Didcot Garden Town Housing Infrastructure Fund (HIF1)

Transport Assessment

Oxfordshire County Council

Project number: 60606782

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Quality information

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1. Introduction

1.1.1 This Transport Assessment (TA) has been prepared in support of a planning application for the HIF1 Didcot Garden Town Infrastructure project ('the HIF1 Scheme') on behalf of Oxfordshire County Council (OCC). The Scheme is designed to improve access to future housing and employment growth in the local area, including access by walking, cycling and public transport. The Scheme is policy-backed and is the cornerstone of mitigation for the planned growth in the area. The Scheme does not aim to provide unlimited highway capacity for cars, or to remove all congestion; it forms part of a balanced transport strategy which also provides high-quality walking and cycling infrastructure, helping to engender modal shift to more sustainable modes.

1.1.2 Planning permission is sought for the following:

Planning application seeking full planning permission for the dualling of the A4130 carriageway (A4130 Widening) from the Milton Gate Junction eastwards, including the construction of three roundabouts; a road bridge over the Great Western Mainline (Didcot Science Bridge); realignment of the A4130 north east of the proposed road bridge including the relocation of a lagoon; construction of a new road between Didcot and Culham (Didcot to Culham River Crossing) including the construction of three roundabouts, a road bridge over the Appleford railway sidings and road bridge over the River Thames; construction of a new road between the B4015 and A415 (Clifton Hampden bypass), including the provision of one roundabout and associated junctions; and controlled crossings, footways and cycleways, landscaping, lighting, noise barriers and sustainable drainage systems.

At Land in the parishes of Milton, Didcot, Harwell, Sutton Courtenay, Appleford-on-Thames, Culham and Clifton Hampden.

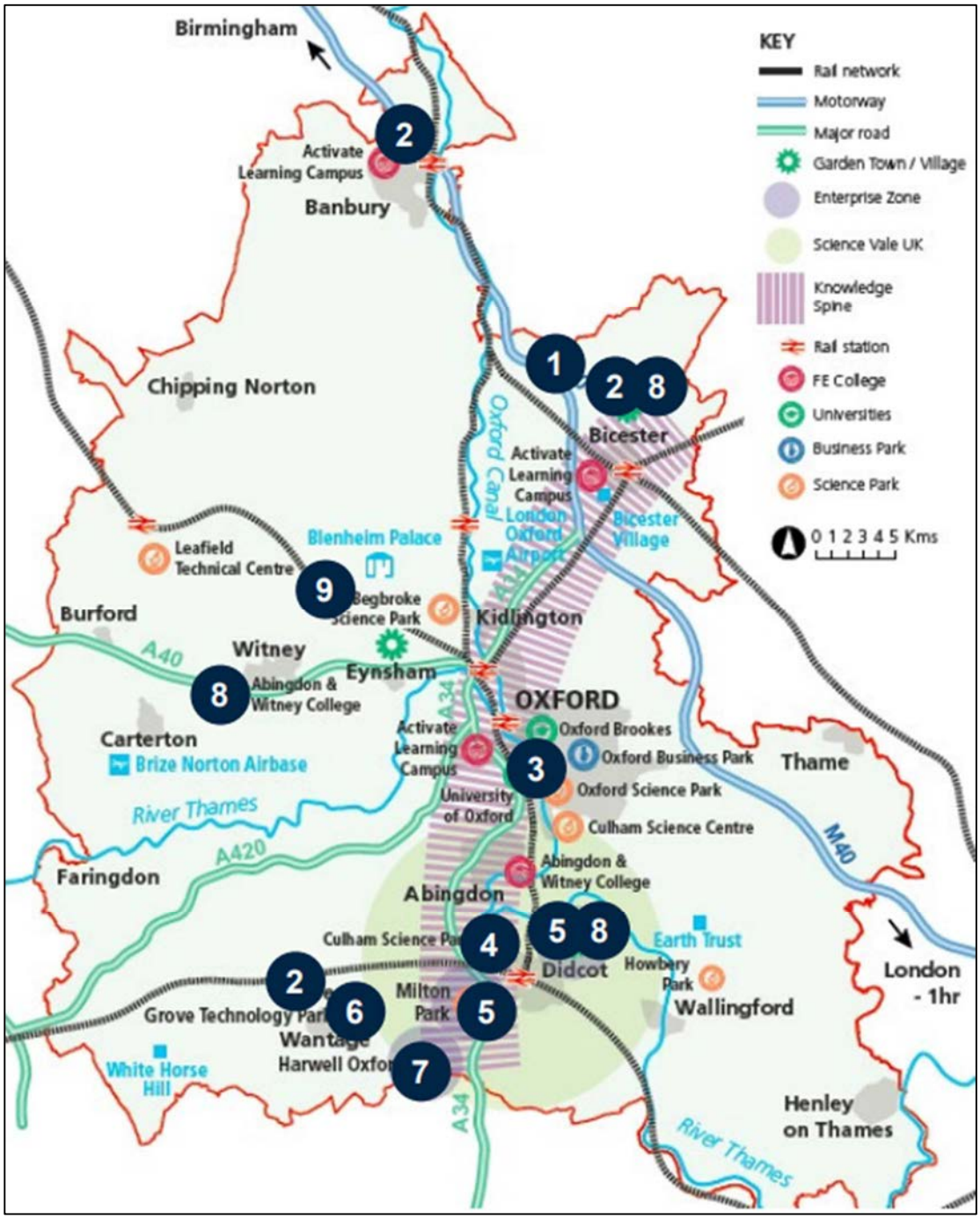
1.2 Scheme Background

1.2.1 The HIF1 Scheme is essential for the economic and social prosperity of Science Vale UK, one of the first Enterprise Zones, in addition to other newer Enterprise Zones in the area. Whilst the HIF1 programme is based on future growth, the HIF1 infrastructure will also help to ameliorate the issues resulting from historic housing and employment growth.

1.2.2 Didcot is a historic growth area in Oxfordshire, led by the growth and development of Didcot Parkway Railway Station, and continues to rapidly expand whilst quickly becoming a destination in its own right. With large urban extensions of the 1990s (Ladygrove) and planned housing and employment growth in the 21st Century, highway infrastructure has failed to keep pace. Additionally, the location of employment centres on historic and relatively remote military bases (Harwell Innovation Campus and Culham Science Centre and Milton Park), compounds congestion in and around the town. The local vicinity is an important employment area recognised nationally by Enterprise Zone status. It forms part of the area known as the 'Science Vale' and is expected to deliver 20,000 additional jobs by 2031. The area is vitally important to the local and national economy. Didcot was awarded Garden Town status by the government in December 2015. Didcot and the surrounding area will deliver around 15,000 new homes up to 2040 in addition to circa 3,300 already built out at Great Western Park.

1.2.3 Figure 1.1 below shows Didcot's central position in Science Vale UK and how it contributes towards the Knowledge Spine, with key employment areas at Milton Park and Culham Science Centre, and other Enterprise Zones.

Figure 1.1: Oxfordshire's critical economic sectors, assets and growth opportunities within the innovation ecosystem



Source: Oxfordshire Local Industrial Strategy (2019), Figure 5

1.2.4 Railway lines and the River Thames creates severance to effective movement and barriers to connectivity between homes, jobs and amenities in Didcot and surrounding areas. High levels of congestion are evident on the A4130, on the existing river crossings between Didcot and Culham/Clifton Hampden and within Clifton Hampden. This has led to Oxfordshire County Council (OCC), as local highway authority (LHA), objecting to the applications of single dwellings on grounds of highway safety, convenience and sustainability. These objections have led to Local Planning Authority (LPA) refusals which have been upheld at appeal by the Planning Inspectorate. Additionally, a Vale of White Horse District Council (VoWHDC) Local Plan strategic allocation for 200 new homes has also been refused planning permission on similar grounds. It is evident that the constrained highway network has already adversely affected growth in the area.

1.2.5 The Scheme is deemed as essential to deliver future growth as identified within Local Plans for both South Oxfordshire District Council (SODC) and the VoWHDC. The Scheme is also identified in OCC's Local Transport Plan 4.

1.2.6 The infrastructure investment will help relieve pressure on local transport networks and will facilitate economic growth across the Science Vale area whilst accommodating the expanding communities in the local area. The provision of walking and cycling facilities offer real mode choice for work and leisure, helping to encourage modal shift. Improving local roads and providing new roads will lead to more reliable journey times, less congestion, more job opportunities, and better community links.

1.2.7 Improving local roads which will lead to faster journeys, less congestion, more job opportunities, and better community links with additional benefits of providing key active travel links to provide real mode choice for work and leisure.

1.2.8 The HIF1 Scheme aims to address the following issues and opportunities:

- **Local and regional economy**: The historic road network in Didcot and the surrounding areas is not currently fit for purpose and will be exacerbated with planned growth. There is congestion at key points, including where new and planned developments access the road network. The Scheme will unlock and support the delivery of circa 18,000 new homes in the area including affordable homes;
- **Local traffic issues**: Didcot is a centre for distribution meaning there are more Heavy Goods Vehicles (HGVs) on the transport network than in other areas, adding to congestion and delay. There is also a need to plan now for all forms of travel, including modes that are only just starting to be tested (e.g. autonomous vehicles). Transport connectivity is poor in the area with limited links making it difficult to travel between existing/ planned housing and employment sites;
- **Environment**: To uphold its "Garden Town" status, developments within Didcot should positively protect and enhance the natural, built and historic environment; including making effective use of land including using brownfield sites, helping to improve biodiversity, using natural resources prudently, providing green infrastructure, addressing issues such as flood risk, climate change and minimising waste and pollution; and
- **People and local communities**: There have been increasing traffic impacts in Didcot and the surrounding villages and their historic cores due to congestion, noise and air quality. The location of railway lines creates physical barriers between some housing and employment sites, including areas proposed for new development because of limited crossings, which are already reaching capacity. The River Thames is also a barrier with limited bridge crossings. The Scheme will facilitate new movements across the Science Vale area. The Scheme will provide direct, safe and convenient walking cycling infrastructure across its full length and opens up opportunities for new and improved bus routes.

1.3 Consultation

1.3.1 The methodology and scope of this Transport Assessment was developed in conjunction with OCC. Highways England (HE) was also consulted due to the proximity of the HIF1 Scheme to the A34 at Milton Interchange, with the A34 being part of the Strategic Road Network (SRN) managed by HE. An assessment of the impact of the HIF1 Scheme on the A34 at Milton Interchange was requested by HE and this has been included in the TA.

1.3.2 Detailed information on the Scheme consultation processes can be found in the Statement of Community Involvement, included in the planning application. Key dates are summarised below:

- The schemes were included in VoWHDC Local Plan 2031 Part 1, subject to consultation in 2014;
- The schemes were included in OCC Local Transport Plan 4, subject to consultation in 2015;
- The schemes were included in VoWHDC Local Plan 2031 Part 2, subject to consultation in 2017;
- OCC held consultation events on the schemes in November 2018;
- The schemes were included in SODC Local Plan 2035, subject to consultation in 2019;
- OCC held an online consultation on the schemes in March/April 2020;
- Ongoing liaison with Parish Councils;

- Ongoing liaison with Non-motorised user (NMU) groups and bus operators;
- Ongoing liaison with statutory bodies (Environment Agency etc);
- Ongoing liaison with businesses; and
- Ongoing liaison with landowners.

1.4 Report Structure

1.4.1 Following this introduction, the report is set out as follows:

- **Section 2: Policy Context** - sets out the relevant national, regional and local policies related to transport and the proposed HIF1 Scheme;
- **Section 3: Baseline Conditions** - outlines the local existing walking, cycling, horse-riding, public transport and highway routes. This section also identifies the available data sources relating to transport network performance and junction capacity modelling for the 2020 base year;
- **Section 4: Development Proposals** – includes a description of the 4 highway schemes that comprise the HIF1 Scheme;
- **Section 5: Modelling Assessment** - summarises the methodology used to identify the impact of the HIF1 Scheme on the local highway network;
- **Section 6: Assessment of Impact** - assesses the impact of the Scheme on the local highway network in the 2024 and 2034 assessment years and provides commentary on impacts on pedestrian, cycle and public transport amenity;
- **Section 7: Construction Period** - Provides consideration of impacts of the Scheme during the construction period, forecast construction delivery activity and measures to minimise the impact of construction;
- **Section 8: Summary and Conclusion** - provides a summary of this TA and a conclusion on the impact of the proposals.

2. Policy Context

2.1 Introduction

2.1.1 The proposed HIF1 Scheme has been considered with reference to the following relevant national, regional and local policies and guidance:

- National Planning Policy Framework (2021)
- Planning Policy Guidance (2014)
- Oxfordshire County Council: Local Transport Plan 4 2015-2031 (2016)
- Oxfordshire County Council 2020 Climate Action Framework
- Oxfordshire Cycling Design Standards (2017)
- Oxfordshire Walking Design Standards (2017)
- Oxfordshire Local Industrial Strategy (2019)
- Oxfordshire LIS – The Investment Plan (2020)
- The Oxfordshire Infrastructure Strategy (2017)
- South Oxfordshire Local Plan 2035 (2020)
- The Planning Inspectorate: Report on the Examination of the South Oxfordshire Local Plan 2011-2034 (2020)
- South Oxfordshire Infrastructure Delivery Plan (2019)
- Vale of White Horse Local Plan 2031 Part 1 (2016)
- Vale of White Horse Local Plan 2031 Part 2 (2019)
- Vale of White Horse Local Plan 2031 Part 1, Inspector's Report (2016)
- Vale of White Horse Local Plan 2031 Part 2, Inspector's Report (2019)
- Vale of White Horse Local Plan 2031 Part 1, Infrastructure Delivery Plan (2015)
- Vale of White Horse Local Plan 2031 Part 2, Infrastructure Delivery Plan (2018)
- Didcot Garden Town Delivery Plan (2017)
- The Strategic Road Network – Planning for the Future (2015)
- Transport for New Developments: Transport Assessments and Travel Plans (2014)
- Design Manual for Roads and Bridges (2020)
- LTN 1/20 Cycle Infrastructure Design (2020)
- Department of Transport Gear Change: A Bold Vision for Cycling and Walking (2020)

2.2 National Policy

National Planning Policy Framework (2021)

2.2.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England, providing a framework within which local people and councils can encourage development which reflects the needs and priorities of their communities.

2.2.2 A key principle of the NPPF is the presumption in favour of sustainable development that contributes to the economic, social, and environmental aspects of a community. The use of sustainable transport modes for the movement of goods and people is widely encouraged.

2.2.3 Chapter 9 sets out Promoting Sustainable Transport (paragraph 104 to 109). This chapter explains the variety of ways in which transport should be considered as part of the planning process. This includes setting out that transport issues should be considered from the earliest stages of the plan-making and development proposals.

2.2.4 Paragraph 106 states that planning policies should '*be prepared with the active involvement of local highways authorities, other transport infrastructure providers and operators and neighbouring councils, so that strategies and investments for supporting sustainable transport and development patterns are aligned'.*

2.2.5 Policies on assessing the transport impact of development proposals are identified in paragraphs 110 to 112. These refer to highway safety as well as capacity and congestion to make clearer that pedestrian and cycle movements should be prioritised, followed by access to high quality public transport, to reflect the importance of creating a well-designed place.

2.2.6 Paragraph 113 states that a development that generates a significant amount of movement should be supported by a Transport Statement or Transport Assessment and should be required to provide a travel plan.

Planning Practice Guidance

2.2.7 In 2014, the Department for Communities and Local Government (DCLG) launched a website containing national planning practice guidance. The website contains guidance on a range of planning topics such as design, Local Plans, Neighbourhood Plans and Travel Plans / Transport Assessments. The section on 'Travel plans, transport assessments and statements in decision-taking' (ID 42 – https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements) provides advice on when Transport Assessments and Transport Statements are required and what they should contain.

2.2.8 Paragraph 014 states:

'The need for, scale, scope and level of detail required of a Transport Assessment or Statement should be established as early in the development management process as possible as this may therefore positively influence the overall nature or the detailed design of the development.

Key issues to consider at the start of preparing a Transport Assessment or Statement may include:

- *The planning context of the development proposal;*
- *Appropriate study parameters (i.e. area, scope and duration of study);*
- *Assessment of public transport capacity, walking/cycling capacity and road network capacity;*
- *Road trip generation and trip distribution methodologies and/ or assumptions about the development proposal;*
- *Measures to promote sustainable travel;*
- *Safety implications of development; and*
- *Mitigation measures (where applicable) – including scope and implementation strategy.'*

2.2.9 Paragraph 015, which sets out what information should be included in Transport Assessments, states:

- *'Information about the proposed development, site layout, (particularly proposed transport access and layout across all modes of transport);*
- *Information about neighbouring uses, amenity and character, existing functional classification of the nearby road network;*
- *Data about existing public transport provision, including provision / frequency of services and proposed public transport changes;*
- *A qualitative and quantitative description of the travel characteristics of the proposed development, including movements across all modes of transport that would result from the development and in the vicinity of the site;*
- *An assessment of trips from all directly relevant committed development in the area (i.e. development that there is a reasonable degree of certainty will proceed within the next 3 years);*
- *Data about current traffic flows on links and at junctions (including by different modes of transport and the volume and type of vehicles) within the study area and identification of critical links and junctions on the highways network;*

- *An analysis of the injury accident records on the public highway in the vicinity of the site access for the most recent 3-year period, or 5-year period if the proposed site has been identified as within a high accident area;*
- *An assessment of the likely associated environmental impacts of transport related to the development, particularly in relation to proximity to environmentally sensitive areas (such as air quality management areas or noise sensitive areas);*
- *Measures to improve the accessibility of the location (such as provision/enhancement of nearby footpath and cycle path linkages) where these are necessary to make the development acceptable in planning terms;*
- *A description of parking facilities in the area and the parking strategy of the development;*
- *Ways of encouraging environmental sustainability by reducing the need to travel; and*
- *Measures to mitigate the residual impacts of development (such as improvements to the public transport network, introducing walking and cycling facilities, physical improvements to existing roads.'*

2.3 Regional Policy

Oxfordshire County Council: Local Transport Plan 4 2015-2031 (2016)

2.3.1 The Oxfordshire County Council: Local Transport Plan 4 (LTP4) outlines the policy and strategy for developing the transport network in Oxfordshire between 2015 and 2031. The LTP4 was adopted in September 2015 following public consultation and was updated in 2016, with emphasis on improving air quality and making better provision for walking and cycling.

2.3.2 The LTP4 has identified three overarching goals relating to transport with ten supporting objectives, which are outlined below:

- **Goal 1:** Support jobs and housing growth and economic vitality:
  - **Objective 1**: Maintain and improve transport connections to support economic growth;
  - **Objective 2**: Make the most effective use of all available transport capacity through innovative management of the network;
  - **Objective 3**: Increase journey time reliability and minimise end-to-end public transport journey times on main routes; and
  - **Objective 4**: Develop a high-quality integrated transport system.
- **Goal 2:** Reduce emissions, enhance air quality and support transition to a low carbon economy:
  - **Objective 5**: Minimise the need to travel;
  - **Objective 6**: Reduce the private car proportion of journeys and make public transport, walking and cycling more attractive;
  - **Objective 7**: Maximise the use of existing and planned sustainable transport investments through influencing the location and layout of developments; and
  - **Objective 8**: Reduce carbon emissions from transport in line with the UK government targets.
- **Goal 3:** Protect, and where possible enhance Oxfordshire's environment and improve the quality of life, including public health, air quality, safety and individual wellbeing:
  - **Objective 9**: Mitigate and where possible enhance the impacts of transport; and
  - **Objective 10**: Increase the levels of walking and cycling to improve public health, reduce transport emissions, reduce casualties and enable inclusive access to jobs, education, training and services.

2.3.3 The LTP4 identifies a number of key policies relating to the development proposals, which include:

- **Policy 01:** Ensure the transport network supports sustainable economic and housing growth, while protecting and where possible enhancing the environment and supporting health and wellbeing of residents;
- **Policy 02:** Manage and where appropriate develop the road network to reduce congestion and minimise disruption and delays;
- **Policy 03**: Support measures and innovation that makes more efficient use of the transport network capacity by reducing the proportion of single occupancy car journeys and encouraging walking, cycling and public transport;
- **Policy 07**: Work with operators and partners to enhance the network of high quality, integrated public transport services, interchanges and supporting infrastructure;
- **Policy 17**: Seek that the location of developments make the best use of existing and planned infrastructure and provides new or improved infrastructure and supports walking, cycling and public transport;
- **Policy 24**: Seek to avoid negative environmental impacts of transport and where possible provide environmental improvements;
- **Policy 28**: Consult from an early stage in the development of schemes;
- **Policy 30**: Identify the parts of the highway network where significant number of accidents occur and propose solutions to prevent further accidents;
- **Policy 31**: Aim to work with partners to support road safety campaigns and education programmes aimed at reducing road accidents and keep speed limits under review;
- **Policy 33**: Seek external funding to support the delivery of transport infrastructure priorities as outlined in the Strategic Economic Plan and Oxfordshire Infrastructure Strategy; and
- **Policy 34**: Require the layout and design of new developments to encourage walking, cycling and to be served by frequent, reliable and efficient public transport.

Science Vale Transport Strategy

2.3.4 The Science Vale Transport Strategy is part of LTP4 and identifies that with the amount of housing and employment growth that is proposed in the Science Vale area, a number of transport schemes are required to mitigate the impact of the growth and support the area.

2.3.5 To improve journeys in the Science Vale area the following schemes are proposed (policy numbers shown in brackets):

- Upgrade the cycle network and undertake maintenance on the existing network (SV 2.6);
- Secure new bus services with associated infrastructure and improve existing bus services (SV 2.2);
- Deliver the Science Bridge and widening of A4130 (SV 2.6);
- Improve access to Culham Science Centre (Clifton Hampden Bypass – SV 2.13);
- Deliver the Didcot to Culham river crossing (SV 2.16); and
- Provide strategic cycle network to encourage the use of sustainable transport. (SV 2.21 & SV 2.22)

Bus and Rapid Transit Strategy

2.3.6 The Bus and Rapid Transit Strategy has been developed to complement the LTP4 and identifies key outcomes in relation to the five key goals identified in the LTP4. The Bus and Rapid Transit Strategy key outcomes include:

- **Support jobs and Housing Growth and Economic Vitality**: *'More people will be able to travel to more destinations by bus, improving access to work, shops and local centres';*
- **Support transition to a Low-Carbon Future**: '*Sustainable, energy-efficient bus transport will reduce sole-occupancy car usage and help manage car emission levels';*
- **Support Social Inclusion and Equality of Opportunity**: *'Accessible bus connections will enable disabled people, elderly people and those unable to drive will travel more';* and

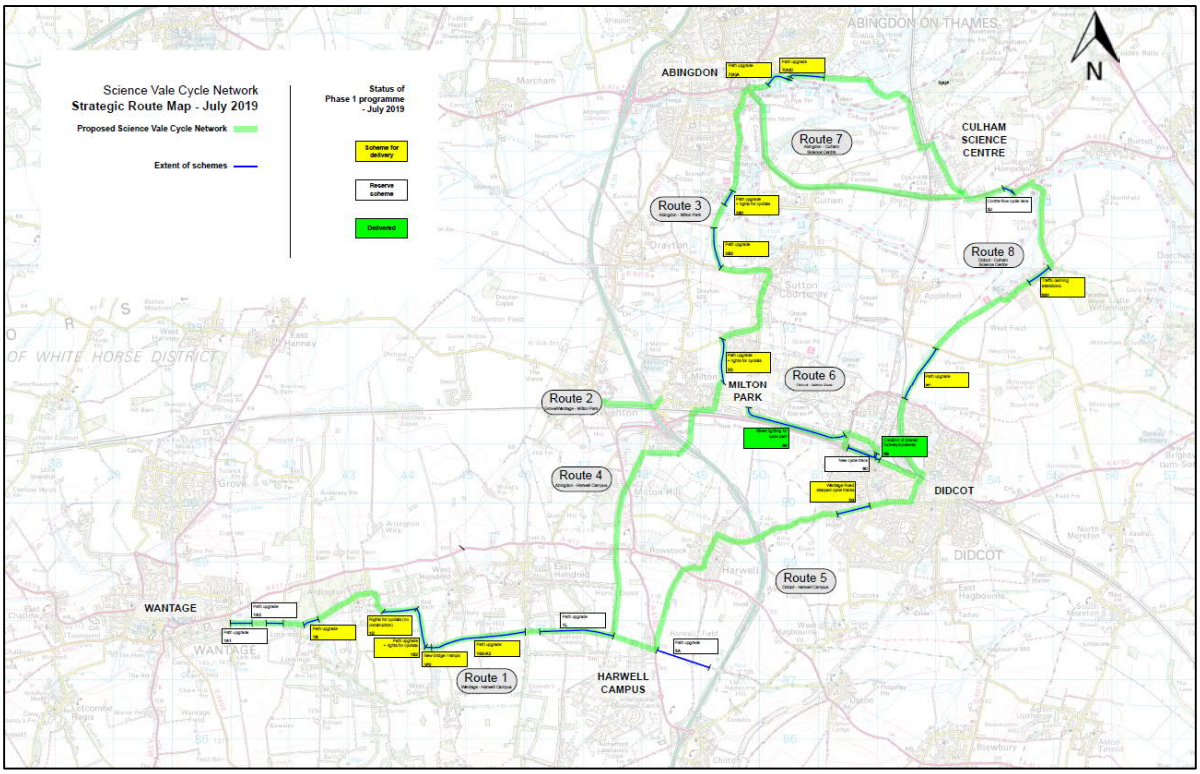
- **Improve Public Health, Safety and Individual Wellbeing**: '*Regular walking and cycling to and from bus stops and interchange can be an important contributor to keeping fit*'.

Active & Healthy Travel Strategy

2.3.7 The Active and Healthy Travel Strategy builds on the LTP4 with the aim to 'contribute to reducing pressure on the road network, contribute to economic growth and the reduction of emissions, quality of life and health, and link active travel with bus and rail options by enabling sustainable door to door journeys combining cycling or walking with public transport'.

2.3.8 As part of the Strategy, a Cycle Premium Route between Didcot and Culham Science Centre, via the existing National Cycle (NCN) Route 5 between Didcot and Long Wittenham and then on-road towards Culham Science Centre via Clifton Hampden Bridge, has been identified as part of the proposed Science Vale Cycle Network, as shown in Figure 2.1. This cycle network has been identified to be a focus for future investment in cycling in the area. Given the importance of the route between the two key attractors in the region, and the existing site constraints at the Clifton Hampden Bridge, the proposed Didcot to Culham River Crossing will provide an opportunity for a high-quality cycle route as an alternative to the existing.

Figure 2.1: Proposed Science Vale Cycle Network Map



Source: https://www.oxfordshire.gov.uk/sites/default/files/file/roads-and-transport-major-projects/science_vale_cycle_network.pdf

Oxfordshire County Council 2020 Climate Action Framework

2.3.9 The 2020 Climate Action Framework sets out OCC's guiding principles and how it will mobilise to tackle climate change. The Council has set itself a target of becoming carbon neutral by 2030, and enabling a zero carbon Oxfordshire by 2050.

2.3.10 The Council intends to use its strategic policy roles and partnerships to take climate action. Through the Council's local transport planning role it will focus on the following:

- Increase walking and cycling; it will be accessible and normal;
- Enable safe, convenient electric public transport across and between towns;
- Accelerate the rise of electric, shared and autonomous travel;
- Increasingly deprioritise journeys by single occupancy private car;

- Implement post Covid schemes to support active travel; and
- Develop and implement local cycling and walking infrastructure plans.

Oxfordshire Cycling Design Standards (2017)

2.3.11 The Oxfordshire Cycling Design Standards (OCDS) is a live document which provides guidance on how to design cycle infrastructure for new developments that will support all cycle users.

2.3.12 The aim of the OCDS is to make cycling the first choice for travel by creating a better environment for cycling, making cycling a more attractive choice and ensuring that it is accessible to everyone.

2.3.13 This guidance outlines the application of contemporary cycle infrastructure design in the Oxfordshire context.

2.3.14 The OCDS outlines how cycle infrastructure in Oxfordshire should be designed based on the type of junction or road, amount of vehicular traffic and existing facilities in the area.

Oxfordshire Walking Design Standards (2017)

2.3.15 The Oxfordshire Walking Design Standards (OWDS) is a live document that provides guidance on how pedestrian infrastructure should be designed in Oxfordshire to encourage more people to walk journeys.

2.3.16 The aim of the OWDS is to make walking people's first choice in Oxfordshire and accessible for all. Streets should be designed with pedestrians at the top of the hierarchy giving them precedence over cyclist, buses and cars.

2.3.17 The OWDS outlines the standards for footways depending on the location, road / junction and amount of traffic. In addition, the standards also set out the different types of crossings and when each type of crossing should be used depending on pedestrian demand, road width, proximity to junctions and road speed.

Oxfordshire Local Industrial Strategy (2019)

2.3.18 The Oxfordshire Local Industrial Strategy (OxLIS) was published in June 2019 and sets out the plan to build on Oxfordshire's strong foundations and world-leading assets by 2040. OxLIS supports the objectives of the National Industrial Strategy.

2.3.19 The new river crossing proposed between Didcot and Culham is designed to link to major employment sites such as Milton Park, Culham and Harwell and enable housing growth in the area. In addition *"Oxfordshire proposes establishing a CAV service between Culham and Harwell via Culham Railway Station, Didcot Parkway and Milton Park. In parallel with using existing rural roads, this CAV service would also use the new road and bridge."*

2.3.20 The growth of the Didcot and Bicester Garden Towns, Oxfordshire Garden Village and the expansion of science parks would address critical connectivity issues in these area and release pressure on existing infrastructure.

OxLIS: The Investment Plan (2020)

2.3.21 The Investment Plan is part of a suite of documents which underpin OxLIS. In the Investment Plan Didcot Garden Town, Milton Park and Culham Science Park are outlined as critical economic sectors, assets and growth opportunities.

2.3.22 The HIF1 projects are identified as being requirements to support the delivery of science-based research and knowledge clusters at Harwell, Culham and Milton Park as well as unlocking homes in the Didcot Garden Town area.

The Oxfordshire Infrastructure Strategy (2017)

2.3.23 The Oxfordshire Infrastructure Strategy (OXIS) examines the emerging development and infrastructure requirements to support growth in the area from 2016 to 2031 and beyond.

2.3.24 Several road improvements are proposed to alleviate congestion in Oxfordshire and support planned growth in the area. These include the Didcot Science bridge, capacity improvements to the A4130 including Didcot North Perimeter Road, Culham to Didcot River Crossing and Clifton Hampden Bypass.

2.4 Local Policy

Vale of White Horse Local Plan 2031 Part One (2016)

2.4.1 The Vale of White Horse Local Plan was adopted in December 2016 and sets out the vision for the district up to 2031.

2.4.2 The key challenges and opportunities that outlined in the Local Plan that the district faces are:

- "*Building healthy and sustainable communities;*
- *Supporting economic prosperity;*
- *Supporting sustainable transport and accessibility, and*
- *Protecting the environment and responding to climate change".*

2.4.3 The relevant core policies stated in the Local Plan are the following:

- **Core Policy 1: Presumption in Favour of Sustainable Development**
  - States that planning applications that accord with the Local Plan and are not anticipated to have adverse impacts that outweigh the benefits will be granted planning permission.
- **Core Policy 7: Providing Supporting Infrastructure and Services**
  - States that the Council will ensure that new infrastructure and services are delivered alongside new housing and employment.
- **Core Policy 17: Delivery of Strategic Highway Improvements with the South-East Vale Sub-Area**
  - States that contributions will be made towards transport infrastructure improvements with the South-East Vale Sub-Area including:
    - Science Bridge and A4130 re-routing through the Didcot A site;
    - A4130 dualling between Milton Interchange and Science Bridge; and
    - A new strategic road connection between the A415 east of Abingdon on-Thames and the A4130 north of Didcot, including a new crossing of the River Thames.
- **Core Policy 18: Safeguarding Land for Strategic Highway Improvements**
  - The Council seeks to ensure that land required for important transport infrastructure in the South East Vale Sub-Area.
- **Core Policy 33: Promoting Sustainable Transport and Accessibility**
  - The Council will support improvements for accessing Oxford and support measures identified in the Local Transport Plan.
- **Core Policy 34: Promoting Public Transport, Cycling and Walking**
  - The Council will seek to support the provision of new cycling routes and ensure that proposals for major development are supported by a Transport Assessment and Travel plan.

Vale of White Horse Local Plan 2031: Part 1, Infrastructure Delivery Plan (2015)

2.4.4 The Infrastructure Delivery Plan was prepared to support the Local Plan 2031: Part 1 which identifies the vision for the area up to 2031 and the infrastructure required to accommodate the growth of the area.

2.4.5 *"The council has been working closely with Oxfordshire County Council and South Oxfordshire District Council so that cross-border infrastructure requirements are fully taken into account and that the Science Vale area is planned holistically."*

2.4.6 The relevant transport infrastructure that has been identified as part of the Science Vale Transport Package is outlined in Table 2.1 below.

Table 2.1: Science Vale Transport Package

Project	Cost	Funding	Rational
Widening A4130	£13,500,000	LGF, CIL	Improving Connectivity between Didcot and the Enterprise Zone.
Science Bridge	£26,000,000	LGF CIL	Capacity improvements for vehicles over the railway line along the A4130 in the vicinity of the Power station.
Cycle Network Improvements Across the Science Vale area	£10,000,000	LGF, GPF LSTF, CIL	Providing easier and greater connectivity by bike providing a key layer to the science Vale transport system and enabling and encouraging sustainable travel across the area.
Thames Crossing at Appleford /Culham and further link between Culham Science Centre and the B4017.	£40,000,000	LGF, CIL	To enable better access between Culham and Oxford. The Scheme will provide an alternative north south link to the A34, linking centres of economic growth.

Source: Vale of White Horse Local Plan 2031: Part 1, Infrastructure Delivery Plan (2015), Table 5.

Vale of White Horse Local Plan 2031: Part 1, Inspector's Report (2016)

2.4.7 In the Inspector's report for the VoWH Local Plan Part 1, the Inspector was satisfied that a mitigation strategy was identified to deal with growth associated with the Local Plan Part 1 and South Oxfordshire's Core Strategy 2016. This was in the knowledge that much of the highway infrastructure was unfunded and a large shortfall was identified to deliver necessary infrastructure. In acknowledgement of the existing traffic congestion, the Inspector noted that infrastructure (to which this Scheme seeking planning permission is part of a wider strategy) would largely mitigate the impact of development. The relevant paragraphs of the report related to highway infrastructure are copied below:

"*144. In relation to transport Oxfordshire County Council, as Highway Authority, commissioned the November 2014 Evaluation of Transport Impacts Study to Inform the Vale of White Horse District Council Local Plan 2031: Part 1. Following several earlier stages this report assessed the likely transport impacts of the plan's proposed 20,560 new homes and 23,000 additional jobs in the district, based on a range of different transport interventions and improvements (one of medium scale and two of large scale). The report concludes that the Stage 5ETI mitigation package (which in essence comprises those transport improvements identified in the plan) would largely mitigate the impacts of the proposed new development in the district, albeit that some congestion issues would remain.*

145. I have read and heard much debate about the robustness of the Impacts Study's findings and whether or not the residual congestion issues it identifies would be "severe" in terms of paragraph 32 of the NPPF. However, there is no convincing and detailed evidence to demonstrate that the study's conclusions are not robust, bearing in mind that they can only ever be a strategic-level forecast and that more detailed transport impact appraisals will be necessary as part of the consideration of specific development proposals. Moreover, whilst it is to a significant degree a matter of judgement, I have read and heard nothing which persuades me that the District and County Councils' conclusion that the likely residual transport impacts would be acceptable is not a soundly-based finding. In considering this point I have borne in mind that the "starting point" situation for the Vale is as a district which very much suffers from traffic congestion."

150. Policy CP7 states that all new development will be required to provide for the necessary on-site and off-site infrastructure requirements arising from the development. However, it goes on to indicate that, where viability constraints are demonstrated, the Council will (i) prioritise contributions sought, giving first priority to essential infrastructure and second priority to other infrastructure (ii) defer part of the contribution to a later date (iii) as a last resort, refuse planning permission if the development would be unsustainable without the unfunded infrastructure requirements. With reference to recent specific examples significant concern has been raised that this would lead to development being permitted without the timely implementation of necessary infrastructure, or even its provision at all.

151. The policy is written such that there is a presumption that the necessary infrastructure will be provided when required and that any relaxation of the requirements will only be considered where viability constraints are demonstrated. However, ultimately it is appropriate that the Council reaches a decision on this issue on a case by case basis at the planning application stage, balancing the benefits of the development against the harm likely to result from delayed or unfunded infrastructure. Consequently, and bearing in mind that it makes clear that ultimately proposals which are unsustainable because of an absence of supporting infrastructure will be refused, the policy is soundly-based. Nonetheless, to ensure the effectiveness of the policy, MM10 and MM11 are necessary to define "essential" and "other" infrastructure in the supporting text of the policy and to require collaboration between developers where infrastructure is necessary to serve more than one site. I have noted the suggested changes to the wording of MM10 but conclude that the modification is appropriate as consulted on, bearing in mind that the supporting text should not alter the meaning of the policy to which it relates."

Vale of White Horse Local Plan 2031 Part Two (2019)

2.4.8 The Vale of White Horse Local Plan Part Two was adopted in December 2019 and complements the Part 1 plan setting out policies and locations for housing up to 2031.

2.4.9 The Part 2 Local Plan includes Core Policy 16b which supports the implementation of Didcot Garden Town. This policy ensures that proposals for development support the successful implementation of the Garden Town.

2.4.10 The key relevant policies stated in part two of the Local Plan are the following:

- **Development Policy 17: Transport Assessments and Travel Plans**
  - States that proposals for large developments will need to be supports by a Transport Assessment or Statement in accordance with Oxfordshire County Council guidance.
- **Development Policy 31: Protection of Public Rights or Way, National Trails and Open Access Areas**
  - The Council will permit developments that can accommodate existing routes or provide alternative routes that are equally or more attractive and convenient for users.

Vale of White Horse Local Plan 2031: Part 2 Infrastructure Delivery Plan (2018)

2.4.11 The Infrastructure Delivery Plan was prepared to support the sites identified in the Local Plan 2031: Part 2. It is intended to be a 'live' document that will be updated and reviewed at regular intervals.

2.4.12 The Local Plan Part 2 identified seven sites for a total of 3,420 dwellings up to 2031.

2.4.13 In order to achieve a sustainable transport network in the VoWH area, the Council is working alongside OCC, South Oxfordshire, Oxfordshire Local Enterprise Partnership (OxLEP) and Oxfordshire Growth Board. The relevant required transport infrastructure that has been identified includes:

- Delivering the Science Bridge and widening of A4130; and
- Providing new and substantially upgraded strategic cycle routes to Milton Park, Harwell and Culham Science Centre through the Science Vale cycle strategy.

Vale of White Horse Local Plan 2031: Part 2, Inspector's Report (2019)

2.4.14 An Inspector's Report for the Local Plan 2031: Part 2 was published in June 2019, assessing the Local Plan. The report concluded that it *"provides an appropriate basis for the planning of the district alongside the existing Vale of White Horse Local Plan: Part 1 provided that a number of main modifications are made to it".*

South Oxfordshire Local Plan 2035 (2020)

2.4.15 The South Oxfordshire Local Plan was adopted in December 2020 and sets out the vision and strategy for the area up to 2035.

2.4.16 Objective 4 of the Local Plan is relevant as it states that it should ensure that essential infrastructure is delivered to support our existing residents and services as well as growth and to make sustainable transport a more attractive and viable choice whilst recognising that car travel will continue to be important.

2.4.17 The relevant policies stated in the Local Plan are the following:

- **Policy STRAT1**: The Overall Strategy
  - Development proposals should be in line with the overall strategy for South Oxfordshire. This includes *"focusing major new development in Science Vale including Didcot Garden Town and Culham so that this area can play an enhanced role in providing homes, jobs and services with improved transport connectivity."*
- **Policy TRANS1b**: Supporting Strategic Transport Investment
  - "*The Council will work with Oxfordshire County Council and others to:*
    - *deliver the transport infrastructure which improves movement in and around Didcot, including measures that help support delivery of the Didcot Garden Town; ii) support measures identified in the Local Transport Plan for the district including within the relevant area strategies;*
    - *support delivery of the safeguarded transport improvements as required to help deliver the development required in this Plan period and beyond;*
    - *understand any cross-border transport impacts from development and plan for associated mitigation."*
- **Policy TRANS2**: Promoting Sustainable Transport and Accessibility
  - "*The Council will support, where relevant, sustainable transport improvements in the wider Didcot Garden Town area and in and around Oxford, particularly where they improve access to strategic development locations".*
- **Policy TRANS3**: Safeguarding of Land for Strategic Transport Schemes
  - States that land is safeguarded to support the delivery of identified transport schemes, including those forming this planning application (not exhaustive list)::
    - Clifton Hampden Bypass
    - A new Thames road crossing between Culham and Didcot Garden Town
    - Science Bridge, Didcot

South Oxfordshire Infrastructure Delivery Plan (2019)

2.4.18 The Infrastructure Delivery Plan (IDP) was produced to support the South Oxfordshire Local Plan 2034 Final Publication Version 2 which has now been adopted and identifies the infrastructure that is needed to support future growth in South Oxfordshire until 2035. The current IDP was last updated in January 2019 and supersedes the previous IDP published in 2017.

2.4.19 The IDP is considered to be a 'live document' meaning it will be regularly updated and monitored as new schemes are completed or new infrastructure requirements are identified.

2.4.20 In order to support the Didcot Garden Town the County Council has secured funding for the delivery of major transport infrastructure including, a new road crossing over the Thames between Culham and Didcot, capacity enhancements to the A4130 and a new 'Science Bridge' improving access to growing areas of Didcot and for a bypass through of Clifton Hampden. This planning application is for that infrastructure.

The Planning Inspectorate: Report on the Examination of the South Oxfordshire Local Plan 2011-2034 (2020)

2.4.21 This report predominantly focusses on the housing sites proposed, and whether the Plan's preparation had complied with the duty to co-operate. It proposed main modifications to the Plan to make it sound and capable of adoption. In relation to infrastructure, which includes this Scheme, the policies are found to be sound. A main modification (MM51) is proposed which further highlights the importance and policy standing of this Scheme, by adding it to the "list of supported projects". The relevant paragraphs of the report related to the Scheme are copied below:

'*209. The plan's spatial strategy and its housing and employment provision will require adequate infrastructure to make it effective. The Council's Infrastructure Delivery Plan Update (April 2020) (Document PSD27) focuses on the Plan's strategic allocations and is supported by an updated Financial Viability Assessment Report and associated documents (PSD52, PSD52.1 and PSD53). The Infrastructure Delivery Plan Update is a thorough document that contains a list of infrastructure requirements for the allocations. Not all the costs can be known, because the allocations are strategic and will need to be worked up in detail through masterplans, and some of the infrastructure is not fully designed and costed. This is inevitable with long term masterplans and strategic allocations, and does not indicate any defect in either the viability assessment or the plan.'*

'213. The set of documents comprising the Evaluation of Transport Impacts (documents TRA06 to TRA06.6.1) examined various development scenarios and their transport impacts, and the evaluation underpins the range of transport improvements required by the Plan in connection with the allocations.

214. The success of the Housing Infrastructure Fund bid will bring about early delivery of a new crossing of the River Thames between Culham and Didcot, a bypass of Clifton Hampden, capacity enhancements to the A4130, and a new 'Science Bridge', which will enable STRAT8, STRAT9 and STRAT10 to proceed. They are part of a wider highway strategy to support the delivery of housing growth in the wider Didcot Garden Town area and to mitigate the impact of existing, approved and allocated developments.'

'216. Policy TRANS1b: Supporting Strategic Transport Investment sets out the ways in which the Council intends to support such investment, and to ensure the policy is fully up to date, ***MM51*** *adds the schemes that are linked to the Housing Infrastructure Funding to the list of supported projects. It also adds support for the re-opening of the Cowley Branch Line for passenger traffic which has the potential to provide an additional sustainable transport choice for sites STRAT11 and STRAT12.*

217. Policy INF1: Infrastructure Provision provides a strategy for infrastructure delivery within South Oxfordshire, developed in partnership with Oxfordshire County Council who are responsible for education and highways. It requires new development to be supported by appropriate infrastructure, both on-site and off-site. Infrastructure required as a consequence of development, and provision for its maintenance, will be secured through planning conditions, obligations and other agreements and funding through the Community Infrastructure Levy. A clarification is inserted into Policy INF1 by ***MM49*** *to the effect that where external forward funding for infrastructure necessary for development has been secured (for example from the Housing Infrastructure Fund), it will be recovered from the development. This is to assist the County Council to recycle funding to help support other future transport improvements, and is necessary to ensure an effective policy towards the provision of infrastructure.'*

'226. Subject to the main modifications described above, the plan's policies, proposals and strategic allocations are viable and its infrastructure policies are sound.'

Didcot Garden Town Delivery Plan (2017)

2.4.22 This plan recognises that Didcot will grow from approximately 26,000 people to over 60,000 by 2031. With this growth, Didcot is expected to become the largest town in Southern Oxfordshire, so even if the resident's movements around the town remain unchanged, town-wide journeys by car will double. This means that infrastructure investment is required, in terms of highways, pedestrian and cycle routes.

2.4.23 The east-west movement corridors like the A4130 and the Science Bridge have been identified as one of the key proposals to achieving sustainable movement across the area. The Clifton Hampden Bypass and the Didcot to Culham River Crossing are also identified in the Delivery Plan to encourage sustainable movement in the area.

2.4.24 A new cycle route between Harwell, Didcot and Culham, referred to as the Garden Line, has also been identified in the Delivery Plan. This is proposed to include upgrading of the route to Culham and a new river crossing to the east of the railway line.

2.5 Other Policy and Guidance

The Strategic Road Network – Planning for the Future (September 2015)

2.5.1 Highways England document '*The Strategic Road Network – Planning for the Future'* (September 2015) provides guidance on the requirements for Transport Assessments and consideration of impacts on the SRN. Regarding assessment years, it states that assessments should be carried out for the following:

- *The development and construction phase; and*
- *The opening year, assuming full build out and occupation; and*
- *Either a date ten years after the date of registration of the associated planning application or the end of the Local Plan period (whichever is the greater).*

The assessment at opening will be used for the determination of impact mitigation needs whilst the latter is necessary to determine the risk which will transfer to us.

Transport for New Developments: Transport Assessments and Travel Plans (March 2014)

2.5.2 OCC requirements for Transport Assessments are set out in the document *'Transport for New Developments: Transport Assessments and Travel Plans'* (March 2014). The document includes a Scoping for Transport Assessment Form, to be completed by the applicant and submitted to the highway authority. The form includes the following under 'Assessment years':

- Existing;
- Year of opening;
- Design Year;
- Other sensitivity tests required, e.g. phasing

2.5.3 The OCC guidance refers to the methodology set out in DfT publication 'Guidance on Transport Assessments' (March 2007). This document states: '*For the SRN (Strategic Road Network), the future year should normally be ten years after registration of a planning application for the development, in line with the forward horizon of the RTS (Regional Transport Strategy). Should the development take place over a longer period than the horizon of the wider planning framework, a longer period of assessment will need to be agreed with the HA'.*

2.5.4 The *'Guidance on Transport Assessments'* document has now been superseded by MHCLG guidance *'Travel Plans, Transport Assessments and Statements'*. With regard to assessment years, the MHCLG guidance states that '*The timeframe that the assessment covers should be agreed with the local planning authority in consultation with the relevant transport network operators and service providers.'*

Design Manual for Roads and Bridges (2020)

2.5.5 The Design Manual for Roads and Bridges (DMRB) identifies the design standards for road layouts in the United Kingdom.

LTN 1/20 Cycle Infrastructure Design (2020)

2.5.6 This Local Transport Note provides guidance and good practice for the design of cycle infrastructure. LTN 1/20 also replaces LTN 1/12: Shared Use Routes for Pedestrians and Cyclists.

2.5.7 The key principles of this guidance are the following:

- Ensuring cycle infrastructure is accessible for all;
- Cycles should be treated as vehicles and separately from pedestrians;
- Cyclists must be physically separated from high volume vehicular traffic;
- Using side street routes that have been closed to through traffic as an alternative to segregated cycle facilities;
- Cycle infrastructure should be designed for all forms of cycles and high volumes of cycles; and
- Cycle schemes must be legible and understandable.

Department of Transport Gear Change: A Bold Vision for Cycling and Walking (2020)

2.5.8 This plan describes the vision for England to increase walking and cycling across the country. It sets out the actions required at all levels of government to make this a reality, grouped under four themes:

- Better streets for cycling and people;
- Putting cycling and walking at the heart of transport, place-making, and health policy;

- Empowering and encouraging local authorities;
- Enabling people to cycle and protecting them when they do.

3. Baseline Conditions

3.1 Introduction

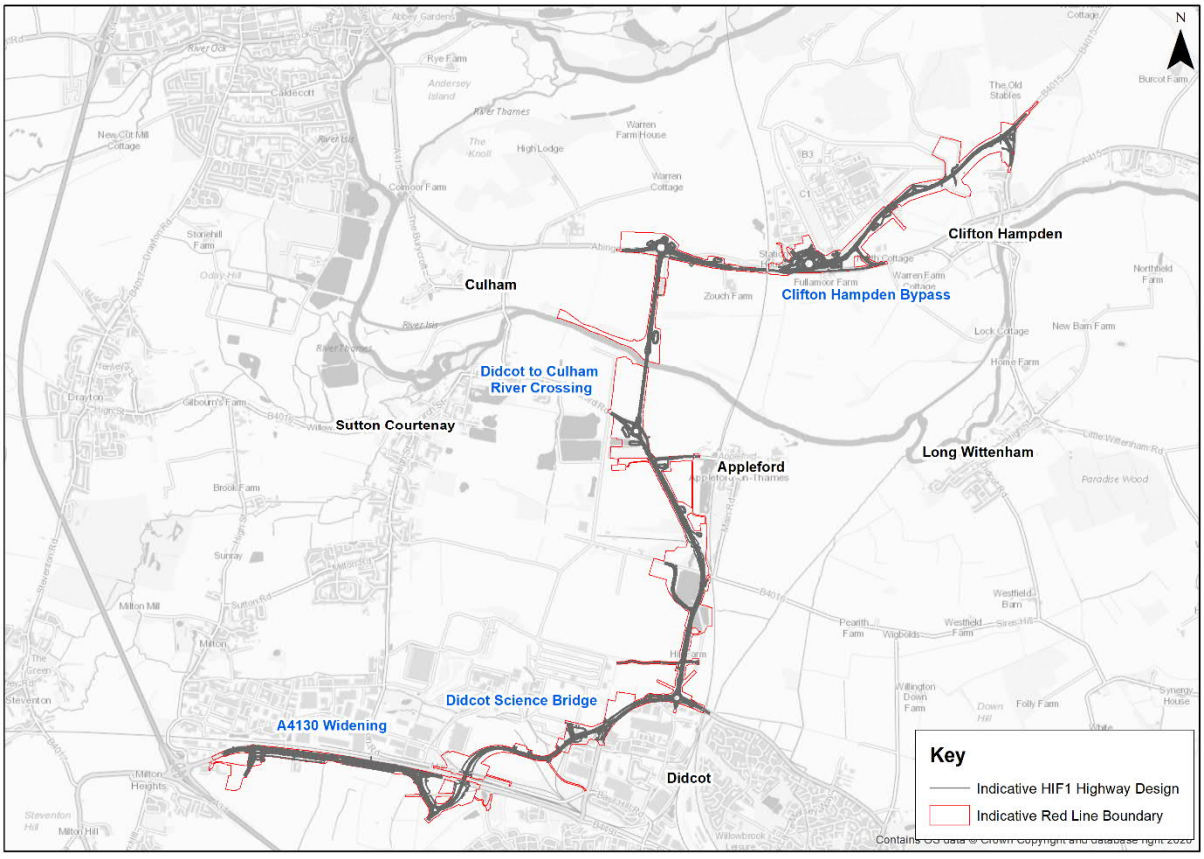
3.1.1 This section provides details of the existing baseline transport conditions relevant to the development proposals.

3.1.2 The proposed HIF1 Scheme is located to the north of Didcot and runs between Milton Gate and Clifton Hampden as shown in Figure 3.1. The HIF1 Scheme is made up of four components:

- A4130 Widening;
- Didcot Science Bridge;
- Didcot to Culham River Crossing; and
- Clifton Hampden Bypass.

3.1.3 Further details of the development proposals are provided in Section 4 of this report.

Figure 3.1: Scheme Location



3.1.4 The following section considers the baseline conditions with respect to the following:

- Walking, Cycling and Horse Riding;
- Public Transport;
- Highway Network;
- Traffic Data;
- Junction Capacity; and
- Road Safety.

3.2 Walking, Cycling and Horse-riding

Walking and Cycling Facilities and Routes

3.2.1 Key origins/destinations for individuals in the area include Culham Science Centre, Milton Park and Didcot. There is currently a lack of direct and attractive walking and cycling routes to these locations to encourage residents / employees to use these modes. For example, the existing route between Didcot and the Culham Science Centre is along NCN route 5 via Long Wittenham to Clifton Hampden and along the A415 Abingdon Road. However, part of NCN route 5 is not lit and are therefore unattractive to pedestrians and cyclists when it is dark due to feeling unsafe. In addition, there is no continuous provision of footpaths for pedestrians to complete this route without walking on the carriageway.

3.2.2 The lack of walking and cycling connectivity between key residential and employment areas is reflected in the proportion of people who walk and cycle to work in Didcot. Table 3.1 compares mode share data for the journey to work from the 2011 Census for Oxfordshire as a whole, Oxford and Didcot. The data represents mode share for residents in these areas. The combined walk and cycle mode share for Didcot is 15.6%, significantly lower than Oxford at 38% and even lower than Oxfordshire as a whole, at 20.9%. Bus use is also low, and as a consequence car driver mode share is above the average for Oxfordshire and significantly higher than Oxford.

Table 3.1: Journey to Work Mode Share

Mode	Oxfordshire	Oxford	Didcot
Underground, metro, light rail, tram	0.2%	0.3%	0.1%
Train	3.2%	2.7%	7.3%
Bus, minibus or coach	7.5%	17.4%	4.0%
Taxi	0.3%	0.4%	0.2%
Motorcycle, scooter or moped	0.9%	0.7%	0.9%
Driving a car or van	61.8%	36.2%	66.3%
Passenger in a car or van	4.6%	3.4%	5.3%
Bicycle	7.7%	18.7%	4.7%
On foot	13.2%	19.3%	10.9%
Other method of travel to work	0.6%	0.8%	0.4%
TOTAL	**100.0%**	**100.0%**	**100.0%**

Source: 2011 Census, dataset QS701EW – Method of Travel to Work.

3.2.3 Between the Milton Interchange roundabout and the rail underpass at Backhill Tunnel (south of Milton Park), up to 3m wide shared use cycle-pedestrian footways are present on both sides of the A4130 carriageway. However, there is no shared use on the northern side nearer Milton Interchange. There is no northern footway along the A4130 east of the tunnel. There is a Toucan crossing at this location and it provides a connection between the northern and southern footways of the A4130 and the Backhill Tunnel which connects to Milton Park for pedestrians and cyclists only.

3.2.4 Between the Backhill Tunnel and the A4130/B4493/Mendip Heights roundabout a 2.5m wide shared use footway is present along the southern frontage. This has poor separation from the high-speed road, and NMUs experience buffeting from vehicles passing by, especially HGVs. This footway is shared by cyclists and pedestrians and links to the Public Rights of Way located to the south of the A4130.

3.2.5 There are poor NMU facilities linking to Manor Overbridge. There is a shared footway/cycleway along the western side of the A4130 between the A4130 / Milton Road / Basil Hill Road roundabout and the A4130 / Hawksworth / Purchas Road roundabout with a footway also present on the eastern side of the carriageway.

3.2.6 Due to the severance created by the River Thames and the historic road network, there are poor opportunities for walking and cycling north / south in this area. For example, residents of Didcot wishing to cycle to Culham Science Centre must use indirect routes, relying on the main carriageway for significant portions.

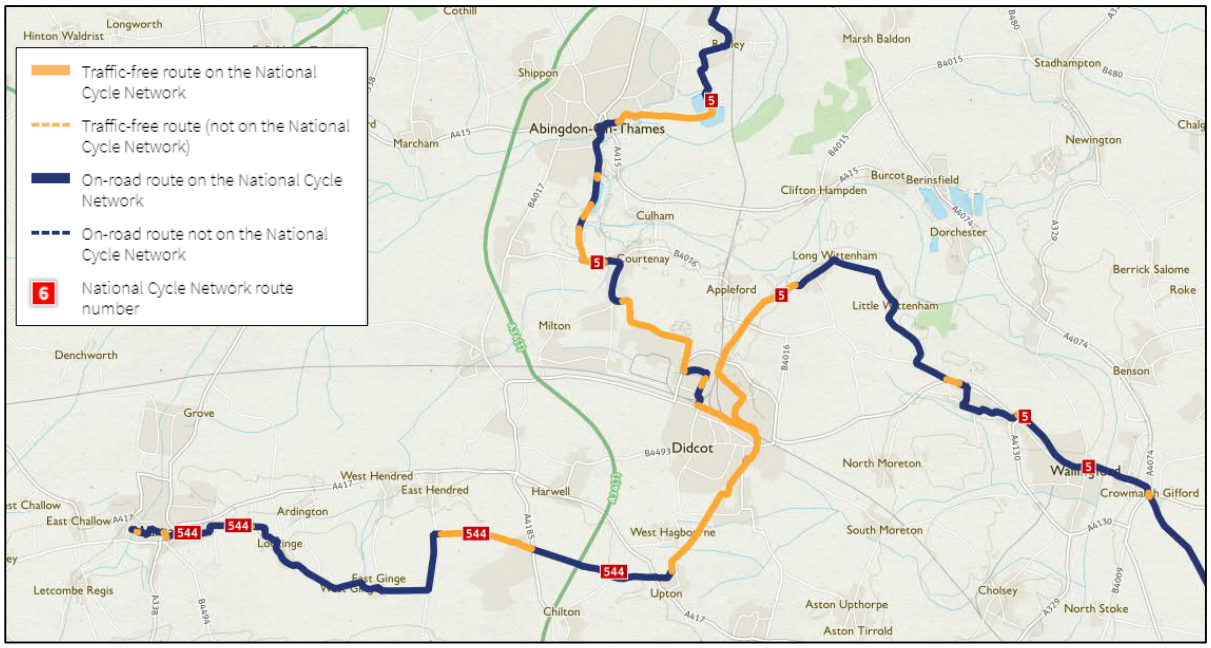
3.2.7 Along A415 Abingdon Road there is a 1.3m wide shared footway / cycleway along the northern side of the carriageway between Thame Lane and Culham Science Centre. There is a 1.5m wide shared

footpath / cycleway on the south side of the A415 Abingdon Road from Culham Science Centre to Clifton Hampden.

