# The Lake Lothing (Lowestoft) Third Crossing Order 201[*]

Lake Lothing THIRD CROSSING

## Document 7.2: Transport Assessment

# Appendix G
# Operational Model Report

Author: Suffolk County Council

REPORT N$^{O}$ 62240712-TP1

# LAKE LOTHING THIRD CROSSING

## VISSIM OPERATIONAL MODEL

CONFIDENTIAL

MAY 2018

# LAKE LOTHING THIRD CROSSING

## VISSIM OPERATIONAL MODEL

**Suffolk County Council**

**Report**
**Confidential**

Project no: 62240712-TP1
Date: May 2018

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# 1 INTRODUCTION

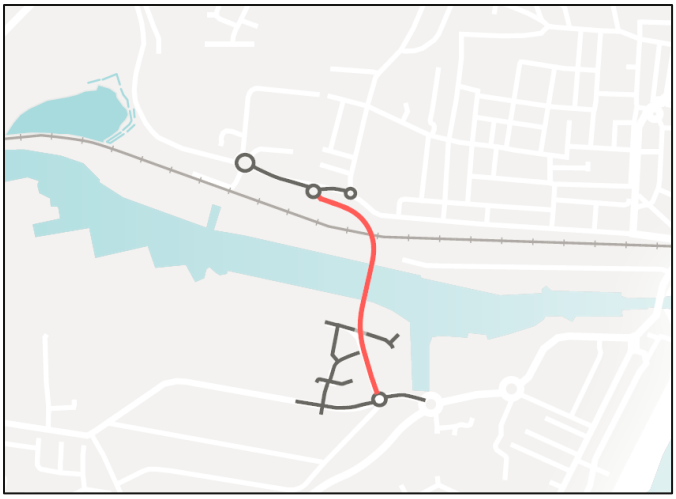
## 1.1 OVERVIEW

Lake Lothing in Lowestoft is currently traversed by two bridges, separated by a distance of 3km, the A47 Bascule Bridge (bordering the town centre) and the western Mutford Bridge (just south of a level rail crossing).

The proposed third The Lake Crossing, illustrated in Figure 1-1, would be a north-south aligned bridge that would connect a new roundabout on Denmark Road (east of the existing Peto Way / Denmark Road roundabout) and Riverside Road to the south of the Lake. It would span both the railway line and The Lake.

The centrally located third crossing would enable traffic to travel easily between the Northern Spine Road (Peto Way) and the Southern Link Road (Tom Crisp Way) and provide relief to the existing bridges.

**Figure 1-1: Proposed scheme**



Provision of an extra crossing would reduce congestion, helping Lowestoft to attract investment and achieve its full potential as a place in which to live and work. With regards to the impact on the adjoining network, it is expected that the proposed scheme would:

- Provide the capacity needed to accommodate planned growth;
- Reduce congestion and delays on the existing bridges over The Lake;
- Reduce congestion and improve accessibility both in the north town centre and south Kirkley shopping and business area.

A microsimulation model using VISSIM has been developed to represent existing traffic conditions and also assess the potential impacts of the proposed scheme on the local road network.

A VISSIM model is able to accurately model on-street behaviour and network capacity issues such as lane usage and exit blocking compared to conventional models such as LINSIG, ARCADY and SATURN.

This document outlines the development of the Base VISSIM model and summarises the impacts for a 2022 forecast year in terms of journey times, traffic volumes and network performance on key routes for various bridge operation scenarios.

## 1.2 MODEL EXTENT

The model boundary, as shown in Figure 1-2, encompasses the A12/A47 corridor to the east, a section of the A146 corridor to the west and the A1144 to the north of Lowestoft town centre.

**Figure 1-2: VISSIM Model Coverage**

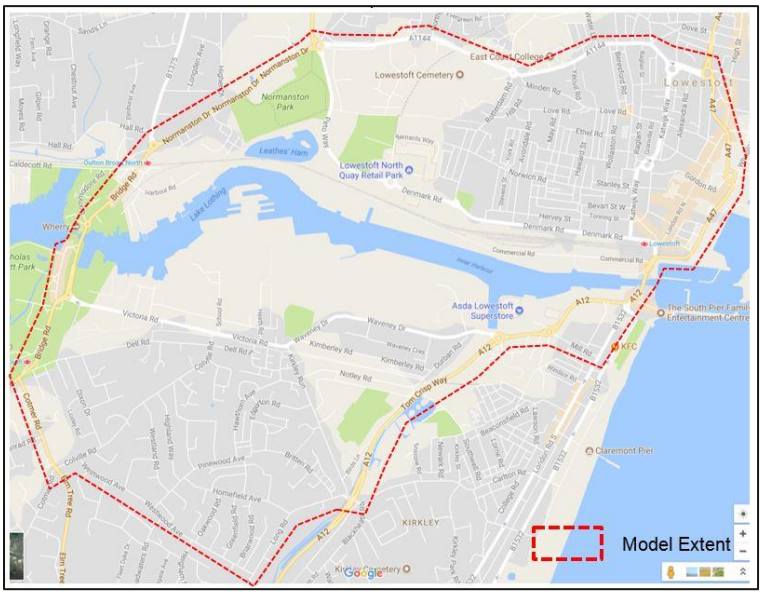
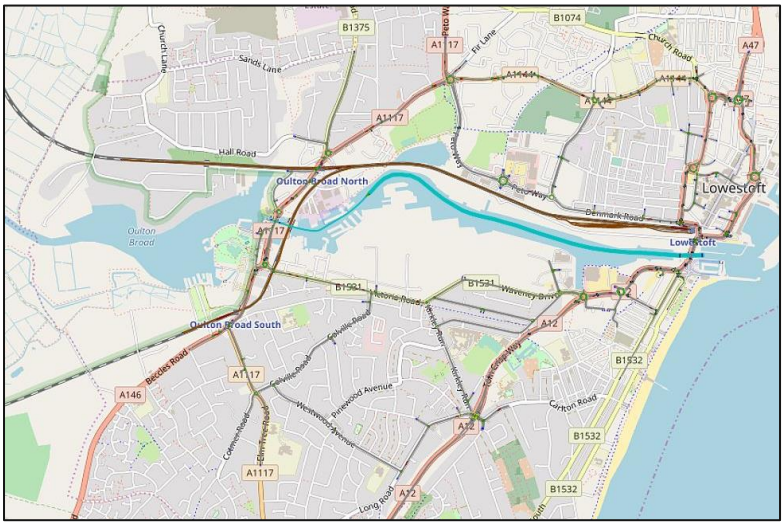



Figure 1-3 demonstrates that the VISSIM base year model network includes the strategic road network together with sections of the local road network. The rail tracks and waterways are also shown on the plan.

**Figure 1-3: VISSIM Model Network**



## 1.3 MODEL DATA

The Base year model has been developed from a VISSIM model originally produced by AECOM using April 2015 survey data. The model has been updated using demand matrices from the 2015 base Local Area SATURN model produced by WSP.

The SATURN Base model was developed from a wide range of data including observed data from ANPR surveys, Automatic Traffic Counts (ATC) and Manual Classified Counts (MCC).

The VISSIM base model was calibrated using MCC surveys on 17 key junctions commissioned in April 2015.

For the purpose of the model validation, a comprehensive set of ATC data, recorded in 2015 across nine key corridors, has been used. In addition, journey time data, obtained from Traffic Master between September 2015 to June 2016 covering both time periods (AM and PM) was used.

## 1.4 MODELLING TIME PERIOD

The peak hour time period for the model is consistent with the WSP Local Area Model as follows:

- AM Peak (08:00 – 09:00)
- PM Peak (17:00 – 18:00)

## 1.5 MODEL PARAMETERS

VISSIM software (version 8.0.10) has been used to develop the operational model. In addition to traffic flow data, VISSIM required the following inputs:

- speed limits,
- speed reduction areas,
- public transport information,
- geometric data including road features and junction features,
- detailed junction control parameters,

Most of these parameters are consistent with the VISSIM model provided by AECOM. Where the model has been extended to include additional nodes, data has been sourced from the Local Area SATURN Model and on-site observations.

## 1.6 MODEL DEVELOPMENT PROCESS

The modelling process for this study involved the following stages:

- Review the existing VISSIM and SATURN models to verify compatibility
- Amend the existing VISSIM network to include the additional network details.
- Calibrate and validate the updated 2015 VISSIM Base model.
- Develop future year Do-Minimum (DM) and Do-Something (DS) scenarios.
- Assess alternative scenarios for bridge lifting in terms of impact on journey time and traffic volumes on key routes and overall network performance.

# 2 BASE MODEL DEVELOPMENT

## 2.1 TRIP DEMAND DEVELOPMENT

The VISSIM model comprised of 65 zones. The matrix building process involved:

- Constructing O/D matrices by obtaining cordon traffic demands from the WSP Local Area SATURN Model for both Base, DM and DS scenarios
- Aggregate demand matrices into Lights (Cars, LGV) and Heavies (OGV1 & OGV2).
- Segregating matrices into six 15-minute time intervals including a 15-minute pre-load and post-peak demand.

## 2.2 ASSIGNMENT

The VISSIM model has been developed to run as dynamic assignment, which allows traffic to choose the route with the least cost at the time they enter the model network.

The traffic demand in a dynamic assignment is modelled with origin-destination matrices. The driver route choice between origin-destination pairs through the network is determined through a series of iterated simulations, where the best path is calculated. The model iteration continues until there are no more significant changes from one iteration to the next in the total journey times in the network; thus convergence is achieved and final routes are determined.

## 2.3 CONVERGENCE

TfL's Traffic Modelling Guidelines[1] suggests that *Convergence will be deemed to have been satisfactorily achieved when 95% of travel times on all paths change by less than 20% for at least four consecutive iterations*. Both AM and PM networks show 92% of travel times on all paths change by less than 20% for at least four consecutive iterations. This is considered an acceptable level of convergence for microsimulation.

Once the model achieved convergence, the model was run using multiple random seeds, all based on the finalised cost and path files.

## 2.4 RANDOM SEEDS

Traffic microsimulation models the random variations in traffic flows using a stochastic process through the use of seed runs. Evaluation of flows and journey times from the model were therefore based on the average of the results obtained from a set of simulation runs with different random seeds.

For the Lowestoft VISSIM model, the AM and PM networks were run 20 times, each with a random seed. TfL modelling guidelines state that, as a guide, 10 simulation runs are normally sufficient to produce reliable results. The guidelines also state that the actual seed number has no significance. In other words, the modeller may choose any seed numbers.

[1] Developed by TfL in 2010 and is deemed a best practice guidance manual for VISSIM modelling

Table 2-1 shows the random seeds used in the modelling. These seeds were chosen as they produce results close to the survey data.

**Table 2-1 – Random Seeds Used for model evaluation**

| TIME PERIOD | RANDOM SEEDS USED |
|---|---|
| AM | 10, 20, 30,40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200 |
| PM | 10, 20, 30,40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200 |

## 2.5 VALIDATION CRITERIA

The criteria for model validation are based upon WebTAG[2] unit 3.1 and are presented in Table 2-2.

For link flows, numerical and percentage difference and GEH were assessed. The criteria were applied to both link flows and turning flows. For journey times, numerical and percentage difference were assessed.

**Table 2-2 – WebTAG Validation Criteria and Acceptability Guidelines**

| CRITERIA AND MEASURES | ACCEPTABILITY GUIDELINE |
|---|---|
| 1. Individual flows within 15% for flows 700 – 2700 vehicles per hour (vph) | > 85% of cases |
| 2. Individual flows within 100 vph for flows <700 vph | > 85% of cases |
| 3. Individual flows within 400 vph for flows > 2700 | > 85% of cases |
| 4. GEH statistic: Individual flows GEH < 5 | > 85% of routes |
| 5. Journey times within 15% (or 1 minute if higher) | > 85% of routes |

TAG (January 2014) guidance states that the two criteria ('Flow' and 'GEH'[3]) are broadly consistent and traffic flows that meet either criterion should be regarded as satisfactory. This means that either the flow or GEH criteria should be met in 85% of cases.

The GEH statistic is defined in TAG as:

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

Where: M = modelled value

C = observed value

The GEH statistics takes into account the magnitude of flow when determining whether another flow value is significantly different from it. This accepts that roads with higher flow volumes can therefore have larger flow differences than roads with flow volumes. Modelled flows are considered acceptable when their GEH is below the value of 5.

[2] TAG Unit M3.1 Highway Assignment Modelling – https://www.gov.uk/guidance/transport-analysis-guidance-webtag
[3] The GEH statistic was created by G.E. Havers and the term GEH is taken from his initials

## 2.6 MODEL CALIBRATION BY TURNING FLOWS

Turning flows from MCC surveys were used to calibrate the model. These flows were taken from the turning counts from the 2015 surveys for the locations listed in Table 2-3 and shown in Figure 2-1.

**Table 2-3 – List of Turning Count Survey Junctions for Calibration**

| SITE | JUNCTION |
|---|---|
| 1A | Station Square / Waveney Rd |
| 1B | Station Square / Commercial Rd |
| 2 | London Rd / Belvedere Rd (A12) |
| 3 | Kirkley Rise / A12 / ASDA access |
| 4 | Denmark Rd / Katwijk Way |
| 5 | Clapham Rd S / Katwijk Way |
| 6 | Battery Green Rd / Waveney Rd |
| 7 | A12 / Blackheath Rd / Long Rd |
| 8 | Horn Hill / Maconochie Way / A12 / Waveney Dr |
| 10 | Victoria Rd / Bridge Rd / Saltwater Way |
| 11 | Bridge Rd / Normanston Dr |
| 12 | Peto Way / Normanston Dr |
| 14 | Battery Green Rd / Gordon Rd / Whapload Rd |
| 15 | A12 / Jubilee Way / St Peters St |
| 16 | A1144 / St Peters St / Katwijk Way |
| 17 | A146 Beccles Rd / A1117 Cotmer Rd |

**Figure 2-1 – Turning count Survey locations for Calibration**

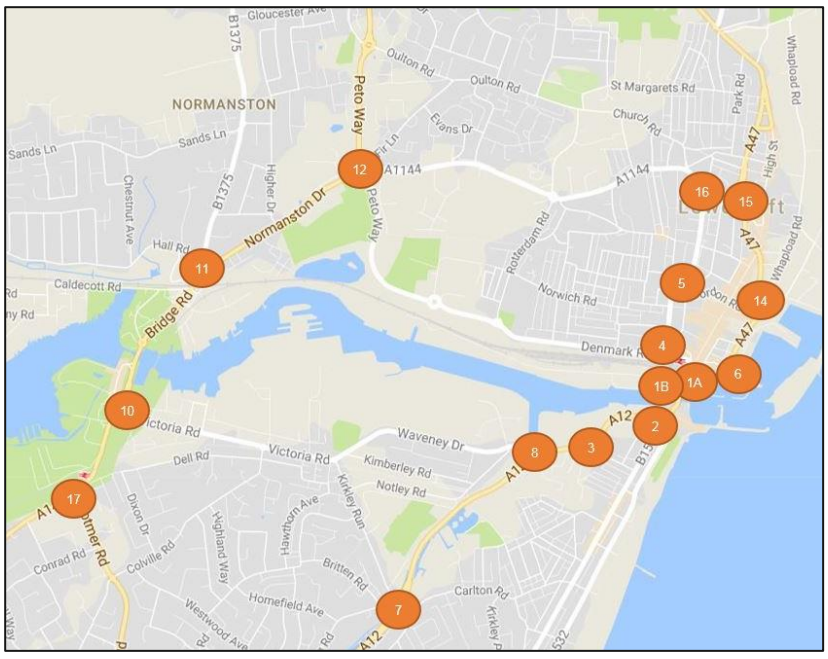



Table 2-4 shows the percentage of lights and heavies that pass the WebTAG criteria (either flow or GEH criteria).

**Table 2-4 Turning Count Calibration Results**

| TIME PERIOD | CRITERIA | LIGHTS | HGV |
|---|---|---|---|
| AM | WebTAG Criteria | 94% | 94% |
| PM | WebTAG Criteria | 96% | 96% |

The model turning flows for lights and heavy vehicle were considered to calibrate satisfactorily against the observed turning count flows in both periods.

## 2.7 VALIDATION BY LINK FLOWS

**Observed traffic flows were used to validate the model. Flows were taken from the 2015 ATC survey. The link count locations are listed in Table 2-5 and are illustrated in**

Figure 2-2.

**Table 2-5 – List of ATC Locations for Link Flow Validation**

| SITE | JUNCTION |
|---|---|
| Site 8 | A12 Tom Crisp Way ATC |
| Site 11 | Kirkley Run ATC |
| Site 12 | A146 Waveney Drive ATC |
| Site 15 | Katwijk Way ATC |
| Site 16 | A12 Battery Green Road ATC |
| Site 19 | Denmark Road ATC |
| Site 21 | Peto Way ATC |
| Site 22 | A1117 Normanston Drive ATC |
| Site 23 | A1144 Normanston Drive |

**Figure 2-2 – ATC Validation Count Locations**

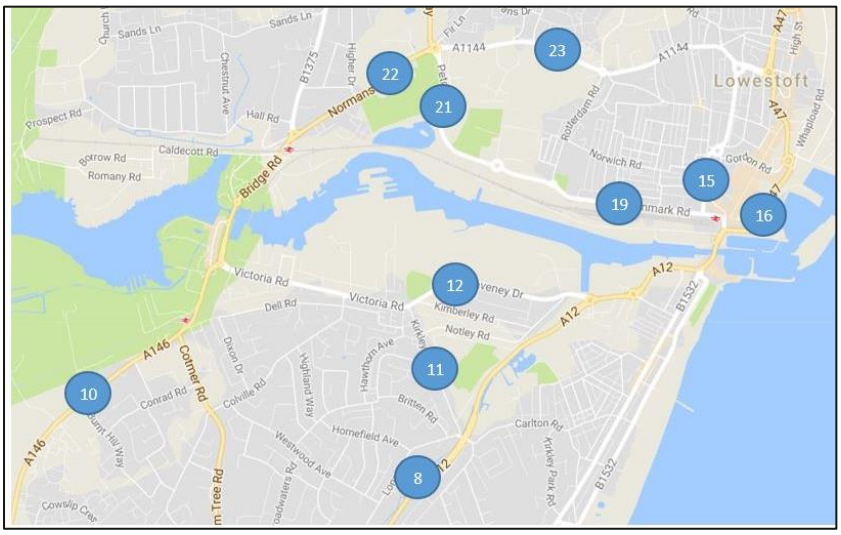



Table 2-6 shows the percentage of lights and heavies that meet the WebTAG criteria for flow and GEH criteria.

