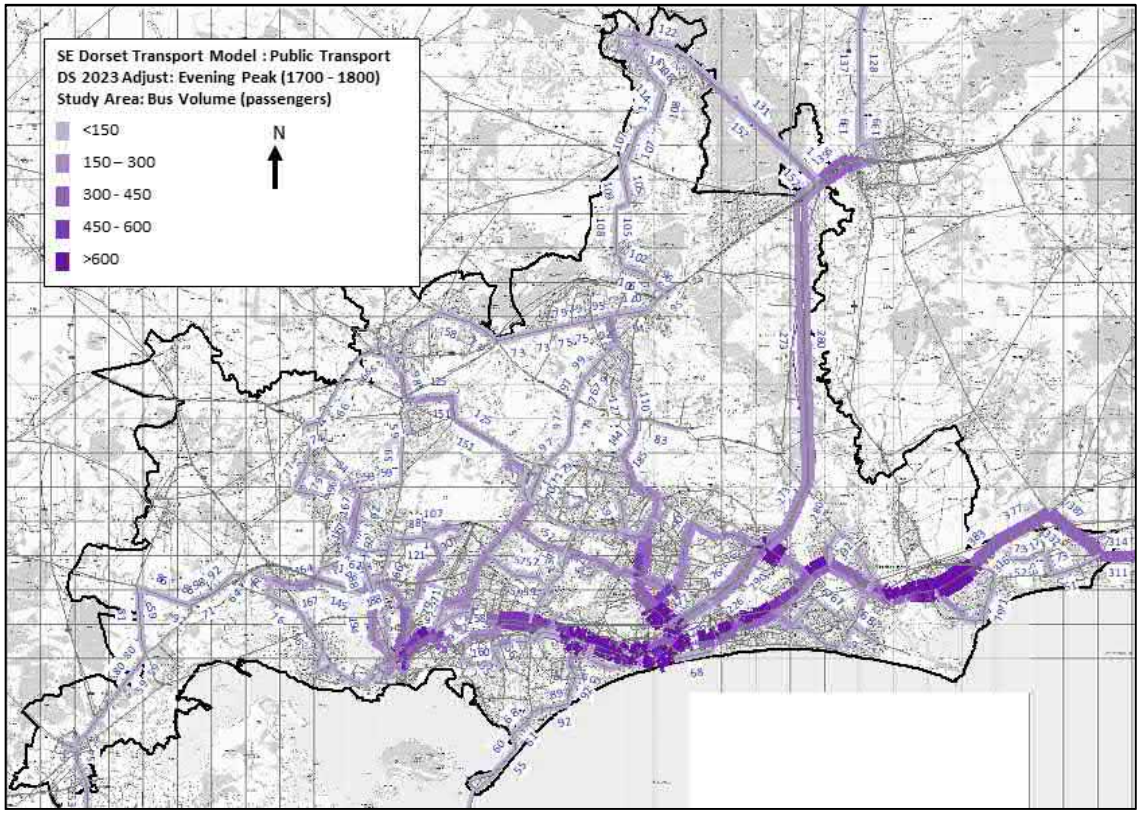

Figure 2.78: Bus Flows (passengers) - 2023 Do Something, PM Peak

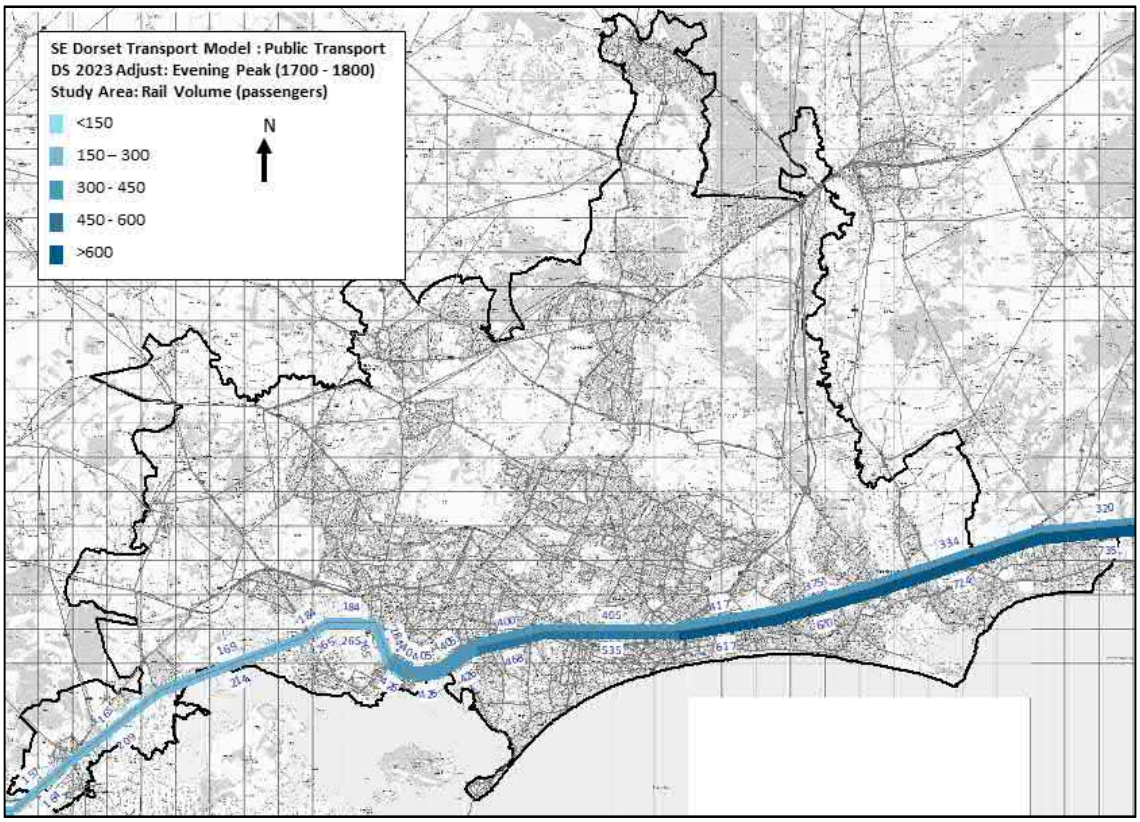

Figure 2.79: Rail Flows (passengers) - 2023 Do Something, PM Peak

2031 Do Something: AM Peak

The model outputs for the 2031 Do Something: AM Peak are shown below. Figure 2.80 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.17.

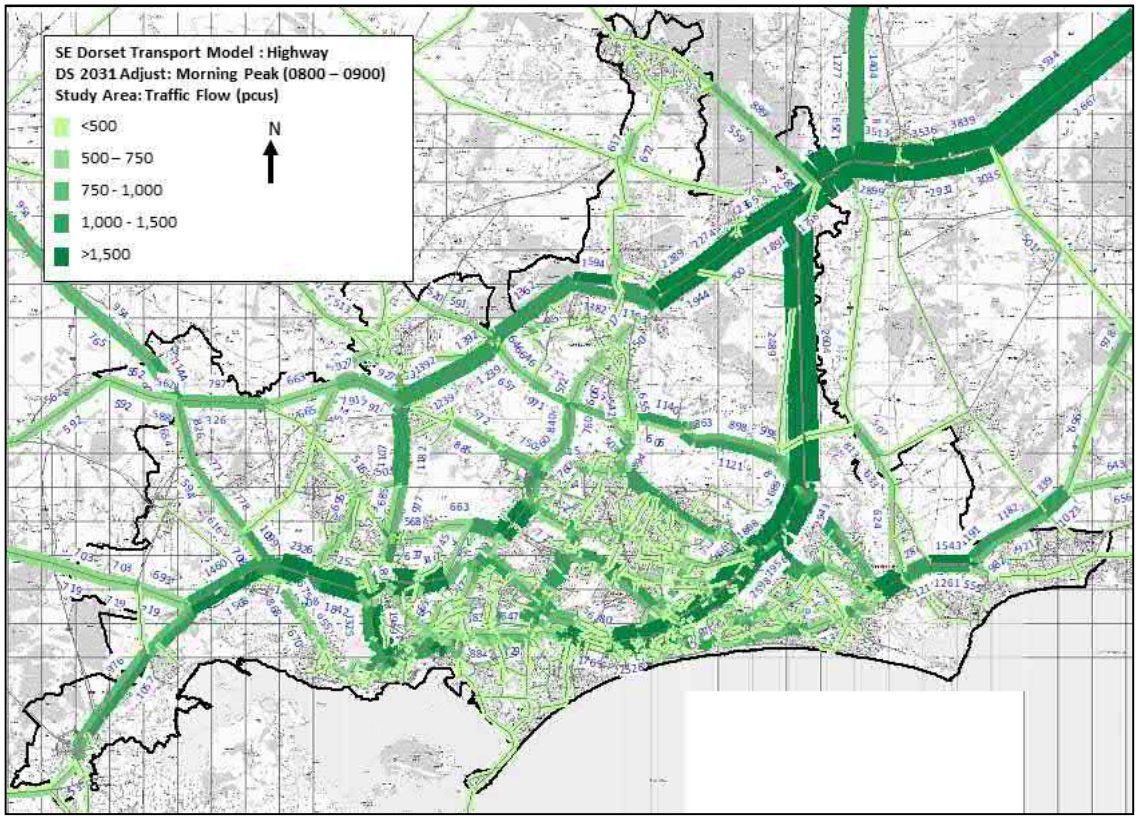

Figure 2.80: Actual Flows (vehicles) – 2031 Do Something, AM Peak

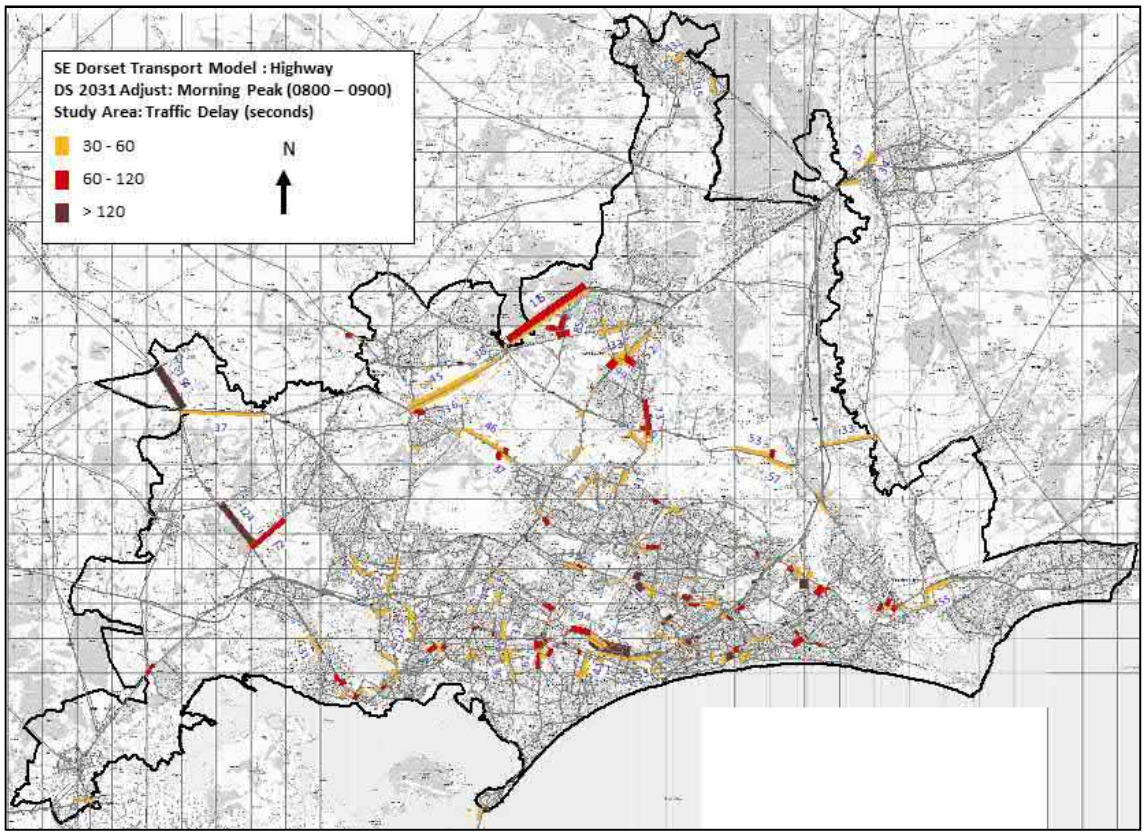

Figure 2.81: Link Delays (seconds) – 2031 Do Something, AM Peak

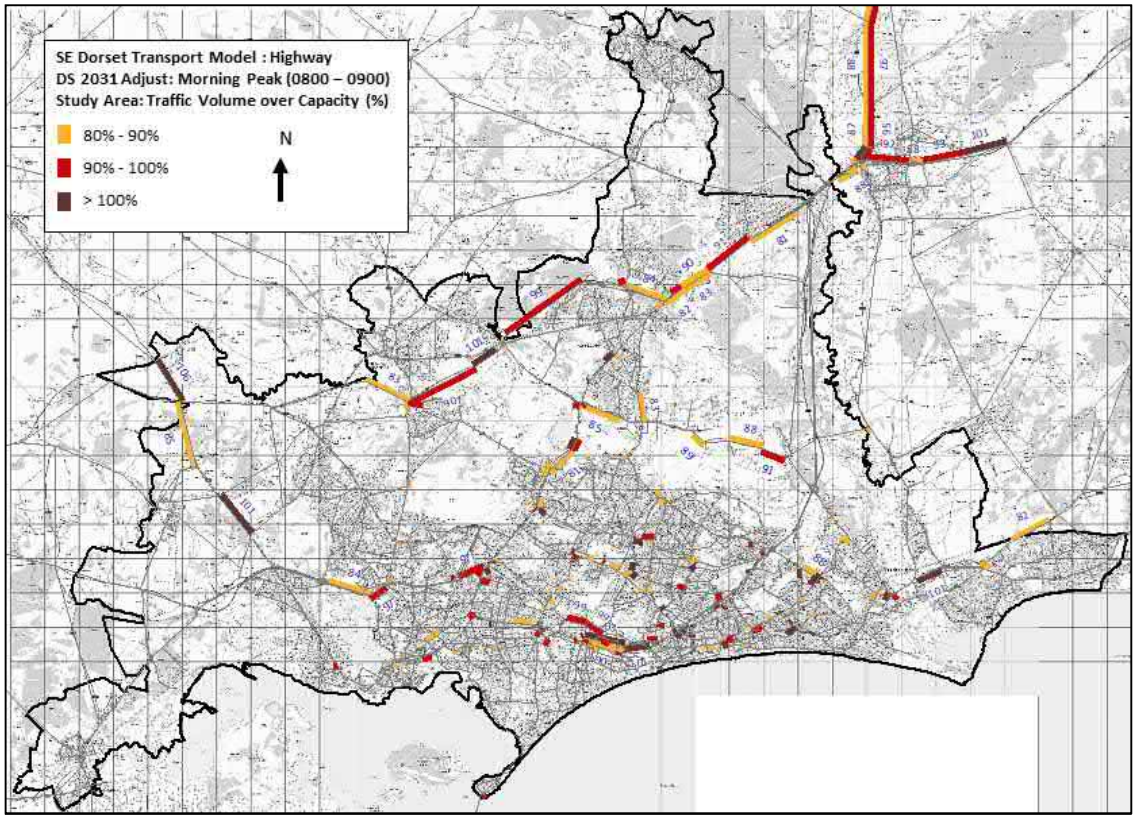

Figure 2.82: Link V/C (%) – 2031 Do Something, AM Peak

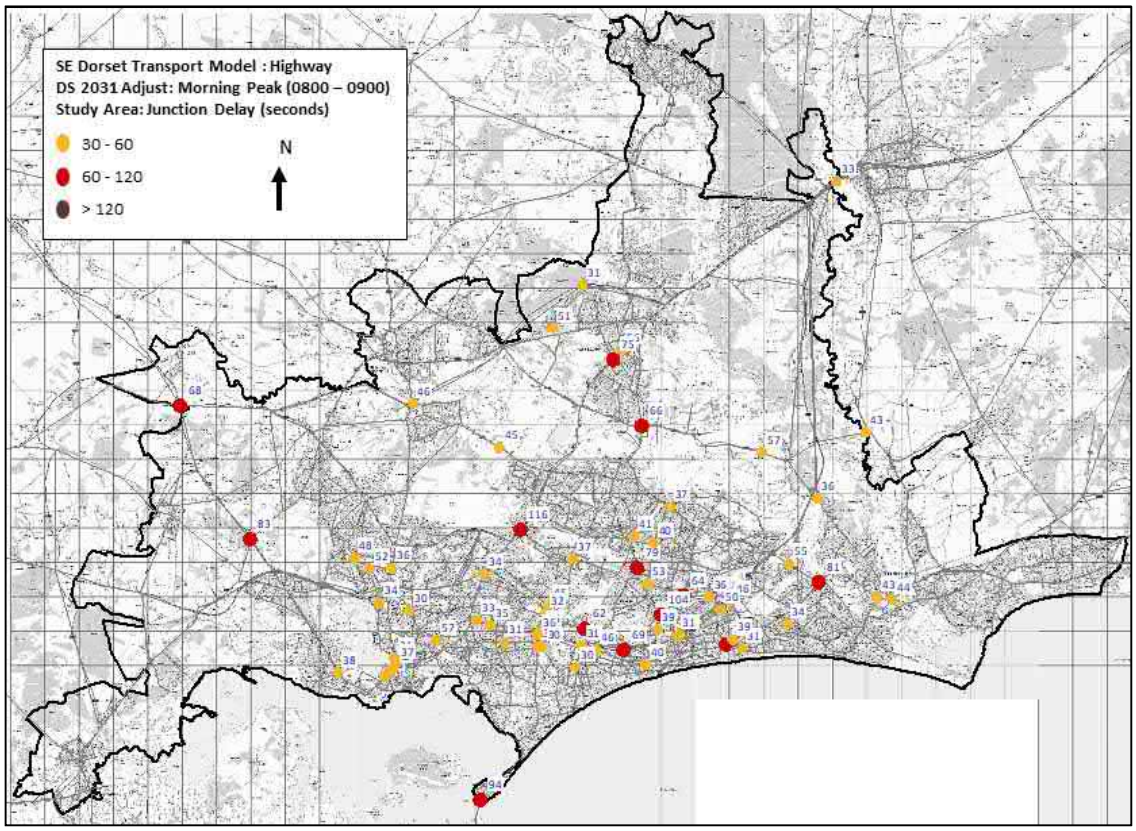

Figure 2.83: Node Delay (seconds) – 2031 Do Something, AM Peak

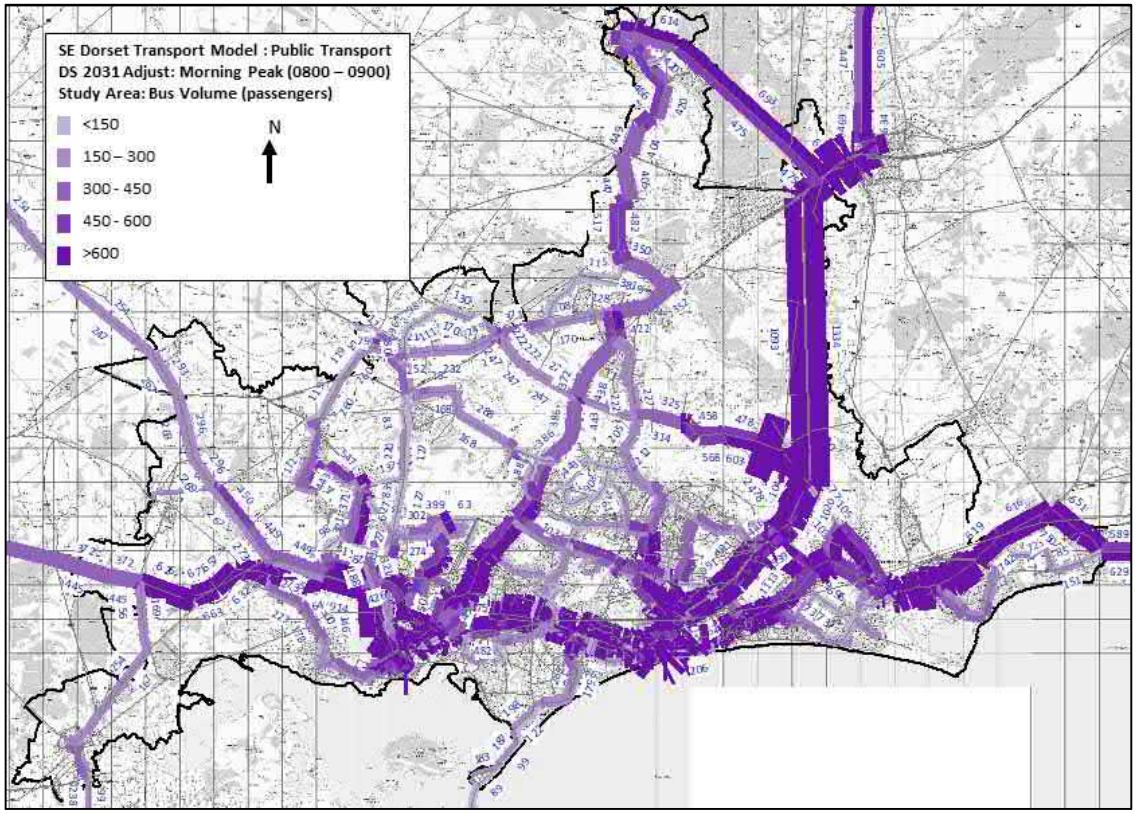

Figure 2.84: Bus Flows (passengers) - 2031 Do Something, AM Peak

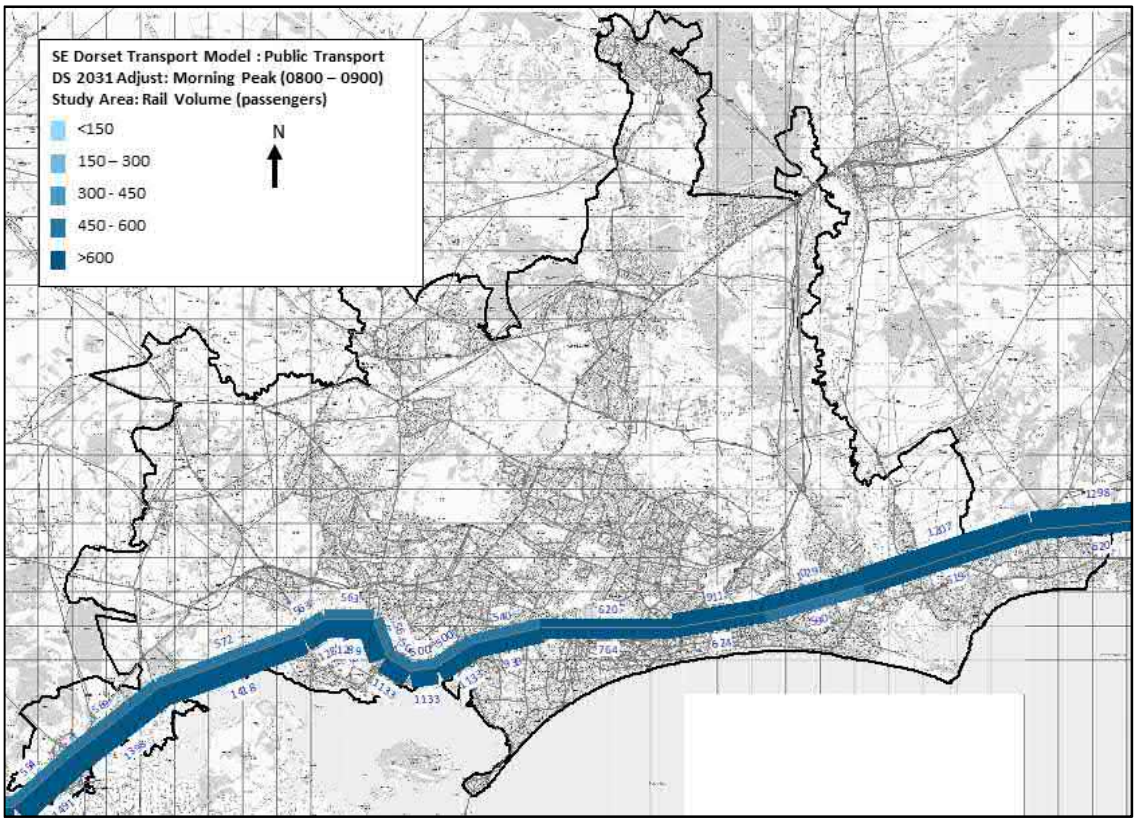

Figure 2.85: Rail Flows (passengers) - 2031 Do Something, AM Peak

2031 Do Something: Interpeak

The model outputs for the 2031 Do Something: Interpeak are shown below. Figure 2.86 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.18.

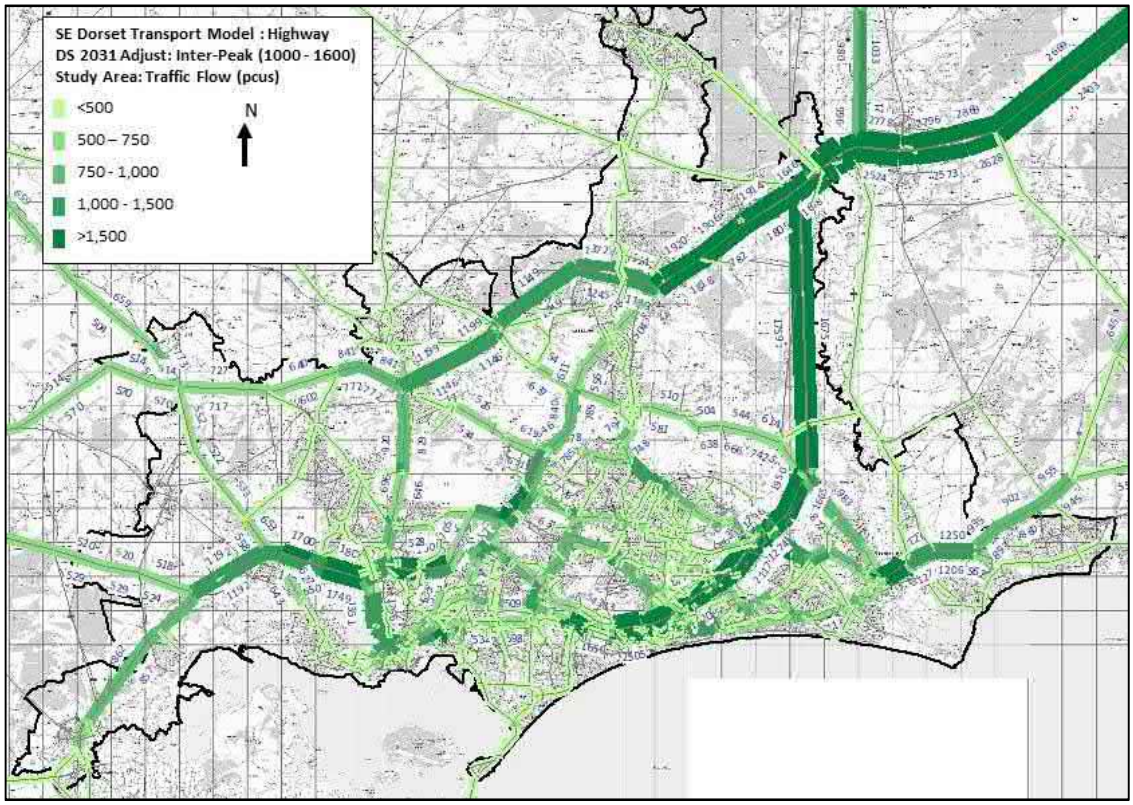

Figure 2.86: Actual Flows (vehicles) – 2031 Do Something, Interpeak

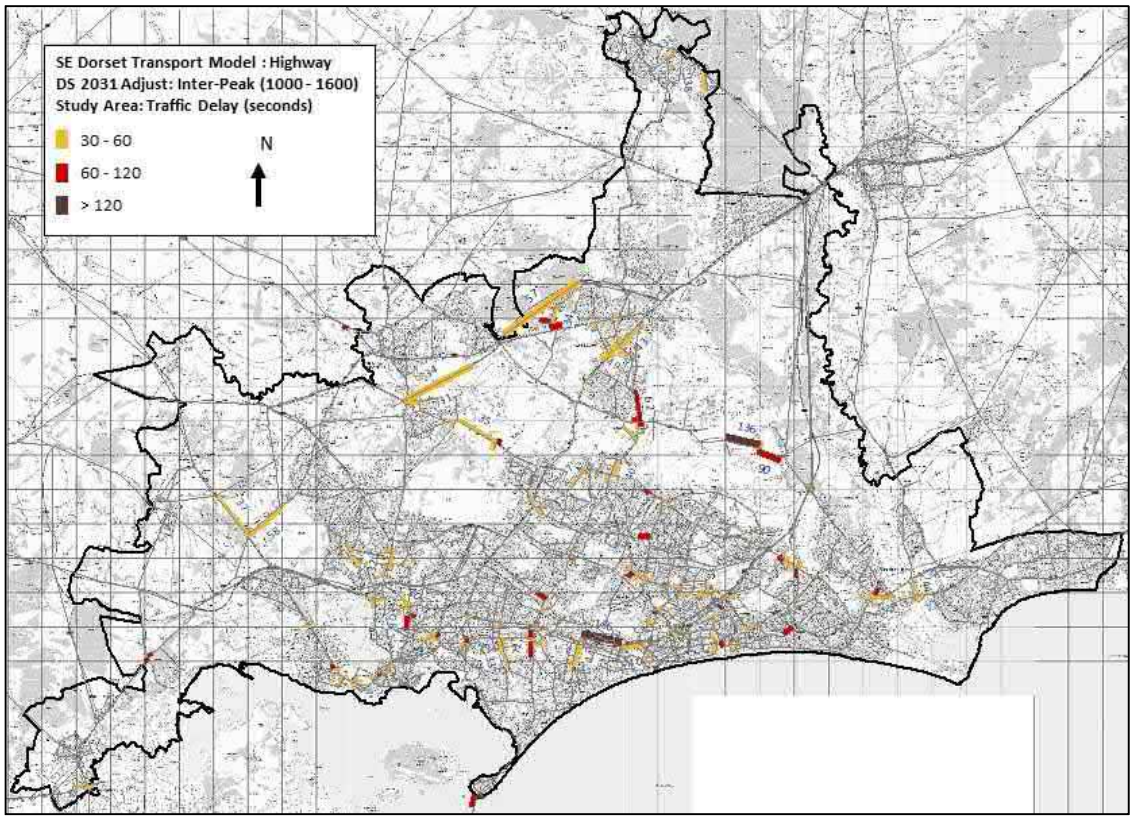

Figure 2.87: Link Delays (seconds) – 2031 Do Something, Interpeak

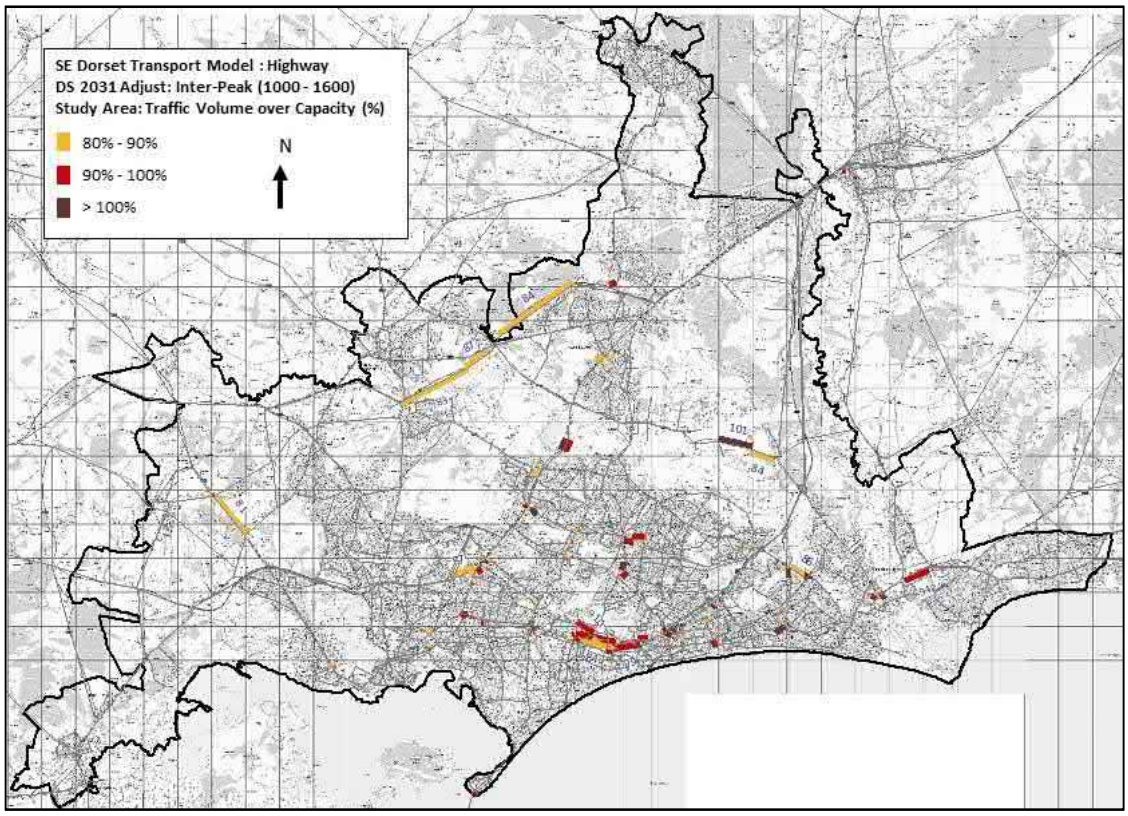

Figure 2.88: Link V/C (%) – 2031 Do Something, Interpeak

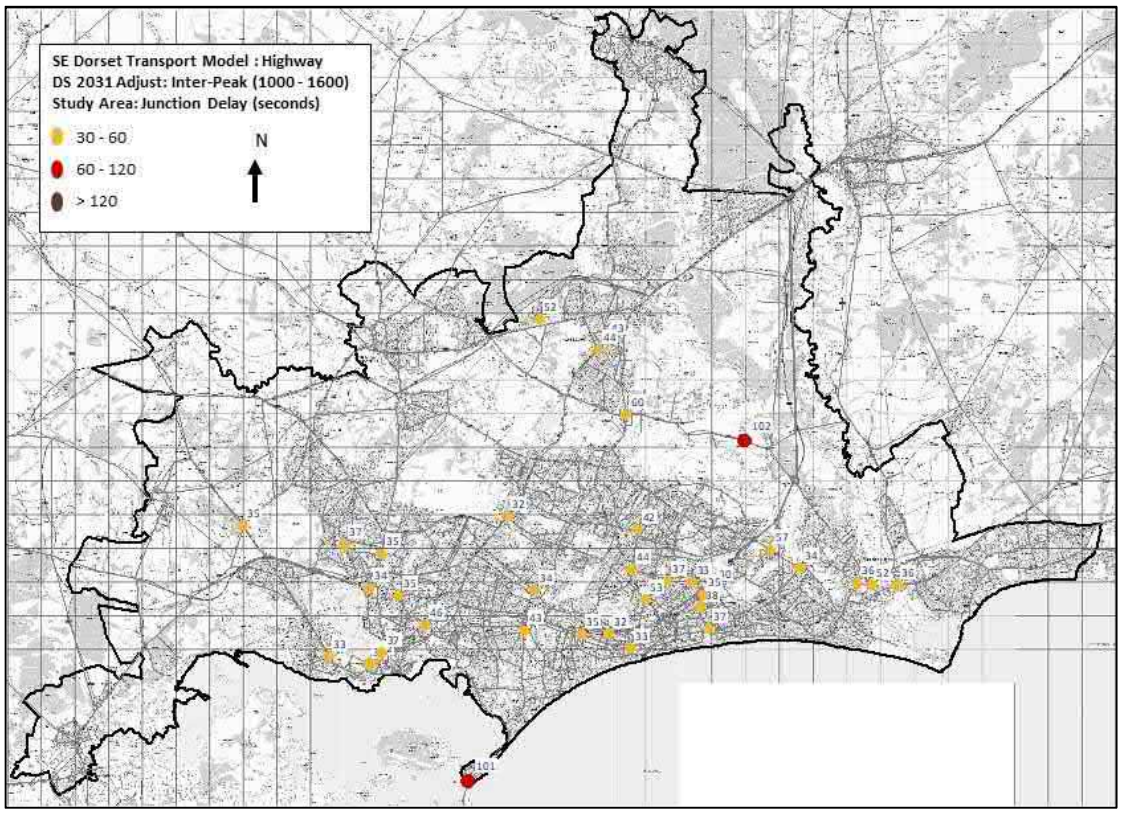

Figure 2.89: Node Delay (seconds) – 2031 Do Something, Interpeak

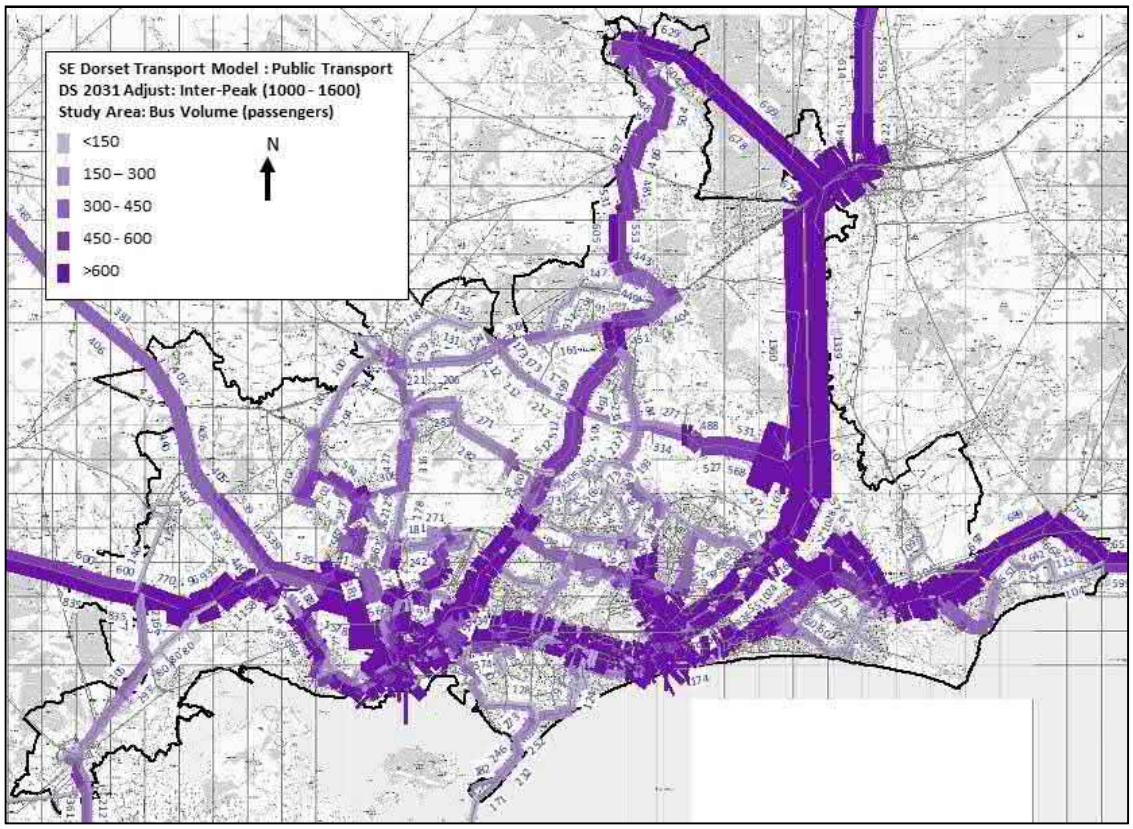

Figure 2.90: Bus Flows (passengers) - 2031 Do Something, Interpeak

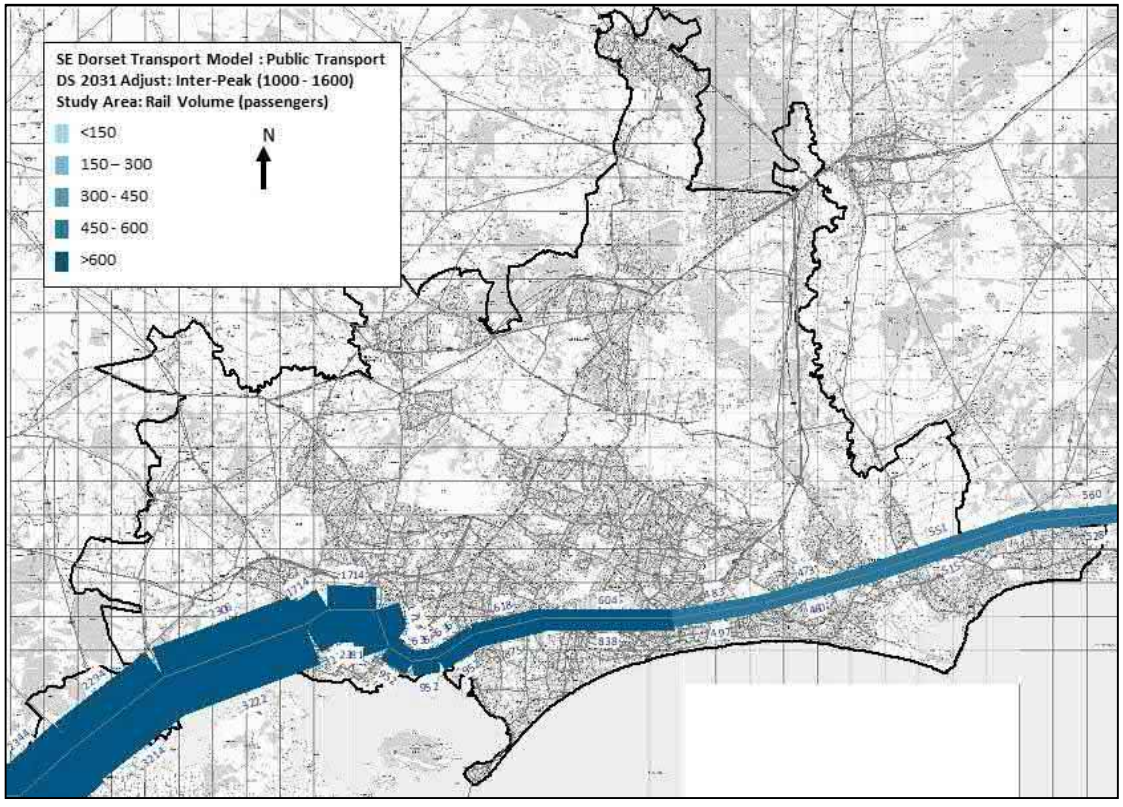

Figure 2.91: Rail Flows (passengers) - 2031 Do Something, Interpeak

2031 Do Something: PM Peak

The model outputs for the 2031 Do Something: PM Peak are shown below. Figure 2.92 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.19.

