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London Luton Airport Expansion

Planning Inspectorate Scheme Ref: TR020001

Volume 8 Additional Submissions (Examination)

**8.109 Applicant's Response to Issue Specific Hearing 4 Action 2:
Covid 19 Additional Modelling Technical Note 2 Risk Assessment**

Infrastructure Planning (Examination Procedure) Rules 2010

Application Document Ref: TR020001/APP/8.109

The Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

**London Luton Airport Expansion Development Consent
Order 202x**

**8.109 APPLICANT'S RESPONSE TO ISSUE SPECIFIC HEARING 4
ACTION 2: COVID 19 ADDITIONAL MODELLING TECHNICAL NOTE
2 RISK ASSESSMENT**

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1 INTRODUCTION

- 1.1.1 As a part of the London Luton Airport application for development consent (DCO) application, the Examining Authority (ExA) made a procedural decision via a Rule 9 Letter to the Applicant to take account of the potential impacts of Covid-19 on the traffic modelling. Luton Rising (the Applicant) responded to the ExA with a proposed methodology and timescales to undertake the work. The proposed methodology was based on the Department for Transport's (DfT) recently updated guidance, Transport Appraisal Guidance (TAG) Unit M4 – Forecasting and Uncertainty, May 2023 (Ref 1).
- 1.1.2 At Issue Specific Hearing 4 (ISH4) on 28 September 2023, the Examining Authority (ExA) requested “the Applicant submit technical notes 1 and 2 in relation to the ongoing work undertaken to update the transport modelling in line with Department for Transport guidance”. This is Action Point 2 from the ISH.
- 1.1.3 The proposed work, as set out in the Rule 9 Response letter, listed several tasks. The initial tasks involve collating recent data to cover the pre- and post-Covid-19 period and includes the analysis of road traffic between 2016 (the Luton Airport DCO strategic transport model base year) and 2023 (most recent available data) to help understand the impacts that the Covid-19 pandemic has had on travel characteristics and volumes. The results of these tasks are reported in the **Applicant's Response to Issue Specific Hearing 4 Action 2: Covid 19 Additional Modelling Technical Note 1 (TN1) Trends Analysis [TR020001/APP/8.98]**.
- 1.1.4 The proposed work, as set out in the Rule 9 Response letter dated 27 June 2023 [AS-064], listed several tasks.
- 1.1.5 This technical note covers the following tasks referenced in the letter:
- a. Task 8: Update future years (FY) Uncertainty Log (UL) for development and infrastructure.
 - b. Task 9: Update FY travel demands for UL, NTEM8 & NRTP22 - 2027, 2039, 2043.
 - c. Task 10: Produce transport demands for new additional year 2023.
 - d. Task 11: Run highway and public transport models - 2023, 2027, 2039, 2043 (via the Demand Model).
 - e. Task 12: Compare 2023 forecasts with 2023 counts and 2016 modelled base year.
 - f. Task 13: Determine future year risks and need (if any) for adjustment factors.
 - g. Task 14: Technical Note 2 Risk Assessment.
- 1.1.6 The Covid-19 impact assessment in TN1 indicates the findings as summarised below, which are in-line with the recent published national trends:

- a. Within the Strategic Road Network (SRN) daily and peak traffic volumes in 2023 have 'recovered' to levels that are equal or exceed those recorded in 2016 and 2019 (pre-Covid-19) in the majority of the locations. There is a slight exception for the A1081 where traffic levels have not fully recovered.
- b. Within the Local Road Network (LRN) traffic volumes in 2023 have not recovered to the same level as 2016 and 2019.

- 1.1.7 The projected growth in background (non-airport) traffic within the strategic transport modelling that has informed the DCO application has been based on the DfT's National Trip End Model (NTEM) v7.2 (which was current at the time of undertaking the model runs). In August 2022, a new version of NTEM v8 was published by the DfT and updated goods vehicles projections were published in December 2022, via the National Road Traffic Projections (NRTP22), which replaced the Road Traffic Forecasts 2018 (RTF18), which informed the strategic modelling. This has prompted the DfT growth projections assessment which has also been undertaken in TN1 to provide a comparison between the two projections.
- 1.1.8 The NTEM v8 projections show significantly lower levels of growth for both population and households, although the employment projections show slightly higher growth when compared with NTEM v7.2. Overall, the trip productions in NTEM v8 show a significant reduction in rates.
- 1.1.9 Based on the findings of TN1, a parallel task concerning the updates of the future year forecasting assumptions has been undertaken to assess the impact on the modelled forecast traffic volumes. This would then be utilised to determine any future year risks and potential need for further adjustment to the forecast year models.
- 1.1.10 In addition, a separate analysis was also undertaken to produce a 2023 model, and to carry out a comparison with the 2023 traffic counts.
- 1.1.11 The analysis above would then be concluded in the production of this Technical Note 2 (TN2) and will assist in the decision of whether an adjustment to the forecasts are required, based on a risk assessment.

2 FUTURE YEAR MODEL UPDATE

2.1 Introduction

- 2.1.1 All core scenarios have been updated, which can be described as follows:
- TAG-based "Without" Expansion forecasts for 2027, 2039 and 2043; and
 - TAG-based "With" Expansion forecasts for 2027, 2039 and 2043.
- 2.1.2 Modelled periods remained unchanged as follows:
- AM Peak Hour (08:00-09:00);
 - Interpeak Hour (average between 10:00-16:00); and
 - PM Peak Hour (17:00-18:00).

2.2 Update

- 2.2.1 In addition to projected growth, several other aspects (airport demand, uncertainty log and future model network) were also considered as explained below.
- 2.2.2 For consistency in this TN2, traffic modelling that informed the application for development consent will be referred to as the 'Original', whereas the modelling update as part of the Rule 9 letter will be referred to as the 'Updated'.

2.3 Airport Demand

- 2.3.1 Airport passenger and staff demand trips are assumed to remain unchanged as the Original runs for all forecast years (2027 at 21.5 mppa, 2039 at 27 mppa and 2043 at 32 mppa).
- 2.3.2 Although the Covid-19 pandemic has impacted demand levels and mode choice, the updates to the modelling do not include any allowance for changes in baseline mode choice as a result of Covid-19. The future year mode choice assumptions for the 2027, 2039 and 2043 assessment years have not been changed as they accord with the minimum targets (for surface access via public transport, plus walking and cycling) as set out in the **Framework Travel Plan [AS-131]**, the proposals for car parking, the **Transport Related Impacts Monitoring and Mitigation Approach (TRIMMA) [TR020001/APP/8.97]** and what has been set out in the respective stakeholder Statement of Common Grounds (SOCGs) and **Green Controlled Growth Framework (GCG) [REP3-017]**. It is anticipated that any short-term impact on mode choice and traffic levels, as a result of Covid-19, will have dissipated as the airport's passenger demand returns to pre-pandemic levels and then continues to grow.
- 2.3.3 However, for the 2023 new model year, the airport demands were adjusted to reflect the existing level of passengers in reference to the latest Luton Airport Passenger Statistics. This was carried out by factoring the 18 mppa demand matrices down by a factor of 0.85. The factor was a result of comparing the latest applicable passenger numbers, 15.23 mppa (Ref 2) to the 18 mppa. ($15.23/18 = 0.85$).

2.4 Uncertainty Log (UL) updates

- 2.4.1 The UL has been updated in August/September 2023 to reflect any certainty changes to the proposed housing and employment development sites included within the log since it was last updated in June 2021.
- 2.4.2 This latest update focused on sites that would have over 250 dwellings or would create over 100 jobs. The update included a review of the individual Local Authorities' Planning Portals, updated Local Plans and news articles about potential future developments.
- 2.4.3 Since producing the previous version (in 2021) there have been several changes and these have been updated accordingly in terms of uncertainty (i.e. 'near certain', 'more than likely', 'reasonably foreseeable' and 'hypothetical'),

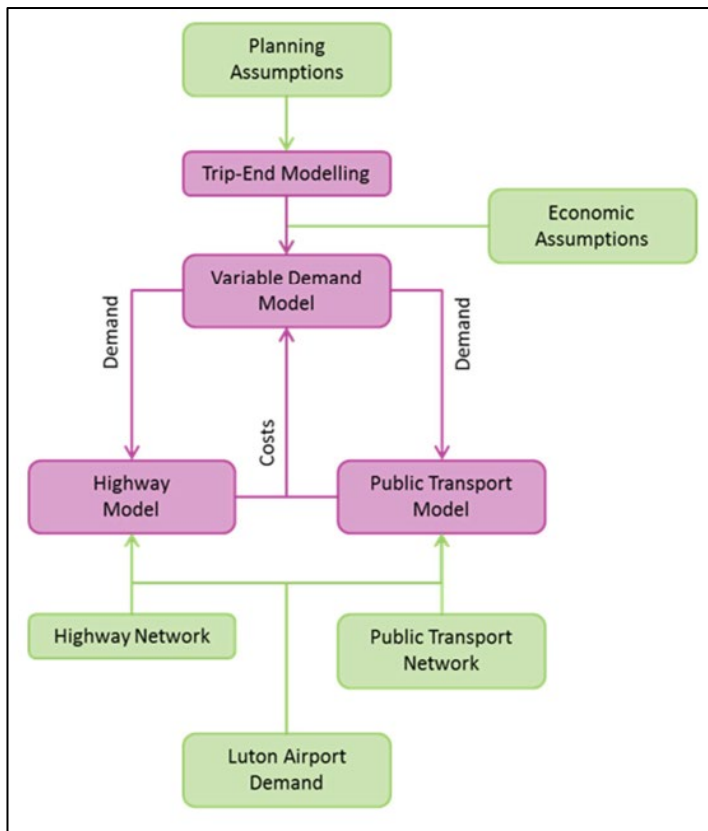
quantum (e.g. households and jobs), anticipated year of completion and phasing.

- 2.4.4 Among the changes, East and North of Luton developments, along with Newlands Park, have changed in terms of certainty level and land quantum which would have a notable direct impact on traffic levels within the study area.
- 2.4.5 The updated UL was shared in August/September 2023 with National Highways and local highway authorities.

2.5 Background Growth Forecast

2.5.1 The forecasting method followed the methodology as reported in the **Strategic Modelling Forecasting report (Appendix F of the Transport Assessment [APP-201])** as summarised below:

Figure 2.1 Overview of CBLTM-LTN Forecasting Process



2.5.2 The updated UL planning data, NTEM v8 and NRTP22 parameters were utilised in this updated modelling, with the growth in traffic being constrained at a district level from NTEM v8, i.e. following the same methodology reported in the **Strategic Modelling Forecasting Report [APP-201]**.

2.6 Model Network Update

Model Assumptions

- 2.6.1 Strategic model runs have been undertaken for the forecast years 2027, 2039 and 2043 for without and with the airport expansion. Runs have also been undertaken for a new model year of 2023.
- 2.6.2 In terms of future year transport infrastructure, the following updates have been assumed:
- a. M1 – in 2043 no smart motorway improvement between J9-J10;
 - b. A1(M) – no smart motorway scheme J6 to J8 in all future years (Ref 3); and
 - c. Vauxhall Way – in 2027 no dualling and junction improvements and therefore reflecting the existing situation.

3 RESULTS

3.1 Introduction

- 3.1.1 The results of the Updated models were checked, analysed and interpreted, in particular in comparison with the Original modelling that was submitted as a part of the application for development consent.
- 3.1.2 The main purpose of the analysis is to establish the impact of the model updates, in comparison with the previous modelling and assess whether there is a risk on the traffic forecasts.

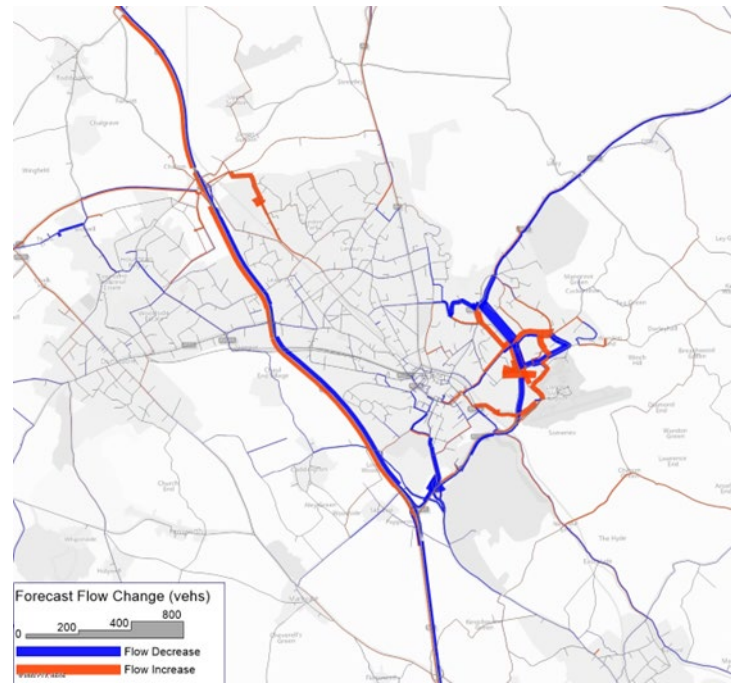
3.2 Highway Model Analysis

- 3.2.1 Traffic flow plot analysis has been undertaken to compare traffic assignment patterns between the Updated and Original runs for both without and with airport expansion.
- 3.2.2 It is worth noting that the Original 2043 model used in this comparison represents the without M1 All Lane Running (ALR) scenario.
- 3.2.3 The comparison as shown in Figure 3.1 to Figure 3.6 show flow reductions on most of the links, except for the area east of M1 J11A and East Luton which can be attributed to the change in UL development assumptions as mentioned in Section 2.4.
- 3.2.4 In comparing the impact of Updated vs Original, a mix of flow increases and reductions can be observed in the 2027 forecast year, whilst the 2039 and 2043 forecast years generally show reductions. This is due to, firstly, higher spare highway capacity available in 2027 and, secondly, the changes in the NTEM version which are more prevalent in 2039 and 2043 compared to 2027.
- 3.2.5 Airport expansion impacts have also been compared between the Updated and Original runs to identify the level of pattern consistency.

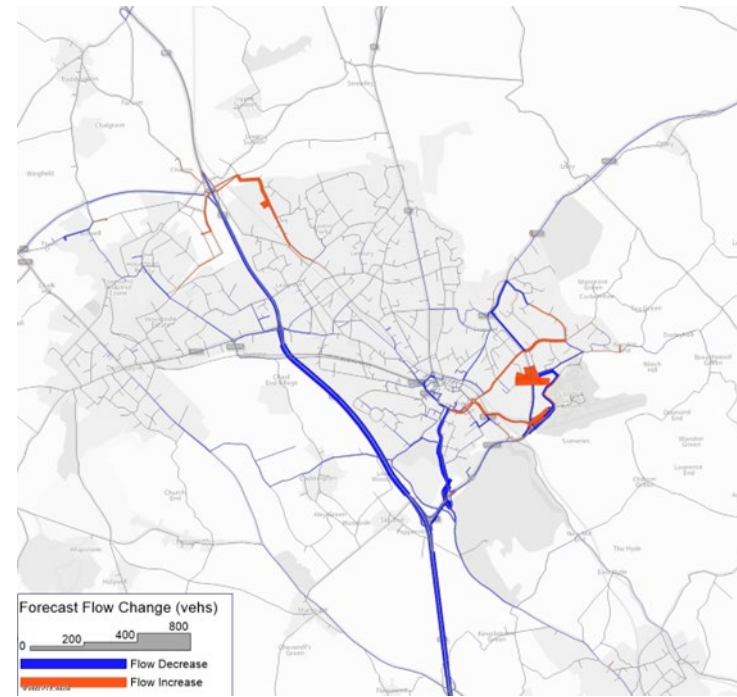
- 3.2.6 Figure 3.7 to Figure 3.12 show similar patterns overall, with minor differences in a few locations which can be attributed to a change in the UL. These differences also occurred within the Updated vs Original comparison without the airport expansion, which indicates that these differences were caused by a change in background (non-airport) traffic rather than the impact of airport expansion.
- 3.2.7 Some flow changes can be seen in the figures, in particular the J10a roundabouts and M1 J10 northbound off slip, which are attributed to the difference in configuration of link structure within the strategic model and not an actual flow increase.
- 3.2.8 The comparison of results outlined above are relatively consistent between without and with airport expansion and ties in with the DfT growth projections assessment results, undertaken in TN1.
- 3.2.9 Importantly, the impact of the airport expansion seems to follow similar patterns when compared with the previous modelling, although with lower overall traffic generally.
- 3.2.10 Further numerical link flow comparisons and analysis are provided in Section 3.3 and 3.4