**Table 2-6 – Link Flow Validation Results**

| TIME PERIOD | CRITERIA | LIGHTS | HGV |
|---|---|---|---|
| AM | GEH | 78% | 61% |

| TIME PERIOD | CRITERIA | LIGHTS | HGV |
|---|---|---|---|
| | Flow criteria | 89% | 100% |
| PM | GEH | 89% | 100% |
| | Flow criteria | 67% | 100% |

The model link flows for lights and heavy vehicle are considered to validate satisfactorily against the observed flows in both AM and PM periods.

Detailed calibration and validation results for individual sites are provided in Appendix A.

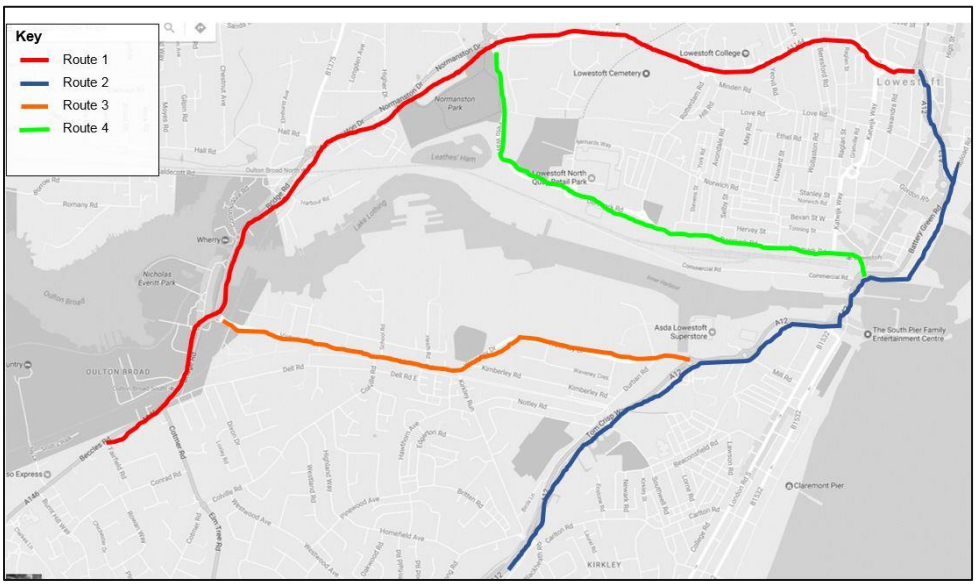
## 2.8 JOURNEY TIME VALIDATION

The journey time validation was undertaken to assess the ability of the model to represent journey times on key routes in the study area. The journey time assessment also provided an independent check of the validity of the model and to check if the junction delays are replicated accurately. The journey time routes are listed in Table 2-7 and illustrated in Figure 2-3.

**Table 2-7 – List of Journey Time Routes used for Validation**

| ROUTE | DESCRIPTION |
|---|---|
| **1 NB** | A146-Fairfield Rd Jn to A12 Katwijk Way / A1144 St Peter's St Jn |
| **1 SB** | A12 Katwijk Way / A1144 St Peter's St Jn to A146-Fairfiled Rd Jn |
| **2 NB** | A12 Tom Crisp Way / Blackheath Rd Jn to A12 St Peters St / Jubilee Way Jn |
| **2 SB** | A12 St Peters St / Jubilee Way Jn to A12 Tom Crisp Way / Blackheath Rd Jn |
| **3 EB** | A1117 / Victoria Rd Jn to A12 Tom Crisp Way / B1531 Waveney Drive |
| **3 WB** | A12 Tom Crisp Way / B1531 Waveney Drive to A1117 / Victoria Rd Jn |
| **4 WB** | A12 Waveney Rd / Station Square Jn to A1117 Normanston Drive / Peto Way Jn |
| **4 EB** | A1117 Normanston Drive / Peto Way Jn to A12 Waveney Rd / Station Square Jn |

**Figure 2-3 – Journey Time Route for Validation**




The journey time validation results are presented in Table 2-8 and Table 2-9 for the AM and PM periods respectively. The AM and PM period shows a good level of journey time validation, with seven out of eight routes, or 87.5% of routes passing the WebTAG criteria as set out in Table 2-2.

**Table 2-8 – AM Journey Time Validation Results**

| ROUTE | SURVEY (SEC) | MODEL (SEC) | DIFFERENCE (SEC) | DIFFERENCE (%) | STATUS |
|---|---|---|---|---|---|
| **1 NB** | 643 | 492 | -151 | 23.5% | Fail |
| **1 SB** | 528 | 547 | 19 | 3.7% | Pass |
| **2 NB** | 428 | 470 | 42 | 9.8% | Pass |
| **2 SB** | 378 | 398 | 20 | 5.4% | Pass |
| **3 EB** | 204 | 209 | 5 | 2.5% | Pass |
| **3 WB** | 246 | 212 | -33 | 13.6% | Pass |
| **4 WB** | 203 | 241 | 38 | 18.6% | Pass |
| **4 EB** | 294 | 294 | 0 | 0.0% | Pass |

**Table 2-9 – PM Journey Time Validation Results**

| ROUTE | SURVEY (SEC) | MODEL (SEC) | DIFFERENCE (SEC) | DIFFERENCE (%) | STATUS |
|---|---|---|---|---|---|
| **1 NB** | 626 | 555 | -71 | 11.3% | Pass |
| **1 SB** | 606 | 561 | -45 | 7.4% | Pass |
| **2 NB** | 487 | 418 | -69 | 14.2% | Pass |
| **2 SB** | 379 | 440 | 60 | 15.9% | Pass |
| **3 EB** | 220 | 194 | -26 | 11.8% | Pass |
| **3 WB** | 320 | 230 | -90 | 28.2% | Fail |
| **4 WB** | 205 | 242 | 37 | 17.9% | Pass |
| **EB** | 336 | 275 | -60 | 17.9% | Pass |

From the above validation results it was concluded that the VISSIM model provided a reliable base for the production of future forecasts for scheme assessment.

# 3 EXISTING AND FORECAST YEAR TRAFFIC CONDITION

## 3.1 EXISTING (BASE 2016) SCENARIO

The 2016 Base VISSIM model represents the existing level of congestion and delays in the network. This section highlights sections within the network that experiences congestion resulting in queues and delays in addition to delays on key routes within the existing network.

Overall, the dominant traffic flow on the strategic A47/A12 Battery Green Road corridor is towards the northbound direction in the AM and the southbound directions in the PM peak. Consequently the VISSIM model shows that the impact of bridge closures and delays at signals along this corridor results in longer queues in the northbound direction in the AM and in the opposite direction in the PM.

On the A117 Normanston Drive, the traffic levels in the AM and PM are similar. However, the closure of traffic at the railway crossing compounded with the Mutford bridge lift results in severe delays.

### BASE AM PEAK

**Figure 3-1: Base AM congestion at A47 \ Station Square Junction**

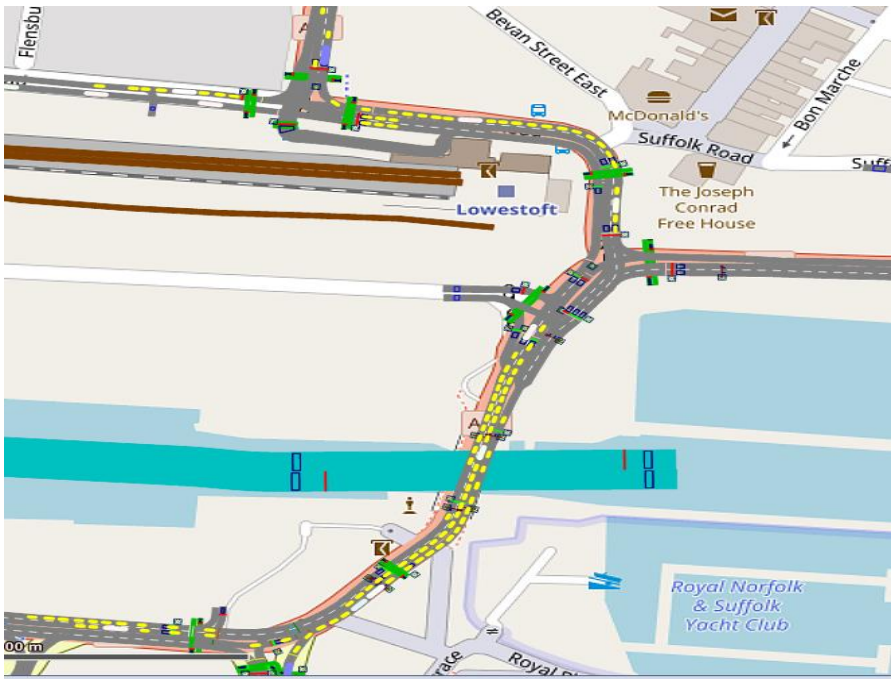



Figure 3-1 shows a long queue on A47/A12 northbound direction. London Road south, northbound approach has shorter green time compared to A47 and has significant queue on this corridor.

**Figure 3-2: Base AM congestion at Normanston Drive \ Golerston Road**


Figure 3-2 shows that the traffic movement on A1117 (Normanston Drive/ Bridge Road) makes it difficult for traffic from B1375 to enter the gyratory. Moreover, the short flare for left turners on the B1375 holds up traffic wanting to turn left.

**Figure 3-3: Base AM congestion at Bridge Road level crossing**


Figure 3-3 shows long queue in Bridge Road, both southbound and northbound when the level crossing is in operation. However, this queue disperses quickly once the level crossing is open to road traffic.

## CONGESTION IN THE BASE PM PEAK

**Figure 3-4: Existing congestion at Denmark Road/Station Square/Belvedere Road**


Figure 3-4 shows traffic queuing at the Station Square/Waveney Road junction, and this blocks back to the north all the way to the Denmark Road/A47 junction. At this point, the southbound Katwijk Way approach is on green but the traffic cannot exit due to the queuing along Denmark Road. The southern section also blocks back across the bridge from the Station Square junction, impacting upon the Pier Terrace/Belvedere Road junction.

**Figure 3-5: Base PM Congestion at Normanston Drive \ Golerston Road**


Figure 3-5 shows significant queueing along Bridge Road, across multiple junctions due to the level crossing. This compounds the problems of the southbound Gorleston Road entry arm. The entry onto the Bridge Road/Normanston Drive roundabout queues along the entire length due to the amount of opposing traffic leading to very few gaps.

The Bridge Road section on A117 experiences long delays. However, the queues are generally low during “normal” operational network conditions. This queuing is exacerbated significantly when the level crossing is closed to traffic, or when the Lake crossings prevent the free flow of traffic (such situations will be described in later text).

## 3.2 FORECAST YEAR 2022 “WITHOUT SCHEME”

In the 2022 AM scenario, the locations where the delays occur are consistent with the base year. With forecast year traffic growth, queues on the A12 extend back beyond the ASDA roundabout (approx. 650m) as a result of the A47 Bascule bridge lift, as shown in Figure 3-6.

**Figure 3-6: Congestion in the DM “without scheme” scenario in 2022 AM**


**Figure 3-7: Congestion in the DM “without scheme” scenario in 2022 PM**


In the PM, queues along Denmark Road (WB) extend back to Clemence Street (approx. 800m) as shown in Figure 3-7. This also leads to exit blocking all along Katwijk Way southbound approach extending back to the next roundabout.

Table 3-1 and Table 3-2 shows a comparison of delays on key routes in the Base 2016 scenario and the forecast year 2022 scenarios. In the forecast year DM AM and PM scenario, there are considerable delays to vehicles, particularly those travelling along the A12 corridor. This delay is aggravated when the A47 Bascule Bridge is lifted.

**Table 3-1 – Delay (mm:ss) on key strategic routes in 2016 and 2022 DM (without Scheme) AM**

| ROUTE | DESCRIPTION | 2016 5MIN BRIDGE LIFT | 2016 10MIN BRIDGE LIFT | DM_2022 5MIN BRIDGE LIFT | DM_2022 10MIN BRIDGE LIFT |
|---|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 01:38 | 01:29 | 01:41 | 01:41 |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 01:48 | 01:10 | 00:53 | 00:58 |
| Route 2 A | A12 (NB) | 03:22 | 05:43 | 03:48 | 06:12 |
| Route 2 B | A12 (SB) | 01:57 | 03:20 | 02:31 | 04:21 |
| Route 3 A | Waveney Drive (EB) | 00:39 | 01:06 | 00:50 | 01:26 |
| Route 3 B | Waveney Drive (WB) | 00:23 | 00:24 | 00:34 | 00:35 |
| Route 4 A | Denmark Road (WB) | 01:23 | 00:43 | 00:45 | 00:56 |
| Route 4 B | Denmark Road (EB) | 01:59 | 03:08 | 04:19 | 06:43 |

**Table 3-2 – Delay (mm:ss) on key strategic routes in 2016 and 2022 DM (without Scheme) PM**

| ROUTE | DESCRIPTION | 2016 5MIN BRIDGE LIFT | 2016 10MIN BRIDGE LIFT | DM_2022 5MIN BRIDGE LIFT | DM_2022 10MIN BRIDGE LIFT |
|---|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 00:55 | 01:02 | 01:01 | 01:51 |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 01:07 | 01:01 | 01:36 | 01:43 |
| Route 2 A | A12 (NB) | 02:48 | 04:57 | 04:25 | 06:43 |
| Route 2 B | A12 (SB) | 04:04 | 07:09 | 04:54 | 06:54 |
| Route 3 A | Waveney Drive (EB) | 00:26 | 00:23 | 00:34 | 00:45 |
| Route 3 B | Waveney Drive (WB) | 00:58 | 00:51 | 01:07 | 01:07 |
| Route 4 A | Denmark Road (WB) | 00:38 | 00:53 | 00:40 | 00:42 |
| Route 4 B | Denmark Road (EB) | 03:04 | 04:40 | 03:04 | 04:19 |

** 'Lift' duration refers to A47 bascule bridge only*

The above table shows that the average delay between A12 Tom Crisp Way/Blackheath Rd Junction and A12 St Peters St / Jubilee Way Junction in the Base scenario is around 4 to 5 minutes in both time periods and increases to around 7 mins in 2022 forecast year.

In the base year, there are significant delays at junction of Denmark Road and A47/A12 particularly when the bridge is lifted and the road is closed to general traffic. These queues are likely to be worse in the 2022 forecast year.

The average delay on Denmark Road is around 3 to 4 minute in the Base year and it increases to a maximum of 7 minutes in the 2022 AM scenario

# 4 SCHEME ASSESSMENT

## 4.1 PROPOSED SCHEME

The proposed “third crossing” of Lake Lothing would be located centrally between the two existing bridges. The proposed scheme will be a single carriageway, with separate footways and cycle tracks linked to existing footway and cycle networks.

The proposed scheme would allow the passage of shipping within the inner harbour. When closed, the bridge would have a clearance of at least 12m which would enable smaller boats to pass and consequently would have to open less frequently than the existing Bascule Bridge at the harbour entrance.

## 4.2 FORECAST YEAR ASSESSMENT

The forecast year assessment has been carried out using demand matrices extracted from the SATURN local area model developed by WSP in October 2017.

Re-routeing a result of the proposed scheme within the Local area SATURN model, attracts additional traffic to the study area resulting in overcapacity on the network. This is believed to be unrealistic as there is likely to be diversions over a wider area and modal shift, resulting in flows less than those predicted in the SATURN model DS scenario.

Demand from the SATURN forecast year 2037 results in capacity issues within the network if the supply side is maintained at the existing levels. The junctions of Victoria Road-Colville Road and A12 Tom Crisp Way / Blackheath Road, in particular, contributes significantly to the delay. Sensitivity tests with the 2037 forecast year matrix and with existing capacity levels is presented in Section 4.7 and shows capacity issues at key locations within the network

Therefore, the forecast year bridge lifting scenarios have been assessed using the DM 2022 matrix from the SATURN model for the AM and PM peak hours.

## 4.3 ASSESSMENT SCENARIOS

The three bridge crossings across the Lake are likely to have a number of scheduled lifts and ad hoc lifts. While there could be occasions where the three bridge lifts are co-ordinated, there may be other occasions where only the existing A47 Bascule Bridge and the proposed scheme bridge are lifted. Therefore, a number of scenarios, with different lifting times and combinations are possible depending on the size and the number of vessels crossing.