3.2.8 Further discussion and photographs of the existing NMU facilities are included in Section 6.2 NMU Impacts.

3.2.9 There are two National Cycling Network (NCN) routes across the Didcot area, as shown in Figure 3.2.

Figure 3.2: National Cycling Network

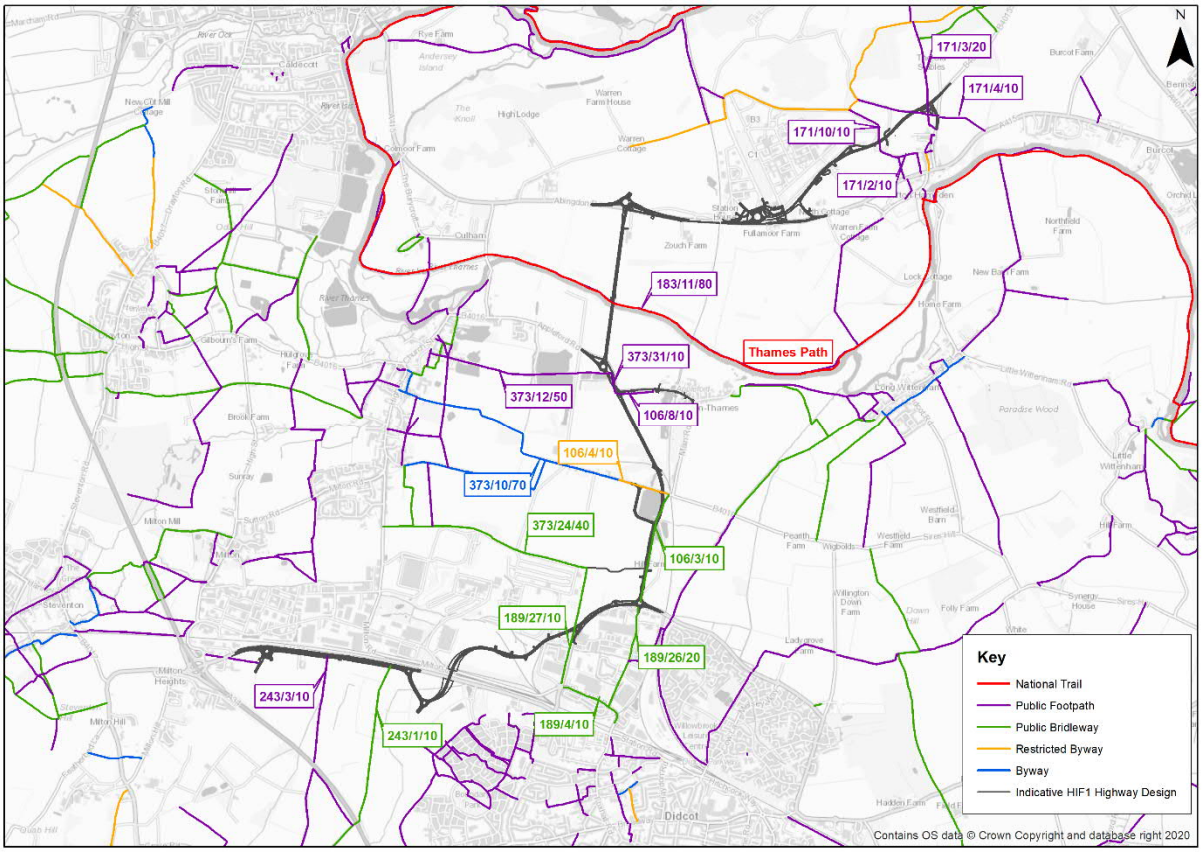


Source: https://www.sustrans.org.uk/national-cycle-network

3.2.10 The National Cycle Network Route 5 connects the area with the Didcot Parkway Station. NCN Route 5 is a long-distance route connecting Reading and Holyhead via Oxford, Stratford-upon-Avon, Bromsgrove, Birmingham, Stoke-on-Trent, Chester, Colwyn Bay and Bangor.

3.2.11 National Cycle Network Route 544 connects Didcot and Wantage. It is a 12-mile route on quiet roads, byways and purpose-built paths.

Figure 3.3: Local Public Rights of Way



3.2.12 Footpath 243/3/10 is located approximately 1.1km to the east of Milton Interchange and runs in a north-south direction connecting to Harwell to the south.

3.2.13 Bridleway 243/1/10 is located on the south side of the A4130, 1.6km east of Milton Interchange and runs in a north-south direction providing a bridge over the A34 to the south connecting to Harwell.

3.2.14 Bridleway 189/4/10 runs between Didcot Parkway station and the A4130 / Basil Hill Road / Milton Road roundabout. This connects to bridleway 189/27/10 which runs in a north-south direction along the A4130 to the A4130 / Hawksworth / Purchas Road Roundabout. The 189/27/10 bridleway joins to the 373/24/40 bridleway providing a connection to Sutton Courtenay.

3.2.15 Bridleway 189/26/20 runs along Collett between Basil Hill Road and the A4130 / Collett / New Link roundabout. Bridleway 106/3/10 runs in a north-south direction between Appleford Crossing and the A4130 / Collett / New Link roundabout.

3.2.16 Restricted byway 106/4/10 runs in an east-west direction connecting Appleford Crossing to byway 373/10/70 which provides a route to Sutton Courtney.

3.2.17 Footpaths 106/8/10, 373/31/10 and 373/12/50 provide a route between Appleford and Sutton Courtney.

3.2.18 Footpath 183/11/80 runs along the north side of the River Thames forming part of the Thames Path which runs between Woolwich and Kemble in the Cotswolds.

3.2.19 Footpath 171/10/10 is located approximately 200m to the west of the A415 Abingdon Road / High Street junction on the north side of the A415. This footpath is approximately 144m long and runs in a north-south direction connecting to Thame Lane and the Culham Science Centre campus. Footway 171/2/10 is located to the east of Clifton Hampden Village Hall and connects to the 171/10/10 footpath.

3.2.20 Footpath 171/4/10 is located approximately 550m to the east of the A415 / B4015 junction.

Walking, Cycling and Horse Riding Assessment and Review (WCHAR)

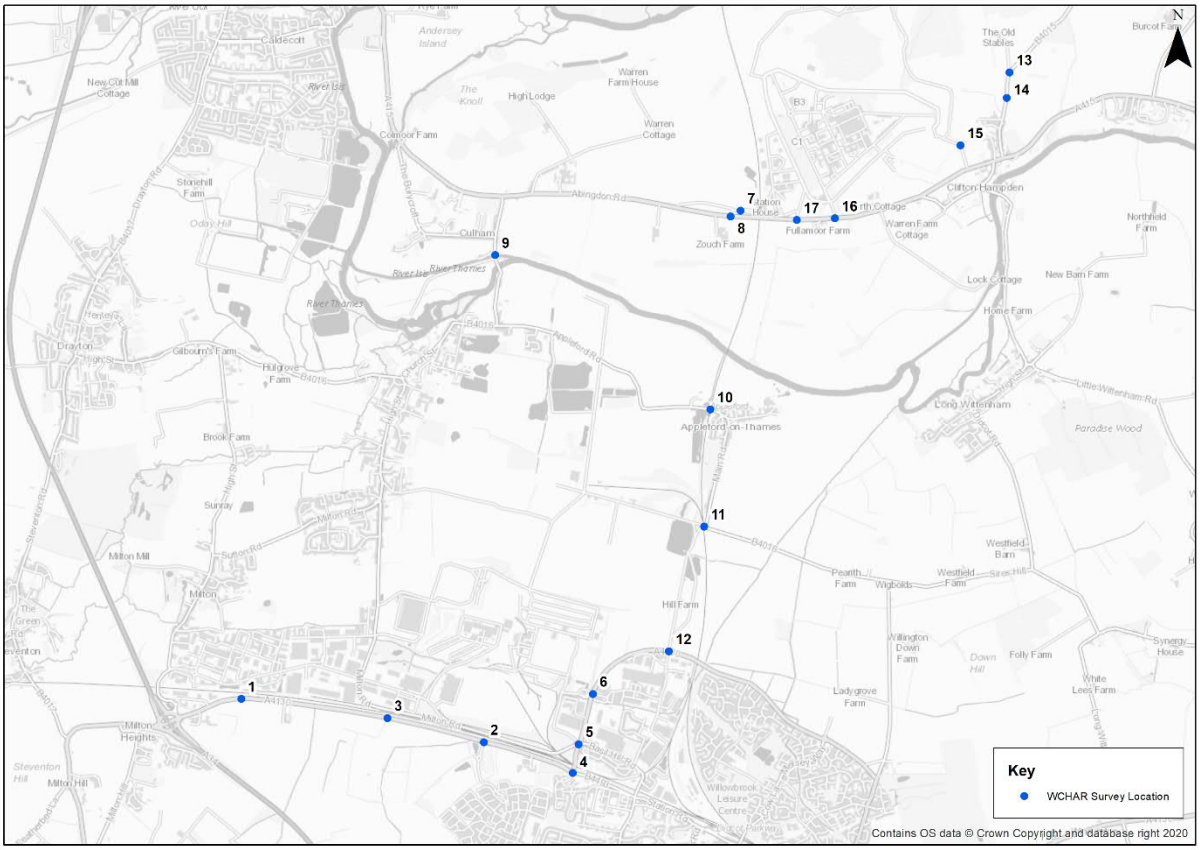
3.2.21 AECOM has undertaken four WCHAR reports for each element of the proposed Scheme, in accordance with the Design Manual for Roads and Bridges GG142. The purpose of the WCHAR is to facilitate the inclusion of all walking, cycling and horse-riding modes in the highway scheme design process from the earliest stage, enabling the design team to identify opportunities for improved facilities and integration with the local and national networks throughout the design process.

3.2.22 As the proposed Scheme does not form part of the trunk road network, a 1km radius of the Scheme has been deemed an appropriate study area for the WCHAR.

3.2.23 Walking, cycling and horse-riding surveys were undertaken between Monday 11th November and Sunday 17th November 2017. The locations of the surveys are identified below and illustrated in Figure 3.4. The WCHAR Reports are provided in Appendix A.

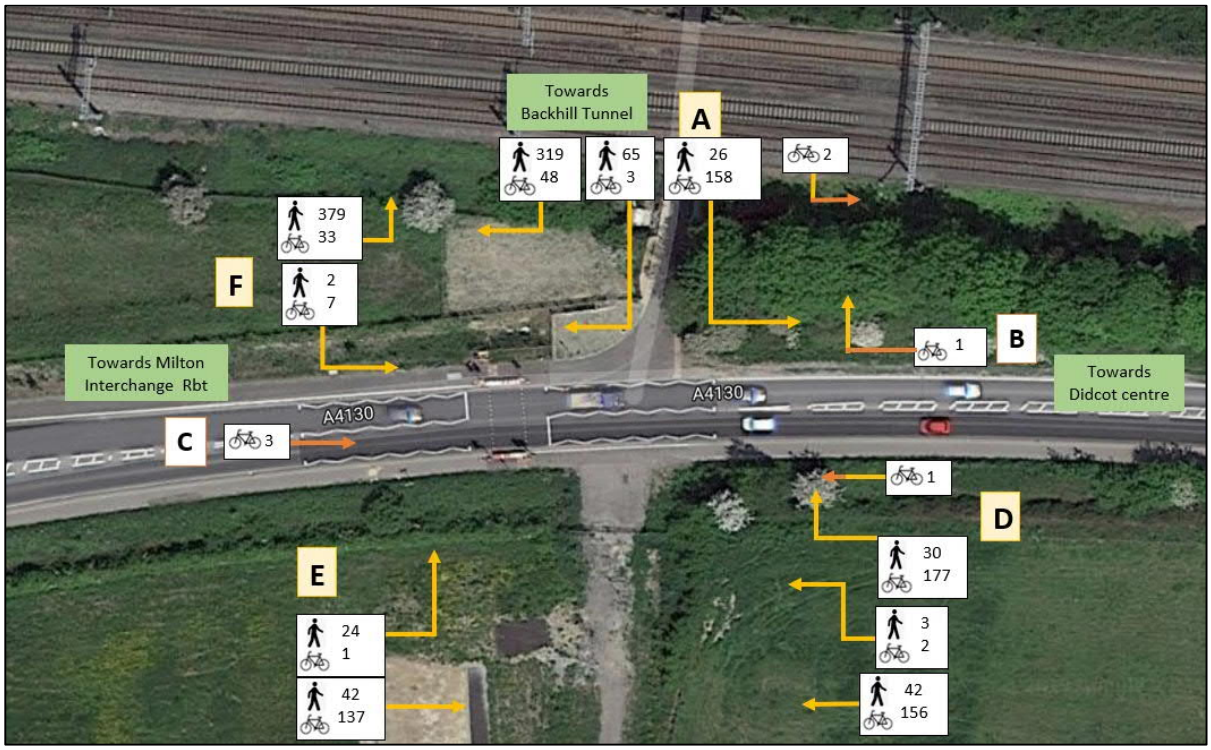
1. Backhill Tunnel / A4130 Junction
2. Sir Frank Williams Avenue / A4130 Junction
3. Cow Lane/ A4130 Junction
4. A4130/ B4493/ Mendip Heights Roundabout
5. Milton Road / Purchas Road / A4130 / Basil Hill Road (PRoW 189/27/10)
6. A4130 / Purchas Road / Hawksworth (PRoW 189/27/10)
7. Culham Railway Station Entrance
8. Station Road / Abingdon Road Junction
9. Thames Path at Tollgate Road, Culham (PRoW 183/11/80)
10. Appleford Railway Station
11. Appleford Level Crossing (PRoW 106/4/10)
12. A4130 and Collett Road Junction
13. Junction of B4015
14. Footpath North of Clifton Hampden (PRoW 171/4/10)
15. Footpath, junction on A415 (PRoW 171/2/10)
16. Culham Science Centre / A415 Junction
17. Station Road / A415 Junction

Figure 3.4: WCHAR Survey Locations



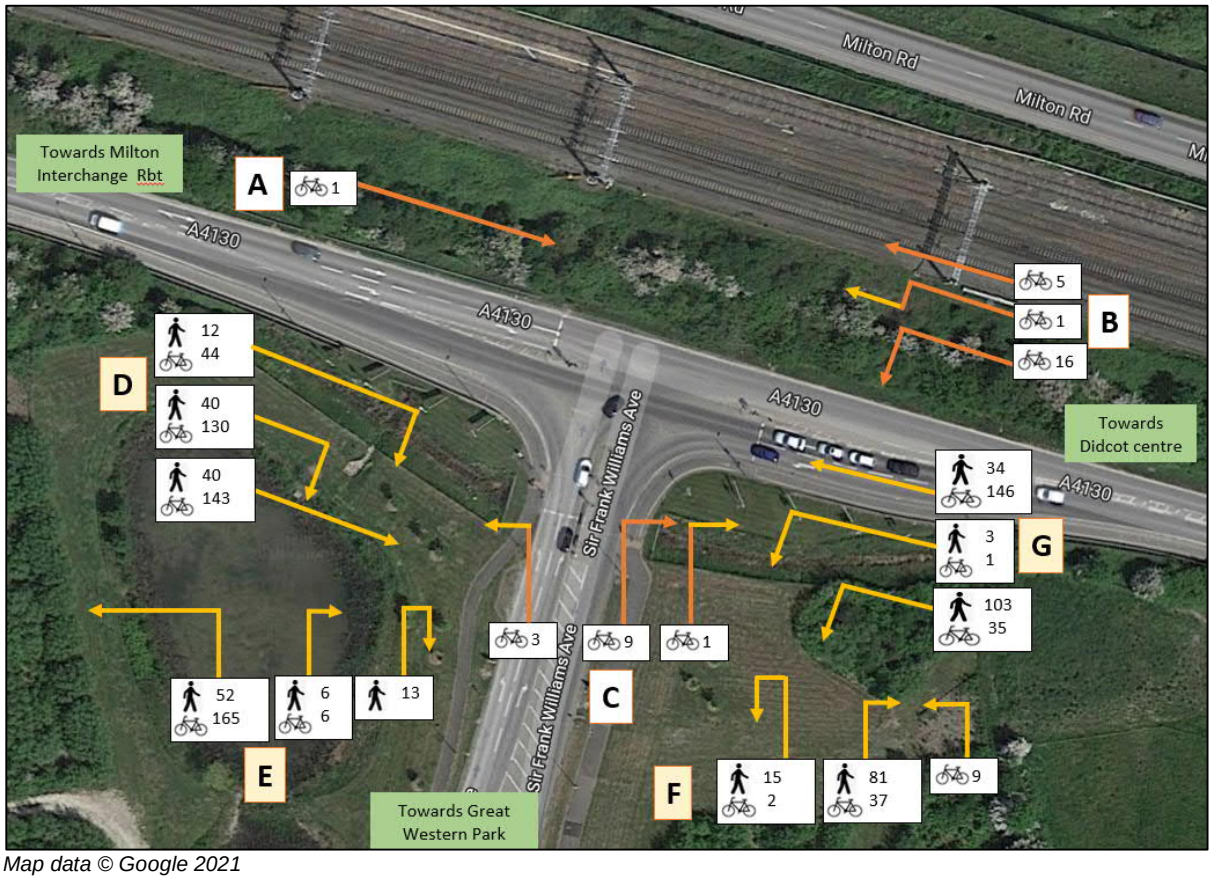
3.2.24 The total NMUs observed over the seven day survey period at each of the survey locations are shown in Figure 3.5 to Figure 3.21 below.

Figure 3.5: Backhill Tunnel / A4130 Tunnel - Total NMUs observed (7-day survey period)



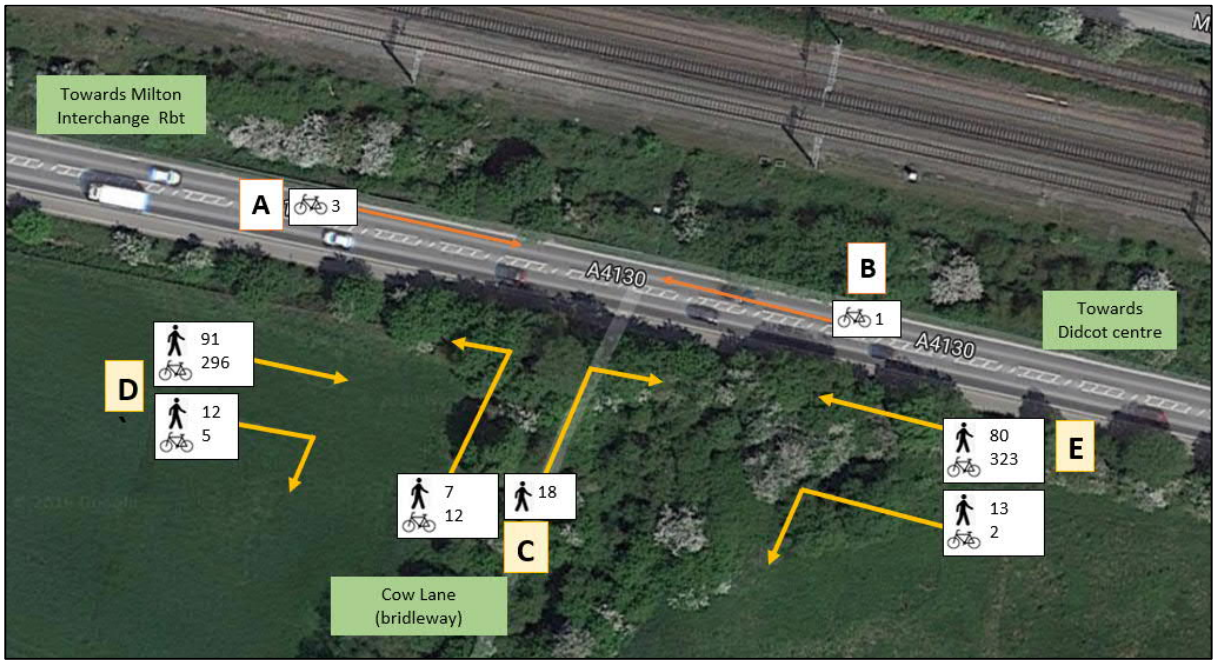
Map data © Google 2021

Figure 3.6: Sir Frank Williams Avenue / A4130 Junction - Total NMUs observed (7-day survey period)



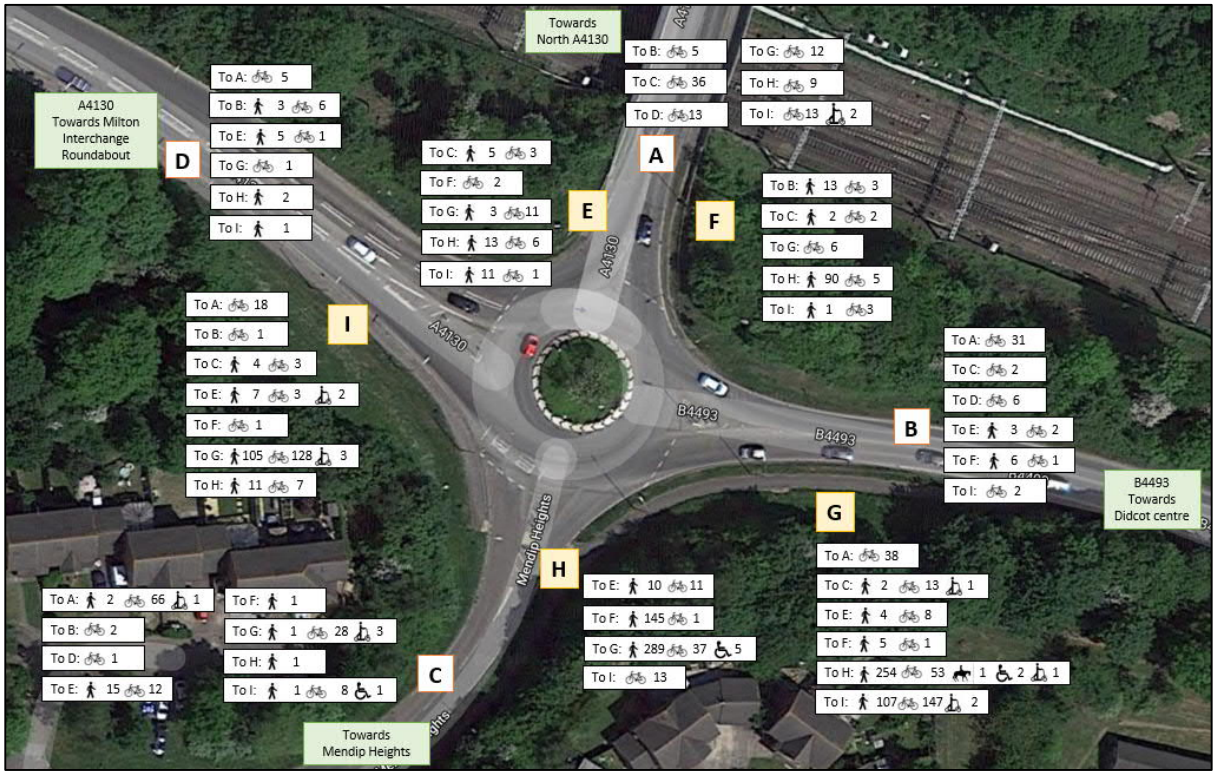
Map data © Google 2021

Figure 3.7: Cow Lane/ A4130 Junction - Total NMUs observed (7-day survey period)



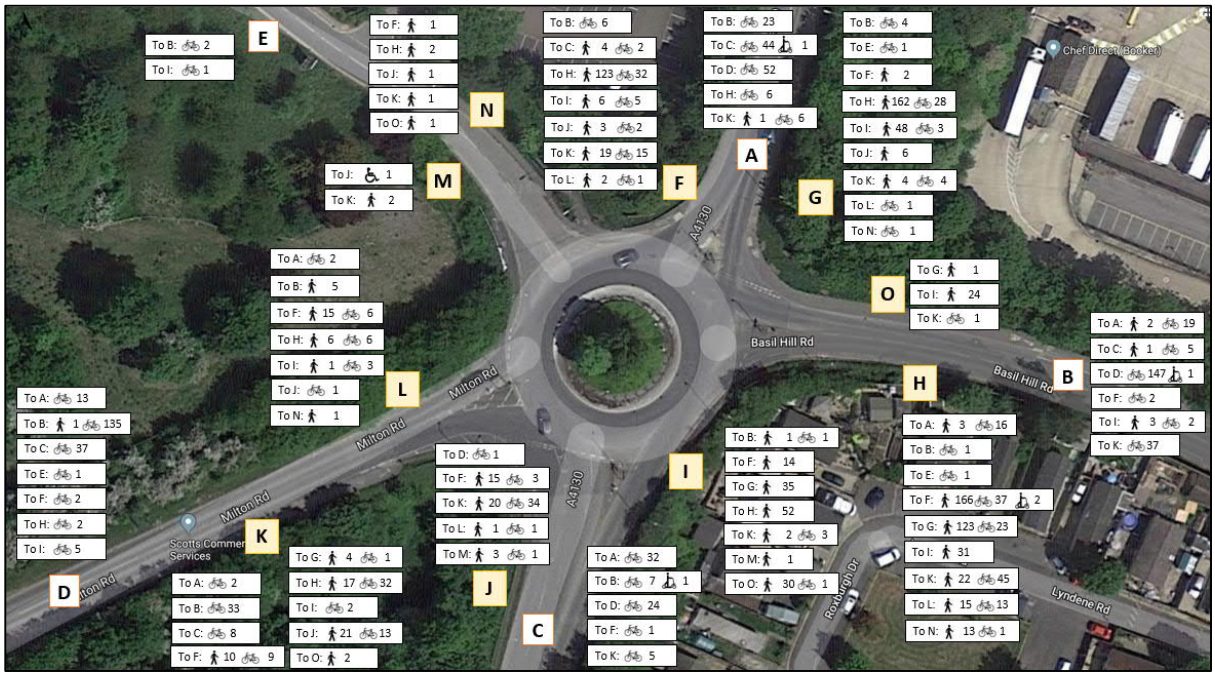
Map data © Google 2021

Figure 3.8: A4130/ B4493/ Mendip Heights Roundabout - Total NMUs observed (7-day survey period)



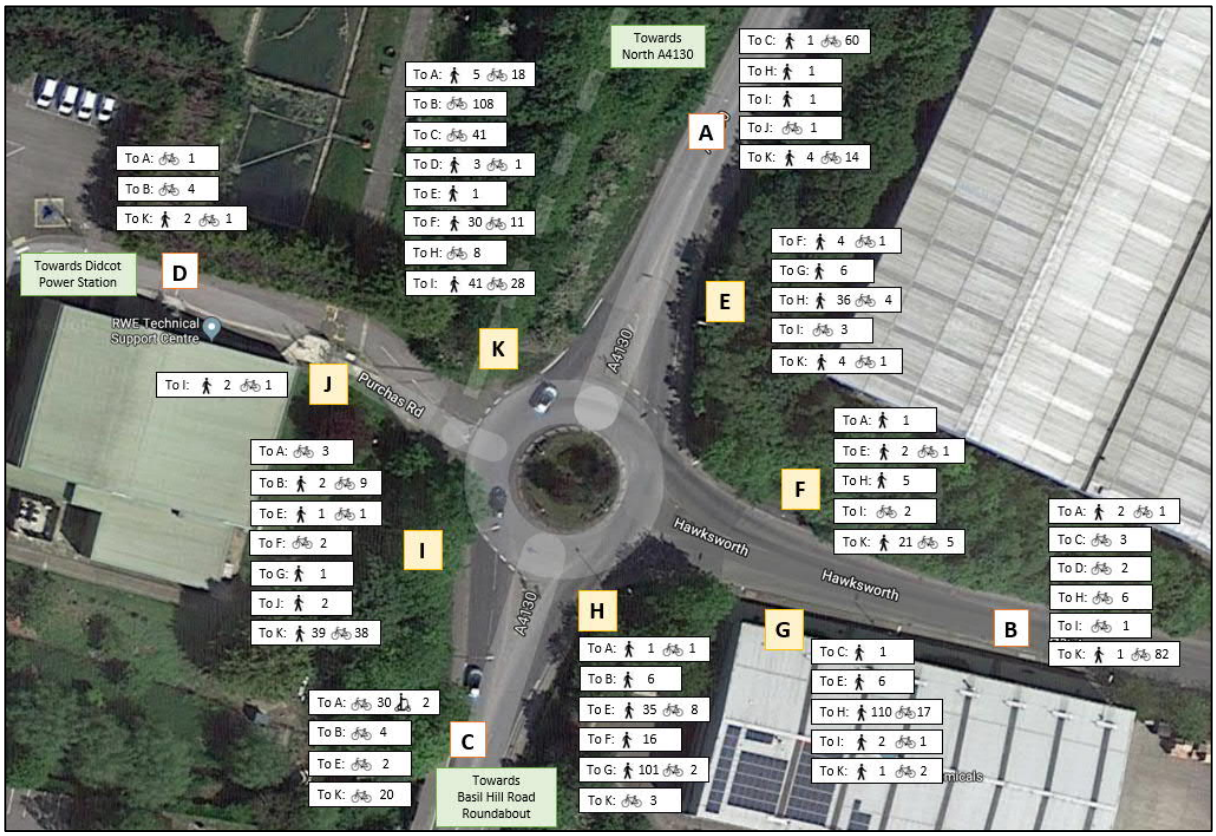
Map data © Google 2021

Figure 3.9: Milton Road / Purchas Road / A4130 / Basil Hill Road (PRoW 189/27/10) - Total NMUs observed (7-day survey period)



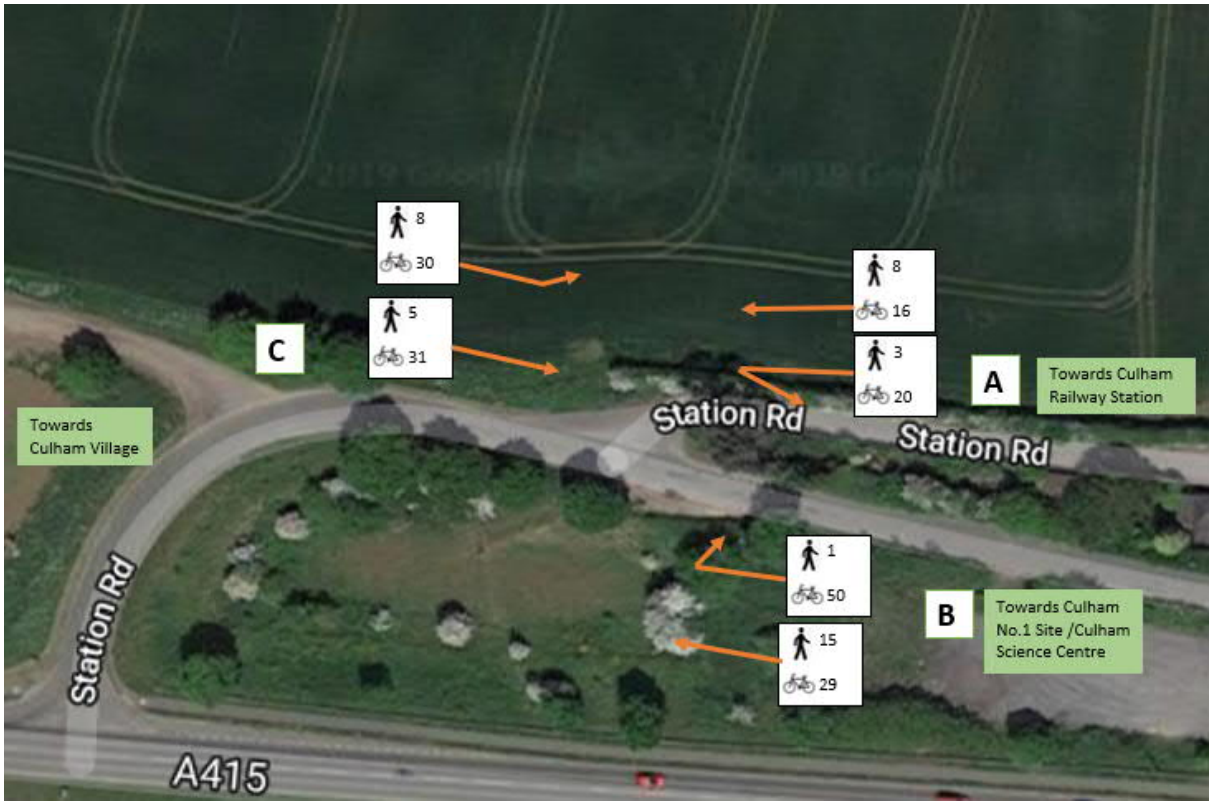
Map data © Google 2021

Figure 3.10: A4130 / Purchas Road / Hawksworth (PRoW 189/27/10) - Total NMUs observed (7-day survey period)



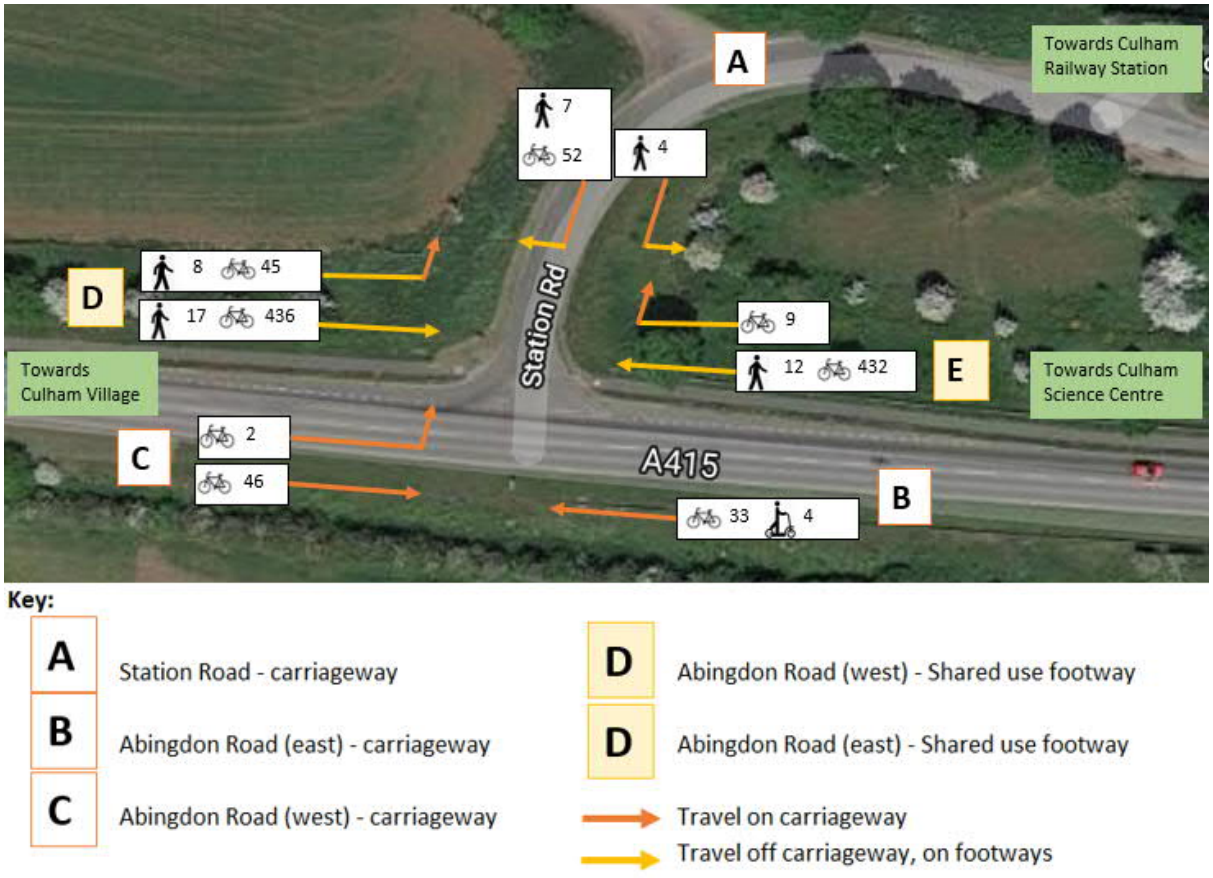
Map data © Google 2021

Figure 3.11: Culham Railway Station Entrance - Total NMUs observed (7-day survey period)



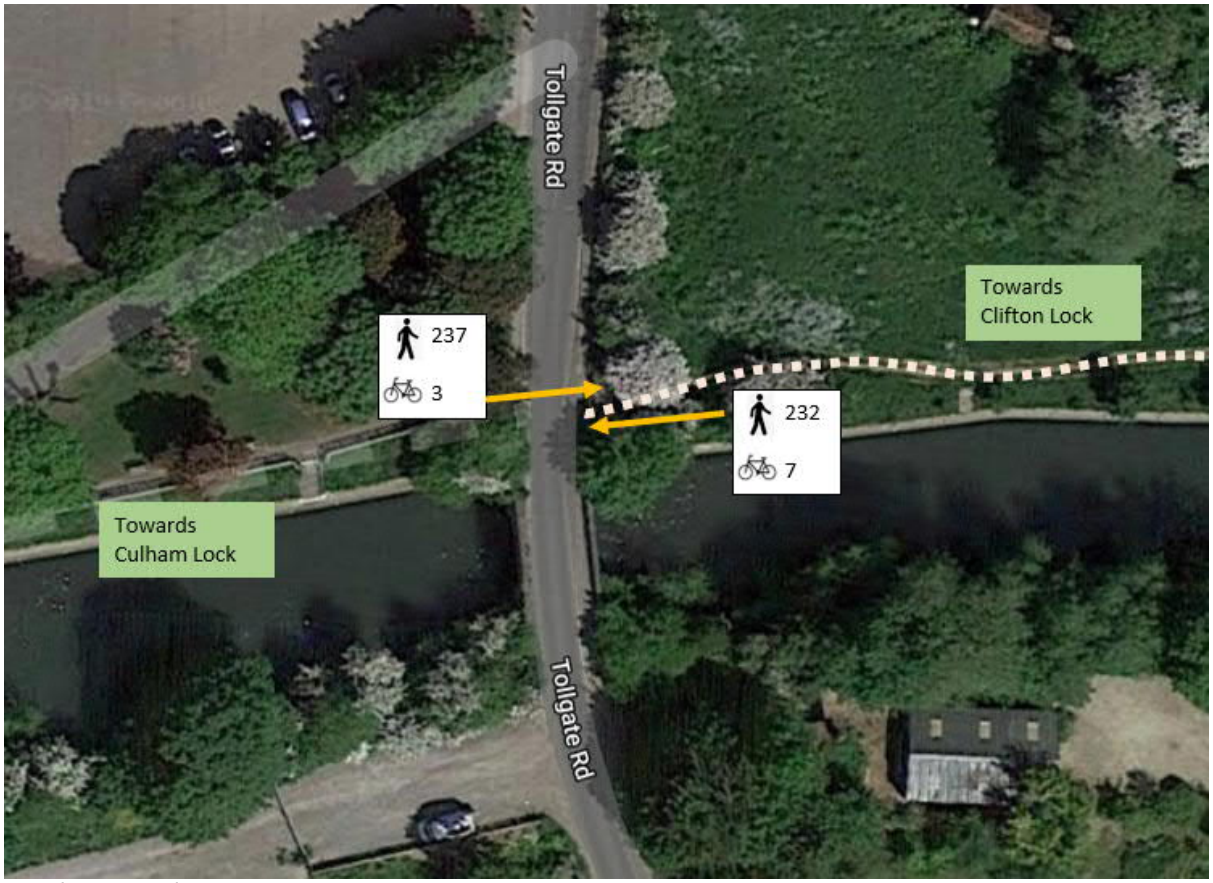
Map data © Google 2021

Figure 3.12: Station Road / Abingdon Road Junction - Total NMUs observed (7-day survey period)



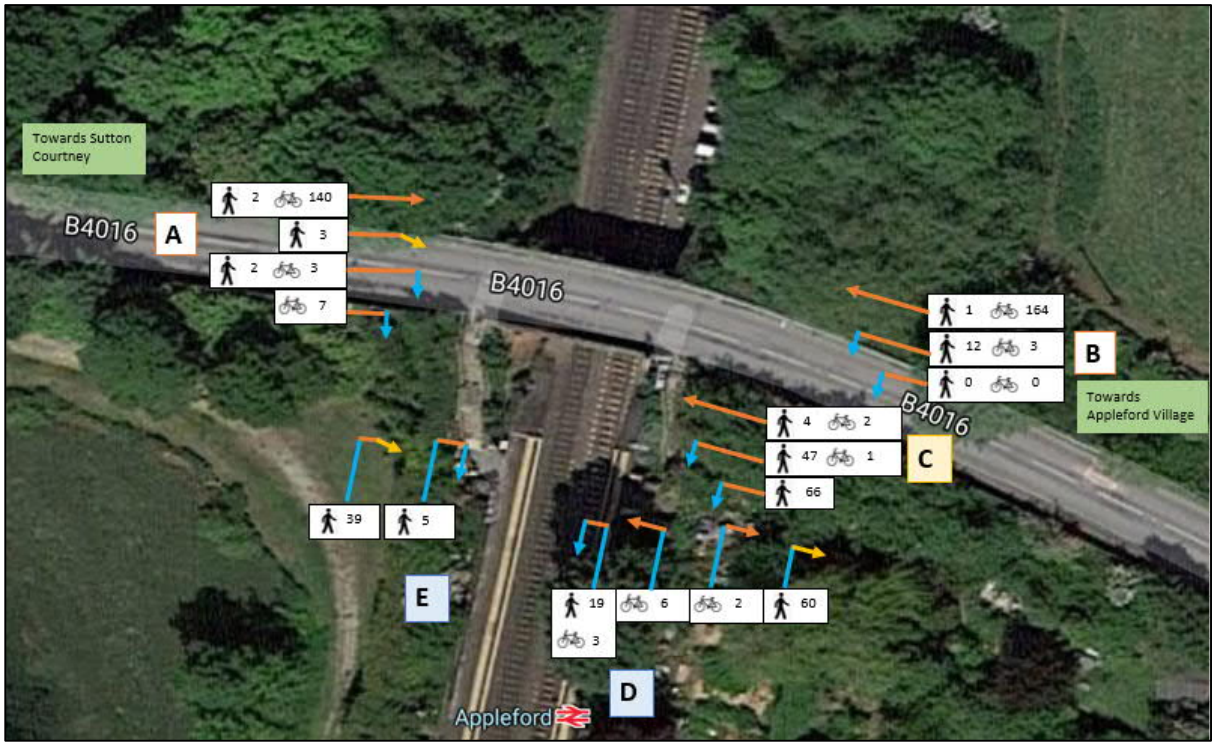
Map data © Google 2021

Figure 3.13: Thames Path at Tollgate Road, Culham (PRoW 183/11/80) - Total NMUs observed (7-day survey period)



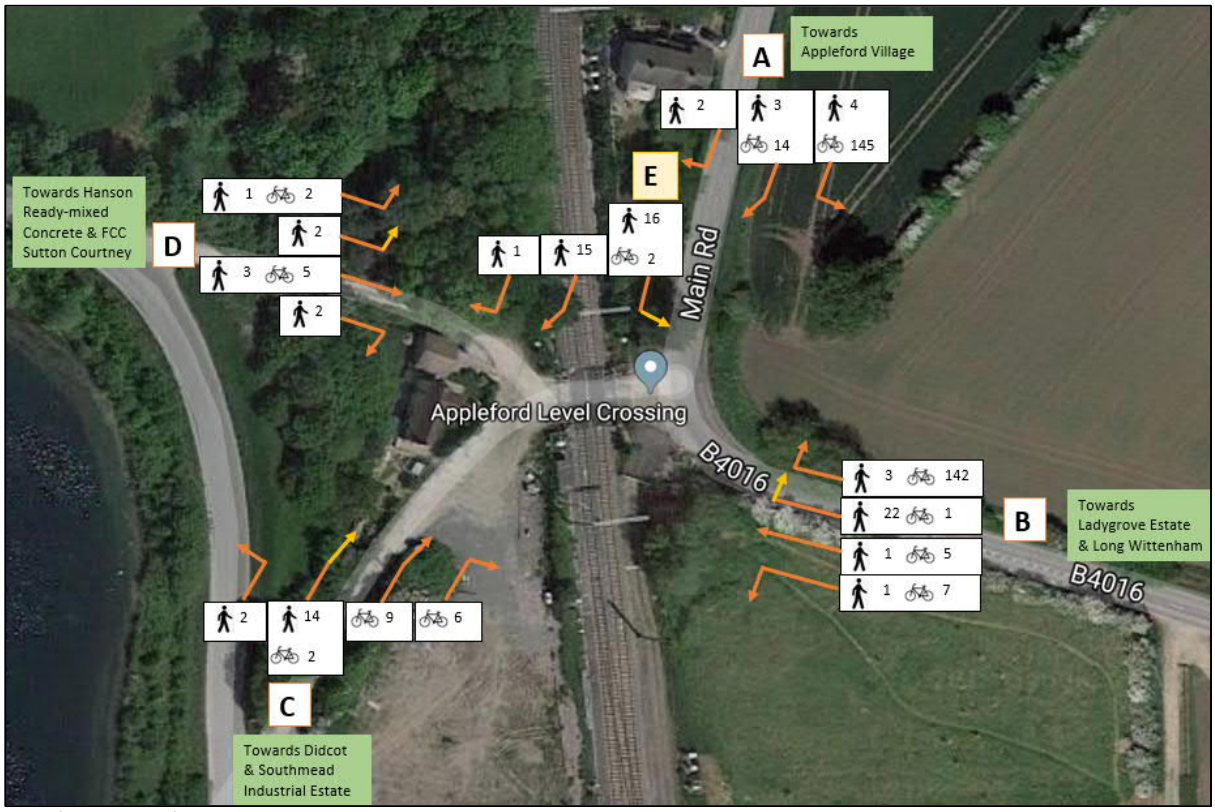
Map data © Google 2021

Figure 3.14: Appleford Railway Station - Total NMUs observed (7-day survey period)



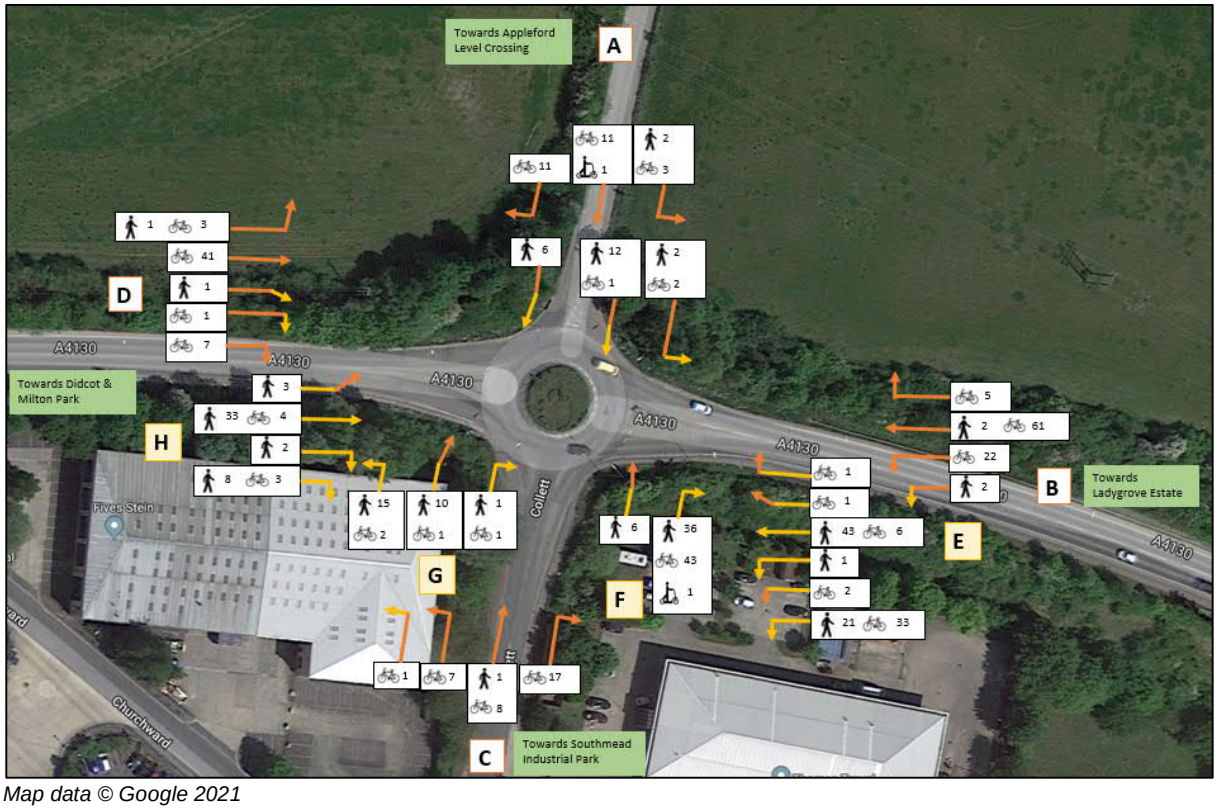
Map data © Google 2021

Figure 3.15: Appleford Level Crossing (PRoW 106/4/10) - Total NMUs observed (7-day survey period)



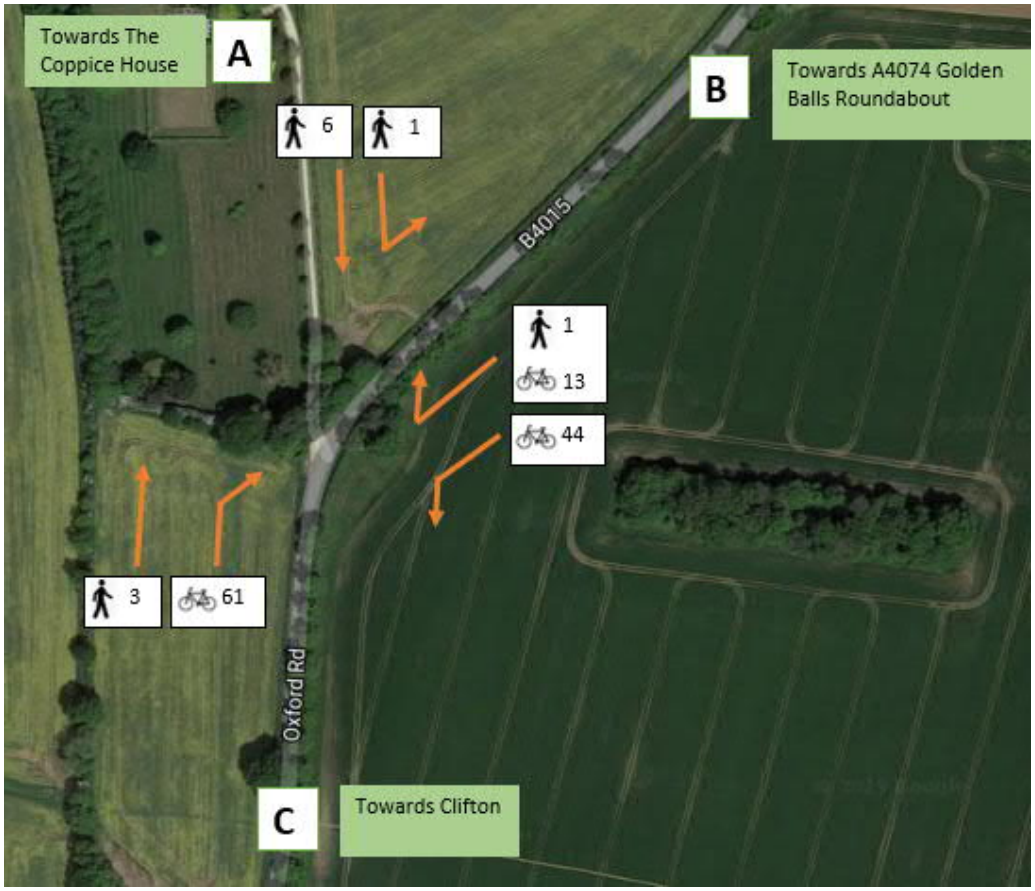
Map data © Google 2021

Figure 3.16: A4130 and Collett Road Junction - Total NMUs observed (7-day survey period)



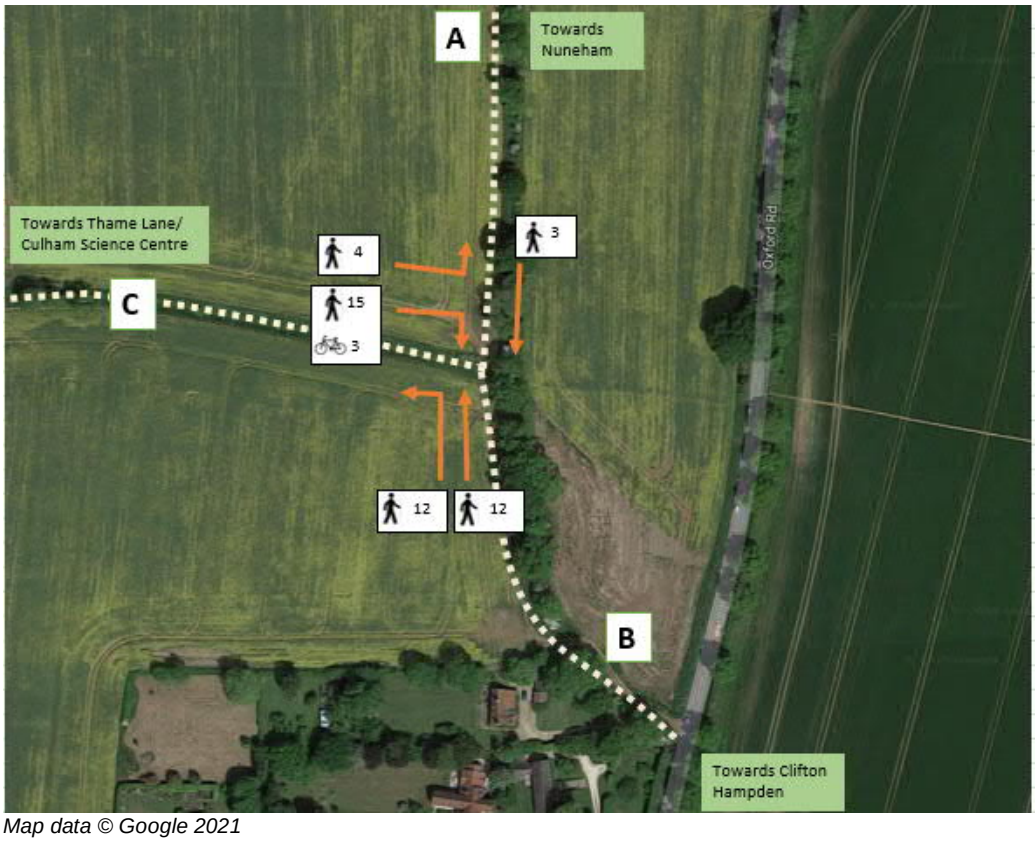
Map data © Google 2021

Figure 3.17: Junction of B4015 - Total NMUs observed (7-day survey period)



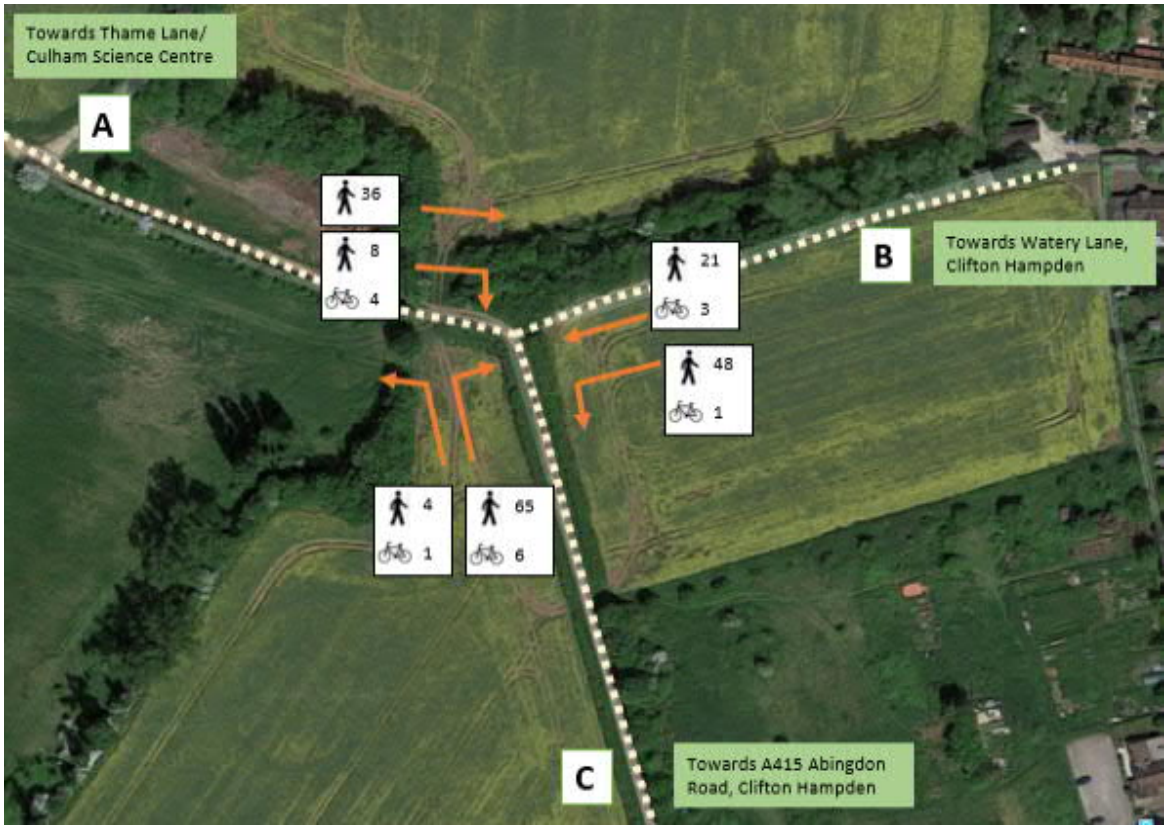
Map data © Google 2021

Figure 3.18: Footpath North of Clifton Hampden (PRoW 171/4/10) - Total NMUs observed (7-day survey period)



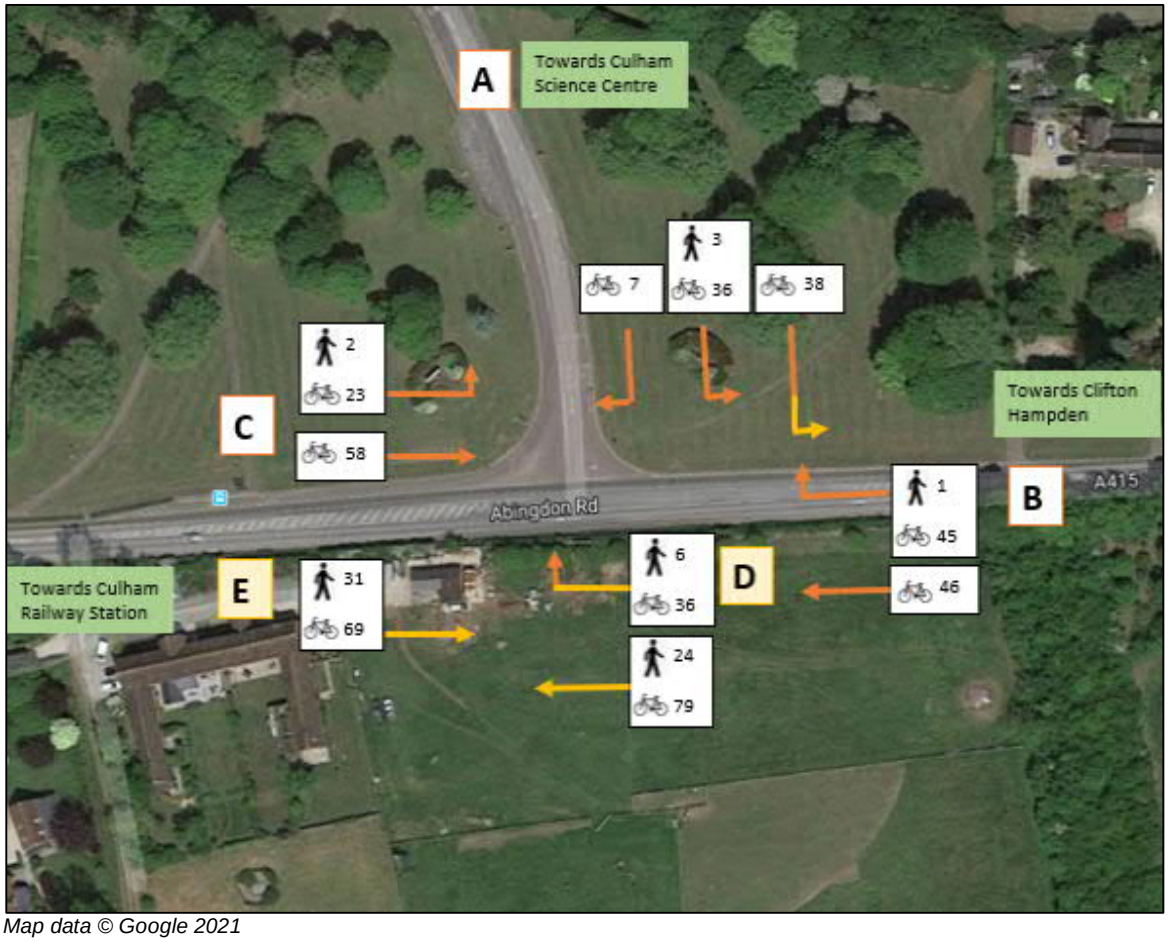
Map data © Google 2021

Figure 3.19: Footpath, junction on A415 (PRoW 171/2/10) - Total NMUs observed (7-day survey period)



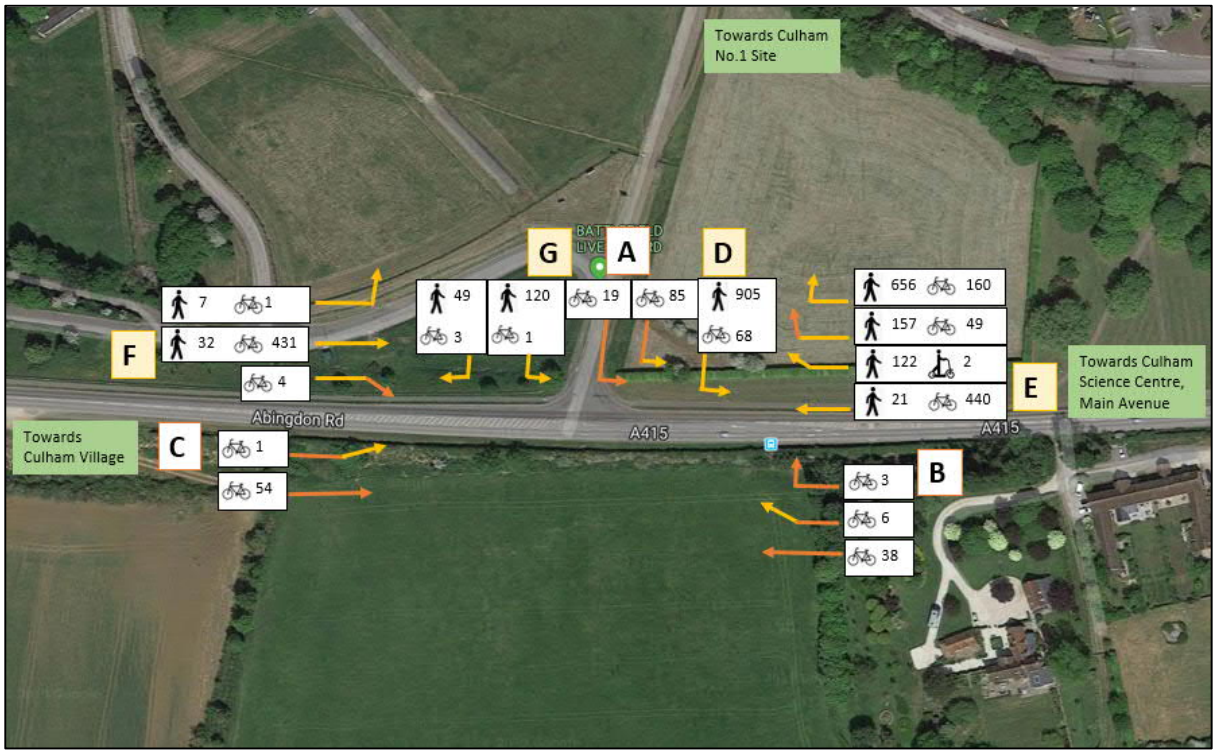
Map data © Google 2021

Figure 3.20: Culham Science Centre / A415 Junction - Total NMUs observed (7-day survey period)



Map data © Google 2021

Figure 3.21: Station Road / A415 Junction - Total NMUs observed (7-day survey period)



Map data © Google 2021

3.2.25 General observations regarding walking and cycling movements in the WCHAR Report found:

- NMU flows were generally higher during 0800-0900 and 1630-1730 along the A415 Abingdon Road suggesting that this is used as a commuter route.
- Pedestrians using public rights of way were mainly recorded during the weekend.