Figure 3.1 2027 without airport expansion – Updated vs Original runs

AM Peak



Inter Peak



PM Peak

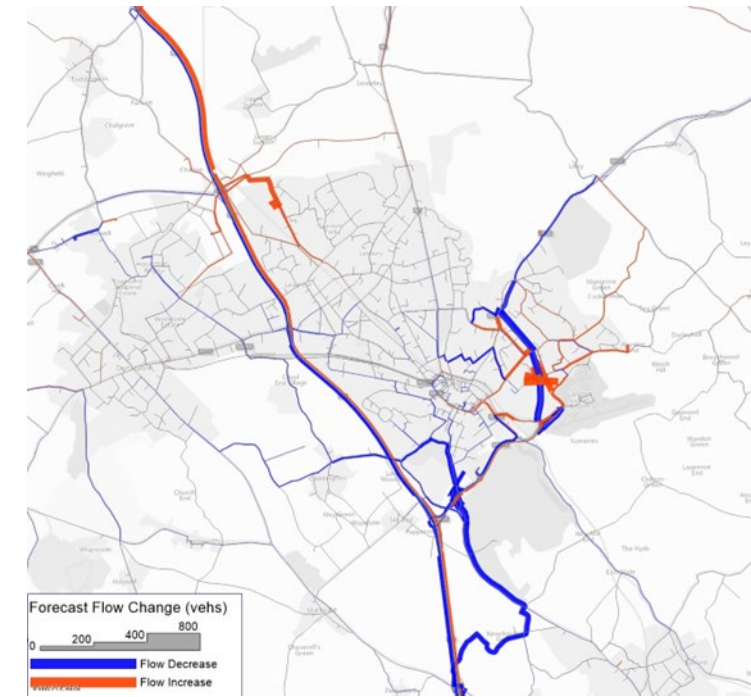
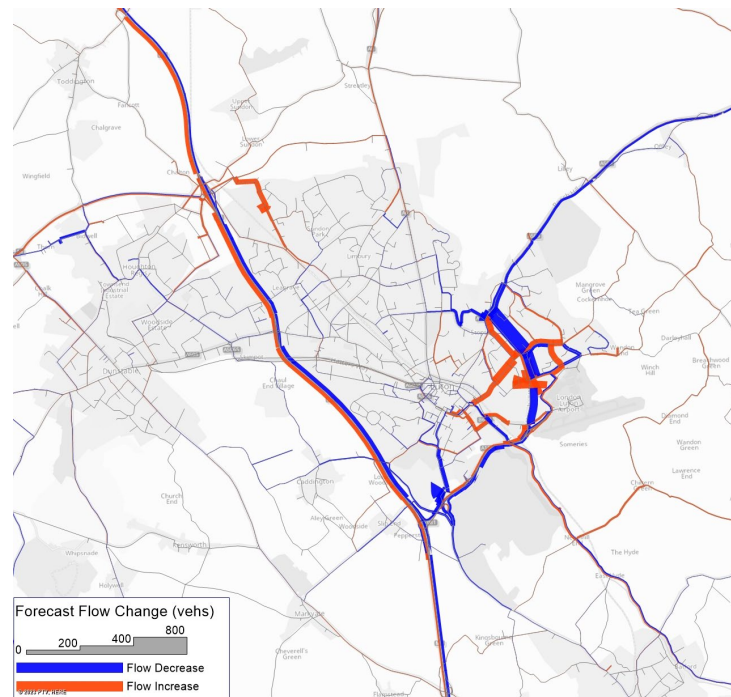
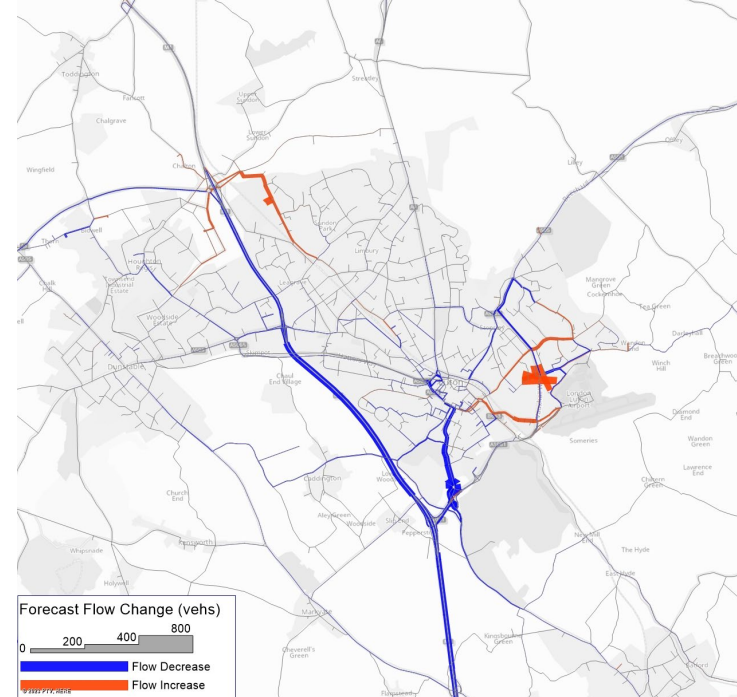


Figure 3.2 2027 with airport expansion – Updated vs Original runs

AM Peak



Inter Peak



PM Peak

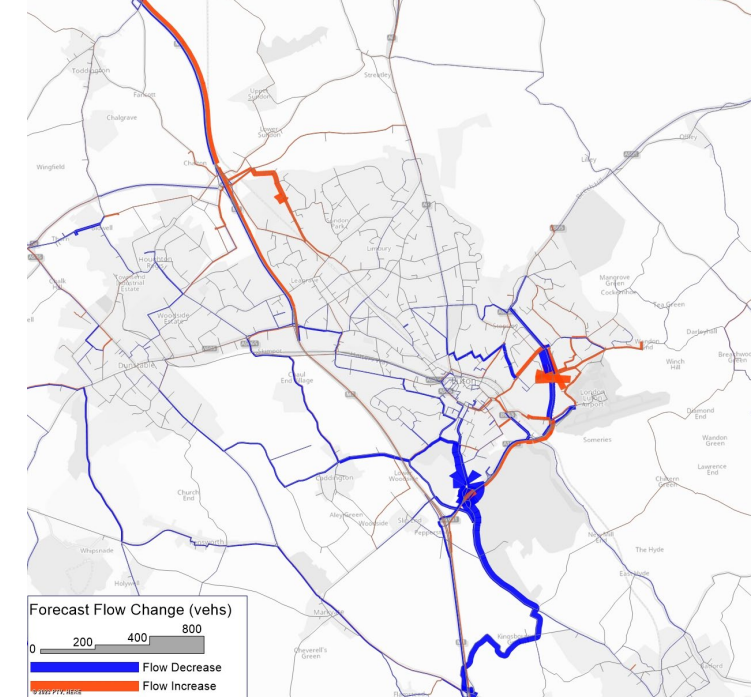
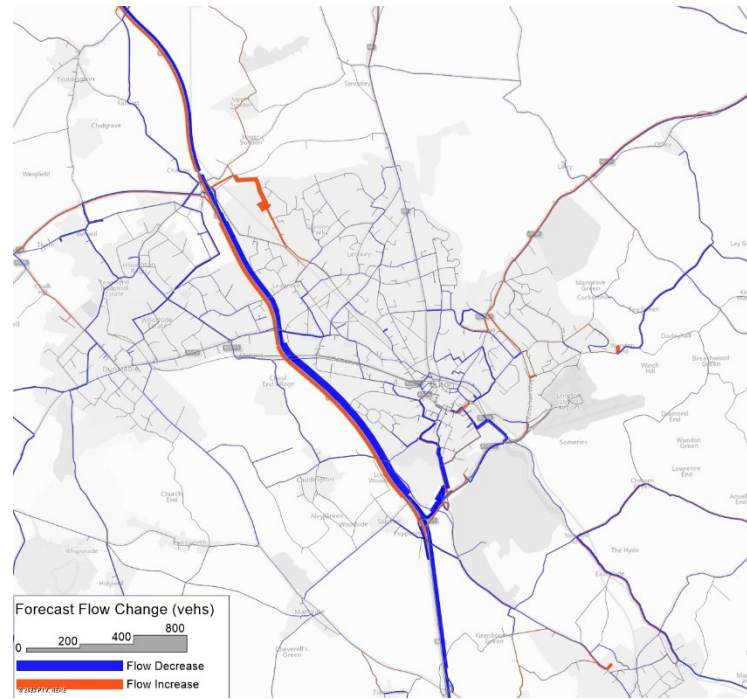
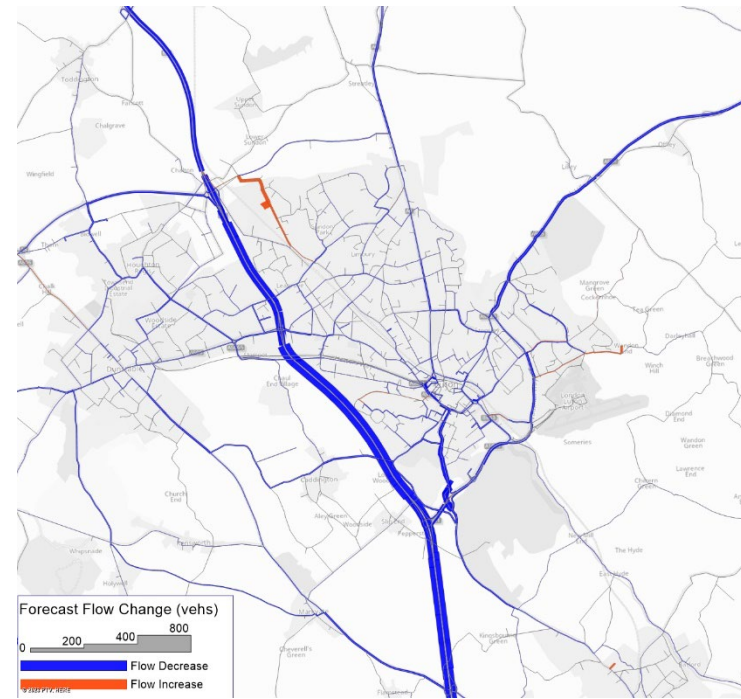


Figure 3.3 2039 without airport expansion – Updated vs Original runs

AM Peak



Inter Peak



PM Peak

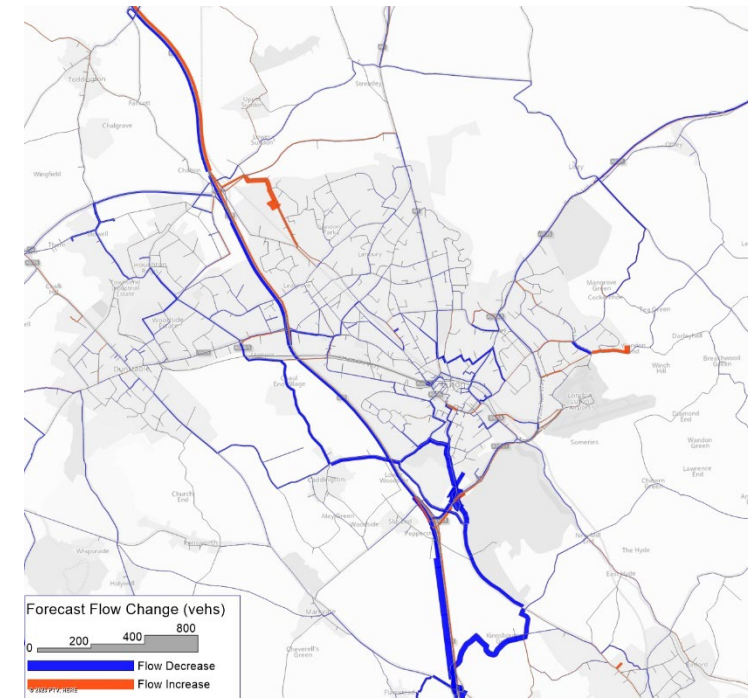
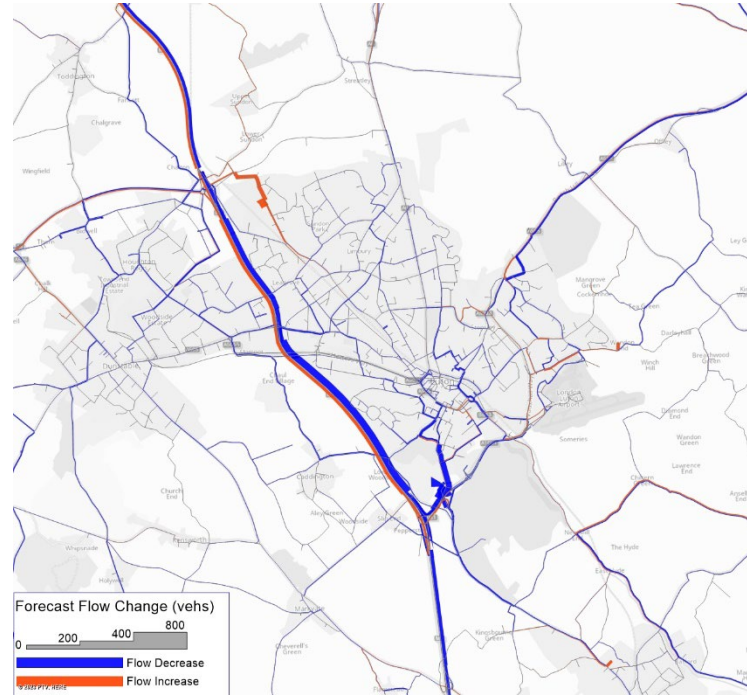
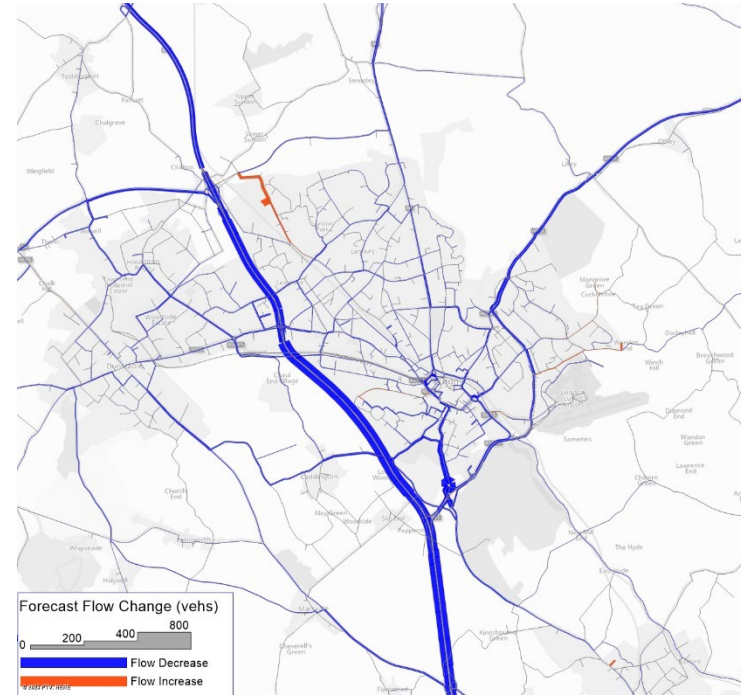


Figure 3.4 2039 with airport expansion – Updated vs Original runs

AM Peak



Inter Peak



PM Peak

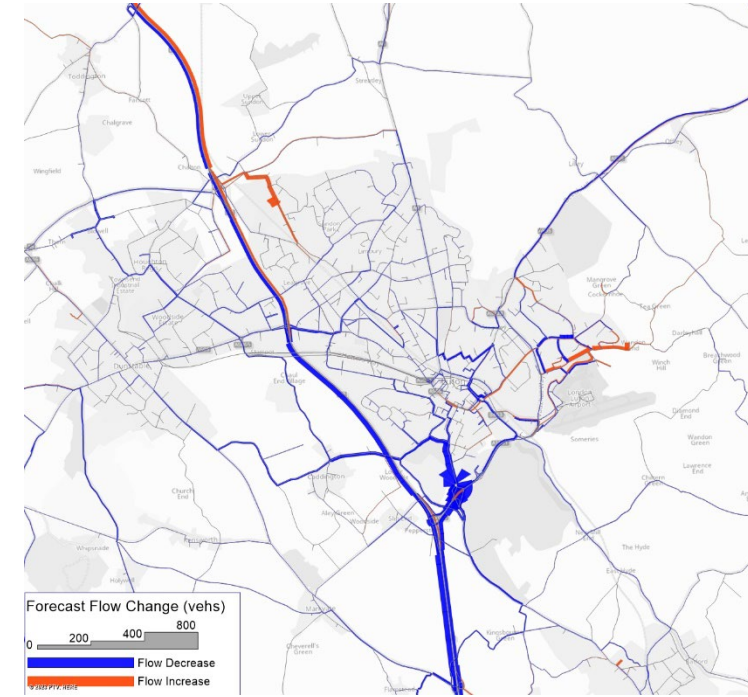
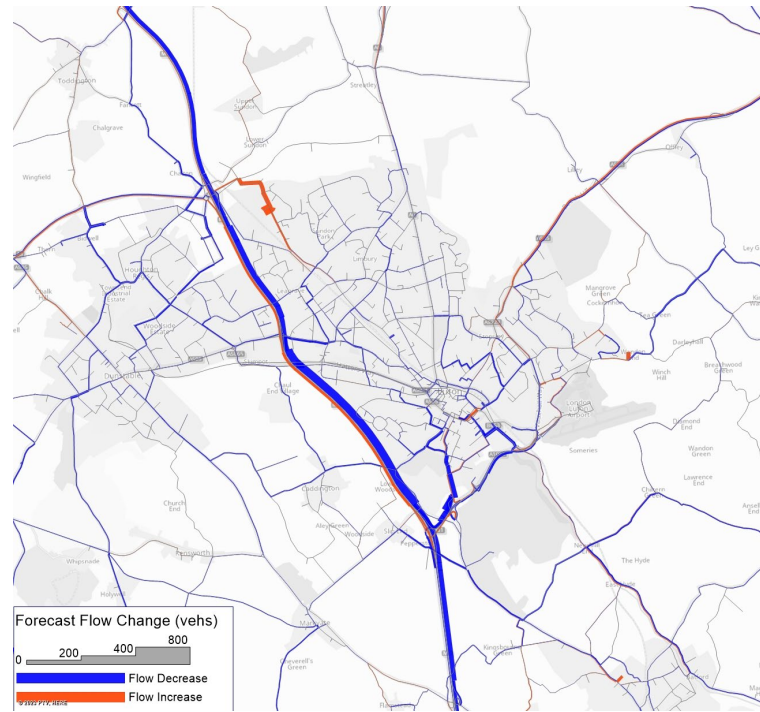
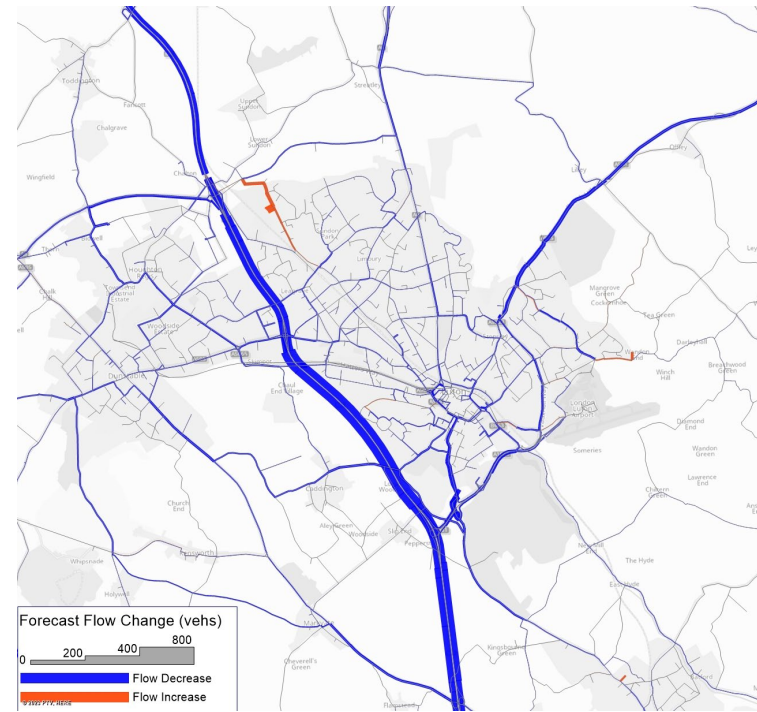


