

Smart Motorways Programme

M4 Junctions 3 to 12 Smart Motorway

Non-Material Change

Huntercombe Spur Overbridge

Technical Note

Document Number: HA514451-CHHJ-GEN-SZ_ZZZZZZZZ_Z-TN-KK-0070

April 2022

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1 Introduction

The Development Consent Order (DCO) was granted for the M4 Junctions 3 to 12 Smart Motorway scheme (the scheme) in September 2016, a 0.5m limit of deviation with respect to vertical movement was set to allow for changes to structures.

Structural works to Huntercombe Spur Overbridge are required in order to enable All Lane Running (ALR) on the M4. The design of Huntercombe Spur Overbridge has changed since the DCO was granted. The 2015 DCO design proposed an offline construction, this proposal is to demolish and replace the existing structure with a new bridge, whilst running all traffic over a temporary structure to the east. This change leads to the height of the bridge being outside of the limits of deviation of the DCO and of the principles set out in the Engineering and Design Report and is therefore being brought forward as part of the Application.

This technical note provides a summary of the changes made to the design of Huntercombe Spur Overbridge, why these changes have been made and an appraisal of the impacts compared to those assessed for the DCO design.

2 Background

The M4 is a strategic part of both the English and Welsh road network, connecting London to South Wales. The scheme is located on 32 miles of the M4, between junction 3 and junction 12. It comprises of 28 miles of three-lane motorway and four miles of four-lane motorway between junction 4 and 4b. The scheme includes the M4 to M25 interchange; the junction for Heathrow Airport and passes by several key regional centres including Slough, Windsor, Maidenhead, Wokingham and Reading.

Junction 7 (Huntercombe Spur) is a trumpet-shaped junction at the end of a 1km long dual two-lane road which links the M4 to the A4 Bath Road between Maidenhead and Slough. The link road, known as the Huntercombe Spur, starts at a roundabout on the A4, heads south, crosses over the M4 on the Huntercombe Spur overbridge, currently a four-span structure similar to those at Marsh Lane and Lake End Road and then swings all the way round to the west and then back north to form the “loop” of the trumpet shape. One lane of the westbound slip road onto the M4 is currently hatched over with white road markings so that the merge on to the motorway operates as a single lane merge. The eastbound slip road off the M4 has two lanes which curve to the north before merging into the link road to the A4.

The current structure has four spans supported by buried abutments in the verge embankment and piers to each verge and the central reserve. Both hard shoulders are currently discontinuous under the structure therefore a replacement bridge needs to be constructed to enable all-lane-running (ALR).

3 2015 DCO Design

The 2015 DCO Design for Huntercombe Spur overbridge is shown in Figure 1 and was a semi-offline construction to allow the junction to remain open during construction. The new bridge was to be built as two separate structures in the following sequence:

- 1) Construct the new southbound bridge to the eastern side of the existing bridge;
- 2) Divert northbound and southbound traffic onto the new bridge with one lane in each direction;
- 3) Demolish the existing bridge;
- 4) Construct the new northbound bridge on the site of the old bridge; and
- 5) Open both new bridges to two lanes of traffic in each direction.

This design would have resulted in a realignment of the bridge to the east. The level of the finished carriageway over the proposed bridge would have been approximately 1.2m higher than the existing overbridge due to the form and span of the proposed structure. The link road and approach embankments would have required realigning.

The new bridges would have each been three-span bridges. The new decks would be some 3m wider than the existing bridge so that each bridge will be able to carry two lanes and a hard shoulder for the spur in each direction.

4 2021 NMC Design

4.1 Structural Changes

The 2021 NMC Design of Huntercombe Spur overbridge is shown in Figure 2. This replaces the previously proposed pair of offline structures with a single wide online structure. The new bridge structure will be a steel composite single span structure, with 8 steel girders instead of the original 12. To facilitate the movement of traffic during construction, a temporary offline bridge will be built to the east of the main structure.

The alignment of the proposed design has changed to tie into the existing highway sooner (approx. 70m earlier south of the structure and 130m earlier north of the structure), reducing the scope of pavement works. As a result of this, the vertical alignment of the Spur has been lowered with the need to tie-in to the existing pavement.

As a result of switching to a new bridge structure design, the alignment of Huntercombe Spur overbridge over the M4 has moved west by up to 17m. A result of this is that the Spur approaching the M4 overbridge is no longer constrained by the eastbound merge slip. Therefore, the 100m long retaining wall on the north-east corner in the previous design (shown in blue in Figure 1) has been replaced by steepened earthworks.

