Planning Policy

www.oxford.gov.uk

OXFORD CITY COUNCIL

Air Quality Screening Addendum

Habitat Regulations Assessment

For the Oxford Local Plan 2040

November 2023

Contents Page

Introduction

1.1 Oxford City Council commissioned Atkins to assess the air quality impacts of the Oxford Local Plan 2040 'alone and in-combination' with other plans, in line with Natural England's internal operational guidance note which was published in June 2018.[1] This addendum to the Habitat Regulations Assessment (September 2023), sets out that development proposed as part of the Oxford Local Plan 2040 is unlikely to have a significant effect on the conservation objective: air quality, at the Oxford Meadows SAC.

Methodology

2.1 Natural England's guidance note, entitled *Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitat Regulations (NEA001)*, provides details of the process that local authorities undertaking Habitat Regulations Assessment Screening for air quality should follow.

2.2 Paragraph 4.10 of the note, sets out that, "with regard to potential risks from road traffic emissions, Natural England and Highways England are in agreement that protected sites falling within 200m from the edge of a road affected by a plan or project need to be considered further."

2.3 The guidance suggests that only designated sites within 200m of a road sensitive to air pollution should be considered. There are two roads which could have a potential impact on air quality at the Oxford Meadows SAC. These are the A34 and A40.

2.4 Paragraphs 4.23-4.25 of the guidance detail the application of screening thresholds. These thresholds are advocated by Highways England in their Design Manual for Roads and Bridges (DMRB)[2]. These non-statutory or guidance threshold is based on a predicted change of daily traffic flows of 1,000 AADT (Annual Average Dailly Traffic) or more or heavy-duty vehicle flows on motorways (HDV) change by 200 AADT or more. In this case, AADT is used as a proxy for emissions.

2.5 The AADT thresholds do not themselves imply any intrinsic environmental effects and are used solely as a trigger for further investigation. Paragraph 4.25 of the 2018 Natural England Guidance Note states "Widely accepted Environmental Benchmarks for imperceptible impacts are set at 1% of the critical load or level, which is considered to be equivalent to the DMRB thresholds for change in traffic flow of 1,000 AADT and for HDV 200 AADT."

[1] Available at https://publications.naturalengland.org.uk/publication/4720542048845824

[2] https://www.standardsforhighways.co.uk/dmrb Highways England , Volume 11, Section 3, Part 1 – Air Quality

Transport Modelling to support the HRA for the Oxford Local Plan 2040

3.1 In July 2023, AtkinsRéalis was commissioned to undertake transport modelling to support the HRA of the Oxford Local Plan 2040. Appendix 1 includes the technical note of the work undertaken. This section includes a summary of what was carried out.

3.2 Transport Modelling was undertaken that looked at the likely increases in vehicle movements associated with a very specific part of the road network. Figure 1 shows the Area of Interest for the study.

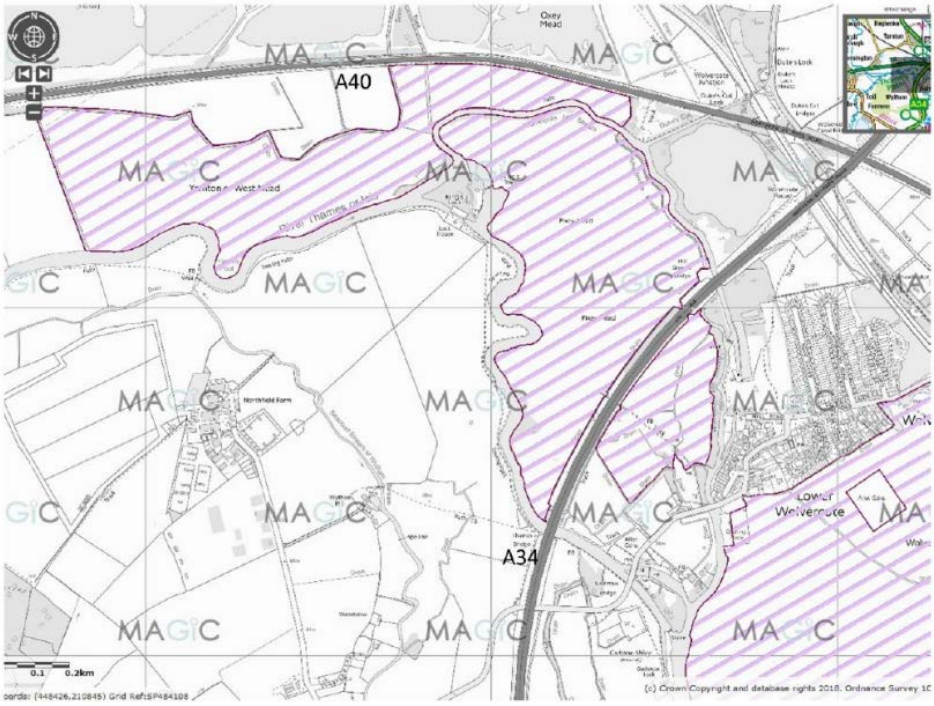

Figure 1: The A34, A40 and relevant section of the Oxford Meadows SAC

3.3 The Oxfordshire Strategic Model (OSM) was used to work out whether specific parts of the road network would exceed Natural England's prescribed screening thresholds as a result of development proposed alone and in combination with the Oxford Local Plan 2040.

3.4 Two scenarios were developed for the assessment. The Local Plan 2040 (LP2040) Do Minimum (DM) and Do Something (DS) scenarios. In terms of demand for vehicles and public transport, the LP2040 DM Scenario included development proposed in the adopted local plans fromm all the Oxfordshire authorities. The LP2040 DM scenario utilised a previously modelled scenario – the County Council "Core Transport Schemes" scenario – which included the likely impacts of the County Council's core transport schemes including the Workplace Parking Levy and Traffic Filters. The impacts of the Core Transport Schemes were "built in" to the model after the modelling year 2022.

3.5 It is worth noting that the previously undertaken HRA work to support the County's Core Schemes[3] showed that there would be a less than 1% increase in the critical load/ level for key pollutants related to the conservation objectives linked to air quality.

3.6 The additional growth proposed as part of the Oxford Local Plan 2040 was then added to the 2040 DM scenario to provide the 2040 DS Scenario. The figure which shows the difference in AADTs for vehicle movement in the Technical Note provided at Appendix 1 is reproduced below.

