SURREY
COUNTY COUNCIL

WOKING TOWN CENTRE MICROSIMULATION MODEL

Local Model Validation Report

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1 INTRODUCTION

1.1.1 The Woking town centre microsimulation model has been developed to understand the potential cumulative impact of multiple developments within the town centre. The model calibration and validation is documented in this report.

1.1.2 The model has been constructed with a 2014 base year for the weekday AM and PM peak hours.

1.1.3 This document outlines the creation of this base model in accordance with Department for Transport (DfT) guidelines on local model validation.

2 MODEL CONSTRUCTION

2.1 S-Paramics

2.1.1 For this study, S-Paramics (**Para**llel **mic**roscopic **s**imulation) modelling program, version 2014.1, was used.

2.1.2 S-Paramics is an internationally recognised microsimulation traffic flow modelling program. It simulates the individual components of traffic flow and congestion, and presents its output as a real-time visual display for traffic management and road network design.

2.2 Network

2.2.1 **Figure 2.1** shows the highway network of the model.

2.2.2 The model centres on Woking Town Centre. The following main roads are therefore represented within the model:

- A320;
- A324; and
- A3046.

2.2.3 Model zones are delineated areas where vehicles load onto, and exit, the model network. Listed below are the 25 model zones.

1. A324 Lockfield Drive
2. Well Lane
3. Brewery Road
4. A3046 Chobham Road
5. A320 Chertsey Road
6. Boundary Road
7. Walton Road & Maybury Road
8. Oriental Road
9. Heathside Road
10. White Rose Lane
11. A320 Guildford Road
12. York Road
13. Goldsworth Road
14. Morrisons
15. Brewery Road Car Park
16. Victoria Way Car Park
17. Station Long Stay Car Park
18. Station Premium Car Park & Drop Off
19. Heathside Crescent Car Park
20. Peacocks Car Park
21. Shoppers Car Park (Toys R Us)
22. Church Street East
23. Chertsey Road On-street Parking/Loading
24. Goldsworth Road On-Street Parking
25. Chapel Street

2.3 Zone Connectors

2.3.1 Zone connectors have been applied on external links where vehicles should arrive at link speed as there are no major junctions situated immediately upstream of the model extent.

2.4 Time Periods and Peak Hours

2.4.1 The model was developed to consider the highway conditions for average weekday AM and PM peak hours, 08:00 – 09:00 and 17:00 – 18:00.

2.4.2 When modelling an hour in isolation it is difficult to replicate the exact conditions because trips will be loading onto an empty highway network. As a result, queues and delays will take longer to establish and thus be underrepresented in the model. To overcome this problem and gain a more accurate reflection of reality, a 60-minute warm-up period has been provided as well as a 60-minute period at the end of the hour. The model time periods are therefore from 07:00 to 10:00, and16:00 to 19:00 hours for the AM and PM peaks respectively.

Figure 2.1: Model highway network

2.5 Buses

2.5.1 The bus services which travel through the model's network during the modelled time period are listed below. The route number is given and one direction of travel:

- 28 Woking – Knaphill – Guildford
- 34 Camberley – Woking – Guildford
- 35 Lightwater/Camberely – Woking – Guildford
- 48 Woking – Frimley Park Hospital
- 73 Woking – Chobham
- 81 Woking – Barnsbury Estate
- 91 Woking – Knaphill – Guildford
- 436 Woking – Byfleet – Weybridge
- 437 Woking – West Byfleet
- 446 Woking – Staines
- 459 Woking – Kingston
- 462 Woking – Guildford
- 463 Woking – Guildford
- 557 Woking – Heathrow Terminal 5
- 592 Woking – Brooklands/Lyne
- 701 Woking – Heathrow Airport

2.5.2 These bus routes have been simulated within the model. Their frequencies and timings were obtained from the following website: www.surreycc.gov.uk/buses (February 2015). Bus lanes on A320 Victoria Way and High Street were included within the model.

2.5.3 Bus stops were incorporated into the model. Their locations were obtained from: www.surreycc.gov.uk/buses (February 2015). Where available, dwell times at stops were taken from Surrey's RTPI system. At other stops, stopping durations of 10-70 seconds were assigned depending on location. Dwell times at the bus station are longer, reflecting the extended layover times.

2.6 Traffic Surveys

2.6.1 The traffic surveys that have been used in the development of the model are listed in **Table 2.1**. These include manual classified counts (MCC), automatic traffic counts (ATC), manual classified turning counts (MCTCNT) and journey time surveys.

2.6.2 **Figure 2.2** geographically presents these traffic surveys, with the exception of the observed journey time routes.

Location	Type	Date
A3046 Kettlewell Hill, between D3654 Horsell Rise and D3659 Wheatsheaf Close	Automatic traffic count (real time)	1/11/12-30/11/12
A3046 Chobham Road roundabout with C140 Brewery Road	Manual classified turning count	24/04/2012
A324 Lockfield Drive; between D3635 Well Lane and A320 Victoria Way	Automatic traffic count (real time)	1/11/12-30/11/12
A324 Lockfield Drive; j/w D3635 Well Lane	Manual classified turning count	01/07/2014
A320 Guildford Road; between D3713 Hill View Road and C141 York Road	Automatic traffic count	27/11/12 - 29/11/12
A320 Guildford Road; between C141 York Road and A320 Victoria Road	Automatic traffic count	27/11/12 - 29/11/12
A320 Station Approach; between A320 Victoria Road and D3079 Heathside Road	Automatic traffic count	27/11/12 - 29/11/12
A320 Victoria Way; between D7244 Goldsworth Road and D7281 Church Street West	Automatic traffic count	27/11/12 - 29/11/12
A320 Victoria Way; between D7424 Forge End and A324 Lockfield Drive	Automatic traffic count	27/11/12 - 29/11/12
A320 Victoria Way; between A324 Lockfield Drive and Peacocks Centre Car Park access	Automatic traffic count	27/11/12 - 29/11/12
A320 Victoria Way; between Peacocks Centre Car Park access and A3046 Chobham Road	Manual Classified Count	15/05/2012
A320 Chertsey Road; opposite D3660 Woodham Rise	Manual Classified Count	05/11/2008
A320 Guildford Road j/w C141 York Road	Manual Classified Count	22/04/2008
A320 Guildford Road j/w A320 Victoria Road and Victoria Road	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
A320 Guildford Road j/w A320 Victoria Road/Station Approach and D3709 Heathside Road	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
A320 Guildford Road j/w D7281 Church Street West and C143 Church Street West	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
A320 Victoria Way j/w D7244 Goldsworth Road	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
A320 Victoria Way j/w D7242 Forge End	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
A320 Victoria Way j/w A324 Lockfield Drive	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
A320 Victoria Way j/w A3046 Chobham Road	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
C143 The Broadway j/w C143 Maybury Road and C143 Stanley Road	Manual Classified Turning Count	05/02/2014
C143 The Broadway j/w C143 High Street and D3662 Chertsey Road	Manual Classified Turning Count	13/02/2014
C143 Chertsey Road, roundabout with C143 Stanley Road and D3662 Church Street East	Manual Classified Turning Count	13/02/2014
D3708 Heathside Crescent, between D3710 Oriental Road and D3710 Park Road	Manual Classified Turning Count	17/03/2011
D3708 Heathside Crescent j/w D3710 Oriental Road	Manual Classified Turning Count	25/02/2014
D3710 Oriental Road j/w D3708 Heathside Crescent	Manual Classified Turning Count	25/02/2014
D3710 Oriental Road j/w D3708 White Rose Lane	Manual Classified Turning Count	25/02/2014

Location	Type	Date
D7244 Goldsworth Road j/w entrance to Morrisons	Manual classified turning count	19/03/2014
D7244 Goldsworth Road roundabout with D7281 Church Street West	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
D7281 Church Street West j/w D7242 Forge End	Manual Classified Turning Count from Vectos	23/11/2012 AM data only
D3708 Victoria Road j/w Station Approach and D3710 Oriental Road	Manual classified turning count	25/02/2014
D3708 Heathside Crescent j/w D3708 White Rose Lane	Manual classified turning count	17/03/2011
D3709 Pembroke Road; between Pembroke Gardens and Hockering Road	Manual classified turning count	17/04/13 - 25/04/13
D3709 Heathside Road j/w D3708 White Rose Lane	Manual Classified Count	24/11/2009
C143 High Street; between C143 Cawsey Way and D3662 Chapel Street	Automatic traffic count	27/11/12 - 29/11/12
Brewery Road Car Park	Manual classified turning count	12/03/2014
Heathside Crescent Car Park	Manual classified turning count	06/03/2014
Station Car Park – Long Stay (Oriental Road)	Manual classified turning count	05/03/2014
Shoppers Car Park (Toys R Us)	Automatic traffic count	27/11/12 - 29/11/12
Peacocks Centre Car Park	Manual classified turning count	04/03/2014
Victoria Way Car Park	Manual classified turning count	06/03/2014

Table 2.1: Traffic surveys used to build the model

2.6.1 Journey times were acquired from Strat-e-gis Congestion, developed by Mott MacDonald. Strat-e-gis Congestion uses congestion data supplied by Trafficmaster plc that is mapped to the Ordnance Survey (OS) Integrated Transport Network (ITN) in order to calculate journey time by ITN link. The Trafficmaster data is obtained from GPS-equipped vehicles traversing the highway.

2.6.2 Tuesday to Thursday weekday data (excluding school holidays) was extracted for the academic year 2013/14 (01/09/13 – 31/08/14). This was used to calibrate and verify model values of delay, speed and journey times. The journey time routes that have been included in the model are shown in **Figure 2.3**.

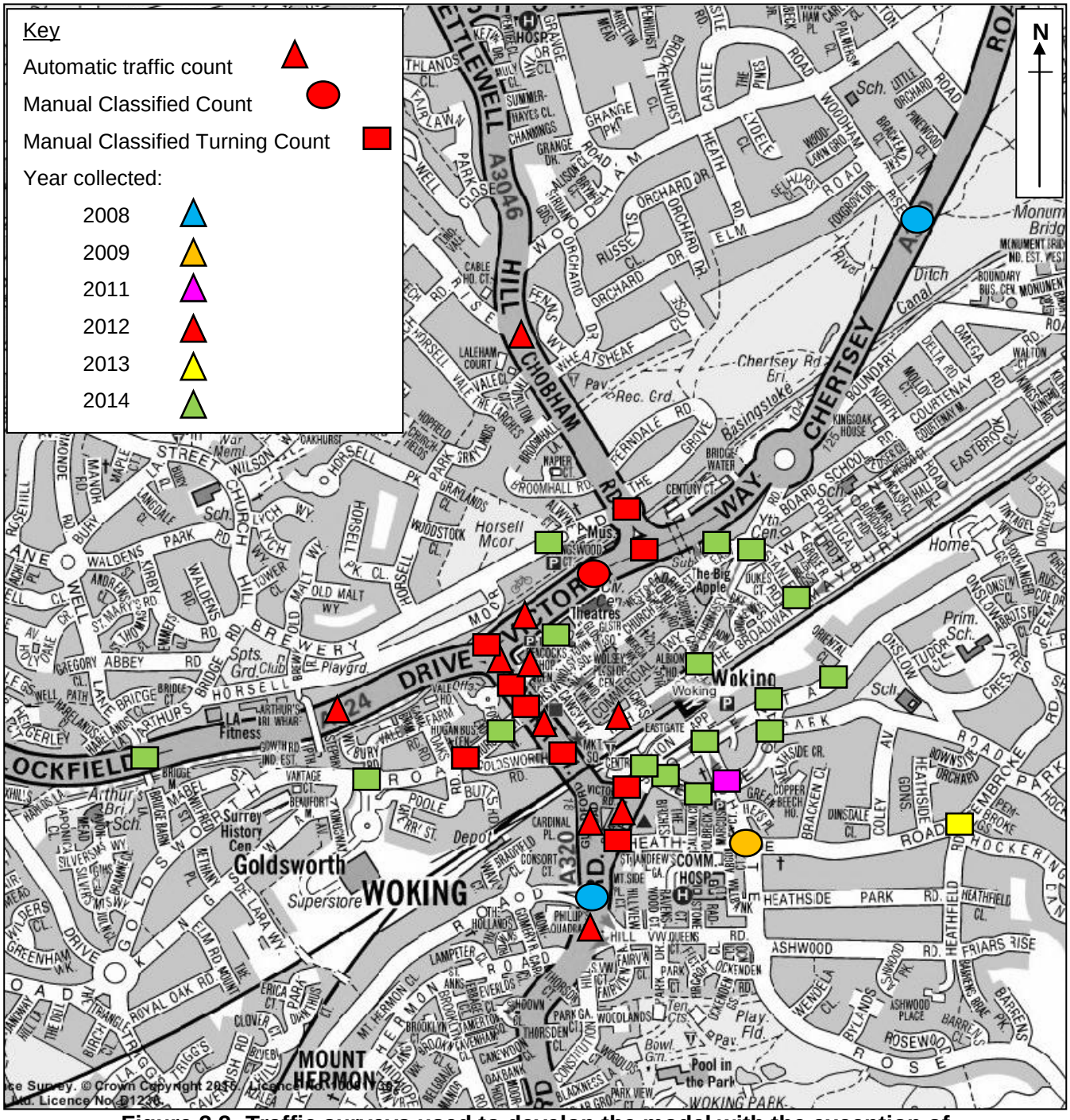


Figure 2.2: Traffic surveys used to develop the model with the exception of observed journey time routes

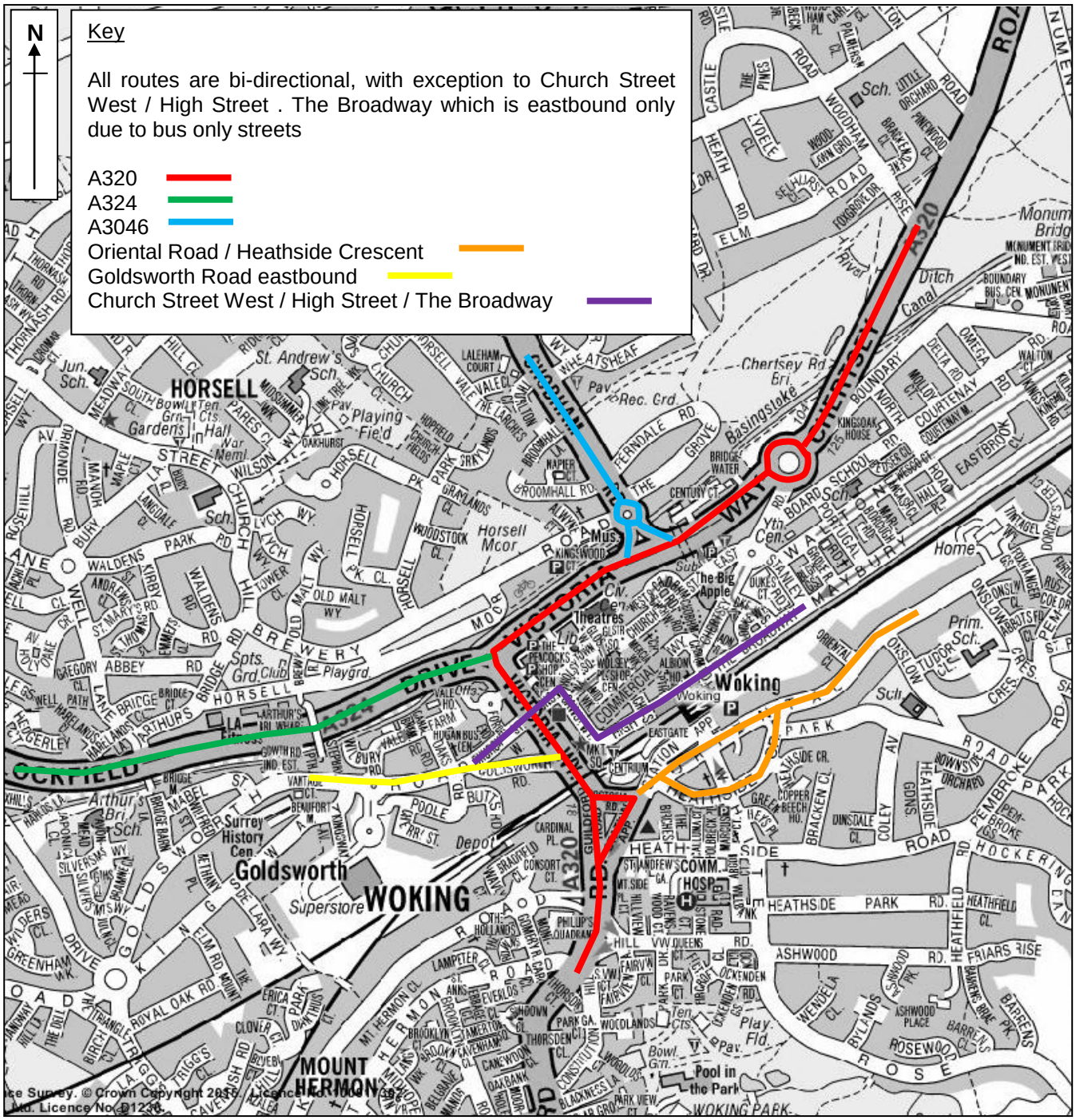


Figure 2.3: Journey time routes analysed

2.7 Traffic Signals and SCOOT Control

2.7.1 The majority of traffic signals within Woking town centre are operated by SCOOT (Split Cycle Offset Optimisation Technique) UTC (Urban Traffic Control). SCOOT UTC is an online computer that continuously monitors traffic flows over the whole network and optimises signal timings to decrease delay and improve traffic flow.

2.7.2 Some traffic signals in Woking are operated by MOVA (Microprocessor Optimised Vehicle Actuation). MOVA provides adaptive signal control for an individual junction that reacts to the on-street traffic conditions.

2.7.3 To replicate the SCOOT UTC and MOVA operation of the traffic signals in Woking town centre, two additional transport modelling software packages would need to

be utilised in conjunction with S-Paramics, SCOOTLink and PCMOVA. Although it would be preferable to develop the model by linking it to SCCOTLink and PCMOVA, it would also cause certain restrictions on future use of the model such as: increased model run times; limitation of only being able to operate the model on two specific computers in Surrey County Council; alterations required to UTC and MOVA datasets for any option tests; and limited options for the model to be licensed to consultants for option testing if required.

2.7.4 Therefore it was thought most beneficial that such UTC and MOVA junctions are represented by average signal timings, sourced from the UTC database and MOVA logs where possible. This will enable the model to be used for quick testing of any future option layouts and by other consultants if needs be.

2.7.5 Signal settings for these signalled junctions and crossings were obtained from Surrey County Council's Network Management and Information Centre. This includes the phasing, staging, minimum, maximum and average green times, as well as intergreens.

2.7.6 **Figure 2.4** presents all the traffic signals and pelican/puffin/toucan crossings that are within the study area and have been simulated within the model, including those that are operating under MOVA and SCOOT control. Further information regarding their calibration is presented in **section 3.15**.

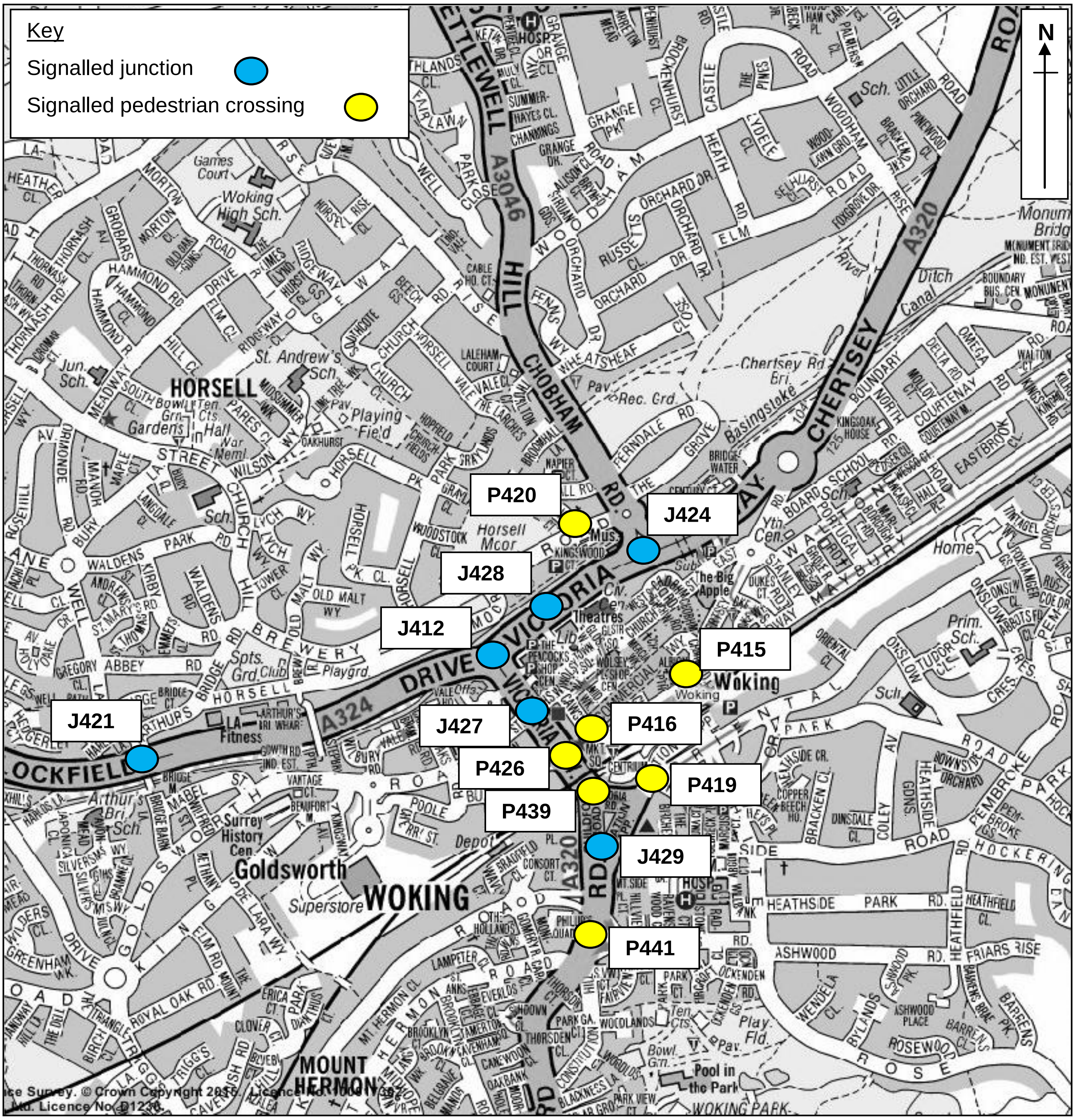


Figure 2.4: Traffic signals simulated within the model

2.8 <u>Vehicle Classifications & Proportions</u>

2.8.1 The following vehicle types have been simulated: cars; Light Goods Vehicle (LGV); Oversized Goods Vehicle 1 (OGV1); and Oversized Goods Vehicle 2 (OGV2).

2.8.2 Two matrix levels were utilised in the model, based on vehicle type. Matrix level one consisted of light vehicles, cars and LGVs, whereas matrix level two consisted of heavy vehicles, OGV1 and OGV2.

2.8.3 The classification and proportions used in the model are shown in **Table 2.2**.

2.8.4 Although observed count data was available for bicycles and motorcycles, these vehicle types were excluded from the model.

Vehicle Type	AM Peak Period (07:00 – 10:00)	PM Peak Period (16:00 – 19:00)
Matrix Level 1 – Light Vehicles		
Car	90.000	93.000
LGV	10.000	7.000
Total	*100*	*100*
Matrix Level 2 – Heavy Vehicles		
OGV1	80.000	82.000
OGV2	20.000	18.000
Total	*100*	*100*

Table 2.2: Vehicle proportions

3 CALIBRATION

3.1.1 This section describes the following aspects of the calibration of the model:

- Matrix estimation;
- Profiles;
- The chosen routeing assignment and the adjustment of routeing factors and link costs;
- Visual check and adaptation of the network to ensure the appropriate level of congestion is replicated.

3.1.2 All parameters that have been adjusted from their default settings during model calibration have been noted below.

3.2 Matrix Estimation

3.2.1 Matrices define the number of vehicles travelling from, and to, each zone.

3.2.2 The traffic survey data presented in **Table 2.1** was used to build the demand matrices. The majority of the demand matrices were built using this data. Car park surveys provided origin and destination data for zones representing car parks in the town centre. The survey data, however, did not cover all the potential origin and destination pairs in the model. As a result, sections of the demand matrices were inferred. This was achieved by applying simple heuristics describing the likelihood of a particular type of journey from origin and destination zones, and estimated from observed counts.

3.2.3 Together, this data enabled prior matrices to be developed. These were then simulated, results were analysed and the demand matrices were altered accordingly, but with consideration of the origin and destination data collected. For each peak period, this process was iterated many times until modelled traffic flows were appropriate and the model reflected observed areas of congestion.

3.3 Matrix Levels

3.3.1 To improve the realism of the model, the demand matrixes have been split into two matrix levels based on vehicle type. As previously stated the matrix levels have been defined as follows:

- Matrix level 1: car and LGV; and
- Matrix level 2: OGV1 and OGV2.

3.3.2 The matrix levels give greater control of routeing through the model. For example it was used to prevent heavy goods vehicles from entering town centre car parks where such restrictions apply.

3.3.3 The demand matrices for the weekday AM and PM peak periods are presented in **Appendix I** and **II** respectively. The trip matrix totals are 15,770 for the AM peak (0700 – 1000) and 18,423 for the PM peak period (1600 – 1900).

3.4 Demand Profiles

3.4.1 Demand profiles determine the proportion of the demand matrix that is assigned to the highway network in 5-minute intervals.

3.4.2 Despite there being a large number of observed counts available, only a few were collected in the 5 to 15 minute time intervals required to create demand profiles.

3.4.3 14 profiles were developed for use in the model. Each zone to zone movement was assigned the most appropriate profile. The profiles are as follows:

1) A324 Lockfield Drive ahead to town centre (zone 1 ahead)
2) A324 Lockfield Drive left to Well Lane (zone 1 left)
3) A324 Lockfield Drive (zone 1 all)
4) Well Lane left to town centre (zone 2 left)
5) Well Lane right to Brookwood (zone 2 right)
6) Brewery Road (zone 3 all)
7) A320 Chertsey Road (zone 5 all)
8) Oriental Road (zone 8 all)
9) Goldsworth Road (zone 13 all)
10) Church Street East (zone 22 all)
11) Departures from all shoppers car parks
12) Arrivals to all shoppers car parks
13) Departures from all commuting car parks
14) Arrivals to all commuting car parks

3.4.4 **Appendix III** presents the profile assignment for all model zones.

3.5 Routeing – Generalised Cost Equation

3.5.1 Information regarding routeing has been taken from the "*S-Paramics 2005 Reference Manual*" (SIAS Limited, 2005).

3.5.2 Routeing assignments control vehicle behaviour and route choice.

3.5.3 The route cost calculation is used to determine the perceived cost of an individual link, representing a combination of factors that drivers take into account when choosing routes, including time (T), distance (D) and costs (P).

3.5.4 The base cost for links is calculated using the generalised cost equation (GCE):

$Cost = a * T + (60 * b * D) + c * P$

where:

- a is the time coefficient (1.0)
- b is the distance coefficient (0.25)
- c is the toll cost coefficient (0.0)
- T is the travel time in minutes
- D is the length of the link in minutes
- P is the price of the toll in monetary cost units

3.5.5 It was determined that the best weighting of coefficients to represent driver behaviour within Woking was 1.0 for time and 0.25 for distance, in line with the county transport model SINTRAM. This means that drivers are more likely to choose the quickest route over the shortest route.

3.6 Routeing – Assignment

3.6.1 Stochastic dynamic assignment was chosen as the most suitable assignment method. This uses the current level of congestion in the road network to modify the route cost calculation of the familiar drivers using feedback. The actual cost to traverse a link, and to move out of it, were used in the calculation, rather than the cost derived from the speed and length of the link (the empty network cost).

3.6.2 Dynamic feedback assignment calculates the true cost of congested links by including the delay encountered by vehicles already on the network, in a constantly updated cost equation.

3.6.3 Links that produce a low cost in an empty network, and hence will be a popular route choice, will produce a higher cost once congestion starts to build up, making alternative routes more attractive. As the congestion reduces, the costs will also reduce, and the route will become attractive once more.

3.6.4 The frequency with which this information is updated, and made available to vehicles in the network, is called the feedback interval. The interval used in this model was 2 minutes.

3.6.5 A feedback factor of 0.5 was used. This factor is the controlling coefficient in the feedback equation:

$V_{new} = a * V_{now} + (1 – a) * V_{old}$

where:

- a is the feedback coefficient
- V is the cost of making a particular turn from a link
- V_{new} is the new value used in routeing calculations
- V_{old} is the value used in previous routeing calculations
- V_{now} is the measured value in the last feedback period

3.7 Routeing – Perturbation

3.7.1 Stochastic assignment uses perturbation. Perturbation is a way of applying variance in the cost of undertaking a journey when there is a choice of routes.

3.7.2 Perturbation parameters control the variance in the true cost, when selecting which turn to make at each junction encountered on a journey. If there is route choice at a junction, each vehicle will calculate the true cost for each possible route, using the GCE, and then take a random perturbation of that cost, as shown below. The route with the lowest perturbed 'newcost' will be selected.

*newcost = truecost + (truecost * variance / 100)*

where:

(-perturbation) < variance < (+perturbation)

3.7.3 The cost is perturbed using a percentage algorithm. This is a simple randomisation of the derived cost, with an even probability of the cost lying in the range ±1% around the derived cost. For example, a perturbation level of 5 will produce a variance of ±5% from the cost produced by the GCE.

3.7.4 **Table 3.1** shows the perturbation routeing factors applied in the model for each vehicle type.

Vehicle Type	Perturbation
Car	**5**
LGV	**5**
OGV1	**5**
OGV2	**5**

Table 3.1: Perturbation routeing factors

3.8 Routeing – Familiarity

3.8.1 Familiarity is a term used in S-Paramics to describe the likely behavioural characteristics within a driving population. The familiarity routeing factors used in the model are presented in **Table 3.2**.

Vehicle Type	Familiarity
Car	**60**
LGV	**60**
OGV1	**20**
OGV2	**20**

Table 3.2: Familiarity routeing factors

3.8.2 Familiar drivers do not perceive any difference between a minor or major link, whereas unfamiliar drivers perceive minor links to be more expensive and thus will be more likely to travel along major links.

3.8.3 Both familiar and unfamiliar drivers use major links. These are assumed to be signposted and tend to have high traffic flows.

3.8.4 Minor links are assumed not to be signposted, such as residential streets, access roads and rat runs.

3.8.5 The road hierarchy of the model is shown in **Figure 3.1**.

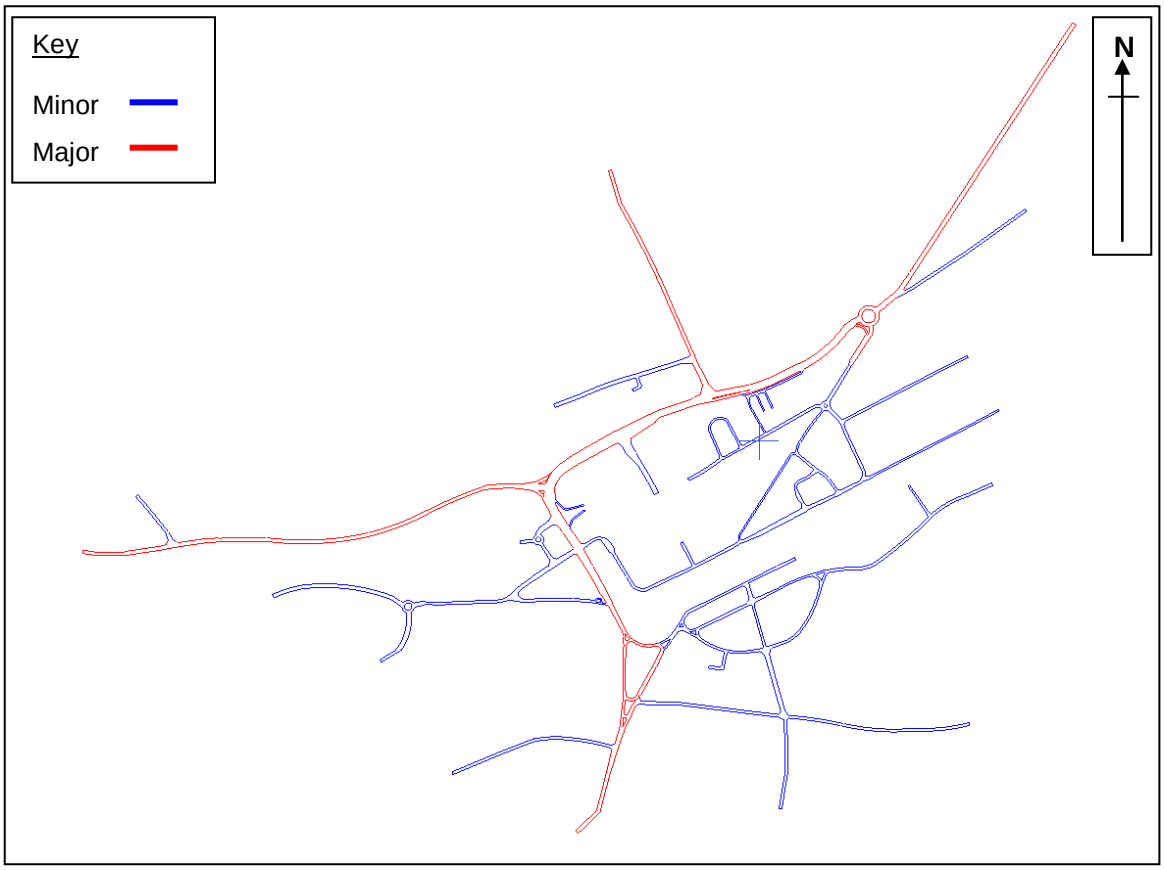


Figure 3.1: Modelled road hierarchy, coded major and minor links

3.9 Routeing – Cost Factors

3.9.1 Cost factors are multiplication factors that have been added to certain links to further influence the road hierarchy.

3.9.2 The default for each link is 1.0. **Figure 3.2** shows the link costs that have been adjusted from their default value of 1.0 in both the AM and PM peak periods. Costs were adjusted to prevent rat running and control vehicle routeing through the model.

Figure 3.2: Weekday AM and PM peak period cost factors *(default is 1.0)*

3.10 Demand Release Algorithm

3.10.1 The demand release algorithm employed in the model is precise.

3.10.2 Precise demand attempts to release the exact number of vehicles in each 5-minute interval defined by the matrix and the profile.

3.11 Visibility for Give-Way Movements

3.11.1 The visibilities of all give-way movements defined within the model were assessed to meet observed conditions.

3.11.2 Visibility is defined in the model as the distance (in metres) away from the junction at which vehicles decide whether they are able to pull out into available gaps.

3.11.3 **Table 3.3** sets out the description of the various visibility parameters applied within the model. A value of 0 metres means that all vehicles will stop at the give-way line before pulling away.

Description	Visibility Value
No visibility	0m
Poor visibility	1 – 10m
Medium visibility	11 – 20m
Good visibility	20 – 30m

Table 3.3: A description of applied visibility values

3.12 GA Look Next

3.12.1 GA stands for gap acceptance. The “GA Look Next” function can be toggled on individual links and signifies that a vehicle leaving the associated link through an opposed turn will look into the link that opposes it and into the link prior to that one. As a result this has been applied for opposed movements at junctions where the immediate link is very short and those giving way have needed to look beyond the first adjacent link.

3.13 Gradients

3.13.1 The height above sea level for each node was inserted so that gradient could be taken into account in the model. Gradient, however, only influences the acceleration and deceleration of heavy vehicles.

3.14 Mini-Roundabouts

3.14.1 Mini-roundabouts that have a central island of less than 4 metres have been coded as a priority junction, with the first exit movement as a minor turn and all other movements to a medium turn. This is in line with S-Paramics guidance and applicable to the following junctions:

- Junction of D7244 Goldsworth Road with D7281 Church Street West; and
- Junction of A3046 Chobham Road with C140 Brewery Road.

3.15 Traffic Signals

3.15.1 Green times were calibrated according to observed average signal timings from the UTC database where possible, or calibrated within their maximum and

minimum allowances using observed values of delay from Trafficmaster data accessed via CJAMS.

3.15.2 Where junctions operate independently, the activation of pedestrian stages within signalled junctions, and pelican and puffin crossings was varied using a Poisson distribution within the "plans" file. The "plans" file is presented in **Appendices IV and V** for the AM and PM peaks respectively.

3.15.3 The level of activations per hour for each pedestrian stage was based on their locality. For example, the crossings situated in the vicinity of the town centre that pedestrians are likely to use in both the peaks were considered to have a high demand for pedestrians, especially P415 due to its proximity to the railway station. For this reason the probability of activation was given to be the probability of a randomly generated number each timestep being less than 18 for a Poisson distribution with a mean value of 11. This equates to the pedestrian phase being called on average 41 times per hour, or every 88 seconds. Using probability also ensures that there is a level of variability between model runs, as there would be on-street from day to day.

3.15.4 Zebra crossings were represented in the model using the same Poisson distribution as signalised pedestrian crossings. Therefore zebra crossings were also modelled as having variable use according to probability.

3.16 Calibration of Problem Areas

3.16.1 For the majority of the model network, no adjustment was required to the program's default values as observed conditions were replicated well. For some junctions or sections of carriageway, however, congestion levels were not reflecting on-street conditions and resulted in the calibration of model parameters. These changes are documented in **Table 3.4** below, together with a description of the problem that was being rectified. These changes need to be considered in any future use of the model, including model forecasting, option testing and a review of the base model.

Location	Problem Description	Affected Nodes/Links	Calibration
A324 Lockfield Drive junction with Well Lane	Vehicles were not making sufficient use of both lanes on the eastbound approach to and through the junction.	2 and 3 See hazard overrides file in **Appendix VI.**	In order to override the default lane ranges within the model, a hazard overrides file was created which allows desired lane ranges to be set. This file can be found in **Appendix VI**. Use of hazard overrides allowed both lanes to be used and merging to occur after travelling through the junction, ensuring all capacity is sufficiently used as it would be on-street. Next lanes were also utilised.
A324 Lockfield Drive junction with A320 Victoria Way	Vehicles were not reflecting the lane discipline as it is marked on-street at this junction. This was occurring at all approaches to this junction, but there was a particular issue with the A320 Victoria Way westbound approach as vehicles did not want to make use of the second lane designated for turning right to A324 Lockfield Drive.	10, 11, 14, 15z and 229 171:15	Hazard overrides were utilised to ensure vehicles reflected on-street lane discipline. Next lanes were also utilised. A “dummy lane” was used to make sure vehicles used both lanes to turn right from A320 Victoria Way to A324 Lockfield Drive. The use of hazard overrides was having no impact on this incorrect lane behaviour. It should be noted that on link 171:15 lane 4 is closed to all traffic and the stoplines have been re-positioned off the model network slightly.
A320 Victoria Way	Vehicles were not adhering to the correct lane discipline when travelling past the entrance to the Peacocks centre from the A320 Victoria Way westbound. Vehicles that were wishing to continue westbound on the A320 were utilising the designated left turn lane into the Peacocks Centre, which in reality would not be possible.	172:173	S-Paramics were contacted for guidance as to how rectify this problem in the model. S-Paramics suggested that the best way to rectify this was to make link 172:173 have a “dummy lane” as the use of hazard overrides was having no impact on this incorrect lane behaviour. It should be noted that on link 172:173 lane 4 is closed to all traffic and the stoplines have been re-positioned off the model network slightly.

