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London Luton Airport Expansion

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**8.183 Response to Examining Authority's Commentary on the
Draft Development Consent Order (PD-018) - Proposed
Amendments to Schedule 1 Off-site Highway Works Work No. 6e**

Infrastructure Planning (Examination Procedure) Rules 2010 Application Document

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The Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

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

**8.183 Response to Examining Authority’s Commentary on the Draft
Development Consent Order [PD-018] - Proposed Amendments to
Schedule 1 Offsite Highway Works Work No. 6e**

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1 INTRODUCTION

1.1.1 The Examining Authority (ExA) in its commentary on the Draft Development Consent Order (DCO) [PD-018] proposed amendments to Schedule 1 of the DCO including amendments to Offsite Highway Works Work No. 6e. The amendments proposed the removal of the following proposed off-site highway works:

(d) Eaton Green Road and Lalleford Road, including the removal of the existing mini-roundabout junction and conversion to a signalised junction and localised realignment of the carriageway;

(e) Wigmore Lane and Crawley Green Road. To include works to:

(i) the Junction of Wigmore and Crawley Green Road, including the removal of the existing roundabout junction and conversion to a signalised junction, the provision of signalised pedestrian crossings, the provision of give-way left-turn flares and the realignment and widening of the carriageway;

(ii) Wigmore Lane, including the realignment and widening of a lane and removal of a bus stop layby; and

(iii) the junction of Wigmore Lane and Raynham Way, including the removal of the existing roundabout junction and conversion to a signalised junction, the provision of signalised pedestrian crossing and the realignment and widening of the carriageway;

(f) Eaton Green Road and Wigmore Lane, including works to the junction of Wigmore Lane and existing Asda, the removal of the existing roundabout junction and conversion to a signalised junction the provision of signalised pedestrian crossings and the realignment and widening of the carriageway;

(j) Crawley Green Road/Lalleford Road, including replacement of the mini roundabout with a three-arm signalised junction, minor kerb line amendments along Crawley Green Road and Lalleford Road and amendments to road markings;

1.1.2 The ExA noted that this was in response to the significant number of relevant representations expressing concerns regarding the extent of the proposed works to Eaton Green Road, Wigmore Lane and Crawley Green Road and the lack of sufficient justification for these works.

1.1.3 The Applicant's response [REP8-036] at Deadline 8 set out the substantial evidence that had been provided in the submission documents to support the need for the works. The Applicant also noted that that removal of these works would have significant adverse impacts on traffic movements in and around Luton and that further information would be provided at Deadline 9 to show the significant adverse impact of the removal.

1.1.4 This document provides a 'sensitivity test' conducted with a 2043 Assessment Phase 2b full development proposed demand and which considers a revised

road network which removes the improvement works on Crawley Green Road, Wigmore Lane and Eaton Green Road in accordance with the ExA's proposals.

2 MODEL UPDATES

- 2.1.1 This sensitivity test has been undertaken using the 2043 Assessment Phase 2b full development models removing the DCO proposed upgrades to Wigmore Lane, Crawley Green Road, Eaton Green Road and the associated junctions. These include the following mitigations shown in the off-site Highway Works drawings, Transport Assessment Appendices - Part 1 of 3 (Appendices A-E) **[APP-200]**:
- a. Eaton Green Road / Lalleford Road Assessment Phase 1 (drawing number **LLADCO-3C-ARP-SFA-HWM-DR-CE-0011**).
 - b. Wigmore Lane / Crawley Green Road Assessment Phase 2a (drawing number **LLADCO-3C-ARP-SFA-HWM-DR-CE-0012**).
 - c. Wigmore Lane / Eaton Green Road Assessment Phase 2a (drawing number **LLADCO-3C-ARP-SFA-HWM-DR-CE-0013**).
 - d. Crawley Green Road / Lalleford Road Assessment Phase 2a (drawing number **LLADCO-3C-ARP-SFA-HWM-DR-CE-0018**).
- 2.1.2 All other capacity upgrades in all three phases Assessment Phase 1, Phase 2a and Phase 2b are included as per the DCO.

3 SENSITIVITY TEST FINDINGS

3.1 Introduction

3.1.1 This section reports the findings of the sensitivity test. The test has been undertaken using the 2043 Assessment Phase 2b with Proposed Development Vissim models that were developed as part of the Rule 9 work and reported in **Accounting for Covid-19 in Transport Modelling Final Report [AS-159]**.