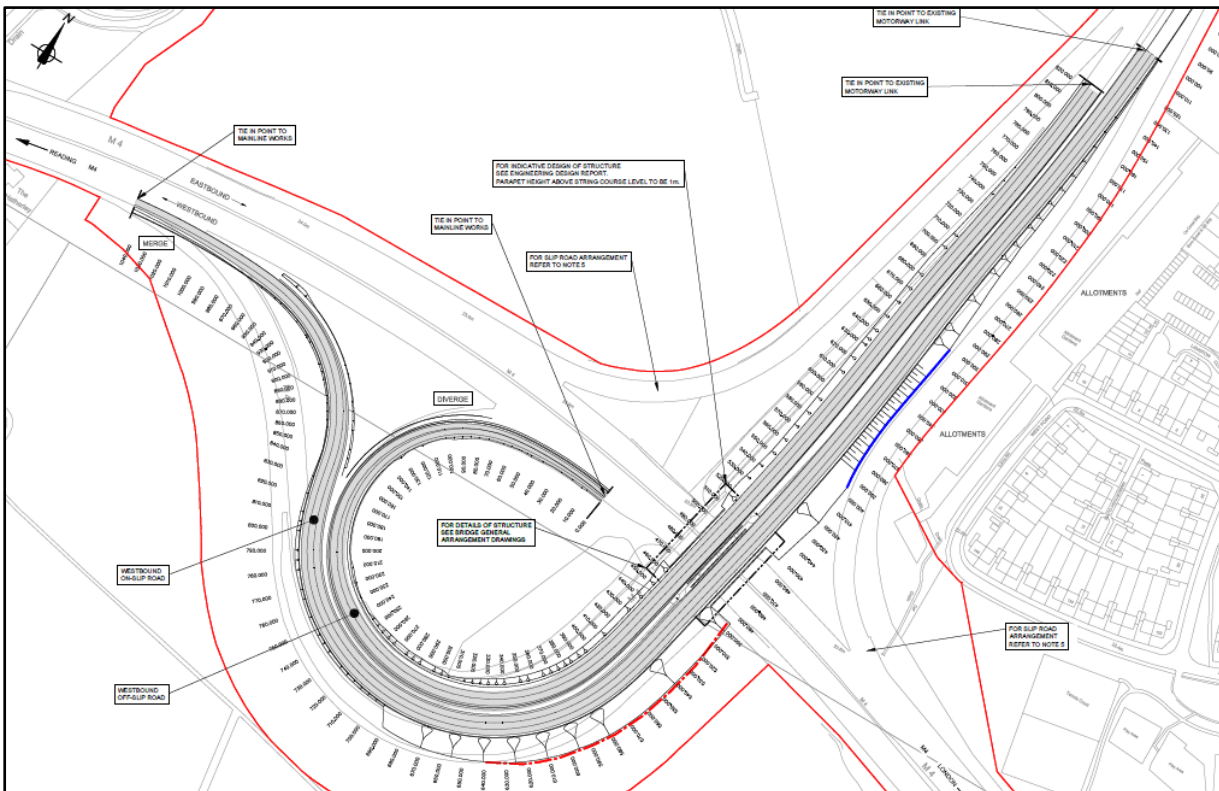


Figure 1 2015 DCO Design of Huntercombe Spur overbridge

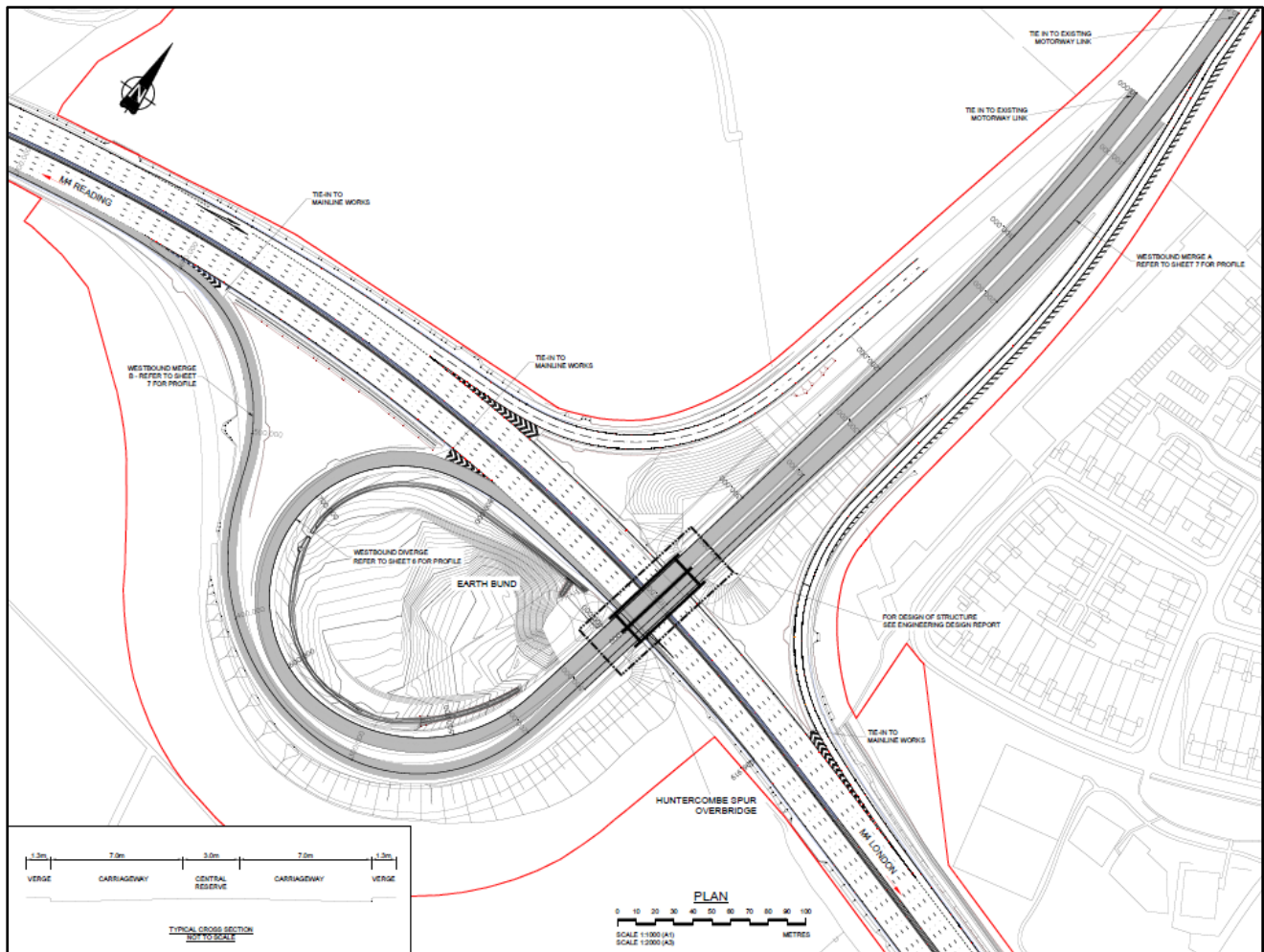


Figure 2 2021 NMC Design of Huntercombe Spur overbridge

4.2 Drainage changes

As the changes at Huntercombe Spur overbridge are related to a structure over the M4, there has been no significant impact of these changes to the drainage proposals.

4.3 Earthworks changes

4.3.1 2015 DCO Design

In the 2015 DCO Design, the earthworks solutions on the eastern-side of the Spur alignment and to the north of the bridge, were constrained by the proximity of the eastbound onslip. The landtake constraints, in combination with the raising of the Spur alignment over the new bridge, required a 100m long, vertical/steeply sloping reinforced earth retaining solution between the westbound onslip and eastbound onslip. Elsewhere around the junction, the earthworks proposals comprised conventional earthfill embankment slopes amenable to planting.

4.3.2 2018 DCO Discharged Design (Requirement 6)

Development of the scheme through to the 2018 DCO discharge added a further length of vertical/steeply sloping reinforced earth retaining solution on the outside of the junction 'loop' below the westbound onslip. This retaining solution was approximately 100m long and was required to prevent the earthworks footprint spilling beyond a local pinch-point in the permanent landtake.

4.3.3 2021 NMC Design

As described above, value engineering changes after the 2018 discharge of DCO Requirements saw the offline structures replaced with a single online structure with a reduction in the vertical alignment of the Spur. A result of these changes is that the Spur approaching the new overbridge from the north is much less constrained by the eastbound onslip. The retaining wall between the onslips has therefore, been replaced by a 1v:3.5h earthworks slope that is amenable to greening and screening planting. To the south of the bridge, the creation of more space between the westbound onslip and the permanent land boundary has also allowed the retaining solution to be removed and a new 1v:3.5h earthworks slopes to fit.

On the western side of the bridge including within the junction loop, landforms of max. 1v:3.5h gradient have been created to allow deposition of excess construction arisings. These new fill slopes will be locally amenable to planting to reduce any potential aesthetic impacts of the newly widened junction.

Around 500m to the north of the Huntercombe Spur overbridge, on the west-side of the Spur, is signage gantry G5-11. The 2015 DCO Design indicates a purely earthworks solution at this location; however, subsequent detailed topographic surveys have highlighted a need for a vertical, sheet piled retaining wall around the associated verge build-out. The current proposal is for a 20m long, max. 2m high sheet piled wall.

4.3.4 Change Summary

In summary, the key changes between the 2015 DCO Design and the 2021 NMC Design are that the switch to an on-line replacement overbridge has allowed the 100m long retaining solution between the westbound merge (north of the bridge) and eastbound merge slip alignments to be deleted and conventional, relatively slack-graded earthworks to be used on the approaches to the bridge, these being fully greening and locally plantable. In addition, new greening landforms have been created in the loop formed by the westbound diverge and to the northwest of the overbridge.

5 Safety

5.1 Driver and Non-Motorised user safety

The change in design has no impact on driver safety. All sightlines have been assessed and the planting areas modified to ensure visibility is compliant with the requirements of DMRB.

Non-Motorised user (NMU) safety is not affected as there is no NMU access in either the 2015 DCO design nor the current proposed design as this is a motorway to trunk road interchange.

5.2 Workforce safety

The change in design to Huntercombe Spur overbridge has no impact on workforce safety. Careful staging of the works, risk assessments and safe working methodology will limit workers exposure to site risks such as working at height, adjacent to traffic, earthworks/embankments etc.

6 Environmental Impact

A review of the potential environmental impact resulting from the 2021 NMC Design, with cross-reference to the Environmental Statement (ES) submitted in support of the DCO application and the environmental documentation submitted in the Examination is discussed below.

The ES submitted in support of the DCO application assessed the following:

- Air Quality;
- Cultural Heritage;
- Landscape;
- Nature Conservation;
- Geology and Soils;
- Materials and Waste;
- Noise and Vibration;
- Effects on All Travellers;
- Community and Private Assets;
- Road Drainage and the Water Environment; and
- Cumulative Effects.

Following a review of the 2021 NMC Design, it has been determined that this Non-Material Change Application needs to consider the potential environmental impact on air quality, noise and vibration, biodiversity, landscape and visual, and water. These are discussed in further detail in the sections below.

It is considered that because there is no increase to construction procedures or any works outside order limits there would be no environmental impact as a result of the 2021 NMC Design on Cultural Heritage, Geology and Soils, Materials and Waste, Effects on All Travellers, or Community and Private Assets. Therefore, in relation to these topics, it is concluded that there are no changes to the assessment of residual effects presented in the ES, and therefore the assessments and conclusions presented in the ES remain valid. These topics are not considered further within this Non-Material Change Application.

Chapter 16 of the ES submitted in support of the DCO application considered combined and cumulative effects.

The former assessed the combined action of different environmental topic-specific impacts upon a single resource/receptor. Consideration of 'in-combination' effects is afforded within the topic change assessments below, where considered relevant.

The latter assessed the combined action of a number of different projects, cumulatively with the project being assessed, on a single resource/receptor. The list of developments included in the cumulative effects assessment was presented in Appendix 16.1 of the ES and was last updated in January 2015 and developments that were accounted for in the traffic model was presented in Appendix 16.2. The locations of the developments were shown on Figure 16.1 of the ES.

A review of relevant planning portals was undertaken in March/April 2021 to determine if any additional developments not in previously considered locations (built or under construction only) within 1km of the 2021 NMC Design, which did not exist within the planning system in January 2015. Such developments would not have been considered in the cumulative effects assessment or the traffic modelling undertaken in support of the DCO application, and therefore, need to be considered for this Non-Material Change Application.

This review concluded that no new committed developments, meeting the selection criteria outlined in Chapter 16 of the ES, are present within 1km of the 2021 NMC Design. Therefore, the cumulative effects assessment and conclusions presented in the ES remain valid.

It should be noted that the ES submitted in support of the DCO application was produced in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009. The Regulations were updated in 2017, in accordance with EIA Directive 2014/52/EU, and require consideration of the following additional factors/topics not cited in the 2009 Regulations:

- Climate
- Population and human health
- Major accidents and disasters
- Heat and radiation.

Regarding climate, there are two aspects to consider i) impact of the 2021 NMC Design on climate (greenhouse gas emissions); and ii) vulnerability of the 2021 NMC Design to climate change (adaptation).

The 2021 NMC Design (predominantly through its drainage design which has taken account of the appropriate climate change allowances (20%)) has been designed to address vulnerability to climate change (adaption), and therefore vulnerability of the 2021 NMC Design to climate change (adaptation) is not considered further within this Non-Material Change Application.

