

## A350 Chippenham Bypass Phases 4&5

WC\_A350-ATK-GEB-XX-RP-TB-000001

# Full Business Case

20/12/2023

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# Notice

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# Executive Summary

## Purpose

Wiltshire Council is seeking full approval for funding from central government for the final phases of the A350 Chippenham Bypass improvements (Phase 4 and 5), which are key components of Wiltshire Council's comprehensive programme to improve regional connectivity. Funding is sought from the Major Road Network (MRN) fund administered by the Department for Transport (DfT) and is subject to the DfT's business case approval process, comprising three key approval stages. Following approval of an Outline Business Case (OBC) in November 2021, this Full Business Case (FBC) is prepared in support of the third and final stage of approval and in line with relevant government guidance.

## Overview of the investment proposal

The A350 is one of the most important routes in Wiltshire. It is a primary north-south route with regional significance, connecting the south coast with the M4 and onwards to Bristol and the Midlands. In Wiltshire, it forms part of the MRN and passes around the principal settlements of Chippenham and Trowbridge via the town of Melksham, and on to Westbury and Warminster. For many years, high traffic volumes on the A350 Chippenham Bypass have resulted in delays and unpredictable journey times for road users. Increasing traffic demand, associated with housing and employment growth, is forecast to make the situation worse.

Following a public inquiry in the 1990s, the A350 dual carriageway Chippenham bypass scheme was granted planning consent. Although initially built as a single carriageway, the highways boundary was secured and bridges were constructed to future-proof the bypass corridor for the full dualling.

It has been a longstanding priority to improve north-south connectivity along the A350, and Wiltshire Council has been progressively bringing forward the dualling of the A350 Chippenham bypass. It has recently completed three major capital schemes along the A350 in Chippenham (Phases 1, 2 and 3). These works have been delivered to improve capacity and safety on the route and have been largely funded through successful Department for Transport (DfT) and/or Local Enterprise Partnerships (LEP) funding bids. The A350 Chippenham Bypass Phase 4 & 5 scheme will build upon that work and will conclude the Council's aim to dual the entire Chippenham Bypass.

After assessing a range of initial options, Wiltshire Council has further developed the preferred option identified at OBC stage, comprising dualling of two sections of the A350 plus junction improvements at Bumpers Farm Roundabout and Lackham Roundabout, in order to fully complete the upgrade of the A350 Chippenham Bypass. The scheme has been developed with input from various key stakeholders and has considered the existing and future needs of all road users, including users of active travel and public transport.

A procurement exercise has been undertaken for the main construction works and a preferred contractor has now been identified. The scheme is well prepared for delivery and, subject to full funding approval, construction is scheduled to commence in May 2024, with scheme opening in November 2026.

## Strategic alignment

The scheme is well aligned to strategic plans and policies from a national to local level and, in particular, strategic priorities relating to: economic growth and rebalancing; housing and jobs delivery; and society and wellbeing (e.g. stronger, safer, connected communities).

Several adopted policy documents outline the county's aims for the A350, in particular the Wiltshire Core Strategy, Chippenham Site Allocations Plan (and supporting Chippenham Transport Strategy), and the Local Transport Plan.

The scheme was identified by the Western Gateway, who are the Sub-national Transport Body, as a regional priority - due to the importance of the corridor for regional economic and housing growth – and is included within its Strategic Transport Plan 2020-25.

There are few north-south connections across the South West of England. The present strategic road for this area is a mixture of the A36 and A46, via Bath, Warminster and Salisbury. Local authorities in the area have suggested that there is a strategic case for adopting an alternative corridor - the A350 - as the main strategic route for the area; and then beginning a coordinated programme of upgrades to provide a high-quality route linking the M4 to the Dorset Coast including Bournemouth and Poole, with its economically-important port facilities. This is being explored further through the National Highways M4 to South Coast connectivity study.

The scheme complements other previous and planned transport investments in both Chippenham and the northern section of the A350 corridor. This includes the proposed MRN scheme at M4 Junction 17 (at the head of the A350), as well as the potential Large Local Majors (LLM) scheme for a A350 Melksham Bypass (to the south of Chippenham).

## Issues and need addressed

The A350 at Chippenham carries up to approximately 30,000 vehicles per day. It caters for more strategic, longer distance trips (including freight), for instance via the SRN, as well as providing connectivity between the West Wiltshire market towns along the A350 and more local access to Chippenham town.

Key issues addressed by the scheme include:

- **Congestion and delay** - Currently, southbound journey times in peak periods along the full stretch of the A350 Chippenham Bypass take approximately 20% longer compared with the inter-peak journey time. These journey times are particularly unreliable between Bumpers Farm Roundabout and Cepen Park South Roundabout with some journeys taking 100% longer than average, during the worst performing days.
- **Poor journey time reliability** – There can be significant day to day variation in journey times. Contributing factors include the current inconsistent standard of provision along the A350 Chippenham Bypass and the lack of spare capacity.
- **Traffic using less suitable routes** – In part due to the factors above, traffic increasingly seeks alternative local routes instead of the A350. This includes parallel routes through the Chippenham urban area where the associated traffic impacts are typically greater due to the built up environment and residential areas.
- **Collisions** – there are safety considerations associated with the high volumes of traffic and current layout and standard of the A350, including provision for pedestrians and cyclists.

## Consequences of no intervention

Traffic data shows that the A350 Chippenham Bypass is already operating close to its capacity, with the areas affected by the Phase 4 and Phase 5 improvements having a Volume-to-Capacity ratio of between 75 and 85%, meaning there is little room to accommodate further traffic growth. Without intervention, the planned housing growth at Chippenham and within the wider A350 corridor, and its associated impact in increasing traffic flows across the local highways network, will lead to increasing congestion and extended and more unreliable journey times on the A350 Chippenham Bypass. Wiltshire Council's Local Plan Review has identified the scheme as a necessary component of the overall mitigation strategy for future growth.

Key consequences of not progressing the scheme include:

- The effective functioning of the A350 Chippenham Bypass as a strategic route could be threatened. Economic growth, particularly in relation to the A350 Growth Zone being constrained due to higher business costs and the reduced attractiveness of the area to inward investment.
- Strategic housing sites within the A350 corridor could become unviable, with transport conditions being a key barrier to deliverability.
- Exacerbated congestion may cause an increasing volume of strategic traffic to re-route away from the A350 and the MRN onto less suitable, local roads. This would lead to adverse environmental, economic and social impact on local residents and businesses of Chippenham.

- Increased collisions along the A350 corridor, due to exacerbated congestion, which is associated with collisions such as rear-end shunts.

A strategic and holistic approach to the A350 is required to fully meet the identified business needs of Wiltshire Council and DfT. The 'Business as Usual' scenario would result in a number of limitations and undesirable outcomes, as identified above. Wiltshire Council is not able to fully fund a strategic intervention from its own resources (including existing / anticipated developer contributions). A more piecemeal approach to completion of the A350 Chippenham Bypass dualling is not considered to be desirable, including due to:

- greater disruption to users, due to multiple construction / works phases; and
- a lack of strategic planning and certainty, which would adversely impact business confidence and inward investment and could impact the viability of the preferred growth strategy for Wiltshire (through the Local Plan Review process).