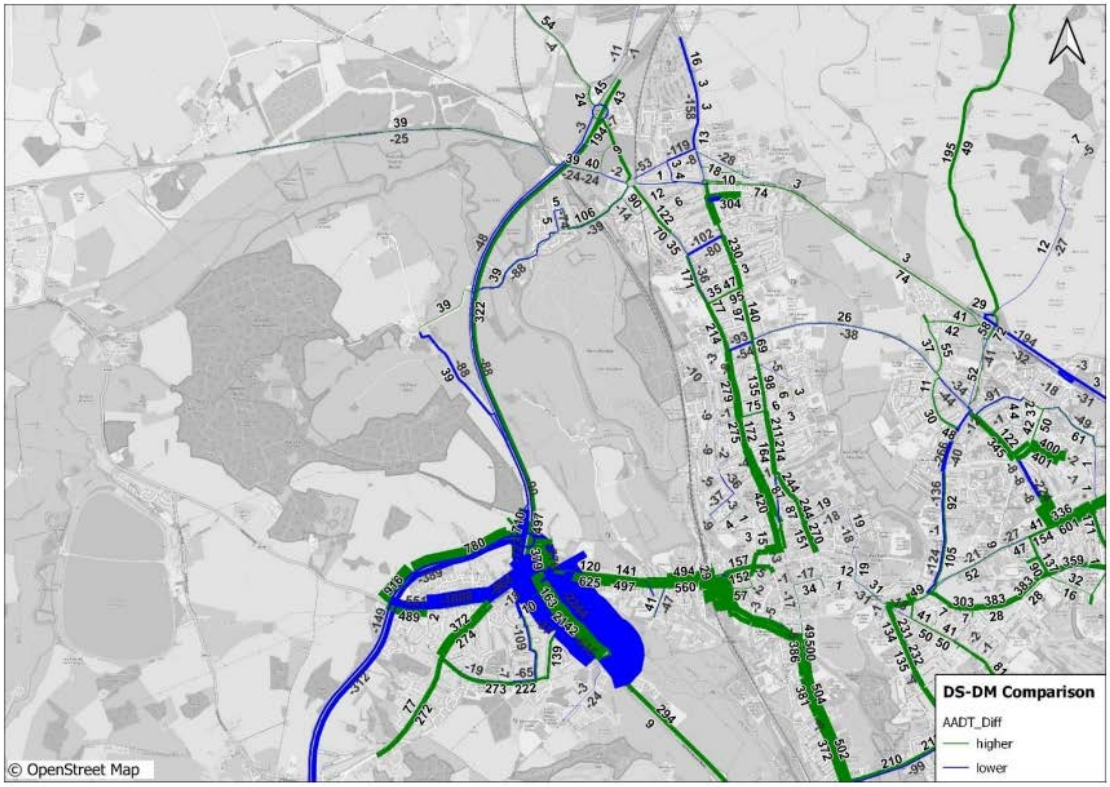

Figure 2: Difference in AADTs (vehicles) on roads within the vicinity of the Oxford Meadows SAC

3.6 As can be seen in Figure 2 above, on the key routes which are within 200m of the Oxford Meadows SAC (i.e. the A34 and A40) the increases in AADT are all below the screening threshold. The Atkins Technical Note also provides a map that shows which routes within the study area are above any of the screening criteria. This figure shows that none of the routes that exceed the screening thresholds are within the study area.

3.7 As can be seen in Figure 2 (above) and Figure 3 (below), the DS-DM comparison (which shows values in AADT) indicates that some of the routes in and around Botley Interchange are shown to be relatively high (in relation to the Natural England's screening thresholds). However, the increased AADT at these road links do not impact the key links related to the Oxford Meadows (I.e., the A34 and A40). Also, Atkins set out in their report that "the changes observed in the vicinity of Botley Interchange are due

[3] Full details of the HRA work undertaken for the County Council's Core Schemes can be found online https://www.oxfordshire.gov.uk/residents/roads-and-transport/connecting-oxfordshire/traffic-filters

to the assignment choosing a slightly different route at the final iteration and are not related in any way to the additional developments".

Figure 3: Map showing the areas within the study area that meet the screening thresholds.

3.8 Figure 3 (above) shows the parts of the road network which exceed Natural England's screening criteria. As can be seen from Figure 3, there are no exceedances along either the A34 or the A40. As such it is not likely that there will be any significant effects on air quality at the Oxford Meadows SAC alone as a result of development proposed in the Oxford City Local Plan 2040.

‘In-combination’ Impacts

4.1 Habitat Regulations Assessments are required to undertake an assessment of the plan ‘alone’ and ‘in-combination’ with other plans and projects. This section of the addendum deals with possible ‘in-combination’ impacts from the Oxford Local Plan 2040.

4.2 The September 2023 HRA document provided a qualitative assessment of other plans and projects that could be considered ‘in-combination’ with Oxford’s Local Plan. This addendum looks specifically at plans being undertaken by other oxfordshire local authorities.

4.3 Table 1 shows the progress of each of the other Oxfordshire local authorities and how they have considered HRA in their plan-making. Both Oxfordshire County Council and Cherwell District Council have undertaken HRA Screening. South Oxfordshire and Vale of White Horse District Councils have undertaken a preliminary Scoping Assessment, but this does not assess the impacts of the plan because their plan is simply not at a sufficiently advanced stage. Similarly West Oxfordshire District Council’s new local plan is at an early stage and as such limited HRA work has been undertaken.

Authority	Plan Stage	HRA undertaken
Oxfordshire County Council	The Local Transport and Connectivity Plan was adopted in July 2022. HRA work was undertaken to support the delivery of the Traffic Filters which form part of the LTCP’s Core Schemes.	An HRA assessment was undertaken by Atkins in November 2022 as part of the implementation of the Core Schemes, in particular the Traffic Filters. The Air Quality Assessment undertaken as part of this HRA showed that the total annual mean concentrations of Oxides of Nitrogen (NOx)were estimated to exceed the critical level at receptors in the opening year. In addition, the work showed that there was expected to be a change in the annual mean NOx concentration of over 1% of the critical level. The assessment showed that exceedances were located up 30m from the SAC boundary with the proposed scheme alone, and up to 50m from the SAC boundary ‘in combination with other plans and projects”. This assessment focused on NOx only. When the changes in background concentrations of NOx, - which were shown to be reducing over time due to the expected future reduction in emissions associated with a cleaner vehicle fleet - were considered alongside the proposed scheme, this showed a decrease in NOx levels. This report concluded that the implementation of the traffic filters will not have an adverse effect on the integrity of the Oxford Meadows SAC.
Cherwell District Council	Regulation 18 (Preferred Options) consultation took place between 22 September and 3 November 2023 for the Cherwell Local Plan Review 2040. This was supported by an HRA	Cherwell District Council have undertaken an HRA (produced by AECOM), which looked at the likelihood of Nitrogen deposition at the Oxford Meadows SAC. An ‘in-combination’ assessment was undertaken which showed that the 1% threshold for the critical level for Oxides of Nitrogen, Ammonia and combined Nitrogen Deposition was likely to be exceeded. However, previous HRA work undertaken by Oxfordshire County Council showed that the background concentrations were likely to reduce. The report considered

	Screening Report produced by AECOM[4].	the reductions in background concentrations to be due to a range of factors, including improvements in emissions technology (focused on oxides of nitrogen) and improvements resulting from the delivery of Oxfordshire County Council's Local Transport and Connectivity Plan. The HRA report concluded that development proposed as part of the Cherwell Local Plan Review 2040 will not cause an adverse effect on the integrity of the Oxford Meadows SAC either alone, or in combination with other plans and projects.
South and Vale	An Issues Stage Consultation was carried out from 12 May and 23 June 2022 for the South and Vale Joint Local Plan 2041	An HRA Scoping Report has been carried out which identifies those designated sites which may be potentially affected by the Plan. Oxford Meadows is considered as a designated site which the plan has the potential to affect, however the plan is not sufficiently progressed to contain potential site allocations. As such it is not possible to consider the potential effects of this plan 'in-combination' with Oxford City's Local Plan 2040.
West Oxfordshire	An Initial Scoping consultation was carried out between 24 August and 5 October 2022. This was followed by a focused consultation which took place between 30 August and 25 October 2023.	As the plan is at an early stage, no HRA work has yet taken place. It is expected that HRA work will inform future stages of plan-making. The plan consultation focused on setting out the draft local plan objectives, the future pattern of development in West Oxfordshire, and a "Call for sites, ideas and opportunities". As no site allocations are contained in the plan it is not possible to consider the potential effects of this plan 'in-combination' with Oxford City's Local Plan 2040.

