



Local Model Validation Report - Bedford Town Centre VISSIM Modelling

2014 BASE YEAR

Report

Local Model Validation Report - Bedford Town Centre VISSIM Modelling

2014 BASE YEAR

Report

JMP Consultants Ltd
3rd Floor
Innovation Court
121 Edmund Street
Birmingham
B3 2HJ
T 0121 230 6010 F 0121 230 6011 E birmingham@jmp.co.uk

www.jmp.co.uk
forwardthinking@jmp.co.uk
facebook.com/jmp.consultants
twitter.com/#!/_jmp
linkedin.com/company/jmp consulting

Report Record

Job No.	Report No.	Issue No.	Prepared	Verified	Approved	Status	Date
ST15239	1	1	Matt Millard	Jon Bunney	Lynn Basford	First Issue	06/08/2015

Contents Amendments Record

Issue No.	Revision description	Approved	Status	Date

Contents

1	EXECUTIVE SUMMARY	5
2	INTRODUCTION	6
	STUDY Background.....	6
	Modelled Network	6
3	METHODOLOGY	8
	Traffic Demand	8
	Network Building	8
	Assignment	9
4	CALIBRATION VALIDATION RESULTS	10
	Summary.....	10
	Calibration and Validation Methodology	11
	AM Calibration and Validation Results.....	15
	PM Calibration and Validation Results.....	21
5	CONCLUSIONS	28

Tables and Figures

Figure 2.1 Model Network Extent.....	7
Figure 4.1 Flow Calibration Sites	11
Figure 4.2 Screenline Flow Sites	12
Figure 4.3 Journey Time Validation Routes.....	13
Figure 4.4 Link Flow and Turning Movement Guidelines.....	14
Figure 4.5 Flow Screenline Guideline	14
Figure 4.6 Journey Time Validation Guideline	14
Table 4.1 Total AM Flow Calibration (Vehicles).....	15
Table 4.2 AM Flow Calibration Analysis	15
Table 4.3 AM Screenline Flow Validation	15
Table 4.4 AM Journey Time Validation Results	16

Figure 4.8 AM Queues at the West End / Ampthill Road Junction	18
Figure 4.9 AM Queues at Wilmer's Corner	18
Figure 4.10 AM Queues on Kempston Road and Britannia Road	19
Figure 4.11 AM Queues at the A4280 double roundabout	19
Figure 4.12 AM Queues on Ashburnham Road / Midland Road.....	20
Table 4.5 Total PM Flow Calibration (Vehicles).....	21
Table 4.6 PM Flow Calibration Analysis	21
Table 4.7 PM Screenline Flow Validation	21
Table 4.8 PM Journey Time Validation Results	22
Figure 4.14 PM Queues at the West End / Ampthill Road Junction	24
Figure 4.15 PM Queues at Wilmer's Corner	25
Figure 4.16 PM Queues on Barkers Lane and Longholme Way southbound.....	25
Figure 4.17 PM Queues at the A4280 double roundabout	26
Figure 4.18 PM Queues on Ashburnham Road / Midland Road.....	26
Figure 4.19 PM Queuing on Ropewalk	27

Appendices

Appendix A Calibration and Validation Statistics

1 Executive Summary

This report summarises the build of the 2014 Bedford Town Centre VISSIM base models. It covers the model and matrix building methodology, assumptions and calibration and validation results.

The model calibration and validation results were good in both the AM and PM peak, even though they did not quite meet the WebTAG guidelines.

The models calibrated to the following standards:

- AM Peak model;
 - Link flows calibrated at 81% to GEH and 81% to the absolute flow criteria;
 - Turn flows calibrated at 82% to GEH and 88% to the absolute flow criteria;
- PM Peak model;
 - Link flows calibrated at 77% to GEH and 73% to the absolute flow criteria; and
 - Turn flows calibrated at 77% to GEH and 86% to the absolute flow criteria.

The models validated to the following standards:

- AM Peak model;
 - 100% of screenlines validated successfully;
 - Five of seven (71%) travel time sections validated successfully;
- PM Peak model;
 - 50% of screenlines validated successfully; and
 - Five of seven (71%) travel time sections validated successfully.

Although the modelled results do not meet the WebTAG guideline, they were close for a network which has congested and variable traffic conditions. Queue locations were verified to matched site observations, therefore the model provides a robust starting point for use in forecasting the impact of traffic growth and proposed schemes in Bedford.

2 Introduction

STUDY BACKGROUND

Bedford Town Centre already experiences congestion in some locations, and this is thought to only worsen in the future. Transport modelling is part of a study to plan how to alleviate these congestion problems by forecasting the impact of proposed transport schemes and interventions. A VISSIM microsimulation model has been developed and will be used to provide an assessment of forecast traffic conditions at a detailed level of modelling within the town centre.

A strategic Saturn model has been developed for the wider area (see report title “Bedford Town Centre Transport Modelling LMVR”, April 2015) which will be used as a basis for traffic demand matrix building, and as a mechanism for forecasting traffic demand into the future.

The 2014 base year VISSIM modelling is presented in this model validation report.

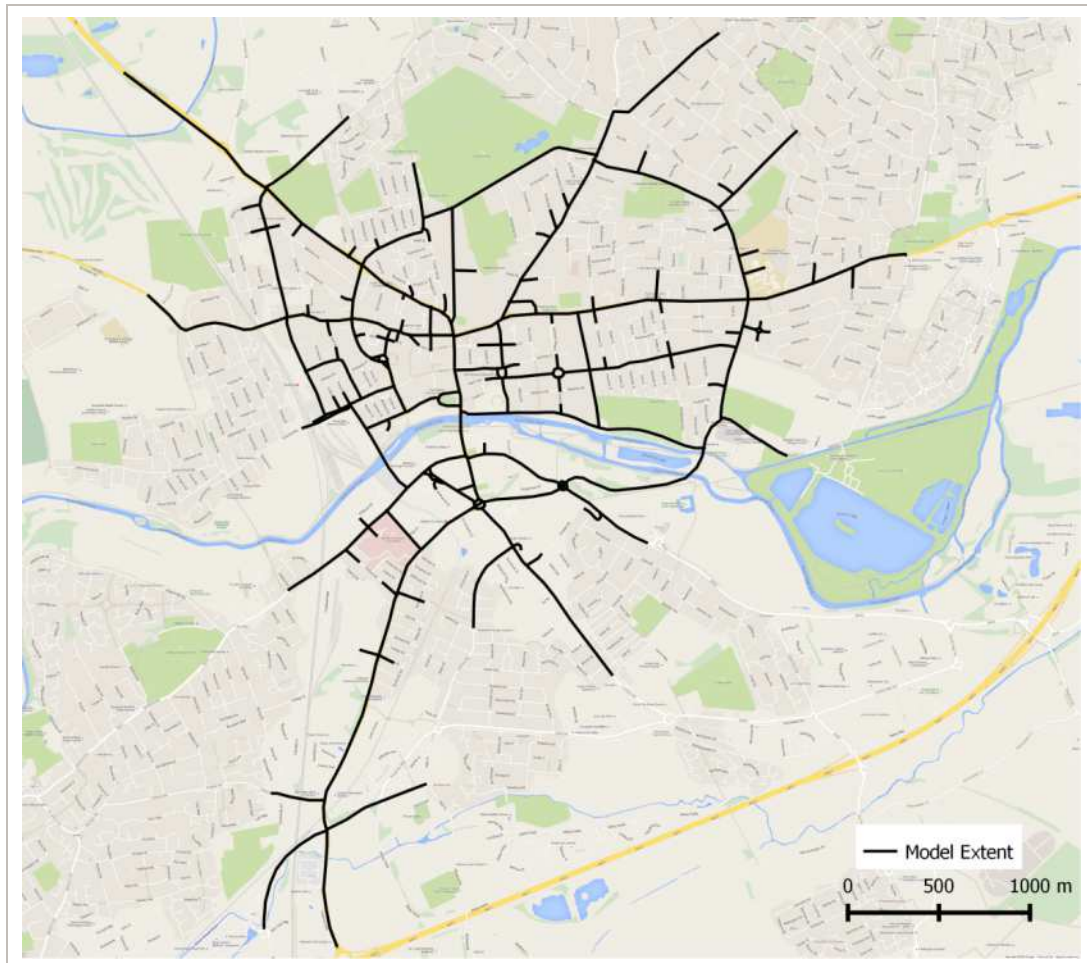
MODELLED NETWORK

The extent of the VISSIM model is shown in Figure 2.1. Bedford town centre includes three road bridges which cross the River Ouse at Prebend Street, A6 St Mary's Street and Longholme Way, and these are key influences to the traffic patterns in and around the town. All three are included in the VISSIM model to allow route choice. The modelled network covers Bedford's inner ring road and extends along the Ampthill Road.

Key junctions in the model include:

- The roundabout between Manton Lane / Clapham Road / Shakespeare Road;
- The double roundabout between A4280 / Shakespeare Road / Ashburnham Road;
- Junctions along the A4280 corridor, including those with Greyfriars Lane, Harpur Street, A6, Kimbolton Road and Polihill Avenue / Newnham Avenue;
- The mini-roundabouts between Shakespeare Road / Midland Road and Prebend Street / Midland Road;
- St Paul's Square;
- The junctions on Cauldwell Street with Kempston Road / Britannia Road, Prebend Street and Cauldwell Street;
- Wilmer's Corner Roundabout;
- Roundabout between Cardington Road / Ropewalk / Longholme Way / A603; and
- Junctions along Ampthill Road with Britannia Road, Victoria Road, Morrisons, Elstow Road and West End / A6.

The full network extent can be seen in Figure 2.1.

Figure 2.1 Model Network Extent

©OpenStreetMap contributors

The modelled network is large for a VISSIM model, and creates some challenges for calibration and validation. The data collected is unlikely to represent an average day in all areas of the model, and it cannot cover every junction in the model area, so there are some unknowns which have to be filled by matrix estimation. In addition the model has a lot of route choice, which can make convergence difficult to achieve, and lessens the likelihood of meeting WebTAG calibration and validation guidelines.

The modelled network extent was chosen however so that the VISSIM model could include route choice. As there are a number of roads with signals and junctions close together, the queue extents and impact this would have on route choice are better simulated in a microsimulation model. The locations of the proposed options for mitigation were also quite far apart, and the larger model offers the possibility of modelling multiple packages in one network.

3 Methodology

TRAFFIC DEMAND

Data Collection

An extensive data collection exercise was carried out for this study, which is outlined in the survey report referenced: ST15226-1/1. The data collected included ANPR origin-destination data, classified turning counts and journey time information. This data was used in the calculation of the Saturn model matrices which were built for 2014.

The classified turning count data was also used for calibration of the VISSIM model matrices, and the journey time data was used for validation of the VISSIM model.

Modelled Time Periods

AM and PM peak hour models were built for Bedford. Each model covered a two hour period, consisting of a 30 minute pre-peak, a peak hour, and a 30 minute cooling-down period. Calibration, validation and all model outputs are produced from the peak hour.

The matrices were built in 15 minute time-slices, for light vehicles (cars, motorcycles and LGVs) and heavy vehicles (OGV1 and OGV2).

The peak hours and 15 minute time profiles were calculated from an aggregation of the turning count data to give a representative view of the whole study area. The peak hours modelled were 08:00 – 09:00 and 17:00 to 18:00. The pre-peak time periods were required to pre-load the network with traffic so that the peak hour was sufficiently congested for model outputs to begin, and the post peak is to allow vehicles to clear the model so that outputs are completed.

Matrix Building Methodology

A matrix was cordoned from the 2014 Saturn base model to provide a starting point for the VISSIM model.

This matrix was disaggregated into the more detailed VISSIM zoning system, and assigned to the VISSIM network. The matrix was then calibrated using the turning count data to increase its accuracy.

The calibration results can be seen in Section 4.

NETWORK BUILDING

Geometry

The model was coded from aerial photography. Its currency and any changes to the geometry were verified on a site visit.

Signals

Signals were coded from signal controller specifications which gave minimum and maximum green times, inter-stage timings and stage diagrams. These were adjusted based on site observations and signal timings from the Saturn model where data was not available.

Signalised junctions were coded as vehicle actuated junctions so that they were demand dependent and provided an approximation for signals on the UTC system. The two signals on Kingsway, and the two

signals between St Paul's Square and the High St were coded as fixed time to maintain their co-ordination as without co-ordination in the model, queues built at an unrealistic rate and quickly blocked Wilmer's Corner.

Pedestrian crossings were coded as fixed time where they were deemed to be regularly activated or the site visit indicated that the signal was influencing traffic behaviour.

Assumptions

Gradients were not included in the modelling.

Driving behaviour including lane change behaviour, priorities and lane utilisation was based on observations from the site visit and modelling experience.

Driving behaviour parameters were based on modelling experience and observations from the site visit. Default parameters were used in general, however a more aggressive driving behaviour was used on some links to achieve sensible weaving behaviour and throughputs. The changes made were to general behaviour (free lane selection), (own) lane change maximum deceleration (-6 m/s²), maximum deceleration for co-operative braking (-9 m/s²), minimum headway (0.3m) and choosing co-operative lane change on default values. The locations that this was used include:

- Broadway;
- St Paul's Square southern arm;
- St Mary's Street into Wilmer's Corner; and
- Ampthill Road north of Elstow Road.

The speed distributions represent the desired travel speeds for vehicles related to the road classification and speed limit of the network. A range of desired speed flow distributions by road type, speed limit and vehicle type, have been defined, based on DfT statistics for Free Flow Vehicle Speeds:

- Table SPE101 – Free-flow vehicle speeds on non-built-up roads by road type and vehicle type in Great Britain, 2011; and
- Table SPE102 – Free-flow vehicle speeds on built-up roads by speed limit and vehicle type in Great Britain, 2011.

The updated desired speed distributions have been incorporated into the model structure, based on the network characteristics, such as road type and speed limit, in order to improve the realism of the model assignment, in line with DfT statistics.

ASSIGNMENT

In line with current best practice, the Bedford VISSIM model simulation used dynamic assignment. Dynamic assignment allows traffic, based on a matrix of origin and destination movements, to choose their preferred route at the time they enter the simulation.

Driver route choice is based on the "cost" of each option, which includes travel time and distance as the most important factors. However, this choice and the time at which vehicles enter the network (within the span of their fifteen minute matrix) is determined by a stochastic assignment of random numbers. One particular assignment is called a "random seed" and this method represents the variation that you get on a day to day basis. There is a risk that a random seed could be biased (maybe more congested than the average) because of the stochastic assignment, so each model run is done for ten random seeds, and results are averaged. The consistency of results are also verified to check that they are sensible.

4 Calibration Validation Results

SUMMARY

The process of calibration and validation consists of two parts. Calibration is the process of adjusting the model network and input traffic demand such that it reflects observed driving behaviour and traffic levels. Validation is the comparison of model outputs to a different set of observed data to check that the model is a robust representation of the network.

The model was calibrated to link and turn flows and validated to journey times and screenline flows. The results were measured using WebTAG criteria and reported against the target WebTAG guidelines. As recommended by WebTAG, the model was run for ten random seeds and the average of the results presented. The guideline criteria for calibration and validation can be seen in the following section.

The calibration and validation results were good, although they did not quite meet the recommended guidelines. However, given that the observed data was just a snapshot of traffic conditions for a study area which large queues and delays which were variable from day to day, the results are acceptable and will provide a robust base to be used for forecasting.

The calibration and validation results for the AM peak were as follows;

- 81% of link flow calibration sites had a GEH < 5;
- 81% of link flow calibration sites met the absolute flow difference guideline;
- 82% of turn flow calibration sites had a GEH < 5;
- 88% of turn flow calibration sites met the absolute flow difference guideline;
- All four screenlines were within the WEBTAG guideline;
- Five out of seven (71%) travel time routes were within the WEBTAG guideline.

The calibration and validation results for the PM peak were as follows;

- 77% of link flow calibration sites had a GEH < 5;
- 73% of link flow calibration sites met the absolute flow difference guideline;
- 77% of turn flow calibration sites had a GEH < 5;
- 85% of turn flow calibration sites met the absolute flow difference guideline;
- Two of four screenlines were within the WEBTAG guideline;
- Five out of seven (71%) travel time routes were within the WEBTAG guideline.

In addition to the results presented above, the location and of queues was verified visually based on information gathered from a site visit.

CALIBRATION AND VALIDATION METHODOLOGY

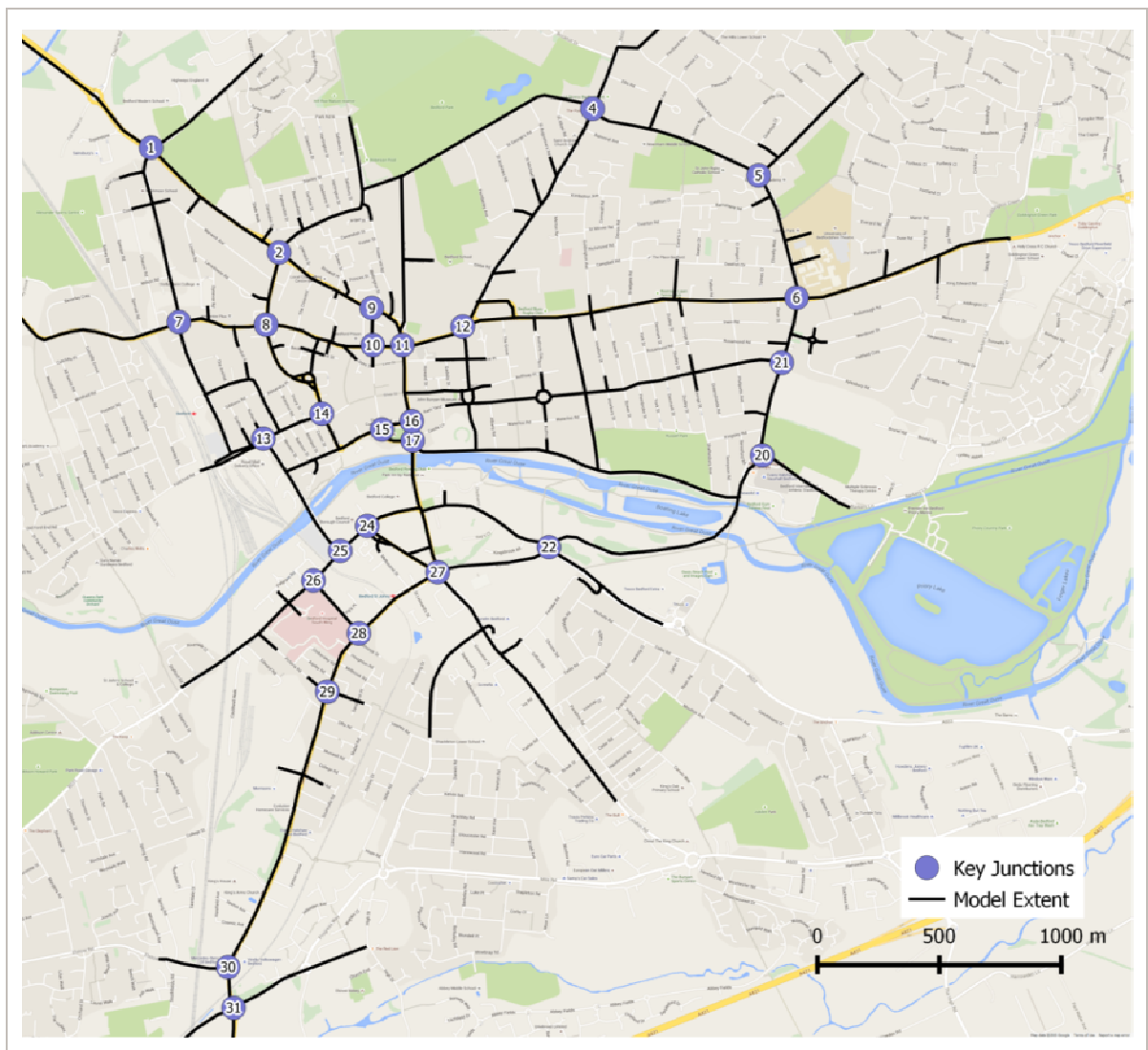
Calibration Methodology

Flow calibration is a process whereby modelled flow outputs are compared and calibrated to match observed traffic flows throughout the network. In this instance this refers to link and turning counts.

The Design Manual for Roads and Bridges (DMRB), Volume 12, provides the guidance on the acceptable criteria when comparing modelled link flows against observed counts. For this assessment the link flow criteria has also been applied for the turning movement calibration, as required in TAG Unit M3.1 – Highway Assignment Modelling.

Flow calibration was done across 27 key junctions in Bedford. The junctions chosen for calibration can be seen in Figure 4.1. For each of these junctions the modelled flow was compared to the surveyed flow for both links and turns.

Figure 4.1 Flow Calibration Sites



Model calibration involved a number of techniques to calibrate driver behaviour such that the model represents network conditions. Many of these techniques and associated assumptions were covered in Section 3. They included calibrating:

- Speed limits, appropriate distributions, and reduced speeds on bends;
- Vehicle priorities and associated gap acceptance;
- Signal control logic and timings;
- Lane change and emergency stop distances; and
- Lane utilisation and banned turns.

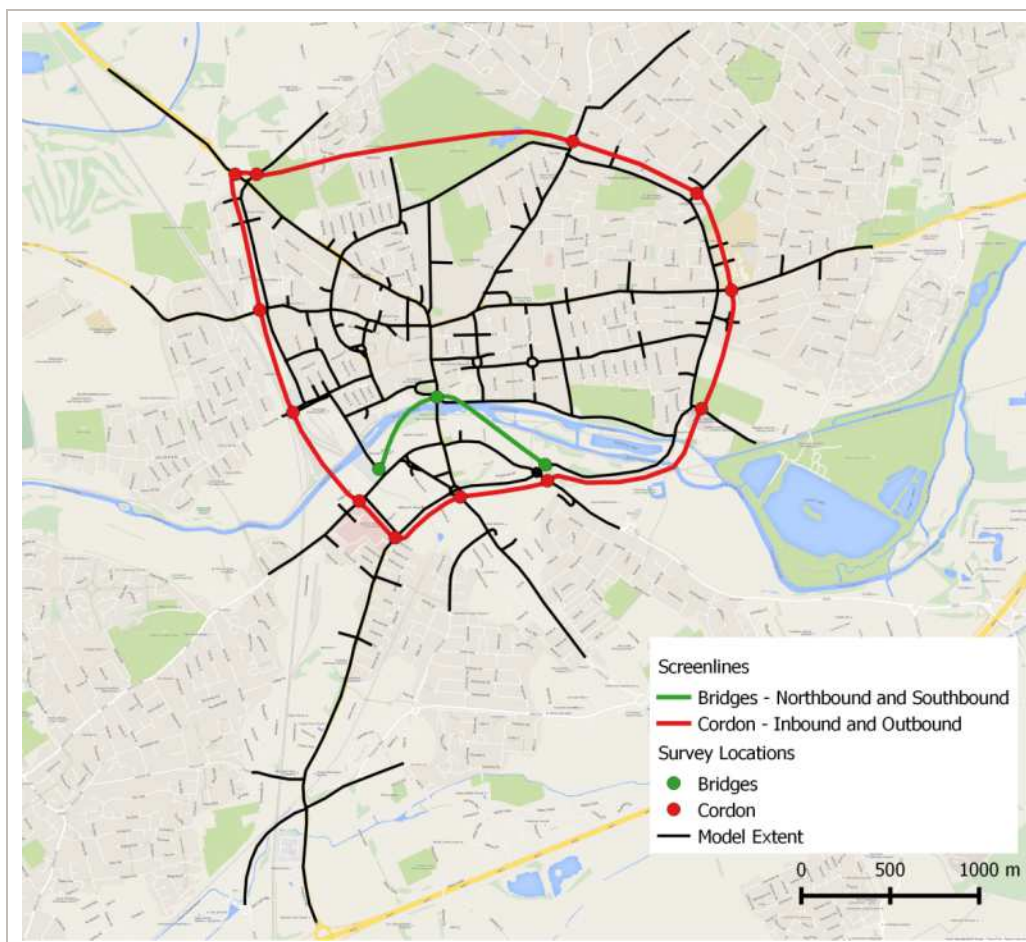
Validation Methodology

Validation was undertaken in two ways, through screenline flow validation and journey time validation.