Figure 3.5 2043 without airport expansion – Updated vs Original runs

AM Peak



Inter Peak



PM Peak

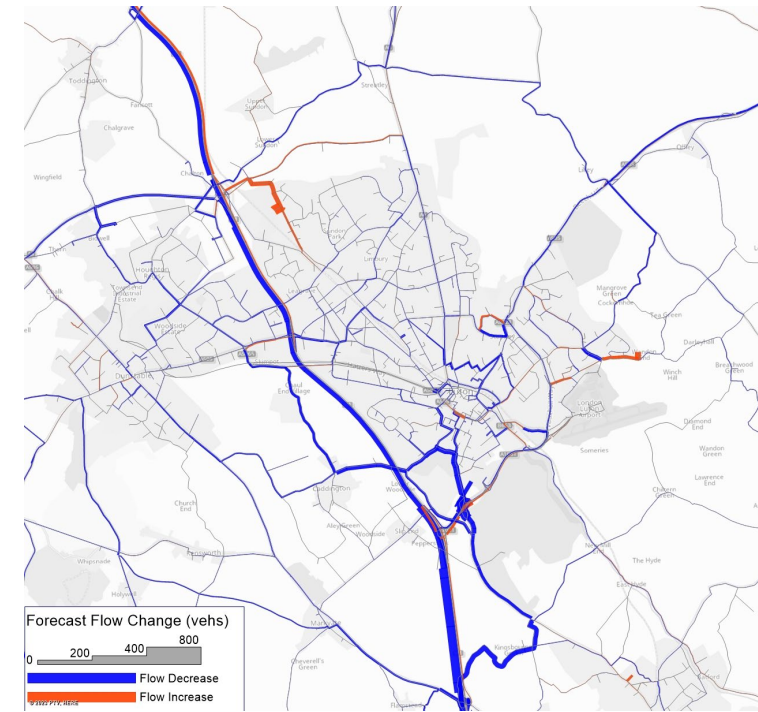
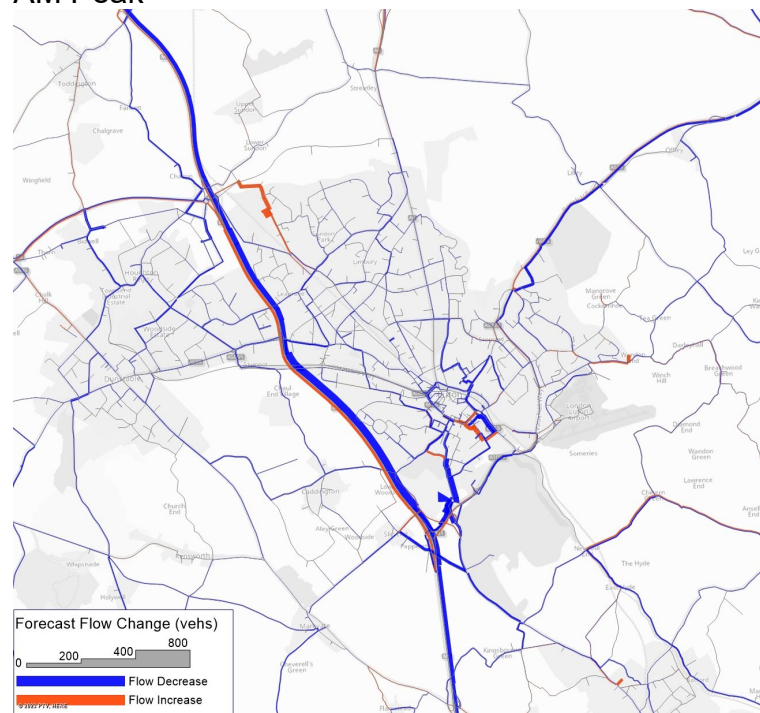
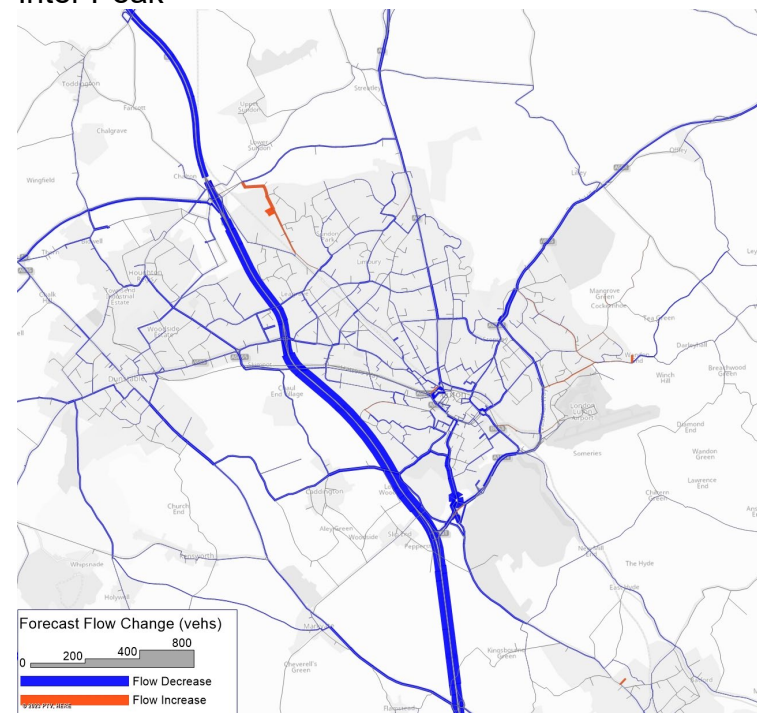


Figure 3.6 2043 with airport expansion – Updated vs Original runs

AM Peak



Inter Peak



PM Peak

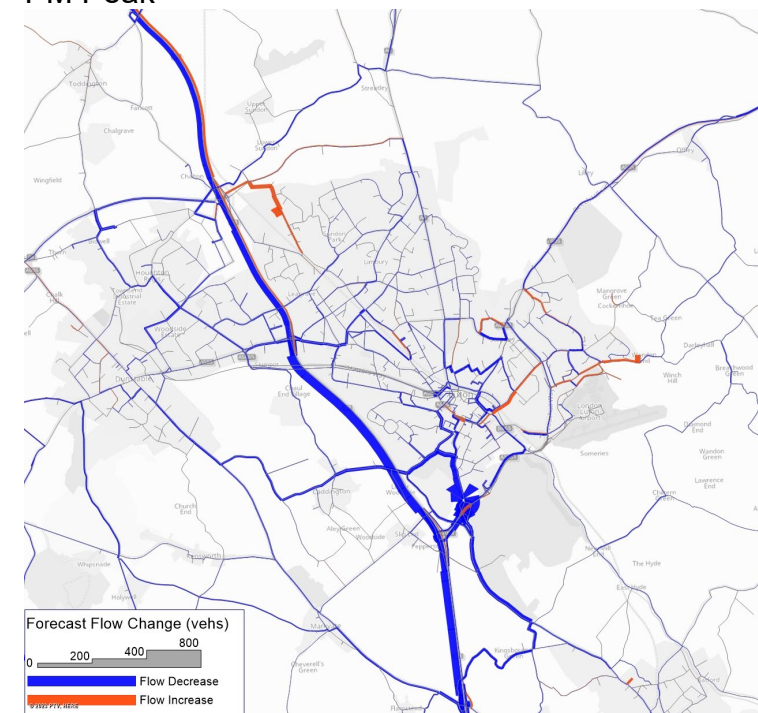
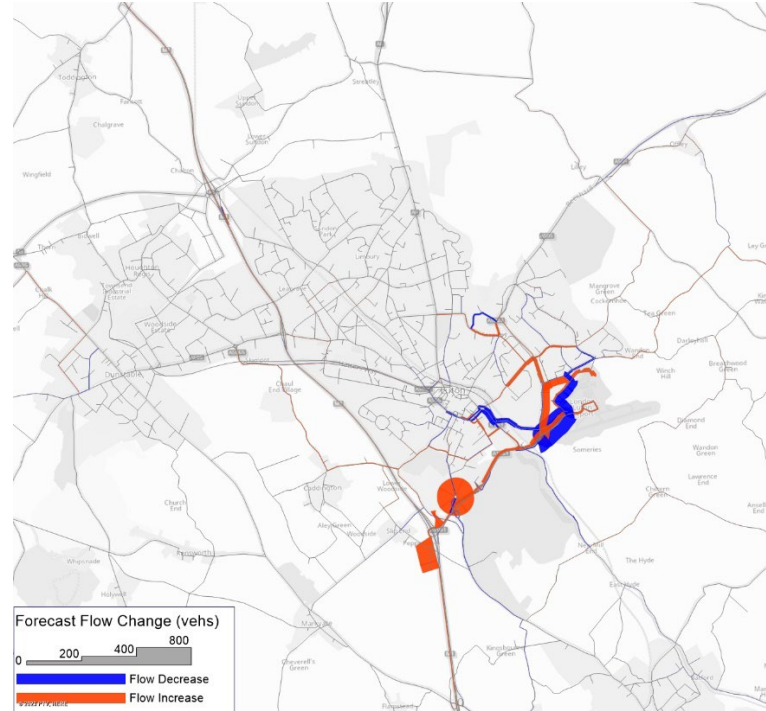


Figure 3.7 2027 Original runs – with vs without airport expansion

AM Peak



Inter Peak



PM Peak

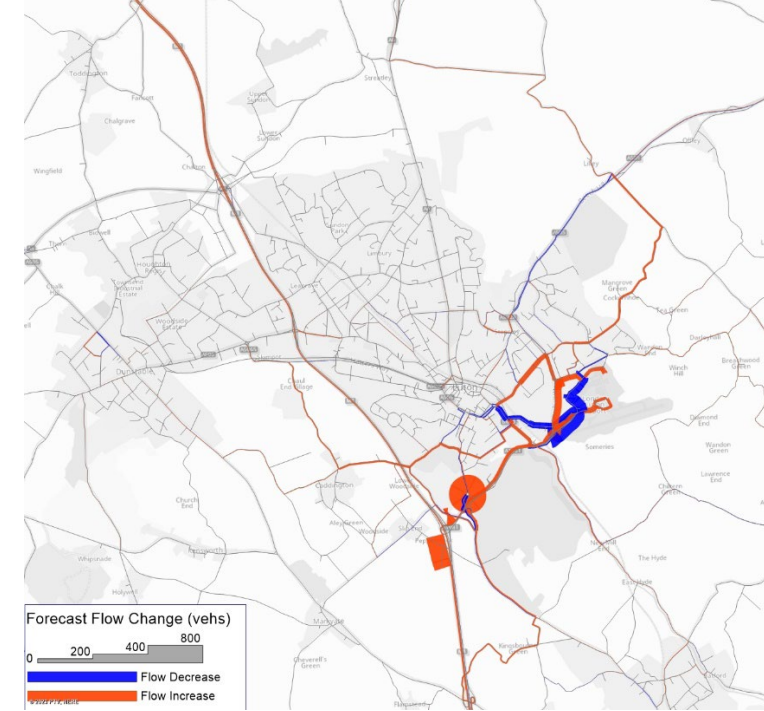
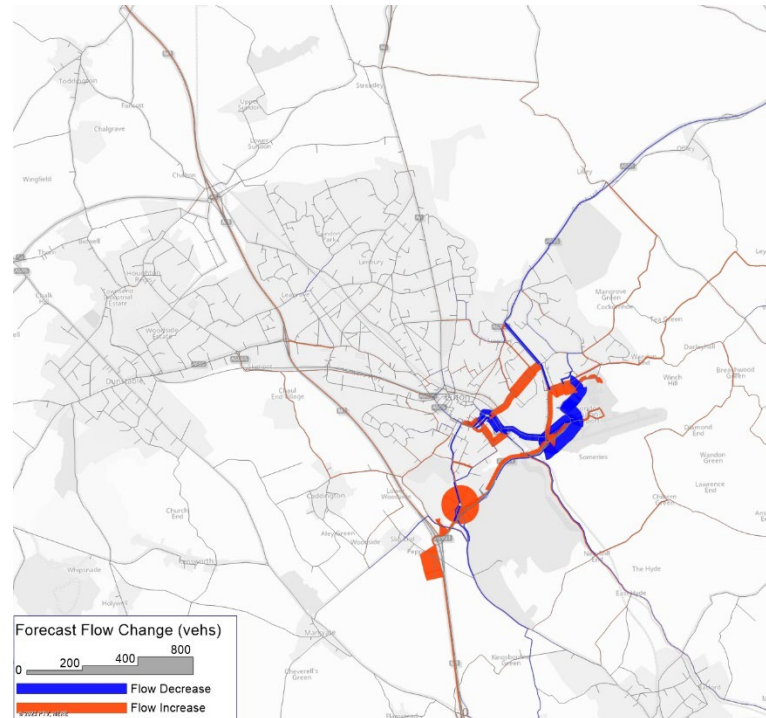
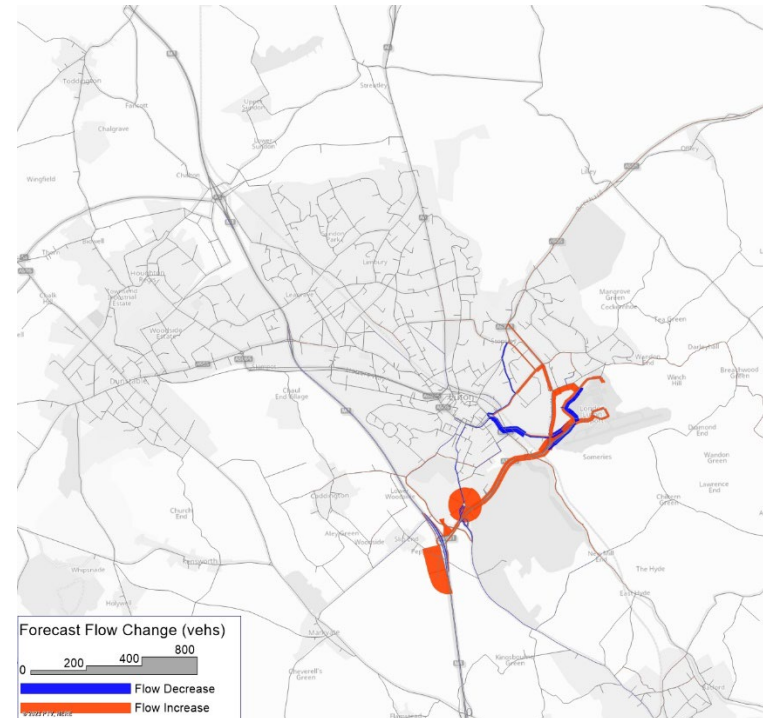


Figure 3.8 2027 Updated runs – with vs without airport expansion

AM Peak



Inter Peak



PM Peak

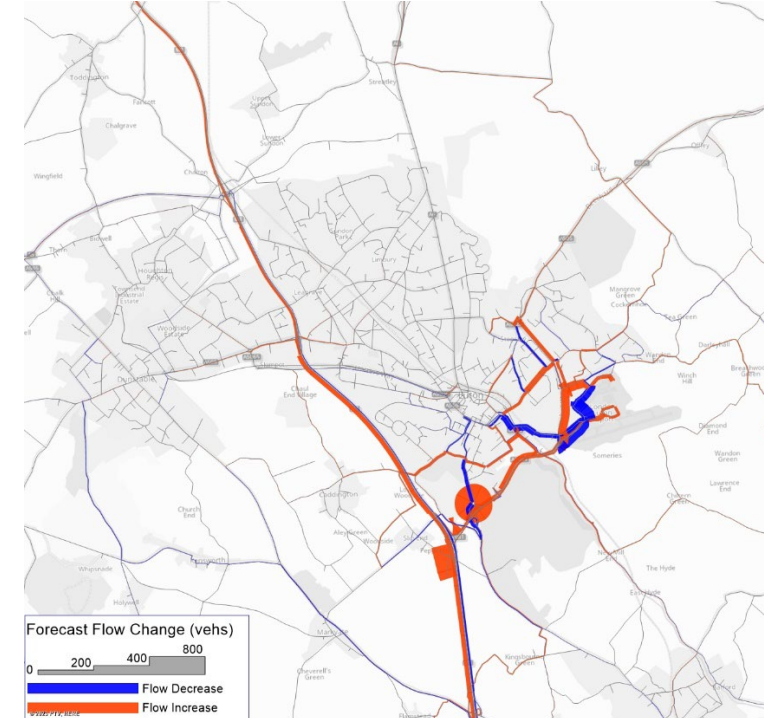
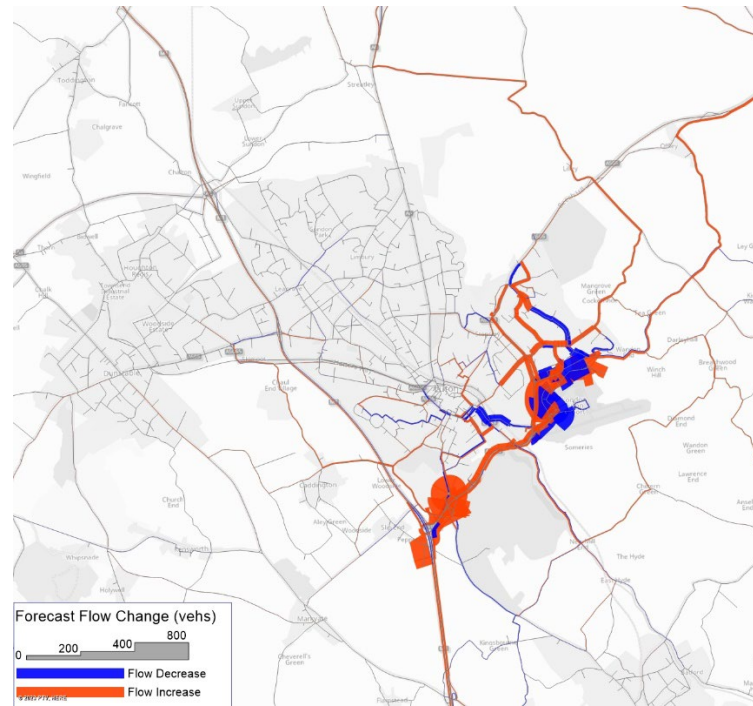
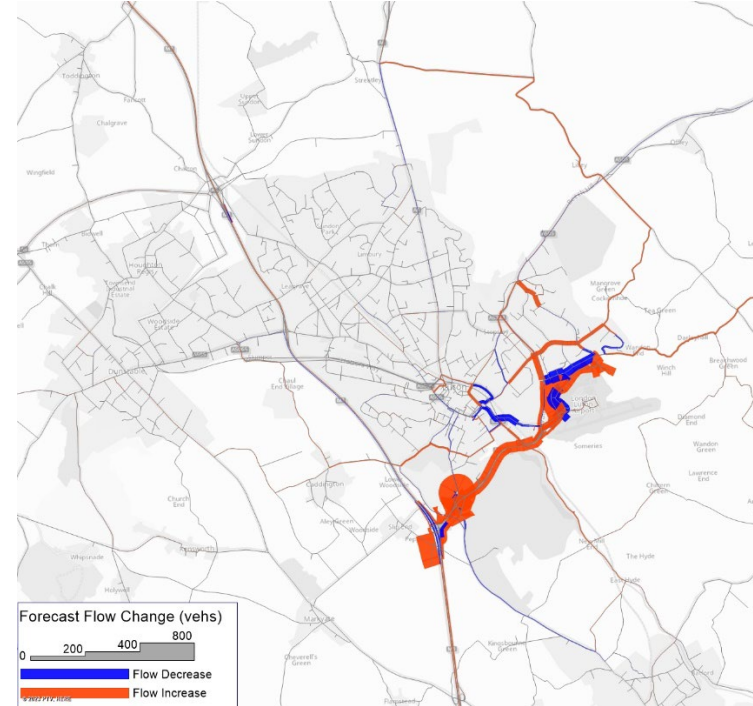