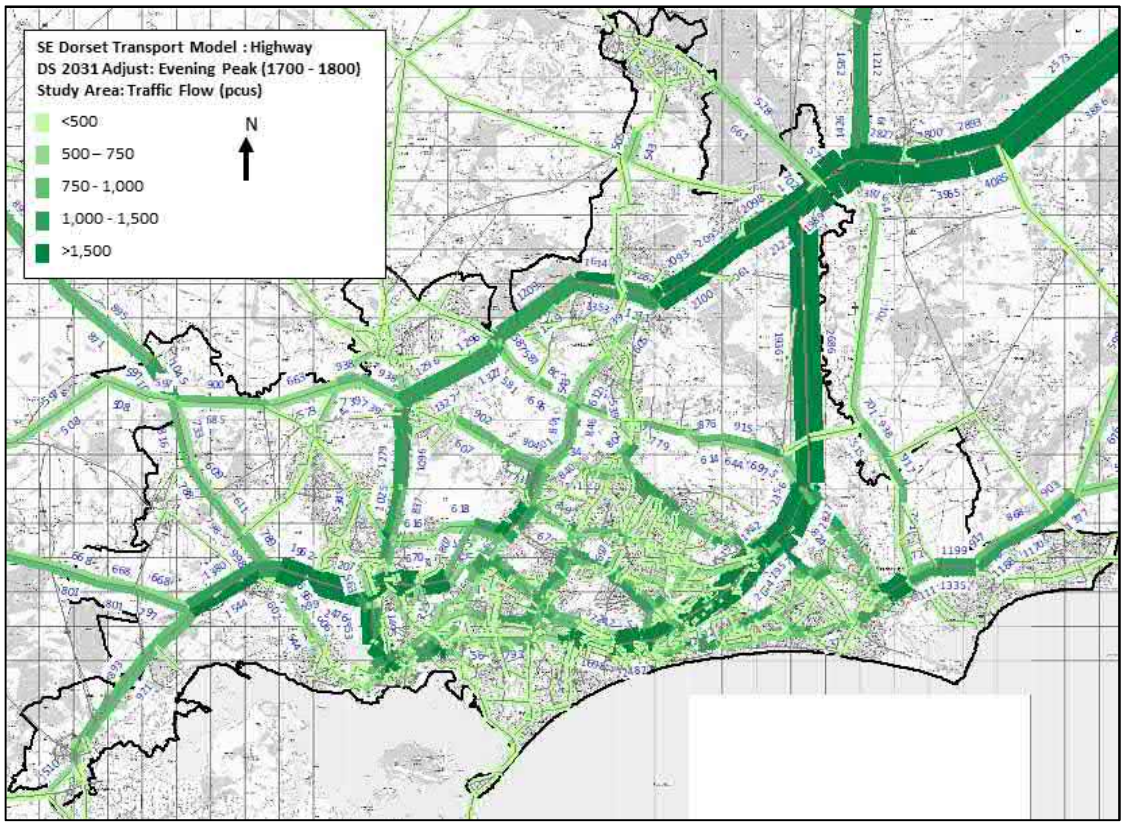

Figure 2.92: Actual Flows (vehicles) – 2031 Do Something, PM Peak

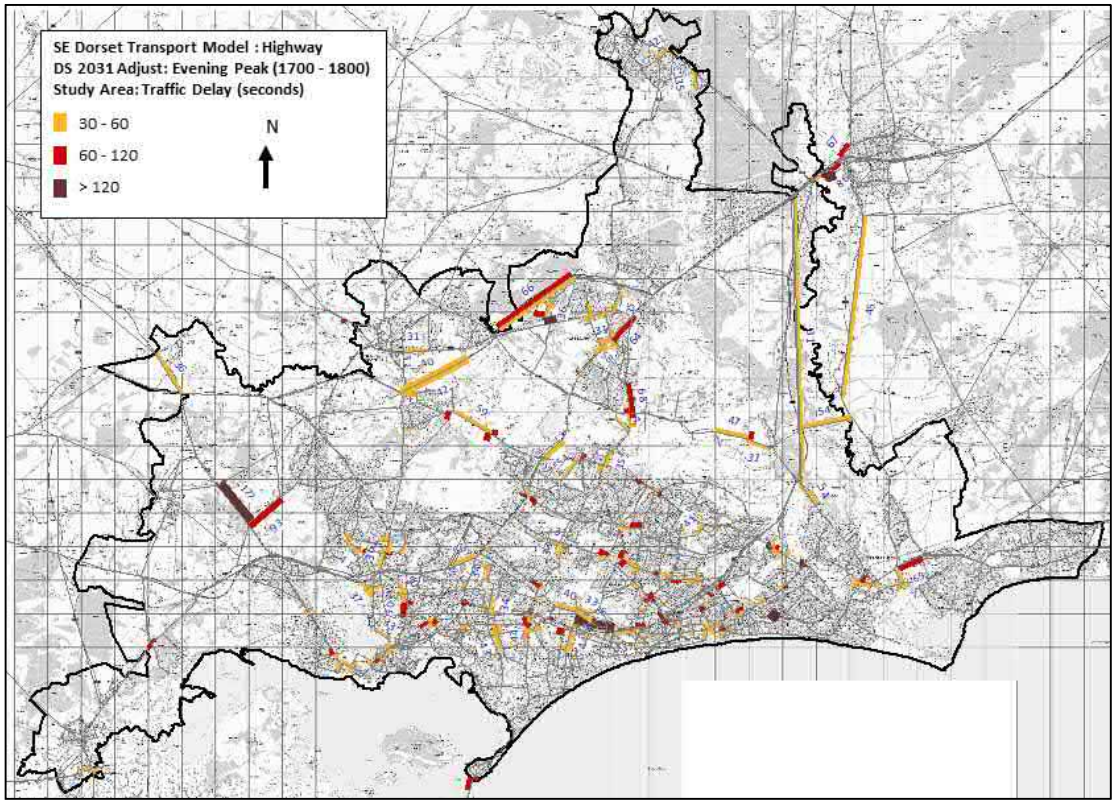

Figure 2.93: Link Delays (seconds) – 2031 Do Something, PM Peak

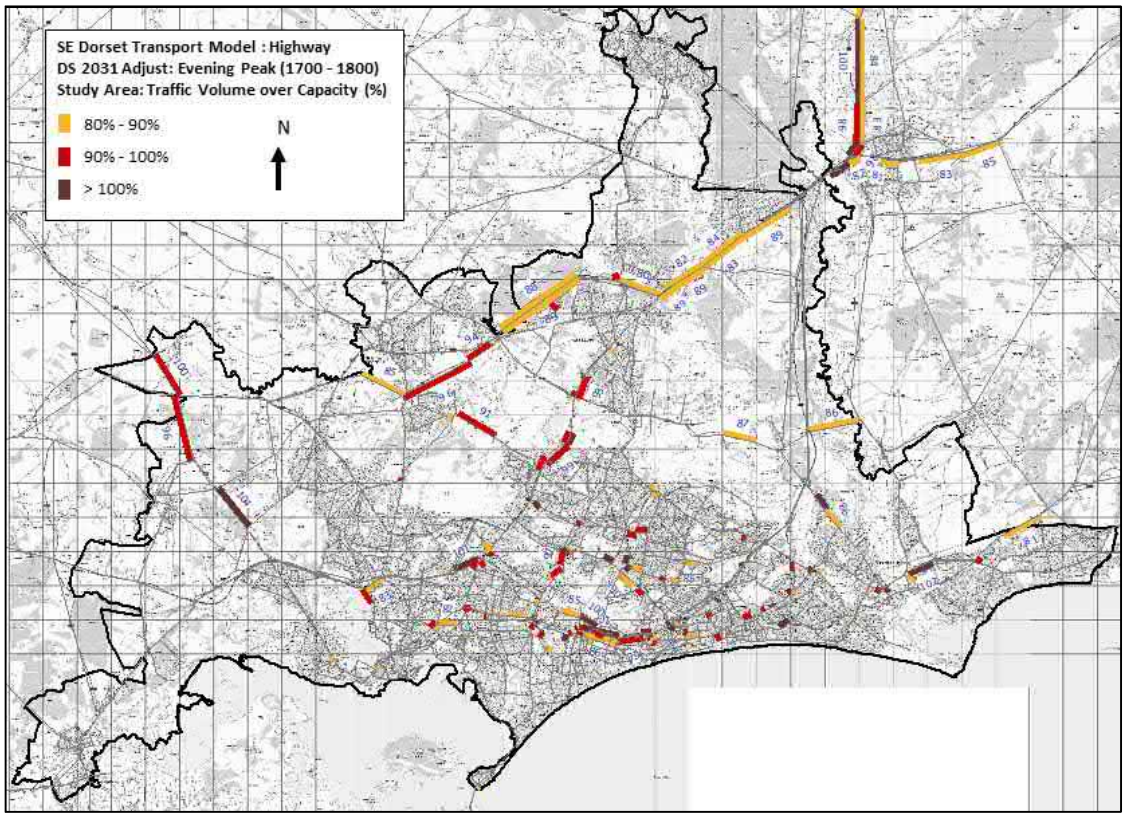

Figure 2.94: Link V/C (%) – 2031 Do Something, PM Peak

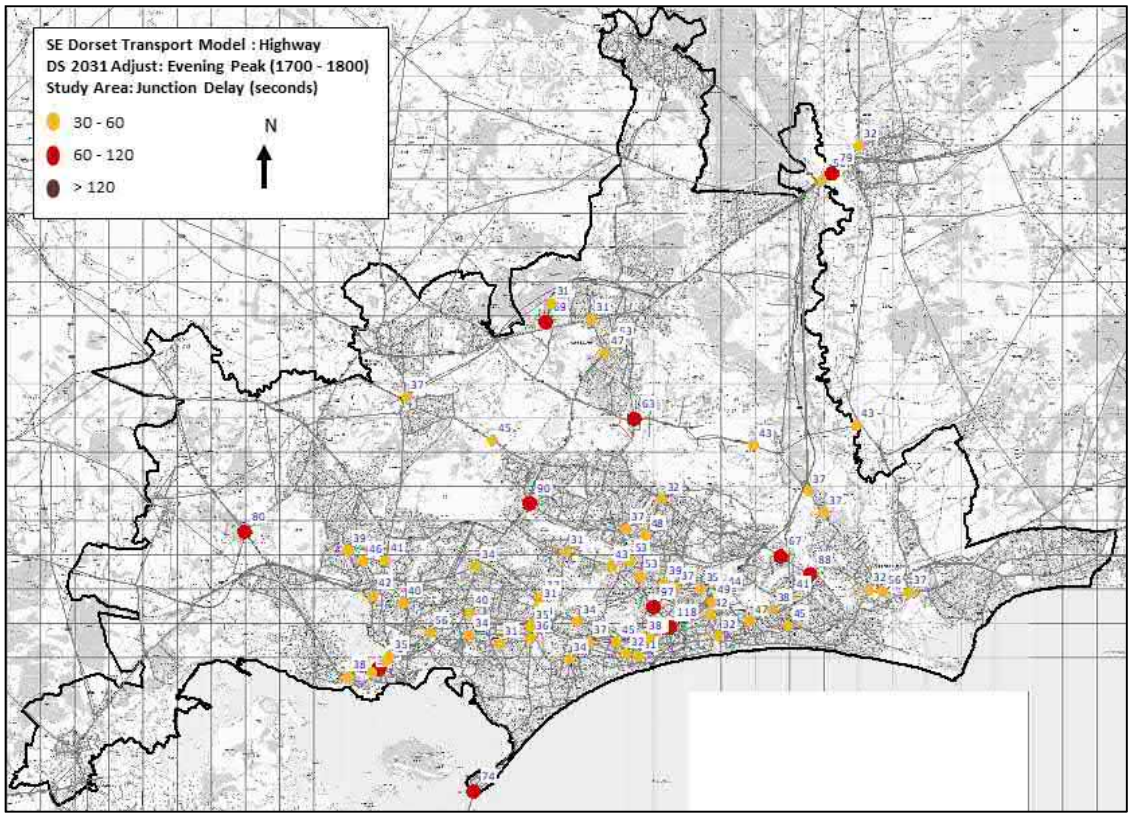

Figure 2.95: Node Delay (seconds) – 2031 Do Something, PM Peak

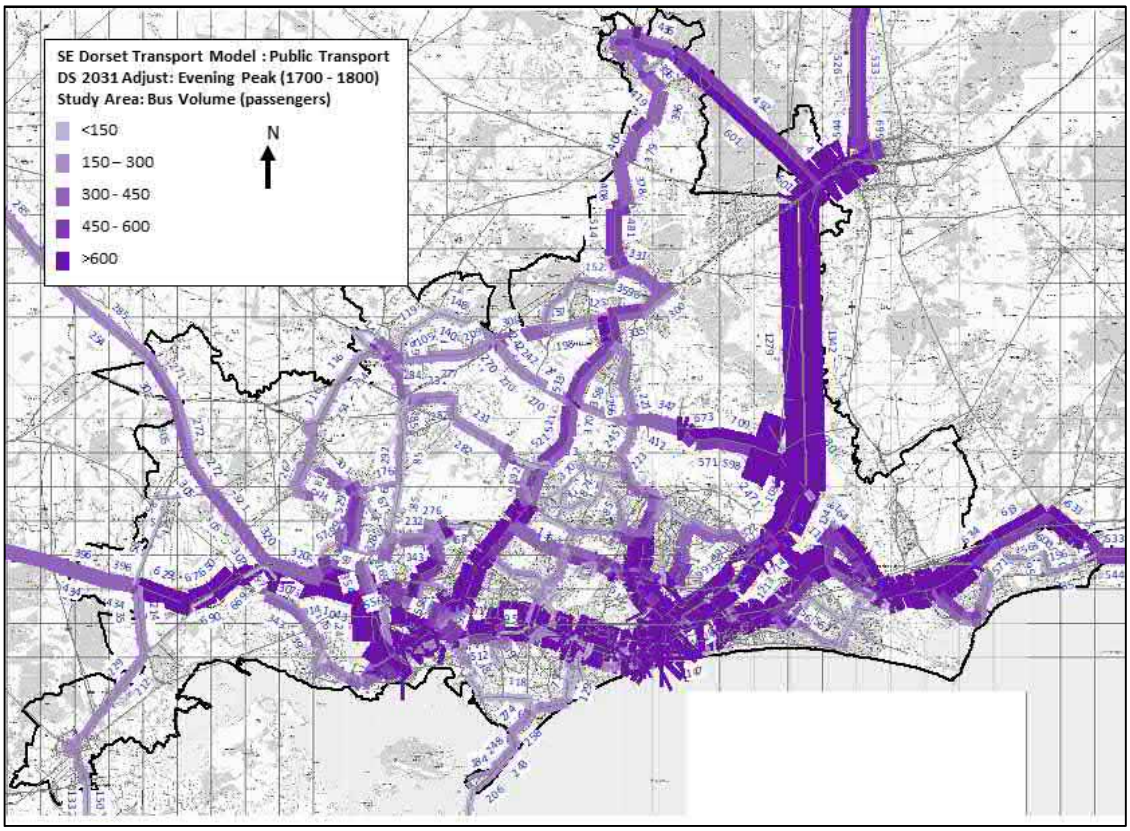

Figure 2.96: Bus Flows (passengers) - 2031 Do Something, PM Peak

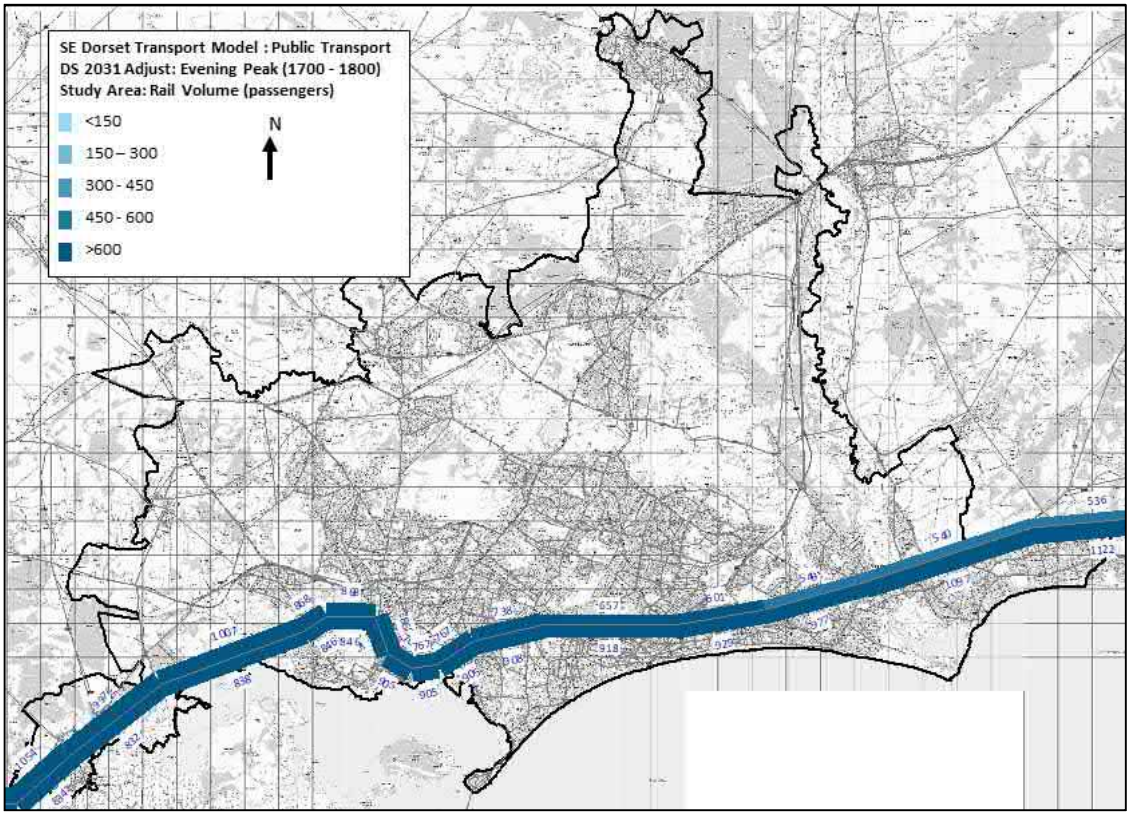

Figure 2.97: Rail Flows (passengers) - 2031 Do Something, PM Peak

2039 Do Something: AM Peak

The model outputs for the 2039 Do Something: AM Peak are shown below. Figure 2.98 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.20.

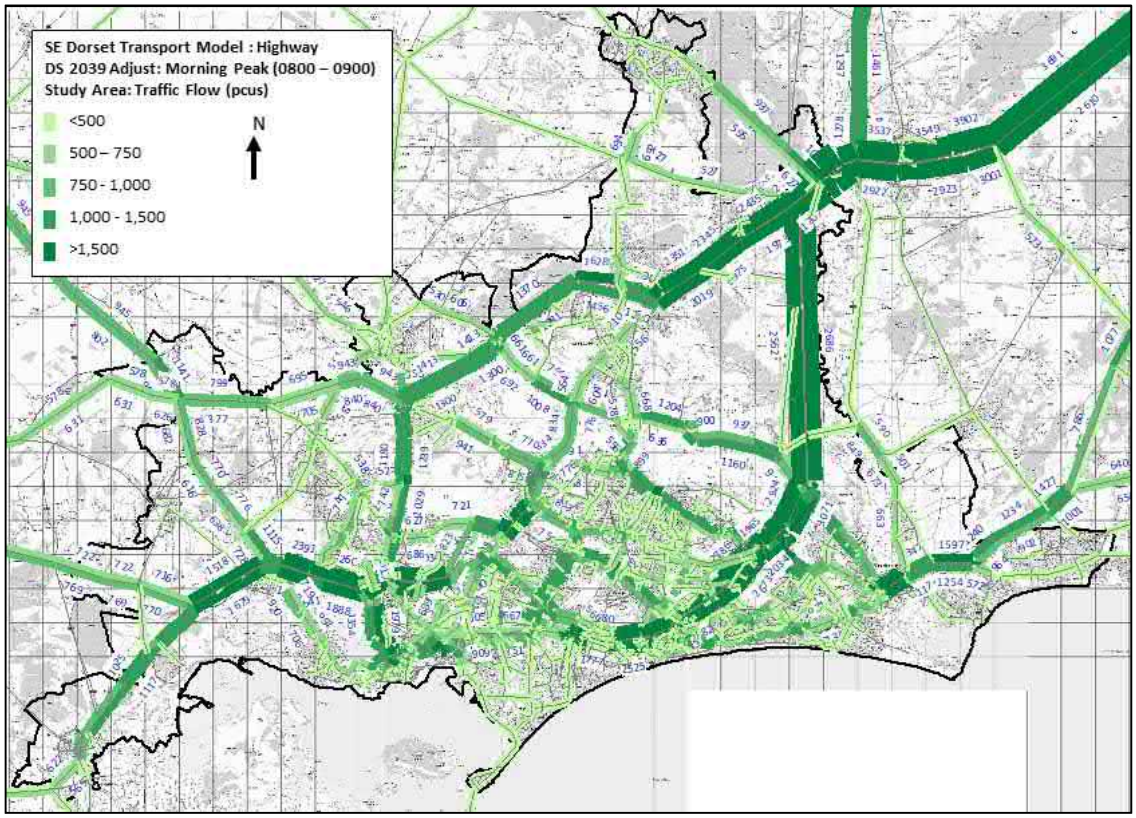

Figure 2.98: Actual Flows (vehicles) – 2039 Do Something, AM Peak

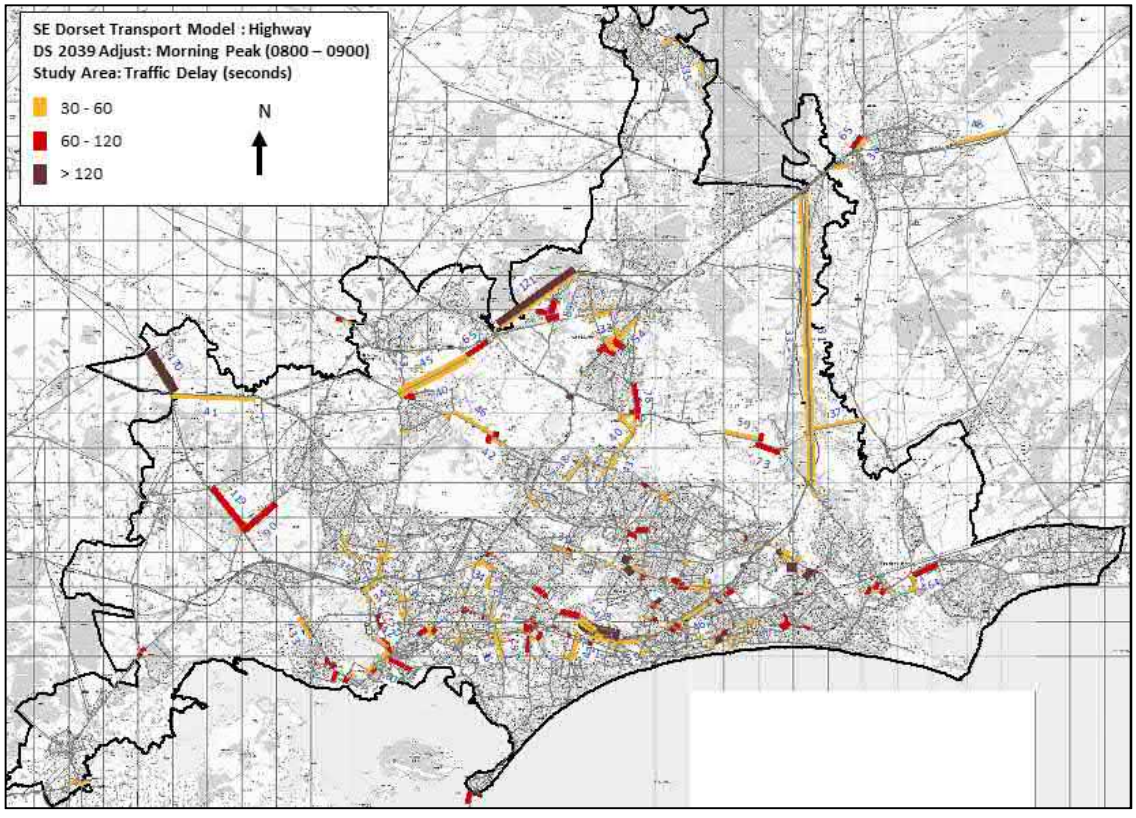

Figure 2.99: Link Delays (seconds) – 2039 Do Something, AM Peak

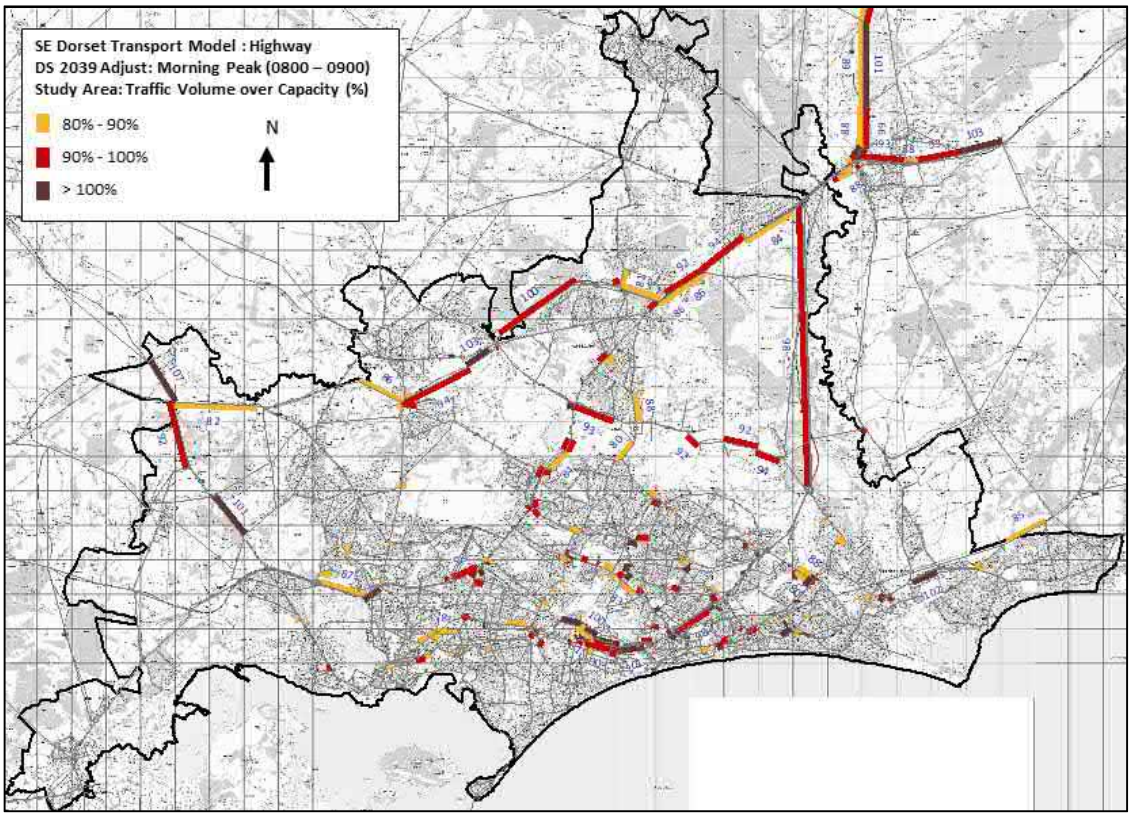

Figure 2.100: Link V/C (%) – 2039 Do Something, AM Peak

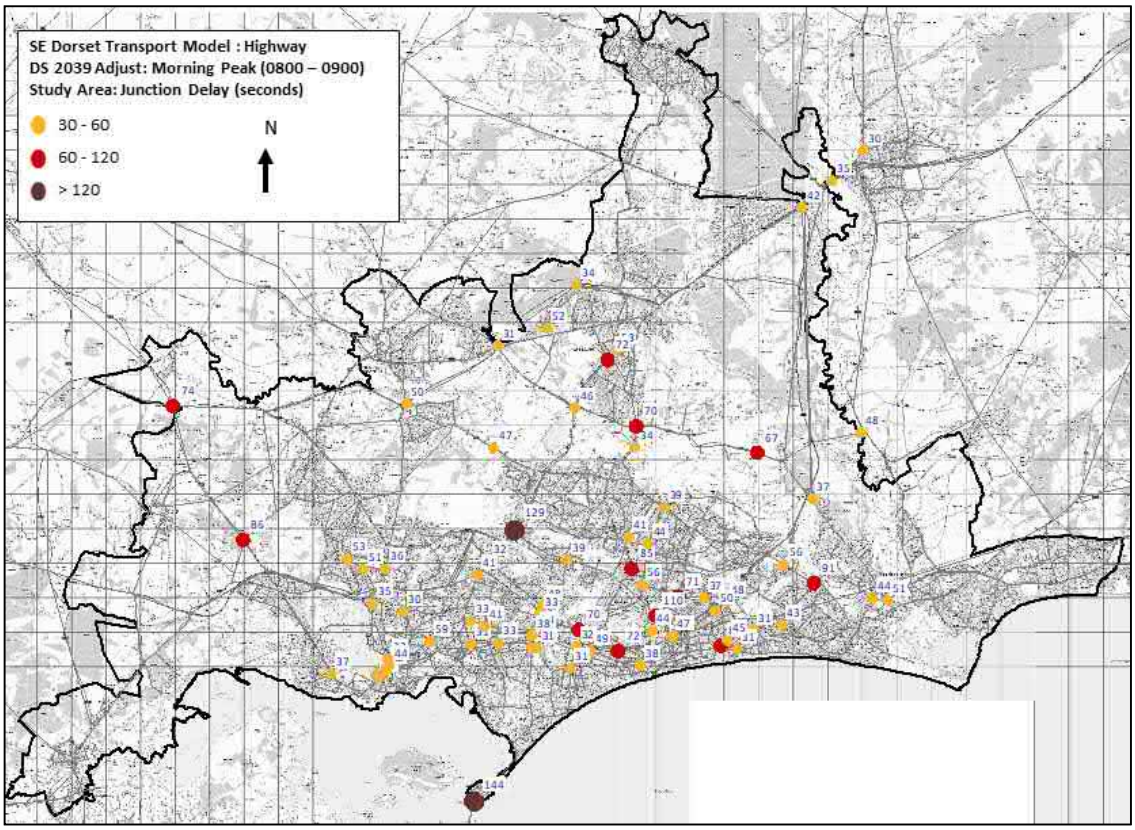

Figure 2.101: Node Delay (seconds) – 2039 Do Something, AM Peak

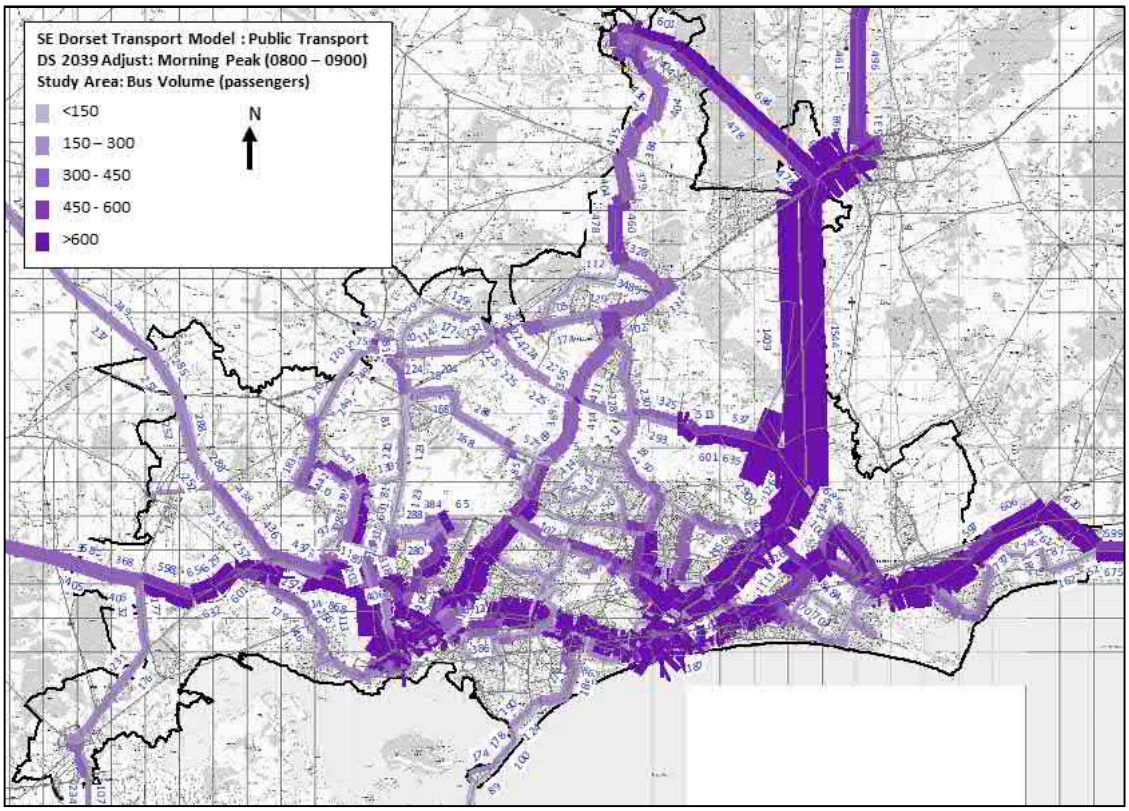

Figure 2.102: Bus Flows (passengers) - 2039 Do Something, AM Peak

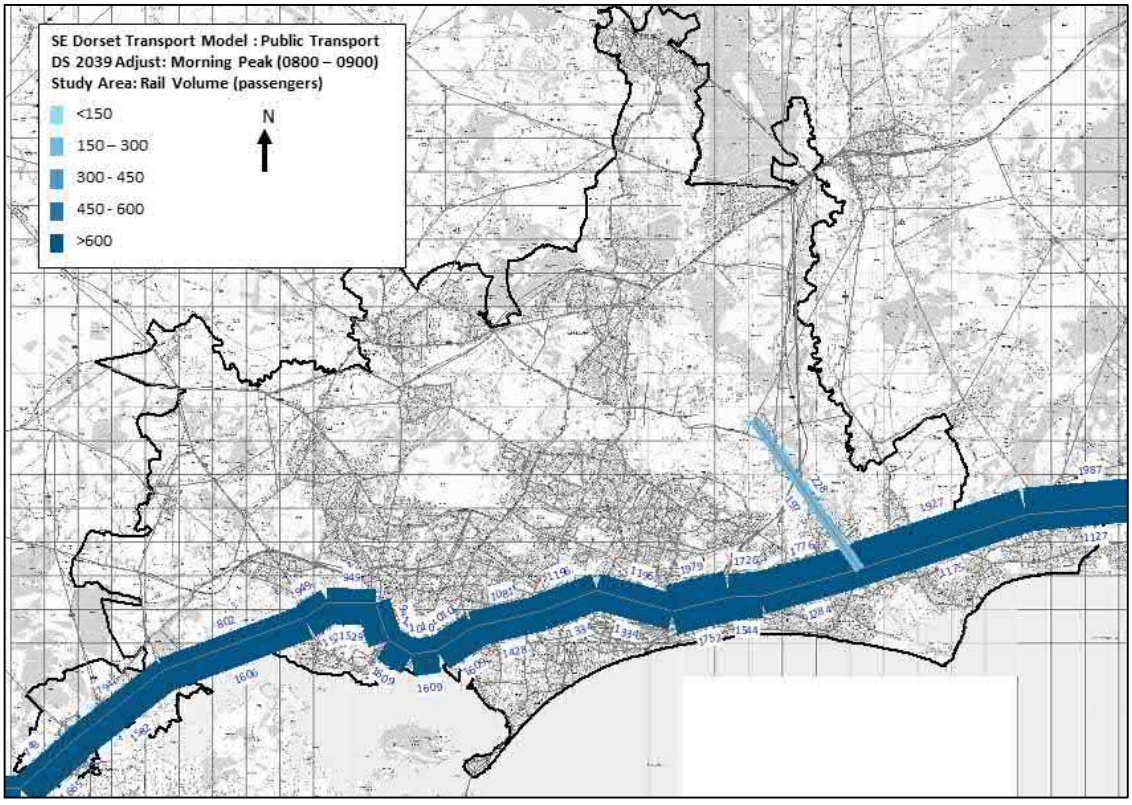

Figure 2.103: Rail Flows (passengers) - 2039 Do Something, AM Peak

2039 Do Something: Interpeak

The model outputs for the 2039 Do Something: Interpeak are shown below. Figure 2.104 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.21.

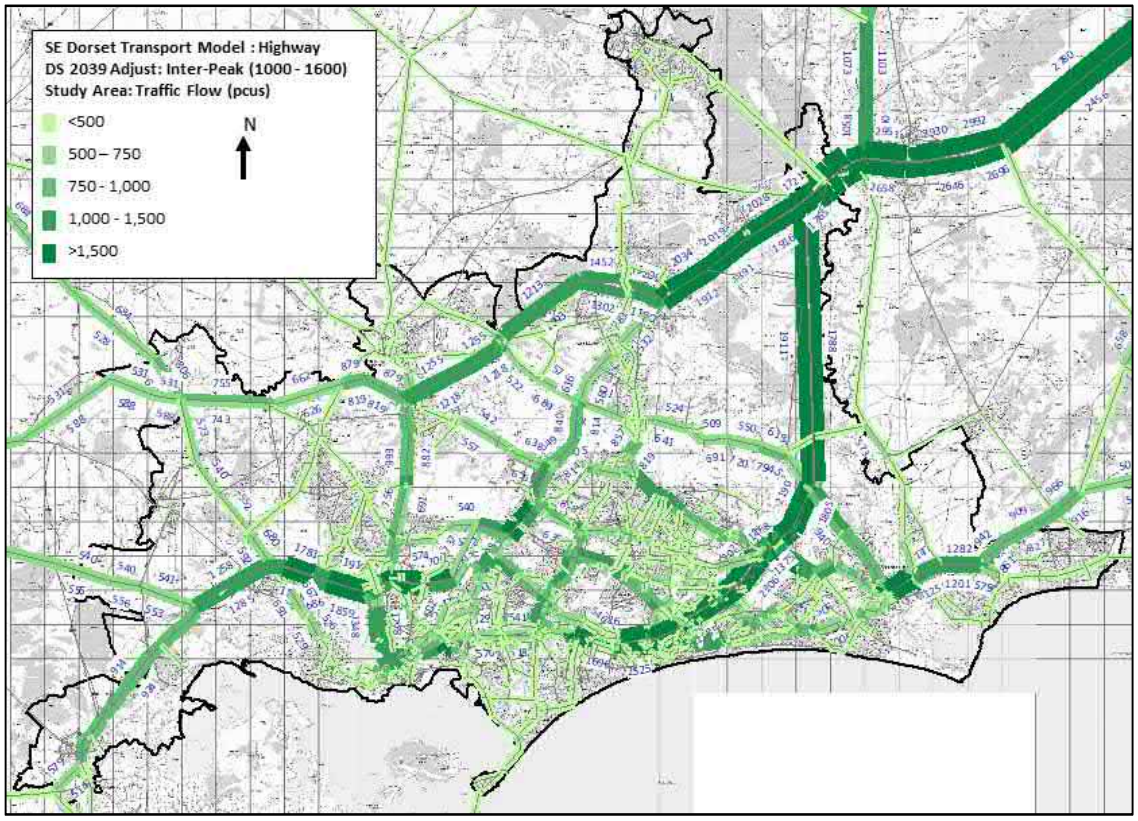

Figure 2.104: Actual Flows (vehicles) – 2039 Do Something, Interpeak

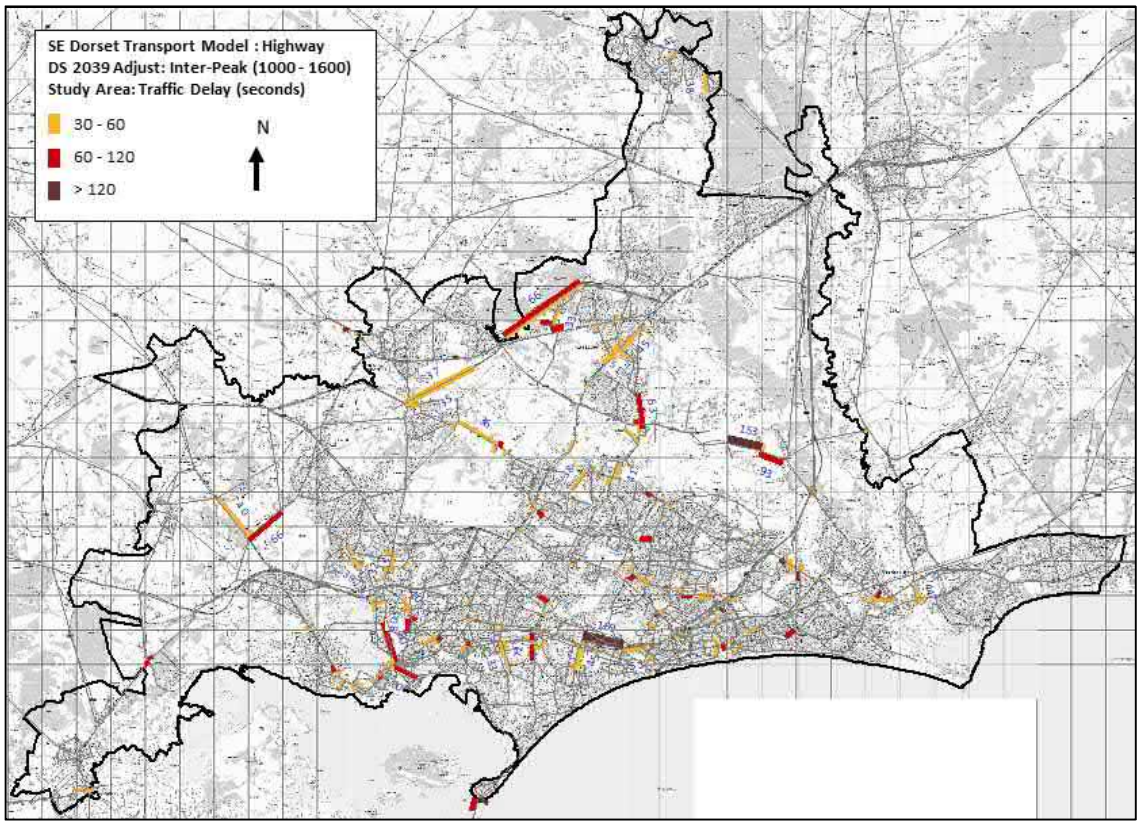

Figure 2.105: Link Delays (seconds) – 2039 Do Something, Interpeak

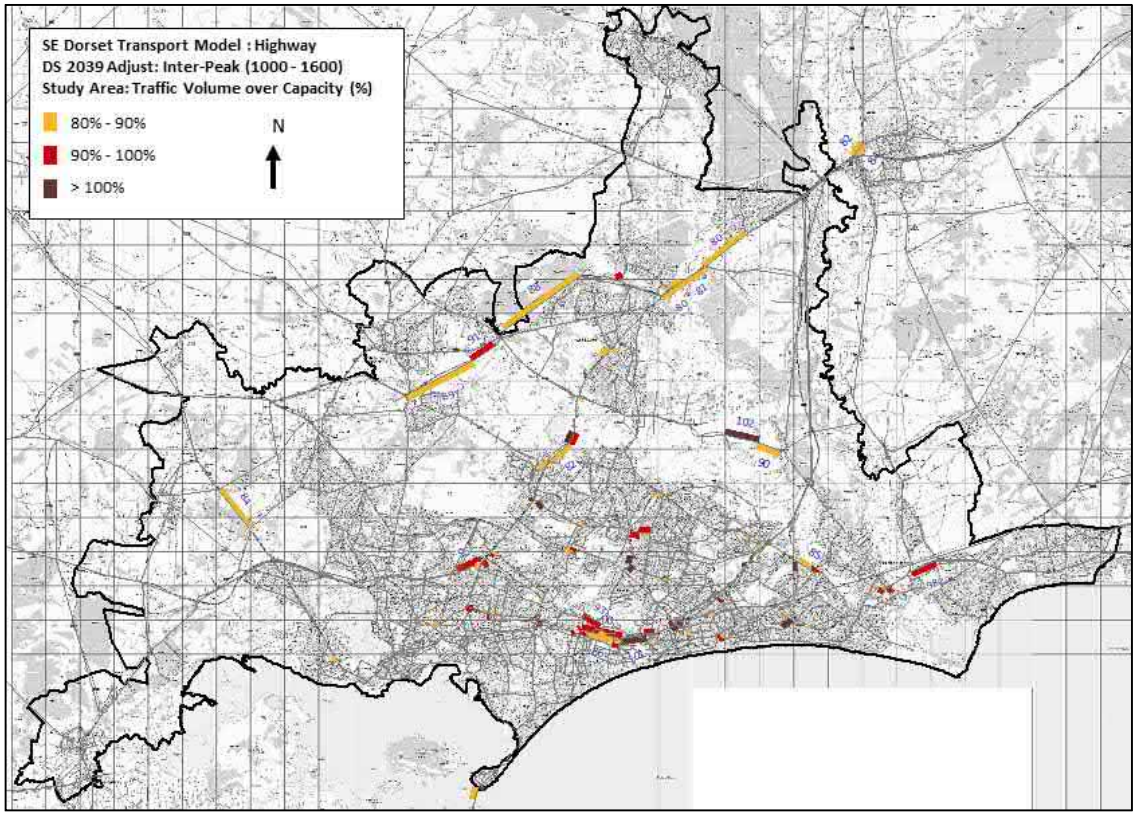

Figure 2.106: Link V/C (%) – 2039 Do Something, Interpeak

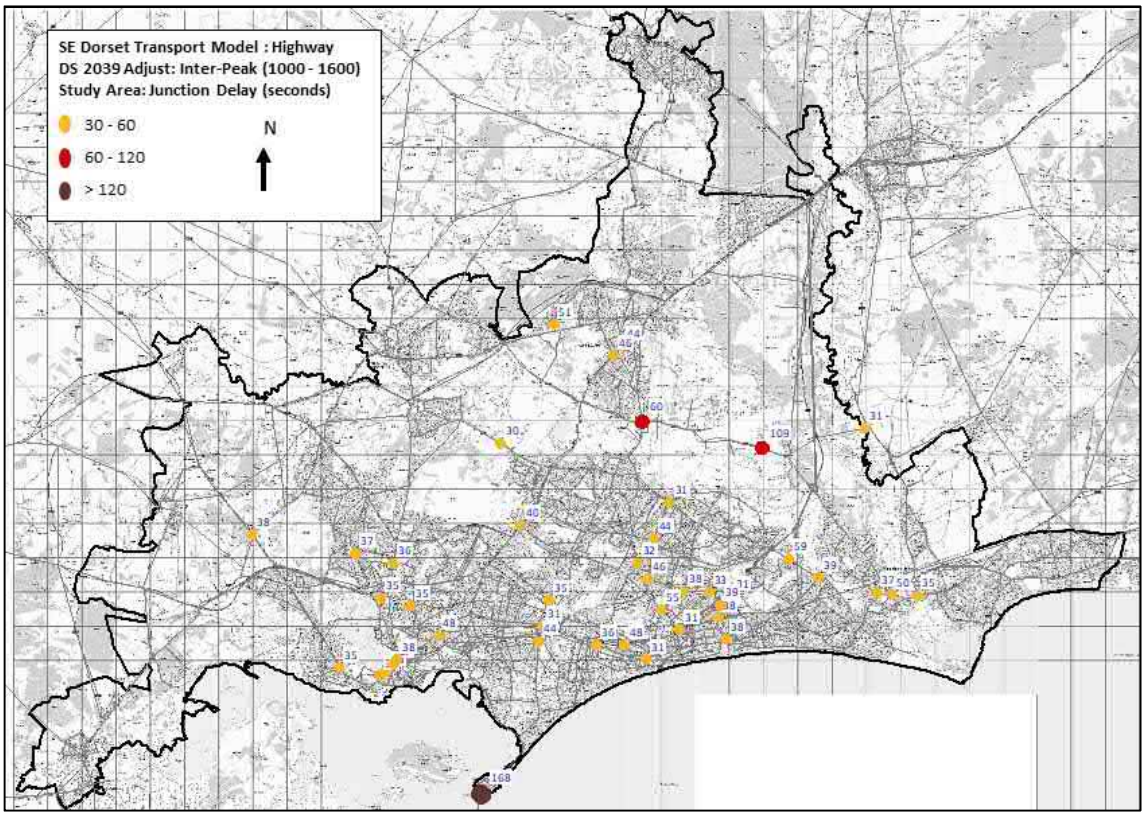

Figure 2.107: Node Delay (seconds) – 2039 Do Something, Interpeak

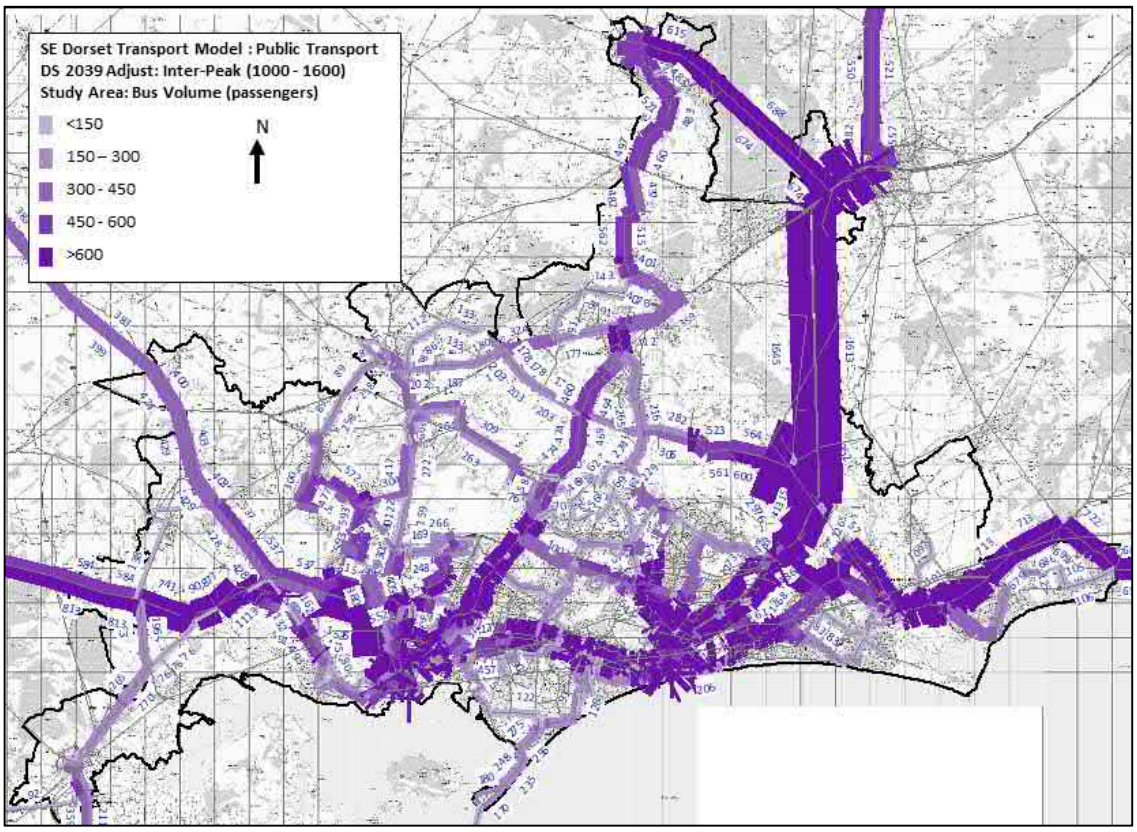

Figure 2.108: Bus Flows (passengers) - 2039 Do Something, Interpeak

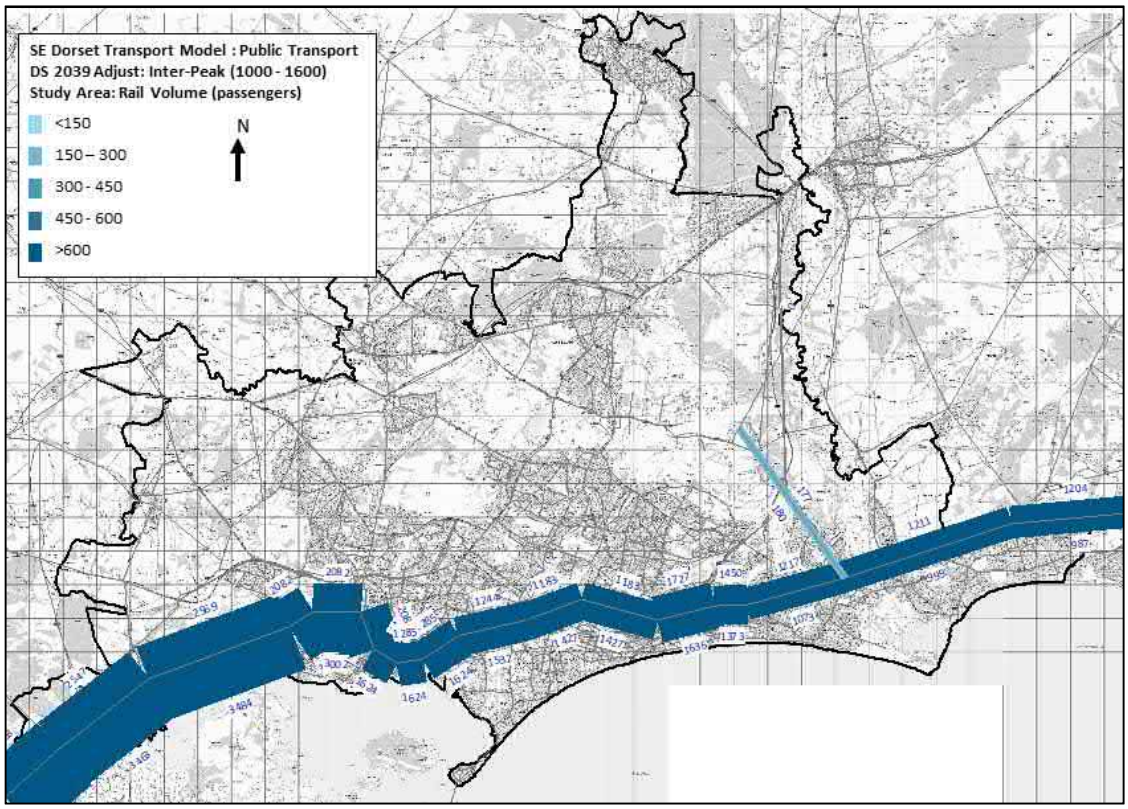

Figure 2.109: Rail Flows (passengers) - 2039 Do Something, Interpeak

2039 Do Something: PM Peak

The model outputs for the 2039 Do Something: PM Peak are shown below. Figure 2.110 shows the actual modelled flows on the highway network in this scenario. The outputs are described further in Table 2.22.