Four screenlines were set up as follows and can be seen in Figure 4.2 below:

- The three bridges northbound;
- The three bridges southbound;
- Cordon of main roads around Bedford inbound; and
- Cordon of main roads around Bedford outbound.

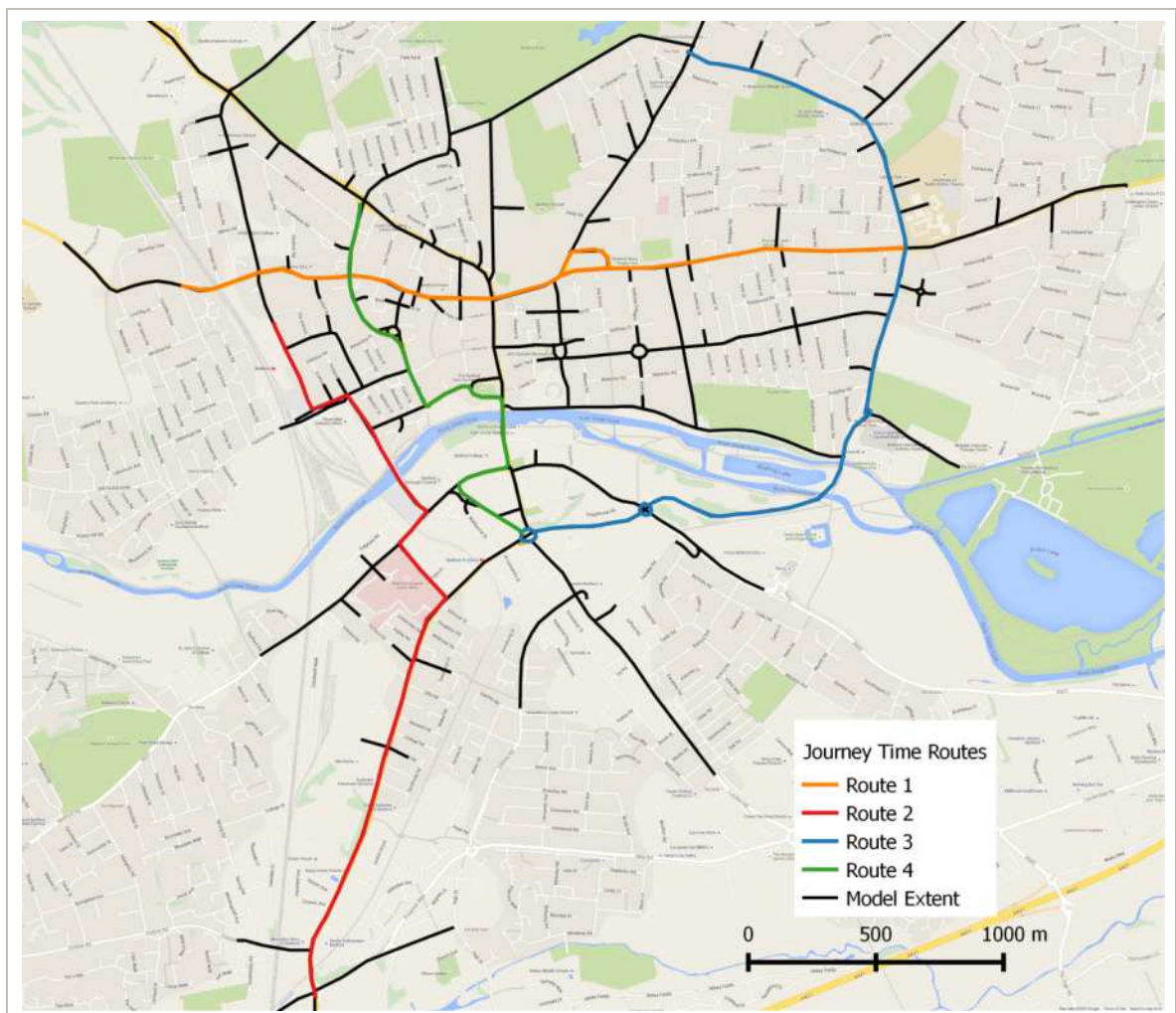
Figure 4.2 Screenline Flow Sites



Note that the Bridges screenline isn't quite complete as there are junctions in between the flow sites and the bridges. However, this is the best approximation of a screenline across the bridges that could be constructed from the surveys which were conducted, and it will still give a good indication of the model's accuracy in this key location.

Journey time validation was surveyed using the car-follower method for the journey time sections seen in Figure 4.3. All routes were validated in both directions, with the exception of route 4 which was only validated northbound.

Figure 4.3 Journey Time Validation Routes



WebTAG Calibration and Validation Guidelines

The WEBTAG calibration and validation guideline criteria have been applied to the Bedford model and can be seen in this section.

Figure 4.4 Link Flow and Turning Movement Guidelines

Link Flow and Turning Movement Validation

3.2.7 For link flow validation, the measures which should be used are:

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

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

where: GEH is the GEH statistic;
M is the modelled flow; and
C is the observed flow.

These two measures are broadly consistent and link flows that meet either criterion should be regarded as satisfactory.

3.2.8 The validation **criteria** and **acceptability guidelines** for link flows and turning movements are defined in Table 2.

Table 2 Link Flow and Turning Movement Validation Criteria and Acceptability Guidelines		
Criteria	Description of Criteria	Acceptability Guideline
1	Individual flows within 100 veh/h of counts for flows less than 700 veh/h	> 85% of cases
	Individual flows within 15% of counts for flows from 700 to 2,700 veh/h	> 85% of cases
	Individual flows within 400 veh/h of counts for flows more than 2,700 veh/h	> 85% of cases
2	GEH < 5 for individual flows	> 85% of cases

WebTAG Unit M3.1

Figure 4.5 Flow Screenline Guideline

Table 1 Screenline Flow Validation Criterion and Acceptability Guideline	
Criteria	Acceptability Guideline
Differences between modelled flows and counts should be less than 5% of the counts	All or nearly all screenlines

WebTAG Unit M3.1

Figure 4.6 Journey Time Validation Guideline

Table 3 Journey Time Validation Criterion and Acceptability Guideline	
Criteria	Acceptability Guideline
Modelled times along routes should be within 15% of surveyed times (or 1 minute, if higher than 15%)	> 85% of routes

WebTAG Unit M3.1

AM CALIBRATION AND VALIDATION RESULTS

Summary

Although the AM model didn't quite meet the WebTAG guidelines, the model still achieved a good level of calibration and validation. Three of the four calibration statistics were slightly below the 85% recommendation with just one passing, yet the four screenlines all validated, and five of the seven journey times passed – requiring just one more to pass to meet WebTAG Guidelines.

The screenshots at the end of this section demonstrate that congestion was modelled in the expected places, and it is likely to be the day to day variation seen in this large, congested study area which means that the modelled outputs did not quite match the targets.

It is considered that the level of calibration and validation is such that the model provides a robust starting point for forecasting.

Flow Calibration Results

Table 4.1 shows that the AM calibration was close to the 85% WebTAG guideline for the two link count criteria and the turn count GEH criteria. The turn count flow criteria exceeded the guideline. 90% of link flows and 88% of turns had GEH < 6, indicating that the model was very close to meeting the guideline.

Table 4.1 Total AM Flow Calibration (Vehicles)

AM Peak Hr (8-9)	Counts	% GEH <5	Flow Test
Link Calibration	172	81%	81%
Turn Calibration	240	82%	88%
Total Counts	412	82%	85%

Table 4.2 AM Flow Calibration Analysis

AM Peak Hr (8-9)	Link Flows	Turn Flows
GEH < 5	81%	82%
GEH < 6	90%	88%
GEH < 15	100%	100%

AM Screenline Flow Validation

The WebTAG guidance states that all or nearly all screenlines should be within 5% of the total flow. As shown in Table 4.3, 100% of screenlines pass in the AM peak. See Appendix A for further detail.

Table 4.3 AM Screenline Flow Validation

Screenline Name	Direction	GEH	% Difference (Modelled – Observed)	Pass / Fail
Bridges	Northbound	0.3	0%	Pass
Bridges	Southbound	0.3	0%	Pass
Cordon	Inbound	2.8	-3%	Pass
Cordon	Outbound	0.5	-1%	Pass

AM Journey Time Validation

Five out of the seven journey time routes passed the guideline criteria, and one was very close (18% instead of 15%). The journey time route results can be seen in Table 4.4.

For all routes, the journey time graphs in Appendix A indicate that the modelled and observed profiles are similar. Even for the routes which don't validate (Route 1 in both directions), the profile is fairly consistent between modelled and observed indicating that there is congestion in the right locations. This is shown in more detail by modelled screenshots in the following section, "AM Queue Locations". There were not many journey time runs so it is also probable that the observed data could be a little skewed and not an accurate picture for an average peak hour of a working day.

Table 4.4 AM Journey Time Validation Results

Route	Direction	Observed Travel Time	Modelled Travel Time	Difference (s)	% Difference	Pass / Fail	Distance
Route 1	WB	710	499	-211	-30%	Fail	2916
Route 1	EB	610	500	-110	-18%	Fail	3389
Route 2	NB	801	813	12	1%	Pass	3213
Route 2	SB	710	701	-9	-1%	Pass	3389
Route 3	NB	459	464	5	1%	Pass	3713
Route 3	SB	330	339	9	3%	Pass	2201
Route 4	NB	379	322	-57	-15%	Pass	2035

AM Queue Locations

A number of key locations were observed having queues and their presence in the VISSIM model has been verified. These included:

- Long queues on the Ampthill Road northbound;

Figure 4.7 AM Queue on Ampthill Road Northbound



- Queuing at the lane drop section on Ampthill Road

Figure 4.8 AM Queues at the West End / Ampthill Road Junction



- Long queues on all entries into Wilmer's Corner;

Figure 4.9 AM Queues at Wilmer's Corner



- Queues on Kempston Road eastbound and Britannia Road northbound;

Figure 4.10 AM Queues on Kempston Road and Britannia Road



- Queuing at the double mini-roundabout eastbound and westbound on the A4280;

Figure 4.11 AM Queues at the A4280 double roundabout



➤ Queuing at the mini roundabouts at Ashburnham Road / Midland Road

Figure 4.12 AM Queues on Ashburnham Road / Midland Road



PM CALIBRATION AND VALIDATION RESULTS

Summary

Although the PM model didn't quite meet the WebTAG guidelines, the model still achieved a good level of calibration and validation. One of the four calibration statistics passed the 85% recommendation with the other three only slightly below. This is likely to be because of the severe congestion in the town centre in the PM, and the variability that accompanies surveyed traffic data in congested areas. Five of the seven journey times passed – requiring just one more to pass to meet WebTAG Guidelines.

The screenshots below demonstrate that congestion was modelled in the expected places, and it was likely to be the day to day variation seen in this large, congested study area which meant that the modelled outputs did not quite match the targets.

It is considered that the level of calibration and validation is such that the model provides a robust starting point for forecasting.

Flow Calibration Results

Table 4.5 shows that the PM calibration was close to the 85% WebTAG guideline for the two link count criteria and the turn count GEH criteria. The turn count flow criteria met the guideline. 84% of link flows and 85% of turns had GEH < 6, indicating that the model was very close to meeting the guideline.

Table 4.5 Total PM Flow Calibration (Vehicles)

PM Peak Hr (17-18)	Counts	% GEH <5	Flow Test
Link Calibration	172	77%	73%
Turn Calibration	240	77%	86%
Total Counts	412	77%	81%

Table 4.6 PM Flow Calibration Analysis

PM Peak Hr (17-18)	Link Flows	Turn Flows
GEH < 5	77%	77%
GEH < 6	84%	85%
GEH < 15	100%	100%

PM Screenline Flow Validation

The WebTAG guidance states that all or nearly all screenlines should be within 5% of the total flow. As shown in Table 4.7, 50% of screenlines pass in the PM peak. See appendix A for further detail.

Table 4.7 PM Screenline Flow Validation

Screenline Name	Direction	GEH	% Difference (Modelled – Observed)	Pass / Fail
Bridges	Northbound	1.0	-2%	Pass
Bridges	Southbound	5.2	-9%	Fail
Cordon	Inbound	2.0	2%	Pass
Cordon	Outbound	5.8	-6%	Fail

PM Journey Time Validation

Five out of the seven journey time routes passed the guideline criteria, however the other two routes did not show the required congestion. The journey time route results can be seen in Table 4.4. It is believed that for Route 2 southbound, the queuing that is not captured in the model may be caused by off-network congestion which begins at the junction between Ampthill Road and the Park and Ride site, and possibly the motorway junction. On Ampthill Road, the model consistently has too many vehicles travelling southbound, yet not enough congestion which would back this up.

For all routes, the journey time graphs in Appendix A indicate that the modelled and observed profiles are similar. Even for the routes which don't validate, the profile is fairly consistent between modelled and observed indicating that there is congestion in most of the right locations. This is shown in more detail by modelled screenshots in the following section, "PM Queue Locations". It is Ampthill Road where the comparison is the most different in both of the journey time runs that fail. It should also be noted that there were not many journey time runs so it is also probable that the observed data could be a little skewed and not an accurate picture for an average PM peak hour of a working day.

Table 4.8 PM Journey Time Validation Results

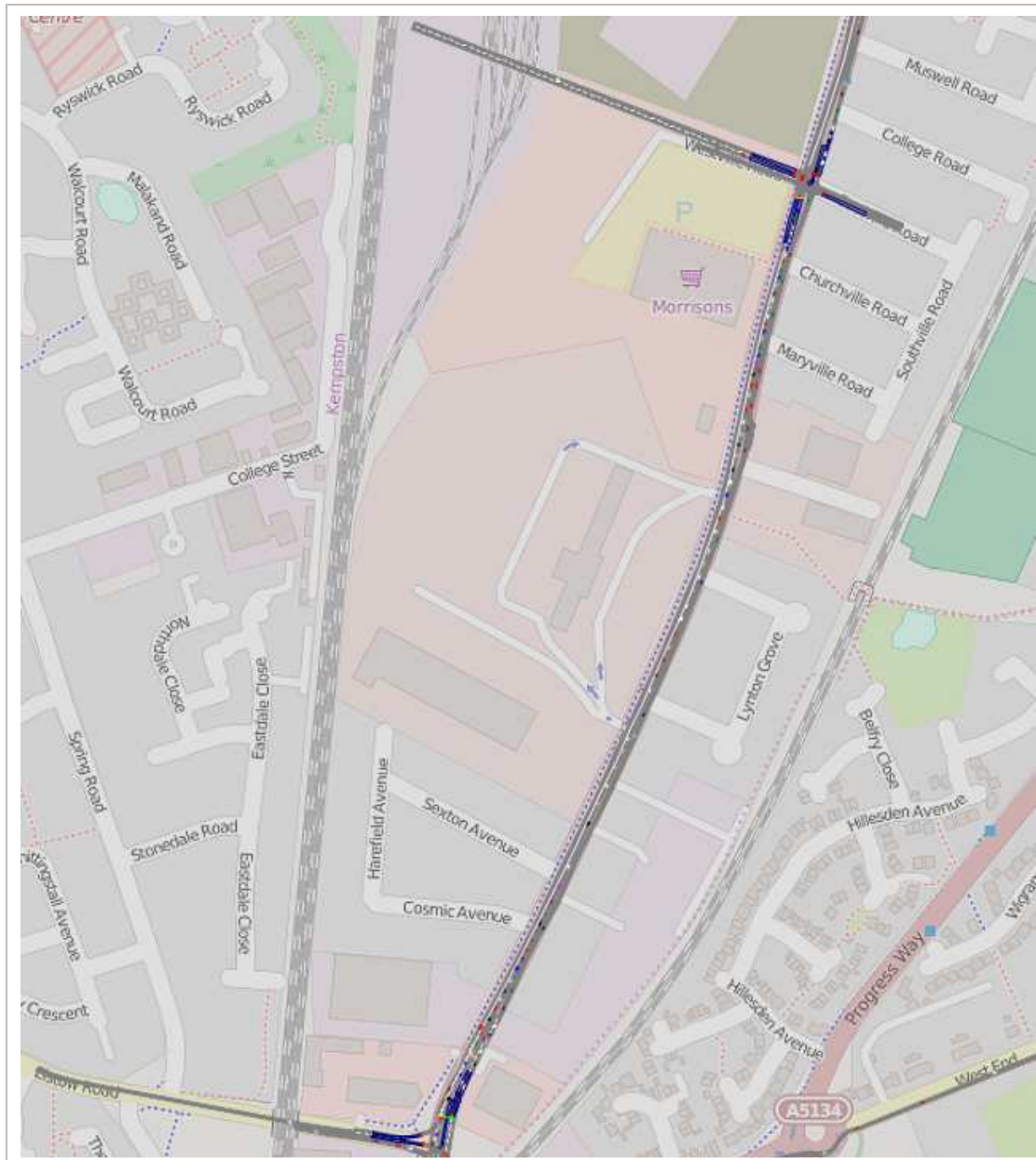
Route	Direction	Observed Travel Time	Modelled Travel Time	Difference (s)	% Difference	Pass / Fail	Distance
Route 1	WB	720	709	-11	-2%	Pass	2916
Route 1	EB	881	763	-118	-13%	Pass	3389
Route 2	NB	1050	1079	29	3%	Pass	3213
Route 2	SB	974	545	-429	-44%	Fail	3389
Route 3	NB	580	588	8	1%	Pass	3713
Route 3	SB	240	276	36	15%	Pass	2201
Route 4	NB	841	409	-431	-51%	Fail	2035

PM Queue Locations

A number of key locations were observed having queues and their presence in the VISSIM model has been verified. These included:

- Long queues on the Ampthill Road northbound;

Figure 4.13 PM Queue on Ampthill Road Northbound



➤ Queuing at the lane drop section on Ampthill Road

Figure 4.14 PM Queues at the West End / Ampthill Road Junction



➤ Queuing at Wilmer's Corner;

Figure 4.15 PM Queues at Wilmer's Corner



➤ Queues on Barkers Lane and Longholme Way southbound;

Figure 4.16 PM Queues on Barkers Lane and Longholme Way southbound



- Queuing at the double mini-roundabout eastbound and westbound on the A4280;

Figure 4.17 PM Queues at the A4280 double roundabout



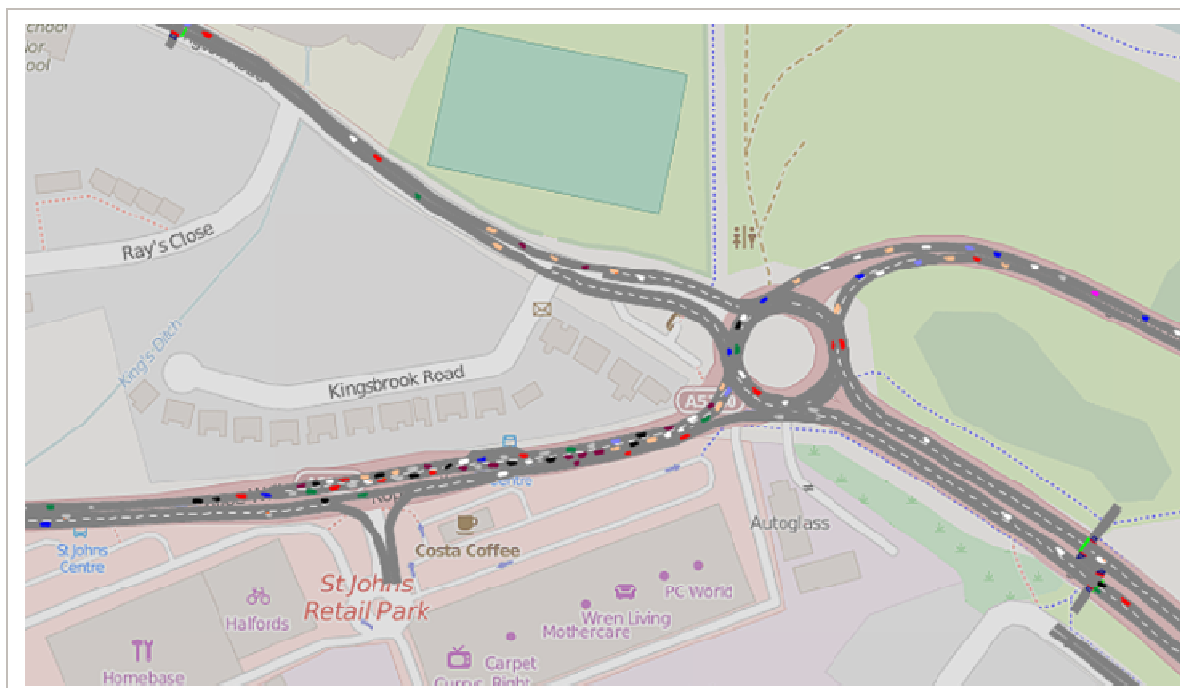
- Queuing at the mini roundabouts at Ashburnham Road / Midland Road northbound

Figure 4.18 PM Queues on Ashburnham Road / Midland Road



➤ Queuing on Ropewalk eastbound;

Figure 4.19 PM Queuing on Ropewalk



5 Conclusions

Although the model does not quite reach the WebTAG calibration and validation guideline statistics, it is considered that the Bedford Town Centre VISSIM model discussed in this report provides a robust base for use in forecasting.