Figure 3.9 2039 Original runs – with vs without airport expansion

AM Peak



Inter Peak



PM Peak

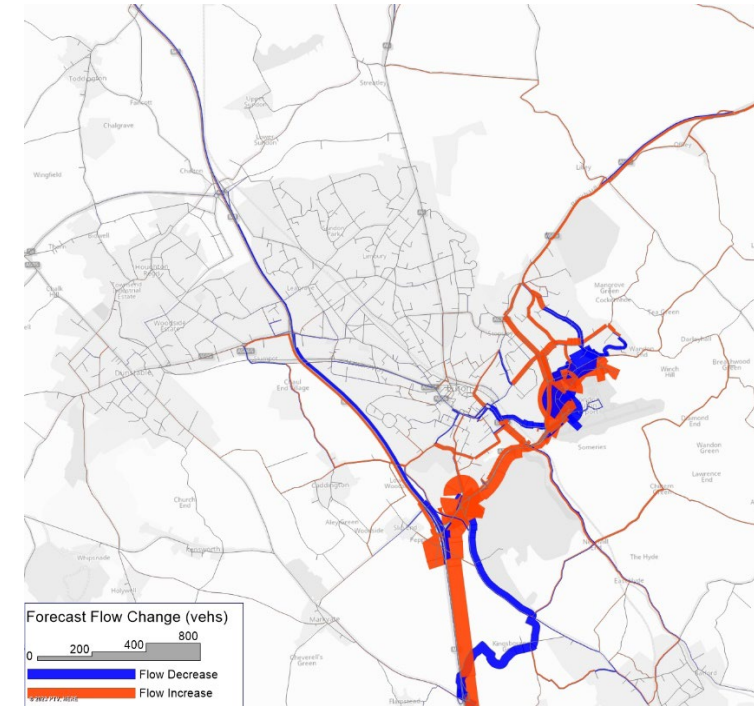
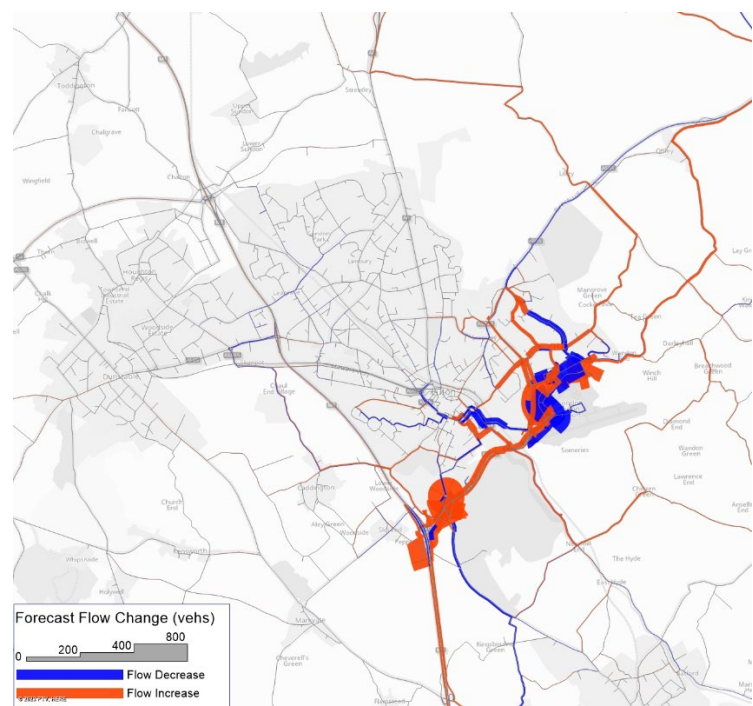
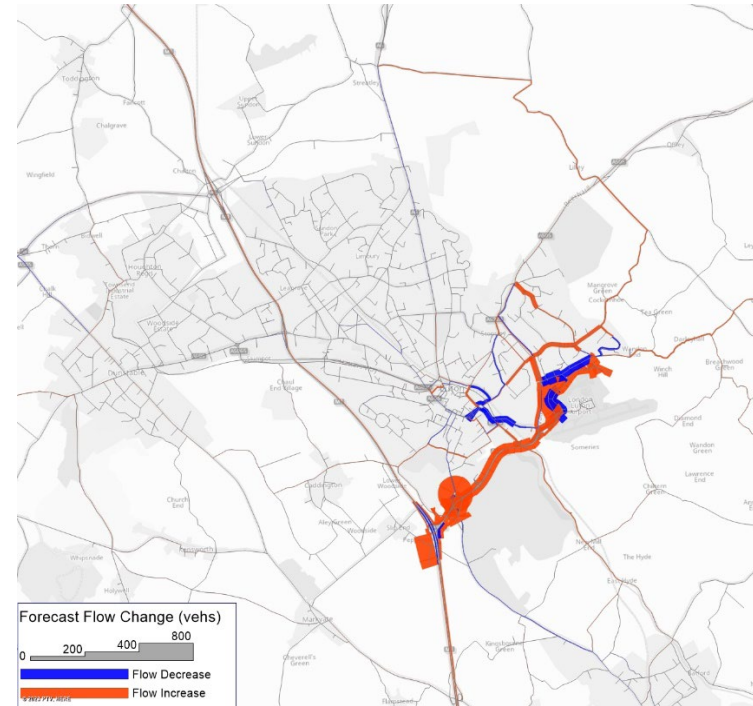


Figure 3.10 2039 Updated runs – with vs without airport expansion

AM Peak



Inter Peak



PM Peak

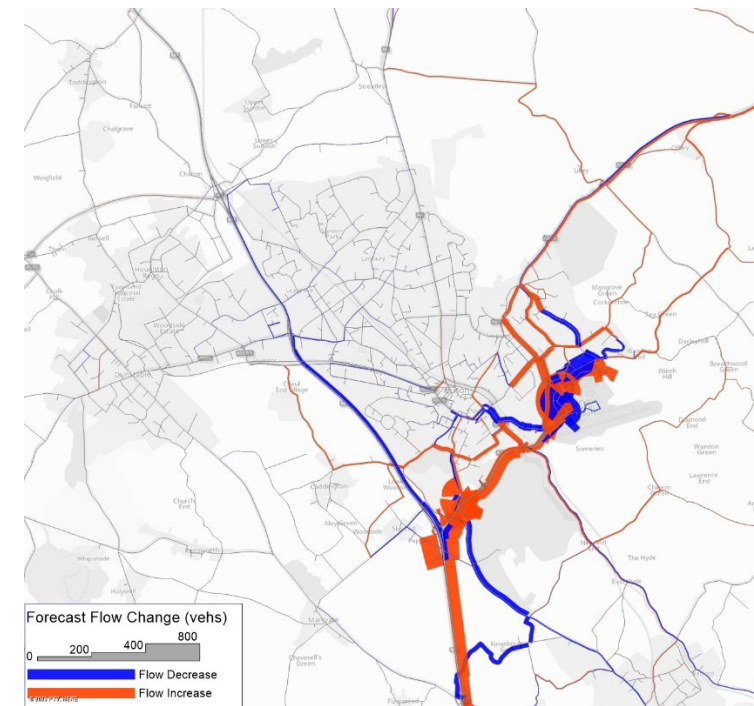
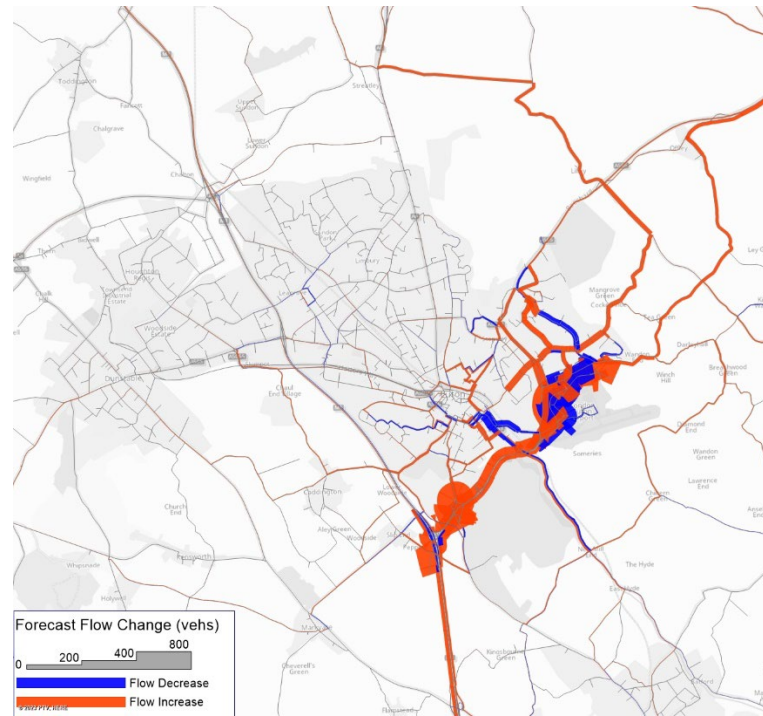
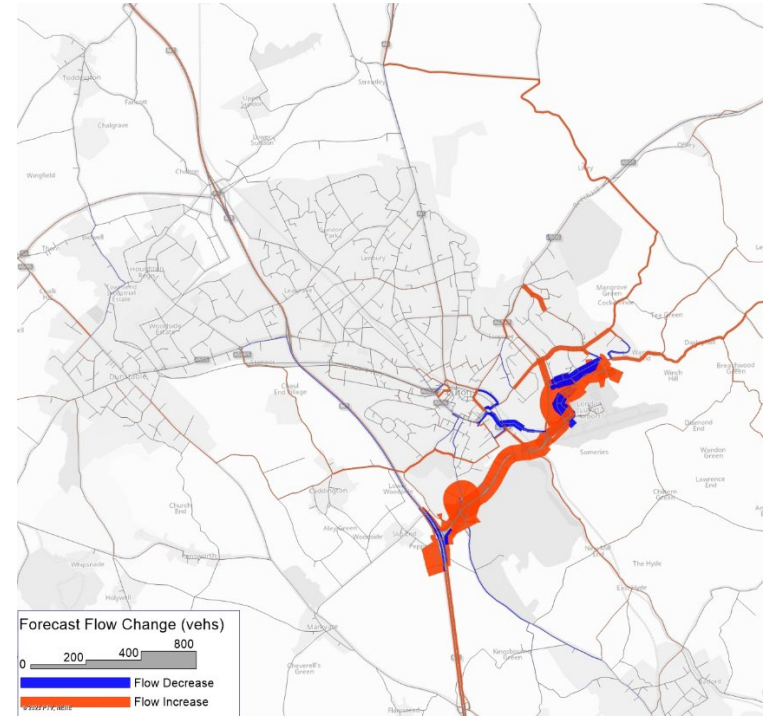


Figure 3.11 2043 Original runs – with vs without airport expansion

AM Peak



Inter Peak



PM Peak

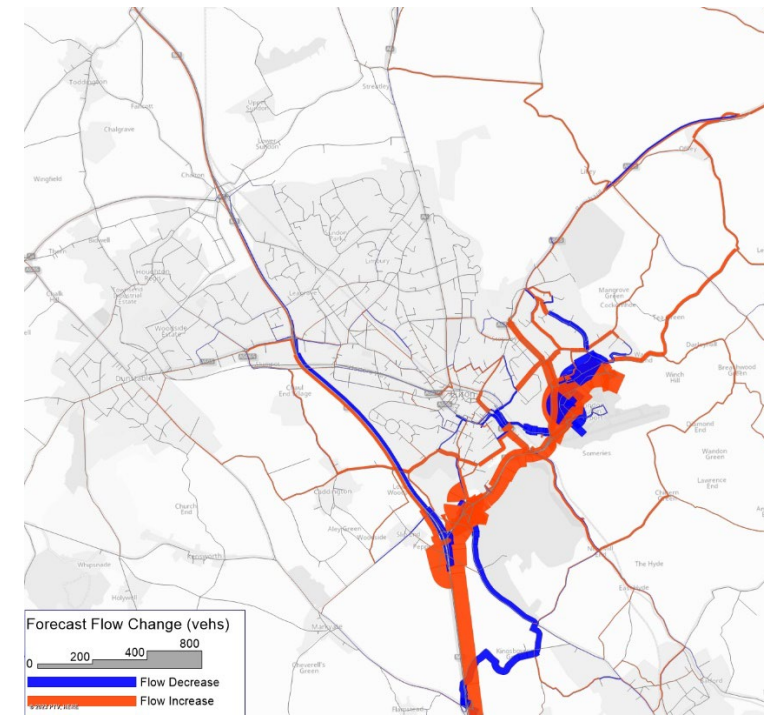
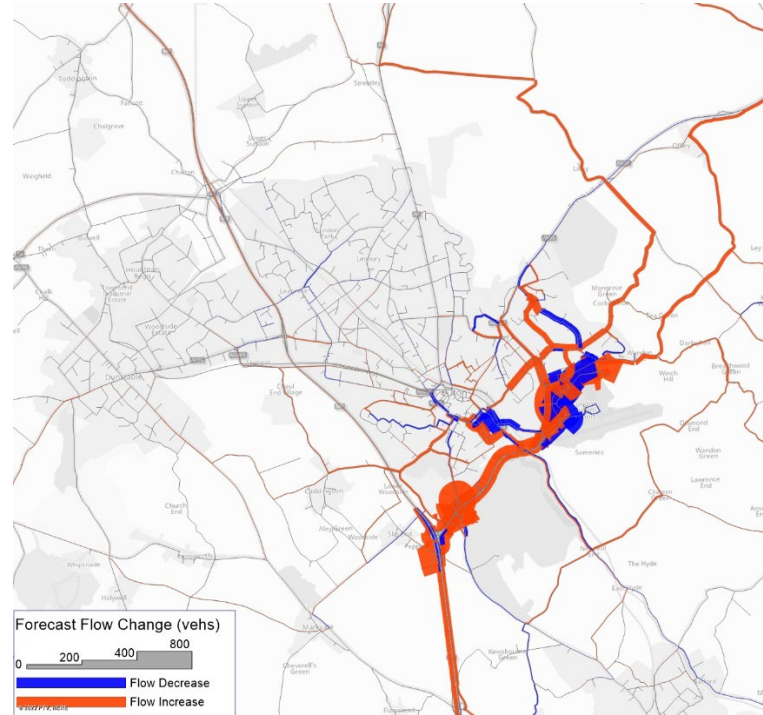
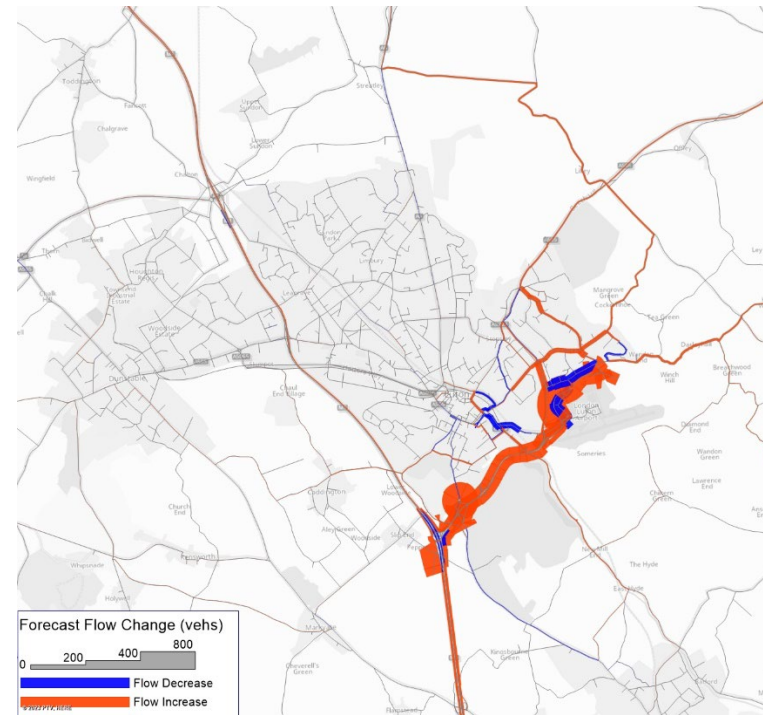


Figure 3.12 2043 Updated runs – with vs without airport expansion

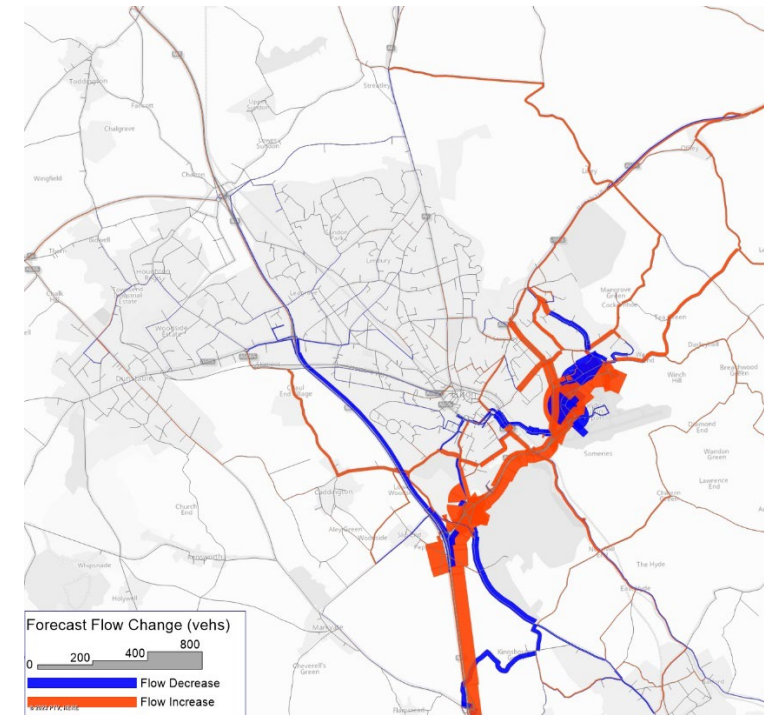
AM Peak



Inter Peak



PM Peak



4 LINK FLOW COMPARISON

4.1 Updated vs original runs

- 4.1.1 Link flow comparisons between the Updated runs and Original runs were undertaken along the M1 between Junction 9 and 11, including the mainline and slip roads in both directions.
- 4.1.2 Base and future year comparisons are provided in Table 4.1 to Table 4.4 which show the Updated flows in AM, inter and PM peak hour vehicles, and daily vehicles, rounded into the nearest 100, followed by the proportional difference between the Updated and Original link flows within the brackets.
- 4.1.3 The GEH statistic, which is a form of the Chi-squared statistic, has been utilised as a statistical indicator for the comparison. It is a standard method, within TAG, of comparing two sets of traffic numbers to determine the level of agreement or discrepancy (the change significance) between the two sets of data.