The scheme assessed within the 2015 DCO did not include an assessment of embodied carbon as this was not a legislative requirement at the time of submission. However, as the Application is focussed on design changes to the overall scheme and that there is therefore no baseline to compare to and given that the scheme construction footprint will be less with the proposed design changes, it is assumed that no further assessment of this matter is required to be taken forward; and it is assumed to not be a factor that will affect the materiality of the change.

The change in horizontal alignment of the 2021 NMC Design does not impact traffic levels. Therefore, the impact of 2021 NMC Design on climate (greenhouse gas emissions) is not considered further within this Non-Material Change Application.

Regarding population and human health, a Health Impact Assessment was submitted at Deadline III of the DCO Examination, which was informed by the results of the air quality and noise assessments in the ES. Aspects of air quality and noise in respect of the Non-Material Change Application are considered in further detail in the sections below. As a result of the conclusions of that work, no further impacts to population and human health specifically are anticipated from the Non-Material Change Application.

Regarding major accidents and disasters, smart motorway schemes, like any major transport corridor, are considered to be potentially vulnerable to the following major man-made events:

- Industrial accidents such as the Buncefield fire affecting the M1;
- Road accidents involving the spillage of hazardous or polluting materials;
- Civil unrest or terrorist incidents; and
- Aviation accidents such as at East Midlands Airport.

In terms of natural hazards, those of relevance to a motorway relate to extreme adverse weather leading to unsafe driving conditions. Such events may lead to the spillage of fuel or other hazardous materials or those potentially damaging to the aquatic environment such as milk or other substances with a high biochemical oxygen demand.

None of the above major events would require a change to the design of a smart motorway scheme. Indeed, the very nature of a smart motorway scheme with the elevated level of motorway

surveillance would mean that the response time to any such incidents would be enhanced and the changes within the Non-Material Change Application would not affect this.

In terms of both man-made and natural major accidents, the incremental environmental risk associated with a smart motorway scheme is the pollution of water quality. However, there is a low probability of a significant impact arising from a low probability major event.

The 2021 NMC Design is not considered vulnerable to risk of major events, nor is there considered to be any consequential changes in the predicted effects of the 2021 NMC Design on environmental factors. Therefore, major accidents and disasters is not considered further within this Non-Material Change Application.

Regarding heat and radiation, the scope of the 2021 NMC Design does not involve the use of radiation. Only under controlled conditions is heat used while the road pavement is laid. Consequently, heat and radiation is not considered further within this Non-Material Change Application.

6.1 Air quality

6.1.1 Introduction

A qualitative change assessment has been undertaken, comparing the 2015 DCO Design with the 2021 NMC Design with reference to the air quality assessment presented in Chapter 6 of the ES submitted in support of the DCO application.

6.1.2 Change Assessment Findings

Construction

The scale of the works being undertaken for the 2021 NMC Design are very similar to those in the 2015 DCO Design. Therefore, the potential for adverse effects due to fugitive emissions of dust will be similar with both designs. As such, proposed mitigation measures included within the ES submitted in support of the DCO application and the Construction Environmental Management Plan will be sufficient to mitigate adverse effects on nearby receptors during the construction phase.

Operation

There are no anticipated changes in traffic flows due to the 2021 NMC Design of Huntercombe Spur, therefore there is no anticipated change in air quality due to traffic flows.

The comparison of the 2015 DCO Design and the 2021 NMC Design shows that the horizontal alignment of the road will move with the revised design. This change is moving the alignment away from the properties to the north east of the junction. These changes are greater than 5m and therefore there is potential for a perceptible change in air quality at these receptors. As the road is moving away from these properties, this would be a beneficial effect on air quality. Annual mean NO₂ concentrations are anticipated to remain well below the objective value, with a smaller increase in pollutant concentrations compared to the effect predicted in the ES.

6.1.3 Conclusion

The change assessment has identified that there are no traffic changes predicted and that changes provided by the 2021 NMC Design would reduce the air quality impact at nearby receptors. Overall in a reduced impact on air quality compared to the assessment presented in the ES is expected.

6.2 Noise and vibration

6.2.1 Introduction

A qualitative change assessment has been undertaken, comparing the 2015 DCO Design with the 2021 NMC Design with reference to the noise and vibration assessment presented in Chapter 12 of the ES submitted in support of the DCO application and the Enhanced Noise Mitigation Study Report submitted at Deadline VII and revised at Deadline VIII of the DCO Examination.

6.2.2 Changes in Baseline

Subsequent changes in traffic flows on the M4 and surrounding roads since the ES was submitted in support of the DCO application would affect the Do Minimum (i.e. without the scheme) and Do Something (i.e. with the scheme) traffic flows in similar ways.

Consequently, the negligible or minor noise level reductions reported in the ES and the Enhanced Noise Mitigation Study Report would still be evident and therefore the assessment and conclusions presented in both documents remain valid.

As shown in the ES and the Enhanced Noise Mitigation Study Report, there are negligible or minor noise level reductions with the scheme in operation. Consequently, there will be no adverse significant effects on any new committed developments within the Huntercombe Spur study area (although none have been identified) resulting from the implementation of the 2021 NMC Design, as there are no anticipated changes in traffic flows due to the Huntercombe Spur overbridge design changes.

6.2.3 Location and Sensitive Receptors

Figure 3, below, shows Huntercombe Spur overbridge and the surrounding area. There is a large residential area to the east and north east of the Spur (Cippenham), with the closest properties to the Spur on Westpoint, Mercian Way and Oldway Lane.

There are small groups of residential properties to the west and north west of the Spur, comprising properties on Lake End Road and Huntercombe Lane South, including Burnham Abbey.



Figure 3 Huntercombe Spur overbridge and Surrounding Area

6.2.4 Change Assessment Findings

Construction Noise and Vibration

Construction of the 2021 NMC Design 16m to the west of the 2015 DCO Design will reduce construction noise and vibration levels to the closest residential properties, which are to the north east of the Spur, albeit negligibly, compared to the 2015 DCO Design. The small number of residential properties to the west of the Spur are at a distance of > 400m and will not experience any additional significant effects as a result of the construction of the 2021 NMC Design compared to construction of the 2015 DCO Design.

Construction of the temporary offline bridge to the east of the 2021 NMC Design will increase construction noise and vibration levels to the closest residential properties, which are to the north east of the Spur. However, these will be comparable to those for the 2015 DCO Design, which is an offline design to the east of the 2021 NMC Design.

Operation of the temporary offline bridge during construction of the 2021 NMC Design will increase traffic noise levels temporarily to the closest residential properties, which are to the north east of the Spur. A simple calculation (employing the Calculation of Road Traffic Noise methodology) has been employed to estimate this temporary noise level increase resulting from moving traffic closer to residential properties. This noise level increase is estimated to be less than 1 dB, which is assessed as not significant. The 2015 DCO Design would have resulted in traffic moving closer to these receptors permanently.

Construction of the westbound on-slip will be short term compared to the overall duration of construction works in this area. Moving these works west by up to 21m will have no significant effect on the nearest residential properties (which lie immediately south of the M4, just to the east of Lake End Road, at a distance of approximately 200m) when compared to the 2015 DCO Design.

Consequently, adoption of the 2021 NMC Design will not result in significant changes to the overall construction noise and vibration levels to sensitive receptors in the vicinity when compared to the 2015 DCO Design.

Operational Noise

There are no anticipated changes in traffic flows due to the 2021 NMC Design of Huntercombe Spur Overbridge.

A comparison of the 2015 DCO Design and the 2021 NMC Design shows that:-

- The minor changes to the vertical alignment (the 2021 NMC Design is slightly lower than the 2015 DCO Design) will reduce noise levels to surrounding receptors, albeit negligibly.
- The minor changes to the horizontal alignment (the 2021 NMC Design shows the Spur to be 16m further west, further away from the closest residential properties, which are to the north east of the Spur) will reduce noise levels to the closest residential properties, albeit negligibly. The small number of residential properties to the west of the Spur are at a distance of > 400m and will not experience any additional significant effects as a result of adopting the 2021 NMC Design.
- The minor changes to the horizontal alignment (the 2021 NMC Design shows the westbound on-slip to be up to 21m further west) will have no significant effect on the nearest residential properties, which lie immediately south of the M4, just to the east of Lake End Road, and where the noise climate is dominated by traffic on the M4 mainline. The M4 mainline is closer to these properties than that part of the westbound on-slip which is moving nearer. Also, traffic flows on the M4 mainline in this location are approximately 150,000 vehicles per day, whilst traffic flows on the westbound on-slip are approximately 11,000 vehicles per day.

Consequently, adoption of the 2021 NMC Design will not result in significant changes to the overall operational noise levels to sensitive receptors in the vicinity when compared to the 2015 DCO Design.

