Our ref: SM/Luton DCO

Secretary of State for Transport
C/o Planning Inspectorate Case Team

By Email only to:

lutonairport@planninginspectorate.gov.uk

Sarah Marshall
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11 October 2024

Dear Secretary of State,

**Application by London Luton Airport Ltd for Development Consent for the Proposed London Luton Airport Expansion**

**Planning Inspectorate Reference TR020001**

**Consultation Seeking Information from the Applicant and Interested Parties**

Thank you for your letter of 27 September 2024.

I refer to paragraph 8. of your letter where Interested Parties were invited to provide further comments. Please take this letter as National Highway's response to the consultation seeking further information from the Applicant and Interested parties.

During the Examination for London Luton Airport Expansion project, you will recall that National Highways submitted a Technical Note to the Examination concerning the "M1 Junction 10 South Facing Slip Interventions" at Deadline 5 [**REP5-093**] which concluded that;

> *"National Highways' principal concern is the ability to accommodate additional development-related traffic at an already congested junction. Whilst it is acknowledged that the Applicant's proposals provide mitigation to the circulatory carriageway, congestion remains on the south facing slip roads and their interaction with the mainline carriageway. These safety issues are not addressed by the Applicant's proposals."*

National Highways confirmed to the Examining Authority in its Deadline 7 representation **[REP7-093]** that the updated microsimulation (VISSIM) modelling still showed that there are some residual delays and queueing on the southbound on-slip merge and that there are queues on the northbound mainline where there is a lane drop from five to four lanes. This gives National Highways safety concerns due to the queueing traffic in these locations and the consequential collision risk. National Highways indicated in its Deadline 7 response of its intention to explore other options with the Applicant.

Following the close of the Examination, National Highways commissioned (Jacobs Systra Joint Venture (JSJV), its retained technical consultants, to update the Deadline 5 report, with the most recent post-covid demand forecasts and a more detailed assessment of the forecast conditions and required mitigation.

The updated M1 Junction 10 Study Final Report (including the NH Requirements Summary Table) is attached for your information. The updated report re-confirms the safety concerns of forecast unmitigated congestion to the south of M1 Junction 10 in both directions, following the implementation of the second and third phases of the proposed airport expansion (assumed to be in 2039 and 2043), including the Applicant's proposed works at M1 Junction 10.

To ensure the safe operation of the network, National Highways requires that the appropriate mitigation identified in this report, or similar, is secured in the DCO, as set out in National Highway's final Deadline 11 submission [**REP-11-073**].

Yours sincerely,

[redacted]

**Sarah Marshall**
**Head of Planning & Highways Legal Team (South)**
**Senior Lawyer**
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# M1 Junction 10 Intervention Assessment Report

## Spatial Planning Framework Commission

| | | | |
|---|---|---|---|
| **Job number:** | B2428401 | | |
| **Job title:** | Luton Airport Expansion | | |
| **LPA name:** | N/A | **LPA Ref:** | N/A |
| **To:** | Jeremy Bloom / Kelly Milburn | **cc:** | |
| **Topic:** | M1 Junction 10 Intervention Assessment | | |

| | **Prepared:** | **Checked/Approved** |
|---|---|---|
| **Name:** | Iain Arthur/Ross Young/ Fiona Ahmed | Mike Howell |
| **Date**: | 20/06/24 | 26/06/2024 |

# Executive Summary

## Scope of Study and Background

1. The JSJV was commissioned by National Highways (NH) to undertake a study of traffic conditions and potential interventions required at M1 junction 10 in the context of the proposed expansion of London Luton Airport.
2. An application for a Development Consent Order (DCO) was made by London Luton Airport Limited (LLAL, known as Luton Rising) in March 2023. This Application would provide for the expansion of London Luton Airport from its current permitted cap of 18 million passengers per annum (mppa) up to 32 mppa. The proposed DCO included a series of upgrades to the highway network to mitigate against the planned increase in airport-related traffic, including on the SRN at M1 Junction 10, as well as public transport and active travel improvements.
3. Analysis undertaken by JSJV on behalf of National Highways prior to and during the DCO Examination concluded that safety concerns as a consequence of congestion were likely to persist following implementation of the highway mitigation in the later phases of airport expansion. National Highways therefore made representations as part of the Examination that additional interventions were required to enable the later stages of the development to proceed.
4. The purpose of the study is to confirm whether highway improvements at this location are required in addition to those included in the Airport Expansion DCO, based on the previous work that NH undertook as part of the Luton Airport DCO examination and the updated post-covid traffic modelling undertaken by Luton Rising.

## Previous NH Study

5. During the DCO examination two key issues were identified with the mitigation proposed by Luton Rising. Firstly, the demand for traffic movement on the southbound south facing merge at M1 junction 10 exceeds safe capacity in the forecast year scenario for the second phase of Airport development (assumed to be 2039). Secondly, the demand for movement in advance of the northbound diverge (at the point of the five to four lane drop) also exceeds capacity by an assumed implementation year of 2042 for the third phase of Airport development. It is also considered that the operation of junction 10 and the southbound M1 mainline carriageway at this location will continue to be impeded by blocking back from junction 9. However, junction 9 is not included in this study area (due to Luton Airport having minimal impact at this junction). Therefore, improvement interventions have been considered in relation to junction 10 only.

6. Two potential interventions were identified as part of work that JSJV undertook for National Highways during the Luton Airport DCO examination. These are set out in the 'South Facing Slips Interventions Technical Note' (REP5-093). The options would increase the capacity, safety performance and journey time reliability of M1 junction 10 and would be required from maximum airport growth following expansion, assumed in 2043.

## Conclusions

7. The interventions have been retested using the latest VISSIM post COVID-19 modelling to confirm whether the mitigation is still required in addition to that proposed by Luton Rising.

8. Based on the post COVID-19 VISSIM testing, it is clear that the proposed northbound diverge would provide sufficient capacity to safely accommodate the growth in demand for movements to Luton Airport by removing the lane drop on the northbound carriageway on the M1 and enabling junction 10 to accommodate the released traffic.

9. Due to the limited network coverage of the VISSIM model, it is difficult to draw definitive conclusions on the performance of southbound merge. However, the need for an intervention to increase capacity at the junction 10 southbound merge has been identified. This capacity upgrade would improve safety and operational performance resulting from longer periods of free-flowing traffic on the SRN. It is advised that a revised strategic model and a VISSIM model that covers both the M1 junction 10 and junction 9 is prepared if the scheme is to be developed further. This would enable the southbound intervention to be fully assessed.

10. When compared to the Luton Rising proposals alone, the interventions identified in this report would deliver capacity increases as demonstrated using the Luton Rising VISSIM model, with DMRB CD 122 compliant merge/diverge layouts suitable for the forecast traffic demands associated with the later stages of Airport expansion.

11. Furthermore, the change to the south facing merge and removal of the lane drop on the northbound carriageway of the M1 south of Junction 10 would also help to reduce the safety risk posed by the likelihood of stationary vehicles occurring on the M1 during peak periods. This would lower the risk of accidents occurring on this part of the SRN.

12. Based on this assessment, it is expected that the interventions would not require land-take as they would be within the highway boundary on land owned by National Highways. Therefore, it is also not anticipated that a DCO would be required for the planning consent.

13. **In conclusion, the two interventions identified by NH previously in the submission within the DCO examination 'South Facing Slips Interventions Technical Note' (REP5-093) still remain a requirement to accommodate the increased forecast demands (post COVID-19) associated with the Luton Airport expansion. The interventions identified would provide an improvement in the operation of M1 junction 10 and M1 mainline in the vicinity of the interchange. These interventions should be secured even after taking account of the reduction in traffic following COVID-19.**

# Introduction

## Background

14. An application for a development consent order (DCO) was made by London Luton Airport Limited (LLAL or Luton Rising) in March 2023 under the Planning Act 2008 (Application). This Application would provide for the expansion of London Luton Airport (the Airport) from its current permitted cap of 18 million passengers per annum (mppa) up to 32 mppa. It would authorise now infrastructure including: new terminal capacity; additional taxiways and other transport infrastructure; the construction of landside support buildings; surface access adjustments (including changes to the Strategic Road Network (SRN)); mitigation works and other associated development (together, the Development). The DCO examination started on 10th August 2024 and closed on 10th February 2024.

15. This Report is prepared by and submitted on behalf of National Highways Limited (NH). The Report addresses work undertaken by Arup for LLAL in support of the Application for the DCO. The Transport Assessment accompanying the Application and undertaken for LLAL presented some interventions for upgrading the Strategic Road Network (SRN) at the M1 junction 10 in order to mitigate the traffic impacts of planned passenger growth at Luton Airport. Detailed submissions in relation to the Application, the Transport Assessment and the impacts of the Development as well as the manner in which mitigation is purported to be secured in respect of the Application is set out in the submissions of NH to the examination.

16. LLAL are proposing to increase the capacity of the M1 Junction 10 roundabout by providing additional lanes and signalising the junction. However, only a limited intervention is proposed to alleviate the forecast congestion at the south-facing merge, namely lengthening of the parallel merge and a DMRB non-compliant attempt to provide an additional lane from the slip onto the M1. No intervention is proposed for the northbound M1 mainline lane drop from five lanes to four to the south of junction 10. Both of these locations are forecast to remain congested following implementation of the Development and the mitigation that LLAL proposes.

17. As part of the DCO examination NH submitted a Technical Note which identified two further interventions that would increase the capacity and journey reliability of the M1 Junction 10 to 2043 and would be essential in order enable maximum airport growth under the Development with improved SRN performance. However, the interventions identified were based on pre COVID-19 modelling. During the DCO Examination, the Examining Authority (ExA) requested that LLAL should review its transport modelling in light of new Department for Transport interim advice, dated April 2023, regarding the treatment of the COVID-19 pandemic in transport modelling. The ExA requested that Luton Rising amend the modelling and application documentation (including any dependent assessments) as necessary. The interventions that NH developed were also based on the pre Covid-19 forecast modelling and this report describes the process of updating the relevant assessment and design. The revised modelling was received 18 December 2023.

## Scope of Work

18. NH commissioned the Jacobs Systra Joint Venture (JSJV) to identify potential interventions at M1 Junction 10 that would mitigate the forecast increase in traffic arising from the expansion of Luton Airport.

19. Following the close of the examination, NH has requested that the JSJV revisit the interventions identified as part of the work undertaken to inform the DCO examination on the M1 junction 10 northbound diverge and southbound merge.

20. The modelling of the Luton Airport expansion proposals has now been updated by LLAL to confirm the revised traffic flows based on the latest post COVID-19 traffic forecasts. It is therefore necessary to confirm whether the mitigation suggested by NH as part of the DCO examination is still required or requires any amendments.

21. Furthermore, NH have requested that the JSJV provide a detailed breakdown of the interventions to enable the NH Commercial Estimating Team to provide a detailed estimate of the intervention costings.

22. In examination, NH confirmed that its analysis of the LLAL assessments demonstrated a need for improvements to the northbound off-slips and southbound on-slips at J10 of the M1 motorway were required in order to mitigate impacts of the Development. Furthermore, it submitted that such interventions were required to enable the Development to operate whilst protecting the SRN and the travelling public. Consequently, NH submitted that the slip road interventions had to be secured by requirements attached to the DCO with clear triggers for provision if the DCO was to be granted. In other words, unless requirements are imposed, the Secretary of State should refuse the Application. The analysis of post-COVID-19 traffic levels was to demonstrate that NH's submissions remain valid (or if the conclusion had changed).

# Methodology

## Overall approach

23. A streamlined approach to Transport Appraisal Guidance (TAG) (Steps 1 to 4) has been followed within this study. This study has been undertaken as a desktop exercise and focuses on assessing potential highway interventions at M1 junction 10. As agreed with NH, stakeholder engagement with NH and other parties has not been undertaken.

24. The JSJV has used information from the DCO examination undertaken by Luton Rising. This includes:

- Use of the Luton VISSIM model prepared for Luton Rising (post COVID-19); and
- Inclusion of the Luton Rising proposed mitigation at junction 10. This intervention comprises widening of the northbound off slip to three lanes, widening of the circulatory carriageway to provide four western lanes and two southern and northern lanes and an increase at the exit to the A1081 to three lanes. This intervention is illustrated in Figure 28 within this report and was described at (REP7-079) in the documents before the Examination.

25. Furthermore, the interventions developed as part of the 'South Facing Slips Interventions Technical Note' (REP5-093) submitted by NH as part of the DCO examination have also been used within this study.

26. The JSJV has extracted traffic flow data from the Luton Rising VISSIM model and used this to identify possible interventions and confirm whether the mitigation previously proposed is still required. The 2043 forecast year VISSIM model has been used as a platform to test these interventions. This model includes forecast demand of 32 million passengers per annum at Luton Airport in the post-COVID-19 scenario.

27. The Luton Rising VISSIM model has been used within this study as it covers the relevant study area and was immediately available. Construction of a bespoke traffic model for this study was discounted as it could not be done within the required programme.

28. The Luton Rising VISSIM model contains a number of limitations that should be borne in mind when considering the outcomes of this task:

- The base model network includes M1 junction 10, but not junctions 9 and 11. This means that the model does not assess interaction between the junctions on the M1 with regard to issues such as weaving or blocking back of queues;
- In order to validate to surveyed journey times, the model utilises dummy speed reductions on the M1 to simulate the influence of off-network delays. The configuration and placement of these desired speed markers obscures the assessment of improvements at the Junction 10 southbound merge in particular;
- The forecasts included within the model follow a bespoke methodology developed by Luton Rising's consultants, and do not follow TAG principles;
- The forecast models are not converged or stabilised, which introduces a high element of risk and uncertainty regarding the overall performance of the models;
- The southbound merge has some coding errors, in particular, the relative speed of vehicles on the southbound merge and the M1 carriageway; and
- A conventional Do-minimum forecast model was not prepared by ARUP. Therefore, the VISSIM model will be used to compare network operation with and without the scheme with the Luton Rising development in place. However, a comparison to a forecast scenario without the Luton Rising traffic is not possible.

29. Despite these limitations, the Luton Rising VISSIM model is considered to be the best currently available platform for model testing. It is advised that the modelling platform for the assessment of SRN interventions at Junction 10 should be changed or upgraded at the earliest opportunity in order to fully validate the modelling results. NH's comments in relation to the suitability of the post COVID-19 are set out in REP5-091.

# Understanding the Current Situation

## Current Transport and Other Policies

### *Review of Local Plan and Relevant Planning Applications*

30. Luton Borough Council's current Local Plan (2011-2031) (Luton Local Plan) was adopted in November 2017. The supporting evidence base (2016) includes 5,050 additional jobs by 2031 and it was assumed that Luton Airport would reach 18 million passengers per annum by 2028. It should be noted that these assumptions were prior to the COVID-19 pandemic and prior to the Application and its accompanying Transport Assessment.

31. The Luton Local Plan includes two policies relating to the development of Luton Airport.

    - Policy LLP6 - London Luton Airport Strategic Allocation (in relation to access to the Century Park development): 'Details of the proposed access, which shall be via the extension of New Airport Way (which connects the airport to M1 junction
    - 10A) and shall link Percival Way through to Century, such access shall be designed so as to ensure that no use is made of Eaton Green Road to provide access to Century Park or the Airport, except for public transport, cyclists, pedestrians and in case of emergency.'; and
    - Policy LLP31 – Sustainable Transport Strategy notes the mitigation and sustainable infrastructure required for the Luton Airport development.

32. 'Support for the continued economic success of London Luton Airport as a transport hub (policy LLP6) will be delivered through:

    - Measures to ensure there is capacity at strategically important junctions; and
    - Continued enhancement of sustainable modes of transport via the Airport Surface Access Strategy.'

33. As part of the modelling undertaken to support Luton's Local Plan 'Luton Development Plan - Junction Mitigation Assessment' it is noted that there are two schemes on the SRN – junction 10a and M1 junction 10 – 13. No further details are given in the report to describe these schemes. It should also be noted that the Transport Assessment submitted was based on an old version of the Circular (DfT Circular 01/2013). An update was published in December 2022 (DfT Circular 01/2022).

34. Other committed developments are set out in an uncertainty log which is summarised in Appendix B.

## Current Network

35. Junction 10 on the M1 is grade separated, with the northbound off-slip approach signalised. The only local road arm is the A1081 which provides a connection between junction 10 and Luton.

36. Segregated left turns are provided at M1 junction 10 between the southbound off-slip and the A1081 as well as from the A1081 to the southbound merge arm.

37. The southbound merge on to the M1 is a Layout B Parallel merge as per the definitions in the DMRB. The northbound diverge takes the form of a Layout B Two Lane Auxiliary diverge.

38. Within the study area, the M1 has four lanes in the southbound direction. In the northbound direction, the M1 has five lanes as it enters the study area. A lane drop occurs approximately 1.1km to the south of the northbound diverge for junction 10. At this location the nearside lane terminates, resulting in a drop from five lanes to four.

## Current Travel Demand and Levels of Service

### *Historic Traffic Trends*

39. Historic Automatic Traffic Counts (ATCs) for sites on the M1 and A1081 have been extracted from the WebTRIS database and analysed. Figure 1 shows the locations of the sites used in the analysis.


*Figure 1: WebTRIS Analysis Locations*

40. Figure 2 shows the AADT flows on the M1 around junction 10 and on the A1081 to the east of junction 10. It shows a reduction in flows in 2020 and 2021 due to the COVID-19 pandemic, and a return in 2022 and 2023 to pre-2020 levels.

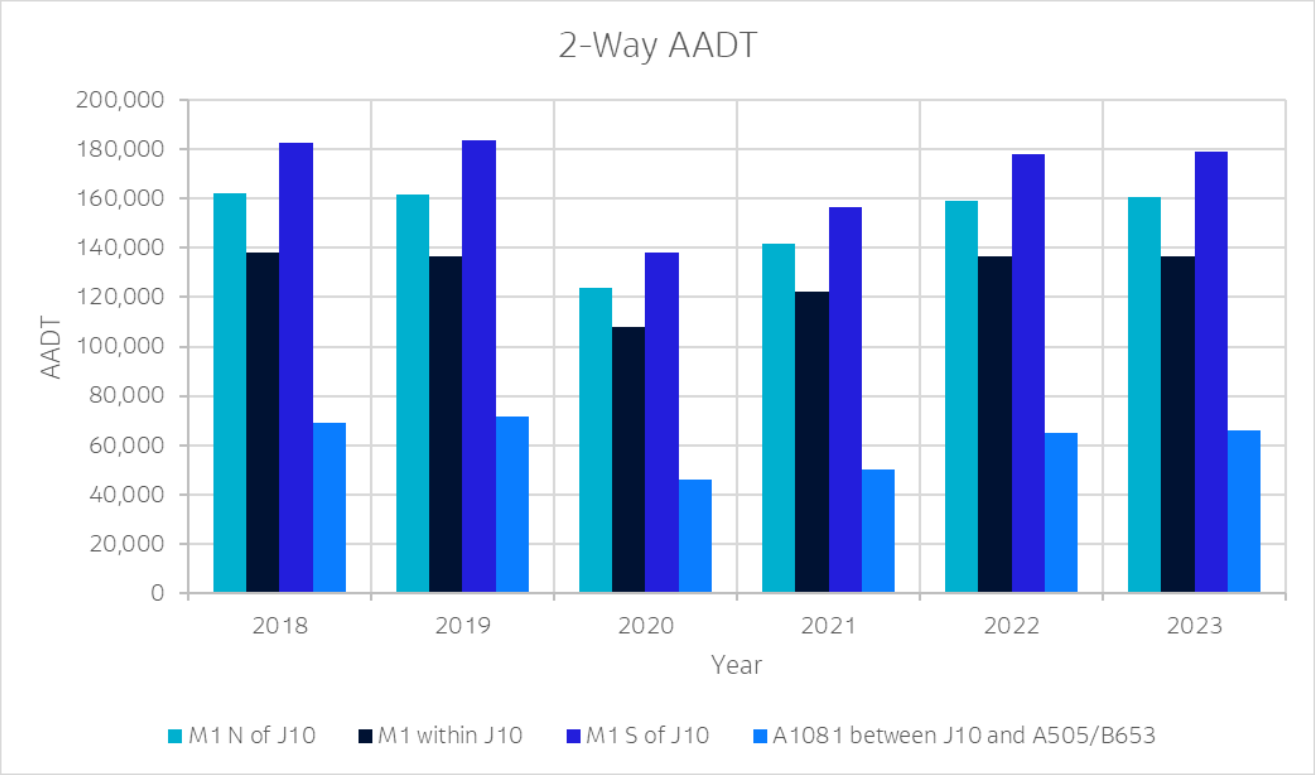



*Figure 2: Two-Way AADT in Study Area*

41. Speed data from WebTRIS has also been analysed, based on Tuesday to Thursday neutral month data. Figure 3 presents the daily speed profile to the north of junction 10 in each direction. It shows reductions in speed within the AM and PM peak periods, except in 2020 during the COVID-19 pandemic. By 2023, the speeds are generally lower than 2019 levels, but it should be noted that 2023 is only represented by the first four months of the year.

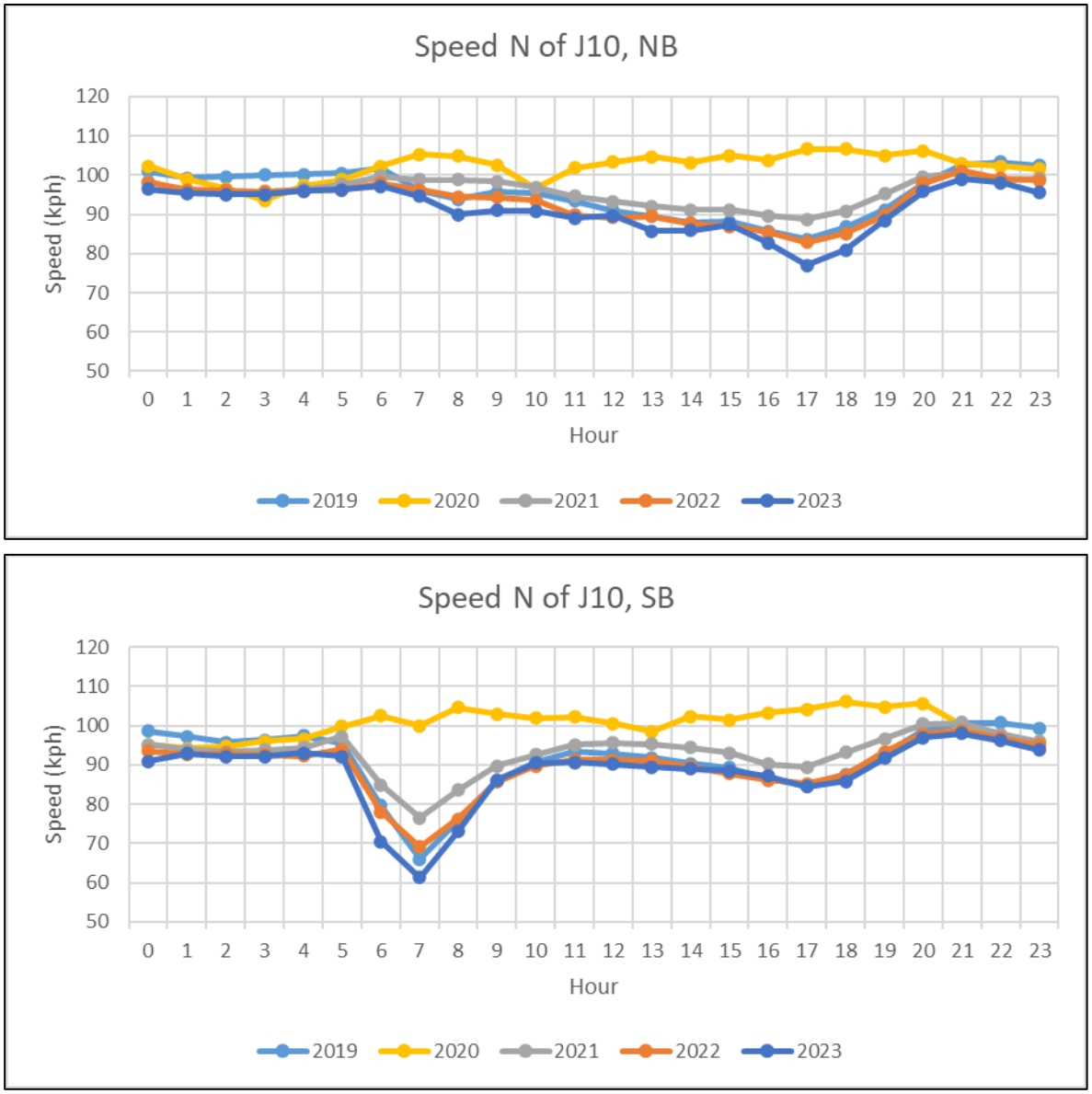



*Figure 3: M1 Speeds, North of Junction 10*

### *VISSIM Base Model Operation*

42. The VISSIM model that has been used in this study was prepared by Luton Rising for the purposes of the Application and the examination. Some observations on network operation are shown in the following paragraphs.