3.1.2 The following sections set out the impact that the removal of the mitigation measures would have on the highway network. In particular, the following sections consider the modelling results from the **Accounting for Covid-19 in Transport Modelling Final Report [AS-159]** for the 2043 Assessment Phase 2b with the Proposed Development including mitigation (referred to below as 'Proposed Development') and the 2043 Assessment Phase 2b with the Proposed Development (with reduced mitigation - referred to below as 'Sensitivity Test').

3.2 Network Performance

3.2.1 **Table 3.1** summarises the network performance statistics for the AM peak and compares the performance of the Proposed Development with the Sensitivity Test.

Table 3.1: 2043 AM Peak network statistics

Parameter	Proposed Development	Sensitivity Test
Average Delay Time per Vehicle (seconds), All Vehicle Types	142	222
Average Number of Stops per Vehicles, All Vehicle Types	7	7
Average Speed (mph), All Vehicle Types	23	21
Average Stopped Delay per Vehicle (seconds), All Vehicle Types	43	122
Number of Unreleased Vehicles	1,325	2,899

3.2.2 **Table 3.1** shows that in the Sensitivity Test there is a significant decline in overall network performance when compared to the outcomes presented for the Proposed Development with average delays increasing significantly (by over 56%) as well as a large increase in the number of unreleased vehicles (vehicles that cannot enter the model network due to network congestion/constraints). This increase is primarily attributed to congestion resulting from capacity constraints at junctions on Wigmore Lane, Crawley Green Road, and Eaton

Green Road, leading to flow breakdown across the local road network. This is shown in **Figure 3.1** to **Figure 3.3** which provide screenshots of the AM peak hour model simulation from the Proposed Development model and the Sensitivity Test model. The red colour in the images represents queues of stationary vehicles on the network.

- 3.2.3 **Figure 3.1** shows the operation of the network towards the start of the AM peak hour (08:15) and shows that in the Proposed Development scenario, the network operates with minimal queues but that in the Sensitivity Test, congestion begins to form at junctions along Wigmore Lane, particularly at the Wigmore Lane/Eaton Green junction. This gradually leads to a breakdown in traffic flow at Wigmore Lane and Eaton Green Road.
- 3.2.4 **Figure 3.2** shows the operation of the network by mid-peak hour (08:30). As can be seen in the Sensitivity Test, the network shows gridlock conditions with extensive stationary vehicles on roads across Luton town centre, impacting the operation on Vauxhall Way, Crawley Green Road, Eaton Green Road, and Airport Access Road (AAR). This occurs as a result of the breakdown in flow caused by congestion along the Wigmore Lane corridor. In contrast, with the Proposed Development scenario shows that there are no significant queues on the network.
- 3.2.5 **Figure 3.3** shows the operation of the network in the late peak hour (09:00). The Proposed Development scenarios show that the network operates seamlessly with no substantial queues on the highway network. In the Sensitivity Test, there is complete flow breakdown resulting in queues across the entire Luton road network and extending to the A1081 and M1.

Figure 3.1: Comparison of network performance (early AM peak hour)



Figure 3.2: Comparison of network performance (mid AM peak hour)