6.2.5 Conclusion

The qualitative change assessment has concluded that the 2021 NMC Design will not result in any significant construction noise and vibration level changes or operational noise level changes to surrounding receptors when compared with the 2015 DCO Design. It is therefore concluded that there are no changes to the assessment of residual effects presented in the ES, nor are there any changes to the assessment presented in the Enhanced Noise Mitigation Study Report, and therefore the assessment and conclusions presented in the ES and the Enhanced Noise Mitigation Study Report remain valid.

6.3 Biodiversity

6.3.1 Introduction

A qualitative change assessment has been undertaken, comparing the 2015 DCO Design with the 2021 NMC Design with reference to the ecology and nature conservation assessment presented in Chapter 9 of the ES submitted in support of the DCO application. The change assessment considered the potential impacts of changes to vegetation clearance on designated sites, habitats, and protected species.

Two sites of European importance to nature conservation were scoped into the impact assessment for the scheme; screening revealed no direct or indirect effects on these sites, their qualifying features, or their conservation objectives. The 2021 NMC Design changes are small scale in nature and do not materially alter the original assessments and there is no change to the

conclusion of No Likely Significant Effect on these statutory designated sites. These sites have not been considered further in this assessment.

6.3.2 Methodology

The qualitative change assessment has been undertaken to enable direct comparison with the assessment presented in Chapter 9 of the ES.

The study area comprises the area within the Order limits around the 2021 NMC Design between chainages 28+700 and 29+400.

The change assessment has been undertaken in two stages:

- The first stage comprised a change assessment of the impacts of the 2021 NMC Design using the baseline ecological information that informed the ES, to enable a 'like for like' comparison of the effects of the 2021 NMC Design against the effects of the 2015 DCO Design.
- The second stage comprised a change assessment of the impacts of the 2021 NMC Design using the baseline ecological information that informed the ES, as well as any relevant updated ecological information collected since (up to 30 March 2021), to provide a current change assessment of the potential effects of the 2021 NMC Design.

The following data sources have been consulted:

- Chapter 9 of the ES (and associated appendices and figures) submitted in support of the DCO application
- Ecological Constraints geodatabase (as of 30 March 2021) (A database that contains information collected pre-construction and by Ecological Clerks of Works during site clearance and construction)
- Vegetation clearance drawings submitted at Deadline VII of the DCO Examination (514451-MUH-ML-ZZ-DR-SC-301244; Sheet 20; revision 6F 04/02/2016)
- 2021 NMC Design Vegetation Clearance Drawings (ELS-SZ_ZZZZZZZZ_Z-DR-LD-5319 to ELS-SZ_ZZZZZZZZ_Z-DR-LD-5320; Sheets 19 to 20, 2022 revision P01)
- 2021 NMC Design Environmental Masterplan Drawings (ELS-SZ_ZZZZZZZZ_Z-DR-LD-5238 to ELS-SZ_ZZZZZZZZ_Z-DR-LD-5240; Sheets 38 to 40; 2022 revision P01)

The change assessment considers impacts during construction only, as the 2021 NMC Design would not result in any significant changes to operational impacts. Whilst the air quality change assessment (see Section 6.1) concludes a beneficial change in air quality with the 2021 NMC Design, this is in relation to properties to the north-east of the junction, and is a result of the change in road alignment, not traffic flow (the spatial distribution of air pollution would change but not the quantity). There are no sensitive designated site receptors within the 200 m threshold for potential significance. Therefore, there would be no significant change in air quality effects in relation to biodiversity as a result of the 2021 NMC Design.

The mitigation measures referred to in this change assessment are those secured through the made DCO, with consideration given as to whether any additional mitigation is required as a result of the 2021 NMC Design.

6.3.3 Change Assessment Findings

Summary of changes in relation to biodiversity

The 2021 NMC Design would result in a slight increase in permanent vegetation clearance and a slight decrease in temporary vegetation clearance, mainly through additional strips of permanent and temporary vegetation clearance along the verges and strips of permanent vegetation clearance in areas previously subject to temporary clearance.

Additional areas of habitat that would be lost include small areas of dense scrub, scattered scrub, and tall ruderal herbs. These areas are located adjacent and parallel to existing carriageway and nearly all are only a few metres wide. The value of these areas to nature conservation is compromised by their small size, poor connectivity to other valuable natural habitats, high levels of disturbance, and lack of management. Areas of temporary vegetation clearance would be replanted with woodland, trees, scrub, shrubs, open grassland, and amenity grassland, which would offset most of the habitat loss.

Impact change assessment using DCO baseline ecological information

The ecological receptors within the study area assessed in the ES comprised designated sites, habitats and plants, invasive species, amphibians, reptiles, birds, bats and badger (*Meles meles*). Table 1 below presents a summary of the assessment of the 2015 DCO Design presented in the ES and a change assessment of the 2021 NMC Design for these receptors using the DCO baseline ecological information.

The significance of residual effects of the 2021 NMC Design on designated sites, habitats and plants, invasive species, birds, bats, and badger when assessed against the DCO baseline ecological information is **neutral**, which represents no change from the assessment of the 2015 DCO Design presented in the ES (**neutral**).

The significance of residual effects of the 2021 NMC Design on amphibians and reptiles when assessed against the DCO baseline ecological information is **slight adverse**, which represents no change from the assessment of the 2015 DCO Design presented in the ES (**slight adverse**).

The 2021 NMC Design would not contribute to any change to in-combination or cumulative effects.

The mitigation as listed in Table 1 and described within the ES remains appropriate and sufficient. These mitigation measures are included within the current version of the Construction Environmental Management Plan (as discharged under Requirement 8 of the DCO).

Impact change assessment using current baseline ecological information

Since the submission of the ES, additional ecological information relating to invasive species, reptiles, bats, and badger has been recorded within the study area. Table 1 below presents a change assessment of the 2021 NMC Design using this current baseline ecological information.

The significance of residual effects of the 2021 NMC Design on designated sites, habitats and plants, invasive species, birds, bats, and badger when assessed against the current ecological baseline is **neutral**, which represents no change from the assessment of the 2015 DCO Design presented in the ES (**neutral**).

The significance of residual effects of the 2021 NMC Design on amphibians and reptiles when assessed against the current ecological baseline is **slight adverse**, which represents no change from the assessment of the 2015 DCO Design presented in the ES (**slight adverse**).

No additional committed developments were identified with potential for cumulative effects.

The 2021 NMC Design would not contribute to any change to in-combination or cumulative effects.

The mitigation as listed in Table 1 (below), and described within the ES, remains appropriate and sufficient. These mitigation measures are included within the current version of the Construction Environmental Management Plan discharged pursuant to Requirement 8 of the DCO.

6.3.4 Conclusion

The qualitative change assessment has concluded that the 2021 NMC Design will not result in any change to the significance of residual, in-combination, or cumulative effects on biodiversity

receptors compared to the 2015 DCO Design, when assessed using either the DCO ecological baseline or the current ecological baseline. It is therefore concluded that there are no changes to the assessment of residual effects presented in the ES and therefore the assessment and conclusions presented in the ES remain valid.

Ecological receptor	Summary of ES assessment of '2015 DCO Design'				Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline				Comments
	Value	Impact Description	Mitigation	Significance of Residual Effect			Significance of Residual Effect	Value	Impact Description	Mitigation	
Designated sites	Local	Pollution	Best practice pollution prevention and control	Neutral No residual effects	Neutral No residual effects (Best practice pollution control measures would remain sufficient to avoid any localised effects to Haymill Valley Local Nature Reserve (LNR) and Site of Importance for Nature Conservation (SINC) and Home Farm Stream Local Wildlife Site (LWS).)	None	Local	Pollution	Best practice pollution prevention and control	Neutral No residual effects (Best practice pollution control measures would remain sufficient to avoid any localised effects to Haymill Valley LNR and SINC and Home Farm Stream LWS.)	
Habitats and plants	Local	Habitat loss Pollution	Minimising works areas Replanting Best practice pollution prevention and control	Neutral Habitat loss	Neutral Habitat loss (Habitats to be lost are still considered to be of local value for nature conservation, and habitat loss, whilst slightly increased, is still minor. Replanting in areas of temporary vegetation clearance would offset habitat loss and best practice pollution control measures would remain sufficient to avoid any other effects to surrounding retained habitats.)	None	Local	Habitat loss Pollution	Minimising works areas Replanting Best practice pollution prevention and control	Neutral Habitat loss (Habitats to be lost are still considered to be of local value for nature conservation, and habitat loss, whilst slightly increased, is still minor. Replanting in areas of temporary vegetation clearance would offset habitat loss and best practice pollution control measures would remain sufficient to avoid any other effects to surrounding retained habitats.)	