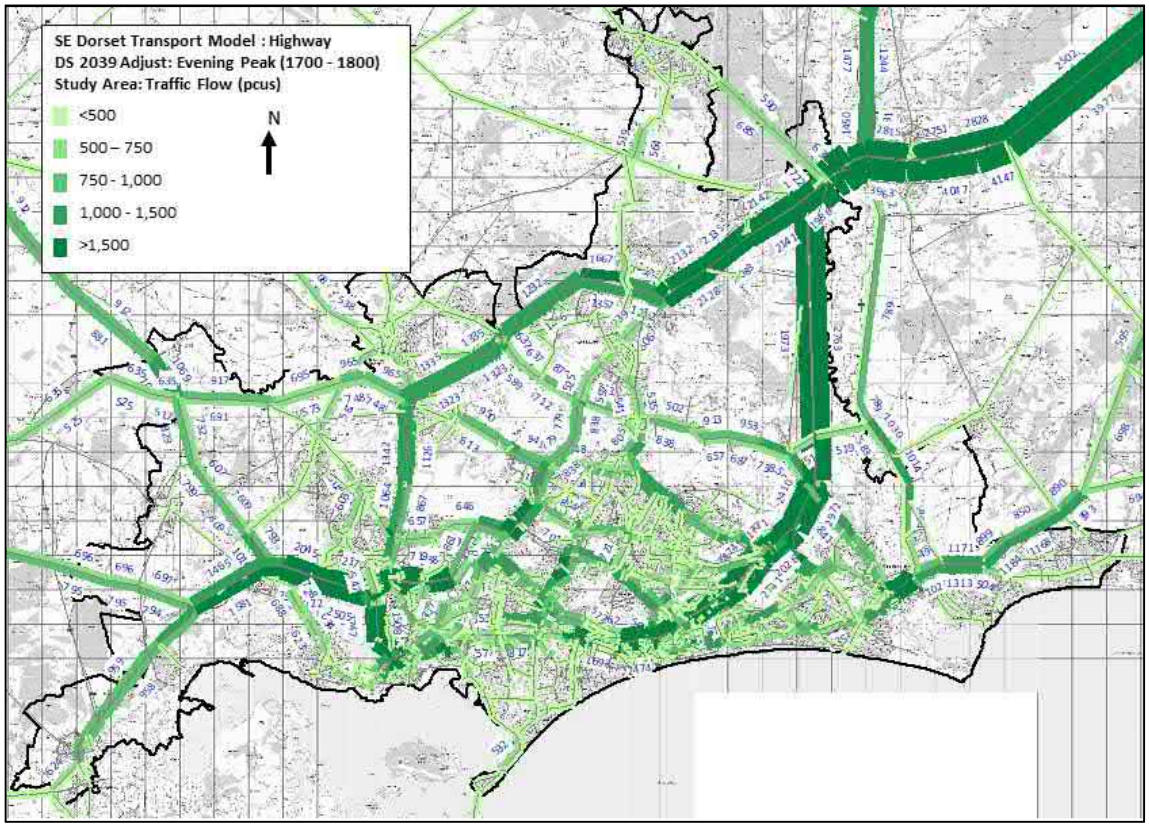

Figure 2.110: Actual Flows (vehicles) – 2039 Do Something, PM Peak

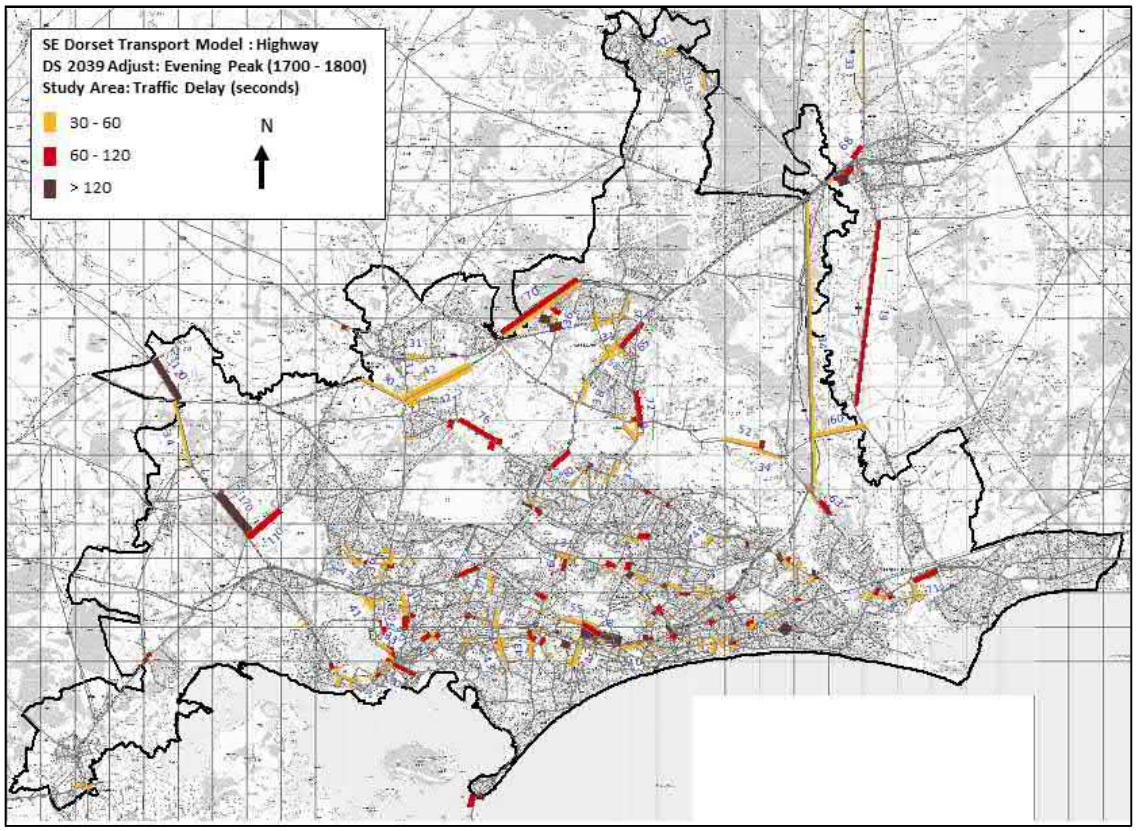

Figure 2.111: Link Delays (seconds) – 2039 Do Something, PM Peak

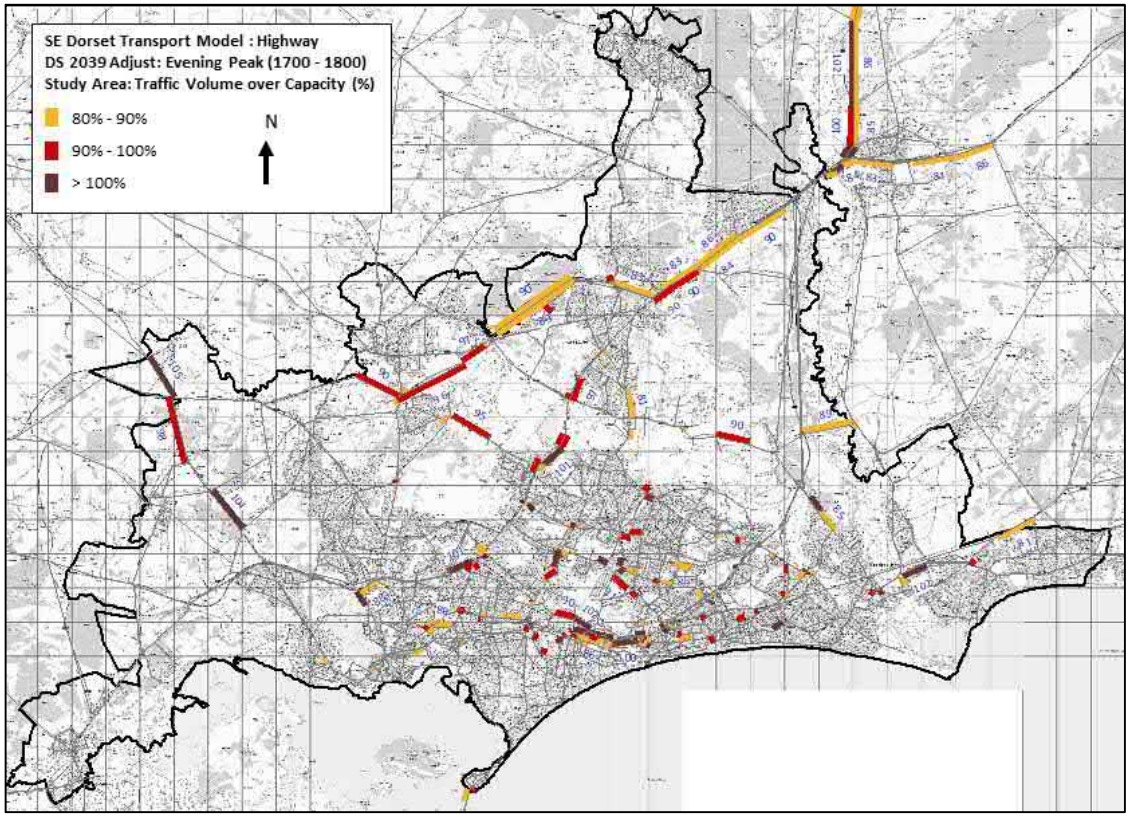

Figure 2.112: Link V/C (%) – 2039 Do Something, PM Peak

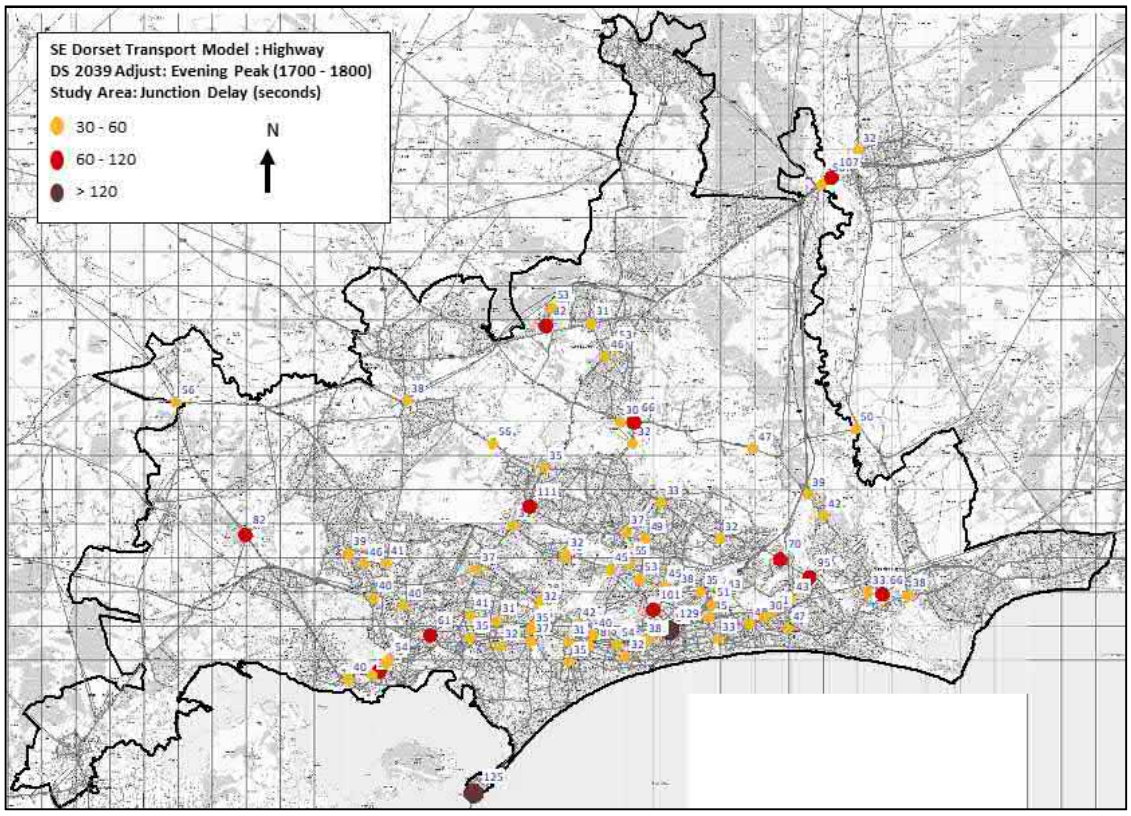

Figure 2.113: Node Delay (seconds) – 2039 Do Something, PM Peak

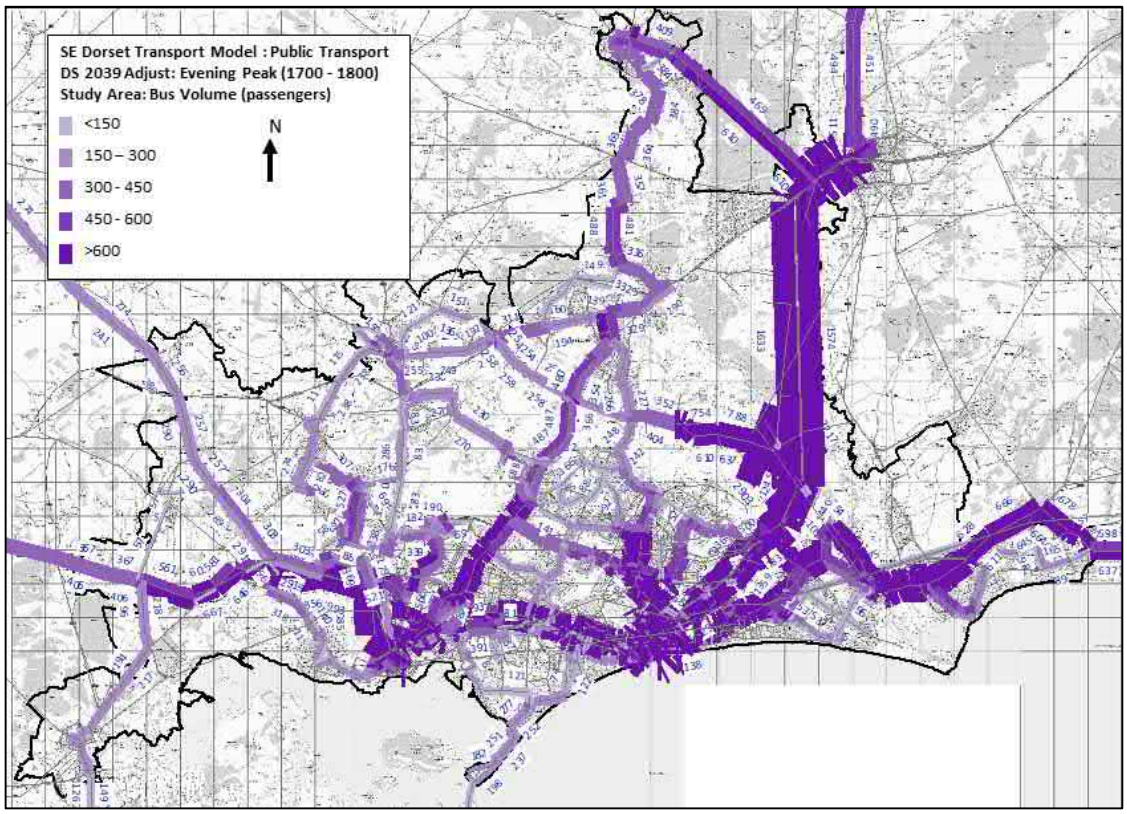

Figure 2.114: Bus Flows (passengers) - 2039 Do Something, PM Peak

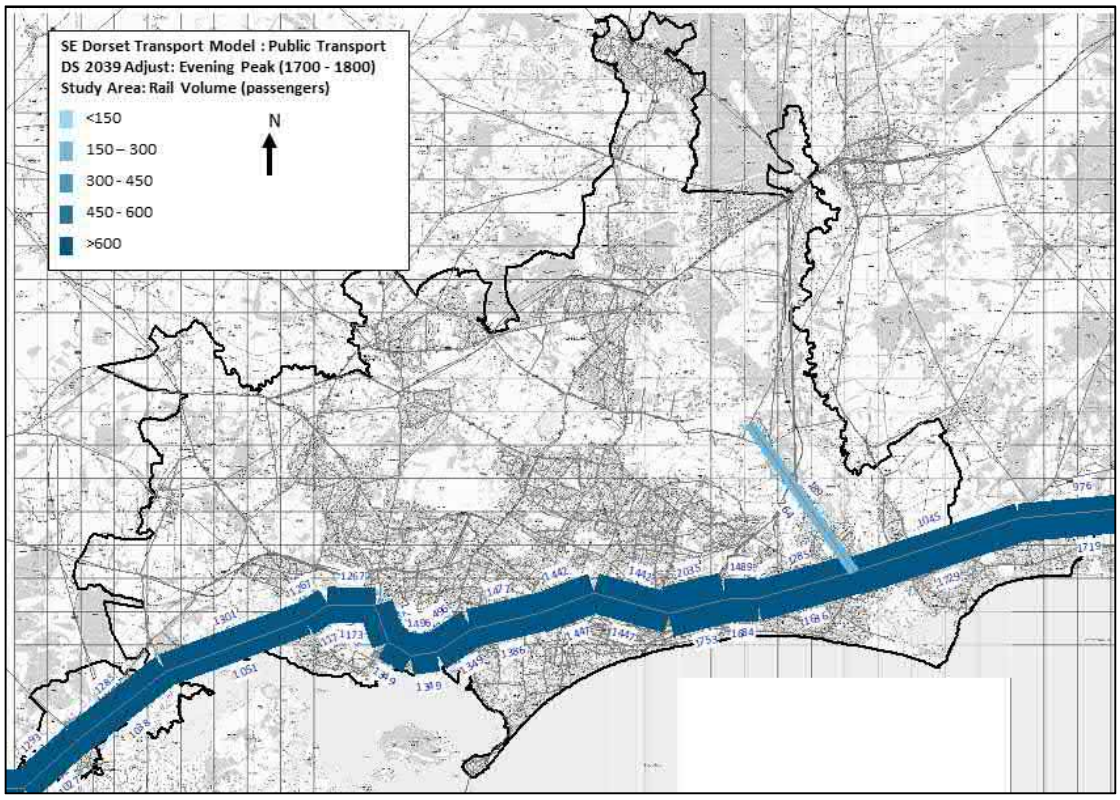

Figure 2.115: Rail Flows (passengers) - 2039 Do Something, PM Peak

Explanation of Do-Something Model Outputs

2023 Do Something: AM Peak

Table 2.14 below outlines the key details from the model outputs for the 2023 Do-Something forecast year for the AM Peak.

Table 2.14: Model Output Details: 2023 Do Something, AM Peak

Scenario and Year	**Do-Something – 2023 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected. Vehicle flow tends to be higher on routes heading into the BCP area: e.g. • 2189 trips inbound on the A350 heading into Poole, with 1293 heading northbound. • 3224 vehicles heading inbound on the A338 compared with 2686 heading outbound (near Holdenhurst) • 973 vehicles heading westbound on the A35 on Iford Bridge compared with 766 heading eastbound
Link Delays (Seconds)	Largest delays are located around: • Along the A350 north of Poole • Along the A31(near Wimborne Minster) • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout) • A35 WB approach to Iford Bridge

Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 96% and 103%) • A335 approaches to St Pauls Roundabout (greater than 100%) • A35 WB approach to Iford Bridge (104%) • A3049 WB approach to A350 roundabout (101%) • On the B3073 approaches to Bournemouth Airport (95-96%)
Node Delay (Seconds)	• There are two junctions with a greater than 120 second delay: A347/B3063/B3064 junction, and Mountbatten Roundabout • Within Poole, most junctions have a delay of less than one minute.
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including • A338 near Westbourne of around 500 in each direction • B3064 Lansdowne Road with around 950 heading southbound into Bournemouth and 450 heading northbound • A35 through Boscombe of around 600 westbound and 400 eastbound (west of Sovereign Shopping Centre) Around 1050 westbound and 950 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35
Rail Flows (Passengers)	Rail flows show around 500 passengers travelling westbound in Bournemouth and 650 passengers on the train from Bournemouth heading east. Rail flows are lower around Poole, reaching around 400 westbound and 250 eastbound.
Statistics (Highway Model)	
Transient queues (pcu hrs)	5,257 across model area and 4,440 within the BCP area.
Over-capacity queues (pcu hrs)	246 across model area and 175 within the BCP area.
Link cruise time (pcu hrs)	11,506 across model area and 8,540 within the BCP area.
Total Travel Time (pcu hours)	17,009 across model area and 13,154 within the BCP area.
Total travel Distance (pcu kms)	655,752 across model area and 457,411 within the BCP area.
Overall average speed (kph)	38.6kph across model area and 34.8kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	8930
Total PT passenger kms	276392
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2023 Do Something: Interpeak

Table 2.15 below outlines the key details from the model outputs for the 2023 Do-Something forecast year for the Interpeak.

Table 2.15 - Model Output Details: 2023 Do Something, Interpeak

Scenario and Year	**Do-Something – 2023 Forecast Year**
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected, • 1509 trips inbound on the A350 heading into Poole, with 1526 heading northbound. • 1656 vehicles heading inbound on the A338 compared with 1969 heading outbound (near Holdenhurst) • 936 vehicles heading eastbound on the A35 Christchurch Bypass, 1073 vehicles heading westbound.
Link Delays (Seconds)	Largest delays are located around: • EB approach on the B3073 to Bournemouth Airport main entrance • A338 EB approach to Bournemouth West roundabout
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the Bournemouth West roundabout (between 91% and 101%) • A35 WB approach to Stony Lane/Bypass roundabout (101%) • On the approaches to Bournemouth Airport (84-103%) • Woodside Road arm on the Seabourne Road/Woodside Road junction (102%)
Node Delay (Seconds)	None of the junctions are above a 120 second delay, and most junctions are below a minute delay. The junctions with the highest delay include: • Bournemouth Airport main entrance • Parley Cross • Fountain Roundabout
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including • A338 near Westbourne of around 600 WB and 500 EB • B3064 Lansdowne Road with around 700 heading southbound into Bournemouth and 600 heading northbound • A35 through Boscombe of around 450 westbound and 550 eastbound (west of Sovereign Shopping Centre) • Around 1100-1150 in each direction through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35
Rail Flows (Passengers)	Rail flows show around 280 passengers travelling westbound in Bournemouth and 300 passengers on the train from Bournemouth heading east. Rail flows are lower around Poole, reaching around 220 westbound and 200 eastbound.
Statistics (Highway Model)	
Transient queues (pcu hrs)	3,411 across model area and 2,903 within the BCP area.
Over-capacity queues (pcu hrs)	32 across model area and 32 within the BCP area.
Link cruise time (pcu hrs)	9,283 across model area and 6,810 within the BCP area.
Total Travel Time (pcu hours)	12,726 across model area and 9,744 within the BCP area.

Total travel Distance (pcu kms)	536,498 across model area and 362,358 within the BCP area.
Overall average speed (kph)	42.2kph across model area and 37.2kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	7992
Total PT passenger kms	238951
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2023 Do Something: PM Peak

Table 2.16 below outlines the key details from the model outputs for the 2023 Do-Something forecast year for the PM Peak.

Table 2.16 - Model Output Details: 2023 Do Something, PM Peak

Scenario and Year	**Do-Something – 2023 Forecast Year**
Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected. • 1571 trips inbound on the A350 heading into Poole, with 2014 heading northbound. • 2878 vehicles heading inbound on the A338 compared with 2487 heading outbound (near Holdenhurst) • 967 vehicles heading westbound on the A35 on Iford Bridge compared with 786 heading eastbound
Link Delays (Seconds)	Largest delays are located around: • Along the A350 north of Poole • Woodside Road arm on the Woodside Road / B3059 junction • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	There are a number of junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 85% and 103%) • Woodside Road arm on the Woodside Road / B3059 junction (115%) • At some locations along A347 Talbot Avenue (greater than 100%) • A350/A3049 junction, on the A350 approach (104%) and A3049 EB approach (92%)
Node Delay (Seconds)	• There are a few junctions with a delay of higher than two minutes, including the A347/B3064/B3063 junction and A35 Iford Roundabout • Within Poole, most junctions have a delay of less than one minute.
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas and the corridors between the three urban areas, including • A338 near Westbourne of around 650 in each direction • B3064 Lansdowne Road with around 700 heading southbound into Bournemouth and 850 heading northbound • A35 through Boscombe of around 400 westbound and 700 eastbound (west of Sovereign Shopping Centre) • Around 750 westbound and 900 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35
Rail Flows (Passengers)	Rail flows show around 600 passengers travelling westbound in Bournemouth and 400 passengers on the train from Bournemouth heading east. Rail flows are lower around Poole, reaching around 400 in each direction.
Statistics (Highway Model)	

Transient queues (pcu hrs)	5,167 across model area and 4,438 within the BCP area.
Over-capacity queues (pcu hrs)	439 across model area and 368 within the BCP area.
Link cruise time (pcu hrs)	11,145 across model area and 8,358 within the BCP area.
Total Travel Time (pcu hours)	16,751 across model area and 13,164 within the BCP area.
Total travel Distance (pcu kms)	633,885 across model area and 445,747 within the BCP area.
Overall average speed (kph)	37.8kph across model area and 33.9kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	8749
Total PT passenger kms	266001
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2031 Do Something: AM Peak

Table 2.17 below outlines the key details from the model outputs for the 2031 Do-Something forecast year for the AM Peak.

Table 2.17 - Model Output Details: 2031 Do Something, AM Peak

Scenario and Year	**Do-Something – 2031 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected, and higher than in 2023. Vehicle flow tends to be higher on routes heading into the BCP area: e.g. • 1949 trips inbound on the A350 heading into Poole, with 1325 heading northbound. • 2891 vehicles heading inbound on the A338 compared with 2681 heading outbound (near Holdenhurst) • 1030 vehicles heading westbound on the A35 on Iford Bridge compared with 841 heading eastbound
Link Delays (Seconds)	Slightly higher delays than 2031, links with higher delay include: • Along the A350 north of Poole • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout) • A35 Western arm to Iford Roundabout
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (greater than 95%) • All approaches to St Pauls Roundabout (greater than 100%) • At Iford Roundabout, the A35 NB approach has a V/C of over 100% • On the approaches to Bournemouth Airport (88-91%)

Node Delay (Seconds)	• There are a number of junctions with node delays of between (with a delay of between one and two minutes) within the Bournemouth area including Bournemouth West junction and the A347/B3063/B3064 junction and Mountbatten Roundabout • Within Poole, most junctions have a delay of less than one minute.
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including • A338 near Westbourne of greater than 1000 in each direction • B3064 Lansdowne Road with around 2000 heading southbound into Bournemouth and 1000 heading northbound • A35 through Boscombe of around 950 westbound and 850 eastbound (west of Sovereign Shopping Centre) • Around 1500 westbound and 1800 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35. Compared with 2023, some bus routes have higher number of passengers on bus routes – this can be attributed to the 2031 interventions which involve a number of improved bus services and routes.
Rail Flows (Passengers)	Rail flows show around 600 passengers travelling westbound in Bournemouth and 900 passengers on the train from Bournemouth heading east. Rail flows are higher westbound around Poole, but lower eastbound suggesting more traffic shifting to rail heading west.
Statistics (Highway Model)	
Transient queues (pcu hrs)	4,404 across model area and 3,679 within the BCP area.
Over-capacity queues (pcu hrs)	127 across model area and 92 within the BCP area.
Link cruise time (pcu hrs)	10,631 across model area and 7,873 within the BCP area.
Total Travel Time (pcu hours)	15,162 across model area and 11,644 within the BCP area.
Total travel Distance (pcu kms)	611,568 across model area and 425,846 within the BCP area.
Overall average speed (kph)	40.3kph across model area and 36.6kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	24727
Total PT passenger kms	783479
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2031 Do Something: Interpeak

Table 2.18 below outlines the key details from the model outputs for the 2031 Do-Something forecast year for the Interpeak.

Table 2.18 - Model Output Details: 2031 Do Something, Interpeak

Scenario and Year	Do-Something – 2031 Forecast Year
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected, • 1266 trips inbound on the A350 heading into Poole, with 1351 heading northbound. • 1653 vehicles heading inbound on the A338 compared with 1936 heading outbound (near Holdenhurst) • 1250 vehicles heading eastbound on the A35 Christchurch Bypass, 1206 vehicles heading westbound.
Link Delays (Seconds)	Links with higher delay include: • Both approaches on the B3073 to Bournemouth Airport main entrance • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the Bournemouth West roundabout (between 91% and 99%) • A35 WB approach to Stony Lane/Bypass roundabout (94%) • On the EB approach to Bournemouth Airport (101%)
Node Delay (Seconds)	Only two junctions show a delay of greater than one minute in the Interpeak period These are; • B3073/Bournemouth Airport junction • Sandbanks Ferry approach
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas and the corridors between the three urban areas, including • A338 near Westbourne of around 1000 in each direction • B3064 Lansdowne Road with around 1400 heading southbound into Bournemouth and 1500 heading northbound • A35 through Boscombe of around 750 westbound and 400 eastbound (west of Sovereign Shopping Centre) • Around 1600 in each direction through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35 Compared with 2023, some bus routes have higher number of passengers on bus routes – this can be attributed to the 2031 interventions which involve a number of improved bus services and routes.
Rail Flows (Passengers)	Rail flows show around 500 passengers travelling westbound in Bournemouth and 500 passengers on the train from Bournemouth heading east. Rail flows are lower around Poole, reaching around 1000 westbound and 650 eastbound.
Statistics (Highway Model)	

Transient queues (pcu hrs)	2,991 across model area and 2,547 within the BCP area.
Over-capacity queues (pcu hrs)	4 across model area and 4 within the BCP area.
Link cruise time (pcu hrs)	8,606 across model area and 6,314 within the BCP area.
Total Travel Time (pcu hours)	11,601 across model area and 8,865 within the BCP area.
Total travel Distance (pcu kms)	501,205 across model area and 338,394 within the BCP area.
Overall average speed (kph)	43.2kph across model area and 38.2kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	27093
Total PT passenger kms	975675
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2031 Do Something: PM Peak

Table 2.19 below outlines the key details from the model outputs for the 2031 Do-Something forecast year for the PM Peak.

Table 2.19 - Model Output Details: 2031 Do Something, PM Peak

Scenario and Year	**Do-Something – 2031 Forecast Year**
Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected, and in most cases higher than in 2023. • 1495 trips inbound on the A350 heading into Poole, with 1853 heading northbound. • 2825 vehicles heading inbound on the A338 compared with 2324 heading outbound (near Holdenhurst) • 1008 vehicles heading westbound on the A35 on Iford Bridge compared with 817 heading eastbound
Link Delays (Seconds)	Links with higher delay include: • Along the A350 north of Poole • Along the A31(near Wimborne Minster) • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout) • WB approach along the B3073 to Bournemouth Airport main entrance
Link V/C Ratio (%)	There are a number of junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 83% and 101%) • All approaches to St Pauls Roundabout (greater than 87%)

	• A350/A3049 junction, on the A350 NB approach (100%) and A3049 EB approach (83%)
Node Delay (Seconds)	• There are a number of junctions with node delays of between (with a delay of between one and two minutes) within the Bournemouth area including along the A347/B3063/B3064 junction, St Pauls Roundabout and Iford Roundabout. • Within Poole, most junctions have a delay of less than one minute.
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, and higher than the other peaks, including • A338 near Westbourne of around 1500 in each direction • B3064 Lansdowne Road with around 1300 heading southbound into Bournemouth and 2000 heading northbound • A35 through Boscombe of around 750 westbound and 1200 eastbound (west of Sovereign Shopping Centre) • Around 1300 westbound and 1600 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35 Compared with 2023, some bus routes have higher number of passengers on bus routes – this can be attributed to the 2031 interventions which involve a number of improved bus services and routes.
Rail Flows (Passengers)	Rail flows show around 900 passengers travelling westbound in Bournemouth and 600 passengers on the train from Bournemouth heading east. Rail flows are slightly higher around Poole, reaching around 750 eastbound and 900 westbound in each direction.
Statistics (Highway Model)	
Transient queues (pcu hrs)	4,176 across model area and 3,573 within the BCP area.
Over-capacity queues (pcu hrs)	151 across model area and 151 within the BCP area.
Link cruise time (pcu hrs)	10,158 across model area and 7,615 within the BCP area.
Total Travel Time (pcu hours)	14,485 across model area and 11,339 within the BCP area.
Total travel Distance (pcu kms)	584,278 across model area and 411,260 within the BCP area.
Overall average speed (kph)	40.3kph across model area and 36.3kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	24736
Total PT passenger kms	819233
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2039 Do Something: AM Peak

Table 2.20 below outlines the key details from the model outputs for the 2039 Do-Something forecast year for the AM Peak.

Table 2.20 - Model Output Details: 2039 Do Something, AM Peak

Scenario and Year	**Do-Something – 2039 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected, and higher than in 2031. Vehicle flow tends to be higher on routes heading into the BCP area: e.g. • 1979 trips inbound on the A350 heading into Poole, with 1354 heading northbound. • 3067 vehicles heading inbound on the A338 compared with 2915 heading outbound (near Holdenhurst) • 999 vehicles heading westbound on the A35 on Iford Bridge compared with 804 heading eastbound
Link Delays (Seconds)	Links with higher delay include: • Along the A350 north of Poole • Along the A31(near Wimborne Minster) • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (greater than 97%) • Surrey Road EB to Prince of Wales Road junction (100%) • St Pauls Roundabout approaches are all greater than 100% • At Iford Roundabout, the A35 NB approach has a V/C of over 103% • In Boscombe, the approaches to the A35 from Boscombe Spa Road is higher than 100% • On the approaches to Bournemouth Airport (92/94%)
Node Delay (Seconds)	• There are a number of junctions with node delays of between one and two minutes including the Bournemouth Airport main entrance and Parley Crossand Iford Roundabout • Within Poole, most junctions have a delay of less than one minute. • There are no junctions with greater than two minute delay
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, including • A338 near Westbourne of around 1000 EB and 900 WB • B3064 Lansdowne Road with around 2000 heading southbound into Bournemouth and 1050 heading northbound • A35 through Boscombe of around 500 westbound and 350 eastbound (west of Sovereign Shopping Centre) • Around 1600 westbound and 1300 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35.
Rail Flows (Passengers)	Rail flows show around 1500 passengers travelling westbound in Bournemouth and 1700 passengers on the train from Bournemouth heading east. Rail flows are lower around Poole, reaching around 1600 westbound and 1000 eastbound.

Statistics (Highway Model)	
Transient queues (pcu hrs)	4,771 across model area and 3,975 within the BCP area.
Over-capacity queues (pcu hrs)	177 across model area and 118 within the BCP area.
Link cruise time (pcu hrs)	11,095 across model area and 8,209 within the BCP area.
Total Travel Time (pcu hours)	16,043 across model area and 12,301 within the BCP area.
Total travel Distance (pcu kms)	637,215 across model area and 443,226 within the BCP area.
Overall average speed (kph)	39.7kph across model area and 36.0kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	26605
Total PT passenger kms	1008495
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2039 Do Something: Interpeak

Table 2.21 below outlines the key details from the model outputs for the 2039 Do-Something forecast year for the Interpeak.

Table 2.21 - Model Output Details: 2039 Do Something, Interpeak

Scenario and Year	**Do-Something – 2039 Forecast Year**
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected, • 1298 trips inbound on the A350 heading into Poole, with 1348 heading northbound. • 1800 vehicles heading inbound towards Bournemouth on the A338 compared with 2175 heading outbound (near Holdenhurst) • 1282 vehicles heading eastbound on the A35 Christchurch Bypass, 1201 vehicles heading westbound.
Link Delays (Seconds)	Links with higher delay include: • Both approaches on the B3073 to Bournemouth Airport main entrance • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	Junctions with a V/C of close to or greater than 100%, including: • All approaches to the Bournemouth West roundabout (between 92 and 101%) • A35 WB approach to Stony Lane/Bypass roundabout (98%) • On the B3073 approaches to Bournemouth Airport (90-102%)

Node Delay (Seconds)	Only two junctions show a delay of greater than one minute in the Interpeak period (excluding the delay at the Sandbanks ferry crossing). These are; • Bournemouth Airport main entrance junction • Parley Cross
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas and the corridors between the three urban areas, including • A338 near Westbourne of around 1050 EB and 1100 WB • B3064 Lansdowne Road with around 1600 heading southbound into Bournemouth and 1600 heading northbound • A35 through Boscombe of around 900 westbound and 900 eastbound (west of Sovereign Shopping Centre) • Around 1600 in each direction through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35
Rail Flows (Passengers)	Rail flows show around 1600 passengers travelling westbound in Bournemouth and 1700 passengers on the train from Bournemouth heading east. Rail flows are lower around Poole, reaching around 1600 westbound and 1200 eastbound.
Statistics (Highway Model)	
Transient queues (pcu hrs)	3,270 across model area and 2,782 within the BCP area.
Over-capacity queues (pcu hrs)	21 across model area and 21 within the BCP area.
Link cruise time (pcu hrs)	9.094 across model area and 6,669 within the BCP area.
Total Travel Time (pcu hours)	12,385 across model area and 9,472 within the BCP area.
Total travel Distance (pcu kms)	528,673 across model area and 356,624 within the BCP area.
Overall average speed (kph)	42.7kph across model area and 37.7kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	28824
Total PT passenger kms	1195223
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2039 Do Something: PM Peak

Table 2.22 below outlines the key details from the model outputs for the 2039 Do-Something forecast year for the PM Peak.

Table 2.22 - Model Output Details: 2039 Do Something, PM Peak

Scenario and Year	**Do-Something – 2039 Forecast Year**
Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	Highest traffic levels on main routes (A31, A338, A3049 and A35) as would be expected, and in most cases higher than in 2031. • 1508 trips inbound on the A350 heading into Poole, with 1747 heading northbound. • 2969 vehicles heading inbound on the A338 compared with 2380 heading outbound (near Holdenhurst) • 982 vehicles heading westbound on the A35 on Iford Bridge compared with 795 heading eastbound
Link Delays (Seconds)	Links with higher delay include: • Along the A350 north of Poole • Along the A31(near Wimborne Minster) • Along the A338 in Westbourne (EB approach to Bournemouth West Roundabout)
Link V/C Ratio (%)	There are a number of junctions with a V/C of close to or greater than 100%, including: • All approaches to the A338/Cambridge Road junction (between 81% and 102%) • All approaches to St Pauls Roundabout (89% to 104%) • EB approach to the Stony Lane/Christchurch Bypass roundabout (102%) • A350/A3049 junction, on the A350 NB approach (100%)
Node Delay (Seconds)	• There are a number of junctions with node delays of between (with a delay of between one and two minutes) including Parley Cross, Iford Roundabout and A347/B3063/B3064 junction • Within Poole, no junctions experience a modelled delay higher than 120 seconds. • Only two junctions have a greater than two minute delay which are the Sandbanks connection to the ferry, and St Pauls Roundabout
Bus Flows (Passengers)	The model shows a higher concentration of bus passengers around the Bournemouth and Christchurch urban areas, and higher than the other peaks, including • A338 near Westbourne of around 1200 in each direction • B3064 Lansdowne Road with around 1400 heading southbound into Bournemouth and 2000 heading northbound • A35 through Boscombe of around 800 westbound and 1000 eastbound (west of Sovereign Shopping Centre) • Around 1300 westbound and 1600 eastbound through the centre of Christchurch, showing a large movement of bus flow along Bridge Street and the A35
Rail Flows (Passengers)	Rail flows show around 1800 passengers travelling westbound in Bournemouth and 1200 passengers on the train from Bournemouth heading east. Rail flows are lower around Poole, reaching around 1400 in each direction.
Statistics (Highway Model)	

Transient queues (pcu hrs)	4,481 across model area and 3,832 within the BCP area.
Over-capacity queues (pcu hrs)	227 across model area and 203 within the BCP area.
Link cruise time (pcu hrs)	10,536 across model area and 7,903 within the BCP area.
Total Travel Time (pcu hours)	15,244 across model area and 11,939 within the BCP area.
Total travel Distance (pcu kms)	604,230 across model area and 425,418 within the BCP area.
Overall average speed (kph)	39.6kph across model area and 35.6kph within the BCP area.
Statistics (Public Transport Model)	
Total PT passengers	26584
Total PT passenger kms	1008845
Journey Times	
All routes	Journey time results are outlined in Appendix C and detailed to be compared with the Do Minimum scenarios in Section 2.3

2.3 Comparison of Do-Minimum and Do-Something Scenarios

This section will compare the results of the modelling with and without the implementation of the modelled interventions. Each scenario and time period will be discussed in turn, concluding with comparisons of the 2023 versus 2031 Do Something Scenarios as well as the 2031 versus 2039 scenarios.

More detailed area maps are outlined in Appendix F. The highway model statistics are outlined in Appendix B and information on the journey times are attached in Appendix C.

2023 Do Minimum vs Do Something: AM Peak

The comparative model outputs including journey times are shown below for the 2023 Do Minimum vs Do Something in the AM Peak. The outputs are described further in Table 2.23.