To assess the impact of the opening of the three bridges and the subsequent closure to the traffic along the route during the lifting operation of the bridge, three scenarios have been modelled and compared against the DM. The DM and DS scenarios include:

| MODEL RUNS | SCENARIOS |
|---|---|
| **DM_2022_5MIN** | Do Minimum – West Bridge Open; Proposed scheme Open; A47 Bascule Bridge Lifted (5 mins) |
| **DM_2022_10MIN** | Do Minimum – West Bridge Open; Proposed scheme Open; A47 Bascule Bridge Lifted (10 mins) |
| **DS_2022_SC-5** | Scenario 1 - West Bridge Open; Proposed scheme Lifted (6 mins); A47 Bascule Bridge Lifted (5 mins) |

| | |
|---|---|
| **DS_2022_SC-6** | Scenario 2 - West Bridge Open; Proposed scheme Lifted (6 mins); A47 Bascule Bridge Lifted (10 mins) |
| **DS_2022_SC-7** | Scenario 3 - West Bridge Open; Proposed scheme Lifted (10 mins); A47 Bascule Bridge Lifted (10 mins) |

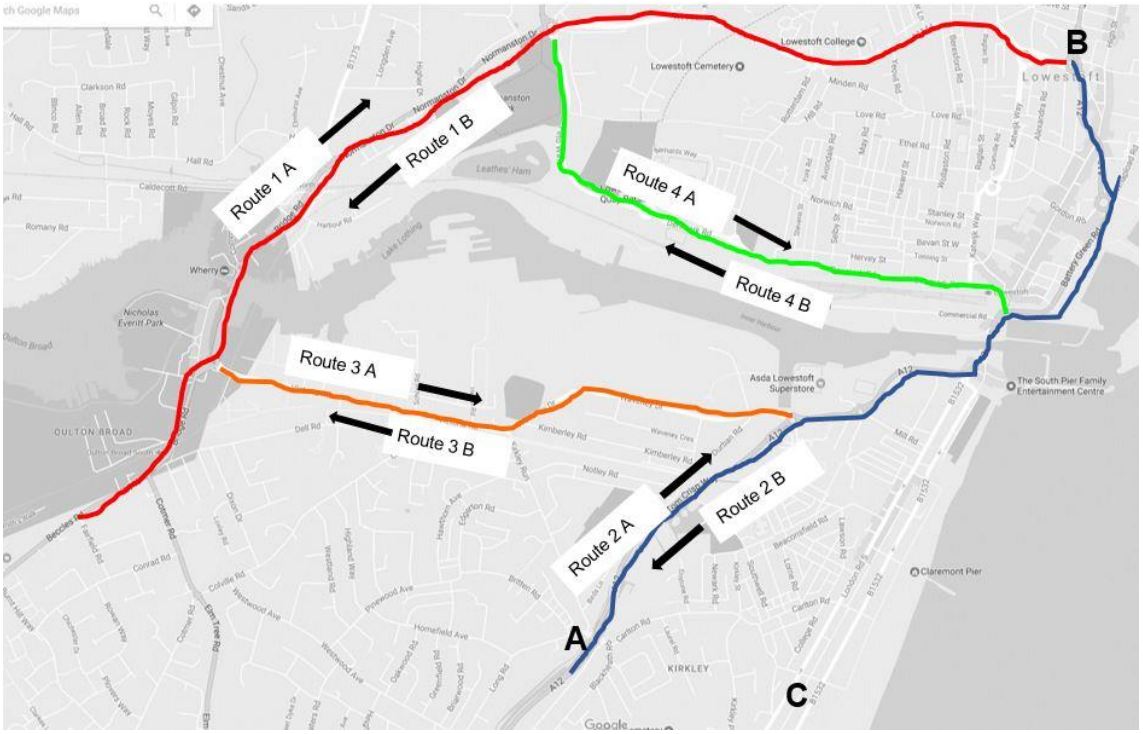
## 4.4 JOURNEY TIME COMPARISON

Journey time evaluations have been undertaken for key north-south (N-S) movements and strategic routes as shown in Figure 4-1 and evaluated as follows:

i. The comparison of the journey time for N-S movements between DM and DS scenarios provides an overall impact on journey time for vehicles between key origin to destination that could be using any route (existing route and proposed scheme).

ii. The comparison of journey time on key strategic routes between the DM and DS scenarios provides the change in journey time on a particular route with the proposed scheme in operation.

**Figure 4-1 – Key Journey Time Route for Scheme Evaluation**




## SCENARIO 1 – WEST BRIDGE OPEN; PROPOSED SCHEME LIFTED (6 MINS); A47 BASCULE BRIDGE LIFTED (5 MINS)

Table 4-1 shows the comparison of AM journey times for Scenario 1 for key north-south movements with and without the proposed scheme.

**Table 4-1 - Comparison of Journey time (sec) between key N-S movements - Scenario 1 AM**

| ROUTE | DESCRIPTION | DM_2022_5MIN | DS_2022_SC-5 | % DIFF |
|---|---|---|---|---|
| A to B | A12 Tom Crisp Way to A47 Jubilee Way | 580 | 523 | -9.8% |

| ROUTE | DESCRIPTION | DM_2022_5MIN | DS_2022_SC-5 | % DIFF |
|---|---|---|---|---|
| B to A | A47 Jubilee Way Jn to A12 Tom Crisp Way | 497 | 461 | -7.3% |
| C to B | London Rd South to A47 Jubilee Way | 576 | 315 | -45.4% |
| B to C | A47 Jubilee Way to B1532 Marine Parade | 307 | 278 | -9.5% |

Table 4-1 shows that there is an overall decrease in journey time on all routes with the proposed scheme in place compared to the DM Scenario, with a significant decrease in journey time for traffic between London Rd South and A47 Jubilee Way (45.4 %) which is one of the key strategic route in Lowestoft.

Table 4-2 shows a change in AM journey time on other routes with and without the proposed scheme.

**Table 4-2 - Comparison of Journey time (sec) on key existing routes in DM and DS - Scenario 1 AM**

| ROUTE | DESCRIPTION | DM_2022_5MIN | DS_2022_SC-5 | % DIFF |
|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 570 | 503 | -11.6% |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 544 | 477 | -12.5% |
| Route 2 A | A12 (NB) | 540 | 494 | -8.5% |
| Route 2 B | A12 (SB) | 476 | 454 | -4.6% |
| Route 3 A | Waveney Drive (EB) | 217 | 238 | 9.3% |
| Route 3 B | Waveney Drive (WB) | 218 | 209 | -4.2% |
| Route 4 A | Denmark Road (WB) | 235 | 219 | -6.5% |
| Route 4 B | Denmark Road (EB) | 486 | 234 | -51.8% |

The above table shows that there is overall reduction in journey time on almost all routes. The slight increase in journey time on Waveney Drive (EB) is caused by the increased volume of traffic accessing the proposed scheme giving way to traffic on the new roundabout.

Table 4-3 shows the comparison of PM journey times for key north-south movements with and without the proposed scheme.

**Table 4-3 - Comparison of Journey time (sec) between key N-S movements - Scenario 1 PM**

| ROUTE | DESCRIPTION | DM_2022_5MIN | DS_2022_SC-5 | % DIFF |
|---|---|---|---|---|
| A to B | A12 Tom Crisp Way to A47 Jubilee Way | 630 | 508 | -19.4% |
| B to A | A47 Jubilee Way Jn to A12 Tom Crisp Way | 629 | 666 | 5.9% |
| C to B | London Rd South to A47 Jubilee Way | 672 | 356 | -47.0% |
| B to C | A47 Jubilee Way to B1532 Marine Parade | 365 | 359 | -1.7% |

Table 4-3 shows there is an overall decrease in journey time on most routes and is consistent with the AM scenario. There is a significant decrease in journey time for traffic between London Rd South and A47 Jubilee Way (47%).

Table 4-4 shows a change in PM journey time on other existing routes with and without proposed scheme.

**Table 4-4 - Comparison of Journey time (sec) on key existing routes in DM and DS - Scenario 1 PM**

| ROUTE | DESCRIPTION | DM_2022_5MIN | DS_2022_SC-5 | % DIFF |
|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 551 | 556 | 1.0% |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 589 | 597 | 1.3% |
| Route 2 A | A12 (NB) | 585 | 455 | -22.3% |
| Route 2 B | A12 (SB) | 605 | 629 | 4.1% |
| Route 3 A | Waveney Drive (EB) | 205 | 234 | 14.3% |
| Route 3 B | Waveney Drive (WB) | 252 | 236 | -6.1% |
| Route 4 A | Denmark Road (WB) | 233 | 240 | 2.9% |
| Route 4 B | Denmark Road (EB) | 400 | 297 | -25.9% |

The above table shows a significant decrease in the northbound journey time on A12 (22.3%) and a decrease on journey time on Denmark Road EB (25.9%). There is an increase of journey time on Waveney Drive (EB) (14.3%) and this is consistent with the AM peak scenario.

**Overall, the results shows that in Scenario 1, there is likely to be a substantial benefit on key N-S movements and also on key routes.**

## SCENARIO 2 - WEST BRIDGE OPEN; PROPOSED SCHEME LIFTED (6 MINS); A47 BASCULE BRIDGE LIFTED (10 MINS)

Table 4-5 shows the comparison of AM journey time for Scenario 2 for key north-south movements with and without the proposed scheme.

**Table 4-5 - Comparison of Journey time (sec) between key N-S movements - Scenario 2 AM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-6 | % DIFF |
|---|---|---|---|---|
| A to B | A12 Tom Crisp Way to A47 Jubilee Way | 728 | 574 | -21.2% |
| B to A | A47 Jubilee Way Jn to A12 Tom Crisp Way | 607 | 547 | -9.8% |
| C to B | London Rd South to A47 Jubilee Way | 680 | 454 | -33.2% |
| B to C | A47 Jubilee Way to B1532 Marine Parade | 417 | 363 | -12.9% |

The above table shows that there is an overall decrease in journey time across all key movements with significant savings between London Rd South and A47 Jubilee Way (33.2 %) and A12 Tom Crisp Way to A47 Jubilee Way (21.2%).

Table 4-6 shows the change in AM journey time on other existing routes with and without proposed scheme.

**Table 4-6 - Comparison of Journey time (sec) on key existing routes in DM and DS - Scenario 2 AM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-6 | % DIFF |
|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 569 | 504 | 11.4% |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 549 | 469 | -14.6% |
| Route 2 A | A12 (NB) | 684 | 600 | -12.3% |
| Route 2 B | A12 (SB) | 585 | 539 | -7.8% |
| Route 3 A | Waveney Drive (EB) | 253 | 237 | -6.4% |
| Route 3 B | Waveney Drive (WB) | 219 | 206 | -6.0% |
| Route 4 A | Denmark Road (WB) | 246 | 226 | -8.1% |
| Route 4 B | Denmark Road (EB) | 630 | 317 | -49.7% |

The above table shows that there is an overall decrease in journey time on all route compared to the DM scenario. In particular, traffic along A12 (NB), Denmark Road (EB) and along A146 Fairfield Road/Normanston Drive (SB) experiences a substantial reduction in journey time.

Table 4-7 presents the PM journey times for key north-south movements with and without the proposed scheme.

**Table 4-7 - Comparison of Journey time (sec) between key N-S movements - Scenario 2 PM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-6 | % DIFF |
|---|---|---|---|---|
| A to B | A12 Tom Crisp Way to A47 Jubilee Way | 812 | 530 | -34.8% |
| B to A | A47 Jubilee Way Jn to A12 Tom Crisp Way | 753 | 686 | -9.0% |
| C to B | London Rd South to A47 Jubilee Way | 749 | 454 | -39.4% |
| B to C | A47 Jubilee Way to B1532 Marine Parade | 490 | 457 | -6.7% |

The above table shows that there is an overall reduction in journey time across all the key movements with a significant decrease in journey time for northbound movements to A47 Jubilee Way, consistent with the AM scenario.

Table 4-8 shows the change in PM journey time on other existing routes with and without proposed scheme.

**Table 4-8 - Comparison of Journey time (sec) on key existing routes in DM and DS - Scenario 2 PM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-6 | % DIFF |
|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 601 | 536 | -10.7% |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 597 | 601 | 0.6% |
| Route 2 A | A12 (NB) | 724 | 502 | -30.6% |
| Route 2 B | A12 (SB) | 724 | 767 | 5.9% |
| Route 3 A | Waveney Drive (EB) | 216 | 230 | 6.6% |

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-6 | % DIFF |
|---|---|---|---|---|
| Route 3 B | Waveney Drive (WB) | 251 | 219 | -12.6% |
| Route 4 A | Denmark Road (WB) | 234 | 245 | 4.9% |
| Route 4 B | Denmark Road (EB) | 475 | 327 | -31.3% |

The above table shows there is an overall reduction in travel time on most routes with considerable savings on A12 (NB) and on Denmark Road (EB). There are slight increase in travel time on A12 (SB) and Waveney Drive (EB) owing to the high volume of southbound traffic in the PM.

**Overall, the results shows that in Scenario 2, there is likely to be substantial benefit on key N-S movement and also on key routes.**

## SCENARIO 3 - WEST BRIDGE OPEN; PROPOSED SCHEME LIFTED (10 MINS); A47 BASCULE BRIDGE LIFTED (10 MINS)

Table 4-9 shows the comparison of AM journey time for Scenario 3 for key north-south movements with and without the proposed scheme.

**Table 4-9 - Comparison of Journey time (sec) between key N-S movements - Scenario 3 AM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-7 | % DIFF |
|---|---|---|---|---|
| A to B | A12 Tom Crisp Way to A47 Jubilee Way | 728 | 565 | -22.4% |
| B to A | A47 Jubilee Way Jn to A12 Tom Crisp Way | 607 | 552 | -9.0% |
| C to B | London Rd South to A47 Jubilee Way | 680 | 447 | -34.3% |
| B to C | A47 Jubilee Way to B1532 Marine Parade | 417 | 372 | -10.9% |

The above table shows that there is an overall decrease in journey time across all key movements with significant savings between London Rd South and A47 Jubilee Way (34.3 %) and A12 Tom Crisp Way to A47 Jubilee Way (22.4%).

Table 4-10 shows the change in AM journey time on other existing routes with and without proposed scheme.

**Table 4-10 - Comparison of Journey time (sec) on key existing routes in DM and DS - Scenario 3 AM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-7 | % DIFF |
|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 569 | 505 | 11.2% |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 549 | 474 | -13.7% |
| Route 2 A | A12 (NB) | 684 | 586 | -14.4% |
| Route 2 B | A12 (SB) | 585 | 549 | -6.2% |
| Route 3 A | Waveney Drive (EB) | 253 | 256 | 1.2% |
| Route 3 B | Waveney Drive (WB) | 219 | 211 | -3.7% |

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-7 | % DIFF |
|---|---|---|---|---|
| Route 4 A | Denmark Road (WB) | 246 | 238 | -3.0% |
| Route 4 B | Denmark Road (EB) | 630 | 312 | -50.5% |

The above table shows that impact on the existing key routes in the AM are consistent with Scenario 2, particularly along A12 (NB), Denmark Road (EB) and A146 Fairfield Rd/Normanston Drive (SB) which experiences a substantial reduction in journey time.

Table 4-11 shows the comparison of PM journey times for north-south movements with and without the proposed scheme.

**Table 4-11 - Comparison of Journey time (sec) between key N-S movements - Scenario 3 PM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-7 | % DIFF |
|---|---|---|---|---|
| A to B | A12 Tom Crisp Way to A47 Jubilee Way | 812 | 537 | -33.9% |
| B to A | A47 Jubilee Way Jn to A12 Tom Crisp Way | 753 | 703 | -6.6% |
| C to B | London Rd South to A47 Jubilee Way | 749 | 475 | -36.6% |
| B to C | A47 Jubilee Way to B1532 Marine Parade | 490 | 481 | -1.8% |

The above table shows that the savings in journey time on existing routes are consistent with Scenario 2 and there continues to be a significant decrease in journey time for NB traffic between to A47 Jubilee Way from A12 Tom Crisp Way and London Road South.

Table 4-12 presents the PM journey time for Scenario 3 for the other routes.

**Table 4-12 - Comparison of Journey time (sec) on key existing routes in DM and DS - Scenario 3 PM**

| ROUTE | DESCRIPTION | DM_2022_10MIN | DS_2022_SC-7 | % DIFF |
|---|---|---|---|---|
| Route 1 A | A146-Fairfield Rd/Normanston Dr (NB) | 601 | 550 | -8.4% |
| Route 1 B | A146-Fairfield Rd/Normanston Dr (SB) | 597 | 601 | 0.7% |
| Route 2 A | A12 (NB) | 724 | 532 | -26.6% |
| Route 2 B | A12 (SB) | 724 | 796 | 9.9% |
| Route 3 A | Waveney Drive (EB) | 216 | 252 | 16.7% |
| Route 3 B | Waveney Drive (WB) | 251 | 236 | -6.1% |
| Route 4 A | Denmark Road (WB) | 234 | 284 | 21.4% |
| Route 4 B | Denmark Road (EB) | 475 | 338 | -28.9% |

Table 4-12 shows that in the PM, there is an overall reduction in travel time on most routes with considerable savings on A12 (NB) and on Denmark Road (EB). There are some increase in travel time on A12 (SB), Waveney Drive (EB) and Denmark Road (WB) which are attributed to the high volume of southbound traffic in the PM adding to the congestion caused by the increased lift time of the proposed scheme bridge.

Overall, the results shows that in Scenario 3, there will be some benefit on key movement and key routes. However, there will be increased delays on some routes, particularly in the PM, as a result of increased lift time of the proposed scheme bridge and A47 Bascule Bridge.

## 4.5 IMPACT ON TRAFFIC FLOWS AND QUEUING

### FLOW ON KEY ROUTES

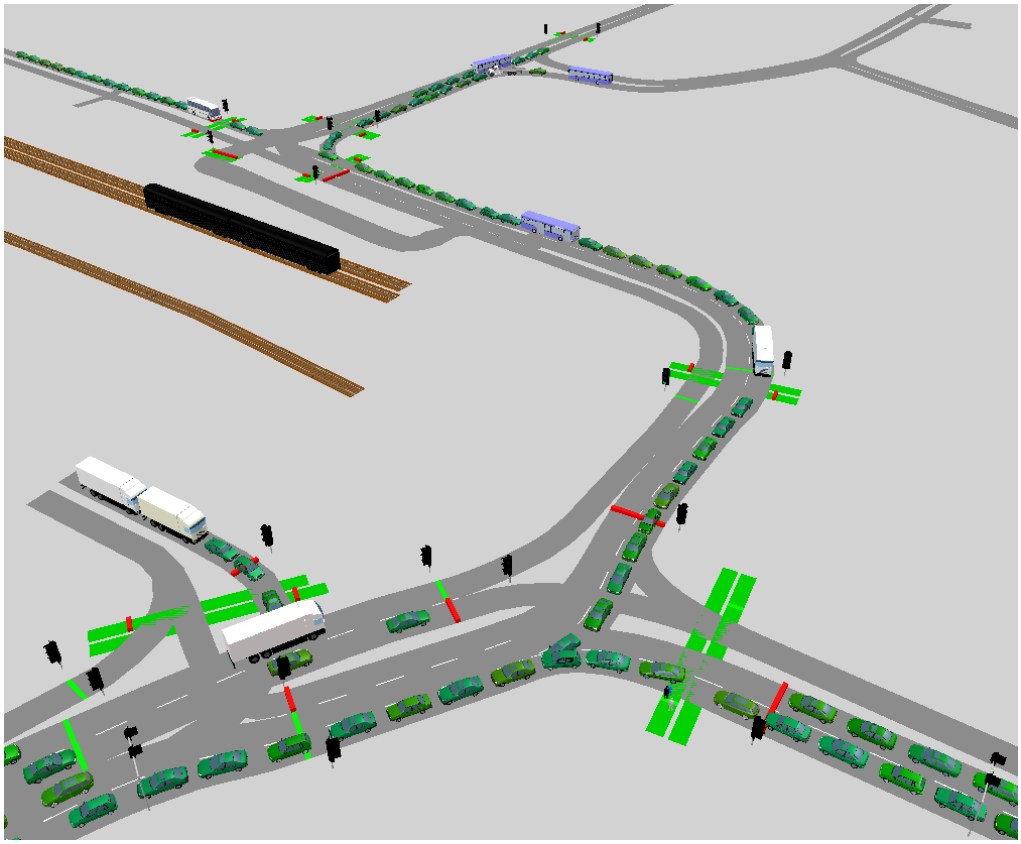
A comparison of link flows on key routes between the DM and DS scenarios are shown in Appendix B

In the AM and PM scenarios, there is a significant increase of flows on Waveney Drive (between Kimberley Rd and Waveney Crescent) in both directions in the DS scenarios and an increase on Peto Way particularly in the AM. This is as a result of traffic re-routeing to gain access on to the proposed scheme. Delays resulting from this extra traffic will be addressed in the scheme development and mitigation section.

