CC2

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT GARDEN TOWN HIGHWAYS INFRASTRUCTURE – A4130 IMPROVEMENT (MILTON GATE TO COLLETT ROUNDABOUT), A4197 DIDCOT TO CULHAM LINK ROAD, AND A415 CLIFTON HAMPDEN BYPASS) COMPULSORY PURCHASE ORDER 2022

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT TO CULHAM THAMES BRIDGE) SCHEME 2022

THE OXFORDSHIRE COUNTY COUNCIL (DIDCOT GARDEN TOWN HIGHWAYS INFRASTRUCTURE – A4130 IMPROVEMENT (MILTON GATE TO COLLETT ROUNDABOUT), A4197 DIDCOT TO CULHAM LINK ROAD, AND A415 CLIFTON HAMPDEN BYPASS) (SIDE ROADS) ORDER 2022

THE CALLED-IN PLANNING APPLICATION BY OXFORDSHIRE COUNTY COUNCIL FOR THE DUALLING OF THE A4130 CARRIAGEWAY, CONSTRUCTION OF THE DIDCOT SCIENCE BRIDGE, ROAD BRIDGE OVER THE APPLEFORD RAILWAY SIDINGS AND ROAD BRIDGE OVER THE RIVER THAMES, AND ASSOCIATED WORKS BETWEEN THE A34 MILTON INTERCHANGE AND THE B4015 NORTH OF CLIFTON HAMPDEN, OXFORDSHIRE (APPLICATION NO: R3.0138/21

PLANNING INSPECTORATE REFERENCE:

APP/U3100/V/23/3326625 and NATTRAN/SE/HAO/286 (DPI/U3100/23/12)

Appendices to the Proof of Evidence of

CLAUDIA LESLEY CURRIE

(Traffic Modelling)

Appendix CC2.1

Oxfordshire Strategic Model (OSM)
Model Standards 2015 Local Model Validation Summary

1. Model Standards 2015

This section describes the standards that the highway assignment model needs to achieve in line with Department for Transport's Transport Appraisal Guidance (TAG).

1.1. Validation Criteria and Acceptability Guidelines

Validation and convergence standards for highway assignment models are specified in TAG Unit M3.1. In general, the advice in TAG Unit M3.1 applies to models created for both general and specific purposes; however, in the case of models created for the assessment of specific interventions, '*it will be natural to pay greater attention to validation quality in the vicinity of the interventions*'.

The unit states that it is important that the fidelity of the underlying trip matrices is not compromised in order to meet the validation standards.

1.1.1. Trip Matrix Validation

For trip matrix validation, the measure which should be used is the percentage difference between modelled flows and counts. Comparisons at screenline level provide information on the quality of the trip matrices. TAG Unit M3.1 describes the validation criterion and acceptability guideline as shown in Table 1-1.

Table 1-1 – Screenline Flow Validation Criterion and Acceptability Guideline

Criterion and Measure	Acceptability Guideline
Differences between modelled flows and counts should be less than 5% of the counts	All or nearly all screenlines

Source: TAG Unit M3.1 Table 1

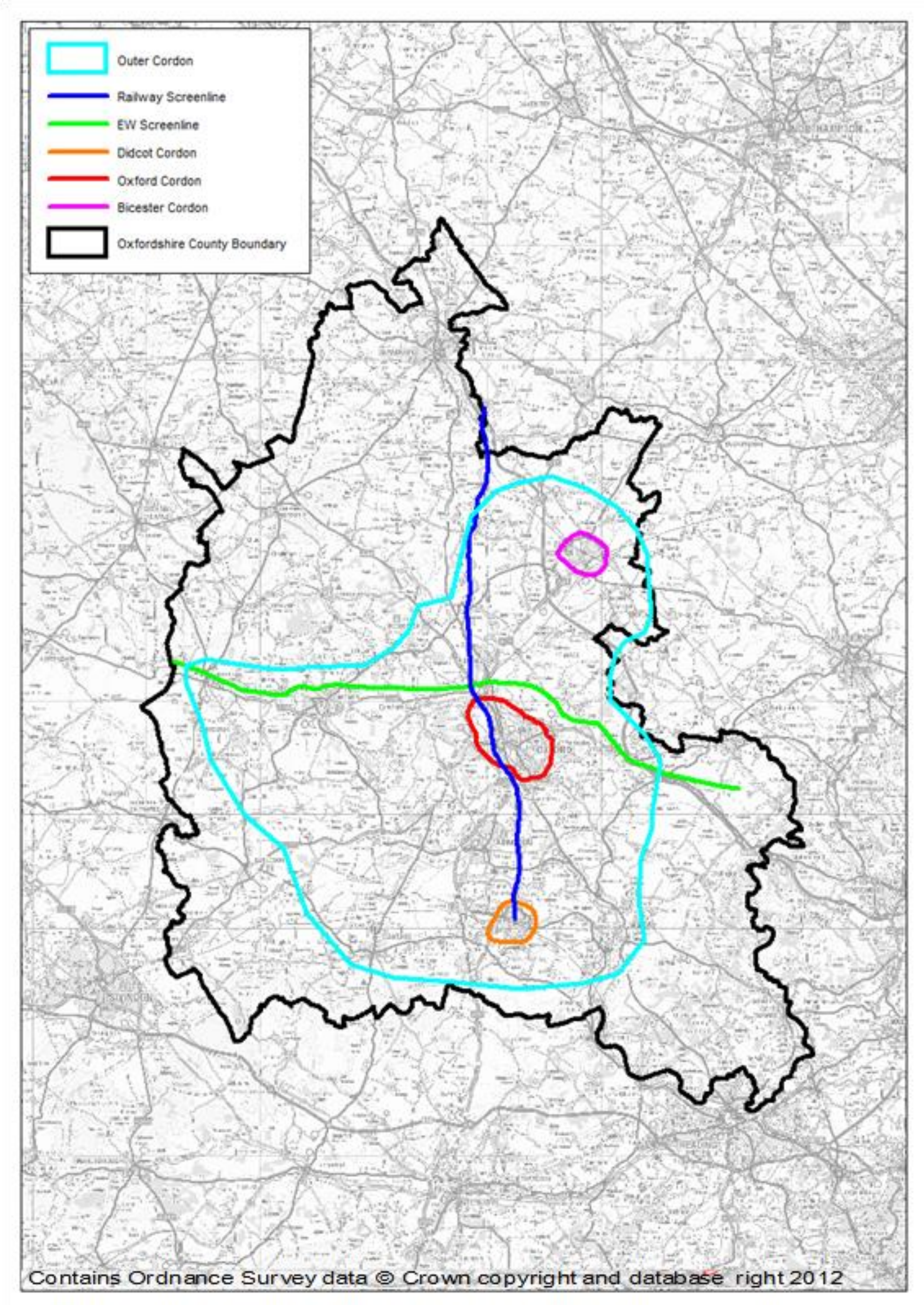
With regard to screenline validation, the following should be noted:

screenlines should normally be made up of 5 links or more;
the comparisons for screenlines containing high flow routes such as motorways should be presented both including and excluding such routes;
the comparison should be presented separately for roadside interview screenlines where they exist;
the other screenlines (made up of ATC[1] for example) used as constraints in matrix estimation (ME) excluding the roadside interview screenlines even though they have been used as constraints in ME);
and screenlines used for independent validation.
the comparisons should be presented by vehicle type (cars, light goods vehicles and other goods vehicles)
the comparisons should be presented separately for each modelled period.

For this highway assignment model, there are four calibration cordons, one each around Oxford, Bicester and Didcot, one outer cordon and one screenline namely and East-West screenline. The Railway screenline is used for validation and all are shown in Figure 1-1.

[1] Automatic traffic count

Figure 1-1 Proposed Screenlines and Cordons for OSM



Validation of the post ME matrices was undertaken by comparing total screenline and cordon modelled flows and counts by vehicle type and time period. The assessment criteria follows those defined in TAG Unit M3.1 Table 1, which states that differences between modelled flows and counts should be less than 5% of the counts for all or nearly all screenlines. The focus of the validation effort was on cars and all vehicles as cars represent typically 80% to 90% of flow on roads in the area of detailed modelling. The results of this assessment are shown in Table 1-2 and are summarised below.

In the morning peak

- All the calibration screenlines (five screenlines in two directions) meet acceptability guidelines for all vehicles and seven screenlines meet acceptability guidelines for cars.
- The Oxford outbound and Didcot inbound screenlines fail with a slight difference of -6% for cars.
- All of the validation screenlines meet acceptability guidelines for cars and all vehicles.

In the inter-peak:

- Eight out of ten calibration screenlines meet acceptability guidelines for all vehicles and four screenlines meet acceptability guidelines for cars.
- The East-West screenline fails with a flow difference of -7% and -6% for Northbound and Southbound for all vehicles respectively.
- Of the six screenlines that fail to meet acceptability guidelines for cars, the Bicester cordon failed slightly by -6% in both directions and Outer cordon inbound by 7%.
- All of the validation screenlines meet acceptability guidelines for cars and all vehicles.

In the evening peak:

- Eight out of ten of the ME screenlines meet acceptability guidelines for all vehicles and four screenlines meet acceptability guidelines for cars. The Oxford inbound, Bicester outbound fail with a slight difference –6%.
- All of the validation screenlines meet acceptability guidelines for all vehicles. For cars, the Eastbound Railway screenline fails with a slight flow difference of -6%.

Table 1-2 – Summary of Screenline and Cordon Validation (Post Matrix Estimation)

Cordon	Direction	AM Cars	AM Total	IP Cars	IP Total	PM Cars	PM Total
Calibration Oxford Cordon	Inbound	-3%	4%	-3%	3%	-6%	3%
	Outbound	-6%	2%	-10%	-1%	-9%	0%
Calibration Bicester Cordon	Inbound	-1%	1%	-6%	-3%	-1%	1%
	Outbound	-1%	2%	-6%	-3%	-6%	-4%
Calibration Didcot Cordon	Inbound	-6%	-3%	2%	0%	-3%	-1%
	Outbound	0%	-1%	4%	0%	8%	7%
Calibration Outer Cordon	Inbound	0%	-1%	7%	4%	5%	5%
	Outbound	0%	0%	2%	0%	-2%	0%
Calibration East - West Screenline	Northbound	-7%	-5%	-9%	-7%	-8%	-5%
	Southbound	-2%	0%	-10%	-8%	-14%	-11%
Independent validation Railway Screenline	**Eastbound**	**2%**	**4%**	**3%**	**0%**	**-6%**	**-1%**
	Westbound	**2%**	**-1%**	**4%**	**2%**	**-2%**	**1%**

Note – Total flows represent sum of three user classes, bus flows and passq flows

1.1.2. Link Flow and Turning Movement Validation

There are two measures which are used for the individual link validation are flow and GEH. The flow measure is based on the relative flow difference between modelled flows and observed counts, with three different criteria set depending on the observed flows. The GEH measure uses the GEH statistic as defined below:

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

Where GEH is the GEH statistic

M is the modelled flow, and

C is the observed flow

TAG Unit M3.1 describes the Link Flow and Turning Movements Validation Criteria and Acceptability Guidelines as shown in Table 1-3.

Table 1-3 – Link Flow and Turning Movements Validation Criteria and Acceptability Guidelines

Criteria and Measures	Acceptability Guideline
Individual flows within 15% for flows from 700 to 2,700 veh/h	> 85% of cases
Individual flows within 100 veh/h for flows less than 700 veh/h	> 85% of cases
Individual flows within 400 veh/h for flows more than 2,700 veh/h	> 85% of cases
GEH <5 for individual flows	> 85% of cases

Source: TAG Unit M 3.1 Table 2

With regard to flow validation, the following should be noted:

- the above criteria should be applied to both link flows and turning movements;
- the acceptability guideline should be applied to link flows but may be difficult to achieve for turning movements especially given the strategic nature of OSM covering the whole County;
- the comparisons should be presented for cars and all vehicles but not for light and other goods vehicles unless sufficiently accurate link counts have been obtained;
- the comparisons should be presented separately for each modelled period; and
- it is recommended that comparisons using both measures are reported in the model validation report.

Consistent with a strategic model, no turning movements were collected for the highway assignment model. The accuracy of the counts (ATC without accompanying MCC) is not sufficient to enable flow and GEH criteria to be examined separately for light and other goods vehicles.

Assignment validation was undertaken by comparing modelled flows and counts on individual links by vehicle type and time period. The assessment criterion follows those defined in TAG Unit M3.1 Table 2, which states that 85% of the criteria should meet acceptability guidelines for flow criteria and GEH criteria. The results are shown in Table 1-4 to Table 1-6 below. A summary of percentage of screenlines and percentage of individual links complying with DMRB are summarised below.

In the morning peak

- In calibration 100% of screenlines comply with the DMRB flow validation criteria, and 90% on the GEH criteria; whilst the percentage of individual links which comply with the DMRB flow criteria is 92% (85% target) and 84% comply on the GEH criteria.
- In validation 100% of screenlines comply with the DMRB flow validation criteria, and 50% on the GEH criteria; however, the percentage of individual links which comply with the DMRB flow criteria is 58% (85% target) and only 44% comply on the GEH criteria.

In the inter-peak

- In calibration 80% of screenlines comply with the DMRB flow validation criteria, and 70% on the GEH criteria; however, the percentage of individual links which comply with the DMRB flow criteria is 94% (85% target) and 83% comply on the GEH criteria.

- In validation 100% of screenlines comply with the DMRB flow validation criteria and the GEH criteria. The percentage of individual links which comply with the DMRB flow criteria is 81% (85% target) and 67% comply on the GEH criteria.

In the evening peak

- In calibration 80% of screenlines comply with the DMRB flow validation criteria, and 70% on the GEH criteria. However, the percentage of individual links which comply with the DMRB flow criteria is 84% (85% target) and 73% comply on the GEH criteria.
- In validation 100% of screenlines comply with the DMRB flow validation criteria and the GEH criteria. However, the percentage of individual links which comply with the DMRB flow criteria is 64% (85% target) and 56% comply on the GEH criteria.

Table 1-4 – Summary of individual lines (Post Matrix Estimation) – AM Peak hour

Calibration or validation	Direction	Number of counts	Flow criteria (% pass)		GEH (% pass)	
			Car	Total	Car	Total
Calibration	Oxford Cordon - IN	19	100	100	95	95
	Oxford Cordon - OUT	19	79	79	63	58
	Bicester Cordon - IN	9	100	89	100	100
	Bicester Cordon - OUT	9	100	100	100	100
	Didcot Cordon - IN	7	86	86	86	86
	Didcot Cordon - OUT	7	100	100	100	100
	Outer Cordon - IN	69	97	94	87	86
	Outer Cordon - OUT	69	100	100	88	88
	East - West Screenline - NB	17	76	76	65	65
	East - West Screenline - SB	17	76	71	65	71
Validation	**Railway Screenline – EB**	**18**	**44**	**50**	**44**	**39**
	Railway Screenline - WB	**18**	**78**	**67**	**67**	**50**

Table 1-5 – Summary of individual lines (Post Matrix Estimation) – IP hour

Calibration or validation	Direction	Number of counts	Flow criteria (% pass)		GEH (% pass)	
			Car	Total	Car	Total
Calibration	Oxford Cordon - IN	19	89	95	84	89
	Oxford Cordon - OUT	19	89	84	68	68
	Bicester Cordon - IN	9	100	100	89	89
	Bicester Cordon - OUT	9	100	100	100	100
	Didcot Cordon - IN	7	100	100	71	86
	Didcot Cordon - OUT	7	100	100	86	86
	Outer Cordon - IN	69	97	96	80	80
	Outer Cordon - OUT	69	96	94	78	87
	East - West Screenline – NB	17	94	94	76	82
	East - West Screenline - SB	17	88	82	71	71
Validation	**Railway Screenline - EB**	**18**	**94**	**83**	**94**	**67**
	Railway Screenline - WB	**18**	**83**	**78**	**83**	**67**

Table 1-6 – Summary of individual lines (Post Matrix Estimation) – PM Peak hour

Calibration or validation	Direction	Number of counts	Flow criteria (% pass)		GEH (% pass)	
			Car	Total	Car	Total
Calibration	Oxford Cordon - IN	19	68	84	68	79
	Oxford Cordon - OUT	19	58	63	47	53
	Bicester Cordon - IN	9	100	100	100	89
	Bicester Cordon - OUT	9	100	100	89	89
	Didcot Cordon - IN	7	71	71	71	71
	Didcot Cordon - OUT	7	86	86	86	86
	Outer Cordon - IN	69	90	90	77	80
	Outer Cordon - OUT	69	83	84	70	72
	East - West Screenline - IN	17	76	82	76	71
	East - West Screenline - OUT	17	71	71	35	41
Validation	**Railway Screenline - IN**	**18**	**89**	**89**	**83**	**72**
	Railway Screenline - OUT	**18**	**50**	**39**	**39**	**39**

1.1.3. Journey Time Validation Criterion and Acceptability Guidelines

For journey time validation, the measure which should be used is the percentage difference between modelled and observed journey times, subject to an absolute maximum difference. TAG Unit M3.1 describes the Journey Time Validation Criterion and Acceptability Guideline as shown in Table 1-7.

Table 1-7 Journey Time Validation Criterion and Acceptability Guideline

Criterion and Measure	Acceptability Guideline
Modelled times along routes should be within 15% (or 1 minute, if higher)	> 85% of routes

Source: TAG Unit M 3.1 Table 3

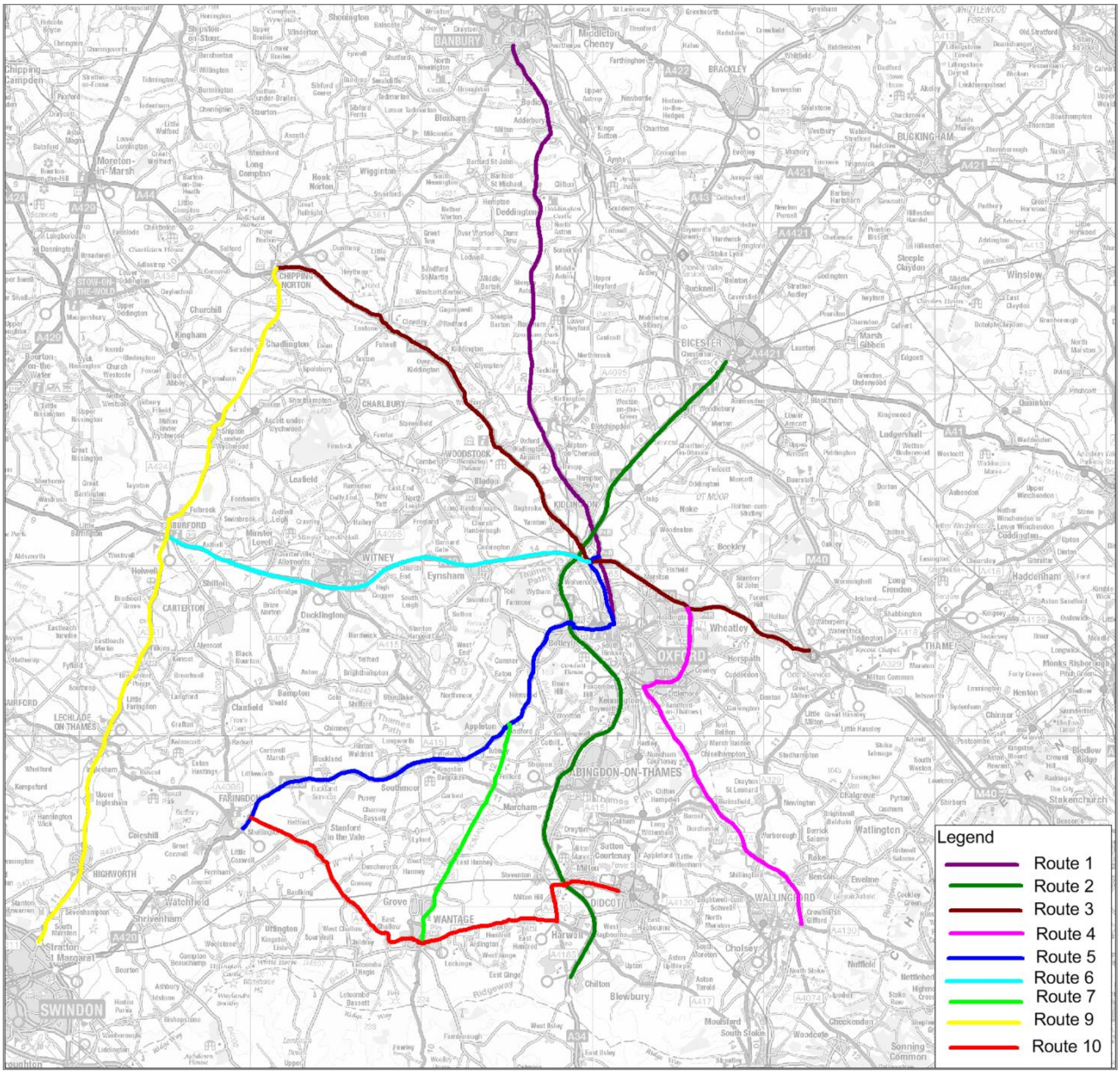
With regard to the journey time validation, the comparisons should be presented separately for each modelled period.

There is no disaggregation of journey time data to enable validation by vehicle type and a single speed/flow relationship is applied to all vehicle types and hence the validation is performed for total vehicles only.

Observed journey time data is obtained from Tom-Tom data that uses Satnav technology.

Journey time validation is undertaken using the 2013 TomTom data collected for the peak hours. Journey time results are presented in Figure 1-2.

Figure 1-2 Journey Time Routes



Modelled journey times are compared against observed data for all modelled periods. The results are summarised as:

- in the AM peak 17 out of 18 routes (94%) satisfy the DMRB journey time validation criteria;
- in the Inter Peak 18 out of 18 routes (100%) satisfy the DRMB criteria for journey time validation; and
- in the PM Peak period 15 out of 18 routes (83%) satisfy the DMRB criteria for journey time validation.

Of the three routes failing in PM, journey time for one route is within +/- 20% of the observed data rather than +/-15%.

1.1.4. Convergence Criteria and Standards

The advice on model convergence is set out in TAG Unit M3.1 (Table 4) and is reproduced below in Table 1-8. A more stringent set of standards may be achieved for the highway assignment model with a target of 99% of links satisfying the convergence measure rather than suggested 98% of links.

Table 1-8 Summary of Convergence Criteria

Convergence Measures	Type	Base Model Acceptable Values
Delta & %GAP	Proximity	Less than 0.1% or at least stable with convergence fully documented and all other criteria met
Percentage of links with flow change (P1) < 1%	Stability	Four consecutive iterations greater than 98%
Percentage of links with cost change (P2) < 1%		Four consecutive iterations greater than 98%
Percentage change in total user costs (V)		Four consecutive iterations less than 0.1% (SUE only)

Source: TAG Unit M3.1 Table 4

The convergence for each model period is summarised in Table 1-9 below. This shows that the model has achieved a high level of convergence for all three time periods, they are stable for at least four consecutive assignment-simulation loops and the delta values (as reported by the %GAP statistic in SATURN) comfortably exceed the targets specified in the DMRB of 1%. Similarly, the P value achieved is higher than the 98% required by guidance.