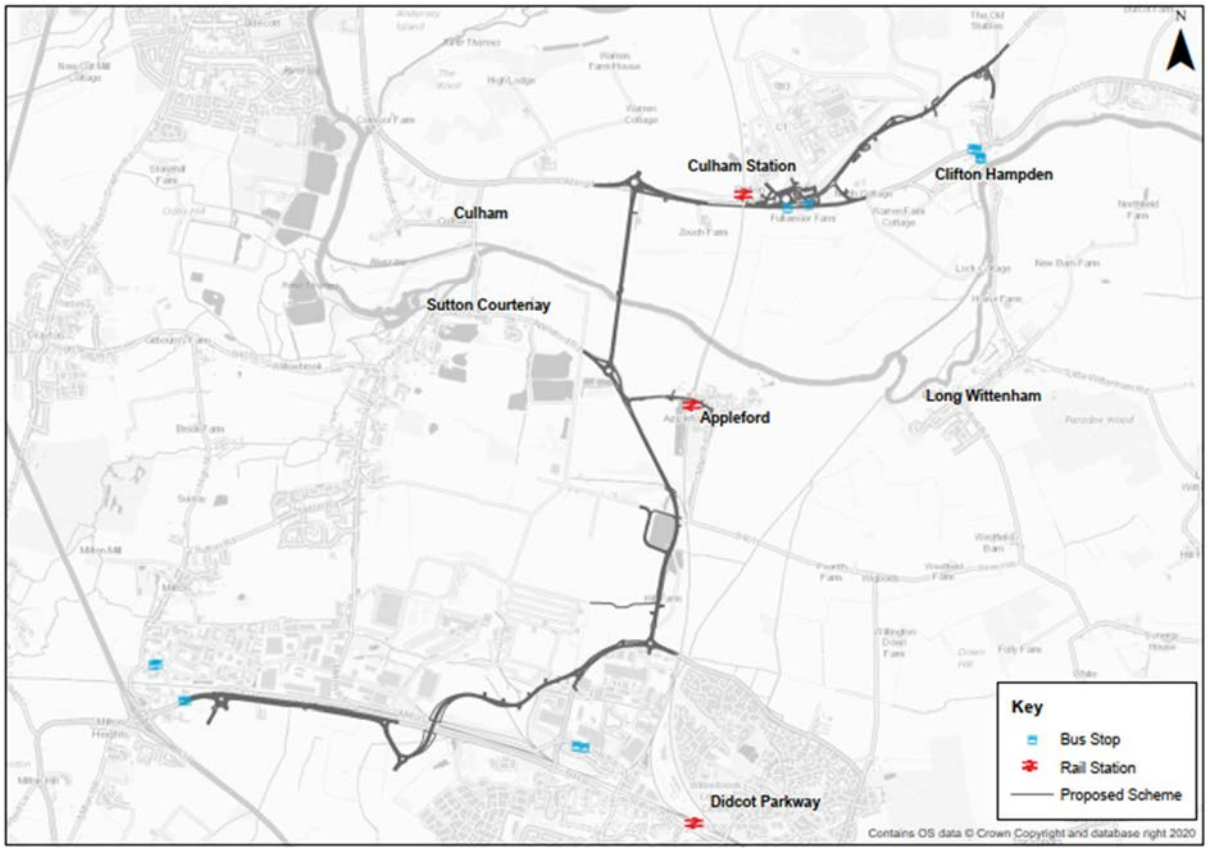
3.3 Public Transport Accessibility

Bus

3.3.1 There are 10 existing bus stops (five pairs) located along the length of the Proposed Scheme or within close proximity. There are two bus stops on the A4130 between Milton Gate and Backhill Tunnel with shelters. In Milton Park along Park Drive there is a pair of bus stops, both with bus shelters. There is a pair of bus stops on Basil Hill Road, both with bus shelters and live bus information is available at the westbound bus stop. There are two bus stops on the A415 Abingdon Road opposite the Culham Science Centre, both with bus shelters. There are two bus stops on the A415 Abingdon Road opposite Clifton Hampden Village Hall, a bus shelter is provided at the westbound bus stop only.

3.3.2 The bus stops are shown in Figure 3.22 below.

Figure 3.22: Public Transport Facilities



3.3.3 Table 3.2 identifies the bus routes that serve the bus stops along or near the Proposed Scheme.

Table 3.2: Local Bus Stops and Bus Routes

Bus Stop Name	Direction	Bus Routes
Milton Park, Sutton Courtenay Road Milton Park, Stop 14	Eastbound	33, 99C, X2, X32, X36
	Westbound	33, 99A, X2, X32, X36
Milton Gate	Eastbound	99A
	Westbound	99C
Foxhall Manor Park	Eastbound	33, 99C, X2, X32, X36
	Westbound	33, 99A, X2, X32, X36
Science Centre Entrance	Eastbound	45, 95
	Westbound	45, 95
Clifton Hampden Village Hall	Eastbound	45, 95
	Westbound	45, 95

3.3.4 Table 3.3 identifies the route and frequency of these services.

Table 3.3: Frequency of Local Bus Routes (Single Direction)

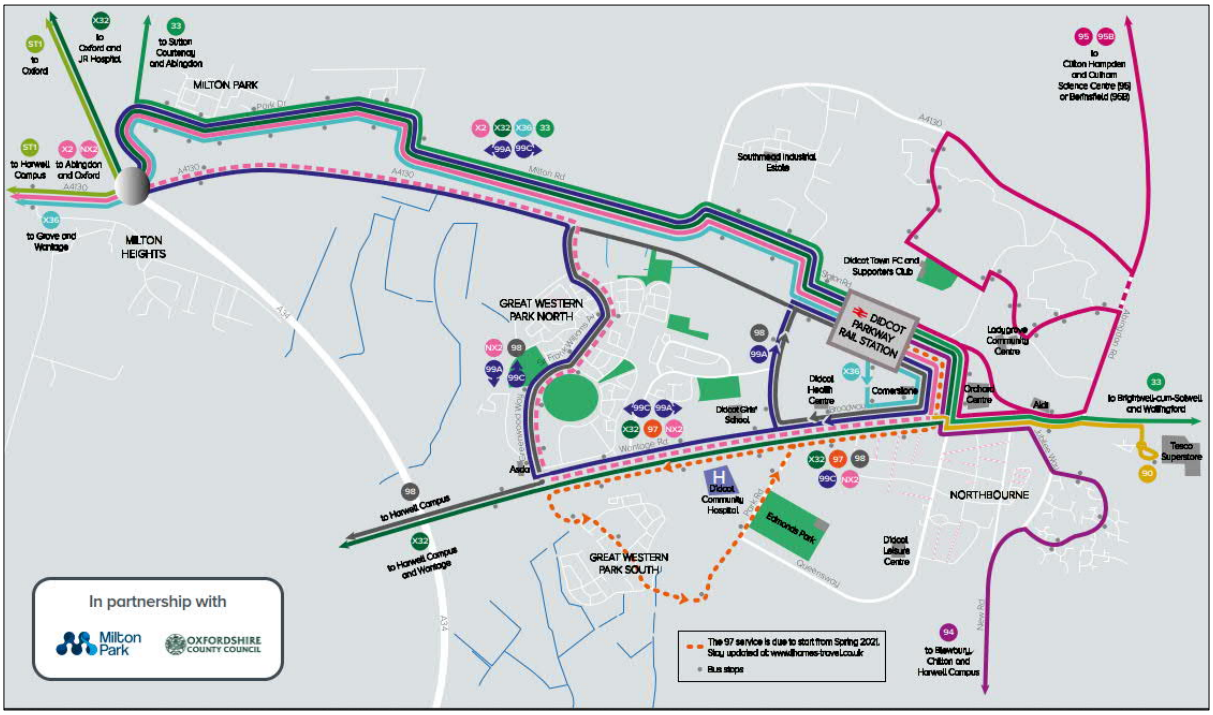
Service	Route	AM Peak 0800-0900	Off-Peak[1]	PM Peak 1700-1800
33	Abingdon – Sutton Courtenay – Milton Park – Didcot – Wallingford	1	1	2
99A	Didcot – Milton Park – Great Western Park – Didcot	0	1	2

[1] Average number of buses per hour taken between 0900-1700

Service	Route	AM Peak 0800-0900	Off-Peak[1]	PM Peak 1700-1800
99C	Didcot – Great Western Park – Milton Park – Didcot	2	1	0
X2	Oxford – Abingdon – Steventon – Milton Park – Didcot	3	3	3
X32	Oxford – Milton Park – Didcot – Harwell – Wantage	2	2	2
X36	Wantage – Grove – Steventon – Milton Park – Didcot	1	2	2
45	Abingdon – Culham Science Centre – Berinsfield – Cowley	2	0.5	2
95/ 95B	Didcot – Culham Science Centre	1	0	1

3.3.5 Bus routes in Didcot are shown in Figure 3.23 (extract from Thames Travel website; https://www.thames-travel.co.uk/maps-guides/).

Figure 3.23: Bus Routes in Didcot



3.3.6 From January 2021 the 33, X2 and X32 bus services have been running on enhanced timetables. The X32 service operates every 30 minutes between Oxford and Wantage via Didcot. The 33 service operates every 30 minutes between Wallingford and Didcot Parkway with one bus per hour continuing to Abingdon via Sutton Courtenay and Culham. The X2 service operates every 20 minutes between Oxford, Abingdon and Didcot.

3.3.7 Due to the severance created by the River Thames and the historic road network with limited crossings, there are poor opportunities for bus routes to offer good journey time reliability north / south in this area due to existing congestion, particularly during the AM and PM peaks. Prior to January 2021, the only service operating over Clifton Hampden Bridge was a less-than-daily service providing access to Didcot from local villages. Route 95 is a new service which commenced in January 2021 to provide a peak hour service from Didcot to Culham Science Centre - two morning journeys and three evening journeys. There is no off-peak service. The service is funded using S106 contributions from Culham Science Centre. Between peak times, three journeys in each direction operate a similar route from Didcot to Clifton Hampden, where they then go to Berinsfield (instead of Culham Science Centre). These journeys are numbered 95B and are operated with the bus that operates route 95, which would otherwise be unused.

3.3.8 The 33 is the only bus service that uses the Culham Cut and Sutton Bridge crossing of the River Thames. It operates a broadly hourly service running between Didcot and Abingdon via Sutton Courtenay and Culham village.

Rail

3.3.9 The nearest rail stations are Didcot Parkway, Appleford and Culham Stations. The Proposed Scheme passes within 1.8km of Didcot Parkway. The station serves the Great Western Mainline and Cherwell Valley Line, providing services to London Paddington, Oxford, Ealing Broadway, Bristol Temple Meads, Banbury and Cheltenham Spa. This station has an average of ten services per hour.

3.3.10 Appleford Station is located along the B4016 to the east of the Proposed Scheme and serves the Cherwell Valley Line, providing services to Banbury, Didcot and Oxford and has an average of one-two services per hour in the peaks, and fewer off-peak.

3.3.11 Culham Station is located in between Culham and Clifton Hampden and is served by Great Western Railway. Culham Station serves the Cherwell Valley Line, providing services to Banbury, Morton-in-Marsh, Oxford and Reading and has an average of one or two services per hour in the peaks, and fewer off-peak.

3.4 Highway Network

3.4.1 Within the extent of the Scheme, the A4130 is a dual carriageway between the Milton Interchange Roundabout and the Milton Gate junction, this is subject to 40mph speed limit.

3.4.2 The A4130 between the A4130/ B4493/ Mendip Heights roundabout and to the east of the Backhill Tunnel is subject to the national speed limit.

3.4.3 The B4493 is a 40mph single carriageway road which runs between the A4130 and Station Road. There is a 2m wide shared footway and cycleway on the south side of the carriageway with street lighting present.

3.4.4 Mendip Heights is a 30mph single carriageway road which serves a residential area. A 2m wide shared footway and cycleway are present on the eastern side of the carriageway with street lighting.

3.4.5 The A4130 between the A4130/ B4493/ Mendip Heights roundabout and A4130/ Milton Road/ Basil Hill Road roundabout is a 50mph single carriageway road with a narrow circa. 1m footway present on the eastern side of the carriageway. Street lighting is present along the A4130.

3.4.6 Milton Road is a 40mph single carriageway road with a 2.5m wide shared footway and cycleway along the southern side of the carriageway. Street lighting is present.

3.4.7 Basil Hill Road is a 30mph single carriageway road with 2.2m shared footway and cycleway on the northern side of the carriageway near the A4130/ Milton Road/ Basil Hill Road roundabout which leads into a 0.8m wide on-street cycle lane. A 0.8m cycle lane is also present on the southern side of the carriageway with street lighting provided.

3.4.8 The A4130 between the A4130/ Milton Road/ Basil Hill Road roundabout and the A4130/ Purchas Road/ Hawksworth junction is a 50mph single carriageway road. There is a 2.2m footway present on both sides of the carriageway with street lighting provided.

3.4.9 Hawksworth is a 30mph road which serves an industrial estate. Footways 1.5m wide are present on both sides of the carriageway with street lighting.

3.4.10 The A4130 between the A4130/ Purchas Road/ Hawksworth junction and the A4130/ Collett Roundabout is a 50mph single carriageway road. A narrow 1m footway is present on the eastern side of the carriageway with street lighting provided.

3.4.11 The B4016 within the extent of the Scheme is a single carriageway road with a national speed limit restriction that runs in an east-west direction between Appleford and Sutton Courtenay.

3.4.12 The A415 Abingdon Road is a single carriageway road which runs between Abingdon and Burcot. This road is subject to a 30mph speed limit through Clifton Hampden and a 40mph speed limit through Burcot. There is a 2m shared footway/ cycleway along the northern side of the carriageway between Thame Lane and Culham Science Centre. A 2m wide shared footway/cycleway is present on the south side of the A415 Abingdon Road from Culham Science Centre to Clifton Hampden. Street lighting is present at the Culham Science Centre.

3.4.13 The key existing junctions within the Scheme extents are:

- A34/ A4130 grade separated Milton interchange includes a five-arm signalised hamburger roundabout with a three-lane circulatory flaring to four lanes between the A34 north approach and A34 south exit arms. The A34 north approach widens to four lanes with a dedicated lane for Milton Park. There is a cut-through from the A4130 east arm providing access to the A34 northbound. The A34 approach arm flares to three lanes at the approach including a slip road leading to the A34 southbound arm. Park Drive provides access to Milton Park flaring to four lanes at the approach to Milton Interchange;
- A4130/ Milton Gate is a signalised priority T-junction. Milton Gate is the minor arm at this junction, providing access to several car dealerships and food retail units;
- A4130/ B4493/ Mendip Heights roundabout has a one lane circulatory with all arms having one lane apart from the A4130 west arm that flares to two lanes at the approach;
- A4130/ Milton Road/ Basil Hill Road roundabout has a one lane circulatory with the A4130 south arm widening to two lanes at the approach;
- A4130/ Hawksworth/ Purchas Road roundabout has a one lane circulatory with the A4130 north and south arms widening to two lanes at the approach;
- A4130/ Collett roundabout is a single circulatory roundabout with the A4130 and Collett approach arms widening to two lanes at the approach;
- Culham Station access junction is a priority T-junction with single lanes at each arm;
- The eastern access to the Culham Station is a priority junction with a right turn ghost island;
- Culham Science Centre priority T-junction with right turn ghost island. The Culham Science Centre access widens to two lanes at the approach with a dedicated right turn lane;
- A415/ High Street (Clifton Hampden) and A415/ B4015 Oxford Road is a staggered signalised junction. The A415 west arm widens to two lanes at the junction to provide a narrow dedicated right turn lane. The southern arm from long Wittenham travels over the historic narrow bridge which operates under signalised shuttle-working. The northern and eastern arms have single lane approaches, providing access to north Clifton Hampden/A4074 and the Burcot/Berinsfield/A4074 respectively; and
- The existing river crossing at Culham Village (Sutton Bridge and Culham Cut) is a historic narrow bridge crossing which operates under signalised shuttle-working. At the northern end is the A415/ Tollgate Road signalised junction and at the southern end B4016 Appleford Road/ Abingdon Road priority T-junction.

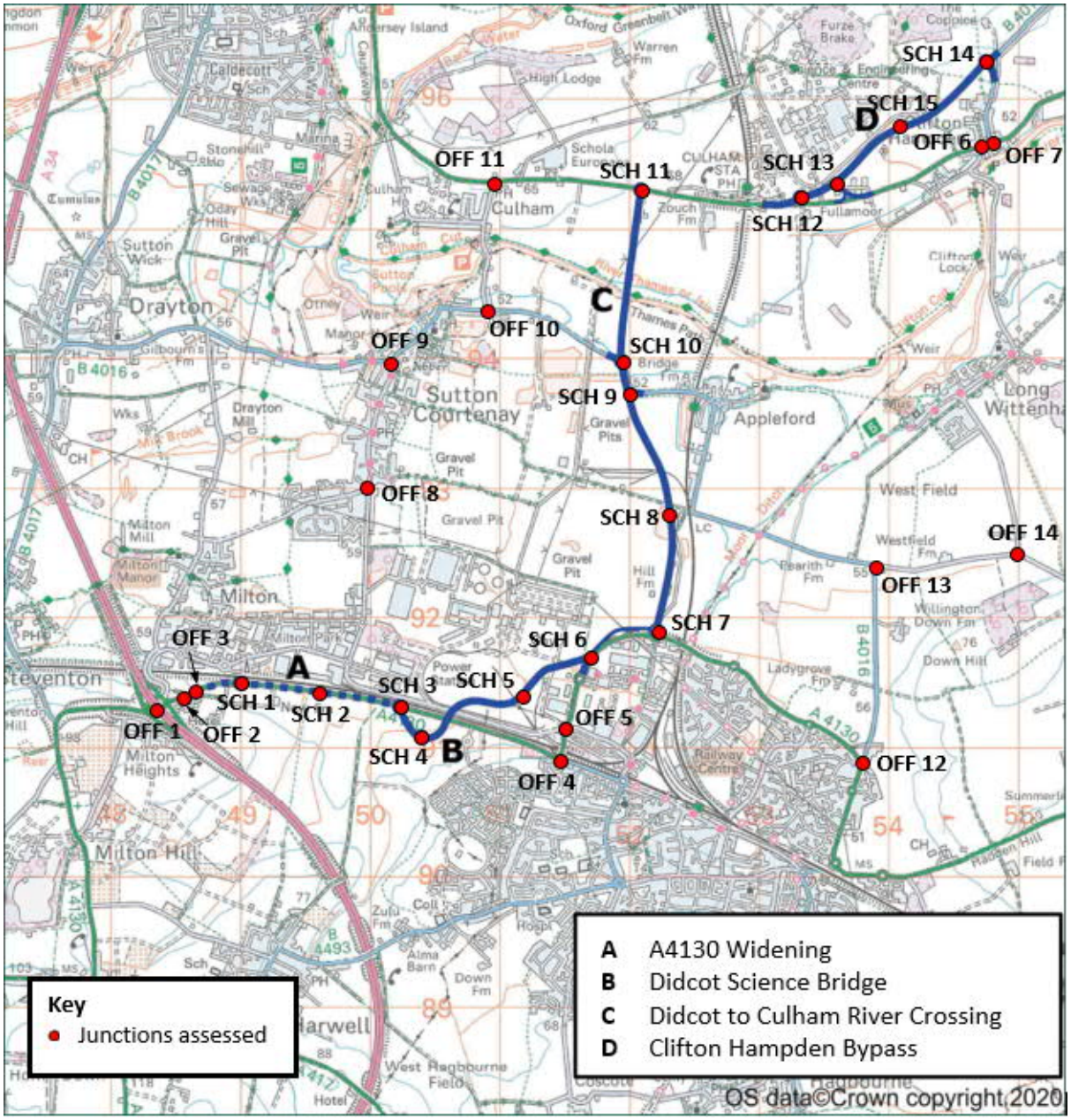
3.5 Junction Capacity Assessments

3.5.1 Capacity assessments of the junctions within the study area have been undertaken for the 2020 base year, using the following industry standard assessment tools:

- Junctions 9 for priority junctions and roundabouts; and
- LinSig for signalised junctions.

3.5.2 Figure 3.24 illustrates which junctions have been assessed below. The 2020 base year assessments are for the off-site junctions only (prefix ‘OFF’). New or amended junctions that form part of the Scheme have the prefix ‘SCH’.

Figure 3.24: Junction Locations



3.5.3 The following section provides a summary of the junction capacity modelling results, based on the modelled 2020 traffic flows, and provides a commentary on the junction operation.

3.5.4 Traffic data for the junction assessments has been obtained from the Didcot Paramics microsimulation model. This model was jointly funded by OCC, VoWHDC and SODC. The model is maintained and run on behalf of OCC by Systra. OCC/Systra provided the AM and PM peak hour junction turning movements for each of the scenarios considered. The 2020 modelled flows were calculated by adding housing and employment completions from 2017 to 2020, as advised by the Local Planning Authorities, to the Paramics 2017 base model. See 'Figure 5.2 Modelling Approach Methodology Diagram' for more information on the modelling methodology.

3.5.5 The performance of the priority junctions and roundabouts has been assessed by considering the ratio to flow capacity (RFC) for each of the approach arms. An RFC value of 0.85 or below indicates that the arm is operating within design capacity. An RFC value of 0.85 to 1.00 indicates that the approach is operating above design capacity but within theoretical capacity, while an RFC value of 1.00 or more indicates that the arm is operating above theoretical capacity and significant queuing and delays may occur.

3.5.6 Traffic flows have been entered into the models as 'one hour/ODTAB' profile which is a synthesised profile created from the peak hour Paramics turning movements. This profile includes 15 minutes

'warm up' and 'cool down' periods either side of the one hour traffic flows. This is to ensure that the model is sufficiently saturated at the beginning of the modelled hour and actual conditions on the network are simulated effectively. This also provides a level of robustness against a flat demand profile that can be used for congested junctions.

3.5.7 The performance of the signalised junctions has been assessed by considering the Degree of Saturation (DoS) for each of the approach arms. A DoS value of 90% or below indicates that the arm is operating within design capacity. A DoS value of 90% to 100% indicates that the approach is operating above design capacity but within theoretical capacity, while a DoS value of 100% or more indicates that the arm is operating above theoretical capacity where significant queuing and delays may occur. The results for the LinSig models also present the Mean Max Queue (MMQ) in PCUs. The Practical Reserve Capacity (PRC) of the signalised junctions is also presented in the modelling results tables along with the cycle time for the AM and PM peak hours.

3.5.8 For the signalised junctions, information was obtained from the local highway authority, OCC, regarding the existing signal timings including phasing, staging and intergreens. Junction operation has been optimised in LinSig, and cycle times have been set such that maximum green times for each phase as identified in the controller specification for the relevant time period are not exceeded. The input parameters for the junctions (cycle time, phase maximum, intergreens, etc) have been replicated for the 2024 and 2034 modelling without and with the Scheme, in order to provide a like-for-like comparison.

3.5.9 The DoS reported for signalised junctions is the equivalent to RFC reported for priority junctions and roundabouts for presenting the junction modelling results.

3.5.10 Geometric parameters for off-site junctions have been obtained from OS mapping.

3.5.11 A summary of the 2020 base junction capacity assessment results is set out in Table 3.4, with more detailed results provided in the following paragraphs. Milton interchange is currently subject to some congestion during the peaks, and due to the complexity of this junction the impact of the Scheme is considered separately (Section 6.9).

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

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

A4130 / Service Area Junction (OFF 2)

3.5.12 Table 3.5 identifies the existing operation of A4130 / Service Area priority junction for the AM peak hour (0800-0900) and PM peak hour (1700-1800). The Junctions 9 (PICADY) model outputs are provided in Appendix B.

Table 3.5: Operation of A4130 / Service Area Junction (OFF 2)

Movement	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
Service Area to A4130	0.60	2	0.55	1
A4130	0.31	0	0.38	1

3.5.13 The results above indicate that the junction operates with RFCs within the satisfactory level of performance in both the AM and PM peaks.

A4130 / Milton Gate Signalised Junction (OFF 3)

3.5.14 Table 3.6 identifies the operation of A4130 / Milton Gate signalised junction in 2020. The LinSig model outputs are also provided in Appendix B.

Table 3.6: Operation of A4130 / Milton Gate Junction (OFF 3)

Approach and Movement	AM		PM	
	DoS (%)	MMQ (PCUs)	DoS (%)	MMQ (PCUs)
A4130 West - Left Ahead	59.2%	8.0	40.6%	5.4
A4130 West - Ahead	59.2%	8.7	42.8%	6.1
Milton Gate - Right Left	25.0%	1.3	30.3%	1.5
A4130 East - Ahead	44.3%	5.4	22.9%	4.4
A4130 East - Ahead Right	88.3%	15.2	91.8%	18.3
Cycle Time	66 seconds		66 seconds	
PRC	7.4%		-2.0%	

3.5.15 The results above indicate that the junction operates within capacity in the AM peak hour with a PRC of 7.4% and a maximum DoS of 88% on the A4130 East ahead and right movement. The junction operates within theoretical capacity in the PM peak hour with a PRC of -2.0% and a maximum DoS of 92% on the A4130 ahead and east movement.

A4130 / B4493 / Mendip Heights Roundabout (OFF 4)

3.5.16 Table 3.7 identifies the existing operation of the A4130 / B4493 / Mendip Heights Roundabout in 2020. The Junctions 9 (ARCADY) model outputs are provided in Appendix B.

Table 3.7: Operation of A4130 / B4493 / Mendip Heights Roundabout (OFF 4)

Arm	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
A4130 (North)	0.49	1	0.66	2
B4493	0.54	1	0.73	3
Mendip Heights	0.08	0	0.10	0
A4130 (West)	0.62	2	0.43	3

3.5.17 The results indicate that the junction operates within capacity with an RFC of less than 0.85 in both peaks.

A4130 / Basil Hill Road / Milton Road (Power Station) Roundabout (OFF 5)

3.5.18 Table 3.8 identifies the existing operation of the A4130 / Basil Hill Road / Milton Road Roundabout. The Junctions 9 (ARCADY) model outputs are provided in Appendix B.

Table 3.8: Operation of A4130 / Basil Hill Road / Milton Road (Power Station) Roundabout (OFF 5)

Arm	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
A4130 (North)	0.79	4	0.61	2
Basil Hill Road	0.72	3	0.54	1
A4130 (South)	0.59	1	0.29	0
Milton Road	0.56	1	1.16	77
Access Road	0.08	0	0.12	0

3.5.19 The results of the junction assessment indicate that the A4130 (South) operates within capacity in the AM peak, with an RFC of less than 0.85. In the PM peak junction capacity is exceeded, with the RFC on the Milton Road approach at 1.16 and a queue of 77 vehicles. This results from the difficulty in turning out from Milton Road due to the high flows in the PM peak, which makes the model very sensitive to the levels of flow for this arm and the reported queue lengths become less reliable.

Clifton Hampden Signalised Junction (OFF 6 & OFF 7)

3.5.20 Table 3.9 identifies the operation of A415 / High Street / B4015 Oxford Road staggered signalised junction in 2020. The LinSig model outputs are provided in Appendix B.

Table 3.9: Operation of Clifton Hampden Signalised Junction (OFF 6 & OFF 7)

Approach & Movement	AM		PM	
	DoS (%)	Queue (PCUs)	DoS (%)	Queue (PCUs)
A415 Abingdon - Ahead Right Left	194.0%	149	175.7%	185
Internal Junction link Eastbound - East Ahead Left	62.6%	2	54.3%	2
A415 Burcot - Ahead Right	307.1%	173	335.8%	194
Internal Junction link Westbound - West Ahead Left Right	57.1%	6	51.8%	7
High Street - Right Left Ahead	151.4%	106	159.7%	62
Watery Lane Plough Inn - Left Right Ahead	0.0%	0	0.0%	0
B4015 Oxford Road - Left Right	107.6%	19	138.2%	62
Cycle Time	90 seconds		90 seconds	
PRC	-241.2%		-273.1%	

3.5.21 The results above indicate the junction operates above capacity in both the AM and PM peak hours, with PRCs of -241% and 273% respectively and significant queues reported on the A415 and High Street. The maximum DoS reported is 335.8% on the A415 Dorchester East approach in the PM peak hour.

Harwell Road / Milton Road / High Street Mini Roundabout (OFF 8)

3.5.22 Table 3.10 identifies the existing operation of the Harwell Road / Milton Road / High Street Roundabout in 2020. The Junctions 9 (ARCADY) model outputs are provided in Appendix B.

Table 3.10: Operation of Harwell Road / Milton Road / High Street Mini Roundabout (OFF 8)

Arm	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
High Street	0.39	1	0.26	0
Harwell Road	0.21	0	0.54	1
Milton Road	0.27	0	0.17	0

3.5.23 The results of the assessment indicate that the junction operates within capacity with a maximum RFC below 0.85 in both peaks.

High Street / Church Street / Brook Street Junction (OFF 9)

3.5.24 Table 3.11 identifies the operation of High Street / Church Street / Brook Street priority junction in 2020. The junction is formed out of three small priority junctions forming a triangle, and each junction has been assessed separately. The Junctions 9 (PICADY) model outputs are provided in Appendix B.

Table 3.11: Operation of High Street / Church Street / Brook Street Junction (OFF 9)

Movement	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
High Street to High Street				
High Street (North) to High Street	0.41	1	0.36	1
High Street (South) to High Street (North)	0.44	1	0.89	7
High Street to Church Street				
High Street to Brook Street/Church Street	0.58	1	1.19	47
Brook Street to High Street	0	0	0	0
High Street to Brook Street				
High Street to Brook Street/Church Street	0.11	0	0.16	0
Church Street to High Street	0.23	1	0.07	0

3.5.25 The results above indicate that the junction operates within capacity with a maximum RFC of less than 0.85 in the AM peak hour. In the PM peak, the junction operates above absolute capacity with a maximum RFC of 1.19 and right turn queue of 47 vehicles. This is a result of the difficulty in turning out of the junction due to the high flows on Brook Street / Church Street and makes the model very sensitive to the levels of flow for this movement. The reported queue lengths therefore become less reliable.

Tollgate Road / Abingdon Road Junctions (OFF 10 and OFF 11)

3.5.26 The operation of the B4016 Appleford Road/Abingdon Road junction (OFF 10) and A415 / Tollgate Road junction (OFF 11) have been assessed based on a LinSig network provided by OCC that includes both junctions as well as the traffic signals that control single lane running across the Culham Bridges located between the two junctions.

3.5.27 LinSig does not allow for the effect of queuing back from one junction to an adjacent junction and the impact this can have on junction capacity. This is known to occur at the B4016 Appleford Road/Abingdon Road and A415/Tollgate Road junctions. To account for this the model utilises the Underutilised Green Time function within LinSig.

3.5.28 Table 3.12 identifies the operation of the Tollgate Road/Abingdon Road junctions in 2020. The LinSig model outputs are provided in Appendix B.

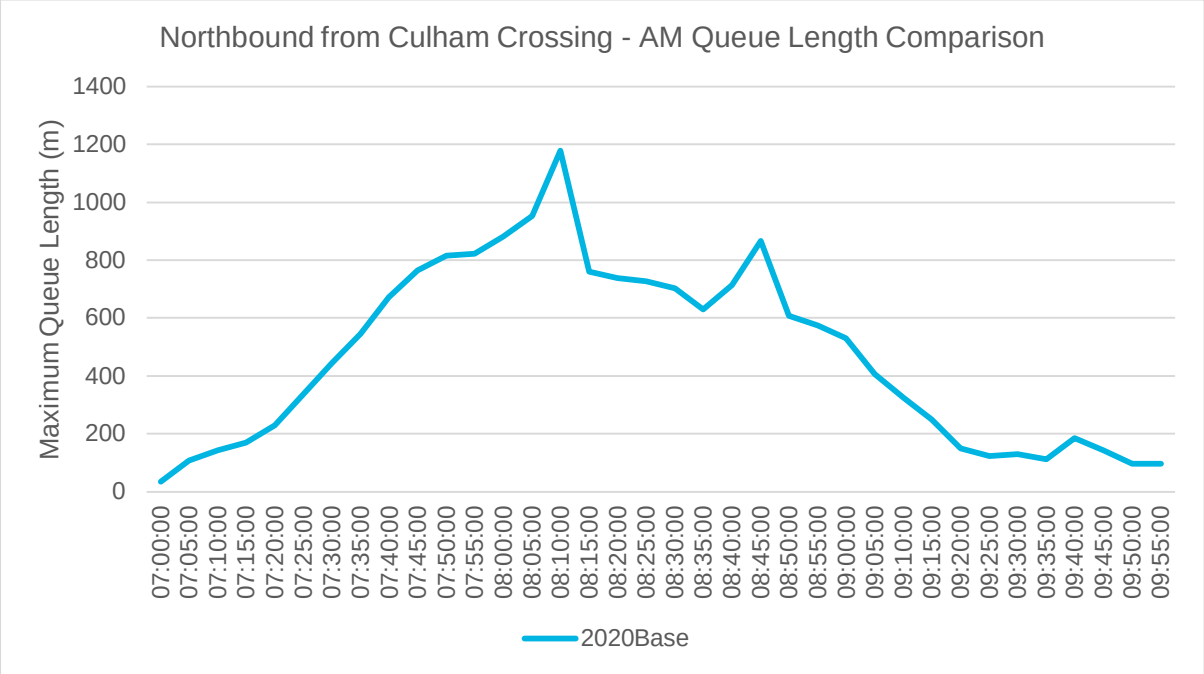
Table 3.12: Operation of Tollgate Road / Abingdon Road Junctions (OFF 10 & OFF 11)

Approach & Movement	AM		PM	
	DoS (%)	Queue (PCUs)	DoS (%)	Queue (PCUs)
A415 / Tollgate Road Junction Signals				
Abingdon Rd (E) - Ahead Left	67%	8	103%	37
Tollgate Road – Right Left	110%	38	99%	16
Abingdon Rd (W) - Ahead Right	100%	28	92%	10
Culham Bridges Signals				
Culham Bridges Northbound - Ahead	110%	51	94%	20
Culham Bridges Southbound – Ahead	49%	11	93%	24
Appleford Road / Abingdon Road Priority Junction				
Appleford Rd (E) – Right Ahead	14%	0	13%	0
Appleford Rd (W) – Left Ahead	30%	0	33%	0
Abingdon Road – Left Right	29%	7	46%	18
Cycle Time	154 / 111 seconds		154 / 111 seconds	
PRC (over all lanes)	-22.3%		-14.1%	

3.5.29 The results above indicate that the network is operating over capacity in both the AM and PM peaks, with PRCs of -22% and -14% respectively. In the AM peak long northbound queues are shown to occur at the Abingdon Road/Tollgate Road junction and at the Culham Bridges. In the PM peak queues are indicated on Abingdon Road (E) arm of the Tollgate Road junction and at the Culham Bridges in both directions.

3.5.30 These junctions are complex to model due to the interaction of queuing back between them, particularly the uncontrolled priority junction at the south. For example, the Culham Bridges Northbound AM predicted queue is 51 PCUs which would queue back to/through Appleford Road / Abingdon Road priority junction, however LinSig does not take account of this as shown by the predicted queue of 0 PCU on the Appleford Road (W) arm. There is a known queue on this arm in the AM peak. To further interrogate this, queue lengths have been extracted from the Paramics model to compare how the junction operates across different model platforms. Paramics takes account of the whole modelled network including interaction between adjacent junctions. In Paramics, a vehicle is determined to be in a queue when the speed drops below 4.47 mph and the distance to the vehicle in front is less than 10 metres.

Figure 3.25: Culham Crossing Queue Length



3.5.31 Figure 3.25 above shows that the Paramics model indicates a queue in the AM peak extending from the northbound signals before the bridge, back for 500m to 1180m across the 0800-0900 AM peak. This is known locally, with queues often extending past the George & Dragon Public House. The queueing in this area is the subject of OCC's objections to applications of single dwellings on grounds of highway safety, convenience and sustainability. These objections have led to Local Planning Authority (LPA) refusals which have been upheld at appeal by the Planning Inspectorate.

A4130 / Lady Grove Junction (OFF 12)

3.5.32 Table 3.13 identifies the existing operation of A4130 / Lady Grove priority junction in 2020. The Junctions 9 (PICADY) model outputs are provided in Appendix B.

Table 3.13: Operation of A4130 / Lady Grove Junction (OFF 12)

Movement	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
A4130 to Lady Grove (North)	0.52	1	0.15	0
A4130 to Lady Grove (South)	0.68	2	0.61	2
Lady Grove (North) to A4130	0.43	1	0.97	19

3.5.33 The results above indicate that the junction operates within capacity in the AM peak. In the PM peak the junction operates within capacity, although the maximum RFC exceeds the desirable maximum of 0.85 on the Lady Grove (North) arm, indicating that the junction is operating at close to its capacity.

Lady Grove / Sires Hill Junction (OFF 13)

3.5.34 Table 3.14 identifies the existing operation of Lady Grove / Sires Hill priority junction for the AM peak hour (0800-0900) and PM peak hour (1700-1800). The Junctions 9 (PICADY) model outputs are provided in Appendix B.

Table 3.14: Operation of Lady Grove / Sires Hill Junction (OFF 13)

Movement	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
Lady Grove to Sires Hill (East)	0.94	4	0.10	0
Lady Grove to Sires Hill (West)	0.95	10	0.47	1
Sires Hill East to Sires Hill (West)	0.17	0	0.48	1

3.5.35 The results above indicate that the junction operates within capacity in both the AM and PM peak hours. However, the maximum RFC exceeds the desirable maximum of 0.85 in the AM peak hour on the Lady Grove arm, indicating that the junction is operating at close to its capacity. The maximum RFC reported is on the Lady Grove to Sires Hill (west) movement with a maximum RFC of 0.95.

Sires Hill / Didcot Road Junction (OFF 14)

3.5.36 Table 3.15 identifies the existing operation of Sires Hill / Didcot Road priority junction in 2020. The Junctions 9 (PICADY) model outputs are provided in Appendix B.

Table 3.15: Operation of Sires Hill / Didcot Road Junction (OFF 14)

Movement	AM		PM	
	Max RFC	Queue (Vehicles)	Max RFC	Queue (Vehicles)
Sires Hill (South) - Sires Hill (West)	0.16	0	0.29	0
Sires Hill (South) - Didcot Road	0.18	0	0.13	0
Sires Hill (West) - Sires Hill (South)	0.26	1	0.20	0

3.5.37 The results above indicate that the junction operates within capacity in both the AM and PM peaks.

3.6 Summary of Existing Road Network Performance

3.6.1 As per the VoWHDC Local Plan Part 1 Inspector's Report (2016), "*the 'starting point' situation for the Vale is as a district which very much suffers from traffic congestion*." A high level of congestion is evident on the A4130, on the existing river crossings between Didcot and Culham/Clifton Hampden and within Clifton Hampden. The local highway infrastructure has failed to keep pace with growth in the area, and the railway lines and the River Thames clearly create barriers to connectivity between homes and jobs. This has led to Oxfordshire County Council (OCC), as local highway authority (LHA), objecting to the applications of single dwellings on grounds of highway safety, convenience and sustainability. These objections have led to Local Planning Authority (LPA) refusals which have been upheld at appeal by the Planning Inspectorate.

3.6.2 Table 3.4 above summarises the network performance, with many of the junctions at or over capacity in one or both peaks. This is particularly evident at the staggered signalised junction in Clifton Hampden (OFF 6 and OFF 7) and the existing river crossing at Culham / Sutton Courtenay (OFF 10 and OFF 11). The additional queue length data from the Paramics model used to support the analysis of the existing river crossing at Culham and Sutton Courtenay shows queues almost 1.2km long in the AM peak through Sutton Courtenay. Later sections of this report present the impact of additional growth on the road network, if unmitigated without the proposed Scheme. Consideration should also be given to non-motorised users (NMU), who in many locations are currently forced to share the congested road network with vehicles due to lack of suitable dedicated NMU provision.

3.7 Road Safety

3.7.1 Collision data has been obtained from Oxfordshire County Council for a five-year period between 9th June 2014 and 8th June 2019. There was a total of 150 collisions recorded within the Scheme extents resulting in 189 casualties. The injury severity is summarised by year for collisions in Table 3.16 and casualties in Table 3.17. The data does not show any clear evidence of deterioration or improvement in road safety in the study area.

3.7.2 The collision data includes part of the A34 road and the Milton Interchange roundabout. As a consequence, the results show more collisions than the immediate Scheme area.

Table 3.16: Total Collisions by Severity

Severity/ Year	2014 (part)	2015	2016	2017	2018	2019 (part)	Total
Fatal	0	0	0	0	1	0	**1**
Serious	4	6	7	7	3	0	**27**
Slight	24	26	19	28	15	10	**122**
Total	**28**	**32**	**26**	**35**	**19**	**10**	**150**

Table 3.17: Total Casualties by Severity

Severity/ Year	2014 (part)	2015	2016	2017	2018	2019 (part)	Total
Fatal	0	0	0	0	1	0	**1**
Serious	4	6	7	8	3	0	**28**
Slight	33	31	29	34	22	11	**156**
Total	**37**	**37**	**36**	**42**	**26**	**11**	**189**

3.7.3 Between 9th June 2014 and 8th June 2019, 31 incidents were recorded at the A4130 Milton Interchange There was one fatal collision recorded which involved a car and a motorcycle rider at the A4130 Milton Interchange Roundabout junction with the A4130. The speed limit of the road was 40 mph. A contributory factor to this incident was disobeying traffic signals. Approximately half of the incidents recorded at the Milton Interchange occurred in 2014 and 2015 before the Milton Interchange improvement scheme was implemented changing the layout of the roundabout to a hamburger roundabout.

3.7.4 For the purposes of this assessment, a cluster site has been defined as an area with seven or more collisions within a 100m radius over a 5-year period. A cluster site was identified in the study area at the A4130 / Milton Road / Basil Hill Road roundabout. A total of 12 collisions were reported within the study period, of which five were serious and seven were slight in severity. All five serious collisions involved vehicles entering the roundabout from the A4130 and failure to give way to cyclists negotiating the roundabout from Milton Road on the west towards Basil Hill Road on the east. Three of these collisions occurred during the hours of darkness and two during daylight hours.

3.7.5 Of the seven slight collisions, five collisions involved a vehicle entering the roundabout from the A4130 and failure to give way to cyclists negotiating the roundabout from Milton Road on the west towards Basil Hill Road on the east. All these collisions occurred during daylight hours, and three of these took place in wet conditions. The two remaining slight collisions involved a HGV failing to give way to a motorcyclist during dry, dark conditions, and an incident involving a vehicle colliding with a cyclist travelling on the nearside on the A4130 approach to the A4130 / Milton Road / Basil Hill Road roundabout.

3.7.6 There is a developer promoted scheme being submitted to alter the 5-arm roundabout which will provide additional crossing points, new footway/cycleway provision and traffic calming features on the roundabout approaches to improve safety for cyclists (refer to Figure 6.16). Therefore, no significant sites have been identified that need to be changed as part of the Scheme.

3.7.7 The collision data and maps can be found in Appendix C.

4. Development Proposals

4.1 Introduction

4.1.1 This section of the TA identifies the key aspects of the development proposals. The objectives of the proposed Scheme are:

- Directly unlock delivery of new homes in the area as allocated in Vale of White Horse District Council and South Oxfordshire District Council Local Plans;
- Unlock thousands of new jobs across existing and new employments sites in the area;
- Ensure the impact of additional housing on the transport network is acceptable;
- Provide real mode choice by future proofing new infrastructure; and
- Reduce congestion in the parishes surrounding Didcot to the north.

4.1.2 The Scheme comprises of the following four separate but interdependent highway schemes:

- A4130 Widening;
- Didcot Science Bridge;
- Didcot to Culham River Crossing; and
- Clifton Hampden Bypass.

4.1.3 Details of the Scheme are shown on the following drawings, which form part of the planning application submission, and are described in Sections 4.2 to 4.5 of this report.

Highways General Arrangement Plans

- Drawing numbers GEN_PD-ACM-GEN-DGT_ZZ_ZZ_ZZ-DR-T-0001 to 0019

Typical Cross Sections

- Drawing numbers GEN_PD-ACM-GEN-DGT_ZZ_ZZ_ZZ-DR-T-0021 to 0026

Highway Swept Paths

- Drawing numbers GEN_PD-ACM-HSP-DGT_ZZ_ZZ_ZZ-DR-T-0001 to 0039

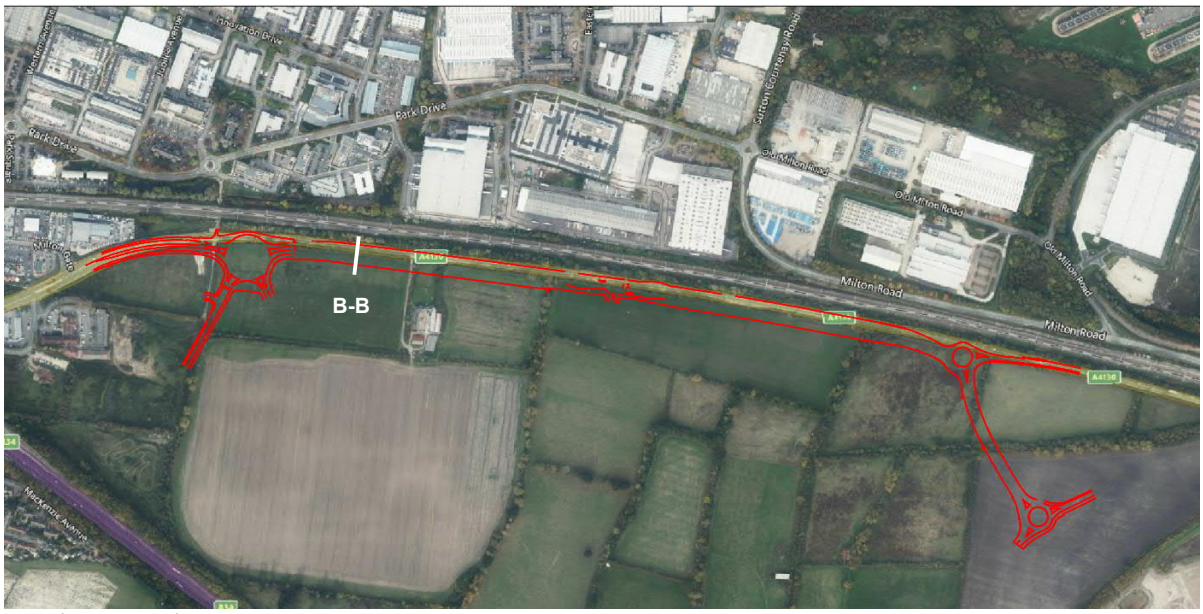
Highway Visibility Splays

- Drawing numbers GEN_PD-ACM-HML-DGT_ZZ_ZZ_ZZ-DR-T-0001 to 0019

4.2 A4130 Widening

4.2.1 The A4130 Widening proposed layout is shown in the following Figure.

Figure 4.1: A4130 Widening Layout Plan



Map data © Google 2021

4.2.2 This part of the Scheme comprises a dual-carriageway from a point approximately 250 m east of Milton Interchange at the junction with Milton Gate, eastwards for approximately 1.6 km to the proposed eastern roundabouts connecting into the future development at Valley Park and the Didcot Science Bridge scheme. Dualling of the A4130 will consist of modifications to the existing single carriageway, establishment of a central reserve and provision of two additional lanes to the south. The existing single carriageway will form the eastbound carriageway towards Didcot and the newly constructed lanes will form the westbound carriageway to the A34 Milton Interchange.

4.2.3 A four-arm roundabout at the western end of the scheme is proposed to serve an area located immediately south-west of this roundabout, which has been subject to approved outline development proposals for Roadside Services and Facilities (planning application reference P15/V2880/O). This 'Backhill roundabout' will also provide access to the 'North West of Valley Park' strategic housing allocation site, to the south and east.

4.2.4 A new signalised T-junction is proposed approximately 600 m east of the Backhill roundabout, which will provide access to the 'Valley Park' strategic housing allocation site, which is the subject of an outline planning application P14/V2873/O, with a resolution to grant permission subject to Section 106 agreement.

4.2.5 A new three-arm 'Old A4130' roundabout is proposed 600 m east of the signalised junction. The eastern arm will be the current A4130, that is to be retained as a single carriageway, providing access into Didcot. The south eastern arm is proposed to be an approximately 260 m single carriageway road connecting to the new Didcot Science Bridge three-arm roundabout. The Didcot Science Bridge roundabout will provide access to the new Didcot Science Bridge to the north, and Valley Park housing development to the south. Access at this location is already being secured through the outline planning application for Valley Park.

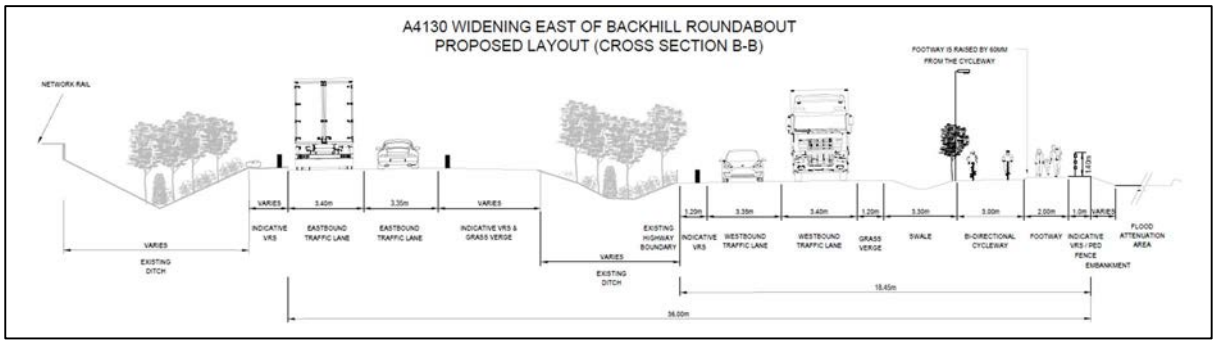
4.2.6 The road corridor will also include a bi-directional segregated cycleway and a footway on the southern side of the dual carriageway, as well as several formal crossing points and buffer.

4.2.7 Along the length of this section of the Scheme, dedicated two-way, off-carriageway, cycling and walking facilities will be provided. East of the Milton Gate junction, the Scheme will include a shared, cycle and footway adjacent to the eastbound and westbound carriageways. This will link to the existing NMU only Backhill Tunnel, and extend around the northern side of Backhill roundabout, where an in-line Toucan crossing (east of the roundabout) will be provided allowing users to cross both carriageways. Dedicated cycling and walking facilities and raised Parallel crossings will also be included around the southern side of Backhill roundabout. The existing toucan crossing by Backhill Tunnel will be replaced by an in-line Toucan crossing over the new dual carriageway to the west of the new roundabout. To the east of Backhill roundabout, a dedicated two-way cycleway and new footway will be provided to the south of the widened and new sections of the road, up to and including the Science Bridge roundabout, and will continue over the Science Bridge.

4.2.8 A shared walking and cycling crossing will be included at the access to the Valley Park development (western access). Additionally, a shared crossing will be provided across both carriageways, which will provide access to the eastbound bus stop (with bus shelter and cycle stands on the southern side). A Toucan crossing will be included across the new A4130 immediately south of the Northern roundabout. This will provide access to the existing shared path for cyclists and pedestrians along the current alignment of the A4130 linking to Didcot.

4.2.9 An indicative cross section for the A4130 widening scheme is presented in Figure 4.2 below.

Figure 4.2: A4130 Widening - Proposed Layout



4.2.10 Figure 4.2 shows that the proposed A4130 widening scheme includes a 3m wide bi-directional cycleway and a 2m wide footway which is raised 60mm above the cycleway. There is a grass verge and swale area separating the bi-directional cycleway from the highway creating a more pleasant environment for NMUs. The GA plans listed in paragraph 4.1.2 show how it is proposed to maintain pedestrian and cycle priority across side roads.

4.3 Didcot Science Bridge

4.3.1 The Didcot Science Bridge proposed layout is shown in the following Figure.

Figure 4.3: Didcot Science Bridge Layout Plan

Map data © Google 2021

4.3.2 This section of the proposed scheme is a new north-south bridge from the proposed Didcot Science Bridge roundabout, over the existing A4130, the Great Western Railway Mainline, and Milton Road, into the former Didcot A Power Station site. The proposed Science Bridge Link Road (SBLR) will connect the bridge with the A4130 Northern Perimeter Road north of the Purchas Road/Hawksworth roundabout, close to the existing Southmead Industrial Estate.

4.3.3 Planning permission (P15/S1880/O and P15/V1304/O) has been granted for a mixed-use development in the power station site and this includes the reservation of land for the SBLR and Didcot Science

Bridge. There will be various embankments associated with the road bridge approaches, and they will vary in width. The road bridge will be approximately 16m in width, including a single carriageway, a bi-directional segregated cycleway and a footway on one side of the road.

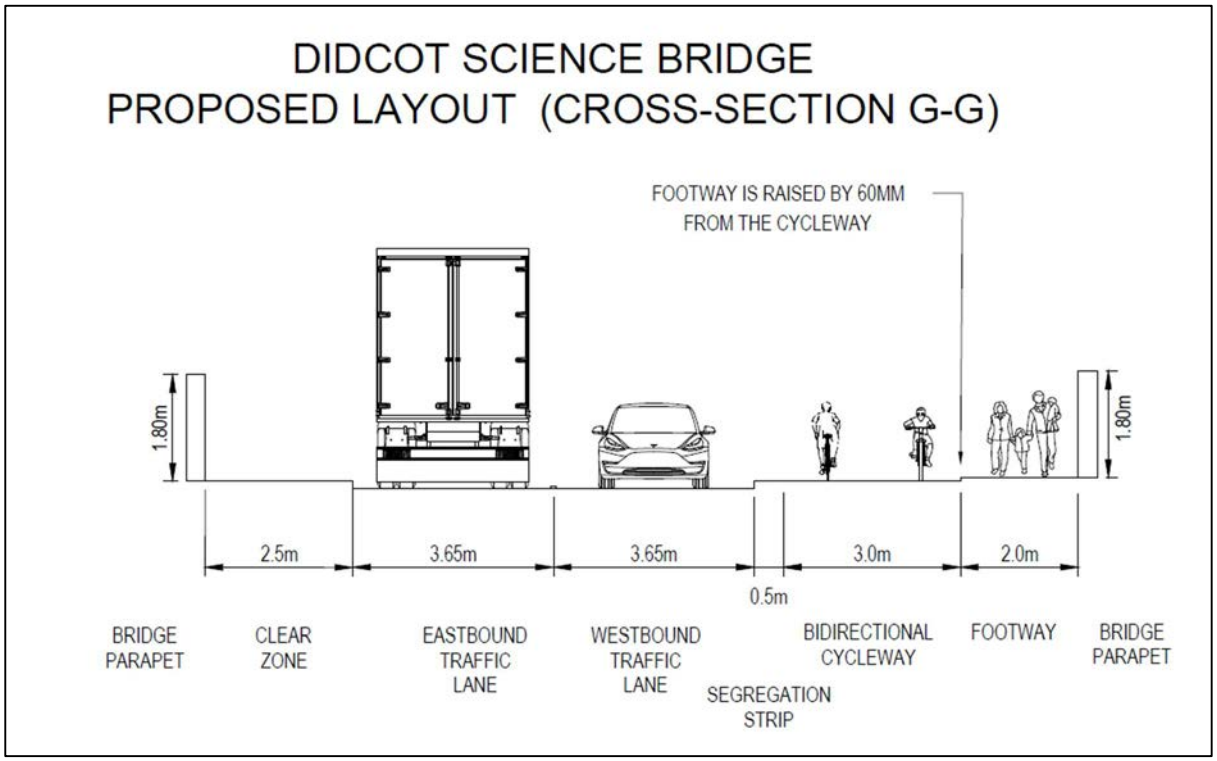
4.3.4 The SBLR will be a single carriageway, with segregated footways and bi-directional cycleways on both sides of the road for most of its length. Various accesses are planned off the road alignment for the proposed development in the power station site (P15/S1880/O and P15/V1304/O). Other works required include the diversion of a watercourse, which will cross underneath the new road in a culvert, and provision of formal Non-Motorised User (NMU) crossings, including a toucan crossing where a National Cycle Route crosses the road alignment.