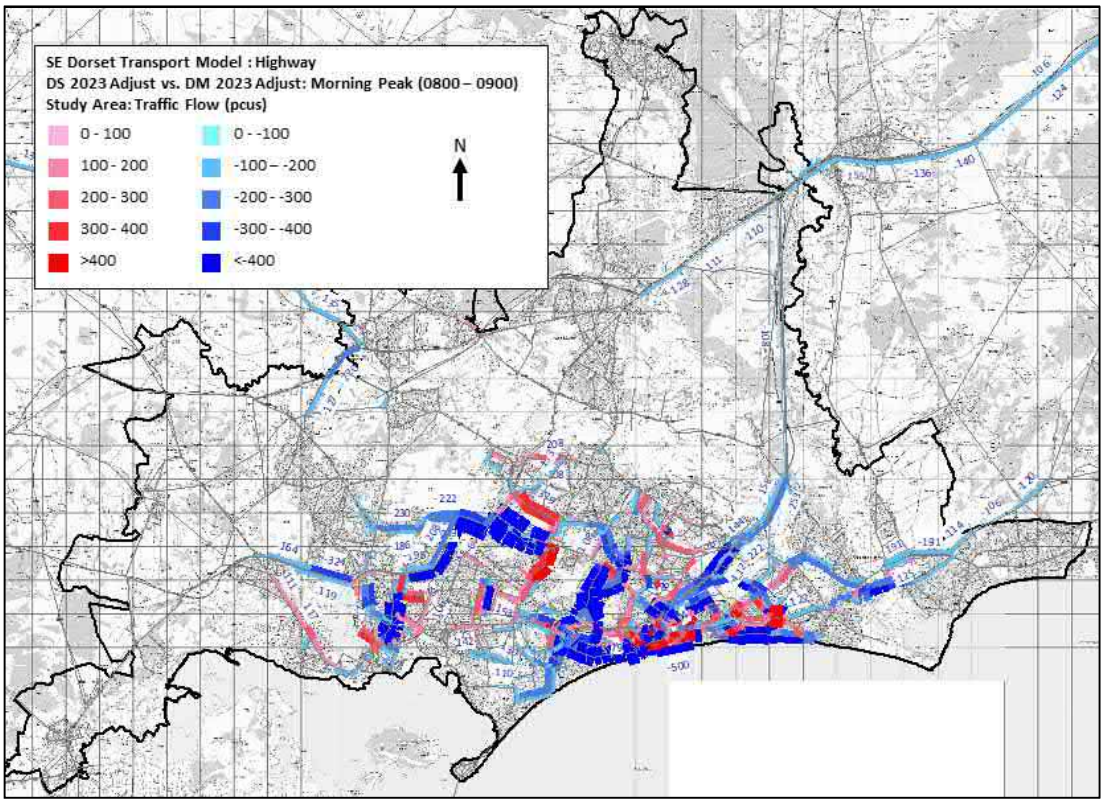

Figure 2.116: Actual Flows (vehicles) – 2023 Do-S vs Do-M, AM Peak

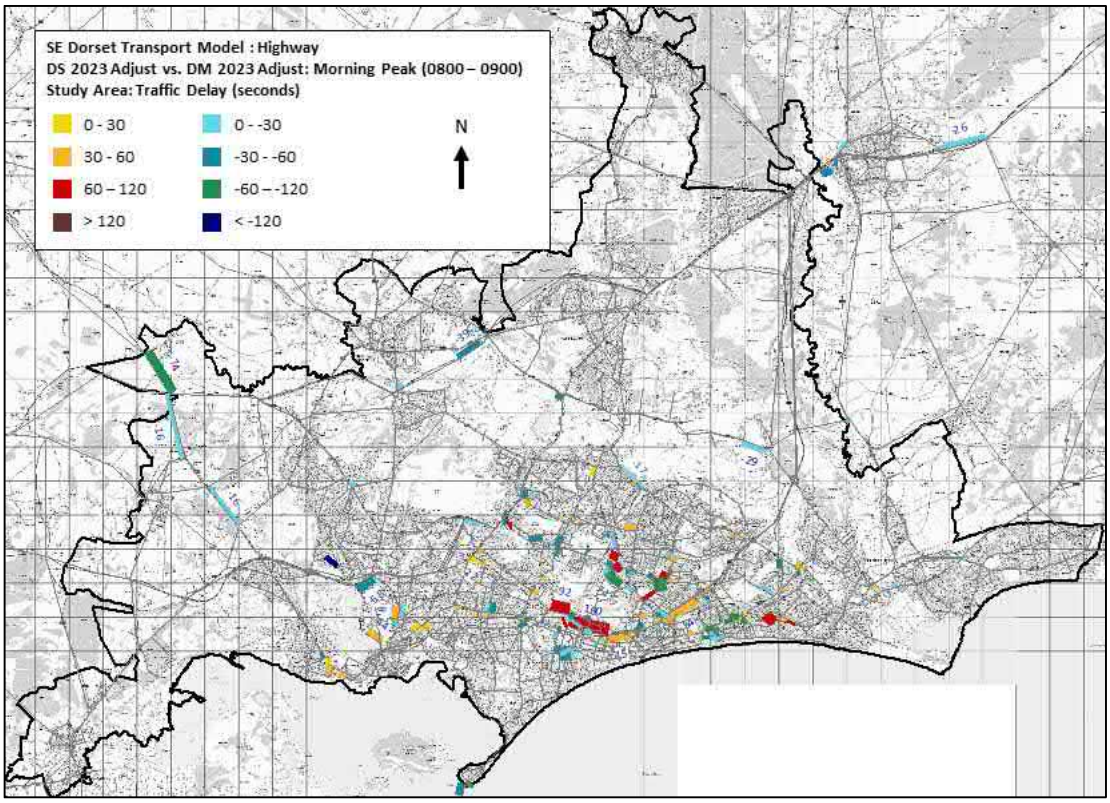

Figure 2.117: Link Delays (seconds) – 2023 Do-S vs Do-M, AM Peak

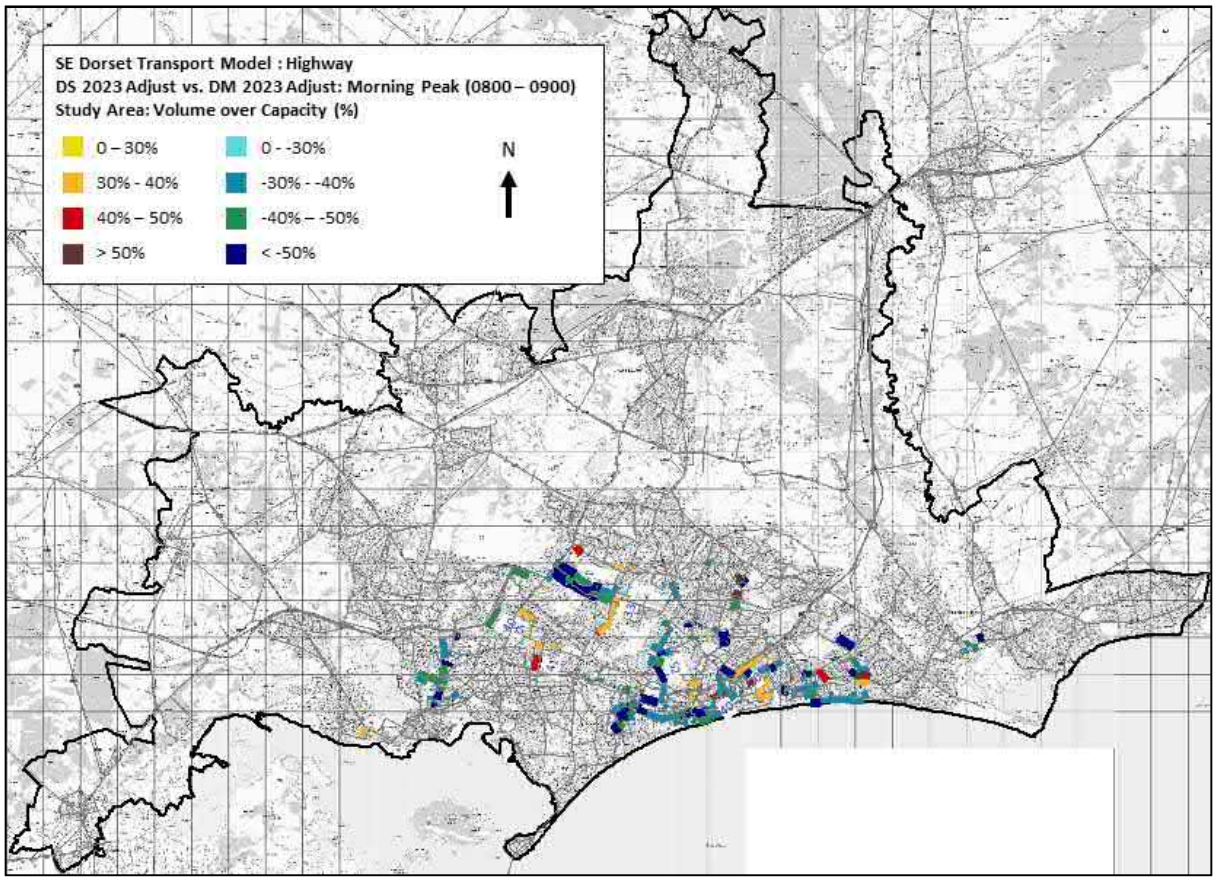

Figure 2.118: Link V/C (%) – 2023 Do-S vs Do-M, AM Peak

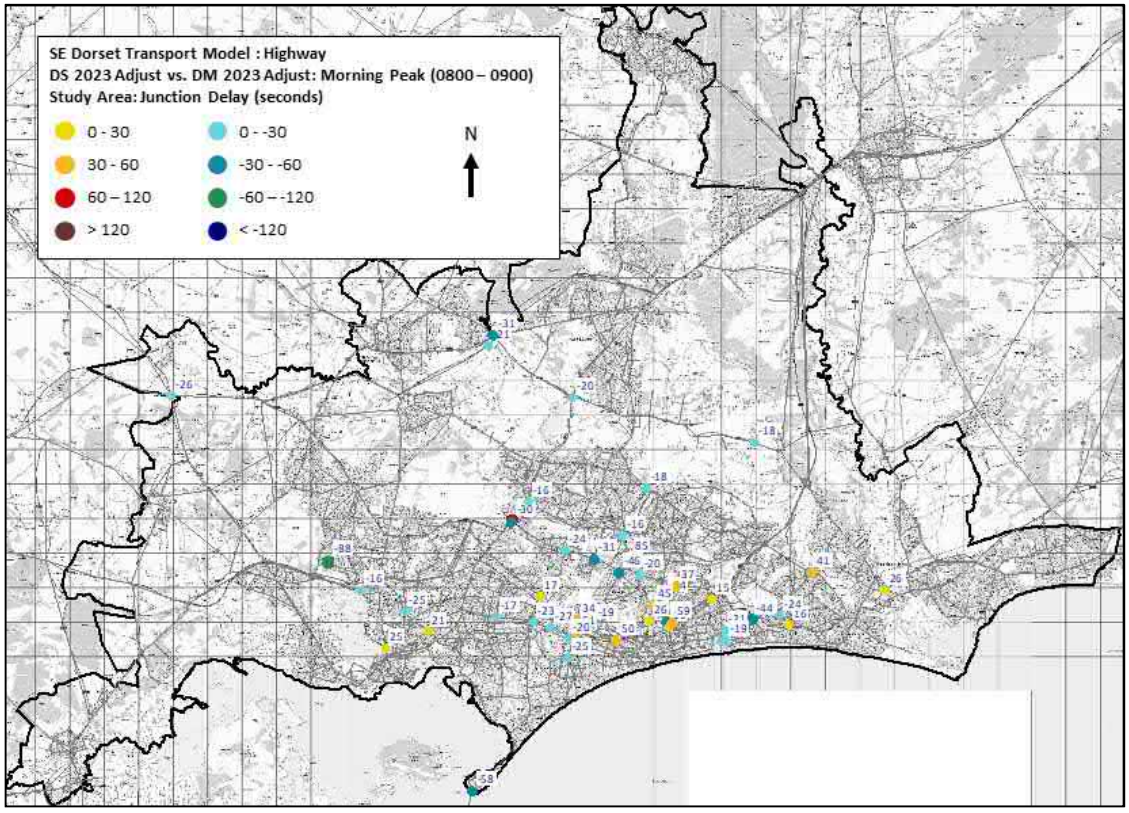

Figure 2.119: Node Delay (seconds) – 2023 Do-S vs Do-M, AM Peak

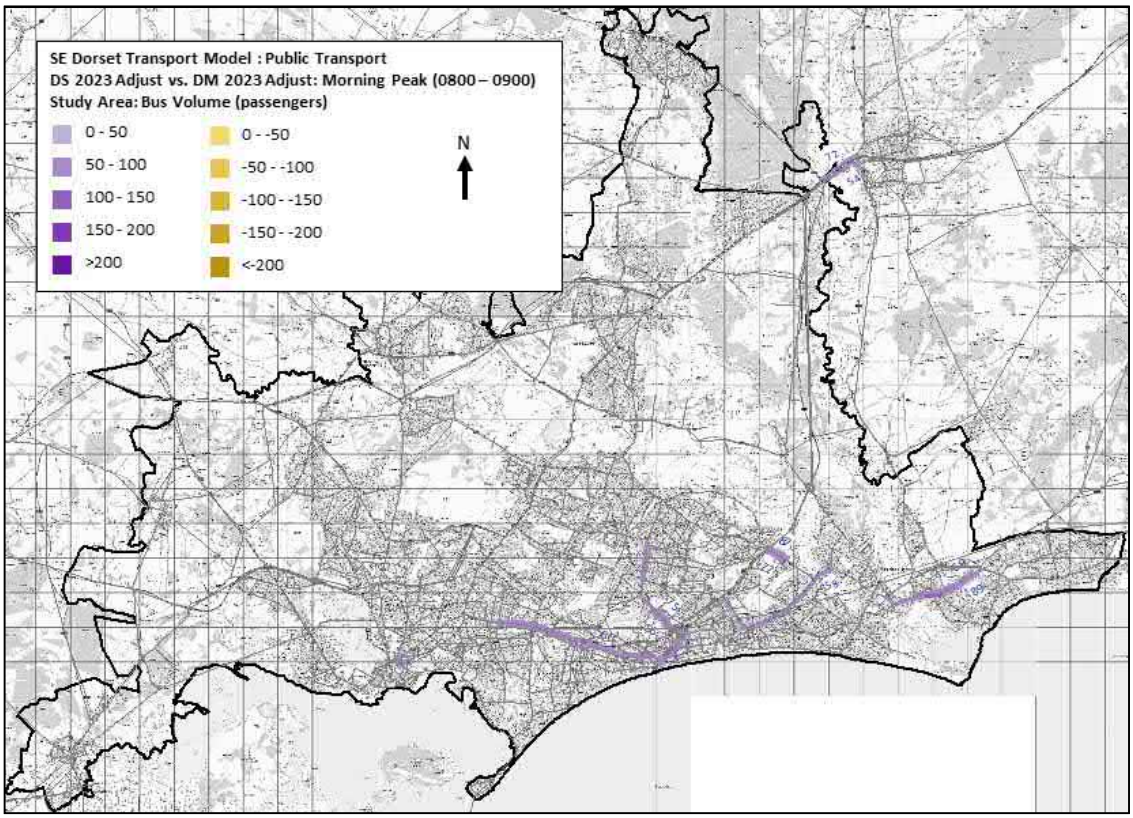

Figure 2.120: Bus Flows (passengers) - 2023 Do-S vs Do-M, AM Peak

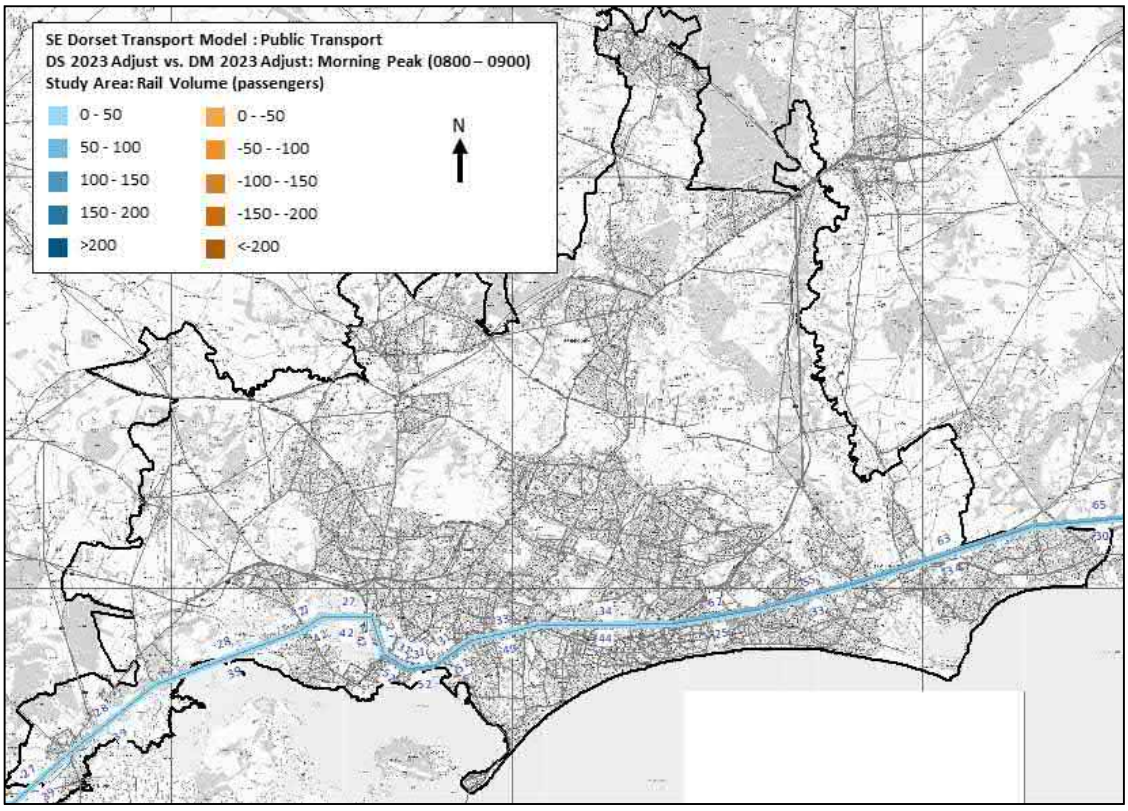

Figure 2.121: Rail Flows (passengers) - 2023 Do-S vs Do-M, AM Peak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.24. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.23: Journey Time changes – 2023 Do-Minimum vs 2023 Do-Something: AM Peak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	1.2%
	Westbound	11.4	-24.4%
A31	Eastbound	28	-4.5%
	Westbound	27.9	-2.7%
A338	Northbound	17.5	30.5%
	Southbound	17.4	11.3%
A341 / A3060	Eastbound	13.7	-4.4%
	Westbound	13.7	-5.0%
A347	Northbound	7.5	-5.1%
	Southbound	8.2	-5.6%
A348 / A3049	Eastbound	13.8	-3.7%
	Westbound	13.9	2.1%
A349	Northbound	5.6	-2.5%
	Southbound	5.5	-6.6%
A35 E	Eastbound	11.7	-2.9%
	Westbound	11.7	-1.6%
A35 W	Eastbound	17.8	-6.3%
	Westbound	18.5	-2.7%
A350	Northbound	13.9	-2.4%
	Southbound	13.9	-2.6%
A351	Eastbound	7.2	-0.4%
	Westbound	7.2	-0.5%
B3073	Eastbound	15.2	-0.7%
	Westbound	15.1	-3.9%

**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*

Table 2.24 below outlines the explanation of the model outputs for the comparison of the 2023 Do-Minimum vs Do-Something forecast year for the AM Peak.

Table 2.24: Model Output Details: 2023 Do Minimum vs Do Something, AM Peak

Scenario and Year	Do-Minimum – 2023 Forecast Year
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant redistribution of traffic across the network but especially within the centre of Bournemouth. This can be attributed to the proposed road closures around the BCP area. Key changes in traffic include:

	• Reduction of traffic along West Cliff Road and Glenferness Avenue and Boscombe Overcliff Drive of greater than 500 vehicles in each direction • An increase on the A350 near Poole, with a decrease in traffic along the A35 and Wimborne Road
Link Delays (Seconds)	Due to the redistribution of traffic, there are some noticeable changes in delay in the Do-Something compared to the Do-Minimum, including • Bournemouth West junction on the A338 EB of around 100 seconds • Woodside Road arm of the junction with Seabourne Road (101 seconds) • In Poole there is a small increase in delay on the A350 with its junction with Sterte Road, due to the increase in vehicles on this road. • The A3049 approach to Holes Bay North roundabout as a decrease in delay of 58 seconds
Link V/C Ratio (%)	There are a number of links across the model with a reduction in volume leading to a lower V/C ratio, including • Along Westcliff Road with a reduction of around 30-60% at junctions along this route, as well as along Boscombe Overcliff Drive of a similar amount. Due to restrictions in this area, there is a redistribution of traffic further north, therefore there are increased V/C ratios along Parkwood Road and Soutbourne Grove • There is a general decrease along the A3047 in both directions with the interventions in place between Mountbatten and Wallisdown Roundabouts • There are decreases in volume around the Longfleet area of Poole in the region of 50% due to the road closures proposed for the area.
Node Delay (Seconds)	The most noticeable junction delays changes are in the outskirts of Bournemouth and Poole. Within the BCP area, changes include • A decrease in node delay along the A3049 of around 20-40 seconds • An increase of around 50 seconds at the Bournemouth West junction • An increase of 41 seconds at Iford Roundabout • An increase of nearly half a minute at the A350/Sterte Road junction, and a decrease of the same amount at the A35/B3093 junction in Oakdale
Bus Flows (Passengers)	There is an increase in bus passengers along specific routes across the BCP area, including; • The A338 west of Bournemouth centre, through Branksome and Westbourne • To the north of Bournemouth centre along Wimborne Road • Along Ashley Road and the A35 through Pokesdown towards Christchurch • Through the centre of Christchurch • In the centre of Poole
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 35 passengers around Poole and 65 around Bournemouth. In the other direction, the increase is around 35 in Bournemouth and 50 in Poole.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced total travel time across the BCP area by around 8%, and total distance travelled by

Over-capacity queues (pcu hrs)	8%. The average speed across the BCP area has increased by 0.1kph (from 34.7 kph to 34.8kph) which suggests a negligible change in congestion levels across the network.
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	17% increase from DM
Total PT passenger kms	17% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a small decrease in journey time in the Do-Something as the majority of interventions involve some highway changes only and not much in the way of modal shift, therefore there is some rerouting but mainly focused on the central areas of Bournemouth, Poole and Christchurch. • The A338 has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath Road near the Pier which is pushing more traffic along the A338. • There is a minor decrease on the A345 W Eastbound as there are a number of interventions on this route which close some movements at junctions.

2023 Do Minimum vs Do Something: Interpeak

The model outputs for the 2023 Do Minimum vs Do Something in the Interpeak are shown below. The outputs are described further in Table 2.25.

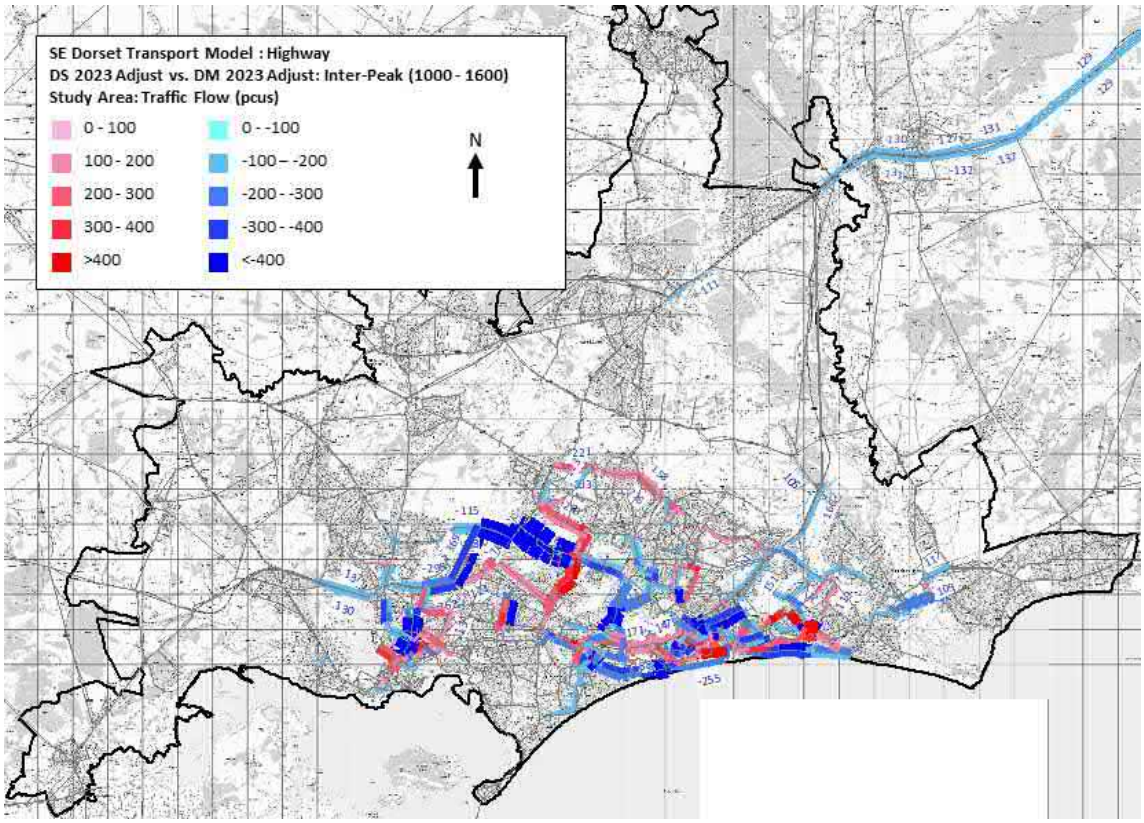

Figure 2.122: Actual Flows (vehicles) – 2023 Do-S vs Do-M, Interpeak

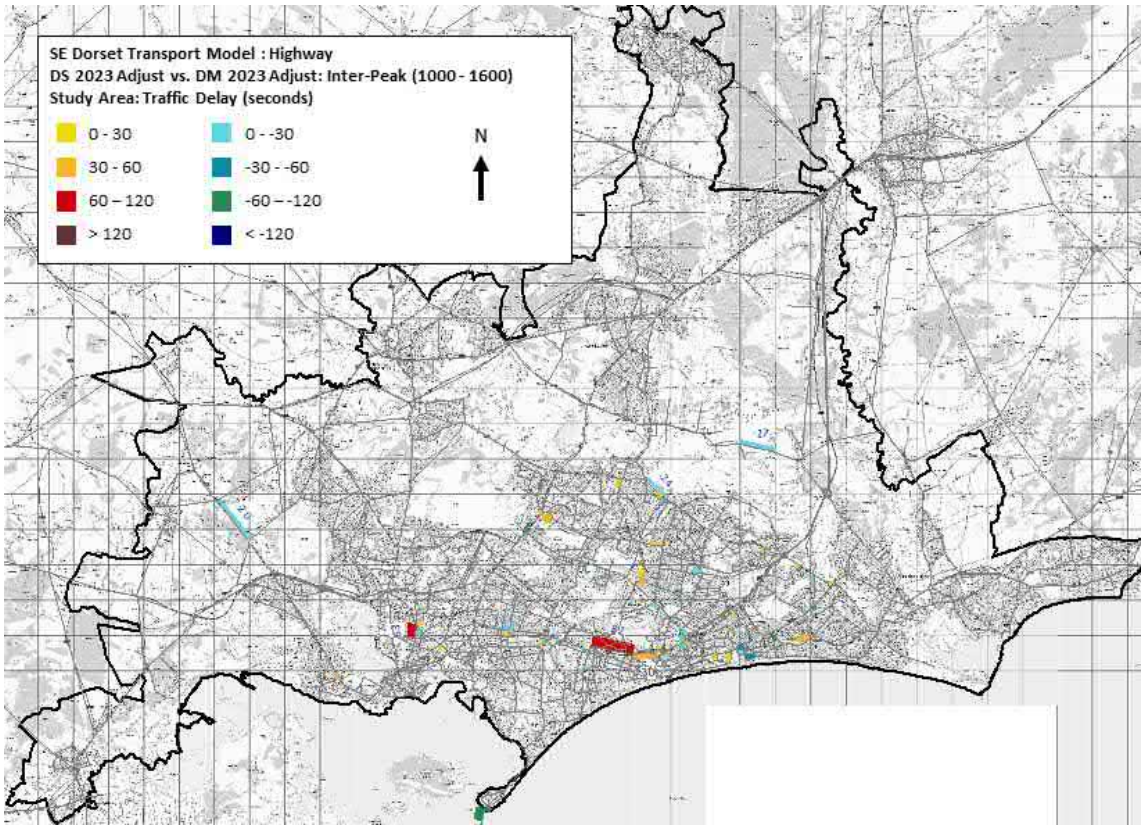

Figure 2.123: Link Delays (seconds) – 2023 Do-S vs Do-M, Interpeak

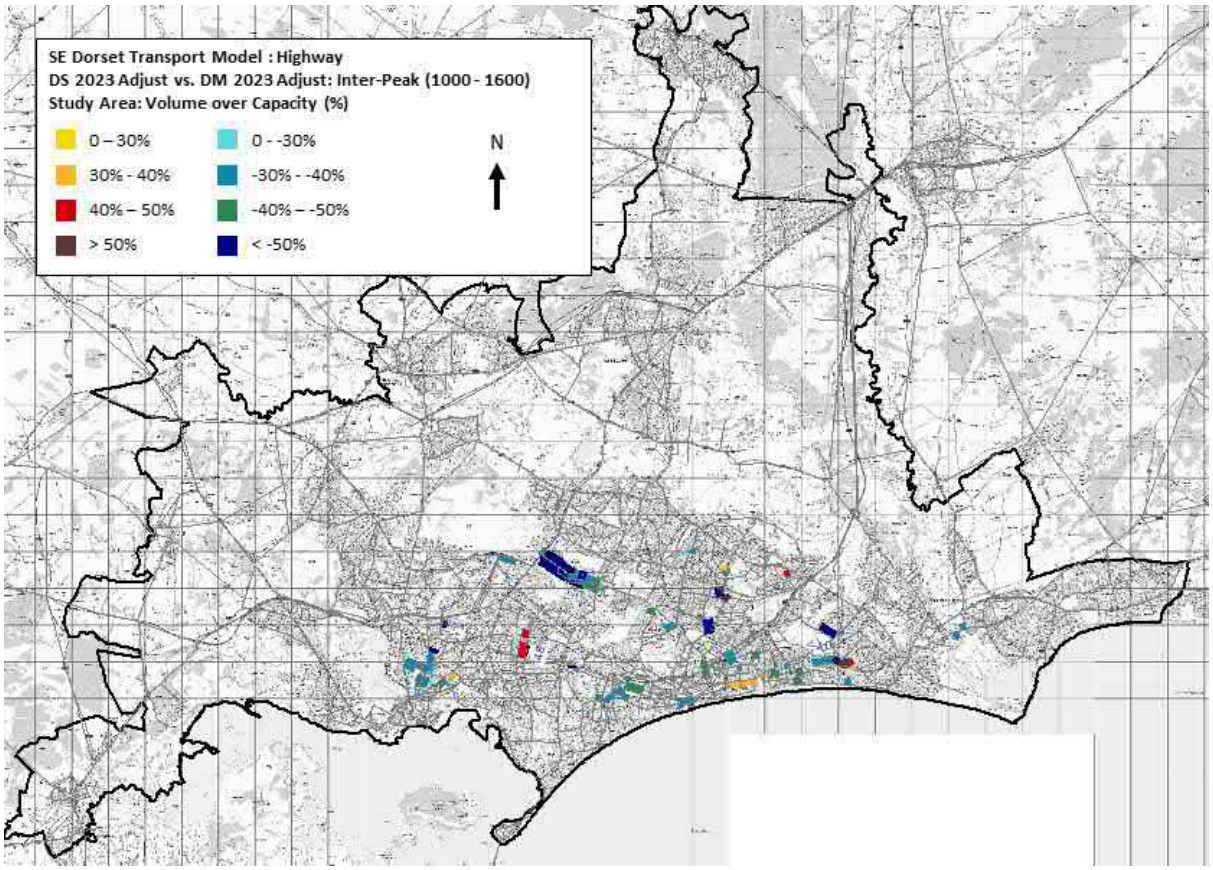

Figure 2.124: Link V/C (%) – 2023 Do-S vs Do-M, Interpeak

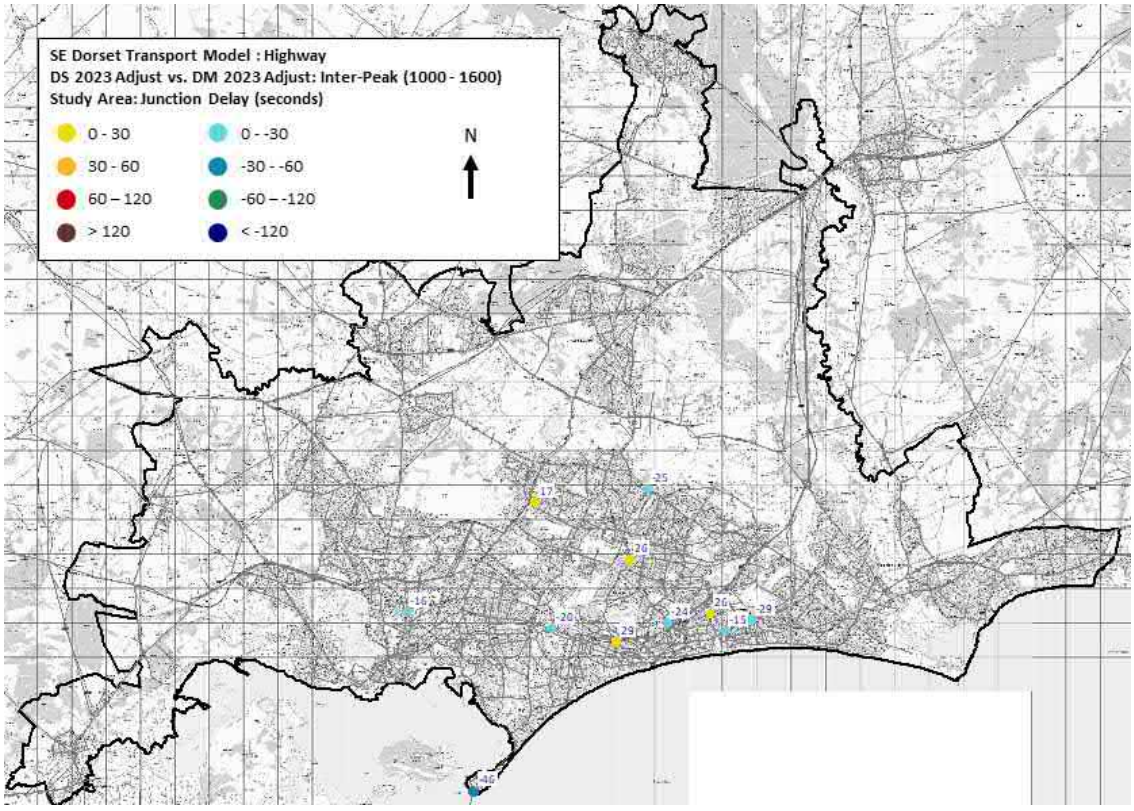

Figure 2.125: Node Delay (seconds) – 2023 Do-S vs Do-M, Interpeak

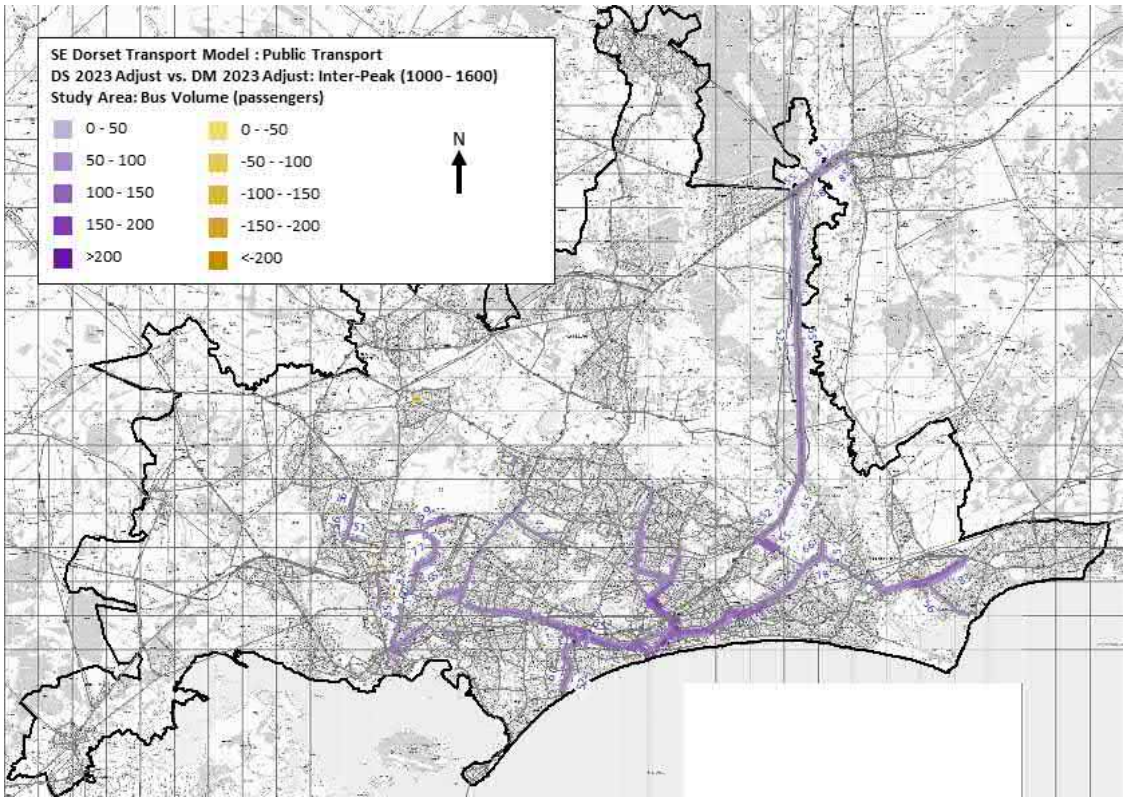

Figure 2.126: Bus Flows (passengers) - 2023 Do-S vs Do-M, Interpeak

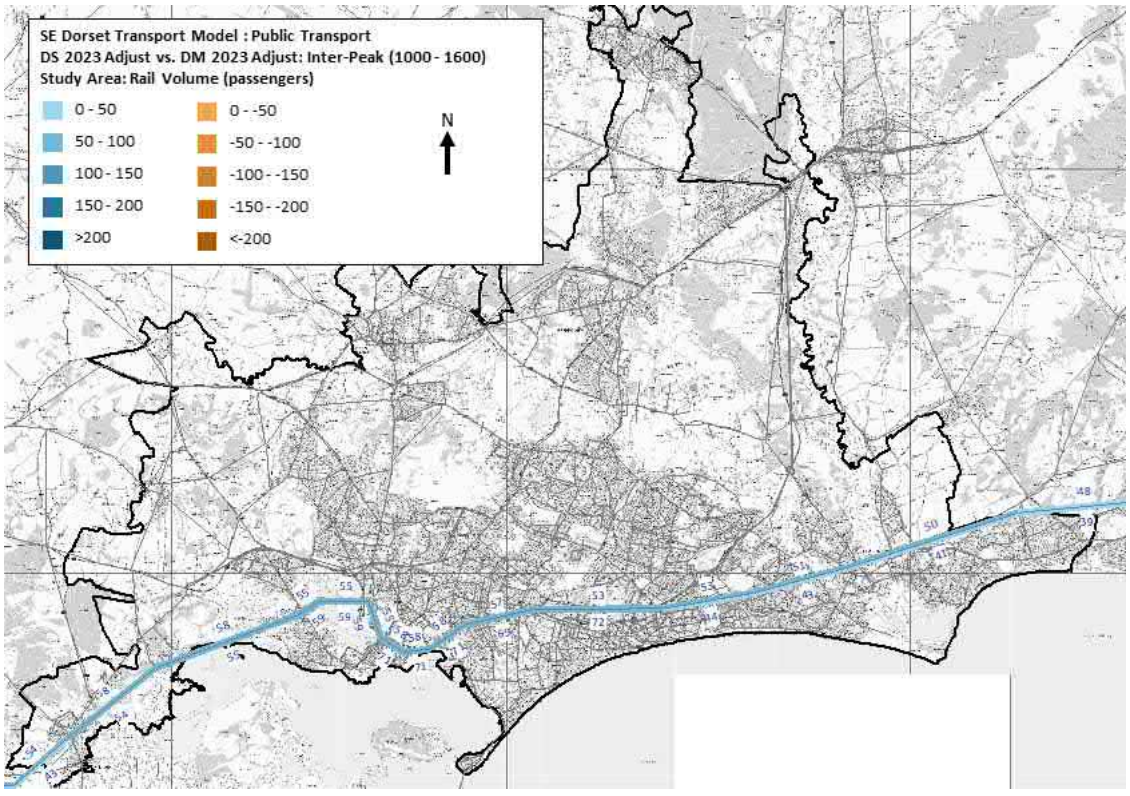

Figure 2.127: Rail Flows (passengers) - 2023 Do-S vs Do-M, Interpeak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.26. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.25: Journey Time changes – 2023 Do-Minimum vs 2023 Do-Something: Interpeak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-11.1%
	Westbound	11.4	-10.4%
A31	Eastbound	28	-1.6%
	Westbound	27.9	-1.8%
A338	Northbound	17.5	17.6%
	Southbound	17.4	4.6%
A341 / A3060	Eastbound	13.7	-1.4%
	Westbound	13.7	-1.4%
A347	Northbound	7.5	-3.8%
	Southbound	8.2	-3.1%
A348 / A3049	Eastbound	13.8	-1.1%
	Westbound	13.9	-0.6%
A349	Northbound	5.6	-1.9%
	Southbound	5.5	-1.1%
A35 E	Eastbound	11.7	0.4%
	Westbound	11.7	-1.1%
A35 W	Eastbound	17.8	-2.9%
	Westbound	18.5	-1.2%
A350	Northbound	13.9	0.4%
	Southbound	13.9	-1.3%
A351	Eastbound	7.2	-0.2%
	Westbound	7.2	-0.5%
B3073	Eastbound	15.2	-0.7%
	Westbound	15.1	-1.3%

**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*

Table 2.26 below outlines the explanation of the model outputs for the comparison of the 2023 Do-Minimum vs Do-Something forecast year for the Interpeak.

Table 2.26: Model Output Details: 2023 Do Minimum vs Do Something, Interpeak

Scenario and Year	Do-Minimum – 2023 Forecast Year
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant redistribution of traffic across the network but especially within the centre and north of Bournemouth and Poole. This can largely be attributed to the proposed road closures around the BCP area. Key changes in traffic include:

	• Reduction of traffic along West Cliff Road and Glenferness Avenue and Boscombe Overcliff Drive of greater than 300 vehicles in each direction, leading to increases along the A338 • An increase on the A350 near Poole, with a decrease in traffic along the A35 and Wimborne Road and along the B3068.
Link Delays (Seconds)	Due to the redistribution of traffic, there are some noticeable changes in delay in the Do-Something compared to the Do-Minimum, including • Bournemouth West junction on the A338 EB of around 80 seconds • B3093 NB approach of the junction with the A35 in Poole, an increase of just over 1 minute • There is a decrease in delay with the interventions in place around Boscombe Overcliff Road including St Johns Road NB due to road closures in the area
Link V/C Ratio (%)	There are a number of links across the model with a reduction in volume leading to a lower V/C ratio, including • A small decrease along Bath Road close to Bournemouth Pier of around 30% • Some noticeable decreases through the centre of Westbourne south of the A338 (around 30-40%) • Decreases along the A3047 between Wallisdown and Mountbatten due to the closure of some movements along this corridor. • There are decreases in volume around the Longfleet area of Poole in the region of 30-40% due to the road closures proposed for the area.
Node Delay (Seconds)	There are some junction delays changes wthin the BCP area but these are relative minor which are largely due to closure of movements at the junctions, changes include • A decrease along the A35 in Boscombe with the junction os St Johns Road of 15 seconds, and Crabton Close Road of around 29 seconds • A decrease of 20 seconds at the A35/Bourne Valley Road junction
Bus Flows (Passengers)	There is an increase in bus passengers along specific routes across the BCP area, including; • Along the A338 west of Bournemouth centre, through Branksome and Westbourne and to the east of Cooper Dean Roundabout • The A35 from Bournemouth through Pokesdown towards Christchurch • In the centre of Poole and heading northbound along the A3093 through Longfleet as well as on the A3068 to the east of Poole.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 50 passengers around Bournemouth and Poole. In the other direction, the increase is around 40 in Bournemouth and 70 in Poole.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced total travel time across the BCP area by around 4%, and total distance travelled by 6%. The average speed across the BCP area has decreased by 0.7kph (from 37.9 kph to 37.2kph) which, although is a small increase in speeds across the study area, suggests the interventions have led to a negligible change in congestion levels across the network
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	

Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	25% increase from DM
Total PT passenger kms	27% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a small decrease in journey time in the Do-Something as the majority of interventions involve some highway changes only and not much in the way of modal shift, therefore there is some rerouting but mainly focused on the central areas of Bournemouth, Poole and Christchurch. • The A338 has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath Road near the Pier which is pushing more traffic along the A338. • The decrease in journey times is, in most cases, less than the the AM and PM peak as the interpeak generally has less congestion than the other two peak hours.

2023 Do Minimum vs Do Something: PM Peak

The model outputs for the 2023 Do Minimum vs Do Something in the PM Peak are shown below. The outputs are described further in Table 2.27.