43. The AM Peak Period (2017 base year) shows that the majority of the M1 junction 10 was seen to operate with no issues in the base model during the AM period. The northbound merge, northbound diverge and southbound diverge are all generally free flowing throughout the time period. The southbound merge does not operate efficiently during the peak hour (08.00-09.00), with large queues building up on both the southbound merge and the mainline, as shown in Figure 4.

*Figure 4: 2017 Base Model at 08:30*

44. The PM Peak Period (2017 base year) model shows no particular capacity issues around M1 junction 10 during the PM period. The northbound diverge from the mainline is free flowing, although the reduction within the northbound merge slip road from two lanes to one results in some minor queuing, as shown in Figure 5. This queuing is contained with the extent of the northbound merge slip road. The southbound merge is generally free flowing.

*Figure 5: 2017 Base Model at 17:30*

45. The junction 10 southbound diverge and approach to the circulatory is free flowing in the PM peak (17:00 – 18:00) base model. Some queuing on the northbound off slip signalled controlled approach to Junction 10 circulatory was highlighted. This is shown in Figure 5. However, this queuing does not impact the main line, as it never extends beyond half the length of the northbound diverge slip road. There is also some queuing on the circulatory at the approach to the signalised junction, which occasionally extends beyond the circulatory into the A1081, as shown in Figure 6. This is brief and generally clears within one cycle.

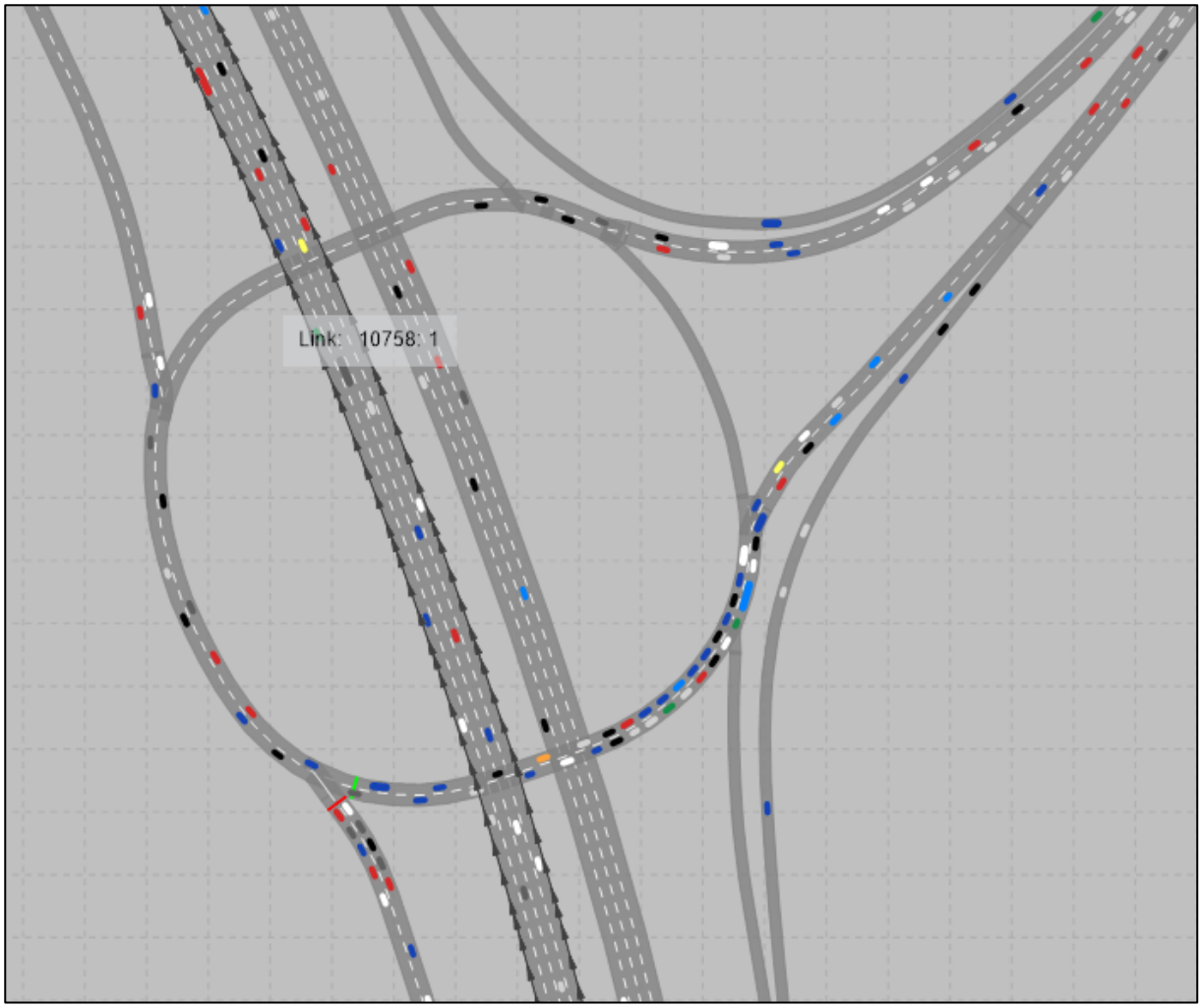



*Figure 6: 2017 Base Model at 18:00*

### *Summary of SATURN actual and demand flows – base junctions 9, 10 and 11*

46. In the absence of SATURN models, information on the current travel demand was extracted from publicly available Luton Rising DCO documents. Figure 7 and Table 1 shows 2016 traffic turning flows at this junction. These flows were extracted from the DCO documents, although it is not clear as to whether these flows are SATURN actual or demand flows. Demand flows from SATURN reflect the level of traffic that wants to move through the network, actual flows are the level of traffic that can get through the network.


*Figure 7: M1 Junction 10*

*Table 1: M1 Junction 10 2016 Turning Flows (Rounded to Nearest 100 Vehicles)*

| 2016 AM | A | B | C |
|---|---|---|---|
| **A** | | 4,100 | 1,300 |
| **B** | 4,300 | | 1,000 |
| **C** | 1,300 | 500 | |

| 2016 IP | A | B | C |
|---|---|---|---|
| **A** | | 3,600 | 800 |
| **B** | 3,300 | | 600 |
| **C** | 1,000 | 600 | |

| 2016 PM | A | B | C |
|---|---|---|---|
| **A** | | 4,800 | 1,400 |
| **B** | 4,200 | | 700 |
| **C** | 1,700 | 900 | |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

47. The volume over capacity (V/C) plots in Figure 8 show the base year V/C plots for different peak periods, with a highlighted red box covering M1 junctions 9 to 11. In the AM peak, the V/C ratio for M1 junction 10 to junction 9 southbound is in the range of 70-80%. In the interpeak, the V/C ratio for junction 10 to Junction 9 northbound is in the range of 80-90%. In the PM peak hour, the V/C ratio is in the range of 70-80% in both directions between Junctions 9 to 11. In summary, the results show that in the 2016 model base year, M1 junctions 9 to 11 are all within the acceptable level of capacity in both directions and in all peak periods.

AM Peak Hour (08:00 to 09:00) Interpeak Hour (10:00 to 16:00) PM Peak Hour (17:00 to 18:00)

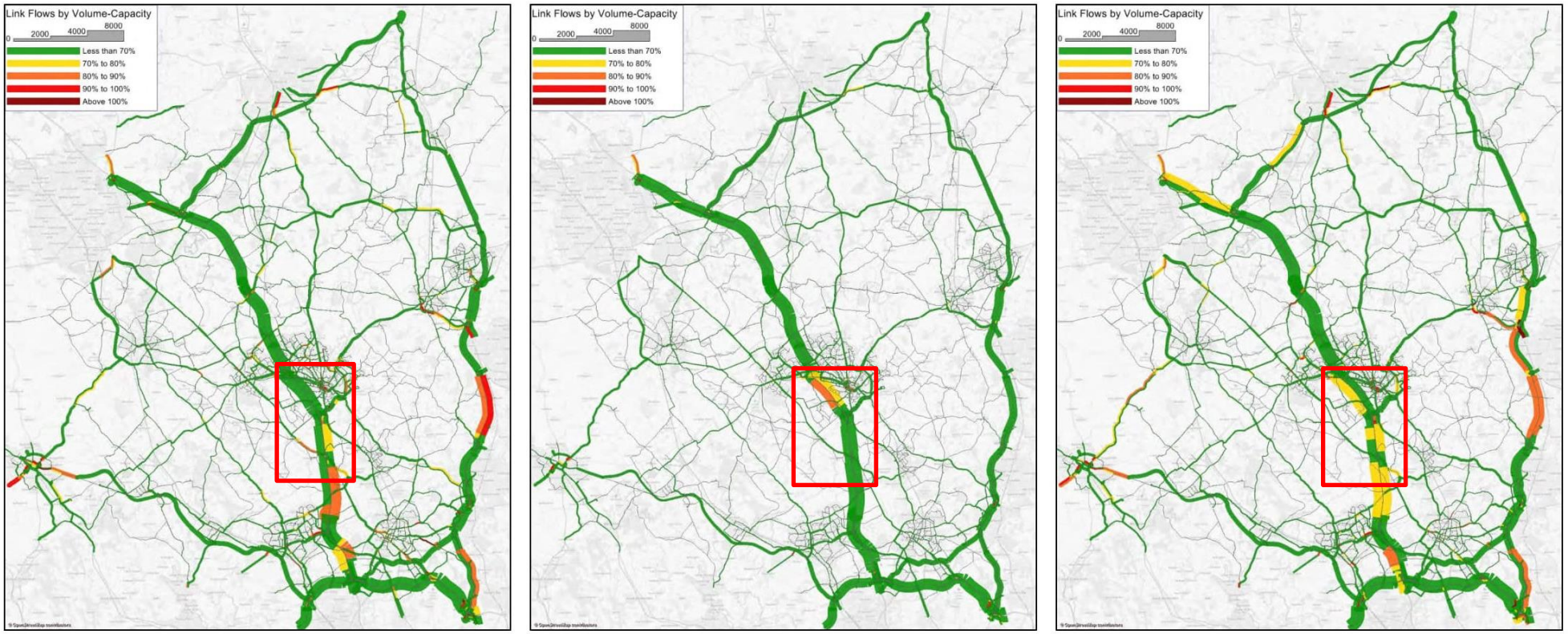



*Figure 8: 2016 Base Year V/C Ratio Plots*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

48. The average junction delays plots are shown in Appendix A. These plots show the maximum delays at M1 junctions 9 to 11 during peak periods are in the region of 30-60 seconds.

### *Summary of VISSIM flows*

49. Modelled 2017 VISSIM base year traffic flows at key study locations are shown in Table 2.

*Table 2: VISSIM 2017 Base Model Traffic Flows*

| | **AM (08:00-09:00)** | **PM (17:00-18:00)** |
|---|---|---|
| M1 NB (within junction) | 4,300 | 5,000 |
| M1 SB (within junction) | 4,500 | 4,800 |
| Southbound Diverge Slip Road | 1,200 | 1,000 |
| Northbound Diverge Slip Road | 1,700 | 1,600 |
| Northbound Merge Slip Road | 800 | 1,500 |
| Southbound Merge Slip Road | 1,100 | 1,700 |

*Source: Luton Rising VISSIM Model*

### *Comparison of VISSIM and SATURN Base Traffic Flows*

Table 3 presents a comparison of the SATURN and VISSIM base model flows for the AM (08:00-09:00) and PM (17:00-18:00) peak hours around junction 10. It should be noted that the VISSIM 2017 base year is one year later than the SATURN 2016 base year. In all cases, except for the AM southbound merge slip road, the VISSIM flows are higher than those in the SATURN model.

*Table 3: SATURN 2016 and VISSIM 2017 Base Model Traffic Flows*

| | AM (08:00-09:00) | | | | PM (17:00-18:00) | | | |
|---|---|---|---|---|---|---|---|---|
| | **SATURN** | **VISSIM** | **Difference** | **% Difference** | **SATURN** | **VISSIM** | **Difference** | **% Difference** |
| M1 Northbound | 4,100 | 4,300 | 200 | 5% | 4,800 | 5,000 | 200 | 4% |
| M1 Southbound | 4,300 | 4,500 | 200 | 5% | 4,200 | 4,800 | 600 | 14% |
| Southbound Diverge Slip Road | 1,000 | 1,200 | 200 | 20% | 700 | 1,000 | 300 | 43% |
| Northbound Diverge Slip Road | 1,300 | 1,700 | 400 | 31% | 1,400 | 1,600 | 200 | 14% |
| Northbound Merge Slip Road | 500 | 800 | 300 | 60% | 900 | 1,500 | 600 | 67% |
| Southbound Merge Slip Road | 1,300 | 1,100 | -200 | -15% | 1,700 | 1,700 | 0 | 0% |

*Source: Luton Rising SATURN and VISSIM Models*

### *Accident record*

**50.** Department for Transport (DfT) STATS19 road traffic accident data was reviewed for the roads within the study area (Figure 9). The analysis used the most recent consecutive five year period of available data (2018 to 2022 inclusive) Figure 9 shows the locations of the injury collisions within the study area and a summary of statistics is provided in Table 4, Table 5 and Table 6.

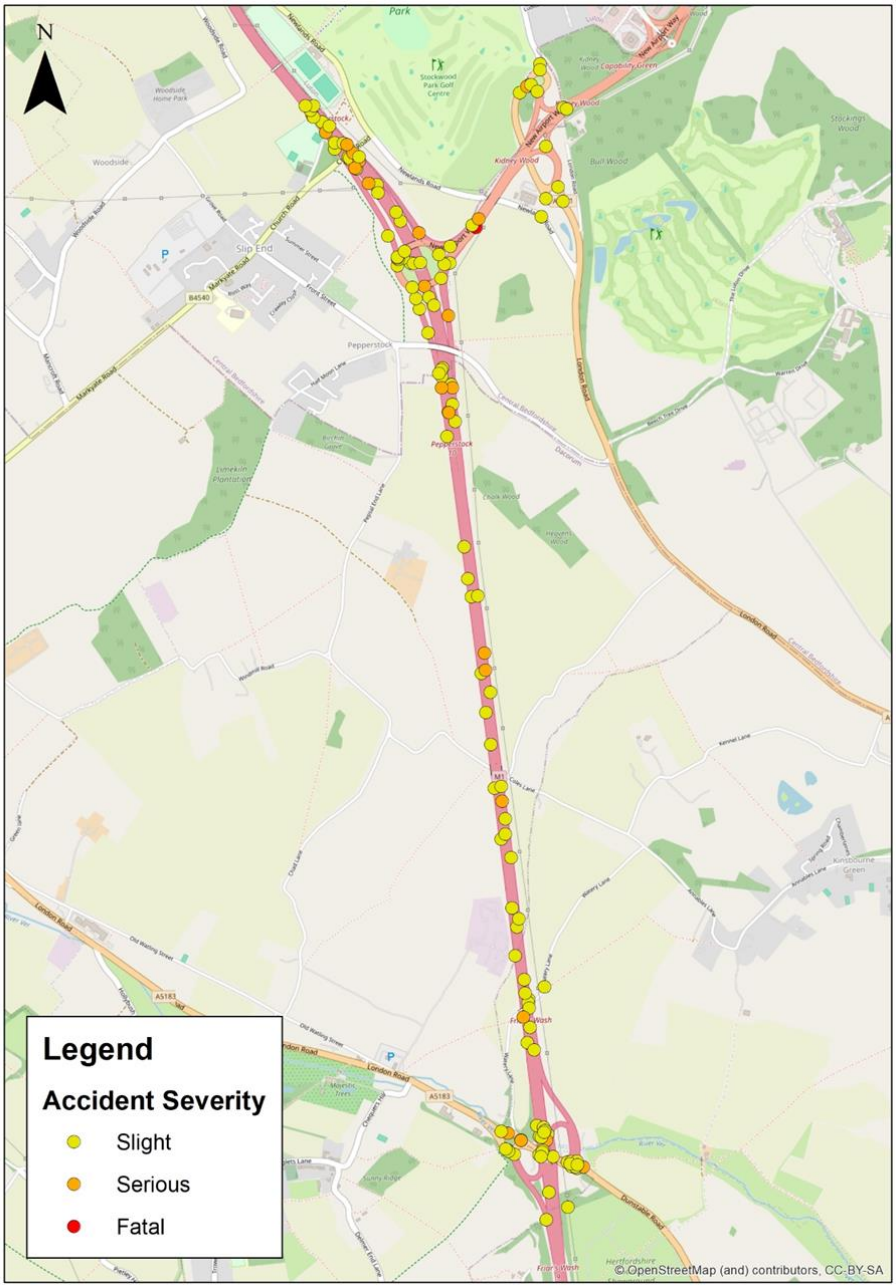



*Figure 9: Collisions From 2018 to 2022*

*Table 4: Collisions in the Study Area by Severity (2018-2022)*

| Collision Severity | Number | Percentage |
|---|---|---|
| Fatal | 1 | 1% |
| Serious | 26 | 17% |
| Slight | 124 | 82% |
| Total | 151 | 100% |

*Source: DfT STATS19*

*Table 5: Vehicle Types Involved in All Collisions (2018-2022)*

| Vehicle Type | Number | Percentage |
|---|---|---|
| Pedal Cycle | 4 | 1% |
| Motorcycle | 12 | 4% |
| Car and Taxi | 217 | 73% |
| Bus | 1 | 0% |
| Van | 18 | 6% |
| HGV | 23 | 8% |
| Other | 22 | 7% |
| Total | 297 | 100% |

*Source: DfT STATS19*

*Table 6: Casualties Involved in All Collisions (2018-2022)*

| Collision Severity | Number | Percentage |
|---|---|---|
| Fatal | 1 | 1% |
| Serious | 17 | 8% |
| Slight | 192 | 91% |
| Total | **268** | **100%** |

*Source: DfT STATS19*

51. National statistics for 2019 show that on Motorways:
    - 'Fatal' collisions made up 2% of total collisions;
    - 'Fatal and serious collisions (unadjusted) made up 18% of total collisions; and
    - 'Slight' collisions made up 82% of total collisions.
52. In general, the severity of collisions within the study area is less severe in comparison with these national statistics.
53. Locations of collision clusters were also identified and are shown in Figure 10. A cluster is defined as a total of four or more collisions on the same road (and in the case of a dual carriageway or motorway, in the same direction) within a 50-metre radius of any other collision within the five-year period as per TAG Unit A4.1. Analysis of the data indicated 11 collision clusters, seven of which are associated with junction 10:
    - M1 junction 10, northbound merge slip road;
    - M1 junction 10, southbound diverge slip road at its diverge;

- M1 junction 10, northbound within junction;
- M1 junction 10, roundabout at northbound on slip exit;
- M1 junction 10 northbound diverge slip road approach to circulatory;
- M1 junction 10, northbound off slip at diverge point;
- M1 junction 10, southbound on slip at merge point;
- M1 junction 9, western circulatory;
- M1 junction 9, eastern circulatory;
- M1 junction 9, northbound on slip at merge point; and
- M1 junction 9, southbound within junction.


*Figure 10: Accident Clusters Identified at M1 junction 10 and M1 junction 9*

54. As flows at these locations are high, the accident rate is relatively low. Additionally, the majority (92%) of accidents are slight, and none of the accidents in the identified clusters are of fatal severity. Therefore, this data does not indicate an existing accident blackspot which needs to be addressed.

## Current Opportunities and Constraints

55. The purpose of the study is to identify whether and where potential improvements may be implemented to mitigate the impact of the expansion of Luton Airport at M1 junction 10.

56. Interaction between junctions 9 and 10 is important with regard to network operation but given that the VISSIM model coverage does not include M1 junction 9 or 11 it is not possible to explicitly consider these junctions within this study. However, the VISSIM model does include a proxy for delay generated by these junctions.

57. The VISSIM model has the following constraints when assessing traffic demand and the operation of the highway network:

- The model gridlocks in later year forecast scenarios, which constrains the level of traffic that is able to travel through the network – and hence its ability to accommodate additional traffic generated by the Development; and
- The level of congestion in the VISSIM network area and any proposed interventions may have an impact on wider network assignment. However, it is not possible to assess that in this study as there is no interaction between the micro and strategic modelling tiers.

This means that the impacts of the Development have not been addressed adequately [or at all] and were the Secretary of State to authorise the Development by granting the DCO, there would be a risk that the impacts would be different to or worse than those for which mitigation can be identified.

# Understanding the Future Situation

## Future Land-Uses and Policies

### *Luton Airport – Phasing*

58. The Transport Assessment that accompanies the DCO application for the Luton Airport development considers three assessment phases:

- Assessment Phase 1 – a core case of 21.5 mppa by 2027 is assumed to deliver works to facilitate the expansion of capacity in Terminal 1 (T1) in line with the demand forecasts contained in the application for development consent;
- Assessment Phase 2a – a core case of 27 mppa by 2039 when Terminal 2 (T2) opens is assumed to deliver works to build and operate T2, and any associated infrastructure; and
- Assessment Phase 2b – a core case of 32 mppa by 2043 when T2 is fully built out.

59. The proposed Development comprises two terminals north of the runway. This includes the expansion of the existing T1 terminal and the delivery of a new T2 terminal on part of the Wigmore Valley Park, which would be relocated further to the east. Additionally, the Development includes development of airfield infrastructure and surface access enhancements to the airport, including an access road and expansion of the Luton DART.

### *Other developments*

60. Appendix B outlines the other future housing and employment developments in the study area. This identifies anticipated residential developments greater than 250 units and employment development creating more than 100 jobs.

## Future Changes to the Transport System

### *Committed infrastructure*

61. Appendix B contains the full list of infrastructure that has been included within the future forecast years modelled scenarios.

## Future Travel Demands and Levels of Service

### *SATURN forecasts for network area – 2043 junctions 9, 10 and 11*

62. Table 7, Table 9, Table 11 and Table 13 show 2043 turning flows for M1 junction 10 and Table 8, Table 10, Table 12 and Table 14 show flows on different sections of the M1 between junctions 9 to 11 for different forecast years.