Location	Problem Description	Affected Nodes/Links	Calibration
A320 Victoria Way	Vehicles travelling westbound on the A320 between access to/from the Peacocks centre and signalised junction with A324 Lockfield Drive were not getting in the correct lanes and making use of all available capacity.	171:15 15:229 229:14	Hazard overrides were utilised to ensure vehicles reflected on-street lane discipline
A320 Victoria Way	Vehicles were not making sufficient use of both lanes before having to merge on the A320 Victoria Way southbound, prior to travelling through the railway arch.	20:42	Use of hazard overrides allowed both lanes to be used and merging to occur ensuring all capacity is sufficiently used as it would be on-street. Next lanes were also utilised.
Access to and from Victoria Way car park	Many vehicles were using the segregated road that facilitates the entrance and exit to Victoria Way car park when congestion increased on the A320 Victoria Way southbound.	167z:168 168:161 163:166 166:617	Cost value was increased on the stated links from the default value of 1 to 10. The locations of these links are shown in **Figure 3.2**.
Roundabout of A320 Chertsey Road with A320 Victoria Way and C143 Chertsey Road	Vehicles approaching the roundabout from C143 Chertsey Road were not representing the lane discipline that is marked on street.	156:157 156:145b	Next lanes were utilised to ensure that vehicles travelled in the correct approach lanes to the roundabout from C143 Chertsey Road.
Signalised pedestrian crossing (J428) on A320 Victoria Way	Vehicles were traversing through the signalised pedestrian crossing with a large amount of lane switching due to nodes being in close proximity and other hazards located downstream. This was occurring in both the eastbound and westbound direction of travel.	170 and 172	Next lanes were utilised to ensure that vehicles did not undertake an unrepresentative amount of lane switching when passing through the signalised pedestrian crossing.
Junction of A320 Victoria Way with access to/from the Peacocks Centre	Vehicles were not using the correct lanes to turn right and left when exiting the Peacocks centre.	171	Hazard overrides were utilised to ensure vehicles reflected on-street lane discipline.
A320 Victoria Way junction with A3046 Chobham Road	Vehicles travelling eastbound on the A320 through the junction with A3046 Chobham Road were not making use of all lanes available.	160	Next lanes were utilised to ensure that vehicles travelled in both lanes when passing through the junction, thus making use of all capacity.

Location	Problem Description	Affected Nodes/Links	Calibration
A320 Victoria Road/Station Approach junction with D3708 Victoria Road	Vehicles were taking too long to pull out from D3708 Victoria Road and not making the most of "gaps" in the opposing traffic flow, therefore there was not enough throughput from the minor arm of the junction.	98:59	The D3708 Victoria Road's lane merge and lane cross values were altered from the default values of 4 seconds to 0 seconds.
A320 Guilford Road junction with A320 Victoria Road	Vehicles were taking too long to pull out from A320 Guildford Road and not making the most of "gaps" in the opposing traffic flow, therefore there was not enough throughput from the minor arm of the junction.	57:54	The A320 Guildford Road's lane merge and lane cross values were altered from the default value of 4 seconds to 2 seconds.
White Rose Lane between Heathside Road and Heathside Crescent	White Rose Lane in a northbound and southbound direction was being used as a rat-run as a means of avoiding the congested A320. Therefore there was too much flow making use of White Rose Lane in both directions and time periods of the model.	85:223 223:77 77:223 223:85	Cost value was increased on White Rose Lane northbound from the default value of 1 to 3, whereas in a southbound direction of travel costs were increased to a value of 5.
A320 Chertsey Road	Not enough delay was being encountered when vehicles were travelling northbound out of the model study area. In reality vehicles would be continuing their journey to approach Six Crossroads roundabout.	207:189	In the AM peak an end stop time of 1 second and end speed of 15mph have been coded to reflect delay at the approach to Six Crossroads roundabout which is located just outside the model area. In the PM peak an end stop time of 2 seconds and end speed of 5mph have been coded.

Table 3.4: Calibration of problem areas

4 VALIDATION

4.1.1 Following the completion of the calibration stage, validation was undertaken. Where possible, independent data from that employed during calibration was used. The validation stage aims to prove that the model performs reliably, sensibly and reflects observed traffic flow conditions.

4.2 Methodology

4.2.1 The steps involved during the validation stage are as follows:

- Traffic flows; and
- Journey times.

4.2.2 Guidelines for model validation are set out in WebTAG unit M3.1 'Highway Assignment Modelling' (DfT, 2014).

4.2.3 The standard method of comparison is to compare modelled values against observed.

4.2.4 The GEH statistic is recommended as a main indicator of comparison of traffic flows. It is a form of the Chi-squared statistic that incorporates both absolute and relative errors. The GEH statistic is defined as:

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

where, M = modelled flow
C = observed flow

4.2.5 General guidance on the GEH statistic is: a GEH below 5 represents a high level of acceptability, while those above 10 are viewed as unacceptable.

4.2.6 **Table 4.1** sets out the assignment acceptability guidelines, taken from WebTAG, which have been used to validate the model.

Criteria and Measures		Acceptability Guideline
Assigned Modelled Hourly Flows Compared with Observed Flows		
1. Observed flow < 700 vph	Modelled flow within ± 100 vph	> 85% of cases
2. Observed flow 700 – 2,700 vph	Modelled flow within ± 15%	
3. GEH Statistic for individual flows < 5		
Modelled Journey Times Compared with Observed Times		
5. Times within 15% (or 1 minute, if higher)		>85 % of cases
All comparisons should be based on directional hourly flows		

Table 4.1 Assignment acceptability guidelines

4.2.7 Multiple runs were carried out using a seed value of 0. Using a seed value of 0 generates a different random seed value each run. The seed value is a random number generator. It is used to determine the release times and the random assignment of attributes within the model, such as the aggression and release of each vehicle.

4.2.8 In this case, each time period was run with 20 random seed values. All presented model outputs for each peak are an average of these 20 runs. This ensures that the model considers natural daily variation.

4.3 Traffic Flows

4.3.1 **Appendices VII** and **VIII** show the weekday AM and PM peak hour flow validation results for individual turning movements. A summary of the validation results is provided in **Table 4.2**.

	Number of Counts Meeting Criteria	% Meeting Criteria	Within DfT Acceptability Guidelines
Individual Turning Counts			
AM PEAK HOUR (0800 – 0900)			
Total number of counts	168		
Average GEH	3.02		
Maximum GEH	14.69		
GEH>10	3		
GEH<10	165		
GEH<5	142	85%	Yes
Flow criteria (see WebTAG guidance)	151	90%	Yes
PM PEAK HOUR (1700 – 1800)			
Total number of counts	112		
Average GEH	2.96		
Maximum GEH	15.70		
GEH>10	2		
GEH<10	110		
GEH<5	96	86%	Yes
Flow criteria (see WebTAG guidance)	102	91%	Yes

Table 4.2: A summary of weekday AM and PM peak hour traffic flow validation results

4.3.2 In the AM, peak 85% of observed movements met the GEH criteria and 90% the flow criteria. The GEH statistic meets the WebTAG desired acceptance level of 85% and the flow statistics exceeds the criteria. In the PM peak both GEH and flow exceeds the WebTAG desired acceptance level with 86% of observed movements meeting the GEH criteria and 91% the flow criteria.

4.3.3 Linear regression, presented in **Figure 4.1** and **4.2**, shows that the degree of correlation between modelled and observed flows results in a R^2 value of 0.96 in both the AM and PM peaks. A value of 0 would indicate no correlation between the flows, whilst a value of 1 would indicate perfect correlation. A value above 0.95, as in this model, is typically considered a good representation of observed flows within the model.

4.3.4 **Figure 4.3** and **4.4** present the cumulative frequency of GEH for the AM and PM peak hours respectively.

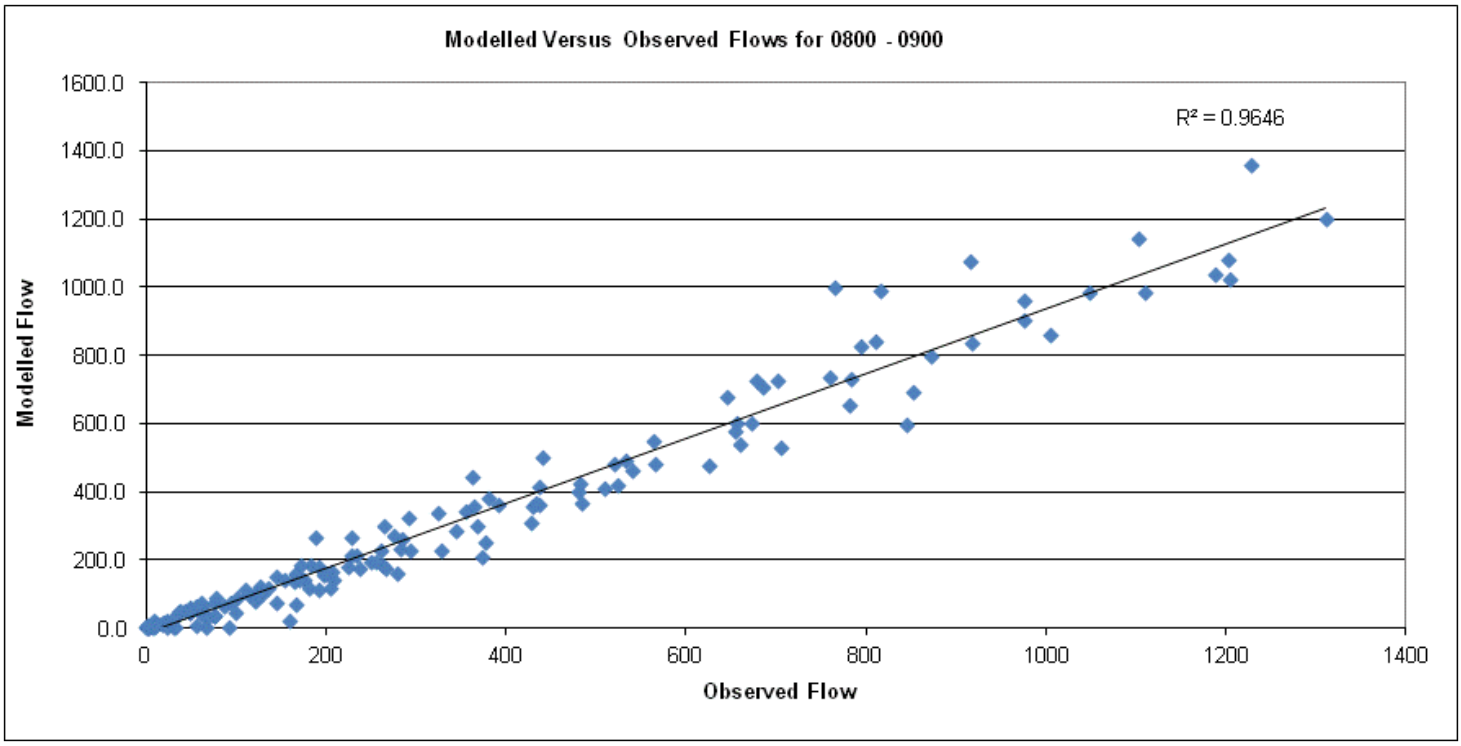


Figure 4.1: Graph showing the correlation between observed and modelled flows for the AM peak hour (0800 – 0900)

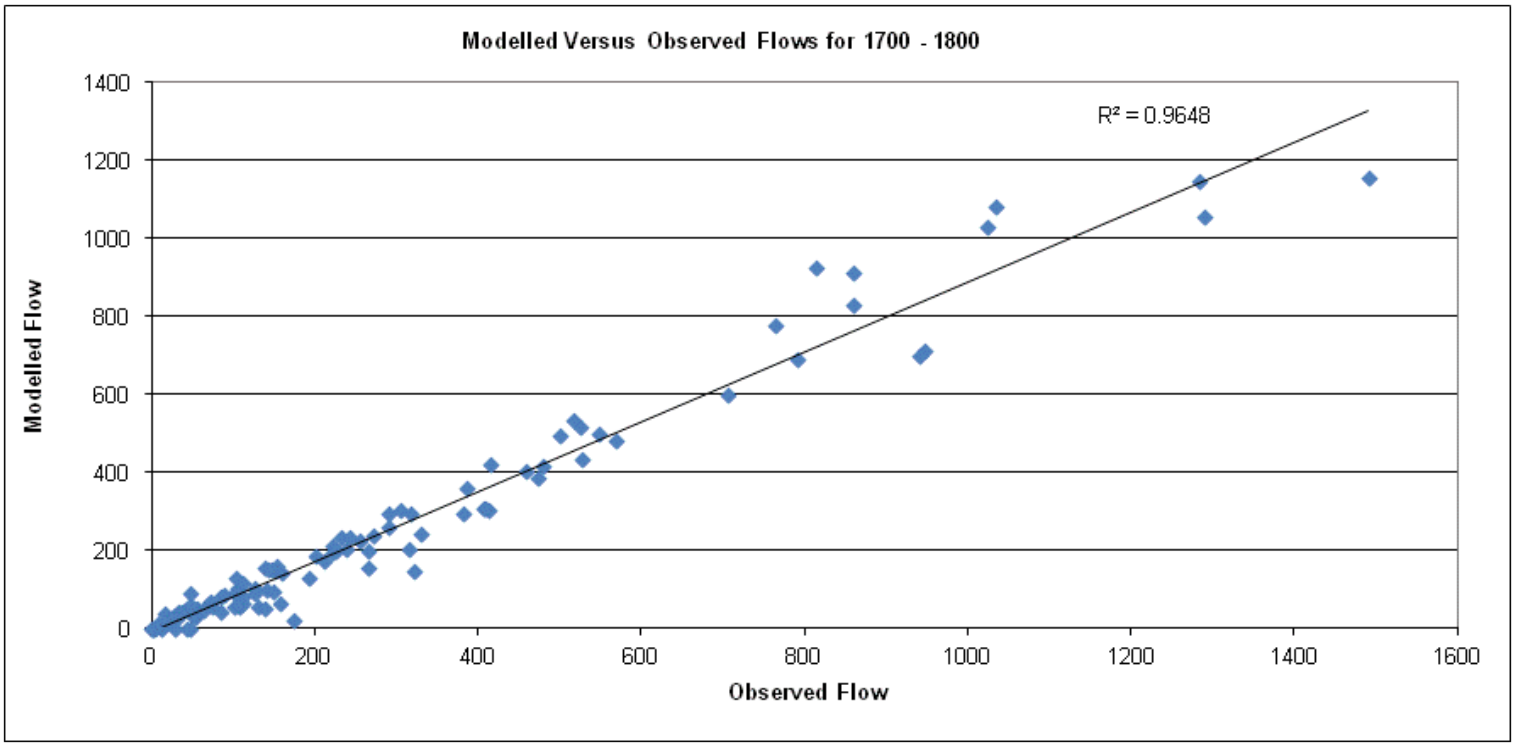


Figure 4.2: Graph showing the correlation between observed and modelled flows for the PM peak hour (1700 – 1800)

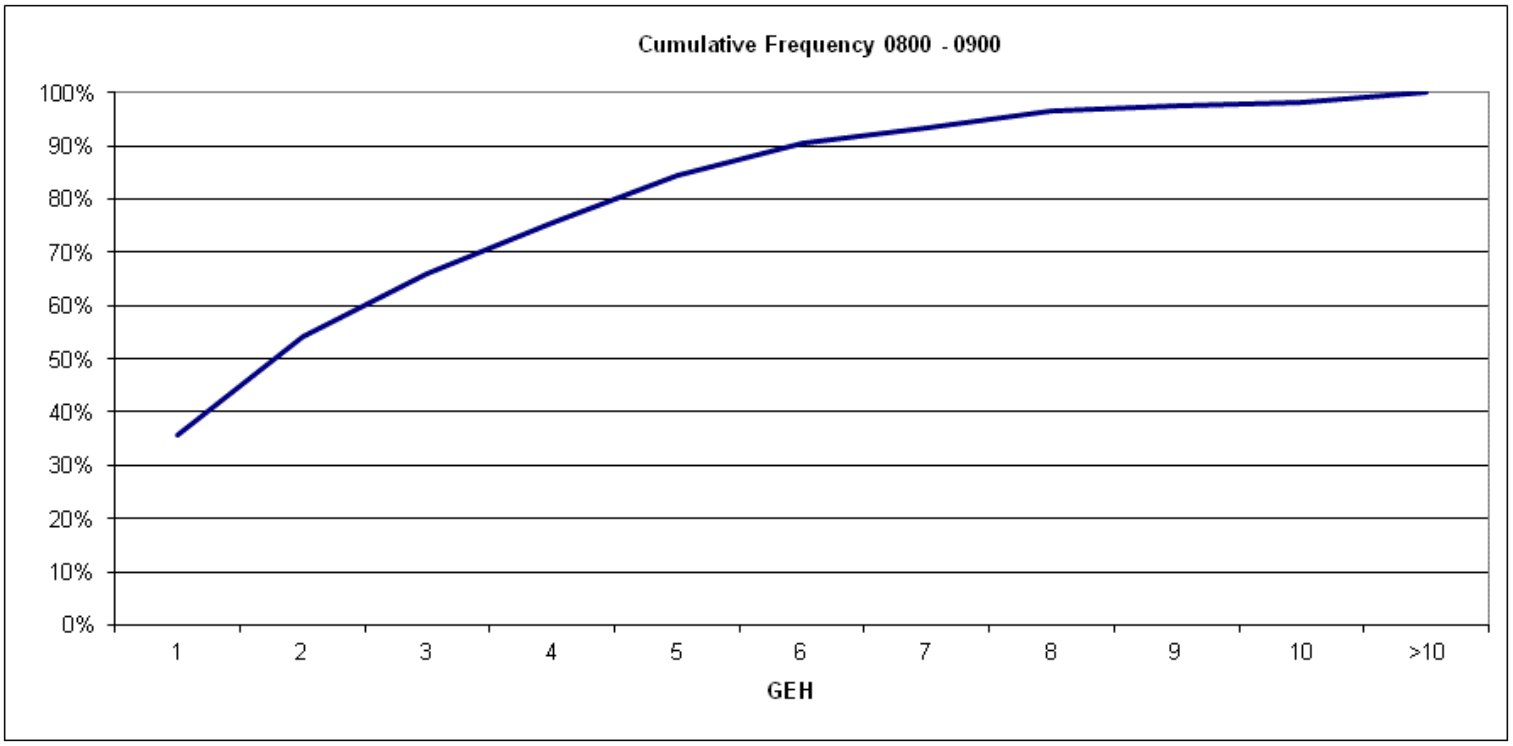


Figure 4.3: Graph showing the variation of GEH for the AM Peak hour (0800 – 0900)

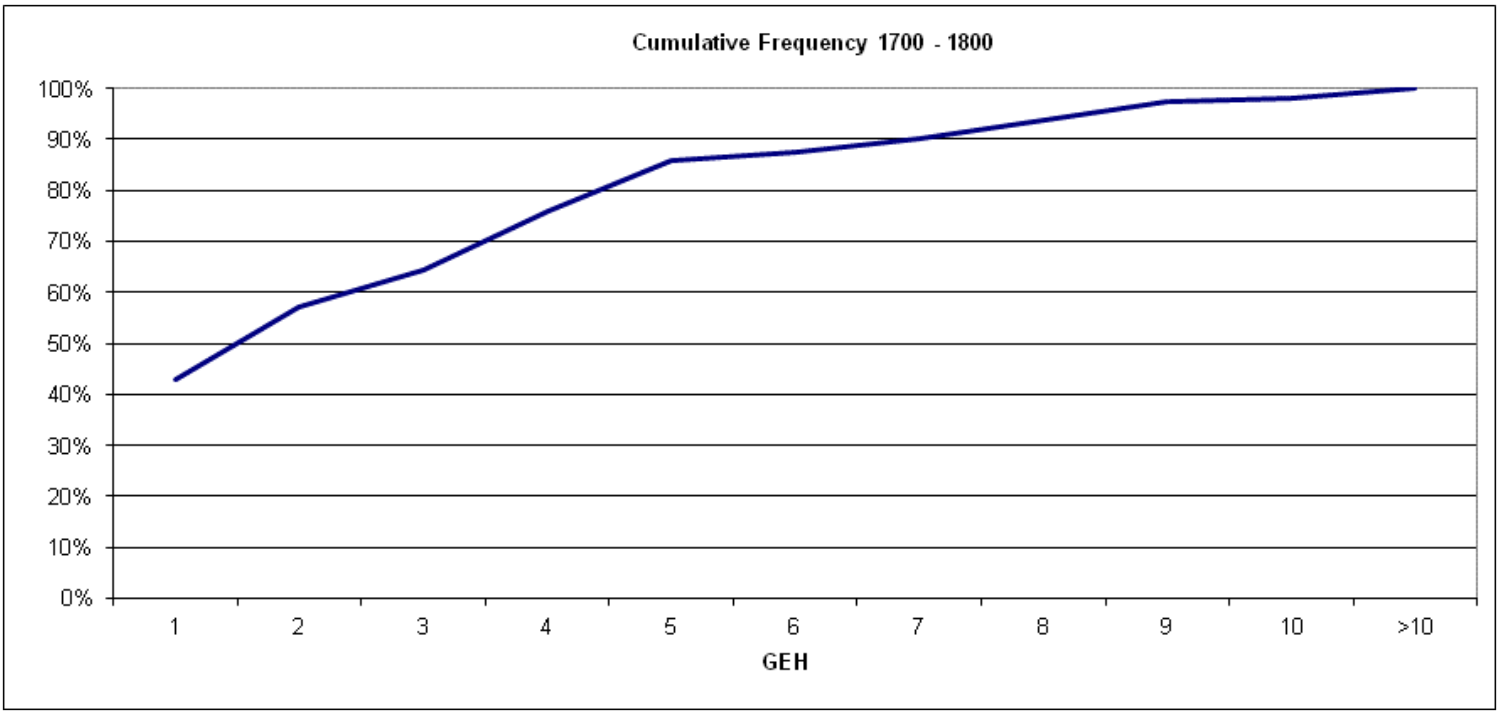


Figure 4.4: Graph showing the variation of GEH for the PM Peak hour (1700 – 1800)

4.4 Journey Times

4.4.1 Evaluation of modelled and observed journey times provides a good indication of how well the model is replicating delay, especially as the observed data is extensive both in terms of area coverage and the sample size.

4.4.2 **Tables 4.3** and **4.4** compare the observed journey time routes with those extracted from the model. The journey time routes that have been evaluated are shown geographically in **Figure 2.3** for reference.

4.4.3 With reference to the criteria set out in **Table 4.1**, the model successfully validates in both time periods. **Appendices IX** and **X** compare observed and modelled routes across the length of the analysed routes.

Route Description	Observed Time (secs)	Modelled Time (secs)	95% Confidence Interval		Difference	% Difference	Meeting Criteria ✓/✗
			Lower	Upper			
A320 Victoria Way northbound	455	332	413	496	-122	-27%	✗
A320 Victoria Way southbound	423	418	389	458	-5	-1%	✓
A324 Lockfield Drive eastbound	134	90	123	145	-44	-33%	✓
A324 Lockfield Drive westbound	92	71	86	99	-21	-23%	✓
A3046 Chobham Road northbound	43	34	34	52	-9	-20%	✓
A3046 Chobham Road southbound	121	94	106	136	-27	-23%	✓
Oriental Road eastbound	92	53	80	104	-39	-43%	✓
Heathside Crescent westbound	154	157	131	177	3	2%	✓
Goldsworth Road eastbound	99	52	84	113	-47	-48%	✓
Goldsworth Road westbound	81	58	68	94	-23	-29%	✓
Church Street West – The Broadway eastbound	227	167	155	298	-59	-26%	✓
Total number of routes that meet criteria	*10*						
Percentage of routes that meet criteria	*91%*						
Within DfT acceptability guidelines	*Yes*						

Table 4.3: Weekday AM peak hour journey time validation results (0800 – 0900)

Route Description	Observed Time (secs)	Modelled Time (secs)	95% Confidence Interval		Difference	% Difference	Meeting Criteria ✓/✗
			Lower	Upper			
A320 Victoria Way northbound	406	367	371	441	-39	-10%	✓
A320 Victoria Way southbound	438	502	409	466	65	15%	✓
A324 Lockfield Drive eastbound	86	104	81	91	19	22%	✓
A324 Lockfield Drive westbound	150	93	140	161	-57	-38%	✓
A3046 Chobham Road northbound	42	35	35	49	-7	-16%	✓
A3046 Chobham Road southbound	60	91	53	66	32	53%	✓
Oriental Road eastbound	82	55	71	93	-27	-33%	✓
Heathside Crescent westbound	175	136	156	194	-39	-23%	✓
Goldsworth Road eastbound	91	147	82	100	56	61%	✓
Goldsworth Road westbound	96	72	79	112	-23	-24%	✓
Church Street West – The Broadway eastbound	293	259	219	368	-34	-12%	✓
Total number of routes that meet criteria	*11*						
Percentage of routes that meet criteria	*100%*						
Within DfT acceptability guidelines	*Yes*						

Table 4.4: Weekday PM Peak hour journey time validation results (1700 – 1800)

4.5 Model Stability

4.5.1 **Table 4.5** sets out the model stability acceptability guidelines, also taken from WebTAG unit M3.1. This has been used to assess the stability of the model over multiple runs.

Measure	Acceptability Guideline
Delta	Less than 0.1% or at least stable with convergence fully documented and all other criteria met
Percentage of links with flow change (P)<1%	Four consecutive iterations greater than 98%
Percentage change in total user costs (V)	Four consecutive iterations less than 0.1%

Table 4.5: Models stability acceptability guidelines

4.5.2 **Table 4.6** presents the model stability results for the AM peak hour and the PM peak hour for the last 10 of 20 model runs. The absolute average difference (AAD) and relative absolute average difference (RAAD) in link flows as well as the standard deviation are also presented.

Comparison	AAD	RAAD	%FLOW	STDEV	DELTA	V
AM PEAK HOUR (0800 – 0900)						
11	13.26	1.65	98.34	100.00	1.29	2.15
12	11.23	1.27	96.95	100.00	1.10	0.26
13	9.44	1.04	99.17	100.00	0.91	1.05
14	8.18	0.92	98.34	100.00	0.79	0.04
15	7.24	0.84	98.34	100.00	0.67	0.05
16	4.71	1.29	97.23	100.00	0.41	3.60
17	5.41	0.56	99.45	100.00	0.52	0.35
18	5.09	0.60	98.89	100.00	0.46	0.61
19	4.17	0.48	99.45	100.00	0.38	1.37
20	4.12	0.53	99.45	100.00	0.37	0.52
Criteria Met	**-**	**-**	✓	**-**	×	×
PM PEAK HOUR (1700 – 1800)						
11	17.52	1.98	96.40	100.00	1.76	1.12
12	15.87	1.59	98.34	100.00	1.52	1.00
13	13.91	1.29	98.34	100.00	1.37	1.89
14	5.60	0.87	97.78	100.00	0.60	1.98
15	10.95	1.27	98.34	100.00	0.97	2.92
16	10.37	1.05	98.61	100.00	0.98	2.12
17	9.94	0.96	99.45	100.00	0.95	0.30
18	8.71	0.89	98.61	100.00	0.85	0.12
19	7.04	0.75	98.61	100.00	0.64	1.52
20	18.97	1.67	98.89	100.00	1.79	1.28
Criteria Met	**-**	**-**	✓	**-**	×	×

Table 4.6: Summary of AM and PM peak hour model stability results

4.5.3 The results presented in **Table 4.6** indicate that the 2014 base model does not meet the model stability criteria set out in WebTAG, relating to delta and percentage change in total user costs (V). For the purposes of model validation this is not considered a problem, but highlights that in any option testing it will be important to undertake more model runs to ensure greater levels of stability and thus robust results.

5 CONCLUSIONS

5.1.1 The Woking town centre microsimulation model has been developed to provide a 2014 base year model that accurately reflects current traffic conditions within the study area.

5.1.2 Routing methodology, junction parameters and matrices were calibrated. Model validation compared observed traffic flows and journey times with those obtained from the traffic model.

5.1.3 Based on the level of validation, the model is shown to replicate existing traffic conditions across the modelled area, and is considered fit for purpose for the assessment of future year scenarios.

5.1.4 An internal audit of the model has been conducted and this report should be read in conjunction with the audit dated 10.08.2015. Particular reference should be made to the comments within the audit in any option testing or future development of the model.

6 APPENDICES

Appendix I: Weekday AM Peak Period Demand Matrices

Appendix II: Weekday PM Peak Period Demand Matrices

Appendix III: Profile Assignment

Appendix IV: Weekday AM Peak “Plans” Input Files

Appendix V: Weekday PM Peak “Plans” Input Files

Appendix VI: ‘Hazard Overrides’ File

Appendix VII: AM Peak Traffic Flow Validation

Appendix VIII: PM Peak Traffic Flow Validation

Appendix IX: AM Peak Journey Time Validation

Appendix X: PM Peak Journey Time Validation

Appendix I: Weekday AM Peak Period Demand Matrices

Matrix Level 1 – 0700 - 1000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total
1	0	272	67	133	484	90	48	167	14	22	259	54	35	46	3	62	27	64	43	289	11	77	32	13	26	**2337**
2	319	0	8	16	38	4	5	20	2	3	31	6	9	6	0	0	1	8	0	0	0	7	0	0	0	**483**
3	32	0	0	121	177	40	52	55	4	8	77	18	24	15	32	68	5	22	12	17	1	29	20	0	0	**829**
4	47	0	97	0	291	26	68	94	7	12	131	31	39	26	20	194	26	37	58	101	6	46	38	10	0	**1404**
5	171	0	57	164	0	56	61	74	12	21	172	46	37	46	3	154	0	64	17	343	24	50	102	0	0	**1675**
6	12	0	8	20	40	0	7	12	2	3	29	7	9	7	0	0	0	9	0	0	0	8	26	0	0	**199**
7	74	0	25	76	72	0	0	19	3	5	49	21	55	46	1	0	0	14	0	0	0	23	160	50	0	**693**
8	153	0	31	72	173	20	21	0	7	52	35	29	39	59	2	0	61	90	90	28	2	33	0	0	0	**996**
9	13	0	12	36	87	10	10	47	0	134	350	15	20	15	1	0	0	12	0	0	0	17	0	0	0	**779**
10	23	0	16	32	38	9	9	104	63	0	31	13	17	13	1	0	1	199	112	19	3	15	0	0	0	**718**
11	59	0	33	101	171	24	25	161	15	8	0	17	99	36	2	49	65	18	17	122	8	41	10	50	0	**1132**
12	32	0	21	58	125	16	17	36	4	5	66	0	62	23	2	0	5	15	17	0	0	27	10	0	0	**541**
13	43	0	25	65	86	28	129	26	35	18	174	41	0	363	3	22	20	51	6	20	0	96	35	70	50	**1404**
14	7	0	10	19	49	6	28	13	2	4	39	8	290	0	1	0	0	11	0	0	0	9	0	0	0	**494**
15	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**25**
16	4	0	0	3	21	0	10	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**41**
17	0	0	0	0	1	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
18	68	0	14	54	69	8	8	65	19	128	23	12	16	11	1	13	0	0	4	0	0	26	0	0	0	**538**
19	23	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**34**
20	22	0	0	20	17	0	0	6	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**77**
21	3	0	0	0	3	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**9**
22	23	0	8	24	39	4	35	20	2	3	15	6	18	6	0	0	0	9	0	0	0	0	0	20	0	**233**
23	44	0	0	20	30	0	0	20	0	0	20	0	46	0	0	0	0	0	0	0	0	30	0	20	0	**230**
24	25	0	0	10	0	0	0	0	0	0	0	0	60	20	0	0	0	0	0	0	0	0	0	0	0	**115**
25	30	0	0	0	30	0	0	30	0	0	30	0	60	0	0	0	0	0	0	0	0	30	0	0	0	**210**
Total	**1226**	**272**	**457**	**1044**	**2040**	**341**	**532**	**984**	**189**	**425**	**1544**	**323**	**937**	**740**	**71**	**562**	**212**	**624**	**376**	**939**	**55**	**565**	**432**	**233**	**76**	**15200**

Matrix Level 2 – 0700 - 1000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total
1	0	6	2	4	13	2	2	1	1	0	7	1	0	0	0	0	0	0	0	3	0	0	5	7	10	**64**
2	3	0	0	1	4	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**13**
3	2	0	0	0	6	1	1	0	1	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**16**
4	2	0	4	0	7	1	1	0	1	0	4	0	0	0	0	0	0	0	0	1	0	0	5	7	0	**33**
5	7	0	3	8	0	3	3	2	3	1	14	2	0	0	0	0	0	0	0	8	0	1	5	0	0	**59**
6	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
7	1	0	0	1	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	20	0	0	**28**
8	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
9	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
10	1	0	0	1	2	0	0	0	2	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**8**
11	5	0	2	5	17	2	2	1	2	0	0	0	0	0	0	0	0	0	0	2	0	0	5	10	0	**55**
12	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	**11**
13	0	0	0	0	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	9	10	10	**34**
14	1	0	0	1	2	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	**8**
15	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
18	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
20	2	0	0	0	3	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**7**
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
22	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	**6**
23	20	0	0	10	0	0	0	10	0	0	30	0	20	0	0	0	0	0	0	0	0	0	0	3	0	**93**
24	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	10	**20**
25	20	0	0	0	20	0	0	0	0	0	20	0	20	0	0	0	0	0	0	0	0	20	0	0	0	**100**
Total	**66**	**6**	**13**	**36**	**86**	**11**	**11**	**17**	**11**	**2**	**90**	**4**	**53**	**1**	**1**	**0**	**0**	**0**	**0**	**16**	**0**	**22**	**54**	**40**	**30**	**570**

Appendix II: Weekday PM Peak Period Demand Matrices

Matrix Level 1 – 1600 - 1900

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total
1	0	369	76	137	249	12	72	150	6	12	130	16	21	6	0	8	0	66	22	85	5	23	18	12	15	**1511**
2	372	0	6	11	27	3	3	14	1	2	22	4	6	10	0	0	1	6	0	0	0	5	0	0	0	**494**
3	49	0	0	206	55	47	20	25	6	10	31	15	20	14	44	0	0	6	0	0	0	6	0	0	0	**554**
4	162	0	222	0	217	17	64	60	15	14	105	25	54	86	92	5	0	23	0	42	0	20	47	8	0	**1280**
5	562	0	177	291	0	40	72	173	44	29	336	60	86	82	0	83	1	34	0	51	4	39	60	0	30	**2254**
6	132	0	40	26	68	0	0	50	5	7	24	11	28	9	0	20	0	8	0	40	0	4	0	0	0	**474**
7	44	0	52	68	74	7	0	21	5	7	25	12	64	47	0	40	0	8	0	40	0	65	250	0	0	**829**
8	147	0	73	110	87	12	18	0	28	97	237	31	25	16	0	0	1	62	11	17	2	19	0	0	0	**994**
9	19	0	6	10	22	3	4	7	0	140	318	5	26	4	0	0	0	19	20	0	0	3	0	0	0	**604**
10	10	0	8	6	12	3	5	52	67	0	48	4	9	6	0	0	0	104	20	0	0	3	0	0	0	**357**
11	236	0	77	131	208	29	49	75	88	0	0	33	144	106	0	0	1	93	0	70	3	15	0	0	0	**1357**
12	75	0	27	46	85	10	31	89	11	0	47	0	61	57	0	0	0	53	0	27	0	10	0	27	0	**657**
13	24	0	18	30	34	7	45	30	9	10	129	42	0	282	0	11	0	12	0	0	0	13	6	48	48	**798**
14	42	0	15	26	56	7	46	59	7	10	76	17	695	0	0	0	0	11	0	0	0	6	0	20	0	**1094**
15	54	0	87	29	5	1	2	3	0	1	3	1	4	1	0	0	0	1	0	0	0	1	0	0	0	**194**
16	176	0	0	0	88	30	80	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**392**
17	20	0	4	21	0	0	0	61	0	1	52	4	16	0	0	0	0	0	0	0	0	0	0	0	0	**178**
18	58	0	22	37	78	9	14	45	6	115	68	11	51	19	0	0	0	0	0	0	0	9	0	0	0	**542**
19	40	0	10	47	17	0	0	73	0	76	14	11	5	0	0	0	0	3	0	0	0	0	0	0	0	**295**
20	394	0	17	101	416	0	80	28	0	14	172	0	20	0	0	0	0	0	0	0	0	0	0	0	0	**1242**
21	0	0	0	0	0	0	0	5	0	6	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**137**
22	42	0	18	27	36	5	64	20	8	7	25	19	58	9	0	0	0	16	0	0	0	0	68	0	18	**440**
23	79	0	40	58	124	26	160	0	0	0	40	7	35	0	0	20	0	0	0	0	0	0	0	0	0	**588**
24	6	0	0	5	0	0	25	0	0	0	25	0	35	0	0	0	0	0	0	0	0	10	10	0	30	**146**
25	44	0	20	70	0	30	0	0	0	0	150	0	100	60	0	0	0	0	0	0	0	0	0	0	0	**474**
Total	**2788**	**369**	**1014**	**1493**	**1959**	**295**	**855**	**1039**	**308**	**557**	**2221**	**329**	**1563**	**815**	**137**	**187**	**5**	**526**	**73**	**372**	**14**	**251**	**459**	**116**	**141**	**17886**