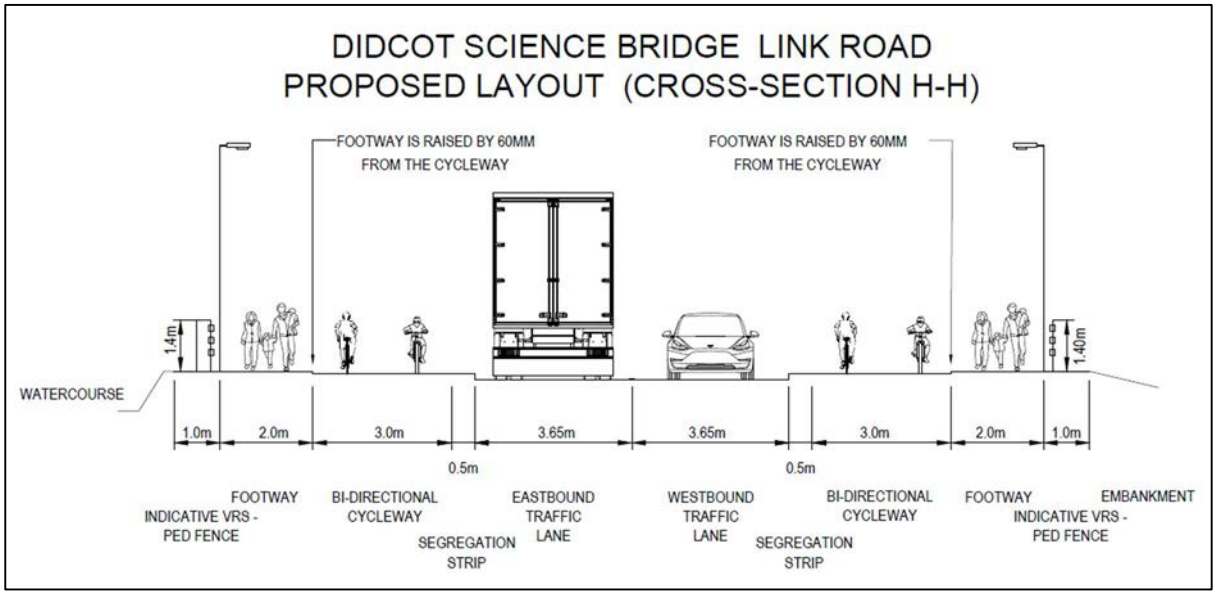
4.3.5 A dedicated two-way cycleway and adjacent footway will be provided over the Didcot Science Bridge on the eastern side of the bridge. East of the Science Bridge and northern approach embankment dedicated bi-directional cycleways and adjacent footways are to be provided on both sides of the road. Three parallel crossings will allow users to cross the Science Bridge Link Road and there will be one Toucan crossing. Where the Scheme ties-in with the existing A4130 Northern Perimeter Road, a Toucan crossing will be provided to allow those using the north-south bridleway (and National Cycle Network route 5) to safely cross the new road. East of this crossing, a dedicated two-way cycleway and adjacent footway will be located away from the carriageway. The existing footway on the southern side of the A4130 will be realigned to the new carriageway.

4.3.6 Four bus stops (two eastbound and two westbound) will be provided as part of the Didcot Science Bridge scheme.

4.3.7 An indicative cross section for the Didcot Science Bridge proposed layout is presented in Figure 4.4 below.

Figure 4.4: Didcot Science Bridge - Proposed Layout



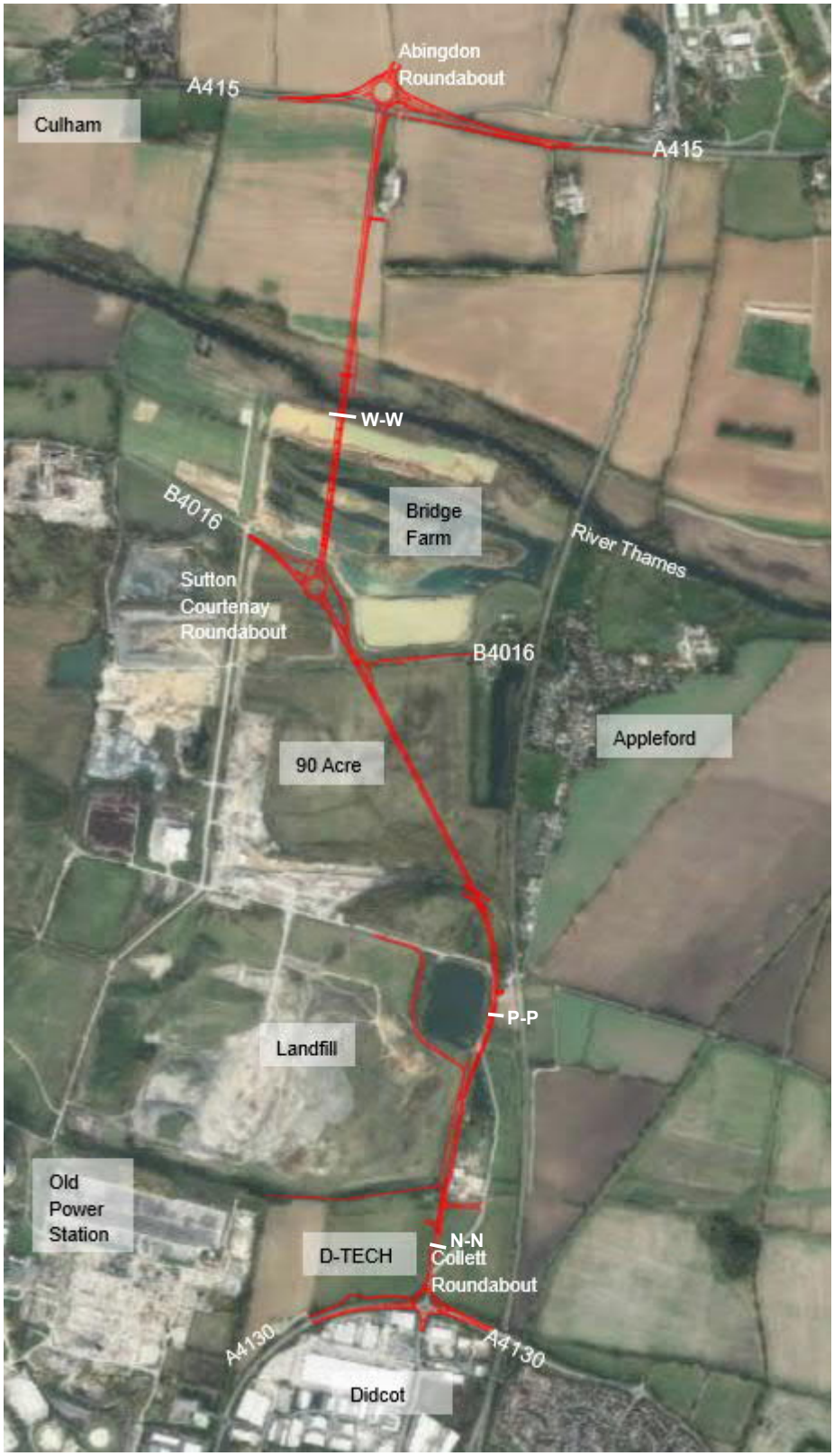


4.3.8 Figure 4.4 indicates that the proposed layout for the Didcot Bridge scheme includes a 3m wide bi-directional cycleway and a 2m wide footway along the eastern side of the carriageway when on the bridge structure (cross-section G-G). When off the structure and in the proposed development site (cross-section H-H) there is a 3m bi-dictional cycleway and 2m footway on both sides of the road. The GA plans listed in paragraph 4.1.2 show how it is proposed to maintain pedestrian and cycle priority across side roads.

4.4 Didcot to Culham River Crossing

4.4.1 The Didcot to Culham River Crossing proposed layout is shown in the following Figure.

Figure 4.5: Didcot to Culham River Crossing Layout Plan



Map data © Google 2021

4.4.2 This section of the Scheme will provide a new 3.6 km single carriageway link road west of the Cherwell Valley railway line and NMU facilities between Didcot and Culham. It will extend north from the A4130 Collett roundabout in Didcot to the A415 Abingdon Road west of CSC.

4.4.3 An improved and enlarged four-arm A4130 Collett roundabout will be provided. This will connect with the Didcot Science Bridge scheme to the west, the Didcot to Culham Link Road to the north, Southmead Industrial Estate to the south and to the existing A4130 to the east.

4.4.4 Agricultural land, private residential properties, a pallet and wood recycling centre, Sutton Courtenay landfill, and Hanson aggregate operations all lay north of Collett roundabout. A Local Development Order is being prepared to enable this agricultural area to become an employment site called D-Tech, in this 'Didcot Growth Accelerator' Enterprise Zone.

4.4.5 North of Collett roundabout to the southern edge of Sutton Courtenay Landfill the new single carriageway road will be approximately 20 m wide, with verges, hard strips, and segregated footways and bi-directional cycleways on both sides. Two accesses, one on either side of the proposed road, will be provided to maintain access to the adjacent agricultural land, private residential properties, and businesses.

4.4.6 The road will extend north along the east edge of Sutton Courtenay Landfill. In this area on the west side of the road a 3.0 m shared use bridleway is provided with the segregated footways and bi-directional cycleways and continues to the east side. On the west side of the road a new priority junction and access road will be provided to Sutton Courtenay Landfill (operated by FCC Environment), and Hanson Aggregates and Appleford Railway Sidings (operated by Hanson). This will replace the existing Portway Road access further north.

4.4.7 The road extends north to Appleford railway sidings passing along the eastern boundary of a large surface water management pond. The Cherwell Valley Line and Appleford Level Crossing is located to the east of the proposed road. Appleford Sidings bridge will be provided to bridge the road over the railway sidings and connect the north and south approach embankments.

4.4.8 The road will traverse 90 Acre Field, an area of restored historic landfill, and link to the B4016 to the west of Appleford. A priority T-junction with a ghost island right turn lane will be provided at this location. Sutton Courtenay roundabout will be provided to the north west with a severed section of the B4016 retained to be a footway cycleway. Sutton Courtenay roundabout will be an at grade, three-arm roundabout providing access to the crossing over the River Thames whilst maintaining links between Appleford, Sutton Courtenay and the surrounding areas.

4.4.9 Extending north from Sutton Courtenay roundabout, a 336 m approach viaduct will be provided to cross the River Thames flood plain with a 155 m bridge provided to span over the River Thames. The River Thames is navigable at this location the bridge height has been designed to accommodate river traffic.

4.4.10 North of the River Thames, the new link road will continue north through existing agricultural land towards A415 where a new at grade four-arm roundabout will be constructed to connect with the A415 and a new development to the north, which is an allocated site in the Local Plan.

4.4.11 Shared-use footway/cycleways are proposed at the Collett roundabout. An in-line Toucan crossing on eastern arm, raised parallel crossing on southern arm, and uncontrolled crossing points on the other two arms.

4.4.12 North of the Collett roundabout, there will be dedicated, off-road, two-way cycleways and footways located either side of the highway. The facilities adjacent to the northbound lane will cease at a parallel crossing. The facilities provided alongside the southbound lane will continue to the northern extent of the Scheme at the A415.There are proposed two parallel crossings and one toucan crossing on the southern section of the new road.

4.4.13 After the point at which the Scheme forms a junction with the B4016 Appleford Road, the cycleway and pedestrian footway will continue along the current alignment of the B4016. There will be an uncontrolled crossing immediately north of the B4016 junction. This will connect with a shared-use pedestrian and cycleway facility, which will extend alongside the northbound lane of the Scheme and continue beside the westbound lane of the B4016 from the Sutton Courtenay roundabout. This crossing serves the new bus stops and connections with existing PRoWs. The bus stops have shelters and cycle stands.

4.4.14 A shared facility will also be located alongside the eastbound lane of the B4016, which will be accessed via a Toucan crossing located across the arm for the River Thames bridge. This route offers connection towards Sutton Courtenay.

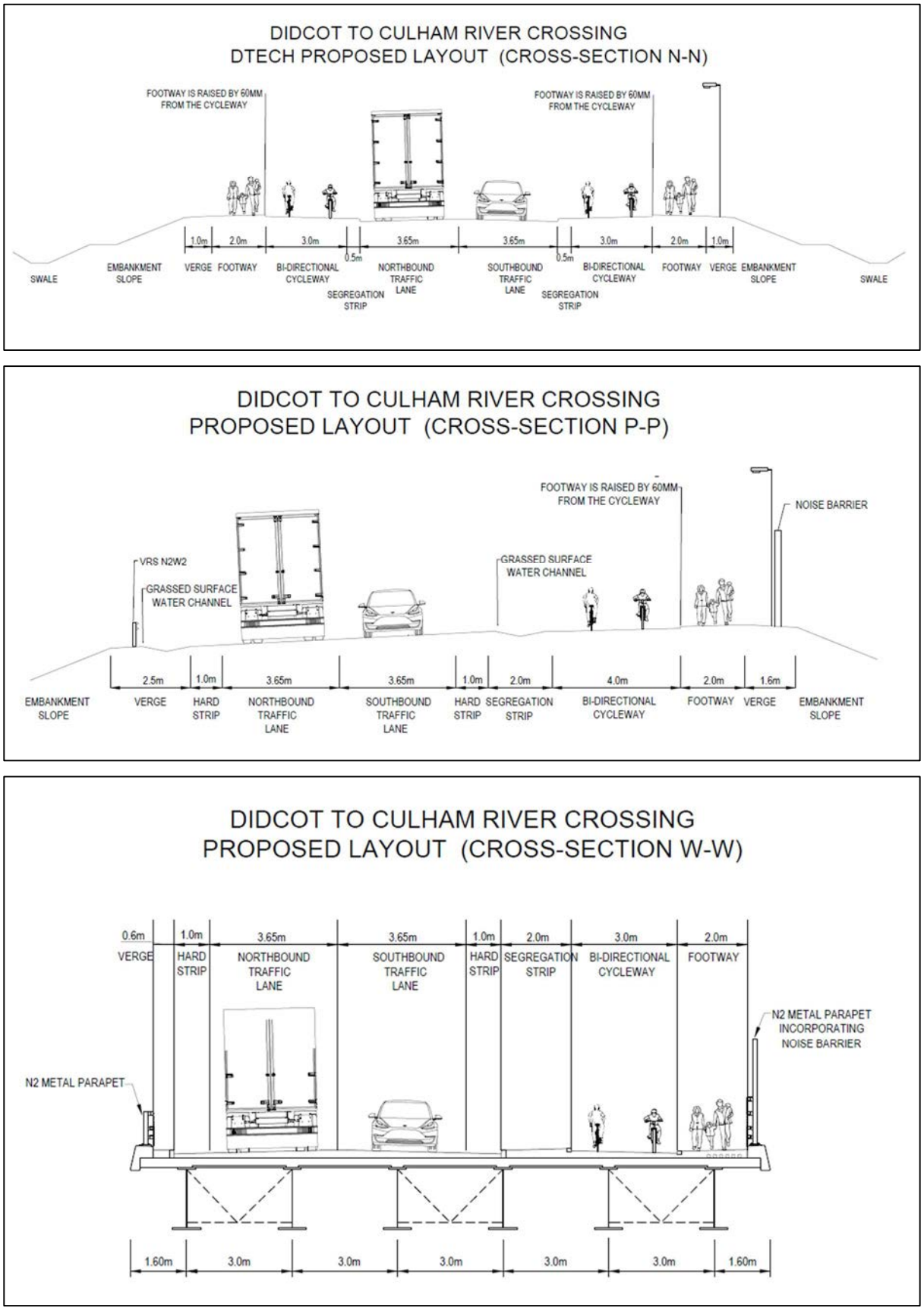
4.4.15 A shared-use cycleway and pedestrian footway will be created adjacent to the eastbound lane of the B4106, in order to connect the Scheme with the village of Appleford.

4.4.16 There will be dedicated, off-road, two-way cycleway and footway facilities located adjacent to the southbound lane on the bridge across the River Thames. These will continue to the northern A415 roundabout, where they will extend east adjacent to the westbound lane of the A415. This will continue

as a shared use facility along the southern side of the A415 to connect with the existing provision at Culham Science Centre. An in-line Toucan crossing is proposed on the eastern arm of the new roundabout, which connects to an improved segregated two-way cycleway and footway on the northern side of the A415, separated from the carriageway. The northern arm of the roundabout is s stub to serve a future housing development allocated in the adopted SODC Local Plan. A raised parallel crossing will be provided across the northern arm of the roundabout.

4.4.17 The indicative cross sections of the proposed layout for the Didcot to Culham River Crossing Scheme is presented in Figure 4.6.

Figure 4.6: Didcot to Culham River Crossing - Proposed Layout



4.4.18 Figure 4.6 illustrates the high quality NMU facilities that are included in the Didcot to Culham River Crossing proposed layout. Cross section N-N shows that a 2m wide footway and a 3m wide bi-directional cycleway is proposed on both sides of the carriageway with the footway being raised above

the cycleway to provide separation between the cyclists and the pedestrians. This is the proposal at the southern end of the Scheme, through the proposed employment site.

4.4.19 Cross section P-P shows that a 2m wide footway and 4m wide bidirectional cycleway is proposed on the eastern side of the carriageway with a 2m wide segregation strip of grass/ water channel between the highway and the cycleway providing separation between vehicles and cyclists. This is the proposal when the Scheme is not on a raised structure.

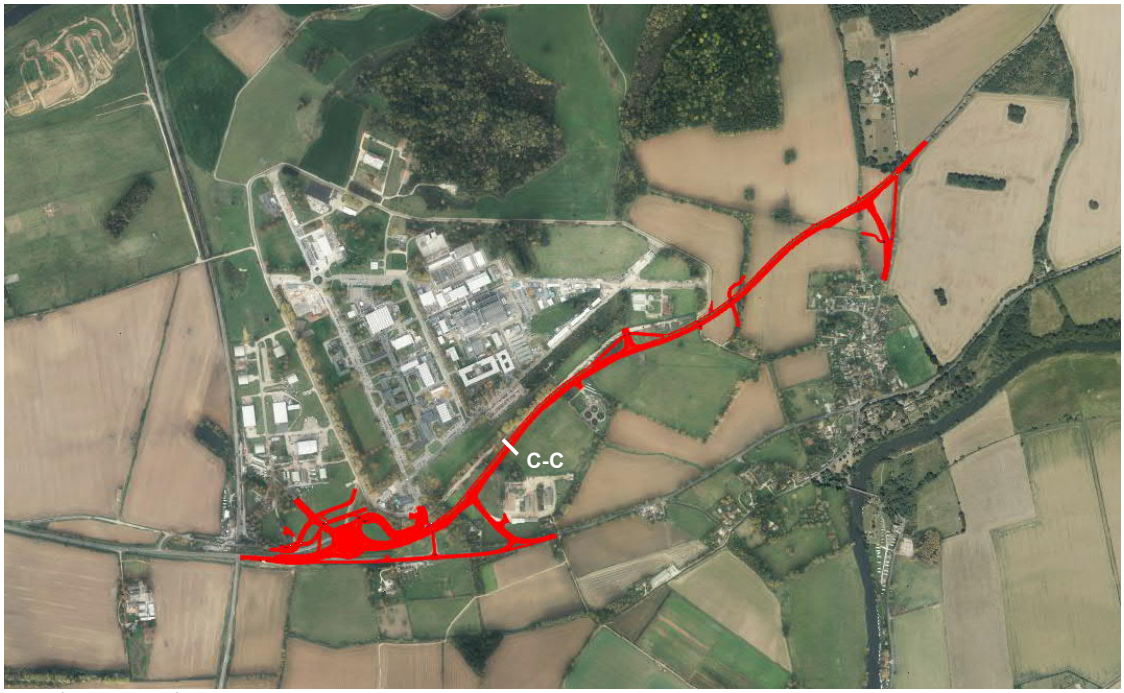
4.4.20 Cross section W-W illustrates that a 3m wide bi-directional cycleway and 2m wide footway is proposed on the eastern side of the carriageway providing high quality facilities for pedestrians and cyclists. A 2m wide segregation strip is proposed to provide separation between the cyclists and moving vehicles to create a more safe and pleasant environment for cyclists. The footway is raised above the cycleway to provide physical separation between the pedestrians and cyclists.

4.4.21 The GA plans listed in paragraph 4.1.2 show how it is proposed to maintain pedestrian and cycle priority across side roads.

4.5 Clifton Hampden Bypass

4.5.1 The Clifton Hampden Bypass proposed layout is shown in the following Figure.

Figure 4.7: Clifton Hampden Bypass Layout Plan



Map data © Google 2021

4.5.2 The Clifton Hampden Bypass will re-route traffic on the A415 around the village of Clifton Hampden, which currently experiences a large amount of through traffic as people travel between the A415 to A4074 northwest of the village.

4.5.3 The link road will provide a bypass northwest of Clifton Hampden village and will be approximately 2.2 km long. The new road will be a single carriageway with adjacent hard strips, grass verges, and a shared-use cycleway / footway. The bypass will be aligned in a south-west to north-east direction and will be a single carriageway, approximately 9.3 m in width including hard strips.

4.5.4 The proposed works also include the construction of a large four-arm roundabout at the western end of the Scheme, providing access to the SODC Local Plan allocated housing site, a railway station and LEDA owned farmland / businesses north of CSC coming off the northern arm, and CSC on the northeast arm. A new T-junction with a ghost island right turn lane connecting the existing B4015 Oxford Road is proposed at the eastern extent of the Scheme.

4.5.5 The current alignment of the A415 will be realigned north into the proposed bypass, with the existing A415 west of this point as a 'no through road' to serve existing residences. All roundabout exits will

include one lane, except the eastern bypass arm which will have two lanes. The roundabout will have a segregated left turn lane from the eastern bypass arm to the western A415 arm.

4.5.6 Station Road will be realigned and will join with a new entrance to the industrial properties located northwest of the roundabout. The existing main access into the CSC will be converted into a shared use footway / cycleway. The northeast roundabout arm will provide access to CSC via the main gate, and a stub towards Perimeter Road for a potential future connection to be delivered by CSC.

4.5.7 The A415 connection road east of the roundabout will provide access from the bypass to the existing A415 and Clifton Hampden.

4.5.8 Along the bypass, four access points will be included on the south side of the road; one will link to the existing alignment of the A415 (as described); one to a Thames Water sewage treatment works; and one to an existing farm track. The bypass will tie-in with the current alignment of the B4015 Oxford Road (east) and a T-junction with a ghost island right turn will be included, to provide access to the current alignment of the B4015 Oxford Road (south-west).

4.5.9 On the north side of the road, two accesses will be created; one will be a new second access into the CSC, the other will link with an existing farm track.

4.5.10 A dedicated, off-road, two-way cycleway and footway will be provided adjacent to both carriageways of the A415, west of the roundabout.

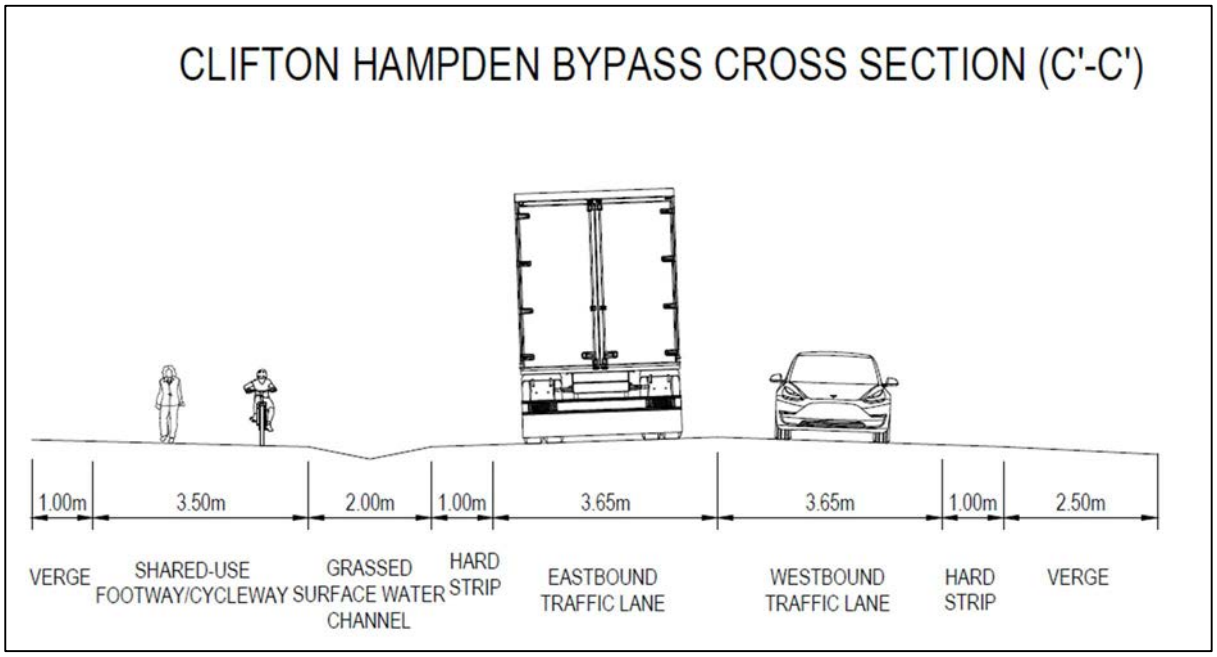
4.5.11 There will be several shared and segregated cycleways and footways, with crossings, created around the roundabout with the CSC and Clifton Hampden Bypass. A new segregated cycleway / footway is proposed to link Culham Station and CSC, in anticipation of heavy NMU demand between these two points. Three raised parallel crossings are proposed to maintain direct NMU links. The stopped-up existing A415 carriageway will be used as a shared-use footway / cycleway, which links up to a new shared-use footway / cycleway on the south side of the A415. This new route extends west across the existing rail bridge and into the Didcot to Culham River Crossing scheme. The existing main entrance to the CSC will be repurposed as a shared-use cycleway / footway. A toucan crossing is proposed where this route meets the bypass, which also serves a pair of new bus stops with shelters and cycle parking.

4.5.12 Along the bypass, a shared-use cycleway / footway will be provided along the north side of the road. Several crossings across adjoining roads will be provided and links to existing footpaths will be provided. Additionally, two uncontrolled crossings over the bypass will be provided.

4.5.13 A shared-use cycleway / footway will be provided along the west side of the realigned B4015 to connect in with the northern end of Clifton Hampden Village.

4.5.14 The indicative cross section of the proposed layout for the Clifton Hampden Bypass is illustrated in Figure 4.8 below.

Figure 4.8: Clifton Hampden Bypass - Proposed Layout



4.5.15 Figure 4.8 shows that a 3.5m wide shared footway/cycleway is proposed on the northern side of the carriageway. A 2m grassed surface channel is also proposed between the main carriageway and the shared footway/cycleway to provide separation between the moving vehicles and the NMUs providing a more pleasant and safe environment for the NMUs. The GA plans listed in paragraph 4.1.2 show how it is proposed to maintain pedestrian and cycle priority across side roads,

4.6 Road Safety Audit

4.6.1 AECOM was commissioned by Oxfordshire County Council to complete a Stage 1 Road Safety Audit (RSA) for the four sections of the Scheme. These were undertaken between December 2019 and May 2020. The RSA reports also include the Design Organisation Response logs. The RSA reports can be found in Appendix D.

5. Modelling Assessment

5.1 Introduction

5.1.1 This section of the report sets out the traffic modelling that has been undertaken to assess the impact of the Scheme.

5.2 Assessment Scenarios

5.2.1 Completion of the Scheme is currently planned for 2024. The adopted Vale of White Horse District Council (VoWHDC) Local Plan Part 1 and 2 period ends in 2031. The adopted South Oxfordshire District Council (SODC) Local Plan period ends in 2035, although little growth is expected between 2034 and 2035. Therefore, based on the guidance set out in Section 2.5 of this report and the available model years, and as agreed with the highway authority, the following assessments have been undertaken for the purposes of this TA:

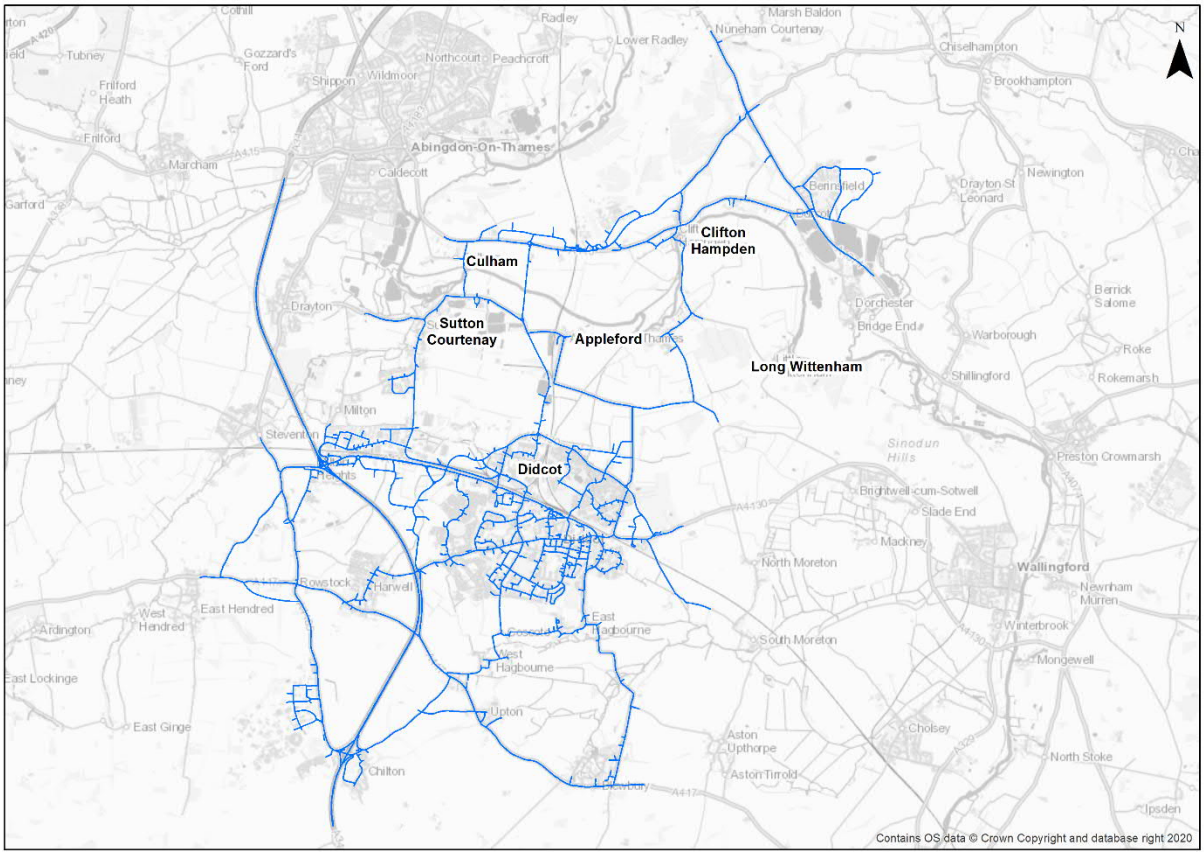
- 2020 Baseline;
- 2024 (year of Scheme opening) – without Scheme;
- 2024 (year of Scheme opening) – with Scheme;
- 2034 (design year) – without Scheme; and
- 2034 (design year) – with Scheme

5.3 Paramics Model

5.3.1 As discussed in Section 3.5.4, traffic data for the junction assessments has been obtained from the Didcot Paramics microsimulation model, which is maintained and run on behalf of OCC by Systra. Data extracted from the Didcot Paramics microsimulation model was provided to AECOM by OCC/Systra for the assessment of impacts on the road network.

5.3.2 The model area extends from the A417 East of East Hendred in the west, through to A4130 Hadden Hill in the East. The network includes the A34 (Chilton Through to Milton Interchange), and up to A4074 Golden Balls Roundabout in the North. The Paramics model extent is shown in Figure 5.1 below.

Figure 5.1: Paramics Model Extent



5.3.3 Traffic demands for each period of the model have been developed using traffic count data collected late in 2016 and in 2017. This included detailed turning count surveys at the key junctions within the study area. Traffic demands were informed by data from OSM to ensure that the traffic patterns within the study area were as consistent as possible with those in the strategic model. Journey time data was utilised to validate the model against WebTAG criteria. Details of the development of the base model are provided in the Systra report 'Didcot Microsimulation Base Model Development Report' (2018) in Appendix E.

5.3.4 The model includes housing and employment completion trajectories as supplied by the relevant LPAs (VoWHDC and SODC). These were updated in June-August 2020, in preparation for the work to support this planning application. Refer to the Systra reports in Appendix F and G for more information on the trajectories and site accesses in the model. Table 5.1 and Table 5.2 below show the additional residential units and employment floor area assumed to be complete over the 2017 base year for the 2020, 2024 and 2034 scenarios.

Table 5.1: Housing Completion Trajectories

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

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

Table 5.2: Employment Completion Trajectories

Site Name	Use Class	Floor Area Additional to Base Year (sqm)		
		2020	2024	2034
Southmead Industrial Estate	B1	656	656	9,076
Culham Science Centre	B1	0	13,632	56,079
Land West of CSC Inc No.1 Site	B1	0	4,851	4,851
	B2	0	255	255
Berinsfield Regeneration	B1	0	0	9,671
	B2	0	0	10,768
	B8 (Storage)	0	0	11,350
Milton Park	B1	11,472	31,411	76,889
	C1	10,563	10,563	10,563
Harwell Campus	B1	11,723	75,427	103,434
	B2	0	6,993	35,000
Other Premises Adjacent to Didcot Power Station - Diageo	B8 (Storage)	0	28,907	28,907
	B8 (Data)	0	68,750	68,750

Site Name	Use Class	Floor Area Additional to Base Year (sqm)		
		2020	2024	2034
Didcot A	B1	0	2,502	25,000
	B2	0	5,505	55,000
	B8 (Storage)	22,483	27,988	77,483
	A1	0	1,351	13,500
Milton Hill Business and Technology Park	B8 (Storage)	0	0	11,338
D-Tech- EZ 2	B2	0	1,000	5,000
	B8 (Data)	0	22,000	110,000
Milton Interchange Site- EZ2	B1	0	0	9,380
	A1	0	0	2,704
	C1	0	0	1,294
Orchard Centre Expansion	A1	11,155	11,155	11,155
TOTAL		**68,052**	**312,946**	**747,446**

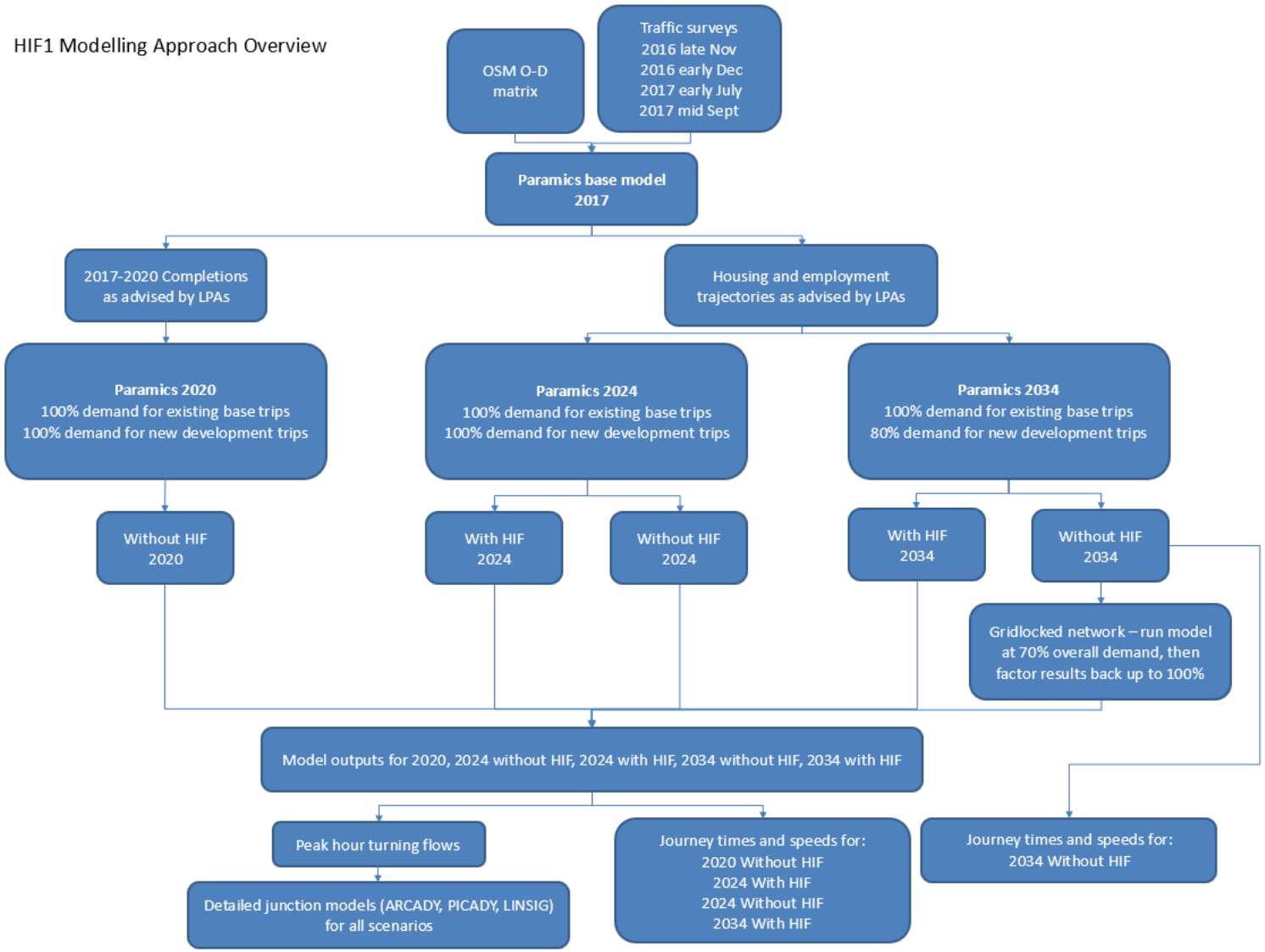
5.3.5 In addition to the Proposed Scheme infrastructure in the with HIF scheme modelling, the infrastructure outlined in Table 5.3 has been included in the Paramics modelling. The infrastructure outlined in the table is cumulative and therefore once present in the modelling is also present for any future year scenarios. Further details are provided in the Systra Technical Note 'HIF1 Paramics Modelling – Future Year Infrastructure Note' (September 2021) in Appendix G.

Table 5.3: Infrastructure included in Paramics Model

Model	Infrastructure
2019 / 2020 Base	Harwell Link Road
	A4185 Newbury Road/Thompson Avenue signals
2024 without HIF / 2024 with HIF	Power Station/Manor Bridge Roundabout improvements
	Featherbed Lane Improvements
	NPR3
	Park Drive/High Street Junction (Milton Park access)
	Eastbound widening between Steventon Lights and Milton Interchange
	Signalised one way shuttle working on the B4016, of approximately 150m, over the bridge adjacent to Appleford Rail Station
	Various development related accesses
2034 without HIF / 2034 with HIF	Valley Park Spine Road
	Milton Interchange improvements
	Rowstock Bypass
	Chilton Interchange Signals
	Golden Balls Improvements
	Milton Road/Park Drive/Sutton Courtenay Road junction alteration
	Various development related accesses

5.3.6 Figure 5.2 below summarises the modelling methodology approach:

Figure 5.2: Modelling Approach Methodology



5.3.7 SYSTRA provided flow turning counts for the peak hours for the junctions. The peak hours are AM (08:00-09:00) and PM (17:00-18:00). These flows were then used in detailed junction modelling as presented in this TA.

5.3.8 For the 2034 scenarios the model assumes 100% demand of existing trips present in the 2017 base, and 80% of demand for new growth. The justification for this approach is set out in Systra Technical Note 'HIF1 Paramics Modelling – Forecasting Note' (September 2021) in Appendix F, and is summarised below (Section 6 of the Systra Technical Note refers):

- *The model uses a generic trip rate across all development in the area. A demand reduction is required to align the trip generation with trip rates recently accepted by OCC TDC for planning applications sites in Didcot. This accounts for approximately half of the demand reduction. See below paragraph for more information.*
- *It is assumed that the Garden Town principles will continue to be enacted in this area over the next 14 years, increasing the usage of sustainable modes. Modal shift from these developments later in the plan period (over a decade away) is more likely as they are coming alongside significantly improved pedestrian / cycle / public transport provisions. The Paramics model is not multi-modal so cannot automatically account for improved NMU infrastructure, therefore a demand reduction is used as a proxy. This and the following point account for approximately half of the demand reduction.*
- *The largest new sites follow good spatial strategies and are in more sustainable locations near public transport hubs and / or are located nearer the growing employment areas which will have significantly improved NMU routes.*

5.3.9 Table 5.4 compares the Paramics model trips rates with planning applications in the area:

Table 5.4: Paramics Model Trip Rates

Site / Model	AM	PM
Paramics at 100% demand	0.571	0.529
Valley Park P14/V2873/O	0.517	0.572
North East Didcot P15/S2902/O	0.5	0.56
South of A4130 P16/S3609/O	0.497	0.489
Paramics equivalent at 80% demand	0.457	0.423

5.3.10 The table above shows how the Paramics model trip rates are overall higher than trip rates accepted for the three development sites. Using 80% demand brings the trip rate lower than the development site trip rates, to account for the Didcot Garden Town principles, modal shift, and spatial strategies. As explained above and in Figure 5.2, this is only for the new growth in the 2034 scenarios, the 2017 base demand is still 100% e.g. it assumes existing residents in the model area do not change travel patterns. This is a robust assumption as it is likely that some would change travel patterns by 2034, due to the improved NMU infrastructure, additional bus stops, future bus routes, and other schemes in LCWIPs etc.

5.3.11 Initial model runs exhibited significant congestion in 2034 with the full development demand in place. To enable results to be extracted for comparisons, in the 2034 without HIF scenarios the model has been run at 70% total demand (70% of everything, after the demand reduction explained in paragraph 5.3.8) as this value enabled the model to run without gridlock. Modelled journeys were able to be completed, and therefore data could be extracted. These data have then been factored back up to 100% to calculate the 'factored' flow e.g. how many vehicles would have wanted to go through that junction, if the network had not been gridlocked. As shown in Figure 5.2, the 70% factoring exercise was not undertaken for the 2034 without HIF journey time and speed data presented in this TA.

5.3.12 This methodology was agreed between Systra and OCC, and further details are provided in the Systra Technical Note in Appendix F.

5.4 Methodology

5.4.1 All major new and existing junctions along the route of the Scheme have been included in the assessment. The extent of off-site junction assessments required has been agreed with the highway authority. The following junctions as shown in Figure 5.3 have been assessed in this report:

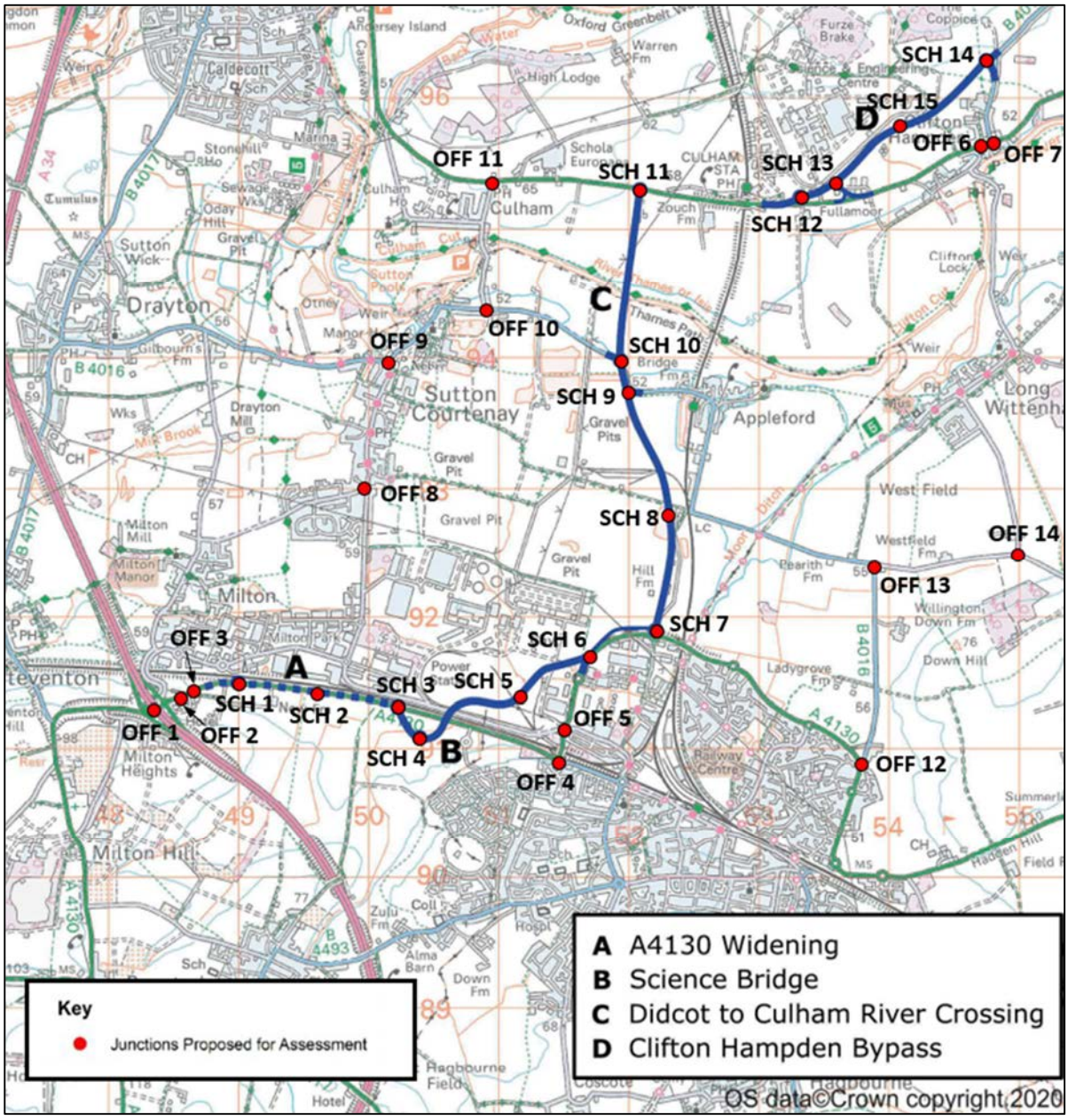
Scheme Junctions:

- SCH 1 A4130 / Service Area / North West Valley Park roundabout
- SCH 2 A4130 / Valley Park access signalised junction
- SCH 3 A4130 / Science Bridge Link roundabout
- SCH 4 Valley Park Spine Road / Science Bridge Link roundabout
- SCH 5 Science Bridge Link Road and New Purchas Road priority junction
- SCH 6 A4130 / Science Bridge priority junction
- SCH 7 A4130 / New Thames River Crossing / Collett roundabout
- SCH 8 New Thames River Crossing / Hanson and FCC Access Road priority junction
- SCH 9 New Thames River Crossing / B4016 priority junction
- SCH 10 New Thames River Crossing / B4016 roundabout
- SCH 11 New Thames River Crossing / A415 roundabout
- SCH 12 A415 / Clifton Hampden Bypass / Culham Science Centre roundabout
- SCH 13 Clifton Hampden Bypass / realigned A415 priority junction
- SCH 14 Clifton Hampden Bypass / B4015 priority junction
- SCH 15 Clifton Hampden Bypass / Culham Science Centre Access

Off-site Junctions:

- OFF 1 A34 / A4130 Milton interchange
- OFF 2 A4130 / Service Area priority junction
- OFF 3 A4130 / Milton Gate signalised junction
- OFF 4 A4130 / B4493 / Mendip Heights roundabout
- OFF 5 A4130 / Basil Hill Road / Milton Road (Power Station) roundabout
- OFF 6 A415 / High Street signalised junction (Clifton Hampden)
- OFF 7 A415 / B4015 Oxford Road signalised junction (Clifton Hampden)
- OFF 8 Harwell Road / Milton Road / High Street mini roundabout junction
- OFF 9 High Street / Church Street / Brook Street priority junction
- OFF 10 B4016 Appleford Road / Abingdon Road priority junction
- OFF 11 A415 / Tollgate Road signalised junction
- OFF 12 A4130 / Lady Grove priority junction / roundabout
- OFF 13 Lady Grove / Sires Hill priority junction
- OFF 14 Sires Hill / Didcot Road priority junction

Figure 5.3: Junction Locations



5.4.2 The selected junctions have been assessed using the appropriate stand-alone junction capacity modelling software (Junctions 9 for roundabouts and priority junctions, LinSig v3.2 for signal-controlled junctions) for all scenarios. In discussions with Highways England, the impact of the HIF1 Scheme on the A34 and at the A34/A4130 Milton Interchange (OFF 1) has been demonstrated by comparing journey times along the A34, as explained in paragraph 6.9.1.

6. Assessment of Impacts

6.1 Introduction

6.1.1 This section of the report sets out the forecast impact of the Scheme on the highway network in terms of junction capacity assessments, impact on non-motorised users (NMUs) and the impact on public transport users.

6.2 NMU impacts

6.2.1 There are limited existing opportunities for walking and cycling north/south in this area to the north Didcot due to the severance created by the River Thames, with just two crossing points at Culham and Clifton Hampden. For example, residents of Didcot wishing to cycle to Culham Science Centre must use indirect routes, cycling on road for significant parts of the journey.

6.2.2 The development proposals will have a very positive impact on NMU travel in the area by directly providing high-quality infrastructure. The provision of additional and improved crossing points for all NMU modes will help to maintain direct routes, connecting footways/bridleways and providing safe access to and from bus stops.

6.2.3 The Scheme has been designed in line with the LTN1/20 guidance, providing priority to cyclists over side roads as appropriate. Details of the Scheme are shown on the following drawings, which form part of the planning application submission.

Highways General Arrangement Plans

- Drawing numbers GEN_PD-ACM-GEN-DGT_ZZ_ZZ_ZZ-DR-T-0001 to 0019

Typical Cross Sections

- Drawing numbers GEN_PD-ACM-GEN-DGT_ZZ_ZZ_ZZ-DR-T-0021 to 0026

6.2.4 As part of the A4130 Widening scheme the following NMU facilities are proposed to increase connectivity for NMUs:

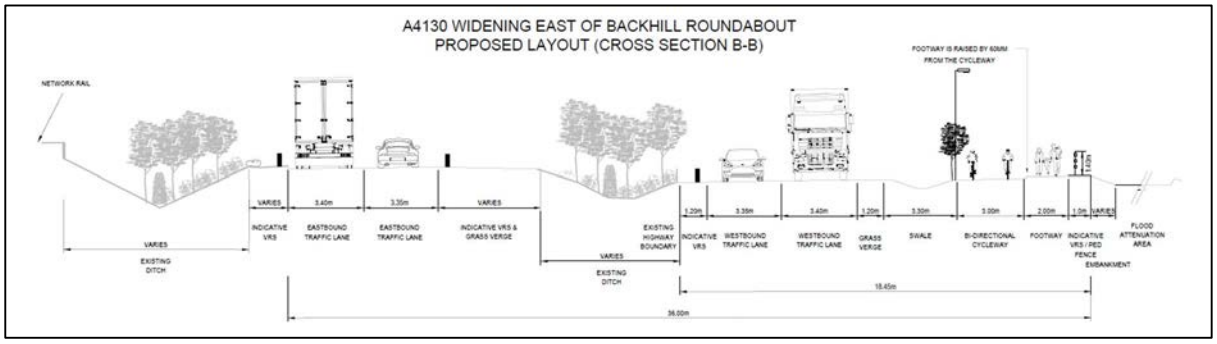
- At or near the proposed bus stops, cycle parking facilities will be provided as appropriate to enable the bus stops to act as an interchange and improve connectivity for cyclists.
- Dedicated two-way, off-carriageway cycling and walking facilities will be provided. East of the Milton Gate junction, the Scheme will include a shared cycle and footway adjacent to the eastbound and westbound carriageways. This will link to the existing NMU only Backhill Tunnel, and extend around the northern side of Backhill roundabout, where an in-line Toucan crossing (east of the roundabout) will be provided allowing users to cross both carriageways. Dedicated cycling and walking facilities and raised parallel crossings will also be included around the southern side of Backhill roundabout. The existing Toucan crossing by Backhill Tunnel will be replaced by an in-line Toucan crossing over the new dual carriageway to the west of the new roundabout. To the east of Backhill roundabout, a dedicated two-way cycleway and new footway will be provided to the south of the widened and new sections of the road, up to and including the Didcot Science Bridge roundabout, and will continue over the Didcot Science Bridge.
- A shared walking and cycling crossing will be included at the access to the Valley Park development (western access). Additionally, a shared crossing will be provided across both carriageways, which will provide access to the eastbound bus stop. A Toucan crossing will be included across the new A4130 immediately south of the Northern roundabout. This will provide access to the existing shared path for cyclists and pedestrians along the current alignment of the A4130 linking to Didcot.
- The segregated footway and two-way cycleway will connect to bridleway 243/1/10 (Cow Lane) and the planned Valley Park development (east access) improving NMU connectivity. The footway will connect to footpath 243/3/10 adjacent to Stert Brook.

6.2.5 On the A4130 to the east of the proposed Backhill roundabout, the existing shared use NMU facility is on the southern side only and is approximately 2.0m usable width including the white line buffer zone. Photograph taken 15th September 2021, looking east.

Figure 6.1: Photograph East of the proposed Backhill Roundabout

6.2.6 In approximately the same location as the photograph the Scheme proposes significantly improved NMU facilities, provided on the southern side of the carriageway:

Figure 6.2: Proposed Layout of A4130



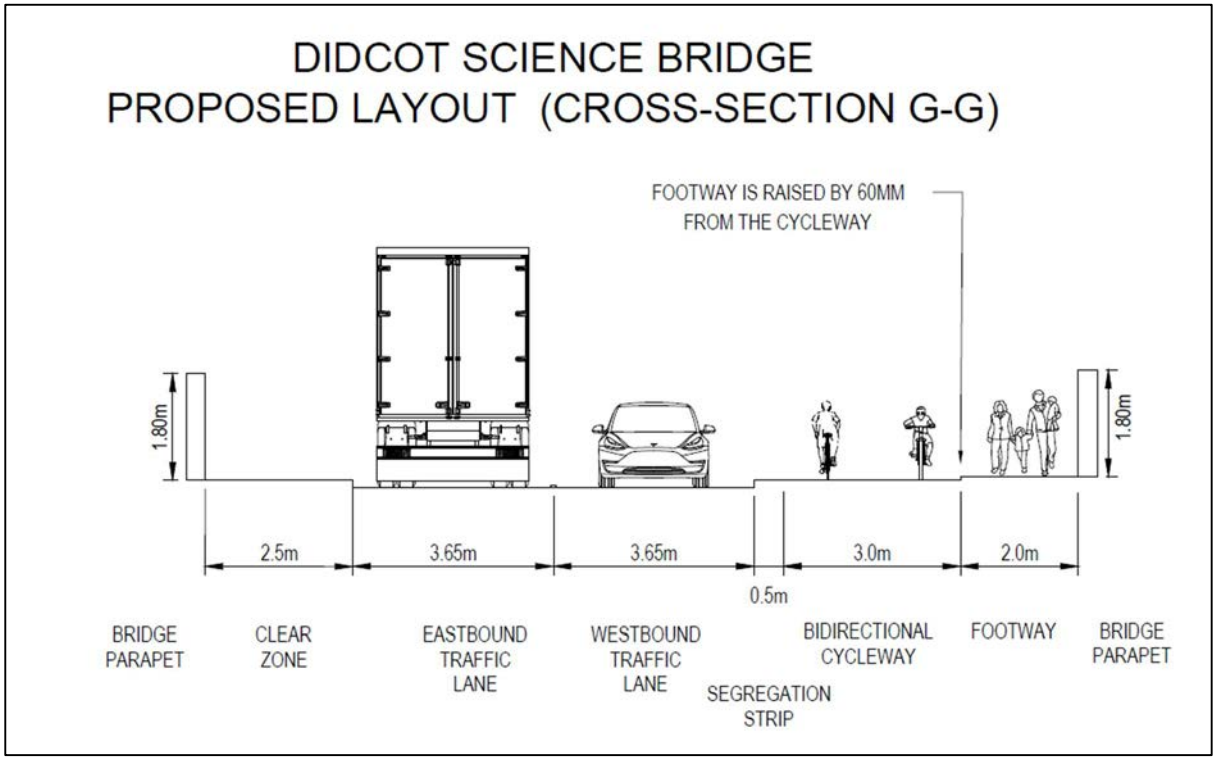
6.2.7 As part of the Didcot Science Bridge scheme the following NMU facilities are proposed to increase connectivity for NMUs:

- The Didcot Science Bridge scheme includes a footway and cycleway along the extents of the scheme with crossing points to increase accessibility for pedestrians and cyclists.
- Three parallel crossing points along the Scheme to facilitate movement across the route, and another parallel crossing on a side road.
- A toucan crossing is proposed over the A4130 at the eastern extent of the Scheme, to provide NMU access to Southmead Industrial Estate / NCN Route 5 (which connects to Sutton Courtenay).
- The existing bridge structure over the Great Western Main Line is Manor Bridge, which forms part of the Didcot Northern Perimeter Road (A4130). There are no formal NMU provisions over the bridge, however NMUs are known to use the grass verges, as shown in the photo below. A developer scheme which seeks to implement a shared use facility at this bridge is undergoing technical review with the OCC Road Agreements Team. This structure does not address the severance to north-south NMU movements. Photograph taken 15th September 2021, looking north.

Figure 6.3: Photograph of Manor Bridge (Didcot Northern Perimeter Road)

6.2.8 In contrast, the new Didcot Science Bridge structure (which is an alternative to the above Manor Bridge) does address the severance to north-south NMU movements, by providing NMU facilities segregated from the carriageway:

Figure 6.4: Proposed Layout of Didcot Science Bridge

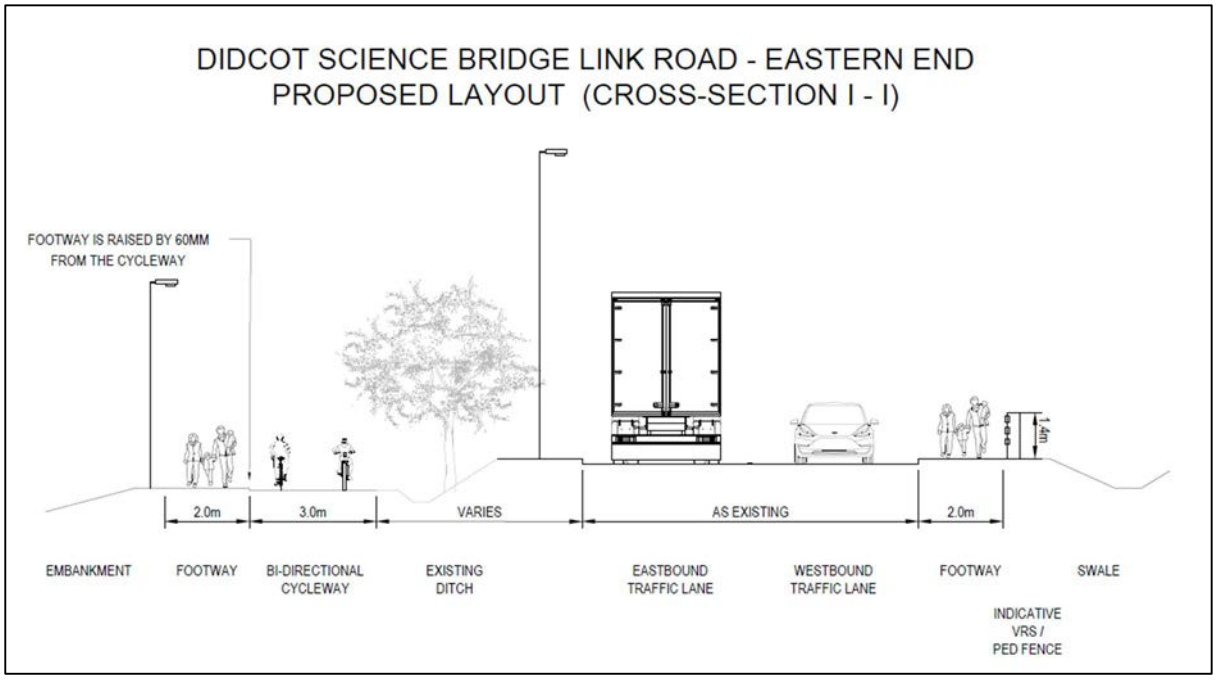


- The Didcot Science Bridge NMU facilities will connect to the River Crossing Scheme NMU facilities behind the hedge on the northern side of the existing A4130 Northern Perimeter Road.
- On the A4130 Northern Perimeter Road, the existing NMU facility is on the southern side only and is a footway of approximately 1.5m width, with no buffer from the carriageway. Photograph taken 15th September 2021, looking northeast.

Figure 6.5: Photograph of NMU Facilities on A4130 Northern Perimeter Road

6.2.9 In approximately the same location as the photograph the Scheme proposes significantly improved NMU facilities, provided on the northern side behind the existing trees and ditch:

Figure 6.6: Proposed layout of new NMU facilities north of A4130 Northern Perimeter Road



6.2.10 As part of the River Crossing Scheme the following NMU crossing facilities are proposed to increase connectivity for NMUs:

- The NMU connection to the Didcot Science Bridge Scheme, as described above.
- At the southern end at Collett Roundabout, an in-line signalised Toucan crossing is proposed on the eastern arm to cater for onwards journeys to Didcot. On the southern arm a raised parallel crossing is proposed. A new section of bridleway between 373/24/40 (Sustrans NCN5) and the Scheme near Hill Farm is shown on application drawings, however this could be delivered by other parties. This would enable a direct link for residents from the southern end of Sutton Courtenay to access the new route northwards over the River Thames, for work at Culham Science Centre for example. The reverse is also true, future residents of the SODC Local Plan proposed housing site would be provided with a direct cycling route towards Milton Park, Didcot centre etc.
- At the southern end of the Scheme, segregated NMU provision is proposed on both sides of the road through the potential future employment site. Two parallel crossings are proposed to cater for east-west movement, and the pair of bus stops. The NMU route has bus stop bypasses and floating bus stop shelters. The cycle routes maintain priority across the two side road accesses for the future employment site.