63. At M1 Junction 10, the largest increase in flow between the scenario with and without the Development is 300 vehicles in the AM peak for the M1 south to A1081, 200 vehicles for M1 south to A1081 and A1081 to M1 south in the interpeak and 200 vehicles for A1081 to M1 south in the PM peak.

64. As for M1 mainline carriageway between junctions 9 and 11, the increase in traffic with the Development and with local growth has hardly changed when compared to the scenario without the Development with a maximum flow change of 100 vehicles in any of the peak periods.

*Table 7: M1 Junction 10 Turning Flows – 2043 TAG Based "Without" Development (Rounded to Nearest 100 Vehicles)*

| 2043 AM | A | B | C |
|---|---|---|---|
| A | | 5,300 | 1,700 |
| B | 5,400 | | 1,900 |
| C | 1,600 | 900 | |

| 2043 IP | A | B | C |
|---|---|---|---|
| A | | 5,100 | 1,000 |
| B | 4,700 | | 900 |
| C | 1,200 | 1,000 | |

| 2043 PM | A | B | C |
|---|---|---|---|
| A | | 6,100 | 1,500 |
| B | 5,100 | | 1,200 |
| C | 2,600 | 1,500 | |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

*Table 8: Vehicle Flows Between M1 Junctions 9, 10 and 11 - TAG Based "Without" Development (Rounded to Nearest 100 Vehicles)*

| Forecast years | Junction 9 - Junction 10 | | | Junction 10 - Junction 11 | | |
|---|---|---|---|---|---|---|
| (Direction) | AM | IP | PM | AM | IP | PM |
| 2016 NB | 5,300 | 4,400 | 6,200 | 4,600 | 4,200 | 5,700 |
| 2016 SB | 5,500 | 4,300 | 5,900 | 5,300 | 3,900 | 4,900 |
| 2043 NB | 7,000 | 6,100 | 7,600 | 6,200 | 6,000 | 7,600 |
| 2043 SB | 7,000 | 5,900 | 7,800 | 7,300 | 5,600 | 6,300 |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

*Table 9: M1 Junction 10 Turning Flows – 2043 TAG Based "With" Development (Rounded to Nearest 100 Vehicles)*

| 2043 AM | A | B | C |
|---|---|---|---|
| A | | 5,100 | 2,000 |
| B | 5,400 | | 1,900 |
| C | 1,700 | 1,000 | |

| 2043 IP | A | B | C |
|---|---|---|---|
| A | | 5,000 | 1,200 |
| B | 4,600 | | 1,000 |
| C | 1,400 | 1,100 | |

| 2043 PM | A | B | C |
|---|---|---|---|
| A | | 6,100 | 1,600 |
| B | 5,200 | | 1,100 |
| C | 2,800 | 1,600 | |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

*Table 10: Vehicle Flows Between M1 Junctions 9, 10 and 11 - TAG Based "With" Development (Rounded to Nearest 100 Vehicles)*

| Year - Direction | Junction 9 - Junction 10 | | | Junction 10 - Junction 11 | | |
|---|---|---|---|---|---|---|
| | AM | IP | PM | AM | IP | PM |
| 2016 NB | 5,300 | 4,400 | 6,200 | 4,600 | 4,200 | 5,700 |
| 2016 SB | 5,500 | 4,300 | 5,900 | 5,300 | 3,900 | 4,900 |
| 2043 NB | 7,100 | 6,200 | 7,700 | 6,200 | 6,100 | 7,600 |
| 2043 SB | 7,100 | 6,000 | 7,900 | 7,300 | 5,600 | 6,300 |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

*Table 11: M1 Junction 10 Turning Flows – 2043 Local Plan Growth "With" Development (Rounded to Nearest 100 Vehicles)*

| 2043 AM | A | B | C |
|---|---|---|---|
| A | | 5,200 | 2,000 |
| B | 5,400 | | 1,900 |
| C | 1,700 | 1,000 | |

| 2043 IP | A | B | C |
|---|---|---|---|
| A | | 5,000 | 1,200 |
| B | 4,600 | | 1,000 |
| C | 1,400 | 1,100 | |

| 2043 PM | A | B | C |
|---|---|---|---|
| A | | 6,000 | 1,700 |
| B | 5,100 | | 1,200 |
| C | 2,800 | 1,600 | |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

*Table 12: Vehicle Flows Between M1 Junctions 9, 10 and 11 - TAG Based Local Plan Growth "With" Development (Rounded to Nearest 100 Vehicles)*

| Forecast years | Junction 9 - Junction 10 | | | Junction 10 - Junction 11 | | |
|---|---|---|---|---|---|---|
| (Direction) | AM | IP | PM | AM | IP | PM |
| 2016 NB | 5,300 | 4,400 | 6,200 | 4,600 | 4,200 | 5,700 |
| 2016 SB | 5,500 | 4,300 | 5,900 | 5,300 | 3,900 | 4,900 |
| 2043 NB | 7,200 | 6,200 | 7,700 | 6,200 | 6,100 | 7,600 |
| 2043 SB | 7,100 | 6,000 | 8,000 | 7,300 | 5,600 | 6,300 |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

*Table 13: M1 Junction 10 Turning Flows – 2043 Local Plan Growth "Without" Development (Rounded to Nearest 100 Vehicles)*

| 2043 AM | A | B | C |
|---|---|---|---|
| A | | 5,300 | 1,700 |
| B | 5,400 | | 1,900 |
| C | 1,600 | 900 | |

| 2043 IP | A | B | C |
|---|---|---|---|
| A | | 5,100 | 1,000 |
| B | 4,700 | | 900 |
| C | 1,300 | 1,000 | |

| 2043 PM | A | B | C |
|---|---|---|---|
| A | | 6,100 | 1,600 |
| B | 5,200 | | 1,200 |
| C | 2,600 | 1,500 | |

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

*Table 14: Vehicle Flows Between M1 Junctions 9, 10 and 11 - TAG Based Local Plan Growth "Without" Development(Rounded to Nearest 100 Vehicles)*

| Forecast years | Junction 9 - Junction 10 | | | Junction 10 - Junction 11 | | |
|---|---|---|---|---|---|---|
| (Direction) | AM | IP | PM | AM | IP | PM |
| 2016 NB | 5,300 | 4,400 | 6,200 | 4,600 | 4,200 | 5,700 |
| 2016 SB | 5,500 | 4,300 | 5,900 | 5,300 | 3,900 | 4,900 |
| 2043 NB | 7,000 | 6,100 | 7,700 | 6,200 | 6,100 | 7,600 |
| 2043 SB | 7,000 | 6,000 | 7,800 | 7,300 | 5,600 | 6,400 |

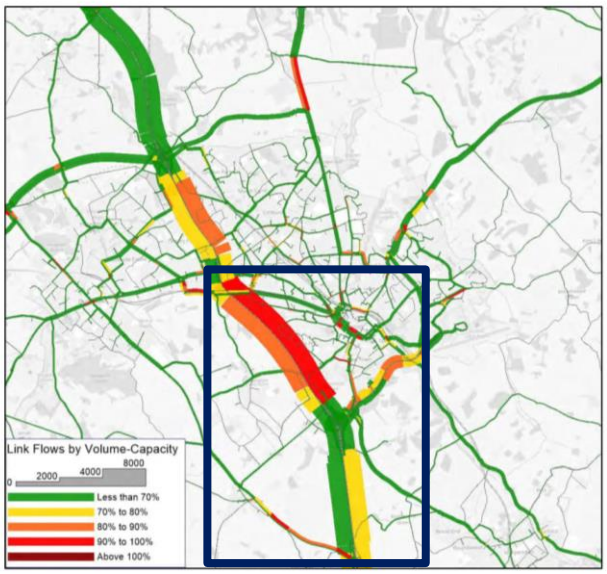
*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

### *Forecast Link Volume Over Capacity Plots*

**65.** Figure 11 shows the 2043 link V/C for the 2043 AM peak hour "without" and "with" expansion forecasts. Different scenarios and different peak periods are shown in Appendix C. Below is a summary of the findings in this plot:

- Comparing the AM peak with and without expansion scenarios, the V/Cs for M1 junction 10 and the A1081 are worse with the expansion. This indicates an increase in traffic congestion on the network.

“Without” Expansion




“With” Expansion

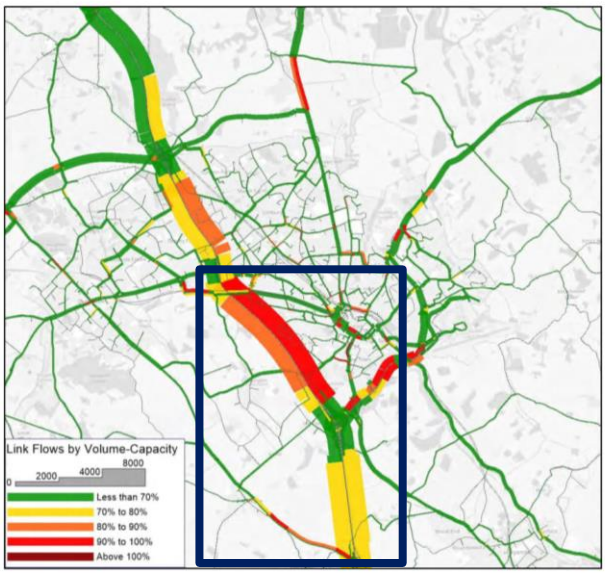



*Figure 11: Forecast Link-Based V/C, TAG-Based “Without” and “With” Expansion Forecasts, Luton Borough – 2043 AM Peak Hour (08:00 – 09:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

**66.** Figure 12 to Figure 15 show forecast junction delay plots for the SATURN simulation network. The plot for the interpeak is in Appendix D. According to these figures, delays at M1 junction 9-11 are no more than 30 seconds.

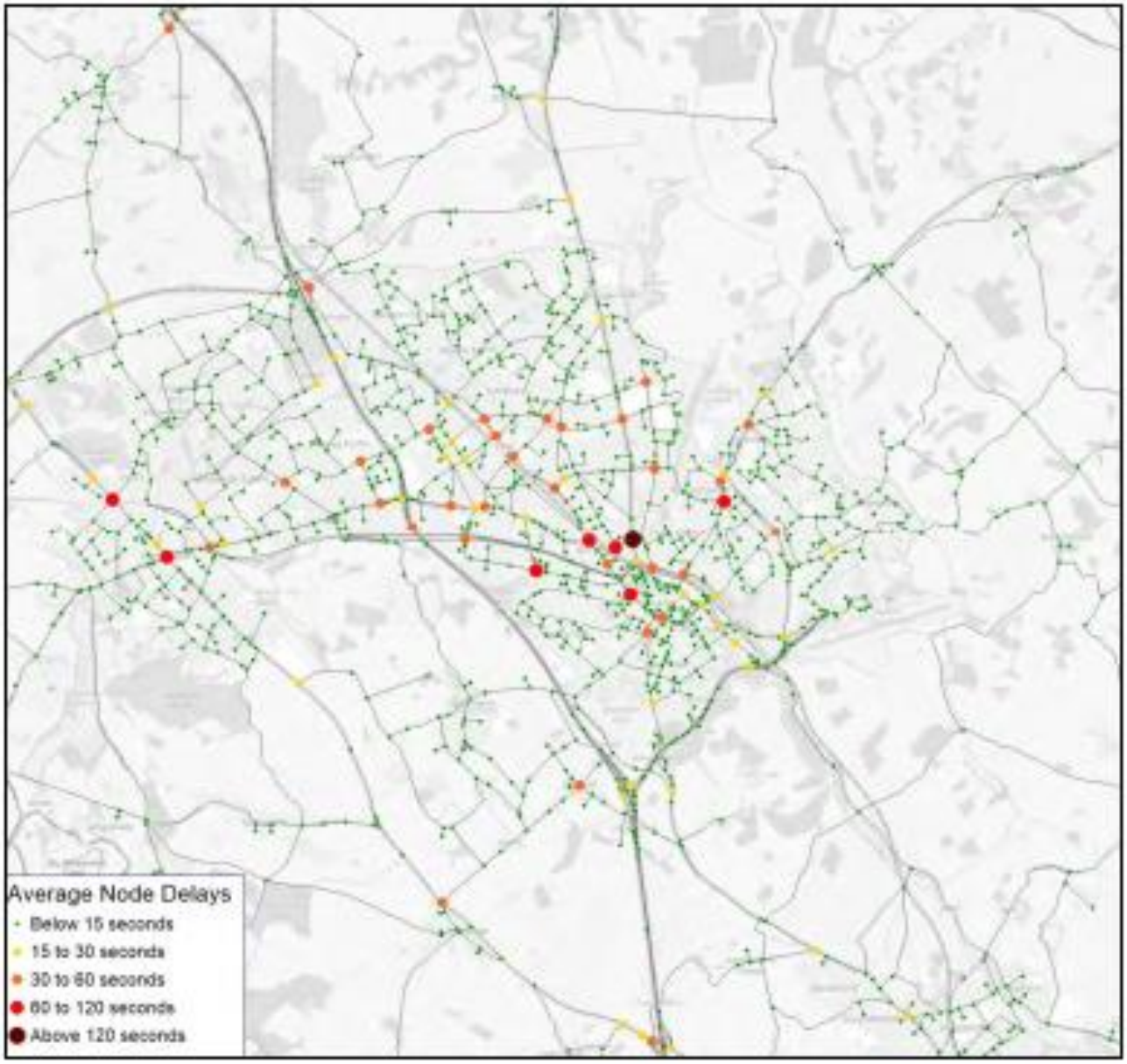



*Figure 12: Forecast Average Node Delays, TAG-based "Without" Development Forecasts, Simulation Network – 2043 AM Peak Hour (08:00 – 09:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices – Part 2 of 3 (Appendix F)*

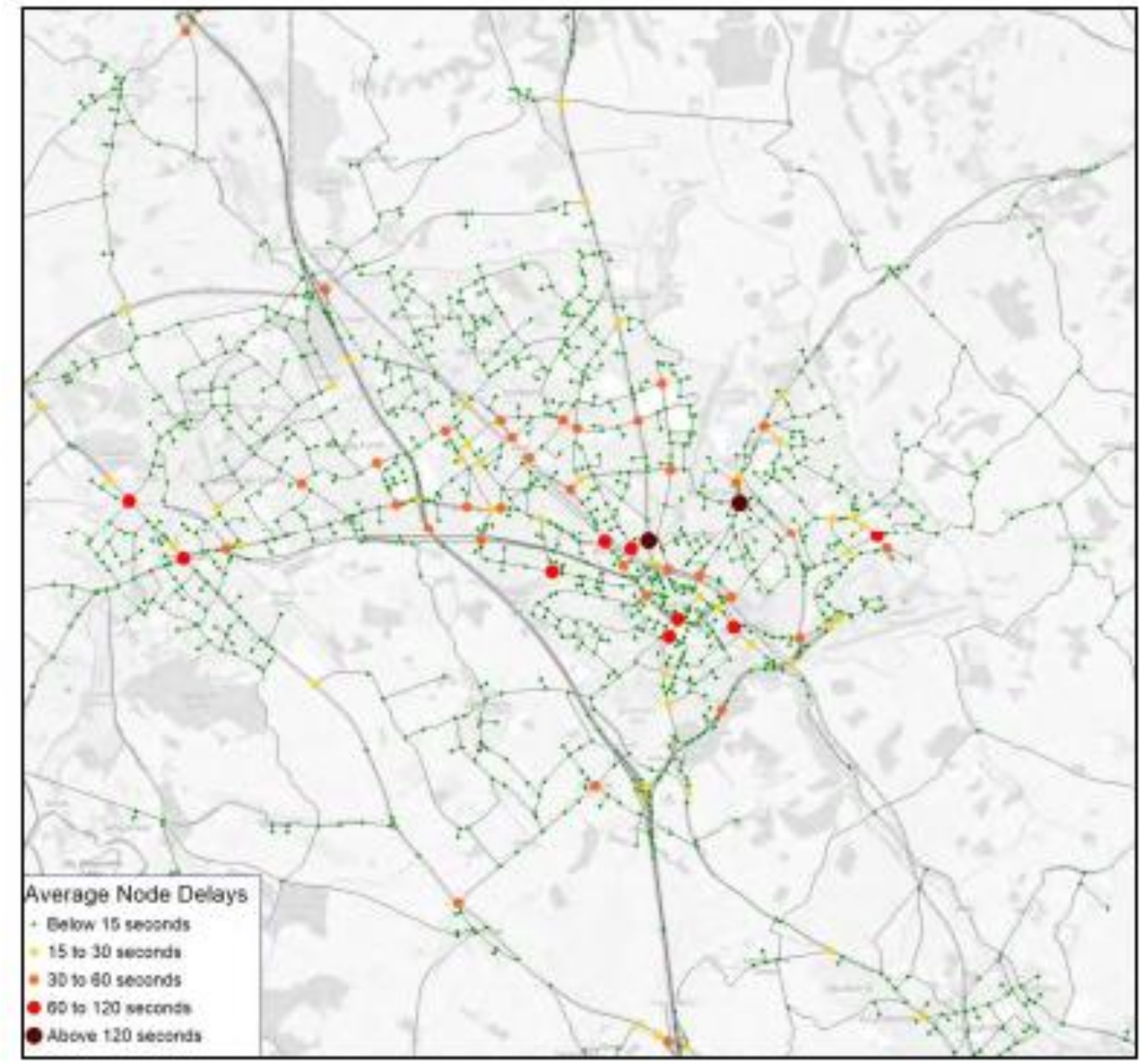



*Figure 13: Forecast Average Node Delays, TAG-based "With" Development Forecasts, Simulation Network – 2043 AM Peak Hour (08:00 – 09:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices – Part 2 of 3 (Appendix F)*

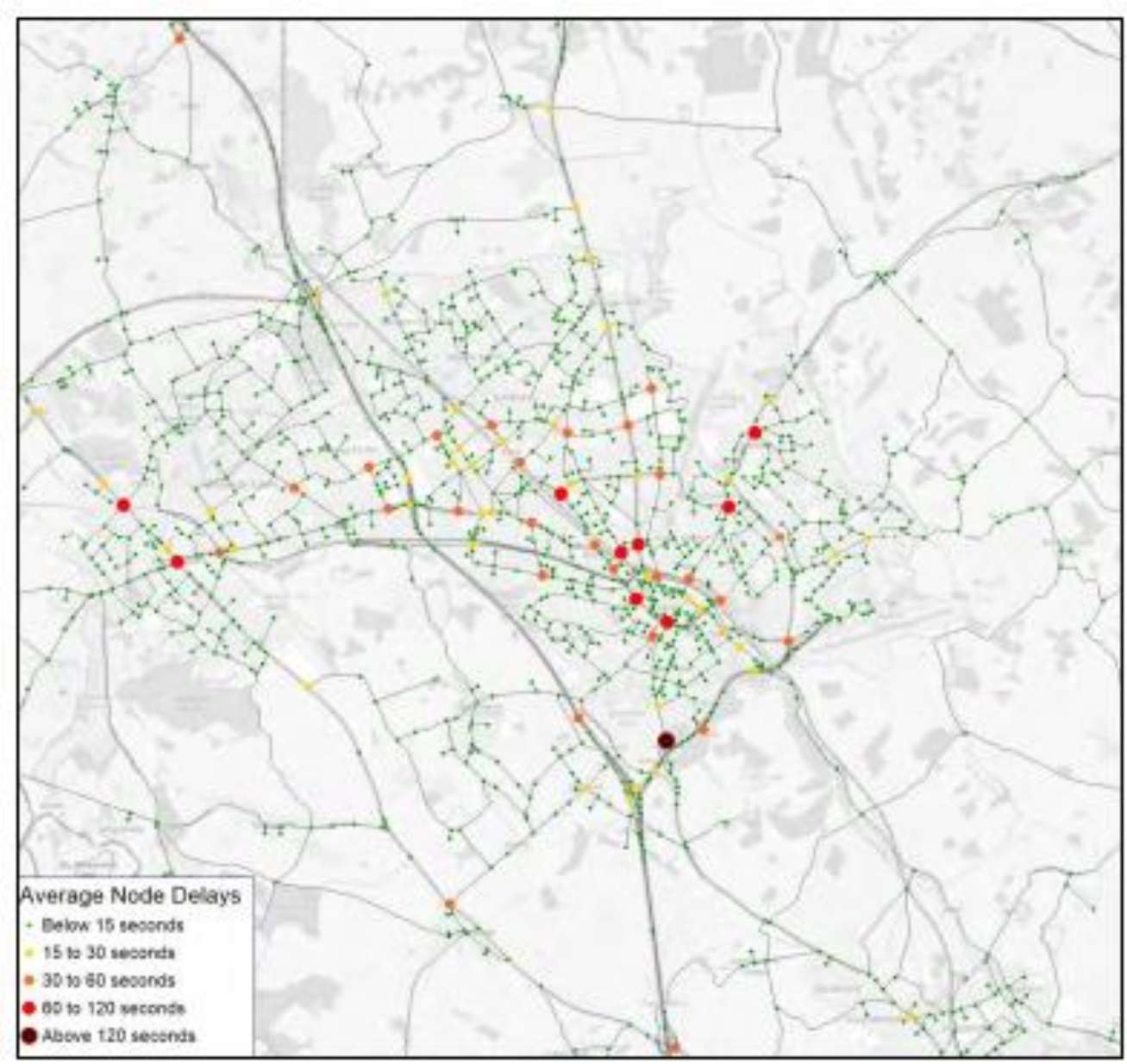



*Figure 14: Forecast Average Node Delays, TAG-Based "Without" Development Forecasts, Simulation Network – 2043 PM Peak Hour (17:00 – 18:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices – Part 2 of 3 (Appendix F)*

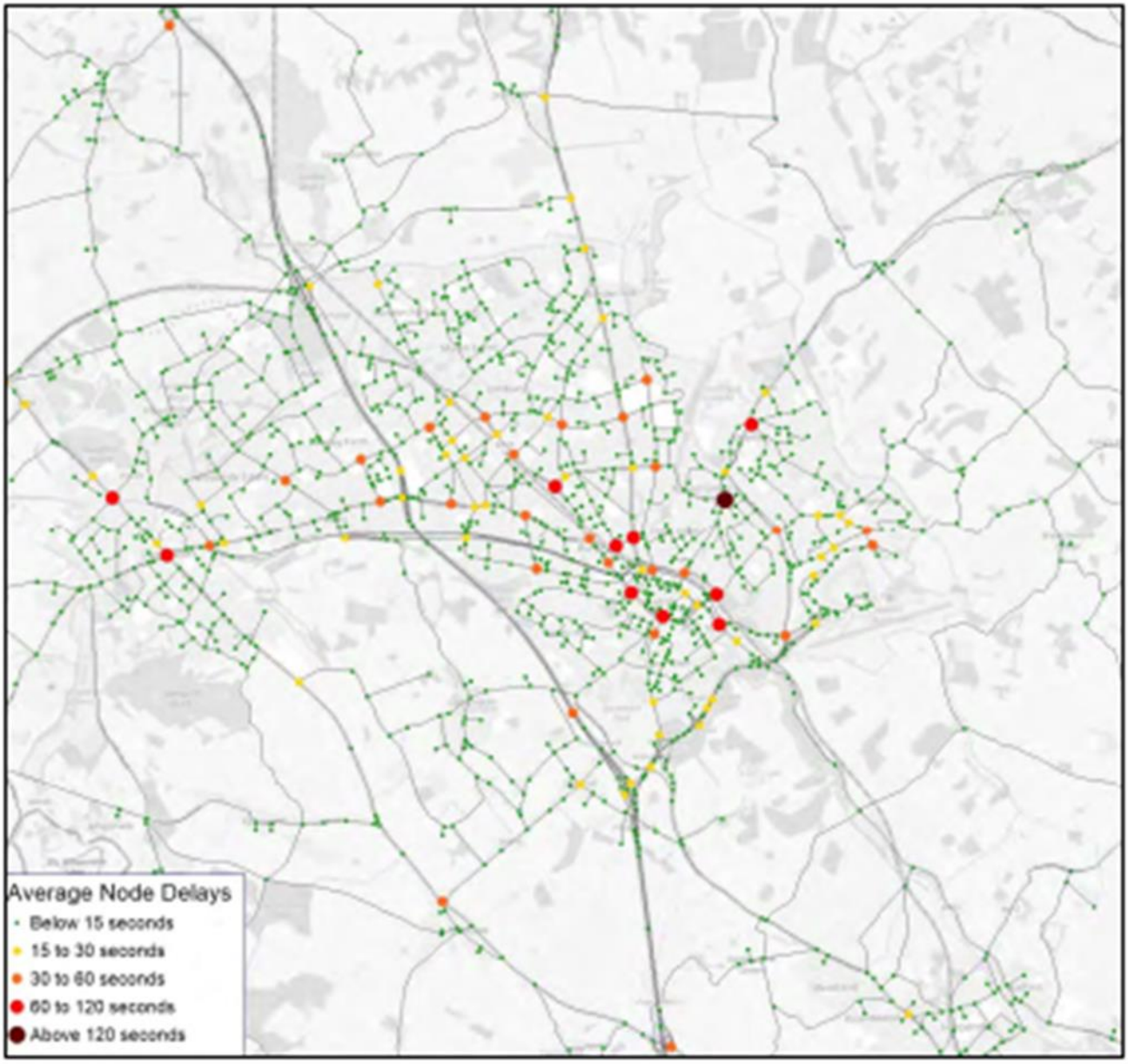



*Figure 15: Forecast Average Node Delays, TAG-Based "With" Development Forecasts, Simulation Network – 2043 PM Peak Hour (17:00 – 18:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

### *VISSIM – description and images of network operation at junction 10 with Development*

2043 AM Peak Period (07:00 – 10:00)

**67.** The 2043 forecast model was seen to operate with no issues around junction 10 during the first hour of the AM peak period. However, as in the base year, from 08.00 onwards, traffic on the southbound mainline south of junction 10 slows. This results in a queue propagating back along the mainline and the southbound merge slip road. Traffic exiting the merge leads to further delay for the mainline of the M1. This is illustrated in Figure 16. After this, the queue begins to clear due to an increase in speeds on the mainline, but residual queuing remains on the network until the end of the modelled time period.

