

**M25 junction 10/A3 Wisley interchange
TR010030
10.7 Transport Assessment
Addendum Report**

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10.7 Transport Assessment Addendum Report

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1. Introduction

1.1 Purpose of Transport Assessment Addendum Report

- 1.1.1 The Transport Assessment Addendum Report has been prepared to describe the anticipated changes in transport related impacts associated with the proposed design modifications on the A245 eastbound between Seven Hills junction and Painshill junction for the M25 junction 10 Wisley Interchange Scheme draft Development Consent Order (dDCO), which was submitted to the Planning Inspectorate on 19 June 2019.
- 1.1.2 This document is to be read in conjunction with the Transport Assessment Report [APP-136], Transport Assessment Supplementary Information Report [REP2-011] and the Traffic Forecasting Report [REP1-010].

2. Summary of Proposed Changes

2.1 Proposed Design Changes

- 2.1.1 The design which has been submitted in the dDCO submission to the Planning Inspectorate included three lanes between Seven Hills junction and Painshill junction on the A245 eastbound carriageway, with a free flow left-turn at Painshill junction for movements from the A245 to the A3 northbound on-slip.
- 2.1.2 The amended design retains three lanes on the A245 eastbound through the Seven Hills junction, however this narrows down to two lanes with a merge after the exit from the Seven Hills junction. Two-lanes on the eastbound carriageway is then retained for approximately 420m before flaring to three lanes on the approach to the Painshill junction.
- 2.1.3 The free-flow left turn lane from the A245 eastbound to the A3 northbound at the Painshill junction has been removed from the design, with all three lanes now subject to traffic signal control.
- 2.1.4 The design allows both the left and middle lanes approaching Painshill Junction to make a left-turn, with the middle lane being a shared straight ahead and left turn lane. It is expected that most vehicles will use the left lane to complete this movement, however allowing left turning vehicles to also use the middle lane increases capacity for this movement, particularly if there is queueing in the left lane.
- 2.1.5 The scheme layout included in the dDCO submission is shown in Figure 2-1 and Figure 2-2.
- 2.1.6 The proposed changes to the scheme are shown in Figure 2-3.

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NOTES

1. THESE PLANS SHOULD BE READ IN CONJUNCTION WITH TR010030/APP/2.8
2. NEW PLAN AND TR010030/APP/2.8 KEY LEGEND
3. THESE PLANS SHOULD BE READ IN CONJUNCTION WITH OTHER PLANS AND DOCUMENTS IN THE DEVELOPMENT CONSENT GRANT LOCAL. THE PROPOSED SCHEME WILL BE SUBJECT TO DETAILED DESIGN DEVELOPMENT WITHIN THE LIMITS OF DEMONSTRATION SHOWN ON THE TR010030/APP/2.8 WORKS PLANS.
4. THE ALIGNMENT OF UTILITY DIVERSIONS ARE SHOWN ON THE TR010030/APP/2.8 WORKS PLANS.
5. FOR CROSS-SECTIONS REFER TR010030/APP/2.9 DRAWINGS.
6. THE INFORMATION SHOWN ON THIS PLAN IS COMMENSURATE WITH THE PRELIMINARY DESIGN STATUS OF THE PROJECT.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazard data normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction	Maintenance / Cleaning	Use	Decommissioning / Demolition
NONE	NONE	NONE	NONE

SHEET LAYOUT

A1

APPROVED - PUBLISHED

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3. Predicted Traffic Flow Impacts

3.1 Changes to traffic flows

- 3.1.1 The strategic SATURN traffic model has been updated to reflect the proposed amended arrangement.
- 3.1.2 The updated traffic flows (shown in vehicles) are compared against those from the dDCO application. These are presented in This is as expected, as there is are very minimal changes in travel time and consequently, reassignment of trips to alternative routes would not be anticipated.
- 3.1.3 Table 3:1 and Table 3:2, which show that the proposed amended arrangement results in negligible changes in forecast traffic flows on the road network.
- 3.1.4 This is as expected, as there is are very minimal changes in travel time and consequently, reassignment of trips to alternative routes would not be anticipated.