- Restricted byway 106/4/10 is proposed to be replaced by a new bridleway around the south and west sides of the lake, connecting with a new north-south route down to Hill Farm, in addition to a new toucan crossing north of Hartwright House to enable NMU's from the west (e.g. from Sutton Courtenay) to access the proposed segregated NMU route on the eastern side of the Scheme, catering for onwards north or south travel.
- A shared-use facility is proposed on the northern side of B4016 towards Appleford Village. An uncontrolled refuge island crossing is proposed on the Scheme to cater for the proposed bus laybys near Appleford, and for east-west NMU movements across the Scheme connecting to PROWs between Appleford and Sutton Courtenay.
- North of the proposed Sutton Courtenay roundabout, it is proposed that the existing B4016 highway is re-used to create a shared footway / cycleway from Sutton Courtenay direction, in addition to a shared footway / cycleway running along the western side of the carriageway with crossing points provided. A toucan crossing is proposed on the northern arm of the roundabout, and an uncontrolled refuge island crossing on the western arm.
- An NMU facility down from the proposed new bridge over the River Thames is proposed to connect to the Thames Path on the northern side of the river, providing access for NMUs. This improves the connectivity to the countryside to existing residents in the area, particularly Appleford Village.
- Along the length of the Scheme, high quality NMU infrastructure is proposed on the eastern side, segregated from the carriageway. This caters for local and longer distance north/south journeys, combatting the existing severance created by the river and existing highway layout at current bridges at Culham and Clifton Hampden. The poor NMU provisions on these existing routes over the River Thames are shown below, compared to the Scheme proposals:
- The existing bridge structure over the River Thames at Sutton Bridge and Culham Cut has a narrow footway immediately adjacent to the carriageway, on the eastern side only. It is approximately 1.5m wide, with pinch points of approximately 1m. This structure does not address the severance to north-south NMU movements. Photograph taken 15th September 2021, looking north.

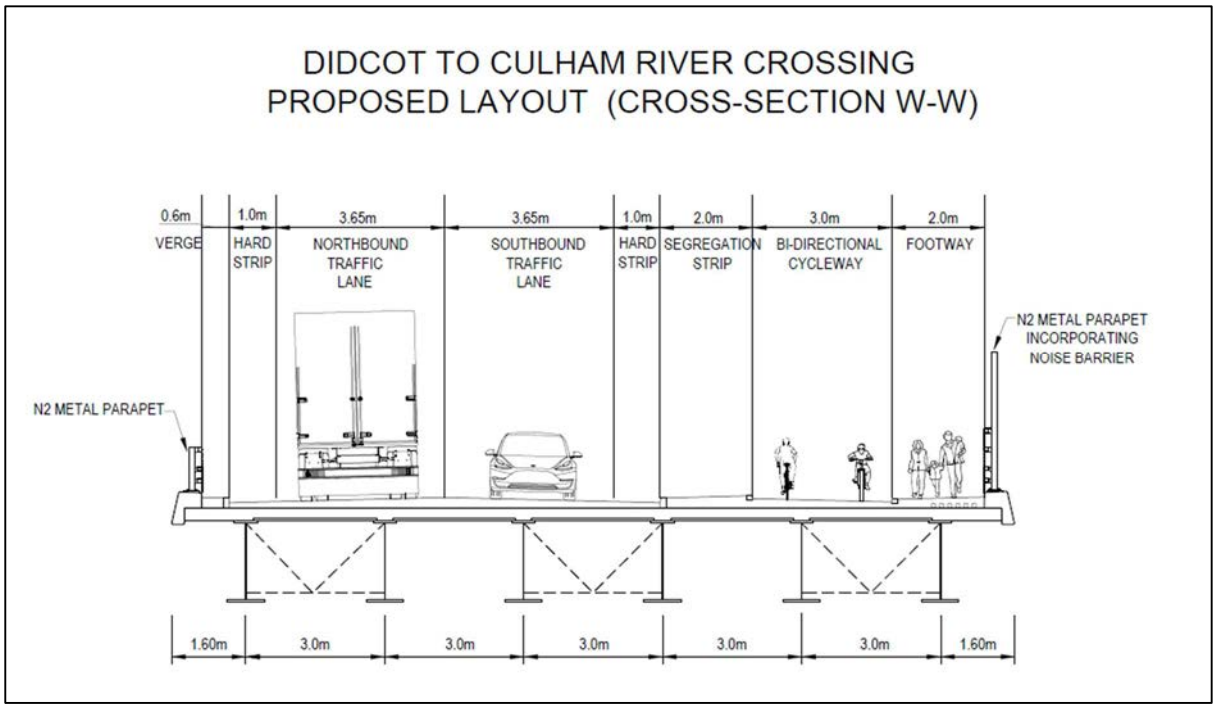
Figure 6.7: Photograph of Existing NMU Facilities at Sutton Bridge

- The existing bridge structure over the River Thames at Clifton Hampden Bridge has no NMU facilities, although some pedestrians try to use the narrow kerb upstand (approximately 0.6m on western side and 0.4m on eastern side), which does not tie into and NMU provision either side of the structure: This structure does not address the severance to north-south NMU movements. Photograph taken 15th September 2021, looking north.

Figure 6.8: Photograph showing lack of NMU facilities at Clifton Hampden Bridge

- In contrast, the new Didcot to Culham River Crossing structure (which is an alternative to the above Sutton Bridge / Culham Cut and Clifton Hampden Bridge) does address the severance to north-south NMU movements, by providing NMU facilities segregated from the carriageway:

Figure 6.9: Proposed Layout of Didcot to Culham River Crossing



6.2.11 At the proposed northern roundabout which connects to the existing A415 Abingdon Road, the development proposals include an in-line toucan crossing on the eastern arm and a raised parallel crossing on the northern arm. This helps cater for connection with future a housing site allocated in the adopted SODC Local Plan here. The Scheme proposes to tie into the existing shared use facility on the northern side of A415, and proposes to include a new shared use facility on the southern side of A415, connecting with the existing provision near Culham Science Centre. As part of the Clifton Hampden Bypass Scheme, a network of shared and segregated footway / cycleways are proposed, increasing accessibility to Culham Science Centre, Culham Rail Station, future housing and employment here, Clifton Hampden, Burcot and Berinsfield. The following NMU facilities are proposed as part of the Scheme:

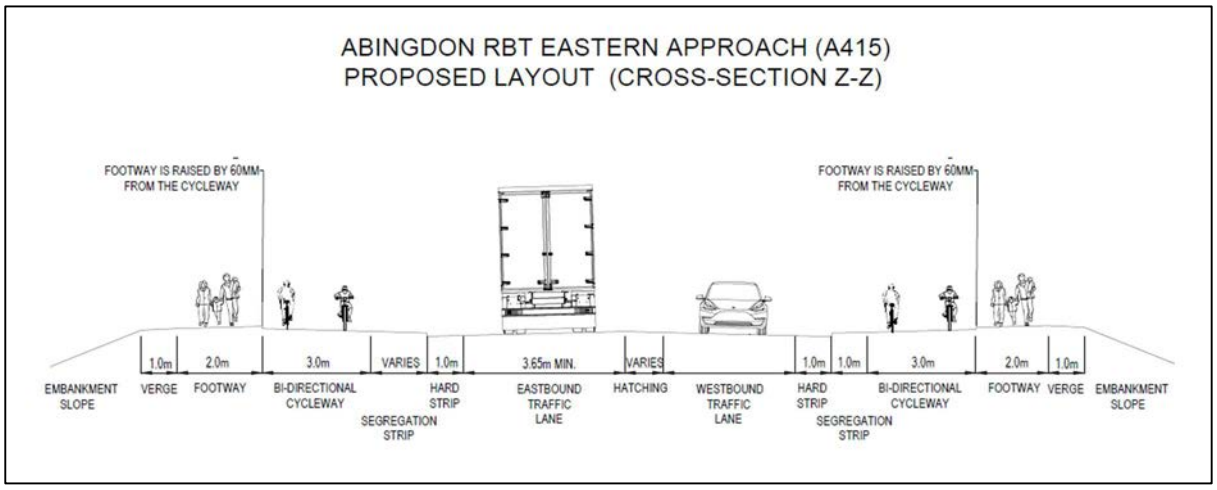
- To the west of the A415 / Clifton Hampden Bypass / Culham Science Centre roundabout a shared footway and cycleway is proposed on both sides of the carriageway; there is an existing provision on the northern side of the A415 that the Scheme will tie into. On the southern side, a new facility will extend from the Didcot to Culham River Crossing, as described above.
- On the A415 to the east of the proposed A415 roundabout, in the vicinity of the high-voltage overhead powerline the existing NMU facility is on the northern side only and is approximately 1.2m

wide shared use with 1.6m grass buffer from the carriageway. There is no provision for NMUs on the southern side. Photograph taken 14th July 2021, looking east.

Figure 6.10: Photograph of Existing NMU Facilities on the A415 east of Proposed Roundabout

- In approximately the same location as the photograph the Scheme proposes significantly improved NMU facilities, provided on both sides of the carriageway:

Figure 6.11: Proposed Layout of Eastern Approach to Abingdon Roundabout

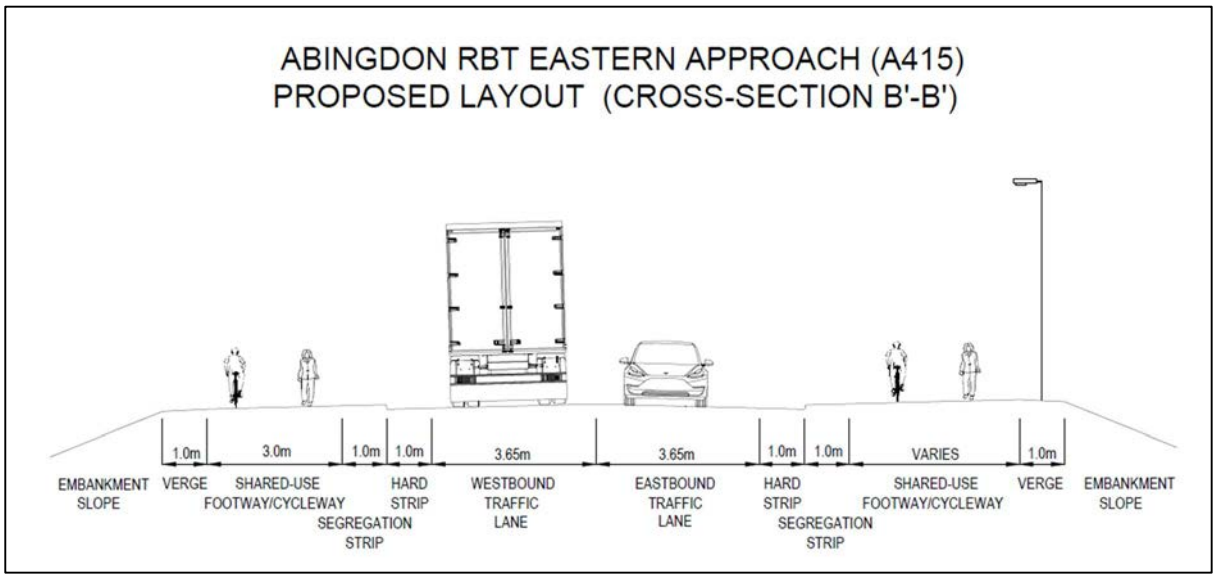


- On the A415 to the west of Station Road (west) the existing NMU facility is on the northern side only and is approximately 1.2m wide shared use with 1.6m grass buffer from the carriageway. There is no provision for NMUs on the southern side. Photograph taken 14th July 2021, looking east.

Figure 6.12: Photograph of Existing NMU Facilities on A415 west of Station Road

- In approximately the same location as the photograph the Scheme proposes significantly improved NMU facilities, provided on both sides of the carriageway:

Figure 6.13: Proposed Layout of A415 west of Station Road



- A segregated footway and cycleway is proposed from the entrance road of Culham Rail Station directly to Culham Science Centre. The pedestrian facility is proposed to be wider than standard to better cater for groups of pedestrians to/from the train. Two raised parallel crossings are proposed to provide convenient routes for NMUs. The segregated footway and cycleway will be separated from the carriageway. Future works at the Culham Science Centre entrance will connect to this route.
- The route from the rail station continues over the Culham Science Centre access arm of the new roundabout on a raised parallel crossing as a shared footway / cycleway, which then continues along the northern side of the Clifton Hampden Bypass for its full length, providing a high quality link from the northern end of Clifton Hampden village. It is separated from the carriageway.
- The Scheme includes a new Toucan signalised crossing on the bypass directly outside the Culham Science Centre, providing direct and convenient access for NMUs. This crossing ties in to sections of existing carriageway which are to be repurposed as NMU routes, and the new bus stops on the bypass.

- The shared footways and cycleways along the Clifton Hampden Bypass connect into existing PRoWs providing increased pedestrian accessibility to the footpaths.
- A raised parallel crossing is proposed over the new Culham Science Centre secondary access.
- At the Clifton Hampden Bypass / B4015 Oxford Road Junction, an uncontrolled refuge island crossing is proposed to provide access to the NMU route on the northern side of the new bypass, and for the new bus stops. The shared footway and cycleway is proposed to run along the south side of the Clifton Hampden Bypass from the southbound bus stop and continuing alongside the B4015, connecting to the existing village and PRoWs.
- A section of existing highway that is made redundant by the Scheme is proposed to become a shared footway/cycleway to help NMUs make more direct journeys in a northbound direction.

6.3 Pedestrian and cycle routes delivered and enabled by the Scheme

6.3.1 The Scheme both directly delivers and indirectly enables a significant number of new and/or improved walking and cycling routes in the area. This helps to engender modal shift away from the private motor car, particularly for commuting purposes for employment and education, but also for important access to amenities such as retail and healthcare, and for leisure trips. As reported above, the journey to work mode share for bicycle in Didcot is only 4.7%. This section of the report does not exhaustively list all routes but aims to highlight some of the significantly improved routes the scheme delivers / facilitates. The potential future NMU schemes that could link to the Scheme may be delivered by OCC, housing or employment developers, or other bodies. There may be other schemes identified through the planning application processes for other developments, or through the Didcot Local Cycling and Walking Infrastructure Plan (LCWIP) which has yet to be undertaken.

Origin: Great Western Park / Valley Park / North West Valley Park / Existing Didcot

Destination: Milton Park (Enterprise Zone)

6.3.2 The existing NMU route is on the narrow, shared use facility on the southern side of the A4130, with no significant buffer from the carriageway. This is not an attractive route, due to the narrow width and wind buffeting experienced by passing vehicles, particularly HGVs. The WCHAR surveys illustrate this, with a low number of just over 600 cyclists (two-way) counted over a 7-day period at the A4130 near Cow Lane. As illustrated in the cross-sections above (Figure 6.2), the scheme directly delivers a significantly improved route along the southern side of A4130, addressing the above issues. This route is also likely to be used by residents from central / southern Didcot, especially when the Valley Park site is constructed which includes NMU infrastructure on the north-south spine road. Additionally, this is likely to be used by residents from Harwell Village, who would access it from Valley Park either from Didcot Road and along the spine road, or along Cow Lane and then up the spine road.

Destination: Culham Science Centre

6.3.3 The existing NMU route is neither convenient nor direct, and for large sections has no NMU facilities which requires NMUs to use the carriageway. For many people this is not attractive, as shown by the low census mode share percentage. The route would include the A415, which the WCHAR surveys show a low number of cyclists, just over 800 (two-way), counted over a 7-day period. The Scheme delivers a convenient, high quality NMU route along the A4130, over the Great Western Main Line railway, north over the River Thames, and directly to Culham Science Centre (CSC). For comparison purposes, approximate routes for cycling to CSC from the junction of Cow Lane/A4130 in the centre of the Valley Park site were measured, using existing facilities. These ranged from 8.97km to 10.29km without HIF and required the use of carriageway in some sections, and narrow shared-use facilities. With the Scheme, the equivalent route is approximately 7.54km, with high-quality off-carriageway facility facilities for the full length.

6.3.4 The same improved route to CSC is accessible to residents of existing Didcot from Collett Roundabout, for example by using the NCN5 from Station Road to access Southmead Industrial Estate.

Origin: Land adjacent to Culham Science Centre (residential)

Destination: Milton Park Enterprise Zone

6.3.5 The future housing site allocation in the adopted SODC Local Plan 2035 would be provided with high quality and direct NMU routes to a significant number of destinations. Without the Scheme, the existing

routes are not conducive to promoting mode shift as they require a large portion of on-carriageway on congested roads.

6.3.6 The Scheme provides a route to Milton Park that is approximately one kilometre longer than the existing route through Sutton Courtenay, but is off-carriageway for the full length as opposed to the existing route which is predominantly on carriageway. Additionally, the traffic reductions the scheme enables through Sutton Courtenay would make the existing on-carriageway route more pleasant for cyclists who wish to use it.

Destination: Didcot Centre / Didcot Railway Station

6.3.7 The Scheme ties in with Collett Roundabout on the A4130 Northern Perimeter Road, which is a short distance from NCN5 inside Southmead Industrial Estate. For comparison purposes, approximate routes for cycling from the proposed housing site to the NCN5 route inside Southmead Industrial Estate (for onwards existing connections to Didcot, Railway Station, etc.) were measured using existing facilities. Without the Scheme, the likely route is approximately 7.44km long, with a large proportion of on-carriageway cycling. With the scheme, this is reduced to approximately 3.97km, all off-carriageway except a small section inside Southmead Industrial Estate.

Origin: Appleford

Destination: CSC

6.3.8 The existing routes via Clifton Hampden or Culham are neither convenient nor direct (approx. 5.68km and 5.62km respectively), and require on-carriageway cycling, using narrow shared-use facilities, some use of bridleway (to Long Wittenham). With the Scheme, the route is approximately 3.67km, formed of high-quality off-carriageway provision (on-carriageway from the western built-up edge of Appleford into the village).

Destination: Milton Park Enterprise Zone

6.3.9 As above for Land adjacent to Culham Science Centre, Appleford also benefits from significantly improved NMU routes to Milton Park.

Destination: Didcot Centre / Didcot Railway Station

6.3.10 As above for Land adjacent to Culham Science Centre, Appleford also benefits from significantly improved NMU routes to Didcot Centre / Railway Station (Appleford has a railway station, however not all trains stop there).

Origin: Berinsfield, Burcot, Clifton Hampden

Destination: Various – Didcot, Milton Park etc

6.3.11 The significant reduction in traffic flow along the A415 through Burcot as a result of the Scheme creates improved conditions for future NMU schemes to be implemented from Berinsfield towards Abingdon/Didcot etc. In the SODC Local Plan, the policy wording for the Berinsfield housing site allocation says:

"*2. The proposals to develop land at Berinsfield will be expected to deliver:*

vi) all necessary transport infrastructure, referring to the Infrastructure Delivery Plan, which is likely to include:

> *e. high quality infrastructure to encourage cycling and walking, and provide links through the site and to adjacent employment and into the village of Berinsfield and to other surrounding locations including Culham; specifically (but not limited to) improving the existing pedestrian/cyclist infrastructure along the A415 from Berinsfield to Culham, and providing for a cycle route from Berinsfield to Oxford."*

6.3.12 The existing shared-use facility will join the Scheme near Culham Science Centre, which then enables village residents to access the Scheme NMU facilities for onwards journeys to Didcot and Milton Park etc, as described in the above sections. With other potential future schemes as described below, this also includes onwards connections to Abingdon and Oxford.

Origin: Various – Didcot, Valley Park, Appleford, Berinsfield, etc.

Destination: Abingdon, Oxford

6.3.13 The scheme NMU facilities are designed to tie into the future housing proposal at Land adjacent to Culham Science Centre. In the SODC Local Plan, the policy wording for this site says:

"2. Proposals to develop Culham will be expected to deliver:

vi) all necessary infrastructure, referring to the Infrastructure Delivery Plan, which is likely to include:

b. provision of a new cycle bridge and associated connectivity and paths across the River Thames to connect appropriately with Abingdon on Thames to the north of the site"

6.3.14 With a new future NMU bridge over the River Thames into southeast Abingdon provided by that site, and other NMU schemes currently being worked on between Abingdon and Oxford via Radley and Kennington, the Scheme NMU facilities will form the missing link between a predominantly off-carriageway cycle route from Oxford City Centre to Didcot. Using sections of NCN5 and 544 in Didcot, this then extends the route from Oxford to Harwell Campus and beyond.

Origin: Milton Heights (residential)

Destination: Various - Milton Park Enterprise Zone (employment) / Didcot Centre / Didcot Railway Station / Culham Science Centre

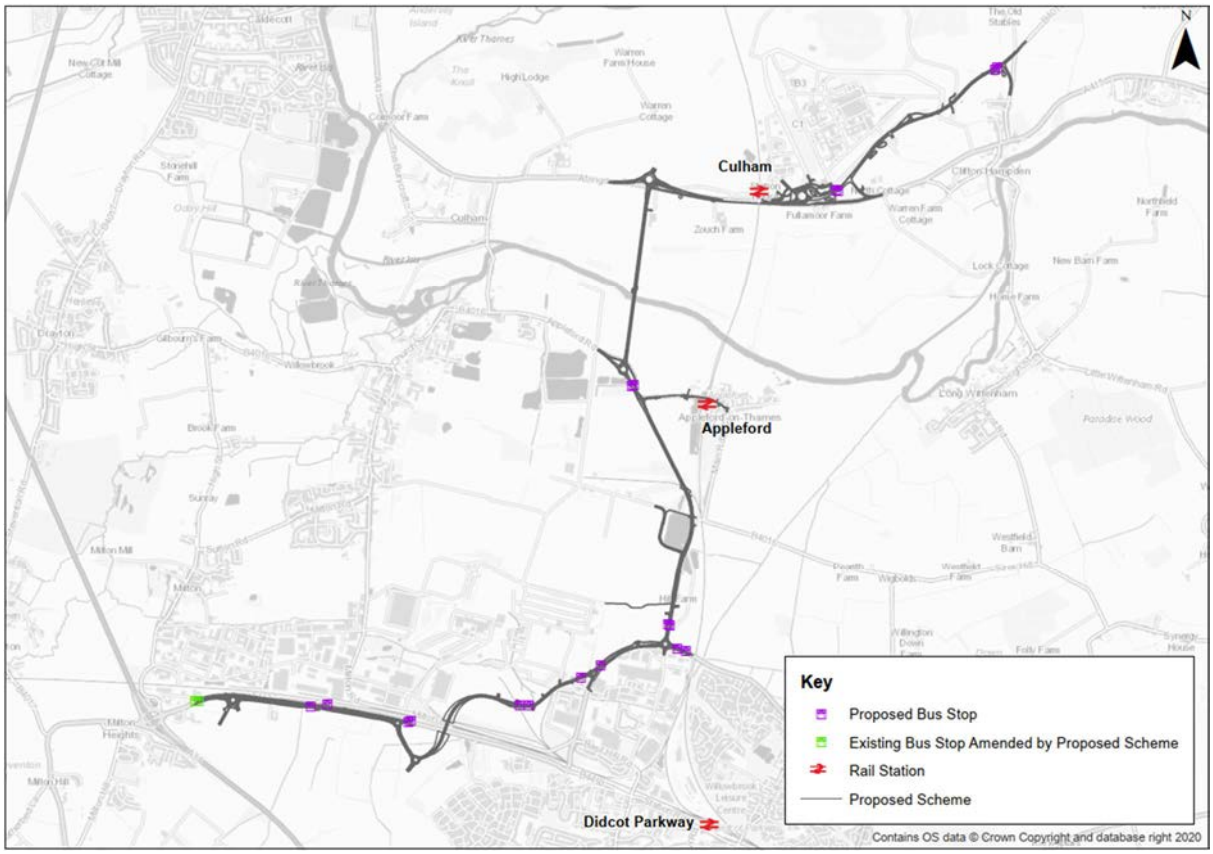
6.3.15 Another scheme is being progressed by OCC to deliver an NMU bridge over the A34, south of Milton Interchange. This would connect with the Scheme at the new Backhill Roundabout on A4130, enabling onwards journeys.

6.4 Public Transport Impact

6.4.1 As part of the HIF1 Scheme, the following new, fully accessible bus stops are proposed as shown in Figure 6.14:

- Four bus stops (two eastbound and two westbound) along the A4130;
- Four bus stops (two eastbound and two westbound) as part of the Didcot Science Bridge section;
- Six bus stops (a pair on the A4130 to the east of Collett Roundabout, a pair at the southern end inside the future employment site, and a pair near Appleford) as part of the River Crossing section; and
- Four bus stops (a pair at Culham Science Centre and a pair north of Clifton Hampden Village) as part of the Clifton Hampden Bypass Scheme.

Figure 6.14: Proposed Bus Stop Locations



6.4.2 These additional bus stops will increase the accessibility and catchment of the existing bus services in this area, whilst also helping to cater for new or improved services in the future. The locations have been determined in liaison with the bus operators serving this area.

6.4.3 The stops are proposed to include shelters and bicycle parking as appropriate.

6.4.1 The journey time data in Section 6.10 below demonstrates that the HIF1 Scheme will significantly improve journey times over the existing river crossings at Culham Cut / Sutton Bridge and Clifton Hampden Bridge. Any routes that use these bridges in the future, currently the 95 and 33 services, would benefit from the improved journey times and reliability.

6.4.2 As explained in Section 3.3, there are currently poor opportunities for bus routes to offer good journey time reliability north / south in this area due to the severance created by the River Thames and the historic road network. The South Oxfordshire Infrastructure Delivery Plan (IDP) includes requirements for several new bus routes to support planned growth. It is the intention for two of these routes to use the new Didcot to Culham River Crossing road, and as such the future bus network has been planned assuming the new road is in place. Without the new road it is unlikely the new bus routes could be delivered; the routes would take longer and be less reliable, increasing operating costs, while at the same time being less attractive to use, suppressing revenue. It is unlikely the proposed new routes would be viable without the new road, which would cause several strategic new developments to be more car dependent and less acceptable in planning terms.

6.4.3 The exact routes of the new services is not yet finalised, however the intention is for them to provide links from the development areas at Chalgrove to Culham Science Centre then via the new Didcot to Culham River Crossing road towards Didcot, and from Oxford's Eastern Arc, covering the Bayswater Brook, Northfield and Grenoble Road development sites, again to Culham Science Centre and onwards towards Didcot via the new road. These services will also serve the proposed strategic housing development at Culham. It is intended that both routes will eventually operate half-hourly, combining to provide four buses per hour along the new road in each direction.

6.4.4 The new services will be initially funded through S106 contributions from the development sites that they will serve. This will cover the start-up period where passenger use is built-up over time and as development build-out progresses. The requirement for subsidy will decline over this time as

passenger numbers and associated revenue increases, with the routes eventually becoming self-funding through passenger revenue alone.

6.5 Impact on the Highway Network

6.5.1 The following sections set out the performance of the junctions along the Scheme, and the impact of the Scheme on off-site junctions, in the 2024 and 2034 scenarios without and with the HIF1 Scheme.

6.6 Scheme Junctions

6.6.1 Table 6.1 summarises the results of the capacity assessments of the junctions along the Scheme. Junction model outputs (Junctions 9 and LinSig) are provided in Appendix H.

Table 6.1: Summary of Scheme Junction Capacity Results

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

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

A4130 / Service Area / North West Valley Park (SCH1)

6.6.2 The results of the 2024 and 2034 capacity assessments for the A4130 / Service Area / North West Valley Park access junction are presented in the following table.

Table 6.2: Operation of A4130 / Service Area / North West Valley Park (SCH1)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
A4130 (E)	0.79	4	0.64	2	0.73	3	0.67	2
NW Valley Park	0.00	0	0.00	0	0.13	0	0.13	0
Mays/Minscombe Services	0.09	0	0.11	0	0.05	0	0.24	0
A4130 (W)	0.52	1	0.61	2	0.71	3	0.94	14

6.6.3 The results indicate that the junction will operate within capacity in 2024. In 2034 the junction is shown to be approaching capacity in the PM peak, with the RFC on the A4130(W) arm exceeding the desirable maximum value of 0.85, but still within capacity.

A4130 / Valley Park access signalised junction (SCH2)

6.6.4 The results of the 2024 and 2034 capacity assessments for the A4130 / Valley Park access signalised junction are presented in the following table.

Table 6.3: Operation of A4130 / Valley Park access signalised junction (SCH2)

Arm	2024				2034			
	AM		PM		AM		PM	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A4130 (E)	68%	17	55%	12	61%	14	64%	14
Valley Park	11%	1	4%	0	51%	4	32%	2
A4130 (W)	38%	6	45%	8	49%	9	68%	14
Cycle time	108s		108s		108s		108s	
PRC	32%		64%		48%		33%	

6.6.5 The results indicate that the junction will operate within capacity in 2024 and 2034, with PRCs in excess of 30% in all scenarios and time periods.

A4130 / Science Bridge junction (SCH3)

6.6.6 The results of the 2024 and 2034 capacity assessments for the A4130 / Science Bridge junction are presented in the following table.

Table 6.4: Operation of A4130 / Science Bridge junction (SCH3)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
A4130 (E)	0.95	14	0.79	4	0.64	2	0.77	3
Science Bridge Link	0.81	4	0.62	2	0.93	11	0.84	5
A4130 (W)	0.58	2	0.68	2	0.78	4	0.97	19

6.6.7 The results indicate that the junction will operate within capacity in 2024, although the desirable maximum RFC is exceeded on the A4130(E) arm in the AM peak. In 2034 the junction is shown to be approaching but within capacity in both peaks, with the desirable maximum RFC exceeded on the Science Bridge link arm in the AM peak and the A4130(W) arm in the PM peak.

6.6.8 The overall flow change from 2024 to 2034 shows an increase. However, the A4130(E) arm has a significant decrease in flow, causing it to show a reduction in RFC (although the other two arms show an increase in RFC). Whilst traffic overall has increased from 2024 to 2034, it is being distributed more efficiently across the arms of the roundabout in 2034, producing a slightly lower maximum RFC in the AM peak.

Valley Park Spine Road / Science Bridge Link (SCH4)

6.6.9 The results of the 2024 and 2034 capacity assessments for the Valley Park Spine Road / Science Bridge Link junction are presented in the following table.

Table 6.5: Operation of Valley Park Spine Road / Science Bridge Link junction (SCH4)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Science Bridge	0.37	1	0.35	1	0.57	2	0.75	3
Valley Park Spine Road	0.07	0	0.03	0	0.77	3	0.61	2
Science Bridge Link	0.38	1	0.39	1	0.65	2	0.83	5

6.6.10 The results indicate that the junction will operate within capacity in 2024 and 2034.

Science Bridge Link Road / New Purchas Road (SCH5)

6.6.11 The results of the 2024 and 2034 capacity assessments for the Valley Park Spine Road / Science Bridge Link junction are presented in the following table.

Table 6.6: Operation of Science Bridge Link Road / New Purchas Road junction (SCH5)

Movement	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
New Purchas Rd - A4130(W)	0.04	0	0.05	0	0.29	0	0.30	0
New Purchas Rd - A4130(E)	0.27	0	0.19	0	0.73	3	0.79	3
A4130(W) - A4130(E)	0.39	1	0.37	1	0.69	4	0.76	6
A4130(W) - New Purchas Rd	0.41	0	0.39	0	0.68	1	0.72	1

6.6.12 The results indicate that the junction will operate within capacity in 2024 and 2034.

A4130 / Science Bridge (SCH6)

6.6.13 The results of the 2024 and 2034 capacity assessments for the A4130 / Science Bridge junction are presented in the following table.

Table 6.7: Operation of A4130 / Science Bridge junction (SCH6)

Movement	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Old A4130 - A4130(W)	1.01	3	1.37	5	1.99	21	1.95	28
Old A4130 - A4130(E)	1.01	12	1.37	71	1.96	65	1.92	48
A4130(W) - Old A4130(E)	0.16	0	0.07	0	0.25	0	0.15	0
A4130(E) - Old A4130(W)	0.62	2	0.53	1	0.75	3	0.69	2

6.6.14 The results indicate that the junction would be operating over capacity in both 2024 and 2034. Queuing and delays are predicted to occur on the minor arm (old A4130) in both peaks, although the new Science Bridge link road operates within capacity with no queuing or delays.

6.6.15 Although the stand-alone junction model indicated this junction would be operating over capacity, the applicant views this as acceptable for the following reasons:

- The strategy for the Scheme is to prioritise the mainline flow over side arm flows, particularly in this location. The intention is for vehicles coming from the west on the A4130 wishing to travel north on Didcot to Culham River crossing or east on the A4130 Didcot Northern Perimeter Road to use the new Didcot Science Bridge, rather than continue along the old A4130 past Sir Frank Williams Avenue and use the A4130 / B4493 / Mendip Heights roundabout (OFF4) and A4130 / Basil Hill Road / Milton Road (Power Station) roundabout (OFF5), A level of queuing on the side arm of SCH6 will help to achieve this by influencing driver behaviour.

- One of the main ways this can be achieved is to discourage traffic from using the existing A4130 between the Mendip Heights and Purchas Road roundabouts by creating a priority T-junction instead of a roundabout where the existing A4130 meets the new A4130, thus giving priority to the peripheral route. The roundabout at the Collett access to the Southmead Industrial Estate will still remain and so provides easier access for HGV movements eastwards.

- The traffic modelling data indicates that 78% of the minor arm traffic at the junction is turning right in the AM peak, and 65% in the PM peak in 2034. There is an alternative route to travel north / east by turning right at the A4130/Purchas Road/Hawksworth Road junction and travelling via the industrial estate to the improved A4130/New Thames River Crossing/Collett roundabout (SCH7), from where traffic can either continue north on the New Thames River Crossing or east along the A4130 eastbound. The southern arm of the proposed A4130/New Thames River Crossing/Collett roundabout has spare capacity to accommodate re-routing traffic (refer to results for SCH7).

- The traffic modelling data indicates that 22% of the minor arm traffic at the junction is turning left in the AM peak, and 35% in the PM peak in 2034. There is an alternative route to travel south / west by turning left at the A4130 / Basil Hill Road / Milton Road (Power Station) roundabout (OFF5) to access the new Didcot Science Bridge Road at SCH5.

- When updating the Paramics model assumptions to support the HIF application the LPA had advised 400 dwellings should be included on the Didcot A site. However, it is understood that this is no longer likely, therefore, if the 400 units do not come forward, the model is assuming too many trips in this area.

- Any drivers from existing housing in Didcot are likely to be heading north over the new Didcot to Culham River Crossing. Without the HIF Scheme, their route north would have been through Long Wittenham / Clifton Hampden or Sutton Courtenay / Culham. Therefore, if they are queuing at SCH6 junction they are taking a different route to baseline conditions, where they would have been queuing through the villages.

- Stand-alone junction models do not account for breaks in the mainline traffic flow as a result of junctions or crossings further upstream and downstream. The results are therefore likely to show longer queues on side arms of priority junctions. For example, in this location of SCH6, the mainline flow is likely to have more gaps in vehicles than predicted by the stand-alone

junction model due to the signalised crossing, bus stop, and roundabout to the north, and to the south the bus stop, three parallel crossings, the other side road accesses from future development, and the roundabout.

A4130 / New Thames River Crossing / Collett (SCH7)

6.6.16 The results of the 2024 and 2034 capacity assessments for the A4130 / New Thames River Crossing / Collett junction are presented in the following table.

Table 6.8: Operation of A4130 / New Thames River Crossing / Collett (SCH7)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
New Culham Crossing	0.33	1	0.59	2	0.69	2	0.74	3
A4130 (E)	0.65	2	0.44	1	0.77	3	0.68	2
Collett	0.16	0	0.13	0	0.32	1	0.40	1
A4130(W)	0.47	1	0.58	1	0.71	3	0.81	4

6.6.17 The results indicate that the junction will operate within capacity in 2024 and 2034.

New Thames River Crossing / Hanson & FCC Access Road (SCH8)

6.6.18 The results of the 2024 and 2034 capacity assessments for the New Thames River Crossing / Hanson & FCC Access Road junction are presented in the following table.

Table 6.9: Operation of New Thames River Crossing / Hanson & FCC Access Road (SCH8)

Movement	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
FCC/Hanson - New Culham Crossing(N)	0.03	0	0.03	0	0.08	0	0.05	0
FCC/Hanson - New Culham Crossing(S)	0.24	1	0.08	0	0.75	3	0.21	0
New Culham Crossing (N) - New Culham Crossing (S) / FCC/Hanson	0.04	0	0.02	0	0.06	0	0.02	0

6.6.19 The results indicate that the junction will operate within capacity in 2024 and 2034.

New Thames River Crossing / B4016 (SCH9)

6.6.20 The results of the 2024 and 2034 capacity assessments for the New Thames River Crossing / B4016 junction are presented in the following table.

Table 6.10: Operation of New Thames River Crossing / B4016 (SCH9)

Movement	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
B4016 - New Thames Crossing (S)	0.01	0	0.02	0	1.00	1	0.99	1
B4016 – New Thames Crossing (N)	0.20	0	0.41	1	0.98	7	0.92	5
New Thames Crossing (S) – New Thames Crossing (N) / B4016	0.04	0	0.02	0	0.06	0	0.06	0

6.6.21 The results indicate that the junction will operate within capacity in 2024. In 2034 the junction is predicted to operate at very close to capacity. Whilst RFC values are predicted to be between 0.92 and 1.00 in 2034, the maximum queue length on the B4016 is only seven vehicles.

6.6.22 Although the stand-alone junction model indicated this junction would be operating at very close to capacity in 2034, the applicant views this as acceptable for the following reasons:

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

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

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

New Thames River Crossing / B4016 Appleford Road (SCH10)

6.6.23 The results of the 2024 and 2034 capacity assessments for the New Thames River Crossing / B4016 Appleford Road junction are presented in the following table.

Table 6.11: Operation of New Thames River Crossing / B4016 Appleford Road (SCH10)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
New Thames Crossing	0.32	1	0.56	1	0.69	2	0.91	9
B4016 Appleford Road (S)	0.42	1	0.39	1	0.69	2	0.67	2
B4016 Appleford Road (N)	0.41	1	0.25	0	0.42	1	0.37	1

6.6.24 The results indicate that the junction will operate within capacity in 2024 and 2034, although the desirable maximum RFC of 0.85 will be exceeded in the 2034 PM peak with a small queue of nine vehicles.

New Thames River Crossing / A415 Abingdon Road (SCH11)

6.6.25 The results of the 2024 and 2034 capacity assessments for the New Thames River Crossing / A415 Abingdon Road junction are presented in the following table.

Table 6.12: Operation of New Thames River Crossing / A415 Abingdon Road (SCH11)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
New Access Road	0.00	0	0.01	0	0.03	0	0.06	0
A415 Abingdon Road (E)	0.22	0	0.35	1	0.33	1	0.52	1
New Thames Crossing	0.48	1	0.33	1	0.61	2	0.59	1
A415 Abingdon Road (W)	0.33	1	0.20	0	0.61	2	0.39	1

6.6.26 The results indicate that the junction will operate within capacity in 2024 and 2034.

A415 / Clifton Hampden Bypass / Culham Science Centre (SCH12)

6.6.27 The results of the 2024 and 2034 capacity assessments for the A415 / Clifton Hampden Bypass / Culham Science Centre junction are presented in the following table.

Table 6.13: Operation of A415 / Clifton Hampden Bypass / Culham Science Centre (SCH12)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
CSC Access	0.05	0	0.28	0	0.11	0	0.38	1
Clifton Hampden Bypass (E)	0.21	0	0.12	0	0.34	1	0.25	0
Clifton Hampden Bypass (W)	0.67	2	0.35	1	0.94	13	0.58	1
CSV Access	0.04	0	0.07	0	0.50	1	0.15	0

6.6.28 The results indicate that the junction will operate within capacity in 2024. In 2034 the junction is shown to be operating within capacity in both peaks, although the desirable maximum RFC of 0.85 is exceeded on the Clifton Hampden Bypass (W) arm in the AM peak.

Clifton Hampden Bypass / Realigned A415 (SCH13)

6.6.29 The results of the 2024 and 2034 capacity assessments for the Clifton Hampden Bypass / Realigned A415 priority junction are presented in the following table.

Table 6.14: Operation of Clifton Hampden Bypass / Realigned A415 (SCH13)

Movement	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
A415 - Clifton Hampden Bypass(W)	0.29	0	0.19	0	***	59	1.28	19
A415 - Clifton Hampden Bypass(E)	0.04	0	0.01	0	***	30	1.16	5
Clifton Hampden Bypass(W) - A415	0.22	0	0.32	1	0.20	0	0.26	0

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

6.6.30 The results indicate that the junction will operate within capacity in 2024. In 2034 capacity is exceeded in both peaks with queues and delays occurring on the minor arm (realigned section of the A415). No delays are experienced on the Clifton Hampden Bypass.

6.6.31 Although the stand-alone junction model indicated this junction would be operating over capacity in 2034, the applicant views this as acceptable for the following reasons:

- The strategy for the Scheme is to prioritise the mainline flow over side arm flows. The intention is for vehicles coming from the south of the River Thames and wishing to head north / east of SCH13 to make the journey from Collett Roundabout (SCH7). A different junction type in this location could be more attractive to drivers, reducing the rerouting benefits of the Scheme that remove trips through Long Wittenham and Clifton Hampden. Therefore, a level of queuing on the side arm in the peaks deemed acceptable as it will operate as a village access whilst not being too attractive for through-trips.

- The traffic modelling data indicates that 34% of the minor arm traffic at the junction is turning right in the AM peak, and 29% in the PM peak in 2034. As this traffic is heading east, there is an alternative route through Clifton Hampden via Abingdon Road and Oxford Road (SCH14), and this would appear to be the more logical route selection to travel east. If the right turn movements are removed from the 2034 scenarios the junction would then operate within capacity. There is also another existing alternative route via A415 through Burcot.

- Any drivers in a queue on this side arm are trying to travel east or west on the Clifton Hampden Bypass. Without the HIF Scheme, significantly more drivers would be travelling through the staggered signalised junction in Clifton Hampden Village (OFF6 and OFF7, see results in Table 6.26 and Table 6.27). Delays at the signalised junction in the 'No HIF' scenario are significantly higher than those predicted at this junction in the 'With HIF' scenario.

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

Clifton Hampden Bypass / B4015 (SCH14)

6.6.32 The results of the 2024 and 2034 capacity assessments for the Clifton Hampden Bypass / B4015 priority junction are presented in the following table.

Table 6.15: Operation of Clifton Hampden Bypass / B4015 (SCH14)

Movement	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
B4015 - Clifton Hampden Bypass (W)	0.05	0	0.06	0	***	18	***	16
B4015 - Clifton Hampden Bypass (E)	0.56	1	0.26	0	***	49	***	29
Clifton Hampden Bypass (W) - Clifton Hampden Bypass (E) / B4015	0.05	0	0.05	0	0.07	0	0.33	1

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

6.6.33 The results indicate that the junction will operate within capacity in 2024. In 2034 capacity is exceeded in both peaks with queues and delays occurring on the minor arm (B4015). No delays are experienced on the Clifton Hampden Bypass.

6.6.34 Although the stand-alone junction model indicated this junction would be operating over capacity in 2034, the applicant views this as acceptable for the following reasons:

- The strategy for the Scheme is to prioritise the mainline flow over side arm flows. The intention is for vehicles coming from the south of the River Thames and wishing to head north / east of SCH14 to make the journey from Collett Roundabout (SCH7). A different junction type in this location could be more attractive to drivers, reducing the rerouting benefits of the Scheme that remove trips through Long Wittenham and Clifton Hampden. Therefore, a level of queuing on the side arm in the peaks is deemed acceptable as it will operate as a village access whilst not being too attractive for through-trips.
- There is another existing alternative route via A415 through Burcot.
- Any drivers in a queue on this side arm are trying to travel east or west on the Clifton Hampden Bypass. Without the HIF Scheme, significantly more drivers would be travelling through the staggered signalised junction in Clifton Hampden Village (OFF6 and OFF7, see results in Table 6.26 and Table 6.27 Delays at the signalised junction in the 'No HIF' scenario are significantly higher than those predicted at this junction in the 'With HIF' scenario.

Clifton Hampden Bypass / Culham Science Centre Access (SCH15)

6.6.35 The results of the 2024 and 2034 capacity assessments for the Clifton Hampden Bypass / Culham Science Centre Access junction (left turn egress only) are presented in the following table.

Table 6.16: Clifton Hampden Bypass / Culham Science Centre (SCH15)

Arm	2024				2034			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
CSC Access – Clifton Hampden Bypass (E)	0.05	0	0.13	0	0.10	0	0.44	1
Clifton Hampden Bypass (E) – CSC Access	0.00	0	0.00	0	0.00	0	0.00	0

6.6.36 The results indicate that the junction will operate within capacity in 2024 and 2034. There is no right turn movement allowed from the bypass into this junction, resulting in 0 RFC values for that movement.

6.7 Off-Site Junctions

6.7.1 Junction capacity assessment results for 2024 and 2034, with and without the HIF1 Scheme, are summarised in the following table. The 2020 baseline scenario results are also shown for comparison purposes (ref. Table 3.4). Impacts at Milton Interchange (OFF 1) are considered in Section 6.9

Table 6.17: Summary of Off-site Junction Capacity Results

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

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

6.8 Future Year Junction Capacity Assessments – Off Site Junctions

6.8.1 The following section provides a summary of the 2024 and 2034 capacity assessments for the off-site junctions, without and with the HIF1 Scheme. Junction model outputs (Junctions 9 and LinSig) are provided in Appendix B.

A4130 / Service Area Junction (OFF 2)

6.8.2 The results of the capacity assessments for the A4130 / Service Area priority junction are presented in Table 6.18 and Table 6.19for 2024 and 2034 respectively.

Table 6.18: Operation of A4130 / Service Area Junction (OFF 2) – 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Service Area to A4130	0.61	2	0.59	1	0.49	1	0.66	1
A4130	0.33	1	0.40	1	0.34	0	0.43	1

Table 6.19: Operation of A4130 / Service Area Junction (OFF 2) – 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Service Area to A4130	1.07	18	0.77	3	0.71	2	0.40	1
A4130	0.60	1	0.47	1	0.35	1	0.38	1

6.8.3 The results indicate that without the HIF1 Scheme, the junction would operate within capacity in 2024 but capacity would be exceeded in the AM peak in 2034, with excessive queuing occurring on the service area access.

6.8.4 The HIF1 Scheme is expected to result in a significant improvement in junction performance, and the junction is predicted to operate within capacity in 2024 and 2034, with minimal queuing on any arm.

A4130 / Milton Gate Signalised Junction (OFF 3)

6.8.5 The results of the capacity assessments for the A4130 / Milton Gate signalised junction are presented in Table 6.20 and Table 6.21 for 2024 and 2034 respectively.

Table 6.20: Operation of A4130 / Milton Gate Signalised Junction (OFF 3) - 2024

Approach & Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A4130 (W) Left Ahead	51.3%	6.5	57.3%	7.8	56.7%	7.4	62.3%	8.7
A4130 (W) Ahead	53.7%	7.5	59.0%	8.6	58.7%	8.6	63.9%	9.8
Milton Gate Right Left	27.5%	1.4	28.4%	1.4	25.5%	1.3	26.6%	1.3
A4130 (E) Ahead	61.8%	8.5	31.2%	3.4	73.3%	11.3	47.7%	5.8
A4130 (E) Ahead Right	94.1%	22.2	92.1%	20.3	95.0%	23.5	93.1%	21.3
Cycle time	66 seconds		66 seconds		66 seconds		66 seconds	
PRC	-4.5%		-2.4%		-5.6%		-3.3%	

Table 6.21: Operation of A4130 / Milton Gate Signalised Junction (OFF 3) - 2034

Approach & Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A4130 (W) Left Ahead	90.3%	18.4	112.7%	86.4	76.2%	12.1	95.4%	23.5
A4130 (W) Ahead	91.2%	20.3	112.7%	93.1	77.8%	13.7	95.8%	25.4
Milton Gate Right Left	32.7%	1.7	25.4%	1.2	25.3%	1.2	26.2%	1.3
A4130 (E) Ahead	134.2%	183.7	84.6%	14.9	61.2%	8.3	50.8%	6.4
A4130 (E) Ahead Right	136.5%	219.6	96.5%	25.7	94.1%	22.2	93.3%	21.5
Cycle time	66 seconds		66 seconds		66 seconds		66 seconds	
PRC	-51.7%		-25.2%		-4.6%		-6.4%	

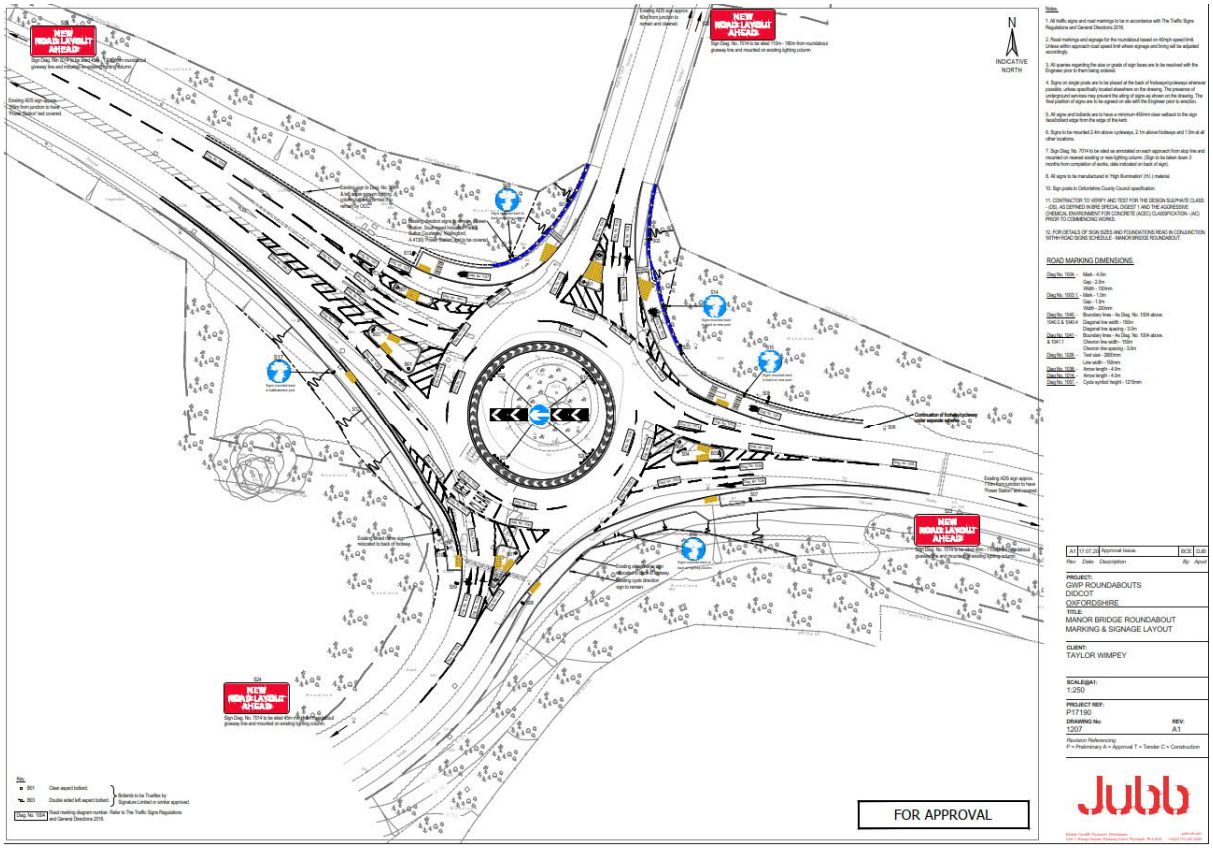
6.8.6 The results indicate that without the HIF1 Scheme, the design capacity of the junction would be exceeded in 2024 in both peaks with a PRC between -2.4% and -4.5%, although the junction would still be operating within theoretical capacity. By 2034 junction performance would deteriorate further, with theoretical capacity exceeded in both peaks and significant queuing on both the A4130(E) and A4130(W) approaches. The PRC for the junction would decrease significantly to between -51.7% and -25.2%.

6.8.7 With the HIF1 Scheme, the junction is predicted to operate within theoretical capacity in 2024 and 2034, although the DoS on the A4130(W) and A4130(E) approaches is predicted to exceed 90%, indicating that the junction is approaching its theoretical capacity and resulting in PRCs of -5% and -6% in the AM and PM peaks respectively. The HIF1 Scheme creates a significant improvement in junction operation in 2034, with performance and queues similar to those in the 2020 baseline assessment.

A4130 / B4493 / Mendip Heights Roundabout (OFF 4)

6.8.8 As explained in Table 5.3, an improvement scheme has been proposed for this junction as S278 works related to a nearby housing site, which is currently undergoing review by OCC Road Agreements Team. The future year assessments have been based on the proposed scheme. The scheme layout is shown below (Drawing 1207 Rev A1, '*Manor Bridge Roundabout Marking and Signage Layout*', Jubb, 17/07/2020).

Figure 6.15: Proposed Layout for A4130/B4493/Mendip Heights Junction



6.8.9 The results of the capacity assessments for the A4130 / B4493 / Mendip Heights junction are presented in Table 6.22 and Table 6.23 for 2024 and 2034 respectively.

Table 6.22: Operation of A4130 / B4493 / Mendip Heights Roundabout (OFF 4) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
A4130 (North)	0.78	3	0.87	6	0.24	0	0.52	1
B4493	1.02	31	1.02	33	0.74	3	0.74	3
Mendip Heights	0.14	0	0.09	0	0.14	0	0.07	0
A4130 (West)	0.56	1	0.52	1	0.41	1	0.29	0

Table 6.23: Operation of A4130 / B4493 / Mendip Heights Roundabout (OFF 4) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
A4130 (North)	1.27	144	1.42	229	0.32	1	0.53	1
B4493	1.47	459	1.29	261	0.73	3	0.54	1
Mendip Heights	0.22	0	0.14	0	0.20	0	0.08	0
A4130 (West)	0.93	12	0.90	8	0.58	1	0.34	1

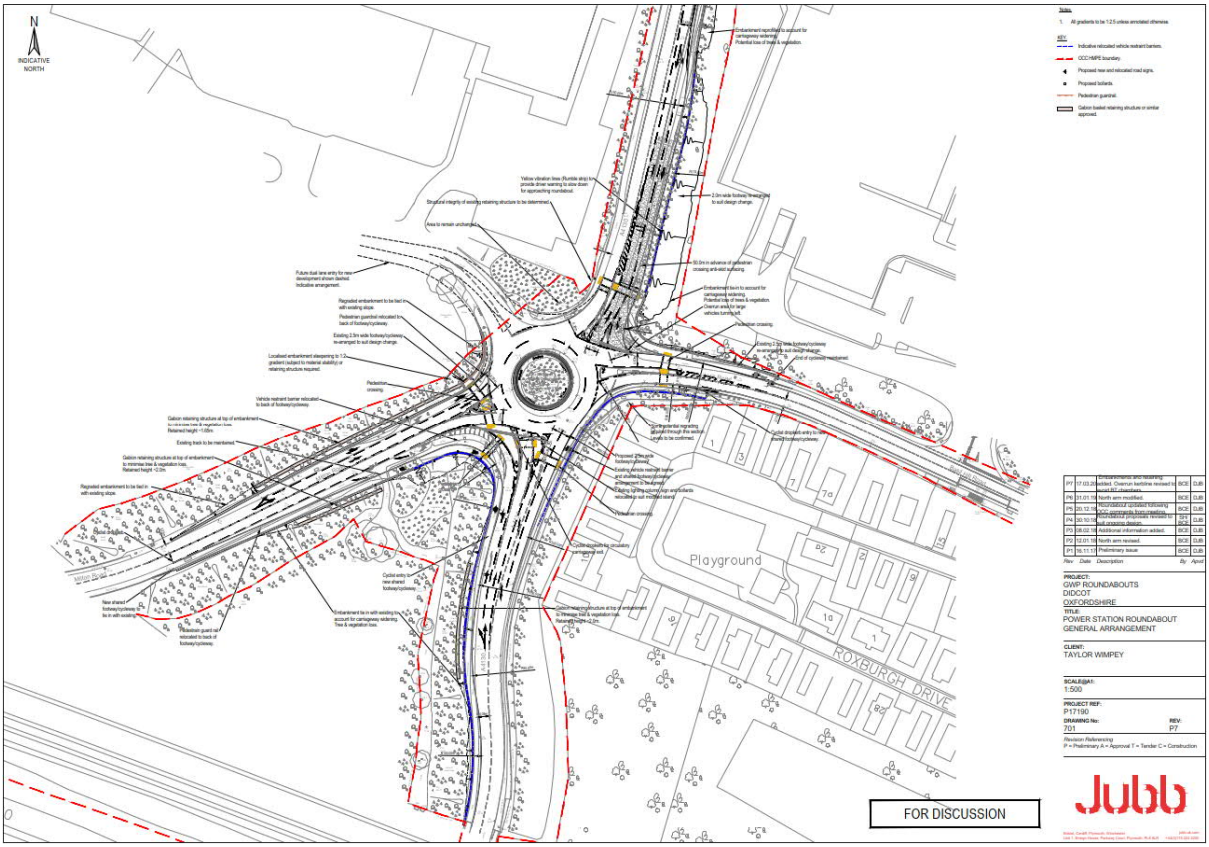
6.8.10 The results indicate that without the HIF1 Scheme, junction capacity would be exceeded in both peaks in 2024 and 2034, with long queues on the A4130(N) and the B4493.

6.8.11 With the HIF1 Scheme, operation of the junction is significantly improved and it is predicted to operate within capacity in 2024 and 2034.

Power Station Roundabout (OFF 5)

6.8.12 As explained in Table 5.3, an improvement scheme has been proposed for this junction as S278 works related to a nearby housing site, which is currently undergoing review by OCC Road Agreements Team. The future year assessments have been based on the proposed scheme. The scheme layout is shown below (Drawing No. 701 Rev P7, '*Power Station Roundabout General Arrangement''*, Jubb, 17/03/2020).

Figure 6.16: Proposed Layout for Power Station Roundabout



6.8.13 The results of the capacity assessments for the Power Station roundabout are presented in Table 6.24 and Table 6.25 for 2024 and 2034 respectively.

Table 6.24: Operation of Power Station Roundabout (OFF 5) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
A4130 (North)	0.67	2	0.46	1	0.22	0	0.23	0
Basil Hill Road	0.73	2	0.25	0	0.42	1	0.26	0
A4130 (South)	0.72	3	0.53	1	0.33	1	0.18	0
Milton Road	0.49	1	0.83	5	0.25	0	0.59	1
Access Road	0.05	0	0.08	0	0.10	0	0.08	0

Table 6.25: Operation of Power Station Roundabout (OFF 5) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
A4130 (North)	0.94	12	0.70	2	0.26	0	0.15	0
Basil Hill Road	38.0	122	0.58	1	0.54	1	0.37	1
A4130 (South)	1.10	54	0.98	18	0.37	1	0.15	0
Milton Road	0.67	2	1.11	57	0.34	1	0.65	2
Access Road	0.25	0	0.31	0	0.19	0	0.18	0

6.8.14 The results indicate that without the HIF1 Scheme, the junction would operate within capacity in 2024, but capacity would be exceeded in both peaks in 2034, with capacity exceeded on the A4130(S) and Basil Hill Road arms in the AM peak, and on the Milton Road arm in the PM peak.

6.8.15 With the HIF1 Scheme, performance of the junction significantly improves. It is forecast to operate within capacity in both 2024 and 2034.

Clifton Hampden Signalised Junction (OFF6 & OFF7)

The results of the capacity assessments for the Clifton Hampden staggered signalised junction are presented in Table 6.26 and Table 6.27 for 2024 and 2034 respectively.