## Scheme benefits

The scheme is expected to generate benefits for a range of both transport and non-transport users including:

- Road users, including commuters and freight, travelling via the A350 Chippenham Bypass will benefit from reductions in congestion and delay, and less variable journey times:
  - Average journey time along the A350, between Lackham Roundabout and Bumpers Farm Roundabout is expected to reduce by up to approximately two minutes at peak times (representing a 15% to 25% journey time reduction).
- All road users (including non-motorised users) will benefit from a safer travelling environment with reduced collisions.
- Local residents will benefit from a reduction in traffic on more local routes as well as local road safety.
- Local residents will benefit from alterations to the local public rights of way network - improving safety for those accessing the countryside.
- Road users along the A350 Chippenham Bypass will benefit from a reduced risk of collisions.
- Businesses, existing and prospective, will benefit from reduced costs and access to a wider pool of potential workers, as well as preserving the route's key role as part of the advisory freight route network.
- Business at the Bumpers Farm Industrial Estate will benefit from improved access / egress.
- Residents in Wiltshire and beyond will benefit from the contribution of the scheme to enhancing economic activity in the area and improving access to employment opportunities.

## Value for Money

### Approach

Value for Money has been assessed in line with the DfT Transport Appraisal Guidance (TAG), with a proportionate approach focused on capturing the impacts most relevant to the scheme, The appraisal is underpinned by predictions of the scheme impacts from traffic modelling, considering localised and wider network impacts.

### Overall Value for Money and uncertainty

The scheme is assessed as having a **final Value for Money (VfM) category of 'High.'**

Under the core ('most likely') scenario, the scheme produces a Benefit Cost Ratio (BCR) of 3.77, based upon monetised benefits of £78.34m and a cost of £20.77m (including future maintenance) for a 60-year period (2010 prices). This places it in the 'High' VfM category.

Uncertainty analysis indicates that there is reasonable probability of variations to circumstances resulting in the VfM category rising to 'Very High'. However, it also indicates a possibility of a lower VfM category (including in

relation to a low growth scenario). Overall, the final assessment of VfM for the A350 Chippenham Bypass Phases 4&5 scheme is a 'High' VfM category

**Table 0-1 – Value for Money categorisation**

VfM Category	Poor	Low	Medium	High	Very High
Likelihood	Very unlikely	Unlikely	Possible	Likely	Possible

### Monetised Impacts

Travel time savings for business (including freight), commuting and social / leisure users are the major contributor to the BCR calculation, whilst a modest benefit has also been calculated in relation to vehicle operating costs, collisions and journey time reliability. A modest disbenefit has been calculated in relation to construction delays and greenhouse gas emissions. All other monetised impacts are marginal.

### Non-monetised Impacts

Qualitative assessment of non-monetised economic, environmental and social impacts indicates a modest scale of impact overall with a typical range from slightly adverse to moderately beneficial, with the balance generally towards neutral / slightly beneficial, as summarised in Table 0-2. The wider economic impacts associated with the scheme have been assessed as slightly beneficial. Whilst the improvements will bring productivity gains, increasing the competitiveness of businesses and allowing firms to access a wider pool of labour, these benefits are expected to contribute a relatively low proportion of the total value of the scheme's impacts.

Environment impacts have been assessed as neutral to slightly adverse and this reflects the fact that the scheme is predominantly within the existing Highway Boundary and that it is an increment to the existing highway infrastructure, as opposed to an entirely new piece of infrastructure being introduced to a greenfield site.

Social impacts have been assessed as neutral or beneficial.

**Table 0-2 - Assessment of non-monetised impacts**

Non-monetised impact	Qualitative assessment score (Large adverse to large beneficial)
<b>Economic</b>	
Wider economic impacts	Slight beneficial
<b>Environment</b>	
Landscape	Neutral
Townscape	Neutral
Historic environment	Slight adverse
Biodiversity	Slight adverse
Water environment	Slight adverse
<b>Social</b>	
Physical activity	Neutral
Security	Slight beneficial
Severance	Moderate beneficial
Journey quality	Slight beneficial
Accessibility	Neutral
Personal affordability	Slight beneficial

### Distributional Impacts

The distributional impacts assessment has considered how the predicted scheme impacts might affect different social groups. All distributional impacts have been assessed as having a beneficial or neutral impact, with the exception of noise, which has been assessed as having a slight adverse impact. The most beneficial impact is in relation to the user benefit indicator, with users in the income quintiles 3, 4 and 5 expected to benefit the most.

### Scheme costs and funding arrangements

The total projected outturn scheme cost is £32.315m, which includes sunk costs to date (October 2023), risk and inflation. This is based on the current delivery programme, which assumes the scheme opens in 2025.

In addition to the £2.076m already granted from the DfT Major Road Network fund, Wiltshire Council is seeking a further £24.549m of DfT grant funding via full approval of the FBC, to deliver the scheme. The total DfT funding contribution of £26.625m represents 82% of total scheme costs. Wiltshire Council is funding the remaining £5.69m (18% of total scheme costs), of which £1.69m is sunk costs to date (October 2023). It is planned that this funding will be sourced from local funding contribution. The budget profile and proposed funding sources is provided in Table 0-3.

**Table 0-3 - Budget profile and proposed funding sources (£ millions)**

	Year	Prior to Oct '23 (sunk cost)	2023/24 (from Nov '23)	2024/25	2025/26	2026/27	Total
<b>Cost (actual / budget)</b>		<b>3.338</b>	<b>0.676</b>	<b>12.305</b>	<b>15.876</b>	<b>0.119</b>	<b>32.315</b>
<b>Funding sources:</b>							
DfT – Major Road Network Fund		1.648	0.428	10.953	13.495	0.101	<b>26.625</b>
	%	49%	63%	89%	85%	85%	<b>82%</b>
Local - Wiltshire Council		1.690	0.248	1.352	2.381	0.018	<b>5.690</b>
	%	51%	37%	11%	15%	15%	<b>18%</b>
Total funding		<b>3.338</b>	<b>0.676</b>	<b>12.305</b>	<b>15.876</b>	<b>0.119</b>	<b>32.315</b>
	%	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Annual maintenance and capital renewals are estimated at £12.802m (2023 prices) over a 60-year period and are therefore expected to average approximately £0.213m per annum. Wiltshire Council will be responsible for the maintenance of all new infrastructure created by the scheme, which will be funded through general maintenance budgets. Whole life costs are also represented within the Economic Dimension and are therefore reflected within the BCR and NPV.

### Procurement arrangements

The Procurement process has been completed in accordance with the legislative framework set out within the Wiltshire Council Corporate Procurement Strategy (2012). The process was governed by the Council's own constitutional Contract Procedure Rules (2012) and subject to the Council's Procurement Gateway Process. The result of this process is that a tender was reviewed and approved by the Council's Cabinet on the 14<sup>th</sup> November 2023. An Advanced Works contractor has been appointed by the Council. This is also the main works preferred contractor. This circumstance provides a range of benefits in simplifying works interface

arrangements. Advanced works are anticipated to start on site in early January 2024. The contract award for the main works would take place following full funding approval.

The contract will be of an industry standard NEC4 Engineering & Construction Contract (Option B). The contract will be managed by the Client Officers (Wiltshire’s Project Manager and Project Director) with ECC Project Manager, Cost Consultants (including the Quantity Surveyor and Risk Manager roles) and a range of site Supervisors and Clerks of Works additionally appointed through the Wiltshire Council Term Highways Consultancy Contract. An allowance for Client staff cost is included in the site supervision budget estimate to allow for abnormal attendances. This allowance is limited as the majority of Client costs are considered to form part of the normal Wiltshire budget as a business-as-usual activity.