Ecological receptor	Summary of ES assessment of '2015 DCO Design'				Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline				Comments
	Value	Impact Description	Mitigation	Significance of Residual Effect			Significance of Residual Effect	Value	Impact Description	Mitigation	
Invasive species	N/A	Spread	Species-specific control measures	Neutral No residual effects	Neutral No residual effects (Species-specific control measures remain sufficient to control spread of invasive plant species.)	Japanese Knotweed (<i>Fallopia japonica</i>) at 29+000 EB no longer present	N/A	Spread	Species-specific control measures	Neutral No residual effects (Species-specific control measures remain sufficient to control spread of invasive plant species)	
Amphibians	Local	Habitat loss	Pre-construction survey Phased vegetation clearance Seasonal avoidance	Slight adverse Minor permanent loss of foraging habitat	Slight adverse Minor permanent loss of foraging habitat (Still considered to be minor due to low value and small areas of habitats to be lost.) (Phased vegetation clearance would remain sufficient to avoid direct mortality.)	None	Local	Habitat loss	Pre-construction survey Phased vegetation clearance Seasonal avoidance	Slight adverse Minor permanent loss of foraging habitat (Still considered to be minor due to low value and small areas of habitats to be lost.) (Phased vegetation clearance would remain sufficient to avoid direct mortality.)	
Reptiles	Local	Habitat loss	Displacement Translocation	Slight adverse Displacement and translocation of individuals Minor permanent loss of foraging habitat	Slight adverse Displacement and translocation of individuals (Phased vegetation clearance and translocation would remain sufficient to avoid direct mortality.) Minor permanent loss of foraging habitat (Still considered to be minor due to low value and small areas of habitats to be lost.)	Suitable and highly optimal reptile habitat recorded between 29+050 - 29+175 within junction	Local	Habitat loss	Displacement Translocation	Slight adverse Displacement and translocation of individuals (Phased vegetation clearance or translocation would remain sufficient to avoid direct mortality.) Minor permanent loss of foraging habitat (Still considered to be minor due to low value and small areas of habitats to be lost.)	

Ecological receptor	Summary of ES assessment of '2015 DCO Design'				Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline				Comments
	Value	Impact Description	Mitigation	Significance of Residual Effect			Significance of Residual Effect	Value	Impact Description	Mitigation	
Birds	Local	Habitat loss	Seasonal avoidance (or pre-construction survey) Replanting	Neutral No residual effects	Neutral No residual effects (No change to effects on birds.)	None	Local	Habitat loss	Seasonal avoidance (or pre-construction survey) Replanting	Neutral No residual effects (No change to effects on birds.)	
Bats	Local	Habitat loss	Pre-construction survey Minimising light spill Replanting	Neutral No residual effects	Neutral No residual effects (No change to effects on bats.)	J7 Huntercombe Spur Overbridge On-slip at 29+022 downgraded to no bat roost suitability	Local	Habitat loss	Minimising light spill Replanting	Neutral No residual effects (No change to effects on bats. Pre-construction survey no longer required as structure subsequently determined to have no suitability for roosting bats.)	
Badger	Local	Habitat loss	Replanting	Neutral No residual effects	Neutral No residual effects (Replanting would offset habitat loss.)	Setts 127-1 and 127-2, both active outlier setts, recorded north of the Huntercombe Spur overbridge near the start of the eastbound on-slip for junction 7	Local	Disturbance Habitat loss	Avoidance Replanting	Neutral No residual effects (Replanting would offset habitat loss.)	

Table 1: Biodiversity impact change assessment

6.4 Landscape and Visual

6.4.1 Introduction

A qualitative landscape and visual impact change assessment comparing the change in design between the 2015 DCO Design and the 2021 NMC Design has been conducted.

The change assessment has considered the landscape and visual impacts of changes to vegetation clearance and planting proposals on sensitive receptors.

This was based on the assumption that the sensitive receptors could be most affected by changes in views of the motorway, due to additional vegetation clearance and therefore less mitigation planting and as an outcome, less visual buffer between the change and the sensitive receptor.

6.4.2 Methodology

The change assessment of landscape change between the 2015 DCO Design and the 2021 NMC Design has been undertaken in four stages:

Stage 1

Identify the landscape and visual effects of the 2015 DCO Design for this specific area using information presented in the following documents:

- Chapter 8: Landscape of the ES submitted in support of the DCO application, which provides information on the predicted temporary landscape and visual effects during construction, the predicted permanent landscape and visual effects during operation, and predicted cumulative effects.
- Appendix 8.3: Visual Effects Schedule of the ES submitted in support of the DCO application, which provides detailed information on the predicted visual effects during both construction and operation.
- Environmental Masterplan submitted at Deadline VIII of the DCO Examination (Version 11F, 29/02/2016).

Stage 2

Compare the 2015 DCO Design identified on the Environmental Masterplan submitted at Deadline VIII of the DCO Examination (Version 11F, 29/02/2016) with the relevant detailed landscape design shown on the ENGINEERING AND DESIGN REPORT, ENVIRONMENTAL MASTERPLAN (P01, S2, HA514451-CHHJ-ELS-SZ_ZZZZZZZZ_Z-DR-LD-5200 to 5265, 18/02/22) and vegetation clearance shown on the NON-MATERIAL CHANGE VEGETATION CLEARANCE (P01, S2, HA514451-CHHJ-ELS-SZ_ZZZZZZZZ_Z-DR-LD-5300 to 5331, 18/02/22) and identify any changes to vegetation clearance, landscape proposals and visual setting of sensitive visual receptors as a result of the 2021 NMC Design, using the baseline information presented in the ES.

Stage 3

Review the baseline information presented in the ES to determine any changes since the ES was published, focussing on the following sensitive receptors:

- Residential properties
- Business and institutional properties
- Listed Buildings
- Conservation Areas
- Scheduled Monuments
- National Character Areas (NCAs)
- Landscape Character Areas (LCAs)

- Landscape designations (e.g. AONB)
- Public rights of way (PRoW)
- National Trails.

Stage 4

Assess the impacts of the 2021 NMC Design against the current baseline (as of April 2021) in recognition that the baseline may have changed since the publication of the ES. Where the effects on the current baseline differ from the effects on the ES baseline (see Stage 2), provide an explanation of that change.

6.4.3 Change Assessment Findings

Stage 1

The following sensitive visual receptors, potentially impacted by the design change associated with the 2021 NMC Design, were identified in the ES and on the Environmental Masterplan submitted at Deadline VIII of the DCO Examination (Version 11F, 29/02/2016), as illustrated on Figure 4:

- Listed buildings 816, 817, 818, 819 - #1
- Huntercombe Conservation Area in the north west of Junction 7- #2
- Users of Public Rights of Way (PRoWs) in the south and south east of the “teardrop” - #3
- Residential properties and allotments in the south west of Cippenham - #4
- LCA 26.2: Dorney

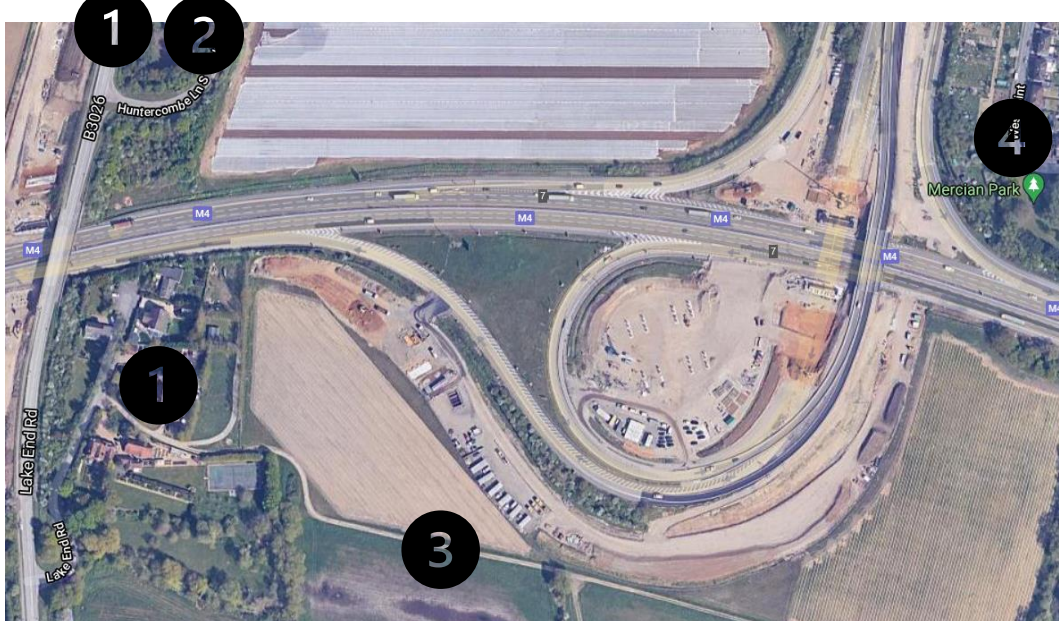


Figure 4 Aerial Image of change assessment area showing sensitive receptors

Figure 5 illustrates the area related to Huntercombe Spur on the Environmental Masterplan submitted in support of at Deadline VIII of the DCO Examination (Version 11F, 29/02/2016).