Appendix A

CALIBRATION AND VALIDATION STATISTICS

Table A.1 - 2014 BY-AM Peak Hr (8-9) - Total Traffic (Lights & Heavies) - Link Calibration

Counts							PASS	FAIL	Criteria	%	Flow Test		Either
							140	32	% GEH <5	81%	% PASS	140	144
							154	18	% GEH <6	90%		81%	84%
							172	0	% GEH <15	100%			
Site	Count	Arm	Ref	Location	Dir	Survey	Model	Diff (M - S)	% Diff	GEH	Flow Test Criteria	Flow Test PASS/FAIL	Pass Either
1	1	350	1-350>	Manton Ln	SB	651	673	22	3%	0.9	100	PASS	PASS
1	2	350	1-350<	Manton Ln	NB	813	798	-15	-2%	0.5	122	PASS	PASS
1	3	332	1-332>	A6 (E)	WB	715	688	-27	-4%	1.0	107	PASS	PASS
1	4	332	1-332<	A6 (E)	EB	760	730	-30	-4%	1.1	114	PASS	PASS
1	5	223	1-223>	Shakespeare Rd	NB	530	420	-110	-21%	5.0	100	FAIL	FAIL
1	6	223	1-223<	Shakespeare Rd	SB	483	508	25	5%	1.1	100	PASS	PASS
1	7	351	1-351>	A6 (W)	EB	905	915	10	1%	0.3	136	PASS	PASS
1	8	351	1-351<	A6 (W)	WB	745	660	-85	-11%	3.2	112	PASS	PASS
2	9	333	2-333>	Roff Ave	SB	558	427	-131	-23%	5.9	100	FAIL	FAIL
2	10	333	2-333<	Roff Ave	NB	457	429	-28	-6%	1.3	100	PASS	PASS
2	11	368	2-368>	A6 (E)	WB	282	349	67	24%	3.8	100	PASS	PASS
2	12	368	2-368<	A6 (E)	EB	700	609	-91	-13%	3.6	105	PASS	PASS
2	13	227	2-227>	Union St	NB	679	677	-2	0%	0.1	100	PASS	PASS
2	14	227	2-227<	Union St	SB	548	615	67	12%	2.8	100	PASS	PASS
2	15	334	2-334>	A6 (W)	EB	784	877	93	12%	3.2	118	PASS	PASS
2	16	334	2-334<	A6 (W)	WB	598	677	79	13%	3.1	100	PASS	PASS
4	17	359	4-359>	Kimbolton Rd (N)	SB	1,162	1,014	-148	-13%	4.5	174	PASS	PASS
4	18	359	4-359<	Kimbolton Rd (N)	NB	648	647	-1	0%	0.0	100	PASS	PASS
4	19	194	4-194>	Polhill Ave	WB	501	424	-77	-15%	3.6	100	PASS	PASS
4	20	194	4-194<	Polhill Ave	EB	498	536	38	8%	1.7	100	PASS	PASS
4	21	186	4-186>	Kimbolton Rd (S)	NB	297	378	81	27%	4.4	100	PASS	PASS
4	22	186	4-186<	Kimbolton Rd (S)	SB	695	409	-286	-41%	12.2	100	FAIL	FAIL
4	23	326	4-326>	Park Ave	EB	347	344	-3	-1%	0.2	100	PASS	PASS
4	24	326	4-326<	Park Ave	WB	466	568	102	22%	4.5	100	FAIL	PASS
5	25	194	5-194>	Pollhill Ave (W)	EB	608	622	14	2%	0.6	100	PASS	PASS
5	26	194	5-194<	Pollhill Ave (W)	WB	614	510	-104	-17%	4.4	100	FAIL	PASS
5	27	360	5-360>	Haylands Way	SB	404	388	-16	-4%	0.8	100	PASS	PASS
5	28	360	5-360<	Haylands Way	NB	248	223	-25	-10%	1.6	100	PASS	PASS
5	29	125	5-125>	Pillhill Ave (E)	WB	659	506	-153	-23%	6.3	100	FAIL	FAIL
5	30	125	5-125<	Pillhill Ave (E)	EB	809	783	-26	-3%	0.9	121	PASS	PASS
6	31	193	6-193<	Pollhill Ave	SB	575	557	-18	-3%	0.8	100	PASS	PASS
6	32	193	6-193>	Pollhill Ave	NB	684	862	178	26%	6.4	100	FAIL	FAIL
6	33	363	6-363<	A4280 (E)	WB	567	611	44	8%	1.8	100	PASS	PASS
6	34	363	6-363>	A4280 (E)	EB	537	584	47	9%	2.0	100	PASS	PASS
6	35	354	6-354<	Newnham Ave	NB	694	733	39	6%	1.5	100	PASS	PASS
6	36	354	6-354>	Newnham Ave	SB	617	678	61	10%	2.4	100	PASS	PASS
6	37	126	6-126<	A4280 (W)	EB	403	608	205	51%	9.1	100	FAIL	FAIL
6	38	126	6-126>	A4280 (W)	WB	401	385	-16	-4%	0.8	100	PASS	PASS
7	39	229	7-229>	Shakespeare Rd	SB	437	512	75	17%	3.4	100	PASS	PASS
7	40	229	7-229<	Shakespeare Rd	NB	505	451	-54	-11%	2.5	100	PASS	PASS
7	41	225	7-225>	A4280 (E)	WB	577	497	-80	-14%	3.5	100	PASS	PASS
7	42	225	7-225<	A4280 (E)	EB	630	754	124	20%	4.7	100	FAIL	PASS
7	43	77	7-77>	Ashburnham Rd	NB	475	516	41	9%	1.8	100	PASS	PASS
7	44	77	7-77<	Ashburnham Rd	SB	453	584	131	29%	5.8	100	FAIL	FAIL
7	45	303	7-303>	A4280 (W)	EB	916	1,059	143	16%	4.6	137	FAIL	PASS
7	46	303	7-303<	A4280 (W)	WB	817	795	-22	-3%	0.8	123	PASS	PASS
8	47	331	8-331>	Union St	SB	481	610	129	27%	5.5	100	FAIL	FAIL
8	48	331	8-331<	Union St	NB	619	699	80	13%	3.1	100	PASS	PASS
8	49	182	8-182>	A4280 (E)	WB	259	290	31	12%	1.9	100	PASS	PASS
8	50	182	8-182<	A4280 (E)	EB	322	390	68	21%	3.6	100	PASS	PASS
8	51	217	8-217>	Greyfriars	NB	423	343	-80	-19%	4.1	100	PASS	PASS
8	52	217	8-217<	Greyfriars	SB	228	286	58	25%	3.6	100	PASS	PASS
8	53	225	8-225>	A4280 (W)	EB	481	615	134	28%	5.7	100	FAIL	FAIL
8	54	225	8-225<	A4280 (W)	WB	475	483	8	2%	0.4	100	PASS	PASS
9	55	19	9-19>	Harpur St	NB	788	961	173	22%	5.9	118	FAIL	FAIL
9	56	156	9-156<	A6 (E)	EB	1,220	1,340	120	10%	3.4	183	PASS	PASS
9	57	158	9-158>	A6 (W)	EB	729	774	45	6%	1.6	109	PASS	PASS
9	58	158	9-158<	A6 (W)	WB	297	395	98	33%	5.3	100	PASS	PASS
10	59	284	10-284>	A4280 (E)	WB	707	924	217	31%	7.6	106	FAIL	FAIL
10	60	282	10-282<	Harpur St (N)	NB	783	962	179	23%	6.1	117	FAIL	FAIL
10	61	215	10-215>	Harpur St (S)	NB	30	21	-9	-30%	1.8	100	PASS	PASS
10	62	15	10-15<	A4280 (W)	WB	417	592	175	42%	7.8	100	FAIL	FAIL
10	63	15	10-15>	A4280 (W)	EB	463	609	146	32%	6.3	100	FAIL	FAIL
11	64	24	11-24>	A4280 (E)	WB	730	778	48	7%	1.7	110	PASS	PASS
11	65	24	11-24<	A4280 (E)	EB	539	681	142	26%	5.7	100	FAIL	FAIL
11	66	156	11-156>	The BRdway	SB	1,398	1,649	251	18%	6.4	210	FAIL	FAIL
11	67	30	11-30<	High St	SB	883	821	-62	-7%	2.1	132	PASS	PASS
11	68	19	11-19<	A4280 (W)	WB	706	925	219	31%	7.7	106	FAIL	FAIL
12	69	104	12-104>	A4280 (E)	WB	656	735	79	12%	3.0	100	PASS	PASS
12	70	104	12-104<	A4280 (E)	EB	556	693	137	25%	5.5	100	FAIL	FAIL
12	71	213	12-213>	St Cuthbert's St	NB	422	400	-22	-5%	1.1	100	PASS	PASS
12	72	213	12-213<	St Cuthbert's St	SB	343	348	5	1%	0.3	100	PASS	PASS
12	73	284	12-284>	A4280 (W)	EB	546	684	138	25%	5.6	100	FAIL	FAIL
12	74	284	12-284<	A4280 (W)	WB	725	778	53	7%	1.9	109	PASS	PASS
13	75	70	13-70>	Midland Rd (E)	WB	478	529	51	11%	2.3	100	PASS	PASS
13	76	70	13-70<	Midland Rd (E)	EB	403	578	175	43%	7.9	100	FAIL	FAIL
13	77	357	13-357<	Rutland Rd	NB	33	30	-3	-9%	0.5	100	PASS	PASS
13	78	69	13-69>	Prebend St	NB	836	933	97	12%	3.3	125	PASS	PASS
13	79	69	13-69<	Prebend St	SB	779	938	159	20%	5.4	117	FAIL	FAIL
13	80	114	13-114>	Ford End Rd	EB	424	451	27	6%	1.3	100	PASS	PASS
13	81	114	13-114<	Ford End Rd	WB	373	364	-9	-2%	0.5	100	PASS	PASS
13	82	75	13-75>	Midland Rd (W)	EB	380	502	122	32%	5.8	100	FAIL	FAIL

13	83	75	13-75<	Midland Rd (W)	WB	530	505	-25	-5%	1.1	100	PASS	PASS
14	84	324	14-324>	Greyfriars (N)	SB	204	420	216	106%	12.2	100	FAIL	FAIL
14	85	324	14-324<	Greyfriars (N)	NB	682	678	-4	-1%	0.2	100	PASS	PASS
14	86	43	14-43>	River St (S)	NB	452	307	-145	-32%	7.4	100	FAIL	FAIL
14	87	43	14-43<	River St (S)	SB	0	0	0	0%	0.0	100	PASS	PASS
14	88	70	14-70>	Midland Rd	EB	278	468	190	68%	9.8	100	FAIL	FAIL
14	89	70	14-70<	Midland Rd	WB	252	517	265	105%	13.5	100	FAIL	FAIL
15	90	365	15-365>	St Pauls Square (S)	NB	953	918	-35	-4%	1.1	143	PASS	PASS
15	91	278	15-278>	Horne Ln	EB	35	6	-29	-83%	6.4	100	PASS	PASS
15	92	278	15-278<	Horne Ln	WB	721	630	-91	-13%	3.5	108	PASS	PASS
15	93	0	15-0<	St Pauls Square (E)	EB	267	294	27	10%	1.6	100	PASS	PASS
16	94	24	16-24>	St Mary's St (N)	SB	1,038	964	-74	-7%	2.3	156	PASS	PASS
16	95	0	16-0>	St Mary's St (S)	NB	0	0	0	0%	0.0	100	PASS	PASS
16	96	156	16-156>	St Pauls Square	WB	256	294	38	15%	2.3	100	PASS	PASS
17	97	364	17-364>	St Mary's St (N)	SB	1,309	1,256	-53	-4%	1.5	196	PASS	PASS
17	98	45	17-45>	St Mary's St (S)	NB	733	683	-50	-7%	1.9	110	PASS	PASS
17	99	45	17-45<	St Mary's St (S)	SB	1,067	1,022	-45	-4%	1.4	160	PASS	PASS
17	100	37	17-37<	St Paul's Square	WB	975	917	-58	-6%	1.9	146	PASS	PASS
20	107	137	20-137>	Newnham Ave	SB	798	760	-38	-5%	1.4	120	PASS	PASS
20	108	137	20-137<	Newnham Ave	NB	670	678	8	1%	0.3	100	PASS	PASS
20	109	120	20-120>	Barkers Ln	WB	694	616	-78	-11%	3.0	100	PASS	PASS
20	110	120	20-120<	Barkers Ln	EB	487	561	74	15%	3.2	100	PASS	PASS
20	111	107	20-107>	Longholme Way (S)	NB	1,076	1,150	74	7%	2.2	161	PASS	PASS
20	112	107	20-107<	Longholme Way (S)	SB	1,411	1,287	-124	-9%	3.4	212	PASS	PASS
21	113	111	21-111>	Newnham Ave (S)	NB	641	646	5	1%	0.2	100	PASS	PASS
21	114	111	21-111<	Newnham Ave (S)	SB	757	755	-2	0%	0.1	114	PASS	PASS
21	115	200	21-200>	Castle Rd	EB	91	103	12	13%	1.2	100	PASS	PASS
21	116	200	21-200<	Castle Rd	WB	169	176	7	4%	0.5	100	PASS	PASS
21	117	196	21-196>	Newnham Ave (N)	SB	793	794	1	0%	0.0	119	PASS	PASS
21	118	196	21-196<	Newnham Ave (N)	NB	599	612	13	2%	0.5	100	PASS	PASS
22	119	107	22-107>	Longholme Way	SB	1,187	998	-189	-16%	5.7	178	FAIL	FAIL
22	120	107	22-107<	Longholme Way	NB	1,421	1,365	-56	-4%	1.5	213	PASS	PASS
22	121	241	22-241>	A603	NB	1,262	1,271	9	1%	0.3	189	PASS	PASS
22	122	241	22-241<	A603	SB	859	891	32	4%	1.1	129	PASS	PASS
22	123	110	22-110>	Rope Walk	EB	846	880	34	4%	1.2	127	PASS	PASS
22	124	110	22-110<	Rope Walk	WB	957	974	17	2%	0.5	144	PASS	PASS
22	125	248	22-248>	Cardington Rd	EB	398	465	67	17%	3.2	100	PASS	PASS
22	126	248	22-248<	Cardington Rd	WB	456	384	-72	-16%	3.5	100	PASS	PASS
24	131	165	24-165>	Kingsway	NB	1,526	1,338	-188	-12%	5.0	229	PASS	PASS
24	132	142	24-142>	Cauldwell St (W)	EB	751	766	15	2%	0.5	113	PASS	PASS
24	133	142	24-142<	Cauldwell St (W)	WB	672	719	47	7%	1.8	100	PASS	PASS
24	134	162	24-162<	Cauldwell St (E)	EB	1,605	1,385	-220	-14%	5.7	241	PASS	PASS
25	135	292	25-292>	Cauldwell St (S)	NB	1,116	1,026	-90	-8%	2.8	167	PASS	PASS
25	136	292	25-292<	Cauldwell St (S)	SB	855	847	-8	-1%	0.3	128	PASS	PASS
25	137	141	25-141>	Prebend St	SB	744	992	248	33%	8.4	112	FAIL	FAIL
25	138	141	25-141<	Prebend St	NB	915	1,036	121	13%	3.9	137	PASS	PASS
25	139	142	25-142>	Cauldwell St (E)	WB	657	667	10	2%	0.4	100	PASS	PASS
25	140	142	25-142<	Cauldwell St (E)	EB	747	802	55	7%	2.0	112	PASS	PASS
26	141	291	26-291>	Cauldwell St	WB	852	843	-9	-1%	0.3	128	PASS	PASS
26	142	291	26-291<	Cauldwell St	EB	1,105	1,026	-79	-7%	2.4	166	PASS	PASS
26	143	56	26-56>	Britannia Rd	NB	400	381	-19	-5%	1.0	100	PASS	PASS
26	144	56	26-56<	Britannia Rd	SB	429	466	37	9%	1.7	100	PASS	PASS
26	145	259	26-259>	Kempston Rd	EB	894	795	-99	-11%	3.4	134	PASS	PASS
26	146	259	26-259<	Kempston Rd	WB	612	527	-85	-14%	3.6	100	PASS	PASS
27	147	48	27-48>	St John's St	SB	1,123	1,067	-56	-5%	1.7	168	PASS	PASS
27	148	49	27-49<	Kingsway	NB	1,086	989	-97	-9%	3.0	163	PASS	PASS
27	149	110	27-110<	Rope Walk	EB	844	881	37	4%	1.3	127	PASS	PASS
27	150	110	27-110>	Rope Walk	WB	911	942	31	3%	1.0	137	PASS	PASS
27	151	247	27-247>	London Rd	NB	871	746	-125	-14%	4.4	131	PASS	PASS
27	152	247	27-247<	London Rd	SB	696	790	94	14%	3.4	100	PASS	PASS
27	153	254	27-254>	Amphill Rd	EB	482	553	71	15%	3.1	100	PASS	PASS
27	154	254	27-254<	Amphill Rd	WB	761	648	-113	-15%	4.3	114	PASS	PASS
28	155	250	28-250>	Amphill Rd (W)	EB	909	843	-66	-7%	2.2	136	PASS	PASS
28	156	250	28-250<	Amphill Rd (W)	WB	808	756	-52	-6%	1.9	121	PASS	PASS
28	157	56	28-56>	Britannia Rd	SB	316	410	94	30%	4.9	100	PASS	PASS
28	158	56	28-56<	Britannia Rd	NB	676	590	-86	-13%	3.4	100	PASS	PASS
28	159	254	28-254>	Amphill Rd (E)	WB	762	650	-112	-15%	4.2	114	PASS	PASS
28	160	254	28-254<	Amphill Rd (E)	EB	503	557	54	11%	2.3	100	PASS	PASS
29	161	283	29-283>	Amphill Rd (N)	SB	748	755	7	1%	0.3	112	PASS	PASS
29	162	283	29-283<	Amphill Rd (N)	NB	802	857	55	7%	1.9	120	PASS	PASS
29	163	251	29-251>	Sandhurst Grove	WB	38	36	-2	-5%	0.3	100	PASS	PASS
29	164	251	29-251<	Sandhurst Grove	EB	26	31	5	19%	0.9	100	PASS	PASS
29	165	369	29-369>	Amphill Rd (S)	NB	838	850	12	1%	0.4	126	PASS	PASS
29	166	369	29-369<	Amphill Rd (S)	SB	748	769	21	3%	0.8	112	PASS	PASS
29	167	258	29-258>	Victoria Rd	EB	31	77	46	148%	6.3	100	PASS	PASS
29	168	258	29-258<	Victoria Rd	WB	79	61	-18	-23%	2.2	100	PASS	PASS
30	169	310	30-310>	Amphill Rd (S)	NB	1,320	1,293	-27	-2%	0.7	198	PASS	PASS
30	170	310	30-310<	Amphill Rd (S)	SB	904	946	42	5%	1.4	136	PASS	PASS
30	171	297	30-297<	Elstow Rd	WB	612	529	-83	-14%	3.5	100	PASS	PASS
30	172	297	30-297>	Elstow Rd	EB	475	462	-13	-3%	0.6	100	PASS	PASS
30	173	329	30-329>	Amphill Rd (N)	NB	707	701	-6	-1%	0.2	106	PASS	PASS
30	174	329	30-329<	Amphill Rd (N)	SB	986	981	-5	-1%	0.2	148	PASS	PASS
31	175	309	31-309>	A6 Amphill Rd (N)	SB	885	945	60	7%	2.0	133	PASS	PASS
31	176	309	31-309<	A6 Amphill Rd (N)	NB	1,295	1,298	3	0%	0.1	194	PASS	PASS
31	177	294	31-294>	W End	WB	842	824	-18	-2%	0.6	126	PASS	PASS
31	178	294	31-294<	W End	EB	507	606	99	20%	4.2	100	PASS	PASS
31	179	295	31-295>	A6 (S)	NB	1,284	1,169	-115	-9%	3.3	193	PASS	PASS
31	180	295	31-295<	A6 (S)	SB	1,094	1,103	9	1%	0.3	164	PASS	PASS
31	181	296	31-296>	Amphill Rd (W)	EB	440	539	99	23%	4.5	100	PASS	PASS
31	182	296	31-296<	Amphill Rd (W)	WB	555	470	-85	-15%	3.8	100	PASS	PASS
Total						112,552	115,286	2,734	2%	8.1			

Table A.2 - 2014 BY-AM Peak Hr (8-9) - Total Traffic (Lights & Heavies) - Turn Calibration