Table 1: Stages of plan-making and HRA for authorities across Oxfordshire (including Oxfordshire County Council)

Implications of other HRA work carried out elsewhere in Oxfordshire

4.4 The implications of Oxfordshire County Council's Traffic Filters HRA work was considered as part of the County's Core Schemes workstream. The Traffic Filters HRA assessment considered the potential impacts of implementing this highways scheme on the wider road network, in particular on the A34 and A40. The implications of the Traffic Filters was considered as part of a wider package of measures, which also included the Workplace Parking Levy and the Zero Emission Zone.

4.5 The Traffic Filters HRA showed a reduction in NOx emissions associated with the introduction of the traffic filters. This was due to changes in background concentrations of NOx. These changes were shown to be reducing over time due to the expected future emissions associated with a cleaner vehicle fleet. As such, the Oxford Local Plan 2040 modelling considered the Traffic Filters as part of the 2040 DM Scenario. Due to the reduction in the background concentrations of NOx levels over time, when considered 'in-combination' with the growth proposed as part of the Oxford City Local Plan 2040, the

[4] https://cherwell.citizenspace.com/planning-policy/cherwell-local-plan-review-2040-consultation-draft/user_uploads/habitats-regulations-assessment-august-2023.pdf

impact of the traffic filters is not likely to have significant impact on the integrity of the Oxford Meadows SAC.

4.5 Cherwell's Local Plan Preferred Options document was supported by an HRA even though the plan is at a relatively early stage in is production. The HRA assessment that was carried out which looked at the potential impacts on air quality at the Oxford Meadows SAC. This HRA concluded that the Cherwell Plan "will not cause an adverse effect on the integrity of the Oxford Meadows SAC either alone, or in combination with other plans and projects." It is worth noting that this HRA assessment was done prior to the publication of the Oxford City Local Plan 2040 Proposed Submission Plan consultation.

4.6 Transport modelling undertaken as part of Oxford City's Local Plan 2040 showed that increases in vehicle movements (measured in AADT) on the A34 and A40 are less than 1,000 as a result of the development proposed in the plan. Natural England's 2018 guidance note states at paragraph 4.25:

> *The AADT thresholds and 1% of critical load/ level are considered by Natural England's air quality specialists (and by industry, regulators and other statutory nature conservation bodies) to be suitably precautionary, as any emissions below this level are considered to be imperceptible and, in the case of AADT, undetectable through the DMRB model.*

4.7 The increases in AADT associated with Oxford City 's Local Plan 2040 "are considered to be imperceptible" according to Natural England's guidance. Therefore, when this 'imperceptible' increase is considered 'in combination' with the growth proposed as part of the Cherwell Local Plan, which as the HRA report states, "will not have an adverse effect on the integrity of the Oxford Meadows SAC", overall Oxford's Local Plan 2040 is not likely to have a significant impact on the integrity of the Oxford Meadows SAC.

Conclusions

5.1 This addendum report concludes that the Oxford Local Plan 2040 is therefore not likely to have a significant impact on the integrity of the Oxford Meadows SAC either alone, or in-combination with other plans or projects in relation to Air Quality.

Appendix 1: Highway Modelling for HRA

TECHNICAL NOTE

Oxford Local Plan 2040

SUBJECT	PROJECT NO.	DATE
Oxford Local Plan 2040 – Task 3 – Highway Modelling for HRA	5223578	10/10/2023

AUTHOR	DISTRIBUTION	REPRESENTING
AtkinsRéalis	Richard Wyatt, Victoria Jersova	Oxfordshire County Council

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	First draft	NB	OS	AEA	AEA	27/09/2023
2.0	Final report	NB	OS	AEA	AEA	10/10/2023

Client signoff

Client	Oxfordshire County Council		
Project	Oxford Local Plan 2040	**Project No.**	5223578
Client signature / date			

Introduction

On the 14th July 2023, AtkinsRéalis was commissioned by Oxfordshire County Council (OCC) to carry out an assessment of the impact of Oxford Local Plan 2040 on the A34 and A40 within the vicinity of Oxford Meadow Special Area of Conservation (SAC), which was requested by Natural England.

To inform the Habitats Regulation Assessment (HRA) being prepared by Oxford City Council for the Oxford Local Plan 2040, comparison of the 2040 DS scenario with the 2040 DM scenario is required using transport modelling data.

This technical note summarises the assumptions that were used and results of the modelling work carried out for this study. The methodology follows the agreement reached at the end of the discussions with OCC. The assessment was carried out using the latest Oxford Strategic Model (OSM) developed by AtkinsRéalis.

1. Modelling Approach

1.1 Assessment Study Scenarios

The assessment involved comparing two scenarios: 2040 Do-Minimum and 2040 Do-Something. The following sections detail the proposed land use updates and other assumptions required to reflect the desired scenarios.

1.2 Do-Minimum Scenario

1.2.1 General Assumptions

It was agreed with OCC that the 2040 Do-Minimum (DM) scenario for this work would be built having as starting point scenario, the 2035 Do-Something (DS) with Workplace Parking Levy (WPL) built in 2022, after all the manual manipulations were applied post VDM. As requested by OCC, the VDM inbuilt in OSM was not undertaken as part of the future year forecasts.

In terms of demand for car and public transport, the 2035 DS scenario included individual developments from the local plans for each of the 5 districts in Oxfordshire. No TEMPRO growth was applied inside the county. TEMPRO v7.2 was, however, used for growth for the rest of Great Britain, outside Oxfordshire. The following approach was agreed with OCC for estimating the car and public transport demand in 2040:

- Inside Oxfordshire, no changes are required as the VDM included individual developments and not TEMPRO growth. While we recognise that the 5 districts have Local Plans for forecast years between 2031 and 2036, we assume that they were all taken into account in the existing 2035 run and no additional growth is considered between 2035 and 2040
- Outside Oxfordshire, we calculate adjustment factors between TEMPRO 7.2 and TEMPRO v8.0 Core scenario in 2035, then apply growth factors based on TEMPRO v8.0 Core scenario between 2035 and 2040.

The demand for light and heavy goods vehicles in the 2035 DS scenario was based on growth factors from RTF 18. It is proposed to calculate adjustment factors between RFT18 and NRTP22 for 2035, then apply NRTP22 growth factors between 2035 and 2040.

In terms of transport schemes, 2035 DS with WPL has the following characteristics:

- six traffic filters, operating 12 hours per day
- increase in parking costs in the City Centre
- Workplace Parking Levy
- Zero Emission Zone charges

Once the demand was updated, the assignments were undertaken using SATURN 11.5.05N. The assignments used Values of Time and Vehicle Operating Costs in line with TAG Databook 1.20.2.(Jan 2023).

1.2.2 Land Use Assumptions

Table 1 and Table 2 show the total number of dwellings and job assumed in 2040 DM, disaggregated by district and Uncertainty Log.

Table 1 – 2040 DM - Number of dwellings per district

No of dwellings	Cherwell (2018 to 2035)	City (2018 to 2035)	South (2018 to 2035)	Vale (2018 to 2035)	West (2018 to 2035)	Total
Completions and Commitments	8,831	1,607	26,014	12,339	3,177	51,968
Near certain	3,948	687	-	5,192	975	10,802
More than likely	11,300	1,698	-	1,479	2,181	16,658
Reasonably foreseeable	-	6,110	-	1,083	2,160	9,353
Hypothetical	-	-	-	-	260	260
Dependent development HIF	-	-	-	-	4,813	4,813
TOTAL	**24,079**	**10,102**	**26,014**	**20,093**	**13,566**	**93,854**

Table 2 – 2040 DM - Number of jobs per district

No of jobs	Cherwell (2018 to 2035)	City (2018 to 2035)	South (2018 to 2035)	Vale (2018 to 2035)	West (2018 to 2035)	Total
Completions and Commitments	14,276	351	2,462	3,261	3,874	24,224
Near certain	4,476	876	-	11,681	3,692	20,724
More than likely	20,000	14,333	-	-	3,143	37,476
Reasonably foreseeable	2,683	11,415	1,820	6,553	-	22,471
Hypothetical	-	-	-	4,737	-	4,737
Dependent development HIF	-	-	-	-	4,556	4,556
TOTAL	**41,434**	**26,975**	**4,282**	**26,232**	**15,266**	**114,189**

1.2.3 Trip rates

Table 3 summarises the trip rates that were used in OSM for the residential development sites. Table 4 summarises the trip rates that were used in OSM for the employment development sites, separated by use type.