## Project management and delivery

### Overview

The delivery arrangements have been assessed in relation to their ability to ensure timely and successful delivery of the scheme and its associated benefits.

The management approach is proportionate to the nature and scale of the scheme, the current stage of scheme development and its delivery complexity and risk. Wiltshire Council has appropriate governance structures in place, a robust delivery programme and active risk management. Other key points include that:

- Wiltshire Council is able to demonstrate good experience of similar project delivery, including the previous phases of dualling, which have been completed by Wiltshire Council within the last 10 years.
- The project is considered to be of relatively low complexity, in part owing to the future-proofing provided at the initial construction of the road and that the works are within the extents of the existing highway boundary (no planning permission has been required).
- Key review / approval stages are defined and reflected within the delivery programme;
- Stakeholder needs and requirements during the implementation phase have been identified and the main contractor will develop and implement a Communications Plan.
- Processes for monitoring and evaluation of the scheme delivery and benefits have been developed;
- A Carbon Management Plan is in place which assesses the carbon impacts of the project over the whole lifecycle (construction and operation) and seeks to encourage the adoption of measures during scheme development and delivery to reduce the overall carbon impact.

### Delivery Programme

Scheme opening is currently set for November 2025. Following approval of the FBC, the contract award will take place, with construction planned to commence in May 2024 with a duration of approximately 18 months. A summary of key programme dates is presented in Table 0-4.

**Table 0-4 - Key programme dates**

Event	Start	Finish
FBC submission		November 2023
Advance works	January 2024	March 2024
FBC decision (anticipated)		April 2024
Main contract award		April/May 2024
Main contract mobilisation	May 2024	May 2024
Main contract works	May 2024	October 2025
Scheme opening		November 2025
End of defects period		November 2026

### Key dependencies and risks

The key risks and dependencies are reflected within the project delivery schedule and risk budget and are proactively monitored and managed. Those most relevant to the successful delivery of the scheme at this stage include:

- Full funding approval – this FBC represents a key milestone with regards to obtaining full approval and is subject to DfT assurance processes.
- Cost increases – this includes the impacts of the current rise in inflation, although it is easing. Cost estimates are based upon the latest available projections at the time of preparation. The DfT funded element is capped and Wiltshire Council is responsible for any additional increase in total cost.
- Utilities and environment - previous experience indicates that major risks associated with implementing a scheme of this type are that there will be delays in public utilities carrying out diversion of their plant, or that environmental constraints will cause delays. These risks will be reduced as much as possible by the careful programming of the works and by carrying out a package of advance work where feasible.
- Contractor performance - despite the stringent procurement procedure and assessment processes there is a risk that the selected contractor does not meet expectations. However, performance will be managed by using suitably experienced supervising staff, performance milestones and key performance indicators to ensure that the contract requirements are met.
- Stakeholder feedback – there is a risk of negative feedback during or after construction, with potential reputational impacts. Early and regular engagement with the primary stakeholders, including local residents and businesses will take place before and throughout the construction works.

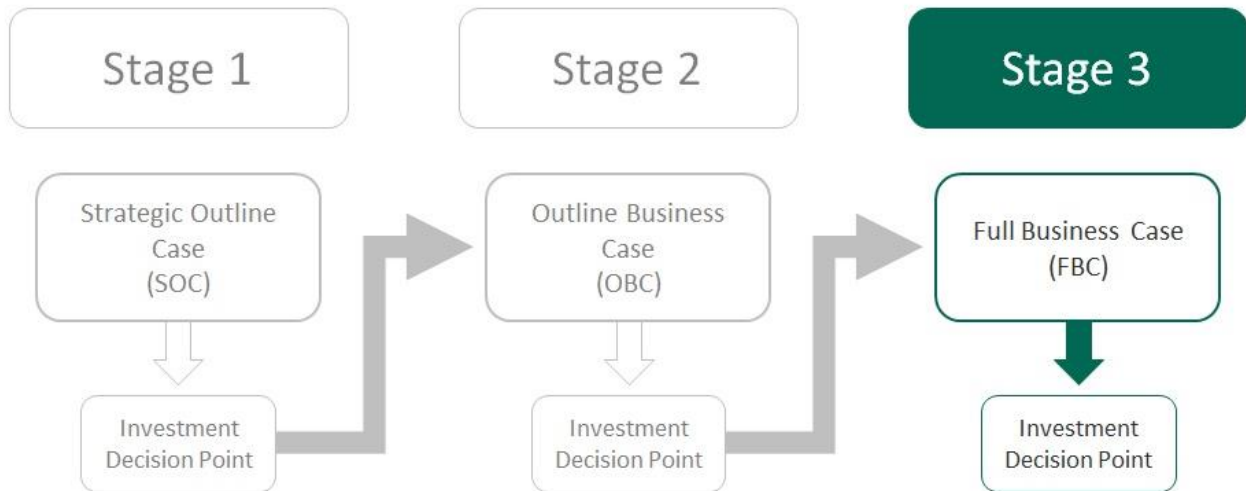
The implementation of the Proposed Scheme is not directly dependent upon any other projects or programmes. It complements completed investments on the A350 corridor, such as the prior completed phases of the dualling of the Chippenham Bypass and builds on the long-term aim of Wiltshire Council to deliver a full dualling of the bypass.

# 1. Introduction

## 1.1. Overall purpose

Wiltshire Council is promoting improvements to the A350 Chippenham Bypass as part of an application to the Major Road Network fund administered by the Department for Transport. DfT funding support is subject to its business case approval process. Following approval of the Outline Business Case (OBC), this document forms the Full Business Case (FBC) - the third and final stage in the approval process (Figure 1-1).

**Figure 1-1 – DfT transport business case approval phases**



## 1.2. Background

### 1.2.1. Evolution of the Major Road Network

In December 2017, the Government launched a consultation setting out proposals for the creation of a Major Road Network (MRN), forming a middle tier of the country's busiest and most economically important local authority 'A' roads, sitting between the national Strategic Road Network (SRN) and the rest of the local road network<sup>1</sup>. The Government established objectives for the MRN to:

- Reduce congestion.
- Support economic growth and rebalancing.
- Support housing delivery.
- Support all road users.
- Support the Strategic Road Network.

Sub-national Transport Bodies (STBs) were tasked with developing a Regional Evidence Base to inform investment proposals and decision making in line with these objectives.