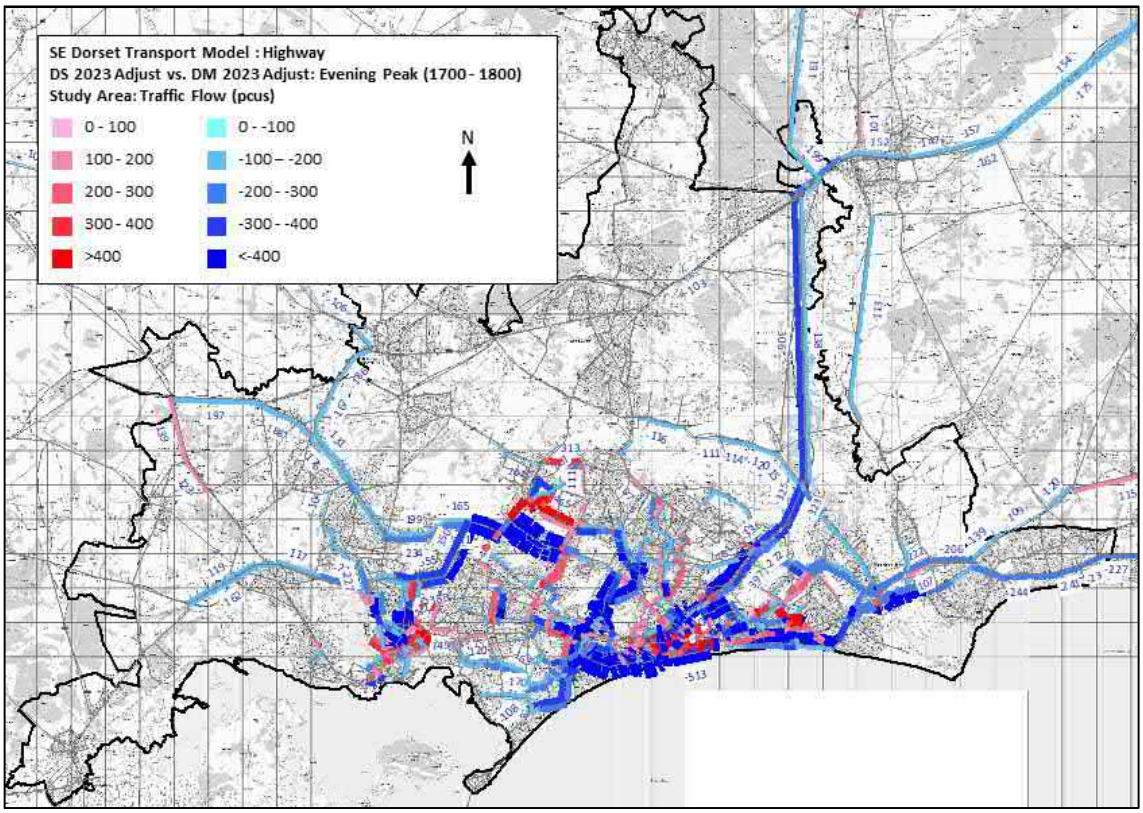

Figure 2.128: Actual Flows (vehicles) – 2023 Do-S vs Do-M, PM Peak

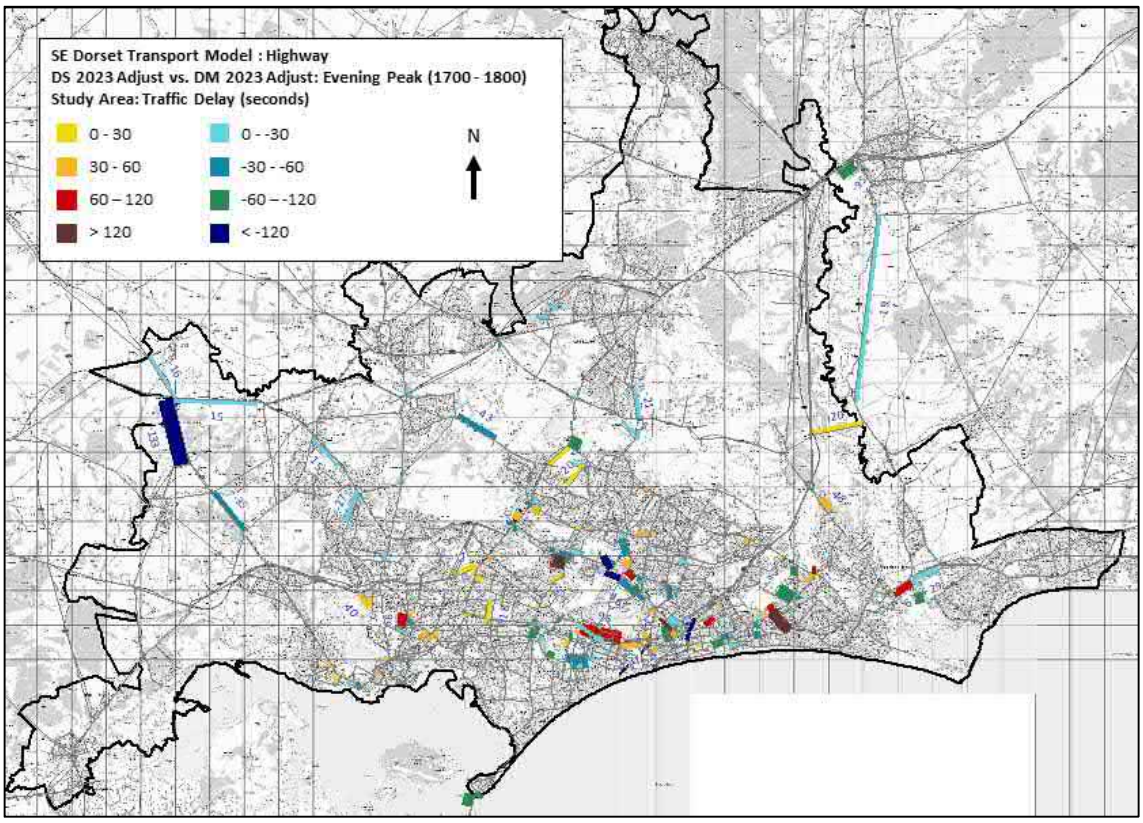

Figure 2.129: Link Delays (seconds) – 2023 Do-S vs Do-M, PM Peak

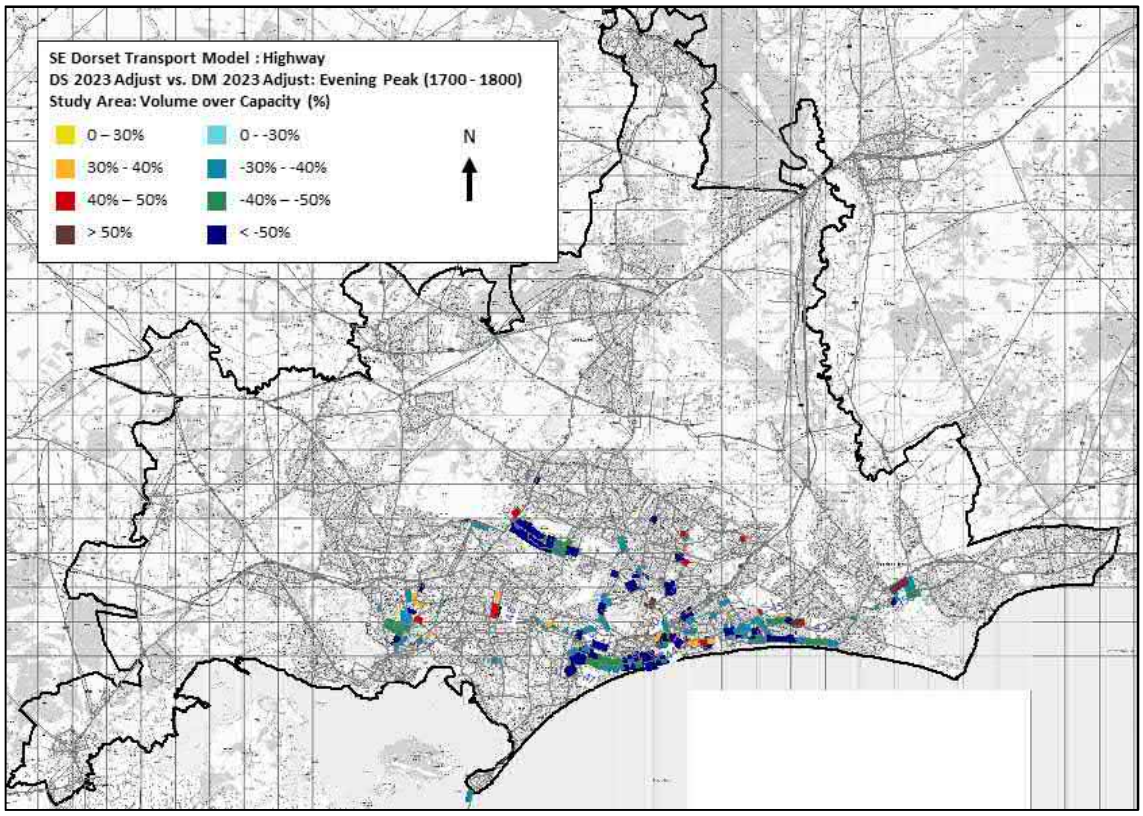

Figure 2.130: Link V/C (%) – 2023 Do-S vs Do-M, PM Peak

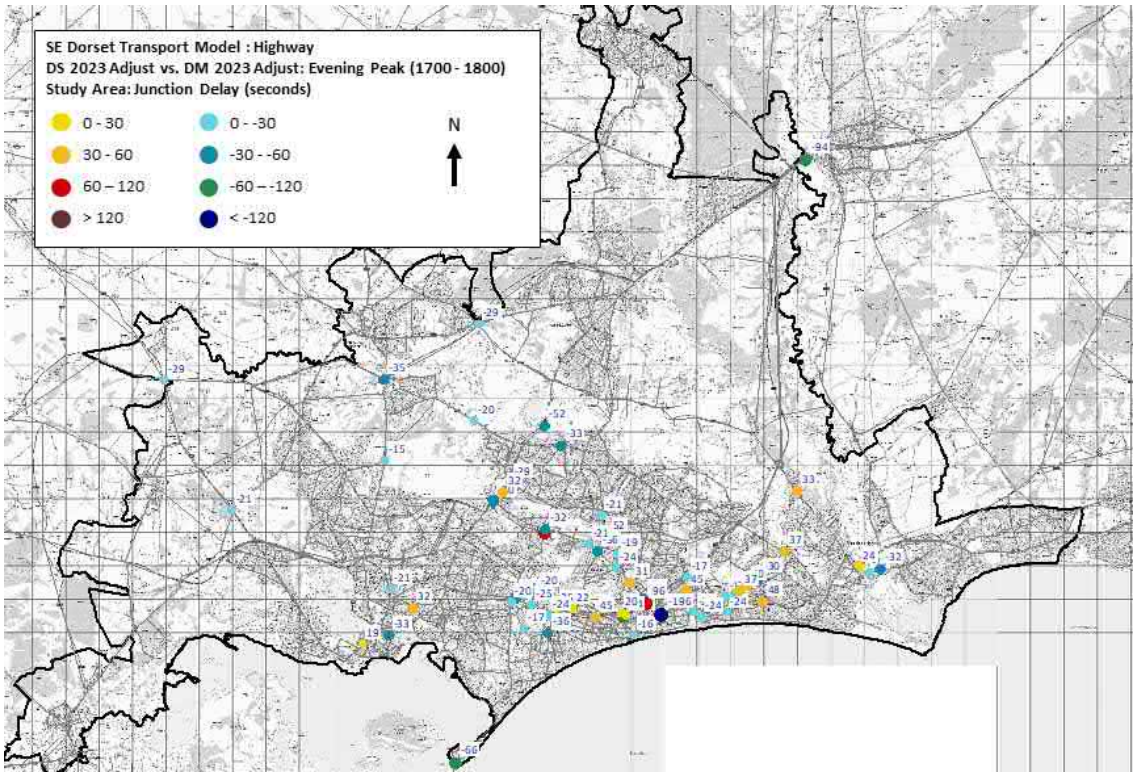

Figure 2.131: Node Delay (seconds) – 2023 Do-S vs Do-M, PM Peak

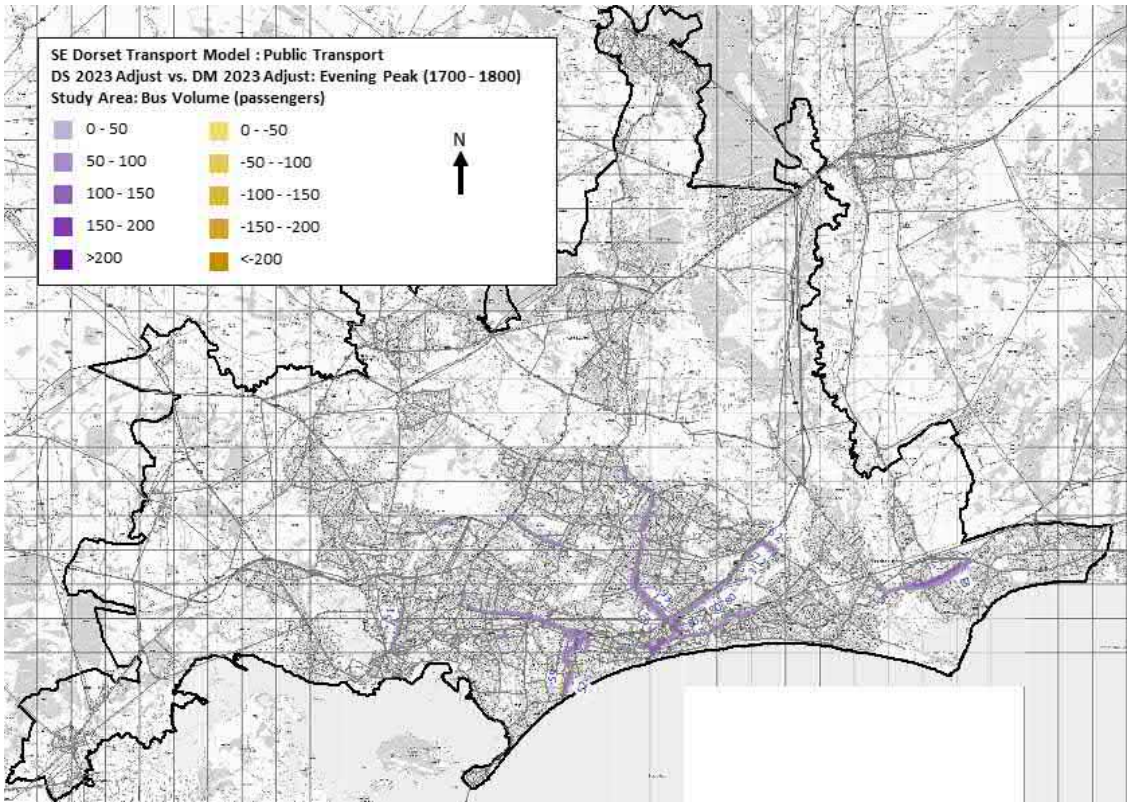

Figure 2.132: Bus Flows (passengers) - 2023 Do-S vs Do-M, PM Peak

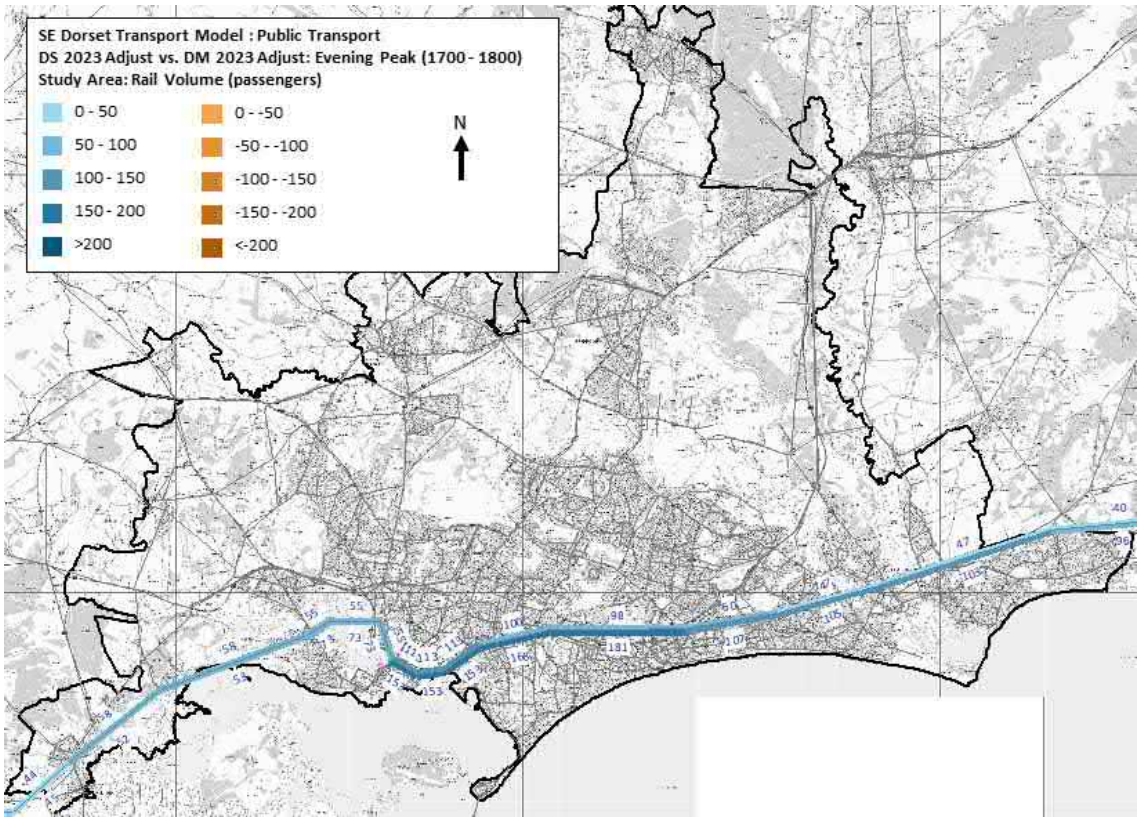

Figure 2.133: Rail Flows (passengers) - 2023 Do-S vs Do-M, PM Peak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.28 The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.27: Journey Time changes – 2023 Do-Minimum vs 2023 Do-Something: PM Peak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-25.7%
	Westbound	11.4	-15.4%
A31	Eastbound	28	-3.4%
	Westbound	27.9	-10.8%
A338	Northbound	17.5	36.4%
	Southbound	17.4	0.6%
A341 / A3060	Eastbound	13.7	-4.4%
	Westbound	13.7	-6.0%
A347	Northbound	7.5	-2.1%
	Southbound	8.2	-7.4%
A348 / A3049	Eastbound	13.8	-2.4%
	Westbound	13.9	-7.1%
A349	Northbound	5.6	-9.0%
	Southbound	5.5	-4.0%
A35 E	Eastbound	11.7	6.1%
	Westbound	11.7	0.6%
A35 W	Eastbound	17.8	-3.8%
	Westbound	18.5	-4.8%
A350	Northbound	13.9	-6.6%
	Southbound	13.9	-1.9%
A351	Eastbound	7.2	-0.3%
	Westbound	7.2	-1.0%
B3073	Eastbound	15.2	0.8%
	Westbound	15.1	-2.3%

**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*

Table 2.28 below outlines the explanation of the model outputs for the comparison of the 2023 Do-Minimum vs Do-Something forecast year for the PM Peak.

Table 2.28: Model Output Details: 2023 Do Minimum vs Do Something, PM Peak

Scenario and Year	Do-Minimum – 2023 Forecast Year
Time Period	Evening peak hour (1700-1800) – PM
Model Output Metrics	

Traffic Flows (pcus)	The outputs show some significant redistribution of traffic across the network but especially within the centre of Bournemouth. This can be attributed to the proposed road closures around the BCP area. Key changes in traffic include: • Reduction of traffic along West Cliff Road and Glenferness Avenue and Boscombe Overcliff. The reduction of traffic on Glenferness Avenue is in the region of 1000 northbound and 500 southbound between Leven Avenue and East Avenue. • There is a large increase in traffic around alternative routes to avoid Lansdowne Roundabout including along Gervis Road (400 2-way increase) and A35 St Pauls Road (300 leading to St Pauls Roundabout) • There is a decrease in traffic along the B3093 through Longfleet in Poole, with an increase along the A350, B3068 and Parkstone Road suggesting a noticeable redistribution of traffic.
Link Delays (Seconds)	Due to the redistribution of traffic, there are some noticeable changes in delay in the Do-Something compared to the Do-Minimum, including • An increase of delay at the Bournemouth West junction on the A338 EB of around 95 seconds, due to closures through Westbourne which is redistributing traffic onto this route. • Woodside Road arm of the junction with Seabourne Road (252 seconds) • In Poole there is a small increase in delay on three of the four arms of the A35/B3068 of between 20-40 seconds. • There is an increase of around 66 seconds on the Wimborne Road arm of the A35/B3093 junction
Link V/C Ratio (%)	There are a number of links across the model with a reduction in volume leading to a lower V/C ratio, including • Due to closures close to the seafront in Bournemouth there is a noticeable reduction in V/C ratios along Westcliff Road and Bath Road, as well as Boscombe Overcliff. • This has led to an increase in congestion on St Peters Road with the redistribution of traffic from those changes as well as changes to Lansdowne Roundabout. • Decreases along the A3047 between Wallisdown and Mountbatten due to the closure of some movements along this corridor. • There are decreases in volume around the Longfleet area of Poole in the region of 30-50% due to the road closures proposed for the area, with some increases on alternative routes.
Node Delay (Seconds)	The most noticeable junction delays changes are around the centre of Bournemouth and on outskirts of Bournemouth and Poole. Within the BCP area, changes include • A increase of 96 seconds at St Pauls Roundabout and 45 seconds at Bournemouth West roundabout due to redistribution of traffic onto this route • Some changes within Poole, including a 32 second increase in delay at the A35/B3068 junction, and a decrease at the A35/B3093. • An increase at the Mossley Avenue/Alder Road however there is a decrease at A3049/Alder Road junction which would suggest that the congestion at the former junction is holding back traffic heading to the A3049.
Bus Flows (Passengers)	There is an increase in bus passengers along specific routes across the BCP area, including;

	• An increase through Lansdowne Roundabout, attributed to the changes at the roundabout with the closure of some private car traffic movements. • To the north of Bournemouth centre along the A338 WB towards Bournemouth and the A35 towards Pokesdown station • There is an increase in bus flows between Branksome Park, Branksome and Parkstone which is attributed to the closure of some movements at junctions along the route to private cars, and open for buses only.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 100 passengers around Poole and 47 around Bournemouth suggesting passengers are using the train to travel from Poole to Bournemouth. In the other direction, the increase is around 105 in Bournemouth and 160 in Poole.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced total travel time across the BCP area by around 10%, and total distance travelled by 11%. The average speed across the BCP area has decreased by 0.4kph (from 34.2 kph to 33.9kph) which, although is a small increase in speeds across the study area, suggests the interventions have led to a negligible change in congestion levels across the network
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	19% increase from DM
Total PT passenger kms	23% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a small decrease in journey time in the Do-Something as the majority of interventions involve some highway changes only and not much in the way of modal shift, therefore there is some rerouting but mainly focused on the central areas of Bournemouth, Poole and Christchurch. • The A338 Northbound has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath Road near the Pier which is pushing more traffic along the A338.

2031 Do Minimum vs Do Something: AM Peak

The model outputs for the 2031 Do Minimum vs Do Something in the AM Peak are shown below. The outputs are described further in Table 2.29.

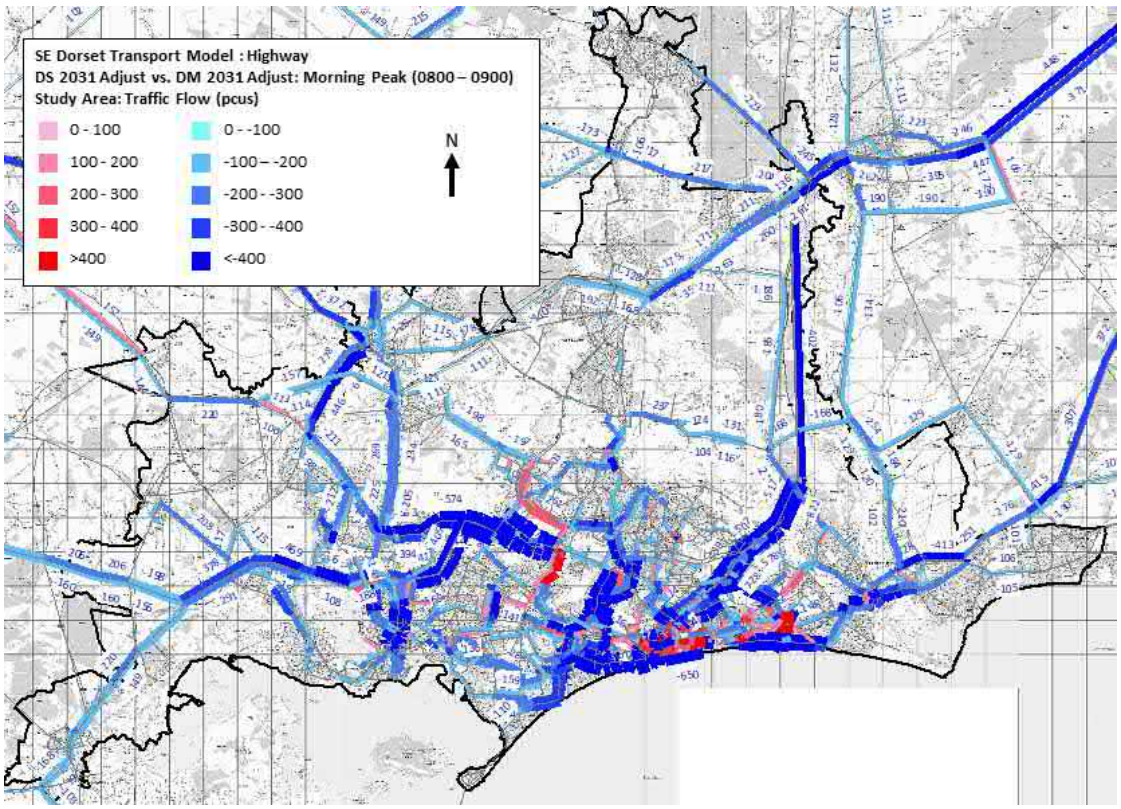

Figure 2.134: Actual Flows (vehicles) – 2031 Do-S vs Do-M, AM Peak

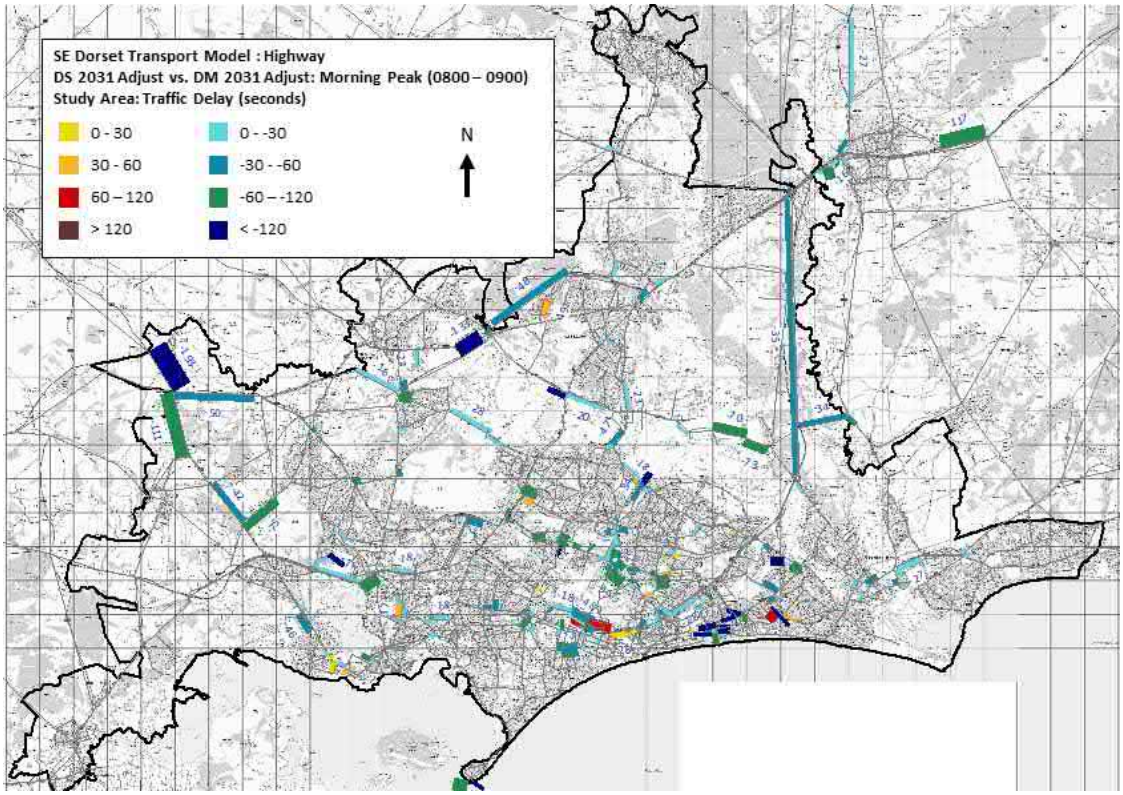

Figure 2.135: Link Delays (seconds) – 2031 Do-S vs Do-M, AM Peak

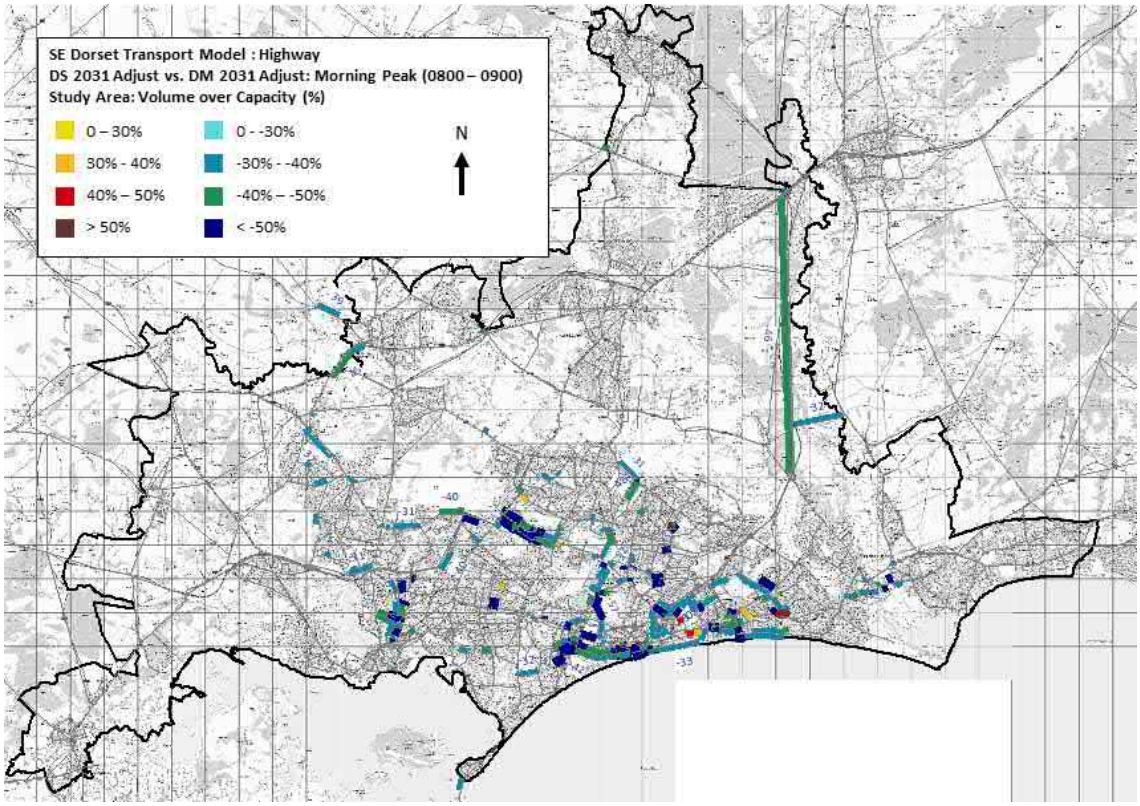

Figure 2.136: Link V/C (%) – 2031 Do-S vs Do-M, AM Peak

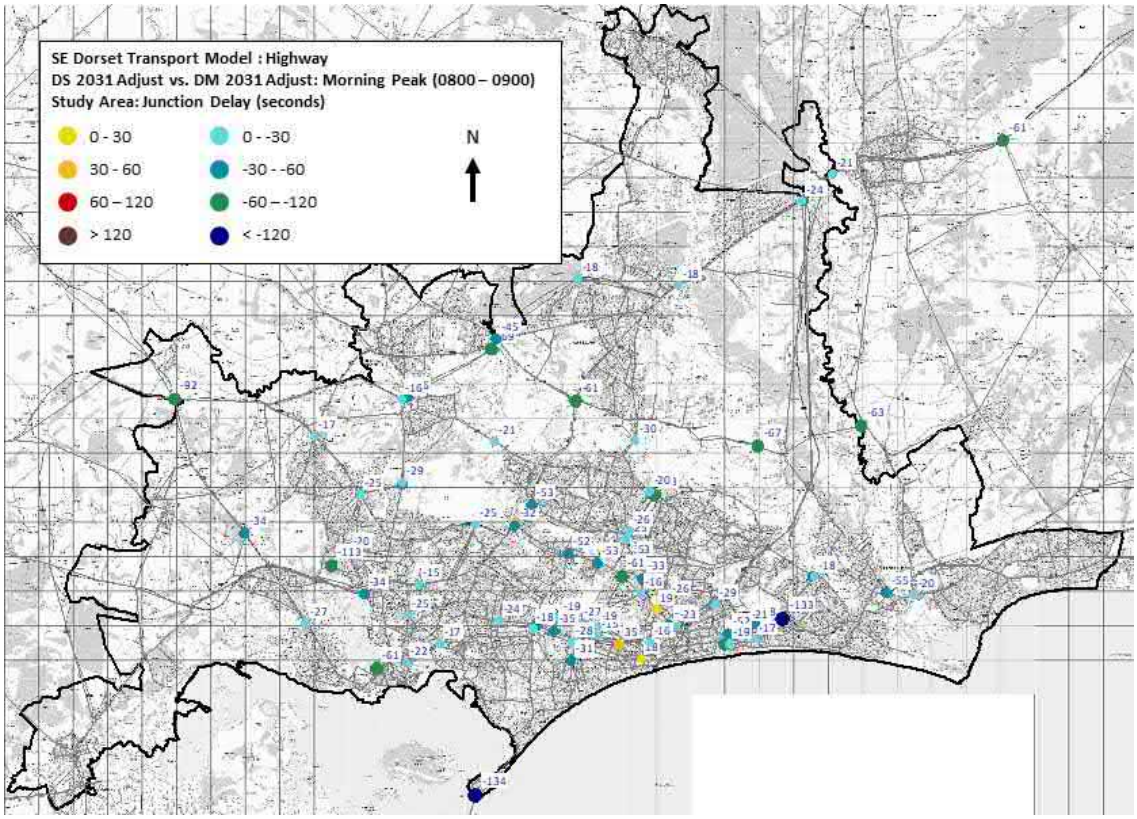

Figure 2.137: Node Delay (seconds) – 2031 Do-S vs Do-M, AM Peak

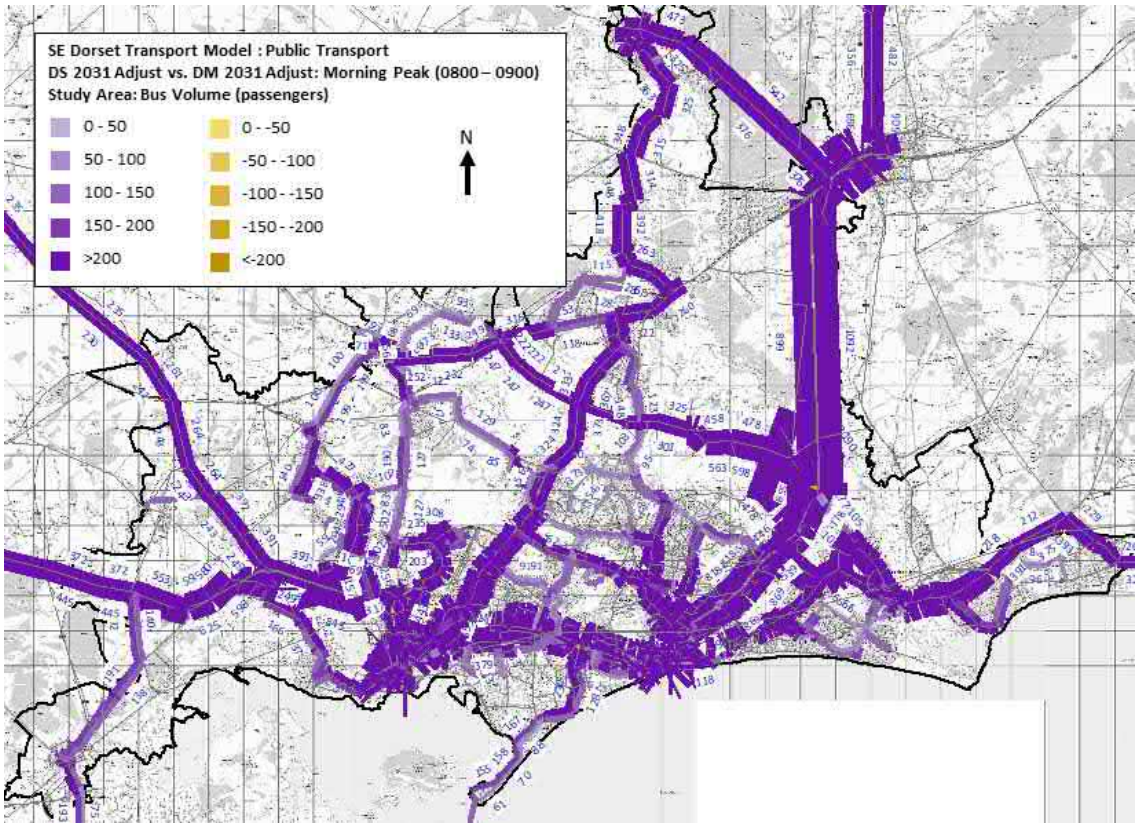

Figure 2.138: Bus Flows (passengers) - 2031 Do-S vs Do-M, AM Peak

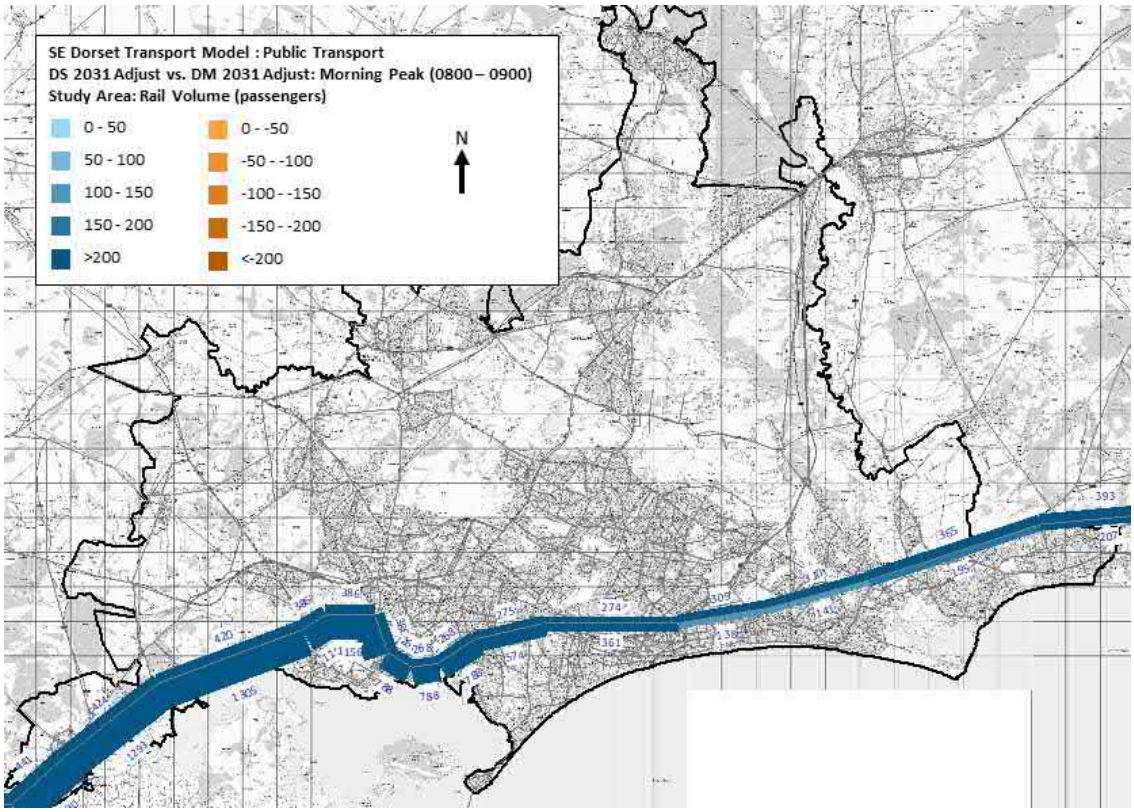

Figure 2.139: Rail Flows (passengers) - 2031 Do-S vs Do-M, AM Peak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.30. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.29: Journey Time changes – 2031 Do-Minimum vs 2031 Do-Something: AM Peak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-15.9%
	Westbound	11.4	-30.9%
A31	Eastbound	28	-20.1%
	Westbound	27.9	-11.8%
A338	Northbound	17.5	8.1%
	Southbound	17.4	-4.2%
A341 / A3060	Eastbound	13.7	-15.0%
	Westbound	13.7	-14.5%
A347	Northbound	7.5	-17.8%
	Southbound	8.2	-19.5%
A348 / A3049	Eastbound	13.8	-14.5%
	Westbound	13.9	-11.8%
A349	Northbound	5.6	-7.3%
	Southbound	5.5	-22.3%
A35 E	Eastbound	11.7	-14.8%

	Westbound	11.7	-17.3%
A35 W	**Eastbound**	17.8	-12.7%
	Westbound	18.5	-9.8%
A350	**Northbound**	13.9	-19.0%
	Southbound	13.9	-18.0%
A351	**Eastbound**	7.2	-3.6%
	Westbound	7.2	-2.4%
B3073	**Eastbound**	15.2	-8.7%
	Westbound	15.1	-11.6%
**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*			

Table 2.30 below outlines the explanation of the model outputs for the comparison of the 2031 Do-Minimum vs Do-Something forecast year for the AM Peak.

Table 2.30: Model Output Details: 2031 Do Minimum vs Do Something, AM Peak

Scenario and Year	**Do-Minimum – 2031 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant changes to traffic around the BCP area with a high proportion of roads seeing a reduction in traffic due to the number of bus-related interventions in this forecast year which has involved a shift of vehicles off the network and onto buses. There is still an obvious redistribution of trips due to the road closures which were added in 2023. • The greatest reduction of trips in Bournemouth are seen along the road closure-affected routes parallel to the coastline • The A338 sees a decrease in traffic, e.g around Holdenhurst there is a decrease of 500 NB and 800 SB which is due to the shuft of cars to PT. • The centre of Christchurch sees a reduction of around 300 in each direction • All routes into Poole sees a decrease in traffic, with a small increase on the A350 NB due to the road closures.
Link Delays (Seconds)	Due to the redistribution of traffic, there are some noticeable changes in delay in the Do-Something compared to the Do-Minimum, including • A decrease in delay on the A350 to the North of Poole. This is likely attributed to the reduction in traffic due to a switch to bus. • An increase in delay (around 80 seconds) on the EB approach to the Bournemouth West roundabout, and WB approach of 28 seconds. • Reduction in delay on various roads south of the A35 in Boscombe due to the removal of movements at the junction, and an increase of 78 seconds on Woodside Road onto Southbourne Grove which would suggest a redistributional impact. • Very little impact on the centre of Poole but a reduction of over a minute on the WB approach to Holes Bay N Roundabout.
Link V/C Ratio (%)	The model shows that there is a general decrease in V/C ratios across the urban areas of Bournemouth and Poole and key routes into each

	area. There are some increases especially in Bournemouth due to redistribution of traffic with road closures. • V/C ratios have decreased along West Cliff Road and Bath Road due to road closures • There is also a noticeable decrease on Glenfurness Avenue. • There is an increase in V/C on the A35 through Boscombe but a decrease on the parallel routes through Springbourne and East Overcliff Drive • There is a reduction along Bridge Street in Christchurch and around the B3093/Tatnam Road junction in Poole.
Node Delay (Seconds)	Generally there is a decrease around the network due to less traffic on the network however there are a few increases at junctions such as Bournemouth West and A347/B3063/B3064 where traffic levels have increased due to road closures. • There are a number of noticeable reductions around Boscombe and Pokesdown • Also along the A338 and A3049 where traffic has also been affected by changes in movements at junctions.
Bus Flows (Passengers)	The output shows an increase across the BCP area of bus passengers due to the bus improvements planned within these interventions. This includes on main routes into the BCP area i.e. the A338 towards Ringwood sees an increase of 899 northbound and 1092 southbound.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 275 passengers around Poole and 300 around Bournemouth. In the other direction, the increase is around 130 in Bournemouth and 600 in Poole.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced total travel time across the BCP area by around 26%, and total distance travelled by 19%. The average speed across the BCP area have increased by over 3kph (from 33.5 kph to 36.6kph) which would be expected, largely due to the number of private cars being reduced due to modal shift to PT.
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	231% increase from DM
Total PT passenger kms	242% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a higher than 10% decrease in journey time in the Do-Something as this forecast year involves some model shift from cars to PT which in turn reduces traffic on the roads and results in faster journey times. • The A338 Northbound still has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath

	Road near the Pier which is pushing more traffic along the A338.

2031 Do Minimum vs Do Something: Interpeak

The model outputs for the 2031 Do Minimum vs Do Something in the Interpeak are shown below. The outputs are described further in Table 2.32.

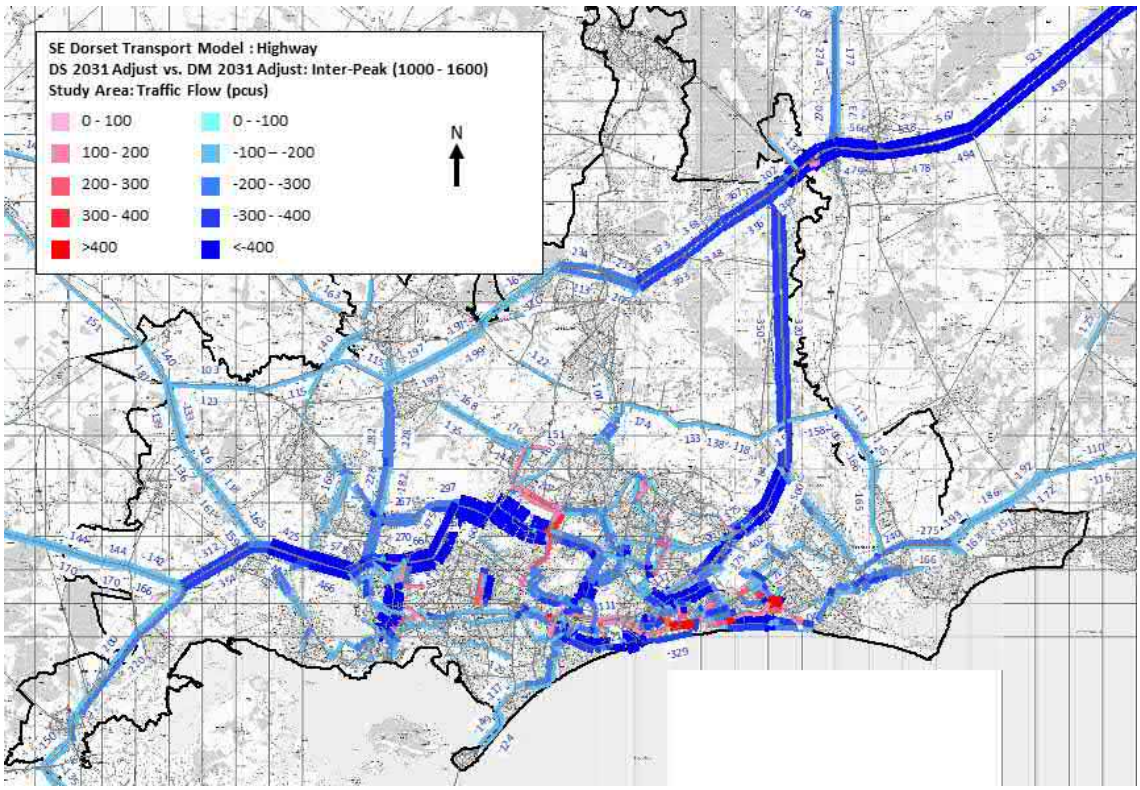

Figure 2.140: Actual Flows (vehicles) – 2031 Do-S vs Do-M, Interpeak

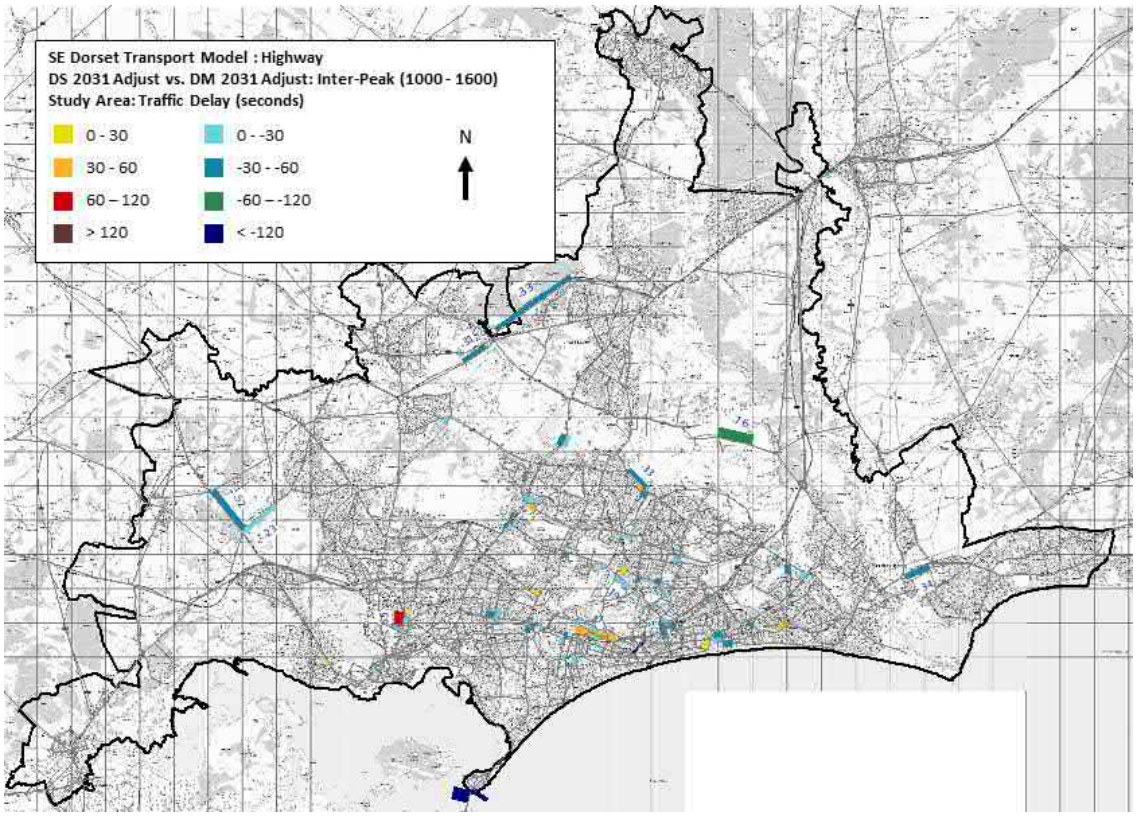

Figure 2.141: Link Delays (seconds) – 2031 Do-S vs Do-M, Interpeak

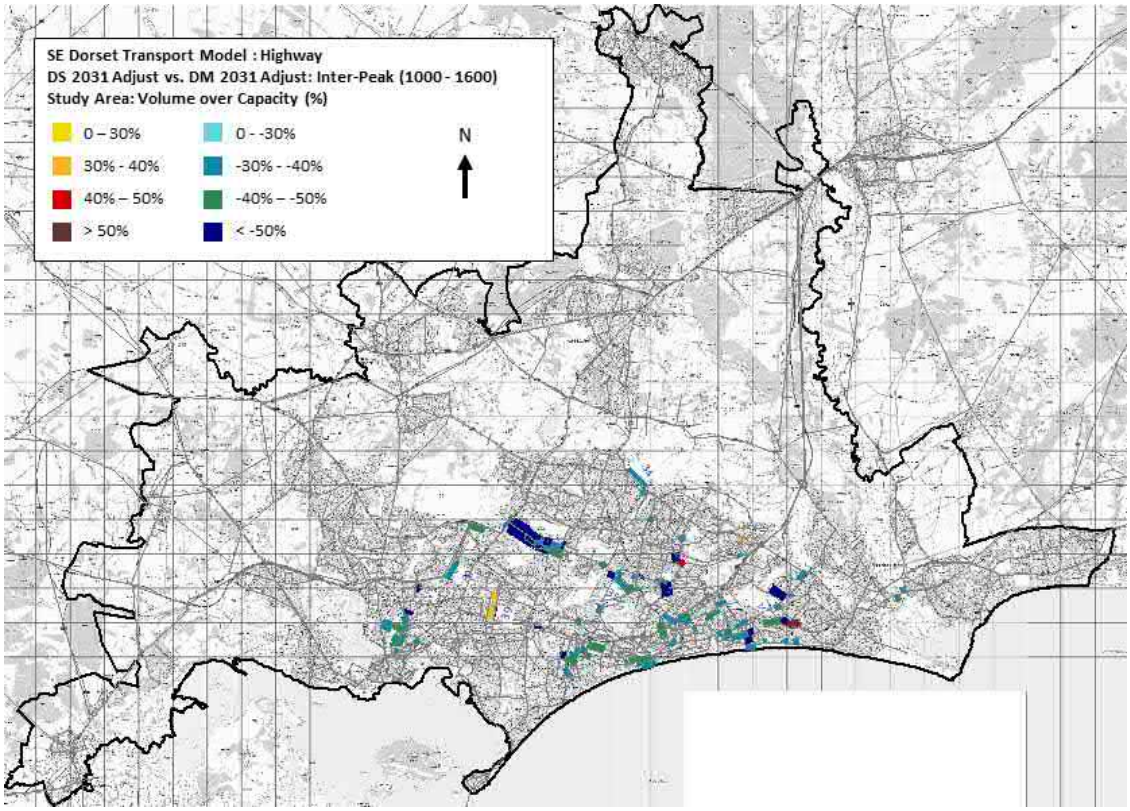

Figure 2.142: Link V/C (%) – 2031 Do-S vs Do-M, Interpeak

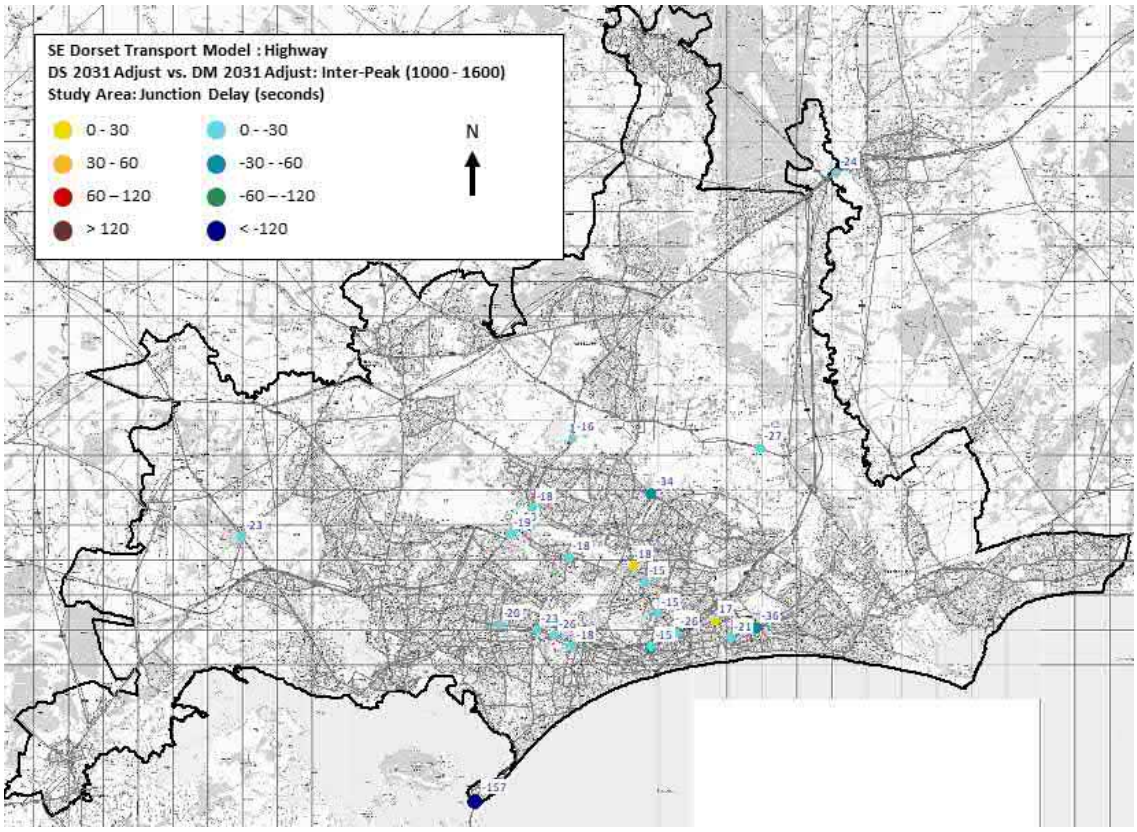

Figure 2.143: Node Delay (seconds) – 2031 Do-S vs Do-M, Interpeak

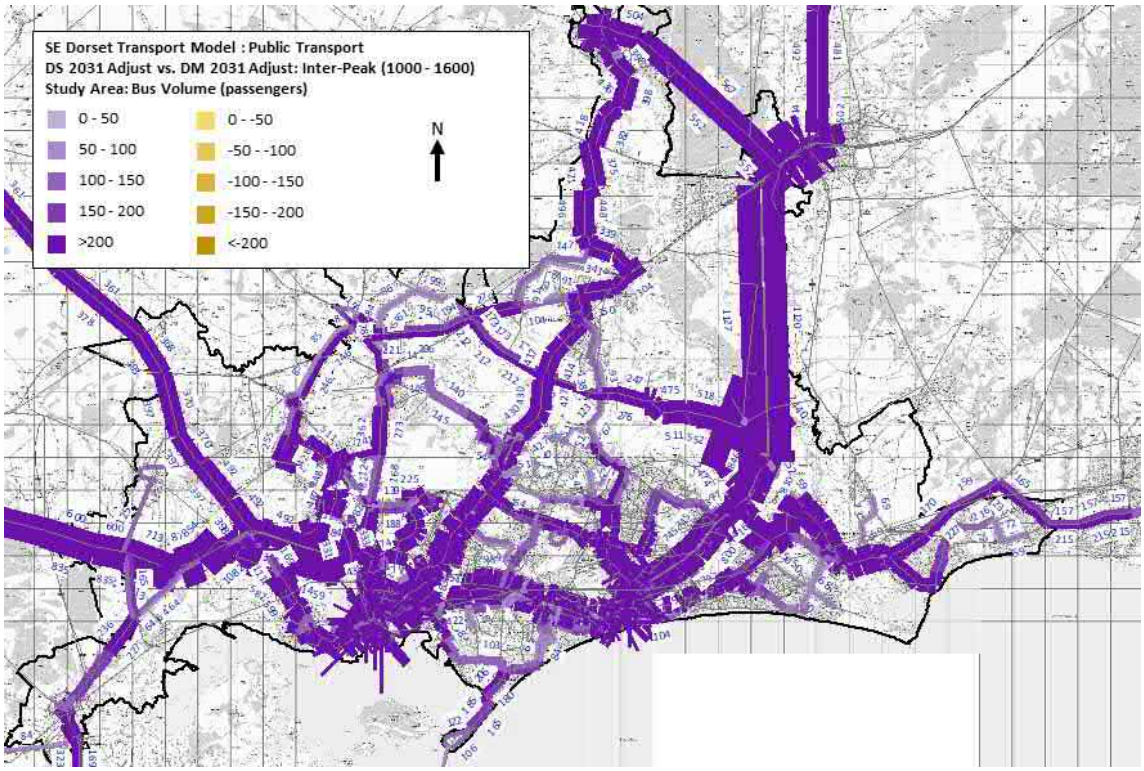

Figure 2.144: Bus Flows (passengers) - 2031 Do-S vs Do-M, Interpeak

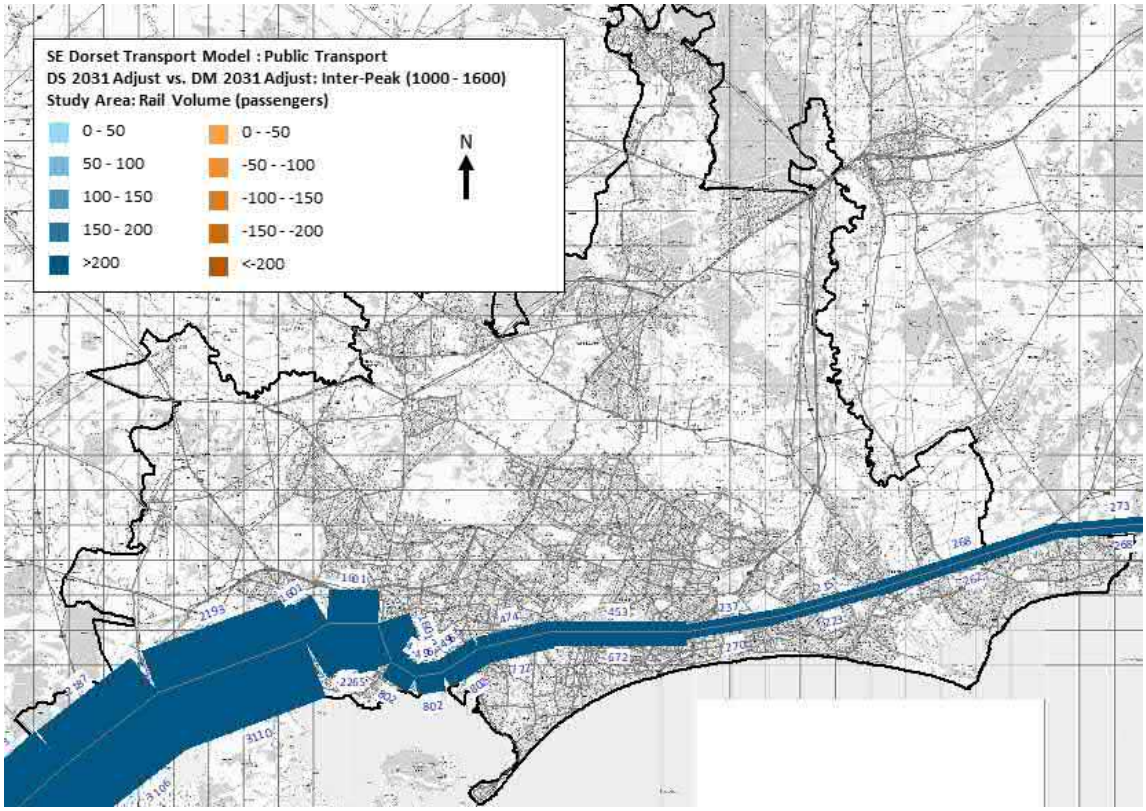

Figure 2.145: Rail Flows (passengers) - 2031 Do-S vs Do-M, Interpeak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.32. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.31: Journey Time changes – 2031 Do-Minimum vs 2031 Do-Something: Interpeak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-16.8%
	Westbound	11.4	-15.8%
A31	Eastbound	28	-8.1%
	Westbound	27.9	-7.2%
A338	Northbound	17.5	6.4%
	Southbound	17.4	-4.0%
A341 / A3060	Eastbound	13.7	-5.0%
	Westbound	13.7	-5.6%
A347	Northbound	7.5	-7.5%
	Southbound	8.2	-6.0%
A348 / A3049	Eastbound	13.8	-9.0%
	Westbound	13.9	-6.6%
A349	Northbound	5.6	-5.6%
	Southbound	5.5	-4.1%
A35 E	Eastbound	11.7	-4.1%
	Westbound	11.7	-9.8%
A35 W	Eastbound	17.8	-7.1%
	Westbound	18.5	-5.0%
A350	Northbound	13.9	-2.9%
	Southbound	13.9	-7.0%
A351	Eastbound	7.2	-1.9%
	Westbound	7.2	-1.8%
B3073	Eastbound	15.2	-6.6%
	Westbound	15.1	-4.9%

**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*

Table 2.26 below outlines the explanation of the model outputs for the comparison of the 2031 Do-Minimum vs Do-Something forecast year for the Interpeak.