However, it should be noted that these trip rates are the input for the original VDM run for the 2035 DS scenario with WPL. Post-VDM, manipulations of the demand due to the Zero Emission Zone charges were applied, and the resulting trip rates would be different.

Additionally, Osney Knowledge Park was treated differentially. For the partial build of the site by 2035, the “B Oxford City” trip rates were used. However, for the additional area built between 2035 and 2040, no additional car trips were included. The assumption agreed with OCC was that all additional trips would be using other modes (public transport, walking, cycling).

Table 3 – Trip rates for residential developments

	AM period (07:00 – 10:00)				Inter-peak period (10:00 – 16:00)				PM period (16:00 – 19:00)			
	Car		PT		Car		PT		Car		PT	
	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart
Rest of OXON	0.368	0.816	0.013	0.100	1.086	1.000	0.049	0.038	0.883	0.598	0.080	0.012
City Unmet Needs	0.331	0.755	0.047	0.211	0.974	0.896	0.154	0.137	0.791	0.527	0.165	0.021
Oxford City	0.295	0.694	0.080	0.322	0.862	0.791	0.258	0.236	0.699	0.457	0.250	0.030
Valley Park	0.349	0.791	0.006	0.050	1.088	1.031	0.052	0.038	0.863	0.587	0.025	0.012
Garden Village - Resi	0.463	1.406	0.013	0.100	0.786	0.600	0.049	0.038	1.338	0.729	0.080	0.012
Northern Gateway	0.335	0.796	0.008	0.111	1.031	1.013	0.058	0.045	0.874	0.569	0.098	0.013

Table 4 - Trip rates for employment developments by type

	AM period (07:00 – 10:00)				Inter-peak period (10:00 – 16:00)				PM period (16:00 – 19:00)			
	Car		PT		Car		Car		PT		Car	
	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart
B Oxford City (per 100 sqm)	1.229	0.380	0.700	0.198	1.080	1.440	0.951	1.100	0.268	1.067	0.075	0.597
B Rest of OXON (per 100 sqm)	1.784	0.551	0.127	0.024	1.670	1.790	0.116	0.164	0.379	1.511	0.025	0.119

	AM period (07:00 – 10:00)				Inter-peak period (10:00 – 16:00)				PM period (16:00 – 19:00)			
	Car		PT		Car		Car		PT		Car	
	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart	Arrival	Depart
B1(per 100 sqm)	2.799	0.703	0.698	0.031	2.252	2.436	0.230	0.325	0.516	2.441	0.050	0.614
B1 NG (per 100 sqm)	2.640	0.571	0.970	0.026	1.686	1.706	0.274	0.485	0.455	2.451	0.056	0.783
B2 (per 100 sqm)	2.113	0.789	0.090	0.015	2.245	2.454	0.026	0.062	0.509	1.713	0.009	0.065
B8 (per 100 sqm)	0.130	0.033	0.000	0.000	0.166	0.170	0.000	0.000	0.022	0.098	0.000	0.000
Hotel NG (beds)	0.328	0.402	0.047	0.177	0.590	0.639	0.102	0.171	0.401	0.326	0.145	0.041
Health (per 100 sqm)	2.113	0.789	0.090	0.015	2.245	2.454	0.026	0.062	0.509	1.713	0.009	0.065
Retail (per 100 sqm)	9.493	6.782	0.266	0.136	35.084	33.995	1.177	1.046	14.860	16.741	0.433	0.405
C (per ha)	18.443	16.483	3.391	19.485	55.867	58.106	42.673	51.111	20.128	20.533	34.743	21.948
D (per 100 sqm)	1.400	0.856	0.719	0.088	3.325	3.494	2.193	2.674	2.566	2.347	0.622	0.570
Hotel (per 100 sqm)	0.736	1.045	0.128	0.498	1.112	1.255	0.285	0.401	0.918	0.629	0.394	0.173
Hotel (beds)	0.271	0.385	0.047	0.184	0.411	0.464	0.105	0.148	0.339	0.233	0.145	0.064

1.3 Do-Something Scenario

1.3.1 General Assumptions

After the above steps described in section 1.2.1, the additional growth proposed after 2035 in the emerging Oxford Local Plan 2040 was added to the demand. The additional developments used the trip distribution of existing zones, and was uplifted for a selection of rows and columns to reach the new trip end targets for the respective zones.

As requested by OCC, the VDM inbuilt in OSM was not used.

Once the demand was updated, the assignments were undertaken using SATURN 11.5.05N. The assignments used Values of Time and Vehicle Operating Costs in line with TAG Databook 1.20.2.(Jan 2023).

1.3.2 Land Use Assumptions

Table 5 and Table 6 show the total number of dwellings and job assumed in 2040 DM, disaggregated by district and Uncertainty Log.

Table 5 – 2040 DS - Number of dwellings per district

No of dwellings	Cherwell (2018 to 2040)	City (2018 to 2040)	South (2018 to 2040)	Vale (2018 to 2040)	West (2018 to 2040)	Total
2040 DM[1]	24,079	10,102	26,014	20,093	13,566	93,854
Oxford LP	-	1,389	-	-	-	1,389
TOTAL	**24,079**	**11,491**	**26,014**	**20,093**	**13,566**	**95,243**

Table 6 – 2040 DS - Number of jobs per district

No of jobs	Cherwell (2018 to 2040)	City (2018 to 2040)	South (2018 to 2040)	Vale (2018 to 2040)	West (2018 to 2040)	Total
2040 DM[1]	41,434	26,975	4,282	26,232	15,266	114,189
Oxford LP	-	7,957	-	-	-	7,957
TOTAL	**41,434**	**34,931**	**4,282**	**26,232**	**15,266**	**122,145**

[1] Consistent with Table 1.

2. Results

This chapter presents the highway network performance statistics for the 2040 DM and 2040 DS scenarios across the Network and the Districts measured using the following metrics:

- Delays / total travel time (pcu/hr) - the time difference between travel during the peak hours and during congestion-free conditions - increased delay can be associated with an increased number of vehicles on the network as a whole or on a specific corridor;
- Congestion / overcapacity queues (pcu/hr) - measured by differences in the total time on the network - increased total time also relates to forecast increase in delay;
- Traffic / total travel distance (pcu/km) - the total distance travelled on the network;
- Speed (km/hr) - average speed on the network - reduced speed suggests that vehicles are forecast to experience increased levels of congestion.