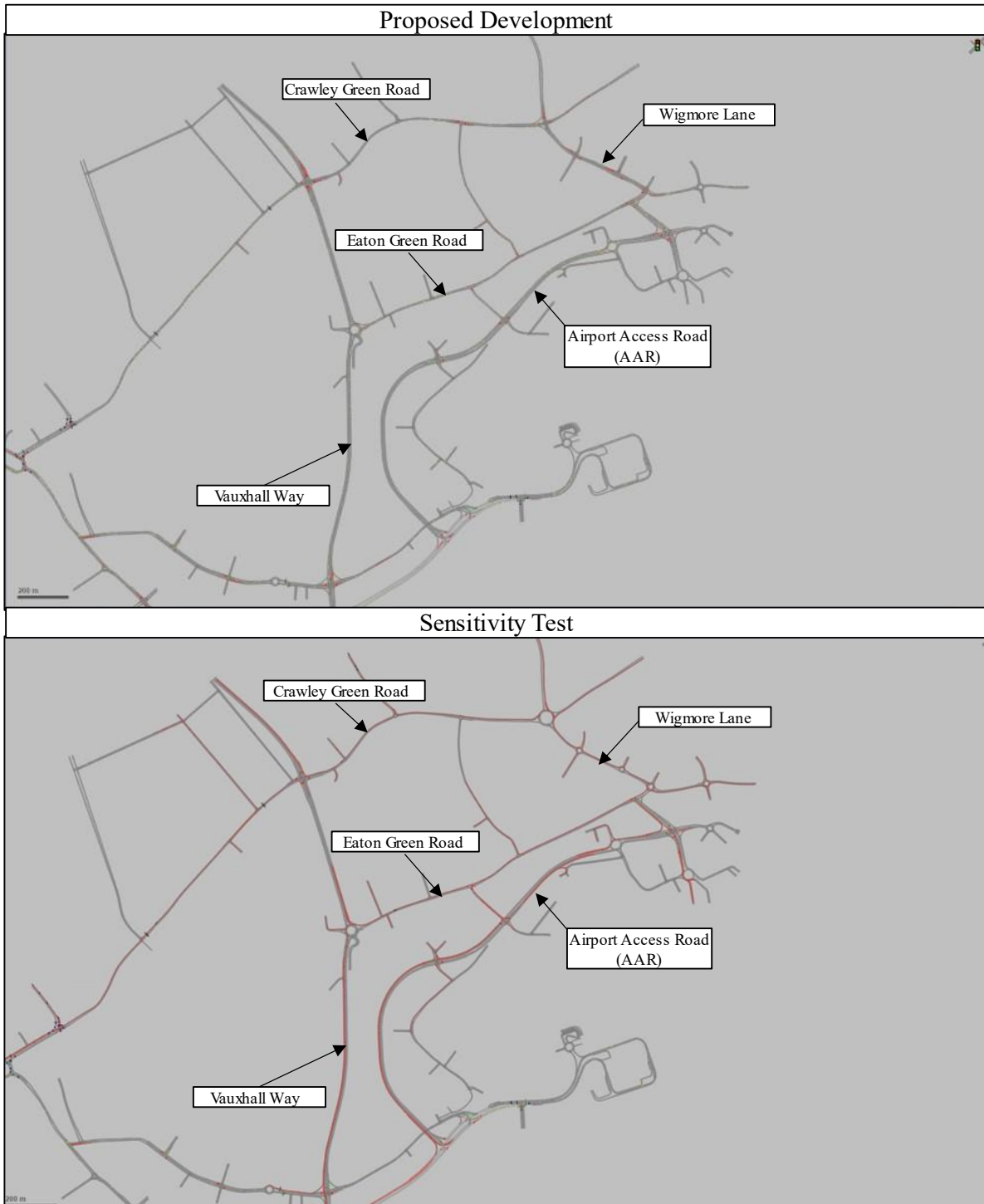
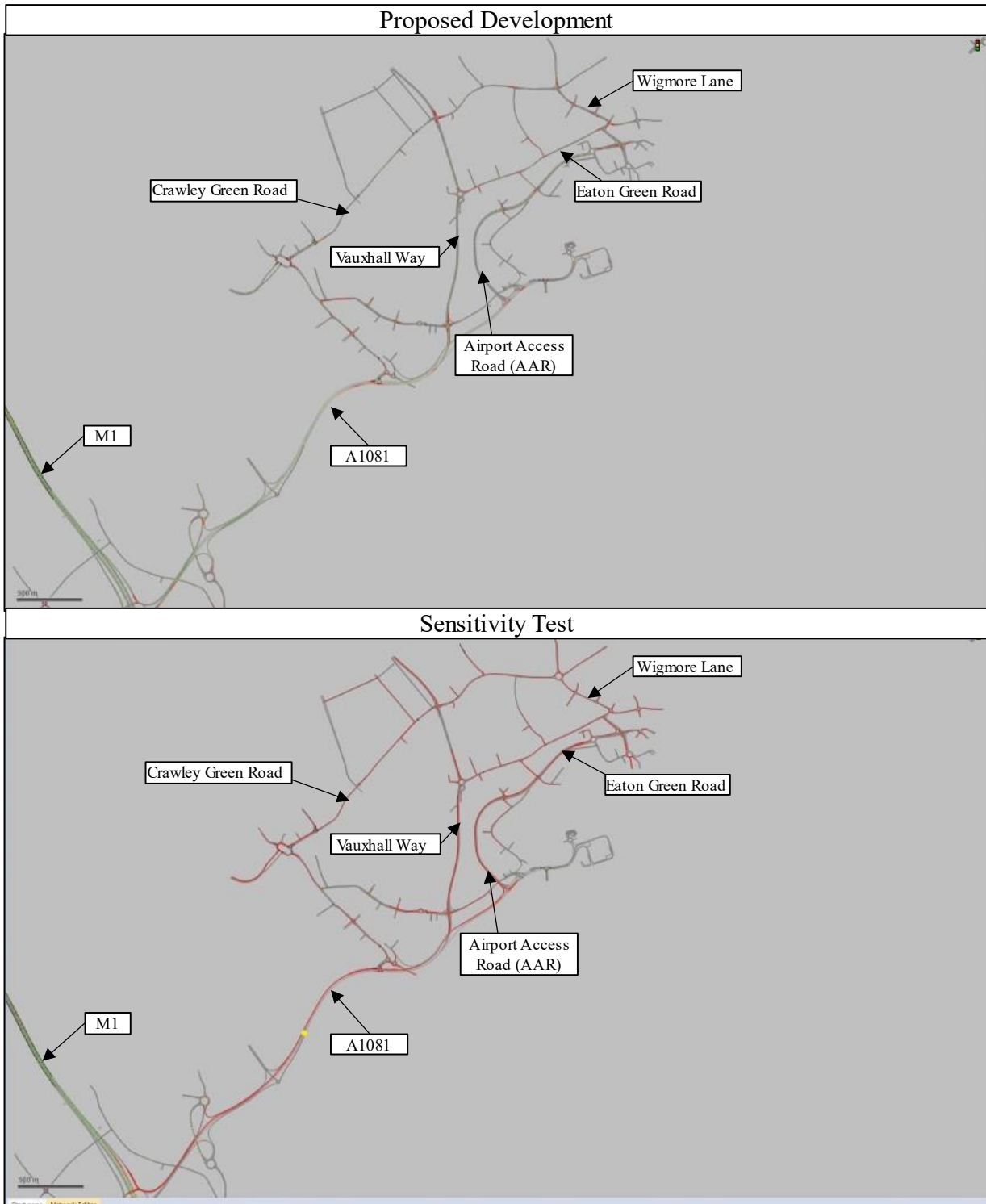