Table 2.32: Model Output Details: 2031 Do Minimum vs Do Something, Interpeak

Scenario and Year	Do-Minimum – 2031 Forecast Year
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant changes to traffic around the BCP area with a high proportion of roads seeing a reduction in traffic due to the number of bus-related interventions in this forecast year which has involved a shift of vehicles off the network and onto buses. There is still

	an obvious redistribution of trips due to the road closures which were added in 2023. Key changes in traffic include: • Reduction of traffic along West Cliff Road and Glenferness Avenue and Boscombe Overcliff Drive leading to increases along the A338 and other alternative routes like Wimborne Road and Avenue Road/Braidley Road to avoid West Cliff Road. • There is an noticeable increase in traffic on sections of the alternative route around Lansdowne Roundabout (i.e. 150 vehicle increase heading westbound on Gervis Road) due to reduction in movements at Lansdowne Roundabout for private vehicles. • A general decrease in traffic across Poole with some small increases in traffic attributed to the redistribution of traffic from the road closures. • Due to the making Churchill Road one-way for vehicles heading into it from the B3061 Ashley Road, this has caused a displacement of trips (around 250) onto the parallel route along Victoria Road.
Link Delays (Seconds)	Due to the redistribution of traffic, there are some noticeable changes in delay in the Do-Something compared to the Do-Minimum, including • An increase in delay with the schemes in place at the Bournemouth West junction on the A338 EB of around 50 seconds • B3093 NB approach of the junction with the A35 in Poole, an increase of just over 1 minute • There is a significant decrease of delay at the WB approach on the B3073 to the Bournemouth Airport access junction of nearly a minute and a half.
Link V/C Ratio (%)	There are a number of links across the model with a reduction in volume leading to a lower V/C ratio, including • A decrease along Bath Road close to Bournemouth Pier of around 40% • Some noticeable decreases through the centre of Westbourne and Boscombe due to road closures of around 30-60% • Decreases along the A3047 between Wallisdown and Mountbatten due to the closure of some movements along this corridor. • There are decreases in volume around the Longfleet area of Poole in the region of 30-40% due to the road closures proposed for the area.
Node Delay (Seconds)	Across the BCP area, there is a obvious reduction in delay at junctions however there are a couple of negligible increases in delay, but these are minor (less than 18 seconds) in the Bournemouth area in more resdential areas. This can be attributed to a small redistribution of traffic due to changes/closures of movements at junctions nearby.
Bus Flows (Passengers)	There is an increase in bus passengers along specific routes across the BCP area due to the addition of bus improvements across the area, including; • The A338 west of Bournemouth centre, through Branksome and Westbourne and to the east of Cooper Dean Roundabout • The A35 from Bournemouth through Pokesdown towards Christchurch • In the centre of Poole and heading northbound along the A3093 through Longfleet as well as on the A3068 to the east of Poole.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 260 at Poole and 300 at Bournemouth. passengers around

	Bournemouth and Poole. In the other direction, the increase is around 130 in Bournemouth and 600 in Poole.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced total travel time across the BCP area by around 22%, and total distance travelled by 20%. The average speed across the BCP area has increased by nearly 1kph (from 37.3 kph to 38.2kph) which would be expected due to the number of private cars being reduced, largely due to the number of private cars being reduced due to modal shift to PT. The increase in speeds is less in the IP compared with the other peaks as the interpeak is generally observed to have less congestion than during peak hours.
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	328% increase from DM
Total PT passenger kms	435% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a higher than 5% decrease in journey time in the Do-Something as this forecast year involves some model shift from cars to PT which in turn reduces traffic on the roads and results in faster journey times. • The A338 Northbound still has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath Road near the Pier which is pushing more traffic along the A338. • The decrease in journey times is, in most cases, less than the the AM and PM peak as the interpeak generally has less congestion than the other two peak hours.

2031 Do Minimum vs Do Something: PM Peak

The model outputs for the 2031 Do Minimum vs Do Something in the PM Peak are shown below. The outputs are described further in Table 2.34.

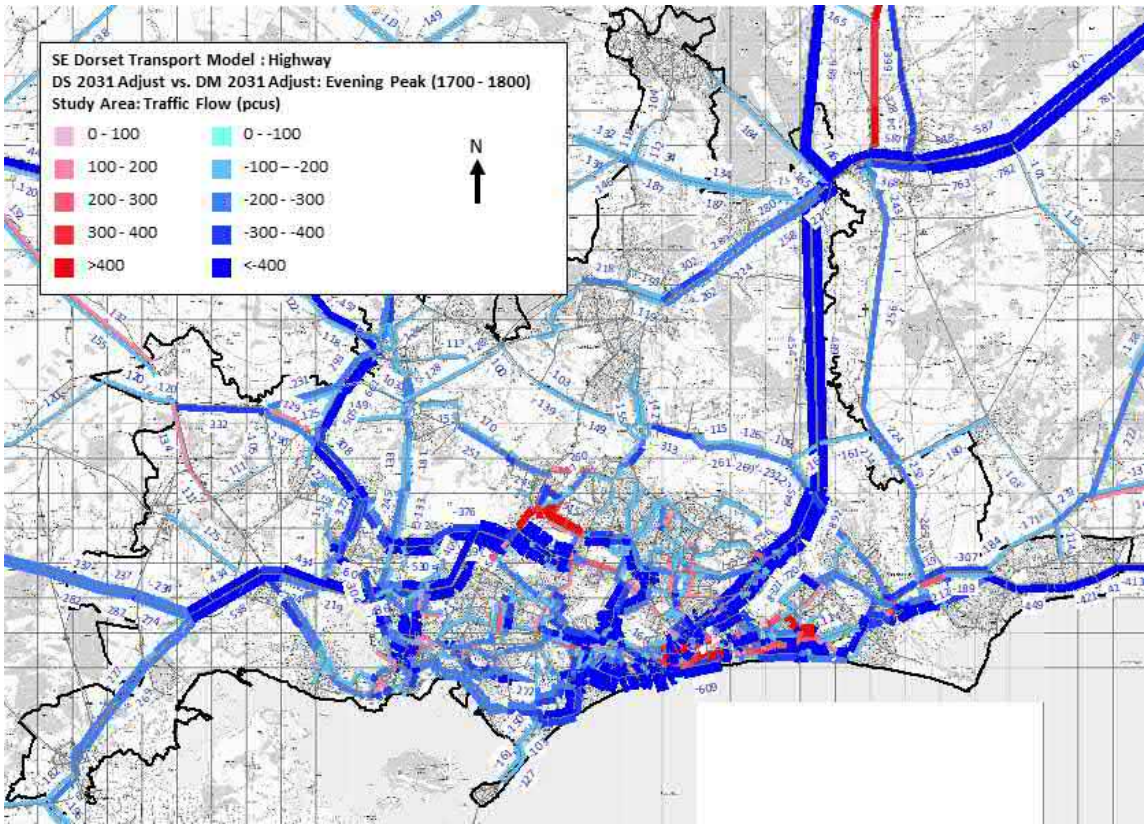

Figure 2.146: Actual Flows (vehicles) – 2031 Do-S vs Do-M, PM Peak

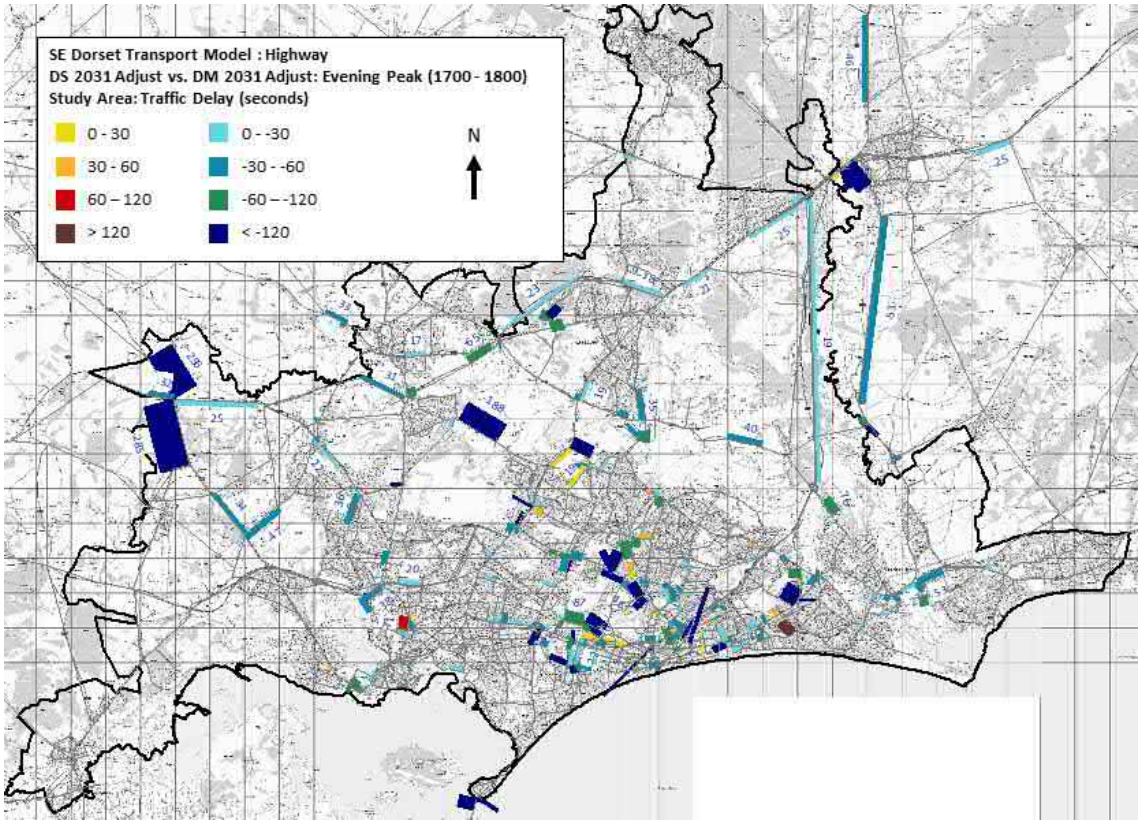

Figure 2.147: Link Delays (seconds) – 2031 Do-S vs Do-M, PM Peak

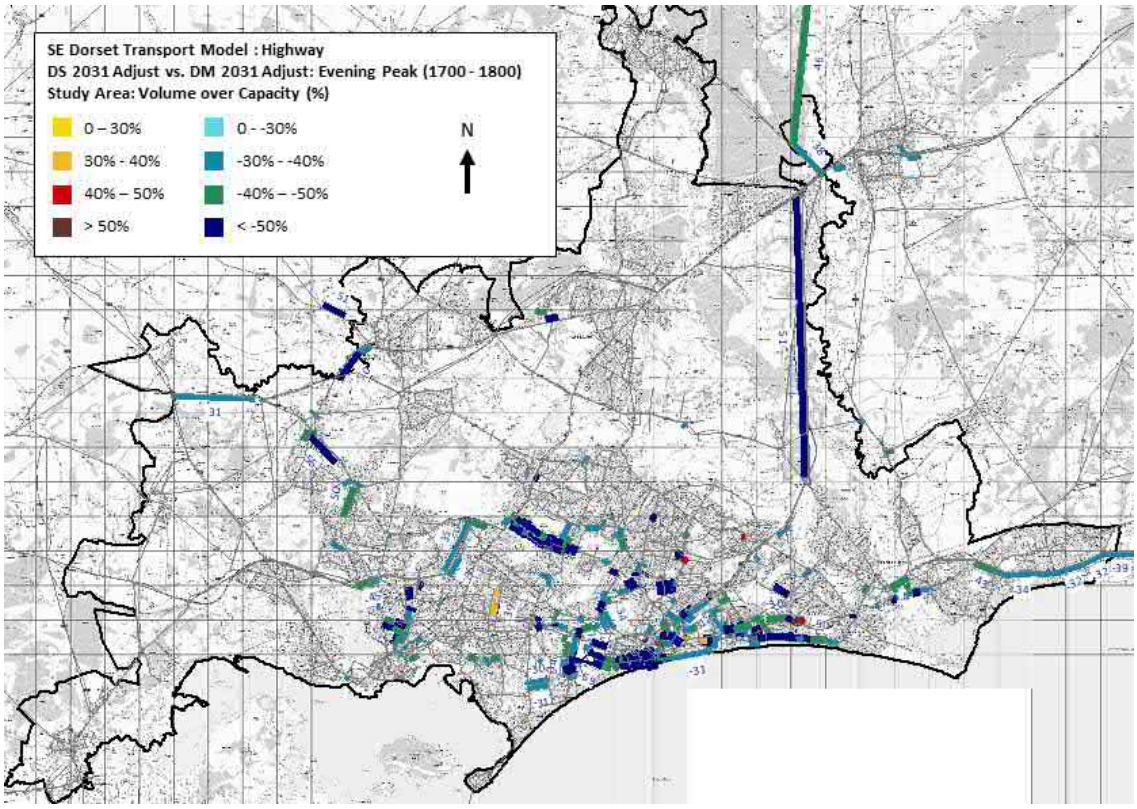

Figure 2.148: Link V/C (%) – 2031 Do-S vs Do-M, PM Peak

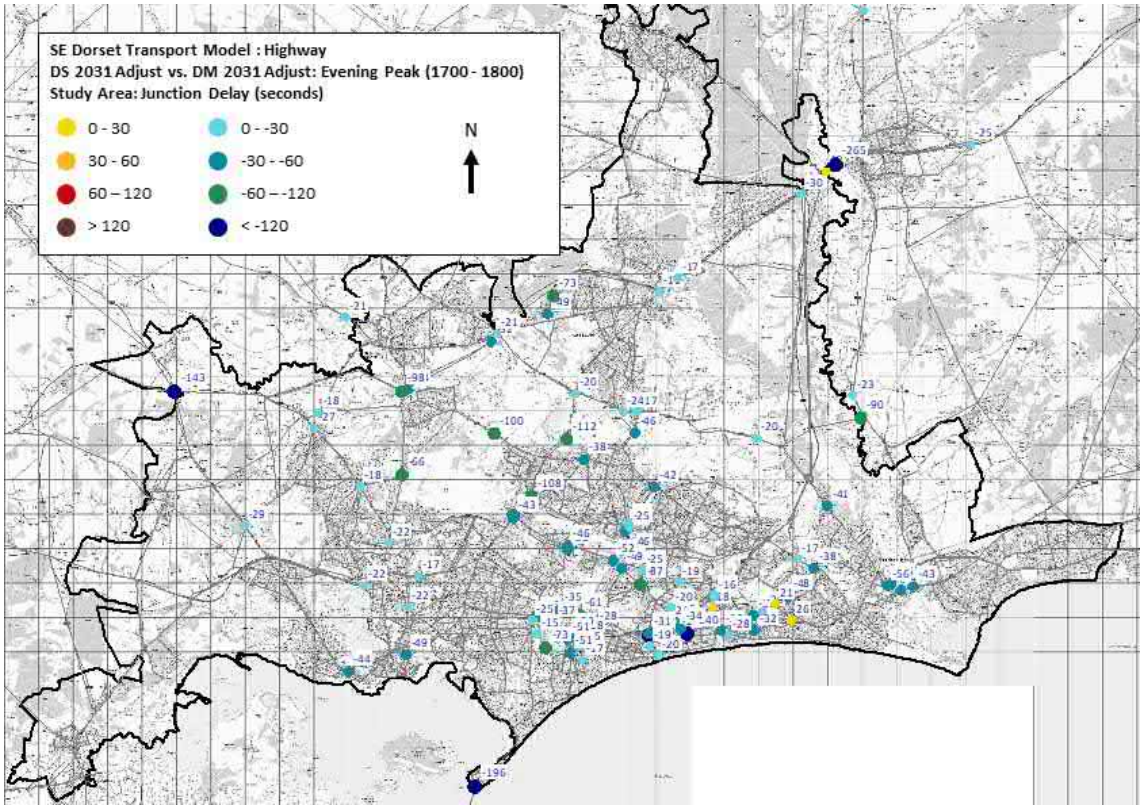

Figure 2.149: Node Delay (seconds) – 2031 Do-S vs Do-M, PM Peak

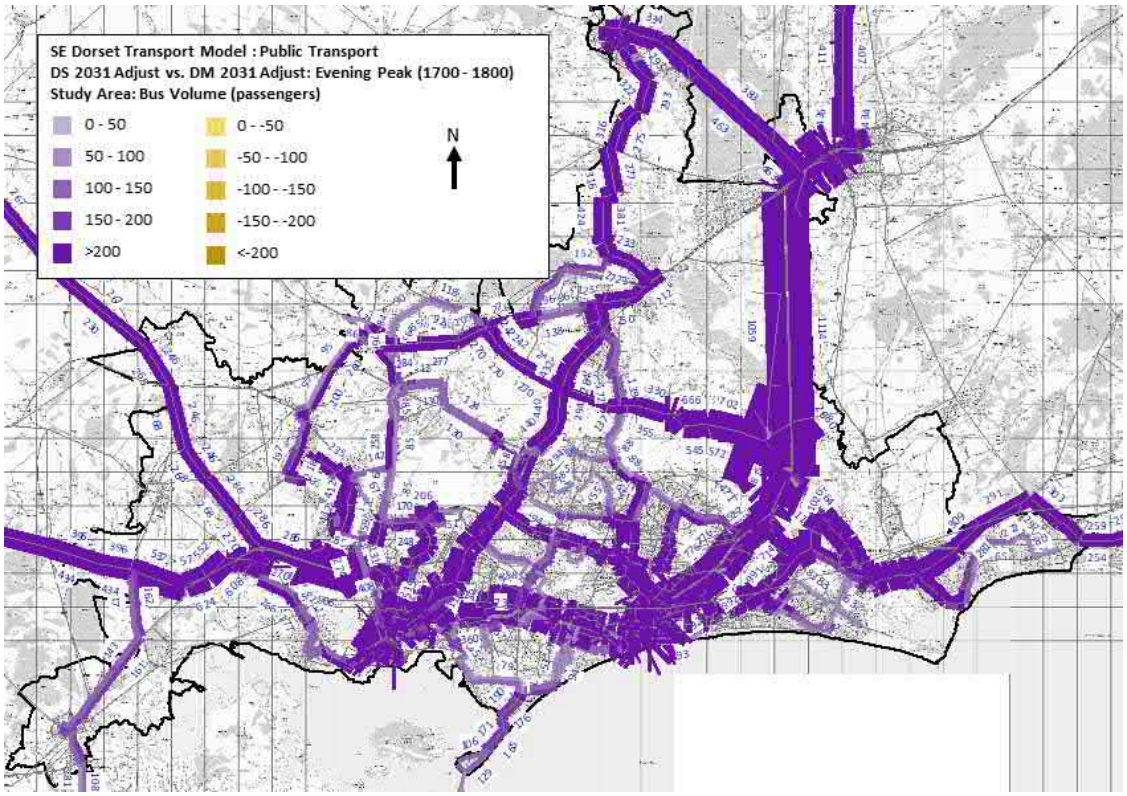

Figure 2.150: Bus Flows (passengers) - 2031 Do-S vs Do-M, PM Peak

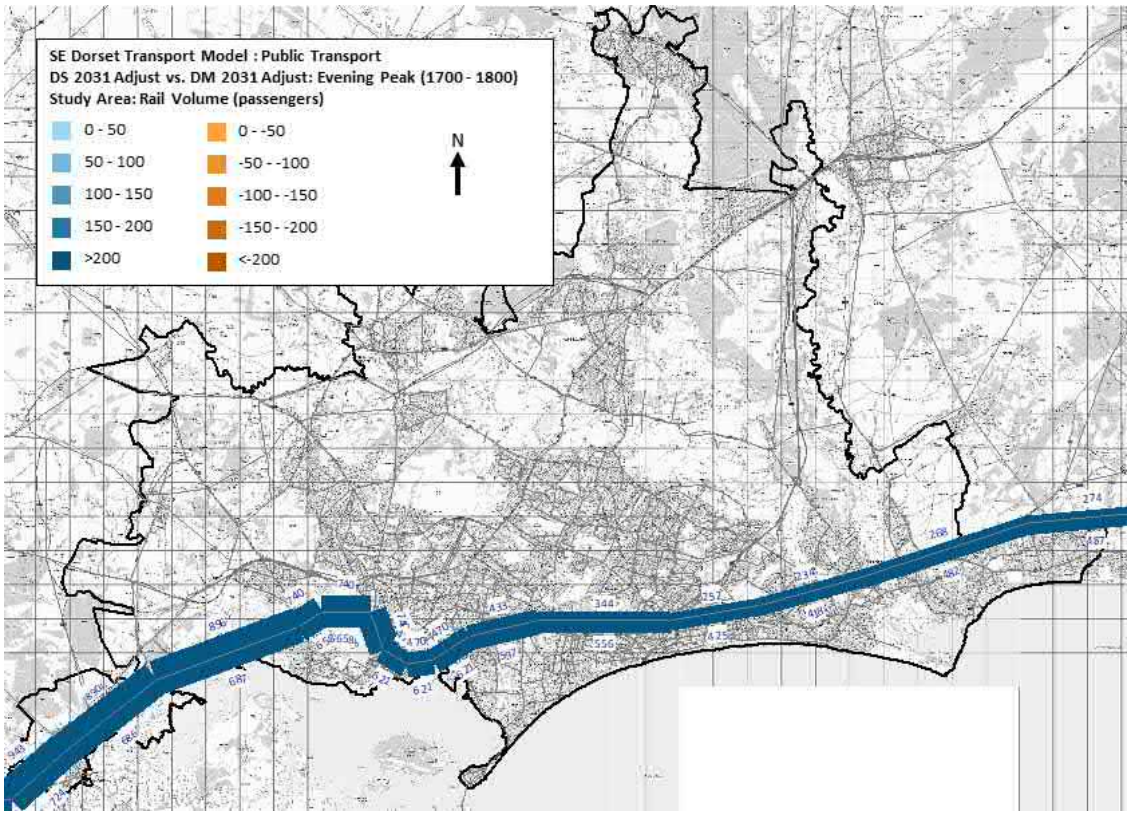

Figure 2.151: Rail Flows (passengers) - 2031 Do-S vs Do-M, PM Peak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.34. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.33: Journey Time changes – 2031 Do-Minimum vs 2031 Do-Something: PM Peak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-37.0%
	Westbound	11.4	-29.1%
A31	Eastbound	28	-13.6%
	Westbound	27.9	-27.9%
A338	Northbound	17.5	0.9%
	Southbound	17.4	-11.8%
A341 / A3060	Eastbound	13.7	-15.8%
	Westbound	13.7	-15.1%
A347	Northbound	7.5	-4.9%
	Southbound	8.2	-20.4%
A348 / A3049	Eastbound	13.8	-21.3%
	Westbound	13.9	-18.4%
A349	Northbound	5.6	-28.2%
	Southbound	5.5	-12.1%
A35 E	Eastbound	11.7	-9.9%
	Westbound	11.7	-18.9%
A35 W	Eastbound	17.8	-10.0%
	Westbound	18.5	-12.5%
A350	Northbound	13.9	-29.1%
	Southbound	13.9	-21.2%
A351	Eastbound	7.2	-2.6%
	Westbound	7.2	-2.9%
B3073	Eastbound	15.2	-13.4%
	Westbound	15.1	-6.8%

**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*

Table 2.34 below outlines the explanation of the model outputs for the comparison of the 2031 Do-Minimum vs Do-Something forecast year for the PM Peak.

Table 2.34: Model Output Details: 2031 Do Minimum vs Do Something, PM Peak

Scenario and Year	Do-Minimum – 2031 Forecast Year
Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant changes to traffic around the BCP area with a high proportion of roads seeing a reduction in traffic due to the number of bus-related interventions in this forecast year which has involved a shift of vehicles off the network and onto buses. There is still

	an obvious redistribution of trips due to the road closures which were added in 2023. Key changes in traffic include: • A reduction of traffic along West Cliff Road and Glenferness Avenue and Boscombe Overcliff. The reduction of traffic on Glenferness Avenue is in the region of 1000 northbound and 500 southbound between Leven Avenue and East Avenue. • There is a large increase in traffic around alternative routes to avoid Lansdowne Roundabout including along Gervis Road (300 vehicles WB) and A35 St Pauls Road (300 leading to St Pauls Roundabout) • There is a decrease in traffic along the B3093 through Longfleet in Poole, with an increase along the A350, B3068 and Parkstone Road suggesting a noticeable redistribution of traffic. • In Christchurch, there is a reduction along Bridge Road of around 700 vehicles WB, with an increase on the parallel route of the Christchurch Bypass which would suggest some redistribution of traffic as well as a shift from car to bus on this route.
Link Delays (Seconds)	Due to the redistribution of traffic, there are some noticeable changes in delay in the Do-Something compared to the Do-Minimum within the BCP area, including • An Increase on the A338 WB approach to the Bournemouth West junction of around 28 seconds, due to closures through Westbourne which is redistributing traffic onto this route. • Woodside Road arm of the junction with Seabourne Road (142 seconds) • In Christchurch there is some reduction in delays along the Christchurch Bypass WB of up to a minute, and a reduction along some sections of Bridge Road over closer to a minute and a half. • In Poole there is an increase of just over a minute on the Wimborne Road approach to the A35/B3093 junction, with a reduction on the A35 NB approach. This would suggest that there is a redistributional impact at this junction with the schemes in place alongside the reduction of trips due to improved bus services.
Link V/C Ratio (%)	Across the BCP area there is a general decrease in V/C ratios which suggest a reduction in volume across the area which is due to the switch of people using private vehicles to using bus services. However there are some areas in which there are increases which would suggest a change to the routing of trips due to closures or junction layout changes in the area. • There is an increase of around 43% on the V/C ratio of St Peters Road in Bournemouth, which could be due to the closure of Bath Road to vehicles and changes at Lansdowne Roundabout which makes this an alternative route • In Poole there is a reduction in V/C ratios along the B3093 which woud suggest less traffic through the area, as some vehicles have switched to buses and some vehicles will choose to use the A350 to access Poole to avoid road closures in the area.
Node Delay (Seconds)	Generally there is a decrease around the network due to less traffic on the network with some small increases in delay where vehicle levels at the junctions have increased due to road closures. • There are some increases across certain parts of Bournemouth, which have already been suggested to have higher traffic levels and therefore higher delays due to the road closures in the area and changes at junctions such as Lansdowne Roundabout.

	• There are some decreases in delays of around 40-50 seconds along Bridge Street and Christchurch Bypass due to the reduction of vehicles switching to bus services.
Bus Flows (Passengers)	There is an increase in bus passengers along specific routes across the BCP area due to the addition of bus improvements across the area, including; • The A338 west of Bournemouth centre, through Branksome and Westbourne and to the east of Cooper Dean Roundabout • The A35 from Bournemouth through Pokesdown towards Christchurch • In the centre of Poole and heading northbound along the A3093 through Longfleet as well as on the A3068 to the east of Poole.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 450 passengers around Poole and 350 around Bournemouth suggesting passengers are using the train to travel from Poole to Bournemouth. In the other direction, the increase is around 550 in Bournemouth and 600 in Poole.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced total travel time across the BCP area by around 30%, and total distance travelled by 23%. The average speed across the BCP area has increased by just over 3kph (from 33kph to 36.3kph) which would be expected, largely due to the number of private cars being reduced due to modal shift to PT.
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	245% increase from DM
Total PT passenger kms	292% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a higher than 10% decrease in journey time in the Do-Something as this forecast year involves some model shift from cars to PT which in turn reduces traffic on the roads and results in faster journey times. • The A351 has a slightly lower reduction in journey time compared with the other routes which is due to being located on the edge of the area therefore it is expected to be more impacted by rail interventions rather than bus interventions in this forecast year.

2039 Do Minimum vs Do Something: AM Peak

The model outputs for the 2039 Do Minimum vs Do Something in the AM Peak are shown below. The outputs are described further in Table 2.36.

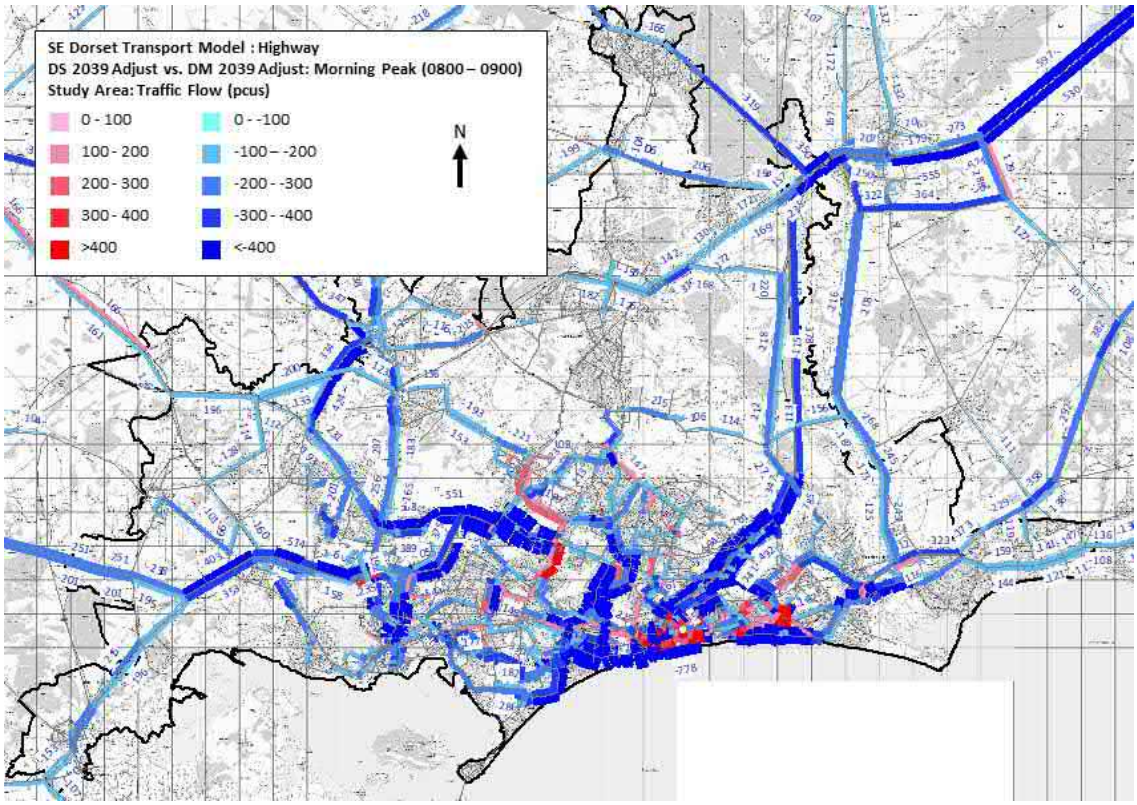

Figure 2.152: Actual Flows (vehicles) – 2039 Do-S vs Do-M, AM Peak

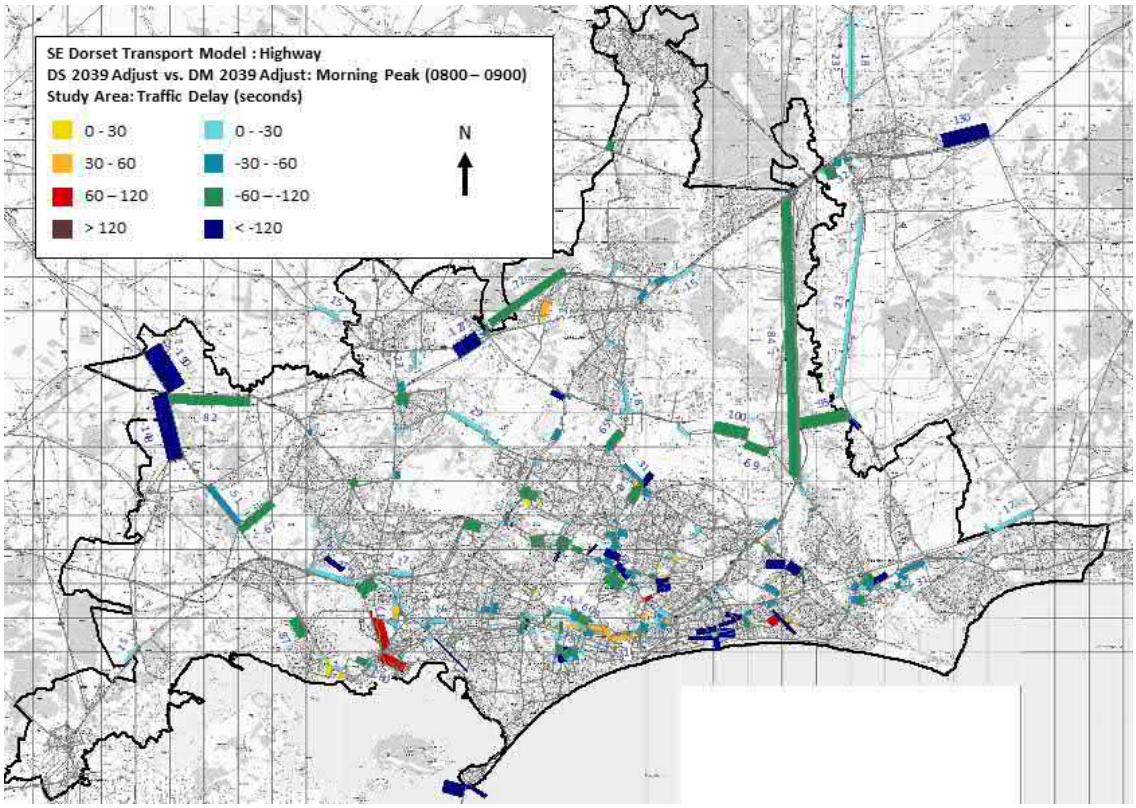

Figure 2.153: Link Delays (seconds) – 2039 Do-S vs Do-M, AM Peak

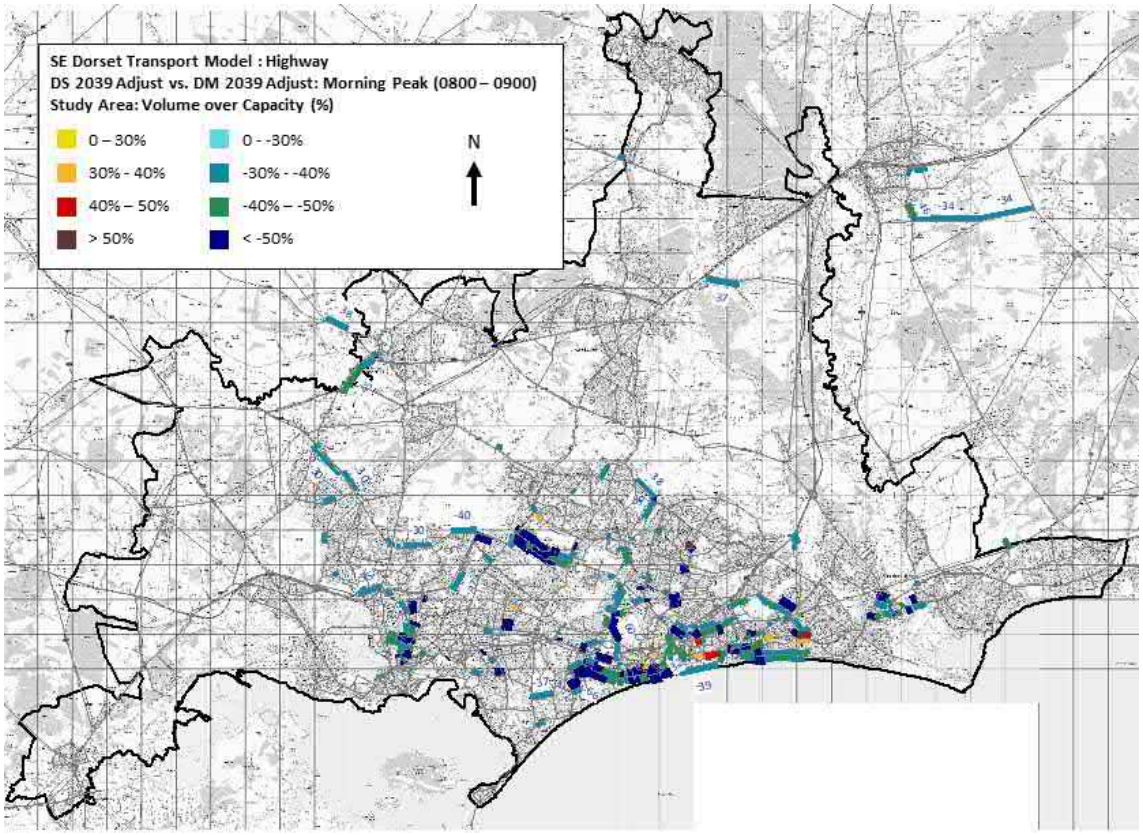

Figure 2.154: Link V/C (%) – 2039 Do-S vs Do-M, AM Peak

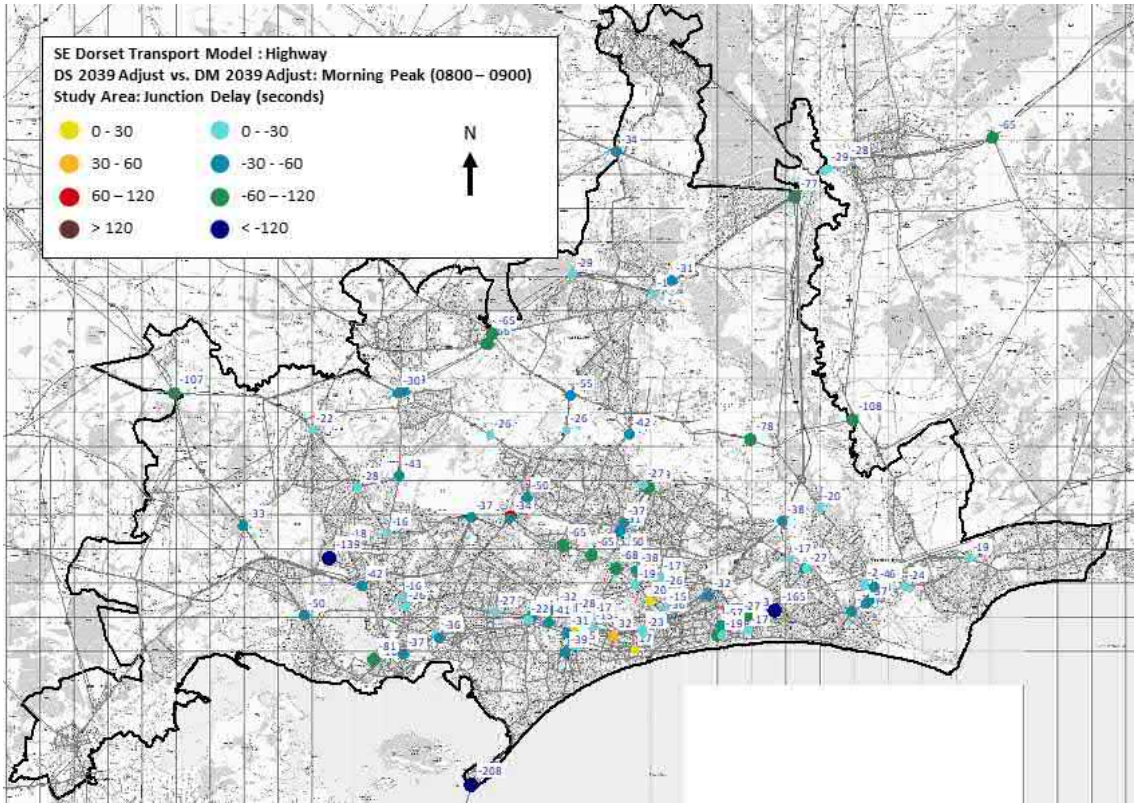

Figure 2.155: Node Delay (seconds) – 2039 Do-S vs Do-M, AM Peak

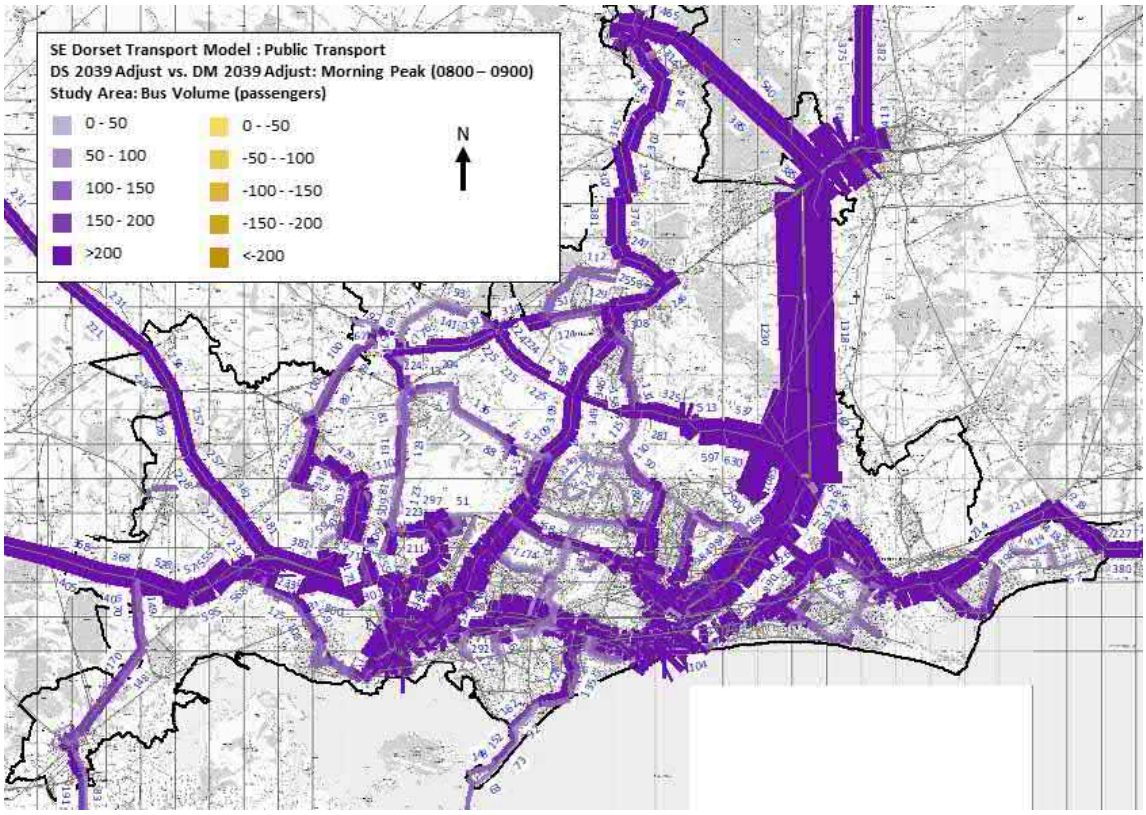

Figure 2.156: Bus Flows (passengers) - 2039 Do-S vs Do-M, AM Peak

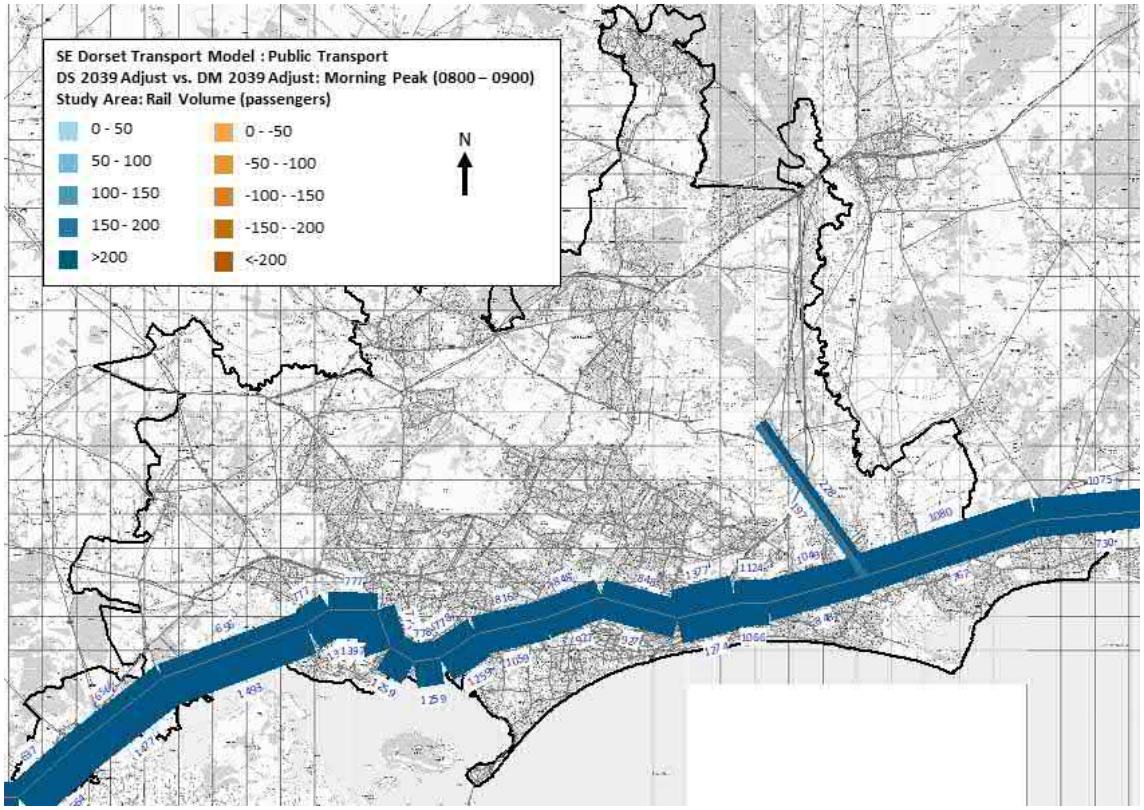

Figure 2.157: Rail Flows (passengers) - 2039 Do-S vs Do-M, AM Peak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.36. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.35: Journey Time changes – 2039 Do-Minimum vs 2039 Do-Something: AM Peak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-16.0%
	Westbound	11.4	-30.1%
A31	Eastbound	28	-18.9%
	Westbound	27.9	-31.7%
A338	Northbound	17.5	-0.3%
	Southbound	17.4	-20.0%
A341 / A3060	Eastbound	13.7	-18.7%
	Westbound	13.7	-15.8%
A347	Northbound	7.5	-6.3%
	Southbound	8.2	-28.5%
A348 / A3049	Eastbound	13.8	-23.7%
	Westbound	13.9	-20.7%
A349	Northbound	5.6	-30.2%
	Southbound	5.5	-13.9%
A35 E	Eastbound	11.7	-11.5%
	Westbound	11.7	-27.1%
A35 W	Eastbound	17.8	-12.5%
	Westbound	18.5	-14.3%
A350	Northbound	13.9	-28.1%
	Southbound	13.9	-17.3%
A351	Eastbound	7.2	-4.1%
	Westbound	7.2	-3.1%
B3073	Eastbound	15.2	-14.7%
	Westbound	15.1	-8.1%

**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*

Table 2.36 below outlines the explanation of the model outputs for the comparison of the 2039 Do-Minimum vs Do-Something forecast year for the AM Peak.