Matrix Level 2 – 1600 - 1900

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total
1	0	3	2	2	7	0	1	0	0	1	5	1	0	1	0	0	0	1	0	2	0	0	20	0	40	**86**
2	6	0	0	1	4	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**16**
3	2	0	0	4	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**13**
4	4	0	0	0	8	0	1	0	0	1	5	1	0	1	3	0	0	0	0	0	0	0	10	0	0	**34**
5	13	0	6	7	0	1	3	1	2	2	17	3	2	2	0	0	0	0	0	3	0	1	0	0	20	**82**
6	2	0	1	1	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**11**
7	2	0	1	1	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**11**
8	1	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**7**
9	1	0	1	1	3	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**10**
10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
11	7	0	3	4	14	1	2	1	1	1	0	0	1	1	0	0	0	1	0	22	0	1	0	0	0	**58**
12	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**4**
13	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	20	20	10	20	**73**
14	0	0	0	0	0	0	0	0	0	0	10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**11**
15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
20	3	0	0	1	8	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**16**
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
22	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	**22**
23	5	0	0	5	5	0	20	0	0	0	5	5	9	0	0	0	0	0	0	0	0	0	0	0	0	**54**
24	4	0	0	4	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	2	2	0	0	**20**
25	10	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	10	0	**30**
Total	**60**	**3**	**16**	**31**	**63**	**4**	**29**	**3**	**4**	**8**	**62**	**11**	**29**	**8**	**3**	**0**	**0**	**2**	**0**	**27**	**0**	**25**	**52**	**20**	**100**	**560**

Appendix III: Profile Assignment

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1		2	1	1	1	1	1	1	1	1	1	1	1	12	14	12	14	14	14	12	12	1	1	1	1
2	5		4	4	4	4	4	4	4	4	4	4	4	12	14	12	14	14	14	12	12	4	4	4	4
3	6	6		6	6	6	6	6	6	6	6	6	6	12	14	12	14	14	14	12	12	6	6	6	6
4	3	3	3		3	3	3	3	3	3	3	3	3	12	14	12	14	14	14	12	12	3	3	3	3
5	7	7	7	7		7	7	7	7	7	7	7	7	12	14	12	14	14	14	12	12	7	7	7	7
6	8	8	8	8	8		8	8	8	8	8	8	8	12	14	12	14	14	14	12	12	8	8	8	8
7	8	8	8	8	8	8		8	8	8	8	8	8	12	14	12	14	14	14	12	12	8	8	8	8
8	8	8	8	8	8	8	8		8	8	8	8	8	12	14	12	14	14	14	12	12	8	8	8	8
9	8	8	8	8	8	8	8	8		8	8	8	8	12	14	12	14	14	14	12	12	8	8	8	8
10	8	8	8	8	8	8	8	8	8		8	8	8	12	14	12	14	14	14	12	12	8	8	8	8
11	9	9	9	9	9	9	9	9	9	9		9	9	12	14	12	14	14	14	12	12	9	9	9	9
12	9	9	9	9	9	9	9	9	9	9	9		9	12	14	12	14	14	14	12	12	9	9	9	9
13	9	9	9	9	9	9	9	9	9	9	9	9		12	14	12	14	14	14	12	12	9	9	9	9
14	11	11	11	11	11	11	11	11	11	11	11	11	11		14	12	14	14	14	12	12	11	11	11	11
15	13	13	13	13	13	13	13	13	13	13	13	13	13	12		12	14	14	14	12	12	13	13	13	13
16	11	11	11	11	11	11	11	11	11	11	11	11	11	12	14		14	14	14	12	12	11	11	11	11
17	13	13	13	13	13	13	13	13	13	13	13	13	13	12	14	12		14	14	12	12	13	13	13	13
18	13	13	13	13	13	13	13	13	13	13	13	13	13	12	14	12	14		14	12	12	13	13	13	13
19	13	13	13	13	13	13	13	13	13	13	13	13	13	12	14	12	14	14		12	12	13	13	13	13
20	11	11	11	11	11	11	11	11	11	11	11	11	11	12	14	12	14	14	14		12	11	11	11	11
21	11	11	11	11	11	11	11	11	11	11	11	11	11	12	14	12	14	14	14	12		11	11	11	11
22	10	10	10	10	10	10	10	10	10	10	10	10	10	12	14	12	14	14	14	12	12		10	10	10
23	10	10	10	10	10	10	10	10	10	10	10	10	10	12	14	12	14	14	14	12	12	10		10	10
24	10	10	10	10	10	10	10	10	10	10	10	10	10	12	14	12	14	14	14	12	12	10	10		10
25	10	10	10	10	10	10	10	10	10	10	10	10	10	12	14	12	14	14	14	12	12	10	10	10	

Appendix IV Weekday AM Peak "Plans" Input Files

```
plan count 66

plan 1 loops 1

if(hour=7 && running && poisson 11 > 17) ## P415 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 10
	clear[1]
}
fi

plan 2 loops 1

if(hour=8 && running && poisson 11 > 16) ## P415 Pelican V.V High #
{
	variable
	reduce (grnleft)
	set[2] 10
	clear[1]
}
fi

plan 3 loops 1

if(hour=9 && running && poisson 11 > 20) ## P415 Pelican Medium #
{
	variable
	reduce (grnleft)
	set[2] 10
	clear[1]
}
fi

plan 4 loops 1

if(hour=7 && running && poisson 11 > 20) ## P419 Pelican Medium #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 5 loops 1

if(hour=8 && running && poisson 11 > 20) ## P419 Pelican Medium #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
```

```
}
fi

plan 6 loops 1

if(hour=9 && running && poisson 11 > 21) ## P419 Pelican Low/Medium #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 7 loops 1

if(hour=7 && running && poisson 11 > 22) ## P420 Pelican Low #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 8 loops 1

if(hour=8 && running && poisson 11 > 22) ## P420 Pelican Low #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 9 loops 1

if(hour=9 && running && poisson 11 > 22) ## P420 Pelican Low #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 10 loops 1

if(hour=7 && running && poisson 11 > 17) ## P441 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 13
	clear[1]
}
fi
```

```
plan 11 loops 1

if(hour=8 && running && poisson 11 > 17) ## P441 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 13
	clear[1]
}
fi

plan 12 loops 1

if(hour=9 && running && poisson 11 > 17) ## P441 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 13
	clear[1]
}
fi

plan 13 loops 1

if(hour=7 && running && poisson 11 > 18) ## P4391 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 14 loops 1

if(hour=8 && running && poisson 11 > 18) ## P4391 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 15 loops 1

if(hour=9 && running && poisson 11 > 18) ## P4391 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 16 loops 1
```

```
if(hour=7 && running && poisson 11 > 17) ## P4392 Toucan High #
{
	variable
	reduce (grnleft)
	set[3] (rand 10)+6
	clear[1]
}
fi

plan 17 loops 1

if(hour=8 && running && poisson 11 > 17) ## P4392 Toucan Very High #
{
	variable
	reduce (grnleft)
	set[3] (rand 10)+6
	clear[1]
}
fi

plan 18 loops 1

if(hour=9 && running && poisson 11 > 18) ## P4392 Toucan High #
{
	variable
	reduce (grnleft)
	set[3] (rand 10)+6
	clear[1]
}
fi

plan 19 loops 1

if(hour=7 && running && poisson 11 > 18) ## P426 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 19)+8
	clear[1]
}
fi

plan 20 loops 1

if(hour=8 && running && poisson 11 > 18) ## P426 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 19)+8
	clear[1]
}
fi

plan 21 loops 1

if(hour=9 && running && poisson 11 > 18) ## P426 Toucan High #
```

```
{
	variable
	reduce (grnleft)
	set[2] (rand 19)+8
	clear[1]
}
fi

plan 22 loops 1

if(hour=7 && running && poisson 11 > 18) ## P416 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 23 loops 1

if(hour=8 && running && poisson 11 > 18) ## P416 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 24 loops 1

if(hour=9 && running && poisson 11 > 18) ## P416 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 25 loops 1

if(hour=7 && running && poisson 11 > 18) ## Oriental Road (nr station) Zebra High #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 26 loops 1

if(hour= 8 && running && poisson 11 > 18) ## Oriental Road (nr station) Zebra High #
{
	variable
```

```
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 27 loops 1

if(hour=9 && running && poisson 11 > 18) ## Oriental Road (nr station) Zebra High #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 28 loops 1

if(hour=7 && running && poisson 11 > 22) ## Stanley Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 29 loops 1

if(hour=8 && running && poisson 11 > 22) ## Stanley Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 30 loops 1

if(hour=9 && running && poisson 11 > 22) ## Stanley Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 31 loops 1

if(hour=7 && running && poisson 11 > 20) ## Goldsworth Road (nr rdbt w/ Church Street
West) Zebra Medium #
{
        variable
        reduce (grnleft)
```

```
        set[2] 0
        clear[1]
}
fi

plan 32 loops 1

if(hour=8 && running && poisson 11 > 20) ## Goldsworth Road (nr rdbt w/ Church Street
West) Zebra Medium #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi

plan 33 loops 1

if(hour=9 && running && poisson 11 > 20) ## Goldsworth Road (nr rdbt w/ Church Street
West) Zebra Medium #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi

plan 34 loops 1

if(hour=7 && running && poisson 11 > 20) ## Goldsworth Road (nr Morrisons) Zebra
Medium #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi

plan 35 loops 1

if(hour=8 && running && poisson 11 > 20) ## Goldsworth Road (nr Morrisons) Zebra
Medium #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi

plan 36 loops 1

if(hour=9 && running && poisson 11 > 20) ## Goldsworth Road (nr Morrisons) Zebra
Medium #
```

```
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 37 loops 1

if(hour=7 && running && poisson 11 > 18) ## A320 Guildford Road Zebra High #
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 38 loops 1

if(hour=8 && running && poisson 11 > 18) ## A320 Guildford Road Zebra High #
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 39 loops 1

if(hour=9 && running && poisson 11 > 20) ## A320 Guildford Road Zebra Medium #
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 40 loops 1

if(hour=7 && running && poisson 11 > 22) ## Heathside Road Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 1
	clear[1]
}
fi

plan 41 loops 1

if(hour=8 && running && poisson 11 > 22) ## Heathside Road Zebra Low #
{
	variable
```

```
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 42 loops 1

if(hour=9 && running && poisson 11 > 22) ## Heathside Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 43 loops 1

if(hour=7 && running && poisson 11 > 20) ## Heathside Crescent (East) Zebra Medium #

{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 44 loops 1

if(hour=8 && running && poisson 11 > 20) ## Heathside Crescent (East) Zebra Medium #

{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 45 loops 1

if(hour=9 && running && poisson 11 > 20) ## Heathside Crescent (East) Zebra Medium #

{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 46 loops 1

if(hour=7 && running && poisson 11 > 20) ## Heathside Crescent (West) Zebra Medium #
```

```
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 47 loops 1

if(hour=8 && running && poisson 11 > 20) ## Heathside Crescent (West) Zebra Medium #

{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 48 loops 1

if(hour=9 && running && poisson 11 > 20) ## Heathside Crescent (West) Zebra Medium #

{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 49 loops 1

if(hour=7 && running && poisson 11 > 22) ## Oriental Road (West) Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 50 loops 1

if(hour=8 && running && poisson 11 > 20) ## Oriental Road (West) Zebra Medium #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 51 loops 1

if(hour=9 && running && poisson 11 > 22) ## Oriental Road (West) Zebra Low #
```

```
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 52 loops 1

if(hour=7 && running && poisson 11 > 20) ## Oriental Road (East) Zebra Medium #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 53 loops 1

if(hour=8 && running && poisson 11 > 20) ## Oriental Road (East) Zebra Medium #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 54 loops 1

if(hour=9 && running && poisson 11 > 20) ## Oriental Road (East) Zebra Medium #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 55 loops 1

if(hour=7 && running && poisson 11 > 22) ## Oriental Road (South) Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 56 loops 1

if(hour=8 && running && poisson 11 > 22) ## Oriental Road (South) Zebra Low #
{
        variable
```

```
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 57 loops 1

if(hour=9 && running && poisson 11 > 22) ## Oriental Road (South) Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 58 loops 1

if(hour=7 && running && poisson 11 > 17) ## J428 Eastbound Very High #
{
        variable
        reduce (grnleft)
        set[2] (rand 9)+6
        clear[1]
}
fi

plan 59 loops 1

if(hour=8 && running && poisson 11 > 17) ## J428 Eastbound Very High #
{
        variable
        reduce (grnleft)
        set[2] (rand 9)+6
        clear[1]
}
fi

plan 60 loops 1

if(hour=9 && running && poisson 11 > 17) ## J428 Eastbound Very High #
{
        variable
        reduce (grnleft)
        set[2] (rand 9)+6
        clear[1]
}
fi

plan 61 loops 1

if(hour=7 && running && poisson 11 > 17) ## J428 Westbound Very High #
{
        variable
        reduce (grnleft)
        set[3] (rand 5)+6
```

```
        clear[1]
}
fi

plan 62 loops 1

if(hour=8 && running && poisson 11 > 17) ## J428 Westbound Very High #
{
        variable
        reduce (grnleft)
        set[3] (rand 5)+6
        clear[1]
}
fi

plan 63 loops 1

if(hour=9 && running && poisson 11 > 17) ## J428 Westbound Very High #
{
        variable
        reduce (grnleft)
        set[3] (rand 5)+6
        clear[1]
}
fi

plan 64 loops 1

if(running && grnleft = 1 && poisson 11 > 13) ##J424 either/or stages for stages 3 and 4
with stage 3 being the stage demanded. By using grnleft = 1 in code it is only assessing
the poisson distribution once in a cycle whereas ped poisson looks continuously so have
to make the poisson numbers differ according to standard
{       variable
        set[3]          52
        clear[1]
}

else
{
if(running && grnleft = 1)
{

        variable
        set[4] 49
        clear[1]
}
fi
}
fi

plan 65 loops 1

if(running && occupied[1])  ## J427 Stage 4 demand dependent for buses turning right #

{
        variable
        set[4] 14
```

```
}
fi

plan 66 loops 1

if(running && occupied[1])  ## J428 Stage 3 demand dependent for right turn out of Peacocks centre in AM only #
{
        variable
        set[3] 11
}
fi



##

use plan 1 on node 112 stage 1
with loops P415 lane 1

use plan 2 on node 112 stage 1
with loops P415 lane 1

use plan 3 on node 112 stage 1
with loops P415 lane 1

##

use plan 4 on node 102 stage 1
with loops P419 lane 1

use plan 5 on node 102 stage 1
with loops P419 lane 1

use plan 6 on node 102 stage 1
with loops P419 lane 1

##

use plan 7 on node 215 stage 1
with loops P420 lane 1

use plan 8 on node 215 stage 1
with loops P420 lane 1

use plan 9 on node 215 stage 1
with loops P420 lane 1

##

use plan 10 on node 70 stage 1
with loops P441 lane 1

use plan 11 on node 70 stage 1
with loops P441 lane 1

use plan 12 on node 70 stage 1
```

with loops P441 lane 1

##

use plan 13 on node 45 stage 1
with loops P4391 lane 1

use plan 14 on node 45 stage 1
with loops P4391 lane 1

use plan 15 on node 45 stage 1
with loops P4391 lane 1

##

use plan 16 on node 45 stage 1
with loops P4392 lane 1

use plan 17 on node 45 stage 1
with loops P4392 lane 1

use plan 18 on node 45 stage 1
with loops P4392 lane 1

##

use plan 19 on node 44 stage 1
with loops P426 lane 1

use plan 20 on node 44 stage 1
with loops P426 lane 1

use plan 21 on node 44 stage 1
with loops P426 lane 1

##

use plan 22 on node 222 stage 1
with loops P416 lane 1

use plan 23 on node 222 stage 1
with loops P416 lane 1

use plan 24 on node 222 stage 1
with loops P416 lane 1

##

use plan 25 on node 96 stage 1
with loops Zebra1 lane 1

use plan 26 on node 96 stage 1
with loops Zebra1 lane 1

use plan 27 on node 96 stage 1
with loops Zebra1 lane 1

##

use plan 28 on node 133 stage 1
with loops Zebra2 lane 1

use plan 29 on node 133 stage 1
with loops Zebra2 lane 1

use plan 30 on node 133 stage 1
with loops Zebra2 lane 1

##

use plan 31 on node 46 stage 1
with loops Zebra3 lane 1

use plan 32 on node 46 stage 1
with loops Zebra3 lane 1

use plan 33 on node 46 stage 1
with loops Zebra3 lane 1

##

use plan 34 on node 49 stage 1
with loops Zebra4 lane 1

use plan 35 on node 49 stage 1
with loops Zebra4 lane 1

use plan 36 on node 49 stage 1
with loops Zebra4 lane 1

##

use plan 37 on node 54 stage 1
with loops Zebra5 lane 1

use plan 38 on node 54 stage 1
with loops Zebra5 lane 1

use plan 39 on node 54 stage 1
with loops Zebra5 lane 1

##

use plan 40 on node 76 stage 1
with loops Zebra6 lane 1

use plan 41 on node 76 stage 1
with loops Zebra6 lane 1

use plan 42 on node 76 stage 1
with loops Zebra6 lane 1

##

use plan 43 on node 212 stage 1
with loops Zebra7 lane 1

use plan 44 on node 212 stage 1
with loops Zebra7 lane 1

use plan 45 on node 212 stage 1
with loops Zebra7 lane 1

##

use plan 46 on node 91 stage 1
with loops Zebra8 lane 1

use plan 47 on node 91 stage 1
with loops Zebra8 lane 1

use plan 48 on node 91 stage 1
with loops Zebra8 lane 1

##

use plan 49 on node 87 stage 1
with loops Zebra9 lane 1

use plan 50 on node 87 stage 1
with loops Zebra9 lane 1

use plan 51 on node 87 stage 1
with loops Zebra9 lane 1

##

use plan 52 on node 86z stage 1
with loops Zebra10 lane 1

use plan 53 on node 86z stage 1
with loops Zebra10 lane 1

use plan 54 on node 86z stage 1
with loops Zebra10 lane 1

##

use plan 55 on node 84z stage 1
with loops Zebra11 lane 1

use plan 56 on node 84z stage 1
with loops Zebra11 lane 1

use plan 57 on node 84z stage 1
with loops Zebra11 lane 1

##

use plan 58 on node 170 stage 1
with loops J428East lane 1

use plan 59 on node 170 stage 1
with loops J428East lane 1

use plan 60 on node 170 stage 1
with loops J428East lane 1

##

use plan 61 on node 170 stage 1
with loops J428West lane 1

use plan 62 on node 170 stage 1
with loops J428West lane 1

use plan 63 on node 170 stage 1
with loops J428West lane 1

##

use plan 64 on node 160 stage 2
with loops J424 lane 1

##

use plan 65 on node 20 stage 3
with loops J427Bus lane 3

##

use plan 66 on node 171 stage 2
with loops J428 lane 3

use plan 66 on node 171 stage 2
with loops J428 lane 4

##

##this plans file contains demand dependency for pelican, toucan and zebra crossings

Appendix V: Weekday PM Peak "Plans" Input Files

```
plan count 65

plan 1 loops 1

if(hour=16 && running && poisson 11 > 17) ## P415 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 10
	clear[1]
}
fi

plan 2 loops 1

if(hour=17 && running && poisson 11 > 17) ## P415 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 10
	clear[1]
}
fi

plan 3 loops 1

if(hour=18 && running && poisson 11 > 17) ## P415 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 10
	clear[1]
}
fi

plan 4 loops 1

if(hour=16 && running && poisson 11 > 20) ## P419 Pelican Medium #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 5 loops 1

if(hour=17 && running && poisson 11 > 18) ## P419 Pelican High #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
```

```
}
fi

plan 6 loops 1

if(hour=18 && running && poisson 11 > 22) ## P419 Pelican Low #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 7 loops 1

if(hour=16 && running && poisson 11 > 22) ## P420 Pelican Low #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 8 loops 1

if(hour=17 && running && poisson 11 > 22) ## P420 Pelican Low #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 9 loops 1

if(hour=18 && running && poisson 11 > 22) ## P420 Pelican Low #
{
	variable
	reduce (grnleft)
	set[2] 9
	clear[1]
}
fi

plan 10 loops 1

if(hour=16 && running && poisson 11 > 18) ## P441 Pelican High #
{
	variable
	reduce (grnleft)
	set[2] 13
	clear[1]
}
fi
```

```
plan 11 loops 1

if(hour=17 && running && poisson 11 > 17) ## P441 Pelican Very High #
{
	variable
	reduce (grnleft)
	set[2] 13
	clear[1]
}
fi

plan 12 loops 1

if(hour=18 && running && poisson 11 > 18) ## P441 Pelican High #
{
	variable
	reduce (grnleft)
	set[2] 13
	clear[1]
}
fi

plan 13 loops 1

if(hour=16 && running && poisson 11 > 18) ## P4391 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 14 loops 1

if(hour=17 && running && poisson 11 > 18) ## P4391 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 15 loops 1

if(hour=18 && running && poisson 11 > 18) ## P4391 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 10)+6
	clear[1]
}
fi

plan 16 loops 1
```

```
if(hour=16 && running && poisson 11 > 18) ## P4392 Toucan High #
{
	variable
	reduce (grnleft)
	set[3] (rand 10)+6
	clear[1]
}
fi

plan 17 loops 1

if(hour=17 && running && poisson 11 > 18) ## P4392 Toucan High #
{
	variable
	reduce (grnleft)
	set[3] (rand 10)+6
	clear[1]
}
fi

plan 18 loops 1

if(hour=18 && running && poisson 11 > 18) ## P4392 Toucan High #
{
	variable
	reduce (grnleft)
	set[3] (rand 10)+6
	clear[1]
}
fi

plan 19 loops 1

if(hour=16 && running && poisson 11 > 18) ## P426 Toucan High #
{
	variable
	reduce (grnleft)
	set[2] (rand 19)+8
	clear[1]
}
fi

plan 20 loops 1

if(hour=17 && running && poisson 11 > 17.5) ## P426 Toucan Very High #
{
	variable
	reduce (grnleft)
	set[2] (rand 19)+8
	clear[1]
}
fi

plan 21 loops 1

if(hour=18 && running && poisson 11 > 20) ## P426 Toucan Medium #
```

```
{
        variable
        reduce (grnleft)
        set[2] (rand 19)+8
        clear[1]
}
fi

plan 22 loops 1

if(hour=16 && running && poisson 11 > 17) ## P416 Toucan Very High #
{
        variable
        reduce (grnleft)
        set[2] (rand 10)+6
        clear[1]
}
fi

plan 23 loops 1

if(hour=17 && running && poisson 11 > 17) ## P416 Toucan Very High #
{
        variable
        reduce (grnleft)
        set[2] (rand 10)+6
        clear[1]
}
fi

plan 24 loops 1

if(hour=18 && running && poisson 11 > 17) ## P416 Toucan Very High #
{
        variable
        reduce (grnleft)
        set[2] (rand 10)+6
        clear[1]
}
fi

plan 25 loops 1

if(hour=16 && running && poisson 11 > 20) ## Oriental Road (nr station) Zebra Medium #

{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 26 loops 1

if(hour= 8 && running && poisson 11 > 18) ## Oriental Road (nr station) Zebra High #
{
```

```
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 27 loops 1

if(hour=18 && running && poisson 11 > 20) ## Oriental Road (nr station) Zebra Medium #

{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 28 loops 1

if(hour=16 && running && poisson 11 > 22) ## Stanley Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 29 loops 1

if(hour=17 && running && poisson 11 > 22) ## Stanley Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 30 loops 1

if(hour=18 && running && poisson 11 > 22) ## Stanley Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 31 loops 1

if(hour=16 && running && poisson 11 > 23) ## Goldsworth Road (nr rdbt w/ Church Street
West) Zebra Very Low #
{
```

```
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi


plan 32 loops 1

if(hour=17 && running && poisson 11 > 23) ## Goldsworth Road (nr rdbt w/ Church Street
West) Zebra Very Low #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi


plan 33 loops 1

if(hour=18 && running && poisson 11 > 23) ## Goldsworth Road (nr rdbt w/ Church Street
West) Zebra Very Low #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi

plan 34 loops 1

if(hour=16 && running && poisson 11 > 22) ## Goldsworth Road (nr Morrisons) Zebra
Low #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi

plan 35 loops 1

if(hour=17 && running && poisson 11 > 22) ## Goldsworth Road (nr Morrisons) Zebra
Low #
{
        variable
        reduce (grnleft)
        set[2] 0
        clear[1]
}
fi
```

```
plan 36 loops 1

if(hour=18 && running && poisson 11 > 22) ## Goldsworth Road (nr Morrisons) Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 37 loops 1

if(hour=16 && running && poisson 11 > 20) ## A320 Guildford Road Zebra Medium #
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 38 loops 1

if(hour=17 && running && poisson 11 > 20) ## A320 Guildford Road Zebra Medium #
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 39 loops 1

if(hour=18 && running && poisson 11 > 20) ## A320 Guildford Road Zebra Medium #
{
	variable
	reduce (grnleft)
	set[2] 0
	clear[1]
}
fi

plan 40 loops 1

if(hour=16 && running && poisson 11 > 22) ## Heathside Road Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 1
	clear[1]
}
fi

plan 41 loops 1
```

```
if(hour=17 && running && poisson 11 > 22) ## Heathside Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 42 loops 1

if(hour=18 && running && poisson 11 > 22) ## Heathside Road Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 43 loops 1

if(hour=16 && running && poisson 11 > 20) ## Heathside Crescent (East) Zebra Medium
#
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 44 loops 1

if(hour=17 && running && poisson 11 > 20) ## Heathside Crescent (East) Zebra Medium
#
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 45 loops 1

if(hour=18 && running && poisson 11 > 20) ## Heathside Crescent (East) Zebra Medium
#
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi
```

```
plan 46 loops 1

if(hour=16 && running && poisson 11 > 20) ## Heathside Crescent (West) Zebra Medium
#
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 47 loops 1

if(hour=17 && running && poisson 11 > 20) ## Heathside Crescent (West) Zebra Medium
#
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 48 loops 1

if(hour=18 && running && poisson 11 > 20) ## Heathside Crescent (West) Zebra Medium
#
{
        variable
        reduce (grnleft)
        set[2] 1
        clear[1]
}
fi

plan 49 loops 1

if(hour=16 && running && poisson 11 > 22) ## Oriental Road (West) Zebra Low #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi

plan 50 loops 1

if(hour=17 && running && poisson 11 > 20) ## Oriental Road (West) Zebra Medium #
{
        variable
        reduce (grnleft)
        set[2] 2
        clear[1]
}
fi
```

```
plan 51 loops 1

if(hour=18 && running && poisson 11 > 22) ## Oriental Road (West) Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 52 loops 1

if(hour=16 && running && poisson 11 > 22) ## Oriental Road (East) Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 53 loops 1

if(hour=17 && running && poisson 11 > 20) ## Oriental Road (East) Zebra Medium #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 54 loops 1

if(hour=18 && running && poisson 11 > 22) ## Oriental Road (East) Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 55 loops 1

if(hour=16 && running && poisson 11 > 22) ## Oriental Road (South) Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 56 loops 1
```

```
if(hour=17 && running && poisson 11 > 22) ## Oriental Road (South) Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 57 loops 1

if(hour=18 && running && poisson 11 > 22) ## Oriental Road (South) Zebra Low #
{
	variable
	reduce (grnleft)
	set[2] 2
	clear[1]
}
fi

plan 58 loops 1

if(hour=16 && running && poisson 11 > 17) ## J428 Eastbound Very High #
{
	variable
	reduce (grnleft)
	set[2] (rand 9)+6
	clear[1]
}
fi

plan 59 loops 1

if(hour=17 && running && poisson 11 > 17) ## J428 Eastbound Very High #
{
	variable
	reduce (grnleft)
	set[2] (rand 9)+6
	clear[1]
}
fi

plan 60 loops 1

if(hour=18 && running && poisson 11 > 17) ## J428 Eastbound Very High #
{
	variable
	reduce (grnleft)
	set[2] (rand 9)+6
	clear[1]
}
fi

plan 61 loops 1

if(hour=16 && running && poisson 11 > 17) ## J428 Westbound Very High #
```

```
{
        variable
        reduce (grnleft)
        set[3] (rand 5)+6
        clear[1]
}
fi

plan 62 loops 1

if(hour=17 && running && poisson 11 > 17) ## J428 Westbound Very High #
{
        variable
        reduce (grnleft)
        set[3] (rand 5)+6
        clear[1]
}
fi

plan 63 loops 1

if(hour=18 && running && poisson 11 > 17) ## J428 Westbound Very High #
{
        variable
        reduce (grnleft)
        set[3] (rand 5)+6
        clear[1]
}
fi

plan 64 loops 1

if(running && grnleft = 1 && poisson 11 > 13) ##J424 either/or stages for stages 3 and 4
with stage 3 being the stage demanded. By using grnleft = 1 in code it is only assessing
the poisson distribution once in a cycle whereas ped poisson looks continuously so have
to make the poisson numbers differ according to standard numbers #
{       variable
        set[3]          32
        clear[1]
}

else
{
if(running && grnleft = 1)
{

        variable
        set[4] 30
        clear[1]
}
fi
}
fi

plan 65 loops 1
```

```
if(running && occupied[1])  ## J427 Stage 4 demand dependent for buses turning right #

{
        variable
        set[4] 14
}
fi



##

use plan 1 on node 112 stage 1
with loops P415 lane 1

use plan 2 on node 112 stage 1
with loops P415 lane 1

use plan 3 on node 112 stage 1
with loops P415 lane 1

##

use plan 4 on node 102 stage 1
with loops P419 lane 1

use plan 5 on node 102 stage 1
with loops P419 lane 1

use plan 6 on node 102 stage 1
with loops P419 lane 1

##

use plan 7 on node 215 stage 1
with loops P420 lane 1

use plan 8 on node 215 stage 1
with loops P420 lane 1

use plan 9 on node 215 stage 1
with loops P420 lane 1

##

use plan 10 on node 70 stage 1
with loops P441 lane 1

use plan 11 on node 70 stage 1
with loops P441 lane 1

use plan 12 on node 70 stage 1
with loops P441 lane 1

##

use plan 13 on node 45 stage 1
```

with loops P4391 lane 1

use plan 14 on node 45 stage 1
with loops P4391 lane 1

use plan 15 on node 45 stage 1
with loops P4391 lane 1

##

use plan 16 on node 45 stage 1
with loops P4392 lane 1

use plan 17 on node 45 stage 1
with loops P4392 lane 1

use plan 18 on node 45 stage 1
with loops P4392 lane 1

##

use plan 19 on node 44 stage 1
with loops P426 lane 1

use plan 20 on node 44 stage 1
with loops P426 lane 1

use plan 21 on node 44 stage 1
with loops P426 lane 1

##

use plan 22 on node 222 stage 1
with loops P416 lane 1

use plan 23 on node 222 stage 1
with loops P416 lane 1

use plan 24 on node 222 stage 1
with loops P416 lane 1

##

use plan 25 on node 96 stage 1
with loops Zebra1 lane 1

use plan 26 on node 96 stage 1
with loops Zebra1 lane 1

use plan 27 on node 96 stage 1
with loops Zebra1 lane 1

##

use plan 28 on node 133 stage 1
with loops Zebra2 lane 1

use plan 29 on node 133 stage 1
with loops Zebra2 lane 1

use plan 30 on node 133 stage 1
with loops Zebra2 lane 1

##

use plan 31 on node 46 stage 1
with loops Zebra3 lane 1

use plan 32 on node 46 stage 1
with loops Zebra3 lane 1

use plan 33 on node 46 stage 1
with loops Zebra3 lane 1

##

use plan 34 on node 49 stage 1
with loops Zebra4 lane 1

use plan 35 on node 49 stage 1
with loops Zebra4 lane 1

use plan 36 on node 49 stage 1
with loops Zebra4 lane 1

##

use plan 37 on node 54 stage 1
with loops Zebra5 lane 1

use plan 38 on node 54 stage 1
with loops Zebra5 lane 1

use plan 39 on node 54 stage 1
with loops Zebra5 lane 1

##

use plan 40 on node 76 stage 1
with loops Zebra6 lane 1

use plan 41 on node 76 stage 1
with loops Zebra6 lane 1

use plan 42 on node 76 stage 1
with loops Zebra6 lane 1

##

use plan 43 on node 212 stage 1
with loops Zebra7 lane 1

use plan 44 on node 212 stage 1
with loops Zebra7 lane 1

use plan 45 on node 212 stage 1
with loops Zebra7 lane 1

##

use plan 46 on node 91 stage 1
with loops Zebra8 lane 1

use plan 47 on node 91 stage 1
with loops Zebra8 lane 1

use plan 48 on node 91 stage 1
with loops Zebra8 lane 1

##

use plan 49 on node 87 stage 1
with loops Zebra9 lane 1

use plan 50 on node 87 stage 1
with loops Zebra9 lane 1

use plan 51 on node 87 stage 1
with loops Zebra9 lane 1

##

use plan 52 on node 86z stage 1
with loops Zebra10 lane 1

use plan 53 on node 86z stage 1
with loops Zebra10 lane 1

use plan 54 on node 86z stage 1
with loops Zebra10 lane 1

##

use plan 55 on node 84z stage 1
with loops Zebra11 lane 1

use plan 56 on node 84z stage 1
with loops Zebra11 lane 1

use plan 57 on node 84z stage 1
with loops Zebra11 lane 1

##

use plan 58 on node 170 stage 1
with loops J428East lane 1

use plan 59 on node 170 stage 1
with loops J428East lane 1

use plan 60 on node 170 stage 1

with loops J428East lane 1

##

use plan 61 on node 170 stage 1
with loops J428West lane 1

use plan 62 on node 170 stage 1
with loops J428West lane 1

use plan 63 on node 170 stage 1
with loops J428West lane 1

##

use plan 64 on node 160 stage 2
with loops J424 lane 1

##

use plan 65 on node 20 stage 3
with loops J427Bus lane 3

##this plans file contains demand dependency for pelican, toucan and zebra crossings

Appendix VI: "Hazardoverrides" Input Files

```
##encourage use of both lanes on A324 Lockfield Drive approach with junction to Arthurs Bridge Road
3:4,1-1,1:2,1-2
3:4,2-2,1:2,1-2

##to ensure lane usage represents on-street signing at junction of A324 Lockfield Drive with A320
11:229,1-2,10:11,1-1
11:14,1-2,10:11,2-2

## to encourage both lanes on A320 Victoria Way southbound to be used on merging on 2 to 1 section before the railway arch
20:42,1-1,14z:18,1-2
20:42,2-2,14z:18,1-2
20:42,1-1,19:20,1-2
20:42,2-2,19:20,1-2
19:20,1-3,229:14,1-2


## to ensure that designated right turn is used to turn right from A320 Victoria Way into A3046 Chobham Road
161z:160,1-1,219:161z,3-3
161z:160,1-1,158:219,2-2

## to encourage both lanes to be used on A320 Victoria Way westbound on approach from roundabout to Peacocks centre, remember right lane before Peacocks is designated for A324 only
165:160,1-2,147:158,1-2
165:160,1-2,158:219,1-2
165:160,1-2,219:161z,1-2

173:171,2-4,165:160,1-2
173:171,2-2,214:170,1-1
173:171,3-3,214:170,2-2
173:171,4-4,214:170,2-2
173:171,2-2,170:172,1-1
173:171,3-3,170:172,2-2
173:171,4-4,170:172,2-2

## to ensure the correct lanes are used on A320 Victoria Way westbound approach to junction with Lockfield Drive
229:14,1-2,173:171,2-3
229:14,3-4,173:171,4-4
229:14,1-1,15:229,1-1
229:14,2-2,15:229,2-2
229:14,3-3,15:229,3-3
229:14,4-4,15:229,4-4
14:11,1-2,15:229,3-4

## to ensure the correct lanes are used on A320 Victoria Way northbound approach to junction with Lockfield Drive
14:15z,1-2,229:14,1-2
14:11,1-2,229:14,3-4
14:229,1-1,15z:14,1-1
```

14:229,2-2,15z:14,2-2
14:229,3-3,15z:14,3-3
229:15,1-1,15z:14,1-1
229:15,2-2,15z:14,2-2
229:15,3-3,15z:14,3-3

to ensure the correct lanes are used to make left turn onto A324 Lockfield Drive when travelling northbound on A320
15z:11,1-2,18:14z,1-1
15z:11,1-2,19:18,1-1
11:10,1-2,15z:11,1-2
15z:11,1-2,14z:15z,1-1

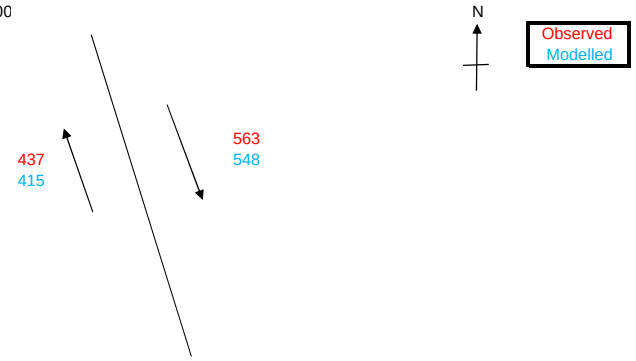
to ensure correct lanes are used on exit from Peacock centre
174:171,1-2,226:174,1-1
174:171,3-4,226:174,2-2

Appendix VII: AM Peak Traffic Flow Validation

A3046 Kettlewell Hill (between Horsell Rise and Wheatsheaf Close)

1/11/12-30/11/12 (Tues-Thurs average)

AM peak hour 0800-0900



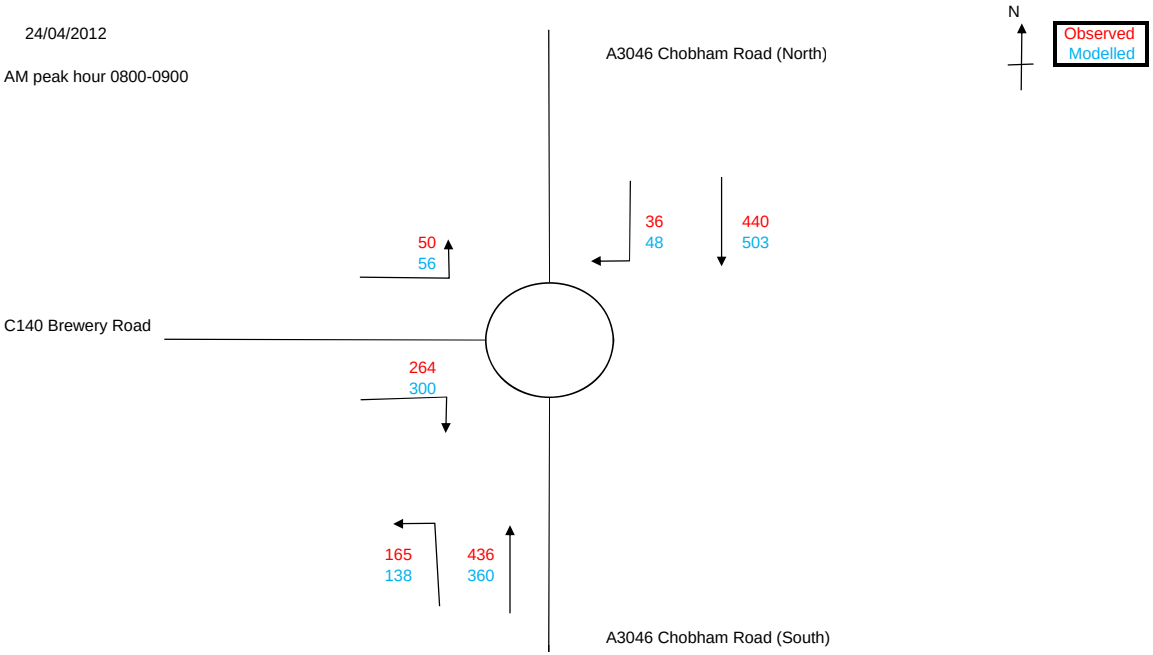
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
Kettlewell Hill (NW bound)	Ahead to A3046 Kettlewell Hill	437	415	-22	-5%	1.08	✓	✓
Kettlewell Hill (SE bound)	Ahead to A3406 Chobham Road	563	548	-15	-3%	0.63	✓	✓