68. On the M1 northbound, at the point where the lanes drop from 5 to 4, congestion gradually builds during the time period. This occurs because the demand exceeds the capacity of the merge. This is shown in Figure 17 for the with Luton Rising 2043 scenario.

*Figure 16: 2043 With Development AM 08:40*

*Figure 17: 2043 With Development AM 08:20*

2043 PM Peak Period (16:00 – 19:00)

**69.** As in the AM peak, in the PM 2043 With Development scenario the lane drop on the northbound carriageway results in congestion, as shown in Figure 18.

*Figure 18: 2043 With Development PM 17:30*

# Establishing the Need for Intervention

70. The proposals by Luton Rising for the junction 10 upgrade comprise widening the circulating carriageway at junction 10 from 2 lanes to 3 on the southern side and 2 lanes to 4 on the western side. The proposed upgrade also includes widening the northbound off-slip from 2 to 3 lanes and the segregated left turn from the A1081 to the southbound on-slip from 1 to 2 lanes. These proposals do not fully mitigate the forecast development trip impact on the SRN. For example, there are additional trips to the northbound lane drop. However, no mitigation is proposed at this location. The Luton Rising VISSIM model demonstrates that at both the southbound merge and at the lane drop on M1 northbound south of junction 10, queuing occurs as demand exceeds capacity.

71. At this location on the SRN, there is no committed scheme in place to alleviate these issues. Therefore, a scheme is necessary to address the forecast congestion and increase the capacity of the network at these locations.

72. This will enable the full economic benefits of the Luton Airport Expansion to be realised whilst maintaining the safe operation of the M1.

### Comparison with NH's South Facing Slips Interventions Technical Note (REP5-093)

73. Subsequent to NH's preparation of the 'South Facing Slips Interventions Technical Note', Luton Rising has updated the forecast of traffic demand within the DCO study area. The forecast has been updated in order to more accurately reflect demands in the post COVID-19 period.

74. A comparison of traffic flows from the 2043 forecast VISSIM models has been undertaken. In general, the comparison reflects the fact that the forecast demand for the DCO area has reduced due to the post-COVID-19 adjustment.

75. Table 15 provides a comparison of the old and new 2043 VISSIM model flows for the AM peak hour. The pre COVID-19 adjustment AM VISSIM model gridlocked due to high demand, which obscures the flow comparison between the DS models to some extent.

76. The junction 10 northbound off-slip flow reduces in the new DS compared to the pre COVID-19 forecast model. This occurs due to the lower level of forecast demand, as less traffic is now released by the proposed intervention.

*Table 15: Traffic Flow Comparison – 2043 VISSIM AM (08:00-09:00)*

| Location | DM old | DM New | Difference | DS Old | DS New | Difference |
|---|---|---|---|---|---|---|
| M1 NB (N of junction 10) | 6,760 | 6,460 | -300 | 6,320 | 6,780 | 460 |
| M1 SB (N of junction 10) | 7,240 | 6,580 | -660 | 6,460 | 7,110 | 650 |
| M1 NB (S of junction 10) | 8,200 | 7,050 | -1,150 | 7,880 | 7,430 | -450 |
| M1 SB (S of junction 10) | 7,100 | 6,420 | -680 | 6,100 | 6,840 | 740 |
| M1 NB (in junction 10) | 5,440 | 5,100 | -340 | 5,380 | 5,390 | 10 |
| M1 SB (in junction 10) | 5,260 | 4,850 | -410 | 4,830 | 5,240 | 410 |
| Junction 10 SB Offslip | 1,970 | 1,730 | -240 | 1,630 | 1,870 | 240 |
| Junction 10 NB Onslip | 1,310 | 1,370 | 60 | 2,500 | 1,380 | -1,120 |
| Junction 10 SB Onslip | 1,840 | 1,570 | -270 | 930 | 1,590 | 660 |
| Junction 10 NB Offslip | 2,710 | 1,950 | -760 | 1,270 | 2,040 | 770 |
| A1081 - M1N | 1,310 | 1,360 | 50 | 920 | 1,370 | 450 |
| A1081 - M1S | 1,790 | 1,530 | -260 | 1,240 | 1,550 | 310 |

A comparison of traffic flows between the new and old versions of the 2043 VISSIM model PM data is shown in Table 16.

*Table 16: Traffic Flow Comparison – 2043 VISSIM PM (17:00-18:00)*

| Location | DM old | DM New | Difference | DS Old | DS New | Difference |
|---|---|---|---|---|---|---|
| M1 NB (N of junction 10) | 8,370 | 7,230 | -1,140 | 8,310 | 7,310 | -1,000 |
| M1 SB (N of junction 10) | 7,320 | 6,850 | -470 | 7,320 | 6,850 | -470 |
| M1 NB (S of junction 10) | 8,460 | 7,310 | -1,150 | 8,410 | 7,410 | -1,000 |
| M1 SB (S of junction 10) | 8,500 | 7,740 | -760 | 8,450 | 7,740 | -710 |
| M1 NB (in junction 10) | 6,180 | 5,450 | -730 | 6,150 | 5,530 | -620 |
| M1 SB (in junction 10) | 5,810 | 5,350 | -460 | 5,810 | 5,350 | -460 |
| Junction 10 SB Offslip | 1,510 | 1,500 | -10 | 1,510 | 1,500 | -10 |
| Junction 10 NB Onslip | 2,190 | 1,780 | -410 | 2,260 | 1,780 | -480 |
| Junction 10 SB Onslip | 2,680 | 2,390 | -290 | 2,160 | 2,390 | 230 |
| Junction 10 NB Offslip | 2,280 | 1,850 | -430 | 2,640 | 1,880 | -760 |
| A1081 - M1N | 2,190 | 1,780 | -410 | 2,160 | 1,780 | -380 |
| A1081 - M1S | 2,680 | 2,390 | -290 | 2,640 | 2,390 | -250 |

77. The data in Table 15 and Table 16 shows that forecast traffic demand and resulting traffic flows have reduced in the updated model. The reductions are due to the change in forecasts of NTEM 8 and the impacts of COVID-19. The new forecast flow data has been assessed against the design standards in 'CD 122 Geometric design of grade separated junctions' to determine the form that a proposed intervention would now take. This process is detailed in the next section of the report.

# Intervention Generation

78. Intervention generation consisted of assessing NH's proposed solutions in 'South Facing Slips Interventions Technical Note' (REP5-093) to the updated post COVID-19 traffic flows obtained from the VISSIM model. These were further evaluated through merge/diverge assessments, a review of relevant design standards including 'CD 122 Geometric design of grade separated junctions', and a consideration of design constraints, with the following key outcomes identified:

- As described in the Technical Note (REP5-093), in principle, the design of the junction 10 circulatory proposed by Luton Rising was in principle acceptable. However, NH remain concerned about the lack of mitigation – far less secured mitigation - to alleviate the congestion predicted at the Junction 10 south-facing merge and diverge, which are shown to remain congested following and in spite of the implementation of Luton Rising's mitigation at junction 10;
- Technical Note (REP5-093) proposed an upgrade to the northbound diverge at junction 10 by continuing the fifth lane northwards to junction 10 from the current lane drop from 5 lanes to 4 lanes between junction 9 and junction 10. The change in traffic flows has confirmed that there is still the need for this intervention with post COVID-19 traffic flows; and
- Technical Note (REP5-093) proposed an upgrade to the southbound merge at junction 10. CD 122 required an arrangement that includes a lane gain, which would need to extend south to junction 9 at a significant cost, therefore a lower cost, more localised intervention was proposed. The change in traffic flows has confirmed that there is still the need for this intervention with post COVID-19 traffic flows.

## Description of Interventions

79. Two interventions have been proposed by NH as being capable of addressing the issues at junction 10 and the south facing merge/diverge lanes:

- Intervention 1 - M1 Junction 10 Northbound Diverge and extension to 5th lane on northbound carriageway – Refer to Appendix E - Figure 45 for drawing; and
- Intervention 2 - M1 Junction 10 Southbound Merge – Refer to Appendix E - Figure 46 for drawing.

### *Intervention 1 - M1 Junction 10 Northbound Diverge*

80. This intervention aims to increase capacity, journey time reliability and maintain the safe operation of this section of the network.

81. The intervention's key components are:

- Changing the existing diverge layout type from 'Layout B – Two-lane auxiliary diverge' to a higher capacity 'Layout D – ghost island lane drop'; and
- Where the northbound carriageway reduces from 5 lanes to 4 lanes between junction 9 and 10, the fifth (nearside) lane would be extended 1.1km north to junction 10 and incorporated into the lane drop arrangement described above.
    - The extension of the fifth lane is proposed because the future year VISSIM model identified a capacity bottleneck where the fifth (nearside) lane terminates;
    - The traffic modelling shows additional congestion at this location because the fifth lane terminates with a near side lane drop, requiring slower-moving vehicles and HGVs to merge into the remaining offside lanes. This disrupts the flow of traffic in the other lanes within the network and leads to an increase in delay.

82. The intervention includes the provision of a CD 122-compliant increased capacity diverge arrangement. The selection of the appropriate diverge layout is described in CD 122 Figure 3.26b using vehicle per hour (VPH) traffic flows in AM and PM peaks, with any relevant modifiers applied from clause 3.9. The minimum diverge layout shall be determined by the worst-case peak flow as described in clause 3.26.

83. The AM Peak flows require a 'Layout D option 1 – ghost island lane drop' with 4 lanes upstream and 3 lanes downstream. The PM Peak flows also require a 'Layout D option 1 – ghost island lane drop' but with 5 lanes upstream and 4 lanes downstream, therefore this layout has been proposed for Intervention 1 as per the requirement of CD 122 Clause 3.26.

84. Compared to Technical Note (REP5-093) both AM and PM Peak flows are lower, however, the same layouts are still required. With the updated traffic flows the PM peak flow (blue line) shown in Figure 19, while remaining in Layout D now intersects closer to the following regions:

- Layout B option 2 - Two-lane auxiliary diverge;
- Layout E - 2-lane drop; and
- Layout D option 1 - ghost island lane drop with 4 lanes upstream and 3 lanes downstream.

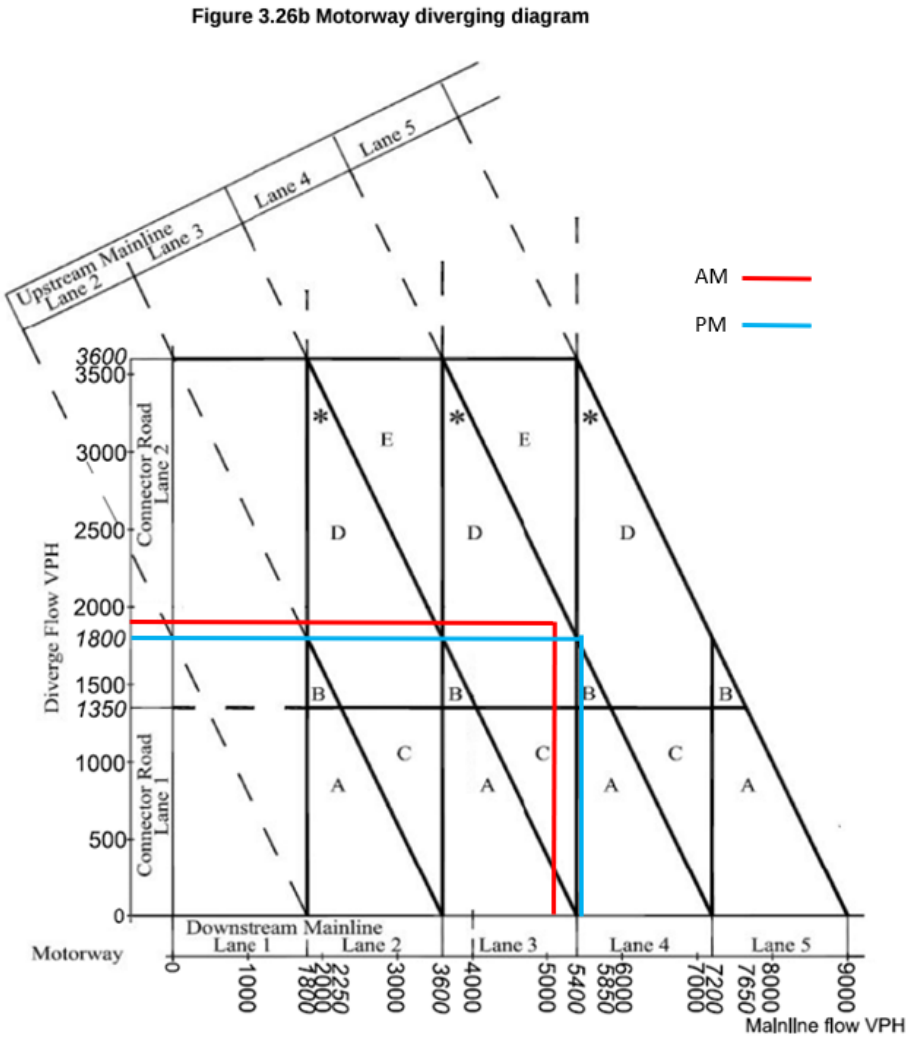



*Figure 19: Figure 3.26b Motorway Diverging Diagram described in DMRB CD122*

**85.** The existing junction 10 northbound diverge arrangement is a 'Layout B option 2 – Two-lane auxiliary diverge' with 4 lanes upstream and downstream, as shown below in Figure 20.

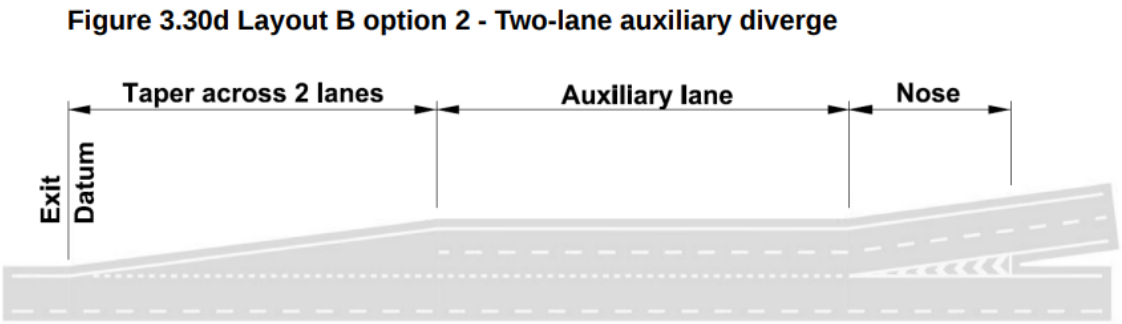



*Figure 20: Figure 3.30d Layout B option 2 – Two-lane auxiliary diverge described in DMRB CD 122*

**86.** The intervention proposes to improve the capacity of the existing arrangement with a 'Layout D option 1 – ghost island lane drop' with 5 lanes upstream and 4 lanes downstream of Junction 10, as shown in Figure 21. This layout is only possible with the extensions of the fifth lane.

**Figure 3.30g Layout D option 1 - ghost island lane drop**

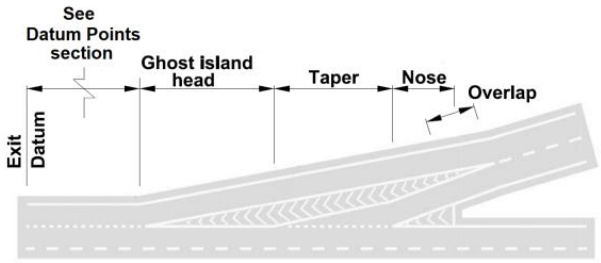



*Figure 21: Figure 3.30g Layout D option 1 – ghost island lane drop*

**87.** A basic 3D topographical model using LiDAR data indicates that the existing motorway embankment and cutting will need to be widened which may be possible within the existing highway boundary. However, additional surveys and assessments such as topographical surveys, ground investigation, and geotechnical analysis will be needed to confirm this. It is recommended that NH undertake these surveys as these interventions are progressed.

**88.** To limit the required widening the following options could be considered:

- Converting the existing 4 lanes plus hard shoulder to 5 lane, as shown in Figure 22, 'All Lane Running' (ALR) operation. Currently, there is a moratorium on new ALR however this position may change. ALR on this section could create the fifth lane without the need for any widening; and
- Reducing lane, hard shoulder, hard strip and/or verge widths, though any of these would require departures from standards.

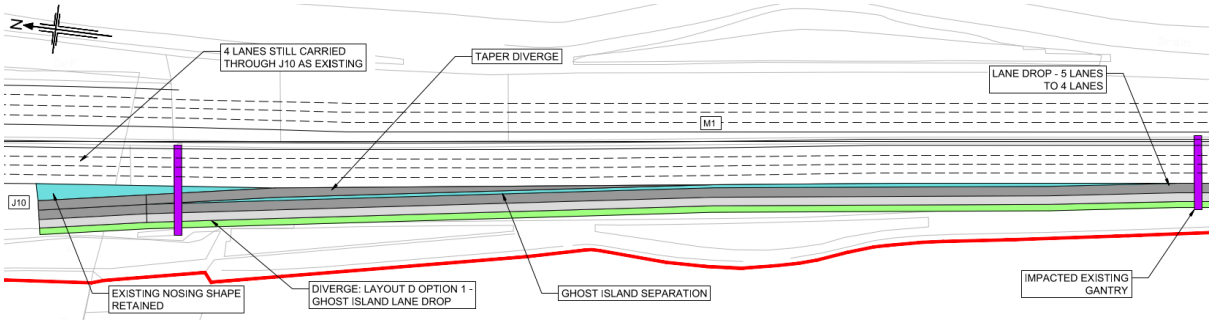



*Figure 22: An extract from the Northbound Diverge Intervention drawing M1J10-NB-A-01*

**89.** Whilst generating interventions the following additional options were considered:

- Retaining the existing layout. The existing M1 junction 10 northbound diverge consists of a 'Layout B option 2 – Two lane auxiliary diverge'. The M1 northbound carriageway reduces from 5 to 4 lanes midway between junction 9 and 10. This option has not been progressed as it does not provide the diverge layout required by CD 122. Additionally, the limitations of lane termination and diverge layout are described in the traffic modelling sections of this report.
- Modifying Lane Reduction Layout. This option would change the mid-link lane reduction from the nearside to the offside. An offside lane reduction is a preferable way to terminate

a lane so that slower-moving HGV vehicles are not required to merge with higher-speed traffic. Whilst this option would likely be a lower cost intervention it would not increase the capacity of the M1 mainline or junction 10 but may increase operational safety at the 5 to 4 lane termination point, therefore has not been proposed.

- Providing a Layout D Option 2 Diverge. When modifying an existing diverge CD 122 allows the use of a Layout D Option 2. The difference with Option 2 is that the ghost island is omitted, resulting in a slightly smaller carriageway footprint. However, due to operational safety considerations, the intervention proposes Option 1. These considerations include Option 1 having a ghost island incorporated in the layout, which increases the clarity for a vehicle navigating the diverge, with the lane drop and diverge taper clearly displayed. The ghost island also separates the lane drop and diverge taper traffic, reducing the risk of vehicle interactions. Both these considerations are significant as this diverge will have a high percentage of HGVs.

### *Intervention 2 - M1 Junction 10 Southbound Merge*

**90.** The intervention's key aspect is changing the merge layout type from the existing 'Layout B – parallel merge' to a higher capacity 'Layout C – ghost island merge'.

**91.** The key aim of this intervention is to provide a higher capacity merge arrangement. The selection of the appropriate diverge layout is described in CD 122 Figure 3.26b using vehicle per hour (VPH) traffic flows in AM and PM peaks, with any relevant modifiers applied from clause 3.9. The minimum merge layout shall be determined by the worst-case peak flow as described in clause 3.12, shown in Figure 23.