Table 7 - Total Network modelled network performance – Morning peak hour

Parameters	Do-Minimum	Do-Something	DS - DM
Delay (pcuh)	13,663.2	14,140.2	477
Total Time (pcuh)	98,096.6	98,740.1	643.5
Total Distance (pcukm)	6,804,129.5	6,811,798.5	7,669
Average Speed (km/h)	69.4	69.0	-0.4

Table 8 - Total Network modelled network performance – Evening peak hour

Parameters	Do-Minimum	Do-Something	DS - DM
Delay (pcuh)	14,559.1	14,917.1	358
Total Time (pcuh)	105,120.2	105,638.1	517.9
Total Distance (pcukm)	7,384,560.5	7,391,991	7,430.5
Average Speed (km/h)	70.2	70.0	-0.2

3. Outputs

To inform the Habitats Regulation Assessment (HRA) being prepared by Oxford City Council for the Oxford Local Plan 2040, comparison of the 2040 DS scenario with the 2040 DM scenario is required using transport modelling data.

At the beginning of this task, the boundary of the Area of Interest (AoI) was defined. The AoI includes at least 200 metres around the Oxford Meadows Special Area of Conservation (SAC) - see Figure 1.

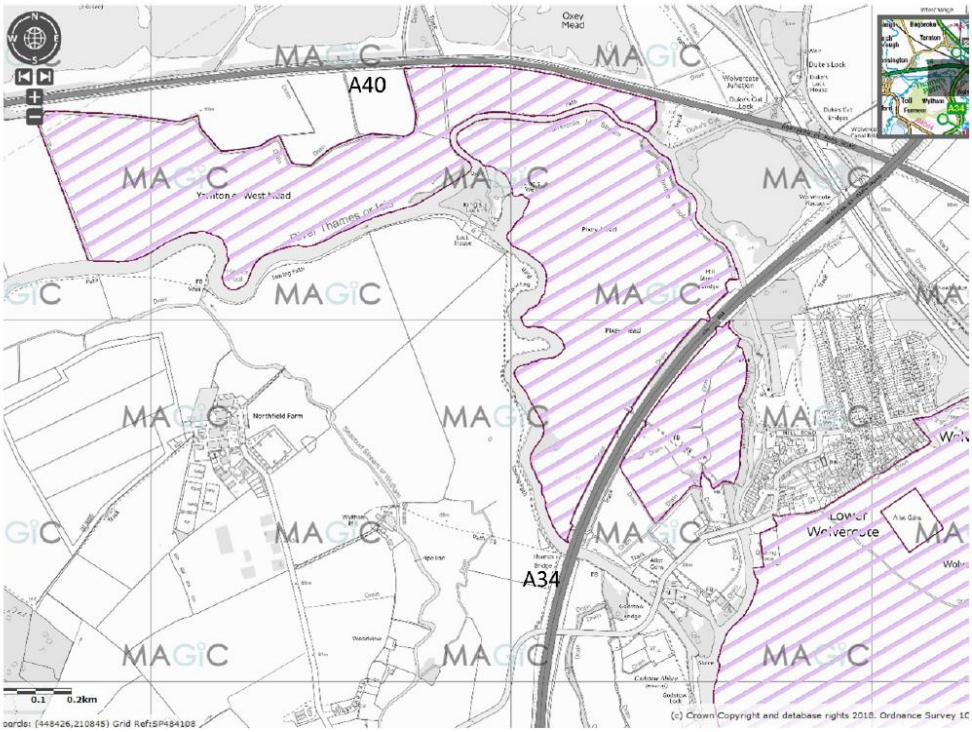

Figure 1 – The A34, A40 and the Oxford Meadows

The set of traffic data Average Annual Daily Traffic (AADT) for both DM and DS scenarios were used to inform HRA of the Oxford Local Plan 2040. The AADTs have been calculated only for the links located inside the cordon shown in Figure 2.

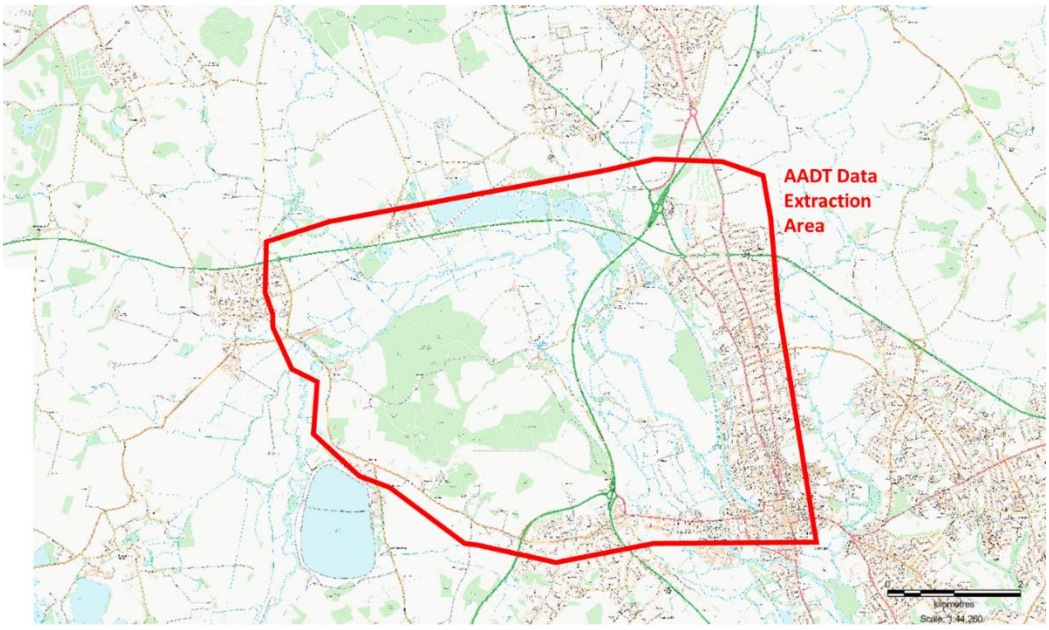

Figure 2 – AADT Data Extraction Area

This output (given to OCC as an xls) highlights the impact of the Oxford Local Plan on the Oxford Meadow SAC and area specified earlier including A40, A34 within 200m of Oxford SAC. It was advised by OCC to consider a significant impact when it matches the conditions listed the Design Manual for Roads and Bridges (DMRB) guidelines (volume 11, section 3, Part 1). This states that the following criteria for defining the significantly impacted air quality areas when comparing 2040 DM and 2040 DS scenarios:

- Daily traffic flows will change by 1,000 AADT (Annual Average Daily Traffic) or more; or
- Heavy duty vehicle (HDV) flows will change by 200 AADT or more; or
- Daily average speed will change by 10 km/hr or more; or
- Peak hour speed will change by 20 km/hr or more; or
- Road alignment will change by 5 m or more.

When processing the traffic data of both scenarios, there were a few links inside the cordon that met any one of the criteria listed above. The links are presented in Figure 3 below with AADT difference (DS-DM) for Oxford City displayed on the links.

Figure 4 shows the difference in AADTs with a focus on the A34, A40 and the Oxford Meadows. The changes in flows observed in Figure 3 in the vicinity of Botley Interchange are due to the assignment choosing a slightly different route at the final iteration and are not related in any way to the additional developments. Figure 6 shows the difference in average speed over a 24-hour period. The changes in speed near Botley Interchange are due to the same reason.

Figure 5 shows the difference in HGV flows over a 24-hour period and presents no issues.