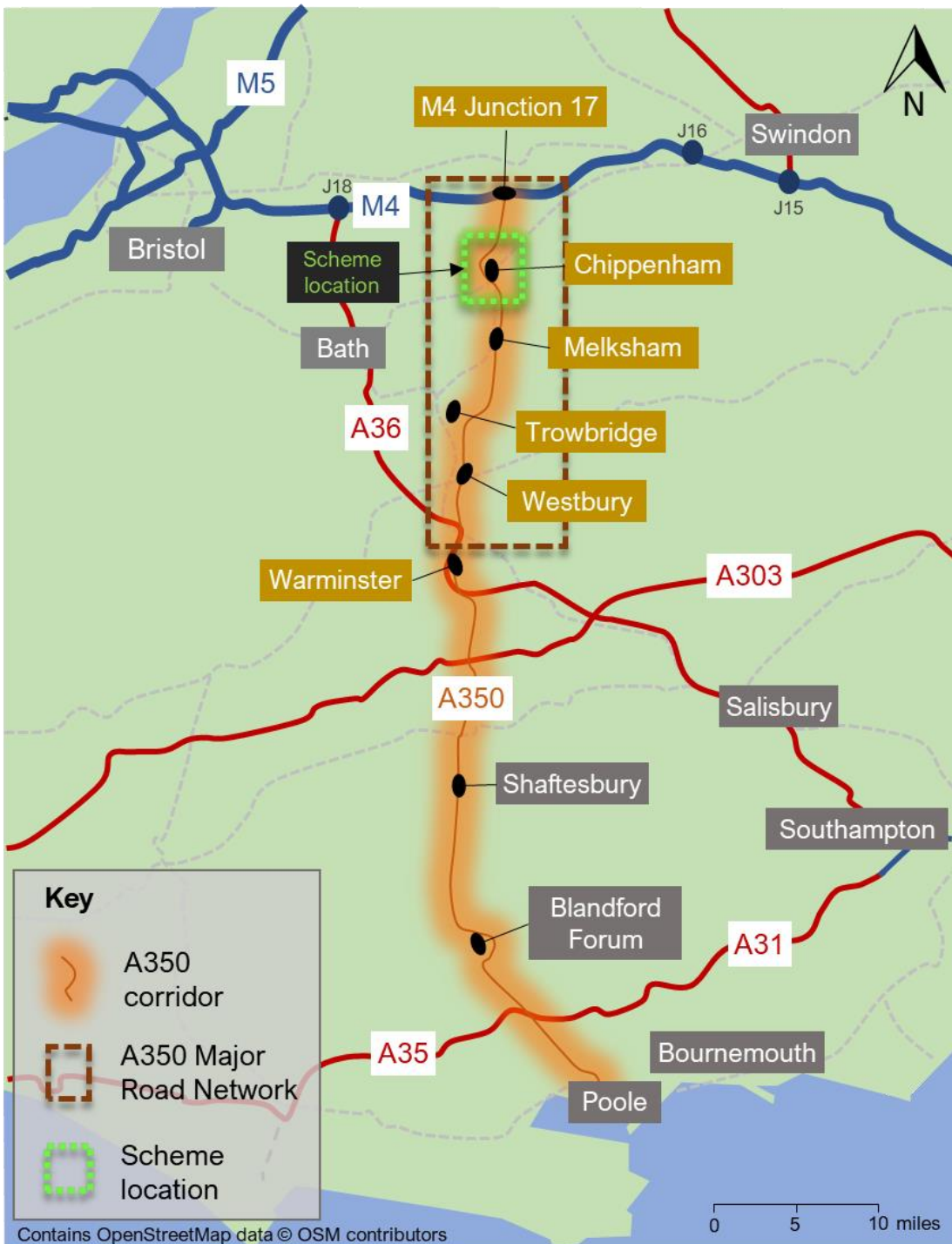
### 1.2.2. Identification of the A350 as a priority corridor

Through the development of its Regional Evidence Base, the Western Gateway STB identified several priority corridors across the region. This included the A350 corridor, running through Wiltshire and Dorset from the M4 Junction 17 to the South Coast (Figure 1-2), with improved north-south connectivity representing a priority



theme for the STB. Of the nine priority schemes identified by Western Gateway STB, three relate to the A350: the A350 Chippenham Bypass improvements (subject of this FBC); M4 Junction 17 improvements, and improvements to the A350 at Melksham. This reflects a long-standing strategy of Wiltshire Council to upgrade the A350, alongside rail service enhancements, to improve north-south connectivity.

Figure 1-2 – The A350 corridor context

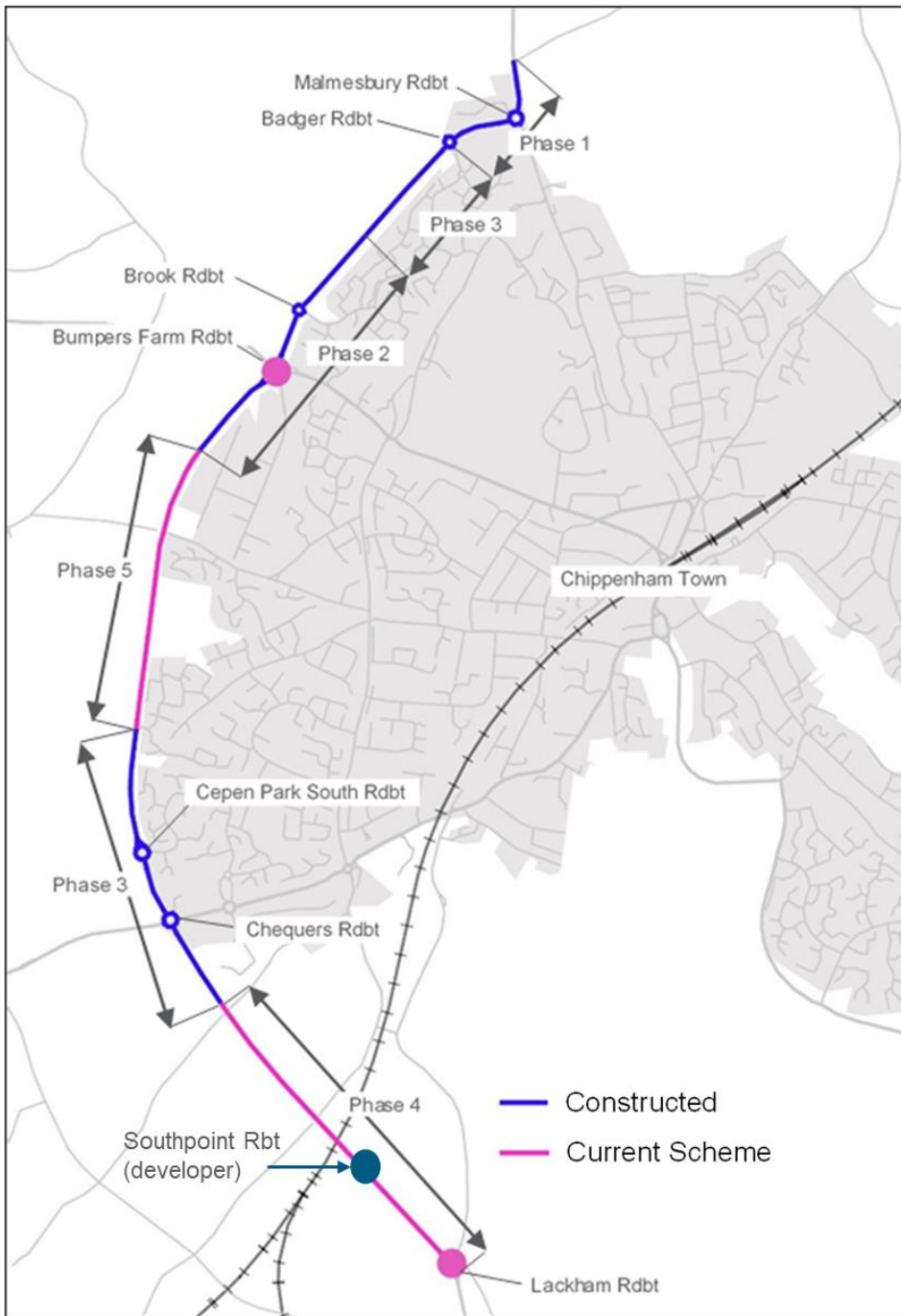


### 1.3. The A350 Chippenham Bypass

The A350 Chippenham Bypass was originally constructed in the 1990's and future dualling was envisaged, and planned for, at the time.