Table 6.26: Operation of Clifton Hampden Signalised Junction (OFF6 & OFF7) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A415 Abingdon Ahead Right Left	166.8%	109.5	90.0%	12.4	41.7%	2.0	45.2%	3.0
Internal Junction link Eastbound East Ahead Left	61.9%	2.2	48.0%	1.8	32.7%	0.5	24.3%	0.6
A415 Burcot Ahead Right	333.0%	192.7	199.3%	160.2	66.2%	4.0	75.5%	5.8
Internal Junction link Westbound West Ahead Left Right	57.1%	6.4	66.3%	6.3	27.2%	1.3	45.8%	4.4
High Street Right Left Ahead	165.5%	132.1	190.8%	101.5	67.4%	6.6	59.6%	3.2
Watery Lane Plough Inn	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
B4015 Left Right	105.8%	17.0	175.4%	96.3	30.4%	1.6	71.9%	5.9
Cycle time	90 seconds		90 seconds		90 seconds		90 seconds	
PRC	-270%		-122%		34%		19%	

Table 6.27: Operation of Clifton Hampden Signalised Junction (OFF6 & OFF7) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A415 Abingdon Ahead Right Left	345.5%	405.4	273.4%	410.1	29.0%	1.3	34.4%	1.6
Internal Junction link Eastbound East Ahead Left	58.7%	2.1	51.5%	1.9	31.0%	0.7	18.0%	0.6
A415 Burcot Ahead Right	635.7%	446.4	385.9%	455.2	39.8%	1.9	87.6%	7.2
Internal Junction link Westbound West Ahead Left Right	58.4%	6.5	69.9%	7.1	18.5%	0.4	63.4%	9.4
High Street Right Left Ahead	376.2%	539.3	403.3%	406.3	80.6%	9.2	76.0%	4.5
Watery Lane Plough Inn	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
B4015 Left Right	260.2%	198.1	281.5%	223.8	30.9%	1.7	85.7%	10.5
Cycle time	90 seconds		90 seconds		90 seconds		90 seconds	
PRC	-606%		-348%		+12%		+3%	

6.8.16 Based on the same signal timings as the 2020 model, the junction is forecast to operate above capacity in 2024 without the HIF1 Scheme, with significant queuing in both AM and PM peaks and a PRC of -270% in the AM peak. By 2034, without the HIF1 Scheme the operation of the junction would deteriorate further, with a PRC of -606% in the AM peak and -348% in the PM peak.

6.8.17 With the HIF1 Scheme there is a significant improvement in the operation of the junction. It is forecast to operate within capacity in both 2024 and 2034 with significantly reduced queues in the village.

Harwell Road / Milton Road / High Street Mini Roundabout (OFF 8)

6.8.18 The results of the capacity assessments for the Harwell Road / Milton Road / High Street mini roundabout are presented in Table 6.28 and Table 6.29 for 2024 and 2034 respectively.

Table 6.28: Operation of Harwell Rd / Milton Rd / High Street Mini Roundabout (OFF 8) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
High Street	0.44	1	0.29	0	0.37	1	0.22	0
Harwell Road	0.47	1	0.63	2	0.17	0	0.29	0
Milton Road	0.36	1	0.21	0	0.27	0	0.15	0

Table 6.29: Operation of Harwell Rd / Milton Rd / High Street Mini Roundabout (OFF 8) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
High Street	0.54	1	0.33	1	0.49	1	0.43	1
Harwell Road	0.97	15	1.00	25	0.24	0	0.44	1
Milton Road	0.74	3	0.44	1	0.29	0	0.22	0

6.8.19 The results indicate that without HIF1 the junction would operate within capacity in 2024, but would be reaching theoretical capacity in 2034 with RFCs exceeding the desirable maximum of 0.85 in both the AM and PM peaks and operating with an RFC of 1.00 in the PM peak without HIF1.

6.8.20 With the HIF1 Scheme there is a significant improvement in the operation of the junction, and it is forecast to operate well within capacity in both 2024 and 2034 with minimal queuing.

High Street / Church Street / Brook Street Junction (OFF 9)

6.8.21 The results of the capacity assessments for the High Street / Church Street / Brook Street junction are presented in Table 6.30 and Table 6.31 for 2024 and 2034 respectively.

Table 6.30: Operation of High Street / Church Street / Brook Street Junction (OFF 9) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
High Street to High Street								
High St (N) to High St	0.49	1	0.39	1	0.43	1	0.30	0
High St (S) to High St (N)	1.00	18	1.10	44	0.43	1	0.45	1
High Street to Church Street								
High St to Brook St/ Church St	1.35	87	1.47	135	0.62	2	0.58	1
Brook St to High St	0	0	0	0	0	0	0	0
High Street to Brook Street								
High St to Brook St/ Church St	0.11	0	0.18	0	0.09	0	0.15	0
Church St to High St	0.26	1	0.11	0	0.20	0	0.08	0

Table 6.31: Operation of High Street / Church Street / Brook Street Junction (OFF 9) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
High Street to High Street								
High St (N) to High St	0.54	1	0.40	1	0.53	1	0.62	2
High St (S) to High St (N)	1.88	494	1.76	447	0.55	1	0.69	2
High Street to Church Street								
High St to Brook St/ Church St	2.69	654	2.43	577	0.84	4	1.06	20
Brook St to High St	0	0	0	0	0	0	0	0
High Street to Brook Street								
High St to Brook St/ Church St	0.16	0	0.24	0	0.11	0	0.49	0
Church St to High St	0.31	1	0.13	0	0.26	1	0.21	0

6.8.22 Without the HIF1 Scheme, the junction is forecast to operate above capacity in the AM peak and PM peak hours in 2024, and the performance of the junction deteriorates further by 2034.

6.8.23 With the HIF1 Scheme there is a significant improvement in junction performance. It is forecast to operate within capacity in 2024. In 2034, capacity is exceeded in the PM peak, with a maximum RFC

of 1.06 on the High Street to Brook Street/Church Street movement and a maximum queue of 20 vehicles. This is low compared to the same without HIF1 scenario with a forecast RFC of 2.43 and a maximum queue of 577.

6.8.24 Junction performance in the 2034 With HIF1 scenario is predicted to be similar to 2020 in the AM, and better in the PM, with a maximum RFC of 1.06 and associated queue of 20 vehicles in 2034 compared to RFC of 1.19 and queue of 47 vehicles in 2020 as shown in Table 3.11.

Tollgate Road / Abingdon Road Junctions (OFF 10 and OFF 11)

6.8.25 The results of the capacity assessments for the B4016 Appleford Road/Abingdon Road junction (OFF 10) and A415 / Tollgate Road junction (OFF 11) are presented in Table 6.32 and Table 6.33 for 2024 and 2034 respectively.

Table 6.32: Operation of Tollgate Road / Abingdon Road Junctions (OFF 10 & OFF 11) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A415 / Tollgate Road Junction Signals								
Abingdon Rd (E) - Ahead Left	64%	7	74%	9	52%	6	61%	9
Tollgate Road – Right Left	112%	42	73%	6	72%	3	54%	2
Abingdon Rd (W) - Ahead Right	99%	28	62%	5	44%	6	38%	3
Culham Bridges Signals								
Culham Br N/bound - Ahead	113%	58	73%	13	24%	4	20%	3
Culham Br S/bound – Ahead	49%	12	75%	15	13%	3	14%	3
Appleford Road / Abingdon Road Priority Junction								
Appleford Rd (E) – Right Ahead	15%	0	20%	0	21%	0	21%	0
Appleford Rd (W) – Left Ahead	47%	0	39%	0	33%	0	24%	0
Abingdon Road – Left Right	40%	12	50%	14	16%	0	14%	0
Cycle time	154 / 111 seconds		154 / 111 seconds		154 / 111 seconds		154 / 111 seconds	
PRC	-26.0%		+19.9%		+24.7%		+46.5%	

Table 6.33: Operation of Tollgate Road / Abingdon Road Junctions (OFF 10 & OFF 11) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	DoS	MMQ	DoS	MMQ	DoS	MMQ	DoS	MMQ
A415 / Tollgate Road Junction Signals								
Abingdon Rd (E) - Ahead Left	81%	11	75%	7	78%	14	80%	16
Tollgate Road – Right Left	93%	16	78%	10	84%	11	73%	5
Abingdon Rd (W) - Ahead Right	91%	13	64%	5	70%	18	54%	7
Culham Bridges Signals								
Culham Br N/bound - Ahead	133%	109	100%	30	82%	17	45%	8
Culham Br S/bound – Ahead	65%	16	84%	16	16%	3	20%	4
Appleford Road / Abingdon Road Priority Junction								
Appleford Rd (E) – Right Ahead	26%	0	31%	0	34%	0	36%	0
Appleford Rd (W) – Left Ahead	73%	1	57%	0	39%	0	34%	0
Abingdon Road – Left Right	121%	87	85%	17	24%	3	44%	6
Cycle time	154 / 111 seconds		154 / 111 seconds		154 / 111 seconds		154 / 111 seconds	
PRC	-47.2%		-10.7%		+6.9%		+12.9%	

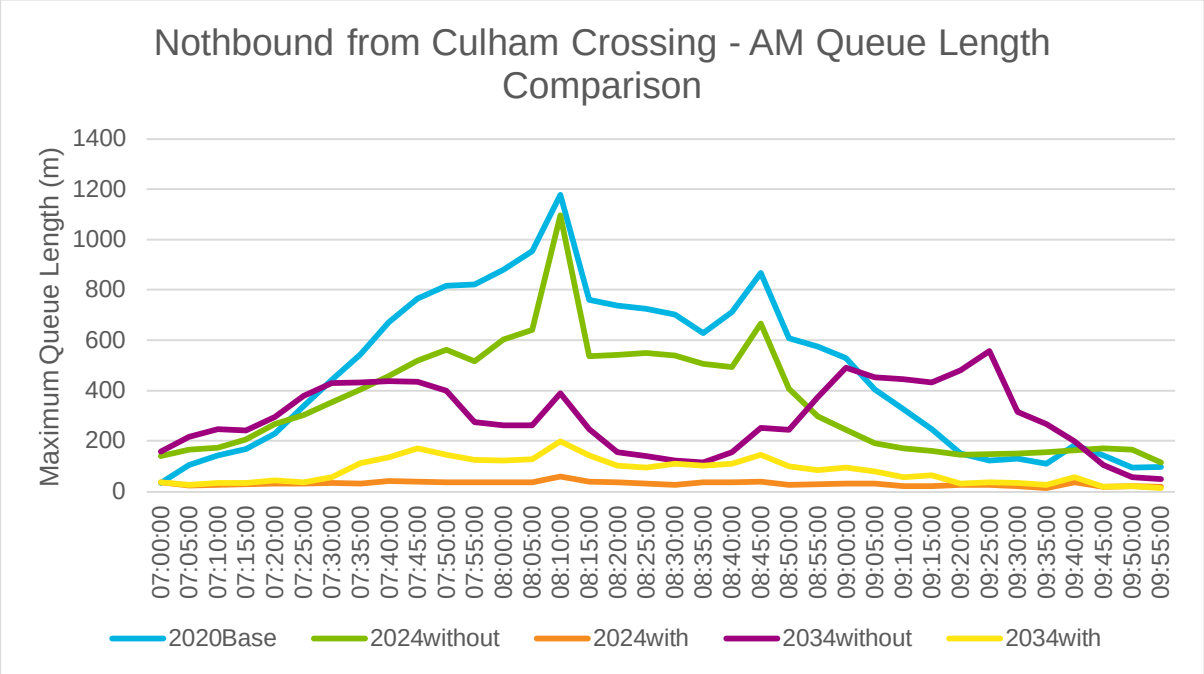
6.8.26 The results indicate that in 2024 without the HIF1 Scheme the junctions will operate above capacity in the AM peak and within capacity in the PM peak. Interrogation of the traffic flows for the 2024 PM peak scenario indicate that total traffic flows are lower than in the 2020 scenario. However, journey time data for the routes through this part of the network indicate higher journey times in 2024 compared to 2020 (ref Section 6.10). Congestion elsewhere on the network is therefore reducing the traffic flows through this part of the network, giving a false indication that network operation has improved when solely modelling this junction in a stand-alone manner.

6.8.27 In 2034 there is further deterioration in network performance in the AM peak. Network performance in the PM peak is indicated to be similar to the 2020 scenario, however this is related to congestion on the network elsewhere preventing traffic reaching these junctions, as for the 2024 scenario.

6.8.28 In the ‘with HIF1’ scenarios there is a significant improvement in network operation, with all junctions operating within capacity in both 2024 and 2034 and predicted queue lengths at a level that would not block back to adjacent junctions. The forecast PRC for all junctions in 2024 is between 24.7% and 46.5% and in 2034 it is forecast to be between 6.9% and 12.9% indicating that there will be spare capacity at these junctions with the HIF1 Scheme.

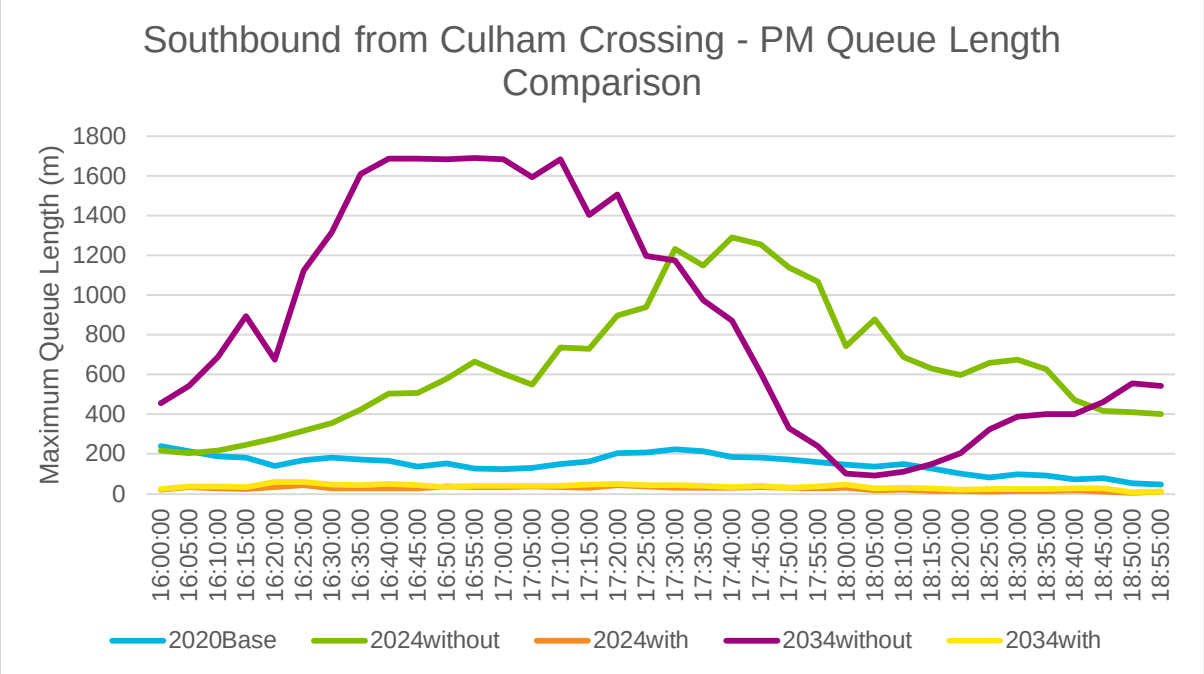
6.8.29 As explained in the baseline section, these junctions are complex to model due to the interaction of queuing back between them, particularly the uncontrolled priority junction at the south. As done for the baseline scenario, queue length data has been extracted from the Paramics model to further understand the predicted operation of these junctions across future scenarios. The model queue data uses the demand scenarios as shown in Figure 5.2, excluding the 70% factoring exercise for 2034 without HIF scenario.

Figure 6.17: Culham Crossing Queue Comparison (Northbound)



6.8.30 Figure 6.17 above shows that the Paramics model indicates significant reductions in queue length from the northbound signals before the bridge as a result of the HIF1 Scheme in both 2024 and 2034 AM scenarios. There is no predicted queueing from the crossing signals that would block back to the southern Appleford Road / Abingdon Road priority junction (approximately 290m distance). This contrasts to the base, 2024 without HIF and 2034 without HIF where queuing is predicted to extend back to the junction (and further through Sutton Courtenay) for large portions of the AM peak. It should be noted that the shorter queue lengths in 2024 and 2034 without HIF when compared to base are not due to an improved performance at this junction, but are a result of vehicles being stuck in queues elsewhere in the model network preventing them from reaching the junction. Regardless of this, the model shows a significant improvement at this junction as a result of the HIF1 Scheme.

Figure 6.18: Culham Crossing Queue Comparison (Southbound)



6.8.31 Figure 6.18 above shows that the Paramics model indicates significant reductions in queue length from the southbound signals before the bridge as a result of the HIF1 Scheme in both 2024 and 2034 PM scenarios. There is no predicted queueing from the crossing signals that would block back to the northern A415 / Tollgate Road signalised junction (approximately 430m distance). This contrasts to the

base year which shows a queue approximately 200m long throughout the PM peak hour, and 2024 without HIF and 2034 without HIF where queuing is predicted to extend back to and through the northern junction (and further along the A415) for almost all of the PM peak hour. Therefore, the model shows a significant improvement at this junction as a result of the HIF1 Scheme.

A4130 / Lady Grove Roundabout (OFF 12)

6.8.32 The capacity of the A4130 / Lady Grove roundabout has been assessed based on the proposed roundabout scheme for the junction, which is included in the Paramics model in 2024 and 2034 as explained in Table 5.3. The results of the capacity assessments are presented in Table 6.34 and Table 6.35 for 2024 and 2034 respectively.

Table 6.34: Operation of A4130 / Lady Grove Roundabout (OFF 12) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Lady Grove	0.27	0	0.50	1	0.12	0	0.25	0
Abington Road	0.53	1	0.41	1	0.53	1	0.43	1
A4130	0.34	1	0.32	1	0.50	1	0.45	1

Table 6.35: Operation of A4130 / Lady Grove Roundabout (OFF 12) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Lady Grove	0.46	1	0.62	2	0.17	0	0.46	1
Abington Road	0.58	1	0.41	1	0.72	3	0.60	2
A4130	0.19	0	0.17	0	0.66	2	0.61	2

6.8.33 The results indicate that without the HIF1 Scheme the junction will operate within capacity in 2024 and 2034.

6.8.34 With the HIF1 Scheme there are slight changes to results on each arm with some increasing and others decreasing, and it is forecast to operate within capacity in both 2024 and 2034.

Lady Grove / Sires Hill Junction (OFF 13)

6.8.35 The results of the capacity assessments for the Lady Grove / Sires Hill junction are presented in Table 6.36 and Table 6.37 for 2024 and 2034 respectively.

Table 6.36: Operation of Lady Grove / Sires Hill Junction (OFF 13) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Lady Grove to Sires Hill (East)	0.16	0	0.05	0	0	0	0	0
Lady Grove to Sires Hill (West)	0.79	3	0.43	1	0.50	1	0.39	1
Sires Hill East to Sires Hill (West)	0.23	1	0.40	1	0	0	0.1	0

Table 6.37: Operation of Lady Grove / Sires Hill Junction (OFF 13) - 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Lady Grove to Sires Hill (East)	1.37	6	1.06	3	0.11	0	0.01	0
Lady Grove to Sires Hill (West)	1.35	49	1.07	13	0.80	4	0.61	2
Sires Hill East to Sires Hill (West)	0.64	4	0.88	13	0.01	0	0.58	2

6.8.36 Without the HIF1 Scheme, the junction is forecast to operate within capacity in both the AM and PM peak hour in 2024. The maximum RFC forecast of 0.79 on the Lady Grove to Sires Hill (west) movement. In 2034, junction capacity is forecast to be exceeded in both the AM and PM peaks, with long queues forming on all arms.

6.8.37 With the HIF1 Scheme there is a significant improvement in the operation of the junction, and it is forecast to operate within capacity in both 2024 and 2034. Junction performance in the 2034 With HIF1 scenario is better than that for 2020, where junction capacity is exceeded in the AM peak with an RFC of 0.95 as shown in Table 6.17.

Sires Hill / Didcot Road Junction (OFF 14)

6.8.38 The results of the capacity assessments for the Sires Hill / Didcot Road junction are presented in Table 6.38 and Table 6.39 for 2024 and 2034 respectively.

Table 6.38: Sires Hill / Didcot Road Junction (OFF 14) - 2024

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Sires Hill (South) to-Sires Hill (West)	0.16	0	0.38	1	0.17	0	0.33	1
Sires Hill (South) - Didcot Road	0.27	0	0.32	1	0.15	0	0.10	0
Sires Hill (West)-Sires Hill (South)	0.35	1	0.32	1	0.30	1	0.28	1

Table 6.39: Sires Hill / Didcot Road Junction (OFF 14) – 2034

Movement	Without HIF1				With HIF1			
	AM		PM		AM		PM	
	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue	Max RFC	Queue
Sires Hill (South) to-Sires Hill (West)	0.39	1	1.54	45	0.06	0	0.01	0
Sires Hill (South) - Didcot Road	0.73	2	1.51	25	0.65	2	0.52	1
Sires Hill (West)-Sires Hill (South)	0.96	25	0.68	5	0.01	0	0.70	0

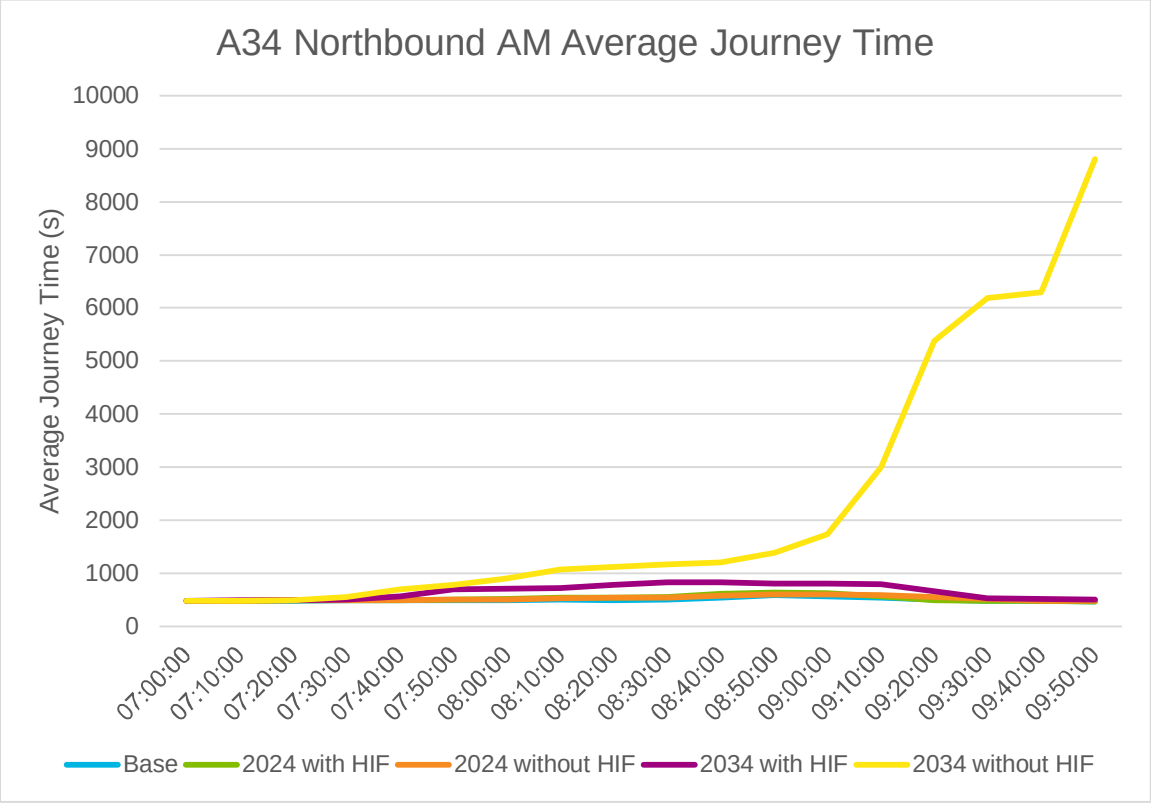
6.8.39 Without the HIF1 Scheme, the junction is forecast to operate within capacity in 2024. In 2034 the junction is forecast to operate at close to capacity in the AM peak, and capacity is exceeded in the PM peak with long queues forming on all arms.

6.8.40 With the HIF1 Scheme there is a significant improvement in the operation of the junction, and it is forecast to operate within capacity in both 2024 and 2034.

6.9 Impacts at Milton Interchange Junction (OFF 1)

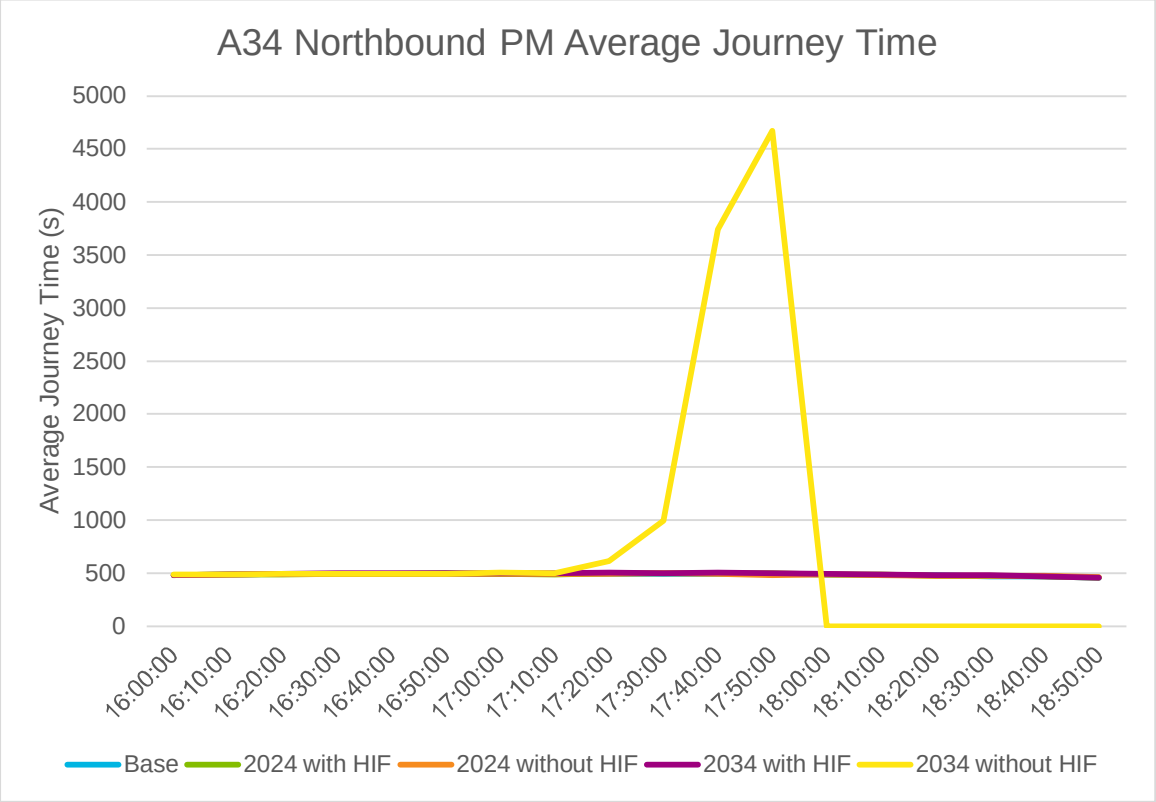
6.9.1 In discussions with Highways England, the impact of the HIF1 Scheme on the A34 and at the A34/A4130 Milton Interchange has been demonstrated by comparing journey times along the A34. This was extracted from the Paramics model along the full length of the A34 covered by the model (approximately 13km), for ten minute intervals 07:00 to 10:00 and 16:00 to 19:00, northbound and southbound, without and with HIF across the scenario years. The demand scenarios are explained in Figure 5.2. Figure 6.19 to Figure 6.22 below show the journey time results.

Figure 6.19: A34 Northbound Average Journey Time (AM)



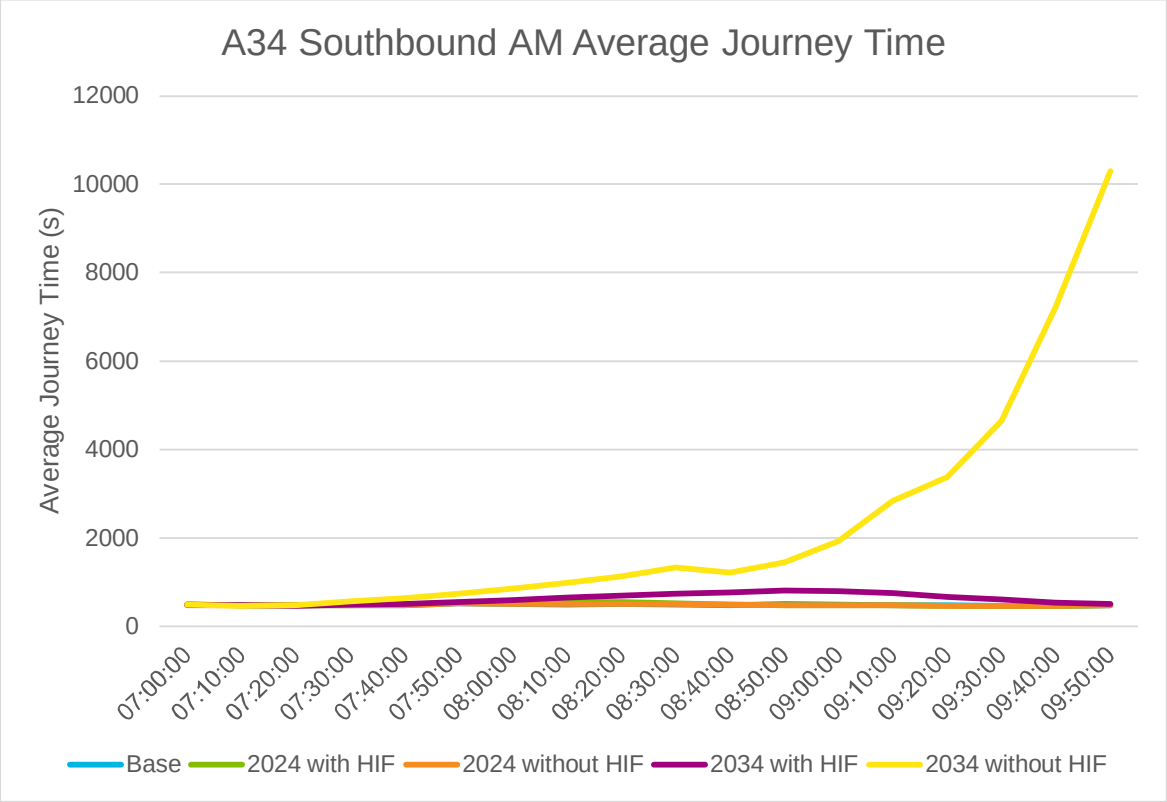
6.9.2 Figure 6.19 shows the northbound AM average journey time along the A34 is similar in the base, 2024 with and without HIF scenarios. The 2034 with HIF scenarios shows a slight increase which is to be expected due to the 14 years of growth above base. The 2034 without HIF scenario shows a significant increase in journey time particularly after 09:00, with vehicles taking over two hours to complete a journey of approximately 13km.

Figure 6.20: A34 Northbound Average Journey Time (PM)



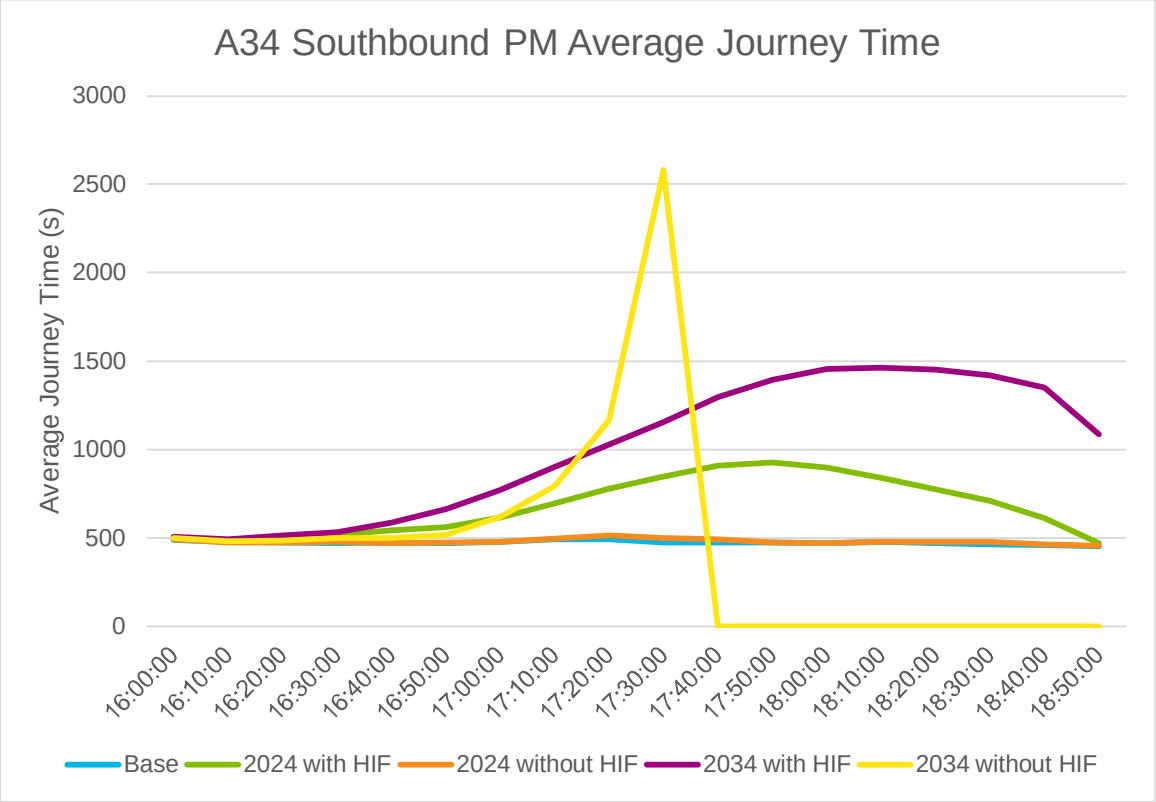
6.9.3 Figure 6.20 shows the northbound PM average journey time along the A34 is similar in the base, 2024 with and without HIF scenarios. The 2034 without HIF scenario shows a significant increase in journey time particularly after 17:30, with vehicles taking over one hour to complete a journey of approximately 13km. After 17:50 the journey time drops to zero as the network is congested and vehicles are not able to complete the journey.

Figure 6.21: A34 Southbound Average Journey Time (AM)



6.9.4 Figure 6.21 shows the southbound AM average journey time along the A34 is similar in the base, 2024 with and without HIF scenarios. The 2034 with HIF scenarios shows a slight increase which is to be expected due to the 14 years of growth above base. The 2034 without HIF scenario shows a significant increase in journey time particularly after 09:00, with vehicles taking over two hours to complete a journey of approximately 13km.

Figure 6.22: A34 Southbound Average Journey Time (PM)



6.9.5 Figure 6.22 shows the southbound PM average journey time along the A34 is similar in the base, 2024 with and without HIF scenarios. The 2034 with HIF scenarios shows an increase which is to be expected due to the 14 years of growth above base. The 2034 without HIF scenario shows a significant increase in journey time particularly after 17:20, with vehicles taking over 41 minutes to complete a journey of approximately 13km. After 17:30 the journey time drops to zero as the network is congested and vehicles are not able to complete the journey.

6.9.6 Interrogation of the model network towards Didcot, across Milton Interchange and travelling east away from it explains the above journey time results on the A34. Figure 6.23 and Figure 6.25 below show the average eastbound journey times in the AM and PM peak hours, for the approximately comparable sections of the model (to the next junction) across the different scenarios. The journey times are across the following distances: 2020 base is 786 metres, 2024 without HIF is 1,032 metres, 2024 with HIF is 724 metres, 2034 without HIF is 1,032 metres, and 2034 with HIF is 717 metres. To allow further comparisons across the scenarios, Figure 6.24 and Figure 6.26 show the average speeds across the section in each scenario, which takes into account the different section lengths.

Figure 6.23: Average Eastbound AM Peak Hour Journey Times

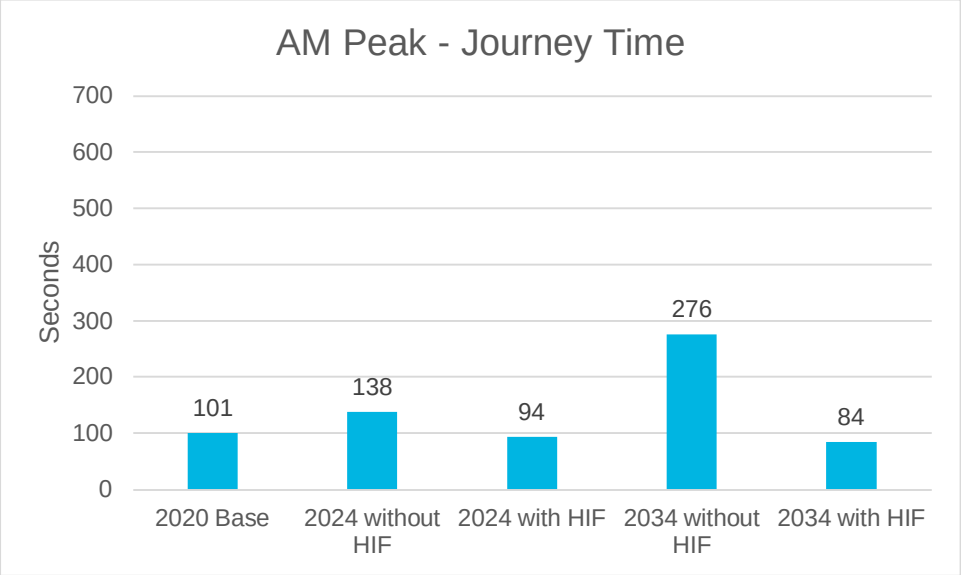
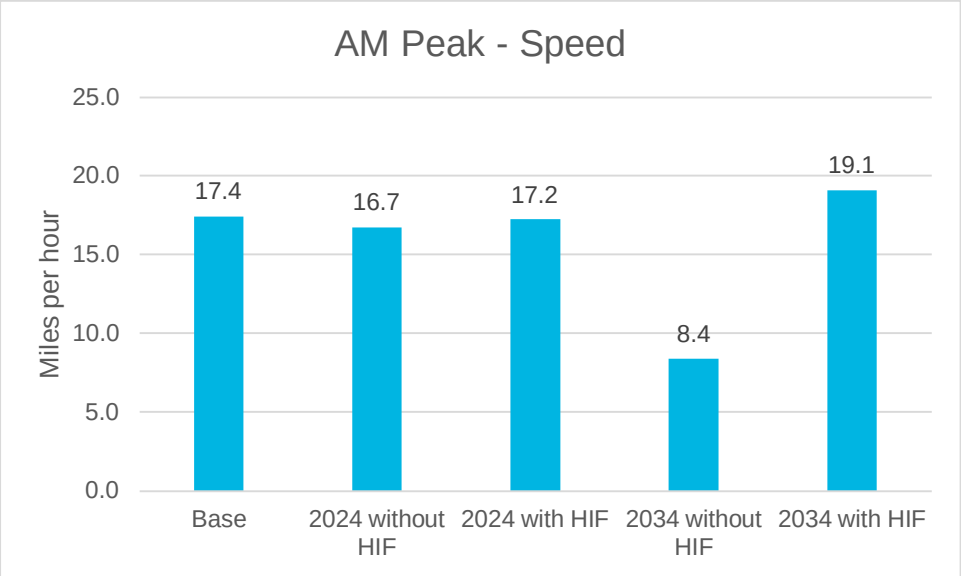


Figure 6.24: Average Eastbound AM Peak Hour Speeds



6.9.7 Figure 6.23 above shows that in 2034 AM peak hour, without HIF the journey takes 276 seconds compared to 84 seconds with HIF. This equates to approximately 8.4 mph and 19.1 mph respectively, as shown in Figure 6.24. The Scheme is allowing vehicles to travel away from Milton Interchange approximately twice as fast, at a speed similar to 2020 base. The effect of this is seen on the A34 as shown in Figure 6.19 and Figure 6.21 above, where significantly increased journey times are seen without HIF, due to the blocking back to Milton Interchange.

Figure 6.25: Average Eastbound PM Peak Hour Journey Times

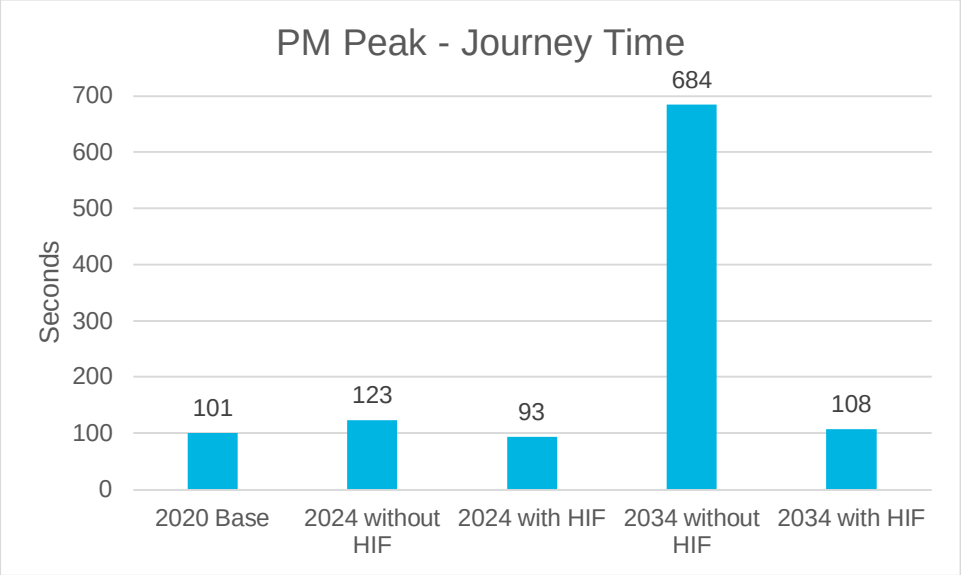
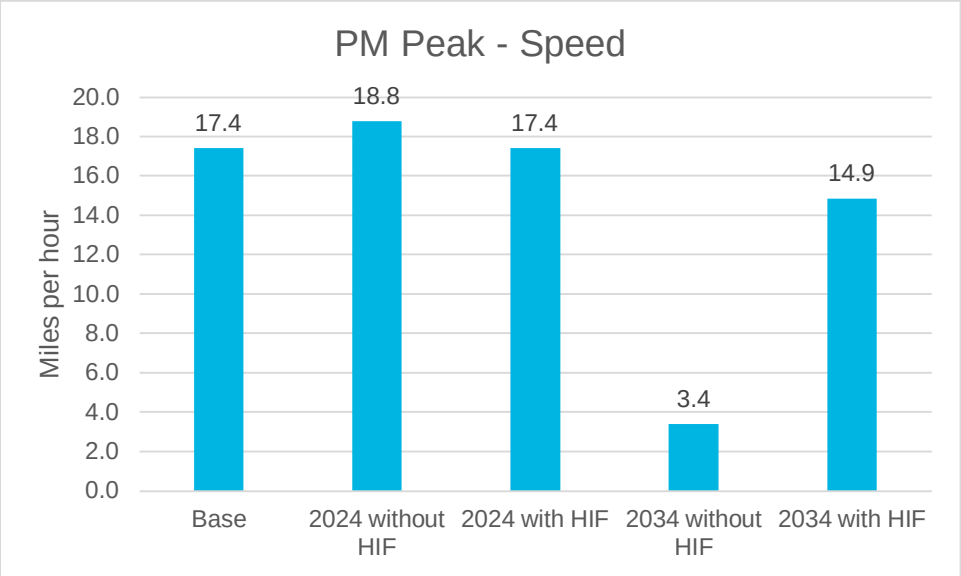


Figure 6.26: Average Eastbound PM Peak Hour Speeds



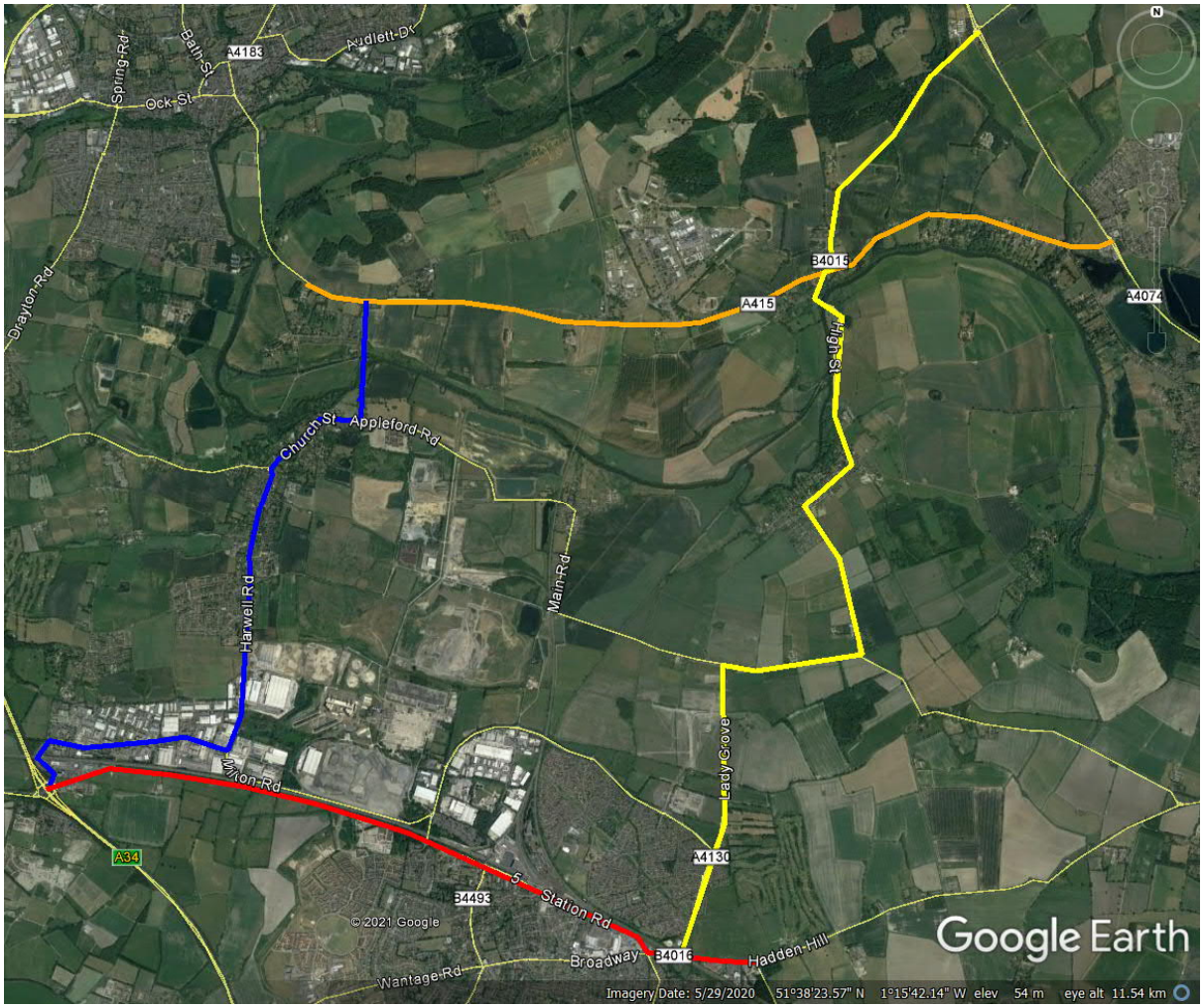
6.9.8 Figure 6.25 above shows that in 2034 PM peak hour, without HIF the journey takes 684 seconds compared to 108 seconds with HIF. This equates to approximately 3.4 mph and 14.9 mph respectively, as shown in Figure 6.26. The Scheme is allowing vehicles to travel away from Milton Interchange approximately four times faster, at a speed similar to 2020 base. The effect of this is seen on the A34 as shown in Figure 6.20 and Figure 6.22 above, where significantly increased journey times are seen without HIF, due to the blocking back to Milton Interchange.

6.9.9 In summary, HIF enables the A4130 eastbound from Milton Interchange to operate more efficiently, allowing vehicles to travel away from the junction. This reduces blocking back through the junction, enabling it to operate more efficiently, which in turn reduces queueing on the A34 off slip roads. The effect of this on the A34 is reduced journey times, as shown in above figures. The greatest impact of the Scheme is shown to be in PM peak.

6.10 Journey Time

6.10.1 Journey time data has been extracted from the Paramics model to enable comparisons of network operation across multiple routes on the highway network. The demand scenarios are explained in Figure 5.2. These four routes, as shown in Figure 6.27, were selected as they represent a good geographic spread across the Scheme area, and they cover the significant areas of existing congestion that the Scheme intends to relieve. They also cover the north/south sections of the existing bus routes over the River Thames, routes 33 and 95.

Figure 6.27: Journey Time Routes



Map data © Google 2021

6.10.2 Journey times for the 2020, 2024 and 2034 scenarios without and with the HIF1 Scheme are presented in Table 6.40 (AM peak) and Table 6.41 (PM peak). The journey times for the '2034 No HIF1' scenario are based on the model run using 100% demand rather than 70% demand (refer to section 5.3.10), as factoring up from the 70% demand model run would not provide reliable results for journey times. The journey times reported for the '2034 No HIF1' scenario therefore reflect the widespread congestion seen on the network in this scenario rather than predicted journey times.

Table 6.40: Journey Time Data – AM Peak

Route	Direction	From	To	Journey Time (seconds)				
				2020 Base	2024 No HIF1	2024 With HIF1	2034 No HIF1	2034 With HIF1
Yellow	Northbound	Hadden Hill	Golden Balls	1,465	3,471	800	7,319	1,224
Yellow	Southbound	Golden Balls	Hadden Hill	1,103	1,553	766	4,953	796
Blue	Northbound	Milton Interchange	A415	1,594	1,287	786	1,648	840
Blue	Southbound	A415	Milton Interchange	997	1,140	804	2,663	1,039
Orange	Eastbound	West of Tollgate Rd	Berinsfield	1,213	1,598	632	5,156	824
Orange	Westbound	Berinsfield	West of Tollgate Rd	666	927	614	2,845	931
Red	Eastbound	Milton Interchange	Hadden Grove	859	940	905	1,486	932
Red	Westbound	Hadden Grove	Milton Interchange	1,139	976	922	1,540	1,624

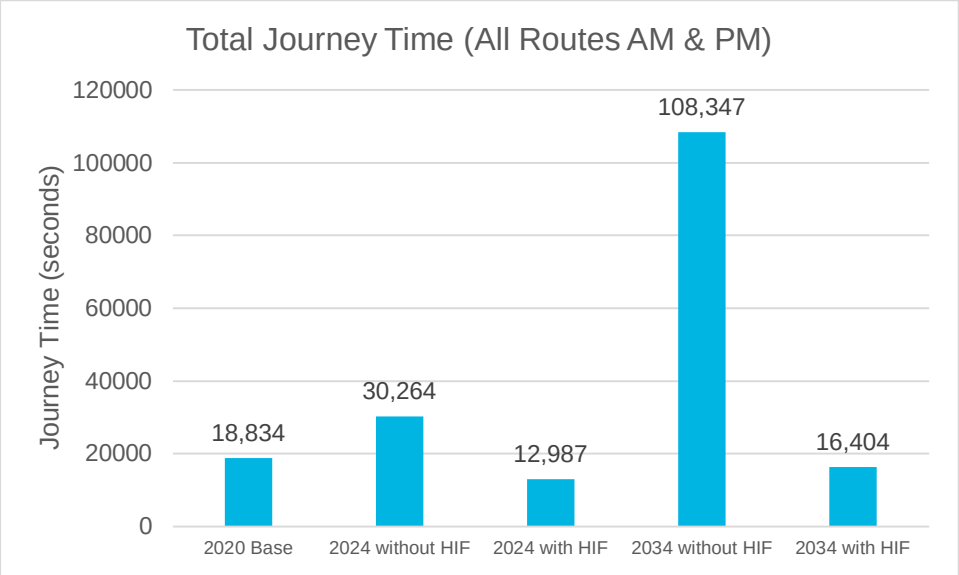
Table 6.41: Journey Time Data – PM Peak

Route	Direction	From	To	Journey Time (seconds)				
				2020 Base	2024 No HIF1	2024 With HIF1	2034 No HIF1	2034 With HIF1
Yellow	Northbound	Hadden Hill	Golden Balls	2,441	4,657	790	12,174	1,144
Yellow	Southbound	Golden Balls	Hadden Hill	1,159	1,206	790	3,009	882
Blue	Northbound	Milton Interchange	A415	967	940	769	1,444	870
Blue	Southbound	A415	Milton Interchange	1,235	2,255	1,280	2,227	1,282
Orange	Eastbound	West of Tollgate Rd	Berinsfield	892	6,250	593	53,785	608
Orange	Westbound	Berinsfield	West of Tollgate Rd	527	842	609	3,627	668
Red	Eastbound	Milton Interchange	Hadden Grove	1,482	1,083	1,038	2,293	1,316
Red	Westbound	Hadden Grove	Milton Interchange	1,096	1,139	888	2,180	1,425

6.10.3 The results indicate significant journey time reductions as a result of the HIF1 Scheme.

6.10.4 A comparison of the sum of journey times for all routes in Table 6.40 and Table 6.41 is shown below.

Figure 6.28: Journey Time Routes



6.10.5 The Figure above demonstrates that the total journey time for all routes is significantly reduced with the HIF1 Scheme in both 2024 and 2034. The yellow and blue routes are used by bus services to cross the River Thames, therefore the Scheme enables lower journey times / improved journey time reliability for bus services using these routes. The significant increase in journey times seen in 2034 without HIF is caused by increases across all routes, but predominantly the orange PM eastbound route. This is created by significant delays at the Clifton Hampden staggered signalised junction and Culham Science Centre entrance. Total journey times in 2034 with the HIF1 Scheme are also slightly lower than those in 2020, showing that the HIF1 Scheme helps to enable the planned growth whilst allowing the road network to operate similarly to the base scenario. Speeds across the entire modelled network help to illustrate this further, as presented in the following section.

6.11 Overall Network Statistics

6.11.1 The average speeds of vehicles were extracted from the Paramics model to represent the overall performance of the network with and without the HIF1 Scheme. The demand scenarios are explained in Figure 5.2. Results from 2020, 2024 and 2034 scenarios without and with the HIF1 Scheme for AM and PM peaks are presented in Figure 6.29 and Figure 6.30 below.

Figure 6.29: AM Average Speed

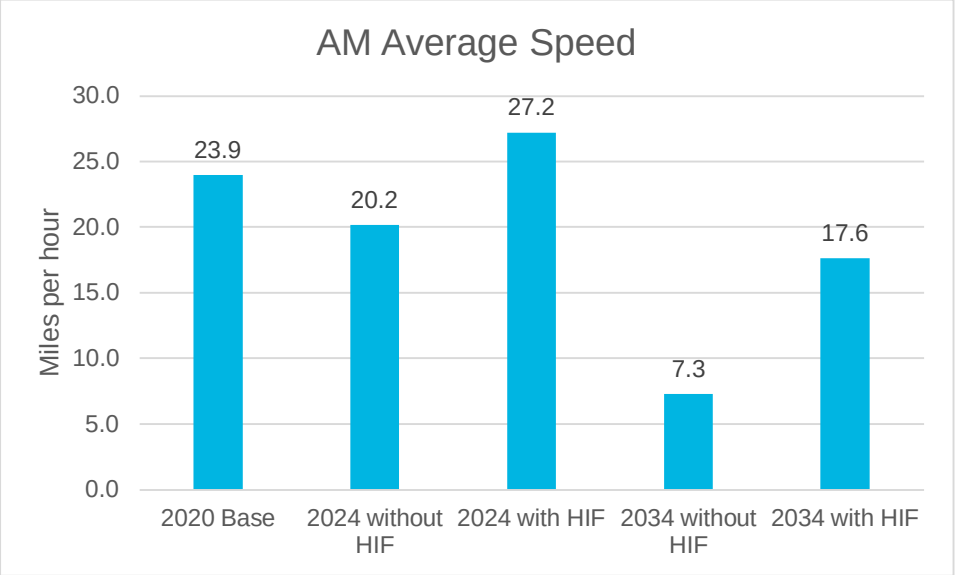
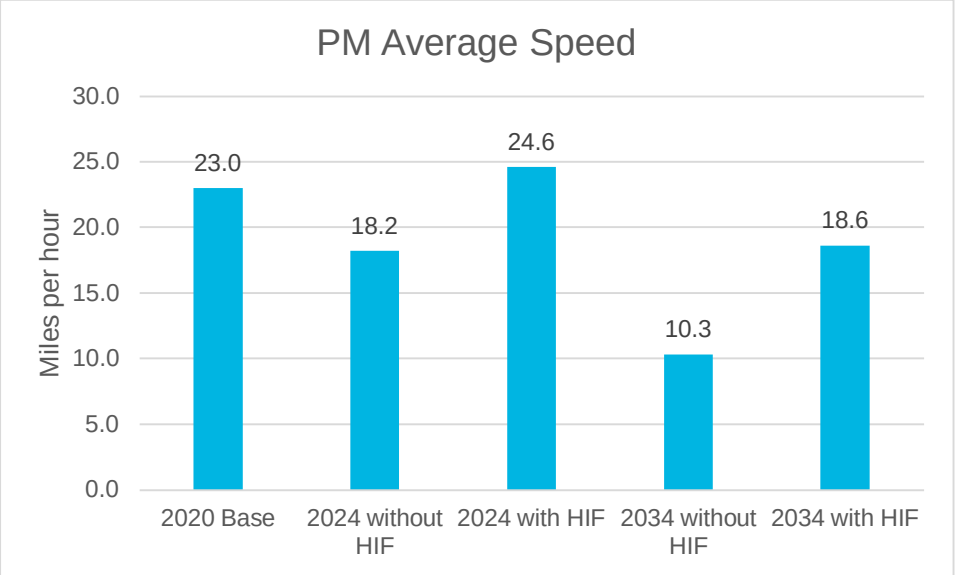


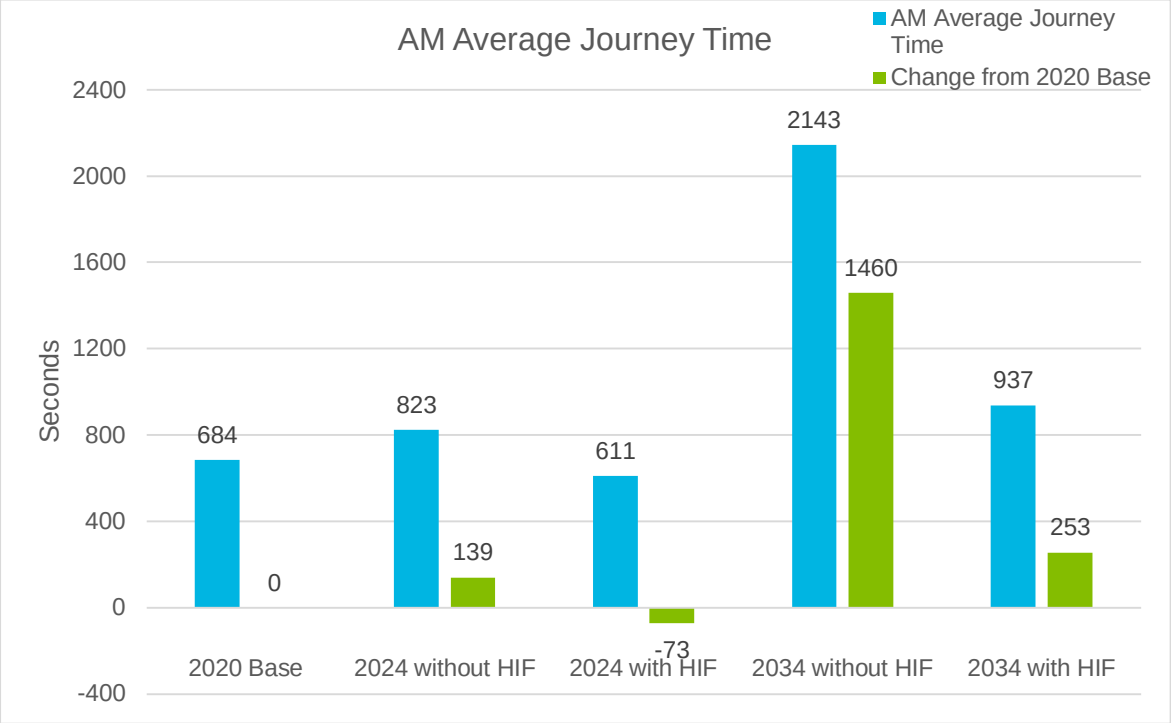
Figure 6.30: PM Average Speed



6.11.2 The Figures above show that additional growth in the model area without the HIF1 Scheme results in a slower moving network, which can be considered as a proxy for congestion. For example, four years of growth from 2020 to 2024 results in a 3.7mph reduction in the AM and 4.8mph reduction in the PM. The HIF1 Scheme in 2024 enables the network to operate more efficiently than 2020, as shown by the higher average speeds. The 2034 without HIF scenario shows a significant reduction in average speed across the network, due to the gridlock situation that develops in the model. The HIF1 Scheme enables the 2034 network to operate similarly to 2024 without HIF. It should be noted that the highway elements of the HIF1 Scheme are intended to be one part of a balanced transport strategy. The high-quality walking and cycling infrastructure elements of the Scheme help to offer alternative options for many journey types and routes.