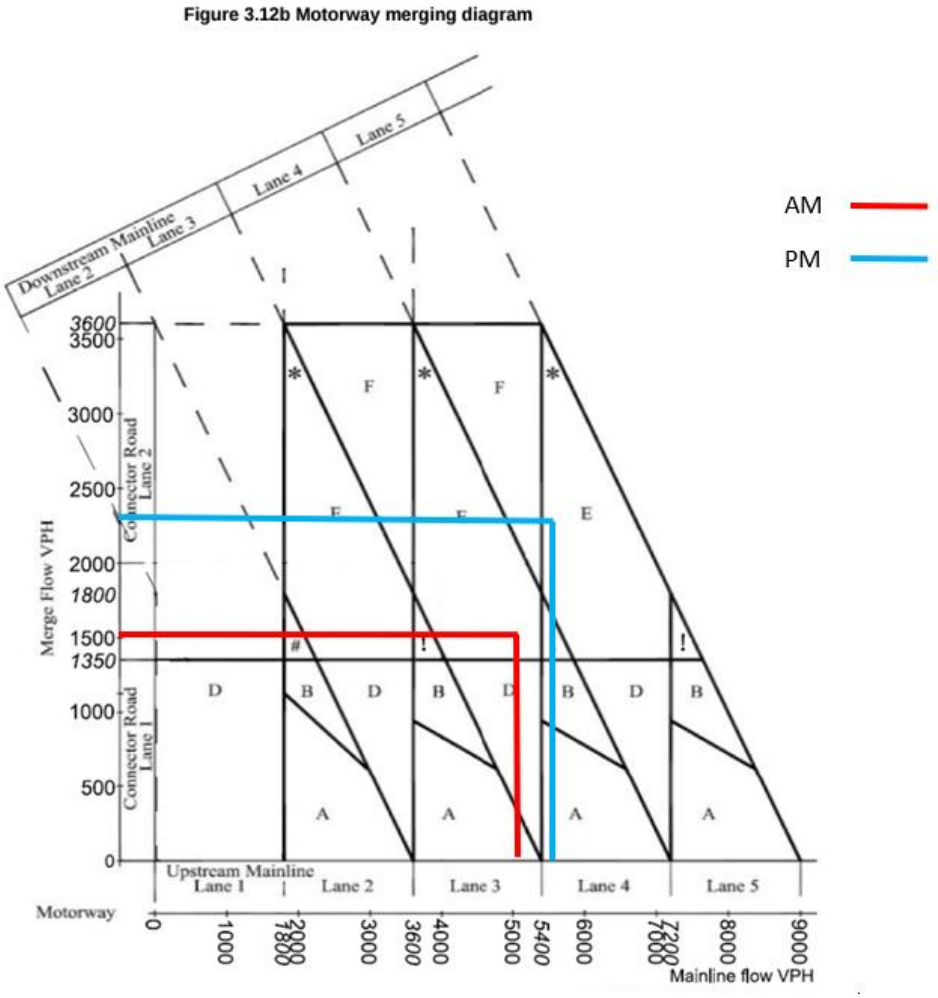



*Figure 23: Figure 3.12b Motorway merging diagram described in DMRB CD 122*

92. The AM peak traffic flows require a ‘Layout E – lane gain with ghost island offside merge’ with 4 lanes downstream and 3 lanes upstream. The PM peak traffic flows also require a ‘Layout E – lane gain with ghost island offside merge’ with 5 lanes downstream and 4 lanes upstream.

93. Compared to Technical Note (REP5-093) both AM and PM Peak flows are lower. However, the same layouts are still required in the post-COVID-19 analysis.

94. To provide the lane gain merge layout a fifth lane southbound would need to be constructed from junction 10 to junction 9 where the diverge arrangement would need to be modified to provide a lane drop. However, this would be a high-cost strategic intervention which is outside the scope of the study.

95. Consequently, a lower cost more localised intervention is proposed shown in Figure 24, namely ‘Layout C – ghost island merge’. This is the highest capacity merge layout that does not include a lane gain. This would require a departure from standard.

**Figure 3.14d Layout C - ghost island merge**

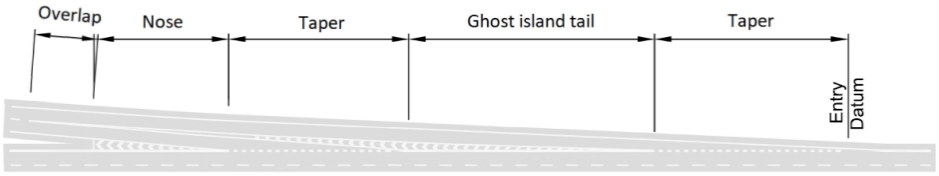



*Figure 24: Figure 3.14d Layout C – ghost island merge described in DMRB CD 122*

96. The existing junction 10 southbound merge arrangement is a ‘Layout B – parallel merge’, as shown in Figure 25 below.

**Figure 3.14c Layout B - parallel merge**

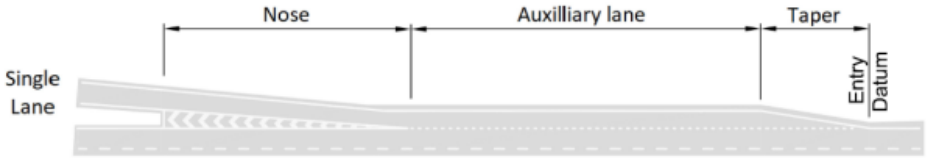



*Figure 25: Figure 3.14c Layout B – parallel merge described in DMRB CD 122*

97. A basic 3D model using LiDAR data indicates that the existing motorway embankment and cutting will need to be widened which may be possible within the existing highway boundary. However, additional surveys and assessments such as topographical surveys, ground investigation, and geotechnical analysis will be needed to confirm this. It is recommended that NH undertake these surveys as these interventions are progressed.

98. To limit the required widening the following options could be considered:

- Reducing lane, hard shoulder, hard strip and/or verge widths, as shown in Figure 26, though any of these would require departures from standards.

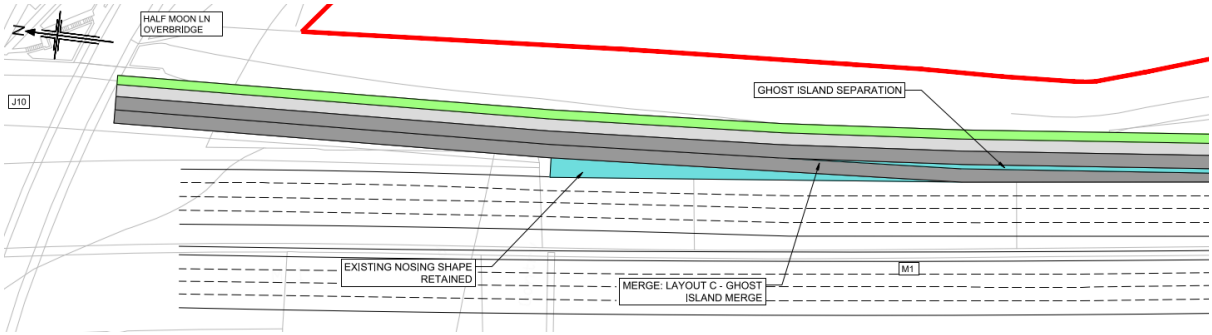



*Figure 26: An extract from the Southbound Merge Intervention drawing M1_J10_SB_Mer_Op1*

**99.** Other intervention options considered for the junction 10 southbound merge are:

- Retaining The Existing Layout. The existing 'Layout B – parallel merge' layout does not provide the merge layout required by CD 122. Additionally, the limitations of the merge layout are described in the traffic modelling sections of this report; and
- M1 Junction 10 to Junction 9 Southbound Lane Gain. This high-cost strategic project would deliver:
  - A compliant 'Layout E – lane gain with ghost island offside merge' arrangement with a fifth lane southbound between junctions 10 and 9;
  - A diverge layout with a lane drop at junction 9;
  - Amendment of gantry portals and technology;
  - The scale of this project would be dependent on whether it is delivered through conventional widening or the implementation of 'All Lane Running' operation; and
  - M1 Southbound Mid-link Lane Termination. To enable the compliant 'Layout E – lane gain with ghost island offside merge' to be provided at a lower cost, the fifth lane that was gained could be terminated before junction 9. This would mirror the existing arrangement between junction 9 and junction 10 on the northbound carriageway. This was not proposed due to concerns about potential congestion at the mid-link termination, though no modelling has been undertaken to confirm this. If this option is considered to warrant further investigation, additional modelling can be undertaken.

### *Comparison of Intervention to Technical Note (REP5-093)*

**100.** Comparing the interventions identified in Technical Note (REP5-093) to the additional design development in this report, the following can be summarised:

- Intervention 1 – Technical Note (REP5-093) proposed to improve the capacity of the existing arrangement with a 'Layout D option 1 – ghost island lane drop' with 5 lanes upstream and 4 lanes downstream of junction 10. This remains the proposal for Intervention 1, however the updated PM peak traffic flow is now closer to other diverge layout regions in Figure 19 diagram. The intervention included the fifth mainline lane being extended 1.1km north to junction 10 and incorporated into the lane drop arrangement, which has also remained in the proposal.
- Intervention 2 – Technical Note (REP5-093) proposed that CD 122 required a lane gain merge, however, due to the Technical Note scope, a non-compliant 'Layout C – ghost island merge' with 4 lanes upstream and downstream is proposed. Despite the lower updated traffic flows, a lane gain merge is still required, but a non-compliant 'Layout C' is still proposed.

# Intervention Assessment

## Traffic Modelling

**101.** The two interventions proposed have been assessed within the Luton Rising 2043 Do-something VISSIM model. The full network coverage of the model is shown in Figure 27. With regard to the SRN, the key intervention within the model is a capacity upgrade and signalisation at the roundabout of junction 10. The layout of this intervention is shown in Figure 28.

**102.** The current VISSIM model gridlocks in the 2043 forecast scenarios both with and without the proposed highway mitigation from the Development. Gridlock means that the model becomes so congested that vehicles are no longer able to complete trips. It must be assumed that traffic would reassign elsewhere on the network, meaning that the impacts occur not only to the SRN, but also on the local road network.

**103.** The operation of the proposed interventions is summarised in this report with regard to the following aspects:

- Visual observations of model operation;
- Traffic volumes;
- Journey times; and
- Queue lengths.

**104.** All quantitative results from the model are based on average results from 10 randomly seeded runs.

**105.** Model results relate to the forecast year of 2043, with demand and proposed infrastructure from the Luton Rising Airport development included. Results for both the weekday AM peak (07.00-10.00) and PM peak (16.00-19.00) periods are presented.

*Figure 27: Network coverage of Luton Rising 2043 Do-something model*

*Figure 28: Luton Rising proposed upgrade to M1 Junction 10*

**106.** Outputs from the VISSIM model are presented for the following modelled scenarios:

- Do-Minimum (DM): 2043 forecast background and committed demand + Luton Rising Development traffic and proposed infrastructure interventions;
- Do-Something 1 (DS1) 2043 DM + Intervention 1a (Northbound 5 to 4 lane drop removal and diverge) + Intervention 2 (as shown in Appendix E - Figure 45); and
- Do-Something 2 (DS2) 2043 DM + Intervention 1b (Northbound lane drop removal and diverge – lower capacity than DS1) +Intervention 2 (as shown in Appendix E - Figure 46).

### *Observations of Model Operation*

#### *M1 Junction 10 Northbound Diverge Intervention 1a and 1b*

**107.** The M1 northbound carriageway between junctions 9 and 10 operates close to capacity within the 2043 forecast VISSIM models. If this congestion were not addressed it could lead to stationary traffic at points on the M1 mainline carriageway, which would present a material safety risk.

**108.** The proposed intervention releases traffic at the existing 5 lane to 4 lane reduction on the M1 northbound carriageway. The upgraded northbound diverge ensures that all traffic can be accommodated at this approach to Junction 10.

**109.** In both the AM and PM period, the queuing on the off-slip generally clears during each green phase at the signals. The queue on the off-slip never reaches back to the M1 northbound carriageway.

**110.** In summary, the tests within the VISSIM model indicate that this intervention on the northbound carriageway and slip road is necessary for the safe and efficient operation of the SRN. The interventions would provide a substantial improvement above what is proposed by Luton Rising to network operation, both in terms of road safety and capacity.

### *M1 Junction 10 Southbound Merge Intervention 2*

**111.** Despite the limitations presented by the network coverage of the VISSIM model, it is clear that there is a risk that stationary vehicles would be present on the M1 southbound carriageway in the DM future year peak periods. This would cause a safety risk on the M1 southbound carriageway.

**112.** The upgrade to the southbound merge provides an improvement to the operation of this part of the network compared to the scenario with the Luton Rising proposal only, enabling a longer period of free-flowing traffic on the SRN.

**113.** The performance of the intervention is somewhat obscured by the technique used to validate the journey times on the M1, which enables some traffic on the new merge to bypass congestion on the main carriageway. It should also be noted that the parallel merge introduces an element of route choice. However, the inherited VISSIM model has not been formally converged or stabilised. The JSJV advise that an improved modelling platform should be used at the earliest opportunity. This would likely involve a change of strategic modelling platform and an improved VISSIM model with a different network coverage.

**114.** Despite the limitations of the modelling platform, it is clear that the intervention provides an upgrade to capacity at the southbound merge above what is proposed as part of the DCO examination by Luton Rising. This capacity upgrade leads to improved journey times on the slip road itself and reduces congestion on the main carriageway at the point of the merge, thereby improving road safety.

### *Traffic Volumes*

**115.** Traffic volumes from the 2043 VISSIM model are summarised in Table 17. The data in this table indicates that the proposed interventions lead to an uplift in the volume of traffic that is able to pass through the M1 during the AM peak hour. The increase in traffic volumes is up to 600 vehicles in both directions in the hour and occurs due to the reduction in congestion at the northbound lane drop and the southbound merge.

*Table 17: Traffic Volumes – 2043 VISSIM Models*

| | AM (0800-0900) | | | PM (1700-1800) | | |
|---|---|---|---|---|---|---|
| **Location** | **DM** | **DS1** | **DS2** | **DM** | **DS1** | **DS2** |
| M1 NB (N of junction 10) | 6,463 | 6,777 | 6,784 | 7,229 | 7,308 | 7,296 |
| M1 SB (N of junction 10) | 6,583 | 7,112 | 7,112 | 6,853 | 6,853 | 6,814 |
| M1 NB (S of junction 10) | 7,051 | 7,434 | 7,452 | 7,305 | 7,409 | 7,373 |
| M1 SB (S of junction 10) | 6,422 | 6,836 | 6,839 | 7,740 | 7,743 | 7,732 |
| M1 NB (in junction 10) | 5,096 | 5,392 | 5,401 | 5,451 | 5,529 | 5,535 |
| M1 SB (in junction 10) | 4,849 | 5,244 | 5,244 | 5,350 | 5,350 | 5,349 |
| Junction 10 SB Off-slip | 1,734 | 1,869 | 1,868 | 1,504 | 1,504 | 1,465 |
| Junction NB On-slip | 1,366 | 1,384 | 1,384 | 1,778 | 1,780 | 1,760 |

| | AM (0800-0900) | | | PM (1700-1800) | | |
|---|---|---|---|---|---|---|
| **Location** | **DM** | **DS1** | **DS2** | **DM** | **DS1** | **DS2** |
| Junction SB On-slip | 1,573 | 1,592 | 1,595 | 2,390 | 2,394 | 2,383 |
| Junction NB Off-slip | 1,955 | 2,042 | 2,052 | 1,854 | 1,880 | 1,838 |
| A1081 - M1 N | 1,356 | 1,373 | 1,373 | 1,778 | 1,780 | 1,760 |
| A1081 - M1 S | 1,531 | 1,549 | 1,553 | 2,385 | 2,389 | 2,378 |

### *Journey Times*

**116.** Journey times from the model for each scenario are summarised in Table 18. The journey time routes set up within the model are shown in Figure 29.

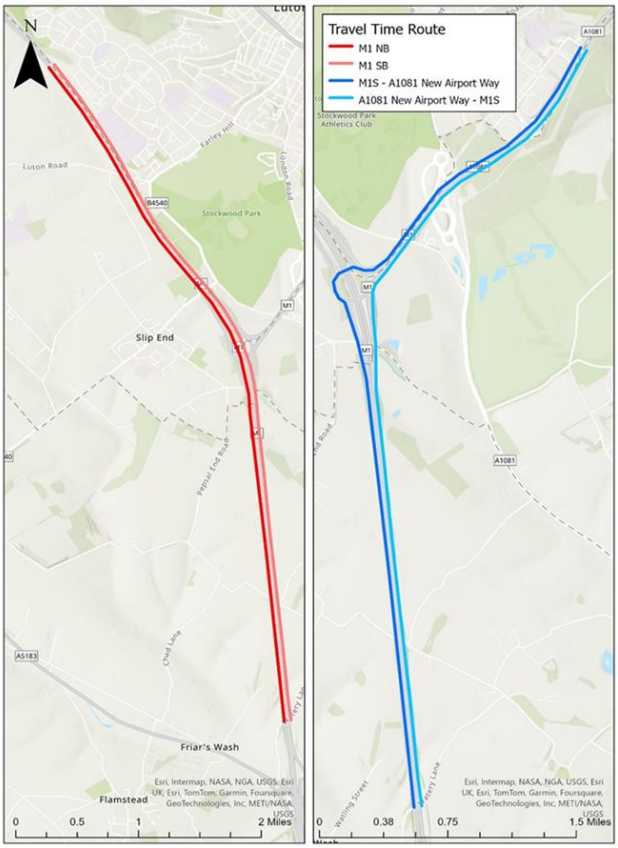



*Figure 29: Journey times through the M1 junction 10*

**117.** The results in Table 18 demonstrate that the interventions deliver an improvement to journey times on the M1. The greatest improvement in journey times is seen in the AM peak period. A reduction in journey times of up to 3 minutes (approx. 25%) is seen in the southbound direction due to the reduction in congestion seen at the southbound merge.

**118.** Journey times in the northbound direction show an improvement of around 60 seconds in both the AM and PM peak periods. This occurs due to the reduction in congestion associated with the removal of the lane drop. The upgraded northbound merge provides sufficient capacity to accommodate the demand released by the removal of the lane drop.

*Table 18: Journey Times (Seconds) – 2043 VISSIM Models*

| | AM (0800-0900) | | | PM (1700-1800) | | |
|---|---|---|---|---|---|---|
| **Route (Length)** | **DM** | **DS1** | **DS2** | **DM** | **DS1** | **DS2** |
| M1 Southbound (6008m) | 607 | 448 | 448 | 258 | 258 | 258 |
| M1 Northbound (5994m) | 417 | 339 | 336 | 369 | 336 | 331 |
| M1 South to Airport Way (5435m) | 401 | 356 | 327 | 403 | 381 | 341 |
| Airport Way to M1 South (5138m) | 486 | 342 | 342 | 322 | 330 | 324 |

**119.** The reduction in congestion at the southbound merge can be seen in the screenshots shown in Figure 30. The image on the left of the figure shows the DM model in the AM period. Operation of the DS1 model is shown in the image on the right of the figure. A comparison between the two images demonstrates the improvement in network operation that is delivered by the proposed intervention at the southbound merge.

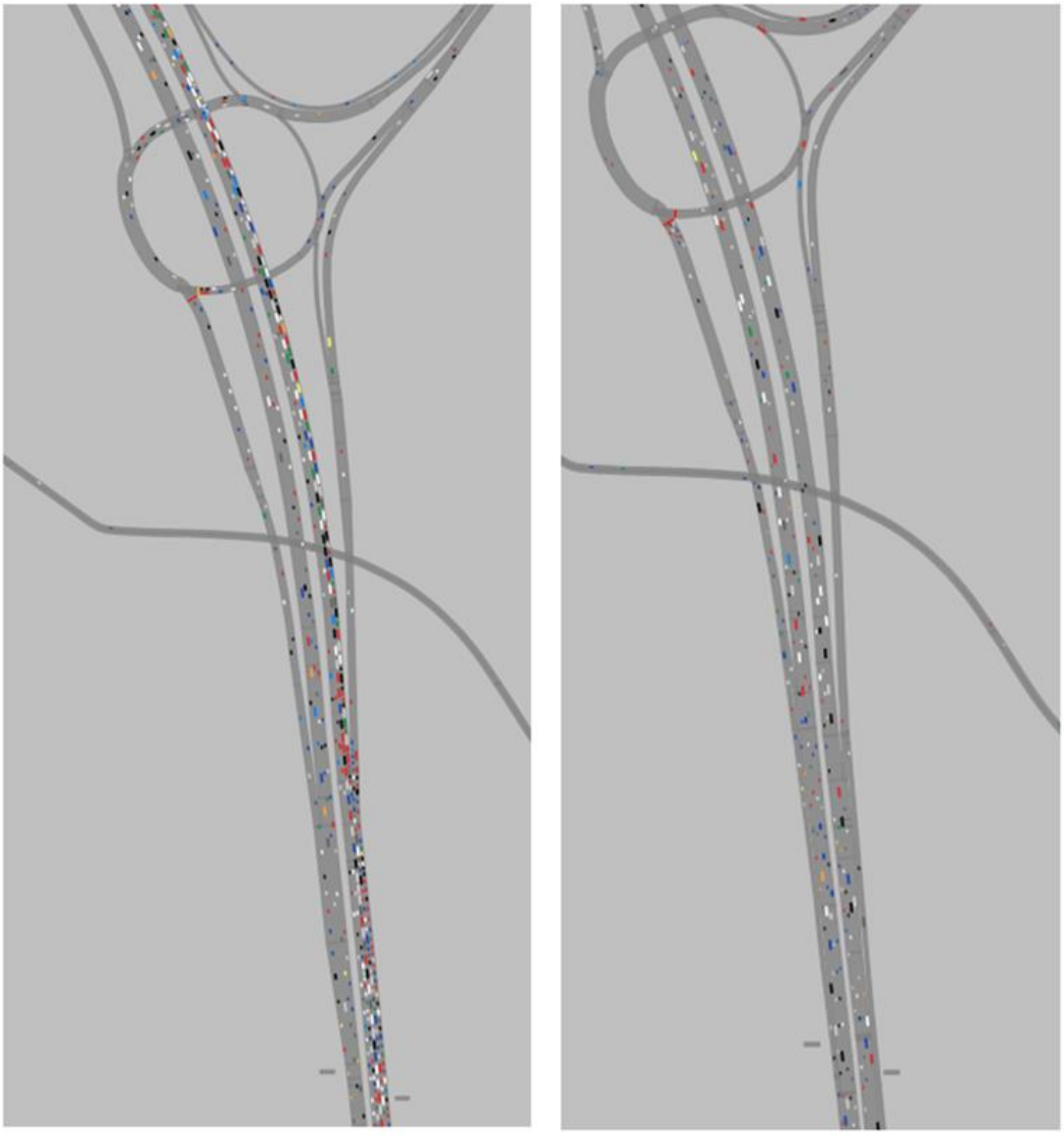


*Figure 30: Junction 10 southbound VISSIM model operation AM peak (DM left and DS1 right)*

### *Queue Lengths*

**120.** Queue length data from the model is presented in Table 19. The data indicates that there is a minor increase in queue length on the northbound off-slip. This occurs due the traffic released due to the removal of the northbound lane drop on the M1. The increase in queue length is around 50m and does not lead to any interaction between the slip road and the main carriageway of the M1.

**121.** The southbound merge on-slip shows a reduction in queue length of up to 170m with the proposed intervention on the southbound merge in place. This is equivalent to a reduction in queue length of approximately 90%.

*Table 19: Queue Lengths (Metres) – 2043 VISSIM Models*

| | AM (08:00-09:00) | | | PM (17:00-18:00) | | |
|---|---|---|---|---|---|---|
| **Location** | **DM** | **DS1** | **DS2** | **DM** | **DS1** | **DS2** |
| Northbound Off slip | 105 | 157 | 102 | 157 | 194 | 217 |
| Southbound Off slip | 2 | 4 | 2 | 0 | 0 | 0 |
| Southbound On slip | 189 | 6 | 22 | 33 | 3 | 3 |

# Recommendations

**122.** The interventions identified in this report provide DMRB CD 122 compliant merge/diverge layouts suitable for the forecast traffic demands associated with the proposed Airport Expansion. Additionally, for the south facing merge and the removal of the lane drop on the northbound carriageway of the M1 south of junction 10 there would likely be a road safety improvement as there is a reduction in safety risk posed by stationary vehicles during peak periods. This would lower the risk of accidents occurring on this part of the SRN.