In more recent times, there has been a phased upgrade of the route, responding to availability of funding streams – as illustrated in Figure 1-3 and detailed further in Table 1-1. The first three phases of A350 dualling and upgrade were concluded between 2014 and 2019. The A350 Chippenham Bypass Phase 4 & 5 scheme (subject of this FBC) will complete Wiltshire Council's aim to dual the entire Chippenham Bypass – in doing so this will dual the A350 route from the M4 to south of Chippenham.

**Figure 1-3 – Phased implementation of the A350 Chippenham Bypass dualling**



**Table 1-1 - Chippenham Bypass improvement schemes completed in recent years**

Scheme Name	Completion and Funding	Description
Phase 1: A350 North of Chippenham	Completed: March 2015 £3m scheme partly funded through the Local Pinch Point Fund	<ul style="list-style-type: none"> <li>• Widening A350 between the Badger roundabout and Malmesbury Road roundabout to dual 2-lane;</li> <li>• Minor adjustments to the entry/exit arms to the south of Badger roundabout;</li> <li>• Improving Malmesbury Road roundabout; and</li> <li>• Widening A350 southbound between Jackson's Lane and Malmesbury Road roundabout to 2- lane.</li> </ul>
Phase 2: Bypass Improvements (Bumpers Farm)	Completed: February 2016 £3.4m scheme partly funded through the Local Growth Fund	<ul style="list-style-type: none"> <li>• Widening the A350 to dual 2-lane between Brook and Bumpers roundabouts;</li> <li>• Additional widening of the A350 for ~ 250 metres north of Brook to allow for a suitable merge length back to single lane and two southbound lanes for 100 metres approaching Brook;</li> <li>• Widening to dual 2-lane on a short stretch of the A350 immediately south of Bumpers roundabout; and</li> <li>• Minor widening of the Bumpers Farm Industrial Estate entry arm to Bumpers roundabout.</li> </ul>
Phase 3: Chippenham Bypass Improvements (Badger-Brook & Chequers)	Completed January 2019 £7m scheme partly funded through the Local Growth Fund	<ul style="list-style-type: none"> <li>• Dualling the gap between pinch point improvements (Phase 1) and the Bumpers Farm improvements (Phase 2);</li> <li>• Dualling the A350 between a point 250 meters north of Cepen Park South roundabout and a point 250m south of Chequers roundabout; and</li> <li>• Widening of the A4 Westbound approaches and exits at Chequers roundabout.</li> </ul>

The current scheme to complete the upgrades to the A350 Chippenham Bypass comprises:

- **Phase 4 dualling:** widening the A350 to a dual two-lane between Chequers roundabout and Lackham Roundabout, thus extending the dualling completed during Phase 3 of the A350 improvement programme.
- **Phase 5 dualling:** widening the A350 to a dual two-lane along the full stretch between Cepen Park South Roundabout and Bumpers Farm Roundabout, connecting the dualling completed during phases two and three of the A350 improvement programme. The combination of Phase 4 and Phase 5 will complete the full dualling of the A350 Chippenham Bypass.
- **Bumpers roundabout:** capacity enhancements to the Bumpers Farm Roundabout including increasing the circulatory from 2 lanes to 3; signalling the A420 and A350 arms; increasing approach arms from A350 (S), A420 (W), and A420 (E) to 3 lanes; and dualling the exits onto the A420 (E) and A420 (W).
- **Lackham roundabout:** minor changes at the Lackham roundabout to improve traffic flows there.

## 1.4. Business case development

### 1.4.1. The Outline Business Case (approved)

An Outline Business Case was submitted alongside the Regional Evidence Base in July 2019. This set out the need for the scheme and identified a preferred option, as well as an assessment of affordability and deliverability. This was subsequently approved by DfT in November 2021 and provided the gateway to working towards the FBC.

### 1.4.2. Development of the Full Business Case

Following the approval of the OBC, the scheme preferred option has been progressed through detailed design and procurement in readiness for full approval via this FBC.

The FBC is the final stage of a coherent three-phase DfT approval process. It ensures the business case remains relevant and up to date. It reconfirms the key information from the OBC, based on the final scheme scope, design and cost following the formal procurement exercise.

In line with government guidance and best practice<sup>1</sup> the OBC follows the five case model in order to demonstrate how the scheme:

- Is supported by a robust case for change that fits with wider public policy objectives – the ‘**strategic dimension**’;
- Demonstrates value for money – the ‘**economic dimension**’;
- Is commercially viable – the ‘**commercial dimension**’;
- Is financially affordable – the ‘**financial dimension**’; and
- Is achievable – the ‘**management dimension**’.

Key activity areas supporting the development of the FBC include:

- Reviewing and updating the strategic context in relation to the scheme, including:
  - Reflecting on more recent policy developments.
  - Reviewing scheme objectives to ensure they remain relevant.
- Updating technical modelling and appraisal assumptions, in a proportionate manner.
- Ongoing engagement with key stakeholders, including a public engagement exercise.
- Selection of a preferred bidder for the main construction works, following a formal procurement exercise.
- Updating scheme cost information, based upon final tender prices.
- Reviewing and updating management processes to reflect the transition of the scheme into a delivery phase (including governance, programme, risk management).

The formal award of the contract for the main construction works would follow FBC approval and final agreement of the funding conditions.