Figure 3.3: Comparison of network performance (late AM peak hour)



3.2.6 This breakdown in flow results in a significant increase in unreleased vehicles in the Sensitivity Test. The majority of these unreleased vehicles are concentrated on corridors directly impacted by the removal of mitigation works:

- a. Eaton Green Road from the east of Wigmore Lane - 219 unreleased vehicles or approximately 40% of total demand on this approach;

- b. Crawley Green Road east of Wigmore Lane - 170 unreleased vehicles or approximately 30% of total demand on this approach;
- c. Wigmore Lane north of Crawley Green Road - 144 unreleased vehicles or approximately 18% of total demand on this approach;
- d. Vauxhall Way north of Crawley Green Road - 189 unreleased vehicles or approximately 15% of total demand on this approach; and
- e. Ashcroft Road north of Crawley Green Road - 93 unreleased vehicles or approximately 16% of total demand on this approach.

3.2.7 This suppressed demand impacts on local journeys and if this latent demand i.e. unreleased vehicles, were to enter the network, it would likely worsen congestion on the network, further deteriorating the overall network performance in the absence of mitigation as provided for in the Proposed Development scenario.

3.2.8 **Table 3.2** summarises the network performance statistics for the PM peak and compares the performance of the Proposed Development with the Sensitivity Test.

Table 3.2: 2043 PM Peak network statistics

Parameter	Proposed Development	Sensitivity Test
Average Delay Time per Vehicle (seconds), All Vehicle Types	103	177
Average Number of Stops per Vehicles, All Vehicle Types	4	4
Average Speed (mph), All Vehicle Types	29	26
Average Stopped Delay per Vehicle (seconds), All Vehicle Types	44	121
Number of Unreleased Vehicles	66	1,524

3.2.9 As with the AM peak results, **Table 3.2** shows that in the PM peak hour, the Sensitivity Test experiences a significant decline in overall network performance when compared to the outcomes presented for the Proposed Development with average delays increasing significantly (by over 72%). Again, this increase is primarily attributed to congestion resulting from capacity constraints at junctions on Wigmore Lane, Crawley Green Road, and Eaton Green Road, leading to flow breakdown across the local road network. **Figure 3.4** to **Figure 3.6** provides screenshots of the PM peak hour model simulation from the Proposed Development model and the Sensitivity Test model.

- 3.2.10 **Figure 3.4** shows the operation of the network towards the start of the PM peak hour (17:15) and shows that in the Proposed Development scenario, the network operates with minimal queues but that in the Sensitivity Test, congestion begins to form at junctions along Wigmore Lane resulting in queues of stationary vehicles on Wigmore Lane and Eaton Green Road.
- 3.2.11 **Figure 3.5** shows the operation of the network by mid-peak hour (17:30). As can be seen in the Sensitivity Test, gridlock conditions emerge due to queues of stationary vehicles particularly on the local roads to the north of the airport. This constrains vehicle entry into the network through Wigmore Lane, Crawley Green Road, Eaton Green Road, and Vauxhall Way. In contrast, the Proposed Development scenario shows that the network continues to operate smoothly, avoiding any adverse impacts on the local highway network.
- 3.2.12 **Figure 3.6**, shows the operation of the network towards the end of the peak hour (18:00). The Proposed Development scenarios shows that the network operates seamlessly with no substantial queues on the highway network. In the Sensitivity Test, there are stationary vehicle queues extending to the A1081 and M1, causing a complete breakdown of flow across the entire Luton road network.