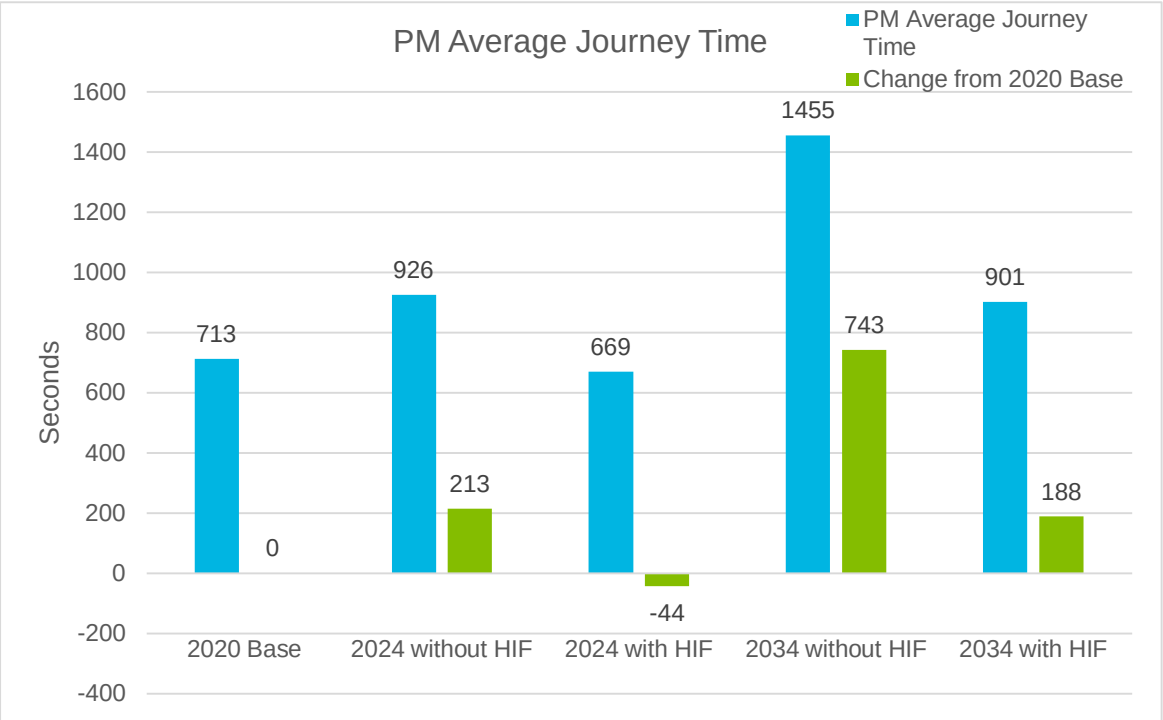
6.11.3 The average journey times of vehicles were extracted from the Paramics model to represent the overall performance of the network with and without the HIF1 Scheme. The demand scenarios are explained in Figure 5.2. Results from 2020, 2024 and 2034 scenarios without and with the HIF1 Scheme for AM and PM peaks are presented in Figure 6.31 and Figure 6.32 respectively. For ease of comparison, the change from 2020 Base is also presented in the same figure for each scenario.

Figure 6.31: Average Journey Time (AM Peak)



6.11.4 Figure 6.31 shows that in the AM peak, four years of growth from 2020 Base, without the HIF Scheme, is modelled to increase average journey times by over two minutes (139 secs). This is significantly worsened with an additional ten years of growth to 2034, with the average journey time increasing by over 24 minutes (1,460 secs) compared to the 2020 base. In 2024, the HIF1 Scheme reduces average journey times compared to the 2020 base by over one minute (-73 secs). In 2034, the HIF1 Scheme has enabled 14 years of growth with an average journey time increase of just over four minutes (253 secs). The average journey time with the HIF1 Scheme in 2034 is less than half of that without HIF1 (937 to 2,143). The HIF1 Scheme enables the 2034 network to operate similarly to 2024 without HIF1.

Figure 6.32: Average Journey Time (PM Peak)



6.11.5 Figure 6.32 shows that in the PM peak, four years of growth from the 2020 Base, without the HIF1 Scheme, is modelled to increase average journey times by three and a half minutes (213 secs). This is significantly worsened with an additional ten years of growth to 2034, with the average journey time

increasing by almost twelve and a half minutes (743 secs) compared to the 2020 Base. In 2024, the HIF1 Scheme reduces average journey times compared to the 2020 base by almost one minute (-44 secs). In 2034, the HIF1 Scheme has enabled 14 years of growth with an average journey time increase of just over three minutes (188 secs). The average journey time with the HIF1 Scheme in 2034 is less than two thirds of that without HIF1 (901 to 1,455). The HIF1 Scheme enables the 2034 network to operate similarly to 2024 without HIF.

7. Construction

7.1 Introduction

7.1.1 This section considers the potential impact of the construction of the proposed HIF1 Scheme. GRAHAM has been appointed by OCC to provide Early Contractor Involvement (ECI) on this project. The detailed construction strategy is being prepared at the time of the production of this TA. Therefore, a high level analysis has been undertaken of the potential implications of the construction activity, based on the information available at the time. Throughout the design process, the Scheme has been amended to move junctions offline where possible. This should enable a shorter construction period with less disruption to residents due to road closures / traffic management.

7.1.2 As part of a planning permission for the proposed development, it is anticipated that there will be a pre-commencement condition to produce a Construction Environmental Management Plan (CEMP), with Construction Traffic Management Plans (CTMP) produced as relevant ahead of each phase of construction. The CTMP will consider the construction activity for that phase and identify appropriate measures to minimise or mitigate significant impacts. A list of the potential measures which may be included within the CTMP is provided at the end of this section.

7.2 Construction Traffic Management Plan

7.2.1 As noted above, a CTMP will be required for each phase of the construction. This will identify the strategy for controlling / minimising traffic related impacts of the construction, in particular the effects of highways works on the A4130 and A415 and associated with deliveries to the site. The following key principles will be identified in the CTMP, and the CEMP where relevant.

- The CTMP will be consulted on with the local highway authority. All proposals for off-site transport management will be required to conform to the CTMP.
- The contractor will work with OCC to identify appropriate times for vehicles to travel to/from the site and to minimise impact of construction vehicles and deliveries, especially during peak times. This will need to take into account key sensitive receptors and the impacts on local residents and communities of different working times and practices, e.g. minimising the need for night-time working where properties are adjacent. Some activities may need to be completed beyond the normal working day for reasons such as engineering practicality and/or public safety, which will be agreed in advance with the LPA / LHA. Examples of this could include:
  - temporary highway/traffic management works;
  - formwork – erection and removal;
  - concrete pours;
  - earthwork movements;
  - completion of crane lifting operations;
  - heavy lifts such as bridge decks;
  - heavy/large components of the Proposed Development; and
  - movement of abnormal loads.
- The identification of routes for construction vehicles to and from the site. The routes identified will primarily be major roads (A roads). Approvals from the local highway authority will be obtained in respect of the means and routes by which anything required for construction is to be transported by large goods vehicles (as defined in Part IV Road Traffic Act 1988) on a highway to a construction or storage site, or to a waste disposal site.
- An appropriate control system will be implemented for the dispatch of all vehicles containing excavated material or other waste material.
- All Temporary Traffic Management shall be in accordance with the Traffic Signs Manual: Chapter 8, Safety at Street Works and Road Works: A Code of Practice (2013), Traffic Signs Regulations and General Directions 2016.
- Approval will be obtained from the relevant highway authorities to the formation, layout or alteration of any permanent or temporary means of access to a highway to be used by vehicular traffic.

Procedures for applications for temporary interference to the highway and for any required Traffic Regulation Orders will be discussed with the local highway authority, with inputs from the LPA.

- The works will be carried out in such a way that inconvenience to the public arising from any increases in traffic flows and disruptive effects of construction traffic is limited, as far as reasonably practicable.
- The Contractor shall ensure appropriate pedestrian and cycling routes are maintained while ensuring any temporary closures are supported by appropriate and clearly signed alternative routes.
- The Contractor will ensure that all working areas are sufficiently and adequately fenced off from members of the public and to prevent animals from straying on to the working area. The standard of enclosure and screening at a particular site will be selected in order to maintain effective site security and achieve appropriate noise attenuation and visual effect, and limit dust accumulation. In some areas screening may be painted and may include viewing points and relevant project information.
- All reasonably practicable measures will be put in place to avoid/limit and mitigate the deposition of mud and other debris on the highway. These measures will have regard to the nature and the use of the Site and will include:
  - hardstanding at the access and egress points which will be cleaned at appropriate intervals;
  - vehicle clean down points to clean vehicle wheels at each exit point on to the highway;
  - the correct loading of vehicles and sheeting of loads where necessary to avoid spillage during their journeys;
  - the use of mechanical road sweepers combined with water sprays for the suppression of dust to clean site hardstanding, roads and footpaths in the vicinity of the Site; and
  - the flushing of gullies in the vicinity of the Site.
- Wherever practicable, concrete wash out facilities will be installed at the point of work. Where this is not practicable, concrete deliveries will be directed to the nearest available wash out facility and supervised to ensure they wash out before driving onto the live carriageway. All compound areas will have a concrete wash out facility.
- Parking for construction staff will be provided within the site compounds. Site access points for site personnel, construction related vehicles and emergency access will be identified and signed for both vehicular traffic and pedestrian/cycle access.
- The Contractor will comply with Construction Logistics and Community Safety (CLOCS) Standard requirements to manage risk associated with vehicle movements. Deliveries and construction activity will be consolidated where feasible.
- Suppliers will be expected to be part of a best practice scheme, e.g. TfL's Freight Operator Recognition Scheme (FORS), which is aligned to CLOCS requirements.

7.3 Programme

7.3.1 In advance of a detailed construction programme and strategy, estimates have been made of the vehicular activity which would be anticipated to occur during the construction period which is outlined in Table 7.2 and Table 7.3 below.

7.3.2 Construction is anticipated to start in March 2023 and continue to 25 months finishing in March 2025.

7.4 Construction Compounds, Site Accesses and Vehicle Movements

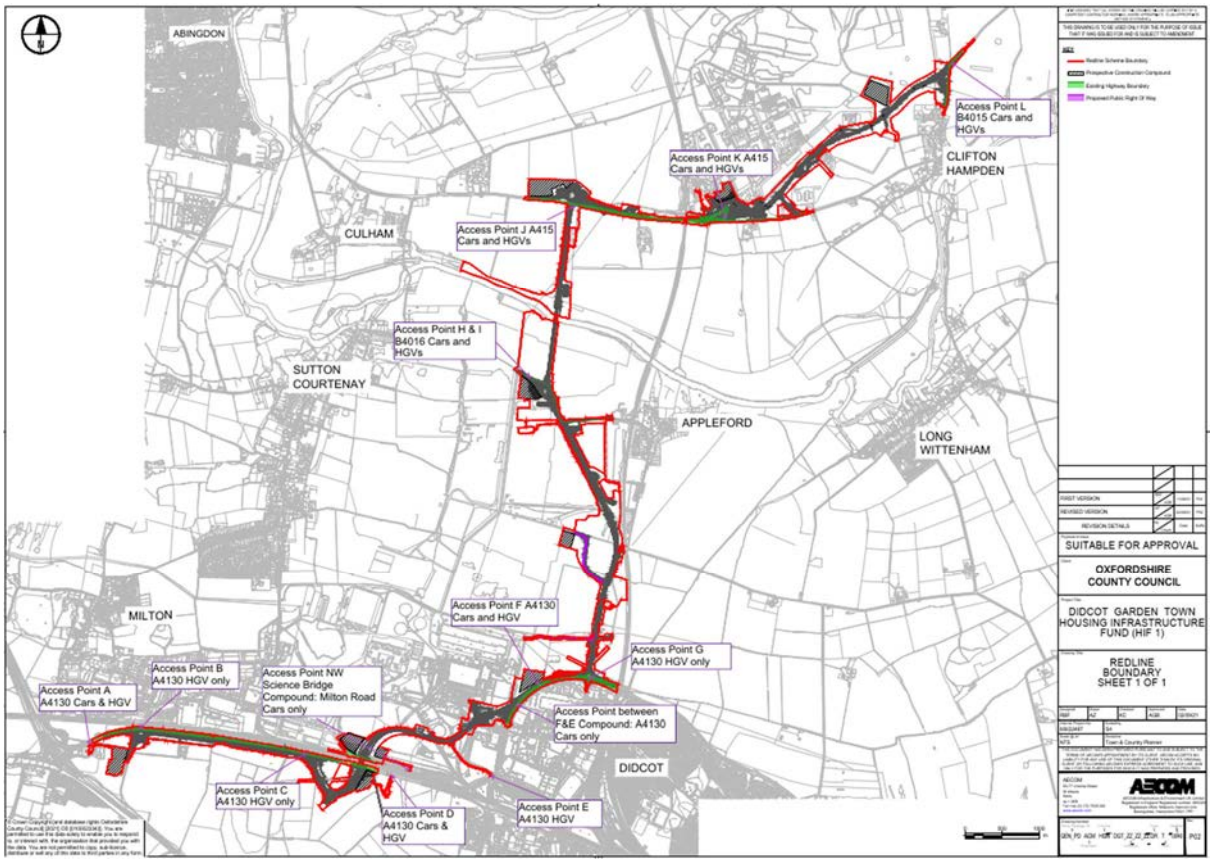
7.4.1 A total of 14 site access points has been identified along the Scheme and are outlined in Table 7.1 below. The ECI Contractor (Grahams) has provided an estimate of the monthly vehicle movements at each access point, for both cars/LGVs and HGVs. Car/LGV movements are predominantly related to staff travelling to and from the Site, and it has been assumed that the import and export of materials is by HGV.

Table 7.1: Construction Access Points

Access	Location	Type
Access A	A4130	HGV
Access B	A4130	HGV
Access C	A4130	HGV
Access D	A4130	HGV & Car/LGV
NW Science Bridge Compound	Milton Road	Car/LGV
Access E	A4130	HGV
Access Between F & E	A4130	Car/LGV
Access F	A4130	HGV & Car/LGV
Access G	A4130	HGV
Access H	B4016	HGV
Access I	B4016	HGV & Car/LGV
Access J	A415	HGV & Car/LGV
Access K	A415	HGV & Car/LGV
Access L	B4015	HGV & Car/LGV

7.4.2 The HGV access points and permitted routes are shown in Figure 7.1 below.

Figure 7.1: Construction HGV Access



7.4.3 It has been assumed that HGVs will use Milton Interchange and the A4130 for access points A to G. To avoid existing weight restrictions on High Street through Milton, access to access points I and H, located between Sutton Courtenay and Appleford, will be via Marcham Interchange on the A34, then the B4017 to Drayton and Drayton Road/Appleford Road. There is an existing 7.5t weight restriction on Appleford Road to the east of the Hanson site access. In order to access the Site it has been assumed that this weight restriction would be moved temporarily to access point H, and HGVs would not be permitted east of this point, thereby maintaining the restriction through Appleford.

7.4.4 HGVs would access Site accesses J and K via Marcham Interchange and the A415 Abingdon Road. Access to Site access L would be via the A4074. There is an existing 7.5t weight restriction on the A4074 to the west of the Notcutts Garden Centre access. It has been assumed that this would temporarily be re-located to Site access L, with HGVs restricted to the west of this point thereby maintaining the restriction through Clifton Hampden.

7.4.5 An assessment of the impact of construction traffic has been included in the Environmental Statement (Chapter 16 'Traffic and Transport'). The conclusions to the assessment are summarised below:

- The assessment indicates that no roads in the local area are expected to experience an increase in daily traffic flows of more than 10% with the traffic associated with the construction of the Scheme, and these increases would be short-term only;
- Some roads are predicted to have large percentage increases in daily HGV traffic. The greatest increase is forecast on the B4016 Appleford Road, to the west of construction Access H and I. However, there is an existing 7.5t weight restriction (except for access) on this link to the east of the Hanson quarry access, and therefore the baseline HGV traffic on this link is low. The construction traffic would not travel east beyond the proposed site access points and through Appleford, and therefore the impact would be limited to a short section of the B4016 between the Hanson access and the proposed site access;
- The southbound A34 On-Slip and the northbound A34 Off-Slip at Milton Interchange are forecast to experience an increase of 154 daily HGVs, equating to a 53% and a 40% increase respectively in 2024 with the construction of the Scheme. If the HGVs are spread evenly across the 10-hour working day this equates to approximately 15 HGVs per hour. This level of HGV traffic is forecast to occur on these slip roads for only month 3 of the construction period. The average number of daily construction HGVs forecast to use the southbound A34 On-Slip and the northbound A34 Off-Slip at Milton Interchange during the entire construction period is 37 HGVs, which equates to 13% and 10% increase in daily HGV traffic flows in 2024. The impact at this junction is not considered to be significant.
- The A415 Abingdon Road is forecast to experience an increase of 154 daily HGVs, equating to a 40% increase. This increase equates to approximately 15 HGVs per hour across a 10-hour working day. However, this level of construction HGVs is only forecast for month 6 of the construction period. The average number of daily construction HGVs forecast to use the A415 Abingdon Road 56 HGVs, which equates to a 14% increase in daily HGV traffic flows. The impact on the A415 is not considered to be significant.
- During the construction of the Scheme there may be lane closures where works need to be undertaken on or adjacent to existing carriageway. This is most likely to occur at the following locations:
  - On the A4130 between Milton Interchange the proposed Science Bridge as part of the A4130 Widening Scheme;
  - The A4130/ Hawksworth/ Purchas Road roundabout;
  - The A4130 between the A4130/ Hawksworth/ Purchas Road roundabout and the A4130/ Collett roundabout;
  - B4016 Appleford Road at the location of the proposed roundabout; and
  - A415 Abingdon Road between the proposed roundabouts.
- These closures will be temporary whilst construction works on the existing highway are undertaken. It is not known at this time how long the closures at each location will last, however, these will be managed by the principal contractor and appropriate signage or alternative routes will be provided to reduce delays.
- HGV movements will be managed through the CTMP to minimise impacts during the highway peak hour. The HGVs will be managed to ensure that they stay on the strategic highway network for as long as possible to reduce the impact on rural roads in the local area.

Table 7.2: Forecast Construction Car / LGV Traffic per Access

Car / LGV Access Points	Month																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25
Access A	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	0	0	0	0	0	0	0
Access D	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
NW Science Bridge Compound	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Access Between F & E	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
Access F	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	0	0
Access I	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	0	0	0	0	0
Access J	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	0	0	0	0	0
Access K	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Access L	20	20	20	20	20	20	20	20	20	20															
Total	**1280**	**1280**	**1280**	**1280**	**1280**	**1280**	**1280**	**1280**	**1280**	**1280**	**1260**	**1260**	**1260**	**1260**	**1260**	**1260**	**1260**	**1260**	**1080**	**1080**	**820**	**820**	**820**	**580**	**580**

Table 7.3: Forecast HGV Traffic per Access

HGV Access Points	Month																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25
Access A	0	0	0	0	0	0	0	19	33	25	41	60	13	3	2	67	13	3	0	0	0	0	0	0	0
Access B	71	188	183	77	53	46	72	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Access C	38	82	185	23	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Access D	5	2	57	57	57	57	57	57	57	57	57	57	57	57	79	3	3	3	11	5	3	9	8	8	0
Access E	16	14	40	54	5	22	5	7	23	4	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Access F	31	32	83	39	27	83	80	81	76	43	23	20	11	59	6	189	68	17	36	100	27	10	11	0	0
Access G	4	10	67	25	19	10	7	8	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Access H	71	114	19	4	7	75	163	134	143	70	43	8	9	38	27	35	12	17	108	2	0	0	0	0	0
Access I	10	4	17	2	2	2	61	74	74	74	74	41	4	4	8	7	4	17	13	48	0	0	0	0	0
Access J	31	4	14	4	135	113	98	86	55	57	84	50	5	212	5	5	3	12	8	32	0	0	0	0	0
Access K	42	10	10	46	66	195	195	199	54	52	8	9	131	45	15	21	77	252	218	124	17	0	0	0	0
Access L	7	45	17	23	28	13	14	28	35	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**323**	**503**	**691**	**354**	**405**	**614**	**752**	**711**	**552**	**392**	**391**	**245**	**230**	**418**	**141**	**327**	**179**	**321**	**394**	**310**	**47**	**19**	**19**	**8**	**0**

8. Summary & Conclusions

8.1 Summary

8.1.1 This TA has been produced to consider the impacts of the proposed HIF1 Scheme on the transport networks that may be affected by the proposals. Traffic and transport implications are also considered with the separate Environmental Statement that has been produced for the planning application, in line with relevant DMRB guidelines.

8.1.2 Planning permission is sought for the following:

Planning application seeking full planning permission for the dualling of the A4130 carriageway (A4130 Widening) from the Milton Gate Junction eastwards, including the construction of three roundabouts; a road bridge over the Great Western Mainline (Didcot Science Bridge); realignment of the A4130 north east of the proposed road bridge including the relocation of a lagoon; construction of a new road between Didcot and Culham (Didcot to Culham River Crossing) including the construction of three roundabouts, a road bridge over the Appleford railway sidings and road bridge over the River Thames; construction of a new road between the B4015 and A415 (Clifton Hampden bypass), including the provision of one roundabout and associated junctions; and controlled crossings, footways and cycleways, landscaping, lighting, noise barriers and sustainable drainage systems.

At Land in the parishes of Milton, Didcot, Harwell, Sutton Courtenay, Appleford-on-Thames, Culham and Clifton Hampden.

8.1.3 Railway lines and the River Thames creates severance to effective movement and barriers to connectivity between homes, jobs and amenities. High levels of congestion are evident on the A4130, on the existing river crossings between Didcot and Culham/Clifton Hampden and within Clifton Hampden. This has led to OCC objecting to the applications of single dwellings on grounds of highway safety, convenience and sustainability. These objections have led to Local Planning Authority (LPA) refusals which have been upheld at appeal by the Planning Inspectorate. Additionally, a Vale of White Horse District Council (VoWHDC) Local Plan strategic allocation for 200 new homes has also been refused planning permission on similar grounds. It is evident that the constrained highway network has already adversely affected growth in the area.

8.1.4 The Scheme is deemed as essential to deliver future growth as identified within Local Plans for both South Oxfordshire District Council (SODC) and the Vale of White Horse District Council (VoWHDC). The Scheme is also identified in OCC's Local Transport Plan 4.

8.1.5 The infrastructure investment will help relieve pressure on local transport networks and will facilitate economic growth across the Science Vale area whilst accommodating the expanding communities in the local area. The provision of walking and cycling facilities offer real mode choice for work and leisure, helping to encourage modal shift. Improving local roads and providing new roads will lead to more reliable journey times, less congestion, more job opportunities, and better community links.

8.1.6 The Scheme includes dedicated off-road pedestrian and cycle facilities along its length, that tie-in to existing facilities where possible. In addition, 18 new bus stops are being provided, which will increase the accessibility and catchment of the existing bus services in this area.

8.1.7 The Scheme is included in Core Policy 17 and 18 of the Vale of White Horse Local Plan 2031. The Inspector's Report for the Vale of White Horse Local Plan states that the proposed infrastructure and services to support new development in the area, of which the HIF1 Scheme forms a major part, '*would largely mitigate*' the likely transport impacts of the new housing and employment, however some congestion issues would remain. The Inspector's report also notes that *"the 'starting point' situation for the Vale is as a district which very much suffers from traffic congestion."*

8.1.8 The Scheme is also identified in Policies TRANS1b and TRANS3 of the South Oxfordshire Local Plan 2035, and the South Oxfordshire Infrastructure Delivery Plan. The Planning Inspectorate report on the Examination of the South Oxfordshire Local Plan 2011-2034 (in 2020) notes that the schemes '*are part of a wider highway strategy to support the delivery of housing growth in the wider Didcot Garden Town area and to mitigate the impact of existing, approved and allocated developments*.'

8.1.9 The TA includes a review of the existing network conditions, based on modelled traffic flows for 2020. The traffic flows were provided by Systra/OCC, and were obtained from the Didcot Paramics microsimulation model. A high level of congestion is evident on the A4130, and a number of junctions are shown to already be operating at or over capacity in one or both peaks. This is particularly evident at

the staggered signalised junction in Clifton Hampden and the existing river crossing at Culham / Sutton Courtenay.

8.1.10 The results confirm that the local highway infrastructure has failed to keep pace with growth in the area, and the railway lines and the River Thames clearly create barriers to connectivity between homes and jobs.

8.1.11 Future baseline assessments with the proposed Scheme have been undertaken for the first year of opening in 2024 and for opening plus 10 years (2034). The traffic model data reflects the future year residential and employment completion trajectories as supplied by the relevant Local Planning Authorities (VoWHDC and SODC).

8.1.12 Capacity assessments of the junctions along the proposed Scheme and also a number of off-site junctions were undertaken for 'without Scheme' and 'with Scheme' scenario in 2024 and 2034. The results for the Scheme junctions indicated that the majority would operate within capacity in 2034. Junctions shown to be operating at or close to capacity on the side arms include the following:

- The A4130 / Science Bridge junction is shown to operate over capacity in 2034 on the side arm. However, an alternative route via the industrial estate is available for traffic heading north or east, with capacity to accommodate re-routing traffic. The strategy is to prioritise the mainline flow, to promote the use of Didcot Science Bridge, as explained in paragraph 6.6.15;
- The New Thames River Crossing / B4016 junction is predicted to operate at close to capacity in 2034 on the side arm. However, the maximum queue length on the B4016 is only seven vehicles. The strategy is prioritise the mainline flow, helping to dissuade through traffic in the village, as explained in paragraph 6.6.22;
- The Clifton Hampden Bypass junctions with the realigned A415 and B4015 are forecast to operate over capacity in 2034 on the side arms. The strategy is to prioritise the mainline flow, helping to dissuade through traffic in the village, as explained in paragraphs 6.6.31 and 6.6.34.

8.1.13 Capacity assessments for the off-site junctions show that the Scheme results in significant improvements at a number of junctions. This includes junctions along the route between Didcot and the A4074 via Long Wittenham and Clifton Hampden and the route from Milton Interchange to Culham via Sutton Courtenay. This also reflected in reduced journey times along these routes.

8.1.14 At Milton Interchange, the HIF1 Scheme enables the A4130 eastbound from Milton Interchange to operate more efficiently, allowing vehicles to travel away from the junction. This reduces blocking back through the junction, enabling it to operate more efficiently, which in turn reduces queueing on the A34 slip roads. The effect of this on the A34 is reduced journey times on the A34 and on the A4130.

8.1.15 Journey time data for key routes in and around Didcot demonstrate significant reductions as a result of the HIF1 Scheme. Total journey times in 2034 with the HIF1 Scheme are slightly lower than those in 2020, showing that the HIF1 Scheme helps to enable the planned growth whilst allowing the road network to operate similarly to the base scenario. This is also reflected in average speed data. This demonstrates that by 2034, without the HIF1 Scheme there would be significant reductions in average speeds across the network, indicating widespread congestion. The HIF1 Scheme increases average speeds to levels similar to those in 2024, although slightly lower than 2020 base speeds. It should be noted, however, that the highway elements of the HIF1 Scheme are intended to be one part of a balanced transport strategy. The high-quality walking and cycling infrastructure elements of the Scheme help to offer alternative options for many journey types and routes.

8.1.16 AECOM has undertaken a WCHAR report for each element of the proposed Scheme. Walking and cycling movements were recorded over a period of one week, and movements were generally low across the network. This reflects the limited opportunities for walking/cycling between residential and employment areas, particularly north/south in the area north of Didcot, and the overall low walk and cycle mode share for the journey to work for Didcot (based on 2011 census data).

8.1.17 A Collision Investigation Study has been undertaken to help inform the design of the highway works. The study found identified one cluster site, at the A4130/Milton Road/Basil Hill roundabout, where 12 collisions were reported in the 5 year study period. A developer promoted scheme is currently under S278 review with OCC Road Agreements Team.

8.1.18 The potential impact of the construction of the proposed HIF1 Scheme has been considered. GRAHAM has been appointed by OCC to provide Early Contractor Involvement (ECI) on this project. Throughout the design process, the Scheme has been amended to move junctions offline where possible. This should enable a shorter construction period with less disruption to residents due to road closures / traffic management.

8.1.19 As part of a planning permission for the proposed development, it is anticipated that there will be a pre-commencement condition to produce a Construction Environmental Management Plan, with Construction Traffic Management Plans produced as relevant ahead of each phase of construction. These plans will consider the construction activity for that phase and identify appropriate measures to minimise or mitigate significant impacts, and other good practice that the main Contractor will be required to adhere to, such as the Construction Logistics and Community Safety Standard and the Freight Operator Recognition Scheme.

8.2 Conclusions

8.2.1 The Scheme is deemed as essential to deliver future growth as identified within Local Plans for both South Oxfordshire District Council and the Vale of White Horse District Council. The Scheme is also identified in Oxfordshire County Council's Local Transport Plan 4.

8.2.2 The infrastructure investment will help relieve pressure on local transport networks and will facilitate economic growth across the Science Vale area whilst accommodating the expanding communities in the local area. Improving local roads will lead to faster journeys, less congestion, more job opportunities, and better community links whilst also providing key active travel links to provide real mode choice for work and leisure.

8.2.3 The Scheme both directly delivers and indirectly enables a significant number of new and/or improved walking and cycling routes in the area. The provision of additional and improved NMU routes and crossing points will help to reduce the existing severance caused by the Great Western Mainline and River Thames. Connections to public rights of way will be provided, and safe access to and from new bus stops. This will help to engender modal shift away from the private motor car, particularly for commuting purposes for employment and education, but also for important access to amenities such as retail and healthcare, and for leisure trips. The potential future NMU schemes that could link to the Scheme may be delivered by OCC, housing or employment developers, or other bodies. There may be other schemes identified through the planning application processes for other developments, or through the Didcot Local Cycling and Walking Infrastructure Plan (LCWIP) which has yet to be undertaken.

8.2.4 There are currently poor opportunities for bus routes to offer good journey time reliability north / south in this area due to the severance created by the River Thames and the historic road network. Journey time data demonstrates that the HIF1 Scheme will significantly improve journey times over the existing river crossings at Culham Cut / Sutton Bridge and Clifton Hampden Bridge. Bus routes that use these bridges in the future, currently the 95 and 33 services, would benefit from the improved journey times and reliability.

8.2.5 The South Oxfordshire IDP includes requirements for several new bus routes to support planned growth. It is the intention for two of these routes to use the new Didcot to Culham River Crossing road, and as such the future bus network has been planned assuming the new road is in place. Without the new road it is unlikely the new bus routes could be delivered; the routes would take longer and be less reliable, increasing operating costs, while at the same time being less attractive to use, suppressing revenue. It is unlikely the proposed new routes would be viable without the new road, which would cause several strategic new developments to be more car dependent and less acceptable in planning terms.

8.2.6 The traffic modelling indicates that without the HIF1 Scheme in place the traffic associated with the Local Plan housing and employment growth would result in congestion throughout the network in and around Didcot by 2034. The Scheme improves overall conditions for existing users of the transport network and helps to accommodate committed local plan growth in a sustainable way as part of an overall balanced transport strategy.

8.2.7 In conclusion, the proposed Scheme will significantly improve the accessibility to the walking, cycling and the bus network, as well improve the journey quality, times and reliability for these users along the Scheme extent. The analysis undertaken as part of this TA does not indicate any significant adverse effects on the highway, walking, cycling, horse-riding or public transport networks as a result of the proposed development.

8.2.8 The Scheme is part of balanced transport strategy, reducing congestion in some areas, providing high-quality walking and cycling routes to engender mode shift away from private motor car, and enables new routes and improved journey times for buses. Therefore, it is considered that the HIF1 Scheme is positive in transport terms, and that the proposed development should be granted planning permission.

Appendix A – Walking, Cycling and Horse-Riding Assessment Reports

Didcot Garden Town HIF 1 - A4130 Widening

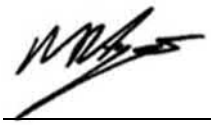
Walking, Cycling and Horse-Riding Assessment Report

Oxfordshire County Council

Project number: 60606782

May 2020

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Andy Blanchard Associate Director	Mike Ager Principal Engineer	Samuel Barnes Associate Director	Andy Blanchard Associate Director

Revision History

Revision	Revision	Details	Authorized	Name	Position
0	20/12/2019	DRAFT	✓	Andy Blanchard	Project Manager
P01	15/05/2020	FINAL – updated & stakeholder feedback added	✓	Andy Blanchard	Project Manager

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Executive Summary

This report outlines the Walking, Cycling and Horse-Riding Assessment and Review (WCHAR) prepared for Oxfordshire County Council for the proposed A4130 Widening scheme. This scheme is one of four that comprise the HIF1 Didcot Garden Town infrastructure project. Whilst the process set out in the Design Manual for Roads and Bridges (DMRB) GG 142 document has generally been followed in preparing this WCHAR Report, as this scheme is not a trunk road some alterations have been made to reflect this, such as a reduced study area.

The WCHAR process is divided into two phases:

- Assessment (this report): undertaken during the options or concept stage of a highway scheme to capture the existing conditions for pedestrians, cyclists and equestrians, and identify the opportunities for improvement for these modes.
- Review: shall be completed as an ongoing review during the various design stages of the highway scheme and shall record the design decisions relating to the provision of walking, cycling and horse-riding facilities.

The aims of this assessment are to gain an understanding of all relevant existing facilities for pedestrians, cyclists and equestrians (the users) in the local area, to provide background user information that can be referred to throughout the design process and to identify opportunities for improvement for users.

The proposed A4130 Widening scheme will deliver a dual carriageway between Milton Interchange at the A34 and the proposed Science Bridge over the Great Western rail line.

This Assessment Report documents the relevant local and national relevant policies and strategies. Within the study area, there has been only one recorded collision involving a pedestrian, and one involving a cyclist in the last five years. While there are a number of local and regional bus services operating in the area, there are no bus stops within the scheme extents. A train station, Didcot Parkway, is located approximately 2km east of the scheme.

The key trip generators in the area include the Milton Park Science Park, as well as Milton Interchange Service Area, and further afield the industrial areas to the north of the Great Western rail line. Movement within the study area is dominated by the private car, with low numbers of pedestrians and cyclists. This is self-reinforcing since the high level of vehicular traffic makes walking and cycling less attractive.

Few pedestrians and cyclists were observed during the site visit or throughout the surveys conducted in November 2019. The majority of cyclists observed used the southern shared use footway, and generally out number pedestrians in the study area.

A public information event covering the four HIF1 schemes was held throughout April 2020, and relevant WCHAR stakeholders were sent a targeted questionnaire to capture their views on the feasibility designs and needs of the users they represent. Their responses are summarised in this report.

Identified user opportunities as part of the assessment included:

- Integrating the walking and cycling networks along the public highways with those proposed as part of planned developments, with convenient, frequent and direct links.
- Improvement and incorporation of the Public Rights of Way and Science Vale Cycle Network with the existing connections and facilities, so that they can be fully utilised.
- Provision of segregated cycle track and footways, to avoid potential discomfort and conflict between pedestrian and cyclists; greening; and convenient crossing points.

1. Background and highways scheme description

1.1 Background

The proposed A4130 Widening scheme, to the west of Didcot, is one of four schemes that are included in the Access to Science Vale Options Assessment Report (OAR) to facilitate new developments to be constructed in the Didcot area.

The scheme will have a significant impact on the highways network in the area and therefore OCC have requested that the GG 142 Walking, Cycling & Horse-Riding Assessment and Review (WCHAR) is completed to inform the scheme design. Mike Ager in the role of Design Team Leader, has appointed Andy Blanchard as the Lead Assessor to undertake the WCHAR process in accordance with GG 142.

Although the scale of the scheme would usually qualify as a 'large' scheme in accordance with GG 142, the assessment will be based on the extent for a small scheme by virtue of this not being a trunk road (to which GG 142 applies) as determined by the Lead Assessor. The scheme will therefore be subject to a Walking, Cycling & Horse-Riding Assessment (this document) during the feasibility design stage of the proposed highway scheme. This will then be followed by a Walking, Cycling & Horse-Riding Review during each design stage.

The A4130 Widening scheme is located in the Science Vale area (see **Figure 1**), which comprises the towns of Didcot (including Milton Park and Didcot Power Station) and Wantage (& Grove) together with the established research centres at Culham Science Centre (CSC) and Harwell International Business Centre (IBC) together with the area between these settlements. The extents of the scheme are outlined in green in the figure below.

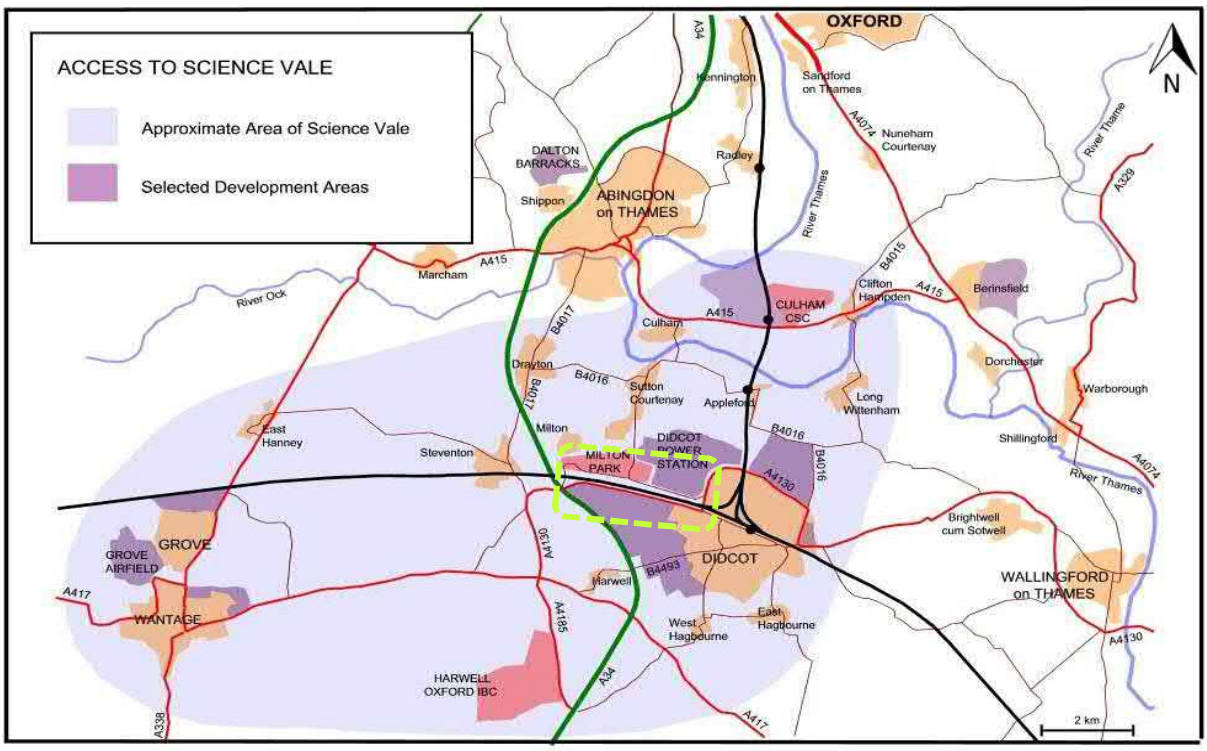

Figure 1: Science Vale area[1]

[1] *"Option Assessment report: Access to Science Vale_OAR_ PART 1_FINAL-converted"*

The A4130 currently provides the principal connection between Didcot and the A34. The A34 is a major regional transport route, linking to the north and south, and giving access to the wider road network. The scheme objectives include improving conditions for walking, cycling and horse-riding as the current route has limited facilities and connections for these users. This is likely to include segregated facilities alongside the proposed dual carriageway and associated pedestrian and cycling infrastructure such as improve crossings and adjacent routes wherever possible.

1.2 Proposed highway scheme

The proposed A4130 Widening scheme will deliver a dual carriageway between Milton Interchange at the A34 and the proposed Science Bridge, which continues north and east to link with the existing A4130 Northern Perimeter Road and the proposed Didcot to Culham River Crossing & the Clifton Hampden Bypass. Dualling of the A4130 will help mitigate the cumulative impact of employment and housing growth in Didcot and the surrounding Science Vale area by providing improved network capacity and resilience.

The proposal (the current design layout is provided in **Appendix A**) includes providing a dual carriageway from a point 320m east of Milton Interchange, eastwards for approximately 1.6km. A four-arm roundabout about 300m to the east of the existing Milton Gate junction is proposed to provide access to a new business park and Local Plan housing allocation to the south of the existing A4130. Approximately 600m east of this roundabout a signalised junction is to be constructed for access to a part of the planned Valley Park housing development. Further east, a new three-arm roundabout will provide a connection to the current A4130 (that is to be retained as single carriageway) and a new dual carriageway link to the proposed Science Bridge roundabout. The Science Bridge roundabout will additionally provide the main access to the planned Valley Park housing development.

Dualling of the existing A4130 will consist of converting the existing single carriageway, and construction of a central reserve and additional two lanes to the south of the existing carriageway. The existing carriageway will form the eastbound carriageway towards Didcot and the newly constructed lanes will form the westbound carriageway to Milton Interchange. The road corridor will also include a two-way segregated 3m cycleway and 2m footway on the southern side of the dual carriageway, as well as a number of formal crossing points.

1.3 WCHAR study area

GG 142 establishes that the Lead Assessor shall define a WCHAR study area on a scheme-by-scheme basis, that should typically extend 5km surrounding a large highway scheme. This scheme does not form part of the trunk road network, and after careful review of the requirements and proposed works, a reduced local study area extent (approximately 1km radius) has been proposed that is deemed appropriate for this study. **Figure 2** shows the proposed study area extents (green dashed line) and the scheme (blue dashed line).

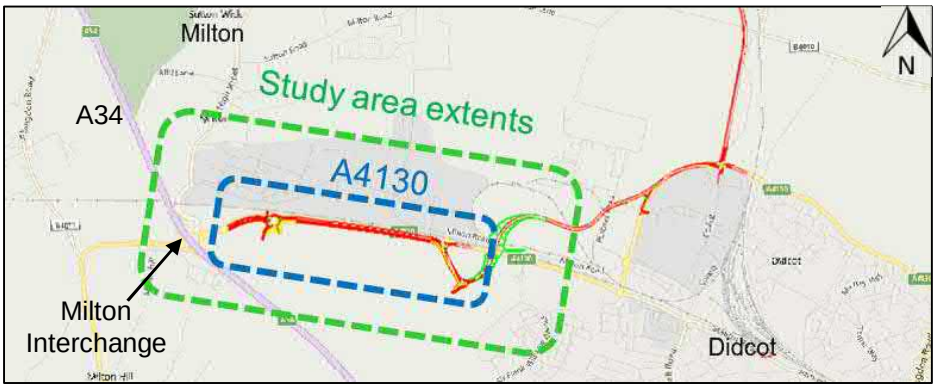

Figure 2: A4130 WCHAR study area location plan[2]

[2] *"Google Map™ and Google Streetview™ have been used, unmodified, within this document. This imagery has been used within the extents of the AECOM license agreement with Google Inc."*

2. WCHAR assessment

2.1 Assessment of walking, cycling and horse-riding policies and strategies

The following regional and local policy documents have been reviewed as part of the assessment:

Oxfordshire County Council's Local Transport Plan 4, 2015 – 2031

LTP4 recognises that new road links and capacity improvements are necessary to accommodate the large scale of employment and residential development in Didcot.

Connecting Oxfordshire: Volume 4 Local Transport Plan 2015-2031 (Adopted 2016) - Active & Healthy Travel Strategy

The strategy states that the number of people who usually drive short journeys to work in Oxfordshire is increasing and therefore roads are becoming more congested. Oxfordshire County Council have a vision to make cycling a safe, simple and accessible option for people of all ages, and in turn make cycling a major mode of travel and reduce air pollution in Oxfordshire. This will include an increase in multimodal door-to-door trips by integrating the cycling and public transport networks to allow bike-rail and bike-bus journeys.

As part of the Strategy, a Cycle Premium Route between Didcot to Culham Science Centre, via the existing National Cycle Route 5 between Didcot and Long Wittenham and then on-road towards Culham Science Centre via Clifton Hampden Bridge, has been identified as part of the proposed Science Vale Cycle Network as shown in Figure 3. This cycle network has been identified to be a focus for future investment to cycling in the area. Given the importance of the route between the two key attractors in the region, and the existing site constraints at the Clifton Hampden Bridge, the proposed Didcot to Culham River Crossing will provide an opportunity for a high quality cycle route as an alternative to the existing.

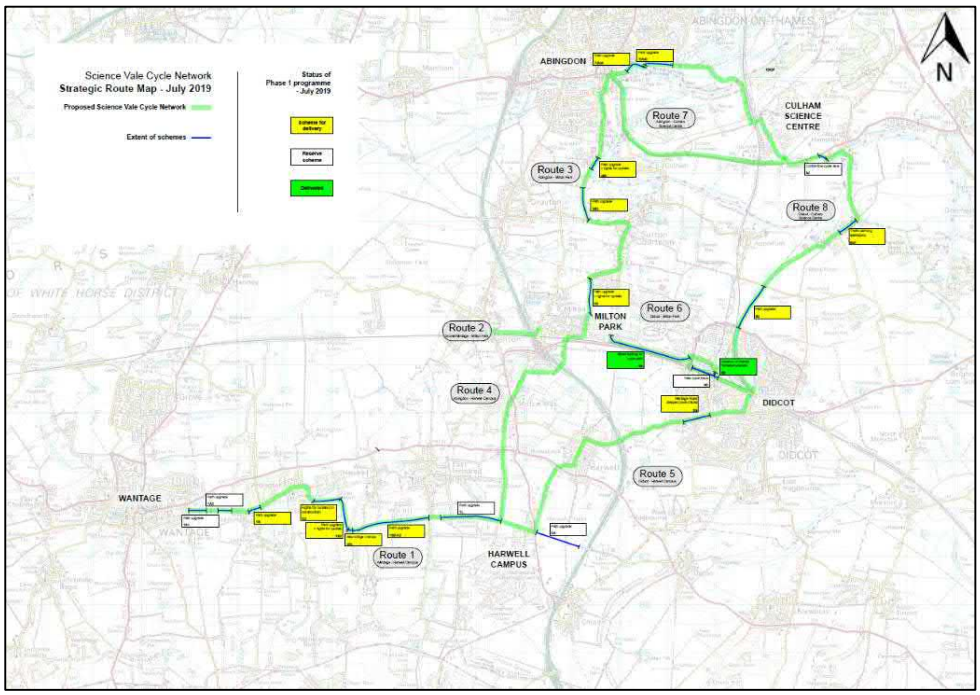

Figure 3: Proposed Science Vale Cycle Network route map[3]

[3] https://www.oxfordshire.gov.uk/sites/default/files/file/roads-and-transport-major-projects/science_vale_cycle_network.pdf

Oxfordshire Rights of Way Management Plan 2015-2025

This document is an extension of the Oxfordshire Local Transport Plan and supports the achievement of the proposed goals. The main relevant objectives are the improvement of public health and wellbeing by increasing levels of walking and cycling, reducing the proportion of journeys made by private car. This is be achieved by making the use of public transport, walking and cycling more attractive, and maximising the use of existing and planned sustainable transport investment, through linking and integrating this with planned development to allow continued and increased use of the right of way network.

Vale of White Horse District Council - Local Plan 2031 (February 2018)

The main goal is to ensure that employment growth centred on the Enterprise Zone and Science Vale sits alongside strategic housing and infrastructure to support sustainable growth. Didcot has been identified as a location for strategic growth with proposals for improvements to the town centre and railway station.

Didcot Garden Town Delivery Plan (October 2017)

This plan recognises that Didcot will grow from approximately 26,000 people to over 60,000 by 2031. With this growth, Didcot is expected to become the largest town in Southern Oxfordshire, so even if the resident's movements around the town remain unchanged, town-wide journeys by car will double. This means that infrastructure investment is required, in terms of highways, pedestrian and cycle routes.

The east-west movement corridors like A4130 Widening and the Science Bridge have been identified as one of the key proposals to achieving sustainable movement across the area.

South Oxfordshire Local Plan 2034 - Infrastructure Delivery Plan (January 2019 update)

In 2015 the Government announced that Didcot would become a Garden Town delivering 15,050 homes and 20,000 high-tech jobs in the greater Didcot area. The Local Plan includes a policy to support the Garden Town, ensuring that proposals for development within the Didcot Garden Town Delivery Plan (October 2017) and its masterplan area will demonstrate a positive contribution to the achievement of the Didcot Garden Town Principles.

The plan has a summary of the infrastructure requirements for sites in Didcot, such as the capacity enhancements to the A4130, the new Science Bridge, the Didcot Station Car Park Expansion, and the Science Vale Cycle Network Improvements, which includes improvements to connectivity between Science Vale and Didcot station by bike.

Design Standards

The following design standards have been reviewed as part of the assessment:

- Oxfordshire Walking Design Standards (A guide for Developers, Planners and Engineers, summer 2017).
- Oxfordshire Cycling Design Standards (A guide for Developers, Planners and Engineers, summer 2017).
- CD 195 Designing for cycle traffic.
- CD 143 Designing for walking, cycling and horse-riding.
- Advice on road crossings for horses (The British Horse Society).

2.2 Collision Data

Collision data from Stats 19 has been obtained and analysed to identify collision cluster sites and trends. Analysis of collision data allows the identification of existing problems which may discourage the use of a particular site.

Collision data has been obtained from Oxfordshire County Council for a five-year period between 9th June 2014 and 8th June 2019. There was a total of 64 collisions recorded within the scheme extents resulting in 82 casualties. The injury severity is summarised by year for collisions in **Table 1** and casualties in **Table 2**. The data does not show any clear evidence of deterioration or improvement in road safety in the study area.

The collision data includes part of the A34 road and the Milton Interchange roundabout. As a consequence, the results show more collision than the immediate scheme area.

Severity/ Year	2014 (part)	2015	2016	2017	2018	2019 (part)	Total
Fatal	0	0	0	0	1	0	**1**
Serious	2	0	2	2	0	0	**6**
Slight	7	18	9	12	6	5	**57**
Total	9	18	11	14	7	5	**64**

Table 1: Total collisions by severity

Severity/ Year	2014(part)	2015	2016	2017	2018	2019(part)	Total
Fatal	0	0	0	0	1	0	**1**
Serious	2	0	2	2	0	0	**6**
Slight	10	21	14	15	9	6	**75**
Total	12	21	16	17	10	6	**82**

Table 2: Total casualties by severity

Of the total 64 collisions and 82 casualties, one involved a pedestrian and one involved a cyclist. No equestrian casualties were recorded in the scheme extents.

There was one fatal collision which involved a car and a motorcycle rider at the A4130 Milton Interchange Roundabout junction with the A4130. The speed limit of the road was 40 mph.

The collision involving a pedestrian was outside the scheme extents (70m west of junction with Trenchard Avenue, to the west of the Milton Interchange Roundabout). The vehicle failed to stop for the red signal at the pedestrian crossing and hit the pedestrian causing slight injury. The speed limit of the road was 40 mph.

The collision involving a cyclist was on the A4130 approximately 750m west of the junction with Sir Frank Williams Avenue. In a 60mph limit section, an HGV mounted the kerb ("possibly due to glare from oncoming headlights or driver illness") and hit the cyclist travelling on the off-road shared use footway.

All the mentioned collisions occurred in fine and dry weather conditions.

Appendix B contains details and balloon diagrams for all the collisions.

2.3 Multi-modal transport services and interchange information

Pedestrians, cyclists and equestrians may combine their modes of travel with public transport as part of a longer trip. As part of this Assessment, public transport services and associated infrastructure such as rail and bus stations (including bus stops) and interchanges have been identified to enable an appropriate assessment of the integration of such modes.

2.3.1 Bus Services

There are no existing bus stops within the scheme extents, but there are bus stops located within the study area, as shown in **Figure 4**. The main reason no bus stops are located along the existing A4130 road is that it passes through an undeveloped green field area with no existing demand for them, and the Great Western main rail line forms a barrier to the Milton Park Science Park to the north. With the proposed developments to the south of the A4130, this is likely to require new bus stops, routes and increased frequencies in the future.

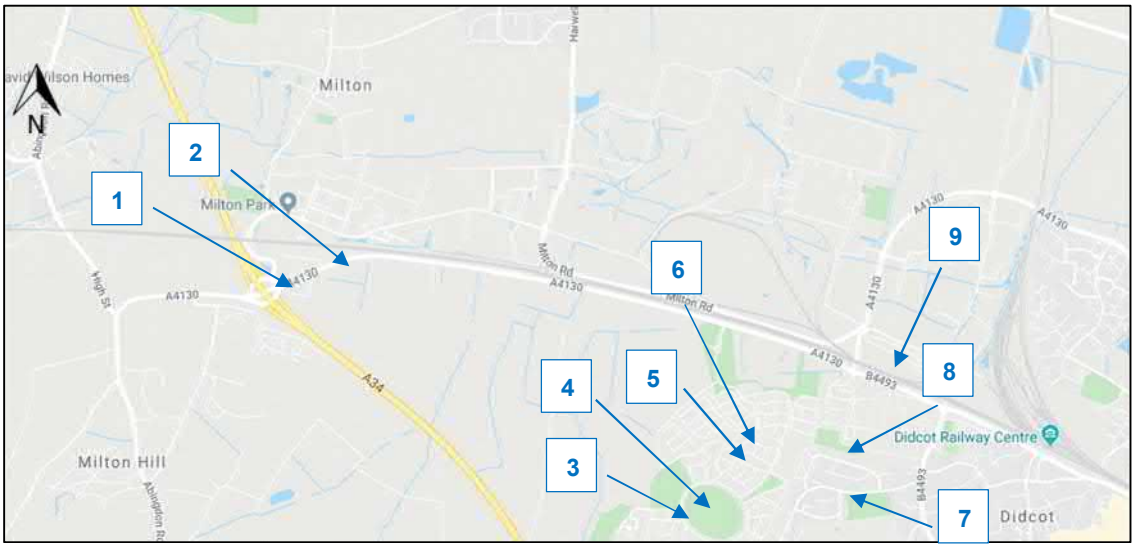

Figure 4: Location of bus stops within the study area

Bus route	Frequency (service hours)	Days of service	Bus stop Nos.	Route connections
Milton Park Shuttle	Every 10-20 min (7:00-19:00)	Monday - Friday	1, 2, 9	Milton Park – Didcot Parkway Station – Milton Park
33 Connector	Every 1.5h (6:20 to 17:20) Hourly (10:00 to 14:00)	Monday - Friday	2, 9	Abingdon to Wantage
99 Connector	Every 30min (7:15 to 19:00) Hourly (9:47 to 15:47)	Monday - Friday	2, 3, 4, 5	Great Western Park to Milton Park
X2 Connector	Every 30 min (4:51 to 20:28) Hourly (5:20 to 6:10; 16:18 to 17:08 and 21:28 to 23:25)	Monday - Sunday	2, 9	Oxford - Abingdon - Milton Park - Didcot - Wallingford
X32 Connector	Every 30min-1hour (5:01 to 20:30)	Monday - Sunday	2, 9	Oxford - Milton Park - Didcot - Chilton - Harwell Campus - Wantage
98 Connector	Every 10-30min 6:00 to 23:40	Monday - Sunday	3, 4, 5, 6	Didcot Parkway - Great Western Park - Harwell Campus
93	Hourly (10:00 to 14:00)	Monday - Friday	7	Broadway - Meadow Way - Freeman Way - Broadway (Circular)
91	Hourly (9:15 to 13:15)	Monday - Friday	8	Didcot - Ladygrove (Circular route)

Table 3: Bus routes within the A4130 scheme extents[4]

[4] https://bustimes.org/localities/didcot

The above bus services have been split between the services around Didcot (**Figure 5**) and those services with connections outside of the Didcot area (**Figure 6**).

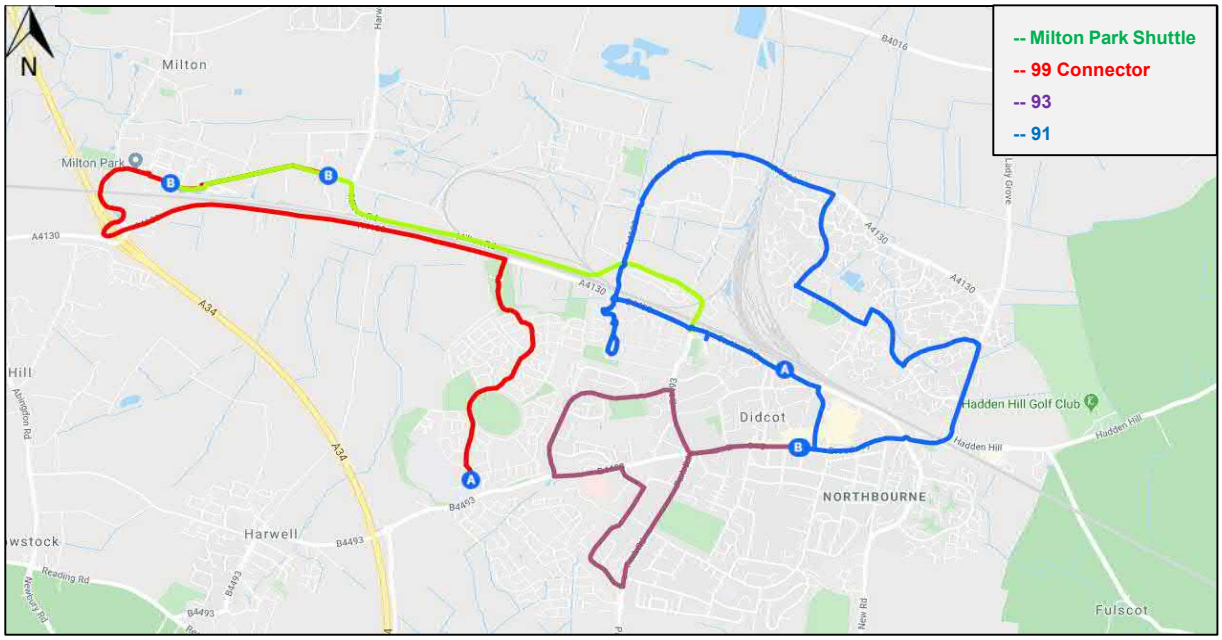

Figure 5: Bus routes around Didcot

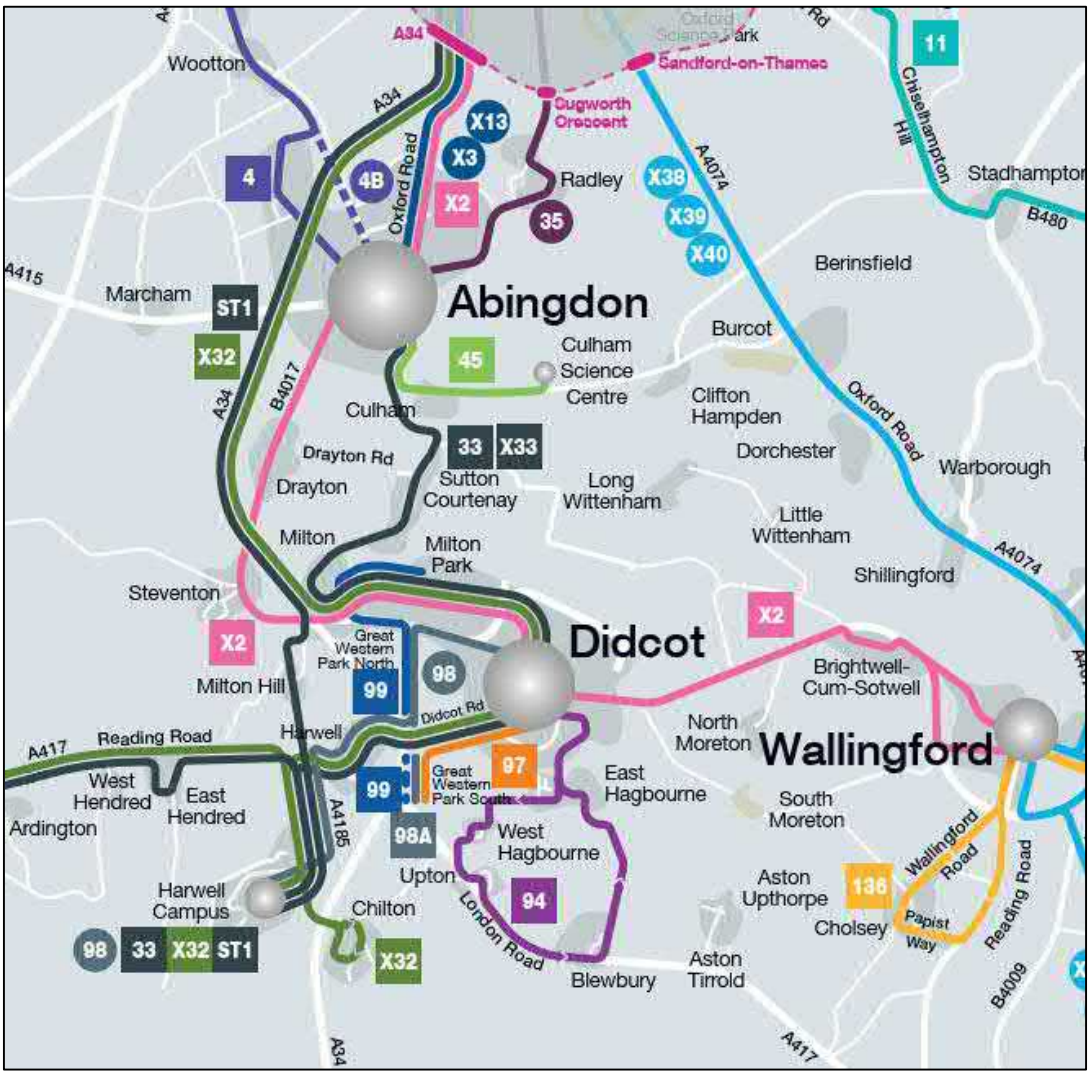

Figure 6: Extract of South Oxfordshire Zone network map

2.3.2 Train Services

While there are no train stations along the A4130 Widening scheme, there is one train station located within the study area. Didcot Parkway station is located less than 2km east of the scheme along the B4493 – Station Road. Train services at this station are operated by Great Western Rail[5], running trains into Oxford, London Paddington, Reading, Cardiff Central, Banbury, Weston Super Mare, Cheltenham Spa, Swansea, Taunton, Bristol Temple Meads and Carmarthen. This station has an average of ten services per hour.