Table A.2 - 2014 BY-AM Peak Hr (8-9) - Total Traffic (Lights & Heavies) - Turn Calibration										PASS	FAIL	Criteria	%	Flow Test			
										197	43	% GEH <5	82%	% PASS	212		
										210	30	% GEH <6	88%				
										240	0	% GEH <15	100%				
Counts		240															
Site	Count	From Arm	From Ref	From	To Arm	To Ref	To	Count Ref	Survey	Model	Diff (M-S)	% Diff	GEH	Flow Test Criteria	Flow Test Criteria	Flow Test PASS/FAIL	
1	1	350	1-350>	Manton Ln	350	1-350<	Manton Ln	1-350>350	2	0	-2	0%	2.0	100	100	PASS	
1	2	350	1-350>	Manton Ln	332	1-332<	A6 (E)	1-350>332	177	103	-74	-72%	6.3	100	100	PASS	
1	3	350	1-350>	Manton Ln	223	1-223<	Shakespeare Rd	1-350>223	266	314	48	15%	2.8	100	100	PASS	
1	4	350	1-350>	Manton Ln	351	1-351<	A6 (W)	1-350>351	206	256	50	20%	3.3	100	100	PASS	
1	5	332	1-332>	A6 (E)	350	1-350<	Manton Ln	1-332>350	330	384	54	14%	2.9	100	100	PASS	
1	6	332	1-332>	A6 (E)	332	1-332<	A6 (E)	1-332>332	2	0	-2	0%	2.0	100	100	PASS	
1	7	332	1-332>	A6 (E)	223	1-223<	Shakespeare Rd	1-332>223	48	32	-16	-50%	2.5	100	100	PASS	
1	8	332	1-332>	A6 (E)	351	1-351<	A6 (W)	1-332>351	335	272	-63	-23%	3.6	100	100	PASS	
1	9	223	1-223>	Shakespeare Rd	350	1-350<	Manton Ln	1-223>350	290	224	-66	-29%	4.1	100	100	PASS	
1	10	223	1-223>	Shakespeare Rd	332	1-332<	A6 (E)	1-223>332	53	85	32	38%	3.9	100	100	PASS	
1	11	223	1-223>	Shakespeare Rd	223	1-223<	Shakespeare Rd	1-223>223	5	0	0	0%	0.0	100	100	PASS	
1	12	223	1-223>	Shakespeare Rd	351	1-351<	A6 (W)	1-223>351	187	111	-76	-68%	6.2	100	100	PASS	
1	13	351	1-351>	A6 (W)	350	1-350<	Manton Ln	1-351>350	191	190	-1	-1%	0.1	100	100	PASS	
1	14	351	1-351>	A6 (W)	332	1-332<	A6 (E)	1-351>332	528	542	14	3%	0.6	100	100	PASS	
1	15	351	1-351>	A6 (W)	223	1-223<	Shakespeare Rd	1-351>223	169	162	-7	-4%	0.5	100	100	PASS	
1	16	351	1-351>	A6 (W)	351	1-351<	A6 (W)	1-351>351	17	21	4	19%	0.9	100	100	PASS	
2	17	333	2-333>	Roff Ave	333	2-333<	Roff Ave	2-333>333	0	0	0	0%	0.0	100	100	PASS	
2	18	333	2-333>	Roff Ave	368	2-368<	A6 (E)	2-333>368	58	62	4	6%	0.5	100	100	PASS	
2	19	333	2-333>	Roff Ave	227	2-227<	Union St	2-333>227	356	275	-81	-29%	4.6	100	100	PASS	
2	20	333	2-333>	Roff Ave	334	2-334<	A6 (W)	2-333>334	144	90	-54	-60%	5.0	100	100	PASS	
2	21	368	2-368>	A6 (E)	333	2-333<	Roff Ave	2-368>333	30	24	-6	-25%	1.2	100	100	PASS	
2	22	368	2-368>	A6 (E)	368	2-368<	A6 (E)	2-368>368	2	0	-2	0%	2.0	100	100	PASS	
2	23	368	2-368>	A6 (E)	227	2-227<	Union St	2-368>227	47	41	-6	-15%	0.9	100	100	PASS	
2	24	368	2-368>	A6 (E)	334	2-334<	A6 (W)	2-368>334	203	284	81	29%	5.2	100	100	PASS	
2	25	227	2-227>	Union St	333	2-333<	Roff Ave	2-227>333	305	262	-43	-16%	2.6	100	100	PASS	
2	26	227	2-227>	Union St	368	2-368<	A6 (E)	2-227>368	142	135	-7	-5%	0.6	100	100	PASS	
2	27	227	2-227>	Union St	227	2-227<	Union St	2-227>227	2	0	-2	0%	2.0	100	100	PASS	
2	28	227	2-227>	Union St	334	2-334<	A6 (W)	2-227>334	230	280	50	18%	3.1	100	100	PASS	
2	29	334	2-334>	A6 (W)	333	2-333<	Roff Ave	2-334>333	122	143	21	15%	1.8	100	100	PASS	
2	30	334	2-334>	A6 (W)	368	2-368<	A6 (E)	2-334>368	498	412	-86	-21%	4.0	100	100	PASS	
2	31	334	2-334>	A6 (W)	227	2-227<	Union St	2-334>227	143	299	156	52%	10.5	100	100	FAIL	
2	32	334	2-334>	A6 (W)	334	2-334<	A6 (W)	2-334>334	21	23	2	9%	0.4	100	100	PASS	
4	33	359	4-359>	Kimbolton Rd (N)	194	4-194<	Polhill Ave	4-359>194	312	304	-8	-3%	0.5	100	100	PASS	
4	34	359	4-359>	Kimbolton Rd (N)	186	4-186<	Kimbolton Rd (S)	4-359>186	589	367	-222	-60%	10.2	100	100	FAIL	
4	35	359	4-359>	Kimbolton Rd (N)	326	4-326<	Park Ave	4-359>326	261	343	82	24%	4.7	100	100	PASS	
4	36	194	4-194>	Polhill Ave	359	4-359<	Kimbolton Rd (N)	4-194>359	215	192	-23	-12%	1.6	100	100	PASS	
4	37	194	4-194>	Polhill Ave	186	4-186<	Kimbolton Rd (S)	4-194>186	90	38	-52	-137%	6.5	100	100	PASS	
4	38	194	4-194>	Polhill Ave	326	4-326<	Park Ave	4-194>326	196	194	-2	-1%	0.1	100	100	PASS	
4	39	186	4-186>	Kimbolton Rd (S)	359	4-359<	Kimbolton Rd (N)	4-186>359	250	281	31	11%	1.9	100	100	PASS	
4	40	186	4-186>	Kimbolton Rd (S)	194	4-194<	Polhill Ave	4-186>194	38	66	28	42%	3.9	100	100	PASS	
4	41	186	4-186>	Kimbolton Rd (S)	326	4-326<	Park Ave	4-186>326	9	31	22	71%	4.9	100	100	PASS	
4	42	326	4-326>	Park Ave	359	4-359<	Kimbolton Rd (N)	4-326>359	183	174	-9	-5%	0.7	100	100	PASS	
4	43	326	4-326>	Park Ave	194	4-194<	Polhill Ave	4-326>194	148	166	18	11%	1.4	100	100	PASS	
4	44	326	4-326>	Park Ave	186	4-186<	Kimbolton Rd (S)	4-326>186	16	4	-12	-300%	3.8	100	100	PASS	
5	45	194	5-194>	Pollhill Ave (W)	360	5-360<	Haylands Way	5-194>360	82	97	15	15%	1.6	100	100	PASS	
5	46	194	5-194>	Pollhill Ave (W)	125	5-125<	Pillhill Ave (E)	5-194>125	526	525	-1	0%	0.0	100	100	PASS	
5	47	360	5-360>	Haylands Way	194	5-194<	Pollhill Ave (W)	5-360>194	121	130	9	7%	0.8	100	100	PASS	
5	48	360	5-360>	Haylands Way	125	5-125<	Pillhill Ave (E)	5-360>125	283	258	-25	-10%	1.5	100	100	PASS	
5	49	125	5-125>	Pillhill Ave (E)	194	5-194<	Pollhill Ave (W)	5-125>194	493	380	-113	-30%	5.4	100	100	FAIL	
5	50	125	5-125>	Pillhill Ave (E)	360	5-360<	Haylands Way	5-125>360	166	126	-40	-32%	3.3	100	100	PASS	
6	51	193	6-193>	Pollhill Ave	363	6-363<	A4280 (E)	6-193>363	138	166	28	17%	2.3	100	100	PASS	
6	52	193	6-193>	Pollhill Ave	354	6-354<	Newnham Ave	6-193>354	505	533	28	5%	1.2	100	100	PASS	
6	53	193	6-193>	Pollhill Ave	126	6-126<	A4280 (W)	6-193>126	41	163	122	75%	12.1	100	100	FAIL	
6	54	363	6-363>	A4280 (E)	193	6-193<	Pollhill Ave	6-363>193	91	93	2	2%	0.2	100	100	PASS	
6	55	363	6-363>	A4280 (E)	354	6-354<	Newnham Ave	6-363>354	115	129	14	11%	1.3	100	100	PASS	
6	56	363	6-363>	A4280 (E)	126	6-126<	A4280 (W)	6-363>126	331	362	31	9%	1.7	100	100	PASS	
6	57	354	6-354>	Newnham Ave	193	6-193<	Pollhill Ave	6-354>193	456	436	-20	-5%	0.9	100	100	PASS	
6	58	354	6-354>	Newnham Ave	363	6-363<	A4280 (E)	6-354>363	130	159	29	18%	2.4	100	100	PASS	
6	59	354	6-354>	Newnham Ave	126	6-126<	A4280 (W)	6-354>126	31	83	52	63%	6.9	100	100	PASS	
6	60	126	6-126>	A4280 (W)	193	6-193<	Pollhill Ave	6-126>193	28	28	0	0%	0.0	100	100	PASS	
6	61	126	6-126>	A4280 (W)	363	6-363<	A4280 (E)	6-126>363	299	286	-13	-5%	0.8	100	100	PASS	
6	62	126	6-126>	A4280 (W)	354	6-354<	Newnham Ave	6-126>354	74	71	-3	-4%	0.4	100	100	PASS	
7	63	229	7-229>	Shakespeare Rd	229	7-229<	Shakespeare Rd	7-229>229	0	0	0	0%	0.0	100	100	PASS	
7	64	229	7-229>	Shakespeare Rd	225	7-225<	A4280 (E)	7-229>225	19	45	26	58%	4.6	100	100	PASS	
7	65	229	7-229>	Shakespeare Rd	77	7-77<	Ashburnham Rd	7-229>77	200	240	40	17%	2.7	100	100	PASS	
7	66	229	7-229>	Shakespeare Rd	303	7-303<	A4280 (W)	7-229>303	218	227	9	4%	0.6	100	100	PASS	
7	67	225	7-225>	A4280 (E)	229	7-229<	Shakespeare Rd	7-225>229	20	40	20	50%	3.7	100	100	PASS	
7	68	225	7-225>	A4280 (E)	225	7-225<	A4280 (E)	7-225>225	0	0	0	0%	0.0	100	100	PASS	
7	69	225	7-225>	A4280 (E)	77	7-77<	Ashburnham Rd	7-225>77	89	90	1	1%	0.1	100	100	PASS	
7	70	225	7-225>	A4280 (E)	303	7-303<	A4280 (W)	7-225>303	468	367	-101	-28%	4.9	100	100	FAIL	
7	71	77	7-77>	Ashburnham Rd	229	7-229<	Shakespeare Rd	7-77>229	252	170	-82	-48%	5.6	100	100	PASS	
7	72	77	7-77>	Ashburnham Rd	225	7-225<	A4280 (E)	7-77>225	92	145	53	37%	4.9	100	100	PASS	
7	73	77	7-77>	Ashburnham Rd	77	7-77<	Ashburnham Rd	7-77>77	0	0	0	0%	0.0	100	100	PASS	
7	74	77	7-77>	Ashburnham Rd	303	7-303<	A4280 (W)	7-77>303	131	201	70	35%	5.4	100	100	PASS	
7	75	303	7-303>	A4280 (W)	229	7-229<	Shakespeare Rd	7-303>229	233	241	8	3%	0.5	100	100	PASS	
7	76	303	7-303>	A4280 (W)	225	7-225<	A4280 (E)	7-303>225	519	564	45	8%	1.9	100	100	PASS	
7	77	303	7-303>	A4280 (W)	77	7-77<	Ashburnham Rd	7-303>77	164	254	90	35%	6.2	100	100	PASS	
8	78	331	8-331>	Union St	182	8-182<	A4280 (E)	8-331>182	34	138	104	75%	11.2	100	100	FAIL	
8	79	331	8-331>	Union St	217	8-217<	Greyfriars	8-331>217	228	286	58	20%	3.6	100	100	PASS	
8	80	331	8-331>	Union St	225	8-225<	A4280 (W)	8-331>225	219	186	-33	-18%	2.3	100	100	PASS	
8	81	182	8-182>	A4280 (E)	331	8-331<	Union St	8-182>331	45	42	-3	-7%	0.5	100	100	PASS	
8	82	182	8-182>	A4280 (E)	217	8-217<	Greyfriars	8-182>217	0	0	0	0%	0.0	100	100	PASS	
8	83	182	8-182>	A4280 (E)	225	8-225<	A4280 (W)	8-182>									

10	95	215	10-215>	Harpur St (S)	282	10-282<	Harpur St (N)	10-215>282	30	21	-9	-43%	1.8	100	100	PASS
10	96	15	10-15>	A4280 (W)	282	10-282<	Harpur St (N)	10-15>282	463	609	146	24%	6.3	100	100	FAIL
11	97	156	11-156>	The BRdway	24	11-24<	A4280 (E)	11-156>24	539	681	142	21%	5.7	100	100	FAIL
11	98	156	11-156>	The BRdway	30	11-30<	High St	11-156>30	750	661	-89	-13%	3.4	113	113	PASS
11	99	156	11-156>	The BRdway	19	11-19<	A4280 (W)	11-156>19	109	307	198	64%	13.7	100	100	FAIL
11	100	24	11-24>	A4280 (E)	30	11-30<	High St	11-24>30	133	160	27	17%	2.2	100	100	PASS
11	101	24	11-24>	A4280 (E)	19	11-19<	A4280 (W)	11-24>19	597	618	21	3%	0.9	100	100	PASS
12	102	104	12-104>	A4280 (E)	213	12-213<	St Cuthbert's St	12-104>213	183	150	-33	-22%	2.6	100	100	PASS
12	103	104	12-104>	A4280 (E)	284	12-284<	A4280 (W)	12-104>284	473	585	112	19%	4.9	100	100	FAIL
12	104	213	12-213>	St Cuthbert's St	104	12-104<	A4280 (E)	12-213>104	170	207	37	18%	2.7	100	100	PASS
12	105	213	12-213>	St Cuthbert's St	284	12-284<	A4280 (W)	12-213>284	252	193	-59	-31%	4.0	100	100	PASS
12	106	284	12-284>	A4280 (W)	104	12-104<	A4280 (E)	12-284>104	386	486	100	21%	4.8	100	100	FAIL
12	107	284	12-284>	A4280 (W)	213	12-213<	St Cuthbert's St	12-284>213	160	198	38	19%	2.8	100	100	PASS
13	108	70	13-70>	Midland Rd (E)	357	13-357<	Rutland Rd	13-70>357	7	4	-3	-75%	1.3	100	100	PASS
13	109	70	13-70>	Midland Rd (E)	70	13-70<	Midland Rd (E)	13-70>70	0	0	0	0%	0.0	100	100	PASS
13	110	70	13-70>	Midland Rd (E)	69	13-69<	Prebend St	13-70>69	218	356	138	39%	8.1	100	100	FAIL
13	111	70	13-70>	Midland Rd (E)	114	13-114<	Ford End Rd	13-70>114	157	97	-60	-62%	5.3	100	100	PASS
13	112	70	13-70>	Midland Rd (E)	75	13-75<	Midland Rd (W)	13-70>75	96	72	-24	-33%	2.6	100	100	PASS
13	113	69	13-69>	Prebend St	357	13-357<	Rutland Rd	13-69>357	9	7	-2	-29%	0.7	100	100	PASS
13	114	69	13-69>	Prebend St	70	13-70<	Midland Rd (E)	13-69>70	234	325	91	28%	5.4	100	100	PASS
13	115	69	13-69>	Prebend St	69	13-69<	Prebend St	13-69>69	5	0	-5	0%	3.2	100	100	PASS
13	116	69	13-69>	Prebend St	114	13-114<	Ford End Rd	13-69>114	182	225	43	19%	3.0	100	100	PASS
13	117	69	13-69>	Prebend St	75	13-75<	Midland Rd (W)	13-69>75	406	376	-30	-8%	1.5	100	100	PASS
13	118	114	13-114>	Ford End Rd	357	13-357<	Rutland Rd	13-114>357	11	12	1	8%	0.3	100	100	PASS
13	119	114	13-114>	Ford End Rd	70	13-70<	Midland Rd (E)	13-114>70	146	120	-26	-22%	2.3	100	100	PASS
13	120	114	13-114>	Ford End Rd	69	13-69<	Prebend St	13-114>69	240	262	22	8%	1.4	100	100	PASS
13	121	114	13-114>	Ford End Rd	114	13-114<	Ford End Rd	13-114>114	0	0	0	0%	0.0	100	100	PASS
13	122	114	13-114>	Ford End Rd	75	13-75<	Midland Rd (W)	13-114>75	27	57	30	53%	4.6	100	100	PASS
13	123	75	13-75>	Midland Rd (W)	75	13-75<	Midland Rd (W)	13-75>75	1	0	-1	0%	1.4	100	100	PASS
13	124	75	13-75>	Midland Rd (W)	357	13-357<	Rutland Rd	13-75>357	6	7	1	14%	0.4	100	100	PASS
13	125	75	13-75>	Midland Rd (W)	70	13-70<	Midland Rd (E)	13-75>70	23	133	110	83%	12.5	100	100	FAIL
13	126	75	13-75>	Midland Rd (W)	69	13-69<	Prebend St	13-75>69	316	320	4	1%	0.2	100	100	PASS
13	127	76	13-75>	Midland Rd (W)	70	13-114<	Ford End Rd	13-75>114	34	42	8	19%	1.3	100	100	PASS
14	128	324	14-324>	Greyfriars (N)	70	14-70<	Midland Rd	14-324>70	204	420	216	51%	12.2	100	100	FAIL
14	129	43	14-43>	River St (S)	324	14-324<	Greyfriars (N)	14-43>324	404	210	-194	-92%	11.1	100	100	FAIL
14	130	43	14-43>	River St (S)	43	14-43<	River St (S)	14-43>43	0	0	0	0%	0.0	100	100	PASS
14	131	43	14-43>	River St (S)	70	14-70<	Midland Rd	14-43>70	48	97	49	51%	5.8	100	100	PASS
14	132	70	14-70>	Midland Rd	324	14-324<	Greyfriars (N)	14-70>324	278	468	190	41%	9.8	100	100	FAIL
14	133	70	14-70>	Midland Rd	43	14-43<	River St (S)	14-70>43	0	0	0	0%	0.0	100	100	PASS
14	134	70	14-70>	Midland Rd	70	14-70<	Midland Rd	14-70>70	0	0	0	0%	0.0	100	100	PASS
15	135	365	15-365>	St Pauls Square (S)	278	15-278<	Horne Ln	15-365>278	721	630	-91	-14%	3.5	108	108	PASS
15	136	365	15-365>	St Pauls Square (S)	0	15-0<	St Pauls Square (E)	15-365>0	232	288	56	19%	3.5	100	100	PASS
15	137	278	15-278>	Horne Ln	0	15-0<	St Pauls Square (E)	15-278>0	35	6	-29	-483%	6.4	100	100	PASS
16	138	156	16-156>	St Pauls Square	0	16-0<	St Mary's St (S)	16-156>0	256	294	38	13%	2.3	100	100	PASS
16	139	24	16-24>	St Mary's St (N)	0	16-0<	St Mary's St (S)	16-24>0	1,038	964	-74	-8%	2.3	156	156	PASS
17	140	45	17-45>	St Mary's St (S)	37	17-37<	St Paul's Square	17-45>37	733	683	-50	-7%	1.9	110	110	PASS
17	141	364	17-364>	St Mary's St (N)	45	17-45<	St Mary's St (S)	17-364>45	1,067	1,022	-45	-4%	1.4	160	160	PASS
17	142	364	17-364>	St Mary's St (N)	37	17-37<	St Paul's Square	17-364>37	242	234	-8	-3%	0.5	100	100	PASS
20	143	137	20-137>	Newnham Ave	137	20-137<	Newnham Ave	20-137>137	1	0	-1	0%	1.4	100	100	PASS
20	144	137	20-137>	Newnham Ave	120	20-120<	Barkers Ln	20-137>120	80	100	20	20%	2.1	100	100	PASS
20	145	137	20-137>	Newnham Ave	107	20-107<	Longholme Way (S)	20-137>107	717	660	-57	-9%	2.2	108	108	PASS
20	146	120	20-120>	Barkers Ln	137	20-137<	Newnham Ave	20-120>137	100	106	6	6%	0.6	100	100	PASS
20	147	120	20-120>	Barkers Ln	120	20-120<	Barkers Ln	20-120>120	0	0	0	0%	0.0	100	100	PASS
20	148	120	20-120>	Barkers Ln	107	20-107<	Longholme Way (S)	20-120>107	594	510	-84	-16%	3.6	100	100	PASS
20	149	107	20-107>	Longholme Way (S)	137	20-137<	Newnham Ave	20-107>137	569	572	3	1%	0.1	100	100	PASS
20	150	107	20-107>	Longholme Way (S)	120	20-120<	Barkers Ln	20-107>120	407	461	54	12%	2.6	100	100	PASS
20	151	107	20-107>	Longholme Way (S)	107	20-107<	Longholme Way (S)	20-107>107	100	117	17	15%	1.6	100	100	PASS
21	152	111	21-111>	Newnham Ave (S)	200	21-200<	Castle Rd	21-111>200	90	70	-20	-29%	2.2	100	100	PASS
21	153	111	21-111>	Newnham Ave (S)	196	21-196<	Newnham Ave (N)	21-111>196	551	576	25	4%	1.1	100	100	PASS
21	154	200	21-200>	Castle Rd	111	21-111<	Newnham Ave (S)	21-200>111	43	67	24	36%	3.2	100	100	PASS
21	155	200	21-200>	Castle Rd	196	21-196<	Newnham Ave (N)	21-200>196	48	36	-12	-33%	1.9	100	100	PASS
21	156	196	21-196>	Newnham Ave (N)	111	21-111<	Newnham Ave (S)	21-196>111	714	688	-26	-4%	1.0	107	107	PASS
21	157	196	21-196>	Newnham Ave (N)	200	21-200<	Castle Rd	21-196>200	79	106	27	25%	2.8	100	100	PASS
22	158	107	22-107>	Longholme Way	107	22-107<	Longholme Way	22-107>107	2	0	-2	0%	2.0	100	100	PASS
22	159	107	22-107>	Longholme Way	241	22-241<	A603	22-107>241	492	366	-126	-34%	6.1	100	100	FAIL
22	160	107	22-107>	Longholme Way	110	22-110<	Rope Walk	22-107>110	561	564	3	1%	0.1	100	100	PASS
22	161	107	22-107>	Longholme Way	248	22-248<	Cardington Rd	22-107>248	132	68	-64	-94%	6.4	100	100	PASS
22	162	241	22-241>	A603	107	22-107<	Longholme Way	22-241>107	681	685	4	1%	0.2	100	100	PASS
22	163	241	22-241>	A603	241	22-241<	A603	22-241>241	3	0	-3	0%	2.4	100	100	PASS
22	164	241	22-241>	A603	110	22-110<	Rope Walk	22-241>110	328	346	18	5%	1.0	100	100	PASS
22	165	241	22-241>	A603	248	22-248<	Cardington Rd	22-241>248	250	240	-10	-4%	0.6	100	100	PASS
22	166	110	22-110>	Rope Walk	107	22-107<	Longholme Way	22-110>107	529	525	-4	-1%	0.2	100	100	PASS
22	167	110	22-110>	Rope Walk	241	22-241<	A603	22-110>241	218	236	18	8%	1.2	100	100	PASS
22	168	110	22-110>	Rope Walk	110	22-110<	Rope Walk	22-110>110	27	43	16	37%	2.7	100	100	PASS
22	169	110	22-110>	Rope Walk	248	22-248<	Cardington Rd	22-110>248	72	76	4	5%	0.5	100	100	PASS
22	170	248	22-248>	Cardington Rd	107	22-107<	Longholme Way	22-248>107	209	155	-54	-35%	4.0	100	100	PASS
22	171	248	22-248>	Cardington Rd	241	22-241<	A603	22-248>241	146	289	143	49%	9.7	100	100	FAIL
22	172	248	22-248>	Cardington Rd	110	22-110<	Rope Walk	22-248>110	41	21	-20	-95%	3.6	100	100	PASS
22	173	248	22-248>	Cardington Rd	248	22-248<	Cardington Rd	22-248>248	2	0	-2	0%	2.0	100	100	PASS
24	174	165	24-165>	Kingsway	142	24-142<	Cauldwell St (W)	24-165>142	672	719	47	7%	1.8	100	100	PASS
24	175	165	24-165>	Kingsway	162	24-162<	Cauldwell St (E)	24-165>162	854	619	-235	-38%	8.7	128	128	FAIL
24	176	142	24-142>	Cauldwell St (W)	162	24-162<	Cauldwell St (E)	24-142>162	751	766	15	2%	0.5	113	113	PASS
25	177	292	25-292>	Cauldwell St (S)	141	25-141<	Prebend St	25-292>141	622	608						