## 1.5. Document Structure

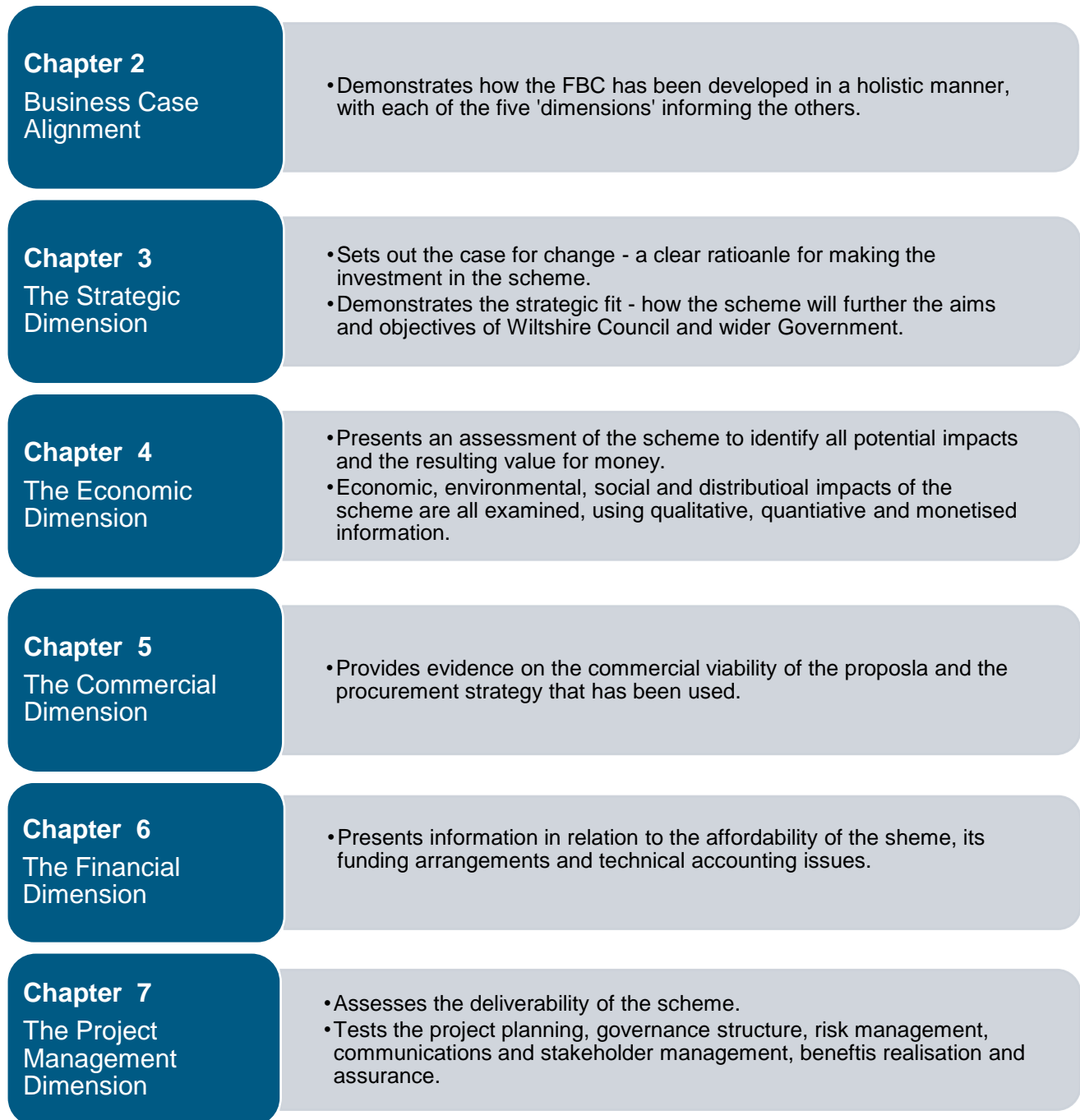
This FBC presents key information in relation to the scheme in a transparent manner, in order to support evidence-based decision making. Last updated in December 2022, the DfT provides detailed guidance on transport business cases, and has issued a template business case structure to scheme promoters. This FBC

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<sup>1</sup> <https://www.gov.uk/government/publications/transport-business-case/transport-business-case-guidance>

document has been prepared in line with the DfT template for FBCs, with the document structure set out in Figure 1-4.

**Figure 1-4 – FBC structure**



## 2. Business case alignment

### 2.1. Overview of business case development and alignment

This FBC builds upon the approved OBC. Consistency within the core project team (across Wiltshire Council and AtkinsRéalis) has ensured that the FBC represents a practical and co-ordinated progression of the project, keeping the business case up to date, accurate and relevant.

A holistic approach has been taken to developing the FBC. The five dimensions are connected and inter-related. A number of working practices have been put in place to ensure a strong alignment across all parts of the business case; these include:

- Appropriate governance and a 'whole team' collaborative approach:
  - Ensuring the project is governed at a business case level.
  - Utilising skilled business case practitioners.
  - Bringing together the relevant experts and ensuring a full appreciation of inter-relationships between different disciplines.
- Ensuring that any changes in assumptions are reflected across each of the five dimensions, such that consistency is maintained throughout.
- Adopting a common evidence base and assumptions, managed centrally, in order to maintain consistency across technical and analytical work across the different business case dimensions.
- Ensuring feedback from key stakeholder engagement (particularly with National Highways) is fed back in a co-ordinated manner, with a review of implications across each of the five business case dimensions.

### 2.2. Principal area of business case alignment

Table 2-1, presented in matrix format, demonstrates how each of the business case dimensions informs the other. It highlights key area of alignment and interaction across the FBC five dimensions. Throughout the FBC, specific references are also made where there are important linkages to other parts of the FBC.

**Table 2-1 – Alignment of the business case dimensions**

	Strategic	Economic	Financial	Management	Commercial
Strategic		Scheme benefits aligned to economic appraisal impacts. Most rigour applied to the primary benefit streams. Final option demonstrates a strong strategic fit.	Scope/ outputs as defined for final design inform scheme cost. Ensure all strategically aligned funding mechanisms are explored	Stakeholder engagement activity in line with Stakeholder Management Plan. Defined outcomes & benefits inform Monitoring & Evaluation Plan.	Scope/ outputs for final design informs procurement strategy and final decision.
Economic	Economic appraisal / value for money informs selection of final design. Quantified evidence from economic appraisal used to demonstrate scheme impacts.		Value for money considerations prompt review of scheme costs (e.g. value engineering)	Quantified economic appraisal analysis informs Benefits Realisation, Monitoring & Evaluation Plan.	N/A
Financial	Funding sources aligned to strategic context. Ensure fit with funding objectives is demonstrated.	Scheme capital and revenue costs inform the economic appraisal PVC. Financial risk cost sense-checked against optimism bias assumption for appraisal.		Risk Management Strategy identifies mitigation for key cost risks. Spend and funding profiles aligned with overall delivery programme.	Scheme cost and funding strategy informs consideration of procurement strategy.
Management	Delivery programme developed in context of key inter-dependencies	Delivery timescales inform economic appraisal (profiling of costs and benefits).	Risk management process and Risk Register informs the calculation of risk cost. Delivery timescales inform scheme cost (e.g. inflation and spend profile).		Overall project delivery programme and governance arrangements taken into account in procurement strategy.
Commercial	Output based specification aligned with final design scheme scope.	N/A	Scheme cost estimate updated once procurement process is completed and tender price confirmed.	Overall scheme delivery programme is set out, in line with the final procurement and tender arrangements.	

## 3. Strategic Dimension

The strategic dimension describes how the investment aligns with local, region and national objectives, and is presented in three parts:

- The **'Strategic Context'** – demonstrates how the A350 Chippenham Bypass Improvements scheme aligns with the strategic priorities and objectives of the principal organisations and regional / local strategic and plans.
- The **'Case for Change'** – showcases the overall need for intervention, setting out the existing arrangements, business needs and service gaps, and the impact of not changing (assuming no intervention).
- The **'Investment Proposal'** – provides details of the scheme and how it has developed, including: the scheme scope; the strategic benefits that will result from the investment, stakeholder perception and requirements, consideration of options (and selection of the preferred option); and risk and constraints.

### 3.1. Strategic context

#### 3.1.1. Key updates since OBC

Following a review of the strategic context from the OBC stage, the proposal continues to demonstrate a strong alignment with strategic priorities and objectives from a local to national level, as set out within this chapter.

#### 3.1.2. Organisation overview and area of interest

##### 3.1.2.1. Principal organisations

The principal organisations responsible for the A350 proposal are:

- The Department for Transport (DfT)
- Wiltshire Council; and
- Western Gateway Sub-National Transport Body.

An overview of these organisations is provided below. Further details on their strategic priorities and the alignment of the proposal with these is provided in section 3.1.5.

#### **Department for Transport**

The Department for Transport (DfT) is a ministerial department of the UK Government under the overall responsibility of the appointed Secretary of State for Transport. Its stated purpose is to *“work with our agencies and partners to support the transport network that helps the UK’s businesses and gets people and goods travelling around the country. We plan and invest in transport infrastructure to keep the UK on the move.”* Amongst its responsibilities, the DfT provides policy, guidance, and funding to English local authorities to help them run and maintain their road networks, improve passenger and freight travel, and develop new major transport schemes.