Table 1-9 – Summary of Model Convergence

Time Period	Assignment - Simulation Loop	Delta (%)* (δ)	%Gap	% Flow Change (P)
AM	23	0.0089	0.011	98.5
	24	0.0087	0.0097	98.9
	25	0.0070	0.0091	99.2
	26	0.0063	0.0091	99.2
IP	16	0.0058	0.0052	99.2
	17	0.0047	0.0062	99.2
	18	0.0067	0.0039	99.3
	19	0.0032	0.0054	99.2
PM	23	0.0145	0.014	98.7
	24	0.0129	0.020	98.7
	25	0.0139	0.015	98.8
	26	0.0130	0.012	99.0

1.1.5. Impact of Matrix Estimation (ME)

Tag Unit M3.1 states that the changes brought about by ME should be carefully monitored by the following means:

- scatter plots of matrix zonal cell values, prior to and post ME, with regression statistics (slopes, intercepts and R2 values);
- scatter plots of zonal trip ends, prior to and post ME, with regression statistics (slopes, intercepts and R2 values);

- trip length distributions, prior to and post ME, with means and standard deviations; and
- sector to sector level matrices, prior to and post ME, with absolute and percentage changes.

The changes introduced by the application of ME should be understood and may be assessed using TAG Unit M3.1 (Table 5), as shown in Table 1-10 below.

Table 1-10 Significance of Matrix Estimation Changes

Measure	Significance Criteria
Matrix zonal cell levels	Slope within 0.98<Slope<1.02 Intercept near zero R^2 in excess of 0.95
Matrix zonal trip ends	Slope within 0.99<Slope<1.01 Intercept near zero R^2 in excess of 0.98
Trip length distributions	Means within 5% Standard deviations within 5%
Sector to sector level matrices	Differences within 5%

Source: TAG Unit M3-1 Table 5

The unit states that it is important that the fidelity of the underlying trip matrices is not compromised in order to meet the validation standards. All exceptions to these criteria should be examined and assessed for their importance for the accuracy of the matrices in the Fully Modelled Area.

The comparisons should be presented by vehicle type (preferably cars, light goods vehicles and other goods vehicles). The comparisons should also be presented separately for each modelled period or hour.

1.1.5.1. Matrix totals

A comparison of matrix totals before and after ME in OSM is shown in Table 1-11. In order to clearly show the impacts of ME on the matrix changes in the study area, the external trips are removed from this analysis as they were outside of the matrix building process and controls on these movements were less restrictive.

Table 1-11 – Comparison of Matrix Totals – Prior and Post ME2 (only internal movements)

Time Period	Cars			Lights			Heavies		
	Prior	Post ME2	% Change	Prior	Post ME2	% Change	Prior	Post ME2	% Change
AM	64,917	62,292	-4.0%	6,115	6,457	5.6%	1,762	1,902	7.9%
IP	43,621	42,912	-1.6%	4,033	4,390	8.8%	2,060	2,001	-2.8%
PM	70,344	69,129	-1.7%	4,881	4,928	1.0%	622	592	-4.8%

1.1.5.2. Matrix zonal values

Matrix zonal changes, excluding the external trips, by time period are presented in Table 1-12 below. In most cases the criteria are met. The only notable exception is the slope of the trip ends rows in the morning peak hour, which is 0.95 rather than within 0.99 and 1.01 but still has a R-squared value within the criteria.

Table 1-12 – Matrix Estimation Changes by time period (excluding external trips)

Measure	Significance Criteria	AM	IP	PM
Matrix Zonal Cell Values	Slope within 0.98 and 1.02	0.980	0.991	0.990
	Intercept near zero	0.000	0.000	0.000
	R^2 in excess of 0.95	0.940	0.980	0.970
Matrix Zonal Trip Ends (Rows)	Slope within 0.99 and 1.01	0.940	0.980	0.990
	Intercept near zero	0.940	0.220	-0.150
	R^2 in excess of 0.98	0.970	0.990	0.990
Matrix Zonal Trip Ends (Columns)	Slope within 0.99 and 1.01	0.960	0.990	0.962
	Intercept near zero	0.960	-0.110	2.440
	R^2 in excess of 0.98	0.990	0.990	0.980

1.1.5.3. Matrix trip length distribution

This analysis demonstrates that ME has not significantly affected the length of trips in the matrices for cars and LGV but has made some impact on the HGV matrix. However, the source of the HGV matrix was not as comprehensive as the data for cars and LGV, hence the ME process for HGV movements was given more flexibility.

Table 1-13 – Mean and Standard Deviation for Trip Length Distribution by time period

Time Period	CAR		LGV		HGV	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
AM	-2%	1%	-4%	-5%	-18%	-8%
IP	-0.1%	1%	-2%	-4%	-24%	-10%
PM	-2%	-0.1%	-1%	-2%	-17%	-5%

1.2. Interpretation of the Guidelines

TAG Unit M3.1 states that the achievement of the validation acceptability guidelines specified in Table 1, Table 2 and Table 3 (of TAG Unit M3.1) does not guarantee that a model is ‘fit for purpose’ and likewise a failure to meet the specified validation standards does not mean that a model is not ‘fit for purpose’.

Furthermore, in some models, particularly models of large, congested areas, it may be difficult to achieve the link flow and journey time validation acceptability guidelines set out in Table 2 and Table 3 (of TAG Unit M3.1) without ME bringing about changes greater than the limits shown in Table 5 (of TAG Unit M3.1). In these cases, the limits set out in Table 5 (of TAG Unit M3.1) should be respected, the impacts of ME should be reduced so that they do not become significant, and a lower standard of validation reported. In other words, ME should not be allowed to make significant changes to the prior matrices in order that the validation standards are met.

Appendix CC2.2

Didcot Microsimulation Base Model Development Report
Model Calibration and Validation

Didcot Microsimulation Model **26/9/18**

Reference number GB01T17C68

DIDCOT MICROSIMULATION BASE MODEL DEVELOPMENT REPORT

5 MODEL CALIBRATION AND VALIDATION

5.1. Introduction

The calibration process involves checking the network description, demand matrices, and model inputs and parameters to ensure the model achieves a satisfactory representation of traffic flows and conditions in the study area.

The calibration and validation of the model uses the guidelines set out within *WebTAG Unit M3.1* and the *Design Manual for Roads and Bridges (DMRB), Vol. 12 Section 2 Part 1*.

The calibration of the model was undertaken by comparing modelled turn counts to the observed data set. Further to this, queue comparisons were undertaken, however no criteria for queue length comparisons is presented in *WebTAG/DMRB*.

Several journey time routes were coded into the model to reflect the moving observer journey time surveys undertaken. The model records journey times for vehicles completing these routes and this allows an independent data validation between observed and modelled journey times.

WebTAG/DMRB guidelines are summarised in Table 5.1 Below.

Table 5.1 : WebTAG/DMRB criteria

DMRB Criteria and Measurement	Acceptability Guidelines
Assigned Hourly Flows	
1. Individual flows within 15% (for flows 700-2700vph)	>85% Cases
2. Individual flows within 100vph (for flows < 700vph)	>85% Cases
3. Individual flows within 400vph (for flows > 2700vph)	>85% Cases
4. Total screenline flows to be within 5%	All (or nearly all) screenlines
GEH	
5i. GEH Statistic: Individual flows GEH < 5	>85% Cases
5ii. GEH Statistic:Total flows GEH < 4	All (or nearly all) screenlines
Journey Times	
6. Modelled journey times within 15% (or 1 minute, if higher)	>85% Cases

The GEH statistic is used in the calibration of a model to compare the difference between an observed flow and an assigned flow on a link.

The GEH statistic is used in preference to the absolute or relative flow difference as it can cope with a wide range of flows. Where an absolute difference of 100 vehicles per hour can be important in a flow of say 200 vehicles per hour, it is less significant in a flow of several thousand vehicles per hour.

5.2. Turn Count Calibration

The turn count calibration process was carried out in accordance with the criteria specified in WebTAG and DMRB. These guidelines are summarised in Table 5.1.

The GEH statistic is used in the calibration and validation of the model to compare the difference between observed and modelled flows on a link, and is defined as follows:

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

Where C = observed traffic flow and M = modelled traffic flow.

The Base Model calibration was undertaken using individual turning flows across the study area, and link counts on the A34 Mainline. The observed versus modelled comparison included between 570 and 633 Weekday and 230 Saturday turn and link count locations for each hour modelled. Table 5.2 shows the summary of GEH comparison by hour, with the percentage of comparisons falling within a GEH of < 7, < 5 and < 3 shown.

Table 5.2 : Criteria 5i - Turn & Link Count Individual Flow Comparison

Period	Time (hh:mm)	Eligible Comparisons	GEH <3 %	GEH <5 %	GEH <7 %
AM	07:00-08:00	632	71%	90%	97%
	08:00-09:00	632	70%	89%	97%
	09:00-10:00	581	75%	90%	96%
IP	10:00-11:00	569	82%	96%	99%
	11:00-12:00	569	85%	96%	99%
	12:00-13:00	569	81%	95%	99%
	13:00-14:00	569	81%	95%	99%
	14:00-15:00	569	79%	93%	98%
	15:00-1600	569	71%	90%	97%
PM	16:00-17:00	633	72%	89%	97%
	17:00-18:00	632	71%	88%	95%
	18:00-19:00	581	72%	90%	98%
SAT	10:00-11:00	230	81%	97%	100%
	11:00-12:00	230	89%	98%	100%
	12:00-13:00	230	88%	97%	99%
	13:00-14:00	230	87%	96%	99%

The Base model results show that in all cases the hourly GEH comparisons meet the criteria for GEH less than 5 in 85% of cases.

Table 5.3 shows the summary of individual flow comparisons by hour, with the percentage of comparisons meeting each specified criteria shown.

Table 5.3 : Criteria 1, 2 & 3 – Assigned Hourly Flow Band Comparison

Period	Time (hh:mm)	Criteria 1 700<> 2700 vph	Flows within 15%	Criteria 2 <700Vph	Flows within 100vph	Criteria 3 >2700 vph	Flows within 400vph
AM	07:00-08:00	14	79%	617	98%	1	100%
	08:00-09:00	18	78%	613	96%	1	100%
	09:00-10:00	8	88%	573	96%	0	-
IP	10:00-11:00	3	100%	566	100%	0	-
	11:00-12:00	6	100%	563	100%	0	-
	12:00-13:00	6	67%	563	99%	0	-
	13:00-14:00	5	100%	564	99%	0	-
	14:00-15:00	6	100%	563	99%	0	-
	15:00-1600	7	100%	562	98%	0	-
PM	16:00-17:00	13	85%	619	97%	1	100%
	17:00-18:00	15	53%	616	97%	1	100%
	18:00-19:00	8	75%	573	99%	0	-
SAT	10:00-11:00	4	100%	226	99%	0	-
	11:00-12:00	4	100%	226	100%	0	-
	12:00-13:00	4	75%	226	100%	0	-
	13:00-14:00	4	100%	226	100%	0	-

The Base model results show that the majority of comparisons are in the less than 700vph category (criteria 2) and fall well within the criteria. It should be noted that with Criteria 1 and 3 the number of comparisons are relatively low compared to the total number of count records, making the comparison harder to achieve.

It should also be borne in mind that the validation guidelines were originally developed for deterministic models, which ensure that a particular solution will always result from a particular set of input data. Microsimulation utilises a different methodology and instead reflects reality where traffic is rarely constant, repeatable and encompasses variability.

With this in mind, the level of calibration achieved and presented within this document for a network the size and scale of Didcot is considered high. To further emphasise the suitability of the results, an XY scatter chart of observed flows versus modelled flows was developed for each modelled period. The XY scatter plot provides a good way of presenting the variation in data in a pictorial format, illustrating the relationship between the observed flows and assigned flows in the model. The correlation coefficient (R) gives some measure of the goodness of model fit, and the slope of the best-fit regression line through the origin indicates the extent to which modelled values are over or under estimated. Acceptability values of R are above 0.95 and the line of best fit should be between 0.9 and 1.1 as stated in DMRB *(Ref. Vol 12, Section 2, Part 1, Chapter 4, §4.4.42)*.

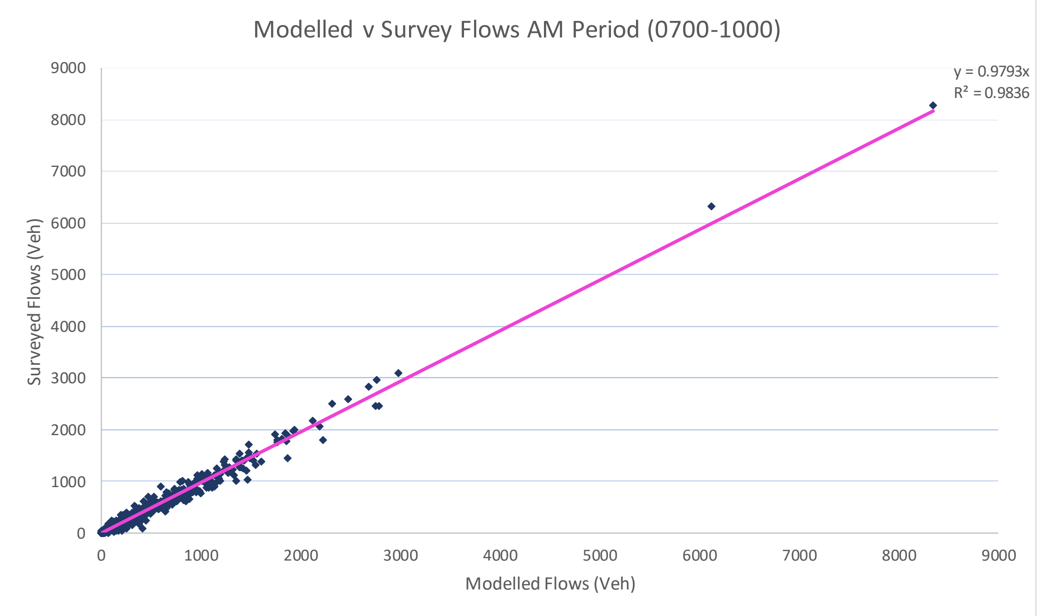


Figure 5.1 : AM Period XY Scatter Plot, Observed v Modelled

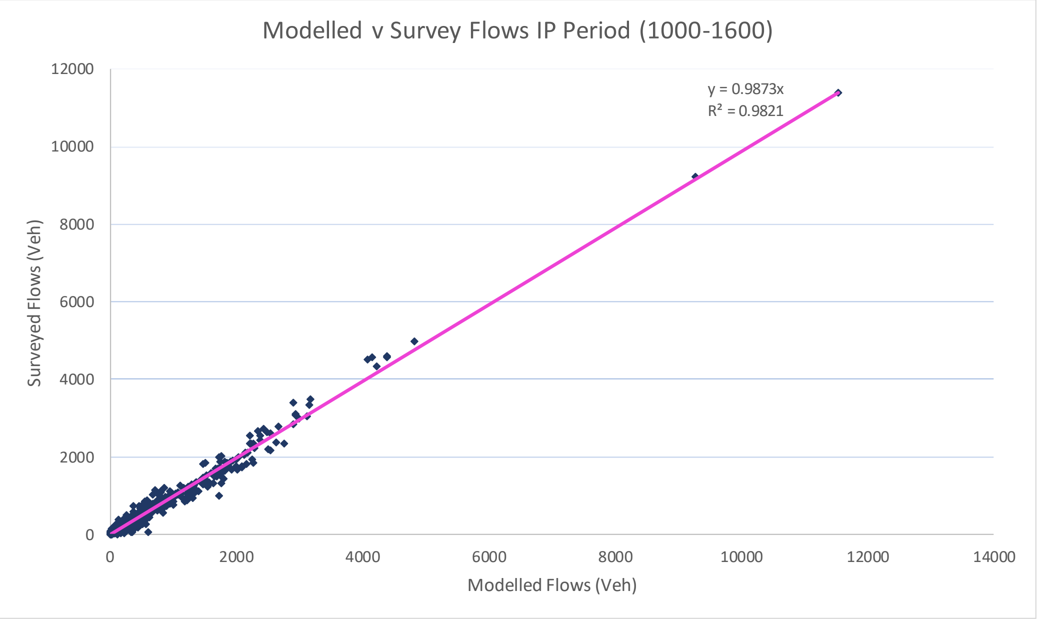


Figure 5.2 : IP Period XY Scatter Plot, Observed v Modelled

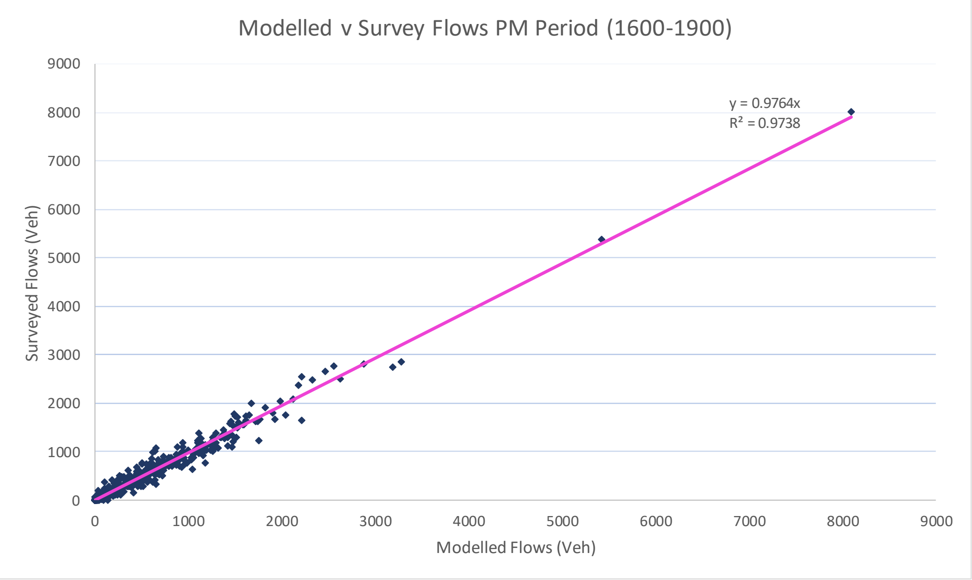


Figure 5.3 : PM Period XY Scatter Plot, Observed v Modelled

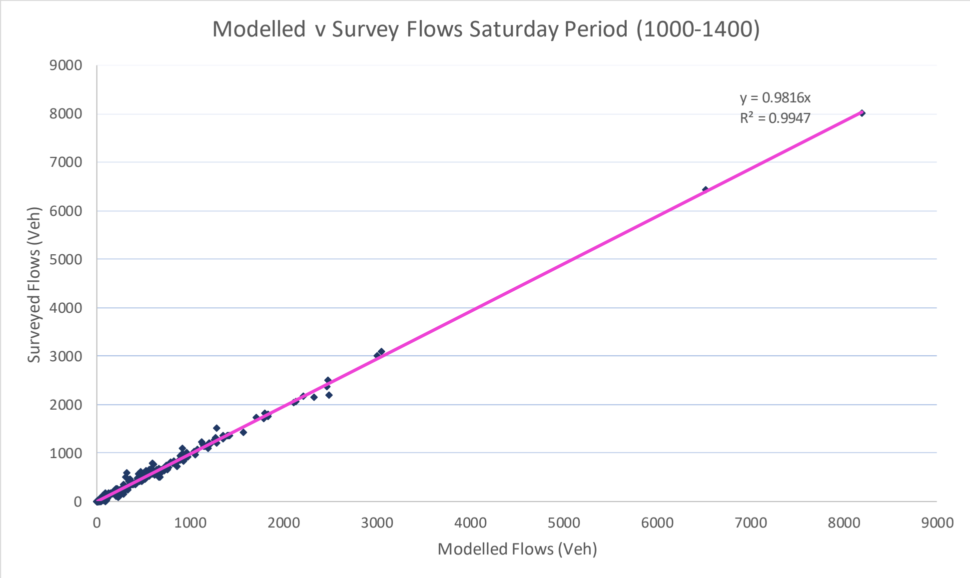


Figure 5.4 : Saturday Period XY Scatter Plot, Observed v Modelled

The XY scatter plot analyses shows all periods to have both an R^2 value and line of best fit value of close to 1.

In an ideal situation, the observed and assigned flows plotted would form a single line and show a positive correlation between each variable, i.e. the line of best fit would be y=x. Given that traffic flows vary on a day to day basis and that the model generally aims to simulate an average day, and the fact that the surveyed data generally reflects a range of days across the study area, this can never realistically be achieved.

The results show that for all modelled periods the line of best fit closely matches the y=x line and is well within the acceptability values of 0.9-1.1. With the exception of a few outliers, the results show a close relationship between observed flows and those assigned within the model.

In addition, Checks were undertaken for each modelled hour and the R value (coefficient of determination) was shown to be above 0.95 in all cases as shown in Table 5.4 below.

Table 5.4 : Weekday and Saturday Hourly R Values

Period	Time (hh:mm)	R Value
AM	07:00-08:00	0.986
	08:00-09:00	0.984
	09:00-10:00	0.981
IP	10:00-11:00	0.990
	11:00-12:00	0.991
	12:00-13:00	0.987
	13:00-14:00	0.988
	14:00-15:00	0.986
	15:00-1600	0.981
PM	16:00-17:00	0.984
	17:00-18:00	0.980
	18:00-19:00	0.984
SAT	10:00-11:00	0.995
	11:00-12:00	0.996
	12:00-13:00	0.996
	13:00-14:00	0.994

5.3. Journey Time Validation

A number of journey time routes were coded into the Didcot Base Model to reflect the surveyed routes. This allowed for comparison between modelled and observed journey times to be made to ensure that the model satisfactorily reflected on-street traffic conditions. The DMRB criteria for journey time validation is summarised in Table 5.1. The criteria states that a modelled journey time must be within 15% or within 1 minute of the observed journey time in more than 85% of cases.

Figure 5.5 details the journey time routes used for model validation, as derived from the journey time surveys.