ATC (real time); data source:H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC

A3046 Chobham Road; j/w C140 Brewery Road (mini roundabout)

24/04/2012

AM peak hour 0800-0900



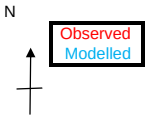
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
C140 Brewery Road	Left to A3046 Chobham Road (Nc	50	56	6	13%	0.86	✓	✓
C140 Brewery Road	Right to A3046 Chobham Road (S	264	300	36	13%	2.12	✓	✓
A3046 Chobham Road (North)	Ahead to A3046 Chobham Road (	440	503	63	14%	2.89	✓	✓
A3046 Chobham Road (North)	Right to C140 Brewery Road	36	48	12	32%	1.79	✓	✓
A3046 Chobham Road (South)	Left to C140 Brewery Road	165	138	-27	-16%	2.18	✓	✓
A3046 Chobham Road (South)	Ahead to A3046 Chobham Road (	436	360	-76	-17%	3.81	✓	✓

MCTCNT; data source:H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

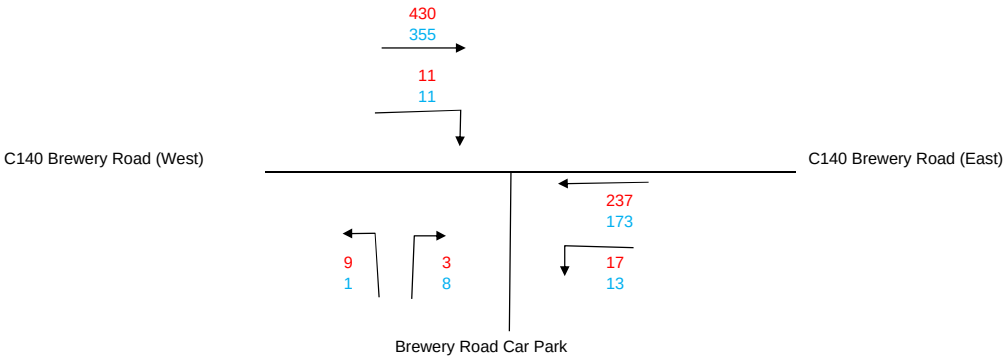
Brewery Road Car Park

12/03/2014

AM peak hour 0800-0900



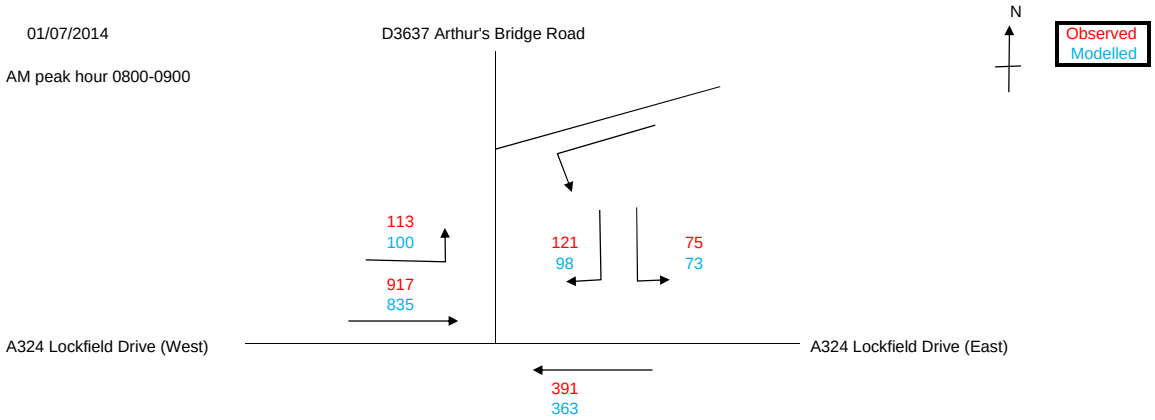
Observed
Modelled



Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Brewery Road Car Park	Left to C140 Brewery Road (East)	9	1	-8	-88%	3.55	✓	✓
Brewery Road Car Park	Right to C140 Brewery Road (We	3	8	5	170%	2.16	✓	✓
C140 Brewery Road (West)	Ahead to C140 Brewery Road (Ea	430	355	-75	-17%	3.79	✓	✓
C140 Brewery Road (West)	Right to Brewery Road Car Park	11	11	-1	-5%	0.15	✓	✓
C140 Brewery Road (East)	Left to Brewery Road Car Park	17	13	-4	-23%	1.02	✓	✓
C140 Brewery Road (East)	Ahead to C140 Brewery Road (W	237	173	-64	-27%	4.47	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

A324 Lockfield Drive; j/w Arthur's Bridge Road



Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
D3637 Arthur's Bridge Road	Left to A324 Lockfield Drive (East)	75	73	-2	-3%	0.23	✓	✓
D3637 Arthur's Bridge Road	Right to A324 Lockfield Drive (We	121	98	-23	-19%	2.16	✓	✓
A324 Lockfield Drive (West)	Ahead to A324 Lockfield Drive (Ea	917	835	-82	-9%	2.78	✓	✓
A324 Lockfield Drive (West)	Left to D3637 Arthur's Bridge Roa	113	100	-13	-11%	1.23	✓	✓
A324 Lockfield Drive (East)	Ahead to A324 Lockfield Drive (W	391	363	-28	-7%	1.44	✓	✓

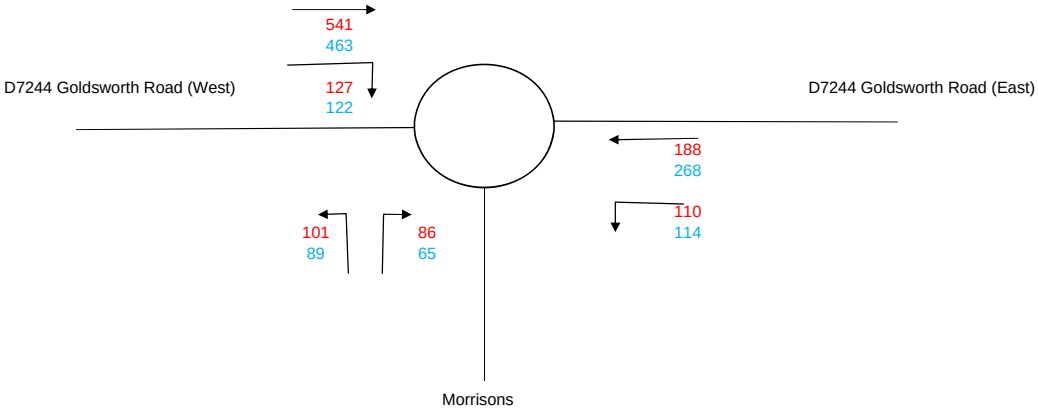
MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

D7244 Goldsworth Road; roundabout at entrance to Morrisons

19/03/2014

AM peak hour 0800-0900

Observed
Modelled



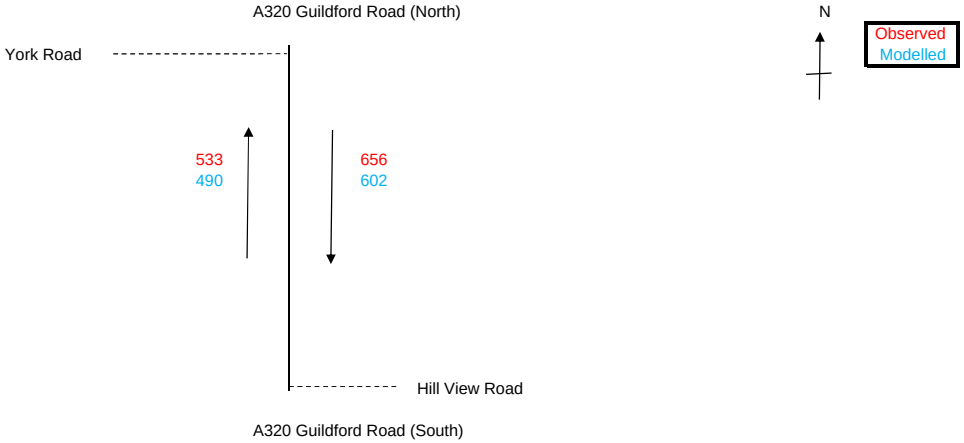
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Morrisons	Left to D7244 Goldsworth Road (\	101	89	-12	-12%	1.21	✓	✓
Morrisons	Right to D7244 Goldsworth Road	86	65	-21	-25%	2.44	✓	✓
D7244 Goldsworth Road (East)	Ahead to D7244 Goldsworth Roac	188	268	80	42%	5.28	✓	✓
D7244 Goldsworth Road (East)	Left to Morrisons	110	114	4	3%	0.35	✓	✓
D7244 Goldsworth Road (West)	Right to Morrisons	127	122	-5	-4%	0.42	✓	✓
D7244 Goldsworth Road (West)	Ahead to D7244 Goldsworth Roac	541	463	-78	-14%	3.49	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

A320 Guildford Road; at j/w York Road

average from 27/11/12-29/11/12

AM peak hour 0800-0900



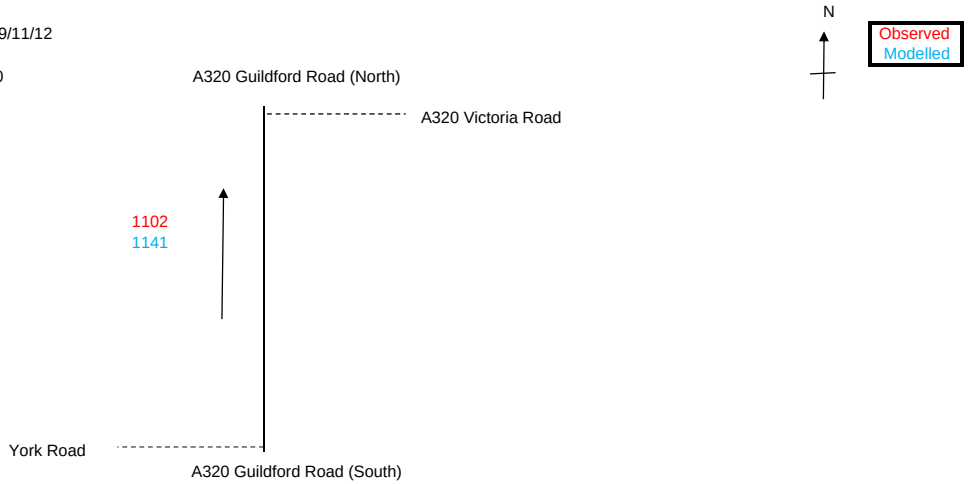
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road (North)	Ahead to A320 Guildford Road (S	656	602	-54	-8%	2.14	✓	✓
A320 Guildford Road (South)	Ahead to A320 Guildford Road (N	533	490	-43	-8%	1.88	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

A320 Guildford Road; on one-way system

average from 27/11/12-29/11/12

AM peak hour 0800-0900



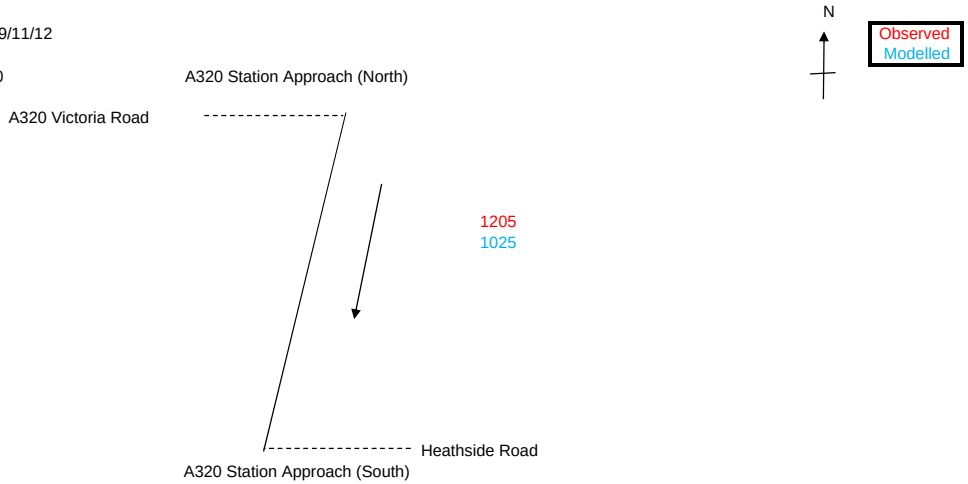
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road (South)	Ahead to A320 Guildford Road (N	1102	1141	39	4%	1.18	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

A320 Station Approach; on one-way system

average from 27/11/12-29/11/12

AM peak hour 0800-0900



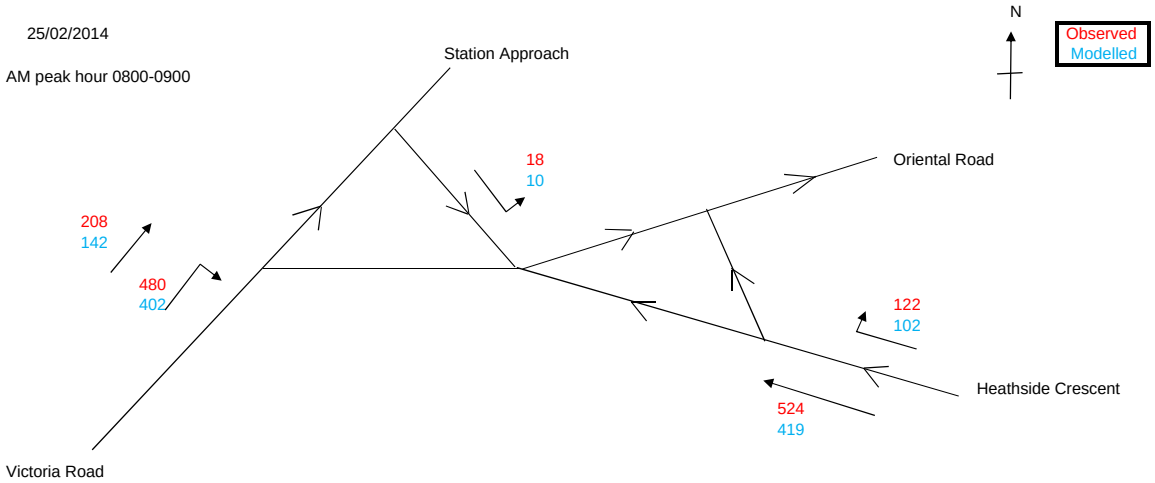
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Station Approach (North)	Ahead to A320 Station Approach	1205	1025	-180	-15%	5.40	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

Victoria Road j/w Station Approach/Oriental Road/Heathside Crescent

25/02/2014

AM peak hour 0800-0900



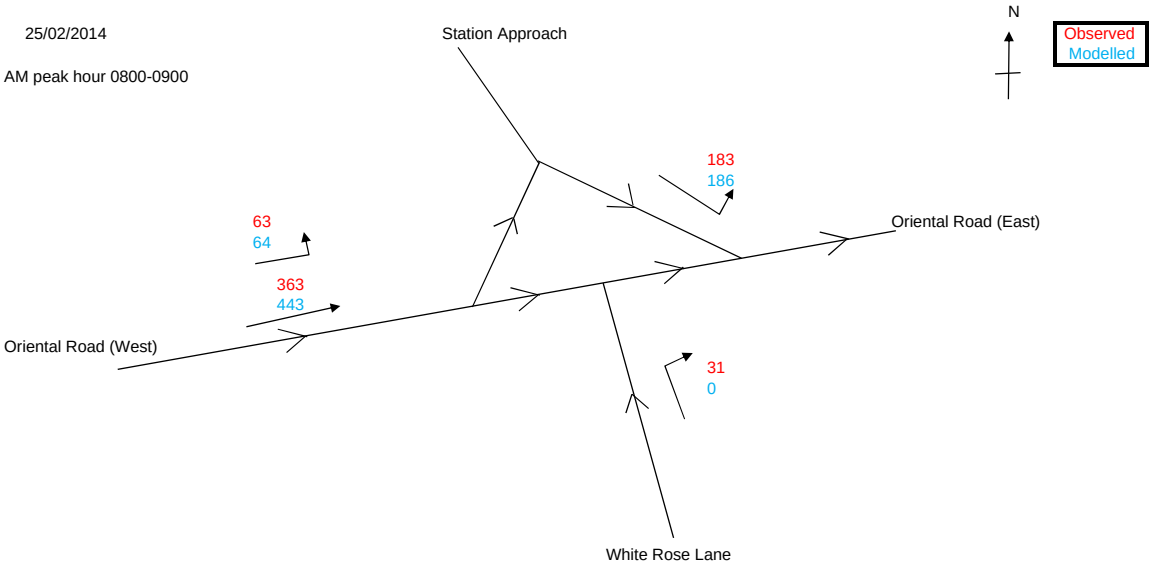
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Victoria Road	Left to Station Approach	208	142	-67	-32%	5.03	✓	✓
Victoria Road	Right to Oriental Road	480	402	-78	-16%	3.69	✓	✓
Station Approach	Left to Oriental Road	18	10	-8	-43%	2.05	✓	✓
Heathside Crescent	Ahead to Victoria Road	524	419	-105	-20%	4.81	✓	✖
Heathside Crescent	Right to Oriental Road	122	102	-20	-17%	1.93	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

D3710 Oriental Road j/w White Rose Lane

25/02/2014

AM peak hour 0800-0900



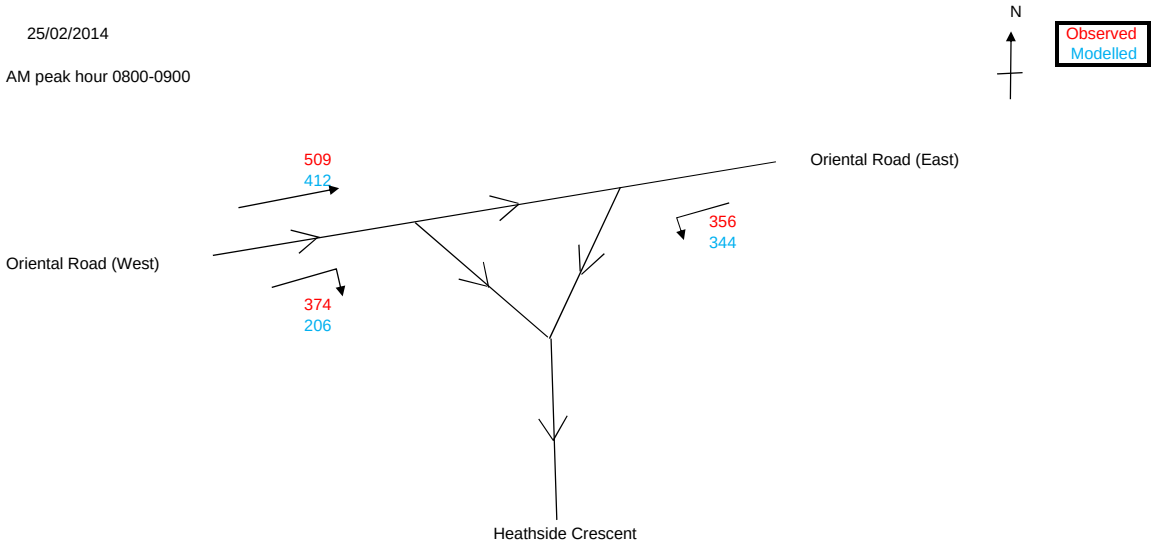
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
Oriental Road (West)	Left to Station Approach	63	64	1	2%	0.18	✓	✓
Oriental Road (West)	Ahead to Oriental Road (East)	363	443	80	22%	3.98	✓	✓
Station Approach	Left to Oriental Road (East)	183	186	3	2%	0.25	✓	✓
White Rose Lane	Right to Oriental Road (East)	31	0	-31	-100%	7.82	✗	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

D3710 Oriental Road j/w Heathside Crescent

25/02/2014

AM peak hour 0800-0900



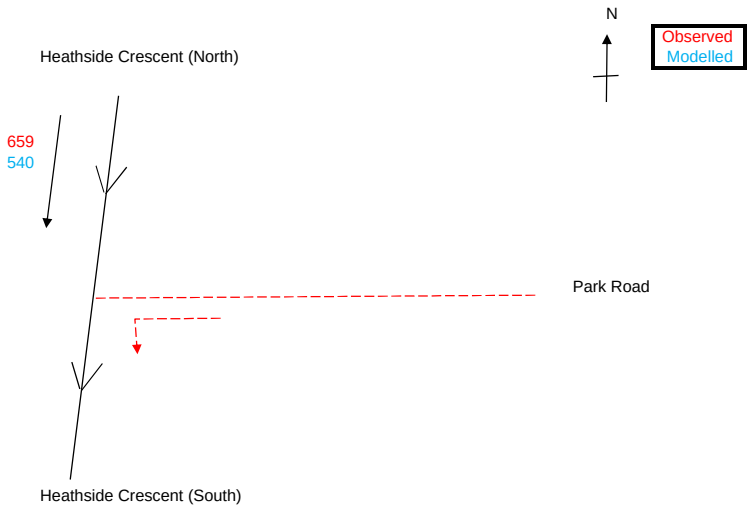
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
Oriental Road (West)	Ahead to Oriental Road (East)	509	412	-97	-19%	4.52	✓	✓
Oriental Road (West)	Right to Heathside Crescent	374	206	-168	-45%	9.85	✗	✗
Oriental Road (East)	Left to Heathside Crescent	356	344	-12	-3%	0.63	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

Heathside Crescent j/w Park Road

17/03/2011

AM peak hour 0800-0900



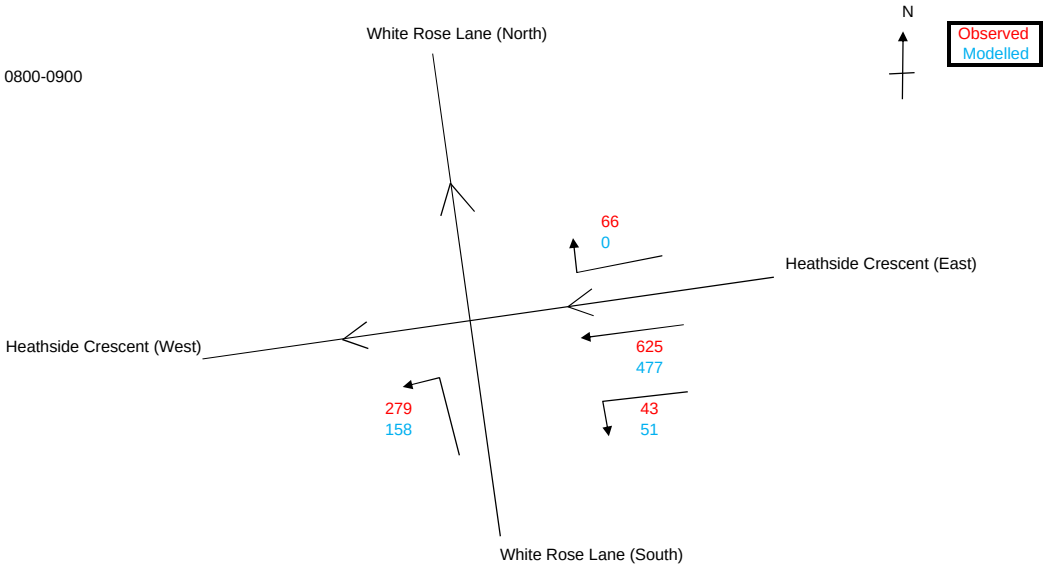
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Crescent (North)	Ahead to Heathside Crescent (So	659	540	-119	-18%	4.86	✓	✖

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

Heathside Crescent j/w White Rose Lane

17/03/2011

AM peak hour 0800-0900



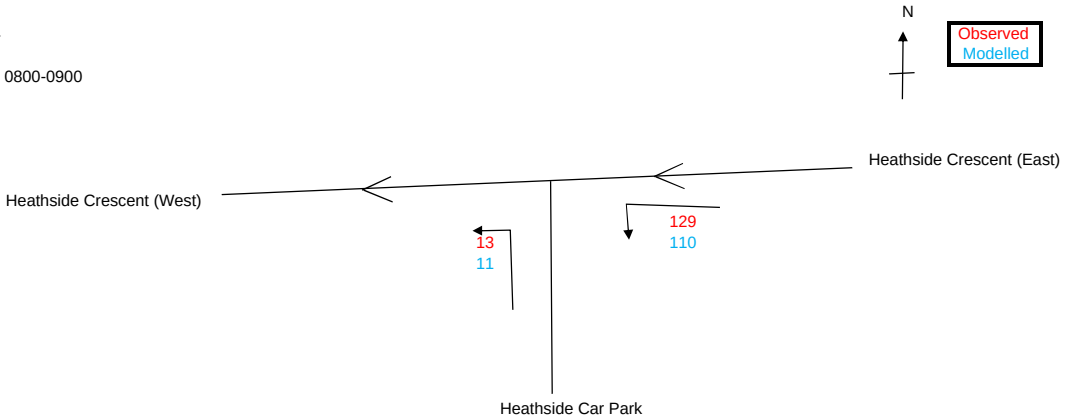
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Crescent (East)	Left to White Rose Lane (South)	43	51	8	19%	1.17	✓	✓
Heathside Crescent (East)	Ahead to Heathside Crescent (We	625	477	-148	-24%	6.29	✖	✖
Heathside Crescent (East)	Right to White Rose Lane (North)	66	0	-66	-100%	11.45	✖	✓
White Rose Lane (South)	Left to Heathside Crescent (West)	279	158	-121	-43%	8.15	✖	✖

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

Heathside Crescent Car Park

06/03/2014

AM peak hour 0800-0900



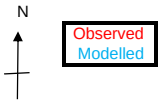
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Crescent (East)	Left into Heathside Car Park	129	110	-20	-15%	1.79	✓	✓
Heathside Car Park	Left onto Heathside Crescent (We	13	11	-2	-12%	0.46	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

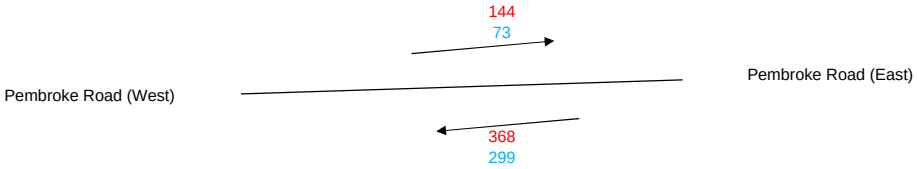
Pembroke Road; between Pembroke Gardens and Hockering Road

17/4/13-25/4/13 Tues-Thurs avg

AM peak hour 0800-0900



Observed
Modelled



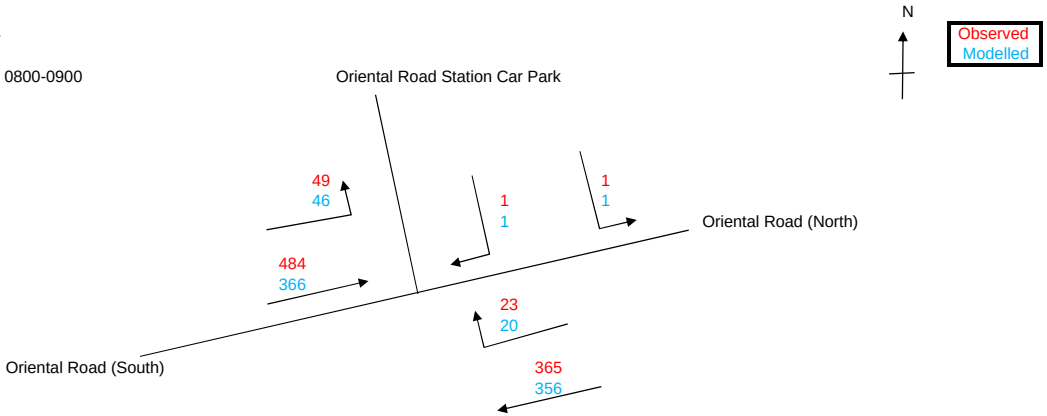
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
Pembroke Road (East)	Ahead to Pembroke Road (West)	368	299	-69	-19%	3.80	✓	✓
Pembroke Road (West)	Ahead to Pembroke Road (East)	144	73	-71	-49%	6.80	✗	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC

Oriental Road j/w Station Car Park

05/03/2014

AM peak hour 0800-0900



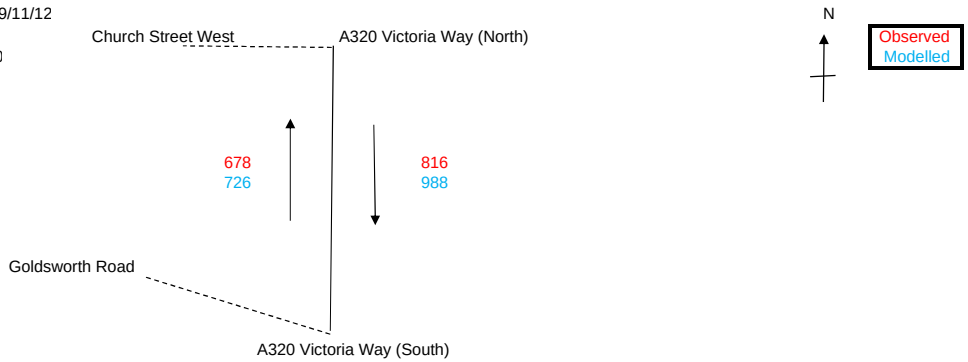
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Oriental Road Station Car Park	Left to Oriental Road (North)	1	1	-1	-50%	0.58	✓	✓
Oriental Road Station Car Park	Right to Oriental Road (South)	1	1	0	-35%	0.39	✓	✓
Oriental Road (South)	Ahead to Oriental Road (North)	484	366	-118	-24%	5.70	✖	✖
Oriental Road (South)	Left to Oriental Road Station Car I	49	46	-3	-6%	0.43	✓	✓
Oriental Road (North)	Right to Oriental Road Station Ca	23	20	-3	-14%	0.69	✓	✓
Oriental Road (North)	Ahead to Oriental Road (South)	365	356	-9	-2%	0.48	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

A320 Victoria Way; between Goldsworth Road and Church Street West

average from 27/11/12-29/11/12

AM peak hour 0800-0900



Observed
Modelled

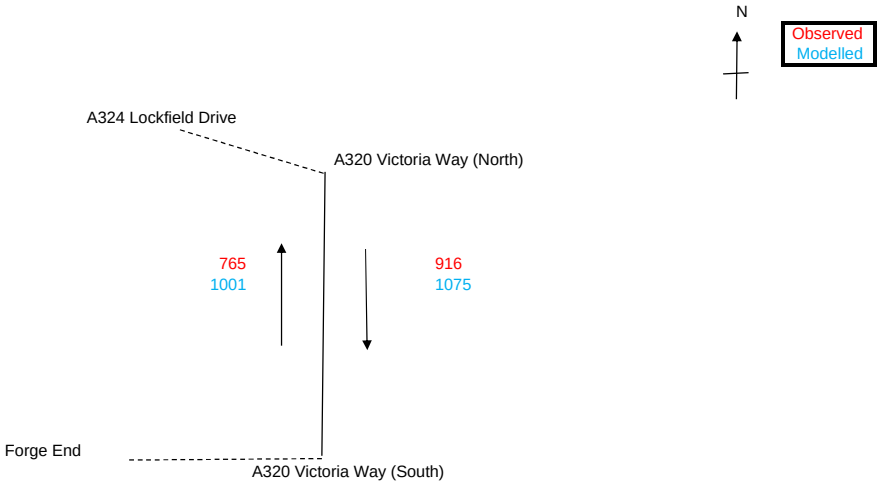
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (North)	Ahead to A320 Victoria Way (Sou	816	988	172	21%	5.72	✖	✖
A320 Victoria Way (South)	Ahead to A320 Victoria Way (Nort	678	726	48	7%	1.82	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

A320 Victoria Way; between Forge End and A324 Lockfield Drive

average from 27/11/12-29/11/12

AM peak hour 0800-0900



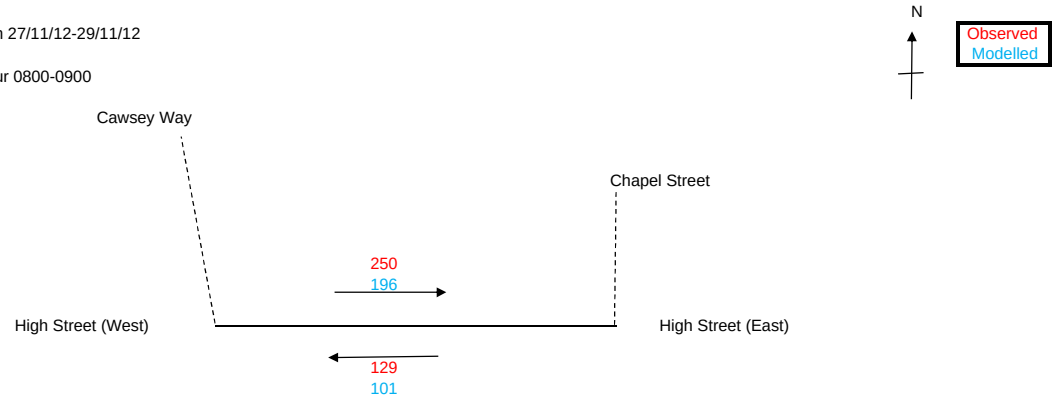
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
A320 Victoria Way (North)	Ahead to A320 Victoria Way (Sou	916	1075	159	17%	5.05	✓	✖
A320 Victoria Way (South)	Ahead to A320 Victoria Way (Nort	765	1001	236	31%	7.95	✖	✖

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

High Street; between Cawsey Way and Chapel Street

average from 27/11/12-29/11/12

AM peak hour 0800-0900



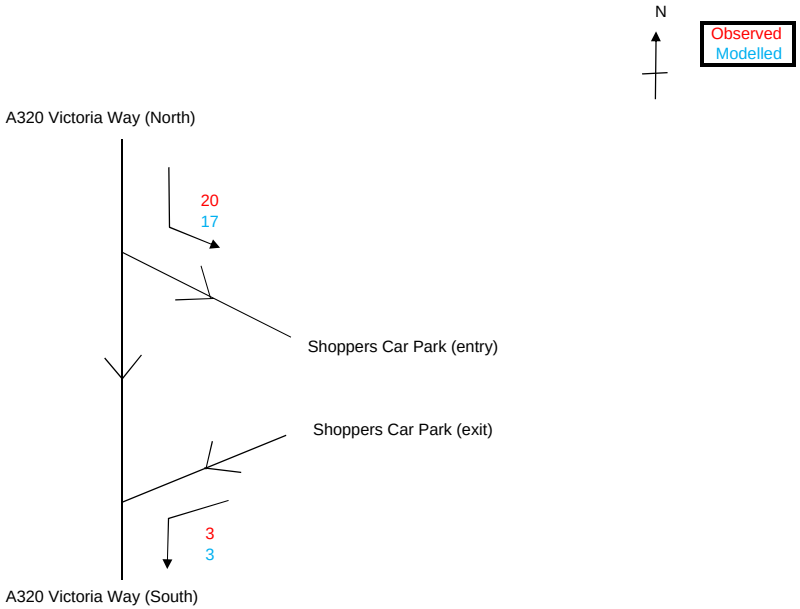
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
High Street (West)	Ahead to High Street (East)	250	196	-54	-22%	3.64	✓	✓
High Street (East)	Ahead to High Street (West)	129	101	-28	-22%	2.65	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

Shoppers Car Park (ToysRUs); entry and exit onto A320 Victoria Way (southbound only)

average from 27/11/12-29/11/12

AM peak hour 0800-0900



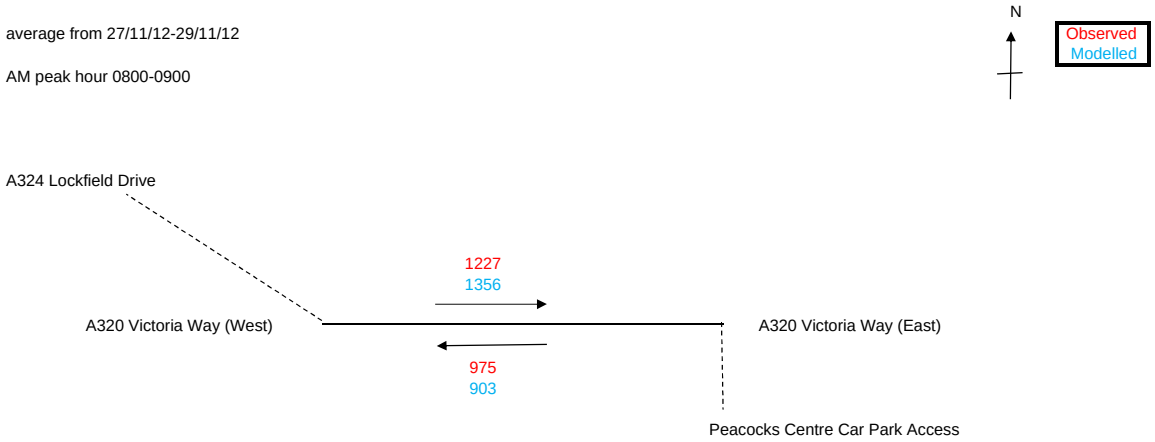
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (North)	Left to Shoppers Car Park (entry)	20	17	-4	-18%	0.82	✓	✓
Shoppers Car Park (exit)	Left to A320 Victoria Way (South)	3	3	0	-5%	0.09	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