Table 3:1 Traffic Flow Comparison at Seven Hills junction (dDCO scheme vs amended scheme)

Peak	Arm	2022			2037		
		dDCO scheme DS	Updated scheme DS	Difference	dDCO scheme DS	Updated scheme DS	Difference
AM (Average 07:00-10:00)	A245 W (Byfleet)	1,076	1,068	-7	1,218	1,214	-5
	Seven Hills Road North	730	724	-6	757	755	-2
	A245 E (Painshill)	2,174	2,170	-4	2,143	2,141	-2
	Total	3,980	3,962	-17	4,118	4,110	-8
IP (Average 10:00 – 16:00)	A245 W (Byfleet)	1,038	1,032	-6	1,238	1,231	-7
	Seven Hills Road North	651	649	-2	676	674	-2
	A245 E (Painshill)	1,583	1,583	0	1,801	1,804	3
	Total	3,273	3,265	-8	3,715	3,710	-6
PM (Average 16:00 – 19:00)	A245 W (Byfleet)	1,124	1,116	-8	1,408	1,396	-12
	Seven Hills Road North	704	701	-3	762	763	1
	A245 E (Painshill)	1,860	1,859	-1	1,859	1,862	2
	Total	3,688	3,677	-12	4,029	4,021	-9

Table 3:2 Traffic Flow Comparison at Painshill junction (dDCO scheme vs amended scheme)

Peak	Arm	2022			2037		
		dDCO scheme DS	Updated scheme DS	Difference	dDCO scheme DS	Updated scheme DS	Difference
AM (Average 07:00-10:00)	A245 W (Seven Hills)	1,691	1,679	-12	1,834	1,8282	-6
	A3 N	814	810	-4	635	634	-1
	A245 E (Cobham)	1,153	1,153	-1	1,150	1,148	-2
	A3 S	1,322	1,319	-3	1,534	1,534	0
	Total	4,981	4,961	-20	5,153	5,145	-9
IP (Average 10:00 – 16:00)	A245 W (Seven Hills)	1,646	1,641	-5	1,849	1,845	-5
	A3 N	199	197	-2	208	210	2
	A245 E (Cobham)	1,131	1,130	-1	1,115	1,114	-1
	A3 S	1,429	1,427	-2	1,667	1,668	1
	Total	4,405	4,395	-10	4,840	4,837	-3
PM (Average 16:00 – 19:00)	A245 W (Seven Hills)	1,747	1,736	-11	2,062	2,049	-13
	A3 N	537	533	-3	448	448	0
	A245 E (Cobham)	1,200	1,200	1	1,177	1,178	1
	A3 S	1,319	1,319	0	1,457	1,458	0
	Total	4,803	4,789	-13	5,144	5,133	-11

3.2 Changes to operational performance

- 3.2.1 Additional traffic modelling has also been undertaken using the S-Paramics operational model and local junction models to assess the impact of the proposed change on the operation of the road network.
- 3.2.2 The summary results from the Painshill and Seven Hills junctions LinSig models have been compared against the results from Table 7-24 of the Transport Assessment Report [APP-136] and are presented in Table 3:3 and Table 3:4.
- 3.2.3 The model results show that for both forecast years there are minimal changes in the operational performance of the two junctions compared to the dDCO Scheme and that the significant capacity improvements and reduced Degree of Saturation (DoS) compared to the Do Minimum scenario are preserved by the amended scheme.

Table 3:3 Operational Performance at Seven Hills junction (LinSig)

Peak	Output	2022			2037		
		Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
AM	PRC (%)	-57.5	-3.6	-3.5	-54.1	-5.9	-6.1
	Max DoS	141.7	93.3	93.2	138.7	95.3	95.5
PM	PRC (%)	-43.7	11.4	14.1	-46.6	-0.3	-2.6
	Max DoS	129.3	80.8	78.9	132	90.3	92.4

Table 3:4 Operational Performance at Painshill junction (LinSig)