The DfT is the principal funding body for the A350 Chippenham Bypass Improvements scheme, and is responsible for the Major Road Network programme, within which it sits.

#### **Wiltshire Council**

Wiltshire Council is a council for the unitary authority of Wiltshire in South West England. It provides local government services to approximately 435,000 Wiltshire residents. The Council establishes policy and strategy for the area, including in relation to transport, health and well-being, the economy and land use, in line with its



overall Business Plan. Amongst its responsibilities, the Council is the local highway authority with responsibility for all aspects of the local highway network, including maintenance, safety and new infrastructure. This excludes the Motorway (M4) and the Trunk Roads (A303, A36 and A419). Wiltshire Council is acting as the scheme promoter for the A350 Chippenham Bypass Improvements.

### Western Gateway Sub-National Transport Body

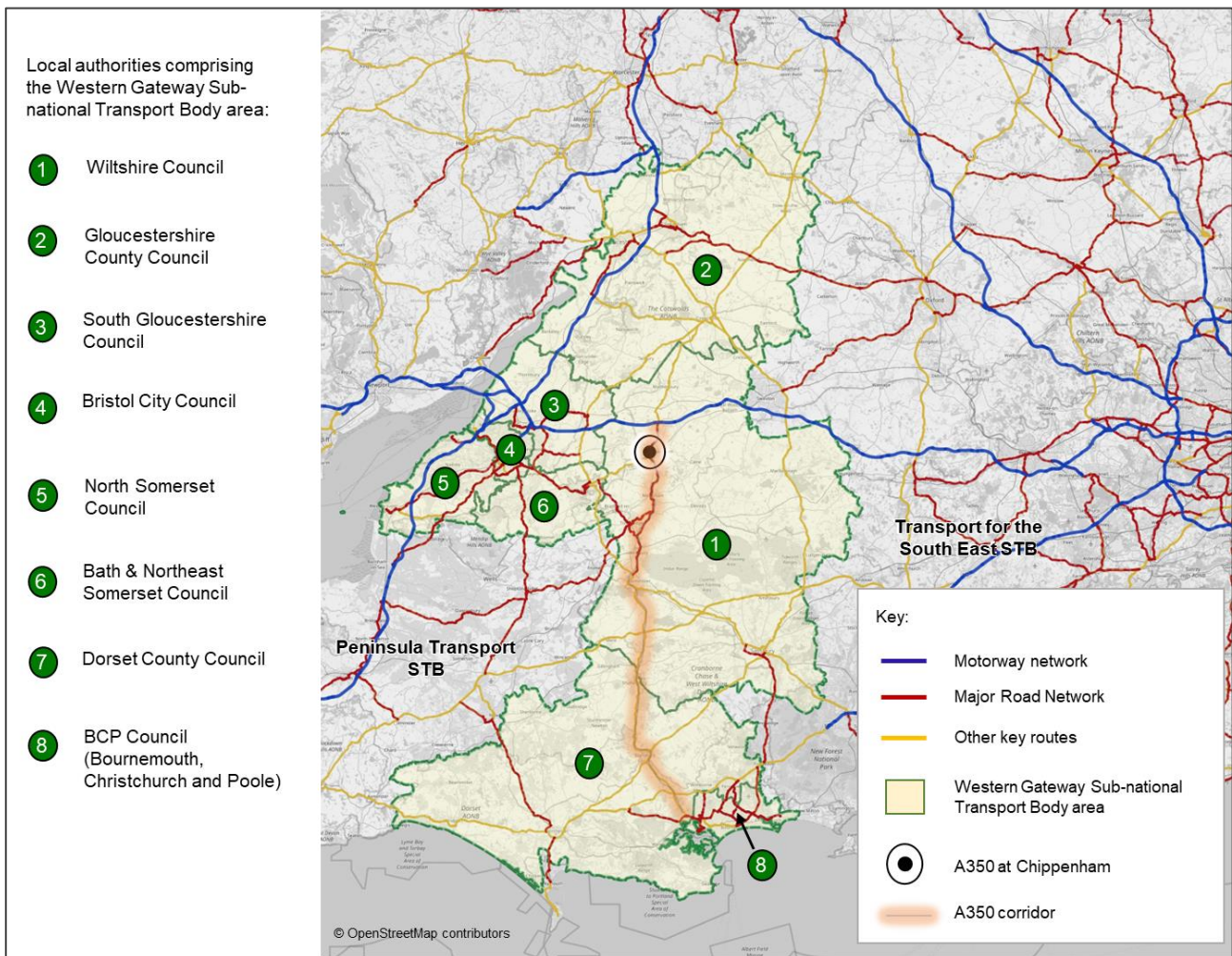
The Western Gateway STB (which covers the area shown in Figure 3-1) has also had a significant role in the identification and prioritisation of the proposal to serve the strategic connectivity needs of the sub-region (underpinned by its Regional Evidence Base). The body does not have any formal role in the development and delivery of the scheme.

#### 3.1.2.2. Area of Interest

The Proposed Scheme is located on the A350, a 70-mile-long road which runs between Junction 17 of the M4 Motorway to the north, and the south coast. The scheme itself relates to the section of the A350 which runs to the west of Chippenham town.

Given the nature of the proposal, and the A350's role in supporting strategic transport connectivity, it is appropriate to consider the strategic context for the scheme in relation to a broader regional area, such as the Western Gateway area (Figure 3-1), and at the A350 corridor level (see Figure 3-5).