A320 Victoria Way; between A324 Lockfield Drive and Peacocks Centre Car Park Access

average from 27/11/12-29/11/12

AM peak hour 0800-0900



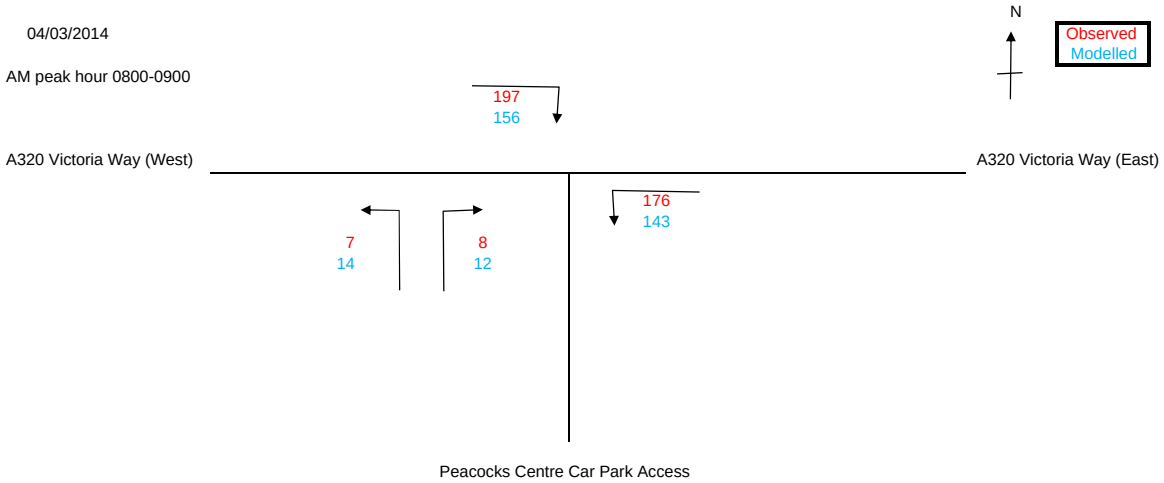
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
A320 Victoria Way (West)	Ahead to A320 Victoria Way (East	1227	1356	129	11%	3.59	✓	✓
A320 Victoria Way (East)	Ahead to A320 Victoria Way (Wes	975	903	-72	-7%	2.35	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

Peacocks Centre Car Park Access; j/w A320 Victoria Way

04/03/2014

AM peak hour 0800-0900



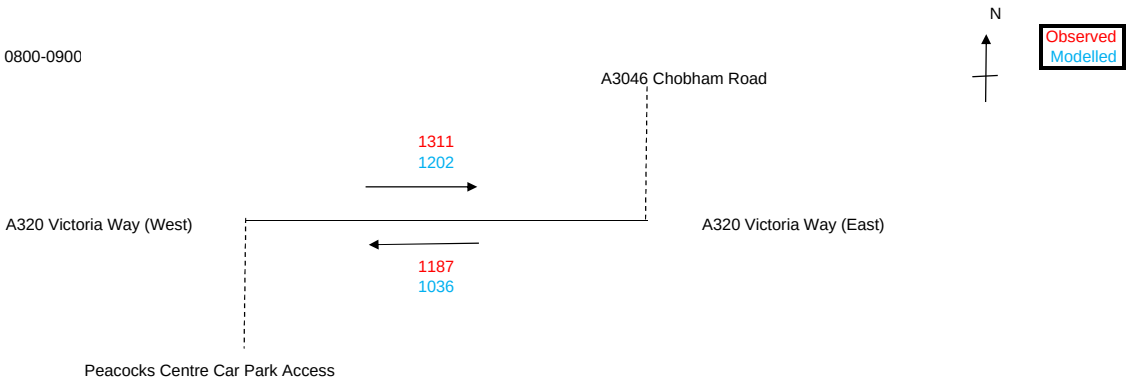
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Peacocks Centre Car Park Access	Left to A320 Victoria Way (West)	7	14	7	93%	2.03	✓	✓
Peacocks Centre Car Park Access	Right to A320 Victoria Way (East)	8	12	4	51%	1.29	✓	✓
A320 Victoria Way (West)	Right to Peacocks Centre Car Par	197	156	-41	-21%	3.06	✓	✓
A320 Victoria Way (East)	Left to Peacocks Centre Car Park	176	143	-33	-19%	2.60	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

A320 Victoria Way; between Peacocks Centre Car Park Access and A3046 Chobham Road

15/05/2012

AM peak hour 0800-0900



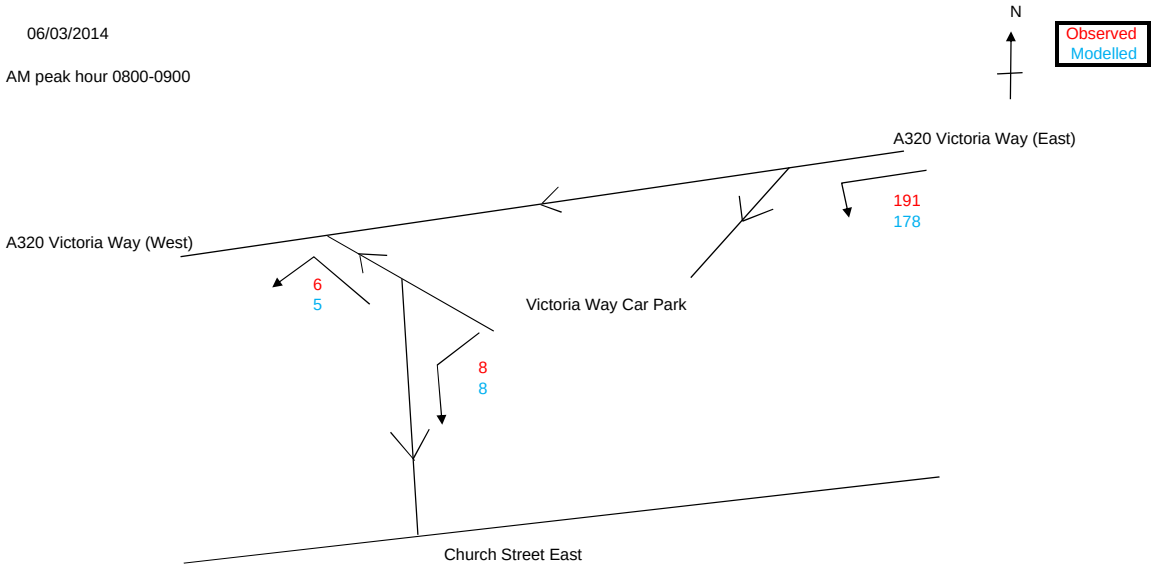
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (West)	Ahead to A320 Victoria Way (East	1187	1036	-151	-13%	4.54	✓	✓
A320 Victoria Way (East)	Ahead to A320 Victoria Way (Wes	1311	1202	-109	-8%	3.09	✓	✓

MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCC

Victoria Way Car Park; entrance from A320 Victoria Way and exit onto Victoria Way/Church Street East

06/03/2014

AM peak hour 0800-0900



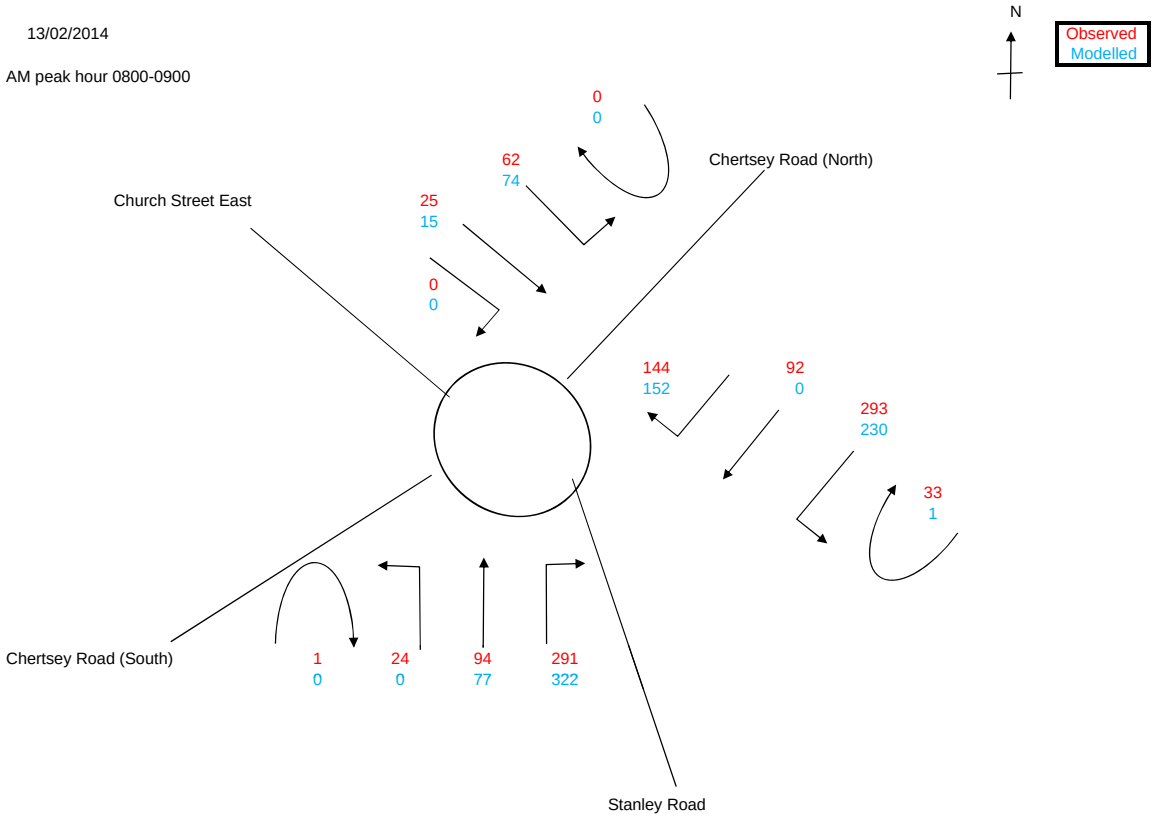
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (East)	Left to Victoria Way Car Park	191	178	-13	-7%	0.95	✓	✓
Victoria Way Car Park	Left to Church Street East	8	8	0	-1%	0.02	✓	✓
Victoria Way Car Park	Left to A320 Victoria Way (West)	6	5	-1	-17%	0.43	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

Chertsey Road; roundabout with Stanley Road and Church Street East

13/02/2014

AM peak hour 0800-0900



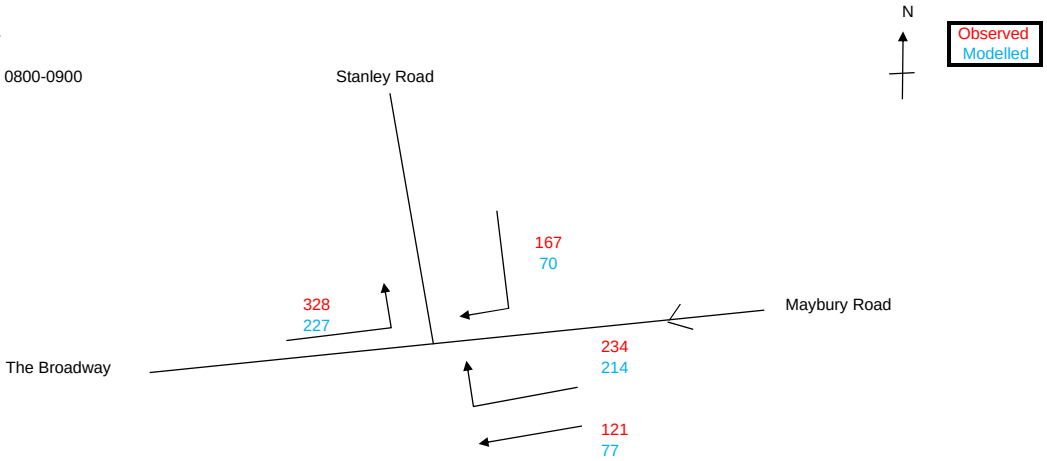
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Chertsey Road (North)	Left to Stanley Road	293	230	-63	-22%	3.93	✓	✓
Chertsey Road (North)	Ahead to Chertsey Road (South)	92	0	-92	-100%	13.56	✗	✓
Chertsey Road (North)	Right to Church Street East	144	152	8	5%	0.65	✓	✓
Chertsey Road (North)	U-turn to Chertsey Road (North)	33	1	-32	-98%	7.89	✗	✓
Stanley Road	Left to Chertsey Road (South)	24	0	-24	-100%	6.93	✗	✓
Stanley Road	Ahead to Church Street East	94	77	-17	-19%	1.89	✓	✓
Stanley Road	Right to Chertsey Road (North)	291	322	31	11%	1.77	✓	✓
Stanley Road	U-turn to Stanley Road	1	0	-1	-100%	1.41	✓	✓
Church Street East	Left to Chertsey Road (North)	62	74	12	19%	1.41	✓	✓
Church Street East	Ahead to Stanley Road	25	15	-10	-40%	2.26	✓	✓
Church Street East	Right to Chertsey Road (South)	3	0	-3	-100%	2.45	✓	✓
Church Street East	U-turn to Church Street East	0	0	0	-100%	0.45	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

The Broadway; j/w Maybury Road and Stanley Road

05/02/2014

AM peak hour 0800-0900



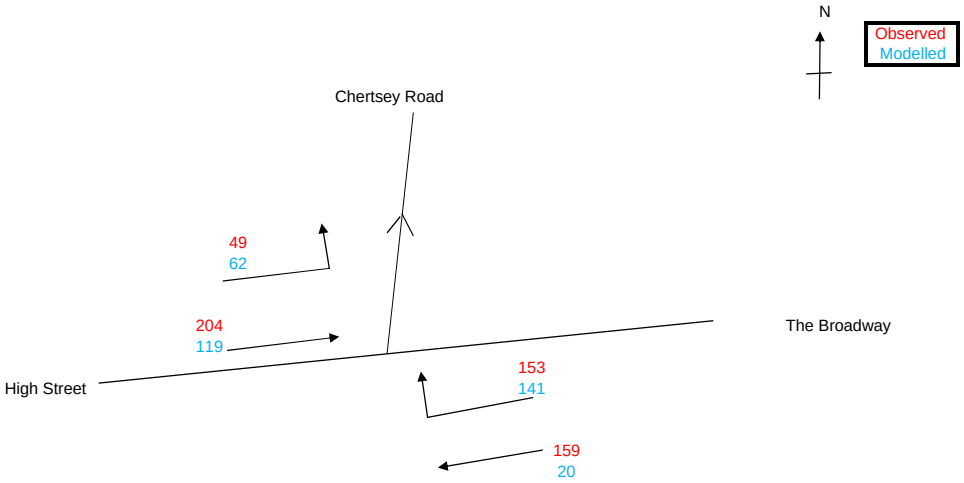
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Maybury Road	Right to Stanley Road	234	214	-20	-9%	1.37	✓	✓
Maybury Road	Ahead to The Broadway	121	77	-44	-36%	4.37	✓	✓
The Broadway	Left to Stanley Road	328	227	-101	-31%	6.06	✖	✖
Stanley Road	Right to The Broadway	167	70	-97	-58%	8.88	✖	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

C143 The Broadway; j/w High Street and Chertsey Road

13/02/2014

AM peak hour 0800-0900



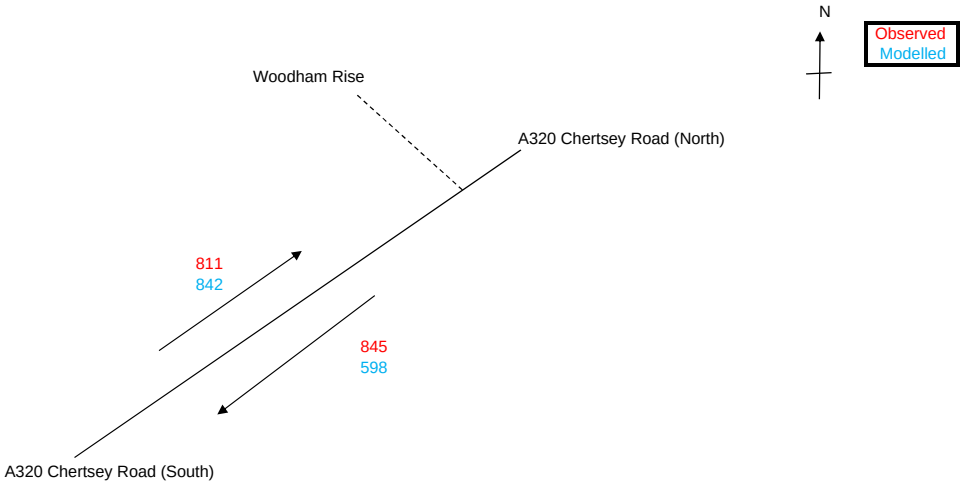
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
The Broadway	Right to Chertsey Road	153	141	-12	-8%	1.02	✓	✓
The Broadway	Ahead to High Street	159	20	-139	-87%	14.69	✖	✖
High Street	Left to Chertsey Road	49	62	13	26%	1.71	✓	✓
High Street	Ahead to The Broadway	204	119	-85	-42%	6.68	✖	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

A320 Chertsey Road; opposite Woodham Rise

05/11/2008

AM peak hour 0800-0900



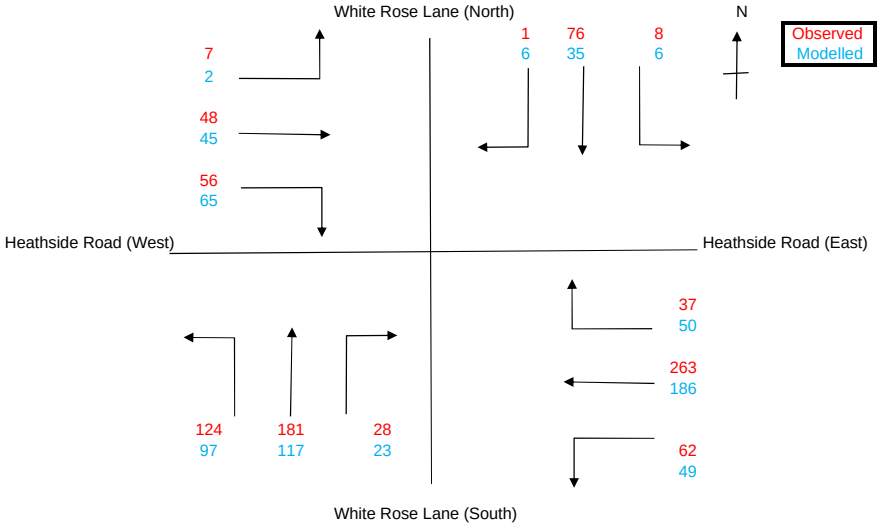
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Chertsey Road (South)	Ahead to A320 Chertsey Road (N	811	842	31	4%	1.09	✓	✓
A320 Chertsey Road (North)	Ahead to A320 Chertsey Road (S	845	598	-247	-29%	9.18	✖	✖

MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCC

D3709 Heathside Road j/w D3708 White Rose Lane

24/11/2009

AM peak hour 0800-0900



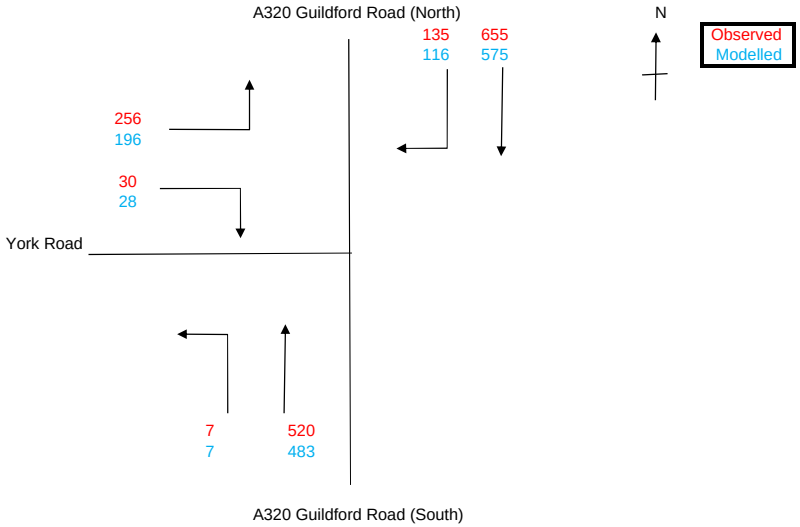
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Road (East)	Left to White Rose Lane (South)	62	49	-13	-21%	1.71	✓	✓
Heathside Road (East)	Ahead to Heathside Road (West)	263	186	-77	-29%	5.16	✓	✓
Heathside Road (East)	Right to White Rose Lane (North)	37	50	13	36%	2.01	✓	✓
White Rose Lane (South)	Left to Heathside Road (West)	124	97	-27	-22%	2.61	✓	✓
White Rose Lane (South)	Ahead to White Rose Lane (North	181	117	-64	-35%	5.21	✓	✓
White Rose Lane (South)	Right to Heathside Road (East)	28	23	-5	-19%	1.03	✓	✓
Heathside Road (West)	Left to White Rose Lane (North)	7	2	-5	-71%	2.33	✓	✓
Heathside Road (West)	Ahead to Heathside Road (East)	48	45	-3	-7%	0.47	✓	✓
Heathside Road (West)	Right to White Rose Lane (South)	56	65	9	17%	1.21	✓	✓
White Rose Lane (North)	Left to Heathside Road (East)	8	6	-2	-30%	0.92	✓	✓
White Rose Lane (North)	Ahead to White Rose Lane (South	76	35	-41	-54%	5.49	✓	✓
White Rose Lane (North)	Right to Heathside Road (West)	1	6	5	530%	2.77	✓	✓

MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCC

A320 Guildford Road j/w C141 York Road

22/04/2008

AM peak hour 0800-0900



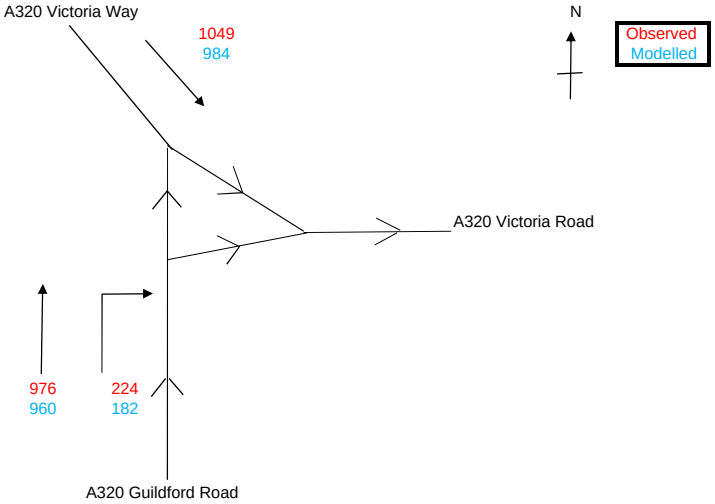
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road (South)	Left to York Road	7	7	0	5%	0.13	✓	✓
A320 Guildford Road (South)	Ahead to Guildford Road (North)	520	483	-37	-7%	1.65	✓	✓
York Road	Left to Guildford Road (North)	256	196	-60	-23%	3.97	✓	✓
York Road	Right to Guildford Road (South)	30	28	-2	-8%	0.45	✓	✓
A320 Guildford Road (North)	Right to York Road	135	116	-19	-14%	1.73	✓	✓
A320 Guildford Road (North)	Ahead to Guildford Road (South)	655	575	-80	-12%	3.22	✓	✓

MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTC

A320 Guildford Road j/w Victoria Way and Victoria Road

23/11/2012

AM peak hour 0800-0900



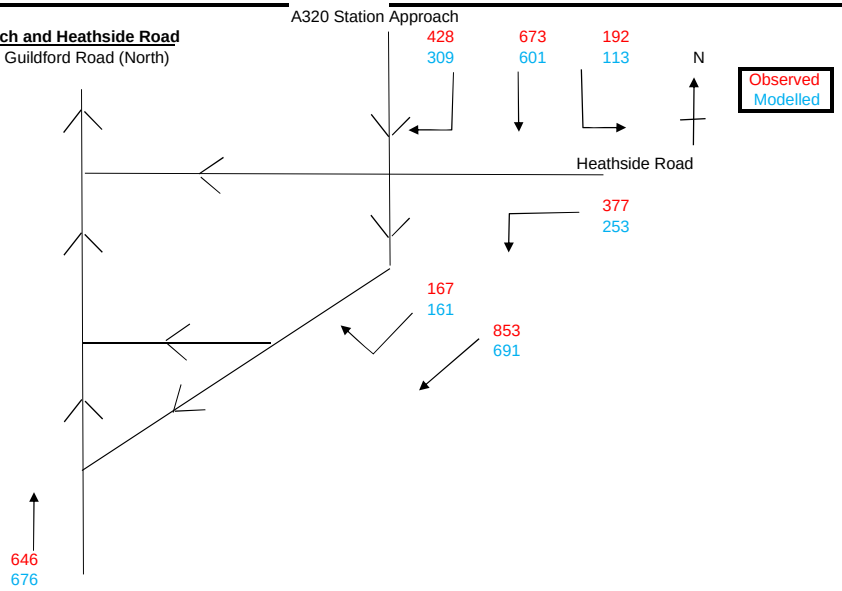
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road	Ahead to A320 Victoria Way	976	960	-16	-2%	0.52	✓	✓
A320 Guildford Road	Right to A320 Victoria Way	224	182	-42	-19%	2.98	✓	✓
A320 Victoria Way	Ahead to A320 Victoria Road	1049	984	-65	-6%	2.04	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

A320 Guildford Road j/w Station Approach and Heathside Road

23/11/2012

AM peak hour 0800-0900



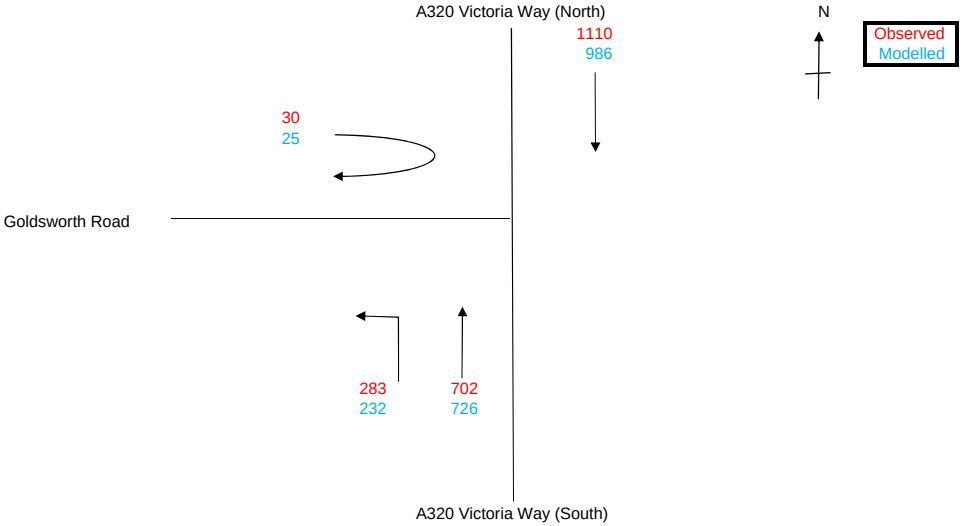
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road (South)	Ahead to A320 Guildford Road (N	646	676	30	5%	1.17	✓	✓
A320 Station Approach	Left to Heathside Road	192	113	-79	-41%	6.41	✗	✓
A320 Station Approach	Ahead to A320 Guildford Road (S	673	601	-72	-11%	2.84	✓	✓
A320 Station Approach	Right to A320 Guildford Road (No	428	309	-119	-28%	6.18	✗	✗
Heathside Road	Left out of junction	377	253	-124	-33%	6.97	✗	✗
South btw Heathside and A320	Ahead to A320 Guildford Road (S	853	691	-162	-19%	5.85	✗	✗
South btw Heathside and A320	Right to A320 Guildford Road (No	167	161	-6	-3%	0.43	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

A320 Victoria Way j/w Goldsworth Road

23/11/2012

AM peak hour 0800-0900



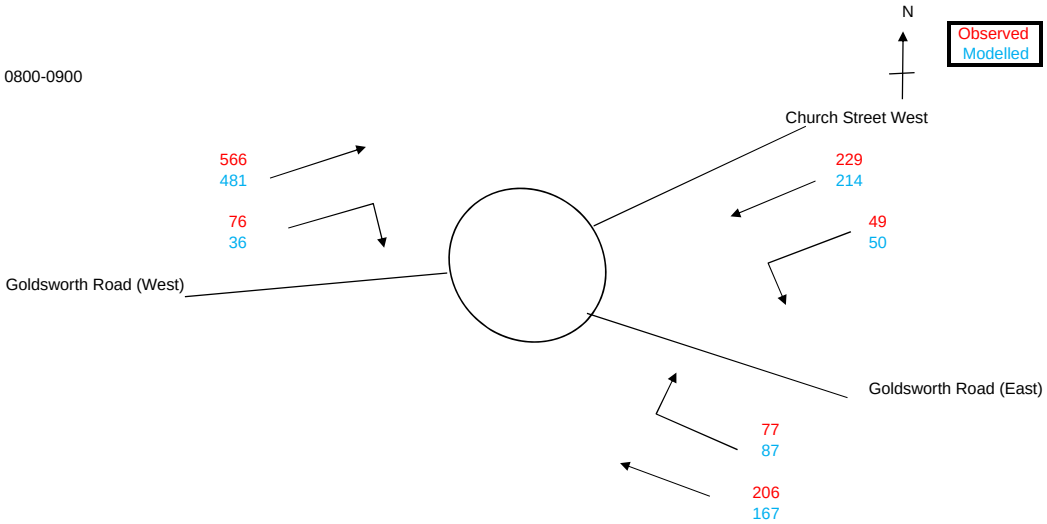
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
A320 Victoria Way (North)	Ahead to A320 Victoria Way (Sort	1110	986	-124	-11%	3.84	✓	✓
A320 Victoria Way (South)	Left to Goldsworth Road	283	232	-51	-18%	3.21	✓	✓
A320 Victoria Way (South)	Ahead to A320 Victoria Way (Nort	702	726	24	3%	0.91	✓	✓
Goldsworth Road	U-turn to Goldsworth Road	30	25	-5	-18%	1.02	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

Goldsworth Road j/w Church Street West

23/11/2012

AM peak hour 0800-0900



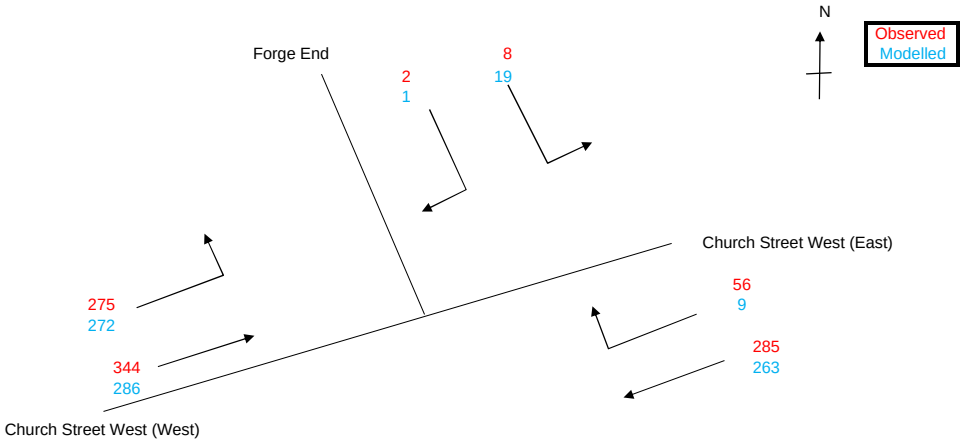
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Church Street West	Left to Goldsworth Road (East)	49	50	1	2%	0.14	✓	✓
Church Street West	Ahead to Goldsworth Road (West	229	214	-15	-6%	0.99	✓	✓
Goldsworth Road (East)	Ahead to Goldsworth Road (West	206	167	-39	-19%	2.88	✓	✓
Goldsworth Road (East)	Right to Church Street West	77	87	10	13%	1.10	✓	✓
Goldsworth Road (West)	Ahead to Church Street West	566	481	-85	-15%	3.72	✓	✓
Goldsworth Road (West)	Right to Goldsworth Road (East)	76	36	-40	-53%	5.38	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

Church Street West j/w Forge End

23/11/2012

AM peak hour 0800-0900



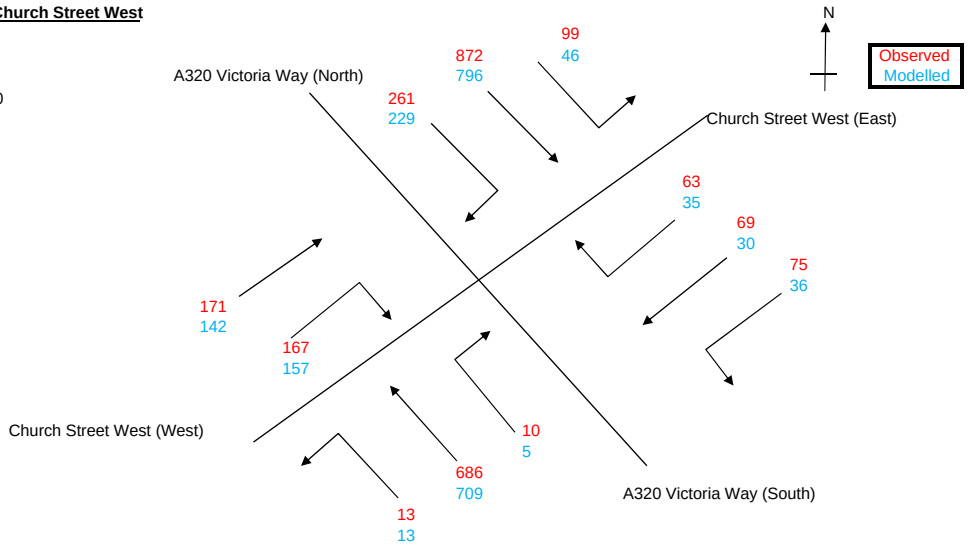
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Church Street West (East)	Ahead to Church Street West (We	285	263	-22	-8%	1.32	✓	✓
Church Street West (East)	Right to Forge End	56	9	-47	-84%	8.20	✗	✓
Church Street West (West)	Left to Forge End	275	272	-3	-1%	0.18	✓	✓
Church Street West (West)	Ahead to Church Street West (Ea:	344	286	-58	-17%	3.27	✓	✓
Forge End	Left to Church Street West (East)	8	19	11	141%	3.05	✓	✓
Forge End	Right to Church Street West (Wes	2	1	-1	-65%	1.12	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

A320 Victoria Way j/w Church Street West

23/11/2012

AM peak hour 0800-0900



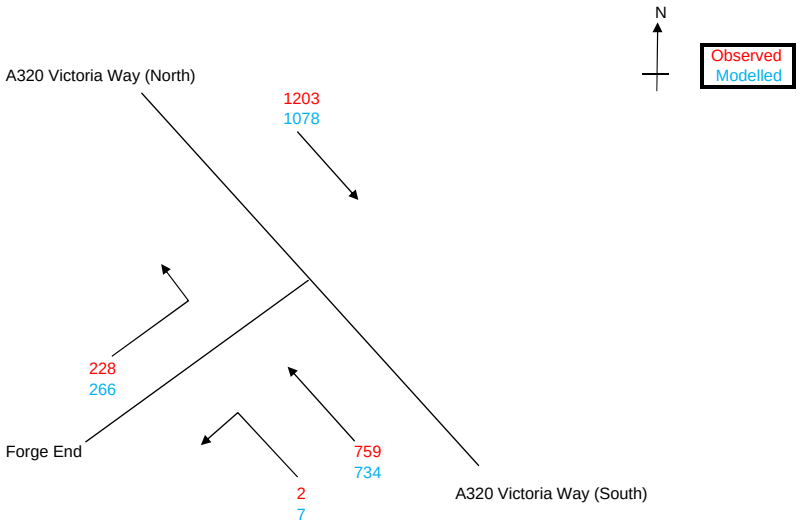
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (North)	Left to Church Street West (West)	99	46	-53	-54%	6.26	✗	✓
A320 Victoria Way (North)	Ahead to A320 Victoria Way (Sou	872	796	-76	-9%	2.62	✓	✓
A320 Victoria Way (North)	Right to Church Street West (East	261	229	-32	-12%	2.02	✓	✓
Church Street West (East)	Left to A320 Victoria Way (South)	63	35	-28	-45%	4.04	✓	✓
Church Street West (East)	Ahead to Church Street West (We	69	30	-39	-56%	5.51	✗	✓
Church Street West (East)	Right to A320 Victoria Way (North	75	36	-39	-52%	5.20	✓	✓
A320 Victoria Way (South)	Left to Church Street West (West)	13	13	0	-3%	0.13	✓	✓
A320 Victoria Way (South)	Ahead to A320 Victoria Way (Nort	686	709	23	3%	0.85	✓	✓
A320 Victoria Way (South)	Right to Church Street West (East	10	5	-5	-50%	1.83	✓	✓
Church Street West (West)	Ahead to Church Street West (Ea:	171	142	-29	-17%	2.28	✓	✓
Church Street West (West)	Right to A320 Victoria Way (South	167	157	-10	-6%	0.82	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

A320 Victoria Way j/w Forge End

23/11/2012

AM peak hour 0800-0900



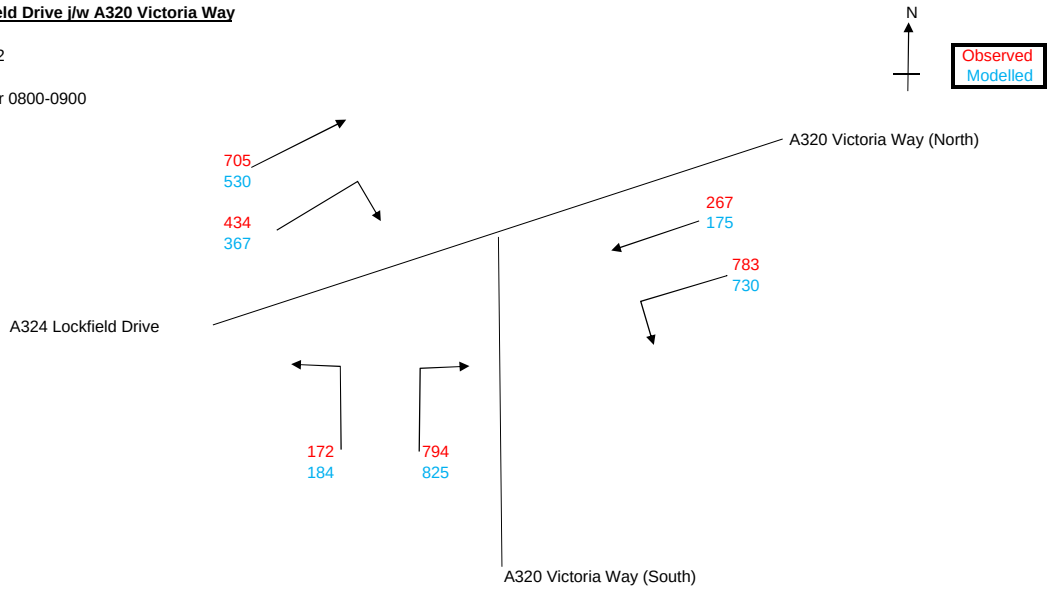
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (North)	Ahead to A320 Victoria Way (Sou	1203	1078	-125	-10%	3.70	✓	✓
A320 Victoria Way (South)	Left to Forge End	2	7	5	245%	2.32	✓	✓
A320 Victoria Way (South)	Ahead to A320 Victoria Way (Nort	759	734	-25	-3%	0.92	✓	✓
Forge End	Left to A320 Victoria Way (North)	228	266	38	17%	2.45	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