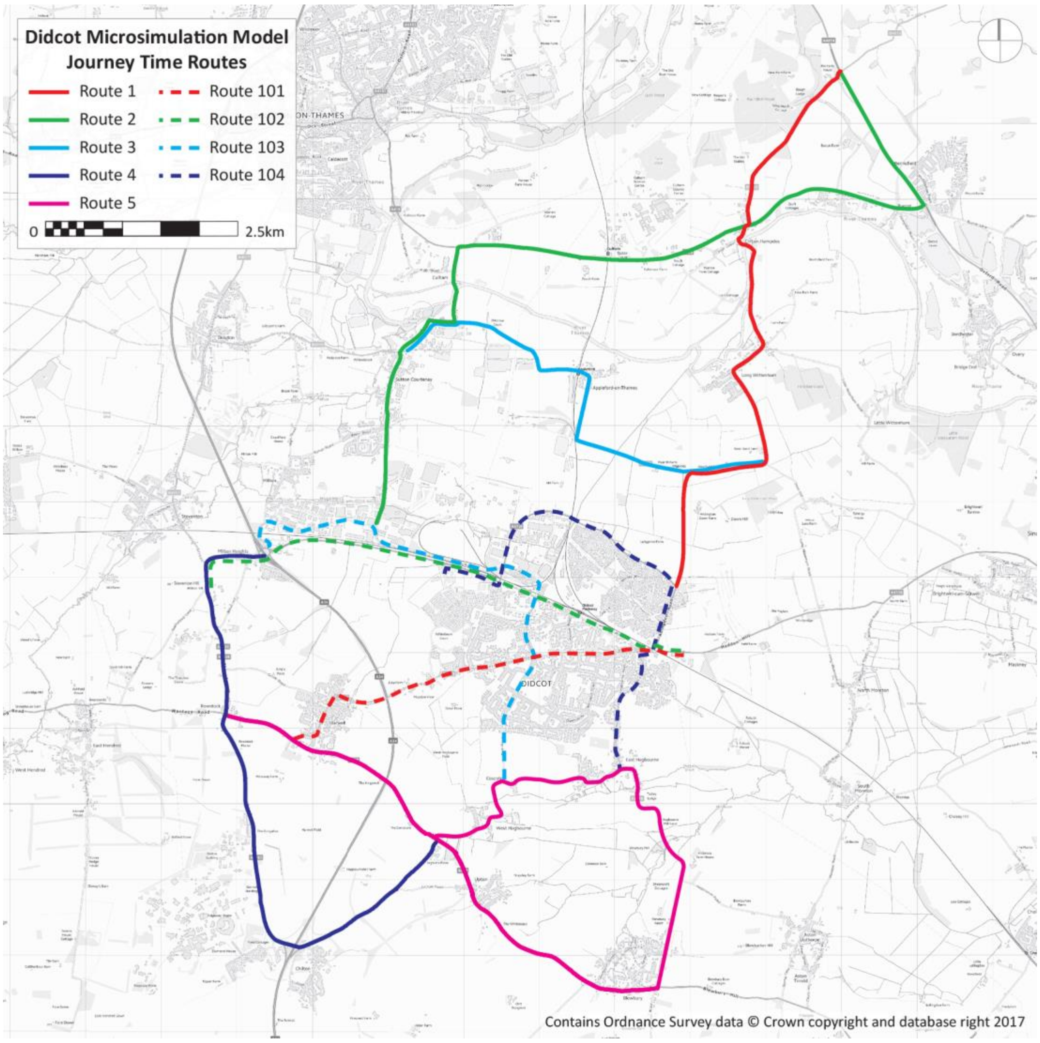


Figure 5.5 : Journey Time Routes

Comparisons between observed and modelled journey times on each of the 9 routes for each peak period are provided below, along with a discussion on a number of routes that do not meet the TAG criteria. Due to the low number of observed journey time runs peak hour comparisons are not presented.

The comparison between observed and modelled journey times on each route for the AM period (07:00-10:00) is shown in Table 5.5.

Table 5.5 : AM Period Average Journey Time Comparison

Route	Direction	Survey Count	Average Observed Time (mm:ss)	Average Modelled Time (mm:ss)	Diff	% Diff	Within DMRB?
101	E/B	7	14:17	11:47	02:30	17%	×
101	W/B	6	11:52	10:29	01:23	12%	✓
102	E/B	5	14:37	14:35	00:02	0%	✓
102	W/B	5	13:56	15:05	01:09	8%	✓
103	N/B	5	14:24	11:52	02:32	18%	×
103	S/B	6	12:22	13:07	00:45	6%	✓
104	N/B	7	11:57	13:54	01:57	16%	×
104	S/B	7	10:22	10:25	00:02	0%	✓
1	N/B	3	13:34	12:49	00:45	6%	✓
1	S/B	4	15:24	14:20	01:04	7%	✓
2	N/B	2	17:38	24:13	06:35	37%	×
2	S/B	2	17:25	21:02	03:37	21%	×
3	E/B	9	07:47	07:37	00:10	2%	✓
3	W/B	7	07:36	08:25	00:50	11%	✓
4	N/B	6	12:19	11:04	01:15	10%	✓
4	S/B	5	10:40	10:23	00:17	3%	✓
5	E/B	3	23:39	15:44	07:55	33%	×
5	W/B	2	21:57	16:17	05:40	26%	×

The comparisons between observed and modelled journey times on each route for the IP period (10:00-16:00) is shown in Figure 5.6.

Table 5.6 : IP Period Average Journey Time Comparison

Route	Direction	Survey Count	Average Observed Time (mm:ss)	Average Modelled Time (mm:ss)	Diff	% Diff	Within DMRB?
101	E/B	7	11:14	08:58	02:16	20%	×
101	W/B	7	10:39	09:13	01:26	14%	✓
102	E/B	6	11:21	09:53	01:29	13%	✓
102	W/B	6	10:58	09:01	01:58	18%	×
103	N/B	8	10:33	08:53	01:41	16%	×
103	S/B	7	09:50	09:11	00:39	7%	✓
104	N/B	7	10:11	08:22	01:49	18%	×
104	S/B	8	09:47	08:01	01:46	18%	×
1	N/B	7	11:08	09:16	01:51	17%	×
1	S/B	8	10:23	08:53	01:31	15%	✓
2	N/B	4	15:49	15:28	00:20	2%	✓
2	S/B	5	17:16	17:02	00:13	1%	✓
3	E/B	5	07:27	05:57	01:29	20%	×
3	W/B	7	07:17	05:59	01:17	18%	×
4	N/B	8	10:10	07:27	02:44	27%	×
4	S/B	8	09:19	07:11	02:07	23%	×
5	E/B	2	22:14	13:38	08:36	39%	×
5	W/B	2	20:57	13:51	07:06	34%	×

The comparisons between observed and modelled journey times on each route for the PM period (16:00-19:00) is shown in Table 5.7.

Table 5.7 : PM Period Average Journey Time Comparison

Route	Direction	Survey Count	Average Observed Time (mm:ss)	Average Modelled Time (mm:ss)	Diff	% Diff	Within DMRB?
101	E/B	6	13:33	11:27	02:05	15%	×
101	W/B	6	13:30	12:45	00:45	6%	✓
102	E/B	5	16:25	16:58	00:33	3%	✓
102	W/B	5	14:13	13:18	00:55	6%	✓
103	N/B	5	12:36	11:15	01:22	11%	✓
103	S/B	4	18:17	12:08	06:09	34%	×
104	N/B	6	12:54	12:16	00:38	5%	✓
104	S/B	7	11:38	10:57	00:42	6%	✓
1	N/B	6	12:43	13:02	00:20	3%	✓
1	S/B	6	14:10	12:25	01:45	12%	✓
2	N/B	4	20:58	22:00	01:02	5%	✓
2	S/B	4	20:16	18:40	01:36	8%	✓
3	E/B	10	06:50	06:44	00:06	1%	✓
3	W/B	10	06:38	06:51	00:13	3%	✓
4	N/B	7	11:32	11:08	00:24	3%	✓
4	S/B	7	09:35	09:12	00:23	4%	✓
5	E/B	3	20:38	15:42	04:56	24%	×
5	W/B	3	23:20	16:05	07:15	31%	×

The comparisons between observed and modelled journey times on each route for the Saturday period (10:00-14:00) is shown in Table 5.8.

Table 5.8 : Saturday Period Average Journey Time Comparison

Route	Direction	Survey Count	Average Observed Time (mm:ss)	Average Modelled Time (mm:ss)	Diff	% Diff	Within DMRB?
101	E/B	8	10:57	10:29	00:27	4%	✓
101	W/B	9	12:34	10:00	02:34	20%	×
102	E/B	9	15:29	10:50	04:39	30%	×
102	W/B	8	11:02	09:42	01:20	12%	✓
103	N/B	10	09:57	09:38	00:18	3%	✓
103	S/B	10	10:09	09:50	00:20	3%	✓
104	N/B	10	09:57	09:19	00:39	6%	✓
104	S/B	11	09:53	09:00	00:53	9%	✓
1	N/B	8	11:41	10:06	01:35	14%	✓
1	S/B	8	11:35	09:53	01:42	15%	✓
2	N/B	6	16:55	17:10	00:15	1%	✓
2	S/B	7	16:49	17:19	00:29	3%	✓
3	E/B	11	07:32	06:38	00:54	12%	✓
3	W/B	11	07:47	06:39	01:09	15%	✓
4	N/B	13	08:56	08:34	00:22	4%	✓
4	S/B	13	08:42	08:25	00:17	3%	✓
5	E/B	6	21:26	15:32	05:54	28%	×
5	W/B	5	21:45	15:53	05:53	27%	×

The above tables show that the DMRB criteria is not met in some cases. In general, where there is a robust number of observations (6+) the model matches the observations well. Where a lower number of observations exists, the comparison is poor.

This is not surprising as the modelled data reflects a full sample of journeys through the period and the limited number of observations reflect sporadic sampling. In addition, on-board journey time videos were not available for many surveys, so checking the robustness of the observed data was not possible.

Further to the initial base model reporting, OCC provided further journey time data for the study area from the DfT, in the form of Trafficmaster GPS journey time data from 2016. This data was captured over the whole year, and therefore does not include the same sampling problems as the surveyed journey time dataset. The GPS data also allows the definition of an hourly, rather than periodic, observed journey time dataset. Further moving observer surveys undertaken by OCC in June 2018 were used to "validate" the GPS data where discrepancies were noted between previous observations of traffic conditions provided by the client team, and the conditions implied by the GPS journey times.

Journey times for the surveyed routes were extracted from this data set, and compared to the modelled journey times, at an hourly level. Tables 5.9-5.13 present the hourly comparisons between modelled and observed for each period (as a percentage difference), and indicate whether the DMRB criteria (modelled within 15% of observed) has been achieved for each route, by hour.

Table 5.9 : AM Period GPS Average Journey Time Comparison

Route	Direction	07:00-08:00	DMRB	08:00-09:00	DMRB	09:00-10:00	DMRB
101	E/B	-2%	1	4%	1	-1%	1
101	W/B	-9%	1	-2%	1	-3%	1
102	E/B	-14%	1	11%	1	12%	1
102	W/B	1%	1	40%	**1**	43%	**1**
103	N/B	-15%	1	-1%	1	4%	1
103	S/B	5%	1	12%	1	10%	1
104	N/B	1%	1	22%	0	7%	1
104	S/B	9%	1	39%	**1**	39%	**1**
1	N/B	-14%	1	3%	1	-5%	1
1	S/B	-7%	1	0%	1	6%	1
2	N/B	12%	1	9%	1	-3%	1
2	S/B	1%	1	-2%	1	11%	1
3	E/B	-8%	1	2%	1	-14%	1
3	W/B	-8%	1	12%	1	-13%	1
4	N/B	-21%	0	-13%	1	-10%	1
4	S/B	-18%	0	-16%	0	-12%	1
5	E/B	-2%	1	-3%	1	-4%	1
5	W/B	1%	1	-2%	1	-4%	1
Percentage Pass			**89%**		**89%**		**100%**

Table 5.10 : IP Period GPS Average Journey Time Comparison 1

Route	Direction	10:00-11:00	DMRB	11:00-12:00	DMRB	12:00-13:00	DMRB
101	E/B	-2%	1	-13%	1	-11%	1
101	W/B	-14%	1	-6%	1	-2%	1
102	E/B	-2%	1	-2%	1	0%	1
102	W/B	-1%	1	-2%	1	-2%	1
103	N/B	-10%	1	-10%	1	-10%	1
103	S/B	-7%	1	-5%	1	-3%	1
104	N/B	-5%	1	-4%	1	-2%	1
104	S/B	-5%	1	-5%	1	-6%	1
1	N/B	-10%	1	-10%	1	-10%	1
1	S/B	-12%	1	-11%	1	-12%	1
2	N/B	0%	1	0%	1	0%	1
2	S/B	2%	1	1%	1	2%	1
3	E/B	-12%	1	-12%	1	-14%	1
3	W/B	-12%	1	-13%	1	-14%	1
4	N/B	-14%	1	-15%	1	-24%	0
4	S/B	-13%	1	-13%	1	-12%	1
5	E/B	-3%	1	-4%	1	-2%	1
5	W/B	-7%	1	-4%	1	-7%	1
Percentage Pass			**100%**		**100%**		**94%**

Table 5.11 : IP Period GPS Average Journey Time Comparison 2

Route	Direction	13:00-14:00	DMRB	14:00-15:00	DMRB	15:00-16:00	DMRB
101	E/B	-2%	1	-11%	1	-17%	0
101	W/B	0%	1	-2%	1	-4%	1
102	E/B	-1%	1	-2%	1	-8%	1
102	W/B	-2%	1	1%	1	-4%	1
103	N/B	-7%	1	-7%	1	-9%	1
103	S/B	-4%	1	-4%	1	-6%	1
104	N/B	-3%	1	-4%	1	-3%	1
104	S/B	-4%	1	-4%	1	-5%	1
1	N/B	-10%	1	-11%	1	-15%	1
1	S/B	-11%	1	-14%	1	-18%	0
2	N/B	1%	1	-1%	1	-6%	1
2	S/B	1%	1	3%	1	10%	1
3	E/B	-13%	1	-15%	1	-15%	1
3	W/B	-12%	1	-11%	1	-12%	1
4	N/B	-18%	0	-15%	1	-16%	0
4	S/B	-8%	1	-12%	1	-10%	1
5	E/B	-4%	1	-3%	1	-4%	1
5	W/B	-1%	1	-4%	1	-2%	1
Percentage Pass			**94%**		**100%**		**83%**

Table 5.12 : PM Period GPS Average Journey Time Comparison

Route	Direction	16:00-17:00	DMRB	17:00-18:00	DMRB	18:00-19:00	DMRB
101	E/B	-2%	1	4%	1	0%	1
101	W/B	0%	1	8%	1	7%	1
102	E/B	12%	1	25%	**1**	10%	1
102	W/B	1%	1	10%	1	-3%	1
103	N/B	-10%	1	-10%	1	-5%	1
103	S/B	1%	1	-11%	1	-4%	1
104	N/B	5%	1	12%	1	3%	1
104	S/B	14%	1	20%	**1**	3%	1
1	N/B	-6%	1	15%	1	-11%	1
1	S/B	-2%	1	-10%	1	-4%	1
2	N/B	4%	1	5%	1	1%	1
2	S/B	-7%	1	0%	1	-3%	1
3	E/B	-12%	1	-22%	0	-16%	0
3	W/B	-11%	1	-13%	1	-14%	1
4	N/B	-9%	1	2%	1	-15%	0
4	S/B	-6%	1	2%	1	-3%	1
5	E/B	-1%	1	0%	1	0%	1
5	W/B	-3%	1	-1%	1	-2%	1
Percentage Pass			**100%**		**94%**		**89%**

Table 5.13 : SAT Period GPS Average Journey Time Comparison

Route	Direction	10:00-11:00	DMRB	11:00-12:00	DMRB	12:00-13:00	DMRB	13:00-14:00	DMRB
101	E/B	-2%	1	-26%	0	-19%	0	-7%	1
101	W/B	-11%	1	-14%	1	-9%	1	-5%	1
102	E/B	-15%	1	-22%	0	-20%	0	-15%	1
102	W/B	-10%	1	-11%	1	-9%	1	-5%	1
103	N/B	-8%	1	0%	1	-3%	1	-2%	1
103	S/B	-8%	1	1%	1	1%	1	5%	1
104	N/B	-3%	1	-4%	1	-1%	1	0%	1
104	S/B	-7%	1	-4%	1	-4%	1	-1%	1
1	N/B	-10%	1	-11%	1	-13%	1	-11%	1
1	S/B	-11%	1	-10%	1	-14%	1	-11%	1
2	N/B	2%	1	3%	1	3%	1	2%	1
2	S/B	2%	1	-1%	1	-4%	1	0%	1
3	E/B	-13%	1	-14%	1	-14%	1	-10%	1
3	W/B	-9%	1	-11%	1	-9%	1	-9%	1
4	N/B	-11%	1	-13%	1	-9%	1	-8%	1
4	S/B	-6%	1	-7%	1	-9%	1	-7%	1
5	E/B	0%	1	0%	1	1%	1	2%	1
5	W/B	0%	1	-1%	1	0%	1	3%	1
Percentage Pass			**100%**		**89%**		**89%**		**100%**

All hours, with the exception of 15:00-16:00, achieve the required threshold of >85% of routes meeting the criteria. The three routes failing to meet the threshold in this hour only just exceed the 15% difference allowed.

Upon examining the GPS data, and comparing to the moving observer and modelled times, it became apparent that the GPS data did not capture the delays witnessed on the A4130 at peak times approaching the Frank Williams Drive signals. Further observations undertaken by the councils in June 2018 supported this observation. As such, for some hours, a number of routes which were failing due to discrepancies between modelled and observed times around Frank Williams drive were assumed to pass. These are noted in bold in the "DMRB" column of the tables above, and are as noted below:

- Route 102 WB, 08:00-09:00 and 09:00-10:00
- Route 102 EB, 17:00-18:00
- Route 104 SB, 08:00-09:00, 09:00-10:00 and 17:00-18:00

6. SUMMARY AND CONCLUSIONS

6.1. Summary

SYSTRA Ltd have been commissioned by South Oxfordshire District Council (SODC) and Vale of White Horse District Council (VoWHDC), through the Five Councils Partnership to develop a microsimulation base model of the Didcot area and future year scenario models reflecting the Council's future land allocations.

The model was developed using Paramics Discovery (V19) software. The simulation runs the AM Period (07:00-10:00), IP period (10:00-16:00), PM Period (16:00-19:00) and Saturday Period (10:00-14:00) independently.

Traffic surveys were undertaken in late 2016/mid 2017 to provide the traffic data information required to develop the model. Turn count, moving observer journey time and queue surveys were supplied.

The model has been calibrated and validated based on WebTAG and DMRB guidance and SYSTRA's Microsimulation Consultancy Good Practice Guide. Video footage from the surveys was also utilised to ensure the general behaviour of traffic in the model reflected the conditions on site.

In addition, a model demonstration and feedback meeting with OCC, SODC and VoWHDC was arranged to effectively 'sign off' the base model as representative of current conditions before proceeding with future year model development.

6.2. Conclusions

The Didcot 2017 Base model meets DMRB turn count flow criteria with 85% of cases meeting a GEH value < 5. Comparisons using the Flow band criteria shows a good result, with criteria 1 (700<>2700 vph within 15%) showing some modelled hours outwith the criteria (although there is a low sample in this case).

Modelled and observed journey time comparisons have shown that where robust observed data is available, the model reflects observed journey times well, and meets the DMRB/WebTAG criteria.

OCC, SODC and VoWHDC have reviewed the model and resulting traffic conditions, and are satisified that the general traffic conditions observed on a daily basis are reflected in the model.

The Base model is considered fit for the purpose of Reference Case development and Future Year testing.

Appendix CC2.3

Extracts from CDA.7
Didcot Garden Town HIF1 Transport Assessment
Housing Trajectory

Didcot Garden Town Housing Infrastructure Fund (HIF1)

Transport Assessment

Oxfordshire County Council

Project number: 60606782

September 2021

Table 5.1: Housing Completion Trajectories

Site Name	Units Additional to Base Year		
	2020	2024	2034
Ladygrove East - Land off A4130, Hadden Hill, Didcot	0	107	642
Land at Didcot Road, Great Western Park	514	514	514
Land to the south of Blenheim Hill Harwell	60	60	60
Land at Barnett Road Steventon OX13 6AJ	65	65	65
Land south of Appleford Road, Phase 1	85	101	101
Land south of Appleford Road, Phase 2	0	91	91
Land at Abingdon Road Steventon	15	15	15
Land to south of Hadden Hill Didcot	74	74	74
Land to the West of Great Western Park (Valley Park)	0	384	4,254
Land at Reading Road Harwell	3	16	16

Site Name	Units Additional to Base Year		
	2020	2024	2034
Land at former Didcot A	0	0	120
Land at former Didcot A	0	0	280
Land North of Grove Road Harwell	191	207	207
Land off Hanney Road Steventon OX13 6AS	44	44	44
Land to the north east of Didcot	27	548	1,880
Land north of Appleford Road	0	43	93
Land off Drayton Road, Milton	18	18	18
Land to north of Manor Close	18	18	18
Land to the South of A4130 Didcot	31	166	166
Milton Heights (Allocation - Site 9)	56	186	458
Land at Milton Hill, Milton Heights	32	53	53
East of Sutton Courtenay (Allocation - Site 5)	0	0	200
Chailey House Bessels Way	22	22	22
Land adjacent Culham Science centre	0	0	1,850
Great Western Park	818	1,155	1,155
Orchard Centre Phase 2	0	0	300
North West Valley Park (Allocation - Site 8)	0	0	800
Vauxhall Baracks	0	0	300
Land at Berinsfeld	0	0	1,600
Long Reach, Didcot Road	0	19	19
Didcot Gateway South	0	100	300
Land Adjacent to the Village Hall	0	70	74
Land off fieldside track	0	36	36
TOTAL	**2,073**	**4,112**	**15,825**

Table 5.2: Employment Completion Trajectories

Site Name	Use Class	Floor Area Additional to Base Year (sqm)		
		2020	2024	2034
Southmead Industrial Estate	B1	656	656	9,076
Culham Science Centre	B1	0	13,632	56,079
Land West of CSC Inc No.1 Site	B1	0	4,851	4,851
	B2	0	255	255
Berinsfield Regeneration	B1	0	0	9,671
	B2	0	0	10,768
	B8 (Storage)	0	0	11,350
Milton Park	B1	11,472	31,411	76,889
	C1	10,563	10,563	10,563
Harwell Campus	B1	11,723	75,427	103,434
	B2	0	6,993	35,000
Other Premises Adjacent to Didcot Power Station - Diageo	B8 (Storage)	0	28,907	28,907
	B8 (Data)	0	68,750	68,750
Site Name	**Use Class**	**Floor Area Additional to Base Year (sqm)**		
		2020	**2024**	**2034**
Didcot A	B1	0	2,502	25,000
	B2	0	5,505	55,000
	B8 (Storage)	22,483	27,988	77,483
	A1	0	1,351	13,500
Milton Hill Business and Technology Park	B8 (Storage)	0	0	11,338
D-Tech- EZ 2	B2	0	1,000	5,000
	B8 (Data)	0	22,000	110,000
Milton Interchange Site- EZ2	B1	0	0	9,380
	A1	0	0	2,704
	C1	0	0	1,294
Orchard Centre Expansion	A1	11,155	11,155	11,155
TOTAL		**68,052**	**312,946**	**747,446**

Appendix CC2.4

Extracts from CDA.7
Didcot Garden Town HIF1 Transport Assessment
Junction Capacity Assessment

Didcot Garden Town Housing Infrastructure Fund (HIF1)