**123.** Based on the post COVID-19 VISSIM testing as set out in this study, the proposed northbound diverge would provide sufficient additional capacity to safely accommodate the growth in demand for movements to Luton Airport by removing the lane drop on the northbound carriageway on the M1 and enabling junction 10 to accommodate the released traffic.

**124.** The capacity upgrade at the southbound merge would improve safety and operational performance resulting from longer periods of free-flowing traffic on the SRN. However, due to the limitations of the VISSIM model, it is difficult to draw definitive conclusions on the performance of the southbound merge. In order to fully assess the southbound merge, it is advised that a revised strategic model and VISSIM model that covers both the M1 junction 10 and junction 9 is developed should the scheme be progressed further.

**125.** Based on this assessment, it is expected that the interventions would not require land-take as they would be within the highway boundary on land owned by National Highways. Therefore, it is also not anticipated that a DCO would be required for the planning consent.

**126.** **In conclusion, the two interventions identified by NH previously in the submission within the DCO examination 'South Facing Slips Interventions Technical Note' (REP5-093) still remain a requirement to accommodate the increased forecast demands (post COVID-19) associated with the Luton Airport expansion. The interventions identified would provide an improvement in the operation of M1 junction 10 and M1 mainline in the vicinity of the interchange. These interventions should be secured even after taking account of the reduction in traffic following COVID-19.**

# APPENDIX A

**Average Junction Delays Plots**

Figure 31 shows average junction delays (seconds) across the SATURN network for different peak periods in 2016 model base year. As shown in these plots, maximum delays at M1 junctions 9 to 11 are in the region of 30-60 seconds.

AM Peak Hour (08:00 to 09:00) | Interpeak Hour (Between 10:00 to 16:00) | PM Peak Hour (17:00 to 18:00)

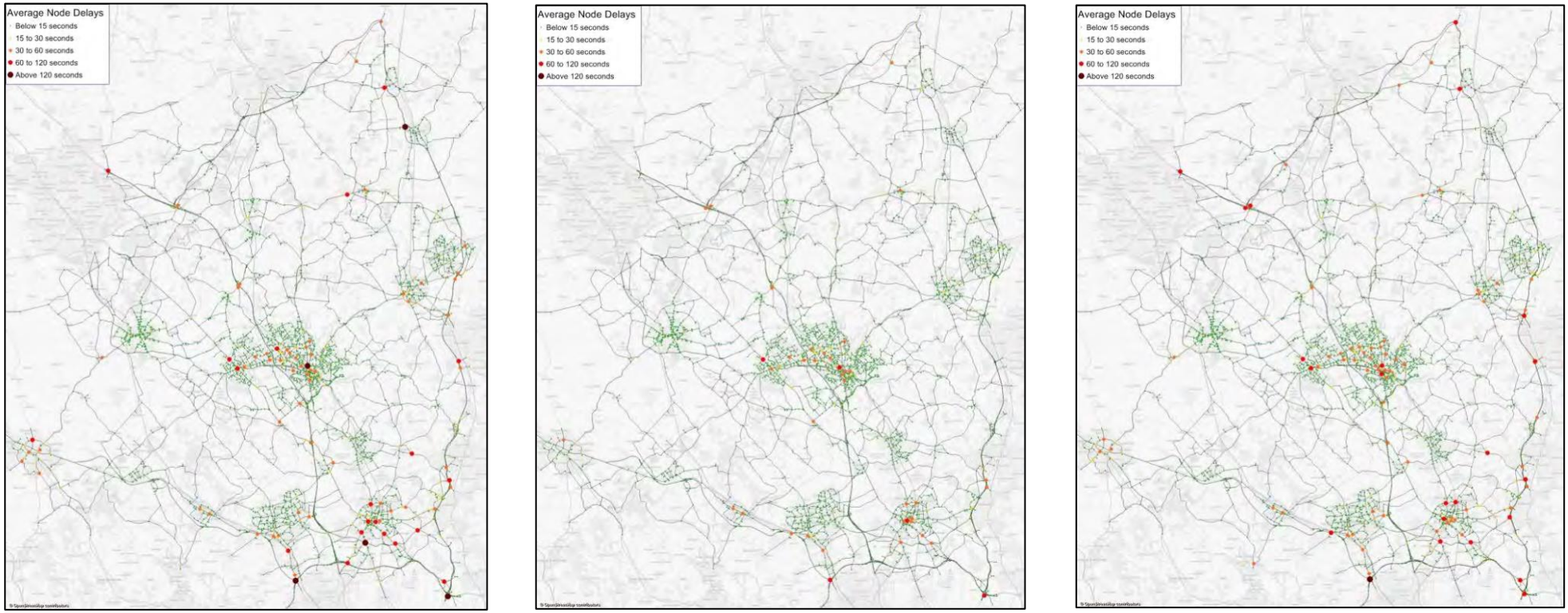



*Figure 31: Average node delays (seconds), simulation network, 2016 base model*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

# APPENDIX B

***Future Land-Uses and Policies – Other Development***

*Table 20: Forecast Residential Developments (Greater Than 250 Dwellings)*

| Location | Scheme Name | Certainty | Dwellings | Included from | Comment |
|---|---|---|---|---|---|
| Luton | Kimpton Road (Napier Park), Former Vauxhall Motors Site | Near certain | 1,474 | 2019-2028 | Under construction |
| Luton | Power Court | Near certain | 1,200 | 2026-2029 | Planning application approved |
| Luton | Hayward Tyler 1 Kimpton Road Luton LU1 3LD | More than likely | 1,000 | 2022 | Outline application submitted |
| Luton | Land Adjacent to Caddington Road & Newlands Road | Near certain | 340 | 2024-2024 | Planning Permission granted |
| Luton | Station Quarter<br>Bute Street Shoppers Car Park, Church Street, LU1 2EY | More than likely | 400 | 2025-2027 | new flexible community / leisure space |
| Luton | Imperial Square, Land opposite Whitbread House, Flowers Way | Near certain | 380 | 2025-2025 | Planning application granted |
| Central Bedfordshire | Marston Vale New Villages<br>Land between Brogborough, Lidlington and Marston Moretaine | More than likely | 5,000 | 2026-2039 | Outline Application (awaiting decision as of July 2023) Land allocated within Local Plan |

| | | | | | |
|---|---|---|---|---|---|
| Central Bedfordshire | North of Luton (Town Extension) (SA1) | Reasonably foreseeable | 3,100 | 2023-2034 | Land allocated within Local Plan Linked with M1-A6 link road |
| Central Bedfordshire | North of Houghton Regis (Site 1)<br>Land on the northern edge of Houghton Regis | Near certain | 5,150 | 2024-2049 | Planning application granted |
| Central Bedfordshire | East of Arlesey (Town Extension)<br>between Arlesey in the east, the A507 road and Fairfield in the west | Reasonably foreseeable | 2,000 | 2024-2037 | Land allocated within Local Plan |
| Central Bedfordshire | North of Houghton Regis (Site 2 - Land West of Bidwell) (SC1) | Near certain | 1,842 | 2020-2030 | Outline planning permission |
| Central Bedfordshire | Wixams<br>Land and Buildings at Elstow Storage Depot, Houghton Conquest | Near certain | 1,290 | 2022-2032 | Outline planning permission |
| Central Bedfordshire | East of Biggleswade (New Village) | Near certain | 1,500 | 2024-2034 | Land allocated within Local Plan |
| Central Bedfordshire | East of Leighton Linslade (Clipstone Park) | Near certain | 1,280 | 2020-2028 | Planning application registered |
| Central Bedfordshire | Land at Chase Farm & Land West/NE of High Street (East) | Near certain | 1,030 | 2024-2033 | Outline planning permission |
| Central Bedfordshire | Land South of The Wixams | More than likely | 1,200 | 2024-2035 | Land allocated within Local Plan Landowner intent to develop. Planning application submitted (Awaiting decision as of July 2023) |

| | | | | | |
|---|---|---|---|---|---|
| | Little Thickthorn Farm, Thickthorn Lane, Houghton Conquest, Bedford, MK45 3NQ | | | | |
| Central Bedfordshire | East of Leighton Linslade (Chamberlains Barn) Chamberlains Barn Quarry, Heath Road, Leighton Buzzard | Near certain | 950 | 2020-2026 | Planning granted. Outline application submitted |
| Central Bedfordshire | Wixams Southern Extension (Wixams Park) | Near certain | 650 | 2019-2030 | Land allocated within Local Plan Landowner intent to develop |
| Central Bedfordshire | Land to the East of Barton le Clay | More than likely | 500 | 2024-2030 | Awaiting decision as of July 2023. Land allocated within Local Plan Landowner intent to develop |
| Central Bedfordshire | Land to the west of Midland Mainline Railway, Harlington | Near certain | 400 | 2025-2031 | Planning Permission Granted in December 2022 'for up to 400 dwellings'. Land allocated within Local Plan Landowner intent to develop |
| Central Bedfordshire | Land North of Biggleswade | More than likely | 416 | 2023-2028 | Land allocated within Local Plan Landowner intent to develop. Application submitted, awaiting decision. |
| Central Bedfordshire | Land to the East of Houghton Regis | Reasonably foreseeable | 355 | 2025-2030 | Land allocated within Local Plan Landowner intent to develop |
| Central Bedfordshire | East of Leighton Linslade (Stearn Land) | Near certain | 270 | 2024-2028 | Planning permission granted |
| Central Bedfordshire | Land at Moreteyne Farm | Near certain | 365 | 2018-2021 | Reserved matters granted |

| | | | | | |
|---|---|---|---|---|---|
| Central Bedfordshire | Warren Farm<br>Land off Flitwick Road | Near certain | 259 | 2018-2020 | Reserved matters granted |
| Central Bedfordshire | Land at Steppingley Road & Froghall Road | Near certain | 400 | 2018-2019 | Reserved matters granted |
| Central Bedfordshire | Dukeminster Estate | Near certain | 270 | 2019-2020 | screening application CB/16/01281/SCN for up to 330 units. approved application CB/16/02972/Full for 270 dwellings |
| Central Bedfordshire | Land East of Biggleswade (Blocks 1-7, 46-48a, 50, 51a) | Near certain | 288 | 2018-2018 | Reserved matters granted |
| Central Bedfordshire | Land at Potton Road Biggleswade SG18 0EJ | Near certain | 301 | 2018 | Planning permission granted |
| Dacorum | Marchmonth Farm | More than likely | 350 | 2024-2027 | Land identified in Local Plan Currently undertaking consultation<br>Application is with planning case officer as of July 2023 |
| Dacorum | West Hemel (Phase One) | Near certain | 350 | 2021-2021 | Planning application granted (December 2021)<br>Planning application submitted |
| Dacorum | West Hemel (Phase Two) | Near certain | 750 | 2024-2027 | Land identified in Local Plan<br>Planning application granted (December 2021) |

| | | | | | |
|---|---|---|---|---|---|
| Dacorum | Town Centre | Reasonably foreseeable | 1,200 | 2018-2031 | Development identified in Local Plan |
| Dacorum | East Hemel | Near certain | 600 | 2019-2031 | Development identified in Local Plan |
| Dacorum | Rest of Hemel | Reasonably foreseeable | 2,770 | 2018-2031 | Development identified in Local Plan |
| Dacorum | Rest of Berkhampstead | Reasonably foreseeable | 564 | 2018-2031 | Development identified in Local Plan |
| Dacorum | Dacorum Countryside | Reasonably foreseeable | 252 | 2018-2031 | Development identified in Local Plan |
| Dacorum | Kier Park, Maylands Avenue, Hemel Hempstead | Reasonably foreseeable | 268 | 2021 | Planning application registered but then refused Jun 2019 |
| Dacorum | Land between Three Cherry Tree Lane and Cherry Tree Lane, Hemel Hempstead | Near certain | 600 | 2021-2023 | Planning application granted April 2020 |
| North Hertfordshire | Land north of Baldock | Reasonably foreseeable | 2,800 | 2023-2031 | Strategic site in Local Plan. Planning application registered Withdrawn March 2023 |
| North Hertfordshire | East of Luton | More than likely | 2,060 | 2025-2031 | Awaiting decision Strategic site in Local Plan |
| North Hertfordshire | Land North of Stevenage | More than likely | 900 | 2023-2031 | Strategic site in Local Plan Planning application submitted. It says 'decided' but status unknown as of July 2023 |

| | | | | | |
|---|---|---|---|---|---|
| North Hertfordshire | Land north of Letchworth (Garden City) | Reasonably foreseeable | 900 | 2023-2031 | Strategic site in Local Plan. Application expected 2021. |
| North Hertfordshire | Highover Farm, Hitchin | More than likely | 700 | 2023-2031 | Strategic site in Local Plan Planning application registered |
| North Hertfordshire | Land north east of Great Ashby | More than likely | 650 | 2023-2031 | Scoping Opinion submitted and decided June 2023 Strategic site in Local Plan |
| North Hertfordshire | Royston | Near certain | 332 | 2018-2021 | Completions / Permissions |
| North Hertfordshire | Roundwood, Great Ashby | More than likely | 330 | 2023-2031 | Screening opinion submitted; decision made Feb 2023 Land allocated within Local Plan |
| North Hertfordshire | Land north of Newmarket Road, Royston | Near certain | 330 | 2023-2031 | Land allocated within Local Plan Conditional permission dec 2016. |
| North Hertfordshire | Rest of Hitchin | Near certain | 319 | 2018-2021 | Completions / Permissions |
| North Hertfordshire | Land south of Newmarket Road, Royston | Near certain | 325 | 2023-2031 | Application No got conditional Permission in Feb 2020 Land allocated within Local Plan |
| North Hertfordshire | Land south of Little Wymondley, Wymondley | More than likely | 300 | 2023-2031 | Outline application received Apr 2022 Land allocated within Local Plan |
| North Hertfordshire | Rest of Letchworth | Near certain | 297 | 2018-2021 | Completions / Permissions |
| North Hertfordshire | Land west of Ivy Farm, Baldock Road, Royston | Near certain | 279 | 2023-2031 | Land allocated within Local Plan |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | Planning application conditional permission Feb 2019 |
| North Hertfordshire | Land West of A1M Stevenage | More than likely | 1,500 | 2022-2030 | Planning application submitted |
| St. Albans | East Hemel Hempstead (north) | Reasonably foreseeable | 600 | 2023-2031 | Land allocated within Local Plan (Local Plan 2018 withdrawn) |
| St. Albans | East Hemel Hempstead (south) | More than likely | 2,452 | 2023-2031 | Land allocated within Local Plan |
| St. Albans | North Hemel Hempstead | Reasonably foreseeable | 1,500 | 2035-2041 | Land allocated within Local Plan |
| St. Albans | East St Albans | Reasonably foreseeable | 900 | 2023-2027 | Land allocated within Local Plan |
| St. Albans | East St Albans | Near certain | 348 | 2021-2021 | Extant planning permission |
| St. Albans | North St Albans | Reasonably foreseeable | 1,100 | 2022-2035 | Land allocated within Local Plan |
| St. Albans | North East Harpenden | Reasonably foreseeable | 760 | 2022-2035 | Land allocated within Local Plan |
| St. Albans | North West Harpenden | More than likely | 550 | 2022-2035 | Land allocated within Local Plan |

| | | | | | |
|---|---|---|---|---|---|
| St. Albans | West of London Colney | Reasonably foreseeable | 440 | 2022-2035 | Land allocated within Local Plan |
| St. Albans | West of Chiswell Green | More than likely | 391 | 2022-2035 | Land allocated within Local Plan |
| St. Albans | Park Street Garden Village | Reasonably foreseeable | 2,300 | 2029-2039 | Land allocated within Local Plan |
| Central Bedfordshire | Parcels 6A and 6B, Land West of Bidwell | Near certain | 625 | 2021-2025 | Planning granted |
| Central Bedfordshire | Parcel 5A and 5B, Land West of Bidwell | Near certain | 336 | 2022-2028 | Approved planning permission |
| Central Bedfordshire | Land to West of Houghton Regis, Watling Street (Parcel 7), Land West of Bidwell | Near certain | 255 | 2021-2025 | |
| Central Bedfordshire | Parcel 3&4 (Phase 7, 7a, and 7b) Land at Thorn Road, North of Houghton Regis (HRN2) | Near certain | 264 | 2020-2026 | |
| Luton | 4-11 Burr Street Luton | More than likely | 272 | 2022 | Awaiting decision - application received Mar 2021 |
| North Hertfordshire | Land Off Barkway Road and North Of Flint Hall, Barkway Road, Royston, Hertfordshire | More than likely | 280 | 2022 | Outline application registered March 2021 |

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|---|---|---|---|---|---|
| North Hertfordshire | East of Luton | Reasonably foreseeable | 700 | 2023 - 2031 | Connected to NorthHerts-Res2 |
| Dacorum | Marsworth Airfield Lukes Lane Gubblecote Tring Hertfordshire HP23 4QH | More than likely | 320 | 2025 - 2031 | Planning submitted, no decision yet |
| St. Albans | Oaklands College Smallford Campus Hatfield Road St Albans Hertfordshire Al4 0Ja | Near certain | 348 | 2026 - 2031 | Planning submitted, no decision yet |

*Table 21: Forecast Employment Development (Greater Than 100 Jobs)*

| Location | Development | Uncertainty | Total jobs | Timescale | Comment |
|---|---|---|---|---|---|
| Luton | London Luton Airport Airport Way<br>Luton, Bedfordshire<br>LU2 9LY | | 5100 | 2023-2039 | Scheme to be tested |
| Luton | Butterfield Hitchin Road<br>Luton, Bedfordshire | More than likely | 1090 | 2020-2030 | Application permitted July 2022 Submitted Planning Application - Approved 2005.<br>Application for extension of time limits set in 2005 refused in July 2019. |
| Luton | Wigmore Employment Area (Century Park) Eaton Green Road | Near certain | 3200 | 2020-2024 | Application submitted, awaiting decision Application permitted June 2021 |
| Luton | Power Court | Near certain | 839 | 2026 | Recent discharge of conditions 22/01205/doc<br>application approved May 23 for continuation of car parking for 18 months Application approved (Sept 2019) |
| Luton | Napier Park | Near certain | 2700 | 2020-2030 | Application Permitted |
| Luton | Newlands Park | Near certain | 1809 | 2025 | Application permitted (sept 2019) |
| Luton | Hart House Business Centre, Kimpton Road,<br>Luton, LU2 0LA (Bartlett Square) | Near certain | 165 | 2021-2025 | Planning application permitted Jan 2020 |

| | | | | | |
|---|---|---|---|---|---|
| Luton | The Poynt<br>Dunstable Road Luton, Bedfordshire | Complete | 104 | 2018 | |
| Luton | Unit 1 PC World Madford Retail Park<br>540 Dunstable Road Luton, Bedfordshire | Complete | 106 | 2018 | |
| Luton | Cargo 10 Airport Way Luton, Bedfordshire | Complete | 114 | 2018 | |
| Luton | University Of Bedfordshire - Block K (Fairview House)<br>65 Park Street Luton, Bedfordshire | Complete | 160 | 2018 | |
| Luton | Stopsley High School and Community College St Thomas's Road<br>Luton, Bedfordshire | Complete | 283 | 2018 | |
| Luton | Drop Off Zone<br>London Luton Airport Airport Way<br>Luton, Bedfordshire | Complete | 614 | 2018 | |
| Central Bedfordshire | North Luton | Reasonably foreseeable | 1000 | 2018-2025 | Linked with M1-A6 link road |

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|---|---|---|---|---|---|
| Central Bedfordshire | Stratton Farm | Reasonably foreseeable | 1941 | 2018-2030 | Development identified, but no planning application |
| Central Bedfordshire | Wixams Southern Extension | Reasonably foreseeable | 441 | 2018-2030 | Land allocated within Local Plan<br>Landowner intent to develop |
| Central Bedfordshire | Houghton Regis North 1 | Complete | 1417 | 2018-2031 | Planning application granted |
| Central Bedfordshire | Houghton Regis North 2 | Near certain | 393 | 2018-2021 | Outline planning permission |
| Central Bedfordshire | East Leighton Buzzard | More than likely | 2171 | 2018-2031 | Planning application registered |
| Central Bedfordshire | Thorn Turn | Complete | 187 | 2018-2021 | |
| Central Bedfordshire | Sundon RFI | Reasonably foreseeable | 2000 | 2018-2025 | Linked with M1-A6 link road |
| Central Bedfordshire | RAF Henlow | Reasonably foreseeable | 2000 | 2018-2035 | Identified in Local Plan<br>Land yet to be purchased from MoD |
| Central Bedfordshire | West of A1 Biggleswade | Reasonably foreseeable | 2000 | 2018-2025 | Pre-application Advice Released (Dec 2020) |
| Central Bedfordshire | Marston Gate | Near certain | 2207 | 2019-2026 | Identified in Local Plan |

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|---|---|---|---|---|---|
| St. Albans | Industrial site & new business/tech park - East Hemel Hempstead | More than likely | 10000 | 2018-2035 | |
| St. Albans | 2 new primary schools - East Hemel Hempstead (south) | Near certain | 100 | 2018-2035 | Linked with residential developments |
| St. Albans | 2 new primary schools - Park Street Garden Village | Reasonably foreseeable | 100 | 2018-2035 | Linked with residential developments |
| Dacorum | Growth of app. 10,000 jobs over plan period, spread across district based on base year employment | Reasonably foreseeable | 6025 | 2018-2031 | Included in current Local Plan<br>No specific proposals - use TEMPro growth |
| Dacorum | Maylands Gateway, Hemel Hempstead - comprehensive redevelopment of site | Near certain | 975 | 2020-2020 | Planning Granted |
| Dacorum | Spencers Park, Cherry Tree Lane, Hemel Hempstead | Near certain | 127 | 2021-2034 | Part of Herts LEZ, no planning specific proposals |
| Dacorum | Prologis Park, Wood Lane End, Hemel Hempstead | Near certain | 700 | 2019-2020 | Planning permission granted |
| Dacorum | 499 London Road, Hemel Hempstead - 3 floors of offices | Near certain | 150 | 2020 | Planning permission granted |
| North Hertfordshire | Royston Road, Baldock | Near certain | 1307 | 2018-2031 | Strategic site in Local Plan Planning application Agreed |

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|---|---|---|---|---|---|
| North Hertfordshire | Wilbury Way, Hitchin | Reasonably foreseeable | 2593 | 2018-2031 | Land allocated within Local Plan |
| North Hertfordshire | Burymead Road, Hitchin | Reasonably foreseeable | 473 | 2018-2031 | Land allocated within Local Plan |
| North Hertfordshire | Former power station, Works Road, Letchworth | Near certain | 100 | 2018-2031 | Land allocated within Local Plan |
| North Hertfordshire | Land north of York Way, Royston | Reasonably foreseeable | 713 | 2018-2031 | Land allocated within Local Plan |
| Central Bedfordshire | Non-B jobs (dispersed according to household growth throughout the unitary authority - split across housing sites with 100+ dwellings (55 sites)) | More than likely | 12785 | 2018-2031 | Linked with residential developments |
| Central Bedfordshire | Land at Phase 6 Stratton Business Park, East of Pegasus, Biggleswade | Near certain | 756 | 2021 | Planning application submitted.<br>Reserved Matters Granted in March 2019 |
| Central Bedfordshire | Land To the North and East of Houghton Regis, Sundon Road, Houghton Regis | Near certain | 833 | 2022 | Most recent application CB/23/01482/NMA Planning application submitted.<br>Reserved Matters Granted in March 2020 |
| Central Bedfordshire | Land to the South East of Prologis Park Marston Gate | More than likely | 1587 | 2026-2028 | New Outline Application No: CB/22/02213/OUT (Awaiting decision) CB/18/04600/OUT Application was withdrawn. Planning application submitted. |