Figure 3.4: Comparison of network performance (early PM peak hour)



Figure 3.5: Comparison of network performance (mid PM peak hour)

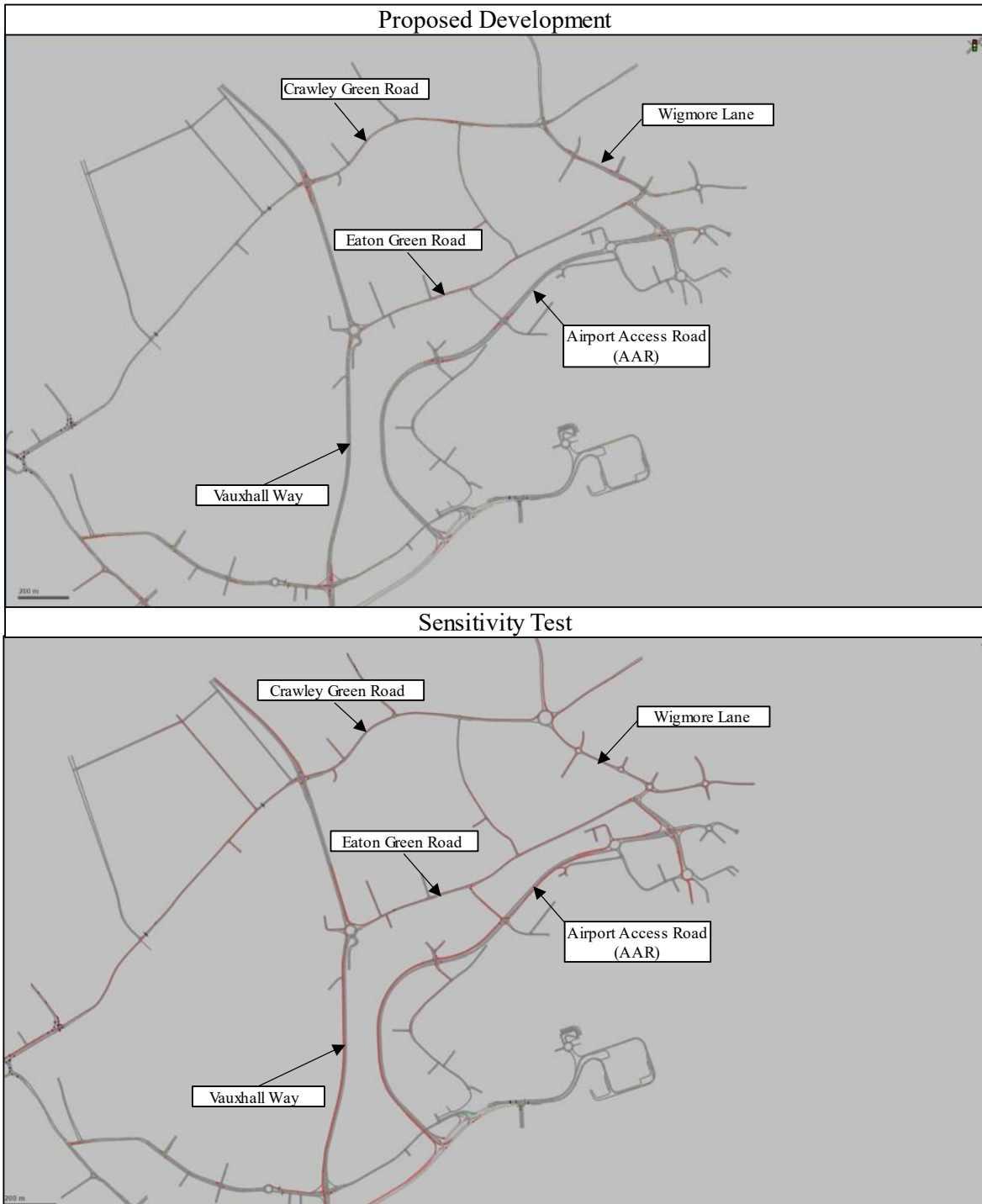
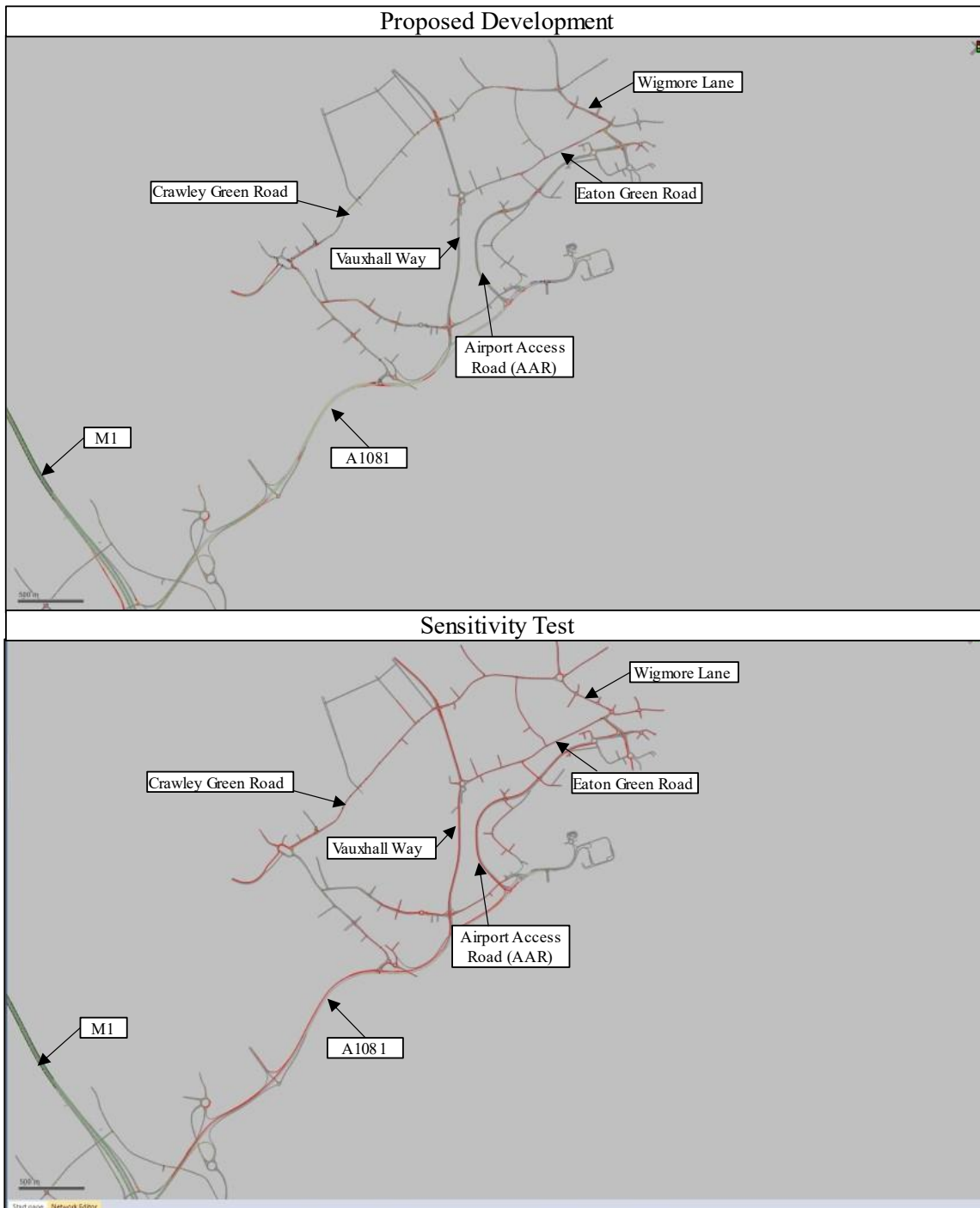