Transport Assessment

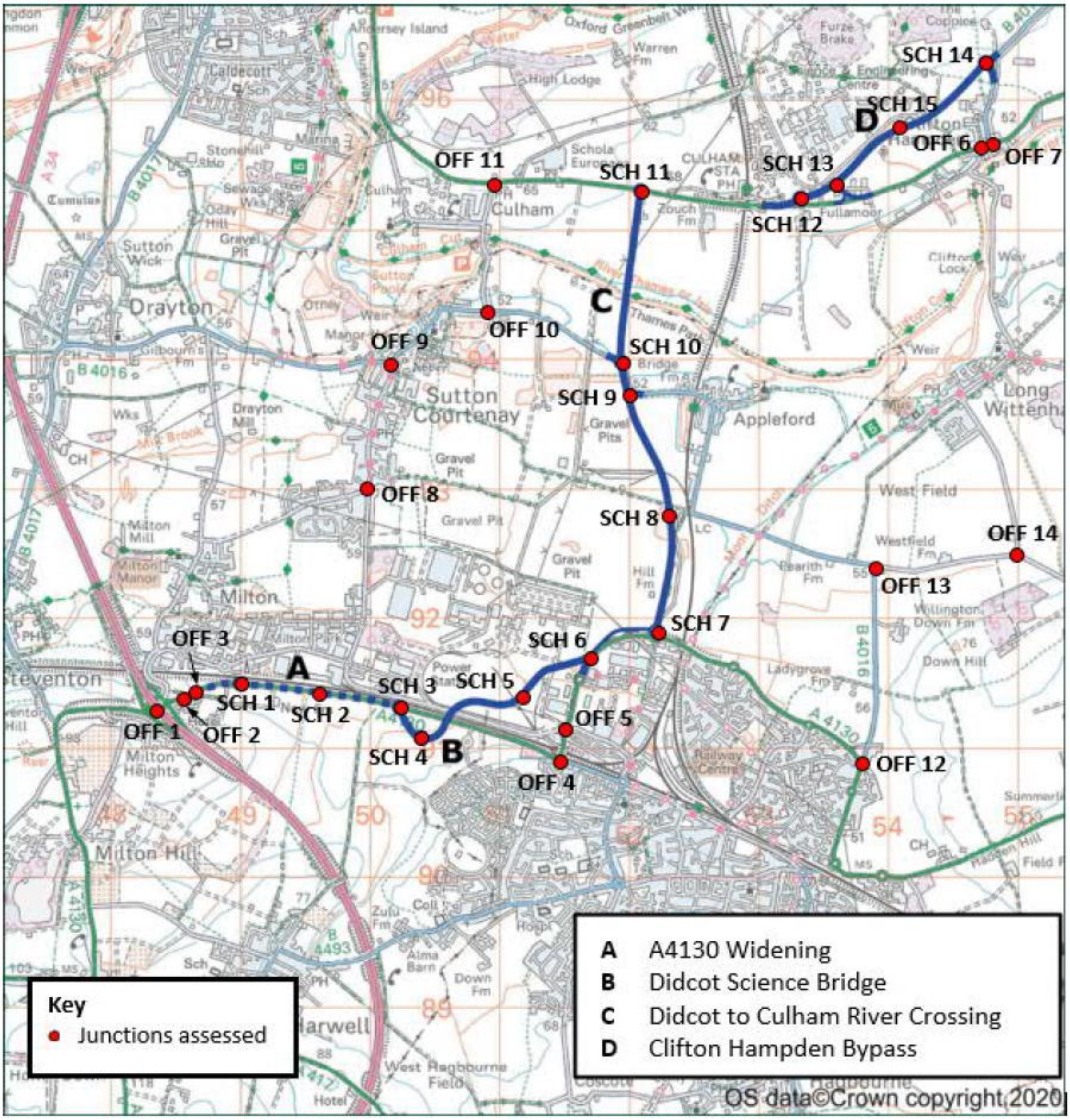
Oxfordshire County Council

Project number: 60606782

September 2021

Page 44

Figure 3.24: Junction Locations



Page 45

Table 3.4: 2020 Base Junction Capacity Assessment Summary (Maximum RFC/PRC)

No.	Junction	Type	AM	PM
OFF 1	A34 / A4130 Milton interchange	Grade separated interchange	Refer to Section 6.9 for Milton interchange	
OFF 2	A4130 / Service Area	Priority junction	0.60	0.55
OFF 3	A4130 / Milton Gate	Signalised junction	+7.4%	-2.0%
OFF 4	A4130 / B4493 / Mendip Heights	Roundabout	0.62	0.73
OFF 5	A4130 / Basil Hill Road / Milton Road (Power Station)	Roundabout	0.79	1.16
OFF 6	A415 / High Street (Clifton Hampden)	Signalised junction	-241%	-273%
OFF 7	A415 / B4015 Oxford Road (Clifton Hampden)	Signalised junction		
OFF 8	Harwell Road / Milton Road / High Street	Mini roundabout	0.39	0.54
OFF 9	High Street / Church Street / Brook Street Junction	Priority junction	0.58	1.19
OFF 10	B4016 Appleford Road / Abingdon Road	Priority junction	-22.3%	-14.1%
OFF 11	A415 / Tollgate Road	Signalised junction		
OFF 12	A4130 / Lady Grove	Priority junction	0.68	0.97
OFF 13	Lady Grove / Sires Hill	Priority junction	0.95	0.48
OFF 14	Sires Hill / Didcot Road	Priority junction	0.26	0.29

Page 85

Table 6.1: Summary of Scheme Junction Capacity Results

Junction		Junction Type	2024 With				2034 With			
			AM		PM		AM		PM	
			RFC/ PRC	Queue	RFC/ PRC	Queue	RFC/ PRC	Queue	RFC/ PRC	Queue
SCH1	A4130 / Service Area / North West Valley Park	Roundabout	0.79	4	0.64	2	0.73	3	0.94	14
SCH2	A4130 / Valley Park access signalised junction	Signalised Junction	32%	16	64%	11	48%	13	33%	14
SCH3	A4130 / Science Bridge	Roundabout	0.95	14	0.79	4	0.93	11	0.97	19
SCH4	Valley Park Spine Road / Science Bridge Link	Roundabout	0.38	1	0.39	1	0.77	3	0.83	5
SCH5	Science Bridge Link Road / New Purchas Road	Priority Junction	0.41	1	0.39	1	0.73	4	0.79	6
SCH6	A4130 / Science Bridge	Priority Junction	1.01	12	1.37	71	1.99	65	1.95	48
SCH7	A4130 / New Thames River Crossing / Collett	Roundabout	0.65	2	0.59	2	0.77	3	0.81	4
SCH8	New Thames River Crossing / Hanson and FCC Access Road	Priority Junction	0.24	1	0.08	0	0.75	3	0.21	0
SCH9	New Thames River Crossing / B4016	Priority Junction	0.20	0	0.41	1	1.00	7	0.99	5
SCH10	New Thames River Crossing / B4016	Roundabout	0.42	1	0.56	1	0.69	2	0.91	9
SCH11	New Thames River Crossing / A415	Roundabout	0.48	1	0.35	0	0.61	2	0.59	1
SCH12	A415 / Clifton Hampden Bypass / Culham Science Centre	Roundabout	0.67	2	0.35	1	0.94	13	0.58	1
SCH13	Clifton Hampden Bypass / realigned A415	Priority Junction	0.29	0	0.32	1	***	59	1.28	19
SCH14	Clifton Hampden Bypass / B4015	Priority Junction	0.56	1	0.26	0	***	49	***	29
SCH15	Clifton Hampden Bypass / Culham Science Centre Access	Left In / Left Out Junction	0.05	0	0.13	0	0.10	0	0.44	1

**** Indicates that Junctions 9 predicts that the flow is significantly in excess of capacity and is unable to calculate a maximum RFC.*

Table 6.17: Summary of Off-site Junction Capacity Results

Junction		Junction Type	2020 Baseline				2024 Without HIF1				2024 With HIF 1				2034 Without HIF 1				2034 With HIF1			
			AM		PM		AM		PM		AM		PM		AM		PM		AM		PM	
			RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)	RFC/ PRC	Q (PCU)
OFF2	A4130 / Service Area	Priority Junction	0.60	2	0.55	1	0.61	2	0.59	1	0.49	1	0.66	2	1.07	18	0.77	3	0.71	2	0.40	1
OFF3	A4130 / Milton Gate	Signalised Junction	+7%	15	-2%	18	-5%	22	-2%	20	-6%	24	-3%	21	-52%	220	-25%	93	-5%	22	-6%	25
OFF4	A4130 / B4493 / Mendip Heights	Roundabout	0.62	2	0.73	3	1.02	31	1.02	33	0.74	3	0.74	3	1.47	459	1.42	229	0.73	3	0.54	1
OFF5	A4130 / Basil Hill Rd / Milton Rd (Power Station)	Roundabout	0.79	4	1.16	77	0.73	2	0.83	5	0.42	1	0.59	1	1.10	122	1.11	57	0.54	1	0.65	2
OFF6 & OFF7	A415 / High Street/ B4015 Oxford Rd	Signalised Junction	-241%	173	-273%	194	-270%	192	-122%	160	34%	7	19%	6	-606%	539	-348%	455	12%	9	3%	11
OFF8	Harwell Road / Milton Road / High Street	Mini Roundabout	0.39	1	0.54	1	0.47	1	0.63	2	0.37	1	0.29	0	0.97	15	1.00	25	0.49	1	0.44	1
OFF9	High St / High St	Priority Junction	0.44	1	0.89	7	1.00	18	1.10	44	0.43	1	0.45	1	1.88	494	1.76	447	0.55	1	0.69	2
	High St /Church St	Priority Junction	0.58	1	1.19	47	1.35	87	1.47	135	0.62	2	0.58	1	2.69	654	2.43	557	0.84	4	1.06	20
	High St / Brook St	Priority Junction	0.23	1	0.16	0	0.26	1	0.18	0	0.20	0	0.15	0	0.31	1	0.24	0	0.26	1	0.49	0
OFF10	B4016 / Abingdon Road	Priority Junction	-22%	51	-14%	37	-26%	58	20%	15	25%	6	47%	9	-47%	109	-11%	30	7%	18	13%	16
OFF11	A415 / Tollgate Road	Signalised Junction																				
OFF12	A4130 / Lady Grove	Priority junction / Roundabout *	0.68	2	0.97	19	0.53	1	0.50	1	0.53	1	0.45	1	0.58	1	0.62	2	0.72	3	0.61	2
OFF13	Lady Grove / Sires Hill	Priority Junction	0.95	10	0.48	1	0.79	3	0.43	1	0.50	1	0.39	1	1.37	49	1.07	13	0.80	4	0.61	2
OFF14	Sires Hill / Didcot Road	Priority Junction	0.26	1	0.29	0	0.35	1	0.38	1	0.30	1	0.33	1	0.96	25	1.54	45	0.65	2	0.70	1

* *Priority junction in 2020 baseline scenario; roundabout in 2024 and 2034 scenarios*

Appendix CC2.5

Local Plan Extracts
Volume to Capacity Plots

Evaluation of Transport Impacts Study to inform the Vale of White Horse District Council Local Plan 2031: Part 1 Strategic Sites and Policies

ATKINS

Final Report

Oxfordshire County Council

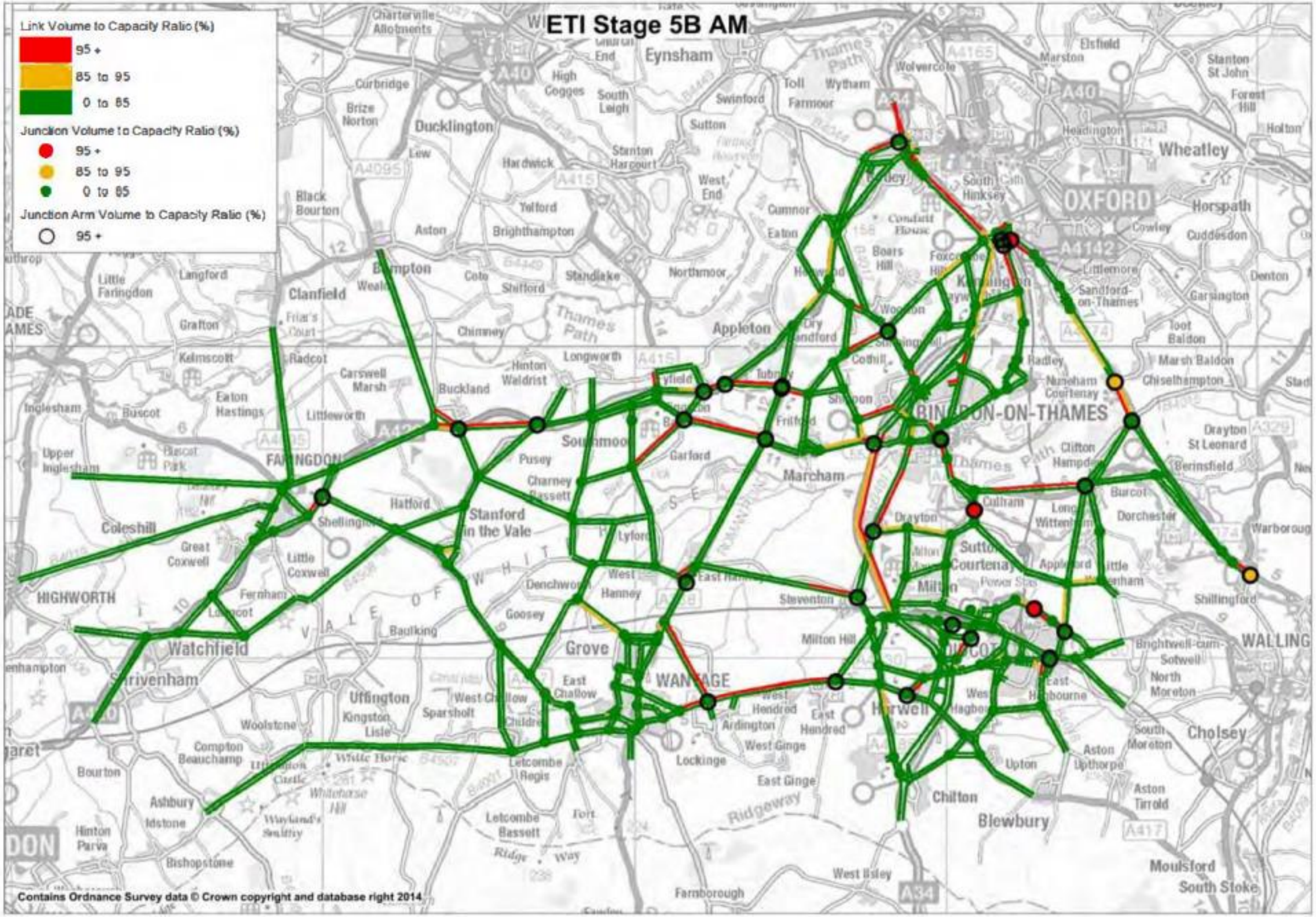
November 2014

Plan Design Enable

Evaluation of Transport Impacts Study to inform the Vale of White Horse District Council Local Plan 2031 Part 1 Strategic Sites and Policies (November 2014)

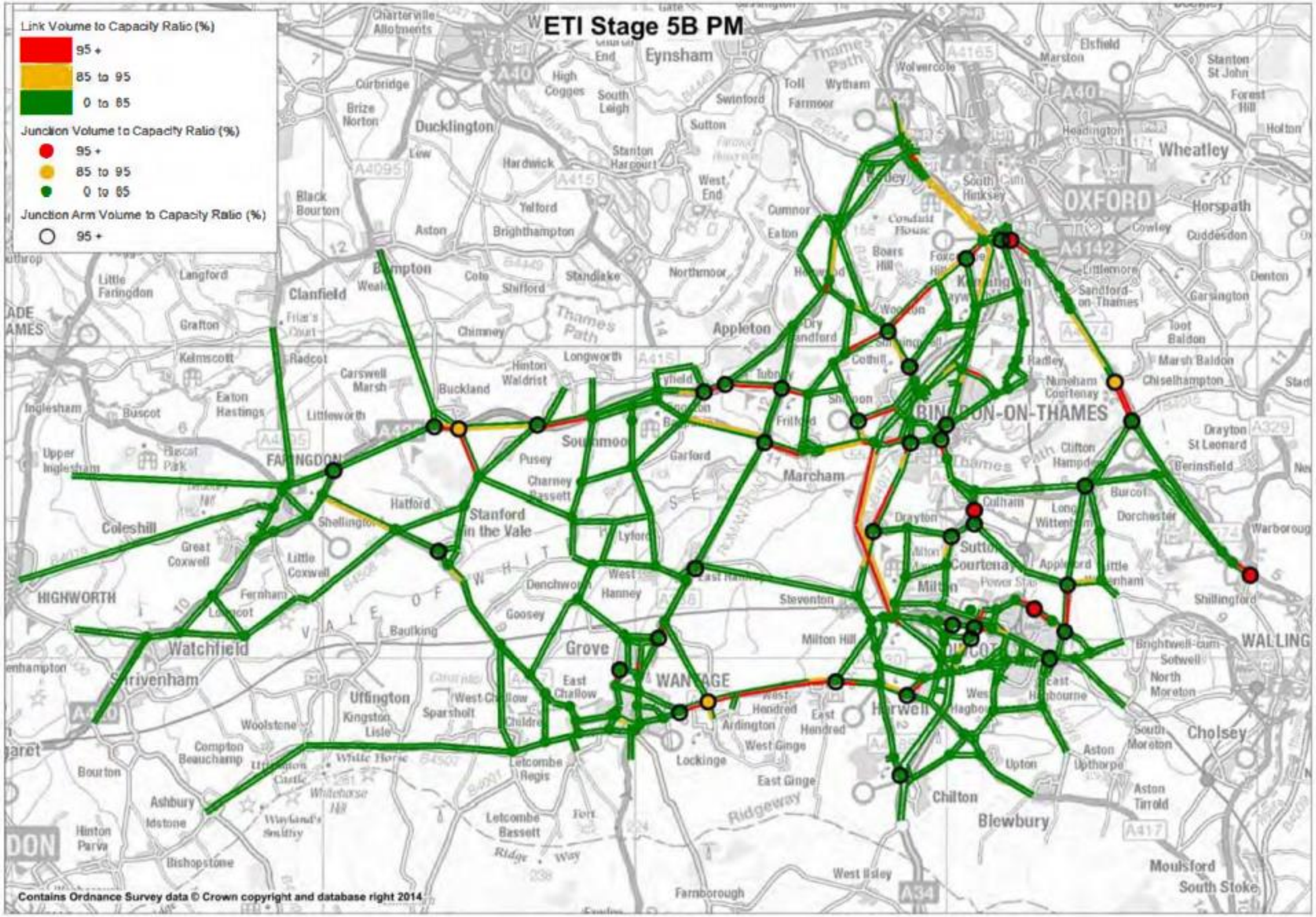
The results of the modelling assessments for the Vale of White Horse District Council Local Plan 2031 Part 1 are shown in CDG.2.4 ‘TRA02.1 Evaluation of Transport Impacts Study Final Report Appendices’ November 2014, in Figures C9 on page 20 and C10 on page 21:

Figure -C9 Impact on the traffic network - ETI Stage 5b AM Peak Hour



3

Figure -C10 Impact on the traffic network - ETI Stage 5b PM Peak Hour



4

CC2.5
Local Plan Extracts
Volume to Capacity Plots

ATKINS

Vale of White Horse District Council Local Plan 2031 Part 2

Evaluation of Transport Impacts - Stage 2

Oxfordshire County Council

05 October 2017

Evaluation of Transport Impacts - Stage 2 for Vale of White Horse District Council Local Plan 2031 Part 2 (October 2017)

The results of the modelling assessments of the Vale of White Horse District Council Local Plan 2031 Part 2 are shown in CDG.2.12 'TRA06 Evaluation of Transport Impacts – Stage 2' October 2017, in Figures 20 on page 55 and 21 on page 56:

Figure 20 V/C for links and junctions – 2031 Mitigation scenario - morning peak hour

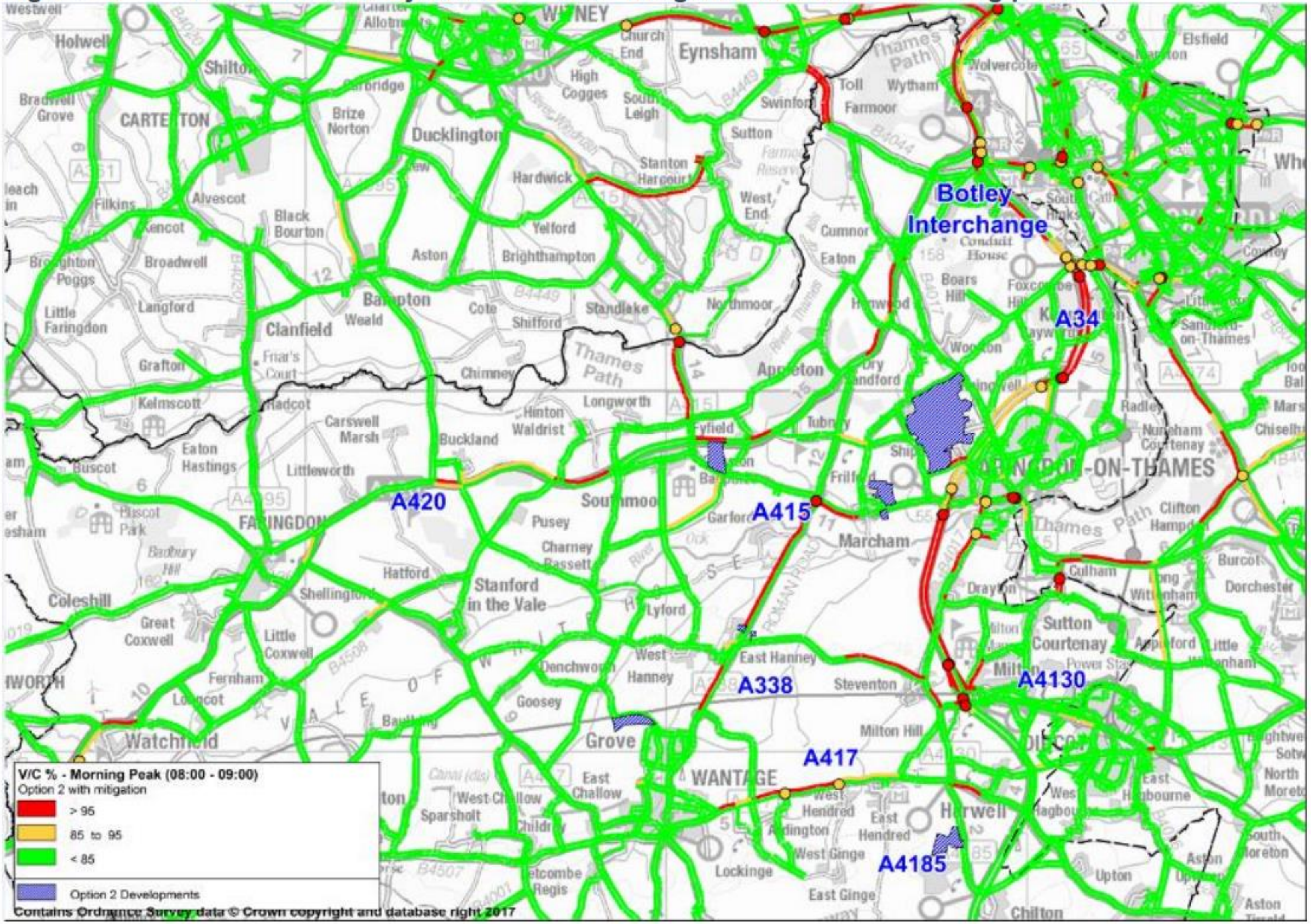
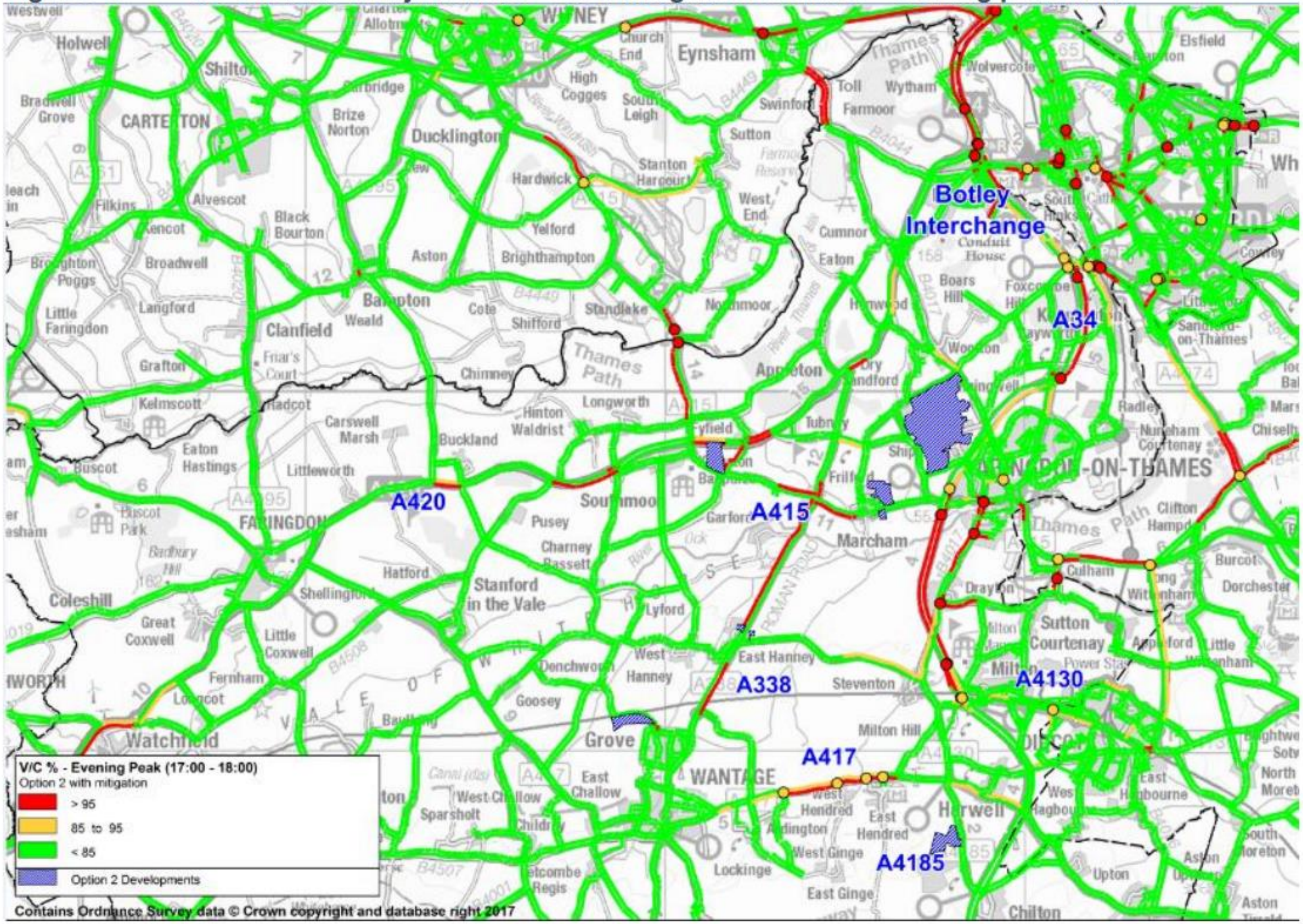