A324 Lockfield Drive j/w A320 Victoria Way

23/11/2012

AM peak hour 0800-0900



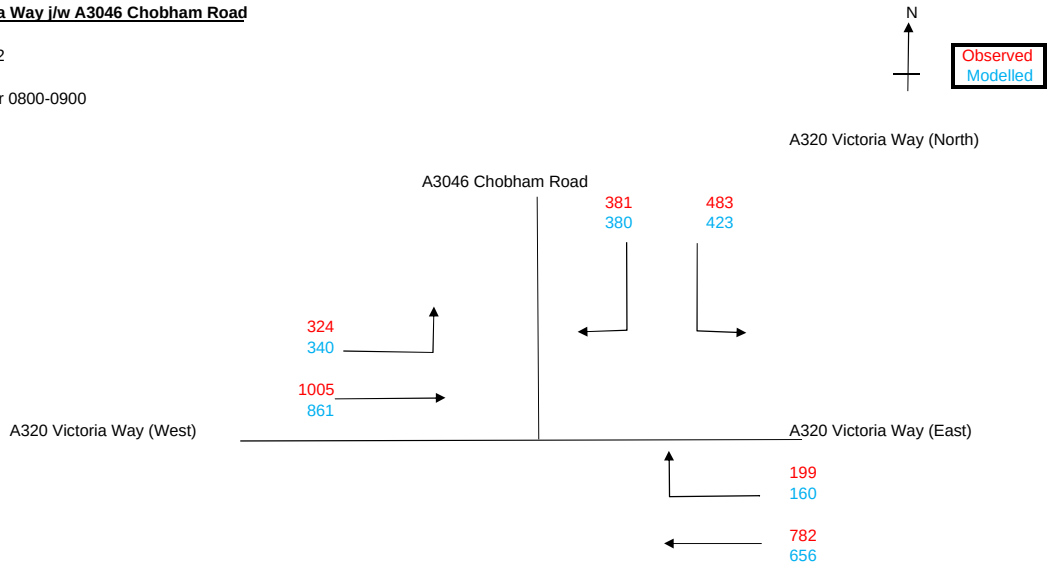
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (North)	Left to A320 Victoria Way (South)	783	730	-53	-7%	1.92	✓	✓
A320 Victoria Way (North)	Ahead to A324 Lockfield Drive	267	175	-92	-34%	6.19	✖	✓
A320 Victoria Way (South)	Left to A324 Lockfield Drive	172	184	12	7%	0.93	✓	✓
A320 Victoria Way (South)	Right to A320 Victoria Way (North	794	825	31	4%	1.09	✓	✓
A324 Lockfield Drive	Ahead to A320 Victoria Way (Nort	705	530	-175	-25%	7.02	✖	✖
A324 Lockfield Drive	Right to A320 Victoria Way (Soutl	434	367	-68	-16%	3.37	✓	✓

Sourced from Vectos daigrams from TA - do not have the raw data

A320 Victoria Way j/w A3046 Chobham Road

23/11/2012

AM peak hour 0800-0900



Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
A3046 Chobham Road	Left to A320 Victoria Way (East)	483	423	-60	-12%	2.80	✓	✓
A3046 Chobham Road	Right to A320 Victoria Way (West)	381	380	-1	0%	0.03	✓	✓
A320 Victoria Way (East)	Ahead to A320 Victoria Way (Wes	782	656	-126	-16%	4.71	✓	✖
A320 Victoria Way (East)	Right to A3046 Chobham Road	199	160	-39	-20%	2.92	✓	✓
A320 Victoria Way (West)	Left to A3046 Chobham Road	324	340	16	5%	0.87	✓	✓
A320 Victoria Way (West)	Ahead to A320 Victoria Way (East	1005	861	-145	-14%	4.73	✓	✓

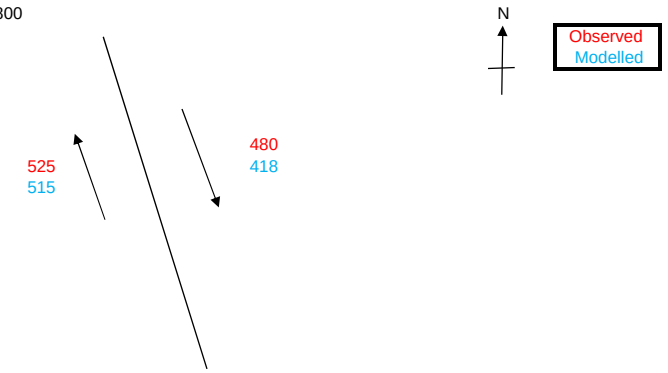
Sourced from Vectos daigrams from TA - do not have the raw data

Appendix VIII: PM Peak Traffic Flow Validation

A3046 Kettlewell Hill (between Horsell Rise and Wheatsheaf Close)

1/11/12-30/11/12 (Tues-Thurs average)

PM peak hour 1700-1800



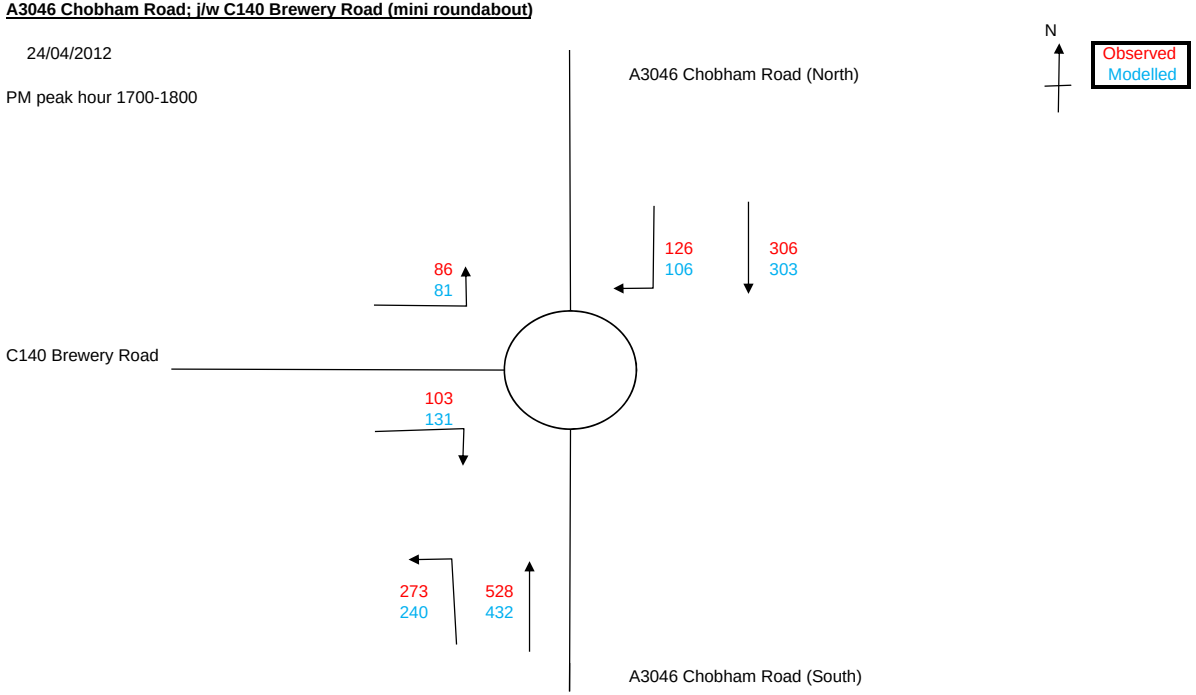
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Kettlewell Hill (NW bound)	Ahead to A3046 Kettlewell Hill	525	515	-10	-2%	0.45	✓	✓
Kettlewell Hill (SE bound)	Ahead to A3406 Chobham Road	480	418	-62	-13%	2.94	✓	✓

ATC (real time); data source:H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC

A3046 Chobham Road; j/w C140 Brewery Road (mini roundabout)

24/04/2012

PM peak hour 1700-1800



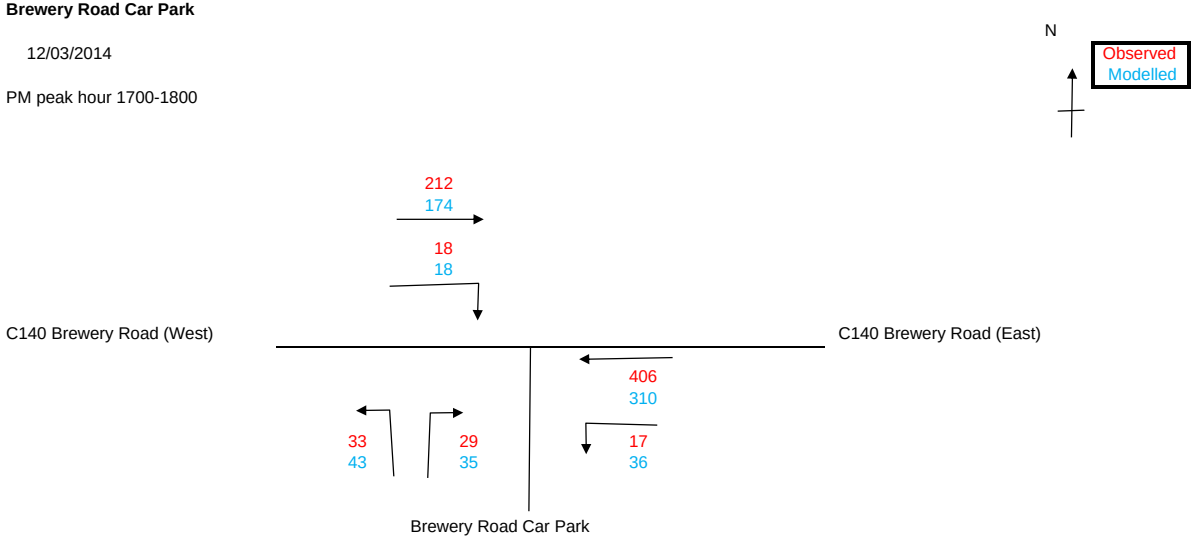
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
C140 Brewery Road	Left to A3046 Chobham Road (Nc	86	81	-5	-6%	0.56	✓	✓
C140 Brewery Road	Right to A3046 Chobham Road (S	103	131	28	27%	2.61	✓	✓
A3046 Chobham Road (North)	Ahead to A3046 Chobham Road (	306	303	-3	-1%	0.15	✓	✓
A3046 Chobham Road (North)	Right to C140 Brewery Road	126	106	-20	-16%	1.90	✓	✓
A3046 Chobham Road (South)	Left to C140 Brewery Road	273	240	-33	-12%	2.07	✓	✓
A3046 Chobham Road (South)	Ahead to A3046 Chobham Road (	528	432	-96	-18%	4.37	✓	✓

MCTCNT; data source:H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

Brewery Road Car Park

12/03/2014

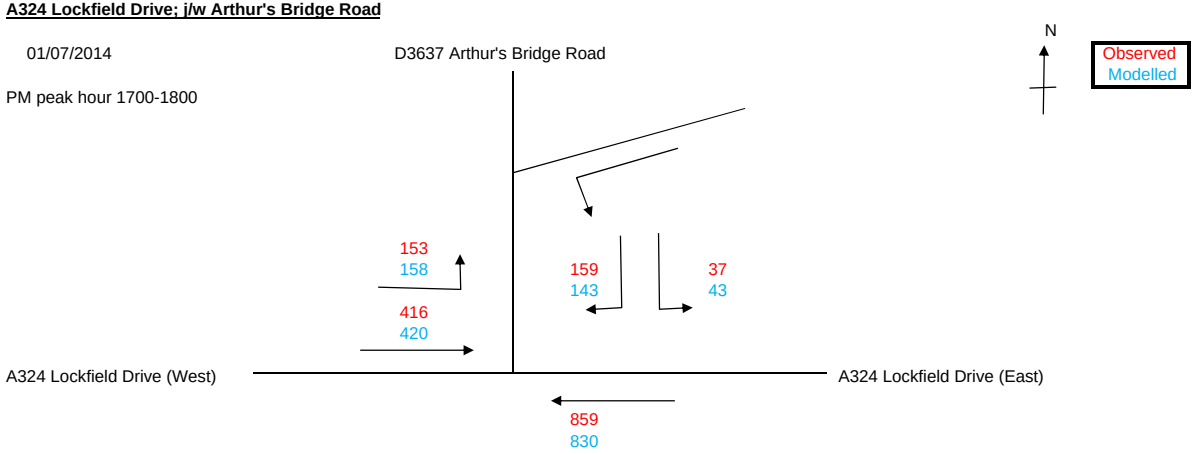
PM peak hour 1700-1800



Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Brewery Road Car Park	Left to C140 Brewery Road (East)	33	43	10	29%	1.57	✓	✓
Brewery Road Car Park	Right to C140 Brewery Road (We	29	35	6	21%	1.09	✓	✓
C140 Brewery Road (West)	Ahead to C140 Brewery Road (Ea	212	174	-38	-18%	2.73	✓	✓
C140 Brewery Road (West)	Right to Brewery Road Car Park	18	18	0	0%	0.01	✓	✓
C140 Brewery Road (East)	Left to Brewery Road Car Park	17	36	19	114%	3.75	✓	✓
C140 Brewery Road (East)	Ahead to C140 Brewery Road (W	406	310	-96	-24%	5.10	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

A324 Lockfield Drive; j/w Arthur's Bridge Road



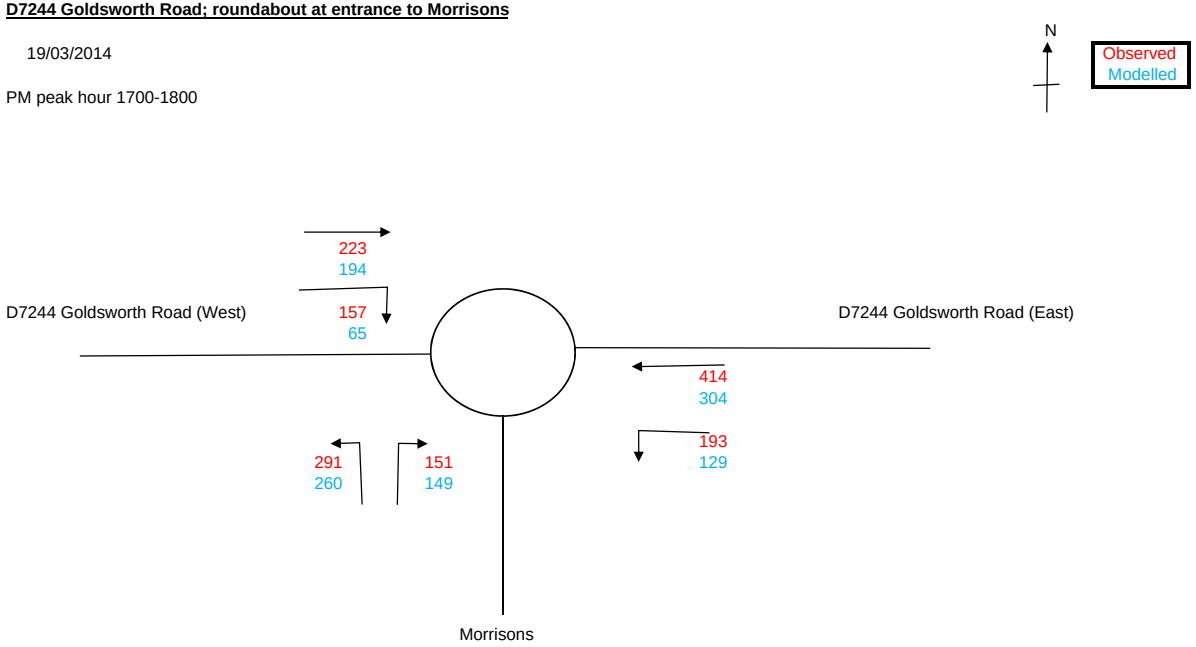
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
D3637 Arthur's Bridge Road	Left to A324 Lockfield Drive (East	37	43	6	17%	0.99	✓	✓
D3637 Arthur's Bridge Road	Right to A324 Lockfield Drive (We	159	143	-16	-10%	1.32	✓	✓
A324 Lockfield Drive (West)	Ahead to A324 Lockfield Drive (E:	416	420	4	1%	0.18	✓	✓
A324 Lockfield Drive (West)	Left to D3637 Arthur's Bridge Roa	153	158	5	3%	0.42	✓	✓
A324 Lockfield Drive (East)	Ahead to A324 Lockfield Drive (W	859	830	-29	-3%	0.99	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

D7244 Goldsworth Road; roundabout at entrance to Morrisons

19/03/2014

PM peak hour 1700-1800



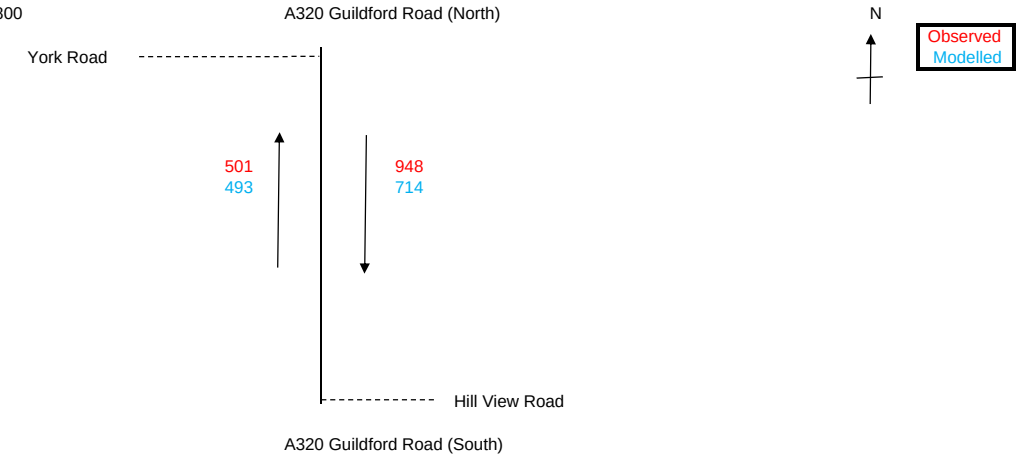
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Morrisons	Left to D7244 Goldsworth Road (\	291	260	-31	-11%	1.88	✓	✓
Morrisons	Right to D7244 Goldsworth Road	151	149	-2	-1%	0.16	✓	✓
D7244 Goldsworth Road (East)	Ahead to D7244 Goldsworth Roa	414	304	-110	-27%	5.81	✗	✗
D7244 Goldsworth Road (East)	Left to Morrisons	193	129	-64	-33%	5.02	✓	✓
D7244 Goldsworth Road (West)	Right to Morrisons	157	65	-92	-59%	8.72	✗	✓
D7244 Goldsworth Road (West)	Ahead to D7244 Goldsworth Roa	223	194	-29	-13%	2.03	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

A320 Guildford Road; at j/w York Road

average from 27/11/14-29/11/14

PM peak hour 1700-1800



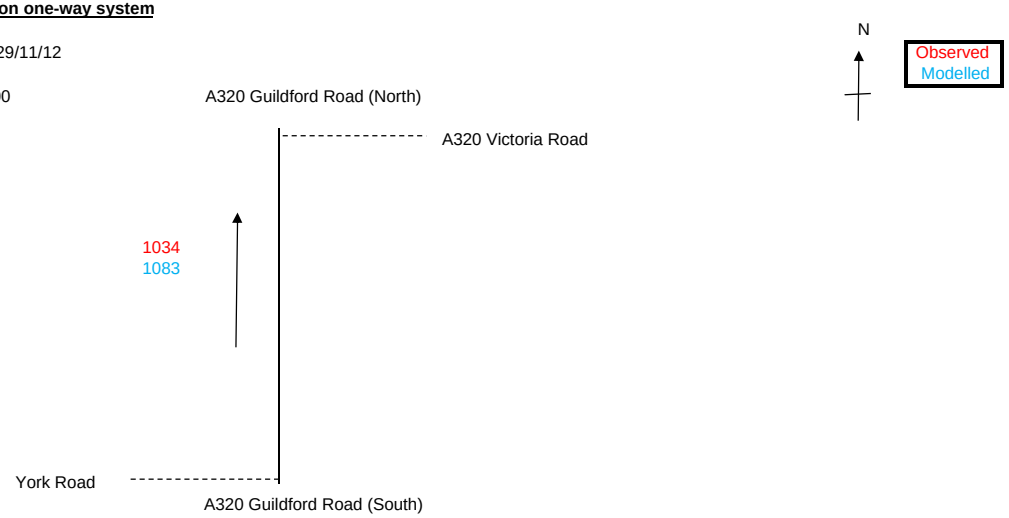
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road (North)	Ahead to A320 Guildford Road (S	948	714	-234	-25%	8.13	✖	✖
A320 Guildford Road (South)	Ahead to A320 Guildford Road (N	501	493	-8	-2%	0.35	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

A320 Guildford Road; on one-way system

average from 27/11/12-29/11/12

PM peak hour 1700-1800



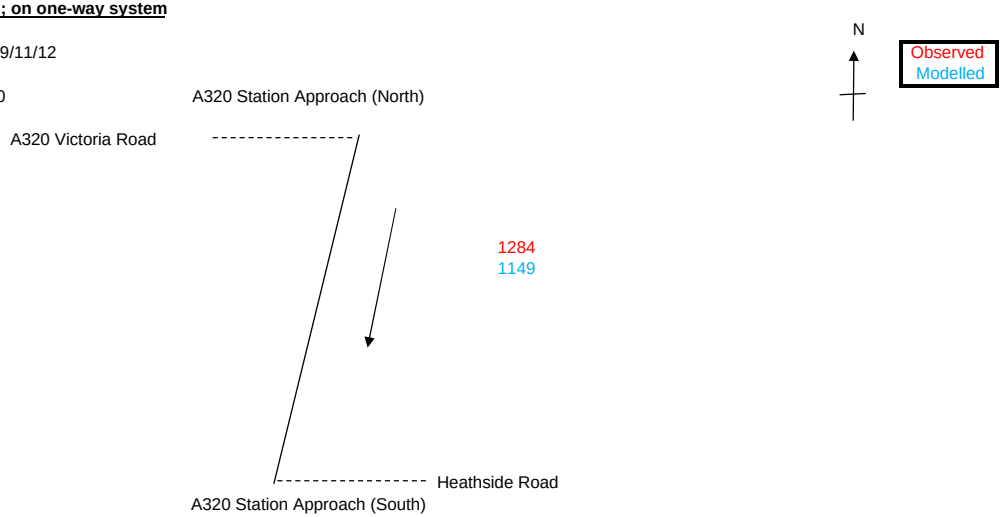
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road (South)	Ahead to A320 Guildford Road (N	1034	1083	49	5%	1.52	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

A320 Station Approach; on one-way system

average from 27/11/12-29/11/12

PM peak hour 1700-1800



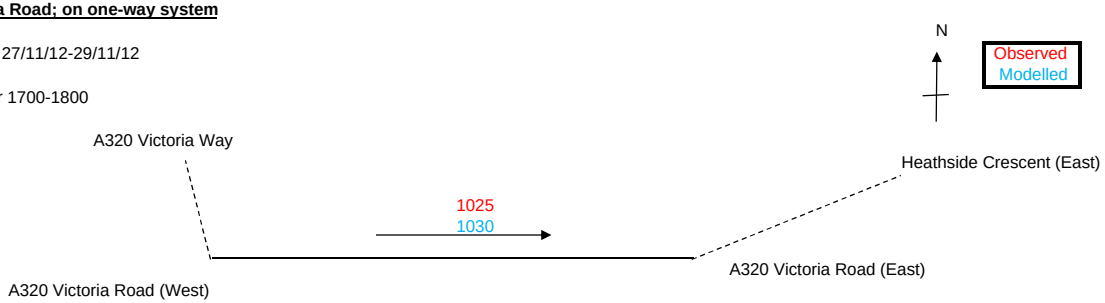
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Station Approach (North)	Ahead to A320 Station Approach	1284	1149	-135	-11%	3.88	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

A320 Victoria Road; on one-way system

average from 27/11/12-29/11/12

PM peak hour 1700-1800



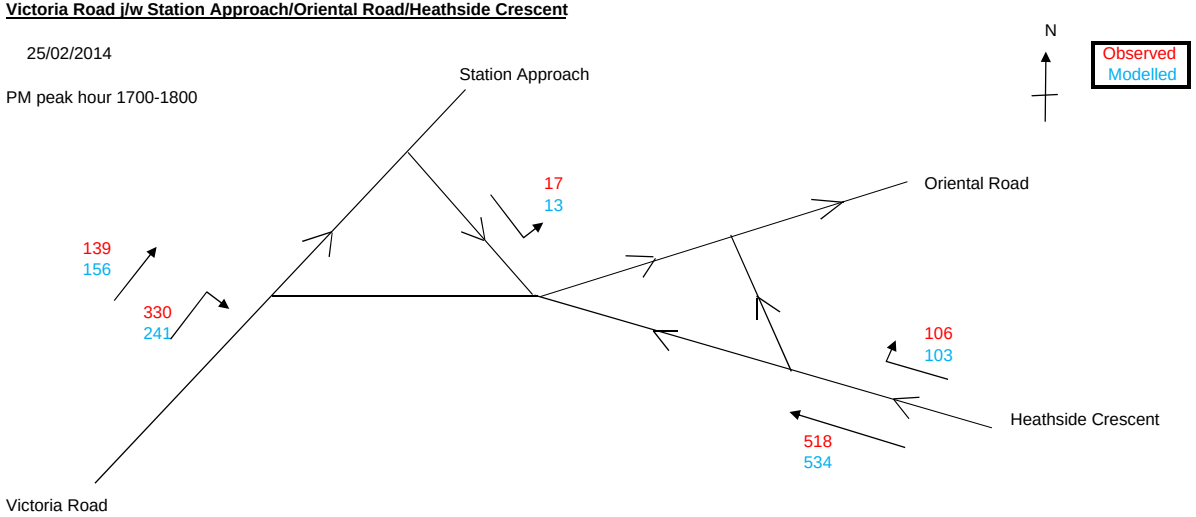
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
A320 Victoria Road (West)	Ahead to A320 Victoria Road (Ea	1025	1030	5	0%	0.15	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

Victoria Road j/w Station Approach/Oriental Road/Heathside Crescent

25/02/2014

PM peak hour 1700-1800



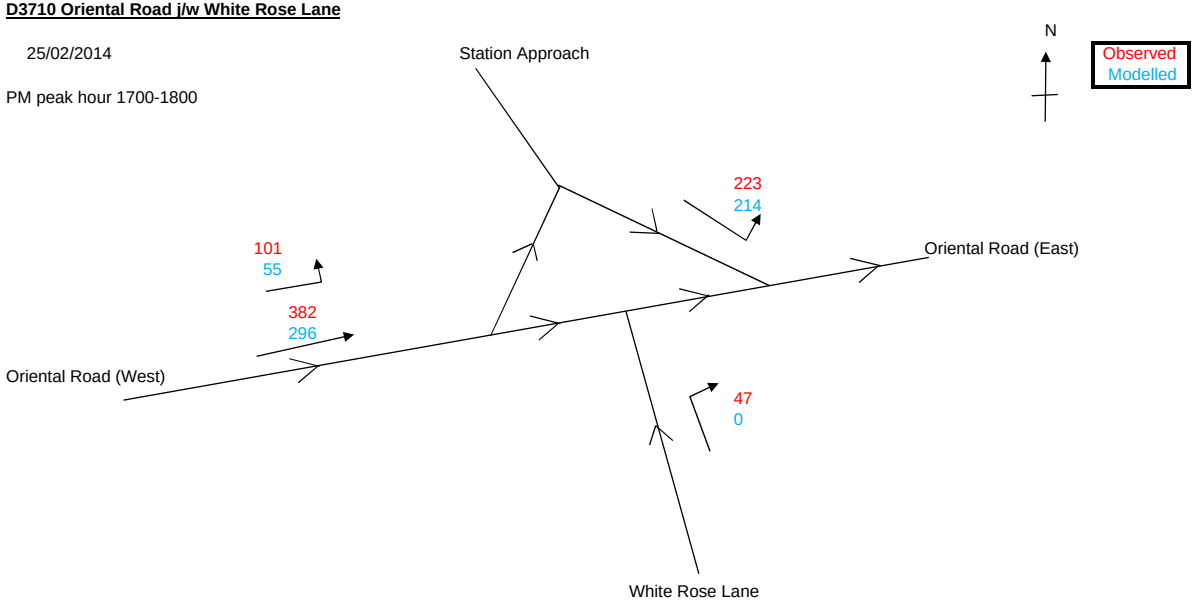
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Victoria Road	Left to Station Approach	139	156	17	13%	1.43	✓	✓
Victoria Road	Right to Oriental Road	330	241	-89	-27%	5.27	✓	✓
Station Approach	Left to Oriental Road	17	13	-4	-22%	0.96	✓	✓
Heathside Crescent	Ahead to Victoria Road	518	534	16	3%	0.68	✓	✓
Heathside Crescent	Right to Oriental Road	106	103	-3	-3%	0.26	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

D3710 Oriental Road j/w White Rose Lane

25/02/2014

PM peak hour 1700-1800



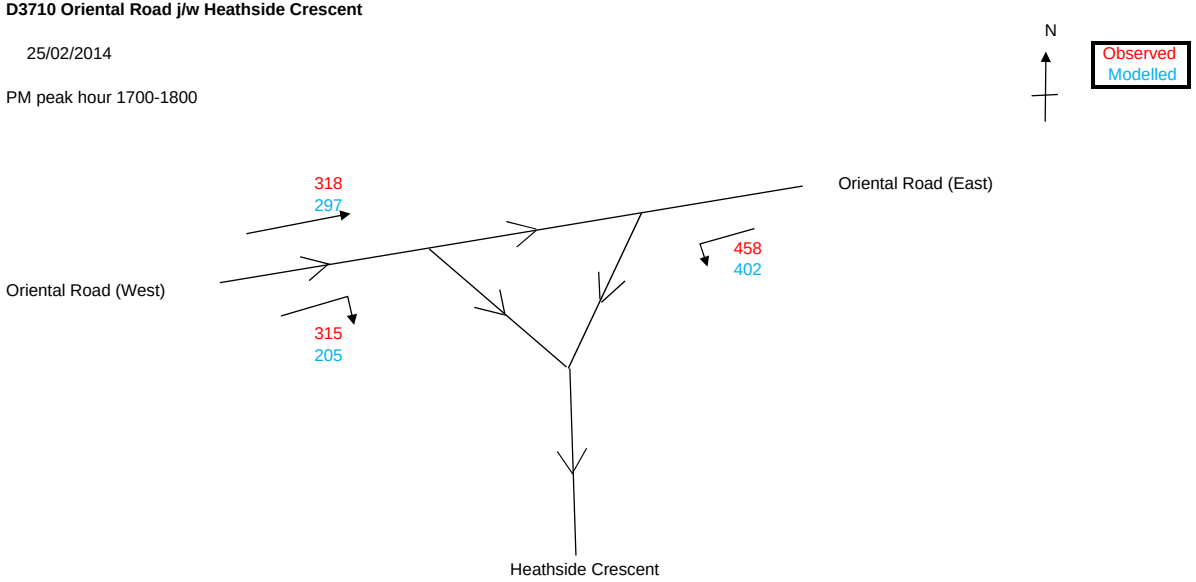
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Oriental Road (West)	Left to Station Approach	101	55	-46	-45%	5.16	✓	✓
Oriental Road (West)	Ahead to Oriental Road (East)	382	296	-86	-22%	4.65	✓	✓
Station Approach	Left to Oriental Road (East)	223	214	-9	-4%	0.61	✓	✓
White Rose Lane	Right to Oriental Road (East)	47	0	-47	-100%	9.66	✗	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

D3710 Oriental Road j/w Heathside Crescent

25/02/2014

PM peak hour 1700-1800



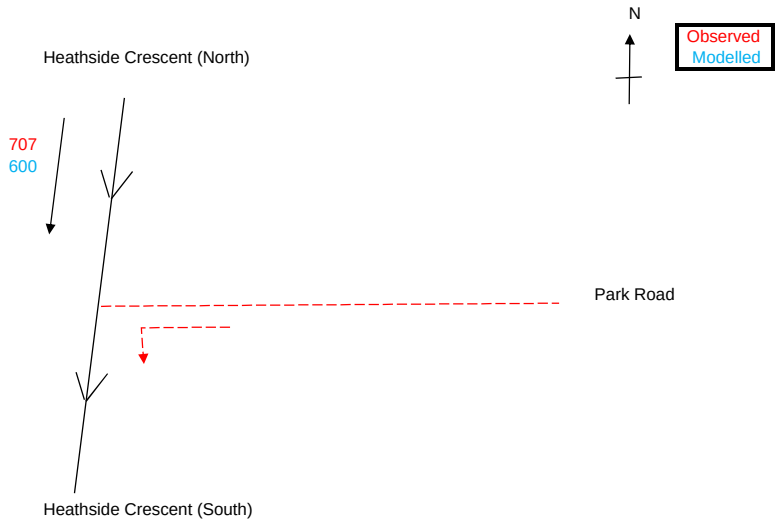
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Oriental Road (West)	Ahead to Oriental Road (East)	318	297	-21	-7%	1.21	✓	✓
Oriental Road (West)	Right to Heathside Crescent	315	205	-110	-35%	6.85	✗	✗
Oriental Road (East)	Left to Heathside Crescent	458	402	-56	-12%	2.69	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

Heathside Crescent j/w Park Road

17/03/2011

PM peak hour 1700-1800



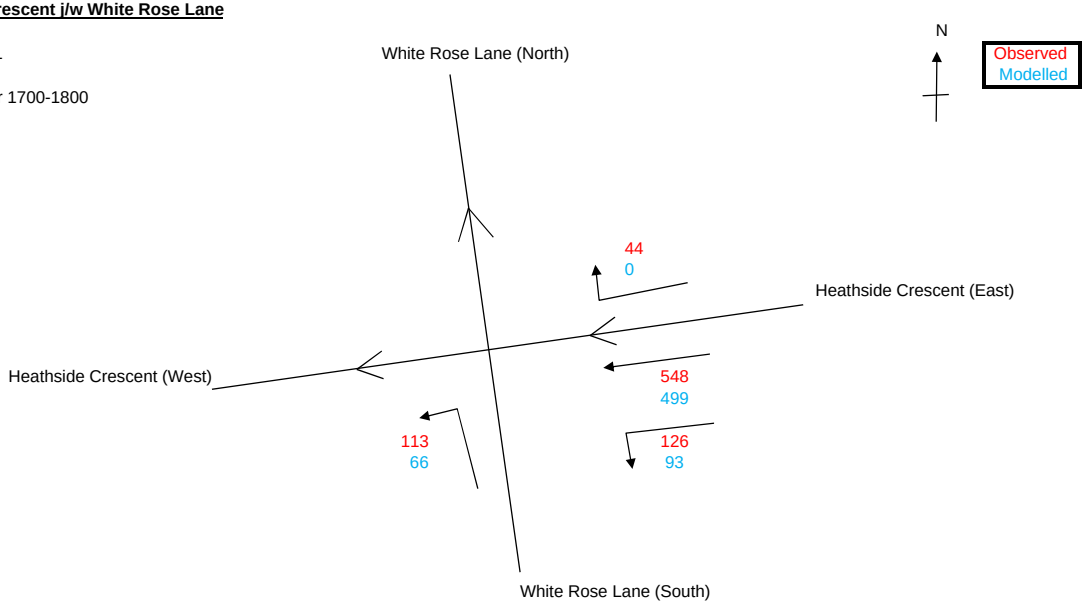
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Crescent (North)	Ahead to Heathside Crescent (So	707	600	-107	-15%	4.18	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCN

Heathside Crescent j/w White Rose Lane

17/03/2011

PM peak hour 1700-1800



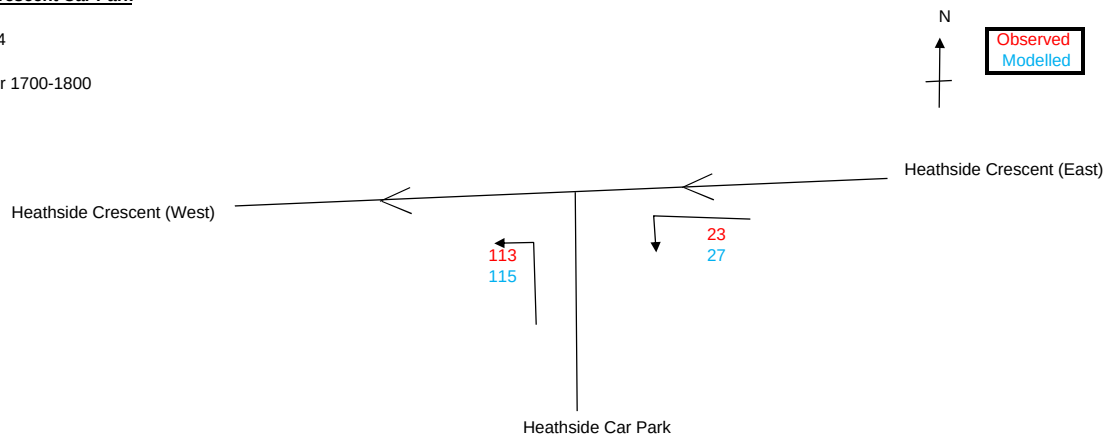
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Crescent (East)	Left to White Rose Lane (South)	126	93	-33	-27%	3.20	✓	✓
Heathside Crescent (East)	Ahead to Heathside Crescent (We	548	499	-49	-9%	2.14	✓	✓
Heathside Crescent (East)	Right to White Rose Lane (North)	44	0	-44	-100%	9.35	✗	✓
White Rose Lane (South)	Left to Heathside Crescent (West)	113	66	-47	-42%	4.99	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

Heathside Crescent Car Park

06/03/2014

PM peak hour 1700-1800



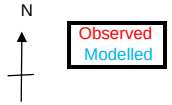
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Crescent (East)	Left into Heathside Car Park	23	27	4	19%	0.87	✓	✓
Heathside Car Park	Left onto Heathside Crescent (We	113	115	2	2%	0.23	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