Figure 3 – DS-DM comparison (values showing difference in AADTs)

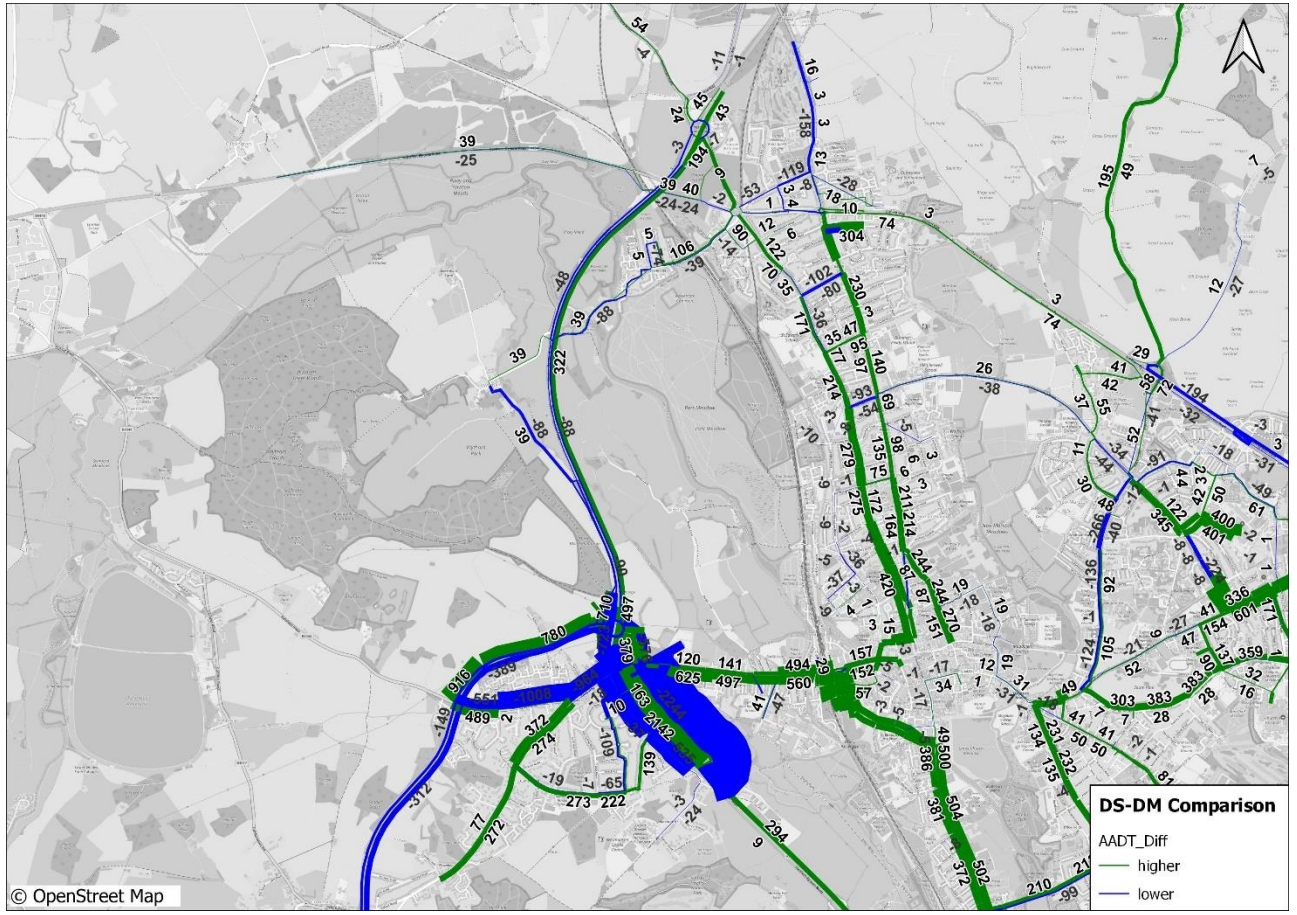

Figure 4 – Difference in AADTs (vehicles)

Figure 5 - Difference in Heavy Goods Vehicles[2] over a 24-hr period (vehicles)

[2] There are no changes for buses between the two scenarios.

Figure 6 - Difference in average speed over a 24-hr period (km/h)

4. Deliverables

The output is provided to OCC as a spreadsheet that accompanies this document, named “Oxford_Local_Plan_2040 - Housing and Employment_assump_external.xlsx “. This spreadsheet includes both DM and DS traffic data for the area specified in Figure 2 and the calculations carried to estimate the AADT.

Another deliverable is provided in the form of a GIS Shape file format covering the roads in the extraction area (Figure 2). The file names and descriptions are as follows:

- UserLinks.shp: This represents the model links/roads falling in the extraction area and data associated, including:
  - Link ID which forms from A-B nodes and mentioned in spreadsheet under column head title “Link ID”
  - SATURN A and B Nodes
  - X-Y coordinates
  - Link type
  - Distance in meter
- UserNodes.shp: This represents the model nodes, such as junctions, falling in the extraction area and data associated including:
  - Node ID
  - X-Y coordinates
  - Label which represents that whether that node is a zone centroid or normal node.
  - Node Type which states the type of node (example: centroid, signalized. etc.)
  - Sector ID which represents the sector in which the node is falling.

This document is also accompanied by a spreadsheet with the detailed land use assumptions.

5. Conclusions

On the 14th July 2023, AtkinsRéalis was commissioned by Oxfordshire County Council (OCC) to carry out an assessment of the impact of Oxford Local Plan 2040 on the A34 and A40 within the vicinity of Oxford Meadow Special Area of Conservation (SAC), which was requested by Natural England.

To inform the Habitats Regulation Assessment (HRA) being prepared by Oxford City Council for the Oxford Local Plan 2040, comparison of the 2040 DS scenario with the 2040 DM scenario is required using transport modelling data.

It was agreed with OCC that the Do-Minimum (DM) scenario for this work would be built having as starting point scenario, the 2035 Do Something with Workplace Parking Levy built in 2022, after all the manual manipulations were applied post VDM. As requested

by OCC, the VDM inbuilt in OSM was not undertaken as part of the future year forecasts.

After the DM scenario was built, the additional growth proposed after 2035 in the emerging Oxford Local Plan 2040 was added to the demand. The additional developments used the trip distribution of existing zones and was uplifted for a selection of rows and columns to reach the new trip end targets for the respective zones.

The set of traffic data Average Annual Weekday Traffic (AADT) for both DM and DS scenarios were used to inform the Habitats Regulations Assessment of the Oxford Local Plan 2040. The AADTs have been calculated only for the links located inside the cordon shown in Figure 2. Detailed results are given in the spreadsheet that accompanies this document.

TECHNICAL NOTE

Appendices

Appendix A. Transport schemes

A.1 Highway assumptions

District	Highway scheme description	2035 DS with WPL	Uncertainty Log
Cherwell	A41 / Neunkirchen Way roundabout (Rodney House)	Y	More than Likely
Cherwell	A41 Oxford Road / Boundary Way roundabout improvement scheme	Y	More than Likely
Cherwell	Bicester Town Centre changes	Y	Near Certain
Cherwell	M40 J10 Improvements	Y	Near Certain
Cherwell	M40 J9 Phase 2	Y	Near Certain
Cherwell	Oxford Road / Pingle Drive junction	Y	More than Likely
Cherwell	Bucknell Road/A4095 Howes Lane new priority junction	Y	More than Likely
Cherwell	Pioneer Roundabout	Y	More than Likely
Cherwell	Upper Heyford improvement	Y	Near Certain
Cherwell	Updated Bicester SE Perimeter Road as indicated by OCC, Langford Lane is not included in the model for being only a local access	Y	More than Likely
Cherwell	Spine Road Through SE Bicester – modelled at a speed of 40 mph (64 kph) as indicated by OCC	Y	More than Likely
Cherwell	Upgrade of the SE Segment of the A4421	Y	More than Likely
Cherwell	Improvements to Skimmingdish Lane	Y	More than Likely
Cherwell	Tunnel under the rail line – Howes Lane Realignment and the off-site mitigation at Lords Lane	Y	Near Certain
Cherwell	London Road is not available as a through route in the model to reflect the severe restrictions of the level crossing by 2031	Y	More than Likely
Cherwell	Charbridge Lane – dualled	Y	More than Likely
Cherwell	Include the realignment and signalisation of the A4260/ A4095 junctions as part of the Shipton Quarry permitted use	Y	Near Certain
City	Becket Street extension and new junction with Oxpens Road – New site access and link road through Oxpens site	Y	Near Certain
City	Botley interchange – Capacity improvements on circulatory and approaches	Y	Complete
City	Cutteslowe and Wolvercote Roundabouts	Y	Complete
City	Eastern Arc	Y	Near Certain
City	Frideswide Square improvements: Station access converted from signalised junction to a roundabout. Park End Street / Hythe Bridge	Y	Complete