27	198	247	27-247>	London Rd	110	27-110<	Rope Walk	27-247>110	223	244	21	9%	1.4	100	100	PASS
27	199	247	27-247>	London Rd	247	27-247<	London Rd	27-247>247	0	0	0	0%	0.0	100	100	PASS
27	200	247	27-247>	London Rd	254	27-254<	Amphthill Rd	27-247>254	159	58	-101	-174%	9.7	100	100	FAIL
27	201	254	27-254>	Amphthill Rd	49	27-49<	Kingsway	27-254>49	152	128	-24	-19%	2.0	100	100	PASS
27	202	254	27-254>	Amphthill Rd	110	27-110<	Rope Walk	27-254>110	261	354	93	26%	5.3	100	100	PASS
27	203	254	27-254>	Amphthill Rd	247	27-247<	London Rd	27-254>247	63	71	8	11%	1.0	100	100	PASS
27	204	254	27-254>	Amphthill Rd	254	27-254<	Amphthill Rd	27-254>254	6	0	-6	0%	3.5	100	100	PASS
28	205	250	28-250>	Amphthill Rd (W)	56	28-56<	Britannia Rd	28-250>56	497	473	-24	-5%	1.1	100	100	PASS
28	206	250	28-250>	Amphthill Rd (W)	254	28-254<	Amphthill Rd (E)	28-250>254	412	370	-42	-11%	2.1	100	100	PASS
28	207	56	28-56>	Britannia Rd	250	28-250<	Amphthill Rd (W)	28-56>250	225	223	-2	-1%	0.1	100	100	PASS
28	208	56	28-56>	Britannia Rd	254	28-254<	Amphthill Rd (E)	28-56>254	91	187	96	51%	8.1	100	100	PASS
28	209	254	28-254>	Amphthill Rd (E)	250	28-250<	Amphthill Rd (W)	28-254>250	583	533	-50	-9%	2.1	100	100	PASS
28	210	254	28-254>	Amphthill Rd (E)	56	28-56<	Britannia Rd	28-254>56	179	117	-62	-53%	5.1	100	100	PASS
29	211	283	29-283>	Amphthill Rd (N)	251	29-251<	Sandhurst Grove	29-283>251	8	20	12	60%	3.2	100	100	PASS
29	212	283	29-283>	Amphthill Rd (N)	369	29-369<	Amphthill Rd (S)	29-283>369	703	704	1	0%	0.0	105	105	PASS
29	213	283	29-283>	Amphthill Rd (N)	258	29-258<	Victoria Rd	29-283>258	37	31	-6	-19%	1.0	100	100	PASS
29	214	251	29-251>	Sandhurst Grove	283	29-283<	Amphthill Rd (N)	29-251>283	7	0	-7	0%	3.7	100	100	PASS
29	215	251	29-251>	Sandhurst Grove	369	29-369<	Amphthill Rd (S)	29-251>369	22	20	-2	-10%	0.4	100	100	PASS
29	216	251	29-251>	Sandhurst Grove	258	29-258<	Victoria Rd	29-251>258	9	16	7	44%	2.0	100	100	PASS
29	217	369	29-369>	Amphthill Rd (S)	283	29-283<	Amphthill Rd (N)	29-369>283	789	825	36	4%	1.3	118	118	PASS
29	218	369	29-369>	Amphthill Rd (S)	251	29-251<	Sandhurst Grove	29-369>251	16	11	-5	-45%	1.4	100	100	PASS
29	219	369	29-369>	Amphthill Rd (S)	258	29-258<	Victoria Rd	29-369>258	33	14	-19	-136%	3.9	100	100	PASS
29	220	258	29-258>	Victoria Rd	283	29-283<	Amphthill Rd (N)	29-258>283	6	32	26	81%	6.0	100	100	PASS
29	221	258	29-258>	Victoria Rd	251	29-251<	Sandhurst Grove	29-258>251	2	0	-2	0%	2.0	100	100	PASS
29	222	258	29-258>	Victoria Rd	369	29-369<	Amphthill Rd (S)	29-258>369	23	45	22	49%	3.8	100	100	PASS
30	223	310	30-310>	Amphthill Rd (S)	297	30-297<	Elstow Rd	30-310>297	458	423	-35	-8%	1.7	100	100	PASS
30	224	310	30-310>	Amphthill Rd (S)	329	30-329<	Amphthill Rd (N)	30-310>329	862	870	8	1%	0.3	129	129	PASS
30	225	297	30-297>	Elstow Rd	310	30-310<	Amphthill Rd (S)	30-297>310	351	351	0	0%	0.0	100	100	PASS
30	226	297	30-297>	Elstow Rd	329	30-329<	Amphthill Rd (N)	30-297>329	124	111	-13	-12%	1.2	100	100	PASS
30	227	329	30-329>	Amphthill Rd (N)	310	30-310<	Amphthill Rd (S)	30-329>310	553	595	42	7%	1.8	100	100	PASS
30	228	329	30-329>	Amphthill Rd (N)	297	30-297<	Elstow Rd	30-329>297	154	106	-48	-45%	4.2	100	100	PASS
31	229	309	31-309>	Amphthill Rd (N)	294	31-294<	W End	31-309>294	151	263	112	43%	7.8	100	100	FAIL
31	230	309	31-309>	Amphthill Rd (N)	295	31-295<	A6 (S)	31-309>295	539	549	10	2%	0.4	100	100	PASS
31	231	309	31-309>	Amphthill Rd (N)	296	31-296<	Amphthill Rd (W)	31-309>296	195	133	-62	-47%	4.8	100	100	PASS
31	232	294	31-294>	(W) End	309	31-309<	A6 Amphthill Rd (N)	31-294>309	249	229	-20	-9%	1.3	100	100	PASS
31	233	294	31-294>	(W) End	295	31-295<	A6 (S)	31-294>295	446	447	1	0%	0.0	100	100	PASS
31	234	294	31-294>	(W) End	296	31-296<	Amphthill Rd (W)	31-294>296	147	148	1	1%	0.1	100	100	PASS
31	235	295	31-295>	A6 (S)	309	31-309<	A6 Amphthill Rd (N)	31-295>309	826	748	-78	-10%	2.8	124	124	PASS
31	236	295	31-295>	A6 (S)	294	31-294<	W End	31-295>294	245	232	-13	-6%	0.8	100	100	PASS
31	237	295	31-295>	A6 (S)	296	31-296<	Amphthill Rd (W)	31-295>296	213	189	-24	-13%	1.7	100	100	PASS
31	238	296	31-296>	Amphthill Rd (W)	309	31-309<	A6 Amphthill Rd (N)	31-296>309	220	321	101	31%	6.1	100	100	FAIL
31	239	296	31-296>	Amphthill Rd (W)	294	31-294<	W End	31-296>294	111	111	0	0%	0.0	100	100	PASS
31	240	296	31-296>	Amphthill Rd (W)	295	31-295<	A6 (S)	31-296>295	109	107	-2	-2%	0.2	100	100	PASS
Total									56,923	58,272	-1,349	-2%	5.6			

[Bedford VISSIM Model](#)

Screenline Flow Validation Results

Table A.3 - 2014 BY-AM Peak Hr (8-9) - Bridges Northbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Prebend St	NB	915	1,036	121	13%
St Mary's St (S)	NB	733	683	-50	-7%
Longholme Way	NB	1,421	1,365	-56	-4%
Bridges Total	NB	3,069	3,084	15	0%

Table A.4 - 2014 BY-AM Peak Hr (8-9) - Bridges Southbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Prebend St	SB	744	992	248	33%
St Mary's St (S)	SB	1,067	1,022	-45	-4%
Longholme Way	SB	1,187	998	-189	-16%
Bridges Total	SB	2,998	3,012	14	0%

Table A.5 - 2014 BY-AM Peak Hr (8-9) - Cordon Inbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Manton Ln	SB	651	673	22	3%
A6 (W)	EB	905	915	10	1%
Kimbolton Rd (N)	SB	1,162	1,014	-148	-13%
Haylands Way	SB	404	388	-16	-4%
A4280 (E)	WB	567	611	44	8%
Barkers Ln	WB	694	616	-78	-11%
A603	NB	1,262	1,271	9	1%
London Rd	NB	871	746	-125	-14%
Ampthill Rd (W)	EB	909	843	-66	-7%
Kempston Rd	EB	894	795	-99	-11%
Ford End Rd	EB	424	451	27	6%
A4280 (W)	EB	916	1,059	143	16%
Cordon Total	Inbound	9,659	9,382	-277	-3%

Table A.6 - 2014 BY-AM Peak Hr (8-9) - Cordon Outbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Manton Ln	NB	813	798	-15	-2%
A6 (W)	WB	745	660	-85	-11%
Kimbolton Rd (N)	NB	648	647	-1	0%
Haylands Way	NB	248	223	-25	-10%
A4280 (E)	EB	537	584	47	9%
Barkers Ln	EB	487	561	74	15%
A603	SB	859	891	32	4%
London Rd	SB	696	790	94	14%
Ampthill Rd (W)	WB	808	756	-52	-6%
Kempston Rd	WB	612	527	-85	-14%
Ford End Rd	WB	373	364	-9	-2%
A4280 (W)	WB	817	795	-22	-3%
Cordon Total	Outbound	7,643	7,596	-47	-1%

Figure A.1 - 2014 BY-AM Peak Hr (8-9) - Route 1 Eastbound Travel Time Validation

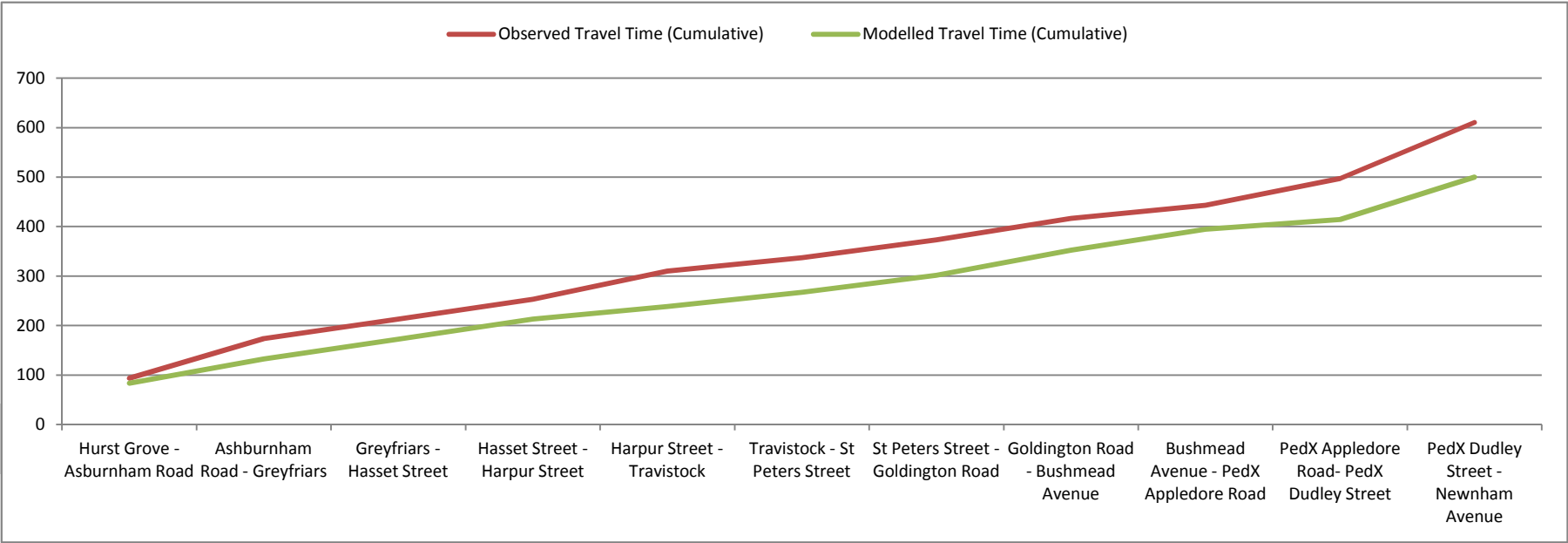


Figure A.2 - 2014 BY-AM Peak Hr (8-9) - Route 1 Westbound Travel Time Validation



Figure A.3 - 2014 BY-AM Peak Hr (8-9) - Route 2 Northbound Travel Time Validation

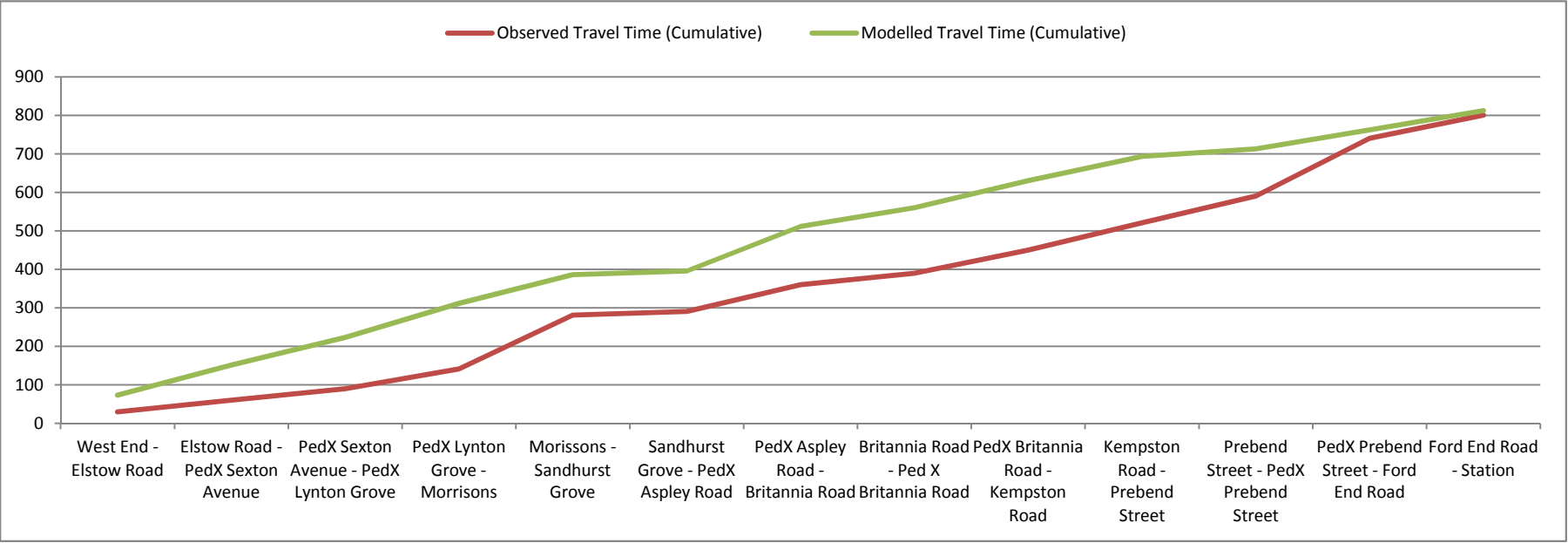


Figure A.4 - 2014 BY-AM Peak Hr (8-9) - Route 2 Southbound Travel Time Validation

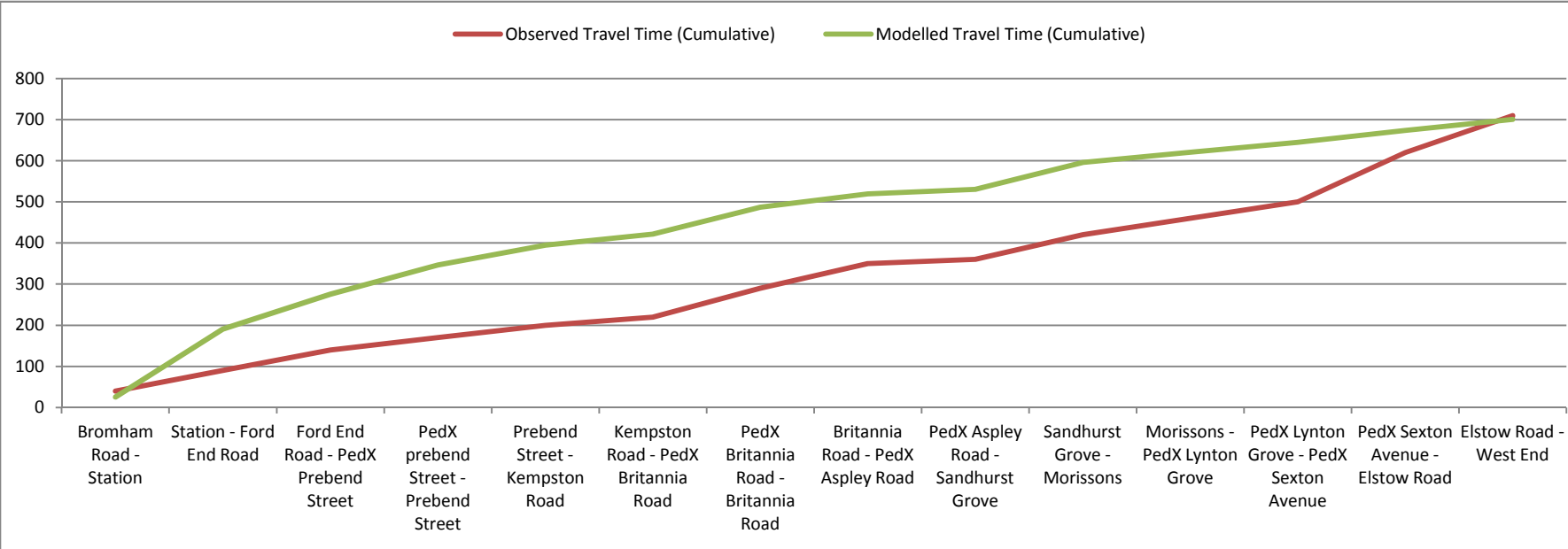


Figure A.5 - 2014 BY-AM Peak Hr (8-9) - Route 3 Northbound Travel Time Validation

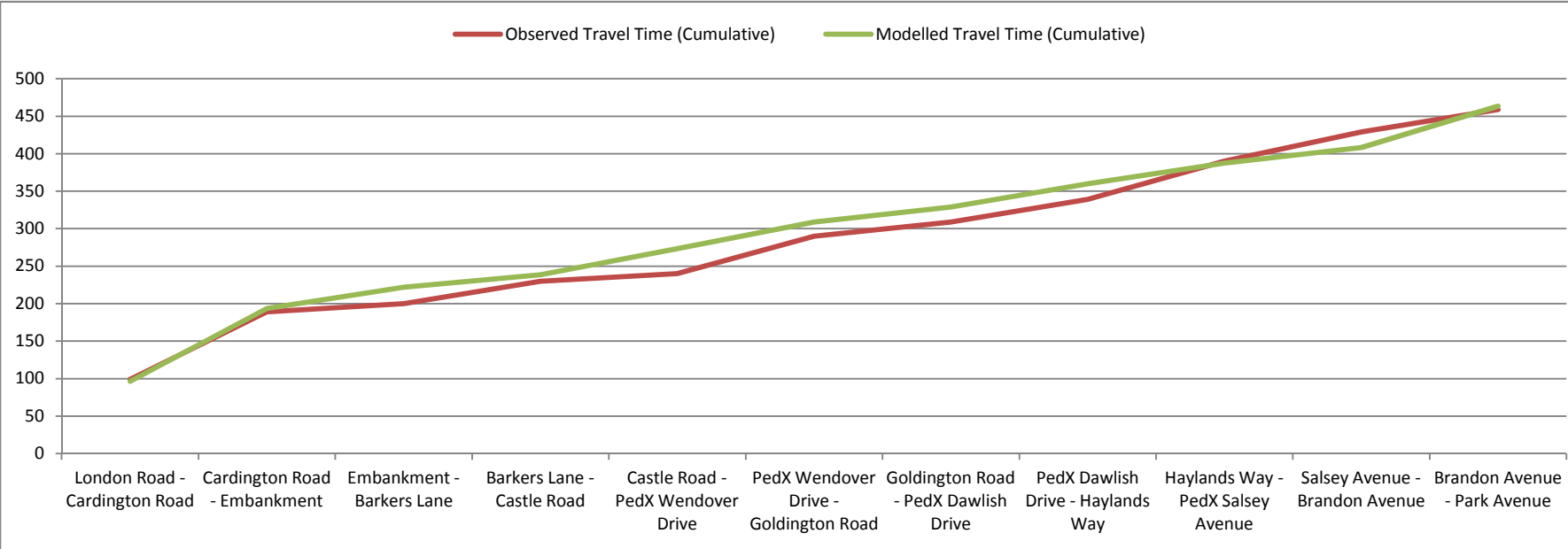


Figure A.6 - 2014 BY-AM Peak Hr (8-9) - Route 3 Southbound Travel Time Validation

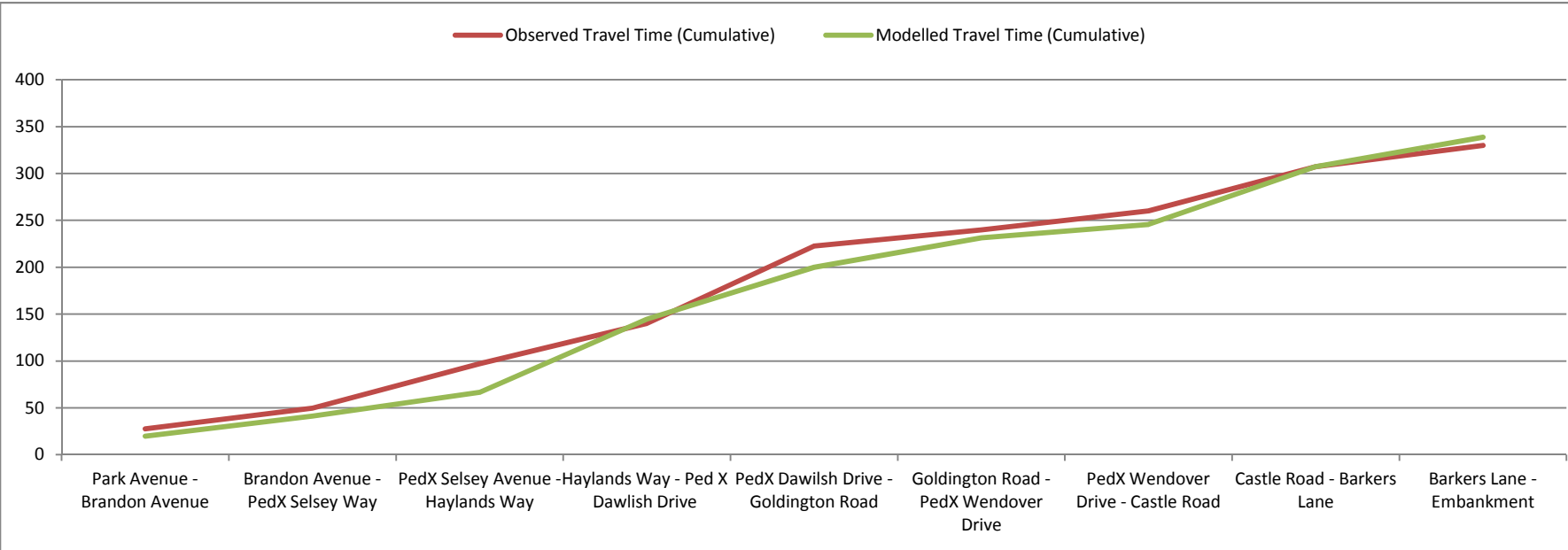


Figure A.7 - 2014 BY-AM Peak Hr (8-9) - Route 4 Northbound Travel Time Validation

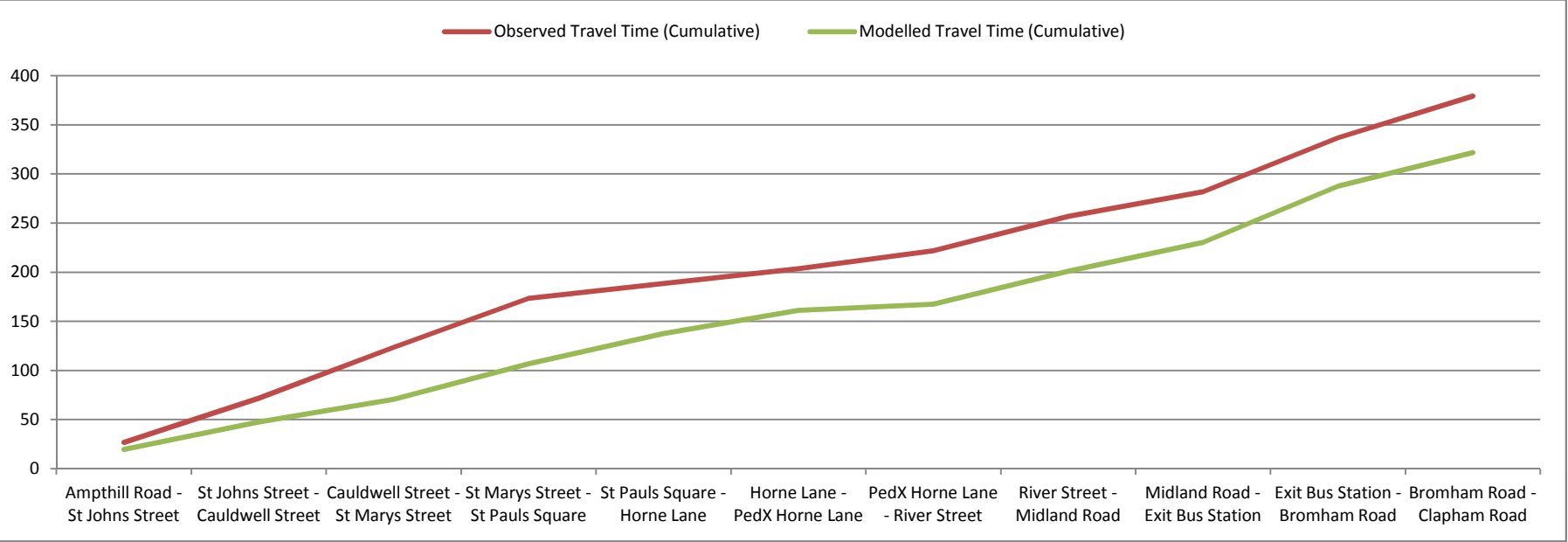


Table A.7 - 2014 BY-PM Peak Hr (17-18) - Total Traffic (Lights & Heavies) - Link Calibration