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|---|---|---|---|---|---|
| Luton | Land Adj to Progress Way Vauxhall Aftersales Warehouse Luton LU4 9TR | Near certain | 1500 | | Application permitted Oct 2022 |
| Dacorum | Land At Green Lane Hemel Hempstead Hertfordshire | Near certain | 550 | | Granted permission Jun 2023. |
| Luton | Prologis Park 60 Windmill Road LU13XL | More than likely | 405 | 2025 | Application Permitted Oct 2022 |

*Future Changes to the Transport System*

| Location | Development | Certainty | Included from | Comment |
|---|---|---|---|---|
| Luton | Access arrangements for Terminal 2 | Scheme to be tested | | Includes access road to Terminal 2 and reallocation of car parking |
| Luton | DART | Near certain | 2027 | Intermediate station at mid-stay car park. Five minutes journey time to terminal.<br>Headway assumed to be four minutes.<br>Removal of existing shuttle bus service, with associated changes to bus-only infrastructure along route.<br>https://www.llal.org.uk/LLAL-MPT.html. |
| Luton | Century Park Link | See comment | | This has been transferred to AAR. |
| Luton | Luton Airport Access Road (AAR) | Scheme to be tested | 2039 | Dualling of airport access road between Percival Way and the terminal, and associated junction improvements. Funding in place and included in latest LBC infrastructure plan. 2039 for phase 1 and 2043 for full phase. |
| Luton | Hitchin Road / Ramridge Road / Stockingstone Road | Near certain | 2027 | Junction improvements:<br>Option 1 - Signalise Hitchin Road and Stockingstone Road junctions and convert Ramridge Road / Stockingstone Road junction to priority<br>Option 2 - Signalise Hitchin Road & Stockingstone Road and Ramridge Road & Stockingham Road & link both sets of signals.<br>Funding in place and included in latest LBC infrastructure plan. |

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|---|---|---|---|---|
| Luton | Hitchin Road / Vauxhall Way Roundabout | Complete | 2023 | Junction converted to three-arm signalised junction. |
| Luton | Vauxhall Way / Crawley Green Road Roundabout | Near certain | 2039 | Signalising this junction was initially considered as a result of improvements required to increase capacity to cater for increased traffic to airport but rejected in favour of localised widening at the roundabout. Vacant highway land on Vauxhall Way approaches may provide opportunities for this localised widening.<br>See Arup ID in Mitigation Drawing Log. Funding in place and included in latest LBC infrastructure plan. |
| Luton | Vauxhall Way / Kimpton Road Roundabout | Near certain | 2039 | Lengthen flares on Vauxhall Way and Eaton Green Road. Funding in place and included in latest LBC infrastructure plan. |
| Luton | Airport Way to Gypsy Lane Signals | Near certain | 2027 | Junction improvements. Funding in place and included in latest LBC infrastructure plan. |
| Luton | Wigmore Lane / Eaton Green Road Roundabout | Near certain | 2027 | Junction improvements. Funding in place and included in latest LBC infrastructure plan. |
| Luton | Luton Northern Bypass: M1 to A6 | Near certain | 2027 | https://www.centralbedfordshire.gov.uk/info/55/transport_roads_and_parking/581/m1-a6_link_road/6. Planning application granted Dec 2020. |
| Luton | A5-M1 Link Road | Complete | 2023 | New link road to north of Dunstable, including new Junction 11a on M1, Poynters Road scheme and connection to Woodside Link from Parkside Drive. Scheme complete. |

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| Luton | Dunstable Road | Complete | 2023 | Widening to 3 lanes south-eastbound and 2 lanes north-westbound between Telford Way and Cardiff Road. Scheme complete. |
| Luton | Hitchin Road / Ramridge Road | Near Certain | 2027 | See Arup ID in Mitigation Drawing Log |
| Luton | Wigmore Lane / Crawley Green Road | Near Certain | 2027 | See Arup ID in Mitigation Drawing Log |
| Luton | A1081 / London Road (North) | Near Certain | 2027 | See Arup ID in Mitigation Drawing Log |
| Luton | Windmill Road / Kimpton Road | Near Certain | 2027 | See Arup ID in Mitigation Drawing Log |
| Luton | Windmill Rd / Manor Rd / St. Mary's Rd | Near Certain | 2027 | See Arup ID in Mitigation Drawing Log |
| Luton | A505 Vauxhall Way / Eaton Green Road | Near Certain | 2027 | See Arup ID in Mitigation Drawing Log |
| Luton | Eaton Green Road / Lalleford Road | Near Certain | 2027 | See Arup ID in Mitigation Drawing Log |
| Luton | Eaton Green Road / Frank Lester Way | Near certain | 2027 | See Arup ID in Mitigation Drawing Log |
| C.Beds | A421 Dualling (including between Eagle Farm and M1) | Near Certain | 2027 | Signalised roundabout where A421 crosses M1, coded as dual carriageway with speed limit of 70mph. Approved planning status. |

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| C.Beds | Houghton Regis North Site 1 development access | Near Certain | 2027 | 20mph dual carriageway link connecting Sundon Road and Woodside Link. Intermediate roundabouts connect the new access to Woodside Link. |
| C.Beds | Houghton Regis North Development 2 distributor road | More than likely | 2027 | 20 - 40mph dual carriageway link running across the north of the development between the B5120 and Woodside Link. Bus priority measures west of the Woodside Link Road. Junction with Woodside Link Road is a 3 arm roundabout. |
| C.Beds | Billington Rd traffic calming (Leighton Buzzard) | More than likely | 2027 | Assumed 15mph speed limit and restricted capacity |
| C.Beds | A505 / Billington Rd / Stanbridge Rd roundabout (Leighton Buzzard) | More than likely | 2027 | Assumed to be mini roundabout |
| C.Beds | East Leighton Distributor Road (Leighton Buzzard) | More than likely | 2027 | 40mph dual carriageway connecting Leighton Road and Heath Road in eastern Leighton buzzard. Junction with A4012 and Vandyke Road signalised. Alignment of Vandyke Road amended. |
| C.Beds | Marston Vale New Villages | More than likely | 2027 | Assess arrangements for development |
| C.Beds | North of Houghton Regis (Site 1) | Near certain | 2027 | Assess arrangements for development |
| C.Beds | East of Arlesey | More than likely | 2027 | Assess arrangements for development |

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| C.Beds | North of Houghton Regis (Site 2 - Land West of Bidwell) | Near certain | 2027 | Assess arrangements for development |
| C.Beds | Wixams | Near certain | 2027 | Assess arrangements for development |
| C.Beds | East of Leighton Linslade (Clipstone Park) | Near certain | 2027 | Assess arrangements for development |
| C.Beds | Land South of The Wixams | More than likely | 2027 | Assess arrangements for development |
| C.Beds | Wixams Southern Extension (Wixams Park) | Near certain | 2027 | Associated with A5-M1 Link. Coded as two 3 lane roundabouts of the A5 joining to the M1. Scheme complete. |
| NH | M1 J11a Dumbbell Junction | Complete | 2023 | Upgraded into Dumbbell roundabout. |
| NH | M1 J11a Dumbbell Junction with capacity-increase measures and access to M1-A6 link | More than likely | 2027 | Assumed additional lane with speed limit reduction in peak hours. |
| NH | A428 Black Cat to Caxton Gibbet | Near Certain | 2027 | |
| NR | East West Rail – Western Section | Near Certain | 2027 | Three additional hourly services i.e., Bedford to Oxford (in 61 minutes), Milton Keynes to Oxford (in 41 minutes) and Milton Keynes to Aylesbury (in 33 minutes). This translates to 2 services |

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|---|---|---|---|---|
| | | | | per hour on the Marston Valley line (between Bletchley and Bedford). https://www.eastwestrail.org.uk/train-services/ |
| Dacorum | Signalisation of Kings Road/Kingshill Way/Shootersway, Berkhamstead | Complete | 2023 | Funding in place within Dacorum Infrastructure Delivery Plan |
| Dacorum | Improve High St/Kings Road junction, Berkhamstead | More than likely | 2027 | Funding in place within Dacorum Infrastructure Delivery Plan |
| Dacorum | Traffic calming & 20mph zone - Castle St, Berkhamstead | Near certain | 2027 | Funding not in place for scheme |
| Dacorum | Traffic calming & 20mph zone - Gravel Path - Berkhamstead | Near certain | 2027 | Funding not in place for scheme |
| St Albans | Additional bus routes to new development locations (housing/employment) with particular emphasis on connecting bus routes to new schools | More than likely | 2043 | Linked to development proposals within St Albans, so expected to be delivered in line with additional housing / employment |

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|---|---|---|---|---|
| C.Beds | Wixams Western Access – B530 Roundabout | Complete | 2023 | New roundabout introduced as part of the development. |
| C.Beds | Marston Valley – C94/Western Access | More than likely | 2027 | Condition of approved planning permission |
| C.Beds | Marston Valley – C94/Eastern Access | More than likely | 2027 | Condition of approved planning permission |
| C.Beds | Marston Valley – Northern Access/Station Lane | More than likely | 2027 | Condition of approved planning permission |
| C.Beds | Marston Valley – C94/Woburn Road Junction Upgrade | More than likely | 2027 | Condition of approved planning permission |
| C.Beds | Marston Valley – C94 Rbt and minor access | More than likely | 2027 | Condition of approved planning permission |
| C.Beds | Marston Valley – Section of Station Road closure – Downgrade to cycleway | More than likely | 2027 | Condition of approved planning permission |
| C.Beds | Marston Valley – Marston Road Access | More than likely | 2027 | Condition of approved planning permission |
| C.Beds | M1 J13 Junction Improvements | More than likely | 2027 | Part of pending planning application |

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|---|---|---|---|---|
| C.Beds | M1 J13 Junction Improvements - Bypass lane at North-Western Rbt | More than likely | 2027 | |
| C.Beds | A1 Biggleswade North Roundabout Capacity improvements | More than likely | 2043 | |
| C.Beds | Land E of Biggleswade - Accesses | Near certain | 2027 | Approved planning status |
| C.Beds | Land E of Biggleswade - A1/London Rd Rbt | Near certain | 2027 | Approved planning status |
| C.Beds | Land E of Biggleswade - A1/Hill Lane Rbt | Near certain | 2027 | Approved planning status |
| C.Beds | M1 junction 11a | More than likely | 2027 | Construction of a new single and dual carriageway 2.75 miles (4.4km) road linking the M1 and the A6 between the M1 junction 11a and the A6 Barton Road. Comprising intermediate junctions, overbridges, underbridges, cycle paths, revisions to the Public Rights of Way network, drainage and landscaping. Approved planning. |
| NH | M1 J13-J16 SMP | Near Certain | 2027 | Completion is due in 2023. |
| C.Beds | PT - East West Rail Western Section | Near certain | 2027 | Approved planning status. https://www.networkrail.co.uk/running-the-railway/railway-upgrade-plan/key- projects/east-west-rail/east-west-rail-western-section/. Rail scheme linking Bicester to Bedford - EWR TWAO website. |

| | | | | |
|---|---|---|---|---|
| C.Beds | Biggleswade Eastern Relief Road | Complete | 2023 | |
| C.Beds | East of Leighton Link Road | More than likely | 2027 | Part of planning application ref 02827, 04444, 01937 |
| C.Beds | Woodside Link Road | Complete | 2023 | |
| NorthHerts | Southern link road connection B656/A607, Baldock | Near certain | 2027 | Funded |
| Milton Keynes | M1 J14, and associated development infrastructure | More than likely | | Application submitted - allocated site |

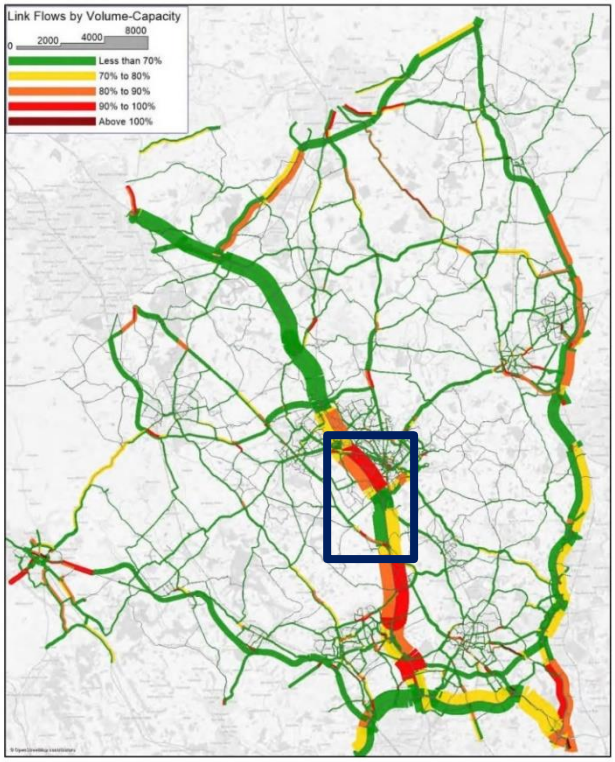
# APPENDIX C

**Forecast Link Volume Over Capacity Plots**

Below is a summary of the findings in these plots:

- Comparing AM peak TAG based with and without Development for simulation network (Figure 32) V/C for M1 NB at M1 junction 10 the scenario with Development are worse;
- Comparing interpeak TAG based with and without Development for simulation network (Figure 33): V/Cs for both scenarios are the same;
- Comparing interpeak TAG based with and without Development for Luton (Figure 34): V/Cs for both scenarios are the same;
- Comparing PM peak TAG based with and without Development for simulation network (Figure 35) V/Cs for A1081 westbound approach to M1 junction 10 in the scenario with Development are worse;
- Comparing PM peak TAG based with and without Development for Luton (Figure 36): V/Cs for A1081 westbound approach to M1 junction 10 in the scenario with Development are worse;
- Comparing AM peak Local Plan alternative with and without Development for simulation network (Figure 37): V/Cs for A1081 at its junction with Kimpton Road are worse in the scenario with Development;
- Comparing AM peak Local Plan alternative with and without Development for Luton (Figure 38): V/Cs for A1081 at its junction with Kimpton Road are worse in the scenario with Development;
- Comparing interpeak Local Plan alternative with and without Development for simulation network (Figure 39): V/Cs for both scenarios are the same;
- Comparing interpeak Local Plan alternative with and without Development for Luton (Figure 40): V/Cs for A1081 at its junction with Kimpton Road and for the scenario with expansion and the M1 NB at junction 10 in the scenario without Development are worse;
- Comparing PM peak Local Plan alternative with and without Development for Luton (Figure 41) V/Cs for both scenarios are the same; and
- Comparing PM peak Local Plan alternative with and without Development for Luton (Figure 42): V/Cs for A1081 at its junction with Kimpton Road are worse in the scenario with Development.

"Without" Development




"With" Development

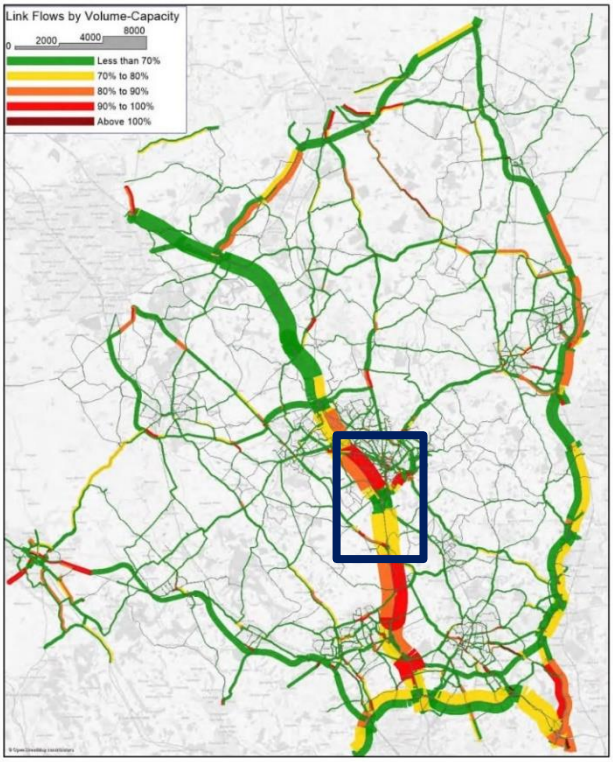
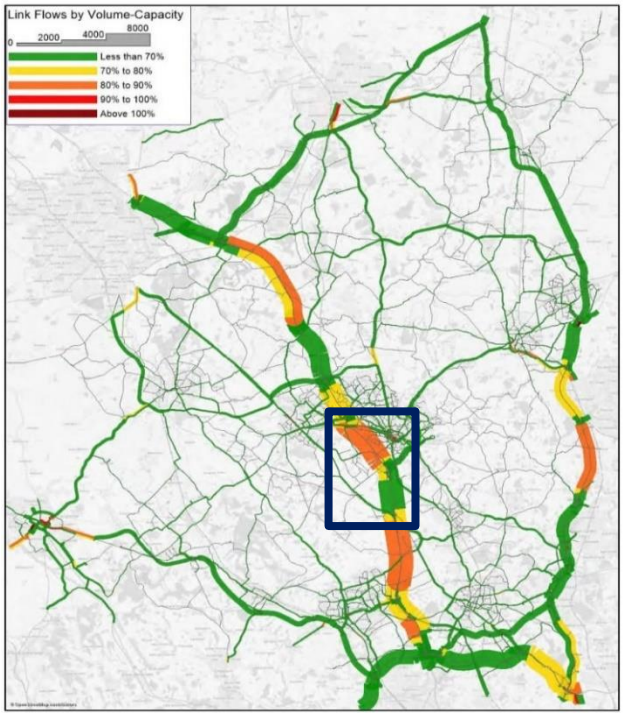



*Figure 32: Forecast link-based V/C, TAG-based "without" and "with" development forecasts, simulation network – 2043 AM peak hour (08:00 – 09:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

"Without" Development




"With" Development

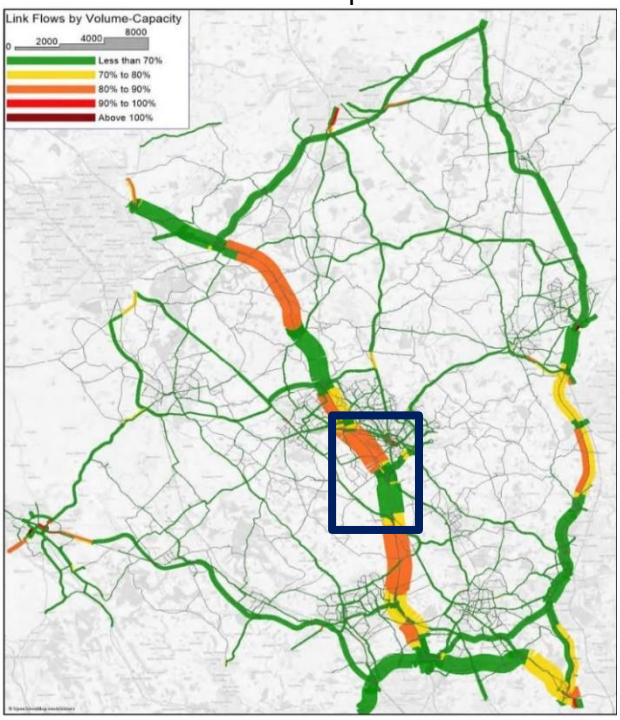



*Figure 33: Forecast link-based V/C, TAG-based "without" and "with" development forecasts, simulation network – 2043 interpeak (10:00 – 16:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

"Without" Development

"With" Development

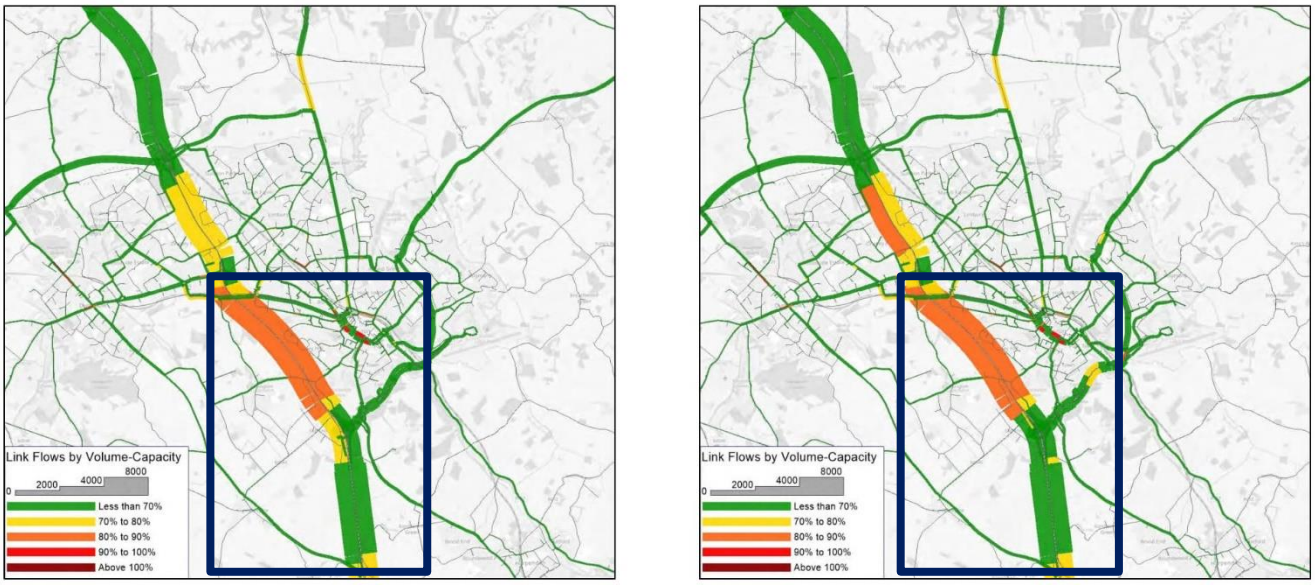



*Figure 34: Forecast link-based V/C, TAG-based "without" and "with" development forecasts, Luton borough – 2043 interpeak (10:00 – 16:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