However, in the context of total network delay and overall journey time benefits on the other key routes, this is considered acceptable

There is also an increase in traffic through Katwijk Road SB in the DS leading to long queues at the junction of Denmark Road and A12 as shown in Figure 4-2. In the AM, this increase is at a maximum with Scenario 1 when the bridges are lifted for 5 mins.

**Figure 4-2 – Junction of Denmark Road and A12 – Scenario 1 AM**



In both AM and PM, there is a decrease in traffic volume on the key strategic road A12 Battery Green Road in both directions. In the AM and PM the queues extending from the junction of

Denmark Road and A12, as a result of lifting of the East Bridge, are less in the DS scenario. Figure 4-3 and Figure 4-4 shows the extent of queuing on the proposed scheme in Scenario 1 when the bridge is lifted for five minutes.

**Figure 4-3 – NB Queues on proposed scheme during lift – Scenario 1 AM**

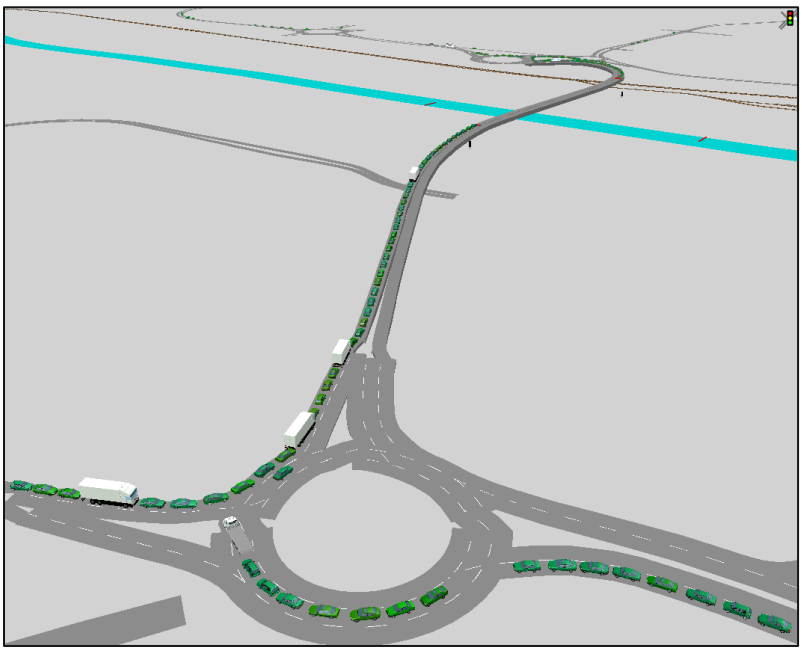
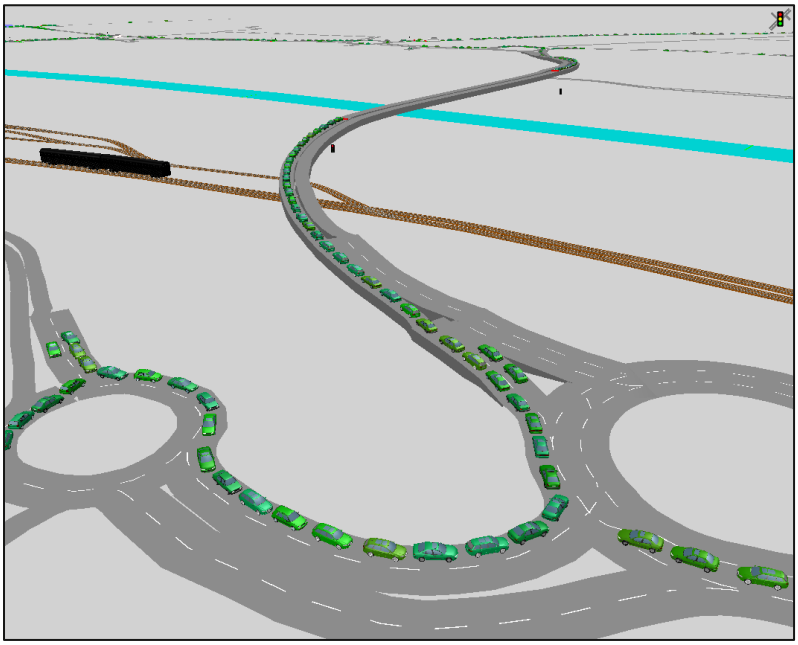


**Figure 4-4 – SB Queues on proposed scheme during lift – Scenario 1 PM**



## 4.6 NETWORK PERFORMANCE

A comparison of average travel time saving between the DM and the DS scenarios (5 to 7) for forecast year 2022 is shown in Table 4-13.

**Table 4-13 – Average Travel time Savings per Vehicle - Network wide**

| | DS_2022_SC-5 | DS_2022_SC-6 | DS_2022_SC-7 |
|---|---|---|---|
| AM | 02:01 | 01:40 | 01:58 |
| PM | 01:23 | 01:20 | 01:40 |

Table 4-13 shows that with the proposed scheme, there is a travel time saving in all scenarios. The travel time saving ranges between 1min 20 seconds to 2 minutes.

A comparison of increase in average vehicle speed between the DS and the DS scenarios (5 to 7) for forecast year 2022 is shown in Table 4-14.

**Table 4-14 – Average Speed increase (mph) - Network wide**

| | DS_2022_SC-5 | DS_2022_SC-6 | DS_2022_SC-7 |
|---|---|---|---|
| AM | 2.55 | 2.13 | 2.34 |
| PM | 2.16 | 1.52 | 2.22 |

Table 4-14 shows that with the proposed scheme, there is an increase in average vehicular speed in all scenarios. The speed increased ranges between 1.5 mph to 2.5mph.

## 4.7 SENSITIVITY TEST (2037 DEMAND WITH EXISTING SUPPLY)

The VISSIM model sensitivity test with 2037 matrices revealed that the following hot spots results in the increased journey time if the supply side is kept to the existing levels.

### VICTORIA ROAD-COLVILLE RD JUNCTION

In the 2037 DS AM, there is a significant delay on the EB Victoria Road approach at the junction with Colville Road. In 2037, there is an increase in traffic demand coming from the Colville Road and also from the Area Action Plan.

**Figure 4-5 – Victoria Road-Colville Rd-AM**

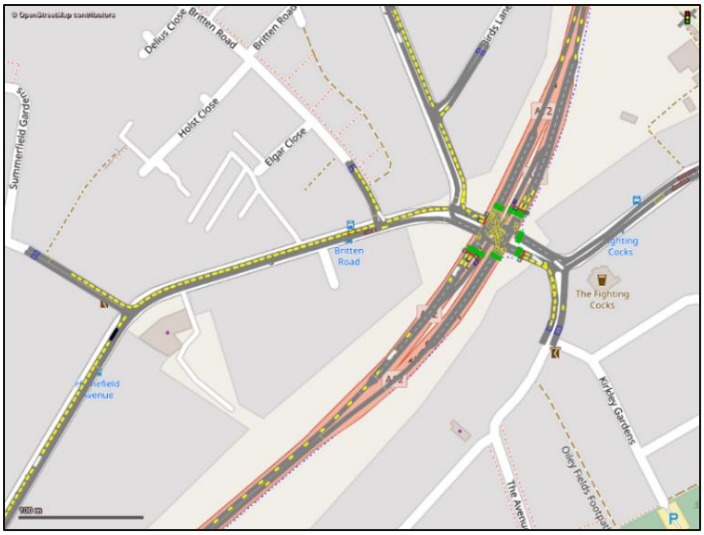
The diverted traffic accessing the proposed scheme aggravates the congestion and results in a complete gridlock as shown in Figure 4-5 above.

The junction is currently a mini roundabout and the model shows the junction will not have adequate capacity to accommodate the DS 2037 demand.

## A12 TOM CRISP WAY / BLACKHEATH RD JUNCTION

While delay at this junction is observed with the 2022 forecast flows traffic, it is more extensive with the growth in 2037. In the AM, the model shows an increase in queuing on the minor approaches of the junction. This delay is observed in the DM and DS scenarios.

**Figure 4-6 – A12 Tom Crisp Way / Blackheath Rd Junction Congestion DS - AM**




The congestion is worse in the PM when there is significant queueing observed on the A12 Southbound approach in both the DM and DS scenarios.

**Figure 4-7 – A12 Tom Crisp Way / Blackheath Rd Junction Congestion DS PM**

# 5 SUMMARY AND CONCLUSIONS

This report has described the development of the Lowestoft microsimulation base model, the existing and forecast year congestion levels and the operational assessment of the impact of the proposed scheme on the local road network in three different 'bridge lift' scenarios.

## BASE MODEL

The base model was calibrated with observed 2015 turning traffic counts from 16 sites which showed an excellent match between the modelled and observed values.

The base model was validated against link counts from nine 2016 ATC surveys sites. The validation shows an excellent match between the modelled and observed values meeting the criteria set out in WebTAG.

The model was also validated against observed journey times from Traffic Master data. Journey times also showed the model validated well. In the AM and PM, seven out of eight journey time routes were validated according to WebTAG criteria, a level of 87.5%.

It is therefore concluded that the 2015 base model is a robust tool and cable of reproducing observed conditions to the required level of accuracy. It is considered a reliable model for undertaking operational assessments of scheme scenarios.

## EXISTING TRAFFIC CONDITION

The impact of the A47 Bascule Bridge closures and delays at signals along the A47/A12 Battery Green Road corridor results in longer queues in the northbound direction in the AM and in the opposite direction in the PM.

The key locations where congestion and delay occur in both the AM and PM peak hours are:

1. A47/Station Square Junction
2. A1117 (Normanston Drive/ Bridge Road)
3. Denmark Road/Station Square/Belvedere Road

With the forecast year traffic, congestion gets worse. For example, queues along Denmark Road (WB) leads to exit blocking all along Katwijk Way southbound approach extending back to the next roundabout.

The average delay between A12 Tom Crisp Way/Blackheath Road Junction and A12 St Peters St / Jubilee Way Junction in the Base scenario is around 4 to 5 minutes in both time periods and increases to around 7 mins in 2022 forecast year. Similarly, the average delay on Denmark Road is around 3 to 4 minute in the Base year and it increases to a maximum of 7 minutes in the 2022 AM scenario

## SCHEME ASSESSMENT

To assess the impact of the opening of the three bridges (A47 Bascule Bridge & West Bridge and the proposed scheme) and the subsequent closure to the traffic movement along the route during

the lifting operation of the bridge, four scenarios have been modelled using VISSIM microsimulation in the 2022 forecast year scenario. These include:

- Scenario 1 - West Bridge Open; Proposed scheme Lifted (6 mins); A47 Bascule Bridge Lifted (5 mins)
- Scenario 2 - West Bridge Open; Proposed scheme Lifted (6 mins); A47 Bascule Bridge Lifted (10 mins)
- Scenario 3 - West Bridge Open; Proposed scheme Lifted (10 mins); A47 Bascule Bridge Lifted (10 mins)

## JOURNEY TIME EVALUATION

A comparison of journey time between the DM 2022 and DS 2022 shows that there is a significant decrease in journey time for traffic between London Road South and A47 Jubilee Way across all scenarios in the AM and PM. This shows that once the proposed scheme is built in the future year, a large proportion of trips between these two key zones will be using the new alternate route.

Vehicles using the northbound route along the proposed scheme will save approx. 3 to 4 mins journey time compared to the existing northbound A12 route in the AM. This also results in de-congestion on the A12 Battery Green Road in the AM and PM peak periods.

Also in the AM, there is an increase in journey time for traffic on eastbound approach of Waven ey Drive across almost all scenarios. This is because more traffic is expected to re-route along Waveney Drive to approach the proposed scheme from Victoria Road.

There is also a significant decrease in journey time along the eastbound approach of Denmark Road in both the AM and PM. This is approx. 5 mins in the AM and 2 mins in the PM. The most likely reason is that the traffic which travelled along Denmark Road to access the A47 Bascule Bridge would now find the route along the proposed scheme more favourable, resulting in reduced congestion on Denmark Road EB.

Overall, the proposed scheme provides significant benefits to the journey time and congestion on the key strategic corridors.

## IMPACT ON TRAFFIC FLOW

In the AM and PM scenarios, there was a significant increase of flows on Waveney Drive in both directions in all the DS scenarios. This was a result of traffic diversions to gain access on to the proposed scheme. There was also an increase in traffic through Katwijk Road SB in the DS.

Denmark Road WB in the AM and in both direction in the PM also experienced a decrease in traffic demonstrating that the proposed scheme model resulted in a considerable de-congestion on these routes.

## OVERALL NETWORK PERFORMANCE

With the proposed scheme, there was travel time saving for vehicles within the network in all scenarios. The average travel time saving ranged between 20 seconds to 2 minutes.

There was also an increase in average vehicular speed in all scenarios ranging between 1.5 mph to 2.5 mph.

# 6 RECOMMENDATIONS

Demand from the SATURN forecast years 2022 and 2037 results in capacity issues within the network if the supply side is maintained at the existing levels. The junctions of Victoria Road/Colville Road and A12 Tom Crisp Way / Blackheath Rd, in particular, contributes to the delay. The delays are significantly worse in 2037 where there is an overall increase in demand of approx. 25%.

It is therefore recommended that junction assessments are undertaken to identify the necessary mitigation measures at these key junction and appropriate improvement measures are put in place to cater for forecast year flows.

An assessment based upon demand flows from the forecast year 2037 should be undertaken with adequate mitigation measures in place. A sensitivity test should also be undertaken using DS matrices from the SATURN 2037 forecast year model.