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

where: **GEH** is the GEH statistic
 M is the modelled flow
 C is the observed flow

- 4.1.4 When the GEH is less than five, this indicates a good match between two sets of traffic data.
- 4.1.5 A colour coded method has been adopted to allow for easier visual comparison of each link flow comparison:
- a. Links with Updated flow < Original flow are marked as green;
 - b. Links with Updated flow > Original flow and GEH values less than five are marked as green as the changes are deemed to be less significant; and
 - c. Links with Updated flow > Original flow and GEH values higher than five are marked as red.
- 4.1.6 The SRN links comparison shows the Updated flows in all forecast years as either lower than the Original flows or higher than the Original flows but with a GEH less than 5, which is considered to be less significant change.
- 4.1.7 A consistent pattern of links comparison can be seen on both the with and without airport expansion comparison, which shows that the majority of the LRN links have Updated flows either lower than the Original flows or higher than the Original flows but with a GEH less than 5.
- 4.1.8 Several increases in the Updated flows within the LRN compared to the Original flows on Eaton Green, east of Wigmore Lane can be attributed to re-routing traffic and the update on UL developments, namely the East of Luton development.
- 4.1.9 Increases on the Kimpton Road daily flows and Vauxhall Way AM peak flows can be attributed to the non-inclusion of Vauxhall Way dualling and its associated junctions in 2027. In 2039 and 2043 with the inclusion of the

Vauxhall Way dualling and its associated junctions, there is no longer a difference between the Updated and Original flows.

Table 4.1 SRN Link Flows Comparison – Without Expansion

| Without Expansion | | | | | | |
|-------------------|------------|------|-------------|-------------|-------------|--------------|
| Location | Direction | Year | AM | IP | PM | AADT |
| M1 Jn9 to 10 | Northbound | 2016 | 5,300 | 4,400 | 6,200 | 70,000 |
| | | 2027 | 6,200 (1%) | 5,300 (-2%) | 6,800 (-3%) | 81,400 (-1%) |
| | | 2039 | 6,800 (0%) | 5,800 (-4%) | 7,000 (-4%) | 88,200 (-3%) |
| | | 2043 | 6,900 (1%) | 5,900 (-4%) | 7,100 (-5%) | 89,600 (-4%) |
| M1 Jn9 to 10 | Southbound | 2016 | 5,500 | 4,300 | 5,900 | 69,600 |
| | | 2027 | 6,200 (-2%) | 5,100 (-2%) | 6,600 (2%) | 79,800 (-1%) |
| | | 2039 | 6,500 (-3%) | 5,600 (-4%) | 6,900 (1%) | 86,200 (-3%) |
| | | 2043 | 6,600 (-3%) | 5,700 (-4%) | 7,000 (1%) | 87,400 (-3%) |
| M1 within Jn10 | Northbound | 2016 | 4,100 | 3,600 | 4,800 | 56,000 |
| | | 2027 | 4,800 (3%) | 4,300 (-2%) | 5,400 (-2%) | 66,100 (-1%) |
| | | 2039 | 5,200 (2%) | 4,800 (-4%) | 5,600 (-3%) | 71,900 (-3%) |
| | | 2043 | 5,300 (1%) | 4,900 (-5%) | 5,700 (-5%) | 73,100 (-4%) |
| M1 within Jn10 | Southbound | 2016 | 4,200 | 3,400 | 4,200 | 53,200 |
| | | 2027 | 4,900 (-2%) | 4,000 (-2%) | 4,800 (2%) | 61,900 (-1%) |
| | | 2039 | 5,100 (-3%) | 4,400 (-5%) | 5,200 (1%) | 67,500 (-3%) |
| | | 2043 | 5,200 (-4%) | 4,500 (-5%) | 5,300 (1%) | 68,500 (-3%) |
| M1 Jn10 to 11 | Northbound | 2016 | 4,600 | 4,200 | 5,700 | 65,400 |
| | | 2027 | 5,600 (3%) | 5,100 (-3%) | 6,700 (-2%) | 78,600 (-1%) |
| | | 2039 | 6,100 (3%) | 5,600 (-5%) | 7,100 (-2%) | 85,700 (-2%) |
| | | 2043 | 6,200 (2%) | 5,700 (-5%) | 7,200 (-3%) | 87,100 (-3%) |
| M1 Jn10 to 11 | Southbound | 2016 | 5,300 | 3,900 | 4,900 | 63,100 |
| | | 2027 | 6,400 (-3%) | 4,700 (-2%) | 5,900 (1%) | 75,200 (-1%) |
| | | 2039 | 6,800 (-5%) | 5,200 (-5%) | 6,300 (0%) | 81,800 (-3%) |
| | | 2043 | 6,900 (-4%) | 5,300 (-5%) | 6,400 (0%) | 83,100 (-4%) |
| M1 Jn10 Off-Slip | Northbound | 2016 | 1,300 | 800 | 1,400 | 14,000 |
| | | 2027 | 1,400 (-6%) | 900 (-1%) | 1,400 (-7%) | 15,200 (-3%) |
| | | 2039 | 1,600 (-7%) | 1,000 (-3%) | 1,400 (-8%) | 16,300 (-4%) |
| | | 2043 | 1,600 (-2%) | 1,000 (0%) | 1,400 (-3%) | 16,500 (-4%) |
| M1 Jn10 On-Slip | Northbound | 2016 | 500 | 600 | 900 | 9,300 |
| | | 2027 | 800 (5%) | 800 (-7%) | 1,300 (-5%) | 12,500 (-4%) |
| | | 2039 | 900 (6%) | 900 (-6%) | 1,500 (6%) | 13,800 (-1%) |
| | | 2043 | 900 (4%) | 900 (-3%) | 1,500 (10%) | 14,000 (-1%) |
| M1 Jn10 Off-Slip | Southbound | 2016 | 1,000 | 600 | 700 | 9,900 |
| | | 2027 | 1,500 (-6%) | 800 (-4%) | 1,000 (-3%) | 13,300 (-4%) |
| | | 2039 | 1,700 (-8%) | 800 (-6%) | 1,100 (-3%) | 14,300 (-6%) |
| | | 2043 | 1,700 (-5%) | 900 (-4%) | 1,100 (-1%) | 14,600 (-6%) |
| M1 Jn10 On-Slip | Southbound | 2016 | 1,300 | 1,000 | 1,700 | 16,400 |
| | | 2027 | 1,400 (-1%) | 1,100 (-3%) | 1,700 (0%) | 18,000 (-2%) |
| | | 2039 | 1,400 (0%) | 1,200 (-3%) | 1,700 (0%) | 18,800 (-2%) |
| | | 2043 | 1,400 (-1%) | 1,200 (-1%) | 1,700 (0%) | 19,000 (-1%) |

Table 4.2 SRN Link Flows Comparison – With Expansion

| Location | Direction | With Expansion | | | | AADT |
|------------------|------------|----------------|-------------|-------------|-------------|--------------|
| | | Year | AM | IP | PM | |
| M1 Jn9 to 10 | Northbound | 2016 | 5,300 | 4,400 | 6,200 | 70,000 |
| | | 2027 | 6,300 (1%) | 5,300 (-2%) | 7,000 (-1%) | 82,100 (-1%) |
| | | 2039 | 6,900 (0%) | 5,800 (-4%) | 7,000 (-3%) | 88,900 (-3%) |
| | | 2043 | 7,100 (3%) | 6,000 (-4%) | 7,100 (-4%) | 91,300 (-3%) |
| M1 Jn9 to 10 | Southbound | 2016 | 5,500 | 4,300 | 5,900 | 69,600 |
| | | 2027 | 6,200 (-2%) | 5,100 (-2%) | 6,500 (1%) | 79,600 (-1%) |
| | | 2039 | 6,600 (-2%) | 5,700 (-4%) | 7,400 (-2%) | 88,300 (-3%) |
| | | 2043 | 6,700 (-3%) | 5,800 (-4%) | 7,600 (1%) | 90,600 (-3%) |
| M1 within Jn10 | Northbound | 2016 | 4,100 | 3,600 | 4,800 | 56,000 |
| | | 2027 | 4,800 (3%) | 4,300 (-2%) | 5,500 (1%) | 66,200 (0%) |
| | | 2039 | 5,200 (2%) | 4,700 (-5%) | 5,600 (-3%) | 71,100 (-3%) |
| | | 2043 | 5,200 (1%) | 4,800 (-5%) | 5,600 (-4%) | 72,100 (-3%) |
| M1 within Jn10 | Southbound | 2016 | 4,200 | 3,400 | 4,200 | 53,200 |
| | | 2027 | 4,900 (-2%) | 3,900 (-2%) | 4,800 (1%) | 61,200 (-1%) |
| | | 2039 | 5,100 (-4%) | 4,300 (-5%) | 5,000 (1%) | 66,300 (-3%) |
| | | 2043 | 5,100 (-3%) | 4,400 (-5%) | 5,000 (1%) | 67,100 (-3%) |
| M1 Jn10 to 11 | Northbound | 2016 | 4,600 | 4,200 | 5,700 | 65,400 |
| | | 2027 | 5,600 (3%) | 5,100 (-3%) | 6,900 (0%) | 79,100 (-1%) |
| | | 2039 | 6,100 (2%) | 5,600 (-5%) | 7,100 (-3%) | 85,700 (-3%) |
| | | 2043 | 6,200 (1%) | 5,700 (-4%) | 7,100 (-4%) | 87,200 (-3%) |
| M1 Jn10 to 11 | Southbound | 2016 | 5,300 | 3,900 | 4,900 | 63,100 |
| | | 2027 | 6,400 (-3%) | 4,700 (-2%) | 5,800 (0%) | 75,200 (-1%) |
| | | 2039 | 6,800 (-5%) | 5,200 (-5%) | 6,200 (0%) | 81,800 (-3%) |
| | | 2043 | 6,900 (-3%) | 5,400 (-5%) | 6,200 (0%) | 83,200 (-4%) |
| M1 Jn10 Off-Slip | Northbound | 2016 | 1,300 | 800 | 1,400 | 14,000 |
| | | 2027 | 1,500 (-5%) | 1,000 (-1%) | 1,400 (-6%) | 15,900 (-3%) |
| | | 2039 | 1,700 (-5%) | 1,100 (-2%) | 1,500 (-6%) | 17,900 (-3%) |
| | | 2043 | 1,900 (7%) | 1,200 (1%) | 1,500 (-1%) | 19,300 (-3%) |
| M1 Jn10 On-Slip | Northbound | 2016 | 500 | 600 | 900 | 9,300 |
| | | 2027 | 800 (5%) | 800 (-6%) | 1,300 (-2%) | 12,900 (-3%) |
| | | 2039 | 1,000 (6%) | 900 (-4%) | 1,500 (-4%) | 14,700 (-3%) |
| | | 2043 | 1,000 (2%) | 900 (-2%) | 1,500 (-3%) | 15,200 (-4%) |
| M1 Jn10 Off-Slip | Southbound | 2016 | 1,000 | 600 | 700 | 9,900 |
| | | 2027 | 1,600 (-5%) | 800 (-4%) | 1,100 (0%) | 14,000 (-3%) |
| | | 2039 | 1,700 (-7%) | 900 (-5%) | 1,200 (-4%) | 15,400 (-5%) |
| | | 2043 | 1,800 (-3%) | 1,000 (-3%) | 1,200 (-2%) | 16,100 (-5%) |
| M1 Jn10 On-Slip | Southbound | 2016 | 1,300 | 1,000 | 1,700 | 16,400 |
| | | 2027 | 1,400 (-1%) | 1,200 (-3%) | 1,700 (1%) | 18,400 (-2%) |
| | | 2039 | 1,500 (2%) | 1,300 (-3%) | 2,400 (-8%) | 22,000 (-3%) |
| | | 2043 | 1,600 (0%) | 1,400 (1%) | 2,500 (2%) | 23,500 (-1%) |

Table 4.3 LRN Link Flows Comparison – Without Expansion

| Without Expansion | | | | | | |
|---|------------|------|--------------|-------------|--------------|--------------|
| Location | Direction | Year | AM | IP | PM | AADT |
| A1081, between Capability Green and B653 | Eastbound | 2016 | 2000 | 1400 | 2300 | 22900 |
| | | 2027 | 2,500 (1%) | 1,700 (-1%) | 2,400 (-4%) | 27,000 (-1%) |
| | | 2039 | 2,600 (0%) | 1,800 (-3%) | 2,600 (-2%) | 28,600 (-2%) |
| | | 2043 | 2,600 (-1%) | 1,800 (-3%) | 2,600 (-1%) | 29,000 (-3%) |
| A1081, between Capability Green and B653 | Westbound | 2016 | 2400 | 1500 | 2300 | 24500 |
| | | 2027 | 2,600 (-5%) | 1,800 (-2%) | 2,600 (2%) | 28,300 (-1%) |
| | | 2039 | 2,800 (-3%) | 1,900 (-4%) | 2,700 (1%) | 29,900 (-2%) |
| | | 2043 | 2,800 (-2%) | 1,900 (-3%) | 2,700 (1%) | 30,200 (-3%) |
| Kimpton Road | Eastbound | 2016 | 300 | 400 | 500 | 5600 |
| | | 2027 | 600 (4%) | 700 (-2%) | 900 (1%) | 9,700 (0%) |
| | | 2039 | 700 (-5%) | 900 (-4%) | 1,100 (1%) | 11,900 (-3%) |
| | | 2043 | 700 (-6%) | 900 (-6%) | 1,100 (-2%) | 12,200 (-6%) |
| Kimpton Road | Westbound | 2016 | 600 | 500 | 400 | 6300 |
| | | 2027 | 1,100 (16%) | 800 (13%) | 600 (7%) | 11,000 (13%) |
| | | 2039 | 1,300 (1%) | 900 (-2%) | 700 (-5%) | 12,500 (-2%) |
| | | 2043 | 1,300 (-1%) | 900 (-3%) | 700 (-9%) | 12,600 (-4%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Northbound | 2016 | 1000 | 800 | 1200 | 12800 |
| | | 2027 | 1,000 (21%) | 900 (0%) | 1,100 (-17%) | 13,500 (-1%) |
| | | 2039 | 900 (-1%) | 1,000 (-5%) | 1,400 (-2%) | 14,300 (-4%) |
| | | 2043 | 900 (-1%) | 1,000 (-6%) | 1,400 (-1%) | 14,900 (-4%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Southbound | 2016 | 1200 | 800 | 1100 | 12600 |
| | | 2027 | 1,200 (-21%) | 1,000 (-1%) | 1,100 (-7%) | 14,200 (-6%) |
| | | 2039 | 1,700 (1%) | 1,100 (-6%) | 1,200 (-1%) | 16,500 (-4%) |
| | | 2043 | 1,700 (-1%) | 1,100 (-2%) | 1,200 (-2%) | 16,500 (-2%) |
| A505, west of Lilley | Eastbound | 2016 | 900 | 700 | 1200 | 11000 |
| | | 2027 | 1,000 (3%) | 800 (-1%) | 1,300 (-5%) | 12,200 (-1%) |
| | | 2039 | 1,000 (5%) | 800 (-7%) | 1,500 (-3%) | 13,500 (-4%) |
| | | 2043 | 1,000 (6%) | 900 (-10%) | 1,500 (-3%) | 13,800 (-6%) |
| A505, west of Lilley | Westbound | 2016 | 1300 | 700 | 1000 | 11200 |
| | | 2027 | 1,400 (-7%) | 700 (-3%) | 1,000 (-2%) | 12,300 (-4%) |
| | | 2039 | 1,600 (-1%) | 900 (-8%) | 1,100 (1%) | 14,200 (-5%) |
| | | 2043 | 1,700 (-2%) | 900 (-8%) | 1,100 (0%) | 14,400 (-5%) |
| Eaton Green Road, east of Wigmore | Eastbound | 2016 | 200 | 100 | 200 | 1500 |
| | | 2027 | 200 (8%) | 100 (6%) | 300 (27%) | 2,100 (13%) |
| | | 2039 | 200 (-3%) | 100 (25%) | 400 (50%) | 2,600 (26%) |
| | | 2043 | 300 (-1%) | 100 (23%) | 400 (54%) | 2,700 (24%) |
| Eaton Green Road, east of Wigmore | Westbound | 2016 | 200 | 100 | 200 | 1400 |
| | | 2027 | 300 (23%) | 100 (24%) | 200 (19%) | 2,000 (23%) |
| | | 2039 | 300 (9%) | 100 (53%) | 200 (14%) | 2,300 (28%) |
| | | 2043 | 400 (11%) | 100 (57%) | 200 (15%) | 2,400 (29%) |
| Lower Harpenden Road, south of A1081 | Northbound | 2016 | 600 | 400 | 800 | 6600 |
| | | 2027 | 800 (6%) | 400 (2%) | 800 (-3%) | 7,300 (1%) |
| | | 2039 | 800 (1%) | 400 (-4%) | 800 (-3%) | 7,700 (-3%) |
| | | 2043 | 800 (4%) | 400 (-3%) | 800 (-2%) | 7,900 (-2%) |
| Lower Harpenden Road, south of A1081 | Southbound | 2016 | 600 | 300 | 500 | 5600 |
| | | 2027 | 700 (-3%) | 400 (1%) | 700 (-1%) | 6,800 (-1%) |
| | | 2039 | 800 (-3%) | 400 (-2%) | 800 (-2%) | 7,700 (-2%) |
| | | 2043 | 800 (-5%) | 500 (-1%) | 800 (1%) | 8,000 (-2%) |
| London Road, south of Front Street | Northbound | 2016 | 800 | 600 | 700 | 8600 |
| | | 2027 | 900 (0%) | 700 (-5%) | 900 (-5%) | 10,200 (-4%) |
| | | 2039 | 1,100 (3%) | 700 (-7%) | 1,000 (0%) | 11,200 (-4%) |
| | | 2043 | 1,100 (4%) | 700 (-5%) | 1,000 (-1%) | 11,500 (-4%) |
| London Road, south of Front Street | Southbound | 2016 | 800 | 500 | 800 | 8200 |
| | | 2027 | 900 (-4%) | 500 (-2%) | 1,000 (-18%) | 9,300 (-7%) |
| | | 2039 | 1,000 (-5%) | 600 (-5%) | 1,200 (-12%) | 10,300 (-7%) |
| | | 2043 | 1,100 (-7%) | 600 (-5%) | 1,300 (-4%) | 10,700 (-7%) |