Figure 3.6: Comparison of network performance (late PM peak hour)



3.2.13 As with the AM peak, the majority of the unreleased vehicles are concentrated on roads with direct impact of removal of mitigations works including:

- a. Eaton Green Road from the east of Wigmore Lane - 32 unreleased vehicles or approximately 15% of total demand on this approach;
- b. Crawley Green Road east of Wigmore Lane - 55 unreleased vehicles or approximately 17% of total demand on this approach;

- c. Wigmore Lane north of Crawley Green Road - 84 unreleased vehicles or approximately 18% of total demand on this approach;
- d. Vauxhall Way North of Crawley Green Road - 100 unreleased vehicles or approximately 10% of total demand on this approach; and
- e. Ashcroft Road north Crawley Green Road - 54 unreleased vehicles or approximately 15% of total demand on this approach.

3.2.14 As with the AM peak hour, it is the mitigation strategy associated with the Proposed Development that enables this unreleased demand to be catered for and reduces the impact on local journeys.

3.3 Junction modelling

3.3.1 **Table 3.3** summarises the AM Peak junction performance for the Proposed Development and the Sensitivity Test. **Table 3.3** shows the Level of Service (LoS) and the junction throughput for each of the junctions.

Table 3.3: 2043 AM Peak junction performance summary

Junctions	Level of Service (LoS)		Junction Throughput (vehicles per hour)	
	Proposed Development	Sensitivity Test	Proposed Development	Sensitivity Test
M1 Junction 10 (1)	D	C	6,518	6,216 (-302)
A1081 New Airport Way / London Road (north) roundabout (2)	B	B	2,386	2,288 (-98)
A1081 New Airport Way / A1081 London Road (south) roundabout (3)	A	A	2,527	2,414 (-113)
A1081 New Airport Way / B653 / Gipsy Lane junctions (4)	C	C	7,687	7,084 (-603)
Kimpton Road / A505 Vauxhall Way signalised junction (5)	C	C	3,688	3,234 (-454)
A1081 New Airport Way / AAR signalised junction (6)	B	B	3,396	3,129 (-267)
A1081 New Airport Way / Percival Way signalised junction (7)	A	A	2,219	2,025 (-194)

Junctions	Level of Service (LoS)		Junction Throughput (vehicles per hour)	
	Proposed Development	Sensitivity Test	Proposed Development	Sensitivity Test
Percival Way / Frank Lester Way / President Way signalised junction (8)	B	B	5,344	4,587 (-757)
Eaton Green Road Link / AAR signalised junction (9)	C	C	2,812	2,298 (-514)
A505 Vauxhall Way / Eaton Green Road revised roundabout (10)	B	B	3,418	2,866 (-552)
Eaton Green Road / Frank Lester Way signalised junction (11)	B	C	1,665	1,411 (-254)
Eaton Green Road / Wigmore Road signalised junction (12)	D	E	2,545	1,975 (-570)
Vauxhall Way / Crawley Green Road signalised junction (13)	D	D	3,805	3,254 (-551)
Crawley Green Road / Wigmore Lane signalised junction (14)	C	D	2,453	1,943 (-510)
Windmill Road / Kimpton Road signalised junction (15)	C	B	2,181	1,981 (-200)
Eaton Green Road / Lalleford Road signalised junction (16)	C	B	1,446	1,325 (-121)
Wigmore Lane / Raynham Way signalised junction (17)	B	B	1,661	1,257 (-404)
Wigmore Lane / Asda access signalised junction (18)	B	A	1,654	1,236 (-418)
Windmill Road / St Mary's Road / Crawley Green Road roundabout (19)	D	C	2,954	2,615 (-339)
Crawley Green Road / Lalleford Road signalised junction (20)	C	A	1,785	1,611 (-174)
Provost Way / AAR signalised junction (21)	B	B	2,653	2,338 (-315)

Junctions	Level of Service (LoS)		Junction Throughput (vehicles per hour)	
	Proposed Development	Sensitivity Test	Proposed Development	Sensitivity Test
Provost Way / Percival Way signalised junction (22)	A	A	580	493 (-87)
President Way / AAR roundabout (23)	A	A	2,602	2,117 (-485)
Terminal 2 access roundabout (24)	A	A	787	659 (-128)
Notes: LoS A and B (highlighted in green): stable flows, LoS C and D (highlighted in yellow): stable flows with acceptable delays, LoS E and F (highlighted in red): unstable flow with intolerable delays				

3.3.2 **Table 3.3** shows that whilst there is not a material change in the LoS, there is a substantial reduction in the throughput of junction not only along Wigmore Lane, Eaton Green Road and Crawley Green Road but across the entire network. The LoS figures only reflect delays experienced by vehicles that successfully cross the junctions and as such should not be relied upon in isolation when considering the impacts of the Proposed Development. In the Sensitivity Test, a relatively lower number of vehicles manage to cross the junctions, mostly during the first half of the peak hour when congestion is less severe. Beyond this point, there is a breakdown in flow on Wigmore Lane which results in the Wigmore Lane junctions ‘locking-up’ such that few vehicles are able to get through the junctions and this gradually extends to other roads in Luton town centre. In the Proposed Development models, the inclusion of mitigation measures at Wigmore Lane, Crawley Green Road, and Eaton Green Road ensures that a significantly higher number of vehicles can cross the junctions without adversely affecting the LoS of the junctions.

3.3.3 **Table 3.4** summarises the PM Peak junction performance for the Proposed Development and the Sensitivity Test.