# Appendix A

**Table 6-1: Calibration Turn Flows – LGV AM Peak**

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_LGV | MODEL FLOWS (AM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 1a | Station Square / Waveney Rd | Site 1a_A | 279 | 321 | 42 | 2.4 | No | Pass |
| 1a | | Site 1a_B | 20 | 9 | -11 | 2.9 | Yes | Pass |
| 1a | | Site 1a_D | 558 | 401 | -157 | 7.2 | No | Fail |
| 1a | | Site 1a_F | 752 | 543 | -209 | 8.2 | No | Fail |
| 1a | | Site 1a_G | 775 | 713 | -62 | 2.3 | Yes | Pass |
| 1b | Station Square / Commercial Rd | Site 1b_A | 34 | 36 | 2 | 0.3 | Yes | Pass |
| 1b | | Site 1b_B | 801 | 685 | -116 | 4.3 | No | Pass |
| 1b | | Site 1b_D | 1508 | 1246 | -262 | 7.1 | No | Fail |
| 1b | | Site 1b_E | 34 | 67 | 33 | 4.6 | Yes | Pass |
| 1b | | Site 1b_G | 6 | 20 | 14 | 3.9 | Yes | Pass |
| 1b | | Site 1b_H | 17 | 12 | -5 | 1.3 | Yes | Pass |
| 2 | London Rd / Belvedere Rd (A12) | Site 2_A | 416 | 441 | 25 | 1.2 | No | Pass |
| 2 | | Site 2_B | 385 | 264 | -121 | 6.7 | No | Fail |
| 2 | | Site 2_D | 208 | 214 | 6 | 0.4 | No | Pass |
| 2 | | Site 2_E | 17 | 5 | -12 | 3.6 | Yes | Pass |
| 2 | | Site 2_H | 1343 | 1104 | -239 | 6.8 | No | Fail |
| 3 | Kirkley Rise / A12 / ASDA access | Site 3_A | 65 | 101 | 36 | 4.0 | Yes | Pass |
| 3 | | Site 3_B | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_C | 9 | 3 | -6 | 2.4 | Yes | Pass |
| 3 | | Site 3_D | 69 | 51 | -18 | 2.3 | Yes | Pass |
| 3 | | Site 3_F | 38 | 63 | 25 | 3.5 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_LGV | MODEL FLOWS (AM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 3 | | Site 3_G | 356 | 379 | 23 | 1.2 | No | Pass |
| 3 | | Site 3_H | 11 | 2 | -9 | 3.5 | Yes | Pass |
| 3 | | Site 3_I | 10 | 0 | -10 | 4.5 | Yes | Pass |
| 3 | | Site 3_J | 13 | 4 | -9 | 3.1 | Yes | Pass |
| 3 | | Site 3_K | 245 | 0 | -245 | 22.1 | No | Fail |
| 3 | | Site 3_L | 29 | 14 | -15 | 3.2 | Yes | Pass |
| 3 | | Site 3_M | 66 | 42 | -24 | 3.3 | Yes | Pass |
| 3 | | Site 3_N | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 3 | | Site 3_P | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 3 | | Site 3_Q | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 3 | | Site 3_R | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_S | 9 | 3 | -6 | 2.4 | Yes | Pass |
| 3 | | Site 3_U | 15 | 18 | 3 | 0.7 | Yes | Pass |
| 3 | | Site 3_V | 57 | 37 | -20 | 2.9 | Yes | Pass |
| 3 | | Site 3_W | 1022 | 1052 | 30 | 0.9 | Yes | Pass |
| 3 | | Site 3_X | 105 | 132 | 27 | 2.5 | No | Pass |
| 3 | | Site 3_Y | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 4 | | Site 4_A | 27 | 51 | 24 | 3.8 | Yes | Pass |
| 4 | | Site 4_B | 100 | 154 | 54 | 4.8 | No | Pass |
| 4 | | Site 4_D | 469 | 384 | -85 | 4.1 | No | Pass |
| 4 | Denmark Rd / Katwijk Way | Site 4_E | 309 | 328 | 19 | 1.1 | No | Pass |
| 4 | | Site 4_F | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 4 | | Site 4_G | 177 | 179 | 2 | 0.1 | No | Pass |
| 4 | | Site 4_H | 48 | 83 | 35 | 4.3 | Yes | Pass |
| 5 | | Site 5_A | 76 | 27 | -49 | 6.8 | Yes | Pass |
| 5 | Clapham Rd S / Katwijk Way | Site 5_B | 77 | 80 | 3 | 0.3 | Yes | Pass |
| 5 | | Site 5_C | 137 | 112 | -25 | 2.2 | No | Pass |
| 5 | | Site 5_D | 7 | 23 | 16 | 4.1 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_LGV | MODEL FLOWS (AM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 5 | | Site 5_E | 33 | 58 | 25 | 3.7 | Yes | Pass |
| 5 | | Site 5_F | 25 | 0 | -25 | 7.1 | Yes | Pass |
| 5 | | Site 5_G | 10 | 19 | 9 | 2.4 | Yes | Pass |
| 5 | | Site 5_I | 110 | 90 | -20 | 2.0 | No | Pass |
| 5 | | Site 5_J | 296 | 324 | 28 | 1.6 | No | Pass |
| 5 | | Site 5_K | 107 | 53 | -54 | 6.0 | No | Fail |
| 5 | | Site 5_L | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 5 | | Site 5_M | 35 | 33 | -2 | 0.3 | Yes | Pass |
| 5 | | Site 5_N | 48 | 38 | -10 | 1.5 | Yes | Pass |
| 5 | | Site 5_O | 113 | 39 | -74 | 8.5 | No | Fail |
| 6 | | Site 6_A | 530 | 389 | -141 | 6.6 | No | Fail |
| 6 | | Site 6_B | 24 | 48 | 24 | 4.0 | Yes | Pass |
| 6 | | Site 6_D | 9 | 40 | 31 | 6.3 | Yes | Pass |
| 6 | Battery Green Rd / Waveney Rd | Site 6_E | 7 | 6 | -1 | 0.4 | Yes | Pass |
| 6 | | Site 6_G | 21 | 61 | 40 | 6.2 | Yes | Pass |
| 6 | | Site 6_H | 745 | 499 | -246 | 9.9 | No | Fail |
| 6 | | Site 6_J | 18 | 7 | -11 | 3.1 | Yes | Pass |
| 6 | | Site 6_L | 43 | 24 | -19 | 3.3 | Yes | Pass |
| 7 | | Site 7_A | 45 | 41 | -4 | 0.6 | Yes | Pass |
| 7 | | Site 7_B | 248 | 288 | 40 | 2.4 | No | Pass |
| 7 | | Site 7_C | 55 | 31 | -24 | 3.7 | Yes | Pass |
| 7 | | Site 7_E | 103 | 75 | -28 | 3.0 | No | Pass |
| 7 | A12 / Blackheath Rd / Long Rd | Site 7_F | 176 | 136 | -40 | 3.2 | No | Pass |
| 7 | | Site 7_G | 93 | 77 | -16 | 1.7 | Yes | Pass |
| 7 | | Site 7_I | 91 | 81 | -10 | 1.1 | Yes | Pass |
| 7 | | Site 7_J | 702 | 743 | 41 | 1.5 | Yes | Pass |
| 7 | | Site 7_K | 40 | 43 | 3 | 0.5 | Yes | Pass |
| 7 | | Site 7_M | 41 | 81 | 40 | 5.1 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_LGV | MODEL FLOWS (AM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 7 | Horn Hill / Maconochie Way / A12 / Waveney Dr | Site 7_N | 165 | 94 | -71 | 6.2 | No | Fail |
| 7 | | Site 7_O | 91 | 60 | -31 | 3.6 | Yes | Pass |
| 8 | | Site 8_A-B | 11 | 2 | -9 | 3.5 | Yes | Pass |
| 8 | | Site 8_A-C | 301 | 344 | 43 | 2.4 | No | Pass |
| 8 | | Site 8_A-D | 227 | 179 | -48 | 3.4 | No | Pass |
| 8 | | Site 8_B-A | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 8 | | Site 8_B-C | 2 | 2 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_B-D | 6 | 1 | -5 | 2.7 | Yes | Pass |
| 8 | | Site 8_C-A | 764 | 813 | 49 | 1.7 | Yes | Pass |
| 8 | | Site 8_C-B | 8 | 12 | 4 | 1.3 | Yes | Pass |
| 8 | | Site 8_C-D | 111 | 55 | -56 | 6.1 | No | Fail |
| 8 | | Site 8_D-A | 369 | 424 | 55 | 2.8 | No | Pass |
| 8 | | Site 8_D-B | 6 | 7 | 1 | 0.4 | Yes | Pass |
| 8 | | Site 8_D-C | 46 | 16 | -30 | 5.4 | Yes | Pass |
| 10 | Victoria Rd / Bridge Rd / Saltwater Way | Site 10_A | 622 | 579 | -43 | 1.8 | No | Pass |
| 10 | | Site 10_B | 212 | 199 | -13 | 0.9 | No | Pass |
| 10 | | Site 10_C | 10 | 16 | 6 | 1.7 | Yes | Pass |
| 10 | | Site 10_D | 367 | 221 | -146 | 8.5 | No | Fail |
| 10 | | Site 10_E | 49 | 34 | -15 | 2.3 | Yes | Pass |
| 10 | | Site 10_G | 43 | 135 | 92 | 9.8 | Yes | Pass |
| 10 | | Site 10_H | 698 | 644 | -54 | 2.1 | No | Pass |
| 10 | | Site 10_I | 6 | 7 | 1 | 0.4 | Yes | Pass |
| 11 | Bridge Rd / Normanston Dr | Site 11_A | 401 | 417 | 16 | 0.8 | No | Pass |
| 11 | | Site 11_B | 77 | 63 | -14 | 1.7 | Yes | Pass |
| 11 | | Site 11_D | 57 | 55 | -2 | 0.3 | Yes | Pass |
| 11 | | Site 11_E | 418 | 335 | -83 | 4.3 | No | Pass |
| 11 | | Site 11_F | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 11 | | Site 11_G | 481 | 564 | 83 | 3.6 | No | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_LGV | MODEL FLOWS (AM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 11 | Peto Way / Normanston Dr | Site 11_H | 421 | 221 | -200 | 11.2 | No | Fail |
| 11 | | Site 11_I | 22 | 11 | -11 | 2.7 | Yes | Pass |
| 12 | | Site 12_A | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 12 | | Site 12_B | 133 | 127 | -6 | 0.5 | No | Pass |
| 12 | | Site 12_C | 42 | 15 | -27 | 5.1 | Yes | Pass |
| 12 | | Site 12_D | 12 | 4 | -8 | 2.8 | Yes | Pass |
| 12 | | Site 12_F | 12 | 2 | -10 | 3.8 | Yes | Pass |
| 12 | | Site 12_G | 59 | 30 | -29 | 4.3 | Yes | Pass |
| 12 | | Site 12_H | 123 | 120 | -3 | 0.3 | No | Pass |
| 12 | | Site 12_I | 20 | 4 | -16 | 4.6 | Yes | Pass |
| 12 | | Site 12_K | 11 | 13 | 2 | 0.6 | Yes | Pass |
| 12 | | Site 12_L | 33 | 23 | -10 | 1.9 | Yes | Pass |
| 12 | | Site 12_M | 159 | 123 | -36 | 3.0 | No | Pass |
| 12 | | Site 12_N | 113 | 134 | 21 | 1.9 | No | Pass |
| 12 | | Site 12_P | 158 | 146 | -12 | 1.0 | No | Pass |
| 12 | | Site 12_Q | 399 | 196 | -203 | 11.8 | No | Fail |
| 12 | | Site 12_R | 161 | 135 | -26 | 2.1 | No | Pass |
| 12 | | Site 12_S | 135 | 233 | 98 | 7.2 | No | Fail |
| 12 | | Site 12_U | 119 | 96 | -23 | 2.2 | No | Pass |
| 12 | | Site 12_V | 209 | 160 | -49 | 3.6 | No | Pass |
| 12 | | Site 12_W | 115 | 115 | 0 | 0.0 | No | Pass |
| 12 | | Site 12_X | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 14 | | Site 14_B | 49 | 66 | 17 | 2.2 | Yes | Pass |
| 14 | | Site 14_C | 471 | 346 | -125 | 6.2 | No | Fail |
| 14 | | Site 14_D | 50 | 101 | 51 | 5.9 | Yes | Pass |
| 14 | | Site 14_E | 15 | 20 | 5 | 1.2 | Yes | Pass |
| 14 | | Site 14_F | 58 | 15 | -43 | 7.1 | Yes | Pass |
| 14 | | Site 14_H | 12 | 48 | 36 | 6.6 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_LGV | MODEL FLOWS (AM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 14 | | Site 14_I | 134 | 129 | -5 | 0.4 | No | Pass |
| 14 | | Site 14_J | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | Battery Green Rd / Gordon Rd / Whapload Rd | Site 14_K | 207 | 189 | -18 | 1.3 | No | Pass |
| 14 | | Site 14_L | 444 | 230 | -214 | 11.7 | No | Fail |
| 14 | | Site 14_M | 9 | 0 | -9 | 4.2 | Yes | Pass |
| 14 | | Site 14_N | 51 | 81 | 30 | 3.7 | Yes | Pass |
| 14 | | Site 14_O | 6 | 21 | 15 | 4.1 | Yes | Pass |
| 14 | | Site 14_P | 12 | 15 | 3 | 0.8 | Yes | Pass |
| 14 | | Site 14_Q | 11 | 68 | 57 | 9.1 | Yes | Pass |
| 14 | | Site 14_R | 9 | 11 | 2 | 0.6 | Yes | Pass |
| 14 | | Site 14_U | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_V | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_X | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 15 | | Site 15_A | 200 | 192 | -8 | 0.6 | No | Pass |
| 15 | | Site 15_B | 40 | 14 | -26 | 5.0 | Yes | Pass |
| 15 | | Site 15_C | 307 | 264 | -43 | 2.5 | No | Pass |
| 15 | | Site 15_D | 26 | 153 | 127 | 13.4 | Yes | Pass |
| 15 | | Site 15_E | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_F | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 15 | | Site 15_G | 7 | 16 | 9 | 2.7 | Yes | Pass |
| 15 | A12 / Jubilee Way / St Peters St | Site 15_H | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_I | 9 | 2 | -7 | 3.0 | Yes | Pass |
| 15 | | Site 15_K | 48 | 47 | -1 | 0.1 | Yes | Pass |
| 15 | | Site 15_L | 283 | 79 | -204 | 15.2 | No | Fail |
| 15 | | Site 15_M | 96 | 104 | 8 | 0.8 | Yes | Pass |
| 15 | | Site 15_N | 6 | 7 | 1 | 0.4 | Yes | Pass |
| 15 | | Site 15_P | 21 | 20 | -1 | 0.2 | Yes | Pass |
| 15 | | Site 15_Q | 260 | 266 | 6 | 0.4 | No | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_LGV | MODEL FLOWS (AM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 15 | | Site 15_R | 186 | 313 | 127 | 8.0 | No | Fail |
| 15 | | Site 15_S | 228 | 70 | -158 | 12.9 | No | Fail |
| 15 | | Site 15_T | 46 | 53 | 7 | 1.0 | Yes | Pass |
| 16 | | Site 16_A | 222 | 217 | -5 | 0.3 | No | Pass |
| 16 | | Site 16_B | 444 | 519 | 75 | 3.4 | No | Pass |
| 16 | | Site 16_C | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 16 | | Site 16_G | 57 | 0 | -57 | 10.7 | Yes | Pass |
| 16 | | Site 16_I | 5 | 0 | -5 | 3.2 | Yes | Pass |
| 16 | A1144 / St Peters St / Katwijk Way | Site 16_J | 192 | 216 | 24 | 1.7 | No | Pass |
| 16 | | Site 16_K | 130 | 78 | -52 | 5.1 | No | Fail |
| 16 | | Site 16_L | 42 | 5 | -37 | 7.6 | Yes | Pass |
| 16 | | Site 16_M | 208 | 199 | -9 | 0.6 | No | Pass |
| 16 | | Site 16_N | 10 | 0 | -10 | 4.5 | Yes | Pass |
| 16 | | Site 16_O | 185 | 231 | 46 | 3.2 | No | Pass |
| 16 | | Site 16_P | 49 | 19 | -30 | 5.1 | Yes | Pass |
| 17 | | Site 17_A | 359 | 271 | -88 | 5.0 | No | Pass |
| 17 | | Site 17_B | 286 | 346 | 60 | 3.4 | No | Pass |
| 17 | A146 Beccles Rd / A1117 Cotmer Rd | Site 17_D | 337 | 403 | 66 | 3.4 | No | Pass |
| 17 | | Site 17_E | 27 | 70 | 43 | 6.2 | Yes | Pass |
| 17 | | Site 17_G | 25 | 54 | 29 | 4.6 | Yes | Pass |
| 17 | | Site 17_H | 385 | 376 | -9 | 0.5 | No | Pass |