Table 4.4 LRN Link Flows Comparison – With Expansion

| | | With Expansion | | | | |
|---|------------|----------------|--------------|-------------|--------------|---------------|
| Location | Direction | Year | AM | IP | PM | AADT |
| A1081, between Capability Green and B653 | Eastbound | 2016 | 2000 | 1400 | 2300 | 22900 |
| | | 2027 | 2,600 (3%) | 1,800 (-1%) | 2,600 (-3%) | 29,100 (-1%) |
| | | 2039 | 2,900 (-1%) | 2,000 (-3%) | 2,700 (-3%) | 31,900 (-3%) |
| | | 2043 | 3,000 (3%) | 2,200 (-2%) | 2,800 (-1%) | 34,000 (-3%) |
| A1081, between Capability Green and B653 | Westbound | 2016 | 2400 | 1500 | 2300 | 24500 |
| | | 2027 | 2,600 (-7%) | 1,900 (0%) | 2,700 (5%) | 29,800 (0%) |
| | | 2039 | 2,900 (-2%) | 2,100 (-3%) | 3,100 (-1%) | 33,700 (-2%) |
| | | 2043 | 3,000 (-2%) | 2,300 (0%) | 3,300 (3%) | 35,900 (-2%) |
| Kimpton Road | Eastbound | 2016 | 300 | 400 | 500 | 5600 |
| | | 2027 | 500 (1%) | 700 (14%) | 900 (19%) | 9,800 (14%) |
| | | 2039 | 600 (-9%) | 800 (-2%) | 900 (4%) | 10,900 (-2%) |
| | | 2043 | 600 (-4%) | 900 (1%) | 900 (5%) | 11,200 (0%) |
| Kimpton Road | Westbound | 2016 | 600 | 500 | 400 | 6300 |
| | | 2027 | 900 (0%) | 700 (15%) | 500 (2%) | 9,700 (10%) |
| | | 2039 | 1,300 (1%) | 800 (-3%) | 600 (-13%) | 11,600 (-3%) |
| | | 2043 | 1,300 (3%) | 900 (1%) | 600 (-6%) | 12,100 (-3%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Northbound | 2016 | 1000 | 800 | 1200 | 12800 |
| | | 2027 | 1,000 (12%) | 1,100 (1%) | 1,100 (-24%) | 14,700 (-4%) |
| | | 2039 | 1,100 (1%) | 1,200 (-4%) | 1,500 (-2%) | 17,100 (-3%) |
| | | 2043 | 1,100 (1%) | 1,200 (-2%) | 1,600 (4%) | 17,700 (-2%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Southbound | 2016 | 1200 | 800 | 1100 | 12600 |
| | | 2027 | 1,100 (-31%) | 1,000 (-5%) | 1,100 (-8%) | 14,300 (-11%) |
| | | 2039 | 1,800 (0%) | 1,200 (-6%) | 1,500 (-1%) | 18,000 (-4%) |
| | | 2043 | 1,800 (1%) | 1,200 (-3%) | 1,500 (-2%) | 18,600 (-3%) |
| A505, west of Lilley | Eastbound | 2016 | 900 | 700 | 1200 | 11000 |
| | | 2027 | 900 (-1%) | 800 (-1%) | 1,300 (-1%) | 12,300 (-1%) |
| | | 2039 | 1,000 (3%) | 900 (-7%) | 1,400 (-5%) | 13,500 (-5%) |
| | | 2043 | 1,000 (2%) | 900 (-5%) | 1,500 (-2%) | 14,100 (-4%) |
| A505, west of Lilley | Westbound | 2016 | 1300 | 700 | 1000 | 11200 |
| | | 2027 | 1,400 (-8%) | 800 (-3%) | 1,000 (1%) | 12,300 (-3%) |
| | | 2039 | 1,600 (-5%) | 900 (-7%) | 1,200 (1%) | 14,300 (-5%) |
| | | 2043 | 1,600 (-6%) | 900 (-5%) | 1,200 (-2%) | 14,900 (-5%) |
| Eaton Green Road, east of Wigmore | Eastbound | 2016 | 200 | 100 | 200 | 1500 |
| | | 2027 | 300 (16%) | 100 (1%) | 300 (25%) | 2,400 (11%) |
| | | 2039 | 200 (-4%) | 200 (8%) | 400 (52%) | 2,900 (18%) |
| | | 2043 | 300 (-5%) | 200 (1%) | 500 (47%) | 3,700 (1%) |
| Eaton Green Road, east of Wigmore | Westbound | 2016 | 200 | 100 | 200 | 1400 |
| | | 2027 | 300 (23%) | 100 (29%) | 200 (13%) | 1,900 (23%) |
| | | 2039 | 400 (8%) | 100 (17%) | 200 (1%) | 2,600 (11%) |
| | | 2043 | 500 (26%) | 200 (22%) | 200 (8%) | 3,200 (12%) |
| Lower Harpenden Road, south of A1081 | Northbound | 2016 | 600 | 400 | 800 | 6600 |
| | | 2027 | 800 (12%) | 400 (1%) | 800 (-2%) | 7,800 (2%) |
| | | 2039 | 900 (2%) | 500 (-4%) | 900 (-3%) | 8,400 (-3%) |
| | | 2043 | 900 (3%) | 500 (-2%) | 1,000 (-2%) | 8,700 (-2%) |
| Lower Harpenden Road, south of A1081 | Southbound | 2016 | 600 | 300 | 500 | 5600 |
| | | 2027 | 700 (-5%) | 400 (1%) | 700 (-1%) | 6,700 (-1%) |
| | | 2039 | 800 (-1%) | 500 (-2%) | 700 (-2%) | 7,600 (-2%) |
| | | 2043 | 800 (-5%) | 500 (0%) | 800 (7%) | 7,900 (-1%) |
| London Road, south of Front Street | Northbound | 2016 | 800 | 600 | 700 | 8600 |
| | | 2027 | 900 (-1%) | 700 (-6%) | 800 (-7%) | 9,900 (-5%) |
| | | 2039 | 1,000 (-2%) | 700 (-6%) | 900 (-2%) | 10,800 (-4%) |
| | | 2043 | 1,000 (6%) | 700 (-5%) | 900 (-7%) | 11,000 (-6%) |
| London Road, south of Front Street | Southbound | 2016 | 800 | 500 | 800 | 8200 |
| | | 2027 | 900 (-4%) | 500 (-3%) | 1,100 (-19%) | 9,300 (-8%) |
| | | 2039 | 1,000 (-6%) | 600 (-6%) | 1,000 (-8%) | 9,600 (-6%) |
| | | 2043 | 1,100 (-6%) | 600 (-5%) | 1,100 (1%) | 10,000 (-8%) |

4.1.10 Table 4.5 shows the comparison of average 2-way link flows for the M1 and average 1-way link flows for both the SRN and LRN and demonstrates that overall, the Updated flows are either lower than the Original flows or when higher than the Original flows they are with a GEH of less than 5.

Table 4.5 SRN and LRN Average Link Flow Comparison

| Without Expansion | | | | | | |
|--------------------|-----------|------|--------------|--------------|--------------|---------------|
| Location | Direction | Year | AM | IP | PM | AADT |
| M1 Average | 2-Way | 2016 | 9,600 | 8,000 | 10,600 | 125,800 |
| | | 2027 | 11,400 (0%) | 9,500 (-2%) | 12,000 (0%) | 147,700 (-1%) |
| | | 2039 | 12,200 (-1%) | 10,500 (-5%) | 12,700 (-1%) | 160,400 (-3%) |
| | | 2043 | 12,400 (-1%) | 10,600 (-5%) | 12,800 (-2%) | 162,900 (-3%) |
| Average Local Road | 1-way | 2016 | 900 | 600 | 900 | 9900 |
| | | 2027 | 1,100 (-1%) | 800 (0%) | 1,100 (-4%) | 11,900 (-1%) |
| | | 2039 | 1,200 (-1%) | 800 (-4%) | 1,200 (-1%) | 13,100 (-3%) |
| | | 2043 | 1,200 (-1%) | 800 (-4%) | 1,200 (-1%) | 13,400 (-3%) |

| With Expansion | | | | | | |
|--------------------|-----------|------|--------------|--------------|--------------|---------------|
| Location | Direction | Year | AM | IP | PM | AADT |
| M1 Average | 2-Way | 2016 | 9,600 | 8,000 | 10,600 | 125,800 |
| | | 2027 | 11,400 (0%) | 9,500 (-2%) | 12,100 (0%) | 147,800 (-1%) |
| | | 2039 | 12,200 (-1%) | 10,500 (-4%) | 12,700 (-2%) | 160,700 (-3%) |
| | | 2043 | 12,400 (-1%) | 10,700 (-4%) | 12,900 (-2%) | 163,800 (-3%) |
| Average Local Road | 1-way | 2016 | 900 | 600 | 900 | 9900 |
| | | 2027 | 1,100 (-4%) | 800 (1%) | 1,100 (-3%) | 12,200 (-1%) |
| | | 2039 | 1,200 (-1%) | 900 (-4%) | 1,200 (-2%) | 13,800 (-3%) |
| | | 2043 | 1,300 (0%) | 900 (-2%) | 1,300 (1%) | 14,500 (-3%) |

4.2 With vs without airport expansion

- 4.2.1 Comparisons between the with and without airport expansion for the Updated runs and Original runs were also undertaken along the M1 to identify the level of pattern consistency in relation to the impact of airport expansion.
- 4.2.2 Table 4.6 to Table 4.9 provides the with airport expansion flows in AM, inter and PM peak hour vehicles, and daily vehicles, rounded into the nearest 100, followed by the proportional difference between the with and without airport expansion link flows within the brackets.
- 4.2.3 A colour code method has been adopted for this comparison with green indicating reduction in flows as a result of airport expansion (i.e. compared to without expansion), and vice versa for the links marked red.
- 4.2.4 As shown in Table 4.6 to Table 4.9, the majority of both the SRN and LRN links show consistent patterns of flow assignment again as a result of airport expansion. There are a few minor changes in the link flow assignment comparisons such as around A1081, A505, west of Lilley, Eaton Green Road, east of Wigmore, Vauxhall Way and Kimpton Road, which can be attributed to a combination of changes in traffic growth projections, traffic re-routing and changes in the UL.

Table 4.6 SRN Link Flows Comparison – Original Runs

| Location | Direction | Original | | | | AADT |
|------------------|------------|----------|-------------|-------------|-------------|--------------|
| | | Year | AM | IP | PM | |
| M1 Jn9 to 10 | Northbound | 2016 | 5,300 | 4,400 | 6,200 | 70,000 |
| | | 2027 | 6,200 (1%) | 5,400 (0%) | 7,000 (1%) | 82,800 (0%) |
| | | 2039 | 6,900 (1%) | 6,100 (1%) | 7,300 (0%) | 91,500 (1%) |
| | | 2043 | 6,900 (1%) | 6,200 (1%) | 7,400 (0%) | 94,400 (1%) |
| M1 Jn9 to 10 | Southbound | 2016 | 5,500 | 4,300 | 5,900 | 69,600 |
| | | 2027 | 6,400 (0%) | 5,200 (0%) | 6,400 (0%) | 80,600 (0%) |
| | | 2039 | 6,800 (1%) | 5,900 (1%) | 7,500 (10%) | 91,000 (3%) |
| | | 2043 | 6,900 (2%) | 6,000 (1%) | 7,500 (8%) | 93,000 (3%) |
| M1 within Jn10 | Northbound | 2016 | 4,100 | 3,600 | 4,800 | 56,000 |
| | | 2027 | 4,600 (0%) | 4,400 (-1%) | 5,500 (1%) | 66,500 (0%) |
| | | 2039 | 5,100 (-1%) | 4,900 (-1%) | 5,700 (-1%) | 73,100 (-1%) |
| | | 2043 | 5,200 (-2%) | 5,000 (-2%) | 5,900 (-2%) | 74,600 (-2%) |
| M1 within Jn10 | Southbound | 2016 | 4,200 | 3,400 | 4,200 | 53,200 |
| | | 2027 | 5,000 (0%) | 4,000 (-1%) | 4,700 (0%) | 61,800 (-1%) |
| | | 2039 | 5,300 (-1%) | 4,500 (-1%) | 4,900 (-4%) | 68,300 (-2%) |
| | | 2043 | 5,300 (-1%) | 4,600 (-2%) | 5,000 (-4%) | 69,300 (-2%) |
| M1 Jn10 to 11 | Northbound | 2016 | 4,600 | 4,200 | 5,700 | 65,400 |
| | | 2027 | 5,400 (0%) | 5,300 (0%) | 6,900 (1%) | 79,800 (0%) |
| | | 2039 | 6,000 (1%) | 5,900 (0%) | 7,300 (1%) | 88,100 (0%) |
| | | 2043 | 6,200 (1%) | 6,000 (0%) | 7,400 (1%) | 90,400 (0%) |
| M1 Jn10 to 11 | Southbound | 2016 | 5,300 | 3,900 | 4,900 | 63,100 |
| | | 2027 | 6,600 (0%) | 4,800 (0%) | 5,800 (0%) | 76,300 (0%) |
| | | 2039 | 7,100 (0%) | 5,500 (0%) | 6,200 (-2%) | 84,500 (0%) |
| | | 2043 | 7,100 (-1%) | 5,600 (0%) | 6,200 (-2%) | 86,300 (0%) |
| M1 Jn10 Off-Slip | Northbound | 2016 | 1,300 | 800 | 1,400 | 14,000 |
| | | 2027 | 1,600 (3%) | 1,000 (4%) | 1,500 (2%) | 16,400 (4%) |
| | | 2039 | 1,800 (7%) | 1,100 (9%) | 1,500 (4%) | 18,500 (8%) |
| | | 2043 | 1,800 (9%) | 1,200 (15%) | 1,500 (7%) | 19,800 (15%) |
| M1 Jn10 On-Slip | Northbound | 2016 | 500 | 600 | 900 | 9,300 |
| | | 2027 | 800 (1%) | 900 (3%) | 1,400 (0%) | 13,400 (2%) |
| | | 2039 | 900 (11%) | 1,000 (4%) | 1,600 (13%) | 15,100 (8%) |
| | | 2043 | 1,000 (16%) | 1,000 (7%) | 1,500 (14%) | 15,700 (11%) |
| M1 Jn10 Off-Slip | Southbound | 2016 | 1,000 | 600 | 700 | 9,900 |
| | | 2027 | 1,600 (1%) | 900 (5%) | 1,100 (1%) | 14,500 (4%) |
| | | 2039 | 1,800 (1%) | 1,000 (10%) | 1,200 (6%) | 16,200 (7%) |
| | | 2043 | 1,800 (2%) | 1,000 (12%) | 1,200 (7%) | 17,000 (9%) |
| M1 Jn10 On-Slip | Southbound | 2016 | 1,300 | 1,000 | 1,700 | 16,400 |
| | | 2027 | 1,400 (0%) | 1,200 (3%) | 1,700 (-1%) | 18,700 (3%) |
| | | 2039 | 1,500 (8%) | 1,400 (9%) | 2,600 (53%) | 22,700 (19%) |
| | | 2043 | 1,600 (13%) | 1,400 (13%) | 2,500 (46%) | 23,700 (23%) |

Table 4.7 SRN Link Flows Comparison – Updated Runs

| Location | Direction | Updated | | | | |
|------------------|------------|---------|-------------|-------------|-------------|--------------|
| | | Year | AM | IP | PM | AADT |
| M1 Jn9 to 10 | Northbound | 2016 | 5,300 | 4,400 | 6,200 | 70,000 |
| | | 2027 | 6,300 (1%) | 5,300 (0%) | 7,000 (3%) | 82,100 (1%) |
| | | 2039 | 6,900 (1%) | 5,800 (1%) | 7,000 (1%) | 88,900 (1%) |
| | | 2043 | 7,100 (3%) | 6,000 (2%) | 7,100 (1%) | 91,300 (2%) |
| M1 Jn9 to 10 | Southbound | 2016 | 5,500 | 4,300 | 5,900 | 69,600 |
| | | 2027 | 6,200 (0%) | 5,100 (0%) | 6,500 (-1%) | 79,600 (0%) |
| | | 2039 | 6,600 (1%) | 5,700 (1%) | 7,400 (7%) | 88,300 (2%) |
| | | 2043 | 6,700 (2%) | 5,800 (2%) | 7,600 (9%) | 90,600 (4%) |
| M1 within Jn10 | Northbound | 2016 | 4,100 | 3,600 | 4,800 | 56,000 |
| | | 2027 | 4,800 (0%) | 4,300 (-1%) | 5,500 (3%) | 66,200 (0%) |
| | | 2039 | 5,200 (-1%) | 4,700 (-1%) | 5,600 (-1%) | 71,100 (-1%) |
| | | 2043 | 5,200 (-2%) | 4,800 (-1%) | 5,600 (-1%) | 72,100 (-1%) |
| M1 within Jn10 | Southbound | 2016 | 4,200 | 3,400 | 4,200 | 53,200 |
| | | 2027 | 4,900 (0%) | 3,900 (-1%) | 4,800 (-2%) | 61,200 (-1%) |
| | | 2039 | 5,100 (-1%) | 4,300 (-1%) | 5,000 (-4%) | 66,300 (-2%) |
| | | 2043 | 5,100 (-1%) | 4,400 (-2%) | 5,000 (-4%) | 67,100 (-2%) |
| M1 Jn10 to 11 | Northbound | 2016 | 4,600 | 4,200 | 5,700 | 65,400 |
| | | 2027 | 5,600 (0%) | 5,100 (0%) | 6,900 (3%) | 79,100 (1%) |
| | | 2039 | 6,100 (0%) | 5,600 (0%) | 7,100 (0%) | 85,700 (0%) |
| | | 2043 | 6,200 (0%) | 5,700 (0%) | 7,100 (-1%) | 87,200 (0%) |
| M1 Jn10 to 11 | Southbound | 2016 | 5,300 | 3,900 | 4,900 | 63,100 |
| | | 2027 | 6,400 (0%) | 4,700 (0%) | 5,800 (-1%) | 75,200 (0%) |
| | | 2039 | 6,800 (0%) | 5,200 (1%) | 6,200 (-2%) | 81,800 (0%) |
| | | 2043 | 6,900 (0%) | 5,400 (1%) | 6,200 (-3%) | 83,200 (0%) |
| M1 Jn10 Off-Slip | Northbound | 2016 | 1,300 | 800 | 1,400 | 14,000 |
| | | 2027 | 1,500 (5%) | 1,000 (4%) | 1,400 (3%) | 15,900 (4%) |
| | | 2039 | 1,700 (9%) | 1,100 (9%) | 1,500 (6%) | 17,900 (10%) |
| | | 2043 | 1,900 (19%) | 1,200 (16%) | 1,500 (9%) | 19,300 (17%) |
| M1 Jn10 On-Slip | Northbound | 2016 | 500 | 600 | 900 | 9,300 |
| | | 2027 | 800 (0%) | 800 (3%) | 1,300 (3%) | 12,900 (3%) |
| | | 2039 | 1,000 (10%) | 900 (6%) | 1,500 (2%) | 14,700 (6%) |
| | | 2043 | 1,000 (14%) | 900 (8%) | 1,500 (1%) | 15,200 (8%) |
| M1 Jn10 Off-Slip | Southbound | 2016 | 1,000 | 600 | 700 | 9,900 |
| | | 2027 | 1,600 (2%) | 800 (5%) | 1,100 (4%) | 14,000 (5%) |
| | | 2039 | 1,700 (2%) | 900 (11%) | 1,200 (5%) | 15,400 (8%) |
| | | 2043 | 1,800 (3%) | 1,000 (14%) | 1,200 (5%) | 16,100 (10%) |
| M1 Jn10 On-Slip | Southbound | 2016 | 1,300 | 1,000 | 1,700 | 16,400 |
| | | 2027 | 1,400 (0%) | 1,200 (3%) | 1,700 (0%) | 18,400 (3%) |
| | | 2039 | 1,500 (10%) | 1,300 (9%) | 2,400 (41%) | 22,000 (17%) |
| | | 2043 | 1,600 (14%) | 1,400 (16%) | 2,500 (49%) | 23,500 (24%) |