Peak	Output	2022			2037		
		Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
AM	PRC (%)	-19.9	-3.7	-2.6	-43.7	-2.3	-4.8
	Max DoS	107.9	93.3	92.4	129.3	92	94.4
PM	PRC (%)	-24.1	2.4	2.3	-19.1	-2.5	-1.3
	Max DoS	111.7	87.9	88.0	107.2	92.2	91.1

3.2.4 The average journey time and average delay per vehicle results from the updated S-Paramics model have been compared against those presented in Table 7-25 of the Transport Assessment [APP-136]. This comparison is presented in Table 3:5 and 3:6. The average journey time and delay per vehicle presented is the total through both the Seven Hills and the Painshill junctions, covering all approach arms.

Table 3:5 Average Journey Time(s) - Painshill/Seven Hills junctions (S-Paramics)

Time Period	2022				2037			
	Do Minimum	dDCO scheme DS	Updated scheme DS	Difference (Updated scheme vs DM)	Do Minimum	dDCO scheme DS	Updated scheme DS	Difference (Updated scheme vs DM)
0700-0800	4m 37s	3m 11s	3m 16s	-1m 21s	5m 22s	3m 5s	3m 7s	-2m 15s
0800-0900	6m 23s	3m 9s	3m 16s	-3m 7s	6m 33s	3m 4s	3m 9s	-3m 24s
1600-1700	3m 52s	2m 51s	2m 51s	-1m 1s	4m 21s	3m 2s	3m 4s	-1m 17s
1700-1800	3m 51s	2m 49s	2m 50s	-1m 1s	4m 19s	3m 6s	3m 9s	-1m 10s
Peak	4m 39s	3m	3m 3s	-1m 36s	5m 7s	3m 4s	3m 7s	-2m 0s

Table 3:6 Average delay per vehicle (s) - Painshill/Seven Hills junctions (S-Paramics)

Time Period	2022				2037			
	Do Minimum	dDCO scheme DS	Updated scheme DS	Difference (Updated scheme vs DM)	Do Minimum	dDCO scheme DS	Updated scheme DS	Difference (Updated scheme vs DM)
0700-0800	3m 5s	1m 36s	1m 41s	-1m 24s	3m 51s	1m 30s	1m 32s	-1m 19s
0800-0900	4m 51s	1m 34s	1m 41s	-3m 10s	5m 1s	1m 29s	1m 34s	-4m 27s
1600-1700	2m 21s	1m 16s	1m 16s	-1m 5s	2m 49s	1m 27s	1m 29s	-1m 20s
1700-1800	2m 20s	1m 14s	1m 15s	-1m 5s	2m 47s	1m 31s	1m 33s	-1m 14s
Peak	3m 9s	1m 27s	1m 30s	-1m 39s	3m 35s	1m 29s	1m 32s	-2m 3s

- 3.2.5 The results also show there is little difference in the predicted average journey time and delay through the junction between the dDCO scheme and the amended scheme, with a forecast maximum increase of around seven seconds per vehicle in any time period.
- 3.2.6 The updated scheme still shows considerable improvements in operational performance at the Painshill and Seven Hills junctions, through journey time improvements and reductions in delays when comparing with the 2022 and 2037 Do Minimum scenarios.
- 3.2.7 When comparing the dDCO application scheme with the amended scheme, it is noted there are minor increases in journey times for vehicles travelling eastbound from the Seven Hills junction through the Painshill junction to the A3 northbound, as this movement now must travel through the signals. In the previous design, vehicles could use the free-flow left turn lane from the A245 to A3 northbound on-slip.
- 3.2.8 In addition, there are also some journey time increases for vehicles travelling eastbound on the A245 through the Painshill junction, primarily due to minor changes in flow from the strategic model combine with minor tweaks to traffic signal timings.
- 3.2.9 Although there are some localised disbenefits as a result of the amended scheme compared to the dDCO Scheme, it should be noted that in all time periods, the amended scheme maintains significant benefits compared with the Do Minimum scenarios.