**Table 6-2: Calibration Turn Flows – HGV AM Peak**

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_HGV | MODEL FLOWS (AM)_HGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 1a | Station Square / Waveney Rd | Site 1a_A | 11 | 38 | 27 | 5.5 | Yes | Pass |
| 1a | | Site 1a_B | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 1a | | Site 1a_D | 25 | 17 | -8 | 1.7 | Yes | Pass |
| 1a | | Site 1a_F | 23 | 57 | 34 | 5.4 | Yes | Pass |
| 1a | | Site 1a_G | 17 | 62 | 45 | 7.2 | Yes | Pass |
| 1b | Station Square / Commercial Rd | Site 1b_A | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 1b | | Site 1b_B | 32 | 55 | 23 | 3.5 | Yes | Pass |
| 1b | | Site 1b_D | 33 | 118 | 85 | 9.8 | Yes | Pass |
| 1b | | Site 1b_E | 4 | 3 | -1 | 0.5 | Yes | Pass |
| 1b | | Site 1b_G | 2 | 14 | 12 | 4.2 | Yes | Pass |
| 1b | | Site 1b_H | 7 | 0 | -7 | 3.7 | Yes | Pass |
| 2 | London Rd / Belvedere Rd (A12) | Site 2_A | 29 | 50 | 21 | 3.3 | Yes | Pass |
| 2 | | Site 2_B | 5 | 19 | 14 | 4.0 | Yes | Pass |
| 2 | | Site 2_D | 6 | 1 | -5 | 2.7 | Yes | Pass |
| 2 | | Site 2_E | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 2 | | Site 2_H | 34 | 121 | 87 | 9.9 | Yes | Pass |
| 3 | Kirkley Rise / A12 / ASDA access | Site 3_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_C | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_D | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_F | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_G | 31 | 50 | 19 | 3.0 | Yes | Pass |
| 3 | | Site 3_H | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_I | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_J | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_K | 1 | 0 | -1 | 1.4 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_HGV | MODEL FLOWS (AM)_HGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 3 | | Site 3_L | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_M | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_N | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_P | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 3 | | Site 3_Q | 0 | 2 | 2 | 2.0 | Yes | Pass |
| 3 | | Site 3_R | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_S | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_U | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_V | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_W | 29 | 119 | 90 | 10.5 | Yes | Pass |
| 3 | | Site 3_X | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_Y | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 4 | | Site 4_A | 1 | 24 | 23 | 6.5 | Yes | Pass |
| 4 | | Site 4_B | 3 | 22 | 19 | 5.4 | Yes | Pass |
| 4 | | Site 4_D | 9 | 28 | 19 | 4.4 | Yes | Pass |
| 4 | Denmark Rd / Katwijk Way | Site 4_E | 8 | 33 | 25 | 5.5 | Yes | Pass |
| 4 | | Site 4_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 4 | | Site 4_G | 8 | 16 | 8 | 2.3 | Yes | Pass |
| 4 | | Site 4_H | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_B | 2 | 6 | 4 | 2.0 | Yes | Pass |
| 5 | | Site 5_C | 3 | 10 | 7 | 2.7 | Yes | Pass |
| 5 | | Site 5_D | 1 | 2 | 1 | 0.8 | Yes | Pass |
| 5 | Clapham Rd S / Katwijk Way | Site 5_E | 1 | 1 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_G | 1 | 5 | 4 | 2.3 | Yes | Pass |
| 5 | | Site 5_I | 2 | 7 | 5 | 2.4 | Yes | Pass |
| 5 | | Site 5_J | 7 | 21 | 14 | 3.7 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_HGV | MODEL FLOWS (AM)_HGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 5 | | Site 5_K | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_L | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_M | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_N | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 5 | | Site 5_O | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 6 | | Site 6_A | 24 | 1 | -23 | 6.5 | Yes | Pass |
| 6 | | Site 6_B | 1 | 11 | 10 | 4.1 | Yes | Pass |
| 6 | | Site 6_D | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 6 | Battery Green Rd / Waveney Rd | Site 6_E | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 6 | | Site 6_G | 2 | 1 | -1 | 0.8 | Yes | Pass |
| 6 | | Site 6_H | 23 | 56 | 33 | 5.3 | Yes | Pass |
| 6 | | Site 6_J | 0 | 16 | 16 | 5.7 | Yes | Pass |
| 6 | | Site 6_L | 3 | 11 | 8 | 3.0 | Yes | Pass |
| 7 | | Site 7_A | 2 | 14 | 12 | 4.2 | Yes | Pass |
| 7 | | Site 7_B | 30 | 30 | 0 | 0.0 | Yes | Pass |
| 7 | | Site 7_C | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 7 | | Site 7_E | 0 | 6 | 6 | 3.5 | Yes | Pass |
| 7 | | Site 7_F | 2 | 10 | 8 | 3.3 | Yes | Pass |
| 7 | A12 / Blackheath Rd / Long Rd | Site 7_G | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 7 | | Site 7_I | 5 | 10 | 5 | 1.8 | Yes | Pass |
| 7 | | Site 7_J | 28 | 56 | 28 | 4.3 | Yes | Pass |
| 7 | | Site 7_K | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 7 | | Site 7_M | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 7 | | Site 7_N | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 7 | | Site 7_O | 1 | 7 | 6 | 3.0 | Yes | Pass |
| 8 | | Site 8_A-B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | Horn Hill / Maconochie Way / A12 / Waveney Dr | Site 8_A-C | 24 | 44 | 20 | 3.4 | Yes | Pass |
| 8 | | Site 8_A-D | 2 | 6 | 4 | 2.0 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_HGV | MODEL FLOWS (AM)_HGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 8 | | Site 8_B-A | 0 | 2 | 2 | 2.0 | Yes | Pass |
| 8 | | Site 8_B-C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_B-D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_C-A | 13 | 68 | 55 | 8.6 | Yes | Pass |
| 8 | | Site 8_C-B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_C-D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_D-A | 0 | 49 | 49 | 9.9 | Yes | Pass |
| 8 | | Site 8_D-B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_D-C | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 10 | | Site 10_A | 36 | 73 | 37 | 5.0 | Yes | Pass |
| 10 | | Site 10_B | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 10 | | Site 10_C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 10 | Victoria Rd / Bridge Rd / Saltwater Way | Site 10_D | 5 | 9 | 4 | 1.5 | Yes | Pass |
| 10 | | Site 10_E | 3 | 2 | -1 | 0.6 | Yes | Pass |
| 10 | | Site 10_G | 1 | 17 | 16 | 5.3 | Yes | Pass |
| 10 | | Site 10_H | 32 | 47 | 15 | 2.4 | Yes | Pass |
| 10 | | Site 10_I | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 11 | | Site 11_A | 24 | 19 | -5 | 1.1 | Yes | Pass |
| 11 | | Site 11_B | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 11 | | Site 11_D | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 11 | | Site 11_E | 23 | 54 | 31 | 5.0 | Yes | Pass |
| 11 | Bridge Rd / Normanston Dr | Site 11_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 11 | | Site 11_G | 20 | 71 | 51 | 7.6 | Yes | Pass |
| 11 | | Site 11_H | 30 | 5 | -25 | 6.0 | Yes | Pass |
| 11 | | Site 11_I | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 12 | | Site 12_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | Peto Way / Normanston Dr | Site 12_B | 4 | 30 | 26 | 6.3 | Yes | Pass |
| 12 | | Site 12_C | 2 | 0 | -2 | 2.0 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_HGV | MODEL FLOWS (AM)_HGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 12 | | Site 12_D | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 12 | | Site 12_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_G | 3 | 4 | 1 | 0.5 | Yes | Pass |
| 12 | | Site 12_H | 0 | 21 | 21 | 6.5 | Yes | Pass |
| 12 | | Site 12_I | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 12 | | Site 12_K | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_L | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 12 | | Site 12_M | 6 | 6 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_N | 5 | 21 | 16 | 4.4 | Yes | Pass |
| 12 | | Site 12_P | 3 | 21 | 18 | 5.2 | Yes | Pass |
| 12 | | Site 12_Q | 1 | 17 | 16 | 5.3 | Yes | Pass |
| 12 | | Site 12_R | 4 | 23 | 19 | 5.2 | Yes | Pass |
| 12 | | Site 12_S | 7 | 9 | 2 | 0.7 | Yes | Pass |
| 12 | | Site 12_U | 12 | 0 | -12 | 4.9 | Yes | Pass |
| 12 | | Site 12_V | 7 | 0 | -7 | 3.7 | Yes | Pass |
| 12 | | Site 12_W | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 12 | | Site 12_X | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_B | 0 | 2 | 2 | 2.0 | Yes | Pass |
| 14 | | Site 14_C | 18 | 13 | -5 | 1.3 | Yes | Pass |
| 14 | | Site 14_D | 6 | 6 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_E | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 14 | | Site 14_F | 14 | 0 | -14 | 5.3 | Yes | Pass |
| 14 | | Site 14_H | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 14 | | Site 14_I | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 14 | | Site 14_J | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | Battery Green Rd / Gordon Rd / Whapload Rd | Site 14_K | 11 | 7 | -4 | 1.3 | Yes | Pass |
| 14 | | Site 14_L | 14 | 19 | 5 | 1.2 | Yes | Pass |
| 14 | | Site 14_M | 2 | 0 | -2 | 2.0 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_HGV | MODEL FLOWS (AM)_HGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 14 | | Site 14_N | 0 | 11 | 11 | 4.7 | Yes | Pass |
| 14 | | Site 14_O | 1 | 2 | 1 | 0.8 | Yes | Pass |
| 14 | | Site 14_P | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 14 | | Site 14_Q | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_R | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 14 | | Site 14_U | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_V | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_X | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_A | 1 | 1 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_C | 18 | 20 | 2 | 0.5 | Yes | Pass |
| 15 | | Site 15_D | 1 | 1 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_E | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_G | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_H | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 15 | A12 / Jubilee Way / St Peters St | Site 15_I | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_K | 1 | 4 | 3 | 1.9 | Yes | Pass |
| 15 | | Site 15_L | 21 | 0 | -21 | 6.5 | Yes | Pass |
| 15 | | Site 15_M | 6 | 12 | 6 | 2.0 | Yes | Pass |
| 15 | | Site 15_N | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 15 | | Site 15_P | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 15 | | Site 15_Q | 4 | 2 | -2 | 1.2 | Yes | Pass |
| 15 | | Site 15_R | 2 | 9 | 7 | 3.0 | Yes | Pass |
| 15 | | Site 15_S | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 15 | | Site 15_T | 1 | 3 | 2 | 1.4 | Yes | Pass |
| 16 | A1144 / St Peters St / Katwijk Way | Site 16_A | 1 | 12 | 11 | 4.3 | Yes | Pass |
| 16 | | Site 16_B | 5 | 3 | -2 | 1.0 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (AM)_HGV | MODEL FLOWS (AM)_HGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 16 | | Site 16_C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_G | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 16 | | Site 16_I | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_J | 10 | 9 | -1 | 0.3 | Yes | Pass |
| 16 | | Site 16_K | 0 | 3 | 3 | 2.4 | Yes | Pass |
| 16 | | Site 16_L | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_M | 7 | 12 | 5 | 1.6 | Yes | Pass |
| 16 | | Site 16_N | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_O | 2 | 6 | 4 | 2.0 | Yes | Pass |
| 16 | | Site 16_P | 0 | 3 | 3 | 2.4 | Yes | Pass |
| 17 | | Site 17_A | 17 | 37 | 20 | 3.8 | Yes | Pass |
| 17 | | Site 17_B | 21 | 37 | 16 | 3.0 | Yes | Pass |
| 17 | A146 Beccles Rd / A1117 Cotmer Rd | Site 17_D | 24 | 24 | 0 | 0.0 | Yes | Pass |
| 17 | | Site 17_E | 3 | 5 | 2 | 1.0 | Yes | Pass |
| 17 | | Site 17_G | 2 | 18 | 16 | 5.1 | Yes | Pass |
| 17 | | Site 17_H | 15 | 35 | 20 | 4.0 | Yes | Pass |

**Table 6-3: Calibration Turn Flows – LGV PM Peak**

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 1a | Station Square / Waveney Rd | Site 1a_A | 468 | 689 | 221 | 9.2 | No | Fail |
| 1a | | Site 1a_B | 31 | 16 | -15 | 3.1 | Yes | Pass |
| 1a | | Site 1a_D | 1005 | 1054 | 49 | 1.5 | Yes | Pass |
| 1a | | Site 1a_F | 391 | 292 | -99 | 5.4 | No | Fail |
| 1a | | Site 1a_G | 528 | 598 | 70 | 3.0 | No | Pass |
| 1b | Station Square / Commercial Rd | Site 1b_A | 15 | 19 | 4 | 1.0 | Yes | Pass |
| 1b | | Site 1b_B | 1444 | 1725 | 281 | 7.1 | No | Fail |
| 1b | | Site 1b_D | 862 | 849 | -13 | 0.4 | Yes | Pass |
| 1b | | Site 1b_E | 11 | 29 | 18 | 4.0 | Yes | Pass |
| 1b | | Site 1b_G | 42 | 57 | 15 | 2.1 | Yes | Pass |
| 1b | | Site 1b_H | 48 | 39 | -9 | 1.4 | Yes | Pass |
| 2 | London Rd / Belvedere Rd (A12) | Site 2_A | 975 | 1105 | 130 | 4.0 | Yes | Pass |
| 2 | | Site 2_B | 506 | 677 | 171 | 7.0 | No | Fail |
| 2 | | Site 2_D | 142 | 208 | 66 | 5.0 | No | Pass |
| 2 | | Site 2_E | 6 | 5 | -1 | 0.4 | Yes | Pass |
| 2 | | Site 2_H | 724 | 669 | -55 | 2.1 | Yes | Pass |
| 3 | Kirkley Rise / A12 / ASDA access | Site 3_A | 247 | 198 | -49 | 3.3 | No | Pass |
| 3 | | Site 3_B | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_C | 24 | 18 | -6 | 1.3 | Yes | Pass |
| 3 | | Site 3_D | 78 | 107 | 29 | 3.0 | Yes | Pass |
| 3 | | Site 3_F | 135 | 129 | -6 | 0.5 | No | Pass |
| 3 | | Site 3_G | 840 | 954 | 114 | 3.8 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 3 | | Site 3_H | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 3 | | Site 3_I | 2 | 23 | 21 | 5.9 | Yes | Pass |
| 3 | | Site 3_J | 12 | 2 | -10 | 3.8 | Yes | Pass |
| 3 | | Site 3_K | 251 | 0 | -251 | 22.4 | No | Fail |
| 3 | | Site 3_L | 35 | 16 | -19 | 3.8 | Yes | Pass |
| 3 | | Site 3_M | 113 | 83 | -30 | 3.0 | No | Pass |
| 3 | | Site 3_N | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 3 | | Site 3_P | 2 | 1 | -1 | 0.8 | Yes | Pass |
| 3 | | Site 3_Q | 10 | 2 | -8 | 3.3 | Yes | Pass |
| 3 | | Site 3_R | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 3 | | Site 3_S | 28 | 20 | -8 | 1.6 | Yes | Pass |
| 3 | | Site 3_U | 9 | 3 | -6 | 2.4 | Yes | Pass |
| 3 | | Site 3_V | 41 | 24 | -17 | 3.0 | Yes | Pass |
| 3 | | Site 3_W | 454 | 558 | 104 | 4.6 | No | Pass |
| 3 | | Site 3_X | 133 | 145 | 12 | 1.0 | No | Pass |
| 3 | | Site 3_Y | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 4 | Denmark Rd / Katwijk Way | Site 4_A | 73 | 121 | 48 | 4.9 | Yes | Pass |
| 4 | | Site 4_B | 197 | 353 | 156 | 9.4 | No | Fail |
| 4 | | Site 4_D | 254 | 289 | 35 | 2.1 | No | Pass |
| 4 | | Site 4_E | 293 | 313 | 20 | 1.1 | No | Pass |
| 4 | | Site 4_F | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 4 | | Site 4_G | 229 | 341 | 112 | 6.6 | No | Fail |
| 4 | | Site 4_H | 23 | 0 | -23 | 6.8 | Yes | Pass |
| 5 | Clapham Rd S / Katwijk Way | Site 5_A | 85 | 54 | -31 | 3.7 | Yes | Pass |
| 5 | | Site 5_B | 127 | 86 | -41 | 4.0 | No | Pass |
| 5 | | Site 5_C | 94 | 172 | 78 | 6.8 | Yes | Pass |
| 5 | | Site 5_D | 32 | 49 | 17 | 2.7 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 5 | | Site 5_E | 91 | 78 | -13 | 1.4 | Yes | Pass |
| 5 | | Site 5_F | 28 | 4 | -24 | 6.0 | Yes | Pass |
| 5 | | Site 5_G | 24 | 44 | 20 | 3.4 | Yes | Pass |
| 5 | | Site 5_I | 20 | 19 | -1 | 0.2 | Yes | Pass |
| 5 | | Site 5_J | 200 | 255 | 55 | 3.6 | No | Pass |
| 5 | | Site 5_K | 47 | 63 | 16 | 2.2 | Yes | Pass |
| 5 | | Site 5_L | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 5 | | Site 5_M | 76 | 71 | -5 | 0.6 | Yes | Pass |
| 5 | | Site 5_N | 40 | 61 | 21 | 3.0 | Yes | Pass |
| 5 | | Site 5_O | 103 | 76 | -27 | 2.9 | No | Pass |
| 6 | Battery Green Rd / Waveney Rd | Site 6_A | 922 | 970 | 48 | 1.6 | Yes | Pass |
| 6 | | Site 6_B | 3 | 14 | 11 | 3.8 | Yes | Pass |
| 6 | | Site 6_D | 31 | 13 | -18 | 3.8 | Yes | Pass |
| 6 | | Site 6_E | 38 | 24 | -14 | 2.5 | Yes | Pass |
| 6 | | Site 6_G | 5 | 11 | 6 | 2.1 | Yes | Pass |
| 6 | | Site 6_H | 416 | 295 | -121 | 6.4 | No | Fail |
| 6 | | Site 6_J | 52 | 61 | 9 | 1.2 | Yes | Pass |
| 6 | | Site 6_L | 43 | 41 | -2 | 0.3 | Yes | Pass |
| 7 | A12 / Blackheath Rd / Long Rd | Site 7_A | 128 | 199 | 71 | 5.6 | No | Fail |
| 7 | | Site 7_B | 644 | 754 | 110 | 4.2 | No | Pass |
| 7 | | Site 7_C | 104 | 59 | -45 | 5.0 | No | Pass |
| 7 | | Site 7_E | 74 | 20 | -54 | 7.9 | Yes | Pass |
| 7 | | Site 7_F | 212 | 179 | -33 | 2.4 | No | Pass |
| 7 | | Site 7_G | 94 | 39 | -55 | 6.7 | Yes | Pass |
| 7 | | Site 7_I | 117 | 113 | -4 | 0.4 | No | Pass |
| 7 | | Site 7_J | 353 | 391 | 38 | 2.0 | No | Pass |
| 7 | | Site 7_K | 56 | 61 | 5 | 0.7 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 7 | | Site 7_M | 46 | 53 | 7 | 1.0 | Yes | Pass |
| 7 | | Site 7_N | 185 | 134 | -51 | 4.0 | No | Pass |
| 7 | | Site 7_O | 67 | 50 | -17 | 2.2 | Yes | Pass |
| 8 | Horn Hill / Maconochie Way / A12 / Waveney Dr | Site 8_A-B | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 8 | | Site 8_A-C | 816 | 930 | 114 | 3.9 | Yes | Pass |
| 8 | | Site 8_A-D | 447 | 323 | -124 | 6.3 | No | Fail |
| 8 | | Site 8_B-A | 8 | 3 | -5 | 2.1 | Yes | Pass |
| 8 | | Site 8_B-C | 9 | 14 | 5 | 1.5 | Yes | Pass |
| 8 | | Site 8_B-D | 4 | 5 | 1 | 0.5 | Yes | Pass |
| 8 | | Site 8_C-A | 409 | 446 | 37 | 1.8 | No | Pass |
| 8 | | Site 8_C-B | 1 | 1 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_C-D | 58 | 13 | -45 | 7.6 | Yes | Pass |
| 8 | | Site 8_D-A | 306 | 281 | -25 | 1.5 | No | Pass |
| 8 | | Site 8_D-B | 5 | 1 | -4 | 2.3 | Yes | Pass |
| 8 | | Site 8_D-C | 76 | 69 | -7 | 0.8 | Yes | Pass |
| 10 | Victoria Rd / Bridge Rd / Saltwater Way | Site 10_A | 866 | 785 | -81 | 2.8 | Yes | Pass |
| 10 | | Site 10_B | 253 | 185 | -68 | 4.6 | No | Pass |
| 10 | | Site 10_C | 20 | 10 | -10 | 2.6 | Yes | Pass |
| 10 | | Site 10_D | 335 | 223 | -112 | 6.7 | No | Fail |
| 10 | | Site 10_E | 58 | 64 | 6 | 0.8 | Yes | Pass |
| 10 | | Site 10_G | 33 | 15 | -18 | 3.7 | Yes | Pass |
| 10 | | Site 10_H | 764 | 744 | -20 | 0.7 | Yes | Pass |
| 10 | | Site 10_I | 41 | 2 | -39 | 8.4 | Yes | Pass |
| 11 | Bridge Rd / Normanston Dr | Site 11_A | 440 | 538 | 98 | 4.4 | No | Pass |
| 11 | | Site 11_B | 53 | 78 | 25 | 3.1 | Yes | Pass |
| 11 | | Site 11_D | 35 | 22 | -13 | 2.4 | Yes | Pass |
| 11 | | Site 11_E | 459 | 379 | -80 | 3.9 | No | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 11 | | Site 11_F | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 11 | | Site 11_G | 482 | 442 | -40 | 1.9 | No | Pass |
| 11 | | Site 11_H | 486 | 449 | -37 | 1.7 | No | Pass |
| 11 | | Site 11_I | 18 | 9 | -9 | 2.4 | Yes | Pass |
| 12 | Peto Way / Normanston Dr | Site 12_A | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 12 | | Site 12_B | 129 | 138 | 9 | 0.8 | No | Pass |
| 12 | | Site 12_C | 38 | 24 | -14 | 2.5 | Yes | Pass |
| 12 | | Site 12_D | 4 | 9 | 5 | 2.0 | Yes | Pass |
| 12 | | Site 12_F | 8 | 1 | -7 | 3.3 | Yes | Pass |
| 12 | | Site 12_G | 74 | 48 | -26 | 3.3 | Yes | Pass |
| 12 | | Site 12_H | 208 | 249 | 41 | 2.7 | No | Pass |
| 12 | | Site 12_I | 21 | 5 | -16 | 4.4 | Yes | Pass |
| 12 | | Site 12_K | 43 | 19 | -24 | 4.3 | Yes | Pass |
| 12 | | Site 12_L | 73 | 13 | -60 | 9.1 | Yes | Pass |
| 12 | | Site 12_M | 258 | 313 | 55 | 3.3 | No | Pass |
| 12 | | Site 12_N | 217 | 266 | 49 | 3.2 | No | Pass |
| 12 | | Site 12_P | 120 | 77 | -43 | 4.3 | No | Pass |
| 12 | | Site 12_Q | 227 | 180 | -47 | 3.3 | No | Pass |
| 12 | | Site 12_R | 169 | 87 | -82 | 7.2 | No | Fail |
| 12 | | Site 12_S | 117 | 144 | 27 | 2.4 | No | Pass |
| 12 | | Site 12_U | 120 | 92 | -28 | 2.7 | No | Pass |
| 12 | | Site 12_V | 194 | 234 | 40 | 2.7 | No | Pass |
| 12 | | Site 12_W | 71 | 74 | 3 | 0.4 | Yes | Pass |
| 12 | | Site 12_X | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 14 | | Site 14_B | 11 | 18 | 7 | 1.8 | Yes | Pass |
| 14 | | Site 14_C | 564 | 455 | -109 | 4.8 | No | Pass |
| 14 | | Site 14_D | 16 | 38 | 22 | 4.2 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 14 | Battery Green Rd / Gordon Rd / Whapload Rd | Site 14_E | 8 | 9 | 1 | 0.3 | Yes | Pass |
| 14 | | Site 14_F | 192 | 89 | -103 | 8.7 | No | Fail |
| 14 | | Site 14_H | 23 | 26 | 3 | 0.6 | Yes | Pass |
| 14 | | Site 14_I | 279 | 386 | 107 | 5.9 | No | Fail |
| 14 | | Site 14_J | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 14 | | Site 14_K | 92 | 23 | -69 | 9.1 | Yes | Pass |
| 14 | | Site 14_L | 408 | 359 | -49 | 2.5 | No | Pass |
| 14 | | Site 14_M | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 14 | | Site 14_N | 16 | 47 | 31 | 5.5 | Yes | Pass |
| 14 | | Site 14_O | 9 | 22 | 13 | 3.3 | Yes | Pass |
| 14 | | Site 14_P | 33 | 109 | 76 | 9.0 | Yes | Pass |
| 14 | | Site 14_Q | 6 | 12 | 6 | 2.0 | Yes | Pass |
| 14 | | Site 14_R | 14 | 12 | -2 | 0.6 | Yes | Pass |
| 14 | | Site 14_U | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 14 | | Site 14_V | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 14 | | Site 14_X | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 15 | A12 / Jubilee Way / St Peters St | Site 15_A | 131 | 140 | 9 | 0.8 | No | Pass |
| 15 | | Site 15_B | 19 | 6 | -13 | 3.7 | Yes | Pass |
| 15 | | Site 15_C | 343 | 340 | -3 | 0.2 | No | Pass |
| 15 | | Site 15_D | 28 | 62 | 34 | 5.1 | Yes | Pass |
| 15 | | Site 15_E | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 15 | | Site 15_F | 13 | 0 | -13 | 5.1 | Yes | Pass |
| 15 | | Site 15_G | 38 | 66 | 28 | 3.9 | Yes | Pass |
| 15 | | Site 15_H | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 15 | | Site 15_I | 26 | 17 | -9 | 1.9 | Yes | Pass |
| 15 | | Site 15_K | 22 | 11 | -11 | 2.7 | Yes | Pass |
| 15 | | Site 15_L | 371 | 267 | -104 | 5.8 | No | Fail |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 15 | | Site 15_M | 188 | 172 | -16 | 1.2 | No | Pass |
| 15 | | Site 15_N | 1 | 2 | 1 | 0.8 | Yes | Pass |
| 15 | | Site 15_P | 7 | 6 | -1 | 0.4 | Yes | Pass |
| 15 | | Site 15_Q | 216 | 163 | -53 | 3.9 | No | Pass |
| 15 | | Site 15_R | 126 | 187 | 61 | 4.9 | No | Pass |
| 15 | | Site 15_S | 292 | 167 | -125 | 8.3 | No | Fail |
| 15 | | Site 15_T | 27 | 18 | -9 | 1.9 | Yes | Pass |
| 16 | A1144 / St Peters St / Katwijk Way | Site 16_A | 100 | 198 | 98 | 8.0 | No | Fail |
| 16 | | Site 16_B | 283 | 302 | 19 | 1.1 | No | Pass |
| 16 | | Site 16_C | 16 | 0 | -16 | 5.7 | Yes | Pass |
| 16 | | Site 16_G | 29 | 0 | -29 | 7.6 | Yes | Pass |
| 16 | | Site 16_I | 7 | 0 | -7 | 3.7 | Yes | Pass |
| 16 | | Site 16_J | 423 | 378 | -45 | 2.2 | No | Pass |
| 16 | | Site 16_K | 104 | 67 | -37 | 4.0 | No | Pass |
| 16 | | Site 16_L | 101 | 26 | -75 | 9.4 | No | Fail |
| 16 | | Site 16_M | 234 | 213 | -21 | 1.4 | No | Pass |
| 16 | | Site 16_N | 8 | 0 | -8 | 4.0 | Yes | Pass |
| 16 | | Site 16_O | 183 | 307 | 124 | 7.9 | No | Fail |
| 16 | | Site 16_P | 7 | 4 | -3 | 1.3 | Yes | Pass |
| 17 | A146 Beccles Rd / A1117 Cotmer Rd | Site 17_A | 438 | 341 | -97 | 4.9 | No | Pass |
| 17 | | Site 17_B | 501 | 511 | 10 | 0.4 | No | Pass |
| 17 | | Site 17_D | 373 | 427 | 54 | 2.7 | No | Pass |
| 17 | | Site 17_E | 23 | 48 | 25 | 4.2 | Yes | Pass |
| 17 | | Site 17_G | 19 | 56 | 37 | 6.0 | Yes | Pass |
| 17 | | Site 17_H | 418 | 345 | -73 | 3.7 | No | Pass |