Table 4.8 LRN Link Flow Comparison – Original Runs

| Location | Direction | Year | Original | | | |
|---|------------|------|-------------|-------------|--------------|---------------|
| | | | AM | IP | PM | AADT |
| A1081, between Capability Green and B653 | Eastbound | 2016 | 2,000 | 1,400 | 2,300 | 22,900 |
| | | 2027 | 2,600 (5%) | 1,800 (7%) | 2,700 (6%) | 29,300 (7%) |
| | | 2039 | 2,900 (9%) | 2,100 (14%) | 2,800 (6%) | 32,700 (12%) |
| | | 2043 | 2,900 (10%) | 2,200 (19%) | 2,800 (8%) | 35,000 (17%) |
| A1081, between Capability Green and B653 | Westbound | 2016 | 2,400 | 1,500 | 2,300 | 24,500 |
| | | 2027 | 2,800 (0%) | 1,900 (6%) | 2,600 (1%) | 29,900 (4%) |
| | | 2039 | 3,000 (4%) | 2,200 (12%) | 3,200 (17%) | 34,400 (12%) |
| | | 2043 | 3,100 (8%) | 2,300 (17%) | 3,200 (17%) | 36,600 (17%) |
| Kimpton Road | Eastbound | 2016 | 300 | 400 | 500 | 5,600 |
| | | 2027 | 500 (-16%) | 600 (-9%) | 700 (-20%) | 8,600 (-12%) |
| | | 2039 | 600 (-11%) | 900 (-6%) | 800 (-24%) | 11,100 (-10%) |
| | | 2043 | 600 (-17%) | 800 (-9%) | 900 (-26%) | 11,300 (-13%) |
| Kimpton Road | Westbound | 2016 | 600 | 500 | 400 | 6,300 |
| | | 2027 | 900 (-5%) | 600 (-10%) | 500 (-18%) | 8,800 (-10%) |
| | | 2039 | 1,300 (0%) | 900 (-6%) | 700 (-11%) | 12,000 (-6%) |
| | | 2043 | 1,300 (-3%) | 900 (-7%) | 700 (-18%) | 12,400 (-6%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Northbound | 2016 | 1,000 | 800 | 1,200 | 12,800 |
| | | 2027 | 900 (10%) | 1,100 (13%) | 1,400 (8%) | 15,300 (11%) |
| | | 2039 | 1,100 (19%) | 1,200 (20%) | 1,600 (12%) | 17,500 (18%) |
| | | 2043 | 1,100 (18%) | 1,300 (15%) | 1,500 (9%) | 18,100 (16%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Southbound | 2016 | 1,200 | 800 | 1,100 | 12,600 |
| | | 2027 | 1,700 (5%) | 1,000 (7%) | 1,200 (5%) | 16,100 (6%) |
| | | 2039 | 1,700 (3%) | 1,200 (6%) | 1,500 (23%) | 18,700 (9%) |
| | | 2043 | 1,800 (5%) | 1,200 (11%) | 1,500 (27%) | 19,200 (13%) |
| A505, west of Lilley | Eastbound | 2016 | 900 | 700 | 1,200 | 11,000 |
| | | 2027 | 900 (0%) | 800 (2%) | 1,400 (-2%) | 12,400 (1%) |
| | | 2039 | 1,000 (0%) | 900 (2%) | 1,500 (0%) | 14,300 (1%) |
| | | 2043 | 1,000 (2%) | 1,000 (0%) | 1,500 (-2%) | 14,700 (0%) |
| A505, west of Lilley | Westbound | 2016 | 1,300 | 700 | 1,000 | 11,200 |
| | | 2027 | 1,500 (0%) | 800 (0%) | 1,000 (-2%) | 12,700 (0%) |
| | | 2039 | 1,700 (2%) | 900 (-2%) | 1,200 (9%) | 15,100 (1%) |
| | | 2043 | 1,800 (4%) | 1,000 (1%) | 1,300 (9%) | 15,600 (2%) |
| Eaton Green Road, east of Wigmore | Eastbound | 2016 | 200 | 100 | 200 | 1,500 |
| | | 2027 | 300 (13%) | 100 (20%) | 300 (14%) | 2,200 (17%) |
| | | 2039 | 200 (-14%) | 100 (44%) | 300 (14%) | 2,500 (21%) |
| | | 2043 | 300 (0%) | 200 (76%) | 400 (50%) | 3,600 (65%) |
| Eaton Green Road, east of Wigmore | Westbound | 2016 | 200 | 100 | 200 | 1,400 |
| | | 2027 | 200 (-2%) | 100 (-5%) | 200 (2%) | 1,600 (-2%) |
| | | 2039 | 400 (34%) | 100 (45%) | 200 (6%) | 2,400 (31%) |
| | | 2043 | 400 (33%) | 100 (70%) | 200 (1%) | 2,800 (48%) |
| Lower Harpenden Road, south of A1081 | Northbound | 2016 | 600 | 400 | 800 | 6,600 |
| | | 2027 | 700 (0%) | 400 (8%) | 900 (5%) | 7,600 (6%) |
| | | 2039 | 900 (8%) | 500 (9%) | 900 (9%) | 8,600 (9%) |
| | | 2043 | 900 (8%) | 500 (9%) | 1,000 (14%) | 8,800 (9%) |
| Lower Harpenden Road, south of A1081 | Southbound | 2016 | 600 | 300 | 500 | 5,600 |
| | | 2027 | 700 (-4%) | 400 (-2%) | 700 (-2%) | 6,700 (-3%) |
| | | 2039 | 800 (-4%) | 500 (1%) | 800 (-6%) | 7,700 (-2%) |
| | | 2043 | 800 (-7%) | 500 (0%) | 700 (-9%) | 8,000 (-3%) |
| London Road, south of Front Street | Northbound | 2016 | 800 | 600 | 700 | 8,600 |
| | | 2027 | 900 (-2%) | 700 (-1%) | 900 (-3%) | 10,400 (-2%) |
| | | 2039 | 1,000 (-3%) | 700 (-4%) | 1,000 (-4%) | 11,300 (-4%) |
| | | 2043 | 1,000 (-5%) | 800 (-4%) | 1,000 (-3%) | 11,700 (-3%) |
| London Road, south of Front Street | Southbound | 2016 | 800 | 500 | 800 | 8,200 |
| | | 2027 | 1,000 (1%) | 500 (0%) | 1,300 (5%) | 10,200 (2%) |
| | | 2039 | 1,100 (-1%) | 600 (-1%) | 1,100 (-21%) | 10,300 (-7%) |
| | | 2043 | 1,100 (-1%) | 600 (-2%) | 1,100 (-21%) | 10,900 (-5%) |

Table 4.9 LRN Link Flow Comparison – Updated Runs

| Location | Direction | Updated | | | | AADT |
|---|------------|---------|-------------|-------------|--------------|--------------|
| | | Year | AM | IP | PM | |
| A1081, between Capability Green and B653 | Eastbound | 2016 | 2,000 | 1,400 | 2,300 | 22,900 |
| | | 2027 | 2,600 (7%) | 1,800 (8%) | 2,600 (8%) | 29,100 (8%) |
| | | 2039 | 2,900 (9%) | 2,000 (14%) | 2,700 (5%) | 31,900 (11%) |
| | | 2043 | 3,000 (15%) | 2,200 (20%) | 2,800 (8%) | 34,000 (17%) |
| A1081, between Capability Green and B653 | Westbound | 2016 | 2,400 | 1,500 | 2,300 | 24,500 |
| | | 2027 | 2,600 (-2%) | 1,900 (8%) | 2,700 (3%) | 29,800 (5%) |
| | | 2039 | 2,900 (5%) | 2,100 (14%) | 3,100 (15%) | 33,700 (13%) |
| | | 2043 | 3,000 (8%) | 2,300 (21%) | 3,300 (20%) | 35,900 (19%) |
| Kimpton Road | Eastbound | 2016 | 300 | 400 | 500 | 5,600 |
| | | 2027 | 500 (-19%) | 700 (6%) | 900 (-6%) | 9,800 (0%) |
| | | 2039 | 600 (-15%) | 800 (-3%) | 900 (-22%) | 10,900 (-8%) |
| | | 2043 | 600 (-15%) | 900 (-3%) | 900 (-21%) | 11,200 (-8%) |
| Kimpton Road | Westbound | 2016 | 600 | 500 | 400 | 6,300 |
| | | 2027 | 900 (-18%) | 700 (-8%) | 500 (-21%) | 9,700 (-12%) |
| | | 2039 | 1,300 (0%) | 800 (-6%) | 600 (-18%) | 11,600 (-7%) |
| | | 2043 | 1,300 (1%) | 900 (-3%) | 600 (-15%) | 12,100 (-4%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Northbound | 2016 | 1,000 | 800 | 1,200 | 12,800 |
| | | 2027 | 1,000 (2%) | 1,100 (14%) | 1,100 (-2%) | 14,700 (9%) |
| | | 2039 | 1,100 (21%) | 1,200 (21%) | 1,500 (12%) | 17,100 (19%) |
| | | 2043 | 1,100 (20%) | 1,200 (20%) | 1,600 (14%) | 17,700 (19%) |
| Vauxhall Way, between Eaton Green Road and Crawley Green Road | Southbound | 2016 | 1,200 | 800 | 1,100 | 12,600 |
| | | 2027 | 1,100 (-8%) | 1,000 (2%) | 1,100 (3%) | 14,300 (1%) |
| | | 2039 | 1,800 (3%) | 1,200 (7%) | 1,500 (23%) | 18,000 (9%) |
| | | 2043 | 1,800 (8%) | 1,200 (10%) | 1,500 (26%) | 18,600 (12%) |
| A505, west of Lilley | Eastbound | 2016 | 900 | 700 | 1,200 | 11,000 |
| | | 2027 | 900 (-4%) | 800 (2%) | 1,300 (2%) | 12,300 (1%) |
| | | 2039 | 1,000 (-2%) | 900 (1%) | 1,400 (-2%) | 13,500 (0%) |
| | | 2043 | 1,000 (-2%) | 900 (5%) | 1,500 (-1%) | 14,100 (2%) |
| A505, west of Lilley | Westbound | 2016 | 1,300 | 700 | 1,000 | 11,200 |
| | | 2027 | 1,400 (-2%) | 800 (1%) | 1,000 (1%) | 12,300 (0%) |
| | | 2039 | 1,600 (-2%) | 900 (-1%) | 1,200 (9%) | 14,300 (1%) |
| | | 2043 | 1,600 (0%) | 900 (3%) | 1,200 (7%) | 14,900 (3%) |
| Eaton Green Road, east of Wigmore | Eastbound | 2016 | 200 | 100 | 200 | 1,500 |
| | | 2027 | 300 (21%) | 100 (13%) | 300 (12%) | 2,400 (15%) |
| | | 2039 | 200 (-16%) | 200 (24%) | 400 (15%) | 2,900 (13%) |
| | | 2043 | 300 (-4%) | 200 (45%) | 500 (43%) | 3,700 (35%) |
| Eaton Green Road, east of Wigmore | Westbound | 2016 | 200 | 100 | 200 | 1,400 |
| | | 2027 | 300 (-2%) | 100 (-2%) | 200 (-3%) | 1,900 (-2%) |
| | | 2039 | 400 (34%) | 100 (11%) | 200 (-6%) | 2,600 (14%) |
| | | 2043 | 500 (51%) | 200 (32%) | 200 (-5%) | 3,200 (30%) |
| Lower Harpenden Road, south of A1081 | Northbound | 2016 | 600 | 400 | 800 | 6,600 |
| | | 2027 | 800 (6%) | 400 (7%) | 800 (6%) | 7,800 (6%) |
| | | 2039 | 900 (9%) | 500 (9%) | 900 (8%) | 8,400 (9%) |
| | | 2043 | 900 (7%) | 500 (10%) | 1,000 (13%) | 8,700 (10%) |
| Lower Harpenden Road, south of A1081 | Southbound | 2016 | 600 | 300 | 500 | 5,600 |
| | | 2027 | 700 (-6%) | 400 (-2%) | 700 (-2%) | 6,700 (-3%) |
| | | 2039 | 800 (-2%) | 500 (1%) | 700 (-6%) | 7,600 (-2%) |
| | | 2043 | 800 (-7%) | 500 (1%) | 800 (-3%) | 7,900 (-2%) |
| London Road, south of Front Street | Northbound | 2016 | 800 | 600 | 700 | 8,600 |
| | | 2027 | 900 (-4%) | 700 (-3%) | 800 (-4%) | 9,900 (-3%) |
| | | 2039 | 1,000 (-8%) | 700 (-3%) | 900 (-6%) | 10,800 (-4%) |
| | | 2043 | 1,000 (-3%) | 700 (-4%) | 900 (-8%) | 11,000 (-5%) |
| London Road, south of Front Street | Southbound | 2016 | 800 | 500 | 800 | 8,200 |
| | | 2027 | 900 (1%) | 500 (0%) | 1,100 (3%) | 9,300 (1%) |
| | | 2039 | 1,000 (-3%) | 600 (-2%) | 1,000 (-17%) | 9,600 (-7%) |
| | | 2043 | 1,100 (0%) | 600 (-2%) | 1,100 (-17%) | 10,000 (-6%) |

5 RAIL FORECAST COMPARISON

5.1 Updated vs Original runs

5.1.1 Comparisons of the rail forecasts have been undertaken for the forecast year 2043 without airport expansion between the Updated runs and Original runs as shown in Figure 5.1 and Figure 5.2.

Figure 5.1 AM Peak Without Expansion comparison – Updated vs Original

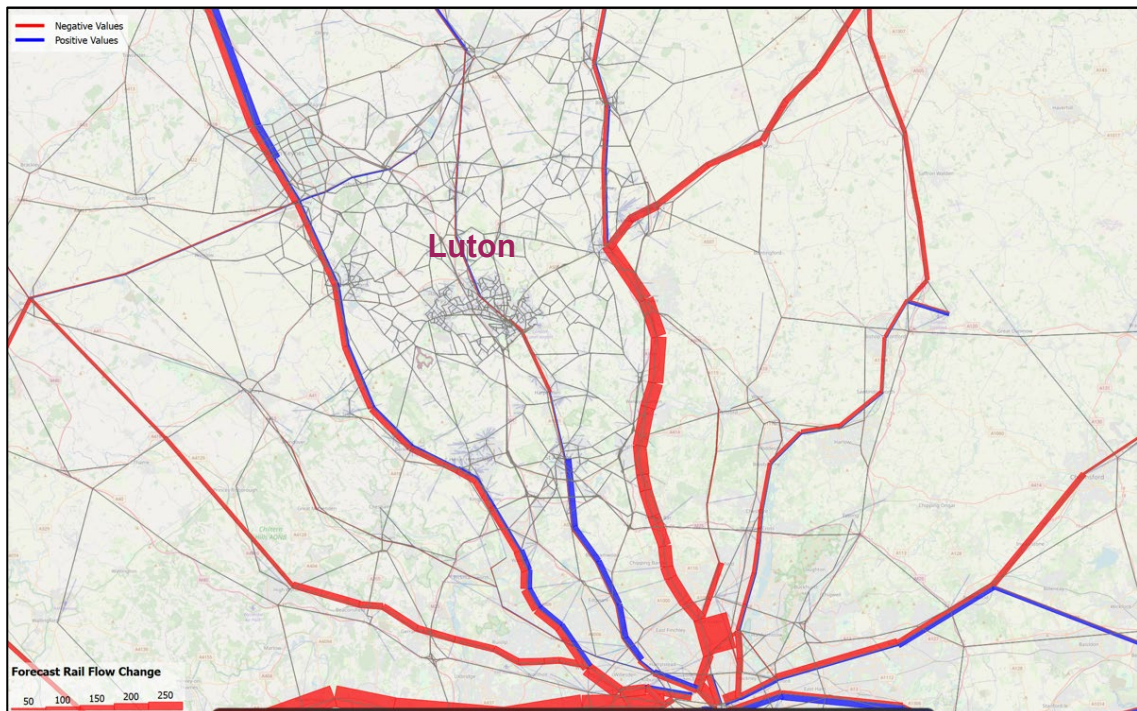
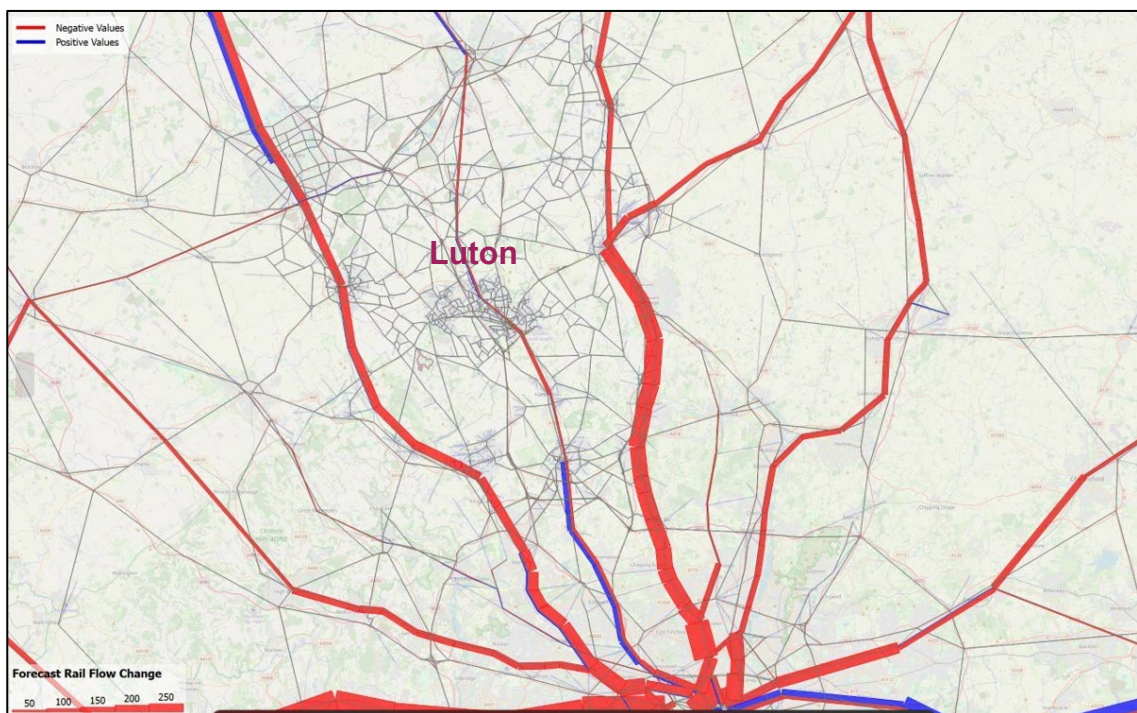


Figure 5.2 PM Peak Without Expansion comparison – Updated vs Original



5.1.2 The flow plot comparisons show the change in background forecast which indicates that the change is relatively minor on London-Luton rail line. The forecast change in flows

on the London-Luton rail line are up to 100 passengers per hour by direction and therefore relatively small.