Table 3.4: 2043 PM Peak junction performance summary

Junctions	Level of Service (LoS)		Junction Throughput (vehicles per hour)	
	Proposed Development	Sensitivity Test	Proposed Development	Sensitivity Test
M1 Junction 10 (1)	B	B	7,410	7,059 (-351)
A1081 New Airport Way / London Road (north) roundabout (2)	C	C	2,446	2,359 (-87)
A1081 New Airport Way / A1081 London Road (south) roundabout (3)	A	A	2,704	2,607 (-97)
A1081 New Airport Way / B653 / Gipsy Lane junctions (4)	C	C	7,881	7,130 (-751)
Kimpton Road / A505 Vauxhall Way signalised junction (5)	D	D	3,808	3,392 (-416)
A1081 New Airport Way / AAR signalised junction (6)	B	B	3,267	2,932 (-335)
A1081 New Airport Way / Percival Way signalised junction (7)	A	A	2,049	1,765 (-284)
Percival Way / Frank Lester Way / President Way signalised junction (8)	B	B	5,382	4,647 (-735)
Eaton Green Road Link / AAR signalised junction (9)	D	D	2,313	1,670 (-643)
A505 Vauxhall Way / Eaton Green Road revised roundabout (10)	B	A	3,598	2,915 (-683)
Eaton Green Road / Frank Lester Way signalised junction (11)	C	C	2,011	1,549 (-462)
Eaton Green Road / Wigmore Road signalised junction (12)	D	D	2,504	1,661 (-843)
Vauxhall Way / Crawley Green Road signalised junction (13)	C	C	4,218	3,610 (-608)
Crawley Green Road / Wigmore Lane signalised junction (14)	B	B	2,582	2,267 (-315)

Junctions	Level of Service (LoS)		Junction Throughput (vehicles per hour)	
	Proposed Development	Sensitivity Test	Proposed Development	Sensitivity Test
Windmill Road / Kimpton Road signalised junction (15)	B	B	2,727	2,503 (-224)
Eaton Green Road / Lalleford Road signalised junction (16)	B	B	1,768	1,321 (-447)
Wigmore Lane / Raynham Way signalised junction (17)	B	B	1,856	1,559 (-297)
Wigmore Lane / Asda access signalised junction (18)	C	B	2,086	1,584 (-502)
Windmill Road / St Mary's Road / Crawley Green Road roundabout (19)	D	D	3,425	3,082 (-343)
Crawley Green Road / Lalleford Road signalised junction (20)	C	B	1,914	1,786 (-128)
Provost Way / AAR signalised junction (21)	B	B	2,881	2,488 (-393)
Provost Way / Percival Way signalised junction (22)	A	A	902	795 (-107)
President Way / AAR roundabout (23)	A	A	2,040	1,604 (-436)
Terminal 2 access roundabout (24)	A	A	688	589 (-99)
Notes: LoS A and B (highlighted in green): stable flows, LoS C and D (highlighted in yellow): stable flows with acceptable delays, LoS E and F (highlighted in red): unstable flow with intolerable delays				

3.3.4 As with the AM Peak hour, **Table 3.4** shows that whilst there is no material change in the level of service, there is a substantial reduction in the throughput of junction across the entire network. This reduction in throughput simply adds to the congestion across the network, reflected in the increased delays and increased unreleased vehicles which further impact local journeys as shown in **Table 3.2** and **Figure 3.4** to **Figure 3.6**.

4 CONCLUSION

- 4.1.1 This note has been prepared in response to the ExA's proposals to amend the off-site highway works described in Schedule 1 of the Draft DCO, to remove proposed mitigation measures on Wigmore Lane, Crawley Green Road and Eaton Green Road.
- 4.1.2 This note provides a comprehensive assessment through a Sensitivity Test which considers the consequential traffic impacts of the removal of the works.
- 4.1.3 The network performance statistics clearly demonstrate that without the mitigation measures there is likely deterioration in overall network performance with increased average delays and a substantial increase in unreleased vehicles which would particularly impact on the local areas around Wigmore Lane, Crawley Green Road and Eaton Green Road.
- 4.1.4 The screenshots from the Vissim model simulation further illustrate the breakdown in flow that occurs from the removal of the mitigation measures with congestion and queues stemming from the capacity constraints impacting on the entire local road network in the town centre, as well as the connecting major roads of the A1081 and M1.
- 4.1.5 In summary, the Sensitivity Test has clearly demonstrated the crucial role that the mitigation works to Wigmore Lane, Crawley Green Road, and Eaton Green Road play in maintaining the flow of traffic across the network and thereby ensuring access to the Airport and the effective operation of highway network in the local and wider area.