Table 2.36: Model Output Details: 2039 Do Minimum vs Do Something, AM Peak

Scenario and Year	**Do-Minimum – 2039 Forecast Year**
Time Period	**Morning peak hour (0800-0900) - AM**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant changes to traffic around the BCP area with a high proportion of roads seeing a reduction in traffic due to the number of bus-related interventions in this forecast year which has involved a shift of vehicles off the network and onto buses. There is still an obvious redistribution of trips due to the road closures which were added in 2023. • The greatest reduction of trips in Bournemouth are seen along the road closure-affected routes parallel to the coastline • The A338 sees a decrease in traffic, e.g around Holdenhurst there is a decrease of 350 NB and 800 SB which is due to the shift of cars to PT. • The centre of Christchurch along Bridge Street sees a reduction of around 300-400 in each direction • Most of the routes into Poole sees a decrease in traffic, with a small increase on the A350 NB which is due to the shift of trips onto this route rather than the along the A35 and through Longfleet.
Link Delays (Seconds)	Due to the interventions linked to improving bus and rail services in the area, there is a general decrease in delay across a number of links across the study area. However, there are also a small number of increases • Some delays have been reduced in Boscombe and around the road network close to St Pauls Roundabout compared with with Do-Minimum which is attributed to a modal shift to PT. • There is a reduction in delays along routes in Christchurch (e.g. Bridge Street and Christchurch Bypass) which is due to mode shift. • There is a small increase in delay at the Bournemouth West junction from both A338 approaches which is expected due to the closure of through-routes to the south within Central Bournemouth.
Link V/C Ratio (%)	The model shows that there is a general decrease in V/C ratios across the urban areas of Bournemouth and Poole and key routes into each area. There are some increases especially in Bournemouth due to redistribution of traffic with road closures. • V/C ratios have decreased along West Cliff Road and Bath Road due to road closures • There is also a noticeable decrease on Glenfurness Avenue. • There is an increase in V/C on the A35 through Boscombe due to the road closure along East Overcliff Drive. • There is a reduction along Bridge Street in Christchurch and around the B3093/Tatnam Road junction in Poole, In Christchurch, this can mainly be attributed to the modal shift, but in Poole it is both the shift and road closures in the centre.
Node Delay (Seconds)	Generally there is a decrease around the network due to less traffic on the network however there are a few increases at junctions such as Bournemouth West and A347/B3063/B3064 where traffic levels have increased due to traffic rerouting

	• There are a number of noticeable reductions around Boscombe and Pokesdown along bus routes where car drivers have shifted to PT. • Also along the A338 and A3049 where traffic has also been affected by changes in movements at junctions.
Bus Flows (Passengers)	There is an increase in bus passengers along all routes across the BCP area due to the bus improvements across the area, including; • The A338 west of Bournemouth centre, through Branksome and Westbourne and to the east of Cooper Dean Roundabout • The A35 from Bournemouth through Pokesdown towards Christchurch • In the centre of Poole and heading northbound along the A3093 through Longfleet as well as on the A3068 to the east of Poole.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 800 passengers around Poole and 1400 around Bournemouth. In the other direction, the increase is around 1300 in Bournemouth and 1300 in Poole. This would suggest a significant shift of trips due to the proposed rail interventions. The outputs show that there are some trips alighting and departing at local stations around the BCP area showing an impact on local trips.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced total travel time across the BCP area by around 27%, and total distance travelled by 19%. The average speed across the BCP area has increased by over 3kph (from 32.4kph to 36kph) which would be expected, largely due to the number of private cars being reduced due to modal shift to PT.
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	265% increase from DM
Total PT passenger kms	350% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a higher than 10% decrease in journey time in the Do-Something as this forecast year involves some model shift from cars to PT which in turn reduces traffic on the roads and results in faster journey times. • The A338 Northbound still has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath Road near the Pier which is pushing more traffic along the A338.

2039 Do Minimum vs Do Something: Interpeak

The model outputs for the 2039 Do Minimum vs Do Something in the Interpeak are shown below. The outputs are described further in Table 2.38.

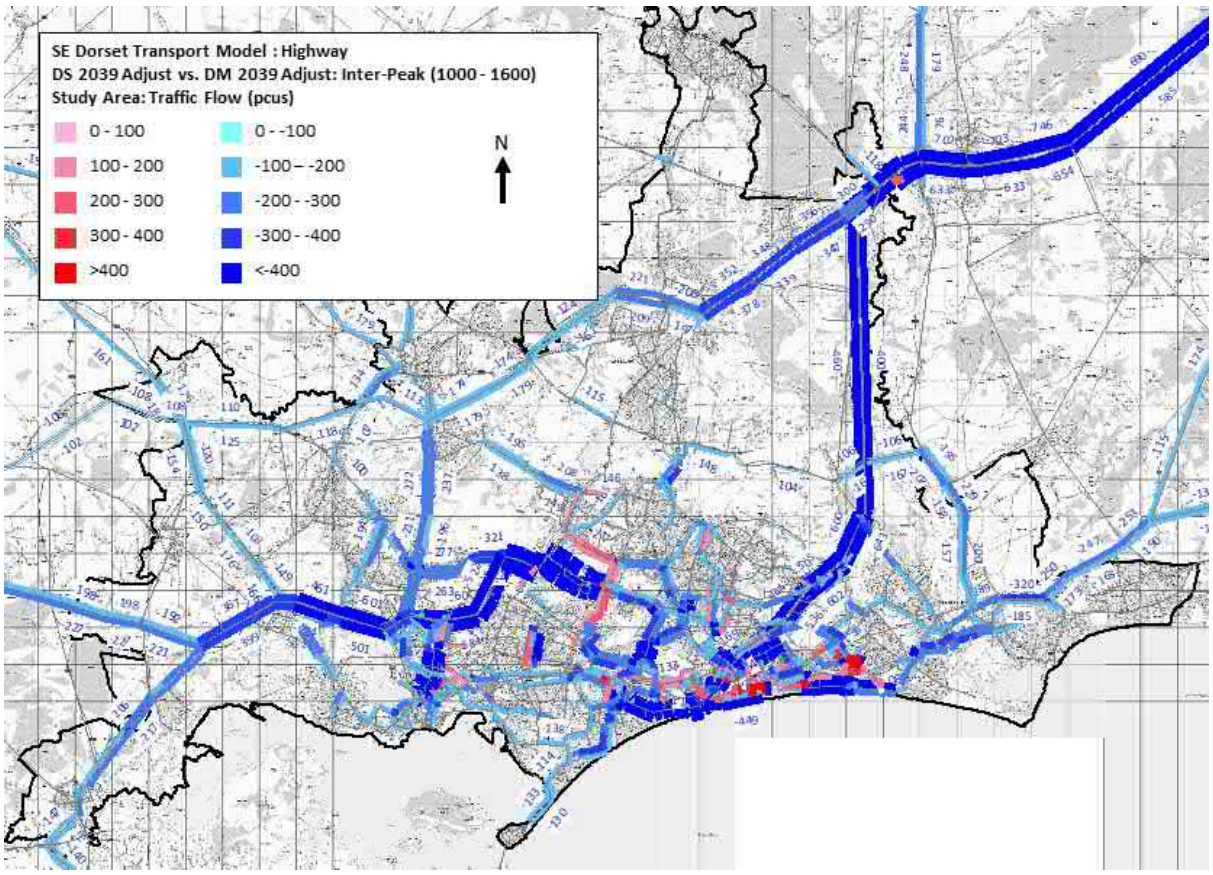

Figure 2.158: Actual Flows (vehicles) – 2039 Do-S vs Do-M, Interpeak

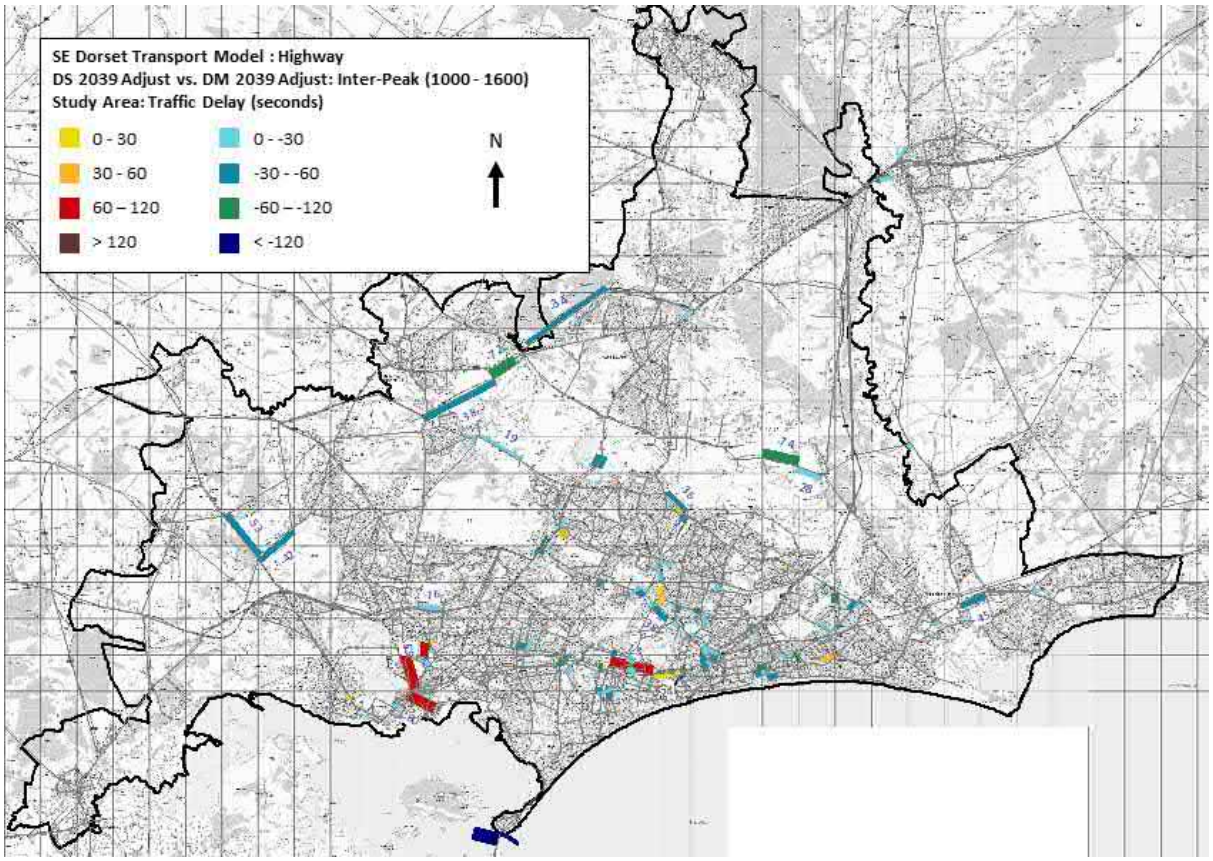

Figure 2.159: Link Delays (seconds) – 2039 Do-S vs Do-M, Interpeak

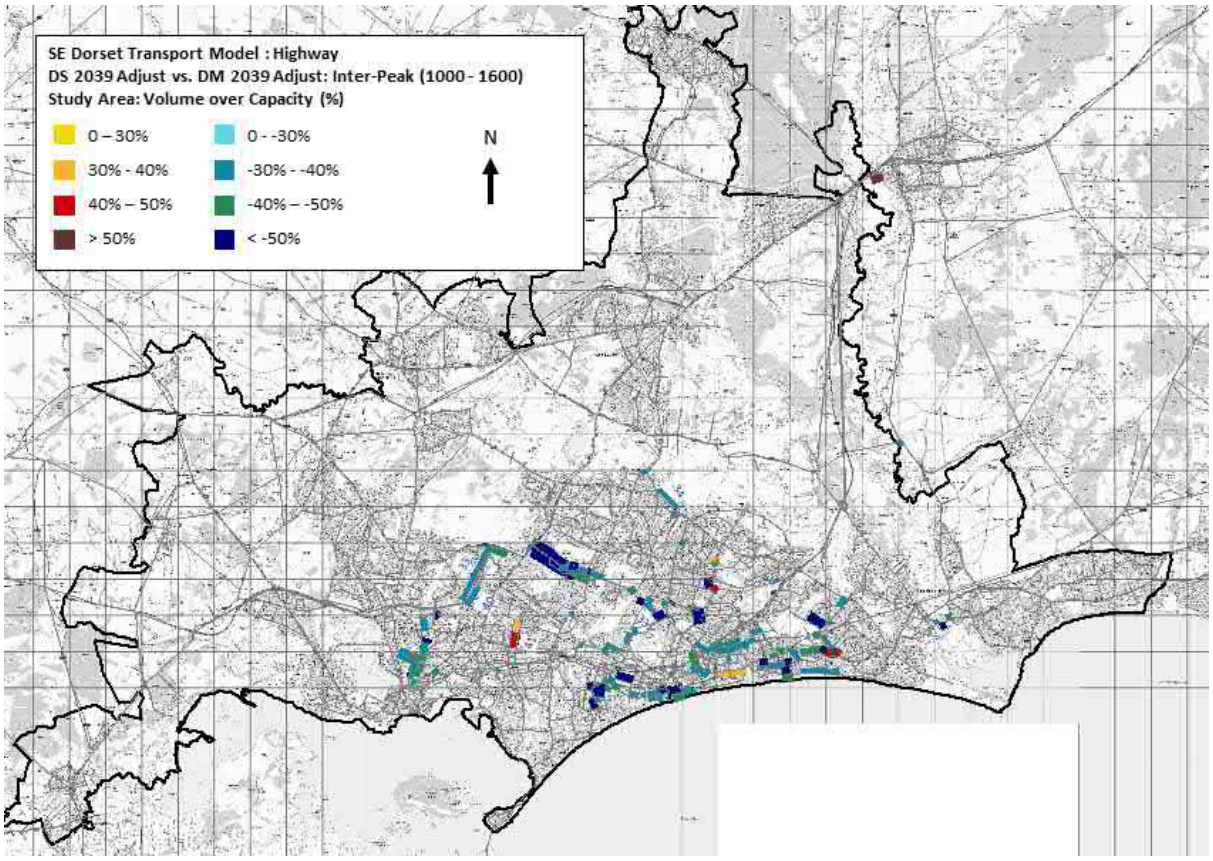

Figure 2.160: Link V/C (%) – 2039 Do-S vs Do-M, Interpeak

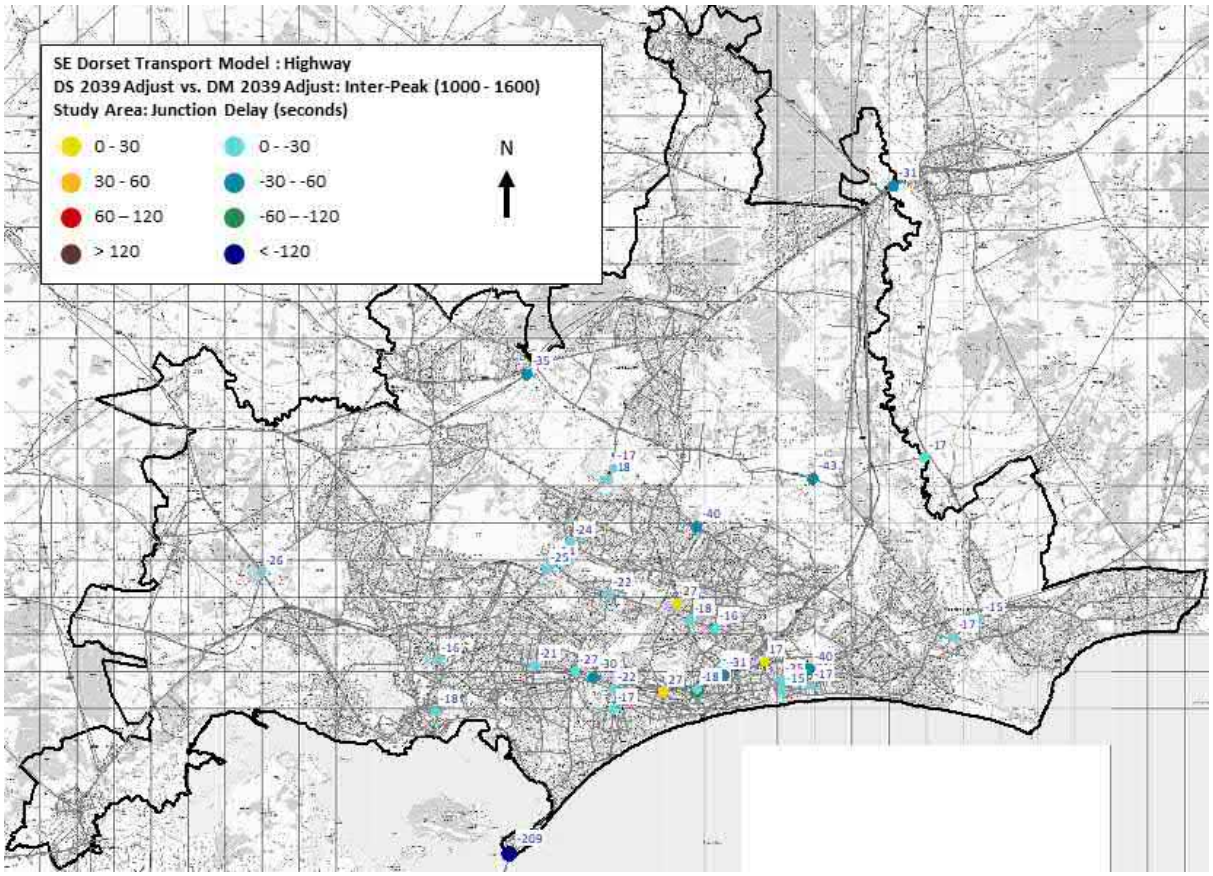

Figure 2.161: Node Delay (seconds) – 2039 Do-S vs Do-M, Interpeak

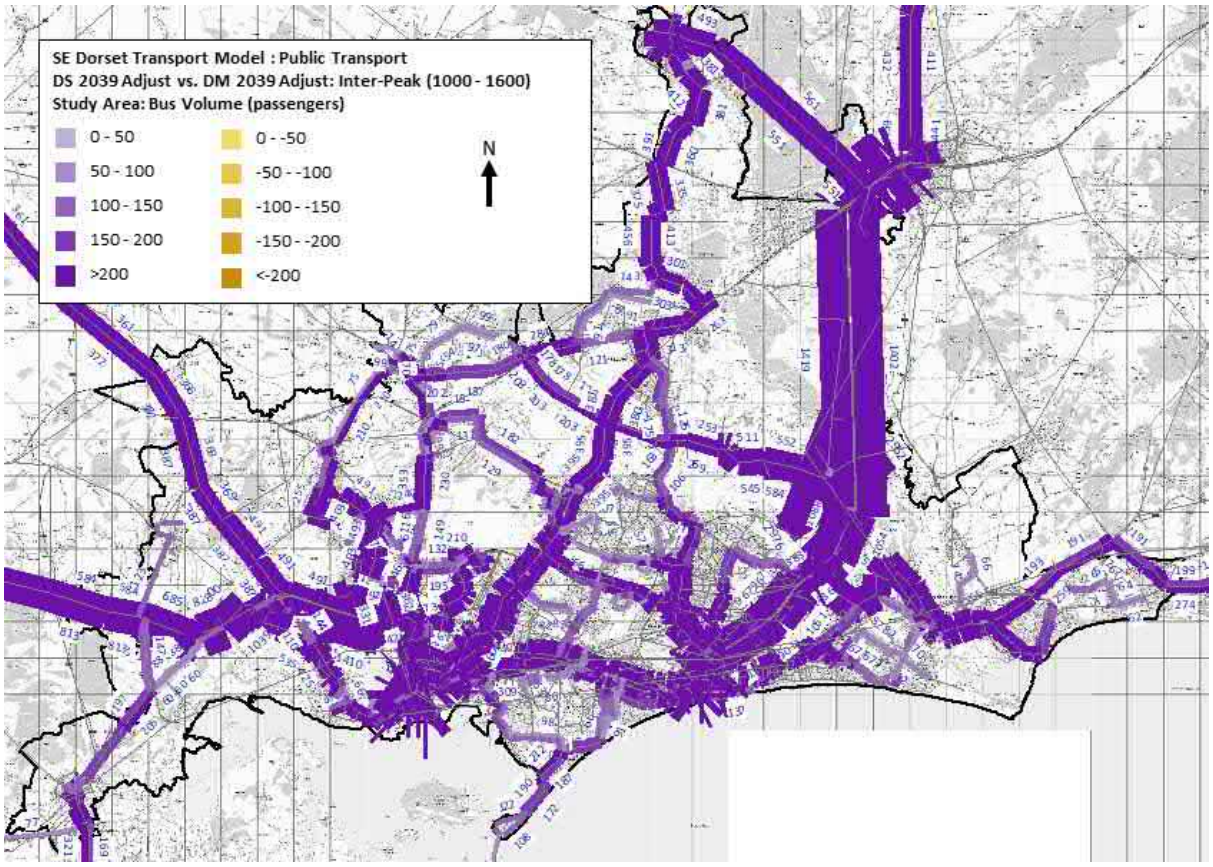

Figure 2.162: Bus Flows (passengers) - 2039 Do-S vs Do-M, Interpeak

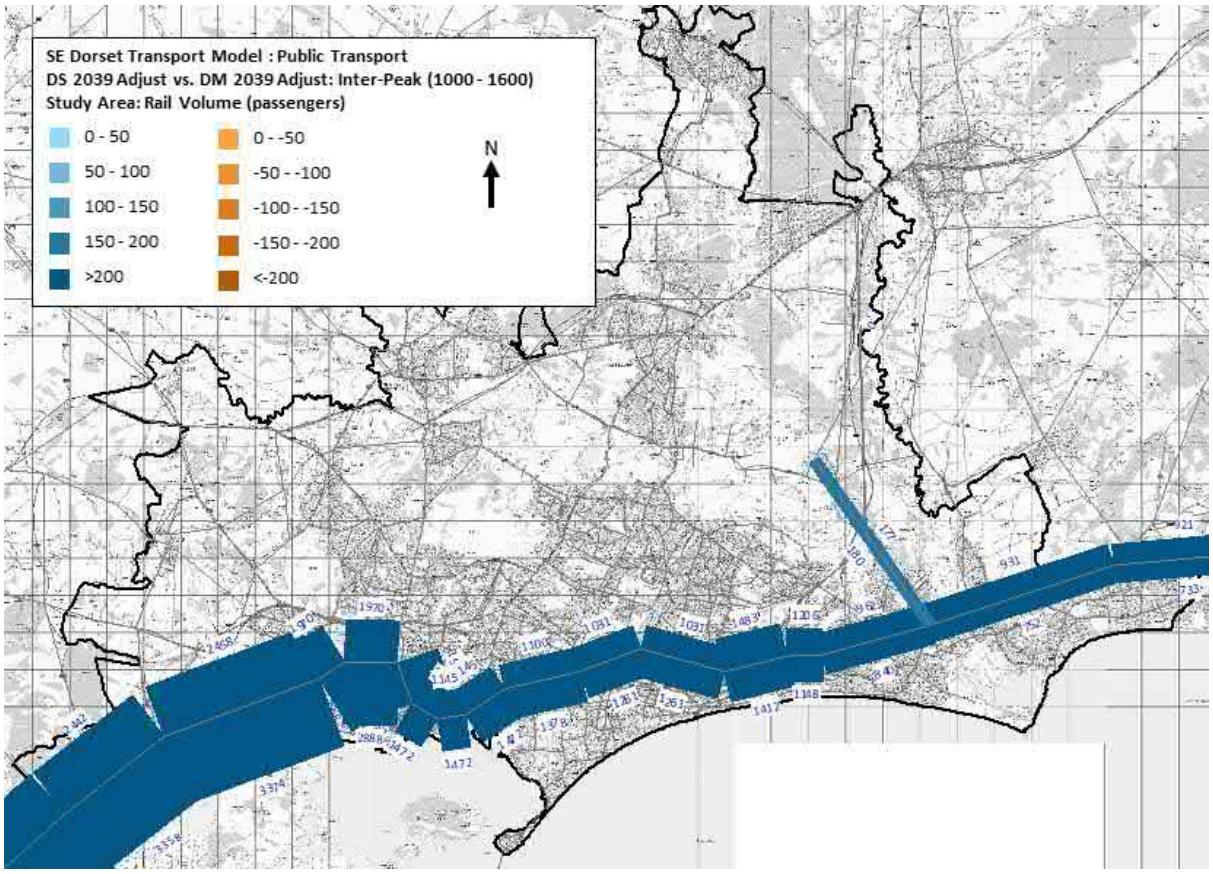

Figure 2.163: Rail Flows (passengers) - 2039 Do-S vs Do-M, Interpeak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.38. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.37: Journey Time changes – 2039 Do-Minimum vs 2039 Do-Something: Interpeak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-18.9%
	Westbound	11.4	-18.9%
A31	Eastbound	28	-11.5%
	Westbound	27.9	-10.7%
A338	Northbound	17.5	10.0%
	Southbound	17.4	-3.4%
A341 / A3060	Eastbound	13.7	-5.9%
	Westbound	13.7	-7.0%
A347	Northbound	7.5	-9.2%
	Southbound	8.2	-7.1%
A348 / A3049	Eastbound	13.8	-10.6%
	Westbound	13.9	-8.2%
A349	Northbound	5.6	-6.5%
	Southbound	5.5	-5.3%

A35 E	**Eastbound**	11.7	-5.5%
	Westbound	11.7	-11.6%
A35 W	**Eastbound**	17.8	-7.9%
	Westbound	18.5	-5.3%
A350	**Northbound**	13.9	-2.8%
	Southbound	13.9	-6.9%
A351	**Eastbound**	7.2	-2.3%
	Westbound	7.2	-2.1%
B3073	**Eastbound**	15.2	-6.3%
	Westbound	15.1	-7.1%
**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*			

Table 2.38 below outlines the explanation of the model outputs for the comparison of the 2039 Do-Minimum vs Do-Something forecast year for the Interpeak.

Table 2.38: Model Output Details: 2039 Do Minimum vs Do Something, Interpeak

Scenario and Year	**Do-Minimum – 2039 Forecast Year**
Time Period	**Average hour between 1000 and 1600 - IP**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant changes to traffic around the BCP area with a high proportion of roads seeing a reduction in traffic due to the number of bus-related interventions in this forecast year which has involved a shift of vehicles off the network and onto buses. There is still an obvious redistribution of trips due to the road closures which were added in 2023. • The greatest reduction of trips in Bournemouth are seen along the road closure-affected routes parallel to the coastline. • The A338 sees a decrease in traffic, e.g around Holdenhurst there is a decrease of 550 NB and 600 SB which is due to the shift of cars to PT. • The centre of Christchurch along Bridge Street sees a reduction of around 200-300 in each direction
Link Delays (Seconds)	Due to the interventions linked to improving bus and rail services in the area, there is a general decrease in delay across a number of links across the study area. However, there are a small number of increases; • Some delays have been reduced in Boscombe and around the road network close to St Pauls Roundabout compared with with Do-Minimum which is attributed to a modal shift to PT. • There is a reduction in delays along routes in Christchurch (e.g. Bridge Street and Christchurch Bypass) which is due to mode shift. • There is a small increase in delay at the Bournemouth West junction from both A338 approaches which is expected due to the closure of through-routes to the south within Central Bournemouth. • There is also improved bus links to the Airport, therefore delays to the main access junction to the airport have reduced by 70 seconds from the west and nearly 30 seconds to the east.
Link V/C Ratio (%)	The model shows that there is a general decrease in V/C ratios across the urban areas of Bournemouth and Poole and key routes into each area. There are some increases especially in Bournemouth due to redistribution of traffic with road closures. • V/C ratios have decreased along West Cliff Road and Bath Road due to road closures • There is an increase in V/C on the A35 through Boscombe due to the road closure along East Overcliff Drive. • There is a reduction along Bridge Street in Christchurch and around the B3093/Tatnam Road junction in Poole, In Christchurch, this can mainly be attributed to the modal shift, but in Poole it is both the shift and road closures in the centre.
Node Delay (Seconds)	Generally there is a decrease around the network due to less traffic on the network however is an increase at Bournemouth West as well as some other minor junctions where traffic levels have increased due to traffic rerouting • There are a number of noticeable reductions around Boscombe and Pokesdown along bus routes where car drivers have shifted to PT.

	• Also along the A338 and A3049 where traffic has also been affected by changes in movements at junctions.
Bus Flows (Passengers)	There is an increase in bus passengers along all routes across the BCP area due to the bus improvements across the area, including; • The A338 west of Bournemouth centre, through Branksome and Westbourne and to the east of Cooper Dean Roundabout • The A35 from Bournemouth through Pokesdown towards Christchurch • In the centre of Poole and heading northbound along the A3093 through Longfleet as well as on the A3068 to the east of Poole.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 1100 passengers around Poole and 1200 around Bournemouth. In the other direction, the increase is around 1150 in Bournemouth and 1450 in Poole. This would suggest a significant shift of trips due to the proposed rail interventions. The outputs show that there are some trips alighting and departing at local stations around the BCP area showing an impact on local trips.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced travel time across the BCP area by around 23%, and distance travelled by 21%. The average speed across the BCP area have increased by nearly 1kph (from 36.8 kph to 37.7kph) which would be expected due to the number of private cars being reduced due to modal shift to PT. The increase in speeds is less in the IP compared with the other peaks as the interpeak is generally observed to have less congestion than during peak hours.
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	361% increase from DM
Total PT passenger kms	570% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a higher than 5% decrease in journey time in the Do-Something as this forecast year involves some model shift from cars to PT which in turn reduces traffic on the roads and results in faster journey times. • The A338 Northbound still has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath Road near the Pier which is pushing more traffic along the A338. • The decrease in journey times is, in most cases, less than the the AM and PM peak as the interpeak generally has less congestion than the other two peak hours.

2039 Do Minimum vs Do Something: PM Peak

The model outputs for the 2039 Do Minimum vs Do Something in the PM Peak are shown below. The outputs are described further in Table 2.40.

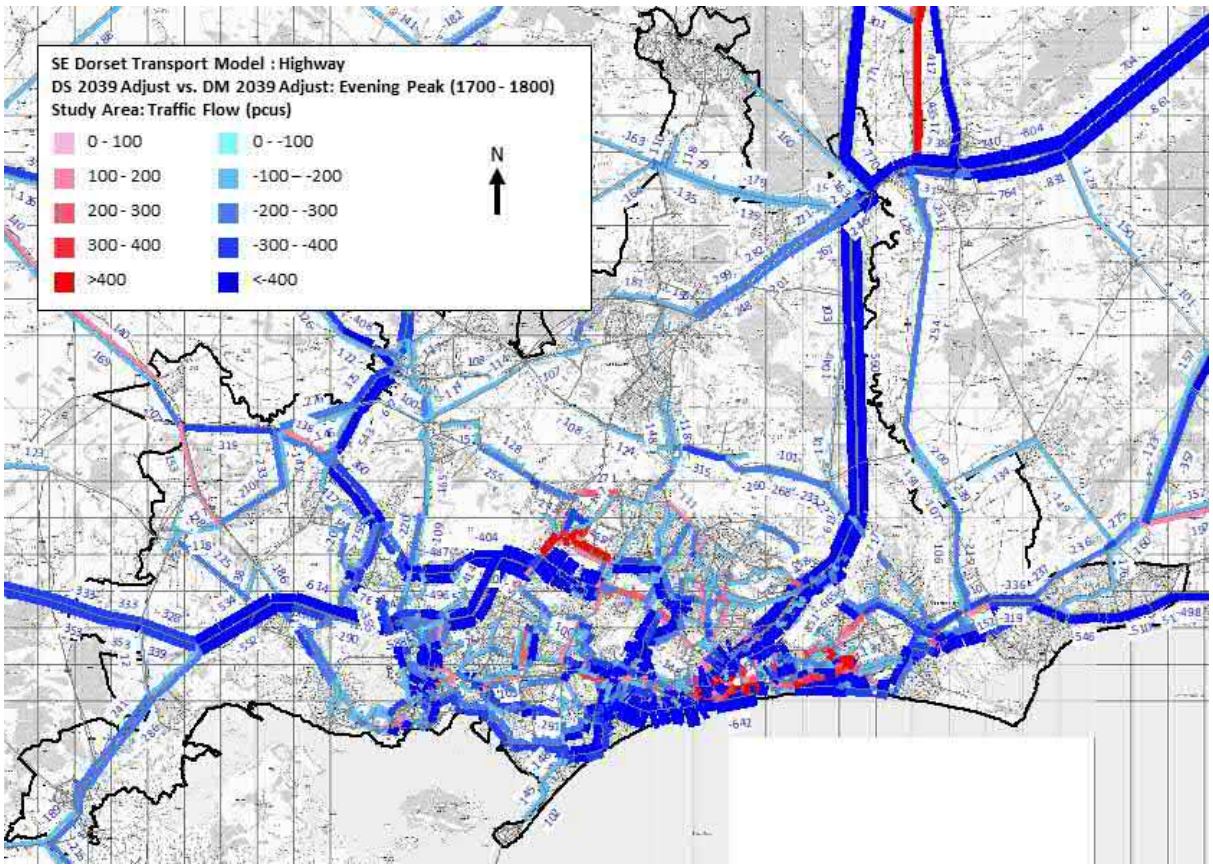

Figure 2.164: Actual Flows (vehicles) – 2039 Do-S vs Do-M, PM Peak

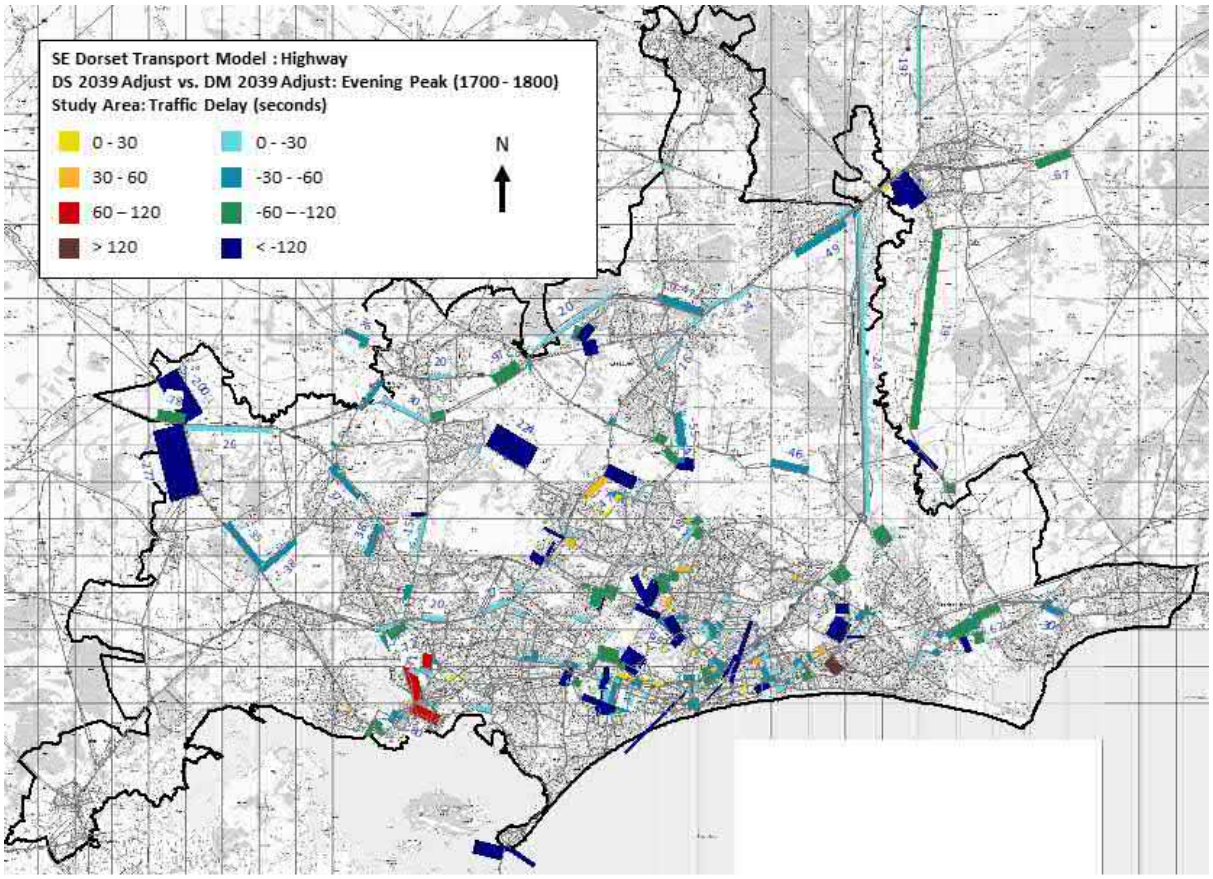

Figure 2.165: Link Delays (seconds) – 2039 Do-S vs Do-M, PM Peak

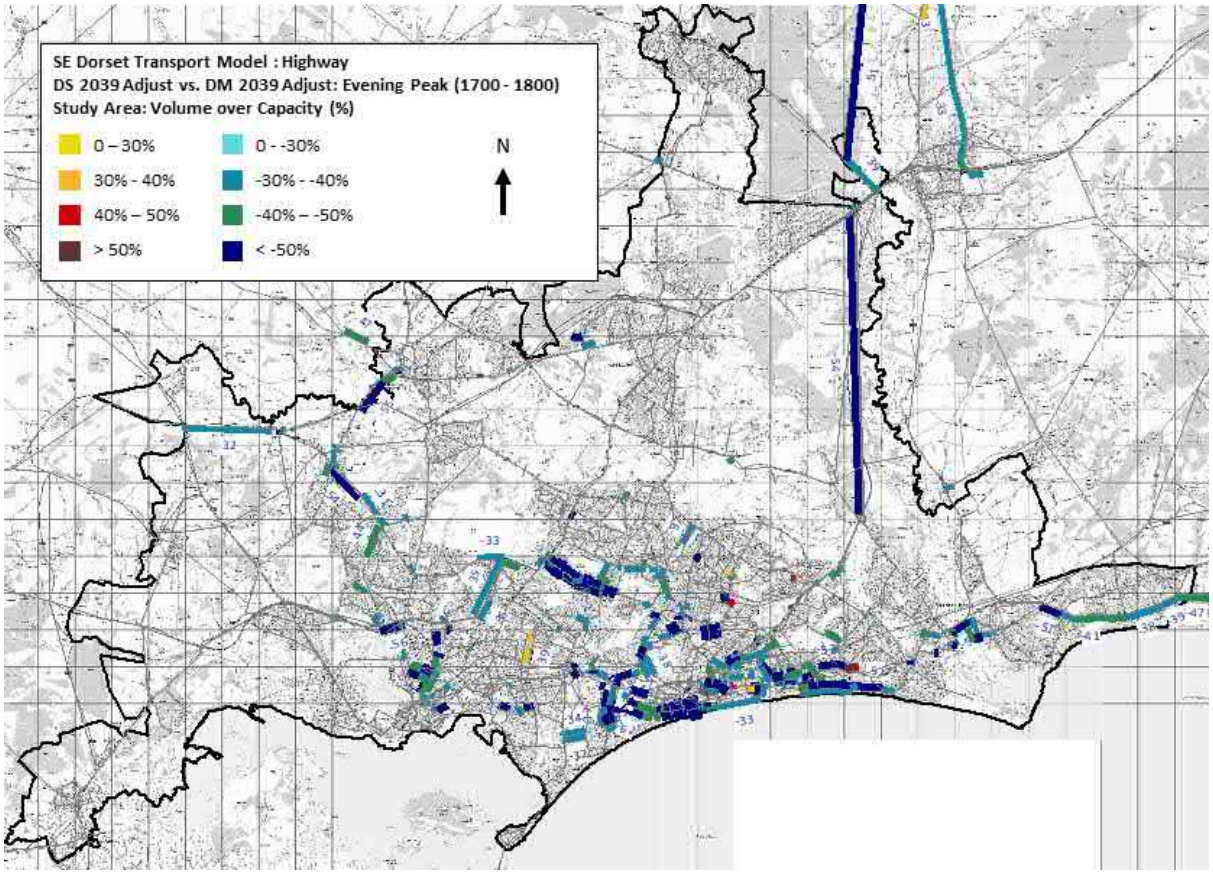

Figure 2.166: Link V/C (%) – 2039 Do-S vs Do-M, PM Peak

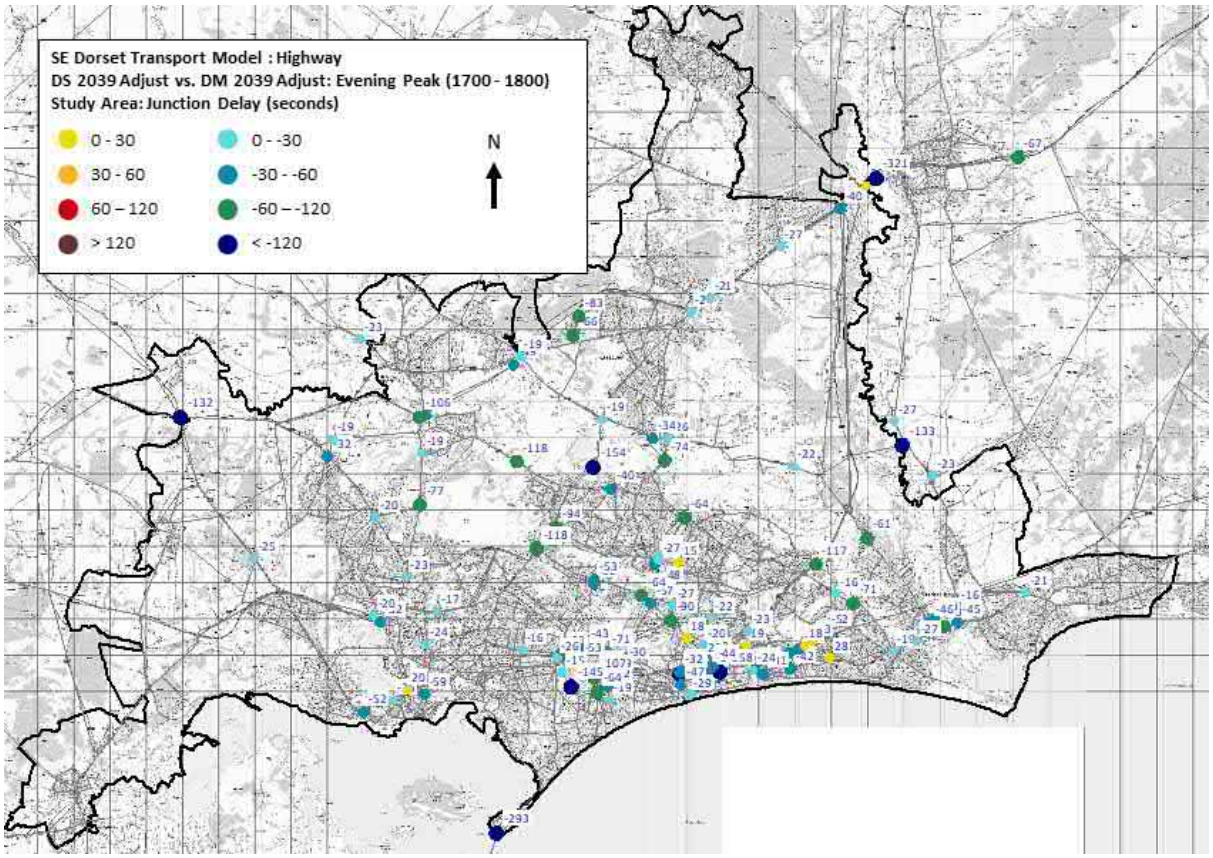

Figure 2.167: Node Delay (seconds) – 2039 Do-S vs Do-M, PM Peak

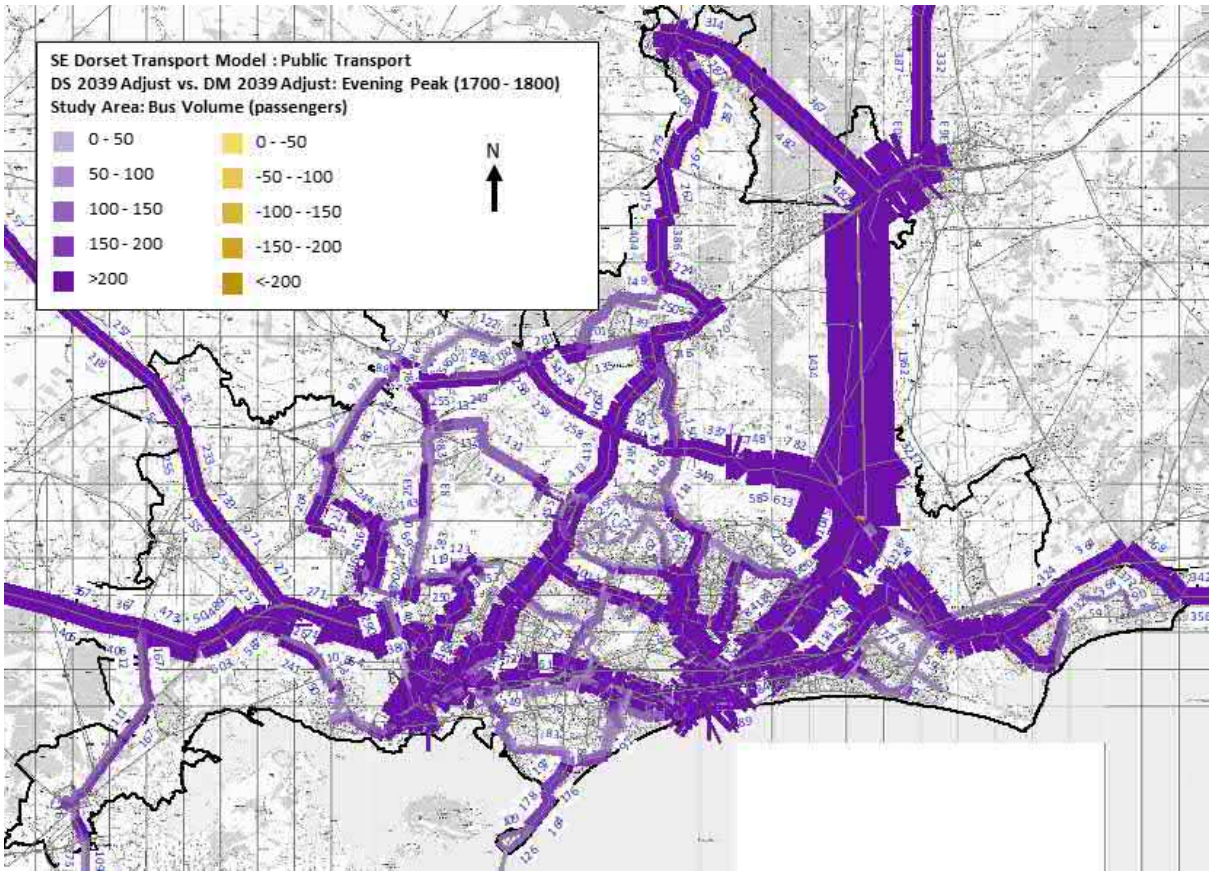

Figure 2.168: Bus Flows (passengers) - 2039 Do-S vs Do-M, PM Peak

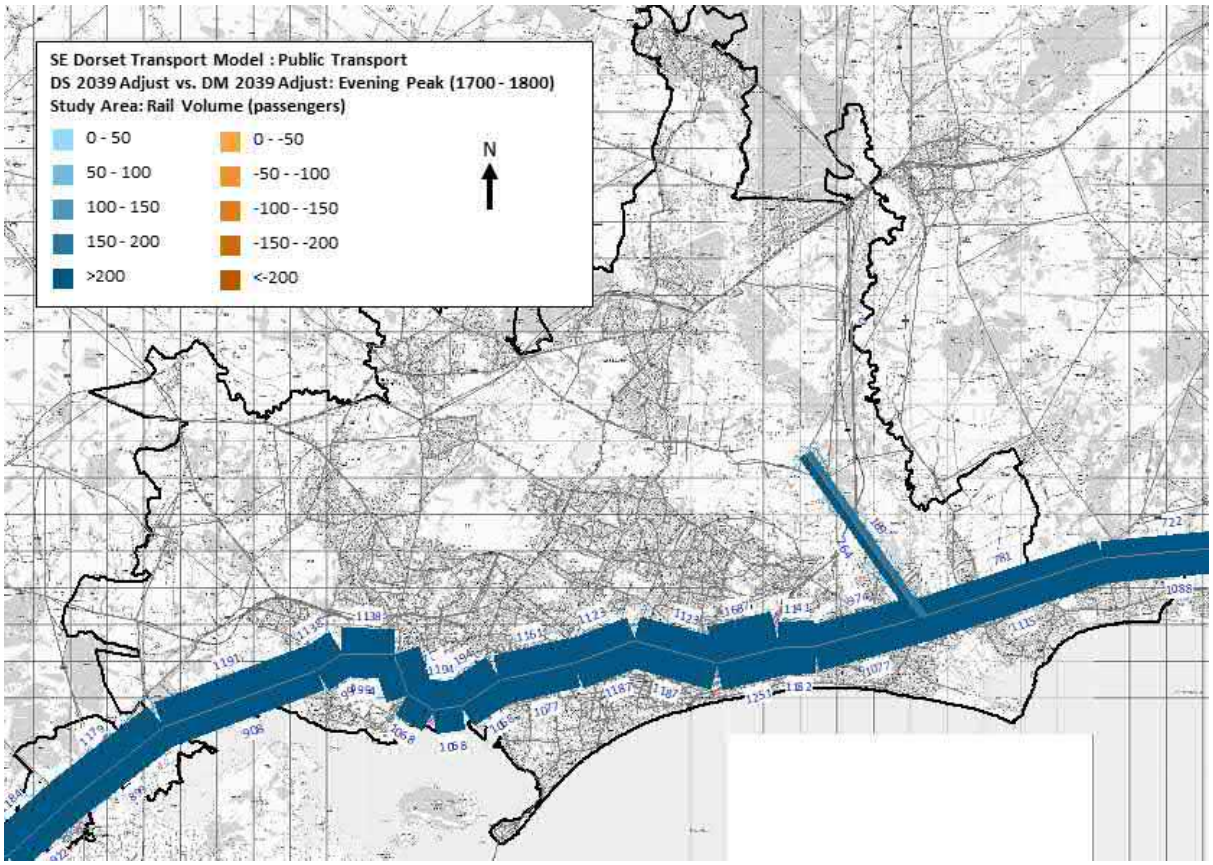

Figure 2.169: Rail Flows (passengers) - 2039 Do-S vs Do-M, PM Peak

The table below shows the journey time change between the Do-Minimum and Do-Something scenarios, this is described further in Table 2.40. The results are described in a sliding scale, with darker blue suggesting a larger decrease in journey time with the interventions in place and a darker red shows a larger increase in journey time in the Do-Something scenario.