Counts							PASS	FAIL	Criteria	%	Flow Test		Either
							133	39	% GEH <5	77%	% PASS	126	136
							145	27	% GEH <6	84%		73%	79%
							172	0	% GEH <15	100%			
Site	Count	Arm	Ref	Location	Dir	Survey	Model	Diff (M - S)	% Diff	GEH	Flow Test Criteria	Flow Test PASS/FAIL	Pass Either
1	1	350	1-350>	Manton Ln	SB	907	1,045	-138	-15%	4.4	136	FAIL	PASS
1	2	350	1-350<	Manton Ln	NB	682	558	124	18%	5.0	100	FAIL	PASS
1	3	332	1-332>	A6 (E)	WB	966	869	97	10%	3.2	145	PASS	PASS
1	4	332	1-332<	A6 (E)	EB	737	814	-77	-10%	2.8	111	PASS	PASS
1	5	223	1-223>	Shakespeare Rd	NB	466	516	-50	-11%	2.3	100	PASS	PASS
1	6	223	1-223<	Shakespeare Rd	SB	452	528	-76	-17%	3.4	100	PASS	PASS
1	7	351	1-351>	A6 (W)	EB	987	997	-10	-1%	0.3	148	PASS	PASS
1	8	351	1-351<	A6 (W)	WB	1,455	1,527	-72	-5%	1.9	218	PASS	PASS
2	9	333	2-333>	Roff Ave	SB	446	469	-23	-5%	1.1	100	PASS	PASS
2	10	333	2-333<	Roff Ave	NB	509	607	-98	-19%	4.1	100	PASS	PASS
2	11	368	2-368>	A6 (E)	WB	517	461	56	11%	2.5	100	PASS	PASS
2	12	368	2-368<	A6 (E)	EB	667	518	149	22%	6.1	100	FAIL	FAIL
2	13	227	2-227>	Union St	NB	704	731	-27	-4%	1.0	106	PASS	PASS
2	14	227	2-227<	Union St	SB	407	482	-75	-18%	3.6	100	PASS	PASS
2	15	334	2-334>	A6 (W)	EB	745	826	-81	-11%	2.9	112	PASS	PASS
2	16	334	2-334<	A6 (W)	WB	829	880	-51	-6%	1.7	124	PASS	PASS
4	17	359	4-359>	Kimbolton Rd (N)	SB	640	618	22	3%	0.9	100	PASS	PASS
4	18	359	4-359<	Kimbolton Rd (N)	NB	796	779	17	2%	0.6	119	PASS	PASS
4	19	194	4-194>	Polhill Ave	WB	438	448	-10	-2%	0.5	100	PASS	PASS
4	20	194	4-194<	Polhill Ave	EB	541	560	-19	-4%	0.8	100	PASS	PASS
4	21	186	4-186>	Kimbolton Rd (S)	NB	378	392	-14	-4%	0.7	100	PASS	PASS
4	22	186	4-186<	Kimbolton Rd (S)	SB	260	261	-1	0%	0.1	100	PASS	PASS
4	23	326	4-326>	Park Ave	EB	538	567	-29	-5%	1.2	100	PASS	PASS
4	24	326	4-326<	Park Ave	WB	397	425	-28	-7%	1.4	100	PASS	PASS
5	25	194	5-194>	Pollhill Ave (W)	EB	607	516	91	15%	3.8	100	PASS	PASS
5	26	194	5-194<	Pollhill Ave (W)	WB	491	532	-41	-8%	1.8	100	PASS	PASS
5	27	360	5-360>	Haylands Way	SB	222	320	-98	-44%	6.0	100	PASS	PASS
5	28	360	5-360<	Haylands Way	NB	338	235	103	30%	6.1	100	FAIL	FAIL
5	29	125	5-125>	Pillhill Ave (E)	WB	654	590	64	10%	2.6	100	PASS	PASS
5	30	125	5-125<	Pillhill Ave (E)	EB	654	659	-5	-1%	0.2	100	PASS	PASS
6	31	193	6-193<	Pollhill Ave	SB	548	504	44	8%	1.9	100	PASS	PASS
6	32	193	6-193>	Pollhill Ave	NB	610	767	-157	-26%	6.0	100	FAIL	FAIL
6	33	363	6-363<	A4280 (E)	WB	745	608	137	18%	5.3	112	FAIL	FAIL
6	34	363	6-363>	A4280 (E)	EB	581	585	-4	-1%	0.2	100	PASS	PASS
6	35	354	6-354<	Newnham Ave	NB	592	797	-205	-35%	7.8	100	FAIL	FAIL
6	36	354	6-354>	Newnham Ave	SB	617	677	-60	-10%	2.4	100	PASS	PASS
6	37	126	6-126<	A4280 (W)	EB	439	603	-164	-37%	7.2	100	FAIL	FAIL
6	38	126	6-126>	A4280 (W)	WB	516	483	33	6%	1.5	100	PASS	PASS
7	39	229	7-229>	Shakespeare Rd	SB	439	549	-110	-25%	4.9	100	FAIL	PASS
7	40	229	7-229<	Shakespeare Rd	NB	478	568	-90	-19%	3.9	100	PASS	PASS
7	41	225	7-225>	A4280 (E)	WB	556	566	-10	-2%	0.4	100	PASS	PASS
7	42	225	7-225<	A4280 (E)	EB	598	558	40	7%	1.7	100	PASS	PASS
7	43	77	7-77>	Ashburnham Rd	NB	566	607	-41	-7%	1.7	100	PASS	PASS
7	44	77	7-77<	Ashburnham Rd	SB	323	523	-200	-62%	9.7	100	FAIL	FAIL
7	45	303	7-303>	A4280 (W)	EB	821	867	-46	-6%	1.6	123	PASS	PASS
7	46	303	7-303<	A4280 (W)	WB	983	940	43	4%	1.4	147	PASS	PASS
8	47	331	8-331>	Union St	SB	380	490	-110	-29%	5.3	100	FAIL	FAIL
8	48	331	8-331<	Union St	NB	637	771	-134	-21%	5.1	100	FAIL	FAIL
8	49	182	8-182>	A4280 (E)	WB	129	235	-106	-82%	7.9	100	FAIL	FAIL
8	50	182	8-182<	A4280 (E)	EB	317	367	-50	-16%	2.7	100	PASS	PASS
8	51	217	8-217>	Greyfriars	NB	504	539	-35	-7%	1.5	100	PASS	PASS
8	52	217	8-217<	Greyfriars	SB	206	163	43	21%	3.2	100	PASS	PASS
8	53	225	8-225>	A4280 (W)	EB	504	519	-15	-3%	0.7	100	PASS	PASS
8	54	225	8-225<	A4280 (W)	WB	357	482	-125	-35%	6.1	100	FAIL	FAIL
9	55	19	9-19>	Harpur St	NB	1,046	946	100	10%	3.2	157	PASS	PASS
9	56	156	9-156<	A6 (E)	EB	1,344	1,199	145	11%	4.1	202	PASS	PASS
9	57	158	9-158>	A6 (W)	EB	694	661	33	5%	1.3	100	PASS	PASS
9	58	158	9-158<	A6 (W)	WB	396	408	-12	-3%	0.6	100	PASS	PASS
10	59	284	10-284>	A4280 (E)	WB	658	803	-145	-22%	5.4	100	FAIL	FAIL
10	60	282	10-282<	Harpur St (N)	NB	1,036	949	87	8%	2.8	155	PASS	PASS
10	61	215	10-215>	Harpur St (S)	NB	101	152	-51	-50%	4.5	100	PASS	PASS
10	62	15	10-15<	A4280 (W)	WB	362	470	-108	-30%	5.3	100	FAIL	FAIL
10	63	15	10-15>	A4280 (W)	EB	639	464	175	27%	7.5	100	FAIL	FAIL
11	64	24	11-24>	A4280 (E)	WB	709	665	44	6%	1.7	106	PASS	PASS
11	65	24	11-24<	A4280 (E)	EB	689	679	10	1%	0.4	100	PASS	PASS
11	66	156	11-156>	The BRdway	SB	1,479	1,447	32	2%	0.8	222	PASS	PASS
11	67	30	11-30<	High St	SB	854	624	230	27%	8.5	128	FAIL	FAIL
11	68	19	11-19<	A4280 (W)	WB	645	809	-164	-25%	6.1	100	FAIL	FAIL
12	69	104	12-104>	A4280 (E)	WB	574	529	45	8%	1.9	100	PASS	PASS
12	70	104	12-104<	A4280 (E)	EB	844	794	50	6%	1.7	127	PASS	PASS
12	71	213	12-213>	St Cuthbert's St	NB	513	464	49	10%	2.2	100	PASS	PASS
12	72	213	12-213<	St Cuthbert's St	SB	248	205	43	17%	2.9	100	PASS	PASS
12	73	284	12-284>	A4280 (W)	EB	700	685	15	2%	0.6	105	PASS	PASS
12	74	284	12-284<	A4280 (W)	WB	695	679	16	2%	0.6	100	PASS	PASS
13	75	70	13-70>	Midland Rd (E)	WB	508	631	-123	-24%	5.2	100	FAIL	FAIL
13	76	70	13-70<	Midland Rd (E)	EB	395	449	-54	-14%	2.6	100	PASS	PASS
13	77	357	13-357<	Rutland Rd	NB	63	48	15	24%	2.0	100	PASS	PASS
13	78	69	13-69>	Prebend St	NB	748	947	-199	-27%	6.8	112	FAIL	FAIL
13	79	69	13-69<	Prebend St	SB	590	865	-275	-47%	10.2	100	FAIL	FAIL
13	80	114	13-114>	Ford End Rd	EB	377	456	-79	-21%	3.9	100	PASS	PASS
13	81	114	13-114<	Ford End Rd	WB	496	534	-38	-8%	1.7	100	PASS	PASS
13	82	75	13-75>	Midland Rd (W)	EB	332	478	-146	-44%	7.3	100	FAIL	FAIL

13	83	75	13-75<	Midland Rd (W)	WB	421	616	-195	-46%	8.6	100	FAIL	FAIL
14	84	324	14-324>	Greyfriars (N)	SB	194	373	-179	-92%	10.6	100	FAIL	FAIL
14	85	324	14-324<	Greyfriars (N)	NB	759	756	3	0%	0.1	114	PASS	PASS
14	86	43	14-43>	River St (S)	NB	564	501	63	11%	2.7	100	PASS	PASS
14	87	43	14-43<	River St (S)	SB	1	0	1	100%	1.4	100	PASS	PASS
14	88	70	14-70>	Midland Rd	EB	285	426	-141	-49%	7.5	100	FAIL	FAIL
14	89	70	14-70<	Midland Rd	WB	283	544	-261	-92%	12.8	100	FAIL	FAIL
15	90	365	15-365>	St Pauls Square (S)	NB	1,005	1,053	-48	-5%	1.5	151	PASS	PASS
15	91	278	15-278>	Horne Ln	EB	97	49	48	49%	5.6	100	PASS	PASS
15	92	278	15-278<	Horne Ln	WB	727	840	-113	-16%	4.0	109	FAIL	PASS
15	93	0	15-0<	St Pauls Square (E)	EB	375	262	113	30%	6.3	100	FAIL	FAIL
16	94	24	16-24>	St Mary's St (N)	SB	930	813	117	13%	4.0	140	PASS	PASS
16	95	0	16-0>	St Mary's St (S)	NB	0	0	0	0%	0.0	100	PASS	PASS
16	96	156	16-156>	St Pauls Square	WB	400	262	138	35%	7.6	100	FAIL	FAIL
17	97	364	17-364>	St Mary's St (N)	SB	1,328	1,081	247	19%	7.1	199	FAIL	FAIL
17	98	45	17-45>	St Mary's St (S)	NB	831	694	137	16%	5.0	125	FAIL	PASS
17	99	45	17-45<	St Mary's St (S)	SB	1,107	726	381	34%	12.6	166	FAIL	FAIL
17	100	37	17-37<	St Paul's Square	WB	1,052	1,049	3	0%	0.1	158	PASS	PASS
20	107	137	20-137>	Newnham Ave	SB	628	817	-189	-30%	7.0	100	FAIL	FAIL
20	108	137	20-137<	Newnham Ave	NB	767	801	-34	-4%	1.2	115	PASS	PASS
20	109	120	20-120>	Barkers Ln	WB	696	645	51	7%	2.0	100	PASS	PASS
20	110	120	20-120<	Barkers Ln	EB	648	640	8	1%	0.3	100	PASS	PASS
20	111	107	20-107>	Longholme Way (S)	NB	1,431	1,311	120	8%	3.2	215	PASS	PASS
20	112	107	20-107<	Longholme Way (S)	SB	1,340	1,332	8	1%	0.2	201	PASS	PASS
21	113	111	21-111>	Newnham Ave (S)	NB	673	737	-64	-10%	2.4	100	PASS	PASS
21	114	111	21-111<	Newnham Ave (S)	SB	663	835	-172	-26%	6.3	100	FAIL	FAIL
21	115	200	21-200>	Castle Rd	EB	113	230	-117	-104%	8.9	100	FAIL	FAIL
21	116	200	21-200<	Castle Rd	WB	163	170	-7	-4%	0.5	100	PASS	PASS
21	117	196	21-196>	Newnham Ave (N)	SB	686	763	-77	-11%	2.9	100	PASS	PASS
21	118	196	21-196<	Newnham Ave (N)	NB	646	725	-79	-12%	3.0	100	PASS	PASS
22	119	107	22-107>	Longholme Way	SB	1,160	1,105	55	5%	1.6	174	PASS	PASS
22	120	107	22-107<	Longholme Way	NB	1,501	1,352	149	10%	3.9	225	PASS	PASS
22	121	241	22-241>	A603	NB	1,111	1,021	90	8%	2.8	167	PASS	PASS
22	122	241	22-241<	A603	SB	1,268	1,095	173	14%	5.0	190	PASS	PASS
22	123	110	22-110>	Rope Walk	EB	971	941	30	3%	1.0	146	PASS	PASS
22	124	110	22-110<	Rope Walk	WB	607	751	-144	-24%	5.5	100	FAIL	FAIL
22	125	248	22-248>	Cardington Rd	EB	394	407	-13	-3%	0.6	100	PASS	PASS
22	126	248	22-248<	Cardington Rd	WB	260	276	-16	-6%	1.0	100	PASS	PASS
24	131	165	24-165>	Kingsway	NB	1,124	1,142	-18	-2%	0.5	169	PASS	PASS
24	132	142	24-142>	Cauldwell St (W)	EB	746	821	-75	-10%	2.7	112	PASS	PASS
24	133	142	24-142<	Cauldwell St (W)	WB	553	629	-76	-14%	3.1	100	PASS	PASS
24	134	162	24-162<	Cauldwell St (E)	EB	1,317	1,334	-17	-1%	0.5	198	PASS	PASS
25	135	292	25-292>	Cauldwell St (S)	NB	786	817	-31	-4%	1.1	118	PASS	PASS
25	136	292	25-292<	Cauldwell St (S)	SB	760	701	59	8%	2.2	114	PASS	PASS
25	137	141	25-141>	Prebend St	SB	799	955	-156	-20%	5.3	120	FAIL	FAIL
25	138	141	25-141<	Prebend St	NB	645	878	-233	-36%	8.4	100	FAIL	FAIL
25	139	142	25-142>	Cauldwell St (E)	WB	547	595	-48	-9%	2.0	100	PASS	PASS
25	140	142	25-142<	Cauldwell St (E)	EB	727	788	-61	-8%	2.2	109	PASS	PASS
26	141	291	26-291>	Cauldwell St	WB	756	704	52	7%	1.9	113	PASS	PASS
26	142	291	26-291<	Cauldwell St	EB	796	812	-16	-2%	0.6	119	PASS	PASS
26	143	56	26-56>	Britannia Rd	NB	380	374	6	2%	0.3	100	PASS	PASS
26	144	56	26-56<	Britannia Rd	SB	293	408	-115	-39%	6.1	100	FAIL	FAIL
26	145	259	26-259>	Kempston Rd	EB	548	641	-93	-17%	3.8	100	PASS	PASS
26	146	259	26-259<	Kempston Rd	WB	595	499	96	16%	4.1	100	PASS	PASS
27	147	48	27-48>	St John's St	SB	1,000	934	66	7%	2.1	150	PASS	PASS
27	148	49	27-49<	Kingsway	NB	806	906	-100	-12%	3.4	121	PASS	PASS
27	149	110	27-110<	Rope Walk	EB	849	914	-65	-8%	2.2	127	PASS	PASS
27	150	110	27-110>	Rope Walk	WB	601	709	-108	-18%	4.2	100	FAIL	PASS
27	151	247	27-247>	London Rd	NB	798	836	-38	-5%	1.3	120	PASS	PASS
27	152	247	27-247<	London Rd	SB	819	715	104	13%	3.8	123	PASS	PASS
27	153	254	27-254>	Amphill Rd	EB	548	598	-50	-9%	2.1	100	PASS	PASS
27	154	254	27-254<	Amphill Rd	WB	473	542	-69	-15%	3.1	100	PASS	PASS
28	155	250	28-250>	Amphill Rd (W)	EB	620	605	15	2%	0.6	100	PASS	PASS
28	156	250	28-250<	Amphill Rd (W)	WB	762	760	2	0%	0.1	114	PASS	PASS
28	157	56	28-56>	Britannia Rd	SB	463	493	-30	-6%	1.4	100	PASS	PASS
28	158	56	28-56<	Britannia Rd	NB	240	299	-59	-25%	3.6	100	PASS	PASS
28	159	254	28-254>	Amphill Rd (E)	WB	481	533	-52	-11%	2.3	100	PASS	PASS
28	160	254	28-254<	Amphill Rd (E)	EB	562	572	-10	-2%	0.4	100	PASS	PASS
29	161	283	29-283>	Amphill Rd (N)	SB	666	760	-94	-14%	3.5	100	PASS	PASS
29	162	283	29-283<	Amphill Rd (N)	NB	498	598	-100	-20%	4.3	100	FAIL	PASS
29	163	251	29-251>	Sandhurst Grove	WB	42	46	-4	-10%	0.6	100	PASS	PASS
29	164	251	29-251<	Sandhurst Grove	EB	36	18	18	50%	3.5	100	PASS	PASS
29	165	369	29-369>	Amphill Rd (S)	NB	539	595	-56	-10%	2.4	100	PASS	PASS
29	166	369	29-369<	Amphill Rd (S)	SB	699	819	-120	-17%	4.4	100	FAIL	PASS
29	167	258	29-258>	Victoria Rd	EB	52	78	-26	-50%	3.2	100	PASS	PASS
29	168	258	29-258<	Victoria Rd	WB	66	44	22	33%	3.0	100	PASS	PASS
30	169	310	30-310>	Amphill Rd (S)	NB	1,208	1,333	-125	-10%	3.5	181	PASS	PASS
30	170	310	30-310<	Amphill Rd (S)	SB	987	1,107	-120	-12%	3.7	148	PASS	PASS
30	171	297	30-297<	Elstow Rd	WB	800	799	1	0%	0.0	120	PASS	PASS
30	172	297	30-297>	Elstow Rd	EB	423	476	-53	-13%	2.5	100	PASS	PASS
30	173	329	30-329>	Amphill Rd (N)	NB	806	931	-125	-16%	4.2	121	FAIL	PASS
30	174	329	30-329<	Amphill Rd (N)	SB	650	834	-184	-28%	6.8	100	FAIL	FAIL
31	175	309	31-309>	A6 Amphill Rd (N)	SB	983	1,108	-125	-13%	3.9	147	PASS	PASS
31	176	309	31-309<	A6 Amphill Rd (N)	NB	1,185	1,342	-157	-13%	4.4	178	PASS	PASS
31	177	294	31-294>	W End	WB	685	724	-39	-6%	1.5	100	PASS	PASS
31	178	294	31-294<	W End	EB	765	661	104	14%	3.9	115	PASS	PASS
31	179	295	31-295>	A6 (S)	NB	1,234	1,234	0	0%	0.0	185	PASS	PASS
31	180	295	31-295<	A6 (S)	SB	1,079	1,195	-116	-11%	3.4	162	PASS	PASS
31	181	296	31-296>	Amphill Rd (W)	EB	836	731	105	13%	3.8	125	PASS	PASS
31	182	296	31-296<	Amphill Rd (W)	WB	709	599	110	16%	4.3	106	FAIL	PASS
Total						110,038	114,083	-4,045	-4%	12.1			

Table A.8 - 2014 BY-PM Peak Hr (17-18) - Total Traffic (Lights & Heavies) - Turn Calibration