Figure 21 V/C for links and junctions – 2031 Mitigation scenario - evening peak hour



Evaluation of Transport Impacts – Stage 3 for South Oxfordshire District Council Local Plan (July 2020)

The results of the modelling assessments of the South Oxfordshire District Council Local Plan 2035 are shown in CDG.1.6 ‘TRA06.6 Evaluation of Transport Impacts Stage 3 – 5c Addendum (updated on 22 July 2020) March 2019, in Figures 3-5 and 3-6 on page 15:

ATKINS

South Oxfordshire District Council Local Plan

Evaluation of Transport Impacts: Stage 3 Development Scenarios and Mitigation Testing - Addendum (updated Do-Minimum and Scenario 5c)

Oxfordshire County Council

22 July 2020

Figure 3-5 – Link and Junction V/C (Scenario 5c) – AM Peak Hour

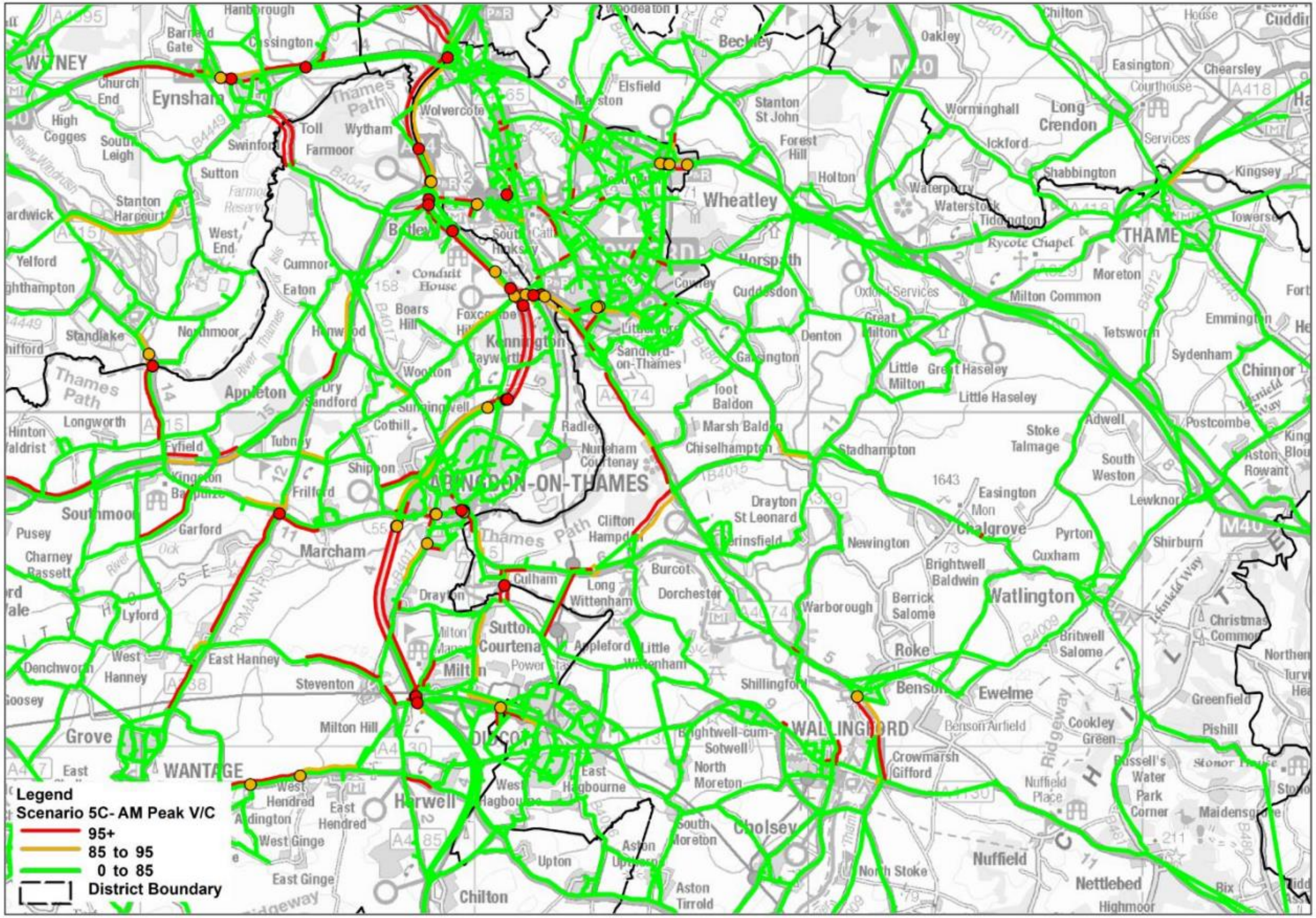
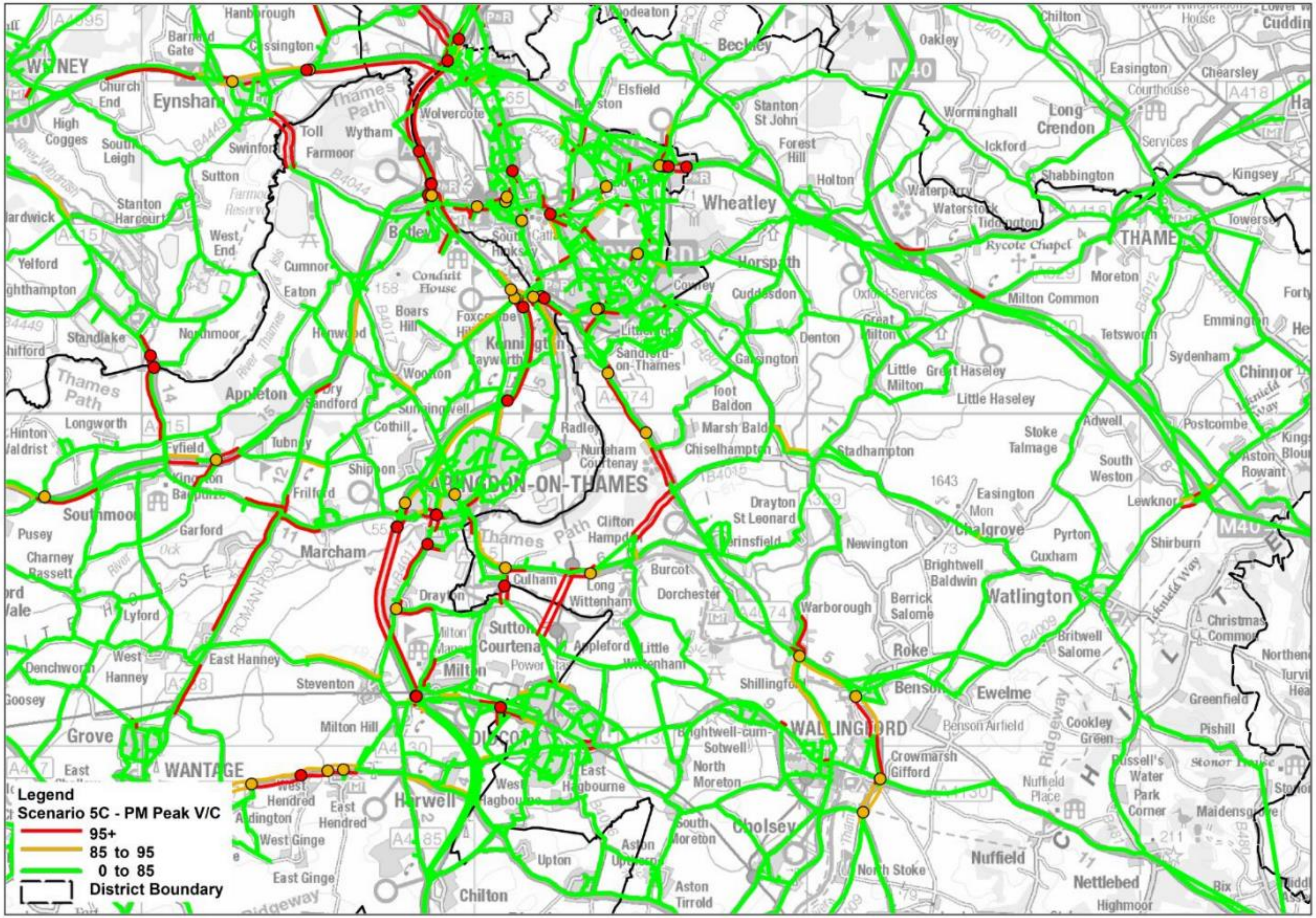


Figure 3-6 - Link and Junction V/C (Scenario 5c) – PM Peak Hour



12

Appendix CC2.6

Historic Traffic Data for Didcot
COVID Effects of Local and Trunk Roads

Local Road Traffic Data

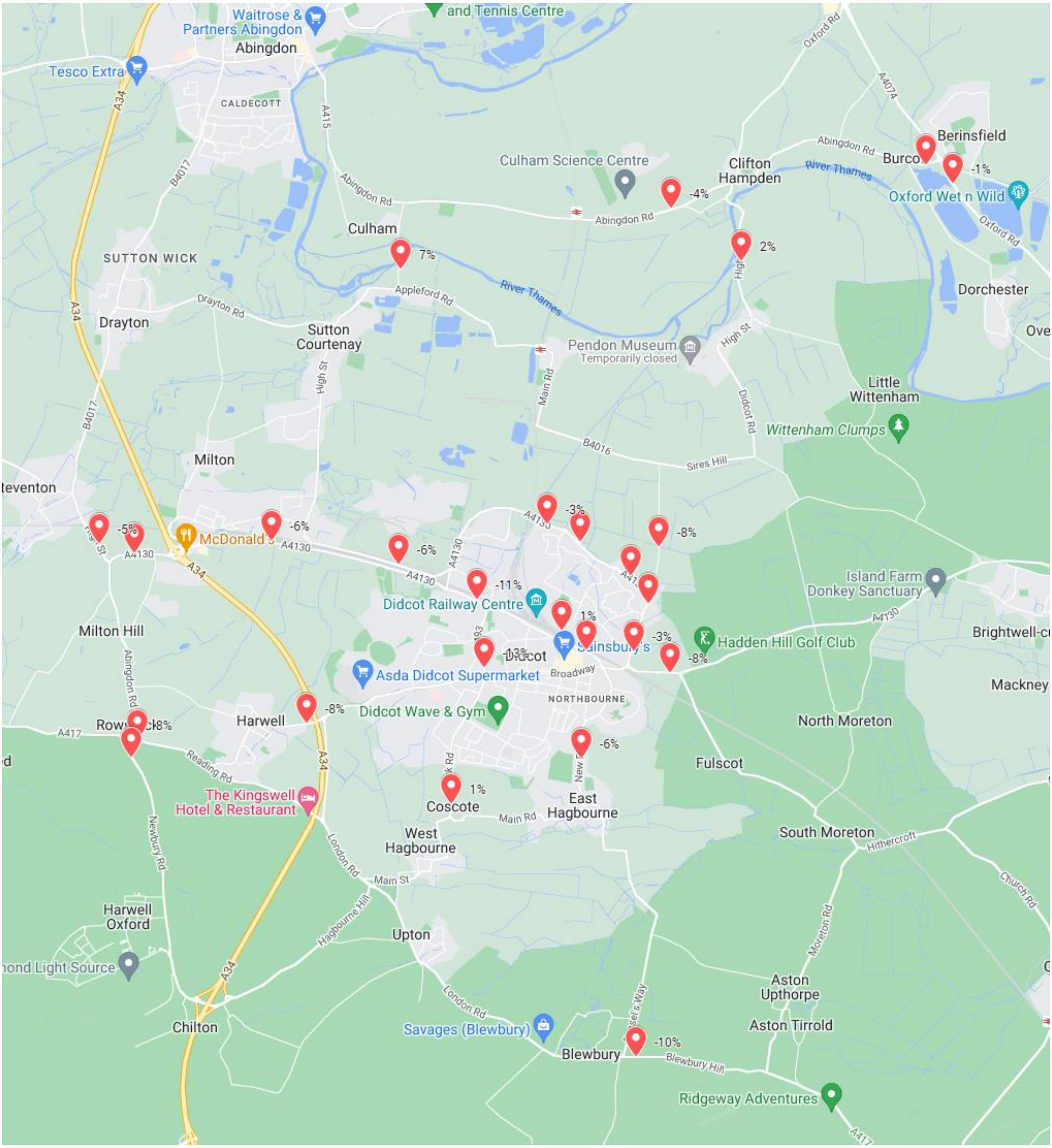
Oxfordshire County Council hold a dataset of Automatic Traffic Counters spread across the county. These have been interrogated to find the counters in the Didcot area which have both historic records from pre-COVID (2017, 2018, and 2019) and 2023, to enable traffic flow comparisons.

Data from 26 counters, shown below, have been analysed to show the change in 24-hour AADT traffic flow between 2018 and 2023 where comparable data exists, between 2019 and 2023 where comparable data exists, and between the average of 2017, 2018 and 2019 compared to 2023 where data exists.

The data shows that in some locations the flows are lower in 2023 than previously, some locations are higher in 2023 than previously, and some locations stay the same.

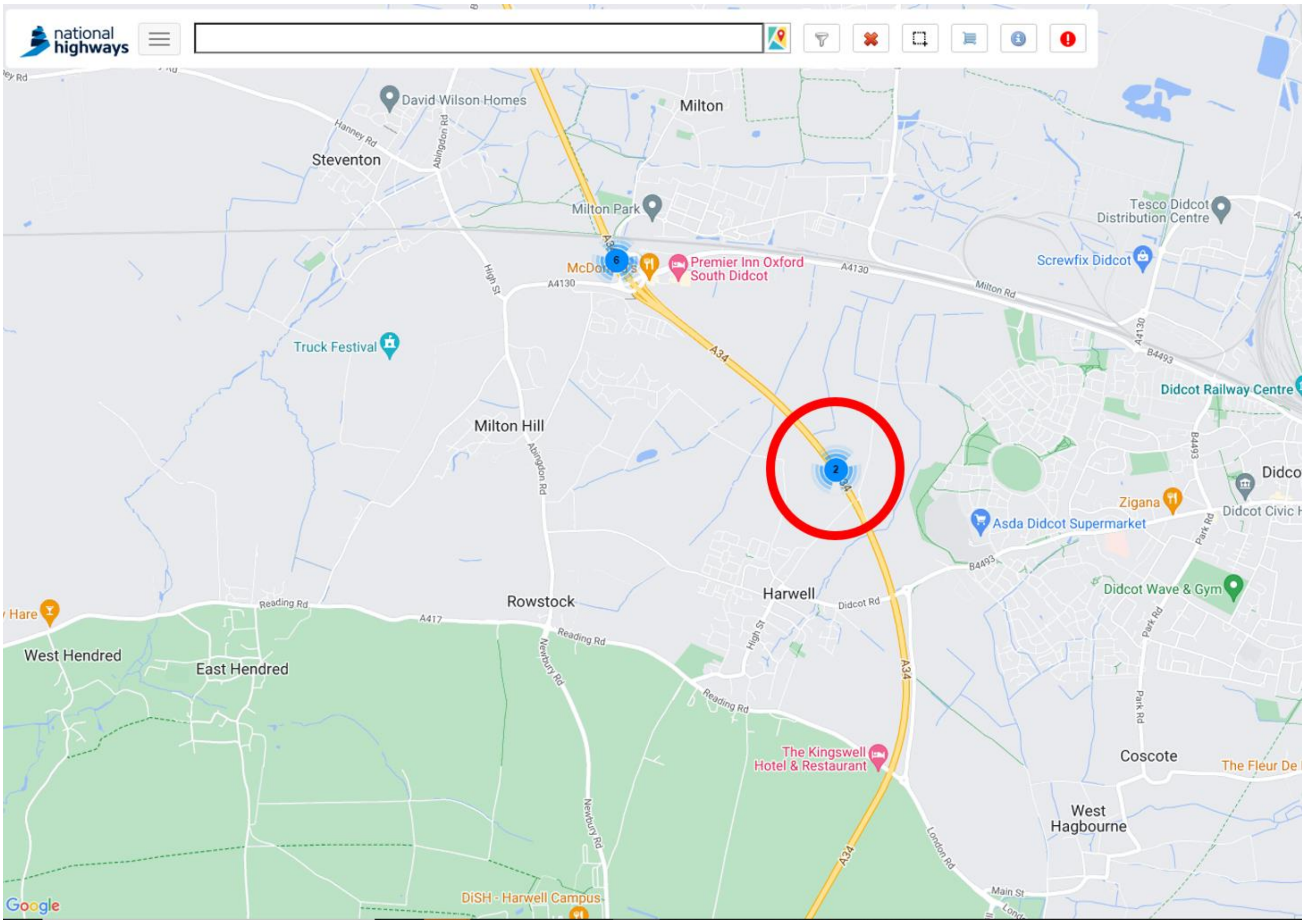
The changes from pre-COVID and pre-Brexit to 2023

Traffic flows in 2023 when compared to 2018 are 5.5% lower.
Traffic flows in 2023 when compared to 2019 are 3.4% lower.
Traffic flows in 2023 when compared to the average across 2017, 2018, and 2019 are 4.6% lower.


Waitrose & Partners Abingdon
Abingdon
Tesco Extra
Caldecott
Culham Science Centre
Clifton Hampden
Berinsfield
Burcot
-1%
Oxford Wet n Wild
-4%
Culham
7%
2%
Sutton Wick
Drayton
Sutton Courtenay
Pendon Museum
Temporarily closed
Dorchester
Little Wittenham
Wittenham Clumps
River Thames
Milton
Steventon
-5%
McDonald's
-6%
-6%
-3%
-8%
-11%
Didcot Railway Centre
1%
-3%
-8%
Didcot
Sainsbury's
Asda Didcot Supermarket
Island Farm Donkey Sanctuary
Hadden Hill Golf Club
Brightwell-cum-Sotwell
Mackney
Milton Hill
Harwell
Rowstock
-8%
-8%
Didcot Wave & Gym
Northbourne
-6%
North Moreton
Fulscot
The Kingswell Hotel & Restaurant
1%
Coscote
East Hagbourne
West Hagbourne
South Moreton
Harwell Oxford
Diamond Light Source
Upton
Aston Upthorpe
Aston Tirrold
Chilton
Savages (Blewbury)
Blewbury
-10%
Ridgeway Adventures
A34
A4130
A417
A415
B4017
B4016
A4074

A34 Trunk Road Traffic Data

Traffic data is available on the Strategic Road Network from the National Highways WebTRIS website (https://webtris.highwaysengland.co.uk/). The traffic counter circled in red below has data for 2018 and 2019 (pre-Covid) and 2023. This counter location is just to the west of Didcot.



The data was analysed to find the 24-hour Average Daily Traffic for months in 2018 and/or 2019 which also had data available for the same months in 2023.

For northbound traffic the flow in 2023 was 2.0% lower than in 2018 and 0.1% lower than in 2019 for comparable months.

For southbound traffic the flow in 2023 was 5.6% lower than in 2018 and 4.8% lower than in 2019 for comparable months.

Appendix CC2.7

Responses to Concerns Raised in Respect of Modelling

RESPONSE TO CONCERNS RAISED IN RESPECT OF MODELLING

1 Responses

1.1 A number of concerns have been received that relate to traffic modelling. These are noted below and a response provided to each, together with a specific response to the matters raised by Professor Phil Goodwin in relation to induced demand.

1.2 Professor Phil Goodwin

1.4 Andrew Dorrian (MRTPI), Planning Aid England

1.4 East Hendred Parish Council

1.5 Sutton Courtenay and Appleford Junctions

1.6 Other Comments

2 Professor Phil Goodwin

2.1 As referred to in paragraphs 5.2 and 5.3 of my Proof of Evidence, many of the comments that relate to induced demand reference Professor Phil Goodwin's comments of 28 February 2022 as appended to the NPC-JC 13 June 2022 representation (CDE.41) and, particularly Appendix 2 "Outline Comments on HIF Forecasts and Appraisal" by Professor Phil Goodwin, BSc (Econ), PhD (Civil Engineering), FCILT, FIHT. Upon reading Professor Goodwin's comments, it is apparent that they had been made in relation to an email chain, and it appears that he had not reviewed the Planning Application documents. The above referenced report states:

> *"He provided me with an email chain between himself and the Head of Infrastructure Delivery, Ms Hannah Battye, and links to various published summary material about the proposals, which I have read, but I have not studied the voluminous earlier work about the development proposals themselves, and do not have a view about these."*
>
> *And:*
>
> *"I am conscious that I have not had the opportunity to read all the documentation and technical reports that surely exist even if not all published, on all the background to the Oxfordshire Transport Strategy, the development proposals and the technical modelling reports, as I would expect to do in a proper professional study. Therefore my conclusions are necessarily provisional."*

2.2 It is clear that Professor Goodwin's comments have not been informed by a holistic understanding of the Scheme and the work that supports it. In the induced demand section within section 5 of my Proof of Evidence, I have presented an explanation of induced demand, explained how it has been accounted for in the work supporting the Scheme, and concluded that that modelling is robust (paragraphs 5.2 to 5.11 of my Proof of Evidence).