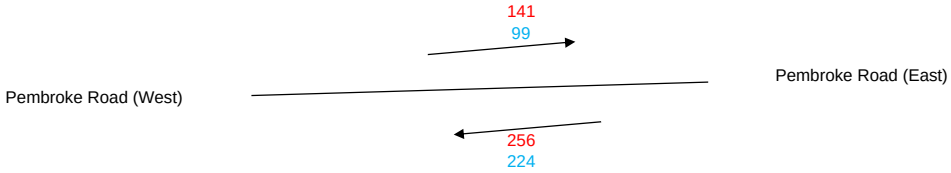
Pembroke Road; between Pembroke Gardens and Hockering Road

17/4/13-25/4/13 Tues-Thurs avg

PM peak hour 1700-1800



Observed
Modelled



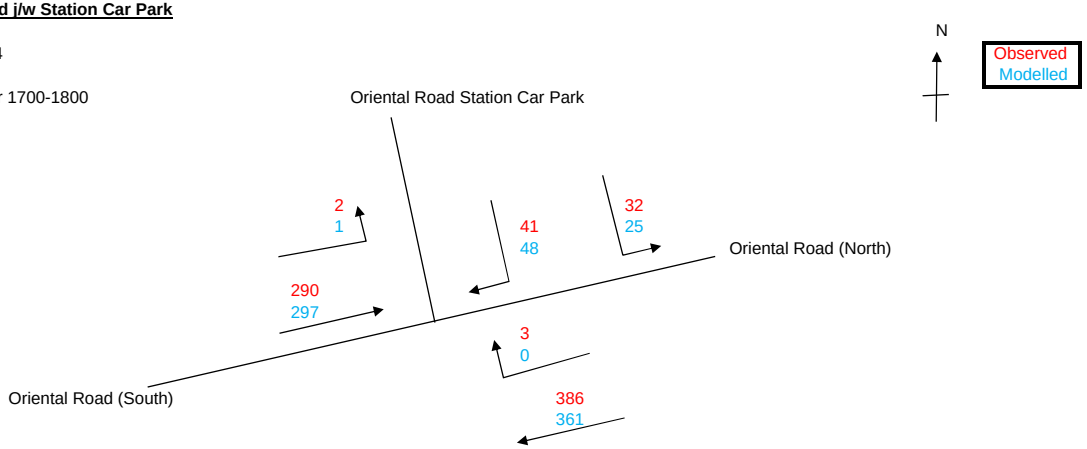
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Pembroke Road (East)	Ahead to Pembroke Road (West)	256	224	-32	-13%	2.09	✓	✓
Pembroke Road (West)	Ahead to Pembroke Road (East)	141	99	-42	-30%	3.84	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC

Oriental Road j/w Station Car Park

05/03/2014

PM peak hour 1700-1800



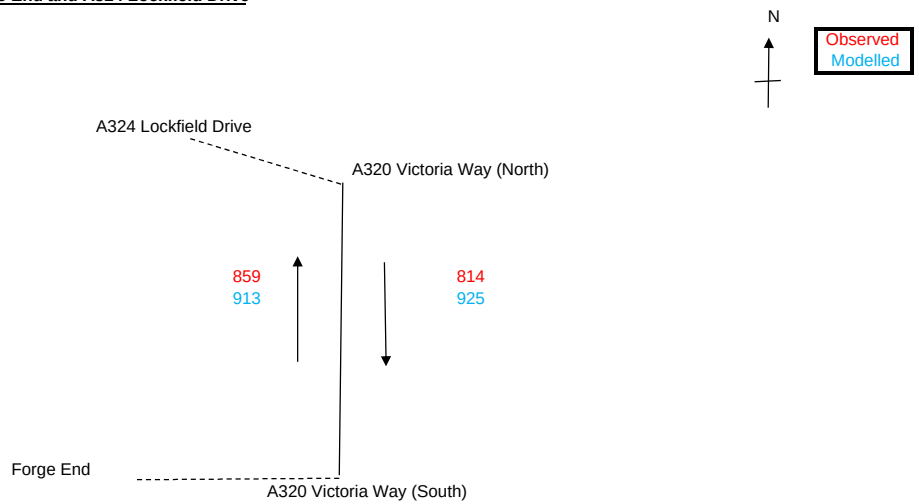
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Oriental Road Station Car Park	Left to Oriental Road (North)	32	25	-7	-22%	1.34	✓	✓
Oriental Road Station Car Park	Right to Oriental Road (South)	41	48	7	17%	1.03	✓	✓
Oriental Road (South)	Ahead to Oriental Road (North)	290	297	7	2%	0.39	✓	✓
Oriental Road (South)	Left to Oriental Road Station Car	2	1	-1	-43%	0.68	✓	✓
Oriental Road (North)	Right to Oriental Road Station Ca	3	0	-3	-87%	1.99	✓	✓
Oriental Road (North)	Ahead to Oriental Road (South)	386	361	-25	-7%	1.30	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

A320 Victoria Way; between Forge End and A324 Lockfield Drive

average from 27/11/12-29/11/12

PM peak hour 1700-1800



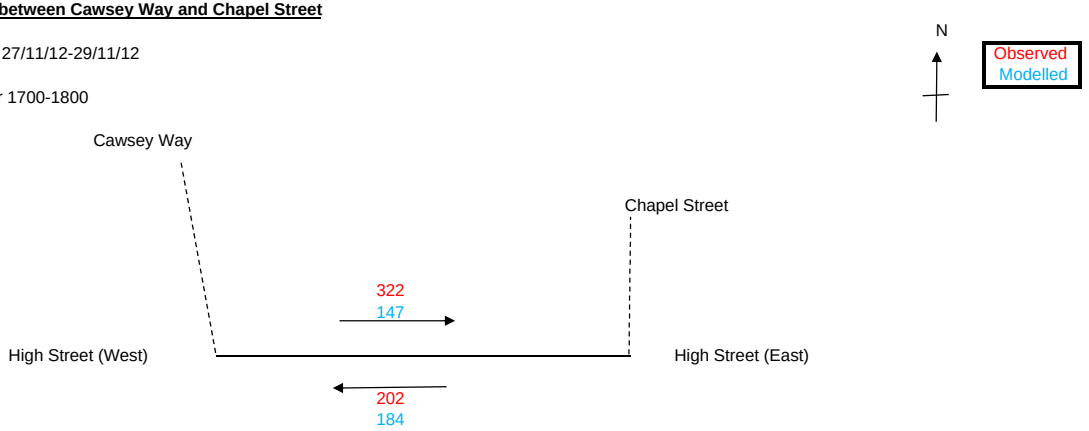
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (North)	Ahead to A320 Victoria Way (Sou	814	925	111	14%	3.75	✓	✓
A320 Victoria Way (South)	Ahead to A320 Victoria Way (Nor	859	913	54	6%	1.81	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

High Street; between Cawsey Way and Chapel Street

average from 27/11/12-29/11/12

PM peak hour 1700-1800



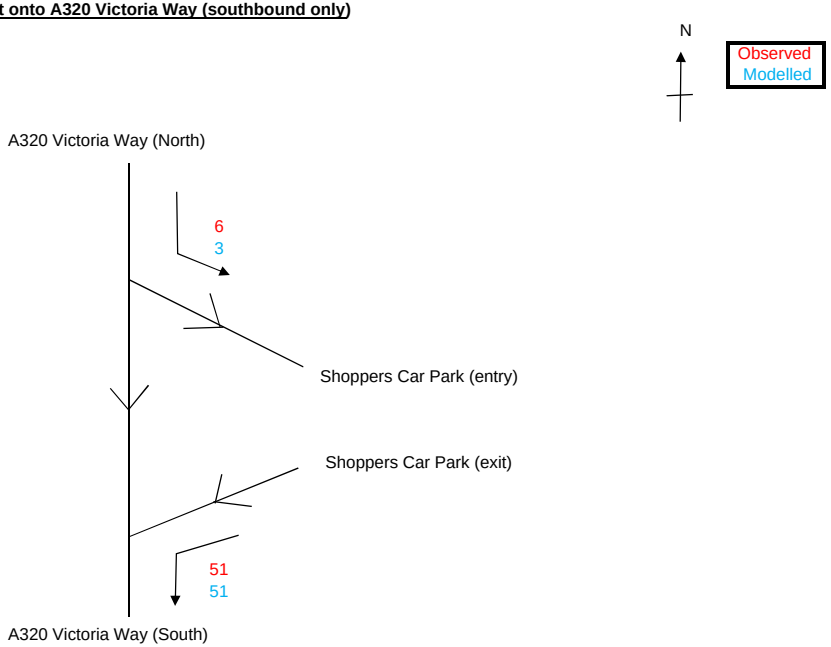
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
High Street (West)	Ahead to High Street (East)	322	147	-175	-54%	11.43	✖	✖
High Street (East)	Ahead to High Street (West)	202	184	-18	-9%	1.28	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

Shoppers Car Park (ToysRUs); entry and exit onto A320 Victoria Way (southbound only)

average from 27/11/12-29/11/12

PM peak hour 1700-1800



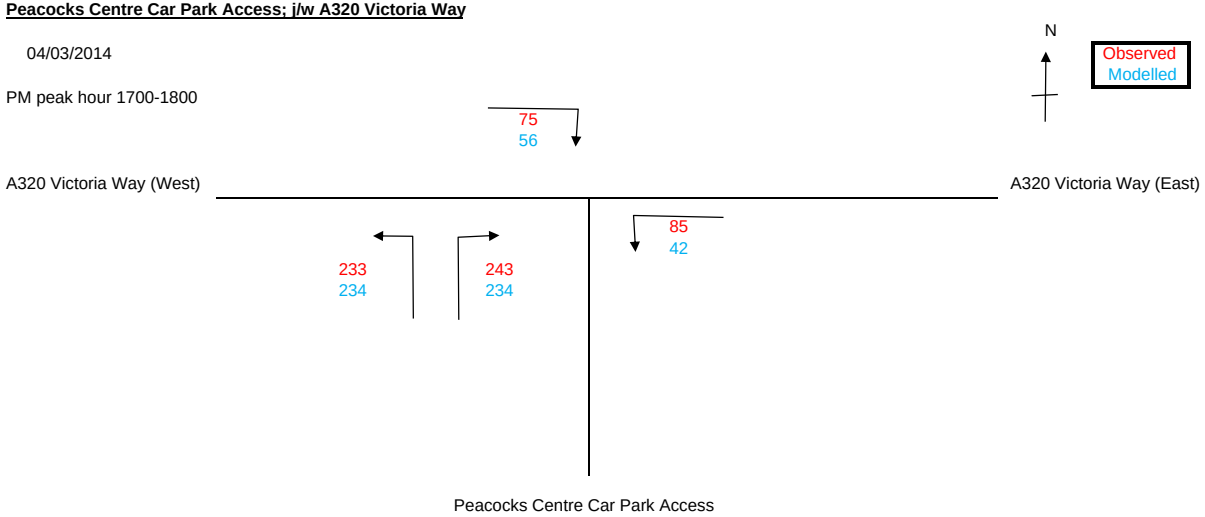
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (North)	Left to Shoppers Car Park (entry)	6	3	-3	-50%	1.41	✓	✓
Shoppers Car Park (exit)	Left to A320 Victoria Way (South)	51	51	0	1%	0.05	✓	✓

ATC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\ATC\Vectos ATC Data

Peacocks Centre Car Park Access; j/w A320 Victoria Way

04/03/2014

PM peak hour 1700-1800



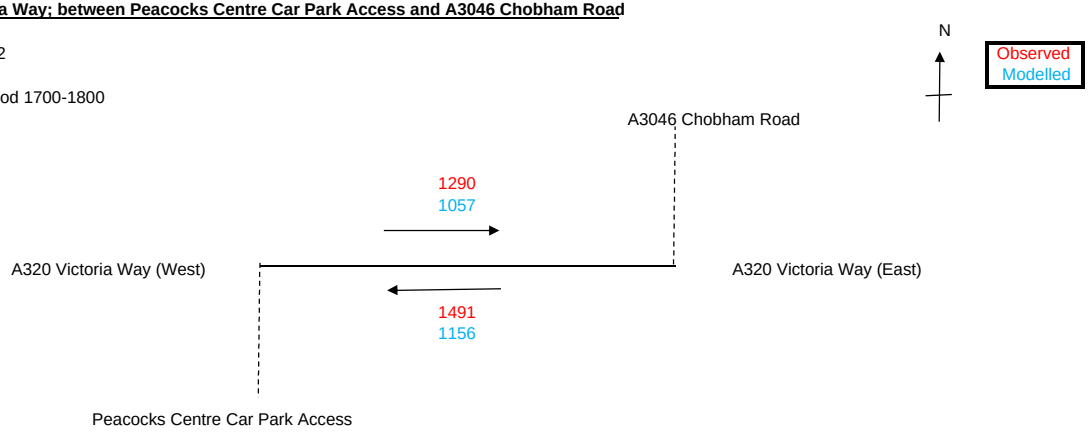
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Peacocks Centre Car Park Access	Left to A320 Victoria Way (West)	233	234	1	0%	0.07	✓	✓
Peacocks Centre Car Park Access	Right to A320 Victoria Way (East)	243	234	-9	-4%	0.56	✓	✓
A320 Victoria Way (West)	Right to Peacocks Centre Car Pa	75	56	-19	-26%	2.39	✓	✓
A320 Victoria Way (East)	Left to Peacocks Centre Car Park	85	42	-43	-51%	5.46	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

A320 Victoria Way; between Peacocks Centre Car Park Access and A3046 Chobham Road

15/05/2012

PM peak period 1700-1800



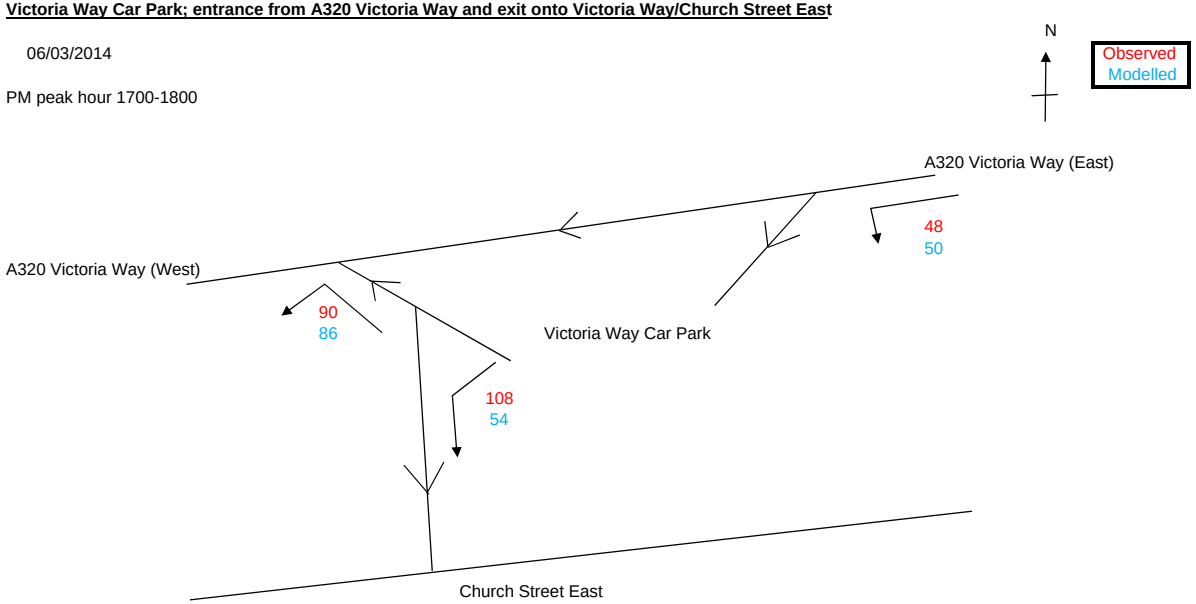
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB	
							GEH	Flow
A320 Victoria Way (West)	Ahead to A320 Victoria Way (Eas	1491	1156	-335	-22%	9.20	✖	✖
A320 Victoria Way (East)	Ahead to A320 Victoria Way (Wes	1290	1057	-233	-18%	6.79	✖	✖

MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCC

Victoria Way Car Park; entrance from A320 Victoria Way and exit onto Victoria Way/Church Street East

06/03/2014

PM peak hour 1700-1800



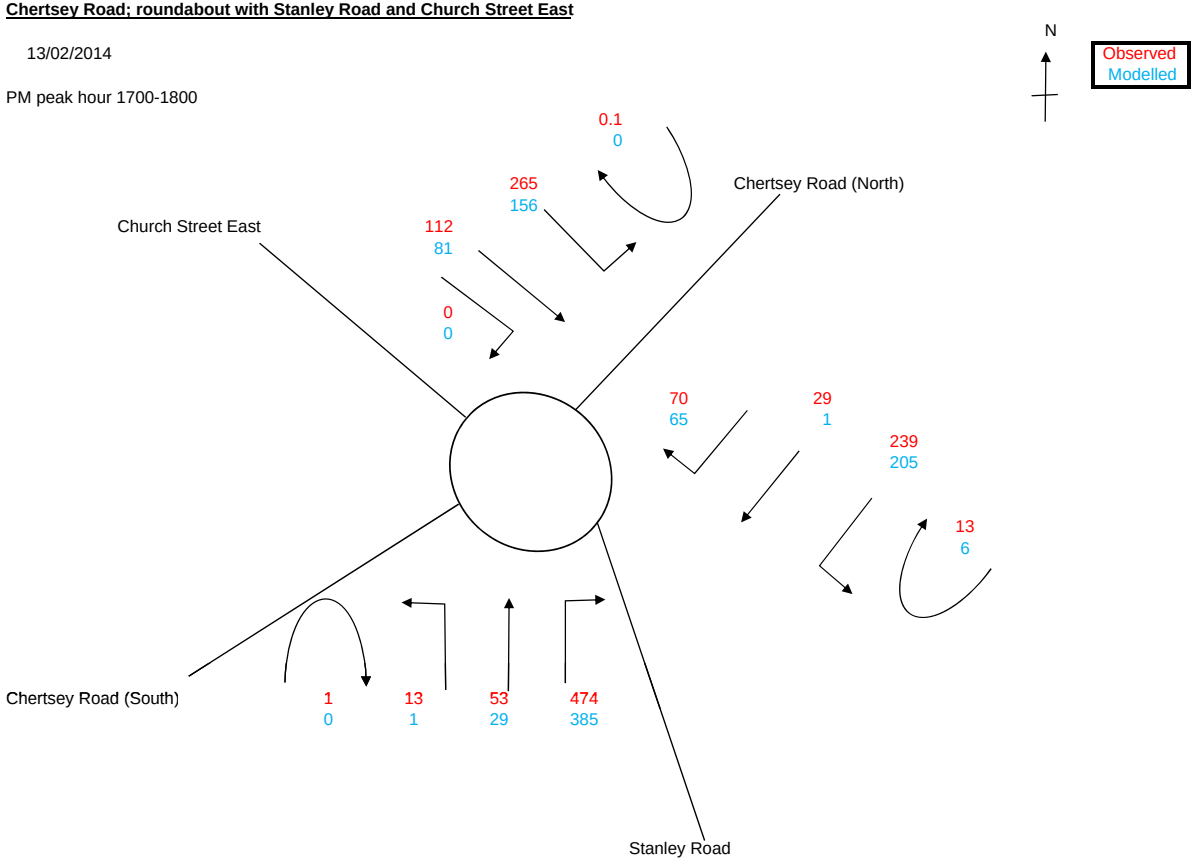
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Victoria Way (East)	Left to Victoria Way Car Park	48	50	2	5%	0.34	✓	✓
Victoria Way Car Park	Left to Church Street East	108	54	-54	-50%	5.96	✘	✓
Victoria Way Car Park	Left to A320 Victoria Way (West)	90	86	-4	-5%	0.43	✓	✓

Car Park MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\Car Parks

Chertsey Road; roundabout with Stanley Road and Church Street East

13/02/2014

PM peak hour 1700-1800



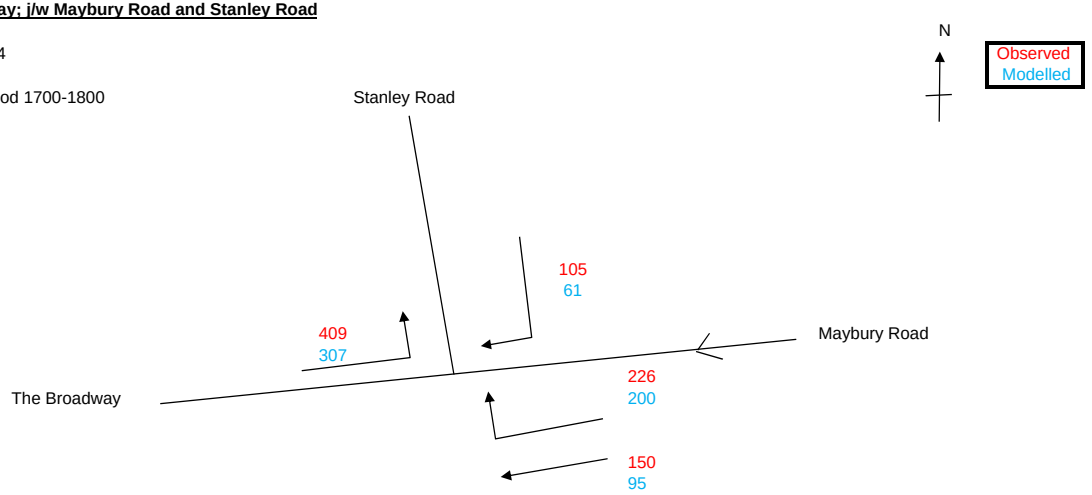
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Chertsey Road (North)	Left to Stanley Road	239	205	-34	-14%	2.31	✓	✓
Chertsey Road (North)	Ahead to Chertsey Road (South)	29	1	-28	-97%	7.29	✗	✓
Chertsey Road (North)	Right to Church Street East	70	65	-5	-7%	0.58	✓	✓
Chertsey Road (North)	U-turn to Chertsey Road (North)	13	6	-7	-53%	2.23	✓	✓
Stanley Road	Left to Chertsey Road (South)	13	1	-12	-89%	4.30	✓	✓
Stanley Road	Ahead to Church Street East	53	29	-24	-45%	3.76	✓	✓
Stanley Road	Right to Chertsey Road (North)	474	385	-89	-19%	4.29	✓	✓
Stanley Road	U-turn to Stanley Road	1	0	-1	-75%	0.95	✓	✓
Church Street East	Left to Chertsey Road (North)	265	156	-109	-41%	7.55	✗	✗
Church Street East	Ahead to Stanley Road	112	81	-31	-28%	3.18	✓	✓
Church Street East	Right to Chertsey Road (South)	1	1	-1	-50%	0.58	✓	✓
Church Street East	U-turn to Church Street East	0	0	0	100%	0.26	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

The Broadway; j/w Maybury Road and Stanley Road

05/02/2014

PM peak period 1700-1800



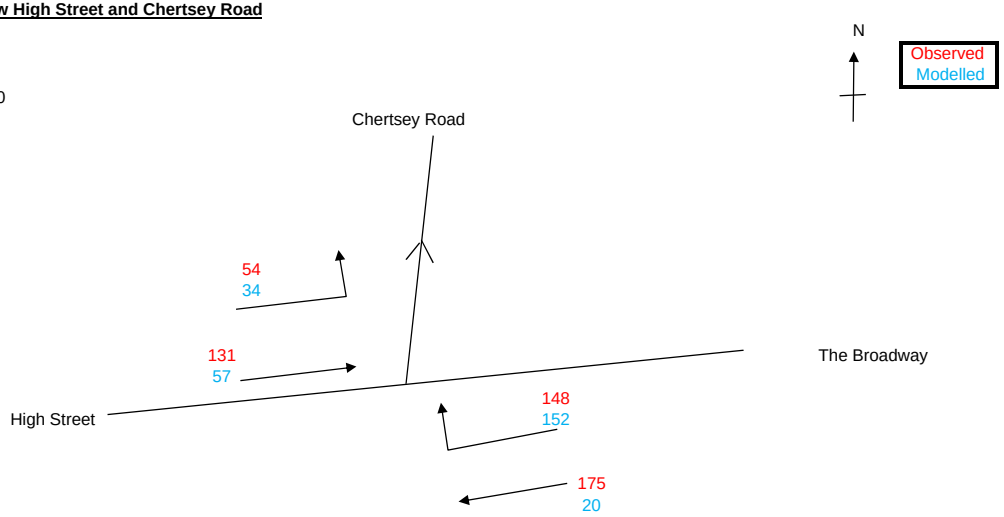
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Maybury Road	Right to Stanley Road	226	200	-26	-12%	1.81	✓	✓
Maybury Road	Ahead to The Broadway	150	95	-55	-37%	4.96	✓	✓
The Broadway	Left to Stanley Road	409	307	-102	-25%	5.40	✓	✖
Stanley Road	Right to The Broadway	105	61	-44	-42%	4.87	✓	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCN

C143 The Broadway; j/w High Street and Chertsey Road

13/02/2014

PM peak hour 1700-1800



Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
The Broadway	Right to Chertsey Road	148	152	4	2%	0.29	✓	✓
The Broadway	Ahead to High Street	175	20	-155	-89%	15.70	✖	✖
High Street	Left to Chertsey Road	54	34	-20	-37%	3.00	✓	✓
High Street	Ahead to The Broadway	131	57	-74	-57%	7.69	✖	✓

MCTCNT; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTCNT

A320 Chertsey Road; opposite Woodham Rise

05/11/2008

PM peak period 1700-1800

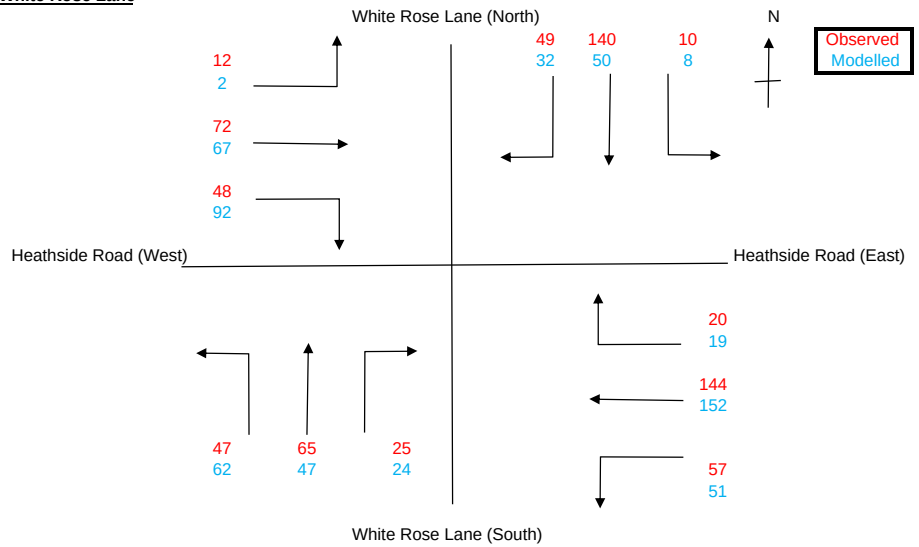
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Chertsey Road (South)	Ahead to A320 Chertsey Road (N	791	693	-99	-12%	3.62	✓	✓
A320 Chertsey Road (North)	Ahead to A320 Chertsey Road (S	764	780	16	2%	0.57	✓	✓

MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCC

D3709 Heathside Road j/w D3708 White Rose Lane

24/11/2009

AM peak hour 1700-1800



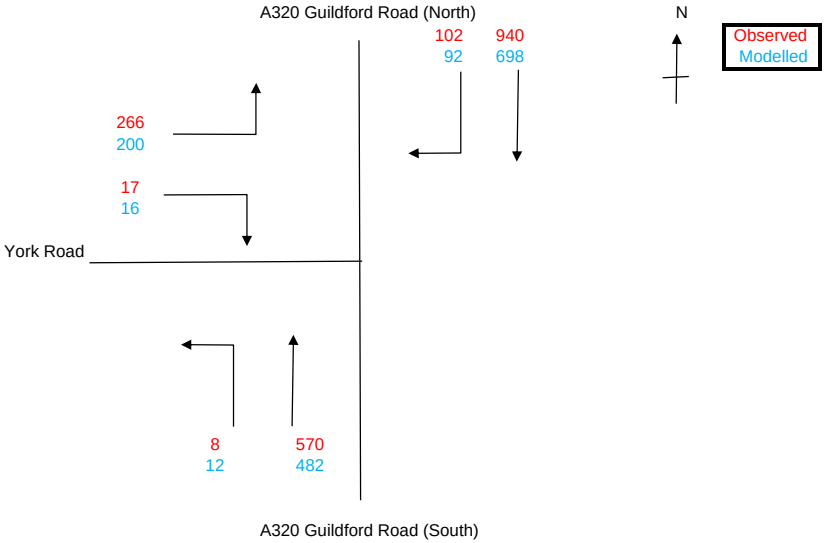
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
Heathside Road (East)	Left to White Rose Lane (South)	57	51	-6	-10%	0.80	✓	✓
Heathside Road (East)	Ahead to Heathside Road (West)	144	152	8	5%	0.65	✓	✓
Heathside Road (East)	Right to White Rose Lane (North)	20	19	-1	-5%	0.23	✓	✓
White Rose Lane (South)	Left to Heathside Road (West)	47	62	15	32%	2.06	✓	✓
White Rose Lane (South)	Ahead to White Rose Lane (North	65	47	-18	-28%	2.40	✓	✓
White Rose Lane (South)	Right to Heathside Road (East)	25	24	-1	-4%	0.22	✓	✓
Heathside Road (West)	Left to White Rose Lane (North)	12	2	-10	-84%	3.81	✓	✓
Heathside Road (West)	Ahead to Heathside Road (East)	72	67	-5	-7%	0.61	✓	✓
Heathside Road (West)	Right to White Rose Lane (South)	48	92	44	91%	5.24	✓	✓
White Rose Lane (North)	Left to Heathside Road (East)	10	8	-2	-19%	0.61	✓	✓
White Rose Lane (North)	Ahead to White Rose Lane (Soutl	140	50	-90	-65%	9.29	✗	✓
White Rose Lane (North)	Right to Heathside Road (West)	49	32	-17	-35%	2.66	✓	✓

MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCC

A320 Guildford Road j/w C141 York Road

22/04/2008

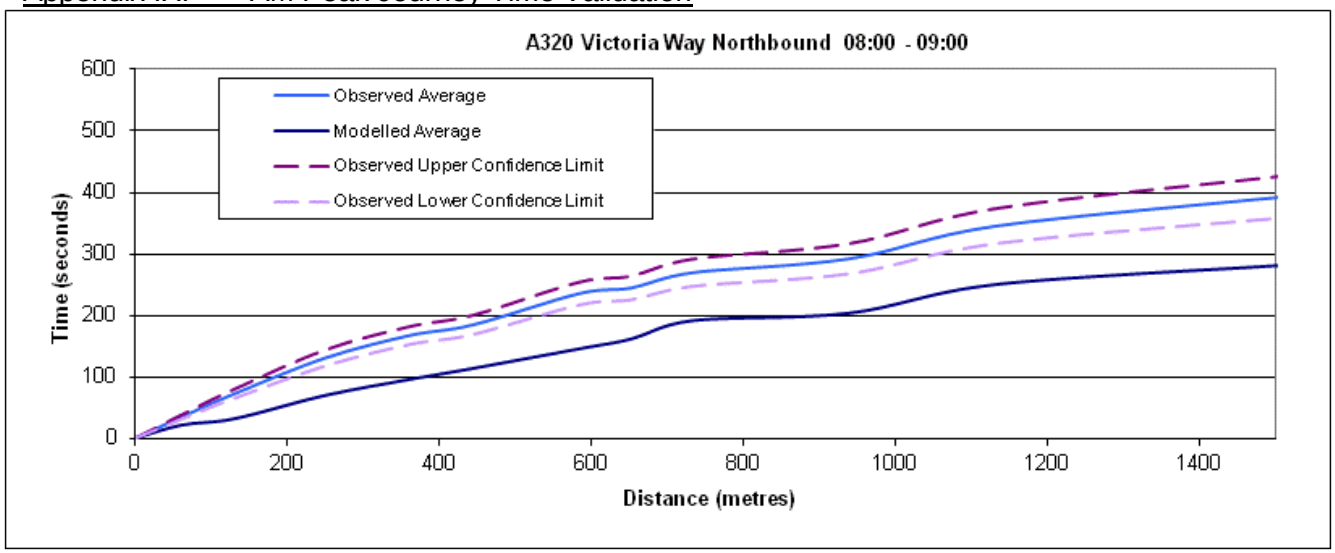
AM peak hour 1700-1800

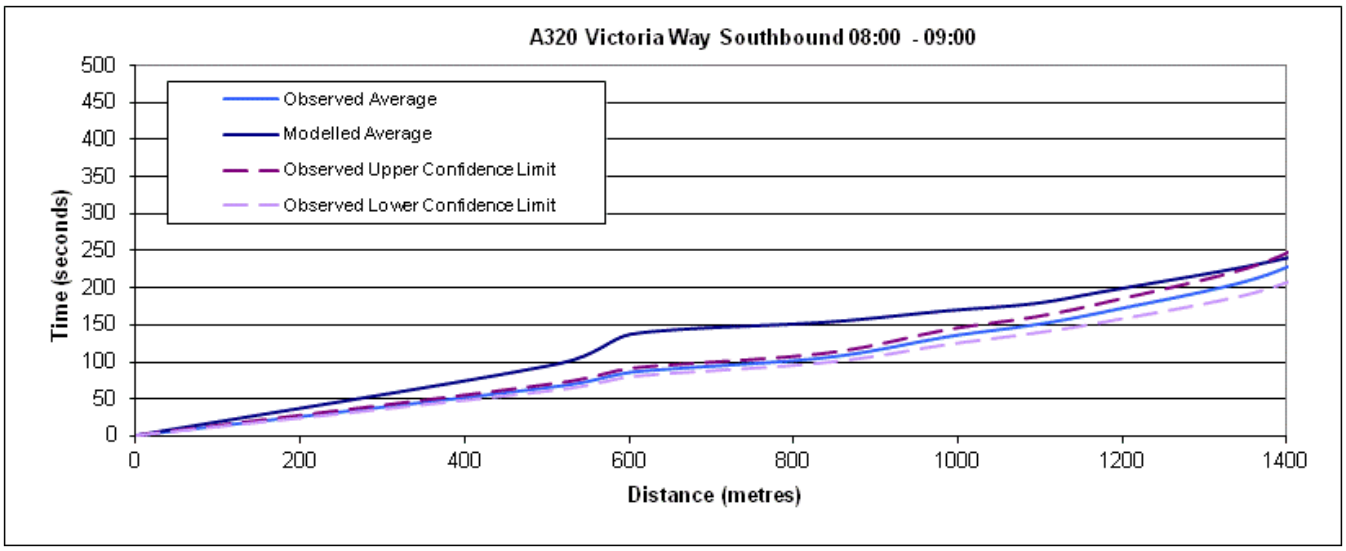


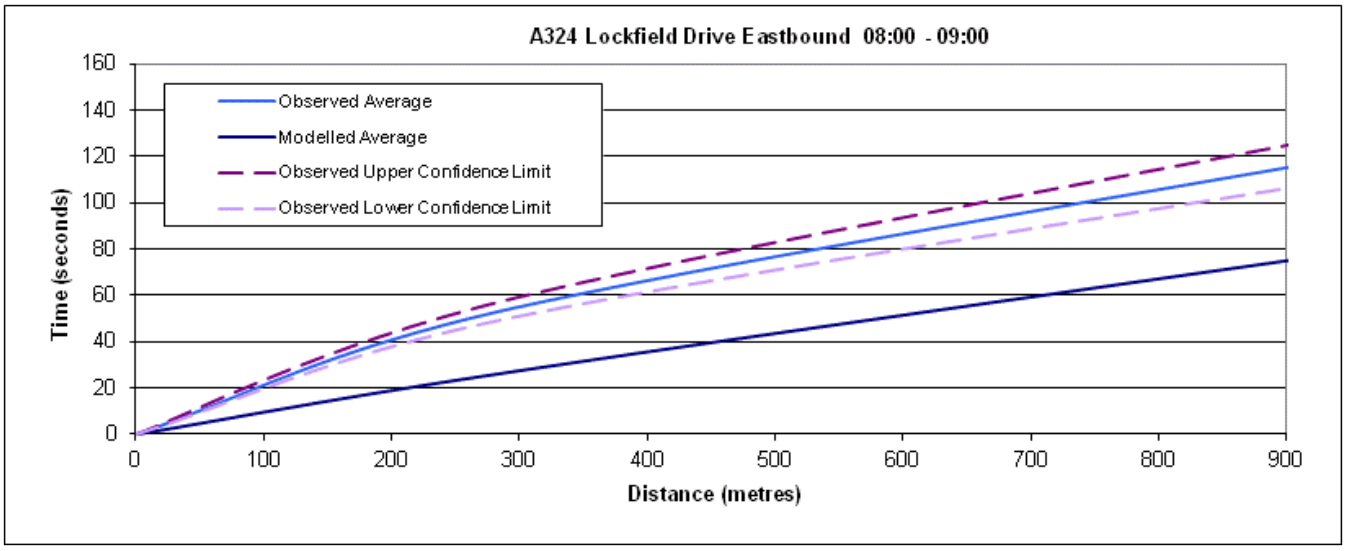
Description	Movement	Observed Flow	Modelled Flow	Diff	% Diff	GEH	Meeting DMRB GEH	Meeting DMRB Flow
A320 Guildford Road (South)	Left to York Road	8	12	4	47%	1.19	✓	✓
A320 Guildford Road (South)	Ahead to Guildford Road (North)	570	482	-89	-16%	3.86	✓	✓
York Road	Left to Guildford Road (North)	266	200	-66	-25%	4.30	✓	✓
York Road	Right to Guildford Road (South)	17	16	-1	-8%	0.35	✓	✓
A320 Guildford Road (North)	Right to York Road	102	92	-10	-10%	1.06	✓	✓
A320 Guildford Road (North)	Ahead to Guildford Road (South)	940	698	-242	-26%	8.44	✗	✗