**Table 6-4: Calibration Turn Flows – HGV PM Peak**

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 1a | Station Square / Waveney Rd | Site 1a_A | 3 | 6 | 3 | 1.4 | Yes | Pass |
| 1a | | Site 1a_B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 1a | | Site 1a_D | 11 | 36 | 25 | 5.2 | Yes | Pass |
| 1a | | Site 1a_F | 5 | 20 | 15 | 4.2 | Yes | Pass |
| 1a | | Site 1a_G | 5 | 11 | 6 | 2.1 | Yes | Pass |
| 1b | Station Square / Commercial Rd | Site 1b_A | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 1b | | Site 1b_B | 11 | 42 | 31 | 6.0 | Yes | Pass |
| 1b | | Site 1b_D | 12 | 31 | 19 | 4.1 | Yes | Pass |
| 1b | | Site 1b_E | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 1b | | Site 1b_G | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 1b | | Site 1b_H | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 2 | London Rd / Belvedere Rd (A12) | Site 2_A | 6 | 42 | 36 | 7.3 | Yes | Pass |
| 2 | | Site 2_B | 5 | 0 | -5 | 3.2 | Yes | Pass |
| 2 | | Site 2_D | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 2 | | Site 2_E | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 2 | | Site 2_H | 13 | 30 | 17 | 3.7 | Yes | Pass |
| 3 | Kirkley Rise / A12 / ASDA access | Site 3_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_D | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_G | 7 | 26 | 19 | 4.7 | Yes | Pass |
| 3 | | Site 3_H | 0 | 3 | 3 | 2.4 | Yes | Pass |
| 3 | | Site 3_I | 0 | 14 | 14 | 5.3 | Yes | Pass |
| 3 | | Site 3_J | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_K | 5 | 0 | -5 | 3.2 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 3 | | Site 3_L | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_M | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_N | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_P | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_Q | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_R | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_S | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 3 | | Site 3_U | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 3 | | Site 3_V | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_W | 10 | 30 | 20 | 4.5 | Yes | Pass |
| 3 | | Site 3_X | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 3 | | Site 3_Y | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 4 | Denmark Rd / Katwijk Way | Site 4_A | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 4 | | Site 4_B | 4 | 5 | 1 | 0.5 | Yes | Pass |
| 4 | | Site 4_D | 1 | 11 | 10 | 4.1 | Yes | Pass |
| 4 | | Site 4_E | 5 | 0 | -5 | 3.2 | Yes | Pass |
| 4 | | Site 4_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 4 | | Site 4_G | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 4 | | Site 4_H | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | Clapham Rd S / Katwijk Way | Site 5_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_B | 2 | 3 | 1 | 0.6 | Yes | Pass |
| 5 | | Site 5_C | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 5 | | Site 5_D | 0 | 3 | 3 | 2.4 | Yes | Pass |
| 5 | | Site 5_E | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_G | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 5 | | Site 5_I | 0 | 1 | 1 | 1.4 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 5 | | Site 5_J | 1 | 8 | 7 | 3.3 | Yes | Pass |
| 5 | | Site 5_K | 0 | 2 | 2 | 2.0 | Yes | Pass |
| 5 | | Site 5_L | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_M | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 5 | | Site 5_N | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 5 | | Site 5_O | 1 | 1 | 0 | 0.0 | Yes | Pass |
| 6 | Battery Green Rd / Waveney Rd | Site 6_A | 6 | 33 | 27 | 6.1 | Yes | Pass |
| 6 | | Site 6_B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 6 | | Site 6_D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 6 | | Site 6_E | 4 | 3 | -1 | 0.5 | Yes | Pass |
| 6 | | Site 6_G | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 6 | | Site 6_H | 5 | 19 | 14 | 4.0 | Yes | Pass |
| 6 | | Site 6_J | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 6 | | Site 6_L | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 7 | A12 / Blackheath Rd / Long Rd | Site 7_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 7 | | Site 7_B | 8 | 25 | 17 | 4.2 | Yes | Pass |
| 7 | | Site 7_C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 7 | | Site 7_E | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 7 | | Site 7_F | 6 | 0 | -6 | 3.5 | Yes | Pass |
| 7 | | Site 7_G | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 7 | | Site 7_I | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 7 | | Site 7_J | 11 | 21 | 10 | 2.5 | Yes | Pass |
| 7 | | Site 7_K | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 7 | | Site 7_M | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 7 | | Site 7_N | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 7 | | Site 7_O | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_A-B | 0 | 2 | 2 | 2.0 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 8 | Horn Hill / Maconochie Way / A12 / Waveney Dr | Site 8_A-C | 7 | 25 | 18 | 4.5 | Yes | Pass |
| 8 | | Site 8_A-D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_B-A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_B-C | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 8 | | Site 8_B-D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_C-A | 4 | 21 | 17 | 4.8 | Yes | Pass |
| 8 | | Site 8_C-B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_C-D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_D-A | 0 | 9 | 9 | 4.2 | Yes | Pass |
| 8 | | Site 8_D-B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 8 | | Site 8_D-C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 10 | Victoria Rd / Bridge Rd / Saltwater Way | Site 10_A | 16 | 21 | 5 | 1.2 | Yes | Pass |
| 10 | | Site 10_B | 7 | 0 | -7 | 3.7 | Yes | Pass |
| 10 | | Site 10_C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 10 | | Site 10_D | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 10 | | Site 10_E | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 10 | | Site 10_G | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 10 | | Site 10_H | 16 | 36 | 20 | 3.9 | Yes | Pass |
| 10 | | Site 10_I | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 11 | Bridge Rd / Normanston Dr | Site 11_A | 4 | 6 | 2 | 0.9 | Yes | Pass |
| 11 | | Site 11_B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 11 | | Site 11_D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 11 | | Site 11_E | 6 | 15 | 9 | 2.8 | Yes | Pass |
| 11 | | Site 11_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 11 | | Site 11_G | 8 | 21 | 13 | 3.4 | Yes | Pass |
| 11 | | Site 11_H | 11 | 15 | 4 | 1.1 | Yes | Pass |
| 11 | | Site 11_I | 0 | 0 | 0 | 0.0 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 12 | Peto Way / Normanston Dr | Site 12_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_B | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 12 | | Site 12_C | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_D | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_G | 5 | 0 | -5 | 3.2 | Yes | Pass |
| 12 | | Site 12_H | 4 | 15 | 11 | 3.6 | Yes | Pass |
| 12 | | Site 12_I | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_K | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_L | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 12 | | Site 12_M | 1 | 9 | 8 | 3.6 | Yes | Pass |
| 12 | | Site 12_N | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 12 | | Site 12_P | 4 | 7 | 3 | 1.3 | Yes | Pass |
| 12 | | Site 12_Q | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 12 | | Site 12_R | 3 | 14 | 11 | 3.8 | Yes | Pass |
| 12 | | Site 12_S | 5 | 0 | -5 | 3.2 | Yes | Pass |
| 12 | | Site 12_U | 3 | 0 | -3 | 2.4 | Yes | Pass |
| 12 | | Site 12_V | 2 | 0 | -2 | 2.0 | Yes | Pass |
| 12 | | Site 12_W | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 12 | | Site 12_X | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_B | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_C | 3 | 16 | 13 | 4.2 | Yes | Pass |
| 14 | | Site 14_D | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 14 | | Site 14_E | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 14 | | Site 14_F | 4 | 0 | -4 | 2.8 | Yes | Pass |
| 14 | | Site 14_H | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_I | 3 | 12 | 9 | 3.3 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 14 | Battery Green Rd / Gordon Rd / Whapload Rd | Site 14_J | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_K | 2 | 7 | 5 | 2.4 | Yes | Pass |
| 14 | | Site 14_L | 3 | 9 | 6 | 2.4 | Yes | Pass |
| 14 | | Site 14_M | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 14 | | Site 14_N | 0 | 4 | 4 | 2.8 | Yes | Pass |
| 14 | | Site 14_O | 0 | 5 | 5 | 3.2 | Yes | Pass |
| 14 | | Site 14_P | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_Q | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_R | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_U | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 14 | | Site 14_V | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 14 | | Site 14_X | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | A12 / Jubilee Way / St Peters St | Site 15_A | 2 | 8 | 6 | 2.7 | Yes | Pass |
| 15 | | Site 15_B | 1 | 1 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_C | 2 | 1 | -1 | 0.8 | Yes | Pass |
| 15 | | Site 15_D | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 15 | | Site 15_E | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_F | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_G | 0 | 3 | 3 | 2.4 | Yes | Pass |
| 15 | | Site 15_H | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_I | 0 | 8 | 8 | 4.0 | Yes | Pass |
| 15 | | Site 15_K | 0 | 2 | 2 | 2.0 | Yes | Pass |
| 15 | | Site 15_L | 5 | 4 | -1 | 0.5 | Yes | Pass |
| 15 | | Site 15_M | 4 | 2 | -2 | 1.2 | Yes | Pass |
| 15 | | Site 15_N | 0 | 1 | 1 | 1.4 | Yes | Pass |
| 15 | | Site 15_P | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 15 | | Site 15_Q | 2 | 9 | 7 | 3.0 | Yes | Pass |

| SITE | JUNCTION | TURN MOVEMENTS (LANE MOVEMENTS) | SURVEY FLOWS (PM)_LGV | MODEL FLOWS (PM)_LGV | DIFFERENCE IN FLOWS | GEH | FLOW CRITERIA | WEBTAG |
|---|---|---|---|---|---|---|---|---|
| 15 | | Site 15_R | 0 | 3 | 3 | 2.4 | Yes | Pass |
| 15 | | Site 15_S | 2 | 3 | 1 | 0.6 | Yes | Pass |
| 15 | | Site 15_T | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | A1144 / St Peters St / Katwijk Way | Site 16_A | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_B | 4 | 9 | 5 | 2.0 | Yes | Pass |
| 16 | | Site 16_C | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 16 | | Site 16_G | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_I | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_J | 5 | 3 | -2 | 1.0 | Yes | Pass |
| 16 | | Site 16_K | 0 | 8 | 8 | 4.0 | Yes | Pass |
| 16 | | Site 16_L | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 16 | | Site 16_M | 0 | 7 | 7 | 3.7 | Yes | Pass |
| 16 | | Site 16_N | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 16 | | Site 16_O | 1 | 7 | 6 | 3.0 | Yes | Pass |
| 16 | | Site 16_P | 0 | 0 | 0 | 0.0 | Yes | Pass |
| 17 | A146 Beccles Rd / A1117 Cotmer Rd | Site 17_A | 10 | 15 | 5 | 1.4 | Yes | Pass |
| 17 | | Site 17_B | 7 | 6 | -1 | 0.4 | Yes | Pass |
| 17 | | Site 17_D | 9 | 11 | 2 | 0.6 | Yes | Pass |
| 17 | | Site 17_E | 1 | 0 | -1 | 1.4 | Yes | Pass |
| 17 | | Site 17_G | 1 | 14 | 13 | 4.7 | Yes | Pass |
| 17 | | Site 17_H | 6 | 25 | 19 | 4.8 | Yes | Pass |