2.3 In summary, the mode comparison tables monitor the difference in trip numbers, by mode of travel, and show a minimal percentage change as there are no induced traffic effects. The trip numbers are such that induced traffic effects are not evident in the model as the percentage variation in traffic flows is negligible, with a difference of less than 0.06% in the peak hours and no change at all for 12-hour flows. Therefore, no further actions need to be carried out as 'induced traffic' for this Scheme is not evident and is therefore not a cause for concern.

3 Andrew Dorrian (MRTPI), Planning Aid England

3.1 The NPC-JC Statement of Case in relation to the called-in Planning Application (CDL.6), references on page 19 two notes by Andrew Dorrian (MRTPI), of Planning Aid England, which are discussed below.

3.2 <u>First Note – 2 January 2023</u>

3.3 The 2 January 2023 Andrew Dorrian note is available in the Neighbouring Parish Councils Joint Committee Interim Objection 20 01 2023 Appendix 3 (document pages 35-42 – 'Independent Transport Assessment Review – Queries to Oxfordshire County Council - Responses' Andrew Dorrian 02/01/2023 (for clarity, note that the 02/01/2023 date is at the start of the response and is how the later response refers to it, but 06/01/2023 is the date written at the end of response)) (CDE.69).

3.4 This note by Andrew Dorrian is in response to the Applicant's CDB.9 'Joint Parish Council Comments – Response Note' 23/03/2022. The purpose is stated as:

> *"This note has been developed taking account of the additional information provided by Oxford County Council and its consultants in October 2022 pursuant to a February 2022 request from the five Parish Councils."*

3.5 In this 2 January 2023 Andrew Dorrian Note, he summarises responses received to previous queries. Many of the comments are already addressed by my Proof of Evidence, on matters such as geographic scope, the proposed Sutton Courtenay roundabout, and diversions from the A34. Some of the comments are addressed by the Transport Assessment (CDA.7) and its appendices, which was included in the Planning Application, such as model network changes associated with new development and whether certain sites are included in the model. The main information Andrew Dorrian requests is commentary on a number of links (24, 29, 26, 33, 38, 40) reported in the ES Transport Chapter 16 (CDA.15), which are discussed below. As There is a Technical Note appended to my Proof of Evidence at Appendix CC2.9, which contains a replacement dataset for link flows. This is the information I have used to inform my comments below for the links where clarification has been requested.

3.6 Links 24 and 29: The reductions in flow are due to the proposed Didcot to Culham River Crossing providing an alternative route north-south in the area.

3.7 Link 26: The reduction in flow is due to the proposed Didcot to Culham River Crossing providing an alternative route north-south in the area.

3.8 Link 33: The increase in flow is due to the proposed Didcot to Culham River Crossing providing an alternative route north-south in the area.

3.9 Links 38 and 40 (it is assumed these are links in question as it states "Abingdon Road" and "B4015 Oxford Road" in the context of Culham Science Centre): The reductions in flow are due to the proposed Clifton Hampden Bypass providing an alternative route northeast-southwest in the area.

3.10 <u>Second Note – 18 January 2023</u>

3.11 The second Andrew Dorrian note is the Neighbouring Parish Councils Joint Committee Interim Objection 20 01 2023 Appendix 4 (document pages 43-47 – 'Independent Transport Assessment Review – Reconciliation of modelling' Andrew Dorrian 18/01/2023) (CDE.69).

3.12 This 18 January 2023 note by Andrew Dorrian states that it:

> *"fulfils a request by the Parish Councils to undertake an assessment of the base modelling and projected demand from committed and future development in the area, pursuant to the planning application for the HIF road improvements The 2 base documents utilised in this assessment include the model validation report produced by JTC dated 28th January 2022 and the Transport Assessment and subsequent response documents produced by AECOM in 2021 and 2022."*

3.13 There appears to be slight confusion with the future growth assumptions included in the model based on wording within Andrew Dorrian's note in section 2.3, some typos in the data tables within the note in section 2.4, and it is not clear how the percentage changes stated in section 2.4 have been calculated. Notwithstanding this, Andrew Dorrian concludes in the note:

> *"Overall, the exercise in establishing the base model, validating it and deriving future demand appears to be reasonable using industry practices."*

3.14 I agree with this conclusion (see section 2 of my Proof of Evidence) and therefore do not comment on the note further, other than to highlight that it also refers to the geographic scope of the modelling and induced demand, so has been referenced in the relevant sections of this appendix of my Proof of Evidence.

4 East Hendred Parish Council

4.1 East Hendred Parish Council raise concerns in their Statement of Case 17 October 2023 (CDL.9) related to modelling in their section 5, and in reference to data provided in Chapter 16 Transport September 2021 (CDA.15).

4.2 I respond as follows:

4.3 A non-material error was made in the reporting of one dataset in the ES Chapter 16 Transport September 2021 (CDA.15) which does not affect any subsequent decision-making processes. However, AECOM have produced a technical note on the matter to provide the updated dataset , which is Appendix CC2.9 of my Proof of Evidence and is titled 'Didcot Garden Town Housing Infrastructure Fund (HIF1) – 2034 DN Traffic Flows Update'. The note provides the replacement dataset and shows how there is no change to the overall results of the ES Chapter 16. This error did not impact any other ES chapters or disciplines, and the results do not change the assessment of the Scheme.

4.4 The 2024 DS (with the Scheme) flows were not previously reported in the ES Chapter 16 as they are not required by the IEMA guidance, however they are now reported in Table 3.3 of the Technical Note alongside the previously reported 2024 DN (without the Scheme) flows. The 2024 DS data is included as it enables easier comparisons of traffic flows with the Scheme / without the Scheme on the network, showing the change in flows created by the rerouting that will result with implementation of the Scheme.

4.5 I use these 2024 flows in addressing the East Hendred Parish Council comments below:

4.6 **Comment 5.1 refers to link flows in East Hendred**

4.7 I highlight that the flows on link 8 can be considered as an appropriate proxy as it connects with the A417 at East Hendred. Link 8 flows have been extracted from Table 3.3 in Appendix CC2.9 and replicated here in Table 1-1 for ease of reference. The data shows no significant change on that link.

Table 1-1 - Link 8 Flows

	2024 DN	2024 DS	Absolute Difference	Percentage Difference
Link 8 A4130 (W)	21,723	21,778	54	0%

4.8 **Comment 5.2 refers to Milton Interchange and flows over the River Thames**

4.9 The requested data for Milton Interchange and cordon counts across the River Thames was not included in the planning application. Section 6.9 of the Transport Assessment (CDA.7) presents the assessment of Milton Interchange, as agreed with Highways England (now National Highways).

4.10 **Comment 5.3 refers to flows on links 1 and 34**

4.11 This table 1-2 reproduces the flow numbers using the updated data provided in Appendix CC02.9 Table 3.1 for the links quoted by East Hendred Parish Council. Only the 2034 DN flows have changed.

Table 1-2 - Link 1 and 34 Flows

	2034 DN	2034 DS	Absolute Difference	Percentage Difference
Link 1 A34 (North)	77,867	76,931	-936	-1%
Link 34 Tollgate Road	10,076	3,061	-7,015	-70%

4.12 The data shows that there is no significant change to flow on link 1 (-1%). This was previously reported erroneously as a -11% change. The flows on link 34 show a -70% change, whereas they were previously erroneously reported as -74%.

4.13 The Technical Note also provides data for 2024 do nothing and do something in Table 3.3, which I reproduce here in Table 1-3 for ease of reference to show the comparisons of traffic flows with and without the Scheme.

Table 1-3 - 2024 Link 1 and 34 Flows

	2024 DN	2024 DS	Absolute Difference	Percentage Difference
Link 1 A34 (North)	71,116	71,162	47	0%
Link 34 Tollgate Road	7,650	1,798	-5,852	-77%

4.14 The data shows that there is no significant change to flow on link 1 (0%). The flows on link 34 show a -77% change.

4.15 The data does not show “c.9,000 vehicles per day on the A34 being diverted onto the proposed River Thames crossing,” quoted by the Parish Council.

4.16 **Comment 5.4 refers to “B4016 Culham Bridge”**

4.17 As per the data in the above tables responding to comment 5.3, the data shows significant reductions of daily traffic flows on the existing “Culham Bridge” (Link 34). Due to the highway layout in this area, it is likely that those trips are utilising the proposed Didcot to Cuham River Crossing instead.

4.18 **Comment 5.5 refers to diversion from A34 and “B4016 Culham Bridge”**

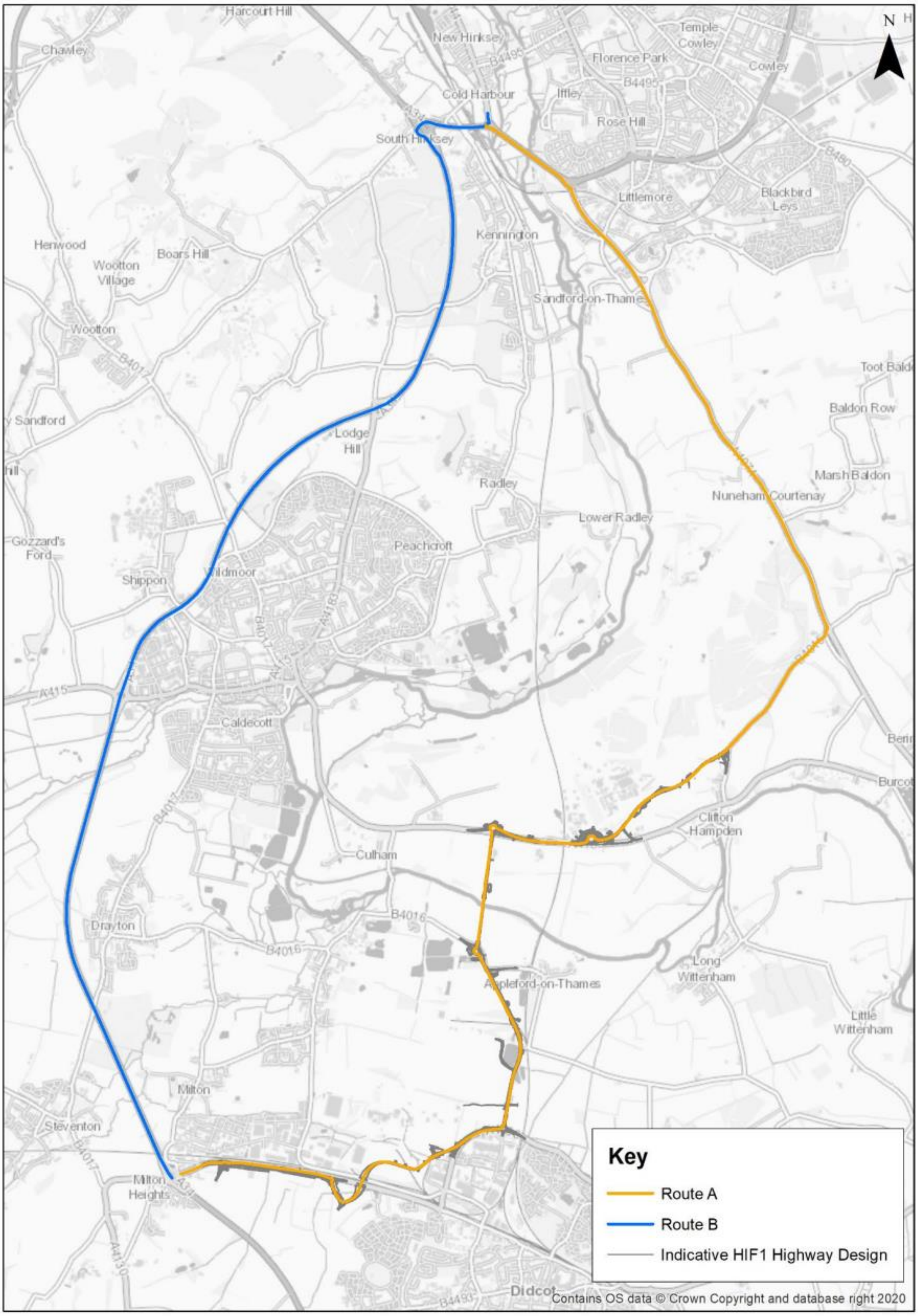
4.19 Diversion from the A34 is not shown in the model data as discussed in response to comment 5.3 above. The diversionary effects of the proposed Didcot to Cuham River Crossing from the existing “B4016 Culham Bridge” is discussed in question 5.4 above.

4.20 **Comment 5.6 refers to diversion from A34**

4.21 Diversion from the A34 is not shown in the model data as discussed in response to comment 5.3 above. In addition to the modelling not showing the scheme reassigning strategic traffic from the A34, a comparison of the two route options (A34 or the Scheme) taking into account road speeds, distance, and number of junctions helps to further explain why this is the case. This is covered ‘Joint Parish Council Comments – Response Note (CDB.09 pp.2 to 3), and the relevant section is quoted below for ease of review:

> *“As shown on Figure 1 Route A (Milton – HIF1 roads – A4074 via Golden Balls) is approximately 20 kilometres in length with the need to navigate 13 junctions (signals and roundabouts and roundabouts) and has sections of 30mph and 40mph roads. Compared to Route 2 (Milton Interchange – A34 – Redbridge) which is approximately 15 kilometres in length with the need to navigate 2 junctions (both signals) which for the vast majority of length is on 70mph roads … Given the above the HIF1 Scheme is not considered to be an attractive alternative for drivers to reroute from the A34 to/from Oxford and beyond.”*

Figure 1 – Comparison of A34 and the Scheme route



4.22 **Comment 5.7 refers to model demand assumptions**

4.23 The assumptions used in the Paramics modelling are summarised in Figure 5.2 of the Transport Assessment (CDA.7), also replicated in this proof of evidence for ease of review in (Figure 5 of my Proof of Evidence). The Transport Assessment sets out in paragraph 5.3.8 reasons why assumptions for modal shift in the 2034 year are included for the new sites but not in 2024 or for existing journeys made in the 2017 base model:

> "… *It is assumed that the Garden Town principles will continue to be enacted in this area over the next 14 years, increasing the usage of sustainable modes. Modal shift from these developments later in the plan period (over a decade away) is more likely as they are coming alongside significantly improved pedestrian / cycle / public transport provisions …*
>
> *The largest new sites follow good spatial strategies and are in more sustainable locations near public transport hubs and / or are located nearer the growing employment areas which will have significantly improved NMU routes."*

5 Sutton Courtenay and Appleford Junctions

5.1 A number of objectors raise concerns around the proposed Sutton Courtenay roundabout on the Didcot to Culham River Crossing, specifically whether the junction impacts traffic movements within Sutton Courtenay Village. Appleford Parish Council also query the proposed 'T-Junction' serving Appleford Village. Those objectors include:

Robin Draper's Representation on the Called-in Planning Application 04.10.2023 (CDN.25).
CDL.6 is the NPC-JC Statement of Case in relation to the called-in Planning Application 11th Dec 2023.
Sutton Courtenay Parish Council's Objection to the Statutory Orders 'Objection 10 - submitted by Sutton Courtenay Parish Council on 7 March 2023' (CDJ.9).
Appleford Parish Council's 20 March 2023 objection to the Statutory Orders (CDJ.11).

5.2 I respond as follows:

5.3 Flows from Drayton / the west

5.4 Objectors raise concerns regarding the proposed Sutton Courtenay roundabout attracting additional car trips from the west. The Transport Assessment (CDA.7) Appendix B shows flows coming from the Drayton direction (the west) with and without the Scheme, illustrated by reviewing the flows on the western arm of junction OFF9, on arm C 'Brook Street'. I summarise the reported flows here in Table 1-4 for ease of review:

Table 1-4 - Flows from Drayton

	2024 AM Without HIF	2024 AM With HIF	2024 PM Without HIF	2024 PM With HIF	2034 AM Without HIF	2034 AM With HIF	2034 PM Without HIF	2034 PM With HIF
From Brook Street	427	425	222	222	480	478	293	291
Percentage change	-0.47%		0%		-0.42%		-0.68%	

5.5 As shown in the table above using data informed by the Paramics model, in 2024 and 2034, the addition of the Scheme (including the proposed Sutton Courtenay roundabout) shows no increase in flow from the Drayton direction.

5.6 Flows through Sutton Courtenay village

5.7 In a similar way to the East Hendred rebuttal section of this Appendix (paragraphs 4.1 to 4.23 above), this Table 1-5 below reproduces flow numbers from Table 3.1 in the updated data provided in Appendix CC2.9. This is done for the links most relevant to Sutton Courtenay. Only the 2034 DN flows have changed to what has been previously reported as part of the Planning Application.

Table 1-5 - Flows through Sutton Courtenay village: 2034

	2034 DN	2034 DS	Absolute Difference	Percentage Difference
Link 30	14,058	7,134	-6,924	-49%
Link 31	12,080	6,429	-5,651	-47%
Link 32	14,029	10,823	-3,206	-23%
Link 33	8,492	10,364	1,872	22%
Link 34	10,076	3,061	-7,015	-70%

5.8 The data shows that the addition of the Scheme (including the proposed Sutton Courtenay roundabout) results in a decrease in flow through Sutton Courtenay Village (Links 30, 31, 32) and a decrease in flow over the existing Culham Bridges (Link 34). The decreases are due to the Didcot to Culham River Crossing providing a more suitable route over the River Thames, resulting in fewer drivers travelling through Sutton Courtenay village (from Didcot, for example). The eastern extent of the village, at link 33, shows a 22% increase in flow as drivers that previously did not use this link but instead used the existing Culham Bridges river crossing (link 34), now are given the option to not turn left onto the existing Culham Bridges but instead travel along link 33 to use the proposed Didcot to Culham River Crossing instead.

5.9 The Technical Note (reference appendix CC2.9) also provides data for 2024 do nothing and do something in Table 3.3, which I reproduce here in Table 1-6 as it enables easier comparisons of traffic flows with HIF / without HIF:

Table 1-6 – Flows through Sutton Courtenay village: 2024

	2024 DN	2024 DS	Absolute Difference	Percentage Difference
Link 30	8,182	4,898	-3,284	-40%
Link 31	7,602	4,748	-2,854	-38%
Link 32	9,957	8,134	-1,823	-18%
Link 33	5,565	7,794	2,229	40%
Link 34	7,650	1,798	-5,852	-77%

5.10 The data for the 2024 scenarios shows similar patterns to the above reported 2034 data, with decreases through Sutton Courtenay village and the existing Culham Bridges river crossing, and an increase at the eastern end of Sutton Courtenay village for the same reasons as discussed above.

5.11 <u>Removal of the Sutton Courtenay roundabout</u>

5.12 Page 124 of the Acquiring Authority Statement of Case (CDM.10) references a SYSTRA modelling report which specifically considers the proposed Sutton Courtenay roundabout. Through the writing of my Proof of Evidence it has come to light that the report had not been appended to that Statement of Case at Appendix 12 as stated in the Statement of Case. I now append the SYSTRA 'Appleford Road Closure - Paramics Model Testing Note' (dated 27/07/2023) as Appendix CC2.8 to my Proof of Evidence. In the report, SYSTRA explain how they used the Paramics model to compare a 2034 'with HIF' scenario to an alternate scenario which was identical other than the proposed Sutton Courtenay roundabout is removed entirely, and no connection is provided between the proposed Didcot to Culham River Crossing Scheme and the B4016 Appleford Road towards Sutton Courtenay. The report explains how the removal of the roundabout alters routing patterns and has significant impacts on queueing in the area. The report concludes:

> *5.2.1 "The modelling shows that the alternate arrangement has significant increases in the AM and PM periods queueing at the existing Culham Bridge, the A415/Tollgate Road and the A415/New Crossing Northern Roundabout. Many of the traffic benefits of the HIF1 proposals are removed in the alternate arrangement with queueing on at the existing crossing which can extend back to Sutton Courtenay as well as queueing on the new crossing".*

5.13 In response to questions raised by Sutton Courtenay Parish Council, the Applicant has undertaken modelling to investigate the impact of the proposed Sutton Courtenay roundabout as outlined in the SYSTRA report in Appendix CC2.8. It is concluded that the roundabout is required as part of the Scheme to enable the traffic benefits in this area.

5.14 <u>Appleford T junction</u>

5.15 Appleford Parish Council's 20 March 2023 objection to the Orders (CDJ.11) states "that justification for a roundabout and T junction (segments 11 & 12 on Key Plan) has not been provided despite many requests for traffic data.". The Transport Assessment (CDA.7) discusses the proposed T-Junction at Appleford (referred to as SCH9 in the TA) in paragraphs 6.6.20 to 6.6.22, some of which are quoted here:

> "*6.6.21 The results indicate that the junction will operate within capacity in 2024. In 2034 the junction is predicted to operate at very close to capacity. Whilst RFC values are predicted to be between 0.92 and 1.00 in 2034, the maximum queue length on the B4016 is only seven vehicles.*
> *6.6.22 Although the stand-alone junction model indicated this junction would be operating at very close to capacity in 2034, the applicant views this as acceptable for the following reasons:*

- *The strategy for the Scheme is to prioritise the mainline flow over side arm flows, particularly in this location. The intention is for vehicles coming from existing areas of Didcot and future new housing on the north and eastern sides of Didcot (North East Didcot 1,880 dwellings in the model, Ladygrove East 642 dwellings in model) to access the new Didcot to Culham River Crossing from the Collett roundabout (SCH7). A different junction type in this location could be more attractive to drivers from the locations stated above, potentially resulting in more trips through Appleford Village. Therefore, a level of queuing on the side arm is deemed reasonable as it will operate as a village access whilst not being too attractive for through trips.*

- *Any drivers from existing housing in Didcot, North East Didcot or Ladygrove East are likely to be heading north over the new Didcot to Culham River Crossing. Without the HIF Scheme, their route north would have likely been through Appleford Village and then Sutton Courtenay / Culham. Therefore, the Scheme is reducing flows through the villages by offering a more suitable route from Collett roundabout (SCH7). Any delay to Appleford residents experienced at this junction SCH9 is significantly outweighed by the reduction in through traffic in the village.*

- *Stand-alone junction models do not account for breaks in the mainline traffic flow as a result of junctions or crossings further upstream and downstream. The results are therefore likely to show longer queues on side arms of priority junctions. For example, in this location of SCH9, the mainline flow is likely to have more gaps in vehicles than predicted by the stand-alone junction model due to the signalised crossing, bus stops, and roundabout to the north, and to the south the signalised crossing, two parallel crossings, bus stops, the other side road accesses from future development, and the roundabout.".*

5.16 Keeping in mind paragraph 1.1.1 of the TA which states *"The Scheme does not aim to provide unlimited highway capacity for cars, or to remove all congestion"* and the principles of decide and provide as discussed in Paragraphs 5.12 to 5.26 of my Proof of Evidence. I find the above quoted justifications for the proposed junction type to be sound.

6 Other Comments

6.1 This section deals with specific comments from other parties.

Councillor Sarah James

Comment

6.2 Councillor Sarah James (CDN.15) makes comments regarding paragraph 16.4.13 of the ES Chapter 16. She comments "that states that A34 on-slips have been categorised as having a very low sensitivity as the traffic is not running into a junction and is merging onto free-flowing traffic. That is simply not true at rush hour on a typical weekday morning when the A34 is itself congested in the vicinity of Milton Interchange due to the volume of on traffic trying to join."