3.3 Changes in Level of Service (LoS)

- 3.3.1 The Level of Service (LoS) results from the updated S-Paramics model have been extracted and compared against those presented in Tables F46 to F-53 of the Transport Assessment [APP-136]. These are presented in Table 3:7 to Table 3:14.
- 3.3.2 The results show that with the amended scheme, there is a limited impact on the LoS results at the Painshill and Seven Hills junctions, with the majority of LoS results being the same compared to the dDCO scheme.

- 3.3.3 There are, however, minor changes in LoS at the following locations:
- 0700-0800 Seven Hills North – Improvement in LoS from D to C in 2022;
 - 0700-0800 Byfleet Road (west) – Reduction in LoS from C to D in 2037;
 - 0800-0900 Byfleet Road (east) – Reduction in LoS from D to E in 2037 (all lanes) and a reduction in Los from C to D in 2022 (right turn);
 - 1700-1800 Cobham Bridge (westbound) – Reduction in LoS from C to D in 2022 and C to E in 2037;
 - 1700-1800 Byfleet Road (east- ahead) – Reduction in LoS from E to D in 2022; and
 - 1700-1800 Byfleet Road (east- right turn) – Improvement in LoS from E to D in 2022.
- 3.3.4 These differences are occurring due to minor changes in flows from the strategic model combined with changes in signal timings.
- 3.3.5 It should be noted that the LoS results in the amended scheme generally show improvements when compared with the Do Minimum scenarios.

AM Peak Hour Level of Service (LoS) Summary Tables

Table 3:7 LoS Painshill junction 0700-0800

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
A3 Southbound off-slip	E	D	D	C	D	D
Cobham Bridge Westbound Approach	C	C	C	C	C	C
A3 Northbound off-slip	F	C	C	F	C	C
Byfleet Road Eastbound Approach	C	D	D	C	C	C
Northern Circulatory	B	B	B	B	A	A
Eastern Circulatory	B	B	B	A	A	A
Southern Circulatory	C	B	B	B	B	B
Western Circulatory	A	B	B	A	B	B

Table 3:8 LoS Seven Hills junction 0700-0800

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
Seven Hills North	B	D	C	B	D	D
Byfleet Road (east-ahead)	E	D	D	F	D	D
Byfleet Road (east-right turn)	D	D	D	D	E	E
Seven Hills Road South	D	D	D	D	D	D
Byfleet Road (west)	F	C	C	F	C	D
Feltonfleet Access	F	A	A	F	A	A

Table 3:9 LoS Painshill junction 0800-0900

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
A3 Southbound off-slip	F	D	D	C	D	D
Cobham Bridge Westbound Approach	D	D	D	C	C	C
A3 Northbound off-slip	F	B	B	F	C	C
Byfleet Road Eastbound Approach	C	E	E	C	C	C
Northern Circulatory	B	A	A	B	A	A
Eastern Circulatory	A	B	B	A	A	A
Southern Circulatory	C	B	B	B	B	B
Western Circulatory	A	B	B	A	B	B

Table 3:10 LoS Seven Hills junction 0800-0900

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
Seven Hills North	C	C	C	B	C	C
Byfleet Road (east-ahead)	F	C	C	F	D	E
Byfleet Road (east-right turn)	E	C	D	E	D	E
Seven Hills Road South	D	E	E	D	E	E
Byfleet Road (west)	F	C	C	F	C	C
Feltonfleet Access	F	A	A	F	A	A

PM Peak Hour Level of Service (LoS) Summary Tables

Table 3:11 LoS Painshill junction 1600-1700

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
A3 Southbound off-slip	C	D	D	B	E	E
Cobham Bridge Westbound Approach	D	C	C	E	D	D
A3 Northbound off-slip	C	C	C	C	B	B
Byfleet Road Eastbound Approach	C	B	B	C	C	C
Northern Circulatory	B	A	A	B	A	A
Eastern Circulatory	A	A	A	A	A	A
Southern Circulatory	B	B	B	B	C	C
Western Circulatory	B	A	A	C	B	B