5.1.3 Larger changes, predominantly reductions, can be observed elsewhere.

6 FORECAST YEAR 2023 MODELLLED / OBSERVED COMPARISON

6.1.1 A new forecast year 2023 model has been developed to provide a comparison with 2023 observed traffic count data to gain an understanding of how the forecast model reflects the actual situation, given its 2016 pre-Covid-19 base year and the recent impact of the Covid-19 pandemic.

6.1.2 Flow validation criteria and guidelines based on TAG Unit M3.1 – Highway Assignment Modelling, May 2020 have been used to gauge the comparison between the two flow sets with criteria described as follows.

Flow Validation criteria:

- Individual flows within 100 veh/h of counts for flows less than 700 veh/h;
- Individual flows within 15% of counts for flows from 700 to 2,700 veh/h; and
- Individual flows within 400 veh/h of counts for flows more than 2,700 veh/h.

GEH Validation criteria: GEH < 5 for individual flows.

6.1.3 Comparisons of the 2023 modelled and observed flows are provided in Table 6.1 to Table 6.6.

Table 6.1 AM Peak SRN Link Flow Comparison – Modelled vs Observed

| Count Location | Direction | 2023 Observed (veh) | 2023 Modelled (veh) | Diff | %Diff | GEH | Low/High | Flow Validation | GEH Validation | Validation Result |
|---------------------|-----------|---------------------|---------------------|------|-------|-----|----------|-----------------|----------------|-------------------|
| M1 between J8-J9 | NB | 5284 | 5343 | 59 | 1% | 0.8 | High | Pass | Pass | Pass |
| M1 between J8-J9 | SB | 6719 | 6960 | 241 | 4% | 2.9 | High | Pass | Pass | Pass |
| M1 between J9-J10 | NB | 5411 | 5686 | 274 | 5% | 3.7 | High | Pass | Pass | Pass |
| M1 between J9-J10 | SB | 6004 | 5860 | -144 | -2% | 1.9 | Low | Pass | Pass | Pass |
| M1 between J10-J11 | NB | 4941 | 5107 | 166 | 3% | 2.3 | High | Pass | Pass | Pass |
| M1 between J10-J11 | SB | 5706 | 5847 | 141 | 2% | 1.9 | High | Pass | Pass | Pass |
| M1 between J11-J11a | NB | 4851 | 4817 | -34 | -1% | 0.5 | Low | Pass | Pass | Pass |
| M1 between J11-J11a | SB | 5066 | 5236 | 170 | 3% | 2.4 | High | Pass | Pass | Pass |
| M1 between J11a-J12 | NB | 4302 | 4078 | -224 | -5% | 3.5 | Low | Pass | Pass | Pass |
| M1 between J11a-J12 | SB | 4308 | 4095 | -213 | -5% | 3.3 | Low | Pass | Pass | Pass |
| A1081 E of M1 | EB | 2474 | 2531 | 56 | 2% | 1.1 | High | Pass | Pass | Pass |
| A1081 E of M1 | WB | 2193 | 1965 | -228 | -10% | 5.0 | Low | Pass | Fail | Pass |

Table 6.2 AM Peak LRN Link Flow Comparison – Modelled vs Observed

| Authority | Count Location | Direction | 2023 Observed (veh) | 2023 Modelled (veh) | Diff | %Diff | GEH | Low/High | Flow Validation | GEH Validation | Validation Result |
|-----------|------------------------|-----------|---------------------|---------------------|------|-------|------|----------|-----------------|----------------|-------------------|
| HCC | A5183 East of Markyate | EB | 506 | 1403 | 896 | 177% | 29.0 | High | Fail | Fail | Fail |
| HCC | A5183 East of Markyate | WB | 964 | 349 | -615 | -64% | 24.0 | Low | Fail | Fail | Fail |
| HCC | A505 West of Hitchin | EB | 370 | 1052 | 682 | 184% | 25.6 | High | Fail | Fail | Fail |
| HCC | A505 West of Hitchin | WB | 1181 | 957 | -224 | -19% | 6.9 | Low | Fail | Fail | Fail |
| HCC | B653 Lower Luton Road | SB | 567 | 726 | 159 | 28% | 6.2 | High | Fail | Fail | Fail |
| HCC | B653 Lower Luton Road | NB | 330 | 723 | 394 | 119% | 17.1 | High | Fail | Fail | Fail |
| CBC | Lower Harpenden Road | NB | 353 | 675 | 322 | 91% | 14.2 | High | Fail | Fail | Fail |
| CBC | Lower Harpenden Road | SB | 575 | 704 | 129 | 22% | 5.1 | High | Fail | Fail | Near |
| CBC | B540 Church Road | EB | 211 | 346 | 135 | 64% | 8.1 | High | Fail | Fail | Fail |
| CBC | B540 Church Road | WB | 197 | 177 | -20 | -10% | 1.5 | Low | Pass | Pass | Pass |
| LBC | Hatters Way | EB | 743 | 978 | 235 | 32% | 8.0 | High | Fail | Fail | Fail |
| LBC | Hatters Way | WB | 737 | 931 | 194 | 26% | 6.7 | High | Fail | Fail | Fail |
| LBC | Vauxhall Way | NB | 530 | 579 | 49 | 9% | 2.1 | High | Pass | Pass | Pass |
| LBC | A5228 Stockingstone Rd | EB | 658 | 1335 | 677 | 103% | 21.4 | High | Fail | Fail | Fail |
| LBC | A5228 Stockingstone Rd | WB | 763 | 847 | 84 | 11% | 3.0 | High | Pass | Pass | Pass |

Table 6.3 Inter Peak SRN Link Flow Comparison – Modelled vs Observed

| Count Location | Direction | 2023 Observed (veh) | 2023 Modelled (veh) | Diff | %Diff | GEH | Low/High | Flow Validation | GEH Validation | Validation Result |
|---------------------|-----------|---------------------|---------------------|------|-------|-----|----------|-----------------|----------------|-------------------|
| M1 between J8-J9 | NB | 5379 | 5206 | -173 | -3% | 2.4 | Low | Pass | Pass | Pass |
| M1 between J8-J9 | SB | 4872 | 5015 | 143 | 3% | 2.0 | High | Pass | Pass | Pass |
| M1 between J9-J10 | NB | 5264 | 5079 | -185 | -4% | 2.6 | Low | Pass | Pass | Pass |
| M1 between J9-J10 | SB | 4836 | 4938 | 102 | 2% | 1.5 | High | Pass | Pass | Pass |
| M1 between J10-J11 | NB | 4930 | 4923 | -7 | 0% | 0.1 | Low | Pass | Pass | Pass |
| M1 between J10-J11 | SB | 4584 | 4579 | -5 | 0% | 0.1 | Low | Pass | Pass | Pass |
| M1 between J11-J11a | NB | 4691 | 4570 | -121 | -3% | 1.8 | Low | Pass | Pass | Pass |
| M1 between J11-J11a | SB | 4262 | 4217 | -45 | -1% | 0.7 | Low | Pass | Pass | Pass |
| M1 between J11a-J12 | NB | 4189 | 3742 | -446 | -11% | 7.1 | Low | Fail | Fail | Fail |
| M1 between J11a-J12 | SB | 3699 | 3712 | 13 | 0% | 0.2 | High | Pass | Pass | Pass |
| A1081 E of M1 | EB | 1783 | 1539 | -244 | -14% | 6.0 | Low | Pass | Fail | Pass |
| A1081 E of M1 | WB | 1814 | 1742 | -73 | -4% | 1.7 | Low | Pass | Pass | Pass |

Table 6.4 Inter Peak LRN Link Flow Comparison – Modelled vs Observed

| Authority | Count Location | Direction | 2023 Observed (veh) | 2023 Modelled (veh) | Diff | %Diff | GEH | Low/High | Flow Validation | GEH Validation | Validation Result |
|-----------|------------------------|-----------|---------------------|---------------------|------|-------|------|----------|-----------------|----------------|-------------------|
| HCC | A5183 East of Markyate | EB | 578 | 488 | -90 | -16% | 3.9 | Low | Pass | Pass | Pass |
| HCC | A5183 East of Markyate | WB | 510 | 603 | 93 | 18% | 3.9 | High | Pass | Pass | Pass |
| HCC | A505 West of Hitchin | EB | 220 | 679 | 459 | 209% | 21.6 | High | Fail | Fail | Fail |
| HCC | A505 West of Hitchin | WB | 1097 | 670 | -426 | -39% | 14.3 | Low | Fail | Fail | Fail |
| HCC | B653 Lower Luton Road | SB | 255 | 346 | 91 | 36% | 5.2 | High | Pass | Fail | Pass |
| HCC | B653 Lower Luton Road | NB | 289 | 369 | 80 | 28% | 4.4 | High | Pass | Pass | Pass |
| CBC | Lower Harpenden Road | NB | 283 | 359 | 77 | 27% | 4.3 | High | Pass | Pass | Pass |
| CBC | Lower Harpenden Road | SB | 267 | 398 | 130 | 49% | 7.1 | High | Fail | Fail | Fail |
| CBC | B540 Church Road | EB | 136 | 143 | 8 | 6% | 0.7 | High | Pass | Pass | Pass |
| CBC | B540 Church Road | WB | 132 | 75 | -56 | -43% | 5.6 | Low | Pass | Fail | Pass |
| LBC | Hatters Way | EB | 815 | 765 | -50 | -6% | 1.8 | Low | Pass | Pass | Pass |
| LBC | Hatters Way | WB | 660 | 936 | 277 | 42% | 9.8 | High | Fail | Fail | Fail |
| LBC | Vauxhall Way | NB | 541 | 648 | 107 | 20% | 4.4 | High | Fail | Pass | Pass |
| LBC | A5228 Stockingstone Rd | EB | 644 | 757 | 113 | 18% | 4.3 | High | Fail | Pass | Pass |
| LBC | A5228 Stockingstone Rd | WB | 686 | 795 | 109 | 16% | 4.0 | High | Fail | Pass | Pass |

Table 6.5 PM Peak SRN Link Flow Comparison – Modelled vs Observed

| Count Location | Direction | 2023 Observed (veh) | 2023 Modelled (veh) | Diff | %Diff | GEH | Low/High | Flow Validation | GEH Validation | Validation Result |
|---------------------|-----------|---------------------|---------------------|------|-------|-----|----------|-----------------|----------------|-------------------|
| M1 between J8-J9 | NB | 6548 | 6265 | -284 | -4% | 3.5 | Low | Pass | Pass | Pass |
| M1 between J8-J9 | SB | 5823 | 6216 | 393 | 7% | 5.1 | High | Pass | Fail | Pass |
| M1 between J9-J10 | NB | 6530 | 6299 | -231 | -4% | 2.9 | Low | Pass | Pass | Pass |
| M1 between J9-J10 | SB | 5874 | 6274 | 400 | 7% | 5.1 | High | Pass | Fail | Pass |
| M1 between J10-J11 | NB | 6173 | 6134 | -39 | -1% | 0.5 | Low | Pass | Pass | Pass |
| M1 between J10-J11 | SB | 5473 | 5480 | 7 | 0% | 0.1 | High | Pass | Pass | Pass |
| M1 between J11-J11a | NB | 5678 | 5381 | -297 | -5% | 4.0 | Low | Pass | Pass | Pass |
| M1 between J11-J11a | SB | 4904 | 5028 | 124 | 3% | 1.8 | High | Pass | Pass | Pass |
| M1 between J11a-J12 | NB | 4886 | 4389 | -497 | -10% | 7.3 | Low | Fail | Fail | Fail |
| M1 between J11a-J12 | SB | 4462 | 4637 | 175 | 4% | 2.6 | High | Pass | Pass | Pass |
| A1081 E of M1 | EB | 2587 | 2151 | -435 | -17% | 8.9 | Low | Fail | Fail | Fail |
| A1081 E of M1 | WB | 2741 | 2812 | 71 | 3% | 1.4 | High | Pass | Pass | Pass |

Table 6.6 PM Peak LRN Link Flow Comparison – Modelled vs Observed

| Authority | Count Location | Direction | 2023 Observed (veh) | 2023 Modelled (veh) | Diff | %Diff | GEH | Low/High | Flow Validation | GEH Validation | Validation Result |
|-----------|------------------------|-----------|---------------------|---------------------|------|-------|------|----------|-----------------|----------------|-------------------|
| HCC | A5183 East of Markyate | EB | 1052 | 612 | -439 | -42% | 15.2 | Low | Fail | Fail | Fail |
| HCC | A5183 East of Markyate | WB | 589 | 948 | 359 | 61% | 13.0 | High | Fail | Fail | Fail |
| HCC | A505 West of Hitchin | EB | 294 | 982 | 688 | 234% | 27.2 | High | Fail | Fail | Fail |
| HCC | A505 West of Hitchin | WB | 1277 | 1154 | -124 | -10% | 3.5 | Low | Pass | Pass | Pass |
| HCC | B653 Lower Luton Road | SB | 316 | 612 | 295 | 93% | 13.7 | High | Fail | Fail | Fail |
| HCC | B653 Lower Luton Road | NB | 536 | 697 | 161 | 30% | 6.5 | High | Fail | Fail | Fail |
| CBC | Lower Harpenden Road | NB | 522 | 611 | 89 | 17% | 3.7 | High | Pass | Pass | Pass |
| CBC | Lower Harpenden Road | SB | 340 | 750 | 410 | 121% | 17.6 | High | Fail | Fail | Fail |
| CBC | B540 Church Road | EB | 178 | 213 | 35 | 20% | 2.5 | High | Pass | Pass | Pass |
| CBC | B540 Church Road | WB | 204 | 140 | -64 | -31% | 4.9 | Low | Pass | Pass | Pass |
| LBC | Hatters Way | EB | 885 | 821 | -64 | -7% | 2.2 | Low | Pass | Pass | Pass |
| LBC | Hatters Way | WB | 657 | 1032 | 376 | 57% | 12.9 | High | Fail | Fail | Fail |
| LBC | Vauxhall Way | NB | 710 | 1039 | 329 | 46% | 11.1 | High | Fail | Fail | Fail |
| LBC | A5228 Stockingstone Rd | EB | 678 | 1051 | 372 | 55% | 12.7 | High | Fail | Fail | Fail |
| LBC | A5228 Stockingstone Rd | WB | 828 | 1026 | 198 | 24% | 6.5 | High | Fail | Fail | Fail |

6.1.4 Overall, the tables show relatively close comparisons on the SRN. Whereas the LRN show poor comparisons, which is to be expected considering the findings on TN1 that showed the LRN links have failed to 'recover' to the traffic levels of pre-COVID-19.

6.1.5 Nevertheless, the modelled flows are mainly higher compared to the observed which implies a potential downward adjustment could be applied to the LRN.

7 SUMMARY

7.1 Key Findings

- 7.1.1 Results from the Updated forecast years modelling indicate that the overall forecast traffic volumes are slightly lower than the Original flows that were reported in the previous modelling, which informed the application for development consent.
- 7.1.2 Comparison between 2023 modelled and observed flows shows relatively good comparison on the SRN but considerably higher modelled than observed flows for the LRN. This result ties in with the findings on the trends analysis in TN1.
- 7.1.3 The trends analysis also indicated (in TN1) a potential for a slight downward adjustment to the forecasts, although noting the limitations on the available observed data to support this.
- 7.1.4 It is, however, anticipated that any short-term impact on traffic levels, because of Covid-19, would likely have dissipated as overall travel demands return to pre-pandemic levels for the 2027, 2039 and 2043 assessment years. TN1 has indicated that volumes on the SRN have largely 'recovered' to pre-pandemic levels and, while volumes on the LRN have been increasing, they are still not back to pre-pandemic levels. There are four more years until the first assessment year of 2027, and the assessment years 2039 and 2043 are respectively 16 and 20 years away.
- 7.1.5 It was discussed, at an October 2023 meeting on the Rule 9 work with National Highways and local highway authorities (Central Bedfordshire Council, Luton Borough council and Hertfordshire County Council), and proposed, not to make adjustments to the base and future year models (apart from the recent Updated changes) in order to continue to make a 'robust' assessment of overall future year traffic volumes.
- 7.1.6 The recent TAG Unit M4 – Forecasting and Uncertainty Appendix B.3 Proportionate accounting for COVID-19 in prior-calibrated models (May 2023) (Ref 1) highlights the need for a proportionate update process, highlighting the importance of identifying the level of risk associated with the forecast model followed subsequently by the decision to select the most appropriate adjustment option. TAG Unit M4 Paragraph B.3.5 states '*A judgment should be made on the most appropriate action relative to the risks to be mitigated.*'
- 7.1.7 After completing this model update, currently the overall forecast risk assessment is therefore considered to be 'very low' due to the slightly reduced traffic flows and the potential of further downward adjustments resulting from the trends analysis.
- 7.1.8 Therefore, the proposed highway mitigation measures for the airport expansion can be considered as 'robust', due to having been developed with traffic flows slightly higher than the recent update, and the TRIMMA will trigger measures on a 'need/impact' basis.

7.2 Recommendation

- 7.2.1 Considering the findings in this TN2, the Applicant recommends no further adjustments are required to the Updated traffic forecasts.
- 7.2.2 The Updated forecasts will therefore be used directly in the VISSIM local micro-simulation model and for air quality / noise assessment. The VISSIM and air quality / noise assessments will then be completed to determine if the respective assessments and highway / environmental mitigations published in the DCO application documents are still appropriate.

REFERENCES

- Ref 1 Department for Transport (2023) TAG Unit M4 Forecasting and Uncertainty
- Ref 2 Luton Airport Passengers Statistics, June 2023.
- Ref 3 National Highways (2020) A1(M) junction 6 to junction 8 smart motorway