Response

6.3 AECOM were requested to review this comment in relation to the ES Chapter 16 and provided the response the below response, with which I concur :

> *"Link sensitivity is used for the assessment of impacts on Accidents & Safety, which is based on daily (24-hour) flows. Therefore the sensitivity of the links is also considered over a 24-hour period, and 'Very Low' is considered appropriate. The magnitude of change for both of the A34 on-slips is less than 10% in both 2024 (Table 16.13) and 2034 (Table 16.16) scenarios. This is categorised as 'Negligible/Very Low'. Therefore, the significance of effect would be 'Negligible' for any link sensitivity (ref Table 16.2 'Significance of Effects' CDA.15 ES Chapter 16 Transport and update note CC2.9).*

Comment

6.4 Councillor Sarah James 01.10.2023 (CDN.15) makes comments regarding the model impacts at Milton Interchange and the A34:

> *"The ES Transport Chapter does model impacts on Milton Interchange and the A34 of building HIF1. The impact on the A34 is described as positive because the new road will take more vehicles away from Milton Interchange more quickly. It doesn't mention the impact of the traffic in the other direction, presumably also more vehicles that will be arriving more quickly at the junction. This half picture is not believable."*

Response

6.5 The assessment of Milton Interchange was agreed with the Local Highway Authority (Oxfordshire County Council), and National Highways (with responsibility for the A34 through Oxfordshire). The Transport Assessment (CDA.7) sets out the assessment of this junction at section 6.9. Journey time and speed data was used to assess and illustrate the Scheme impact on the junction, with the summary at paragraph 6.9.9 explaining *"HIF enables the A4130 eastbound from Milton Interchange to operate more efficiently, allowing vehicles to travel away from the junction. This reduces blocking back through the junction, enabling it to operate more efficiently, which in turn reduces queueing on the A34 off slip roads. The effect of this on the A34 is reduced journey times, as shown in above figures. The greatest impact of the Scheme is shown to be in PM peak."*. As per the Paramics model map in Figure 4 of my Proof of Evidence, the whole junction and its approaches are modelled in Paramics, so any impacts of the Scheme across the whole junction have been accounted for in the operation of the junction in the model, and therefore in the reported results.

Oxfordshire Roads Action Alliance

Comment

6.6 Oxfordshire Roads Action Alliance (CDN.26) comments that "It fails to take into account induced traffic or the impact of traffic diverting from the A34 at rush hour or for road accidents. These occur frequently and will gridlock the area."

Response

6.7 It is industry-standard not to model for the potential of road accidents. The rest of this objector's comment regarding induced demand is covered in the induced demand section of this Proof of Evidence.

NPC-JC

Comment

6.8 In the NPC-JC Statement of Case in relation to the called-in Planning Application 11th December 2023 (CDL.6) it refers to housing figures used in the model on pages 7 and 8:

> *"It was also noted in our previous interim objection that the VoWHDC has reviewed its housing figures resulting in a 32% reduction across the district. SODC is due to review its housing figures in 2025.*
>
> *A substantial reduction in housing over the plan period will have significant bearing on the purported justification for HIF1 and the calculations upon which the Transport Assessment (TA) are based. A 32% reduction in housing across the Scheme area significantly reduces the need for the Scheme, whilst simultaneously increasing the 5 year housing land supply in both districts, enabling the district authorities to more easily meet housing targets without the Scheme.*
>
> *Any reduction in housing figures will also have impacts on the traffic modelling of the Scheme. 32% less new dwellings should result in a pro rata reduction in vehicle movements. This reduction has not been factored into the TA, which is clearly out-of-date in any event. At the very least the model should be re-run using the new housing figures available.".*

Response

6.9 It is not clear where the 32% reduction of housing figures is being quoted from, but it is assumed to be related to changes to the District Council's change in 5 year housing land supply calculations. This does not equate to a 32% reduction in the longer term requirement for housing in the area, as evidenced by the emerging South and Vale Joint Local Plan which proposes to continue to allocate the same large housing sites in the Scheme area. This Objector comment is also responded to in Aron Wisdom's Proof of Evidence with more detail on the proposed housing site changes in the Emerging Joint Local Plan. In terms of modelling, the housing assumptions were informed by trajectories provided by the experts in this field, the LPAs, and were updated specifically for this project as set out in the Transport Assessment (CDA.7) paragraph 5.3.4. Therefore, the modelling is robust.

Comment

6.10 In CDL.6, the NPC-JC Statement of Case in relation to the called-in Planning Application 11th December 2023, it states:

> *"Appleford is concerned about increased traffic from Long Wittenham and Lady Grove Housing estates (Didcot) using it as a rat run to access the new road. This would also increase the traffic over the old protected narrow humped railway bridge, with greater risks to pedestrians, cyclists and rail passengers entering/exiting the station. They are also concerned with the T junction design at the B4026 which means traffic heading to Sutton Courtenay (incl. school runs at peak times) would be required to cross a dangerous 50 mph road."*

Response

6.11 As set out in the Transport Assessment CDA.7 Section 5.3, the Paramics model takes account of existing and future housing in the area, and the routing taken by vehicles in the model takes account of the proposed Scheme, therefore 'rat running' is accounted for. The note included in Appendix CC2.9 of my Proof of Evidence, titled 'Didcot Garen Town Housing Infrastructure Fund (HIF1) – 2034 DN Traffic Flows Update' sets out 2024 links flows in Table 3.3. The link through Appleford (Link 26) shows a 71% reduction through the village as a result of the Scheme.

Comment

6.12 In CDL.6, the NPC-JC Statement of Case in relation to the called-in Planning Application 11th December 2023, it states:

> *"Clifton Hampden & Burcot are concerned at the possibility of a mass of traffic backing up at the Golden Balls roundabout and back towards Clifton Hampden, leading to drivers cutting through the village, thus undermining the reasons for a bypass."*

Response

6.13 The Golden Balls roundabout is subject to a separate OCC study, as is the A4074 Corridor, as set out in paragraph 2.28 of the Applicant's Technical Note concerning Environmental Statement (CDO.1):

> *"The Junction was identified in LTP4 as potentially requiring changes in the future, and through the Local Plan process it was included in the Infrastructure Delivery Plan for multiple allocated development sites, requiring them to pay towards future changes. An A4074 Corridor Strategy is currently underway, looking into future options for the entire route, as per Policy 53 of LTCP. This takes into consideration all modes of transport and is also supported by an ongoing study investigating the feasibility of multiple options for walking and cycling routes between Oxford and Berinsfield, which would form part of the wider Strategic Active Travel Network (linking with HIF1). This walking and cycling route is also required to be funded or delivered by allocated development sites in the SODC Local Plan. A full Options Assessment report process will be undertaken for Golden Balls, where the need and opportunities for changes will be assessed. This will include a wide range of options including walking and cycling, bus priority, mobility hub, the overall future bus strategy, and junction layout changes, amongst other options. Engagement with stakeholders will help to inform the project, including the surrounding villages such as Nuneham Courtenay, Berinsfield, Clifton Hampden, Burcot, the Baldons, and Chiselhampton, amongst others."*

Appleford Parish Council

Comment

6.14 Appleford Parish Council's 20 March 2023 objection to the Orders (CDJ.11) states in section 2:

> *"The traffic model assessment ignores traffic from housing developments (18,000 houses) and is further flawed."*

Response

6.15 This is incorrect, as the Paramics model directly accounts for the planned growth in the area as set out in the Transport Assessment Table 5.1 (CDA.7), replicated in CC2.4 of my Proof of Evidence. From 2017 to 2034, the Paramics model directly includes an additional 15,825 dwellings, as advised to SYSTRA in June to August 2020 during the model trajectory update, by the South Oxfordshire and Vale of White Horse District Councils as Local Planning Authorities.

RWE

Comment

6.16 The RWE Objection to the Orders on 22/03/2023 (CDJ.28) makes multiple comments related to modelling.

Response

6.17 These points were responded to in the ‘EIA Regulation 25 Response’ in November 2022, within ‘Appendix J RWE Transport Assessment response’ (CDB.2), therefore I do not repeat them here.

Appendix CC2.8

HIF1 Paramics Modelling
Appleford Road Closure

DRAFT TECHNICAL **NOTE**

HIF1 PARAMICS MODELLING

APPLEFORD ROAD CLOSURE - PARAMICS MODEL TESTING NOTE

SUMMARY TABLE	
Client/Project owner	Oxfordshire County Council
Project	HIF1 Paramics Modelling
Title of Document	Appleford Road Closure - Paramics Model Testing Note
Type of Document	DRAFT Technical Note
Date	27/07/2023
Reference number	GB01T23C31/27/07/2023
Number of pages	8

1. INTRODUCTION

1.1.1 SYSTRA Ltd (SYSTRA) were commissioned by Oxfordshire County Council (OCC) in March 2023 to test the traffic impact of a proposed alternative layout for the junction between the B4016 Appleford Road and the link road that forms part of the Didcot to Culham River Scheme element of the HIF1 Project.

1.1.2 This report details the development of the test model and a comparison of the model operation with the existing proposed scheme design.

2. BACKGROUND

2.1.1 In 2020/2021 SYSTRA carried out traffic modelling using the Didcot Garden Town Paramics Model in support of the HIF1 Transport Assessment. As part of this study 2024 and 2034 future year models were developed which reflected traffic and network changes to those years. The traffic changes were calculated using the Oxfordshire Strategic Model (OSM) to provide changes to through traffic, and housing and employment trajectories supplied by South Oxfordshire and Vale of White Horse District Councils to calculate traffic generated by future developments. The models also contained new infrastructure expected by 2024 and 2034 including the HIF1 proposals.

2.1.2 Full details of the forecasting methodology can be found in *HIF1 Paramics Modelling, Forecasting Note, SYSTRA, September 2021* and of the network changes in *HIF1 Paramics Modelling, Future Year Infrastructure Note, SYSTRA, September 2021*.

2.1.3 For the purposes of this study the 2034 with HIF infrastructure model will be used as the baseline.

3. ALTERNATE ARRANGEMENT MODEL

3.1.1 OCC provided details of an alternative layout for the junction between the B4016 Appleford Road and the link road that forms part of the Didcot to Culham River Scheme to be tested in this study.

3.1.2 The propopsed scheme has a roundabout which connects the link road with the B4016 Appleford Road towards Sutton Courtenay. There is also a priority junction to the south that connects the scheme to Appleford village. The modelled layout of this scheme is shown in Figure 1.

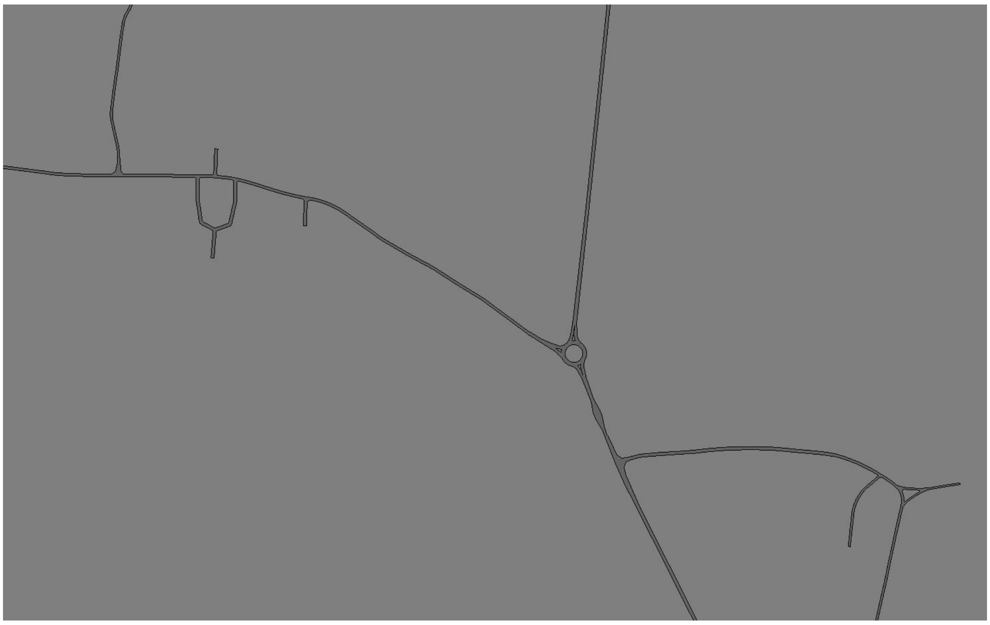


Figure 1. Model Layout - Proposed Scheme

3.1.3 The alternate scheme removes the roundabout entirely and provides no connection between the River Crossing scheme and the B4016 Appleford Road towards Sutton Courtenay. The priority junction connecting the scheme to Appleford village is retained. The alternate layout is shown in Figure 2.

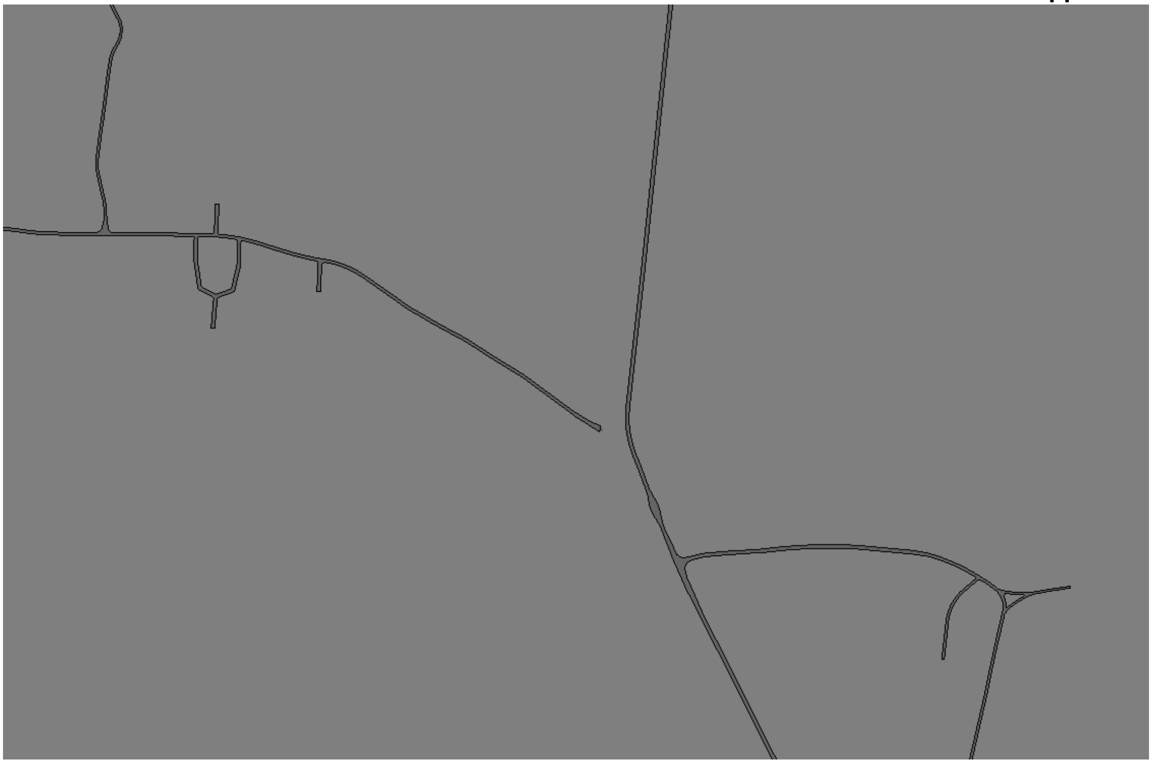


Figure 2. Model Layout - Alternate Scheme

3.1.4 A scenario test model was created using the 2034 with HIF infrastructure model as the starting point and incorporating the changes to the scheme shown above. No further changes were made to the model network or the traffic demand.

4. MODEL OPERATION COMPARISON

4.1.1 The alternate layout test model was run 5 times each for the AM and PM time periods, the results were averaged across the five runs and compared with the standard scheme. A summary is presented in the following sections.

4.2 Queue Length Comparisons

4.2.1 Average maximum queue lengths were recorded on the approaches to the A415/New Crossing Northern Roundabout, Appleford Road/New Crossing Roundabout, the existing Culham Bridge and A415/Tollgate Road in order to assess any potential impacts of the proposals.

4.2.2 The average maximum queue length in metres for the AM and PM periods are shown in Table 1 and Table 2.

Table 1. Average Maximum Queue Length (m) – AM Period

		AM	
		Standard	Alternate
A415/Tollgate Road	A415 West	135	150
	A415 East	101	322
	Tollgate Road	196	305
Appleford New Crossing Roundabout	Appleford Rd East	259	N/A
	New Crossing South	99	N/A
	New Crossing North	77	N/A
Culham Bridge	Crossing South	206	804
	Crossing North	54	270
New Crossing Northern Roundabout	A415 West	316	219
	A415 East	37	54
	Crossing	581	1051
	Development Access	318	141

4.2.3 Table 1 shows that the alternate scheme has impacts on queue lengths at all four locations in the AM period.

4.2.4 At the Appleford Road/New Crossing Roundabout, the queueing is removed in the alternate scheme as the junction has been removed.

4.2.5 The removal of the link between the B4016 and the new crossing alters vehicle routeing in the area. Vehicles which in the standard arrangement were able to use the new crossing to travel between the south west (eg Sutton Courtenay) and north east (eg Culham Science Centre/Goldenballs) are no longer able to, and reroute to use the existing Culham Bridge. This causes an increase of queueing of around 600m to the south and 225m to the north on the existing crossing. The increased queue to the south can extend back to Sutton Courtenay. There is also an increase in queueing at A415/Tollgate Road on the Tollgate Road arm of around 100m and A415 East arm of around 225m due to the same rerouting traffic.

4.2.6 There is an increase in maximum queue length of around 450m on the crossing arm of the A415/New Crossing Northern Roundabout. This is caused by an increase in vehicles heading westbound across the roundabout to head towards the existing Culham Bridge which oppose the new crossing arm and leave fewer gaps for vehicles from the new crossing to enter the roundabout. In the standard scheme these vehicles from the east turn left at this roundabout and so do not oppose the northbound vehicles. The queue being held on the crossing arm means reductions in maximum queue length on the A415 West of around 100m and Development Access of around 200m.

Table 2. Average Maximum Queue Length (m) – PM Period

		PM	
		Standard	Alternate
A415/Tollgate Road	A415 West	171	159
	A415 East	153	538
	Tollgate Road	124	728
Appleford New Crossing Roundabout	Appleford Rd East	137	N/A
	New Crossing South	251	N/A
	New Crossing North	271	N/A
Existing Culham Crossing	Existing Crossing South	126	937
	Existing Crossing North	65	183
New Crossing Northern Roundabout	A415 West	79	65
	A415 East	36	48
	Crossing	378	1312
	Development Access	38	38

4.2.7 Table 2 shows that the impacts of the alternate scheme are similar in PM period to the AM period.

4.2.8 At the Appleford Road/New Crossing Roundabout, the queueing is removed in the alternate scheme as the junction has been removed.

4.2.9 As in the AM, the rerouting of vehicles caused by the removal of the link between the B4016 and the new crossing has impacts on the A415/Tollgate Road junction and on the existing Culham Bridge. The alternate arrangement model has an increase in maximum queue length at A415/Tollgate Road on the Tollgate Road arm of around 600m and A415 East arm of around 400m. The queue to the south on Tollgate Road can extend back to the existing crossing causing issues there and exacerbating the northbound queue. At the existing crossing the alternate arrangement has an increase in maximum queue length of around 800m to the south and 150m to the north. The increased queue to the south can extend back to Sutton Courtenay.

4.2.10 There is an increase in maximum queue length of around 1000m on the crossing arm of the A415/New Crossing Northern Roundabout, taking the queue back past the priority junction with the B4016 Appleford Road. This increase is caused by an increase in vehicles heading westbound across the roundabout to head towards the existing Culham Bridge which oppose the new crossing arm and leave fewer gaps for vehicles from the new crossing to enter the roundabout. There is little change on the other arms of the roundabout.

4.3 Model Snapshots

Figure 3. A415/Existing Culham Bridge/New Crossing AM Queueing

4.3.1 Figure 3 shows an example of the approximate maximum extent of the queueing on the A415 and the New Crossing in the AM. Queueing of westbound traffic is shown extending back to the norther river crossing roundabout and of northbound traffic queueing extends back past the location of the removed B4016 Appleford Road Roundabout.

Figure 4. Existing Culham Bridge AM Queueing

4.3.2 Figure 4 shows the approximate maximum extent of the queueing on the northbound approach to the Culham Bridge. This shows the queueing extending back towards Sutton Courtenay village.

Figure 5. A415/Existing Culham Bridge/New Crossing PM Queueing

4.3.3 Figure 5 shows an example of the approximate maximum extent of the queueing on the A415 and the New Crossing in the PM. As in the AM, Queueing of westbound traffic is shown extending back to the norther river crossing roundabout and of northbound traffic queueing extends back past the priority junction with the B4016 Appleford Road.

5. SUMMARY AND CONCLUSIONS

5.1 Summary

5.1.1 SYSTRA Ltd (SYSTRA) were commissioned by Oxfordshire County Council (OCC) to test the traffic impact of a proposed alternative layout for the junction between the B4016 Appleford Road and the link road that forms part of the Didcot to Culham River Scheme element of the HIF1 Project.

5.1.2 The Alternate Arrangement Model was created using the 2034 with HIF Infrastructure model as a starting point. The 2034 with HIF Infrastructure model was developed in support of the HIF1 Transport Assessment. The alternate scheme removes the roundabout entirely and provides no connection between the River Crossing scheme and the B4016 Appleford Road towards Sutton Courtenay.

5.1.3 The Alternate Arrangement Model was run 5 times for the AM and PM period and the results compared to the standard 2034 with HIF infrastructure model.

5.1.4 The removal of the B4016 Appleford Road access to the new crossing alters the routeing patterns and has significant impacts on queueing in the area. In both the AM and PM periods there are significant increases in queueing at the existing Culham Bridge, the A415/Tollgate Road and the A415/New Crossing Northern Roundabout

5.2 Conclusions

5.2.1 The modelling shows that the alternate arrangement has significant increases in the AM and PM periods queueing at the existing Culham Bridge, the A415/Tollgate Road and the A415/New Crossing Northern Roundabout. Many of the traffic benefits of the HIF1 proposals are removed in the alternate arrangement with queueing on at the existing crossing which can extend back to Sutton Courtenay as well as queueing on the new crossing.

Appendix CC2.9

Didcot Garden Town Housing Infrastructure Fund (HIF1) – 2034 DN Traffic Flows Update

Didcot Garden Town Housing Infrastructure Fund (HIF1) – 2034 DN Traffic Flows Update

Client name	Project name	Date	Project number
Oxfordshire County Council	Didcot Garden Town Housing Infrastructure Fund (HIF1)	12 January 2024	60606782
Prepared by	**Checked by**	**Approved by**	
SOC	RS	SOC	

Revision History

Revision	Revision date	Details	Authorised	Name	Position
A	12/01/2024	Updated following review	SOC	Sean O'Connell	Associate

1. Introduction

1.1 An error was made in the reporting of one dataset in the Environmental Statement (ES) Chapter 16: Transport submitted with the Didcot Garden Town Highway Infrastructure Fund (HIF1) planning application. This Technical Note provides the replacement dataset and shows how there is no change to the overall results of the ES Chapter. This error did not impact any other ES chapters or disciplines, and the results do not change the assessment of the Scheme. The dataset was not reported anywhere other than in ES Chapter 16.