The train station has a ticket office and ticket machine. It also has facilities such as toilets, car parks (1,127 spaces), sheltered cycle storage, bus services, taxi rank and a bike hire station. All station areas have step free access suitable for wheelchairs and ramps for train access.

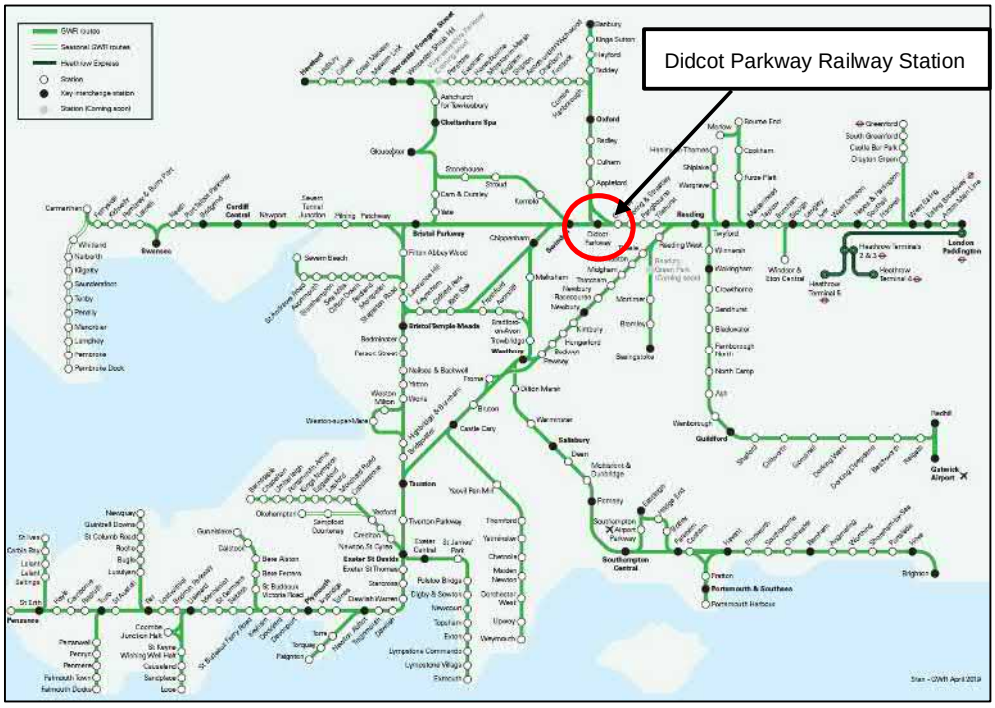

Figure 7: Great Western Railway Network

2.4 Key trip generators and local amenities

2.4.1 Current trip generators

Didcot has a population of 25,140[6], as of the 2011 census, has grown by 1,687 residents (7%) since 2001. Didcot is the largest settlement in South Oxfordshire (19%).

Didcot has a higher proportion of flats, terraced housing and semi-detached houses than average for the district and households are less likely to be owner occupied.

Almost half of the journeys to work which end in Didcot also start in the town. There is almost double the number of journeys out of Didcot to work as journeys into the town. Trips to the rest of the Science Vale area make up the largest number (about 20%), and this includes trips to Milton Park, Harwell and Culham Science Parks. The next largest destination is Oxford with other significant destinations being Abingdon, Wallingford and Reading.

[5] https://www.gwr.com/
[6] http://www.oxford.gov.uk/districtdata/downloads/file/61/south_oxon_census_2011_summary_leaflet

The number of vehicle movements into and out of Didcot town increased from 12,544 in 2001 to 13,826 in 2011[7] however cars per household remains below the district average. The overwhelming mode of travel to work in Didcot is as a car driver. Around 80% of journeys to work in Didcot are made by car, either as driver or passenger. There has been an increase in the number of employees driving to work, going by bus and travelling to work on foot.

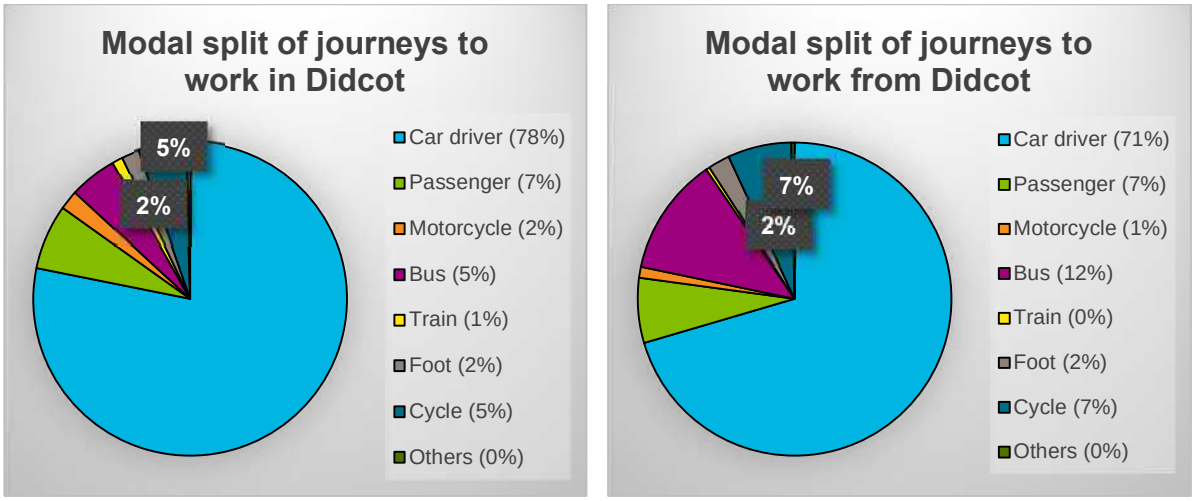

Figure 8: Modal split of journeys to work in and from Didcot

Bus journeys and cycle trips each account for approximately 5% of all journeys to work in Didcot, while the train is used in only 1% of commuter trips and only 2% by foot. Bus trips to work are only significant for trips to elsewhere in Science Vale (which includes Milton Park).

The key trip generators near the proposed scheme that could attract pedestrian and cyclist trips are the following:

Local businesses and key places of interest

Milton Park is a major employer of local staff and from a wider area, increasingly so as it has become a centre for more specialised, higher end activities, and also impacts the balance of in- commuters to out-commuters.

A service area near the Milton Interchange, has businesses such as car dealerships, restaurants, a coffee shop, a fuel station, and hotels.

Didcot Power Station, Southmead Industrial Estate, including Tesco Distribution Centre and the Trident Business Park are also local trip generators. While many Didcot residents use the Didcot Parkway train station to reach destinations further afield.

Residential areas

There are no residential areas that are within the immediate scheme extents, however there are many within a short distance from the scheme:

Didcot

The town offers a broad range of housing and employment opportunities, as well as key services and facilities including retail, health care, leisure and culture. The Great Western Park development, immediately east of the scheme extents has recently delivered many new homes.

[7] http://www.oxford.gov.uk/districtdata/downloads/file/68/didcot_settlement_profile_census_2011

Milton

There is a residential area located west of the scheme. However, there are no stores or restaurants, so residents probably go to Milton Gate or Didcot for these services.

There are some villages outside of the scheme extents such as Sutton Courtenay, Steventon, Milton Hill, Harwell, North Moreton, South Moreton or Appleford that are close to Didcot. Residents in these areas probably travel frequently to Didcot due to the facilities available, including shopping, restaurants, hospital, banks and fuel stations.

Oxford

The A34 links Didcot with Oxford, which is 14 miles to the north. Oxford has several important functions: a centre of higher education (with two universities), a major shopping centre; a centre for public services and a centre of manufacturing. Oxford is one of the largest employment centres in the South East, in addition to a large student population. Oxford also has a high level of in-commuting for employment, public services, education, health services and over 5 million visitors a year.

2.4.2 Future trip generators

Housing areas are planned for the Valley Park area in south-west Didcot (immediately south of the A4130 Widening scheme), Ladygrove North in north-east Didcot, North-east Wantage, and at other locations including Culham, Berinsfield and Dalton Barracks. Together these will add more than 22,000 houses to the local area.

Major employment development is planned within two Enterprise Zones, Science Vale and Didcot Growth Accelerator, and elsewhere at Milton Park and Didcot Power Station, Grove Airfield, Culham Science Centre and Harwell IBC. If these developments were allowed to progress without any improvements in the capacity of the transport networks, then the result would likely be unacceptable local congestion.

The Oxford Strategic Model (OSM) has been developed to predict traffic growth based on travel conditions in 2013. The model consists of an Highway Assignment Model (HAM) representing vehicle-based movements within and across the Oxfordshire County, the Public Transport Assignment Model (PTAM) representing bus and rail-based movements across the same area and for the same periods and a five-stage multi-modal Demand Model (MMDM) that estimates the choice of frequency, mode, period, destination and sub-mode in response to changes in generalised costs of travel.

These model assignments suggest that in the period 2013-2031 there would be around 25% traffic growth in the Didcot area in the morning and evening peaks, while in the inter-peak periods traffic growth could be 45%. The flow on the A4130 to the A34 is predicted to increase by 30-40% in the peaks and over 50% in the inter-peak periods.

The proposed planning applications that are pertinent to the proposed developments in the study area and extents according to the OCC[8] are the following:

South of Great Western Park, Didcot (P17/S3029/SCO)

Scoping opinion for proposed outline application for the development of land to the south of Great Western Park, for approximately 1,023 dwellings.

Land to the north east of Didcot (P15/S2902/O)

Proposed new and integrated neighbourhood to the northeast of Didcot of up to 1,880 homes, two new primary schools, a new secondary school and a new leisure/ sports facility and sports pitches, including a pavilion. A new neighbourhood centre, a mixed-use Public

[8] https://www.oxfordshire.gov.uk/residents/environment-and-planning/planning/find-planning-application/major-planning-applications/south-oxfordshire

House/restaurant, a hotel, a new community hall, a residential Extra Care Housing facility, new areas of green infrastructure including amenity green space, allotments and children's play areas, a supporting town-wide and site-specific associated infrastructure.

Car Park, Station Road, Didcot OX11 7NN (P15/S2159/O)

Planning application for demolition of existing buildings and a mixed-use development comprised of up to 300 residential units, a 70-bed hotel, gym, retail uses, commercial office floorspace, a replacement nursery school and a decked car park of up to three levels and supporting infrastructure. Closure of Lydalls Road to allow for redevelopment and altered pedestrian access.

Land at former Didcot A Power Station, Purchas Road, Didcot (P15/S1880/O)

Mixed-use redevelopment comprising up to 400 dwellings, hotel and pub/restaurant, including link road, related open space, landscaping and drainage infrastructure, together with reservation of land for link road and Science Bridge.

Orchard Shopping Centre, Didcot OX11 7LL (P15/S0433/FUL)

Demolition of existing buildings and construction of 1 and 2 storey buildings comprising retail units, flexible retail units, restaurants and a gym. Replacement public toilets, new public realm, improvements to existing public realm, new landscaping, realignment of drainage channel and alterations to access comprising amendments to the existing parking layout, additional car, motorcycle and cycle parking, new servicing area, new and amended access from the highway (including relocated bus route and closure of the High Street to allow redevelopment for retail use) and altered/ new pedestrian access.

2.5 Site visit

The site visit was undertaken by Andy Blanchard (Project Manager & Lead Assessor), Mike Ager (Design Team Leader), Andrea Blanco (Senior Engineer) and Rebeca Bolado (Graduate Engineer), on 9th December 2019 during daylight hours. The site visit took the form of walking along the A4130 within the scheme extents. The weather during the site visit was windy and sunny, with temperatures of 7 degrees Celsius.

The primary findings of the site visit were:

- The shared use footway along the southern side of the A4130 is relatively narrow (2.5 meters), has no physical segregation from the main carriageway and at the time of the site visit was not well used.
- Pedestrians were observed using the new Toucan crossing at Backhill Tunnel to cross the A4130.
- No pedestrians were observed using any of the Public Rights of Way during the site visit. It appears that two them are not used because one access has a closed gate and the other has overgrown vegetation making it impossible to access.
- No cyclists were seen during the site visit.
- No evidence of equestrian use was found.
- Traffic flows along the A4130 were relatively heavy with a large number of heavy goods vehicles.

2.6 Existing pedestrian, cyclist and equestrian network facilities

2.6.1 Local facilities

The existing facilities for non-motorised users along the scheme extents include the following:

- Between the Milton Interchange roundabout and the rail underpass at Backhill Tunnel (south of Milton Park), up to 3m wide shared use cycle-pedestrian footways is present on both sides of the A4130 carriageway. There is no northern footway along the A4130 east of the tunnel. The Backhill Tunnel is shown in the **Figure 9.**

Figure 9: Backhill Tunnel

- Between the Backhill Tunnel and the A4130/B4493 roundabout (east of the scheme extents) a 2.5m wide shared use footway is present along the southern frontage. This footway is shared by cyclists and pedestrians and links to the Public Rights of Way located to the south of the A4130.

Figure 10: Southern footway of A4130

- There is limited street lighting. Part of the route is lit from Milton Interchange to just east of the Toucan crossing. There is lighting at Backhill Tunnel for pedestrians and cyclists, and there is lighting at the Sir Frank Williams Avenue junction at the entrance to Great Western Park, to the east of the scheme extents. However, there is no other lighting along the A4130 between these junctions.

The figure below shows the location of the Public Rights of Way (PRoW) within the study area.

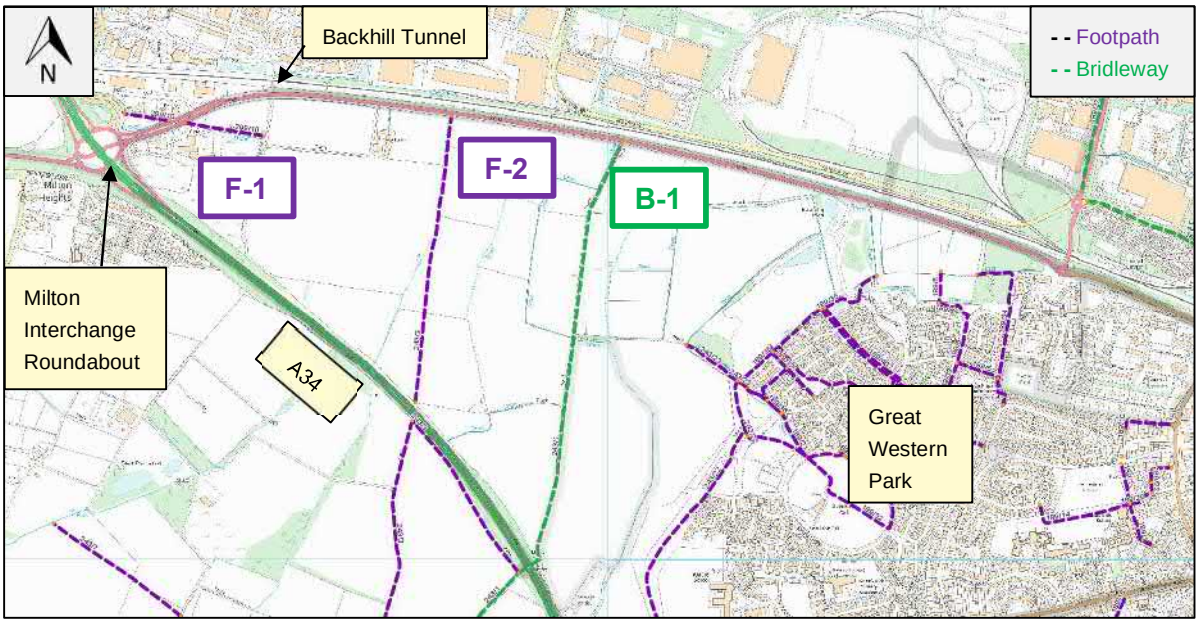

Figure 11: Public Rights of Way within the study area[9]

The following pedestrian, cyclist and equestrian facilities within the scheme extents have been identified:

Walking network facilities

There are two footpaths within the study area extension:

Footpath F-1 (ref 299/10/10):

This footpath is divided by the A4130 into two sections.

- The first section starts close to the Milton Interchange roundabout and stretches for 145 metres up to the northern side of the A4130. Its entrance appears to be shared with cars.
- The second section continues on the southern side of the road but is blocked by a padlocked gate (there is no direct crossings between the two sections over the A4130, but there are controlled crossing facilities at the nearby Milton Gate signals). The footpath beyond the gate stretches for 275m alongside a field and ends at a private lane.
- It would appear that this lane links to the former Backhill Lane (and Backhill tunnel) which may have been a public road prior to the construction of the current A4130.

Figure 12: North entrance to footpath F-1

[9] *https://publicrightsofway.oxfordshire.gov.uk/Web/standardmap.aspx*

Figure 13: South entrance to footpath F-1

Footpath F-2 (ref 243/3/10):

- This footpath is severed by the A34.
- The northern section starts on the southern side of the A4130 but there is dense vegetation and it does not have a clear entrance. This footpath appears to be severed at it is southern end by the A34, there is no way to cross the busy dual carriageway at this point. This footpath seems completely abandoned and is inaccessible.
- South of the A34 it divides into two sections, one leads to Harwell and the other runs parallel to the A34 in the south-east direction.

Figure 14: North entrance to footpath F-2 at the A4130

Bridleways (ref 243/1/10):

There is one bridleway within the study area. This bridleway (known as Cow Lane) is approximately 1,450 metres in length and goes from the north, connecting with the A4130 south, connecting with Harwell. There is a bridge as seen in **Figure 16** crossing the A34.

Figure 15: Northern and southern entrances to bridleway B-1

Figure 16: Bridleway B-1 crossing the A34

Cycling network facilities

There are no cyclist facilities registered in the National Cycling Network within the scheme or study area. However, cycling is permitted along the southern footway for the whole length of the A4130 within the study area, and on the northern footway west of Backhill tunnel. Cycling is also permitted along the Cow Lane bridleway, which has a well compacted natural surface.

Horse-riding network facilities

The bridleway mentioned above is an equestrian facility.

2.6.2 Facilities at a strategic level

Public Right of Way (PRoW)

Figure 17 below shows the location of the Public Rights of Way (PRoW) at a strategic level.

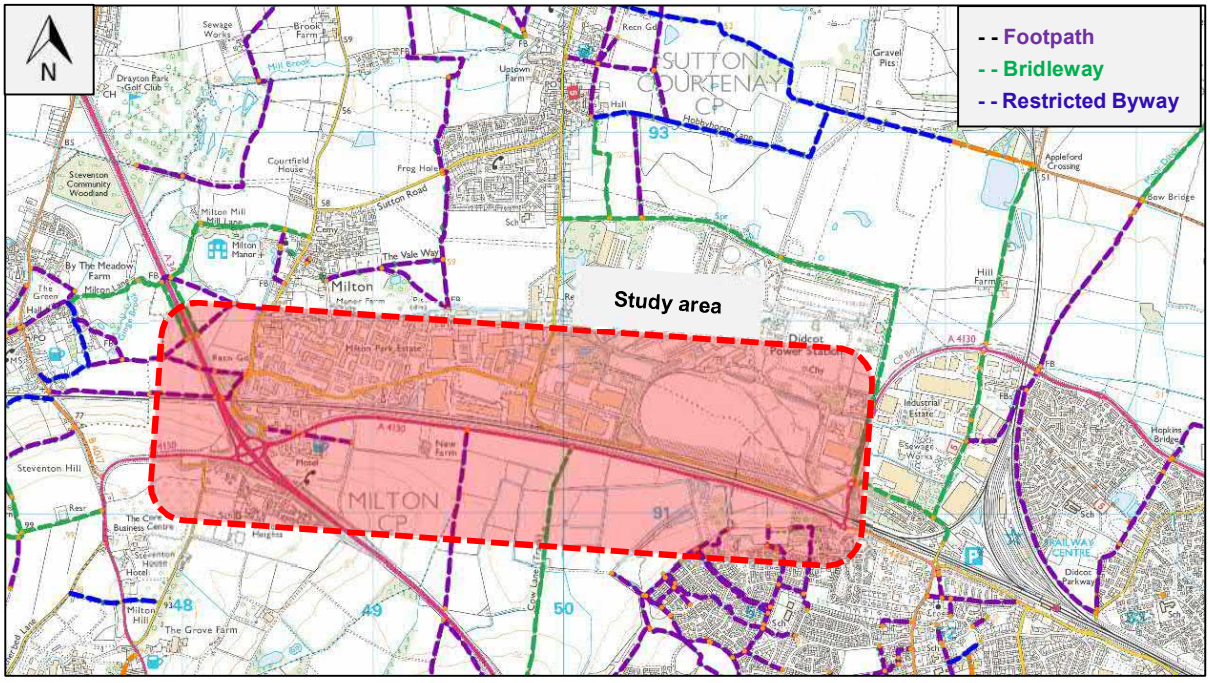

Figure 17: Public Rights of Way outside the study area

Cycling network facilities

There are two National Cycling Network (NCN)[10] routes across the Didcot area, as shown in **Figure 18**.

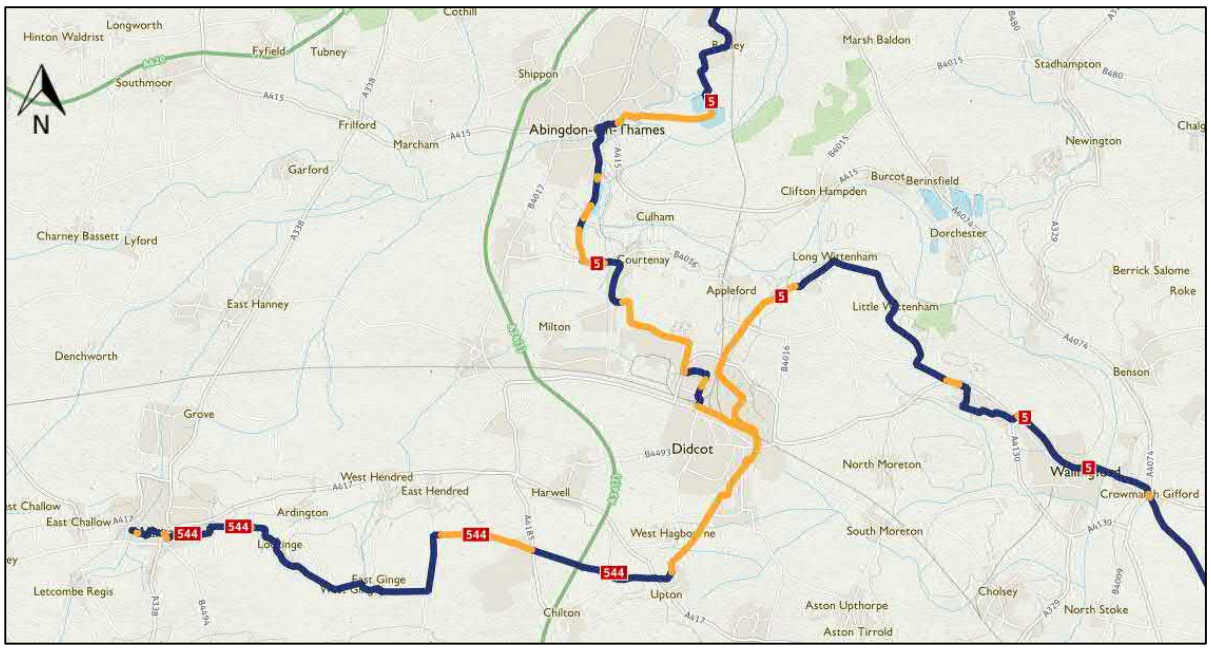

Figure 18: National Cycling Network

National Cycle Network Route 5 is a long-distance route connecting Reading and Holyhead via Oxford, Stratford-upon-Avon, Bromsgrove, Birmingham, Stoke-on-Trent, Chester, Colwyn Bay and Bangor.

The National Cycle Network Route 544 connects Didcot and Wantage. It is a 12-mile route on quiet roads, byways and purpose-built paths, offering a tranquil way to explore Southern Oxfordshire.

Some cycle facilities have been completed as part of the planned Science Vale Cycle Network, see **Figure 3**.

Horse-riding network facilities

There are no known equestrian facilities that exist beyond the scheme extents.

2.7 Walking, cycling & horse-riding survey data

A 7-day, 24-hour survey was conducted in November 2019 to collect data on walking, cycling and horse-riding movements at three locations within the scheme extents. This data was collected in order to provide a quantitative understanding of the existing walking, cycling and horse-riding demand, and understand the use of junctions in the scheme. Additionally, an Automatic Traffic Count (ATC) was conducted on the A4130 to collect data on traffic speeds.

The movement surveys were undertaken between Monday 11th November and Sunday 17th November 2019. The surveys were undertaken using video survey techniques to cover walking, cycling and horse-riding movements through each of the junctions.

The count locations are shown in **Table 4** below. A map of these locations is shown in **Appendix C**.

[10] *https://osmaps.ordnancesurvey.co.uk/ncn*

Survey ID	Location	Survey Type	Grid Reference
WID-01	Backhill Tunnel (NMU only) and A4130 Junction	All NMU movements	E: 448914 N: 191499
WID-02	Sir Frank Williams Avenue (Great Western Park) and A4130 Junction	All NMU movements	E: 450783 N: 191168
WID-03	A4130 (east of Backhill Tunnel)	An ATC speed survey	
WID-04	Cow Lane (bridleway) and A4130 Junction	All NMU movements	E: 450036 N: 191341

Table 4: Locations for WCHAR surveys

2.7.1 ATC and speed surveys

The following table provides the total number of vehicles recorded in each direction along A4130 East of Backhill Tunnel during the survey period and their classification.

Survey ID	Location	Direction	Vehicle Classification (%)					
			Cycles (on road)	Motor/ cycle	Car	LGV	HGV	Buses
WID-03	A4130 East of Backhill Tunnel	Eastbound	0.01	0.35	80.58	10.86	7.76	0.44
		Westbound	0.02	0.42	75.29	14.93	8.74	0.60

Table 5: Total traffic flow and vehicle classification

The average weekly total traffic flow was 85,289 vehicles Eastbound and 85,553 Westbound.

The following table shows the average and 85%ile speeds recorded on the A4130. The recorded information shows that vehicles frequently travel above the speed limit on both roads, although it should be noted that the survey location was at the speed limit change from 40mph to 60mph.

Survey ID	Location	Direction	Speed Limit (mph)	Average speed (mph)	85%ile speed (mph)
WID-03	A4130 East of Backhill Tunnel	Eastbound	40mph	42.4	50.6
		Westbound	40mph	43.3	49.4

Table 6: Surveyed average and 85%ile speeds

Figure 19: A4130 east of Backhill Tunnel

2.7.2 NMU surveys

The total pedestrian and cycle movements have been marked on a location plan for each site. The full survey counts are provided in **Appendix D**.

WID-01: Backhill Tunnel (NMU only) and A4130 Junction

There is a Toucan crossing at this location and it provides a connection between the northern and southern footways of the A4130 and the Backhill Tunnel which connects to Milton Park for pedestrians and cyclists only. There is a footway on the northern side of the carriageway, but it ends east of the tunnel. This means that pedestrians have to cross to the south carriageway, that has a continuous footway, connecting to Didcot. During the survey the Toucan crossing was not operational, so pedestrians / cyclists using the tunnel who were unable to cross to the southern footway, may have decided to continue on the northern footway.

The pedestrian and cycle movements recorded during the survey period are shown in the following figure. During the survey period, no equestrians were counted, but four scooter riders were recorded during the whole week. The number of NMUs recorded at this location averaged 169 pedestrian and 127 cyclist on a weekday, and 44 and 47 respectively during the weekend.

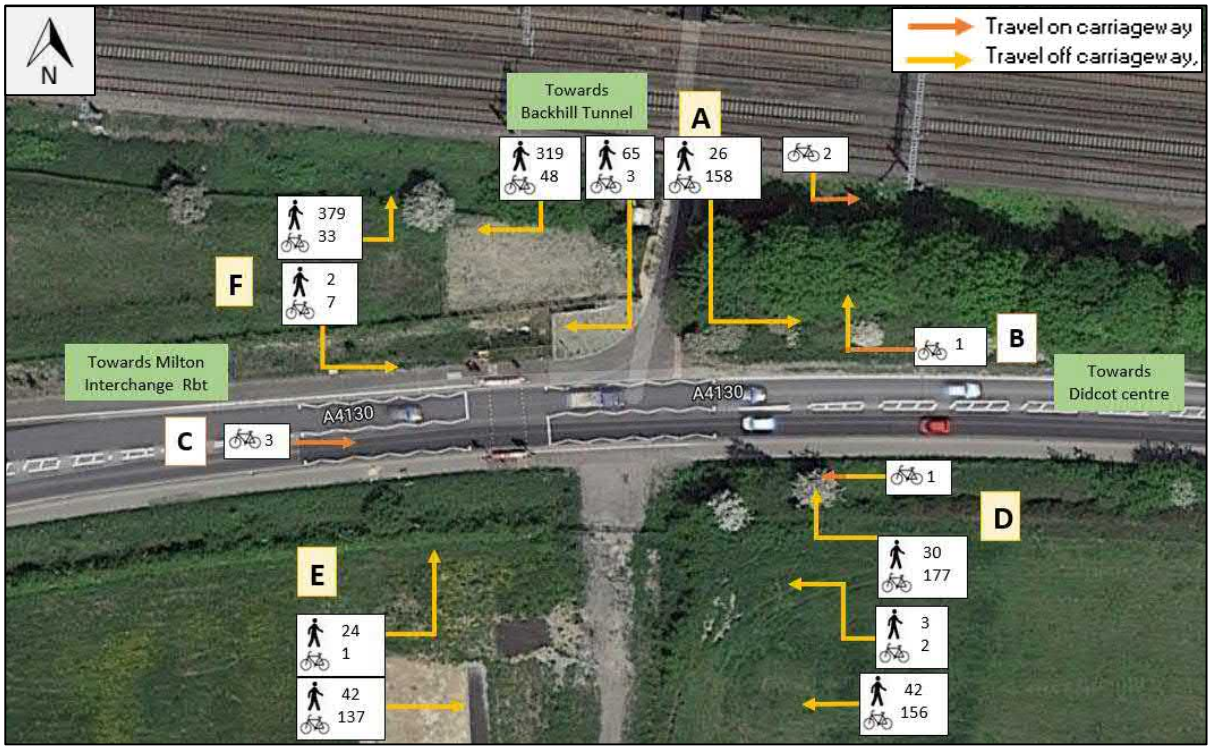

Figure 20: Pedestrian and cycle total weekly movements at Backhill Tunnel

Figure 21: Backhill Tunnel

WID-02: Sir Frank Williams Avenue and A4130 Junction

This junction is signalised and provides a link to the Great Western Park residential development. There is a footway on the southern side of the A4130 carriageway and both sides of Sir Frank Williams Avenue.

The pedestrian and cycle movements recorded during the survey period are shown in the following figure. During the survey period, no equestrians were counted. Four scooter riders using the footway were recorded during the whole week. The number of NMUs recorded at this location averaged 50 pedestrians and 128 cyclist on a weekday, and 73 and 58 respectively during the weekend.

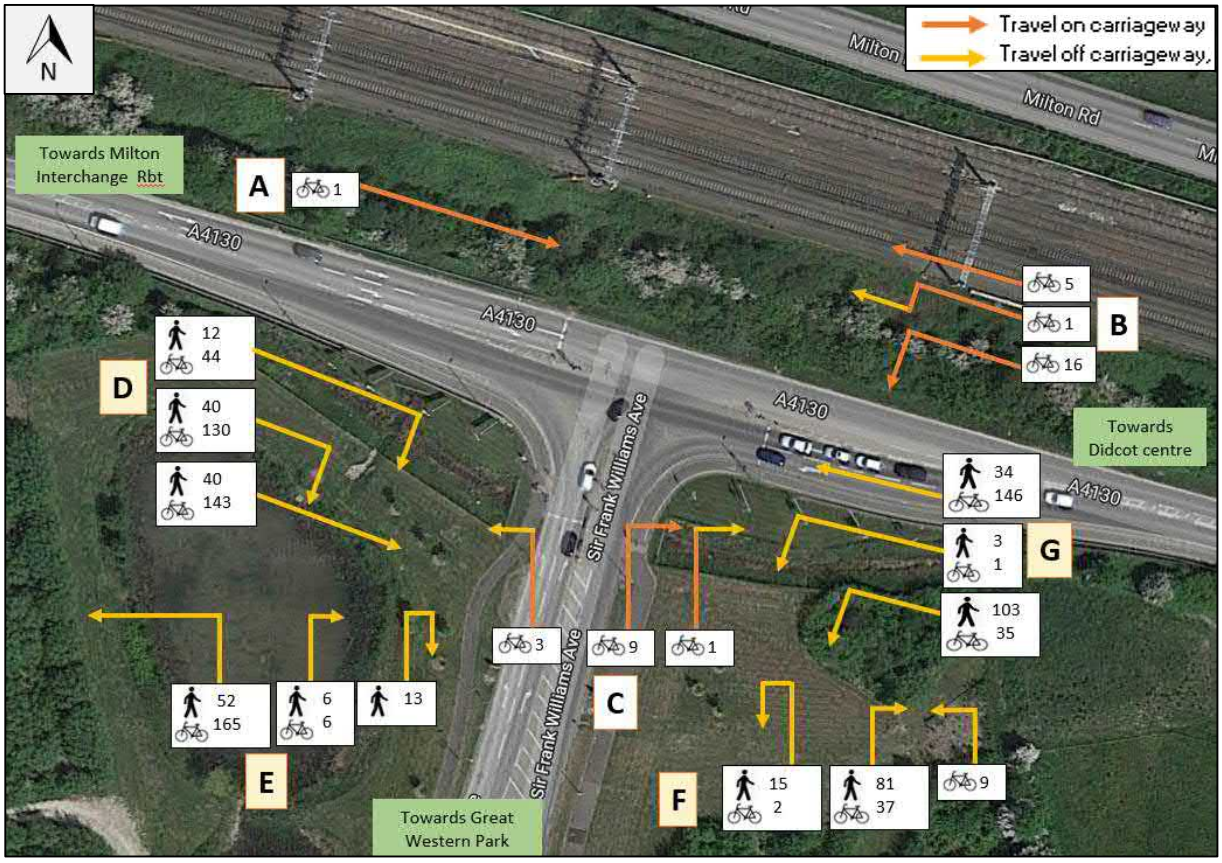

Figure 22: Pedestrian and cycle total weekly movements at WID-02 (from A, B, C and D)

Figure 23: Sir Frank Williams Avenue and A4130 Junction

WID-04: Cow Lane (bridleway) and A4130 Junction

This junction is unsignalised and connects the A4130 with the Cow Lane (bridleway). There is a (shared use) footway on the southern side of the A4130 carriageway at this location.

The pedestrian and cycle movements recorded during the survey period are shown in the following figure. During the survey period, no equestrians were counted. Two scooter riders using the footway were recorded during the whole week. The number of NMUs recorded at location averaged 29 pedestrian and 112 cyclist trips on a weekday, and 37 and 42 respectively during a weekend day.

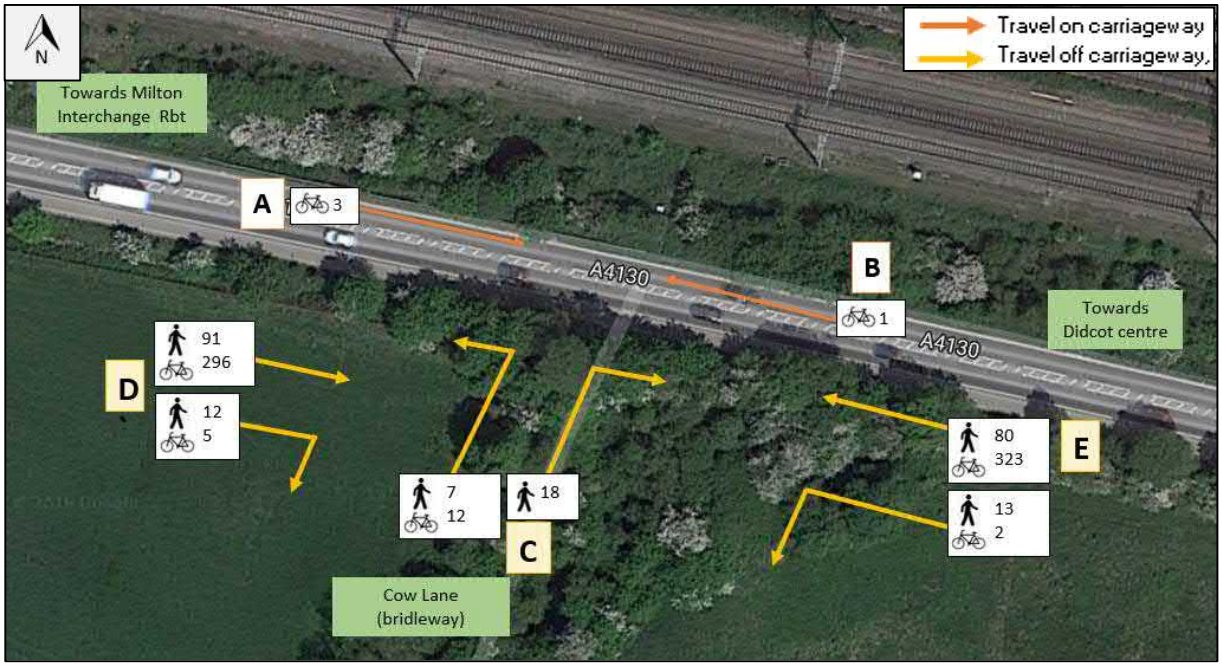

Figure 24: Pedestrian and cycle total weekly movements at WID-04

Figure 25: Cow Lane (bridleway) and A4130 Junction

2.8 Liaison with key stakeholders

In order to be able to incorporate, where appropriate, the comments and views of local people on the preferred alignments into the next stage of the scheme design process of the HIF1 package of schemes an online public consultation was undertaken. This commenced on 20th March 2020 and finished on 30th April 2020. Full details of the consultation are available here: www.oxfordshire.gov.uk/didcotupdate.

As a result of Government restrictions on social distancing in response to the COVID-19 pandemic, it was not possible to hold the five public exhibitions that were scheduled for the last two weeks of March 2020. Due to the very tight timescales imposed by Government with respect to the terms of the funding, it was necessary to continue with an online consultation in order to avoid delay to the project programme.

However, to address this, OCC undertook additional measures to ensure that as many people as possible were aware of the consultation and were able to access the information. This included sending letters to approximately 22,000 residences in the area, using an innovative virtual exhibition room with live chat function, promoting telephone numbers of officers available to answer questions, and sending printed versions of the materials to those without internet access. This was all in addition to the standard means of engagement (newspaper adverts, press releases, electronic mailouts, OCC website etc).

It should be noted that the A4130 Widening scheme was consulted alongside the three other Didcot HIF highways schemes. Later in the year, it is intended that stakeholder workshops will be held to invite further input to the design of the walking, cycling, and horse-riding provision in these schemes.

Overall, 24 questionnaires were sent out to a list of identified key stakeholders and user groups which included representatives from the following:

- OCC Public Health
- OCC Public Rights of Way
- Didcot Garden Town Project Manager
- Harwell Campus Bicycle Users Group (HarBUG)
- Sustrans Thames Valley
- CYCLOX / Cycling UK
- Culham Science Centre Bicycle Users Group (CulBUG)
- Milton Park Bike Users' Group (MilBUG)
- Oxfordshire Cycling Network (OCN)
- Ramblers Association
- Rambers Association Oxon (& Oxford Fieldpaths Society)
- British Horse Society
- Oxfordshire Association for the Blind
- Oxfordshire Unlimited
- Guide Dogs
- Oxfordshire Transport & Access Group (OXTRAG)

In total, seven replies were received. In general, all respondents supported walking and cycling improvements, even if this means less space for other road traffic.

Table 7 provides a summary of the stakeholder responses relating to the proposed A4130 Widening scheme received during the consultation. A copy of the questionnaire and the full responses received are included in **Appendix E**.

Consultee	Summary of Responses
Oxfordshire County Council Public Health	• Providing high quality pedestrian infrastructure will enable people making short trips to walk, but that new routes should be safe and convenient -i.e. providing short cuts and avoiding long wait times at crossings. • Providing high quality cycle infrastructure will improve people's cycling experience, but should be part of a safe network, and be more direct and convenient than driving to encourage more people to cycle, and more often. • Strongly support the full segregation and setting back of walking and cycling facilities from the carriageway. However, the plans will create a relatively fast and noisy traffic corridor that if not carefully designed will reduce people's confidence and desire to walk and cycle. • Particularly concerned about tangential roundabout design that might result in vehicles entering and leaving the roundabouts at speeds that will be intimidating and unpleasant to NMU's using the Toucan crossings and waiting in the central refuges. Radial roundabout design suggestion instead. • Green infrastructure should be implemented to create a more pleasant and less traffic dominated environment, e.g. a boulevard of trees. • Concerns about the proposal impacts on carbon reduction priorities due to the risk that it could induce more traffic.
Public Rights of Way Access Strategy & Develop-ment (OCC PRoW)	• Noted that the improvements for pedestrians are relatively close to traffic and won't encourage new walkers due to the distances involved, but they would enable people who already walk or run on roads in the area to do so more safely. • Recommended creating alternative traffic free routes well away from carriageways and within settlements instead. • Considered that the segregated proposals will provide safer and more convenient facilities for confident cyclists and encourage less confident cyclists to use their bikes for utility and social journeys, provided there were complementary facilities within the neighbouring developments. • Stated preference for having 5m grass verge separation between all motor vehicles and NMUs, i.e. group pod (autonomous vehicle) lane with other motor traffic. • OCC PRoW highlighted several potential improvements: – Speaking to local and national British Horse Society (BHS) to identify the needs of equestrians, because they noted that there is no provision for them. – Provide connections for bridleway users. – Focus on facilities within settlements - these must have traffic-free or physically separate routes to encourage non-cyclists to get on bicycles. • Consult the statutory Oxfordshire Countryside Access Forum.
Harwell Campus Bicycle Users Group (HarBUG)	• People will walk along the route for short distances to get to places but not for pleasure alongside a main road, as it is unpleasant and pedestrians will want to get away from the road as soon as possible. • Cycle paths and facilities must provide direct and convenient connections to existing and new Didcot housing developments, so that cyclists can easily join and leave the new paths. • Cycle paths need to be integrated into the Science Vale Cycling Network. • Key general points relating to improve provision for people who wish to walk, cycle or ride a horse outlined below: – Ensure that Valley Park and other developments along the A4130 have cycle path networks that connect to the new A4130 paths and beyond.

Consultee	Summary of Responses
HarBUG (cont.)	– Optimise the Toucan crossings at the Backhill Lane Tunnel Roundabout to reduce waiting times when traffic flow is low. Maybe the crossing either side of the roundabout should have different timing priorities. – Suggest Toucan crossing at the Valley Park signalised junction to be a raised parallel crossing to provide better continuity for cyclists. • Suggested that the POD lane would be better next to the main carriageway so that, in future, carriageway space can be easily be re-allocated to accommodate more autonomous vehicles without changing the cycle lanes. • Suggestion of Science Vale Cycle Network route naming is used, as proposed in their *Proposal for Network Naming Convention and Routes*, April 2019.
Cyclox	• Cyclox welcome the improvements proposed to encourage people to walk and cycle more often, as they are safer and reduce motorised threat. • Compact roundabouts should be proposed instead of "normal" DMRB style roundabouts, to avoid encouraging increased vehicle speeds and risk to those people using the crossings, particularly at flared entry and exits. If volumes are too great, consider grade separation or full signalisation. • Provisions are not all in the most obvious locations. Crossings should be as close as possible to all roundabouts and junctions – be direct and convenient. • Staggered crossings should be avoided. • Re-engineer the Toucan crossing at Great Western Park to be single stage. • Provide convenient and frequent access into adjacent developments, Valley and Great Western Parks for pedestrians and cyclists. • Make the designs reduce distances for cyclists and increase roadside and road-facing development as much as possible, in line with current guidance (Manuals for Streets 1&2). • Concerned that area's current and future residents will travel by car, creating more congestion, pollution and health problems.
Milton Park Bike Users' Group (MilBUG)	• Improvements would encourage people to walk and cycle more often but only if the new infrastructure has proper connections to destinations within the area, including access points to housing and employment areas. • Walking along traffic-busy roads like A4130 is unpleasant and will be affected unless good segregation (e.g. through planting) can be achieved. • MilBUG highlighted several improvements for consideration: – Improve segregation of modes with good landscaping and speed reduction schemes. – Safe, direct crossing points with sensor-controlled traffic signals to minimise wait times for cyclist. – Ensure all crossings are parallel crossings with cyclist priority. – Further improve Backhill Tunnel access to make the connection with Valley Park and Great Western Park more direct and prominent (taking into account the future cycle hub facility at the entry to the tunnel). • Use Milton Park Travel Survey data to identify where people travel from and review connections to these places, including provision of signage.
Oxfordshire Cycling Network (OCN)	• Use Milton Park Travel Survey data to identify where people travel from and review connections to these places, including provision of signage. • OCN welcomed the improvements proposed to encourage people to walk and cycle more often, but cautioned that if easy driving still remains that good walking and cycling facilities may not encourage a switch to these modes. • Cyclists will be most benefited by the proposals due to the longer distances involved. The routes that can form part of a leisure cycling ride while people would use them for 'function' and not for 'pleasure'. • Supported walking and cycling improvements as they are separated from motor vehicles and pedestrians and cyclists are segregated. Crossings are well-designed, particularly the inclusion of parallel crossings.

Consultee	Summary of Responses
OCN (cont)	• Suggested further improvements: • Ensure several points of connection into Valley Park and GW Park. • Improve the crossing at the BP fossil fuel station. • Ensure single stage Toucan crossing at Valley Park road entrance.
OXTRAG	• OXTRAG welcomes the improvements for encourage people to walk and cycle more often. • Agree with the walking and cycling facilities proposed and are pleased that there will be an off-carriageway cycleway. • Do not expect anyone to want to ride a horse along the proposed road.

Table 7: Summary of Stakeholder Response to Consultation

3. User Opportunities

The opportunities highlighted below are deemed to be relevant to the highway scheme and should be considered by the design team leader throughout the progression of the highway scheme design in addition to any further opportunities that may arise through the ongoing development of the design phases.

It is noted that opportunities labelled “KS-X” have been identified through key stakeholder consultation carried out in April 2020 and have only been raised following the completion of the feasibility design stage. Additional opportunities identified are to be reviewed by designers at the preliminary design stage and to be included in the next stage WCHAR review.

3.1 General

Opportunity 1

Ensure future pedestrian and cyclist facilities within the public highway are integrated with proposed facilities within new developments, to provide a joined up optimal walking and cycling networks. Seek funding from developers to deliver the overall networks.

3.2 Strategic opportunities

Opportunity 2

Provision of convenient, frequent and direct links between the A4130, Milton and the future development areas to the south of the proposed widening scheme.

Opportunity 3

Provision of a direct link along the A4130 into the centre of Didcot, including to Didcot Parkway station.

Opportunity 4

Provision of bus services along the A4130 and bus stops near accesses into the future development areas. The new developments will be predominantly housing, so new transport needs will appear.

Opportunity 5

Improvement and incorporation of the Public Rights of Way to the existing connections and facilities, so that can be fully utilised.

Opportunity KS-1

Group motor vehicle elements together, i.e. move the Pod lane next to carriageway

Opportunity KS-2

Provide as great as possible separation between motor vehicles and the NMU facilities, use green infrastructure to create a more pleasant and less traffic-dominated environment, to ultimately encourage active travel.

Opportunity KS-3

Ensure all crossings are convenient, direct, raised where practical, and do not incur unnecessary delay to NMUs.

3.3 Pedestrian specific opportunities

Opportunity 6

Improve and resurface the existing footways to fix potholes and other defects that may cause potentially unsafe conditions and user discomfort. Any new facilities to have high quality surfacing.

Opportunity 7

Provision of a segregated cycle track and footway on the southern side of the carriageway along the whole scheme, to avoid potential discomfort and conflict between pedestrians and cyclists, as walking and cycling demand increases. People whose mobility is reduced due to a disability, age, pregnancy or travelling with young children in pushchairs, will feel more comfortable if segregated instead of shared facilities being provided. (see also Opportunity #9)

Opportunity 8

It should be noted that since the NMU survey was undertaken, the Toucan crossing at Backhill Tunnel has been switched on. During the site visit, pedestrians were observed using the crossing. An opportunity exists to continue the provision of a crossing facility in the area to accommodate NMU's using Backhill Tunnel, to enable them to move safely between Milton Park and Didcot.

Opportunity KS-4

Provision of a convenient and frequent access into adjacent developments, Valley and Great Western Parks for pedestrians and cyclists.

3.4 Cyclist specific opportunities

Opportunity 9

Convert the shared existing footways to a segregated cycle track throughout the scheme to make off road facilities more attractive and usable, particularly for the less confident cyclists. Provision of a segregated cycle track will minimise the potential for conflict between pedestrians and cyclists, as walking and cycling demand increases.

Opportunity 10

Provision of a segregated cycle facility throughout the scheme, that connects to the Science Vale Cycle Network and the National Cycle Network Route 5.

3.5 Equestrian specific opportunities

No equestrian specific opportunities have been developed for this scheme, as the route along the A4130 has been determined as not being appropriate for these road users.

4. Walking, Cycling and Horse-Riding Assessment Team Statement

As Lead Assessor, I confirm that this walking, cycling and horse-riding assessment report has been generally compiled in accordance with DMRB GG 142 (refer to section 1 for exceptions). The walking, cycling and horse-riding assessment was undertaken by the following assessment and review team:

Name	Andy Blanchard
Position	Associate Director - WCHAR Lead Assessor
Organisation	AECOM
Signed	
Date	15/05/2020

Name	Rebeca Bolado Fernandez
Position	Graduate Engineer - WCHAR Assessor
Organisation	AECOM

As the design team leader, I confirm that the assessment has been undertaken at the appropriate stage of the highway scheme development.

I confirm that in my professional opinion the appointed Lead Assessor has the appropriate experience for the role making reference to the expected competencies contained in GG 142.

Name	Mike Ager
Position	Principal Engineer - Design team leader
Organisation	AECOM
Signed	
Date	15/05/2020

aecom.com

Didcot Garden Town HIF 1 - Science Bridge

Walking, Cycling and Horse-Riding Assessment Report

Oxfordshire County Council

Project number: 60606782

May 2020

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Andy Blanchard Associate Director	Mike Ager Principal Engineer	Samuel Barnes Associate Director	Andy Blanchard Associate Director

Revision History

Revision	Revision	Details	Authorized	Name	Position
0	20/12/2019	DRAFT	✓	Andy Blanchard	Project Manager
P01	19/05/2020	FINAL – stakeholder feedback added	✓	Andy Blanchard	Project Manager

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Executive summary

This report outlines the Walking, Cycling and Horse-Riding Assessment and Review (WCHAR) prepared for Oxfordshire County Council for the proposed Science Bridge scheme. This scheme is one of four that comprise the HIF1 Didcot Garden Town infrastructure project. Whilst the process set out in the Design Manual for Roads and Bridges (DMRB) GG 142 document has generally been followed in preparing this WCHAR Report, as this scheme is not a trunk road some alterations have been made to reflect this, such as a reduced study area.

The WCHAR process is divided into two phases:

- Assessment (this report): undertaken during the options or concept stage of a highway scheme to capture the existing conditions for pedestrians, cyclists and equestrians, and identify the opportunities for improvement for these modes.
- Review: shall be completed as an ongoing review during the various design stages of the highway scheme and shall record the design decisions relating to the provision of walking, cycling and horse-riding facilities.

The aims of this assessment are to gain an understanding of all relevant existing facilities for pedestrians, cyclists and equestrians (the users) in the local area, to provide background user information that can be referred to throughout the design process and to identify opportunities for improvement for users.

The proposed Science Bridge scheme will deliver a new link road and bridge over the Great Western rail line, linking the proposed widened A4130 east of the A34 Milton Interchange with the Didcot Northern Perimeter Road.

This Assessment Report documents the relevant local and national policies and strategies. Within the study area, there has been one recorded collision involving a pedestrian and twenty-one involving cyclists in the last five years. Currently this area comprises of the decommissioned Didcot A Power Station and green fields, there are no bus stops on the route for this scheme. Two train stations, Didcot Parkway and Appleford, are located approximately 1.5km east and 3km north respectively from the scheme extents.

The key trip generators in the area include the nearby Milton Park Science Park and light industrial parks adjacent to the Didcot Northern Perimeter Road, as well as the Great Western Park residential development. Movement within the study area is dominated by the private car. This is self-reinforcing since the high level of vehicular traffic makes walking and cycling less attractive.

Few pedestrians and cyclists were observed during the site visit or throughout the surveys conducted in November 2019. Of those cyclists observed, almost all used the footway.

A public information event covering the four HIF1 schemes was held throughout April 2020, and relevant WCHAR stakeholders were sent a targeted questionnaire to capture their views on the feasibility designs and needs of the users they represent. Their responses are summarised in this report.

Identified user opportunities as part of the assessment included:

- Integrating the walking and cycling networks along the public highways with those proposed as part of planned developments, with convenient, frequent and direct links.
- Improvement and incorporation of the Public Rights of Way and Science Vale Cycle Network with the existing connections and facilities, so that can be fully utilised.
- Provision of segregated cycle track and footways, to avoid potential discomfort and conflict between pedestrian and cyclists; greening; and convenient crossing points.

1. Background and highways scheme description

1.1 Background

The proposed Science Bridge scheme is one of four schemes that are included in the Access to Science Vale Options Assessment Report (OAR) to facilitate new developments to be constructed in the Didcot area.

The scheme will have a significant impact on the highways network in the area and therefore OCC have requested that the GG 142 Walking, Cycling & Horse-Riding Assessment and Review (WCHAR) is completed to inform the scheme design. Mike Ager in the role of Design Team Leader, has appointed Andy Blanchard as the Lead Assessor to undertake the WCHAR process in accordance with GG 142.

Although the scale of the scheme would usually qualify as a 'large' scheme in accordance with GG 142, the assessment will be based on the extent for a small scheme by virtue of this not being a trunk road (to which GG 142 applies) as determined by the Lead Assessor. The scheme will therefore be subject to a Walking, Cycling & Horse-Riding Assessment (this document) during the feasibility design stage of the proposed highway scheme. This will then be followed by a Walking, Cycling & Horse-Riding Review during each design stage.

The Science Bridge is located in the Science Vale area (see **Figure 1**), which comprises the towns of Didcot (including Milton Park and Didcot Power Station) and Wantage (& Grove) together with the established research centres at Culham Science Centre (CSC) and Harwell International Business Centre (IBC) together with the area between these settlements. The extents of the scheme are outlined in green in the figure below.

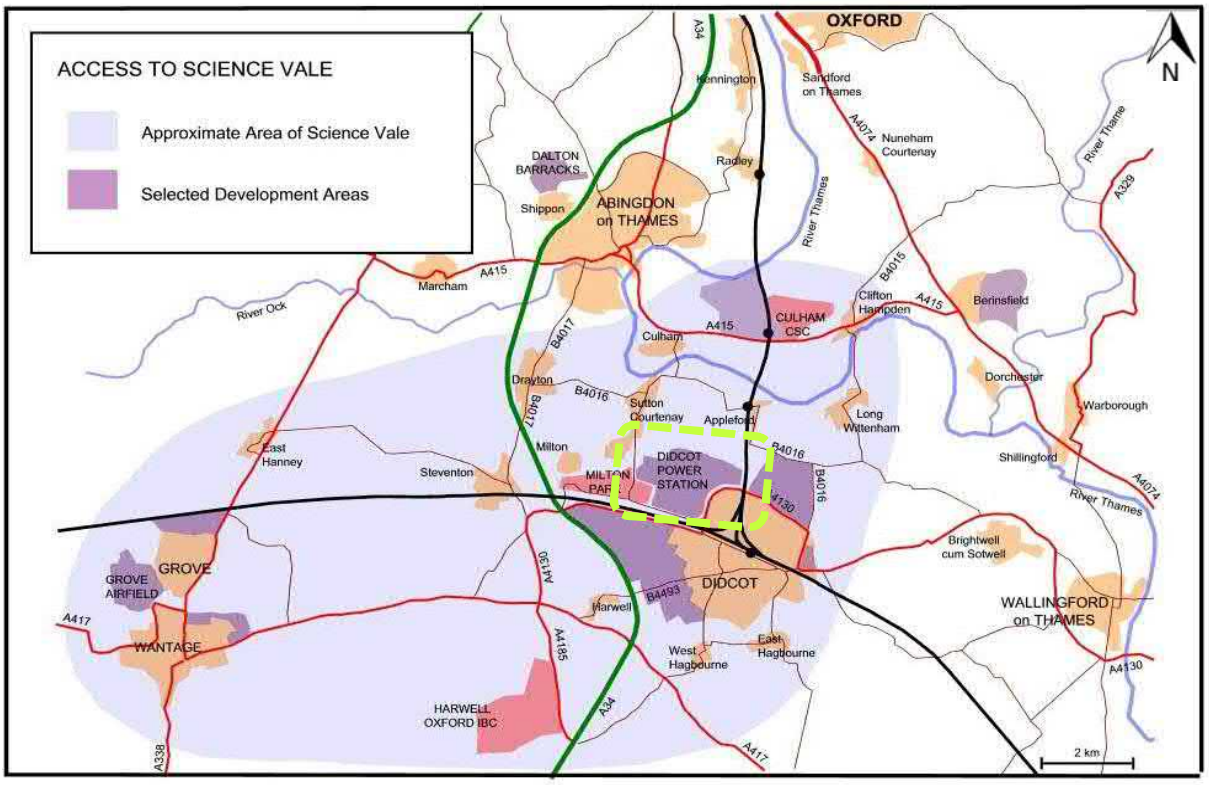

Figure 1: Science Vale area[1]

[1] *"Option Assessment report: Access to Science Vale_OAR_ PART 1_FINAL-converted"*