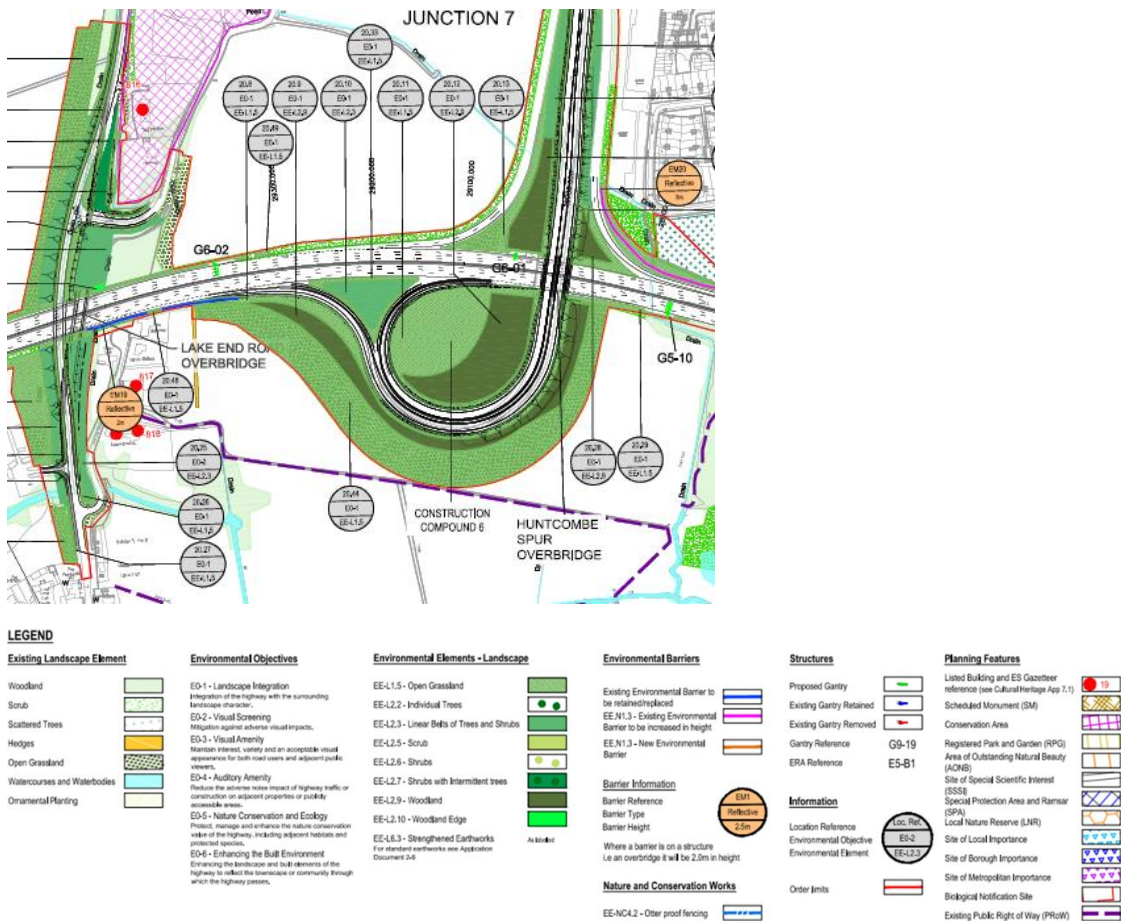


Figure 5 Extract of Environmental Masterplan submitted in support of at Deadline VIII of the DCO Examination (Version 11F, 29/02/2016)

The following residual visual effects were reported in the ES for Oldway Lane:

8.8. 9 Operation (design year, 2037)

The mitigation proposals within this Scheme link are set out on the EM (Document Reference 7.4, Annex A, sheets 17 to 20). The mitigation includes Woodland (EE L2.9) and new tree and shrub planting (EE L2.3) to replace the vegetation lost to the Scheme.

8.8.10 Assessment of residual effects / Construction / Landscape

The site clearance within this Scheme link is shown on the site clearance drawing (Document Reference 7.4, Annex A, sheets 17 to 20) which indicates the trees and shrubs within the Order limits which will be lost to the Scheme. The main areas are:

f) both sides of the Scheme at junction 7 to take account of the realigned M4 spur and associated bridge works within LCA 26.2; Dorney.

8.8.15 The combined impacts of the construction work will have a short term moderate adverse magnitude of impact on the immediate landscape resulting in a moderate adverse significance of effect on LCA 26.2: Dorney

Chapter 8 of the ES presented the assessment of the residual landscape and visual effects on a 'link by link' basis. Huntercombe Spur overbridge falls within the junction 8/9 to 7 –NCA 115 (Thames Valley) link. Table 2 below presents the residual effects assessment for junction 8/9 to 7 – NCA 115 (Thames Valley), taken from Table 8.2 of the ES.

	Impact Description	Receptors Affected	Mitigation	Significance of Residual Effect
Scheme Link	Junction 8/9 to 7–NCA 115 (Thames Valley)			
Temporary Impacts (Construction)	Construction impacts resulting from works to overbridge realignments, embankment strengthening, vegetation removal,	Landscape receptors: LCA 26.2: Dorney. Visual Receptors: PRoWs	Construction best practice to minimise disruption, e.g. protection of retained existing vegetation, including trees covered by TPOs within and immediately adjacent to the Order limits and within a conservation area.	Landscape Moderate adverse Visual amenity Moderate adverse to large adverse for residential receptors and users of PRoW
Permanent Impacts (Operation)	Presence of realigned overbridges and associated earthworks, engineered embankment slopes	Landscape receptors: LCA 26.2: Dorney. Visual Receptors: PRoWs	Woodland (EE L2.9) and new tree and shrub planting (EE L2.3) to replace the vegetation lost.	Landscape Moderate adverse reducing over time to slight adverse Visual amenity Moderate adverse reducing over time to slight adverse for residential receptors and users of PRoW
Cumulative Impact	None identified	None affected	None required	Neutral

Table 2: Residual effects assessment for junction 8/9 to 7 – NCA 115 (Thames Valley), taken from Table 8.2 of the ES

Stage 2

The design of the 2021 NMC Design is shown in Figure 6 below:

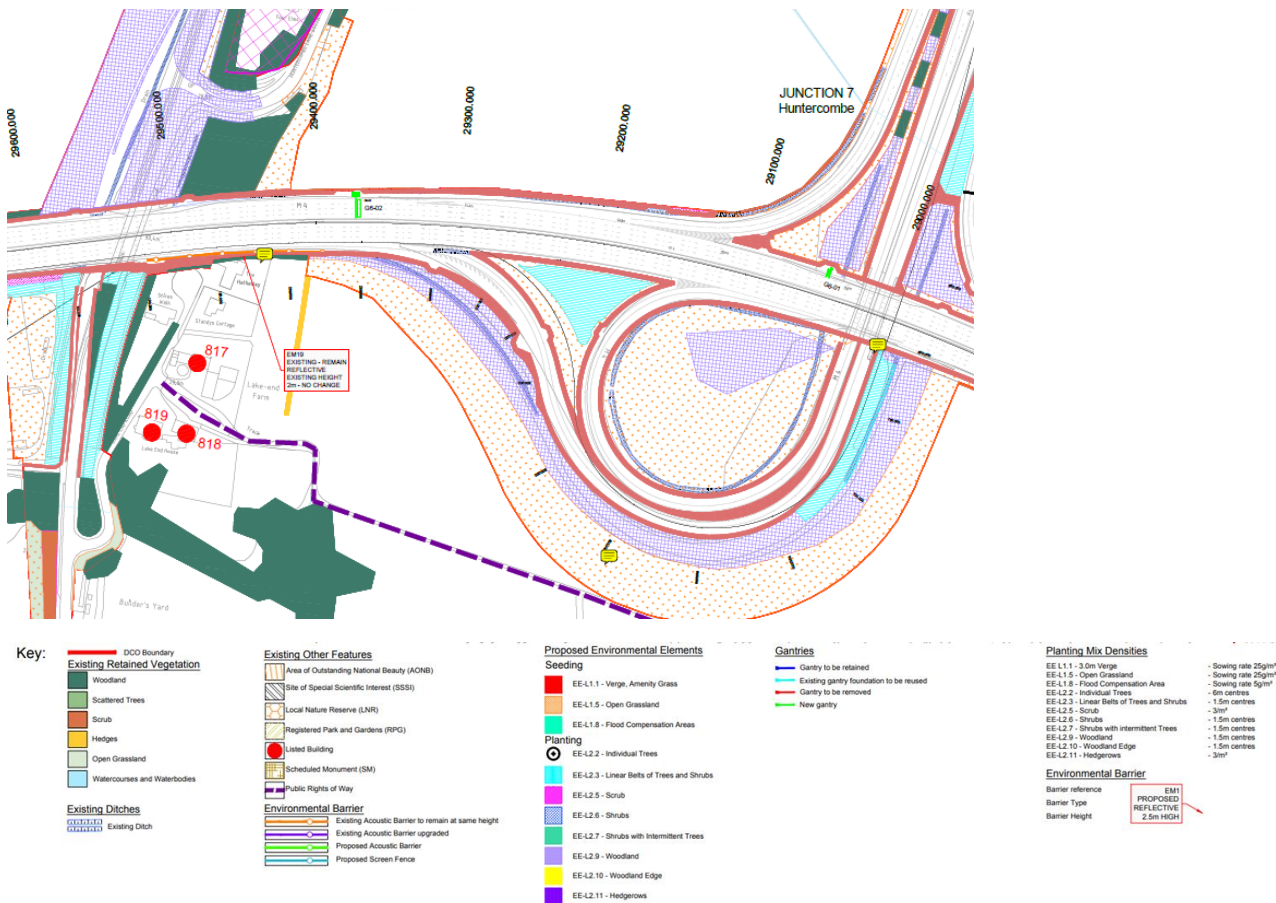


Figure 6 Extract of detailed landscape design shown on the ENGINEERING AND DESIGN REPORT, ENVIRONMENTAL MASTERPLAN (P01, S2, HA514451-CHHJ-ELS-SZ_ZZZZZZZ_Z-DR-LD-5200 to 5265, 18/02/22)

A change assessment of the residual landscape and visual effects of the 2021 NMC Design against the baseline information presented in the ES is presented in Tables 3, 4 and 5 with a summary of the changes provided below.