"Without" Development

"With" Development

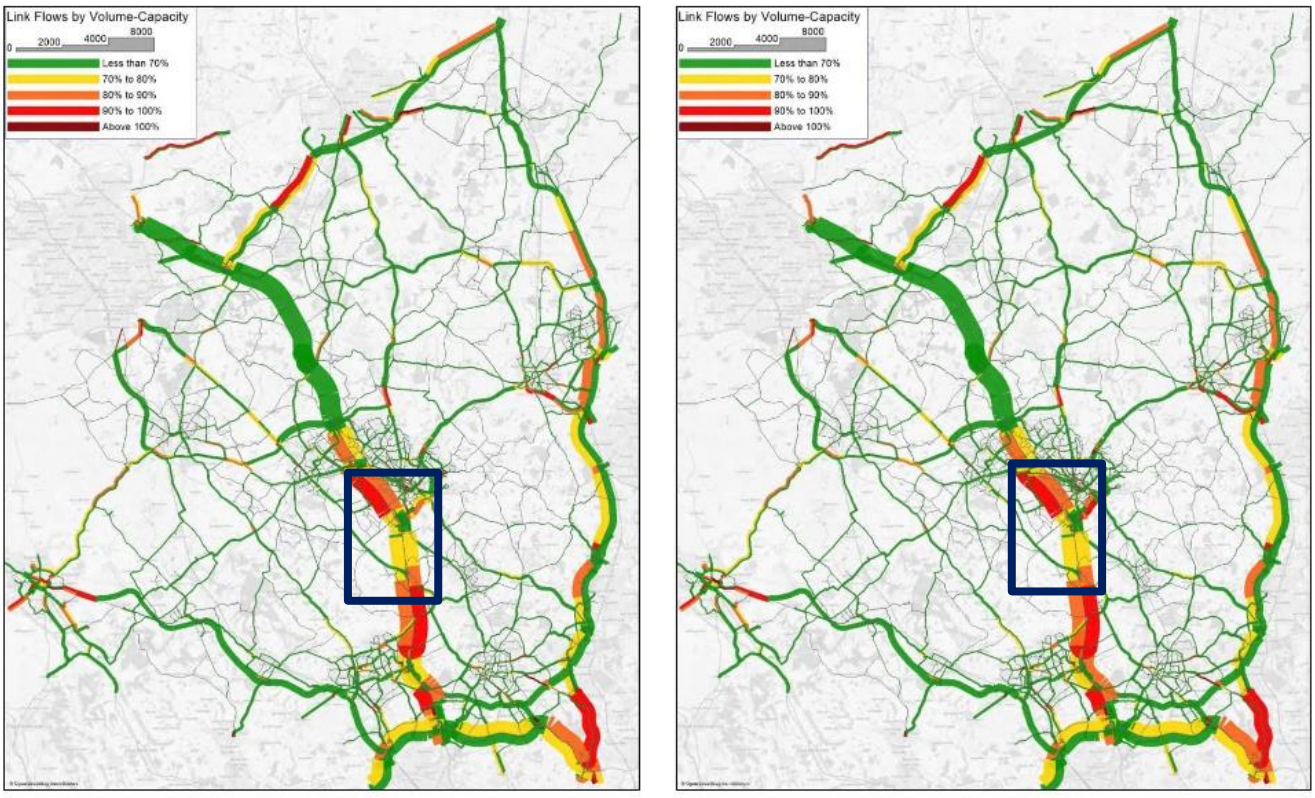



*Figure 35: Forecast link-based V/C, TAG-based "without" and "with" development forecasts, Luton borough – 2043 2043 PM Peak Hour (17:00 – 18:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

"Without" Development

"With" Development


*Figure 36: Forecast link-based V/C, tag-based "without" and "with" development forecasts, Luton borough – 2043 PM peak hour (17:00 – 18:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

"Without" Development

"With" Development


*Figure 37: Forecast link-based V/C, Local Plan alternative scenario forecasts, simulation network – 2043 AM peak hour (08:00 – 09:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

“Without” Development

“With” Development

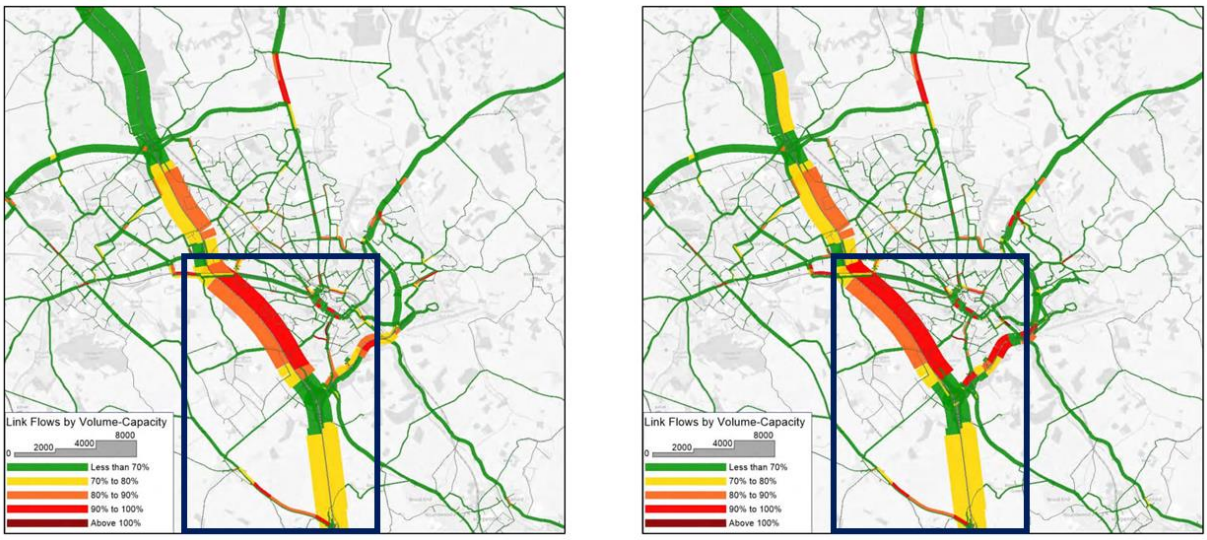



*Figure 38: Forecast link-based V/C, local plan alternative scenario forecasts, Luton borough – 2043 AM peak hour (08:00 – 09:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

“Without” Development

“With” Development


*Figure 39: Forecast link-based V/C, local plan alternative scenario forecasts, simulation network – 2043 interpeak (10:00 – 16:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

"Without" Development

"With" Development


*Figure 40: Forecast link-based V/C, local plan alternative scenario forecasts, Luton borough – 2043 interpeak (10:00 – 16:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

"Without" Development

"With" Development

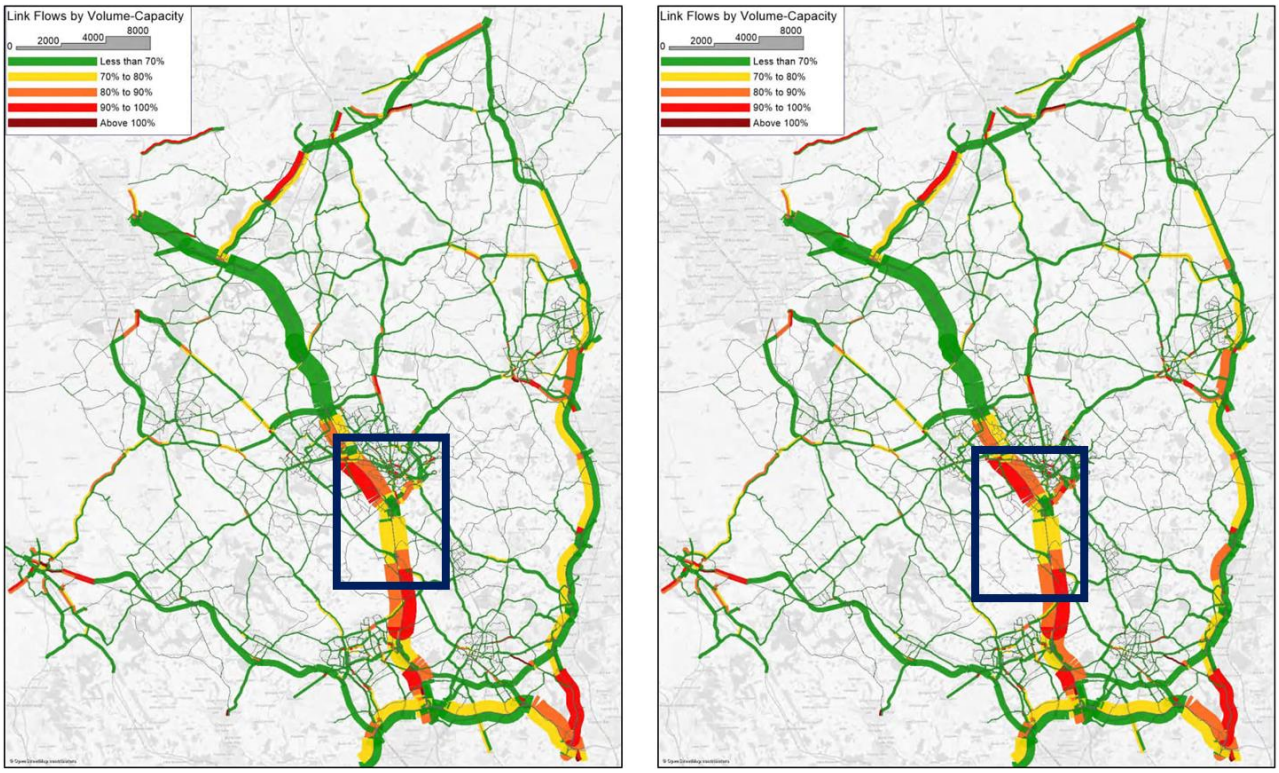



*Figure 41: Forecast link-based V/C, Local Plan alternative scenario forecasts, Luton borough – 2043 PM Peak Hour (17:00 – 18:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

“Without” Development

“With” Development


*Figure 42: Forecast link-based V/C, Local Plan alternative scenario forecasts, Luton borough – 2043 PM Peak Hour (17:00 – 18:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

# APPENDIX D

**Forecast Junction Delay Plots**

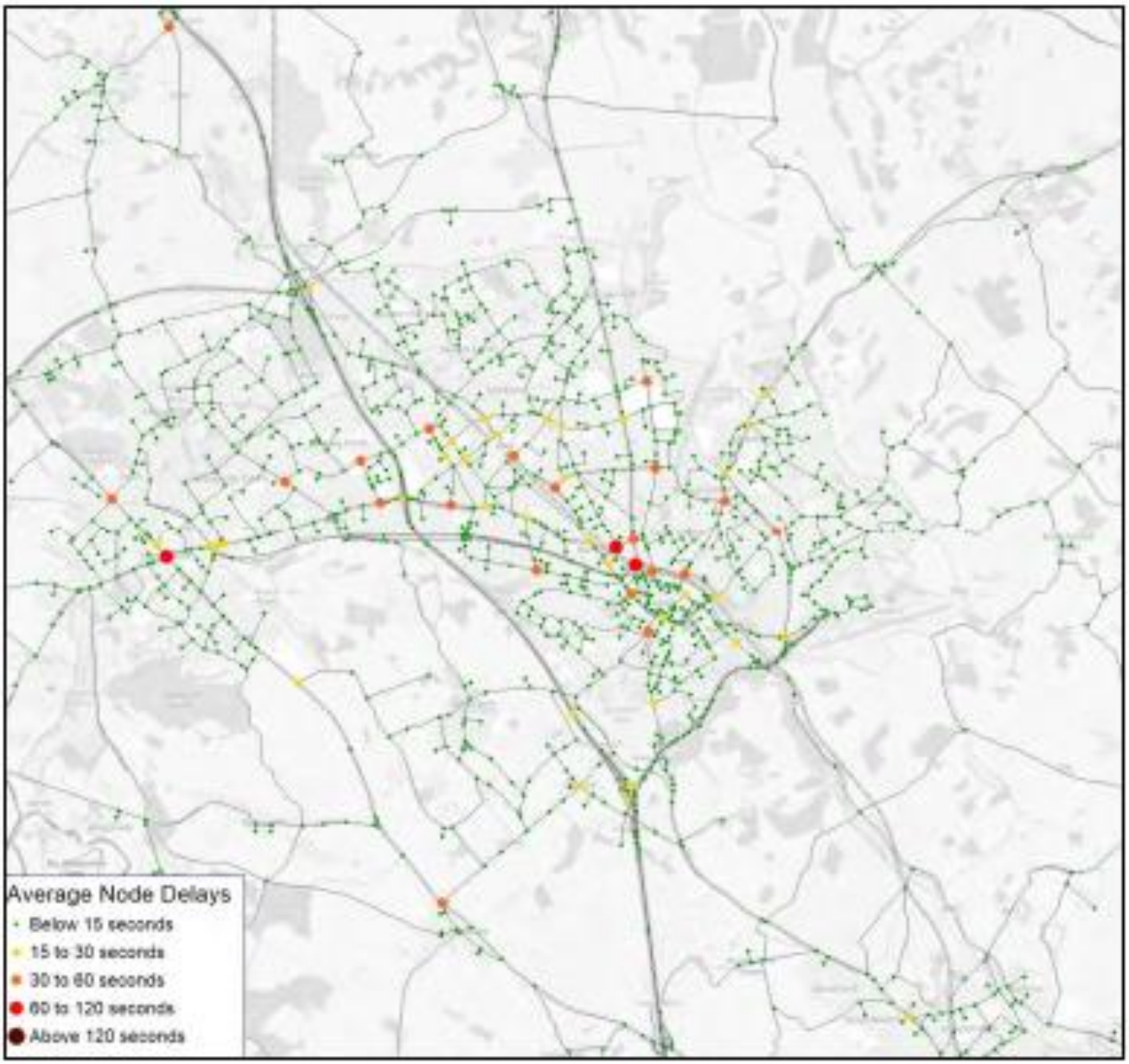



*Figure 43: Forecast average node delays, TAG-based "without" development forecasts, simulation network – 2043 interpeak (10:00 – 16:00)*

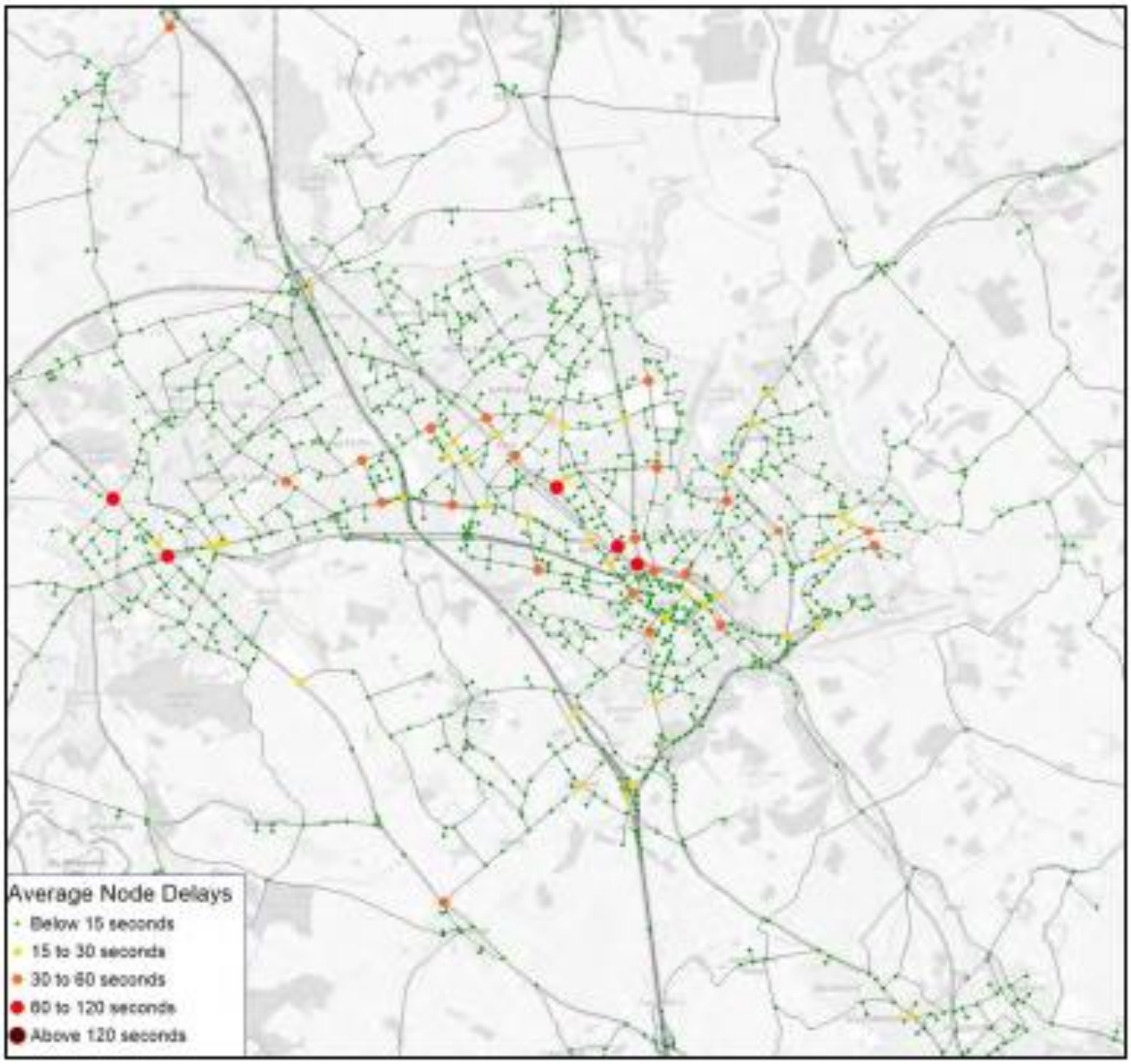



*Figure 44: Forecast average node delays, TAG-based "with" development forecasts, simulation network – 2043 interpeak (10:00 – 16:00)*

*Source: London Luton Airport Expansion, 7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)*

# APPENDIX E

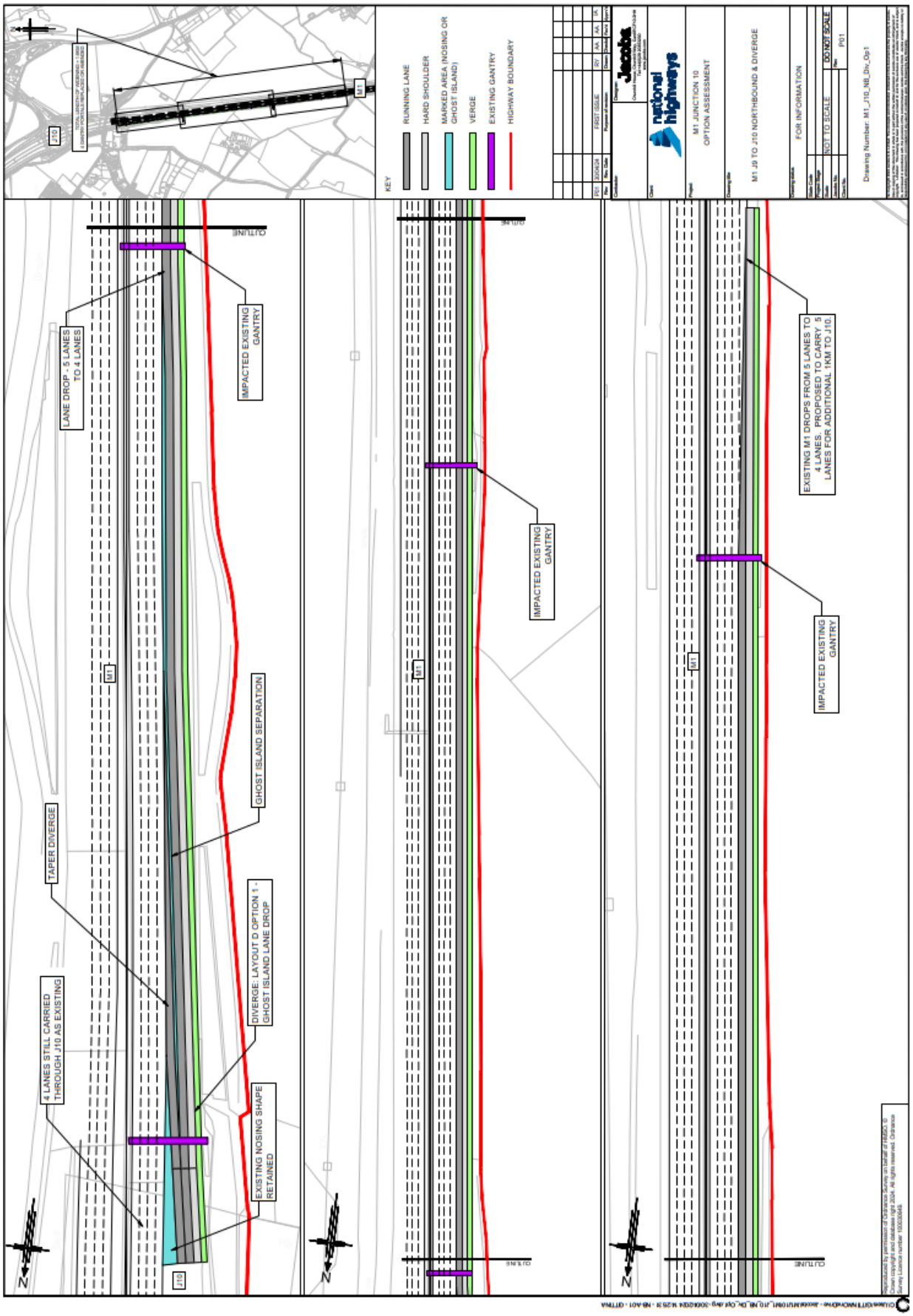



*Figure 45 - Intervention 1 - Drawing M1_J10_NB_Div_Op1-NB-A-01*


*Figure 46 - Intervention 2 - Drawing M1_J10_SB_Mer_Op1-SB-A-01*

# Luton DCO NH Requirements Summary Table

| Airport Expansion Phase | Year* | Airport Passengers (mppa) | DCO Proposal | NH Additional Requirements |
|---|---|---|---|---|
| N/A | 2023 | 18.5 | N/A | N/A |
| 1 | 2027 | 21.5 | Widening to the northbound off-slip to provide three lanes on the roundabout approach<br><br>Widening to the western circulatory carriageway to provide a fourth lane:<br>- Three lanes able to circulate from northbound off-slip onto A1081<br>- Two lanes continue from southern / western circulatory onto the northbound on-slip<br><br>Widening to the A1081 exit to provide a three-lane exit which subsequently merges back to two lanes<br><br>Amendments to the northbound on-slip white lining to extend the length of two-lane running in advance of the merge to one lane | None |
| 2a | 2039 | 27 | Creation of two segregated left turn lanes from A1081 to southbound on-slip, with merge from two lanes to one lane on the slip<br><br>White lining amendments to southbound on-slip, to lengthen merge distance onto mainline by approx. 150m | M1 Junction 10 Southbound Merge:<br><br>Changing the merge layout type from 'Layout B - parallel merge' to a higher capacity 'Layout C - ghost island merge'. This involves some localised widening. |

| | | | | |
|---|---|---|---|---|
| 2b | 2043 | 32 | Two segregated lanes onto southbound on-slip retained, with nearside lane running into hard shoulder and offside lane merging into Lane 2.<br><br>Amendments to northbound off-slip white lining to provide two merging lanes<br><br>Further widening to western circulatory to five lanes, to completely separate eastbound movements onto A1081 from northbound off-slip, and movements from southern circulatory onto northbound on-slip<br><br>Removal of the segregated left turn from southbound off-slip to A1081, to enable three lanes to enter A1081 from circulatory without subsequent merge. Signalisation of the reconfigured junction between the southbound off-slip / northern roundabout circulatory | Changing the diverge layout type from 'Layout B option 2 - Two-lane auxiliary diverge' to a higher capacity 'Layout D option 1 - ghost island lane drop'<br>Where the nearside 5th lane (lane 1) is discontinued between Junction 9 and 10, the discontinued lane would be extended by an additional 1.1km where it would be incorporated into the lane drop described above. |

*Indicative year for planning purposes