Table 2.39: Journey Time changes – 2039 Do-Minimum vs 2039 Do-Something: PM Peak

Corridor	Direction	*Distance of route (km)	Journey Time change (%) from DM to DS
A3049 / A347	Eastbound	11.4	-41.6%
	Westbound	11.4	-30.1%
A31	Eastbound	28	-18.9%
	Westbound	27.9	-31.7%
A338	Northbound	17.5	-0.3%
	Southbound	17.4	-20.0%
A341 / A3060	Eastbound	13.7	-18.7%
	Westbound	13.7	-15.8%
A347	Northbound	7.5	-6.3%
	Southbound	8.2	-28.5%
A348 / A3049	Eastbound	13.8	-23.7%
	Westbound	13.9	-20.7%
A349	Northbound	5.6	-30.2%
	Southbound	5.5	-13.9%

A35 E	**Eastbound**	11.7	-11.5%
	Westbound	11.7	-27.1%
A35 W	**Eastbound**	17.8	-12.5%
	Westbound	18.5	-14.3%
A350	**Northbound**	13.9	-28.1%
	Southbound	13.9	-17.3%
A351	**Eastbound**	7.2	-4.1%
	Westbound	7.2	-3.1%
B3073	**Eastbound**	15.2	-14.7%
	Westbound	15.1	-8.1%
**There may be minimal differences in distance in each direction due to bends in the road/movements through junctions.*			

Table 2.40 below outlines the explanation of the model outputs for the comparison of the 2039 Do-Minimum vs Do-Something forecast year for the PM Peak.

Table 2.40: Model Output Details: 2039 Do Minimum vs Do Something, PM Peak

Scenario and Year	**Do-Minimum – 2039 Forecast Year**
Time Period	**Evening peak hour (1700-1800) - PM**
Model Output Metrics	
Traffic Flows (pcus)	The outputs show some significant changes to traffic around the BCP area with a high proportion of roads seeing a reduction in traffic due to the number of bus-related interventions in this forecast year which has involved a shift of vehicles off the network and onto buses. There is still an obvious redistribution of trips due to the road closures which were added in 2023. • The greatest reduction of trips in Bournemouth are seen along the road closure-affected routes parallel to the coastline. • The A338 sees a decrease in traffic, e.g around Holdenhurst there is a decrease of 600 NB and 700 SB which is due to the shift of cars to PT. • The centre of Christchurch along Bridge Street sees a reduction of around 300-400 in each direction
Link Delays (Seconds)	Due to the interventions linked to improving bus and rail services in the area, there is a general decrease in delay across a number of links across the study area. However, there are a small number of increases; • Some delays have been reduced in Boscombe, Springbourne and around the road network close to St Pauls Roundabout compared with with Do-Minimum which is attributed to a modal shift to PT. There is a small increase at the EB approach to St Pauls Roundabout which is likely due to the redistribution of traffic from the road closures around Bournemouth Centre. • There is a reduction in delays along routes in Christchurch (e.g. Bridge Street and Christchurch Bypass) which is due to mode shift. • As with the other peaks, there is a small increase in delay at the Bournemouth West junction from both A338 approaches which is expected due to the closure of through-routes to the south within Central Bournemouth. • There is also improved bus links to the Airport, therefore delays to the main access junction to the airport have reduced by 70 seconds from the west and nearly 30 seconds to the east.
Link V/C Ratio (%)	The model shows that there is a general decrease in V/C ratios across the urban areas of Bournemouth and Poole and key routes into each area. There are some increases especially in Bournemouth due to redistribution of traffic with road closures. • V/C ratios have decreased along West Cliff Road and Bath Road due to road closures • There is an increase in V/C on the A35 through Boscombe due to the road closure along East Overcliff Drive. • There is also an increase on St Peters Road in Bournemouth near its junction with St Peters Roundabout due to the rerouting of traffic to avoid the closed Bath Road which is for buses only. • There is a reduction along Bridge Street in Christchurch and around the B3093/Tatnam Road junction in Poole, In Christchurch, this can mainly be attributed to the modal shift, but in Poole it is both the shift and road closures in the centre.

Node Delay (Seconds)	Generally there is a decrease around the network due to less traffic on the network however there are a few increases at junctions such as the A347/B3063/B3064 junction and at St Pauls Roundabout where traffic levels have increased due to traffic rerouting • There are reductions along Christchurch Bypass as well as in across Poole. • At Iford Roundabout there is a 71 second reduction in delay. • In Pokesdown there are some increases (maximum of 30 seconds) due to traffic rerouting away from closed routes futher south.
Bus Flows (Passengers)	There is an increase in bus passengers along all routes across the BCP area due to the bus improvements across the area, including; • The A338 west of Bournemouth centre, through Branksome and Westbourne and to the east of Cooper Dean Roundabout • The A35 from Bournemouth through Pokesdown towards Christchurch • In the centre of Poole and heading northbound along the A3093 through Longfleet as well as on the A3068 to the east of Poole.
Rail Flows (Passengers)	The addition of the interventions shows an eastbound increase of around 1200 passengers around Poole and 1700 around Bournemouth. In the other direction, the increase is around 1300 in Bournemouth and 1100 in Poole. This would suggest a significant shift of trips due to the proposed rail interventions. The outputs show that there are some trips alighting and departing at local stations around the BCP area showing an impact on local trips.
Statistics (Highway Model)	
Transient queues (pcu hrs)	The addition of the interventions in this scenario has reduced travel time across the BCP area by around 30%, and distance travelled by 23%. The average speed across the BCP area have increased by over 3kph (from 32.3 kph to 35.6kph) which would be expected due to the number of private cars being reduced due to modal shift to PT.
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	283% increase from DM
Total PT passenger kms	399% increase from DM
Journey Times	
All routes	Key points to note about the change of journey times include: • In general, most routes have a higher than 5% decrease in journey time in the Do-Something as this forecast year involves some model shift from cars to PT which in turn reduces traffic on the roads and results in faster journey times. • The A338 Northbound still has a noticeable increase in journey time with the interventions in place, which is due to the closure of parallel routes to private cars e.g. West Cliff Road and Bath Road near the Pier which is pushing more traffic along the A338.

2023 Do Something vs 2031 Do Something: All Peaks

Table 2.41 below outlines the explanation of the model outputs for the comparison of the 2023 Do-Something vs the 2031 Do-Something forecast year for all peaks.

Table 2.41: Model Output Details: 2023 Do Something vs 2031 Do Something, All peaks

Scenario and Year	**2023 Do Something vs 2031 Do Something**
Time Period	**All peaks**
Model Output Metrics	
Traffic Flows (pcus)	In general, 2031 has some lower highway flows compared with 2023 even though the background growth of traffic is greater in 2031 compared with 2023. These lower flows can be attributed to the addition of bus-related interventions in 2031 which promotes more of a shift from highway to PT.
Link Delays (Seconds)	Across all peaks, the delays are lower in 2031 compared with 2023 due to lower flows which can largely be attributed to the bus interventions. The pattern of where the delays occur is similar across the network which would suggest there is no large amounts of traffic rerouting which would suggest the modal shift is having a larger impact on the network than highway interventions.
Link V/C Ratio (%)	Across the network, the V/C ratios have reduced in 2031 compared with 2023 which is due to the modal shift from highway to bus, reducing vehicles on roads across the BCP area. As explained above, the pattern of where the delays occur is similar across the network which would suggest there is no large amounts of traffic rerouting.
Node Delay (Seconds)	In general there are less delays in 2031 than in 2023 which is down to less traffic on the network in 2031 which, in turn, reduces congestion at junctions.
Bus Flows (Passengers)	In 2031 there is a much higher bus patronage than in 2023 which is expected due to the addition of bus-related interventions in 2031. In both years, there is an obvious corridor of bus usage along the corridors and within the centre of Bournemouth, Poole and Christchurch.
Rail Flows (Passengers)	Across all peaks, rail patronage has changed slightly from 2023 to 2031. In 2031, patronage from Bournemouth to the west has increased in both directions in all peaks. From Bournemouth to the east, the change is slightly lower which can be attributed to natural growth of rail patronage between the two years.
Statistics (Highway Model)	
Transient queues (pcu hrs)	Comparing 2031 to 2023, there is general decrease in queues and travel time which is due to lower traffic levels than 2023 as explained above. Because of this, average speeds across the network are higher in 2031 than 2023.
Over-capacity queues (pcu hrs)	
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	

Statistics (Public Transport Model)	
Total PT passengers	There is a higher number of PT trips in 2031 compared with 2023 for all peaks. This is due to the bus interventions outlined for 2031 which encourage a shift from cars to public transport. This, in turn, increases the total passenger kms across the network.
Total PT passenger kms	
Journey Times	
All routes	In summary, the journey time routes are generally quicker in 2031 than 2023, due to the lower traffic levels on the network which reduces congestion levels and therefore increases speeds across the network.

2031 Do Something vs 2039 Do Something: All Peaks

Table 2.42 below outlines the explanation of the model outputs for the comparison of the 2031 Do-Something vs the 2031 Do-Something forecast year for all peaks.

Table 2.42: Model Output Details: 2031 Do Something vs 2039 Do Something, All peaks

Scenario and Year	**2031 Do-Something vs 2039 Do-Something**
Time Period	**All peaks**
Model Output Metrics	
Traffic Flows (pcus)	In general, the difference between 2039 and 2031 differs across the network however the flows in 2039 are largely higher than 2031. The difference in interventions between 2031 and 2039 are the addition of some PT interventions in 2039 (mainly rail) therefore there is less of an impact of the interventions on certain parts of the model and those which are not impacted are expected to have higher traffic flows due to background growth between 2031 and 2039. In some locations the flows are slightly lower in 2039 compared with 2031 but these will be along the rail lines.
Link Delays (Seconds)	Across all peaks, the delays are higher in 2039 compared with 2031 due to higher flows which can largely be attributed to the traffic growth between the two years. Within the urban areas, the magnitude of link delays are in similar locations e.g. Bournemouth West junction, Iford Bridge, Bournemouth Airport across both years.
Link V/C Ratio (%)	Across the network, the V/C ratios have increased in 2039 compared with 2021 which is due to the background growth between 2031 and 2039, increasing the number of vehicles on roads across the BCP area. However, the increase is minimal within parts of the urban area which may be affected with vehicles switching to rail.
Node Delay (Seconds)	In general there are more delays in 2039 than in 2031 which is down to more traffic on the network in 2039 which, in turn, increases congestion at junctions.
Bus Flows (Passengers)	In 2039 there is a small increase in bus patronage from 2031 corridors and within the centre of Bournemouth, Poole and Christchurch. This is expected due to the increased demand in 2039 compared with 2031.
Rail Flows (Passengers)	Across all peaks, rail patronage has increased quite significantly from 2031 to 2039 which is due to the interventions proposed for 2039 which involve rail improvements.
Statistics (Highway Model)	
Transient queues (pcu hrs)	Comparing 2039 to 2031, there is general increase in queues and travel time which is due to higher traffic levels in 2039 as explained above.

Over-capacity queues (pcu hrs)	Because of this, average speeds across the network are slightly lower in 2039 than 2031.
Link cruise time (pcu hrs)	
Total Travel Time (pcu hours)	
Total travel Distance (pcu kms)	
Overall average speed (kph)	
Statistics (Public Transport Model)	
Total PT passengers	There is a higher number of PT trips in 2039 compared with 2031 for all peaks. This is due to the rail interventions outlined for 2039 which encourage more of a shift from cars to public transport. This, in turn, increases the total passenger kms across the network.
Total PT passenger kms	
Journey Times	
All routes	In summary, the journey time routes are generally slower in 2039 than 2031, due to the higher traffic levels on the network which increases congestion levels and therefore lowers speeds across the network.

2.4 High and Low Growth Scenarios

As outlined in TAG, the core scenario is intended to be the best basis for decision-making given evidence that is available. However, as there is often some uncertainty associated with the forecasting process, alternative scenarios are used to show what the impact of the schemes will be if the growth is lower or higher than evidence suggests. These scenarios are calculated using TAG guidance, which is outlined in Unit M4, Section 4. For this, we have assessed a high and low growth scenario for each year for both in the Do Minimum and the Do Something.

Appendices G and H show the detailed results of the low and high growth assessments respectively.

Table 2.43 shows the percentage change in highway model statistics between the low and high growth scenarios compared with the core scenario for 2023 in the BCP area. As expected, there is a general decrease in queues, travel time and travel distance in the low scenario compared with the core, with a small increase in average speed to account for less queuing in the model. For the high scenario, there is an increase in queuing, travel time and distances which leads to an decrease in travel time. In the high scenario, transient queues increases by 14% in the AM and PM which suggests increased congestion in the area.

Table 2.43: High and Low Growth vs Core Growth: Highway Model Statistics – BCP area: 2023

	Change from Core DS to Low DS (%)			Change from Core DS to High DS (%)		
	AM	IP	PM	AM	IP	PM
Transient Queues (pcu hrs)	-11%	-10%	-10%	14%	10%	14%
Total Travel Time (pcu hours)	-8%	-7%	-7%	6%	6%	6%
Total Travel Distance (pcu kms)	-5%	-6%	-4%	10%	8%	10%
Overall average speed (kph)	3%	2%	4%	-4%	-2%	-4%

Table 2.44 shows the percentage change in highway model statistics between the low and high growth scenarios compared with the core scenario for 2031 in the BCP area. The increases and decreases in percentage change are expected as in 2023, and the differences are greater which is due to a greater difference in demand between the core and the alternative scenarios.

Table 2.44: High and Low Growth vs Core: Highway Model Statistics – BCP area: 2031

	Change from Core DS to Low DS (%)			Change from Core DS to High DS (%)		
	AM	IP	PM	AM	IP	PM
Transient Queues (pcu hrs)	-17%	-16%	-19%	24%	17%	24%
Total Travel Time (pcu hours)	-13%	-12%	-14%	10%	10%	10%
Total Travel Distance (pcu kms)	-10%	-10%	-9%	15%	13%	16%
Overall average speed (kph)	4%	2%	5%	-5%	-3%	-6%

Table 2.45 shows the percentage change in highway model statistics between the low and high growth scenarios compared with the core scenario for 2039 in the BCP area. The increases and decreases in percentage change are expected as the other two years, and the differences are greater which is due to a greater difference in demand between the core and the alternative scenarios. In the low scenario, there is a higher average speed than in Core, with the PM seeing a 7% increase in speed due to less traffic in this scenario compared with the Core. The difference in speed is generally less in the interpeak compared with the other peak periods which is due to less congestion in the Interpeak.

Table 2.45: High and Low Growth vs Core: Highway Model Statistics – BCP area: 2039

	Change from Core DS to Low DS (%)			Change from Core DS to High DS (%)		
	AM	IP	PM	AM	IP	PM
Transient Queues (pcu hrs)	-21%	-19%	-23%	29%	21%	28%
Total Travel Time (pcu hours)	-16%	-15%	-17%	12%	12%	12%
Total Travel Distance (pcu kms)	-11%	-12%	-11%	19%	15%	19%
Overall average speed (kph)	5%	3%	7%	-7%	-3%	-7%

Table 2.46 shows the percentage change of journey times along particular corridors between the core and low growth DS scenarios. The results show that there is a general decrease in journey times due to less demand in the lower scenarios, as would be expected. The A338 NB sees a slightly higher impact on journey times in the low scenarios which suggest a release of queuing with the lower demand on this corridor. This is also shown on the A35 east corridor in a westbound direction which sees a decrease of 14% in the AM Peak.

Table 2.46: Low Growth vs Core: DS Scenarios, Journey Time Change

		Core vs Low								
CORRIDOR	DIR	2023			2031			2039		
		AM	IP	PM	AM	IP	PM	AM	IP	PM
A3049 / A347	EB	-8%	-1%	-4%	-8%	-2%	-5%	-11%	-3%	-6%
	WB	-1%	-1%	-4%	-2%	-1%	-5%	-2%	-2%	-7%
A31	EB	-6%	-2%	-3%	-7%	-3%	-4%	-10%	-4%	-5%
	WB	-3%	-2%	-7%	-4%	-2%	-8%	-5%	-3%	-10%
A338	NB	-8%	-6%	-7%	-12%	-8%	-13%	-15%	-12%	-17%
	SB	-6%	-4%	-3%	-7%	-4%	-2%	-10%	-6%	-2%
A341 / A3060	EB	-4%	-1%	-4%	-3%	-1%	-3%	-4%	-2%	-4%
	WB	-4%	-1%	-3%	-3%	-2%	-2%	-5%	-2%	-3%
A347	NB	-5%	-1%	-1%	-3%	-1%	-1%	-6%	-2%	-2%
	SB	-4%	-1%	-3%	-2%	-1%	-2%	-3%	-1%	-4%
A348 / A3049	EB	-4%	-3%	-4%	-6%	-4%	-7%	-8%	-5%	-10%
	WB	-5%	-2%	-4%	-7%	-3%	-4%	-8%	-4%	-6%
A349	NB	-1%	-1%	-6%	-1%	-1%	-5%	-2%	-2%	-6%
	SB	-4%	-1%	-1%	-3%	-1%	-2%	-5%	-2%	-3%
A35 E	EB	-4%	-2%	-4%	-5%	-2%	-6%	-7%	-3%	-8%
	WB	-8%	-4%	-9%	-10%	-5%	-9%	-14%	-6%	-11%
A35 W	EB	-2%	-1%	-2%	-2%	-2%	-2%	-2%	-2%	-3%
	WB	-3%	-1%	-3%	-3%	-2%	-3%	-4%	-2%	-4%
A350	NB	-2%	-1%	-8%	-2%	-1%	-5%	-4%	-1%	-7%
	SB	-6%	-2%	-3%	-12%	-1%	-4%	-14%	-2%	-11%
A351	EB	0%	0%	0%	-1%	0%	-1%	-1%	-1%	-1%
	WB	-1%	-1%	0%	-1%	-1%	-1%	-1%	-1%	-1%
B3073	EB	-3%	-2%	-4%	-3%	-2%	-5%	-3%	-4%	-7%
	WB	-3%	-1%	-1%	-3%	-1%	-1%	-5%	-2%	-2%

Table 2.47 shows a comparison of the high and core scenarios. There is a general increase in journey times as expected with the increased demand on all corridors. There is a higher increase on corridors such as the A338 EB, in the PM Peak of 26% in 2023 up to 41% in the 2039. The interpeak sees lower increases in journey times which is due to there being less congestion on the network.

Table 2.47: High Growth vs Core: DS Scenarios, Journey Time Change

		Core vs High								
CORRIDOR	DIR	2023			2031			2039		
		AM	IP	PM	AM	IP	PM	AM	IP	PM
A3049 / A347	EB	13%	2%	4%	14%	2%	5%	23%	4%	8%
	WB	3%	2%	13%	2%	2%	12%	6%	4%	16%
A31	EB	8%	2%	12%	11%	3%	9%	15%	6%	17%
	WB	6%	3%	11%	7%	4%	13%	11%	5%	18%
A338	NB	16%	7%	26%	17%	12%	31%	26%	13%	41%
	SB	12%	4%	6%	14%	7%	5%	17%	7%	11%
A341 / A3060	EB	9%	1%	9%	5%	2%	10%	12%	3%	16%
	WB	5%	2%	7%	7%	2%	5%	11%	4%	8%
A347	NB	12%	1%	1%	9%	2%	3%	20%	3%	5%
	SB	15%	1%	7%	7%	1%	6%	19%	2%	15%
	EB	8%	3%	21%	9%	5%	22%	11%	6%	29%

A348 / A3049	WB	8%	3%	6%	9%	4%	7%	13%	5%	10%
A349	NB	2%	1%	26%	2%	2%	16%	5%	2%	26%
	SB	14%	1%	5%	7%	1%	3%	14%	2%	4%
A35 E	EB	7%	3%	19%	11%	3%	21%	15%	6%	28%
	WB	15%	4%	14%	16%	7%	20%	20%	9%	24%
A35 W	EB	3%	2%	3%	3%	2%	3%	4%	3%	4%
	WB	6%	1%	5%	4%	2%	3%	7%	3%	5%
A350	NB	9%	1%	15%	5%	1%	13%	18%	2%	21%
	SB	13%	3%	8%	8%	2%	16%	11%	3%	12%
A351	EB	1%	0%	0%	1%	1%	1%	2%	1%	1%
	WB	1%	1%	1%	1%	1%	1%	2%	1%	1%
B3073	EB	7%	3%	13%	5%	5%	16%	11%	5%	21%
	WB	3%	1%	1%	6%	2%	1%	7%	3%	3%

3. Economic Appraisal

3.1 Economic Assessment

Economic Appraisal Overview

The economic appraisal has utilised the most recent version of the Department for Transport's Transport User Benefits Appraisal (TUBA) version 1.9.14 (August 2020) and Cost and Benefits to Accidents – Light Touch (COBALT) software version 2013.02 and COBALT parameters file version 2020.1. The TUBA appraisal includes monetisation of travel time benefits, vehicle operating costs, and greenhouse gases. The COBALT assessment provided a monetised appraisal of potential collision changes resulting from the scheme.

Outputs from the SE Dorset Multi-Modal Transport Model have been used to inform an economic appraisal for the packages of internetions that have been identified. The key elements that have been included within the economic appraisal for each package of measures are:

- Travel Time Benefits and Vehicle Operating Costs – The predicted change in benefits and costs for business, non-business and public transport users will be assessed using the DfT software 'TUBA'
- Accident Analysis – The predicted change in accidents associated with the package of measures will be assessed using the DfT software 'COBA-LT'
- Scheme costs – where available we will use scheme costs that have previously been prepared for identified schemes, elsewhere we will use ball-park scheme costs from similar projects or estimated scheme costs from professional judgement. These are outlined in Appendix D.

A comparison of the benefits against costs for the packages of measures will be used to define the economic efficiency and a value for money rating.

Annualisation Factors

Economic appraisal requires a consideration of the benefits to all road users, many of which will not be travelling at a time represented by the transport model. Benefits per vehicle vary throughout the day and year to the extent that traffic levels impact on the benefit per vehicle.

The calculation of user benefits requires the calculation of annualisation factors to quantify the way in which the scheme might affect those travelling during weekdays outside of the modelled hours or on weekends and public holidays. For the purpose of this strategy, existing annualisation factors have been used and are detailed in Table 3.1. These have been obtained from the South East Dorset Transforming Cities Fund Strategic Outline Business Case and are consistent with the SEDMMTS model which has the same time periods.

Table 3.1: Annualisation Factors

Monday to Friday (Weekday)	
AM Peak	667
Inter Peak	1518
PM Peak	692

Travel Time Benefits and Vehicle Operating Costs

Travel time benefits and the impact on vehicle operating costs for the proposed scheme have been assessed using TUBA over a standard appraisal period of 60 years as specified in TAG, with 2017 adopted as the appraisal base year.

Travel time benefits from the scheme are calculated by comparing the travel costs between the Do Minimum and Do Something model assignment results. The time saved is then monetised, with the value of time varying based upon the purpose of the trip (e.g. an employer's business trip has a greater value than a personal business trip). The value of time is expected to increase over time due to the increase in general wages and the growth in the economy.

The TUBA default economics input file, which provides parameters, definitions, growth rates and other factors that are consistent with the July 2020[1] TAG Data Book, has been adopted in this appraisal.

The vehicle operating costs are calculated in a similar way to the travel time benefits except that distance and time savings are used.

The non-fuel benefits are calculated using the formula below:

$$Non\ fuel\ VOC\ =\ aD\ +\ bT$$

- Where D is distance in kilometres;
- T is time in seconds; and
- a and b are parameters defined by the user class.

The fuel benefits are calculated using the formula below:

$$Fuel\ Consumed\ =\ \frac{T}{D(a\ +\ b\ \left(\frac{D}{T}\right)\ +\ 2c\ \left(\frac{D}{T}\right)\ +\ 3d\ \left(\frac{D}{T}\right))}$$

- Where D is distance in kilometres;
- T is time in seconds; and
- a, b, c and d are parameters defined by the user class.

Collision Appraisal

Accident analysis has been undertaken using COBALT (Cost and Benefit to Accidents – Light Touch), a computer program developed by the DfT to analyse the impact of a scheme on accidents as part of economic appraisal for a road scheme. COBALT software 2013.2 and COBALT parameters file version 2020.1 were used for the accident assessment.

As flows are input into COBA-LT as Annual Average Daily Traffic (AADT), factors were calculated to scale the hourly model flow results up to 24-hour totals. First, factors were calculated to scale the peak hour models up to their respective periods. In the absence of the original data used for model development, these factors were derived from the Transforming Cities Fund economic appraisal, which utilised the same base model. These peak period factors were used to scale the model results up to a 12 hourly total flow.

In the absence of the original data used for model development, the 12 to 24-hour factors derived from analysis of the locally observed highway data used to define the growth scenarios (Section 1.2) for the remaining 12 hours. The resulting factors can be found in Table 3.2.

[1] July 2020 Update, including minor revisions

Table 3.2: Annual Average Daily Traffic Factors

Period	Period Definition	Factor
AM Peak to AM Period	07:00 – 10:00	2.64
IP Average Hour to IP Period	10:00 – 16:00	6
PM Peak to PM Period	16:00 – 19:00	2.74
12 to 24 Hour Factor		1.23

Using the modelled data and the above AADT factors, a COBA-LT assessment was undertaken. The resuls of this are shown in Table 3.3.

Table 3.3: Accident Costs and Benefits (2010 Prices) – Core Model Scenario

	Do Minimum	Do Something
Accidents		
Total Accidents	16,731	12,956
Total Accidents Saved by Scheme		3,775
Casualties		
Total Casualties (Fatal)	214	166
(Serious)	2,546	1,970
(Slight)	19,733	15,289
Total Casualties Saved by Scheme (Fatal)		47
(Serious)		576
(Slight)		4,444
Economics		
Total Accident Costs (£000's)	801,973	624,433
Total Accident Benefits Saved by Scheme(£000's)		177,540

Overall, the strategy is forecast to provide significant accident benefits. The total number of casualties are forecast to reduce by approximately 30%. These benefits can be attributed to the predicted reduction in number of vehicles using the highway network when the strategy is implemented. When monetised using the latest central Government accident cost values, the overall benefit would be expeted to be slightly over £175 million, in 2010 prices.

Scheme Costs and Profile

Scheme costs have been derived from existing business cases where possible. For schemes where this has not been possible, similar schemes in other cities have been used before a professional judgement has been made. Using this methodology, estimated scheme costs across all schemes totalled £849,718,730 in 2020 market prices.

The cost estimate detailed above include risk costs and optimism bias as detailed by scheme and stage in Table 3.4. This level of optimism bias is considered appropriate for a scheme at this stage of

development, where detailed scheme designs and a quantified risk assessment have been produced, and is in accordance with TAG Unit A1.2[2].

Table 3.4: Risk and Optimism Bias

Category	Stage 1	Stage 2	Stage 3
Roads	44%	15%	3%
Light Rail	66%	40%	6%
Conventional Rail	64%	18%	4%
Fixed Links	66%	23%	6%
Building Projects	51%	28%	4%
IT Projects	200%	105%	10%

The total costs detailed above were then profiled for input into the economic appraisal. Each scheme was categorised into a five year band and then the costs were evenly distributed over the five years (20% each year) and is detailed in Table 3.5. Without any detailed cost profiles, this represents the best assumption.

Table 3.5: Cost Profile

Scheme Length	2020-2024	2025-2029	2030-2034	2035-2039
5 Year Schemes	100%	-	-	-
10 Year Schemes	-	100%	-	-
15 Year Schemes	-	-	100%	-
20 Year Schemes	-	-	-	100%

User Classes

The modelled user classes have been converted to the TUBA user classes shown in Table 3.6.

Table 3.6: TUBA User Classes

TUBA User Class	TUBA Vehicle Type	TUBA Purpose	Model User Class	Factor Applied to Vehicle Matrix
1	1 Car	1 Business	2 Car Employers Business	1
2		2 Commute	1 Car Commute	1
3		3 Other	3 Car Other	1
4	2 LGV Personal	All	4 LGVs	0.12
5	3 LGV Freight	All		0.88
6	4 OGV 1	All	5 HGVs	0.377

[2] Scheme Costs (July 2017)

7	5 OGV 2	All		0.163
8	6 PT	1 Business	2 PT Employers Business	1
9	6 PT	2 Commute	1 PT Commute	1
10	6 PT	3 Other	3 Car Other	1

The factors applied to the Light Goods Vehicle (LGV) trip matrix to convert to LGV personal and LGV freight are default splits from Table A1.3.4 of the July 2020 TAG Data Book.

The factors applied to the Heavy Goods Vehicle (HGV) trip matrix to split into Other Goods Vehicle (OGV) 1 and OGV2 are from the 2019 Department for Transport Road Traffic Statistics. Due to the limited motorways represented in the model, only A roads have been considered. This gave a split of 70/30 for OGV1 and OGV2 respectively and subsequently had the PCU factor applied for TUBA.

All public transport trips are assumed to be passengers within TUBA and therefore drivers are not included.

Greenhouse Gases

The TUBA program includes an assessment of the change in greenhouse gases produced by implementing the scheme. The amount of greenhouse gases in each scenario is calculated using the trip information that has been extracted from the models.

The TUBA program has default values for the amount of carbon produced per litre of fuel. Carbon dioxide emissions have been extracted from the TUBA output file for every year during the appraisal period with the latest year being 2082.

The assessment takes into account the future fuel efficiency of vehicles, which is predicted to increase and also the change in the cost of carbon.

Travel Time Benefits and Vehicle Operating Costs

Table 3.7 shows the total Core scenario benefits over the 60-year appraisal period split into benefit type and split between trip purposes. This highlights that the majority of the benefits created by the strategy are travel time benefits for highway.

Table 3.7: Transport Benefits by Trip Purpose, Core Growth Scenario (£'000 2010 Prices)

	Purpose	Travel Time	PT Fares	VOC Fuel	VOC Non-fuel	Indirect Tax	Total
Highway	**Business**	£309,028	£-	£13,266	£12,076	-£18,778	£315,592
	Commuting	£364,461	£-	£8,597	£82,922	-£65,391	£390,589
	Other	£285,509	£-	£5,334	£128,335	-£99,257	£319,920
	Total	£958,998	£-	£27,196	£223,333	-£183,426	£1,026,101
PT	**Business**	£19,311	£3,735	£-	£-	£-	£23,047
	Commuting	£150,338	£20,877	£-	£-	-£67,367	£103,847
	Other	£163,026	£109,376	£-	£-	-£98,529	£173,873
	Total	£332,675	£133,988	£-	£-	-£165,896	£300,767

Monetised Environmental Assessment Results

The TUBA calculated impact on greenhouse gases for the scheme present a predicted benefit of £76 million. This decrease in cost is predominately down to the mode shift from car to public transport.

Transport Economic Efficiency

The Transport Economic Efficiency (TEE) table provides a summary of the travel time and vehicle operating cost benefits. The benefits are summarised by trip purpose. This includes the benefits

generated from the main TUBA assessment, maintenance and construction scenarios. The TEE table for the core growth scenario for the scheme is shown in Table 3.8. Low and high growth results can be found in Appendix I.

Table 3.8: Economic Efficiency of the Transport System Results, Core Growth Scenario (£'000 2010 Prices)

Non-business: Commuting	**£'000**
User benefits	
Travel time	£514,799
Vehicle operating costs	£91,519
User charges	£20,877
During Construction & Maintenance	£-
NET COMMUTING	£627,194
Non-business: Other	
User benefits	
Travel time	£448,535
Vehicle operating costs	£133,669
User charges	£109,376
During Construction & Maintenance	£-
NET OTHER	£691,580
Business	
User benefits	
Travel time	£328,339
Vehicle operating costs	£25,342
User charges	£3,735
During Construction & Maintenance	£-
Subtotal	
Private sector provider	
Revenue	£-
Operating costs	£1,089,559
Investment costs	£-
Grant/subsidy	£-
Subtotal	£-
Other business impacts	
Developer contributions	£-
NET BUSINESS	£1,446,976
Total	
Present Value of Transport Economic Efficiency Benefits (TEE)	£2,765,750

Public Accounts

The Public Accounts table details the source of the scheme costs and have been summarised by local and central government. The Public Accounts table for the core growth scenario is shown in Table 3.9.

Table 3.9: Public Accounts, Core Growth Scenario (£'000 2010 Prices)

Local Government Funding		
Revenue	£	-
Operating Costs	£	-
Investment Costs	£	-

Developer and Other Contributions	£	-
Grant/Subsidy Payments	£	-
Net Impact:	£	-
Central Government Funding: Transport		
Revenue	£	-
Operating costs	£	-
Investment Costs	£	487,122
Developer and Other Contributions	£	-
Grant/Subsidy Payments	£	-
Net Impact:	£	487,122
Central Government Funding: Non-Transport		
Indirect Tax Revenues	-£	349,322
Totals		
Broad Transport Budget	£	487,122
Wider Public Finances	-£	349,322

Analysis of Monetised Costs and Benefits

The benefits from each individual assessment have been totalled to create the Present Value Benefits (PVB) of the scheme. They have been summarised in the AMCB table along with the PVC and the initial unadjusted Benefit-Cost Ratio (BCR). The AMCB table for the core growth scenario for the scheme is shown in Table 3.10. Low and high growth results can be found in Appendix I.

Table 3.10: Analysis of Monetised Costs and Benefits, Core Growth Scenario (£'000 2010 Prices)

Noise	£-
Local Air Quality	£-
Greenhouse Gases	£76,426
Journey Quality	£-
Physical Activity	£-
Accidents	£177,540
Economic Efficiency: Consumer Users (Commuting)	£627,194
Economic Efficiency: Consumer Users (Other)	£691,580
Economic Efficiency: Business Users and Providers	£1,446,976
Wider Public Finances	£349,322
Present Value of Benefits (PVB)	£2,670,394
Broad Transport Budget	£487,122
Present Value of Costs (PVC)	£487,122
Overall Impacts	
Net Present Value (NPV)	£2,183,272
Initial Unadjusted Benefit to Cost Ratio (BCR)	5.48

The results show that the scheme provides significant benefits to transport users, resulting from the significant improvement in the performance in the South East Dorset area provided by the scheme.

The strategy produces an initial unadjusted BCR of **5.48** for the core growth scenario, which represents very high value-for-money[3].

Appendix I of this report provides details of the economic appraisal that has been undertaken for the low and high growth scenarios. The strategy produces an initial unadjusted BCR of **4.15** for the low growth scenario and **8.33** for the high growth scenario, both of which represent very high value for money.

Conclusion

This report sets out the methodology used to appraise the Transport Strategy set out in this document for South East Dorset. The methodology complies with DfT guidance set out in TAG.

- The economic appraisal has comprised the following key elements:
- Travel time benefits and vehicle operation costs using TUBA;
- Accident analysis using COBALT;
- Estimation of Costs; and
- Analysis of Monetised Costs and Benefits.

The assessment presented in this report shows that for the core scenario the scheme offers very high Value for Money with an initial unadjusted benefit to cost ratio of **5.48**. The low growth initial unadjusted benefit to cost ratio is XXX, whilst the high growth initial unadjusted benefit to cost ratio is XXX.

The Value for Money Benefit has been determined based on the initial unadjusted BCR, using the information in the following table (DfT – Value for Money Framework).

Box 5.1 Standard Categories
(Transport cost outlays exceed revenues or cost savings)

VfM Category	Implied by…*
Very High	BCR greater than or equal to 4
High	BCR between 2 and 4
Medium	BCR between 1.5 and 2
Low	BCR between 1 and 1.5
Poor	BCR between 0 and 1
Very Poor	BCR less than or equal to 0

**Relevant indicative monetised and/or non-monetised impacts must also be considered and may result in a final value for money category different to that which is implied solely by the BCR. This chapter provides guidance on how to select the final value for money category.*

[3] DfT (2015) Value for Money Framework, Box 5.1

3.2 Wider Economic Impacts

Overview of Wider Economic Impacts

Wider economic impact appraisal quantifies the impact on the local, regional and national economy caused by changes in accessibility generated by the transport interventions in the strategy. Wider impacts (WIs) are not captured by the conventional transport user benefits appraisal undertaken in the Department for Transport's (DfT's) TUBA software and reported in section 3.1 of this report. WIs arise when there are market failures (caused by difficulties for businesses in accessing employees, suppliers and other professional services) that are addressed by the proposed transport interventions.

For WIs to contribute to a scheme business case it is necessary to demonstrate, through a scheme specific economic narrative, that the local socio-economic conditions coupled with specific local business market are leading to market failures which are directly addressed by the improvements to accessibility generated by the scheme. Such market failures may include difficulty in businesses attracting sufficiently experienced / qualified staff, or professional services, leading to reductions in productivity and difficulties in potential employment accessing jobs leading to under employment.

The nature of the SEDUM strategy, and its focus on increasing urban mobility, will directly increase accessibility of business to other businesses and employees. In later stages of business case development there will be a requirement to demonstrate a specific link between current mobility issues and business growth constraints with reference to the specific measures and corridors in the strategy. However, assessment of the potential scale of wider economic impacts generated by the combined changes has been undertaken, following TAG methodologies, to provide an indication of the scale of potential impact associated with the strategy interventions.

There are two types of wider economic impact, specifically driven by increased mobility that have been assessed:

- Agglomeration impacts - this relates to the concentration of economic activity across an area. By improving the accessibility of an area to a greater number of firms and workers, transport schemes can deliver increases in Gross Domestic Product (GDP). The primary influences on determining agglomeration impacts are changes in travel costs, the number and location of workers, and the productivity of those workers.
- Labour market impacts from more/less people working – this is the impact of a transport scheme on labour supply and is based mainly on changes in commuting travel costs.

The wider economic impacts of the strategy has been assessed in the core growth scenario using the Department for Transport's WITA software in line with TAG guidance.

This assessment shows that the strategy provides approximately £520 million of wider economic benefits through increased productivity and output. The majority of the benefits (approximately £500 million) are realised through increased economies of agglomeration with the strategy improving accessibility between firms and their suppliers, markets and workers. The wider economic impact benefits equate to 15% of the conventional user benefits (TAG level 1 PVB).

The following sections describe the appraisal methodology and WI results in more detail.

Wider Economic Impact Appraisal Methodology

To assess the wider impacts of the strategy the latest release of the DfT's Wider Impacts in Transport Appraisal (WITA 2.0) software was used.

WITA 2.0 implements the calculations of wider impacts as described in TAG Unit A2.1 'Wider Economic Impacts Appraisal'. In all cases the WITA methodology seeks only to capture the part of the above impacts that is not already captured in conventional transport user benefit calculations.

The data required for the calculation of wider economic impacts overlaps significantly with that required for the conventional appraisal of transport user benefits which has been undertaken for the strategy using the DfT program TUBA.

As part of the appraisal of the conventional user benefits the inputs to TUBA were checked to ensure the robustness of the results. Many of these inputs have been used as input to the WITA assessment. Additional economic parameters have been taken from the DfT Wider Impacts Dataset, Version 3.1.1 - DfT July 2020; and a Commuting Production-Attraction (PA) Matrix has been derived from 2011 census travel to work data.

Due to the nature of transport models, and the mathematical functions within them, changes in assigned traffic flows can occur in areas away from any schemes, as a consequence of other changes arising closer to where the scheme has an impact or where equilibrium has been reached at a slightly different point. These changes may not necessarily be a real reflection of an actual change that would occur. They do, however, affect the travel costs between scenarios upon which economic analysis is undertaken. The effects of the changes in flow and cost can be either positive, providing benefits, or negative.

To ensure the robustness of the economic appraisal results, benefits arising on unrealistic movements have been removed during the assessment of the conventional transport user benefits. This is a process called masking and has been applied to the WITA transport model input data to ensure consistrency..

Wider Economic Impact Appraisal Results

Agglomeration Impacts

An agglomeration economy is a type of location based effect in which individuals and firms derive productivity benefits from locating in close proximity to other individuals and firms. Agglomeration benefits arise from improved labour market interactions, knowledge spill-over and linkages between suppliers and consumers.

The strategy reduces travel times and delay for car and public transport users across South East Dorset improving the connectivity and accessibility between suppliers and firms.

Table 3.11 shows the potential benefits arising from agglomeration by industrial sector.

Table 3.11 Benefits Arising from Agglomeration Impacts

Industrial Sector	Benefit (£,000s)				
	Bournemouth	Poole	Christchurch	East Dorset	Region Total
Manufacturing	£1,400	£3,900	£800	£1,900	**£8,000**
Construction	£8,500	£7,900	£2,900	£5,300	**£24,500**
Consumer Services	£47,800	£33,300	£12,800	£16,700	**£110,600**
Producer Services	£197,100	£106,700	£23,400	£30,300	**£357,500**
Total Agglomeration	**£254,900**	**£151,800**	**£39,800**	**£54,200**	**£500,700**

Note: *2010 prices, discounted to 2010*

Agglomeration benefits arise from improved labour market interactions, knowledge spill-over and linkages between suppliers and consumers. The Strategy reduces travel times and delay for travellers potentially improving the connectivity and accessibility between suppliers and firms.

Table 3.11 shows that there are positive potential agglomeration impacts realised across the strategy interventions providing around £500 million of benefits across the appraisal period. The greatest potential agglomeration benefits are expected in producer service sector in Bournemouth and Poole. This is because of the industrial profile of the region; weighted towards producer services industries that typically sell services primarily to the business community rather than to individuals and households, for example accounting firms, consultants, and design services; and that the urban centres of Poole and Bournemouth contain the largest concentrations of existing business employment in this sector.

Labour Market Impacts from More/Less People Working

Transport costs are likely to affect the overall costs and benefits to an individual from working. In deciding whether or not to work, an individual will weigh travel costs against the wage rate of the job

travelled to. A change in transport costs is therefore likely to affect the incentives of individuals to work and hence the overall level of labour supplied in the economy.

As the strategy interventions reduce the cost of travel, through improved travel times and service availibility, there is therefore potential for a higher level of labour to be supplied in the economy as a result of its implementation.

Table 3.12 shows the total potential benefit arising from labour supply impacts.

Table 3.12 Benefits Arising due to Labour Supply Impacts

	Benefit (£,000s)				
	Bournemouth	**Poole**	**Christchurch**	**East Dorset**	**Region Total**
Labour Supply Impact	£7,100	£5,800	£2,600	£3,600	**£19,100**

Note: *2010 prices, discounted to 2010*

The strategy has the potential to generate modest labour supply impacts of approximately £20 million over the appraisal period. This benefit is driven by reductions in commuter travel times which has postential to increase the pool of employees for businesses and jobs for workers seeking employment.

List of Appendices