District	Highway scheme description	2035 DS with WPL	Uncertainty Log
	Street and Park End Street/Hollybush Row signals converted to roundabouts. Bus link from Hollybush Row to Park End Street/Becket Street junction closed completely		
City	Hinksey Hill – A423 to A34 southbound: Upgrade to the westbound approach from the A423.	Y	Near Certain
City	Hinksey Hill – Science Transit: Bus lane on northbound off-slip	Y	Near Certain
City	Kennington Roundabout improvements: Signalised Hamburger implemented.	Y	Complete
City	The Plain and Longwall Street junction – Signal retiming at Longwall Street and cycle improvements	Y	Near Certain
City	West Way/ Botley Road junction improvements: Junction upgrades on West Way and North Hinksey Road. West Way/A420, West Way/North Hinksey Road and the junction to the south	Y	More than Likely
City	Worcester Street/George Street junction	Y	Near Certain
City	Updated Barton site access and bus link	Y	Near Certain
City	Headington roundabout - phase 1 (completed)	Y	Complete
City	Includes Access to Headington package.	Y	More than Likely
City	Connecting Oxford City Centre Bus Gates	Y	Reasonably Foreseeable
City	Connecting Oxford Workplace Parking Levy	Y	Reasonably Foreseeable
Vale/South	Harwell Link Road Section 1 (B4493 to A417)	Y	More than Likely
Vale/South	Didcot Northern Perimeter Road (NPR) 3 and associated junctions	Y	More than Likely
Vale/South	Wantage Eastern Link Road (WELR)	Y	More than Likely
Vale/South	A34 Milton Interchange Hamburger	Y	More than Likely
Vale/South	A34 Chilton Northern Slip Roads	Y	More than Likely
Vale/South	Foxhall Bridge Widening	Y	More than Likely
Vale/South	Access to Harwell Section 2 (Hagbourne Hill)	Y	More than Likely
Vale/South	Grove Northern Link Rd	Y	More than Likely
Vale/South	Rowstock Roundabout improvements	Y	More than Likely
Vale/South	Featherbed/Steventon Lights junction improvements	Y	More than Likely
Vale/South	Great Western Park access	Y	More than Likely
Vale/South	Valley Park spine road (A4130 – B4493)	Y	More than Likely
Vale/South	Coding to reflect traffic management measures in villages (Harwell)	Y	More than Likely

District	Highway scheme description	2035 DS with WPL	Uncertainty Log
Vale/South	Harwell Oxford all access points junction improvements	Y	More than Likely
Vale/South	Improvements to traffic signals at Frilford Junction (A415/A336)	Y	More than Likely
Vale/South	Junctions on A4130	Y	More than Likely
Vale/South	A420 Western Vale infrastructure (Faringdon – access to The Steeds development)	Y	More than Likely
Vale/South	Lodge Hill Interchange (South facing slip roads onto the A34)	Y	More than Likely
Vale/South	Clifton Hampden Bypass	Y	More than Likely
Vale/South	Culham to Didcot Thames River Crossing	Y	More than Likely
Vale/South	Science Bridge modelled with two roundabouts as in the OCC layout & A4130 Capacity Improvements	Y	More than Likely
Vale/South	South Access to Valley Park Spine Road modelled according to the layout provided by Brookbanks in October (5 arm roundabout).	Y	More than Likely
Vale/South	A420-Highworth Road, Shrivenham	Y	More than Likely
West	A4095/B4022 Staple Hall - Two mini-roundabouts connected by a short connecting link (2014 situation)	Y	Complete
West	A415 Ducklington Lane/Station Lane junction improvement - Capacity increase on the Station Lane approach.	Y	Complete
West	Brize Norton Village Traffic Calming - Capacity constraint on Minster Road between Elm Grove and Manor Road to reflect link layout change.	Y	More than Likely
West	Down's Road/A40 new junction - At grade roundabout access for Downs Road connecting onto the A40.	Y	Complete
West	Shilton Link Road from B4020 to Elmhusrt Way	Y	More than Likely
West	B4477 Capacity Enhancement through widening (still single carriageway)	Y	More than Likely
West	Straightening of the existing road between the A40 at Minster Lovell south to the roundabout junction north of Brize Norton	Y	More than Likely
City	Botley Rd Bus Lane Phase 1	Y	Complete
City	Banbury and Woodstock Roads	Y	Reasonably Foreseeable
Cherwell	A44 Corridor Improvements - Kidlington Roundabout (P1B), Peartree Loop Farm (P1D) and A44 up to and including junction with Cassington Road (P1A)	Y	Near Certain
Cherwell	A44 Corridor Improvements - P2B (A44/A4095 to Langford Lane to Cassington Road)	Y	Reasonably Foreseeable
Cherwell	A44 Corridor Improvements - P2C Langford Lane to Cassington Road	Y	Reasonably Foreseeable
Cherwell	Begbroke P&R access junction	Y	More than Likely
City	North Oxford Scheme (including Eastbound bus lane) – includes updated infrastructure around Northern Gateway on the A40 and A44 according to the latest layout, which includes the internal link road open to through traffic and improvements to Peartree	Y	Near Certain

District	Highway scheme description	2035 DS with WPL	Uncertainty Log
	Interchange. NOTE: new junctions on A40 and A44 with ped crossings etc will limit capacity		
West	A40 Witney - Shores Green scheme (adds access to/from A40 West)	Y	More than Likely
West	Full Eastbound bus lane between Eynsham P&R and Duke's Cut Bridge (without connection to the North Oxford bus lane) and the related junction improvements (@ Witney Road, Eynsham Roundabout and Cassington Signals) to accommodate the bus lanes	Y	More than Likely
West	OCGV access junction (Western Dev RdBt) ONLY NOW SERVES GV	Y	More than Likely
West	OCGV link connects to Lower Road in the east – priority junction	Y	More than Likely
West	Cuckoo Lane is closed at junction with A40	Y	More than Likely
West	West Eynsham SDA – link road from the P&R Junction to the B4449 (roundabout) NOTE THIS IS NOW ACCESSED OFF THE P&R JUNCTION	Y	More than Likely
West	P&R Access Junction - Includes junction for access to Eynsham Park and Ride site (plus 4th arm serving West Eynsham SDA)	Y	More than Likely
West	Full Westbound Bus Lane between Duke's Cut Bridge and Eynsham P&R and related junction improvements (@ Witney Road, Eynsham Roundabout and Cassington Signals) to accommodate the bus lanes	Y	More than Likely
West	Duke's Cut Bridge widening (offers EB bus lane connection to the North Oxford bus lane)	Y	More than Likely
West	Witney to Eynsham: Dualling (2 lanes for general traffic in both directions)	Y	More than Likely
South	Didcot HIF1 Improvements	Y	