1.2 The dataset affected was reported in Tables 16.14 and 16.16 of Chapter 16: Transport of the ES. The updates relate only to the 2034 Do Nothing (DN) two-way daily traffic flows, and there are no changes to the 2034 Do Something (DS) flows. This Technical Note also introduces previously unreported 2024 DS flows, as a means of allowing easier comparisons of 'with HIF' (DS) and 'without HIF' (DN) flows, more clearly showing the rerouting impacts of the Scheme.

2. 2034 Without Scheme scenario

2.1 An error was made when reporting the 2034 DN daily traffic flows in Tables 16.14 and 16.16 of the ES. This erroneous data for the 2034 DN scenario was compared to the DS scenario to demonstrate the impact of the Scheme on the highway network (Table 16.14 of the ES). The 2034 DN traffic flows were also used to assess Scheme impacts on Accidents and Safety (Table 16.16 of the ES), which have also been updated below.

2.2 Tables 16.14 and 16.16 of the ES are presented below with the correct 2034 DN daily two-way flows. The text below the tables has been taken from the original ES Chapter and updated to represent the new values.

Operational Traffic Flows

2.3 The daily two-way traffic flows for the 2034 DN and DS scenarios are presented in Table 3.1 below (corresponding to Table 16.14 of the ES). For clarity, the updated data is in the '2034 DN' (without HIF1) column; the data in the 2034 DS (with HIF1) column remains the same.

Table 3.1: 2034 Daily Two-Way Traffic Flows (Update of ES Table 16.14)

Link		All Vehicles				HGVs			
		2034 DN	2034 DS	Absolute Difference	Percentage Difference	2034 DN	2034 DS	Absolute Difference	Percentage Difference
1	A34 (North)	77,867	76,931	-936	-1%	3,022	2,894	-128	-4%
2	A34 (mid-junction)	40,374	40,454	80	0%	1,344	1,290	-54	-4%
3	A34 (South)	50,350	49,622	-728	-1%	2,195	2,026	-169	-8%
4	A34 On-Slip (NB)	20,024	19,093	-931	-5%	744	718	-26	-4%
5	A34 Off-Slip (SB)	17,486	17,386	-100	-1%	936	885	-51	-5%
6	A34 On-Slip (SB)	4,733	4,530	-203	-4%	371	354	-18	-5%
7	A34 Off-Slip (NB)	5,247	4,638	-609	-12%	481	381	-99	-21%
8	A4130 (W)	26,329	25,507	-822	-3%	1,253	1,181	-72	-6%
9	Park Drive	20,248	19,722	-526	-3%	930	893	-37	-4%
10	A4130 (E)	40,955	39,598	-1,357	-3%	2,835	2,704	-131	-5%
11	A4130	37,844	36,546	-1,298	-3%	2,591	2,428	-163	-6%
12	A4130	38,271	36,187	-2,084	-5%	2,602	2,501	-101	-4%
13	A4130	35,515	35,625	110	0%	2,599	2,522	-77	-3%
14	A4130	33,013	16,187	-16,826	-51%	2,628	848	-1,779	-68%
15	B4493	29,387	20,994	-8,393	-29%	913	555	-358	-39%
16	Mendip Heights	1,956	1,887	-69	-4%	51	48	-3	-6%
17	A4130	29,330	11,242	-18,088	-62%	2,699	670	-2,028	-75%
18	A4130	22,950	7,018	-15,932	-69%	1,928	131	-1,796	-93%
19	A4130	20,023	25,523	5,500	27%	1,497	1,967	470	31%
20	A4130	19,056	25,711	6,655	35%	778	730	-47	-6%

Link		All Vehicles				HGVs			
		2034 DN	2034 DS	Absolute Difference	Percentage Difference	2034 DN	2034 DS	Absolute Difference	Percentage Difference
21	A4130	14,556	15,927	1,371	9%	661	624	-36	-5%
22	Milton Road	19,558	14,521	-5,037	-26%	1,284	605	-678	-53%
23	Basil Hill Road	3,521	6,142	2,621	74%	539	492	-47	-9%
24	Lady Grove	13,847	5,439	-8,408	-61%	295	61	-235	-79%
25	B4016	8,545	3,083	-5,462	-64%	158	2	-156	-99%
26	B4016	8,587	3,087	-5,500	-64%	158	2	-156	-99%
27	Sires Hill	18,041	6,853	-11,188	-62%	217	63	-155	-71%
28	Saxons Heath	17,184	3,712	-13,472	-78%	162	1	-161	-99%
29	B4016 High Street	16,110	3,671	-12,439	-77%	246	99	-146	-60%
30	Harwell Road	14,058	7,134	-6,924	-49%	574	134	-440	-77%
31	High Street	12,080	6,429	-5,651	-47%	586	166	-420	-72%
32	B4016 Church Street	14,029	10,823	-3,206	-23%	659	333	-326	-49%
33	B4016 Appleford Road	8,492	10,364	1,872	22%	124	490	366	296%
34	Tollgate Road	10,076	3,061	-7,015	-70%	606	210	-396	-65%
35	A415 Abingdon Road	9,785	14,893	5,108	52%	399	575	176	44%
36	A415 Abingdon Road	12,493	16,369	3,876	31%	565	675	109	19%
37	A415 Abingdon Road	13,494	29,919	16,425	122%	538	808	271	50%
38	A415 Abingdon Road	14,402	2,384	-12,018	-83%	548	48	-500	-91%
39	A415 Abingdon Road	11,249	2,139	-9,110	-81%	339	41	-298	-88%
40	B4015 Oxford Road	12,707	2,481	-10,226	-80%	371	71	-299	-81%
41	B4015 Oxford Road	12,812	27,640	14,828	116%	374	784	411	110%

2.4 As previously set out in paragraph 16.4.15 of Chapter 16: Traffic of the ES, changes in traffic levels of less than 30% remain and are still considered to be negligible in the context of the ES.

2.5 Paragraphs 16.10.32 to 16.10.38 of ES Chapter 16 provided a summary of the impacts of the Scheme as shown in Table 16-14 in the original ES Chapter 16. This summary is now updated in Paragraphs 2.6 to 2.14 below based on the revised data in Table 3.1.

ES Chapter 16 text updates

2.6 Table 3.1 above (providing updates to the ES chapter 16 table 16.14) indicates that six of the 41 links are forecast to experience an increase in total daily traffic flows of greater than 30% in 2034 with the implementation of the Scheme, and 15 links are forecast to experience a decrease of 30% or more. This is unchanged from the ES.

2.7 In the DN scenario congestion occurs across the network and this results in some link flows being low, as traffic is unable complete their journey within the modelled period as it is held up in queues elsewhere.

2.8 Link 37 (A415 Abingdon Road between the New Thames River Crossing / A415 roundabout and the A415 / Clifton Hampden Bypass / Culham Science Centre roundabout) is forecast to experience a 122% increase in daily traffic flows in 2034 with the implementation of the Scheme. This is due to the Scheme providing a more direct and desirable route to access Culham Science Centre and providing another crossing point across the Thames. Without the Scheme there is severe congestion in this area, resulting in a lower modelled flow on the link as vehicles are queuing and therefore fewer can travel on the link across the time period.

2.9 Link 23 (Basil Hill Road) is shown to experience a 74% increase in daily traffic flows in 2034 with the implementation of the Scheme. The modelled flows demonstrate that this is caused by release of congestion and rerouting.

2.10 Link 41 (B4015 Oxford Road) is forecast to experience a 116% increase in total daily traffic flows in 2034 with the implementation of the Scheme. The Scheme enables a route choice change, as can be seen by the 81% decrease in trips on the alternative route through Burcot (link 39). Other links within Clifton Hampden and Long Wittenham (29, 38, 40) also experience decreases of approximately 80%. Traffic flows through Sutton Courtenay (links 30 and 31) experience reductions of 49% and 47% respectively, and flows over the existing river crossing at Culham (link 34) reduce by 70%.

2.11 Furthermore, Table 3.1 indicates that in 2034 with the implementation of the Scheme the A4130 to the east of the A4130 / New Thames River Crossing / Collett roundabout (link 20) is forecast to experience a 35% increase in daily traffic flows.

2.12 The A415 Abingdon Road to the west of Tollgate Road (Link 35) and to the east (link 36) are forecast to experience 52% and 31% increases respectively in total daily traffic flows in 2034 with the implementation of the Scheme. In the 2034 DN scenario the A415/Tollgate Road is very congested and this restricts traffic flows through this part of the network. The Scheme relieves congestion at this junction and allows traffic to flow more freely along the A415. To help illustrate this further, this Technical Note presents a comparison of 2024 DN to 2024 DS flows in Section 3 Table 3.3. The 2024 data shows a negligible 3% change on link 35. As with the 2034 year, there is some congestion in this model area in the 2024 without HIF (DN) scenario, which is enabled to flow more freely in the with HIF (DS) model, accounting for the 3% increase in flow counted on that link; the scheme hasn't rerouted people onto this link 35 from elsewhere, rather it has reduced the queueing.

2.13 Table 3.1 also indicates that five of the 41 links are forecast to experience an increase in daily HGV traffic of greater than 30% in 2034 with the implementation of the Scheme. The B4016 Appleford Road to the west of the New Thames River Crossing / B4016 roundabout (link 33) is forecast to experience a 296% increase in HGV traffic in 2034 with the implementation of the Scheme. This increase only relates to the section up to the roundabout connecting to the new Scheme, and flows through Appleford (link 26) reduce significantly.

2.14 The B4015 Oxford Road (link 41) is forecast to experience a 110% increase in daily HGV traffic flows in 2034 with the implementation of the Scheme. This is due to the Scheme providing an alternative route to the A4074, as shown by the 88% decrease on link 39 (Burcot). The Scheme provides a more desirable route for HGVs, rerouting them away from the villages of Clifton Hampden and Burcot.

Accidents and Safety

2.15 The impact of the operation of the Scheme on accidents and safety for vehicle travellers has been re-assessed based on the updated traffic flows, and the results are presented in Table 3.2 below (corresponding to Table 16.16 of the ES). For clarity, the updated data is in the '2034 DN' (without HIF1) column; the data in the 2034 DS (with HIF1) column remains the same.

Table 3.2: Accidents and Safety (2034 AADT) (Update of ES Table 16.16)

Link		2034 DN (2-Way)	2034 DS (2-Way)	Absolute Difference	Percentage Difference	Magnitude	Sensitivity	Significance
1	A34 (North)	77,867	76,931	-936	-1%	No Impact	High	No Impact
2	A34 (mid-junction)	40,374	40,454	80	0%	No Impact	High	No Impact
3	A34 (South)	50,350	49,622	-729	-1%	No Impact	High	No Impact
4	A34 On-Slip (NB)	20,024	19,093	-931	-5%	No Impact	Very Low	No Impact
5	A34 Off-Slip (SB)	17,486	17,386	-99	-1%	No Impact	Low	No Impact
6	A34 On-Slip (SB)	4,733	4,530	-203	-4%	No Impact	Very Low	No Impact
7	A34 Off-Slip (NB)	5,247	4,638	-609	-12%	Low	Low	Minor Beneficial
8	A4130 (W)	26,329	25,507	-821	-3%	No Impact	Medium	No Impact
9	Park Drive	20,248	19,722	-527	-3%	No Impact	Very Low	No Impact
10	A4130 (E)	40,955	39,598	-1,357	-3%	No Impact	Medium	No Impact
11	A4130	37,844	36,546	-1,298	-3%	No Impact	Medium	No Impact
12	A4130	38,271	36,187	-2,084	-5%	No Impact	Medium	No Impact
13	A4130	35,515	35,625	110	0%	No Impact	Medium	No Impact
14	A4130	33,013	16,187	-16,826	-51%	High	Medium	Major Beneficial
15	B4493	29,387	20,994	-8,392	-29%	Medium	Medium	Moderate Beneficial
16	Mendip Heights	1,956	1,887	-69	-4%	No Impact	Very Low	No Impact
17	A4130	29,330	11,242	-18,088	-62%	High	Medium	Major Beneficial
18	A4130	22,950	7,018	-15,932	-69%	High	Medium	Major Beneficial
19	A4130	20,023	25,523	5,500	27%	Medium	Medium	Moderate Adverse
20	A4130	19,056	25,711	6,655	35%	High	Medium	Major Adverse
21	A4130	14,556	15,927	1,371	9%	No Impact	Medium	No Impact
22	Milton Road	19,558	14,521	-5,037	-26%	Medium	Very Low	Negligible

Link		2034 DN (2-Way)	2034 DS (2-Way)	Absolute Difference	Percentage Difference	Magnitude	Sensitivity	Significance
23	Basil Hill Road	3,521	6,142	2,621	74%	High	Very Low	Minor Adverse
24	Lady Grove	13,847	5,439	-8,408	-61%	High	Very Low	Minor Beneficial
25	B4016	8,545	3,083	-5,462	-64%	High	Low	Moderate Beneficial
26	B4016	8,587	3,087	-5,499	-64%	High	Low	Moderate Beneficial
27	Sires Hill	18,041	6,853	-11,188	-62%	High	Very Low	Minor Beneficial
28	Saxons Heath	17,184	3,712	-13,472	-78%	High	Very Low	Minor Beneficial
29	B4016 High Street	16,110	3,671	-12,439	-77%	High	Low	Moderate Beneficial
30	Harwell Road	14,058	7,134	-6,924	-49%	High	Very Low	Minor Beneficial
31	High Street	12,080	6,429	-5,650	-47%	High	Very Low	Minor Beneficial
32	B4016 Church Street	14,029	10,823	-3,206	-23%	Medium	Low	Minor Beneficial
33	B4016 Appleford Road	8,492	10,364	1,871	22%	Medium	Low	Minor Adverse
34	Tollgate Road	10,076	3,061	-7,015	-70%	High	Very Low	Minor Beneficial
35	A415 Abingdon Road	9,785	14,893	5,107	52%	High	Medium	Major Adverse
36	A415 Abingdon Road	12,493	16,369	3,876	31%	High	Medium	Minor Adverse
37	A415 Abingdon Road	13,494	29,919	16,424	122%	High	Medium	Major Adverse
38	A415 Abingdon Road	14,402	2,384	-12,018	-83%	High	Medium	Major Beneficial
39	A415 Abingdon Road	11,249	2,139	-9,111	-81%	High	Medium	Major Beneficial
40	B4015 Oxford Road	12,707	2,481	-10,226	-80%	High	Low	Moderate Beneficial
41	B4015 Oxford Road	12,812	27,640	14,828	116%	High	Low	Moderate Adverse

2.16 The sensitivity of highway links and magnitude of impact in terms of accidents and safety are set out in paragraphs 16.4.12 and 16.4.21 respectively of Chapter 16: Transport of the ES. The significance of effects is based on a combination of sensitivity and magnitude of impact, as shown in Table 16.2 of Chapter 16.

2.17 Paragraphs 16.10.45 to 16.10.49 of ES Chapter 16 provided a summary of the impacts of the Scheme as shown in Table 16-16 in the original ES Chapter 16. This summary is updated in Paragraphs 2.18 to 2.22 below based on the revised data in Table 3.2.

ES Chapter 16 text updates

2.18 Table 3.2 above (providing updates to the ES chapter 16 table 16.16) indicates that 19 of the 41 links are forecast to experience minor to major beneficial effects on accidents and safety due to decreases in traffic flows with the implementation of the Scheme in 2034. Eight links are forecast to experience minor to major adverse impacts due to increases in traffic flows. In addition, 14 links are forecast to either have no impact or a negligible effect on accidents and safety.

2.19 Major/moderate adverse effects are forecast on the A4130 (links 19 and 20), A415 Abingdon Road (links 35, 36 and 37), and on the B4015 east of Clifton Hampden (link 41), as traffic diverts from local routes to use the new Scheme, or the Scheme has enabled queuing vehicles in the DN scenario to flow more freely. The Scheme, including junctions along the route, has been designed to DMRB standards and subject to Road Safety Audits, and therefore is better able to accommodate the increase in traffic safely. These effects are also consistent with the aim of the Scheme to remove traffic from local villages.

2.20 The A415 Abingdon Road to the west of Culham (link 35) is shown to have an increase in traffic of 52%, triggering a major adverse effect on accidents and safety. In the 2034 DN scenario the A415/Tollgate Road is very congested and this restricts traffic flows through this part of the network. The Scheme relieves congestion at this junction and allows traffic to flow more freely along the A415. Traffic flows on Tollgate Road are reduced significantly and this reduces conflicts at this junction, reducing the potential for accidents. Therefore, whilst the apparent increase in traffic flows triggers an adverse impact, safety overall is expected to improve in this area. To help illustrate this further, this Technical Note presents a comparison of 2024 DN to 2024 DS flows in Section 3 Table 3.3. The 2024 data shows a negligible 3% change on link 35. As with the 2034 year, there is some congestion in this model area in the 2024 without HIF (DN) scenario, which is enabled to flow more freely in the with HIF (DS) model, accounting for the 3% increase in flow counted on that link; the scheme hasn’t rerouted people onto this link 35 from elsewhere, rather it has reduced the queueing.

2.21 As noted previously, the PIC data does not indicate any significant safety design issues, while the change in traffic flow is considered negligible and not resulting in a significant increase in turning movements within the scheme extents.

2.22 Therefore, operational traffic flows are predicted to have an overall moderate beneficial effect on accidents and safety on the local road network, which is significant.

Summary

2.23 Section 16.12 of the ES Chapter 16 provides a summary of the overall impacts of the Scheme in the Construction and Operation phases.

2.24 The assessment of Construction phase impacts was based on 2024 traffic flow data and therefore is not affected by the update to the 2034 DN two-way daily traffic flows.

2.25 The summary of the Operational phase impacts as set out in Chapter 16 of the ES (paragraphs 16.12.3 to 16.12.5) is repeated below:

- The Scheme is forecast to reduce driver delay at several key existing junctions in the local area due to the re-routing of traffic to use the Scheme. It is therefore considered that the overall effect of the Scheme on driver delay is moderate beneficial, which is significant.

- The Scheme is forecast to have an overall moderate beneficial effect on accidents and safety in 2034 with the operation of the Scheme.

- Although the Scheme does not directly include changes to existing bus services, the reduction in delays on the network will improve journey times and reliability for bus services. The Scheme also creates opportunities for new bus routes in the future. Therefore, it is considered the overall effect of the Scheme on public transport users is moderate beneficial which is significant.

2.26 This summary also remains unchanged by the update to the 2034 DN two-way daily traffic flows.

3. 2024 DN/DS Comparison

3.1 The 2024 DN data was used in the assessment of construction phase impacts (refer to Tables 16.12 and 16.13 of the ES), and has not changed. The 2024 DS (with HIF) flows were not previously reported in the ES Chapter 16 as they are not required by the IEMA guidance, however they are now reported below alongside the previously reported 2024 DN (without HIF) flows. The 2024 DS data is included as it enables easier comparisons of traffic flows with HIF / without HIF on the network, showing the change in flows created by the rerouting that will result with implementation of the Scheme. Note that in some areas in the 2024 without HIF (DN) model network there is congestion, which accounts for some apparent anomalies in the table below. Congestion in the 2024 DN model restricts vehicle flows through parts of the network, creating queues. Implementation of the Scheme then relieves congestion in these areas allowing the traffic to flow more freely. This is further discussed in the Transport Assessment.

3.2 A comparison of the 2024 DN and DS daily traffic flows demonstrates the impact of the Scheme on the network when there is less congestion overall, and is shown in Table 3.3 below.

Table 3.3: 2024 Daily Two-Way Traffic Flows

Link		All Vehicles				HGVs			
		2024 DN	2024 DS	Absolute Difference	Percentage Difference	2024 DN	2024 DS	Absolute Difference	Percentage Difference
1	A34 (North)	71,116	71,162	47	0%	2,811	2,812	2	0%
2	A34 (mid-junction)	40,782	40,620	-162	0%	1,219	1,220	1	0%
3	A34 (South)	49,809	49,566	-243	0%	1,887	2,035	148	8%
4	A34 On-Slip (NB)	15,847	16,072	225	1%	717	720	3	0%
5	A34 Off-Slip (SB)	14,495	14,471	-24	0%	875	872	-3	0%
6	A34 On-Slip (SB)	4,212	4,378	166	4%	289	410	121	42%
7	A34 Off-Slip (NB)	4,809	4,579	-230	-5%	379	407	28	7%
8	A4130 (W)	21,723	21,778	54	0%	925	944	18	2%
9	Park Drive	17,666	17,151	-515	-3%	828	843	15	2%
10	A4130 (E)	30,989	31,275	286	1%	2,439	2,515	76	3%
11	A4130	26,559	27,650	1,091	4%	2,076	2,203	127	6%
12	A4130	26,567	28,408	1,841	7%	2,078	2,262	184	9%
13	A4130	26,390	28,270	1,879	7%	2,079	2,258	179	9%
14	A4130	25,256	16,107	-9,149	-36%	2,051	752	-1,298	-63%
15	B4493	23,788	19,875	-3,913	-16%	838	566	-272	-32%
16	Mendip Heights	1,444	1,425	-19	-1%	37	36	0	-1%
17	A4130	20,890	8,818	-12,072	-58%	2,110	590	-1,519	-72%
18	A4130	18,187	6,596	-11,591	-64%	1,631	142	-1,489	-91%
19	A4130	16,055	17,335	1,280	8%	1,244	1,481	237	19%
20	A4130	15,240	16,897	1,657	11%	559	684	125	22%
21	A4130	12,174	11,387	-787	-6%	474	591	117	25%

Link		All Vehicles				HGVs			
		2024 DN	2024 DS	Absolute Difference	Percentage Difference	2024 DN	2024 DS	Absolute Difference	Percentage Difference
22	Milton Road	14,496	10,588	-3,908	-27%	844	500	-344	-41%
23	Basil Hill Road	2,732	5,082	2,351	86%	468	477	10	2%
24	Lady Grove	10,019	3,898	-6,121	-61%	141	49	-91	-65%
25	B4016	5,573	1,603	-3,970	-71%	112	2	-111	-99%
26	B4016	5,585	1,603	-3,982	-71%	112	2	-110	-99%
27	Sires Hill	11,545	5,241	-6,304	-55%	83	51	-32	-39%
28	Saxons Heath	11,059	3,471	-7,589	-69%	32	0	-32	-100%
29	B4016 High Street	10,914	3,697	-7,216	-66%	106	78	-29	-27%
30	Harwell Road	8,182	4,898	-3,284	-40%	384	84	-300	-78%
31	High Street	7,602	4,748	-2,854	-38%	401	118	-284	-71%
32	B4016 Church Street	9,957	8,134	-1,823	-18%	490	237	-253	-52%
33	B4016 Appleford Road	5,565	7,794	2,229	40%	110	367	257	233%
34	Tollgate Road	7,650	1,798	-5,852	-77%	423	117	-306	-72%
35	A415 Abingdon Road	11,133	11,423	290	3%	387	386	-1	0%
36	A415 Abingdon Road	11,017	10,936	-81	-1%	470	395	-75	-16%
37	A415 Abingdon Road	10,910	17,233	6,323	58%	464	501	37	8%
38	A415 Abingdon Road	11,423	2,730	-8,693	-76%	478	50	-429	-90%
39	A415 Abingdon Road	7,349	3,109	-4,240	-58%	346	58	-288	-83%
40	B4015 Oxford Road	9,344	2,441	-6,903	-74%	178	45	-133	-75%
41	B4015 Oxford Road	9,337	14,552	5,215	56%	178	481	303	170%