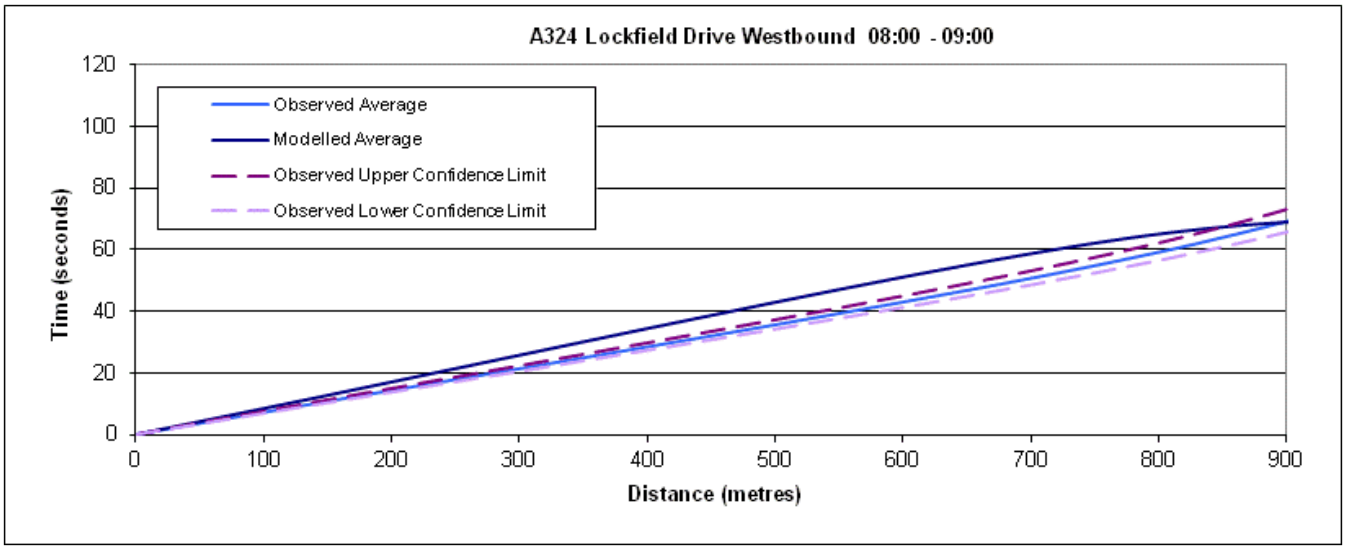
MCC; data source: H:\Modelling\.paramics\4B154001_Woking\01 Modelling\Paramics\Model Development\Surveys\MCTC

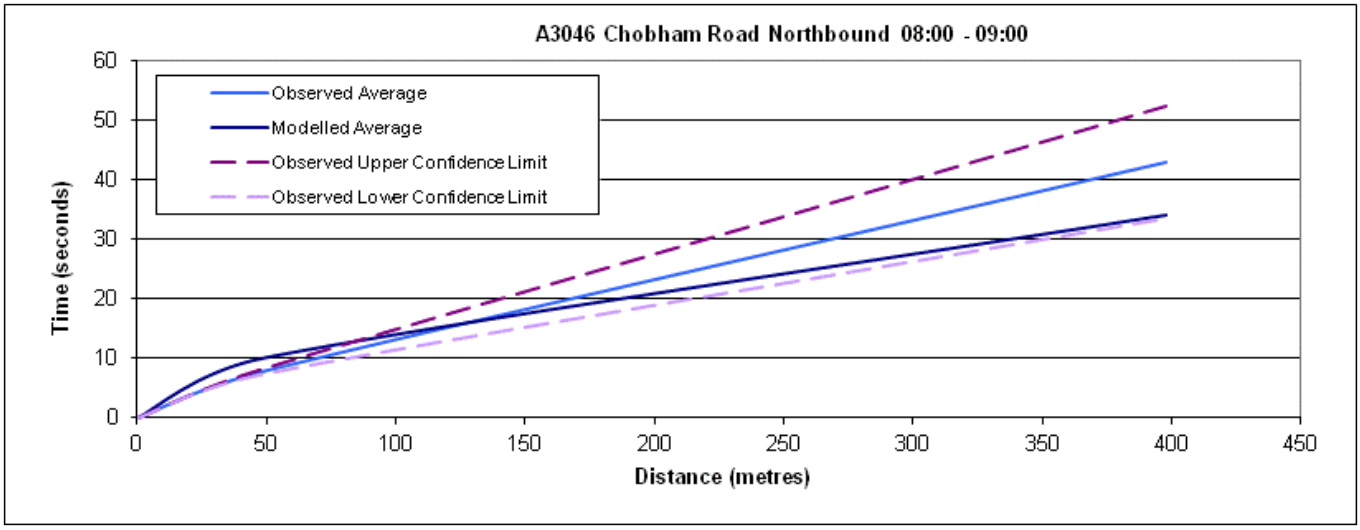
Appendix IX: AM Peak Journey Time Validation



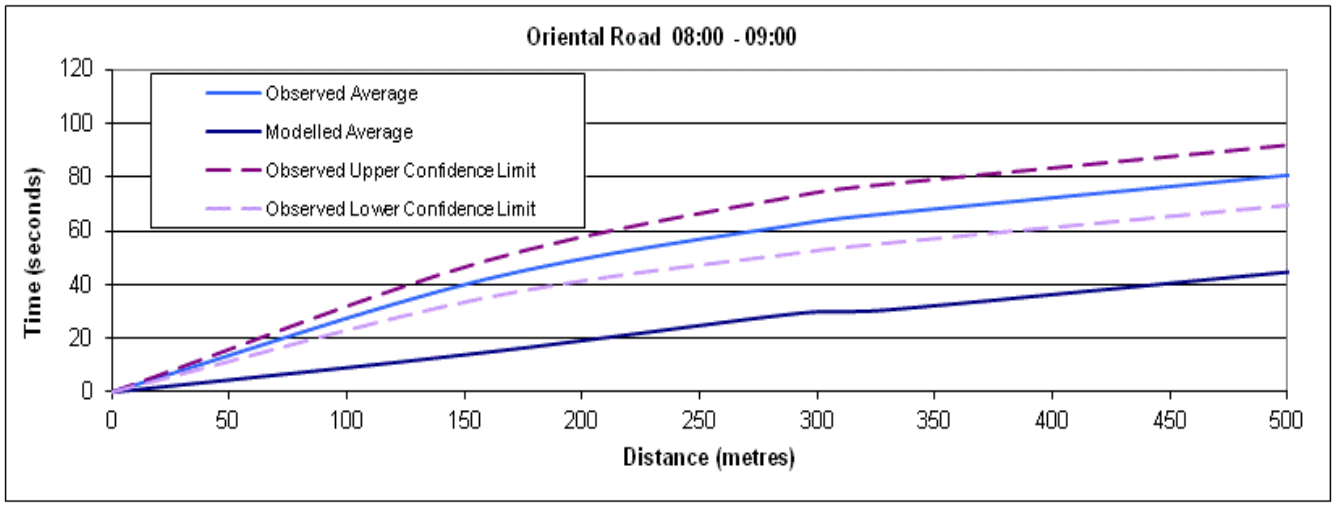


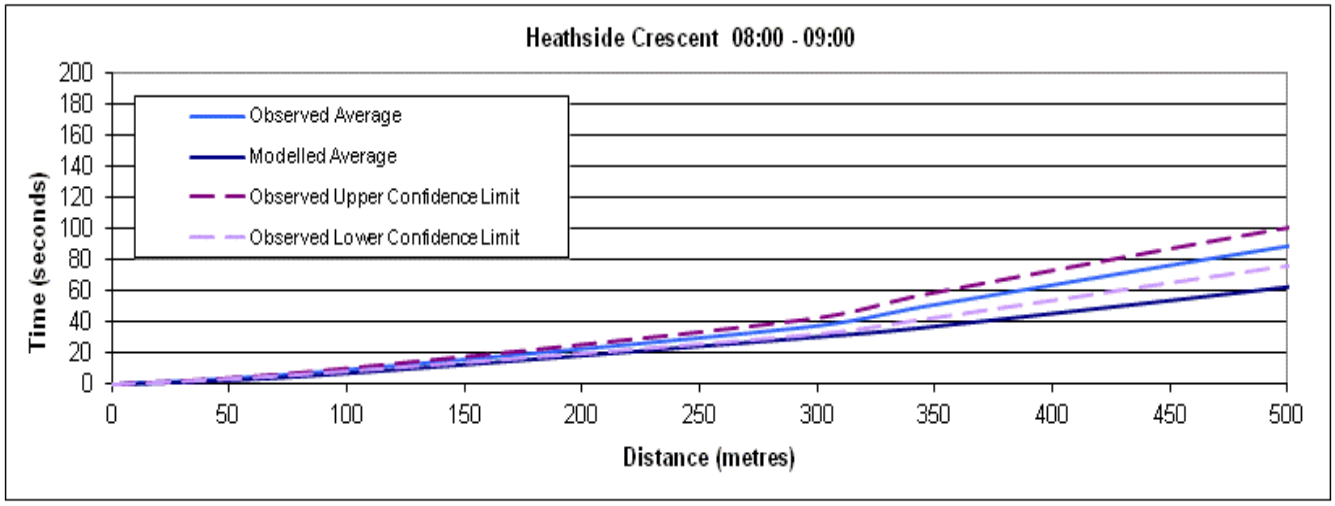


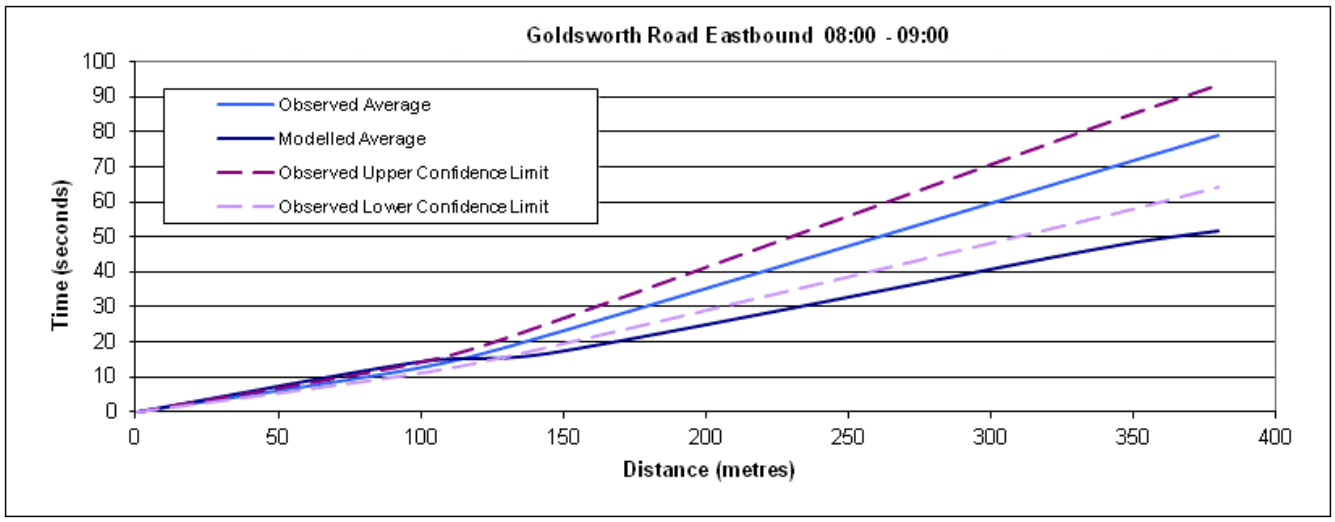

A324 Lockfield Drive Westbound 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
20
40
60
80
100
120
0
100
200
300
400
500
600
700
800
900


A3046 Chobham Road Northbound 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
10
20
30
40
50
60
0
50
100
150
200
250
300
350
400
450

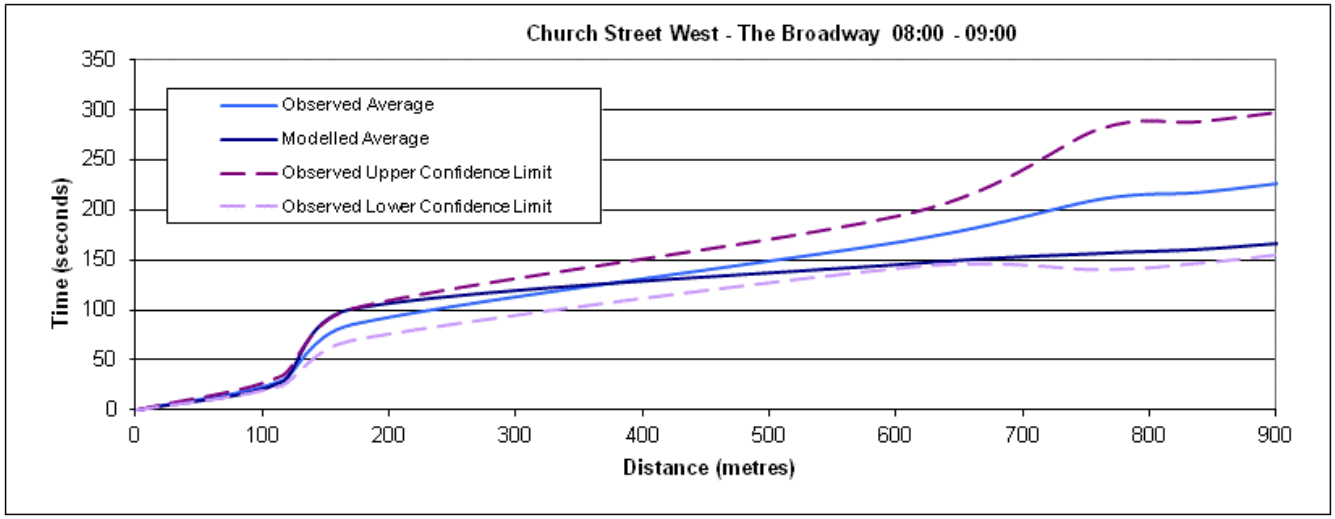

A3046 Chobham Road Southbound 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
20
40
60
80
100
120
140
160
0
50
100
150
200
250
300
350
400
450


Oriental Road 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
20
40
60
80
100
120
0
50
100
150
200
250
300
350
400
450
500

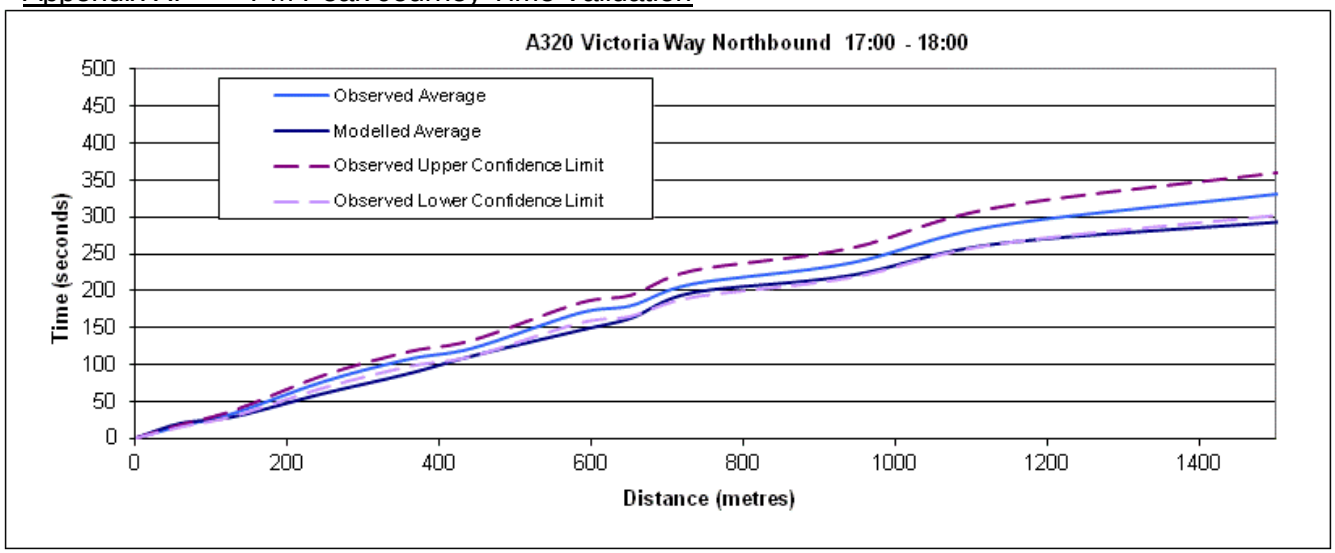

Heathside Crescent 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
20
40
60
80
100
120
140
160
180
200
0
50
100
150
200
250
300
350
400
450
500

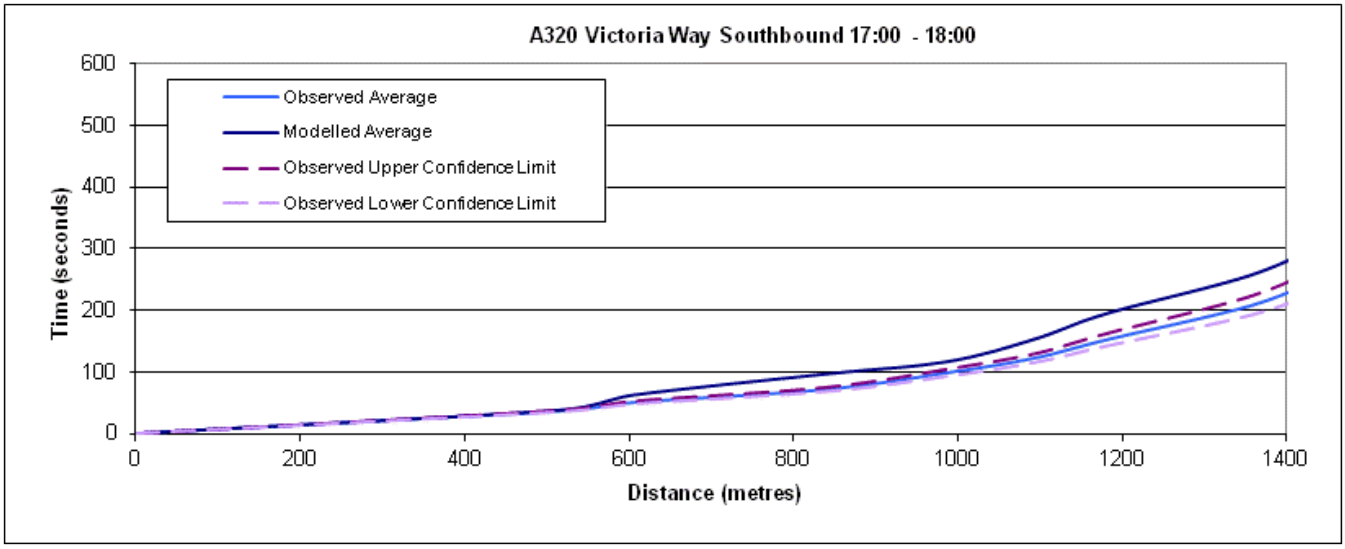

Goldsworth Road Eastbound 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
10
20
30
40
50
60
70
80
90
100
0
50
100
150
200
250
300
350
400

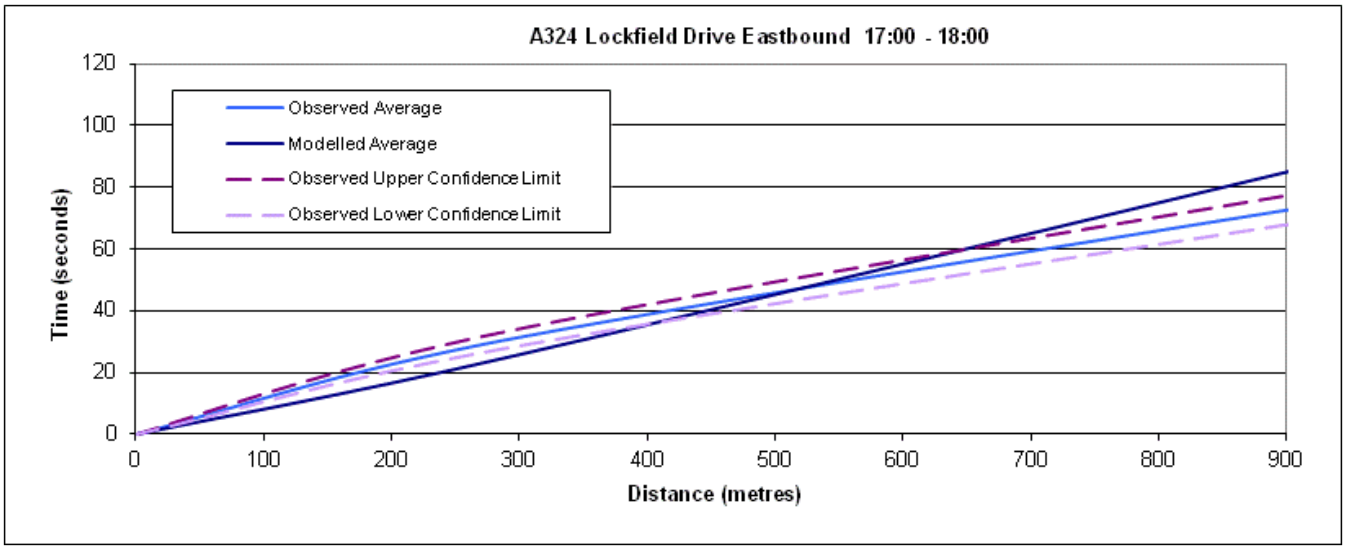

Goldsworth Road Westbound 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
10
20
30
40
50
60
70
80
90
100
0
100
200
300
400
500
600

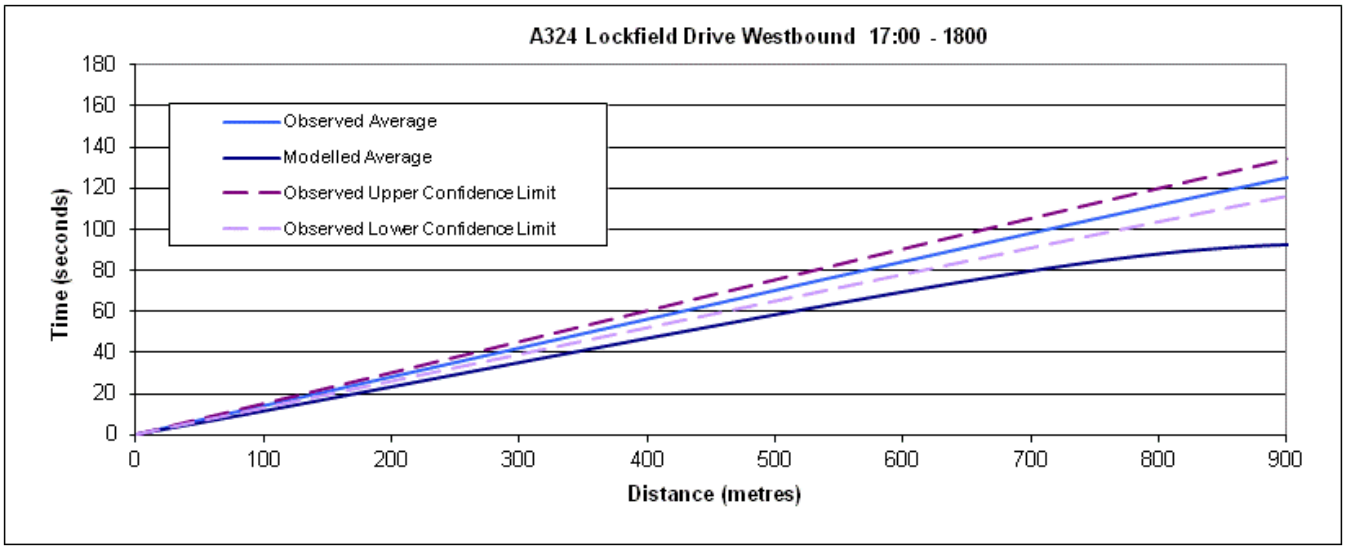

Church Street West - The Broadway 08:00 - 09:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
50
100
150
200
250
300
350
0
100
200
300
400
500
600
700
800
900

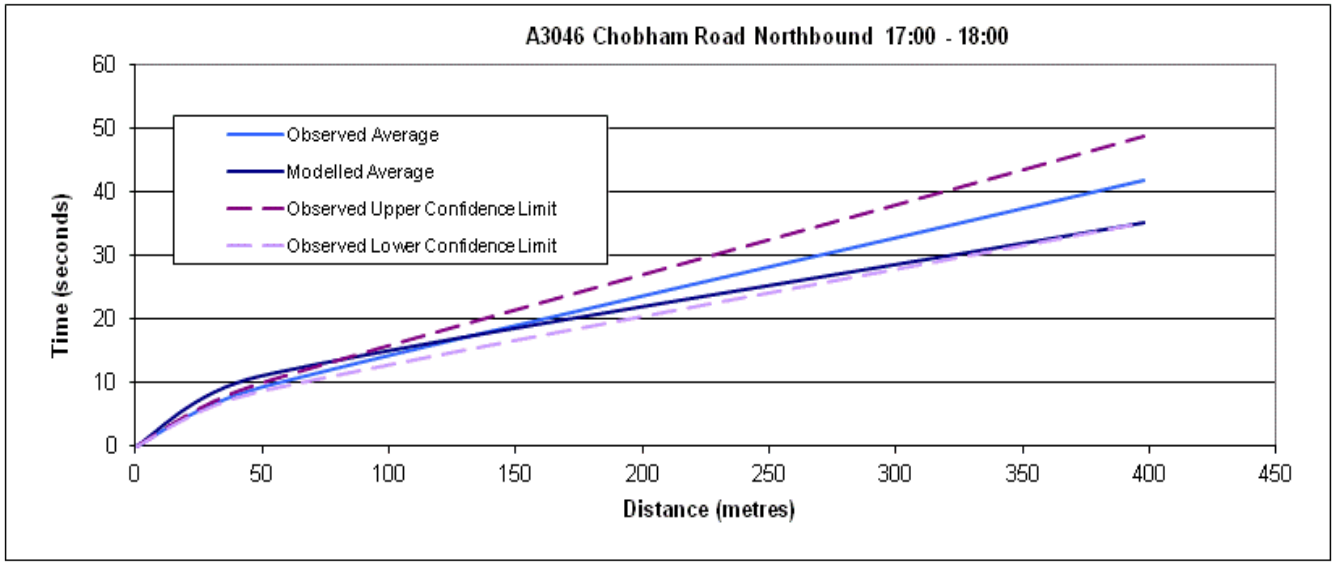
Appendix X: PM Peak Journey Time Validation

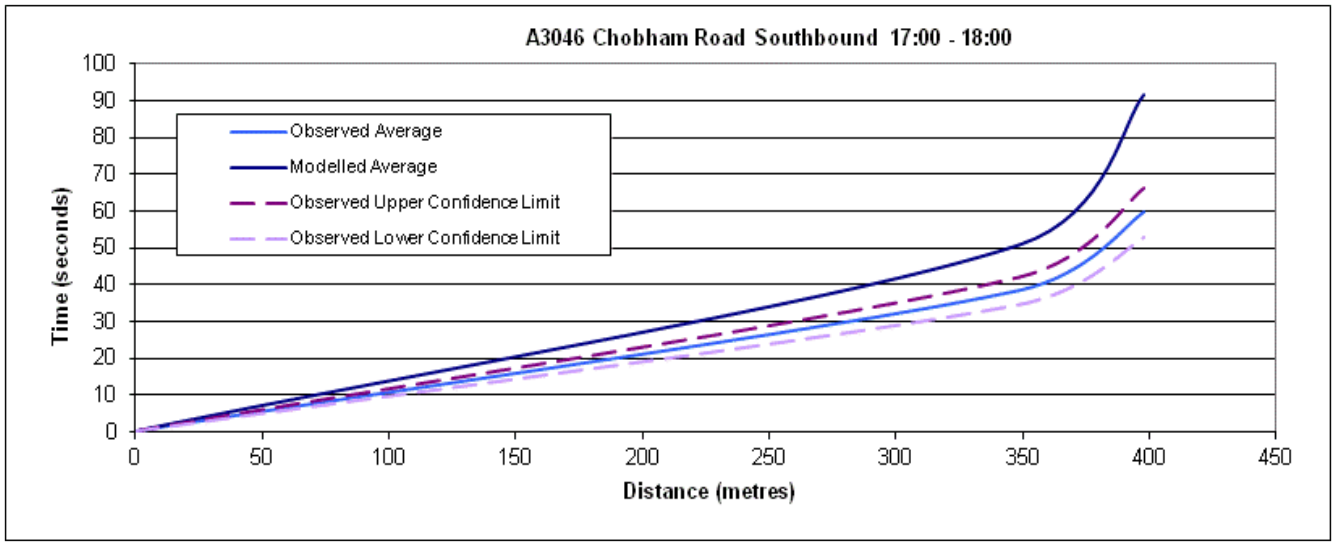


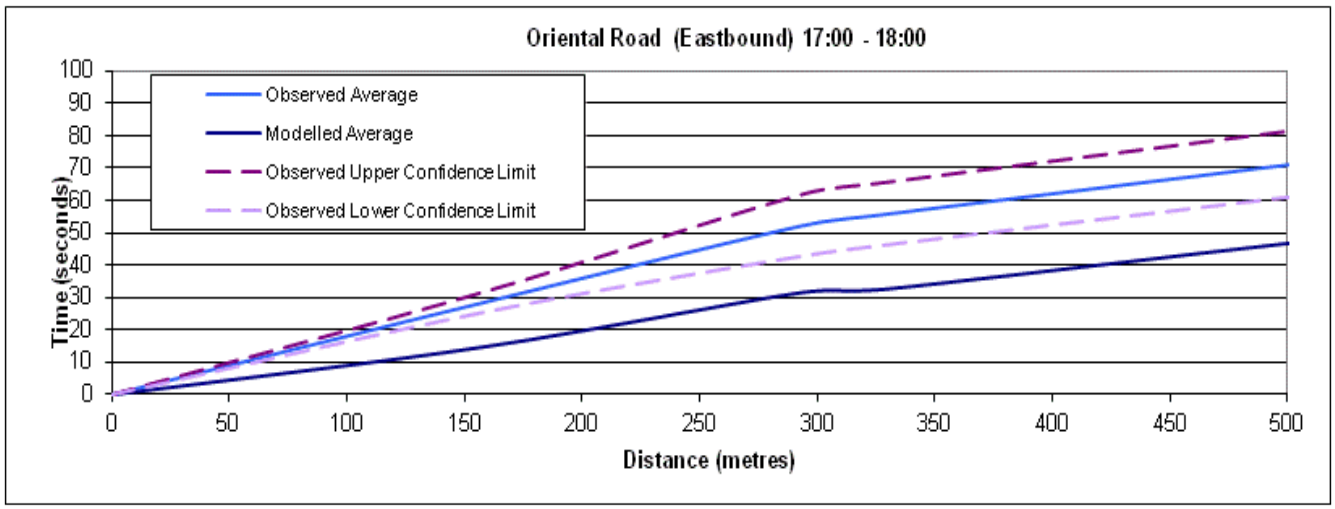


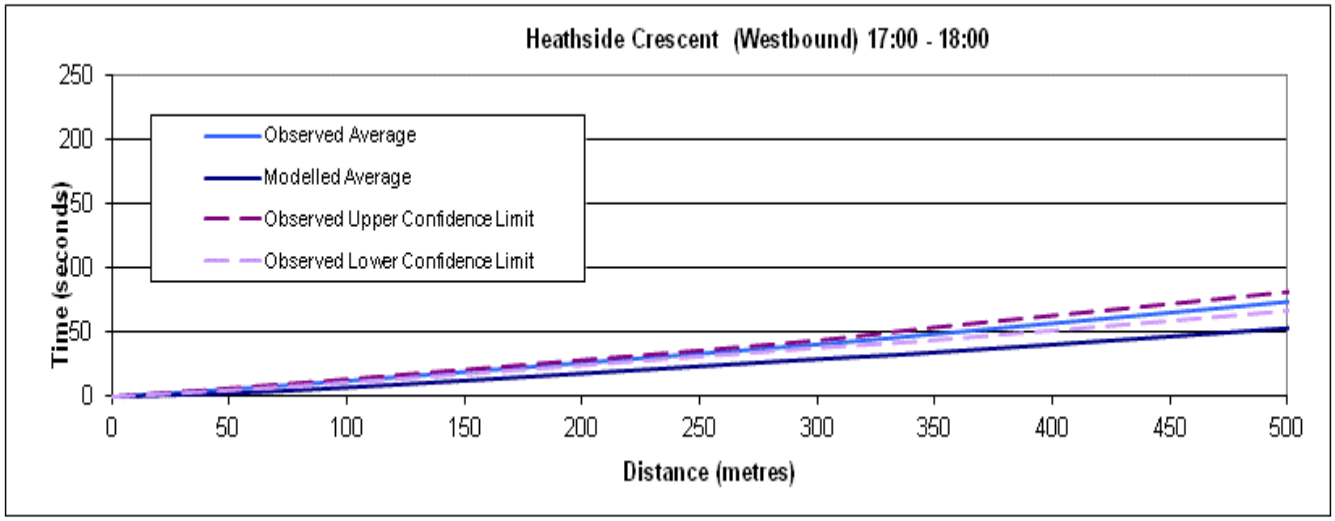


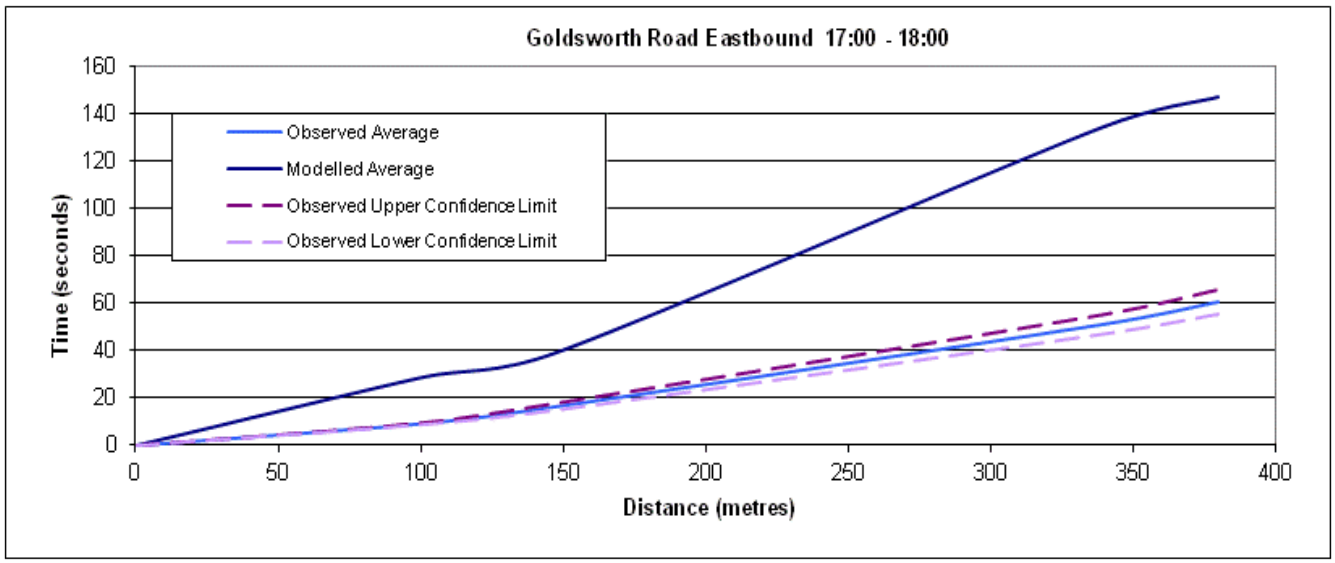

A324 Lockfield Drive Westbound 17:00 - 1800
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
20
40
60
80
100
120
140
160
180
0
100
200
300
400
500
600
700
800
900


A3046 Chobham Road Northbound 17:00 - 18:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
10
20
30
40
50
60
0
50
100
150
200
250
300
350
400
450

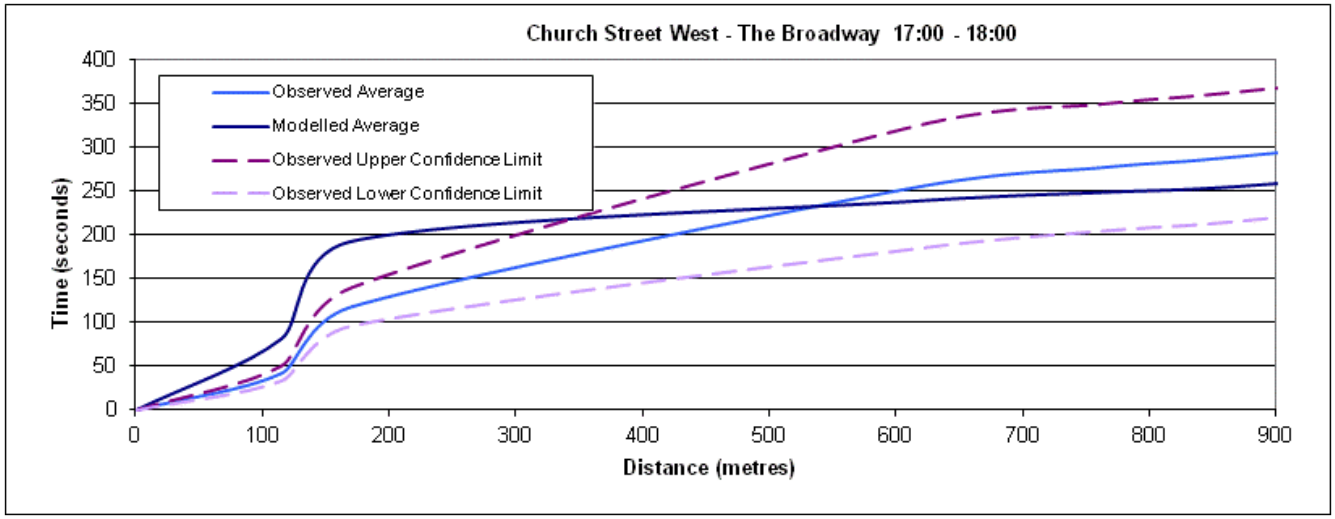

A3046 Chobham Road Southbound 17:00 - 18:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
10
20
30
40
50
60
70
80
90
100
0
50
100
150
200
250
300
350
400
450


Oriental Road (Eastbound) 17:00 - 18:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
10
20
30
40
50
60
70
80
90
100
0
50
100
150
200
250
300
350
400
450
500


Heathside Crescent (Westbound) 17:00 - 18:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
50
100
150
200
250
0
50
100
150
200
250
300
350
400
450
500


Goldsworth Road Eastbound 17:00 - 18:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
20
40
60
80
100
120
140
160
0
50
100
150
200
250
300
350
400


Goldsworth Road Westbound 17:00 - 18:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
20
40
60
80
100
120
0
100
200
300
400
500
600


Church Street West - The Broadway 17:00 - 18:00
Observed Average
Modelled Average
Observed Upper Confidence Limit
Observed Lower Confidence Limit
Time (seconds)
Distance (metres)
0
50
100
150
200
250
300
350
400
0
100
200
300
400
500
600
700
800
900