A.2 Public transport assumptions

District	Service Number	Bus scheme description	2035 DS with WPL	Uncertainty Log
Bus services				
Cherwell	S4 S4A	2 new buses per hour to Banbury via Bankside plus enhancement of service s4 between Deddington and Banbury via main road	Y	Near Certain
Cherwell	25A 25B	Create additional services between Upper Heyford and Bicester, also Upper Heyford with Oxford with an additional frequency of 1 bph for all time periods. (new frequency 2 buses per hour)	Y	Near Certain
Cherwell	NWB	Create new bus service from NW Bicester to Bicester Town Centre	Y	Near Certain
Cherwell	GH	Create new bus service between Bicester Town Centre and Oxford going through Graven Hill (using Spine Road Through SE Bicester and Bicester SE Perimeter Road) with a frequency of 2 buses per hour in each direction	Y	Near Certain

District	Service Number	Bus scheme description	2035 DS with WPL	Uncertainty Log
Cherwell	S5	Update of the bus service S5 to stop at Graven Hill;	Y	Near Certain
Cherwell		As a consequence of the ban on London Road, all the buses using this segment previously were re-routed via Charbridge Lane.	Y	Near Certain
Cherwell		• The following bus services should be removed: o Route 18 Oxford-Woodstock Road-A40-Eynsham-Bampton o Route 17 Cutteslowe - Oxford o Route 94 Ambrosden-Charlton-Islip-Oxford o Routes K1, K2 Kidlington local services, including link to Yarnton, Begbroke o Route 25 Woodstock-Kirtlington-Wendlebury-Bicester	Y	Near Certain
Cherwell		• The following bus services should be updated: o Regarding the S4 Banbury-Deddington-Kidlington-Oxford, 1 bus per hour each way, will become 2 buses per hour each way o Bus service 500 will become 4 buses per hour with the following route: Begbroke P&R – Bladon – Langford Lane – A44 – Water Eaton P&R – Oxford o Bus service 700 will become 4 buses per hour with the following route: Begbroke P&R – Bladon – Langford Lane – A44 – Water Eaton P&R – Headington o Route 25A Oxford-Kirtlington-Upper Heyford-Bicester, 1 bus per hour each way, will become 2 buses per hour each way o S5 will have two additional variants: i. S5a with 2 buses per hour and the following route: Glory Farm – Manorsfield Road – A41 – A34 – Bicester Road – Banbury Road – Headley Way – Brookes University ii. S5b with 2 buses per hour and the following route: Manorsfield Road – Launton Road – Charbridge Lane – South East Bicester link Road – A41 – A34 – Bicester Road – Banbury Road – Oxford (City Centre)	Y	Near Certain
City		Frequency update for services 700, 800 and 900	Y	Near Certain
City	NSS	Bus services serving Barton development (re-routing of bus service 8 and new shuttle service between Barton and John Radcliffe Hosp. with a frequency of 2bph);	Y	Near Certain
City		Revised routing and frequency as part of Connecting Oxford proposals	Y	Reasonably Foreseeable
Vale/South	66	Faringdon - Increase 66 service (Swindon-Oxford) to 3 buses/hour	Y	Near Certain
Vale/South	X39	Wallingford - Increase X39 service (Wallingford-Oxford) to 3 buses/hour	Y	Near Certain
Vale/South	280	Thame - Increase 280 (Thame - Oxford) to 4 buses/hour	Y	Near Certain
Vale/South	36 31	2 buses per hour Harwell-Crab Hill-Grove Airfield-Milton Park Didcot (service 36) plus diversion of 2 buses per hour Wantage Oxford through site (either x30 or 31)	Y	Near Certain
Vale/South	45 44VP 46	“North East Didcot, 4 buses per hour to Didcot Town Centre and Station and then 2 of these extended to Milton Park and on to Harwell”	Y	Near Certain
Vale/South	45 46	“Valley Park, 2 buses per hour Didcot-Wantage Road-Vallley Park-Milton Park, plus 2 buses per hour Didcot - main road - Valley Park – Harwell”	Y	Near Certain
Vale/South	55 56	“Great Western Park, same pattern as at Valley Park, 4 per hour to Didcot Town Centre, 2 to Milton Park, 2 to Harwell”	Y	Near Certain

District	Service Number	Bus scheme description	2035 DS with WPL	Uncertainty Log
West	488	2 buses per hour (Chipping Norton – Banbury) (currently one bus per hour)	Y	Near Certain
West		The following bus services should be updated: S1, S2 and S7 (Frequencies depend on scenario)	Y	Near Certain
Park&Ride sites				
		Peartree	Y	Existing
		Water Eaton	Y	Existing
		Secourt	Y	Existing
		Redbridge	Y	Existing
		Thornhill	Y	Existing
		Begbroke	Y	More than likely
		Eynsham	Y	More than likely
Rail Schemes				
Evergreen 3	EWR3	Evergreen3 from Chiltern Railway consists in the creation of a new service between Oxford and London Marylebone, with a headway of 30 minutes all day.	Y	Complete
Henley-on-Thames	GW_N13 GW_S13	Shuttle service between Henley and Twyford with a frequency of 2 tph, allowing the transfer to the services to London and Oxford.	Y	Complete
North Cotswolds Line*		The services inherited from the Base Year have been substituted by the following (for all time periods):	Y	
	GW_N7 GW_S8	• Worcester Moreton-in-Marsh Oxford London Paddington – 1 tph	Y	More than likely
	GW_S3	• Great-Malvern Moreton-in-Marsh Oxford London Paddington – 1 tph	Y	More than likely
	GW_N10 GW_S10	• Kidderminster Moreton-in-Marsh Oxford London Paddington – 1 tph	Y	
	GW_S11 GW_N11	• Hanborough Oxford Didcot – 1 tph	Y	
	GW_S14 GW_N14	• Hanborough Oxford Culham Didcot – 1 tph	Y	More than likely
Culham Station		The following services now stop at Culham and Radley (in all time periods):	Y	
	EWR1	• Reading to/from Bedford – 1 tph	Y	?
	EWR2	• Reading to/from Milton Keynes – 1 tph	Y	?
Oxford to Didcot	GW_N14 &S14 GW_N11 &S11 GW_N7 &S8	Additionally, two more trains per hour stop at Radley and 1 train per hour stops at Appleton (in all time periods).	Y	?

District	Service Number	Bus scheme description	2035 DS with WPL	Uncertainty Log
Didcot Parkway	GW_N4 GW_S5	For the service between Swindon and London Paddington, 1 more train per hour was added to the ones inherited from the Base Year, making a total of 3 tph (only AM and PM).	Y	?
Banbury to Oxford	GW_S1 GW_N3	The direct service between Banbury and London Paddington was substituted by a shuttle between Banbury and Didcot (in AM and PM) and Banbury and Oxford (in IP) with a frequency of 1 tph.	Y	?
East West Rail		East West Rail comprises four new services:		Reasonably Forseeable
	EWR1	• Reading – Bedford with a headway of 60 minutes all day;	Y	Reasonably Forseeable
	EWR2	• Reading – Milton Keynes with a headway of 60 minutes all day;	Y	Reasonably Forseeable
	EWR5	• Bletchley – Milton Keynes with a headway of 60 minutes all day;	Y	Reasonably Forseeable
	EWR4	• Milton Keynes – Marylebone with a headway of 60 minutes all day.	Y	Reasonably Forseeable
Oxford to Heathrow	LHR	A service with 2 tph already exists between Oxford – Didcot Parkway – Reading – Heathrow – London Paddington. Updated journey time.	Y	Reasonably Forseeable