Table A.8 - 2014 BY-PM Peak Hr (17-18) - Total Tramic (Lights & Heavies) - Turn Calibration										PASS	FAIL	Criteria		%	Flow Test		
										184	56	% GEH <5	77%	% PASS	206		
										205	35	% GEH <6	85%				
										240	0	% GEH <15	100%				
Counts		240															
Site	Count	From Arm	From Ref	From	To Arm	To Ref	To	Count Ref	Survey	Model	Diff (M-S)	% Diff	GEH	Flow Test Criteria	Flow Test Criteria	Flow Test PASS/FAIL	
1	1	350	1-350>	Manton Ln	350	1-350<	Manton Ln	1-350>350	0	0	0	0%	0.0	100	100	PASS	
1	2	350	1-350>	Manton Ln	332	1-332<	A6 (E)	1-350>332	201	214	-13	-6%	0.9	100	100	PASS	
1	3	350	1-350>	Manton Ln	223	1-223<	Shakespeare Rd	1-350>223	260	219	41	19%	2.6	100	100	PASS	
1	4	350	1-350>	Manton Ln	351	1-351<	A6 (W)	1-350>351	446	612	-166	-27%	7.2	100	100	FAIL	
1	5	332	1-332>	A6 (E)	350	1-350<	Manton Ln	1-332>350	236	179	57	32%	4.0	100	100	PASS	
1	6	332	1-332>	A6 (E)	332	1-332<	A6 (E)	1-332>332	0	0	0	0%	0.0	100	100	PASS	
1	7	332	1-332>	A6 (E)	223	1-223<	Shakespeare Rd	1-332>223	39	99	-60	-61%	7.2	100	100	PASS	
1	8	332	1-332>	A6 (E)	351	1-351<	A6 (W)	1-332>351	691	591	100	17%	3.9	100	100	FAIL	
1	9	223	1-223>	Shakespeare Rd	350	1-350<	Manton Ln	1-223>350	196	201	-5	-2%	0.4	100	100	PASS	
1	10	223	1-223>	Shakespeare Rd	332	1-332<	A6 (E)	1-223>332	23	59	-36	-61%	5.6	100	100	PASS	
1	11	223	1-223>	Shakespeare Rd	223	1-223<	Shakespeare Rd	1-223>223	1	0	1	0%	1.6	100	100	PASS	
1	12	223	1-223>	Shakespeare Rd	351	1-351<	A6 (W)	1-223>351	246	256	-10	-4%	0.6	100	100	PASS	
1	13	351	1-351>	A6 (W)	350	1-350<	Manton Ln	1-351>350	250	178	72	40%	4.9	100	100	PASS	
1	14	351	1-351>	A6 (W)	332	1-332<	A6 (E)	1-351>332	513	541	-28	-5%	1.2	100	100	PASS	
1	15	351	1-351>	A6 (W)	223	1-223<	Shakespeare Rd	1-351>223	152	210	-58	-28%	4.3	100	100	PASS	
1	16	351	1-351>	A6 (W)	351	1-351<	A6 (W)	1-351>351	72	68	4	6%	0.5	100	100	PASS	
2	17	333	2-333>	Roff Ave	333	2-333<	Roff Ave	2-333>333	0	0	0	0%	0.0	100	100	PASS	
2	18	333	2-333>	Roff Ave	368	2-368<	A6 (E)	2-333>368	44	36	8	22%	1.3	100	100	PASS	
2	19	333	2-333>	Roff Ave	227	2-227<	Union St	2-333>227	210	218	-8	-4%	0.5	100	100	PASS	
2	20	333	2-333>	Roff Ave	334	2-334<	A6 (W)	2-333>334	192	215	-23	-11%	1.6	100	100	PASS	
2	21	368	2-368>	A6 (E)	333	2-333<	Roff Ave	2-368>333	81	35	46	131%	6.0	100	100	PASS	
2	22	368	2-368>	A6 (E)	368	2-368<	A6 (E)	2-368>368	3	0	3	0%	2.4	100	100	PASS	
2	23	368	2-368>	A6 (E)	227	2-227<	Union St	2-368>227	94	93	1	1%	0.1	100	100	PASS	
2	24	368	2-368>	A6 (E)	334	2-334<	A6 (W)	2-368>334	339	333	6	2%	0.3	100	100	PASS	
2	25	227	2-227>	Union St	333	2-333<	Roff Ave	2-227>333	330	327	3	1%	0.2	100	100	PASS	
2	26	227	2-227>	Union St	368	2-368<	A6 (E)	2-227>368	98	72	26	36%	2.8	100	100	PASS	
2	27	227	2-227>	Union St	227	2-227<	Union St	2-227>227	0	0	0	0%	0.0	100	100	PASS	
2	28	227	2-227>	Union St	334	2-334<	A6 (W)	2-227>334	276	332	-56	-17%	3.2	100	100	PASS	
2	29	334	2-334>	A6 (W)	333	2-333<	Roff Ave	2-334>333	98	245	-147	-60%	11.2	100	100	FAIL	
2	30	334	2-334>	A6 (W)	368	2-368<	A6 (E)	2-334>368	522	410	112	27%	5.2	100	100	FAIL	
2	31	334	2-334>	A6 (W)	227	2-227<	Union St	2-334>227	103	171	-68	-40%	5.8	100	100	PASS	
2	32	334	2-334>	A6 (W)	334	2-334<	A6 (W)	2-334>334	22	0	22	0%	6.6	100	100	PASS	
4	33	359	4-359>	Kimbolton Rd (N)	194	4-194<	Polhill Ave	4-359>194	256	215	41	19%	2.7	100	100	PASS	
4	34	359	4-359>	Kimbolton Rd (N)	186	4-186<	Kimbolton Rd (S)	4-359>186	200	223	-23	-10%	1.6	100	100	PASS	
4	35	359	4-359>	Kimbolton Rd (N)	326	4-326<	Park Ave	4-359>326	184	180	4	2%	0.3	100	100	PASS	
4	36	194	4-194>	Polhill Ave	359	4-359<	Kimbolton Rd (N)	4-194>359	190	193	-3	-2%	0.2	100	100	PASS	
4	37	194	4-194>	Polhill Ave	186	4-186<	Kimbolton Rd (S)	4-194>186	48	28	20	71%	3.2	100	100	PASS	
4	38	194	4-194>	Polhill Ave	326	4-326<	Park Ave	4-194>326	200	227	-27	-12%	1.8	100	100	PASS	
4	39	186	4-186>	Kimbolton Rd (S)	359	4-359<	Kimbolton Rd (N)	4-186>359	309	312	-3	-1%	0.2	100	100	PASS	
4	40	186	4-186>	Kimbolton Rd (S)	194	4-194<	Polhill Ave	4-186>194	56	62	-6	-10%	0.8	100	100	PASS	
4	41	186	4-186>	Kimbolton Rd (S)	326	4-326<	Park Ave	4-186>326	13	18	-5	-28%	1.3	100	100	PASS	
4	42	326	4-326>	Park Ave	359	4-359<	Kimbolton Rd (N)	4-326>359	297	274	23	8%	1.4	100	100	PASS	
4	43	326	4-326>	Park Ave	194	4-194<	Polhill Ave	4-326>194	229	283	-54	-19%	3.4	100	100	PASS	
4	44	326	4-326>	Park Ave	186	4-186<	Kimbolton Rd (S)	4-326>186	12	10	2	20%	0.6	100	100	PASS	
5	45	194	5-194>	Pollhill Ave (W)	360	5-360<	Haylands Way	5-194>360	119	72	47	65%	4.8	100	100	PASS	
5	46	194	5-194>	Pollhill Ave (W)	125	5-125<	Pillhill Ave (E)	5-194>125	488	444	44	10%	2.0	100	100	PASS	
5	47	360	5-360>	Haylands Way	194	5-194<	Pollhill Ave (W)	5-360>194	56	105	-49	-47%	5.5	100	100	PASS	
5	48	360	5-360>	Haylands Way	125	5-125<	Pillhill Ave (E)	5-360>125	166	215	-49	-23%	3.6	100	100	PASS	
5	49	125	5-125>	Pillhill Ave (E)	194	5-194<	Pollhill Ave (W)	5-125>194	435	427	8	2%	0.4	100	100	PASS	
5	50	125	5-125>	Pillhill Ave (E)	360	5-360<	Haylands Way	5-125>360	219	163	56	34%	4.1	100	100	PASS	
6	51	193	6-193>	Pollhill Ave	363	6-363<	A4280 (E)	6-193>363	174	188	-14	-7%	1.0	100	100	PASS	
6	52	193	6-193>	Pollhill Ave	354	6-354<	Newnham Ave	6-193>354	399	468	-69	-15%	3.3	100	100	PASS	
6	53	193	6-193>	Pollhill Ave	126	6-126<	A4280 (W)	6-193>126	37	111	-74	-67%	8.6	100	100	PASS	
6	54	363	6-363>	A4280 (E)	193	6-193<	Pollhill Ave	6-363>193	95	79	16	20%	1.7	100	100	PASS	
6	55	363	6-363>	A4280 (E)	354	6-354<	Newnham Ave	6-363>354	116	176	-60	-34%	5.0	100	100	PASS	
6	56	363	6-363>	A4280 (E)	126	6-126<	A4280 (W)	6-363>126	370	330	40	12%	2.1	100	100	PASS	
6	57	354	6-354>	Newnham Ave	193	6-193<	Pollhill Ave	6-354>193	427	376	51	14%	2.5	100	100	PASS	
6	58	354	6-354>	Newnham Ave	363	6-363<	A4280 (E)	6-354>363	158	139	19	14%	1.6	100	100	PASS	
6	59	354	6-354>	Newnham Ave	126	6-126<	A4280 (W)	6-354>126	32	162	-130	-80%	13.2	100	100	FAIL	
6	60	126	6-126>	A4280 (W)	193	6-193<	Pollhill Ave	6-126>193	26	49	-23	-47%	3.8	100	100	PASS	
6	61	126	6-126>	A4280 (W)	363	6-363<	A4280 (E)	6-126>363	413	281	132	47%	7.1	100	100	FAIL	
6	62	126	6-126>	A4280 (W)	354	6-354<	Newnham Ave	6-126>354	77	153	-76	-50%	7.1	100	100	PASS	
7	63	229	7-229>	Shakespeare Rd	229	7-229<	Shakespeare Rd	7-229>229	0	0	0	0%	0.0	100	100	PASS	
7	64	229	7-229>	Shakespeare Rd	225	7-225<	A4280 (E)	7-229>225	9	32	-23	-72%	5.1	100	100	PASS	
7	65	229	7-229>	Shakespeare Rd	77	7-77<	Ashburnham Rd	7-229>77	131	242	-93	-42%	7.0	100	100	PASS	
7	66	229	7-229>	Shakespeare Rd	303	7-303<	A4280 (W)	7-229>303	299	293	6	2%	0.3	100	100	PASS	
7	67	225	7-225>	A4280 (E)	229	7-229<	Shakespeare Rd	7-225>229	22	37	-15	-41%	2.8	100	100	PASS	
7	68	225	7-225>	A4280 (E)	225	7-225<	A4280 (E)	7-225>225	0	0	0	0%	0.0	100	100	PASS	
7	69	225	7-225>	A4280 (E)	77	7-77<	Ashburnham Rd	7-225>77	67	111	-44	-40%	4.7	100	100	PASS	
7	70	225	7-225>	A4280 (E)	303	7-303<	A4280 (W)	7-225>303	467	418	49	12%	2.3	100	100	PASS	
7	71	77	7-77>	Ashburnham Rd	229	7-229<	Shakespeare Rd	7-77>229	250	279	-29	-10%	1.8	100	100	PASS	
7	72	77	7-77>	Ashburnham Rd	225	7-225<	A4280 (E)	7-77>225	99	99	0	0%	0.0	100	100	PASS	
7	73	77	7-77>	Ashburnham Rd	77	7-77<	Ashburnham Rd	7-77>77	0	0	0	0%	0.0	100	100	PASS	
7	74	77	7-77>	Ashburnham Rd	303	7-303<	A4280 (W)	7-77>303	217	229	-12	-5%	0.8	100	100	PASS	
7	75	303	7-303>	A4280 (W)	229	7-229<	Shakespeare Rd	7-303>229	206	252	-46	-18%	3.0	100	100	PASS	
7	76	303	7-303>	A4280 (W)	225	7-225<	A4280 (E)	7-303>225	490	427	63	15%	2.9	100	100	PASS	
7	77	303	7-303>	A4280 (W)	77	7-77<	Ashburnham Rd	7-303>77	125	188	-63	-34%	5.0	100	100	PASS	
8	78	331	8-331>	Union St	182	8-182<	A4280 (E)	8-331>182	19	97	-78	-80%	10.2	100	100	PASS	
8	79	331	8-331>	Union St	217	8-217<	Greyfriars	8-331>217	206	163	43	26%	3.2	100	100	PASS	
8	80	331	8-331>	Union St	225	8-225<	A4280 (W)	8-331>225	155	230	-75	-33%	5.4	100	100	PASS	
8	81	182	8-182>	A4280 (E)	331	8-331<	Union St	8-182>331	16	82	-66	-80%	9.4	100	100	PASS	
8	82	182	8-182>	A4280 (E)	217	8-217<	Greyfriars	8-182>217	0	0	0	0%	0.0	100	100	PASS	
8	83	182	8-182>	A4280 (E)	2												

10	95	215	10-215>	Harpur St (S)	282	10-282<	Harpur St (N)	10-215>282	101	152	-51	-34%	4.5	100	100	PASS
10	96	15	10-15>	A4280 (W)	282	10-282<	Harpur St (N)	10-15>282	639	464	175	38%	7.5	100	100	FAIL
11	97	156	11-156>	The BRdway	24	11-24<	A4280 (E)	11-156>24	689	679	10	1%	0.4	100	100	PASS
11	98	156	11-156>	The BRdway	30	11-30<	High St	11-156>30	737	556	181	33%	7.1	111	111	FAIL
11	99	156	11-156>	The BRdway	19	11-19<	A4280 (W)	11-156>19	53	212	-159	-75%	13.8	100	100	FAIL
11	100	24	11-24>	A4280 (E)	30	11-30<	High St	11-24>30	117	68	49	72%	5.1	100	100	PASS
11	101	24	11-24>	A4280 (E)	19	11-19<	A4280 (W)	11-24>19	592	597	-5	-1%	0.2	100	100	PASS
12	102	104	12-104>	A4280 (E)	213	12-213<	St Cuthbert's St	12-104>213	122	81	41	51%	4.1	100	100	PASS
12	103	104	12-104>	A4280 (E)	284	12-284<	A4280 (W)	12-104>284	452	448	4	1%	0.2	100	100	PASS
12	104	213	12-213>	St Cuthbert's St	104	12-104<	A4280 (E)	12-213>104	270	233	37	16%	2.3	100	100	PASS
12	105	213	12-213>	St Cuthbert's St	284	12-284<	A4280 (W)	12-213>284	243	231	12	5%	0.8	100	100	PASS
12	106	284	12-284>	A4280 (W)	104	12-104<	A4280 (E)	12-284>104	574	561	13	2%	0.5	100	100	PASS
12	107	284	12-284>	A4280 (W)	213	12-213<	St Cuthbert's St	12-284>213	126	124	2	2%	0.2	100	100	PASS
13	108	70	13-70>	Midland Rd (E)	357	13-357<	Rutland Rd	13-70>357	22	14	8	57%	1.9	100	100	PASS
13	109	70	13-70>	Midland Rd (E)	70	13-70<	Midland Rd (E)	13-70>70	1	0	1	0%	1.4	100	100	PASS
13	110	70	13-70>	Midland Rd (E)	69	13-69<	Prebend St	13-70>69	167	283	-116	-41%	7.7	100	100	FAIL
13	111	70	13-70>	Midland Rd (E)	114	13-114<	Ford End Rd	13-70>114	226	215	11	5%	0.7	100	100	PASS
13	112	70	13-70>	Midland Rd (E)	75	13-75<	Midland Rd (W)	13-70>75	92	119	-27	-23%	2.6	100	100	PASS
13	113	69	13-69>	Prebend St	357	13-357<	Rutland Rd	13-69>357	16	15	1	7%	0.3	100	100	PASS
13	114	69	13-69>	Prebend St	70	13-70<	Midland Rd (E)	13-69>70	208	241	-33	-14%	2.2	100	100	PASS
13	115	69	13-69>	Prebend St	69	13-69<	Prebend St	13-69>69	4	0	4	0%	2.8	100	100	PASS
13	116	69	13-69>	Prebend St	114	13-114<	Ford End Rd	13-69>114	234	245	-11	-4%	0.7	100	100	PASS
13	117	69	13-69>	Prebend St	75	13-75<	Midland Rd (W)	13-69>75	286	446	-160	-36%	8.4	100	100	FAIL
13	118	114	13-114>	Ford End Rd	357	13-357<	Rutland Rd	13-114>357	11	1	10	1000%	4.1	100	100	PASS
13	119	114	13-114>	Ford End Rd	70	13-70<	Midland Rd (E)	13-114>70	134	132	2	2%	0.2	100	100	PASS
13	120	114	13-114>	Ford End Rd	69	13-69<	Prebend St	13-114>69	186	272	-86	-32%	5.7	100	100	PASS
13	121	114	13-114>	Ford End Rd	114	13-114<	Ford End Rd	13-114>114	3	0	3	0%	2.4	100	100	PASS
13	122	114	13-114>	Ford End Rd	75	13-75<	Midland Rd (W)	13-114>75	43	51	-8	-16%	1.2	100	100	PASS
13	123	75	13-75>	Midland Rd (W)	75	13-75<	Midland Rd (W)	13-75>75	0	0	0	0%	0.0	100	100	PASS
13	124	75	13-75>	Midland Rd (W)	357	13-357<	Rutland Rd	13-75>357	14	18	-4	-22%	1.0	100	100	PASS
13	125	75	13-75>	Midland Rd (W)	70	13-70<	Midland Rd (E)	13-75>70	52	76	-24	-32%	3.0	100	100	PASS
13	126	75	13-75>	Midland Rd (W)	69	13-69<	Prebend St	13-75>69	233	310	-77	-25%	4.7	100	100	PASS
13	127	76	13-75>	Midland Rd (W)	70	13-114<	Ford End Rd	13-75>114	33	74	-41	-55%	5.6	100	100	PASS
14	128	324	14-324>	Greyfriars (N)	70	14-70<	Midland Rd	14-324>70	194	373	-179	-48%	10.6	100	100	FAIL
14	129	43	14-43>	River St (S)	324	14-324<	Greyfriars (N)	14-43>324	476	330	146	44%	7.3	100	100	FAIL
14	130	43	14-43>	River St (S)	43	14-43<	River St (S)	14-43>43	0	0	0	0%	0.0	100	100	PASS
14	131	43	14-43>	River St (S)	70	14-70<	Midland Rd	14-43>70	88	171	-83	-49%	7.3	100	100	PASS
14	132	70	14-70>	Midland Rd	324	14-324<	Greyfriars (N)	14-70>324	283	426	-143	-34%	7.6	100	100	FAIL
14	133	70	14-70>	Midland Rd	43	14-43<	River St (S)	14-70>43	1	0	1	0%	1.4	100	100	PASS
14	134	70	14-70>	Midland Rd	70	14-70<	Midland Rd	14-70>70	1	0	1	0%	1.4	100	100	PASS
15	135	365	15-365>	St Pauls Square (S)	278	15-278<	Horne Ln	15-365>278	727	840	-113	-13%	4.0	109	109	FAIL
15	136	365	15-365>	St Pauls Square (S)	0	15-0<	St Pauls Square (E)	15-365>0	278	213	65	31%	4.1	100	100	PASS
15	137	278	15-278>	Horne Ln	0	15-0<	St Pauls Square (E)	15-278>0	97	49	48	98%	5.6	100	100	PASS
16	138	156	16-156>	St Pauls Square	0	16-0<	St Mary's St (S)	16-156>0	400	262	138	53%	7.6	100	100	FAIL
16	139	24	16-24>	St Mary's St (N)	0	16-0<	St Mary's St (S)	16-24>0	930	813	117	14%	4.0	140	140	PASS
17	140	45	17-45>	St Mary's St (S)	37	17-37<	St Paul's Square	17-45>37	831	694	137	20%	5.0	125	125	FAIL
17	141	364	17-364>	St Mary's St (N)	45	17-45<	St Mary's St (S)	17-364>45	1,107	726	381	52%	12.6	166	166	FAIL
17	142	364	17-364>	St Mary's St (N)	37	17-37<	St Paul's Square	17-364>37	221	355	-134	-38%	7.9	100	100	FAIL
20	143	137	20-137>	Newnham Ave	137	20-137<	Newnham Ave	20-137>137	0	0	0	0%	0.0	100	100	PASS
20	144	137	20-137>	Newnham Ave	120	20-120<	Barkers Ln	20-137>120	87	151	-64	-42%	5.9	100	100	PASS
20	145	137	20-137>	Newnham Ave	107	20-107<	Longholme Way (S)	20-137>107	541	666	-125	-19%	5.1	100	100	FAIL
20	146	120	20-120>	Barkers Ln	137	20-137<	Newnham Ave	20-120>137	80	98	-18	-18%	1.9	100	100	PASS
20	147	120	20-120>	Barkers Ln	120	20-120<	Barkers Ln	20-120>120	0	0	0	0%	0.0	100	100	PASS
20	148	120	20-120>	Barkers Ln	107	20-107<	Longholme Way (S)	20-120>107	616	547	69	13%	2.9	100	100	PASS
20	149	107	20-107>	Longholme Way (S)	137	20-137<	Newnham Ave	20-107>137	687	703	-16	-2%	0.6	100	100	PASS
20	150	107	20-107>	Longholme Way (S)	120	20-120<	Barkers Ln	20-107>120	561	489	72	15%	3.1	100	100	PASS
20	151	107	20-107>	Longholme Way (S)	107	20-107<	Longholme Way (S)	20-107>107	183	119	64	54%	5.2	100	100	PASS
21	152	111	21-111>	Newnham Ave (S)	200	21-200<	Castle Rd	21-111>200	83	75	8	11%	0.9	100	100	PASS
21	153	111	21-111>	Newnham Ave (S)	196	21-196<	Newnham Ave (N)	21-111>196	590	662	-72	-11%	2.9	100	100	PASS
21	154	200	21-200>	Castle Rd	111	21-111<	Newnham Ave (S)	21-200>111	57	167	-110	-66%	10.4	100	100	FAIL
21	155	200	21-200>	Castle Rd	196	21-196<	Newnham Ave (N)	21-200>196	56	63	-7	-11%	0.9	100	100	PASS
21	156	196	21-196>	Newnham Ave (N)	111	21-111<	Newnham Ave (S)	21-196>111	606	668	-62	-9%	2.5	100	100	PASS
21	157	196	21-196>	Newnham Ave (N)	200	21-200<	Castle Rd	21-196>200	80	95	-15	-16%	1.6	100	100	PASS
22	158	107	22-107>	Longholme Way	107	22-107<	Longholme Way	22-107>107	7	0	7	0%	3.7	100	100	PASS
22	159	107	22-107>	Longholme Way	241	22-241<	A603	22-107>241	714	571	143	25%	5.6	107	107	FAIL
22	160	107	22-107>	Longholme Way	110	22-110<	Rope Walk	22-107>110	359	463	-104	-22%	5.1	100	100	FAIL
22	161	107	22-107>	Longholme Way	248	22-248<	Cardington Rd	22-107>248	80	71	9	13%	1.0	100	100	PASS
22	162	241	22-241>	A603	107	22-107<	Longholme Way	22-241>107	781	666	115	17%	4.3	117	117	PASS
22	163	241	22-241>	A603	241	22-241<	A603	22-241>241	7	0	7	0%	3.7	100	100	PASS
22	164	241	22-241>	A603	110	22-110<	Rope Walk	22-241>110	178	206	-28	-14%	2.0	100	100	PASS
22	165	241	22-241>	A603	248	22-248<	Cardington Rd	22-241>248	145	149	-4	-3%	0.3	100	100	PASS
22	166	110	22-110>	Rope Walk	107	22-107<	Longholme Way	22-110>107	598	523	75	14%	3.2	100	100	PASS
22	167	110	22-110>	Rope Walk	241	22-241<	A603	22-110>241	306	303	3	1%	0.2	100	100	PASS
22	168	110	22-110>	Rope Walk	110	22-110<	Rope Walk	22-110>110	34	59	-25	-42%	3.7	100	100	PASS
22	169	110	22-110>	Rope Walk	248	22-248<	Cardington Rd	22-110>248	33	56	-23	-41%	3.4	100	100	PASS
22	170	248	22-248>	Cardington Rd	107	22-107<	Longholme Way	22-248>107	115	163	-48	-29%	4.1	100	100	PASS
22	171	248	22-248>	Cardington Rd	241	22-241<	A603	22-248>241	241	221	20	9%	1.3	100	100	PASS
22	172	248	22-248>	Cardington Rd	110	22-110<	Rope Walk	22-248>110	36	23	13	57%	2.4	100	100	PASS
22	173	248	22-248>	Cardington Rd	248	22-248<	Cardington Rd	22-248>248	2	0	2	0%	2.0	100	100	PASS
24	174	165	24-165>	Kingsway	142	24-142<	Cauldwell St (W)	24-165>142	553	629	-76	-12%	3.1	100	100	PASS
24	175	165	24-165>	Kingsway	162	24-162<	Cauldwell St (E)	24-165>162	571	513	58	11%	2.5	100	100	PASS
24	176	142	24-142>	Cauldwell St (W)	162	24-162<	Cauldwell St (E)	24-142>162	746	821	-75	-9%	2.7	112	112	PASS
25	177	292	25-292>	Cauldwell St (S)	141	25-141<	Prebend St	25-292>141</								