**Table 6-5: Validation by Link Flows – Lights AM Peak**

**LIGHTS**

| Site | Location | Direction | From | To | Total | Model | Difference | GEH | Flow Criteria | WEBTAG |
|---|---|---|---|---|---|---|---|---|---|---|
| Site 8 | A12 Tom Crisp Way ATC | SW/NE | A1117 Elm Tree Road (SW) | Blackheath Road (NE) | 791 | 869 | 78 | 2.7 | Yes | Pass |
| Site 8 | A12 Tom Crisp Way ATC | NE/SW | Blackheath Road (NE) | A1117 Elm Tree Road (SW) | 357 | 449 | 92 | 4.6 | Yes | Pass |
| Site 11 | Kirkley Run ATC | NB | Birds Lane (S) | Edgerton Road (N) | 157 | 193 | 36 | 2.7 | Yes | Pass |
| Site 11 | Kirkley Run ATC | SB | Edgerton Road (N) | Birds Lane (S) | 91 | 146 | 55 | 5.1 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | SW/E | Kimberley Road (SW) | Waveney Crescent (E) | 339 | 245 | -94 | 5.5 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | E/SW | Waveney Crescent (E) | Kimberley Road (SW) | 145 | 79 | -66 | 6.2 | Yes | Pass |
| Site 15 | Katwijk Way ATC | NB | Denmark Road (S) | Raglan Street (N) | 381 | 467 | 86 | 4.2 | Yes | Pass |
| Site 15 | Katwijk Way ATC | SB | Raglan Street (N) | Denmark Road (S) | 119 | 132 | 13 | 1.2 | Yes | Pass |
| Site 16 | A12 Battery Green Road ATC | NB | Beach Road (S) | Grove Road (N) | 638 | 563 | -75 | 3.1 | Yes | Pass |
| Site 16 | A12 Battery Green Road ATC | SB | Grove Road (N) | Beach Road (S) | 539 | 437 | -102 | 4.6 | No | Pass |
| Site 19 | Denmark Road ATC | EB | Clemence Street (W) | Trafalgar Street (E) | 206 | 269 | 63 | 4.1 | Yes | Pass |
| Site 19 | Denmark Road ATC | WB | Trafalgar Street (E) | Clemence Street (W) | 295 | 286 | -9 | 0.5 | Yes | Pass |
| Site 21 | Peto Way ATC | EB | A1117 Normanston Drive (W) | Denmark Road (E) | 388 | 325 | -63 | 3.3 | Yes | Pass |
| Site 21 | Peto Way ATC | WB | Denmark Road (E) | A1117 Normanston Drive (W) | 313 | 296 | -17 | 1.0 | Yes | Pass |
| Site 22 | A1117 Normanston Drive ATC | SW/NE | Higher Drive (SW) | Monckton Crescent (NE) | 665 | 715 | 50 | 1.9 | Yes | Pass |
| Site 22 | A1117 Normanston Drive ATC | NE/SW | Monckton Crescent (NE) | Higher Drive (SW) | 489 | 474 | -15 | 0.7 | Yes | Pass |
| Site 23 | A1144 Normanston Drive | EB | Garden Close (W) | Rotterdam Road (E) | 401 | 296 | -105 | 5.6 | No | Fail |
| Site 23 | A1144 Normanston Drive | WB | Rotterdam Road (E) | Garden Close (W) | 186 | 181 | -5 | 0.4 | Yes | Pass |

**Table 6-6: Validation by Link Flows – HGV AM Peak**

| | | | | | HGV | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site** | **Location** | **Direction** | **From** | **To** | **Total** | **Model** | **Difference** | **GEH** | **Flow Criteria** | **WEBTAG** |
| Site 8 | A12 Tom Crisp Way ATC | SW/NE | A1117 Elm Tree Road (SW) | Blackheath Road (NE) | 17 | 67 | 50 | 7.7 | Yes | Pass |
| Site 8 | A12 Tom Crisp Way ATC | NE/SW | Blackheath Road (NE) | A1117 Elm Tree Road (SW) | 15 | 30 | 15 | 3.2 | Yes | Pass |
| Site 11 | Kirkley Run ATC | NB | Birds Lane (S) | Edgerton Road (N) | 2 | 12 | 10 | 3.8 | Yes | Pass |
| Site 11 | Kirkley Run ATC | SB | Edgerton Road (N) | Birds Lane (S) | 2 | 0 | -2 | 2.0 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | SW/E | Kimberley Road (SW) | Waveney Crescent (E) | 9 | 29 | 20 | 4.6 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | E/SW | Waveney Crescent (E) | Kimberley Road (SW) | 6 | 5 | -1 | 0.4 | Yes | Pass |
| Site 15 | Katwijk Way ATC | NB | Denmark Road (S) | Raglan Street (N) | 13 | 28 | 15 | 3.3 | Yes | Pass |
| Site 15 | Katwijk Way ATC | SB | Raglan Street (N) | Denmark Road (S) | 6 | 11 | 5 | 1.7 | Yes | Pass |
| Site 16 | A12 Battery Green Road ATC | NB | Beach Road (S) | Grove Road (N) | 16 | 67 | 51 | 7.9 | Yes | Pass |
| Site 16 | A12 Battery Green Road ATC | SB | Grove Road (N) | Beach Road (S) | 19 | 11 | -8 | 2.1 | Yes | Pass |
| Site 19 | Denmark Road ATC | EB | Clemence Street (W) | Trafalgar Street (E) | 5 | 31 | 26 | 6.1 | Yes | Pass |
| Site 19 | Denmark Road ATC | WB | Trafalgar Street (E) | Clemence Street (W) | 6 | 53 | 47 | 8.7 | Yes | Pass |
| Site 21 | Peto Way ATC | EB | A1117 Normanston Drive (W) | Denmark Road (E) | 5 | 21 | 16 | 4.4 | Yes | Pass |
| Site 21 | Peto Way ATC | WB | Denmark Road (E) | A1117 Normanston Drive (W) | 8 | 27 | 19 | 4.5 | Yes | Pass |
| Site 22 | A1117 Normanston Drive ATC | SW/NE | Higher Drive (SW) | Monckton Crescent (NE) | 12 | 71 | 59 | 9.2 | Yes | Pass |
| Site 22 | A1117 Normanston Drive ATC | NE/SW | Monckton Crescent (NE) | Higher Drive (SW) | 11 | 71 | 60 | 9.4 | Yes | Pass |
| Site 23 | A1144 Normanston Drive | EB | Garden Close (W) | Rotterdam Road (E) | 5 | 17 | 12 | 3.6 | Yes | Pass |
| Site 23 | A1144 Normanston Drive | WB | Rotterdam Road (E) | Garden Close (W) | 3 | 25 | 22 | 5.9 | Yes | Pass |

**Table 6-7: Validation by Link Flows – Lights PM Peak**

**LIGHTS**

| Site | Location | Direction | From | To | Total | Model | Difference | GEH | Flow Criteria | WEBTAG |
|---|---|---|---|---|---|---|---|---|---|---|
| Site 8 | A12 Tom Crisp Way ATC | SW/NE | A1117 Elm Tree Road (SW) | Blackheath Road (NE) | 497 | 567 | 70 | 3.0 | Yes | Pass |
| Site 8 | A12 Tom Crisp Way ATC | NE/SW | Blackheath Road (NE) | A1117 Elm Tree Road (SW) | 713 | 847 | 134 | 4.8 | No | Pass |
| Site 11 | Kirkley Run ATC | NB | Birds Lane (S) | Edgerton Road (N) | 190 | 193 | 3 | 0.2 | Yes | Pass |
| Site 11 | Kirkley Run ATC | SB | Edgerton Road (N) | Birds Lane (S) | 168 | 116 | -52 | 4.4 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | SW/E | Kimberley Road (SW) | Waveney Crescent (E) | 232 | 194 | -38 | 2.6 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | E/SW | Waveney Crescent (E) | Kimberley Road (SW) | 434 | 187 | -247 | 14.0 | No | Fail |
| Site 15 | Katwijk Way ATC | NB | Denmark Road (S) | Raglan Street (N) | 288 | 335 | 47 | 2.7 | Yes | Pass |
| Site 15 | Katwijk Way ATC | SB | Raglan Street (N) | Denmark Road (S) | 208 | 202 | -6 | 0.4 | Yes | Pass |
| Site 16 | A12 Battery Green Road ATC | NB | Beach Road (S) | Grove Road (N) | 450 | 349 | -101 | 5.0 | No | Pass |
| Site 16 | A12 Battery Green Road ATC | SB | Grove Road (N) | Beach Road (S) | 859 | 984 | 125 | 4.1 | Yes | Pass |
| Site 19 | Denmark Road ATC | EB | Clemence Street (W) | Trafalgar Street (E) | 255 | 276 | 21 | 1.3 | Yes | Pass |
| Site 19 | Denmark Road ATC | WB | Trafalgar Street (E) | Clemence Street (W) | 397 | 497 | 100 | 4.7 | No | Pass |
| Site 21 | Peto Way ATC | EB | A1117 Normanston Drive (W) | Denmark Road (E) | 406 | 341 | -65 | 3.4 | Yes | Pass |
| Site 21 | Peto Way ATC | WB | Denmark Road (E) | A1117 Normanston Drive (W) | 592 | 614 | 22 | 0.9 | Yes | Pass |
| Site 22 | A1117 Normanston Drive ATC | SW/NE | Higher Drive (SW) | Monckton Crescent (NE) | 614 | 487 | -127 | 5.4 | No | Fail |
| Site 22 | A1117 Normanston Drive ATC | NE/SW | Monckton Crescent (NE) | Higher Drive (SW) | 626 | 740 | 114 | 4.4 | No | Pass |
| Site 23 | A1144 Normanston Drive | EB | Garden Close (W) | Rotterdam Road (E) | 256 | 206 | -50 | 3.3 | Yes | Pass |
| Site 23 | A1144 Normanston Drive | WB | Rotterdam Road (E) | Garden Close (W) | 323 | 312 | -11 | 0.6 | Yes | Pass |

**Table 6-8: Validation by Link Flows – HGV PM Peak**

| | | | | | HGV | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Site** | **Location** | **Direction** | **From** | **To** | **Total** | **Model** | **Difference** | **GEH** | **Flow Criteria** | **WEBTAG** |
| Site 8 | A12 Tom Crisp Way ATC | SW/NE | A1117 Elm Tree Road (SW) | Blackheath Road (NE) | 5 | 21 | 16 | 4.4 | Yes | Pass |
| Site 8 | A12 Tom Crisp Way ATC | NE/SW | Blackheath Road (NE) | A1117 Elm Tree Road (SW) | 7 | 26 | 19 | 4.6 | Yes | Pass |
| Site 11 | Kirkley Run ATC | NB | Birds Lane (S) | Edgerton Road (N) | 1 | 0 | -1 | 1.6 | Yes | Pass |
| Site 11 | Kirkley Run ATC | SB | Edgerton Road (N) | Birds Lane (S) | 1 | 0 | -1 | 1.2 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | SW/E | Kimberley Road (SW) | Waveney Crescent (E) | 4 | 7 | 3 | 1.4 | Yes | Pass |
| Site 12 | A146 Waveney Drive ATC | E/SW | Waveney Crescent (E) | Kimberley Road (SW) | 5 | 0 | -5 | 3.3 | Yes | Pass |
| Site 15 | Katwijk Way ATC | NB | Denmark Road (S) | Raglan Street (N) | 9 | 11 | 2 | 0.6 | Yes | Pass |
| Site 15 | Katwijk Way ATC | SB | Raglan Street (N) | Denmark Road (S) | 6 | 4 | -2 | 1.1 | Yes | Pass |
| Site 16 | A12 Battery Green Road ATC | NB | Beach Road (S) | Grove Road (N) | 6 | 19 | 13 | 3.8 | Yes | Pass |
| Site 16 | A12 Battery Green Road ATC | SB | Grove Road (N) | Beach Road (S) | 14 | 33 | 19 | 4.0 | Yes | Pass |
| Site 19 | Denmark Road ATC | EB | Clemence Street (W) | Trafalgar Street (E) | 2 | 0 | -2 | 1.9 | Yes | Pass |
| Site 19 | Denmark Road ATC | WB | Trafalgar Street (E) | Clemence Street (W) | 4 | 0 | -4 | 2.9 | Yes | Pass |
| Site 21 | Peto Way ATC | EB | A1117 Normanston Drive (W) | Denmark Road (E) | 4 | 6 | 2 | 0.7 | Yes | Pass |
| Site 21 | Peto Way ATC | WB | Denmark Road (E) | A1117 Normanston Drive (W) | 5 | 9 | 4 | 1.4 | Yes | Pass |
| Site 22 | A1117 Normanston Drive ATC | SW/NE | Higher Drive (SW) | Monckton Crescent (NE) | 7 | 21 | 14 | 3.9 | Yes | Pass |
| Site 22 | A1117 Normanston Drive ATC | NE/SW | Monckton Crescent (NE) | Higher Drive (SW) | 6 | 15 | 9 | 2.9 | Yes | Pass |
| Site 23 | A1144 Normanston Drive | EB | Garden Close (W) | Rotterdam Road (E) | 2 | 0 | -2 | 2.0 | Yes | Pass |
| Site 23 | A1144 Normanston Drive | WB | Rotterdam Road (E) | Garden Close (W) | 3 | 15 | 12 | 4.2 | Yes | Pass |

# APPENDIX B

**Table 6-9: Link Flow Comparison DM vs DS, AM Peak**

| SITE | LOCATION | AM_DM _5 MINS E.BRIDGE CLOSURE | TOTAL_DS_OPT_5 | | AM_DM _10 MINS E.BRIDGE CLOSURE | TOTAL_DS_OPT_6 | | TOTAL_DS_OPT_7 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total | Model | Percentage Diff | Total | Model | Percentage Diff | Model | Percentage Diff |
| Site 8 | A12 Tom Crisp Way ATC | 982 | 982 | 0.0% | 982 | 979 | -0.3% | 982 | 0.0% |
| Site 8 | A12 Tom Crisp Way ATC | 431 | 439 | 1.9% | 405 | 429 | 5.9% | 428 | 5.7% |
| Site 11 | Kirkley Run ATC | 254 | 259 | 2.0% | 258 | 248 | -3.9% | 288 | 11.6% |
| Site 11 | Kirkley Run ATC | 124 | 136 | 9.7% | 127 | 136 | 7.1% | 136 | 7.1% |
| Site 12 | A146 Waveney Drive ATC | 368 | 740 | 101.1% | 299 | 726 | 142.8% | 738 | 146.8% |
| Site 12 | A146 Waveney Drive ATC | 128 | 320 | 150.0% | 118 | 300 | 154.2% | 290 | 145.8% |
| Site 15 | Katwijk Way ATC | 433 | 397 | -8.3% | 393 | 393 | 0.0% | 377 | -4.1% |
| Site 15 | Katwijk Way ATC | 142 | 165 | 16.2% | 126 | 153 | 21.4% | 137 | 8.7% |
| Site 16 | A12 Battery Green Road ATC | 616 | 582 | -5.5% | 566 | 578 | 2.1% | 567 | 0.2% |
| Site 16 | A12 Battery Green Road ATC | 577 | 499 | -13.5% | 573 | 492 | -14.1% | 489 | -14.7% |
| Site 19 | Denmark Road ATC | 244 | 287 | 17.6% | 248 | 279 | 12.5% | 281 | 13.3% |
| Site 19 | Denmark Road ATC | 413 | 193 | -53.3% | 334 | 206 | -38.3% | 212 | -36.5% |
| Site 21 | Peto Way ATC | 285 | 422 | 48.1% | 296 | 415 | 40.2% | 424 | 43.2% |
| Site 21 | Peto Way ATC | 306 | 379 | 23.9% | 275 | 361 | 31.3% | 353 | 28.4% |
| Site 22 | A1117 Normanston Drive ATC | 661 | 738 | 11.6% | 750 | 705 | -6.0% | 743 | -0.9% |
| Site 22 | A1117 Normanston Drive ATC | 420 | 421 | 0.2% | 421 | 400 | -5.0% | 421 | 0.0% |
| Site 23 | A1144 Normanston Drive | 398 | 368 | -7.5% | 451 | 360 | -20.2% | 366 | -18.8% |
| Site 23 | A1144 Normanston Drive | 250 | 265 | 6.0% | 246 | 257 | 4.5% | 260 | 5.7% |

**Table 6-10: Link Flow Comparison DM vs DS, PM Peak**

| SITE | LOCATION | PM_DM_5 MINS E.BRIDGE CLOSURE | TOTAL_DS_OPT_5 | | PM_DM_10 MINS E.BRIDGE CLOSURE | TOTAL_DS_OPT_6 | | TOTAL_DS_OPT_7 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total | Model | Percentage Diff | Total | Model | Percentage Diff | Model | Percentage Diff |
| Site 8 | A12 Tom Crisp Way ATC | 593 | 591 | -0.2% | 593 | 593 | 0.0% | 593 | 0.0% |
| Site 8 | A12 Tom Crisp Way ATC | 804 | 808 | -0.7% | 743 | 803 | 8.1% | 798 | 7.4% |
| Site 11 | Kirkley Run ATC | 278 | 350 | 31.3% | 278 | 304 | 9.4% | 347 | 24.8% |
| Site 11 | Kirkley Run ATC | 108 | 151 | 7.4% | 108 | 134 | 24.1% | 151 | 39.8% |
| Site 12 | A146 Waveney Drive ATC | 326 | 537 | 69.0% | 326 | 529 | 62.3% | 518 | 58.9% |
| Site 12 | A146 Waveney Drive ATC | 193 | 411 | 138.3% | 179 | 367 | 105.0% | 329 | 83.8% |
| Site 15 | Katwijk Way ATC | 325 | 335 | 1.5% | 297 | 281 | -5.4% | 326 | 9.8% |
| Site 15 | Katwijk Way ATC | 193 | 253 | 16.6% | 187 | 248 | 32.6% | 215 | 15.0% |
| Site 16 | A12 Battery Green Road ATC | 355 | 322 | -17.2% | 327 | 318 | -2.8% | 348 | 6.4% |
| Site 16 | A12 Battery Green Road ATC | 1079 | 935 | -10.9% | 919 | 765 | -16.8% | 872 | -5.1% |
| Site 19 | Denmark Road ATC | 364 | 265 | -11.8% | 362 | 241 | -33.4% | 272 | -24.9% |
| Site 19 | Denmark Road ATC | 551 | 428 | -30.9% | 512 | 355 | -30.7% | 385 | -24.8% |
| Site 21 | Peto Way ATC | 315 | 371 | 18.4% | 315 | 358 | 13.7% | 407 | 29.2% |
| Site 21 | Peto Way ATC | 604 | 638 | 10.1% | 587 | 583 | -0.7% | 599 | 2.0% |
| Site 22 | A1117 Normanston Drive ATC | 446 | 513 | 4.5% | 444 | 422 | -5.0% | 486 | 9.5% |
| Site 22 | A1117 Normanston Drive ATC | 764 | 835 | 4.3% | 745 | 766 | 2.8% | 831 | 11.5% |
| Site 23 | A1144 Normanston Drive | 189 | 216 | 2.1% | 189 | 175 | -7.4% | 167 | -11.6% |
| Site 23 | A1144 Normanston Drive | 334 | 444 | 17.1% | 307 | 430 | 40.1% | 457 | 48.9% |