Table 3:12 LoS Seven Hills junction 1600-1700

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
Seven Hills North	F	C	C	F	D	D
Byfleet Road (east-ahead)	C	C	C	C	C	C
Byfleet Road (east-right turn)	D	D	D	D	D	D
Seven Hills Road South	E	E	E	D	E	E
Byfleet Road (west)	F	C	C	F	C	C
Feltonfleet Access	F	A	A	F	A	A

Table 3:13 LoS Painshill junction 1700-1800

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
A3 Southbound off-slip	B	C	C	B	C	C
Cobham Bridge Westbound Approach	D	C	D	E	E	D
A3 Northbound off-slip	C	C	C	C	B	B
Byfleet Road Eastbound Approach	B	B	B	B	C	C
Northern Circulatory	A	A	A	A	A	A
Eastern Circulatory	A	A	A	A	A	A
Southern Circulatory	A	B	B	A	C	C
Western Circulatory	B	A	A	B	B	B

Table 3:14 LoS Seven Hills junction 1700-1800

Arm/Movement	2022			2037		
	Do Minimum	dDCO scheme DS	Updated scheme DS	Do Minimum	dDCO scheme DS	Updated scheme DS
Seven Hills North	C	C	C	C	D	D
Byfleet Road (east-ahead)	C	C	C	C	C	D
Byfleet Road (east-right turn)	E	E	D	D	E	E
Seven Hills Road South	D	D	D	D	D	D
Byfleet Road (west)	F	C	C	F	C	C
Feltonfleet Access	F	A	A	F	A	A

4. Road Safety

4.1 Impact on Road Safety

- 4.1.1 The three-lane section of the eastbound carriageway has been designed in accordance with current standards incorporating a 100 m merge taper to the east of the A245/ Seven Hills Road junction. The nearside merge option has been selected to reflect the split of traffic anticipated by traffic modelling to pass through the junction in the design year. This modelling suggests that 11% of the traffic entering the A245 eastbound from Byfleet Road will be in the inside lane, 32% in the middle lane and 57% in the outside lane. A nearside merge therefore would mean that less than half the number of vehicles are affected by the merge manoeuvre than would be the case with an offside merge. With differential speeds between lanes likely to be minimal, the nearside merge is therefore the safer layout in this location.

5. Sustainable Transport

5.1 Impact on C1 and C2 Bus Routes

- 5.1.1 The improvements being proposed as part of part of the scheme to reduce delays on the highway network will likely be of benefit to bus service efficiency in the amended scheme.

5.2 Non-motorised Users

- 5.2.1 The proposed changes to the Scheme do not materially alter arrangements for non-motorised users and consequently there is no impact on them due to the proposed changes.

6. Summary and Conclusions

- 6.1.1 The transport related impacts of the proposed changes to the scheme, including alterations to the Seven Hills junction, Seven Hills Road (A245) and the Painshill junction following the dDCO application have been assessed and are reported in this Transport Assessment Addendum Report.
- 6.1.2 Traffic modelling has been undertaken to evaluate the traffic impact of the proposed amended design to the A245 eastbound between Seven Hills and Painshill junctions.
- 6.1.3 The results of the traffic modelling, including the strategic and operational modelling, has indicated that the change in layout is predicted to have minimal impacts on traffic flows and the operational performance of the road network compared to the dDCO scheme.
- 6.1.4 The maximum increase in average journey times as a result of the amended design when compared with the dDCO application scheme is seven seconds, in 2022 AM between 0800 and 0900. Across other time periods, the increase in journey times is expected to be less than five seconds.
- 6.1.5 Nonetheless, the scheme generally retains the considerable benefits of the dDCO Scheme compared to the Do Minimum scenarios, in terms of journey time improvements, reductions in delay and improvements in Levels of Service at both junctions.
- 6.1.6 Compared to the dDCO Scheme, the amended scheme is anticipated to slightly reduce the journey time savings for the C1 and C2 bus routes which operates through the Painshill junction and Seven Hills junction travelling via Byfleet Road (A245). However, the amended Scheme is still anticipated to deliver journey time savings for the C1 and C2 bus routes compared with the Do minimum scenarios
- 6.1.7 The proposed changes have no impact on non-motorised users.

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