27	198	247	27-247>	London Rd	110	27-110<	Rope Walk	27-247>110	250	239	11	5%	0.7	100	100	PASS
27	199	247	27-247>	London Rd	247	27-247<	London Rd	27-247>247	0	1	-1	-100%	1.4	100	100	PASS
27	200	247	27-247>	London Rd	254	27-254<	Amphthill Rd	27-247>254	99	99	0	0%	0.0	100	100	PASS
27	201	254	27-254>	Amphthill Rd	49	27-49<	Kingsway	27-254>49	107	140	-33	-24%	3.0	100	100	PASS
27	202	254	27-254>	Amphthill Rd	110	27-110<	Rope Walk	27-254>110	270	378	-108	-29%	6.0	100	100	FAIL
27	203	254	27-254>	Amphthill Rd	247	27-247<	London Rd	27-254>247	163	80	83	104%	7.5	100	100	PASS
27	204	254	27-254>	Amphthill Rd	254	27-254<	Amphthill Rd	27-254>254	8	0	8	0%	4.0	100	100	PASS
28	205	250	28-250>	Amphthill Rd (W)	56	28-56<	Britannia Rd	28-250>56	221	235	-14	-6%	0.9	100	100	PASS
28	206	250	28-250>	Amphthill Rd (W)	254	28-254<	Amphthill Rd (E)	28-250>254	399	370	29	8%	1.5	100	100	PASS
28	207	56	28-56>	Britannia Rd	250	28-250<	Amphthill Rd (W)	28-56>250	300	291	9	3%	0.5	100	100	PASS
28	208	56	28-56>	Britannia Rd	254	28-254<	Amphthill Rd (E)	28-56>254	163	202	-39	-19%	2.9	100	100	PASS
28	209	254	28-254>	Amphthill Rd (E)	250	28-250<	Amphthill Rd (W)	28-254>250	462	469	-7	-1%	0.3	100	100	PASS
28	210	254	28-254>	Amphthill Rd (E)	56	28-56<	Britannia Rd	28-254>56	19	64	-45	-70%	7.0	100	100	PASS
29	211	283	29-283>	Amphthill Rd (N)	251	29-251<	Sandhurst Grove	29-283>251	14	6	8	133%	2.5	100	100	PASS
29	212	283	29-283>	Amphthill Rd (N)	369	29-369<	Amphthill Rd (S)	29-283>369	634	725	-91	-13%	3.5	100	100	PASS
29	213	283	29-283>	Amphthill Rd (N)	258	29-258<	Victoria Rd	29-283>258	18	29	-11	-38%	2.3	100	100	PASS
29	214	251	29-251>	Sandhurst Grove	283	29-283<	Amphthill Rd (N)	29-251>283	14	0	14	0%	5.3	100	100	PASS
29	215	251	29-251>	Sandhurst Grove	369	29-369<	Amphthill Rd (S)	29-251>369	25	46	-21	-46%	3.5	100	100	PASS
29	216	251	29-251>	Sandhurst Grove	258	29-258<	Victoria Rd	29-251>258	3	0	3	0%	2.4	100	100	PASS
29	217	369	29-369>	Amphthill Rd (S)	283	29-283<	Amphthill Rd (N)	29-369>283	474	568	-94	-17%	4.1	100	100	PASS
29	218	369	29-369>	Amphthill Rd (S)	251	29-251<	Sandhurst Grove	29-369>251	20	12	8	67%	2.0	100	100	PASS
29	219	369	29-369>	Amphthill Rd (S)	258	29-258<	Victoria Rd	29-369>258	45	15	30	200%	5.5	100	100	PASS
29	220	258	29-258>	Victoria Rd	283	29-283<	Amphthill Rd (N)	29-258>283	10	30	-20	-67%	4.5	100	100	PASS
29	221	258	29-258>	Victoria Rd	251	29-251<	Sandhurst Grove	29-258>251	2	0	2	0%	2.0	100	100	PASS
29	222	258	29-258>	Victoria Rd	369	29-369<	Amphthill Rd (S)	29-258>369	40	48	-8	-17%	1.2	100	100	PASS
30	223	310	30-310>	Amphthill Rd (S)	297	30-297<	Elstow Rd	30-310>297	645	639	6	1%	0.2	100	100	PASS
30	224	310	30-310>	Amphthill Rd (S)	329	30-329<	Amphthill Rd (N)	30-310>329	563	694	-131	-19%	5.2	100	100	FAIL
30	225	297	30-297>	Elstow Rd	310	30-310<	Amphthill Rd (S)	30-297>310	336	336	0	0%	0.0	100	100	PASS
30	226	297	30-297>	Elstow Rd	329	30-329<	Amphthill Rd (N)	30-297>329	87	140	-53	-38%	5.0	100	100	PASS
30	227	329	30-329>	Amphthill Rd (N)	310	30-310<	Amphthill Rd (S)	30-329>310	651	771	-120	-16%	4.5	100	100	FAIL
30	228	329	30-329>	Amphthill Rd (N)	297	30-297<	Elstow Rd	30-329>297	155	160	-5	-3%	0.4	100	100	PASS
31	229	309	31-309>	Amphthill Rd (N)	294	31-294<	W End	31-309>294	205	200	5	3%	0.4	100	100	PASS
31	230	309	31-309>	Amphthill Rd (N)	295	31-295<	A6 (S)	31-309>295	547	734	-187	-25%	7.4	100	100	FAIL
31	231	309	31-309>	Amphthill Rd (N)	296	31-296<	Amphthill Rd (W)	31-309>296	231	174	57	33%	4.0	100	100	PASS
31	232	294	31-294>	(W) End	309	31-309<	A6 Amphthill Rd (N)	31-294>309	255	288	-33	-11%	2.0	100	100	PASS
31	233	294	31-294>	(W) End	295	31-295<	A6 (S)	31-294>295	273	277	-4	-1%	0.2	100	100	PASS
31	234	294	31-294>	(W) End	296	31-296<	Amphthill Rd (W)	31-294>296	157	159	-2	-1%	0.2	100	100	PASS
31	235	295	31-295>	A6 (S)	309	31-309<	A6 Amphthill Rd (N)	31-295>309	609	700	-91	-13%	3.6	100	100	PASS
31	236	295	31-295>	A6 (S)	294	31-294<	W End	31-295>294	304	268	36	13%	2.1	100	100	PASS
31	237	295	31-295>	A6 (S)	296	31-296<	Amphthill Rd (W)	31-295>296	321	266	55	21%	3.2	100	100	PASS
31	238	296	31-296>	Amphthill Rd (W)	309	31-309<	A6 Amphthill Rd (N)	31-296>309	321	354	-33	-9%	1.8	100	100	PASS
31	239	296	31-296>	Amphthill Rd (W)	294	31-294<	W End	31-296>294	256	193	63	33%	4.2	100	100	PASS
31	240	296	31-296>	Amphthill Rd (W)	295	31-295<	A6 (S)	31-296>295	259	184	75	41%	5.0	100	100	PASS
Total									55,684	57,579	-1,895	-3%	8.0			

Table A.9 - 2014 BY-PM Peak Hr (17-18) - Bridges Northbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Prebend St	NB	645	878	233	36%
St Mary's St (S)	NB	831	694	-137	-16%
Longholme Way	NB	1,501	1,352	-149	-10%
Bridges Total	NB	2,977	2,924	-53	-2%

Table A.10 - 2014 BY-PM Peak Hr (17-18) - Bridges Southbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Prebend St	SB	799	955	156	20%
St Mary's St (S)	SB	1,107	726	-381	-34%
Longholme Way	SB	1,160	1,105	-55	-5%
Bridges Total	SB	3,066	2,786	-280	-9%

Table A.11 - 2014 BY-PM Peak Hr (17-18) - Cordon Inbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Manton Ln	SB	907	1,045	138	15%
A6 (W)	EB	987	997	10	1%
Kimbolton Rd (N)	SB	640	618	-22	-3%
Haylands Way	SB	222	320	98	44%
A4280 (E)	WB	745	608	-137	-18%
Barkers Ln	WB	696	645	-51	-7%
A603	NB	1,111	1,021	-90	-8%
London Rd	NB	798	836	38	5%
Ampthill Rd (W)	EB	620	605	-15	-2%
Kempston Rd	EB	548	641	93	17%
Ford End Rd	EB	377	456	79	21%
A4280 (W)	EB	821	867	46	6%
Cordon Total	Inbound	8,472	8,659	187	2%

Table A.12 - 2014 BY-PM Peak Hr (17-18) - Cordon Outbound
Screenline Validation

Location	Dir	Survey	Model	Diff (M-S)	% Diff
Manton Ln	NB	682	558	-124	-18%
A6 (W)	WB	1,455	1,527	72	5%
Kimbolton Rd (N)	NB	796	779	-17	-2%
Haylands Way	NB	338	235	-103	-30%
A4280 (E)	EB	581	585	4	1%
Barkers Ln	EB	648	640	-8	-1%
A603	SB	1,268	1,095	-173	-14%
London Rd	SB	819	715	-104	-13%
Ampthill Rd (W)	WB	762	760	-2	0%
Kempston Rd	WB	595	499	-96	-16%
Ford End Rd	WB	496	534	38	8%
A4280 (W)	WB	983	940	-43	-4%
Cordon Total	Outbound	9,423	8,867	-556	-6%

Figure A.8 - 2014 BY-PM Peak Hr (17-18) - Route 1 Eastbound Travel Time Validation



Figure A.9 - 2014 BY-PM Peak Hr (17-18) - Route 1 Westbound Travel Time Validation

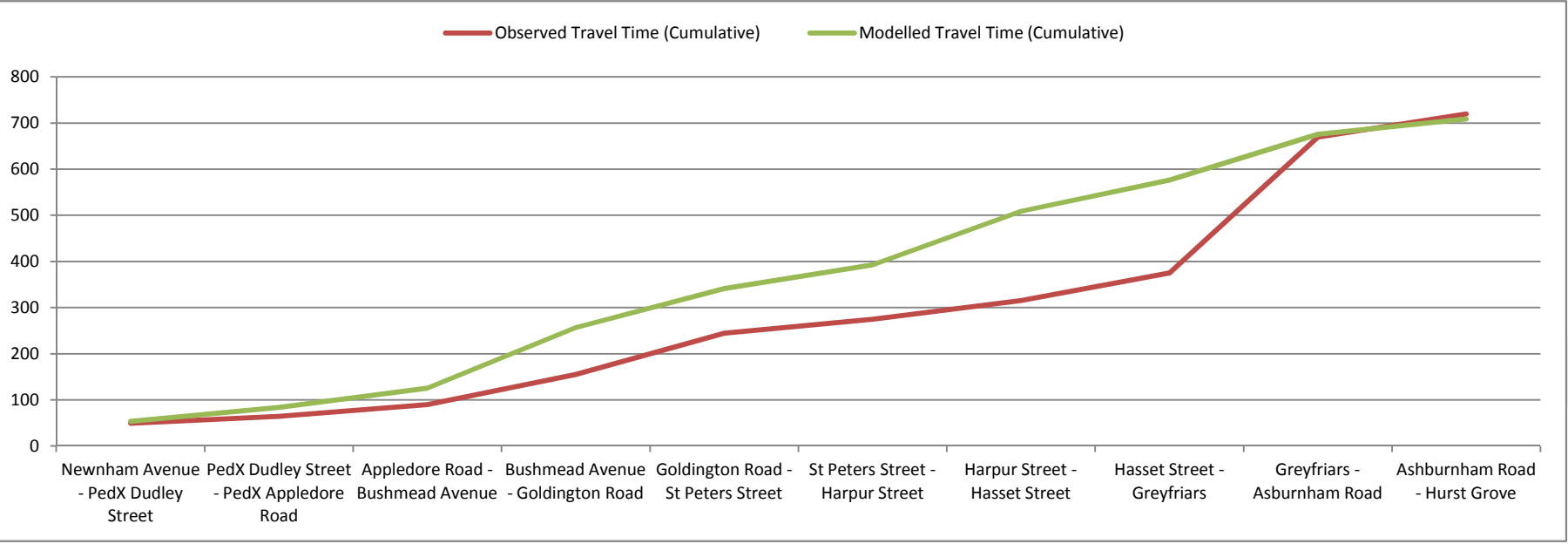


Figure A.10 - 2014 BY-PM Peak Hr (17-18) - Route 2 Northbound Travel Time Validation

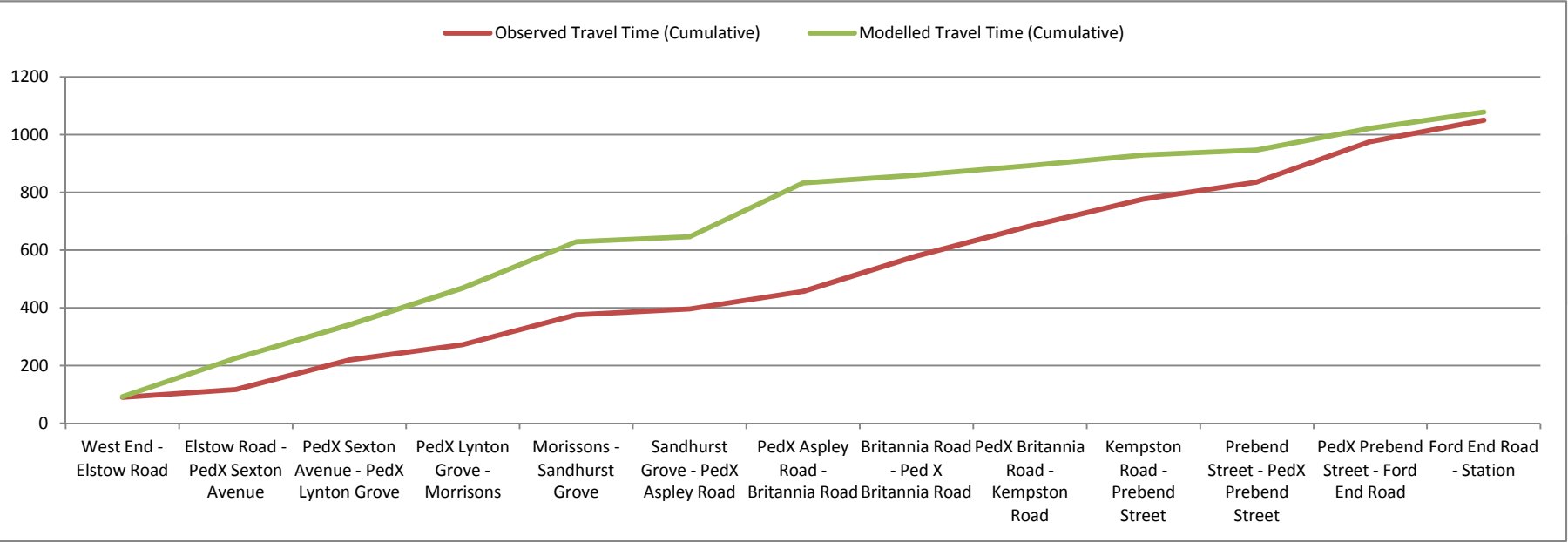


Figure A.11 - 2014 BY-PM Peak Hr (17-18) - Route 2 Southbound Travel Time Validation

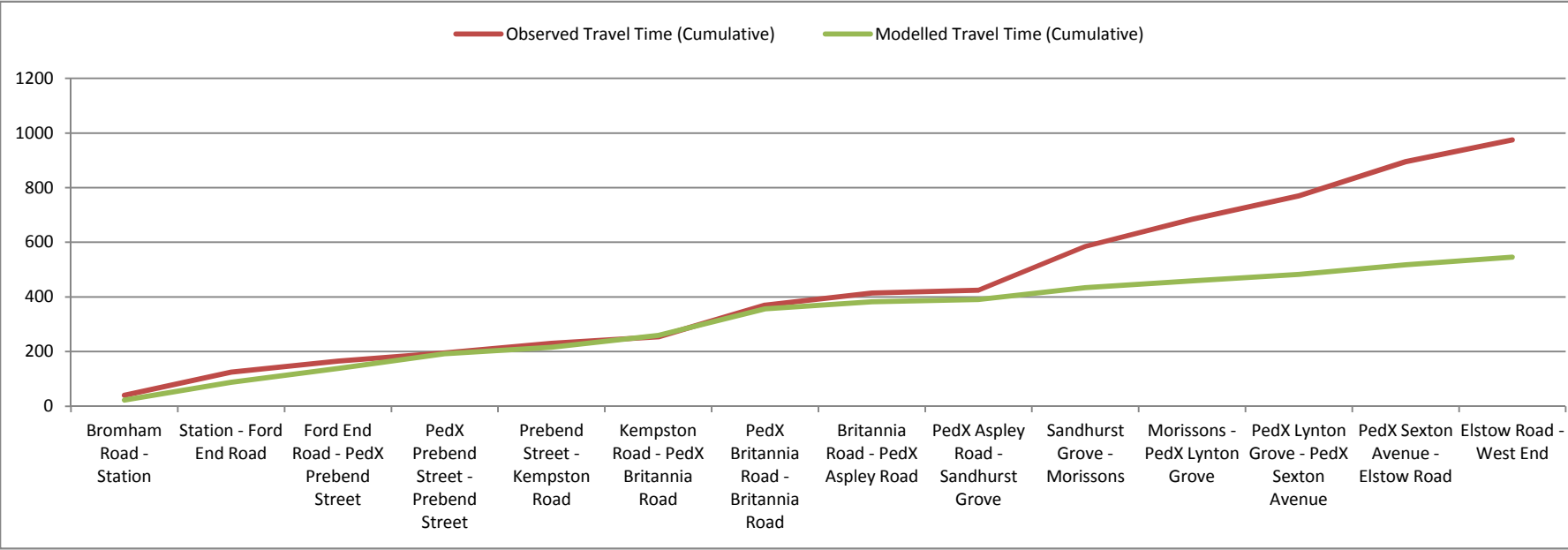


Figure A.12 - 2014 BY-PM Peak Hr (17-18) - Route 3 Northbound Travel Time Validation

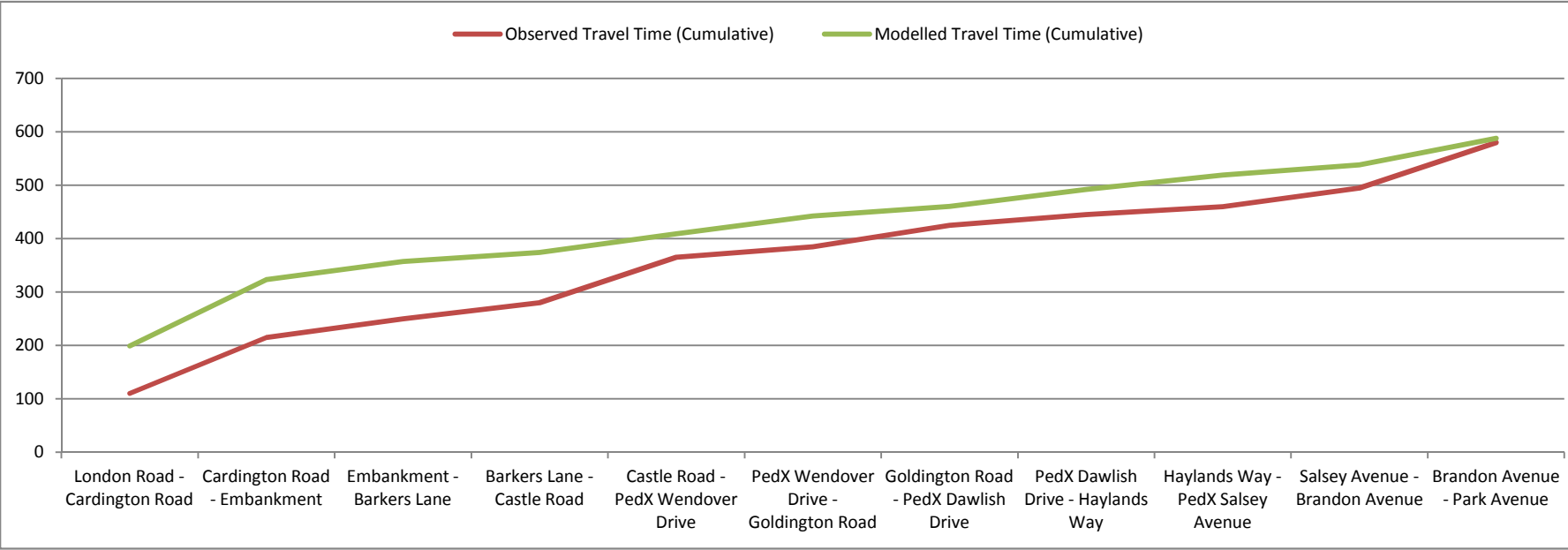


Figure A.13 - 2014 BY-PM Peak Hr (17-18) - Route 3 Southbound Travel Time Validation

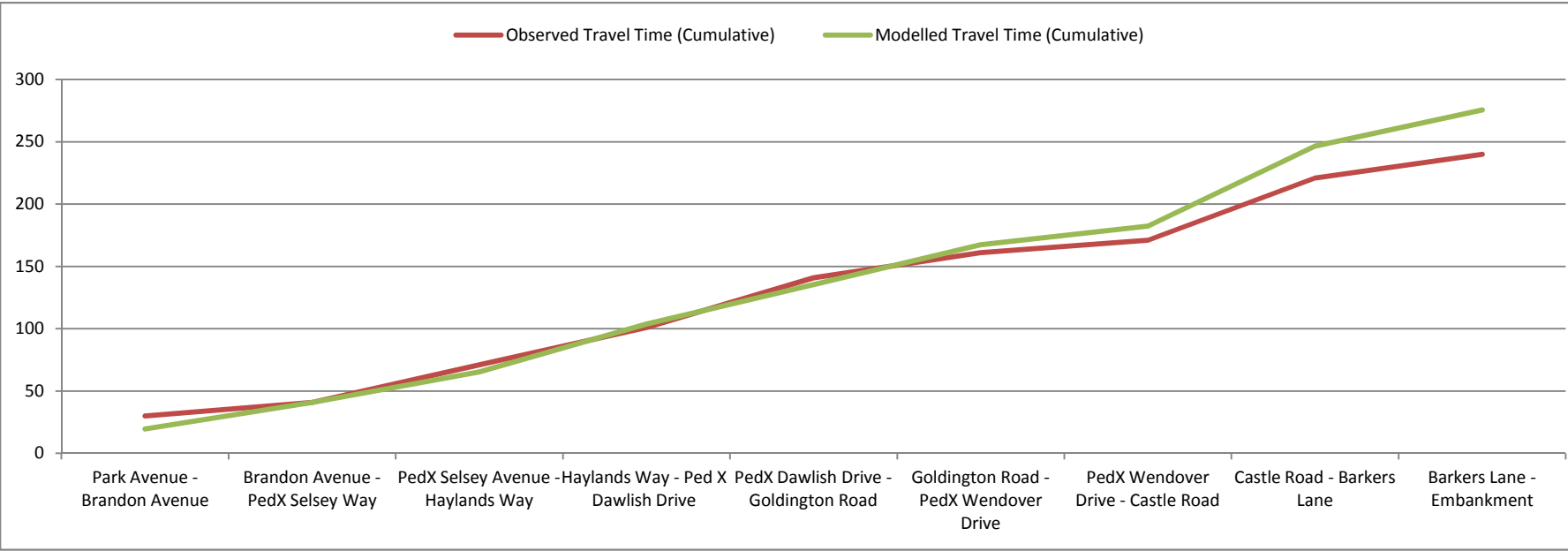


Figure A.14 - 2014 BY-PM Peak Hr (17-18) - Route 4 Northbound Travel Time Validation