Changes to Vegetation Clearance

Additional vegetation clearance along the eastbound off-slip between Lake End Bridge and junction 7.

Additional vegetation clearance in the north of the eastbound on-slip in the North West Quadrant of junction 7, along the allotments in the south west of Cippenham.

Changes to Landscape Proposals

Reduced planting of woodland (EE L2.9) in the “teardrop” for screening traffic on the south western side of the bridge. Reduced planting of trees and shrubs (EE L2.3) along the slip roads along the eastbound off-slip between Lake End Bridge and junction 7 south of Huntercombe Conservation Area and listed Building 816. Mitigation planting not always possible due to re-alignment of road leaves only narrow strip of seeding.

Additional planting of trees and shrubs (EE L2.3) required in the north of the eastbound on-slip in the North West Quadrant of junction 7, adjacent to residential properties and allotments in the south west of Cippenham.

Changes to Visual Amenities

The changes as described above result in a change of the visual amenity for the sensitive receptors as described below as less visual buffer available between bridge traffic and sensitive receptors.

LCA 26.2: Dorney: Although some changes to vegetation clearance and landscape proposals, no change of landscape character as the area has still varying levels of tranquillity, with the busy M4 cutting the landscape and creating a significant visual and audible impact. The M4 dissects the character area centrally, and provides a major transport corridor through the landscape.

Listed Building 816: missing southern part of original re-planting opens more indirect views to the M4 traffic on the mainline, bridge and bridge approach.

Listed Buildings 817, 818, 819: missing southern part of original re-planting in the teardrop opens more indirect views to the traffic on the bridge and bridge approach.

Huntercombe Conservation Area in the north: missing southern part of original re-planting opens more indirect views to the traffic on the M4 mainline, bridge and bridge approach.

Users of PRoWs in the south and southwest of the teardrop: missing southern part of original re-planting opens more indirect and direct views to the traffic on the bridge and bridge approach.

Residential properties in the south west of Cippenham: Now direct views from the residential properties and allotments towards the M4 slip as replacement planting due to the narrow remaining strip is not possible (offset requirements).

Stage 3

After reviewing the area around Huntercombe Spur overbridge, no changes to the baseline information presented in the ES have been identified.

Stage 4

Tables 3, 4 and 5 below present:

- The findings of the assessment of residual landscape and visual effects previously reported in the ES.
- The findings of the change assessment of residual landscape and visual effects of the 2021 NMC Design against the baseline information presented in the ES.
- A summary of any changes to the baseline information presented in the ES since the ES was published.
- The findings of the change assessment of residual landscape and visual effects of the 2021 NMC Design against the current baseline (as of April 2021).
- An explanation of any differences in the change assessment of effects on the current baseline when compared to the assessment of effects on the ES baseline.

Temporary Impacts during Construction

	Summary of ES Assessment of '2015 DCO Design'				Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline			Comments
	Impact Description	Receptors Affected	Mitigation	Significance of Residual Effect	Significance of Residual Effect		Impact Description	Mitigation	Significance of Residual Effect	
Scheme Link	Junction 8/9 to 7-NCA 115 (Thames Valley)									
Temporary Impacts (Construction)	Construction impacts resulting from works to overbridge realignments, vegetation removal	<u>Landscape Receptors:</u> LCA 26.2: Dorney. <u>Visual Receptors:</u> Listed Buildings 816, 817, 818, 819 Huntercombe Conservation Area in the north west of Junction 7 Users of Public Rights of Way (PRoWs) in the south and south east of the "teardrop" Residential properties and allotments in the south west of Cippenham	Protection of retained existing vegetation, including trees covered by TPOs within and immediately adjacent to the Order limits and within a conservation area.	<u>Landscape</u> Moderate adverse <u>Visual amenity</u> Moderate adverse to large adverse	<u>Landscape</u> Moderate adverse <u>Visual amenity</u> Moderate adverse to large adverse	<u>Landscape</u> No additional sensitive receptors have been identified <u>Visual</u> Additional vegetation clearance	<u>Landscape</u> None identified <u>Visual:</u> Listed Building 816: Additional vegetation clearance along the eastbound off-slip between Lake End Bridge and Junction 7. Listed Buildings 817, 818, 819: No additional vegetation clearance. Huntercombe Conservation Area in the north west of Junction 7: Additional vegetation clearance along the eastbound off-slip between Lake End Bridge and Junction 7. Users of Public Rights of Way (PRoWs) in the south and south east of the "teardrop:	Protection of retained existing vegetation, including trees covered by TPOs within and immediately adjacent to the Order limits and within a conservation area.	<u>Landscape</u> Moderate adverse Although some changes to vegetation clearance no change of landscape character as the area has still varying levels of tranquility, with the busy M4 cutting the landscape and creating a significant visual and audible impact. The M4 dissects the character area centrally, and provides a major transport corridor through the landscape. <u>Visual amenity</u> Moderate adverse to large adverse	The conclusion of the ES assessment remains valid

Summary of ES Assessment of '2015 DCO Design'					Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline			Comments
Impact Description	Receptors Affected	Mitigation	Significance of Residual Effect	Significance of Residual Effect	Impact Description		Mitigation	Significance of Residual Effect		
							No additional vegetation clearance. Residential properties and allotments in the south west of Cippenham: Additional vegetation clearance in the north of the eastbound on-slip in the North West Quadrant of Junction 7, along the allotments in the south west of Cippenham.			

Table 3: Temporary Landscape and Visual Impacts during Construction

Permanent Impacts during Operation

	Summary of ES Assessment of '2015 DCO Design'				Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline			Comments
	Impact Description	Receptors Affected	Mitigation	Significance of Residual Effect	Significance of Residual Effect		Impact Description	Mitigation	Significance of Residual Effect	
Scheme Link	Junction 7 to 6 – NCA 115 (Thames Valley) and Junction 6 to 5 – NCA 115 (Thames Valley)									
Permanent Impacts (Operation)	Presence of realigned overbridges and associated earthworks, engineered embankment slopes	<u>Landscape Receptors:</u> LCA 26.2: Dorney. <u>Visual Receptors:</u> Listed Buildings 816, 817, 818, 819 Huntercombe Conservation Area in the north west of Junction 7 Users of Public Rights of Way (PRoWs) in the south and south east of the "teardrop" Residential properties and allotments in the south west of Cippenham	Woodland (EE L2.9) and new tree and shrub planting (EE L2.3) to replace the vegetation lost.	<u>Landscape</u> Moderate adverse reducing over time to slight adverse <u>Visual amenity</u> Moderate adverse reducing over time to slight adverse	<u>Landscape</u> Moderate adverse reducing over time to slight adverse <u>Visual amenity</u> Moderate adverse reducing over time to slight adverse	<u>Landscape</u> No additional sensitive receptors have been identified <u>Visual</u> Additional vegetation clearance	<u>Landscape</u> None identified <u>Visual</u> Listed Building 816: missing southern part of original re-planting opens more indirect views to the M4 traffic on the mainline, bridge and bridge approach. Listed Buildings 817, 818, 819: missing southern part of original re-planting in the teardrop opens more indirect views to the traffic on the bridge and bridge approach missing southern part of original re-planting opens more indirect views to the M4 mainline, bridge	<u>Landscape</u> Woodland (EE L2.9) and new tree and shrub planting (EE L2.3) to replace the vegetation lost wherever possible <u>Visual</u> Listed Buildings 816: Re-Planting not possible due to narrow strip remaining. Seeding only. Listed Buildings 817, 818, 819: Reduced re-planting in teardrop. Huntercombe Conservation Area in the north west of Junction 7: Reduced re-planting. Users of Public Rights of Way (PRoWs) in the south and south east of the "teardrop":	<u>Landscape</u> Moderate adverse reducing over time to slight adverse <u>Visual amenity</u> Moderate adverse reducing over time on in some areas to slight adverse (where re-planting is possible)	The conclusion of the ES assessment remains valid

Summary of ES Assessment of '2015 DCO Design'					Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline			Comments
Impact Description	Receptors Affected	Mitigation	Significance of Residual Effect	Significance of Residual Effect	Impact Description		Mitigation	Significance of Residual Effect		
						<p>and bridge approach.</p> <p>Huntercombe Conservation Area in the north west of Junction 7: missing southern part of original re-planting opens more indirect views to the traffic on the M4 mainline, bridge and bridge approach.</p> <p>Users of Public Rights of Way ("PRoWs") in the south and south east of the "teardrop: missing southern part of original re-planting opens more indirect and direct views to the traffic on the bridge and bridge approach.</p> <p>Residential properties and allotments in the south west of Cippenham: Now direct views from the</p>	<p>Reduced re-planting.</p> <p>Residential properties and allotments in the south west of Cippenham: Re-Planting not possible due to narrow strip remaining. Seeding only.</p>			

Summary of ES Assessment of '2015 DCO Design'					Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline			Comments
Impact Description	Receptors Affected	Mitigation	Significance of Residual Effect	Significance of Residual Effect	Impact Description		Mitigation	Significance of Residual Effect		
							residential properties and allotments towards the M4 slip as replacement planting due to the narrow remaining strip is not possible (offset requirements).			

Table 4: Permanent Landscape and Visual Impacts during Operation

Cumulative Impact

	Summary of ES Assessment of '2015 DCO Design'				Summary of '2021 NMC Design' change assessment using ES baseline	Changes to ES baseline	Summary of '2021 NMC Design' change assessment using current baseline			Comments
	Impact Description	Receptors Affected	Mitigation	Significance of Residual Effect	Significance of Residual Effect		Impact Description	Mitigation	Significance of Residual Effect	
Scheme Link	Junction 7 to 6 – NCA 115 (Thames Valley)									
Cumulative Impacts	None identified	<u>Landscape Receptors:</u> None affected <u>Visual Receptors:</u> None affected	None required	<u>Landscape</u> Neutral <u>Visual amenity</u> Neutral	<u>Landscape</u> Neutral <u>Visual amenity</u> Neutral	No additional sensitive receptors have been identified	<u>Landscape</u> None identified <u>Visual</u> None identified	None required	<u>Landscape</u> Neutral <u>Visual amenity</u> Neutral	The conclusion of the ES assessment remains valid

Table 5: Cumulative Landscape and Visual Impacts

Summary

Overall, for Link junction 8/9 to 7 - NCA 115 (Thames Valley), there are no changes to the assessment of temporary residual effects during construction presented in the ES as a result of the 2021 NMC Design as additional vegetation clearance is not necessary for Listed Buildings 817, 818, 819 and Users of Public Rights of Way (PRoWs) in the south and southeast of the “teardrop”. LCA 2.6 did also not change as the area around junction 7 is restricted and would not change the whole character of the LCA.

However, the significance of residual effect for the following visual receptors is slight adverse compared with the assessment presented in the ES due to the additional vegetation clearance required to construct the 2021 NMC Design: Listed Building 316, Huntercombe Conservation Area in the northwest of junction 7, and the residential properties and allotments in the south west of Cippenham.

Overall, for Link junction 8/9 to 7 - NCA 115 (Thames Valley), there are no changes to the assessment of permanent residual effects during operation presented in the ES as a result of the 2021 NMC Design as within LCA 2.6 the area around junction 7 replanting would take place wherever possible and, as the changes are local only, it would not change the whole character of the LCA.

However, the significance of residual effect for for all visual receptors is not expected to reduce from moderate adverse to slight adverse as the re-planting is limited in the identified locations and therefore reduces only to moderate adverse (where re-planting is not possible).

There are no changes to the assessment of cumulative impacts presented in the ES as a result of the 2021 NMC Design when considering either the baseline information presented in the ES or the current baseline.

6.4.4 Conclusion

The 2021 NMC Design has been assessed against the baseline information presented in the ES and the current baseline (as of April 2021) and has been compared against the assessment of residual effects presented in the ES submitted in support of the DCO application.

It is concluded that there are no changes to the assessment of residual effects presented in the ES, and therefore the assessment and conclusions presented in the ES remain valid.

6.5 Water

6.5.1 Introduction

A qualitative change assessment of the 2021 NMC Design has been undertaken. Two aspects have been considered. The current water environment baseline has been appraised to identify any changes since the ES was submitted in support of the DCO application. The change assessment has also considered whether there are any changes to the residual effects reported in Chapter 15 of the ES, interpreting whether these are due to changes in the baseline status of water environment receptors or due to the 2021 NMC Design.

6.5.2 Methodology

The change assessment has considered the potential for the 2021 NMC Design to cause:

- Changes to flood impacts due to a change in the footprint of works within the floodplain, as defined by Environment Agency Flood Zones 2 and 3 and/or a change to a proposed

watercourse crossing. The 2015 Flood Zone extents have been reviewed against current (2021) flood maps available online¹.

- Changes to pollution effects from accidental spillages and routine runoff during operation because of changes to traffic flows and/or the proposed drainage design. The water quality of watercourses receiving discharges of runoff has been reviewed with reference to current (Cycle 2) Water Framework Directive data published online².
- Changes to groundwater due to a change in the footprint of works within a Source Protection Zone (SPZ) or overlying a Principal Aquifer.

6.5.3 Change Assessment Findings

Review of Baseline Conditions

The future baseline described in ES assumed improvements in surface and groundwater quality driven by implementation of the Water Framework Directive (WFD). However, review of the most recently available data shows that the surface waterbody most local to the Huntercombe Spur (Roundmoor Ditch) has experienced a degradation in some aspects of its water quality. The WFD groundwater body (the Twyford Tertiaries) does achieve an improved status (now at Good) compared to the status reported in the ES.

With regards to flood risk at junction 7, there have been some minor updates to the extent of Flood Zone 2 (medium risk) on the present-day flood map, with no change to the extent of the high risk flood zone (Flood Zone 3).

Changes in the baseline qualities of water environment receptors local to junction 7 are concluded to be limited. The value/sensitivity assigned to surface water receptors, in accordance with the criteria set out in Table 15.2 of the ES, would be the same or lower. However, the groundwater body underlying junction 7 would be assigned a higher value, due to its improved WFD status.

Review of Design Changes

The 2021 NMC Design is located within Environment Agency Flood Zone 1, defined as having an annual probability of flooding from rivers and the sea of less than 0.1%. The Roundmoor ditch is crossed by the Huntercombe Spur and the assessment presented in the ES was based on there being no works to the existing crossing. The 2021 NMC Design results in a reduced width of pavement widening works and does not change the ES assumptions regarding works in the floodplain nor works to the existing crossing of Roundmoor ditch. The effects of the 2021 NMC Design on flood impacts are therefore neutral, with a minor overall benefit to the land drainage regime due to the reduction in impermeable land cover.

There would be no changes to traffic flows due to the proposed change to Huntercombe Spur Overbridge and therefore no change to the assessment presented in the ES of the risk of pollution of watercourses due to accidental spillages and from the discharge of routine runoff at this location.

In the ES, the significance of effects on water quality due to road drainage discharges was qualitatively assessed accounting for mitigation measures to ensure no deterioration compared to the baseline. Subsequently, as part of detailed design, DMRB HD 45/09 assessments incorporating HAWRAT (risk assessment on surface watercourses), groundwater risk assessments and accidental spillage risk assessments were carried out at all outfalls.

¹ Flood map for planning - GOV.UK (flood-map-for-planning.service.gov.uk)

² Environment Agency - Catchment Data Explorer

At Huntercombe Spur overbridge, the accidental spillage risk assessment and groundwater pollution risk assessment confirm that the risk level is acceptable, and no further spillage containment or mitigation measures are necessary at existing outfalls to prevent baseline water quality deterioration. The assessments have also demonstrated that long-term, statutory water quality standards defined by the Environmental Quality Standards for dissolved copper and zinc are met. Short-term impacts defined by runoff specific thresholds for dissolved copper and zinc, as well as the degree of sedimentation at outfalls, were both at an acceptable level and were no worse than the baseline. The DMRB HD 45/09 assessments therefore confirm that the impact of the 2021 NMC design on water quality would be neutral.

The 2021 NMC Design is not situated within a groundwater SPZ and the underlying geology does not support any Principal Aquifers. The 2021 NMC Design involves the removal of retaining earthworks solutions as well as an overall reduction in earthworks, with potential for a very minor and localised benefit to groundwater.

6.5.5 Conclusion

It is concluded that there are no changes to the assessment of residual effects presented in the ES, apart from a minor beneficial change for the land drainage regime and groundwater due to a reduction in impermeable land cover and the scope of earthworks required, and therefore the assessment and conclusions presented in the ES remain valid.

7 Conclusion

The 2021 NMC Design does not change the assessment of residual effects presented in the ES submitted in support of the DCO application, nor the environmental documentation submitted in the Examination. Therefore, the assessment and conclusions presented in the ES remain valid.