**Figure 3-1 – The A350 at Chippenham in the context of the Western Gateway STB area**



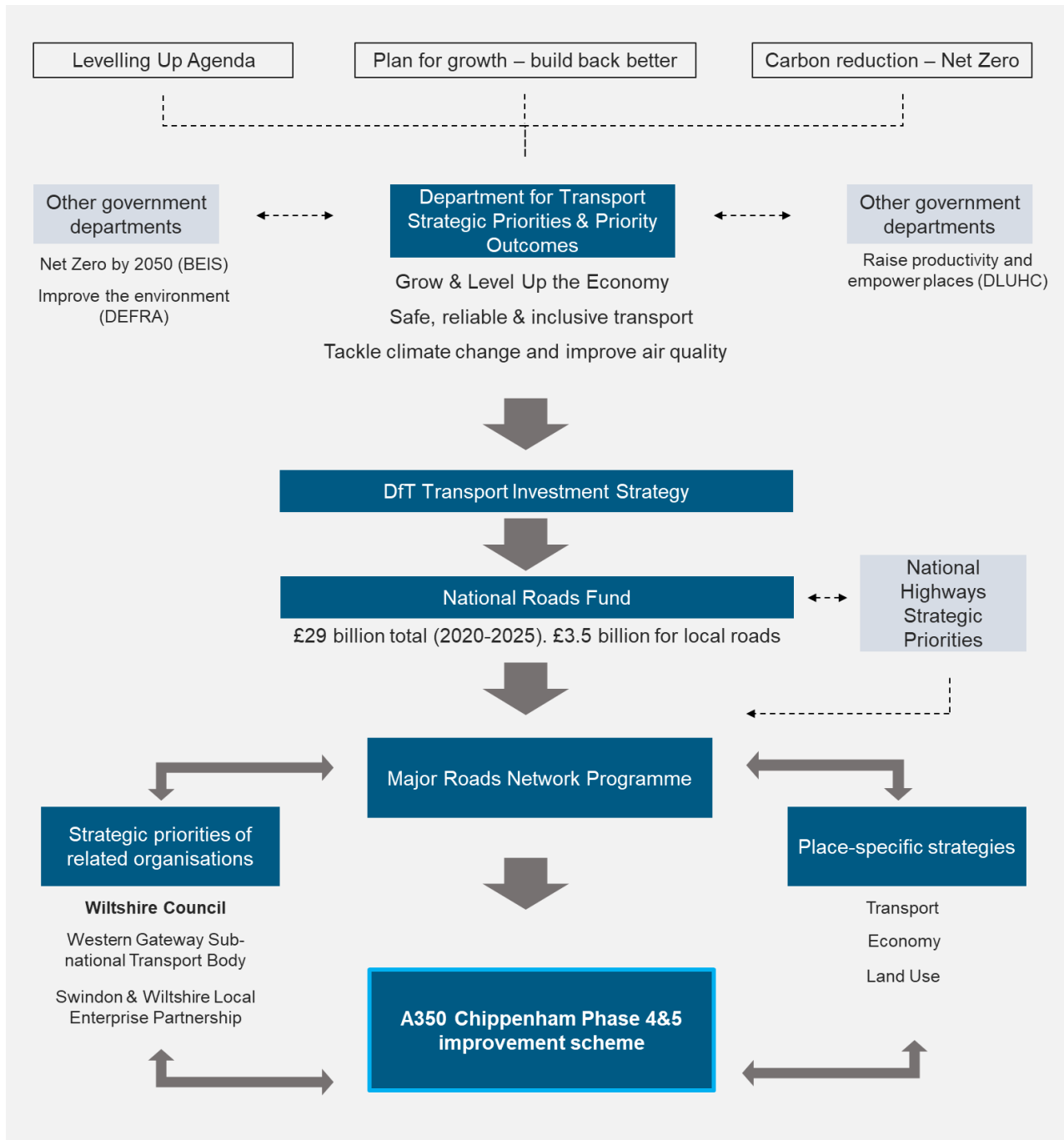
The **Western Gateway is important regionally and nationally** as it is both a single area containing some of the UK's fastest-growing local economies as well as being a **crucial facilitator of improved connectivity to other parts of the country**, including the South West, the Solent area, South Wales and the West Midlands. Wiltshire occupies a particularly strategic location centrally within the STB area, acting as an **important gateway to other parts of the region**. The A350 is one of the key transport corridors which link strategically important locations across the Western Gateway area, including the main urban centres, ports and airports.

### 3.1.3. Thread of strategic alignment

The scheme has evolved in a holistic and coherent manner within the context of compatible policies, strategies, strategic portfolios and programmes at a national, regional and local level. As such, it complements existing infrastructure and economic structures as well as planned policies and investments. **Figure 3-2** illustrates this key thread of strategic alignment, identifying how the project sits within and contributes to: national government priorities; DfT (and other department) priority outcomes and its strategic portfolio and programme priorities for road investment; priorities of Wiltshire Council and other organisations; and place-based strategies and objectives for Wiltshire, the A350 corridor and the wider region.

Section 3.1.5 and Section 3.1.6 further demonstrate the alignment of the proposal with these priorities. Section 3.1.8 provides additional detail in relation to the interdependencies between the proposal and other programmes and projects.

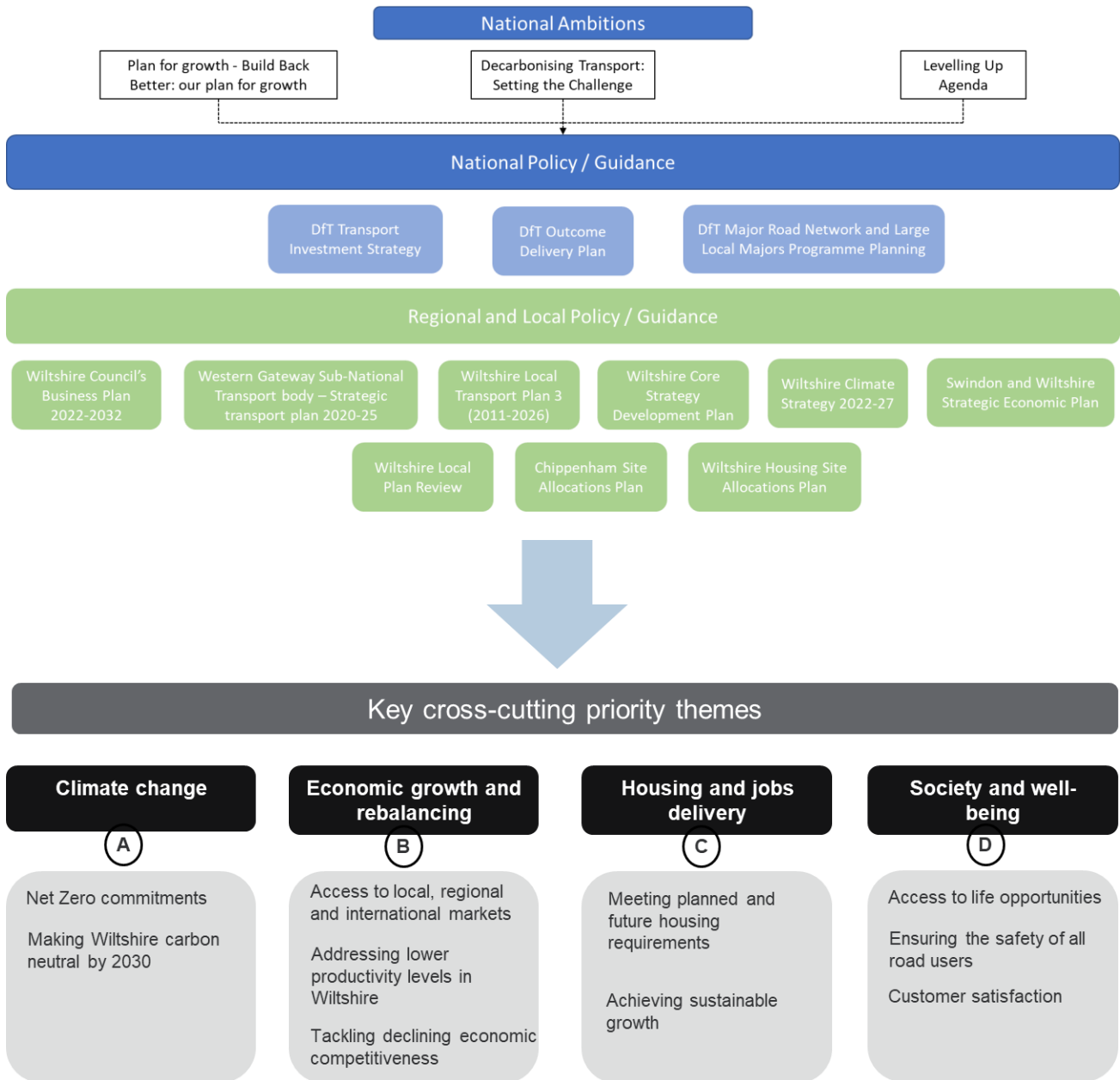
Figure 3-2 – Thread of strategic alignment relating to the A350 Chippenham Phase 4&5 scheme



### 3.1.4. Strategic context: cross-cutting priority themes

A small number of cross-cutting priority themes have been identified which are relevant to the strategic context for the scheme, as illustrated in **Figure 3-3**. These are referred to in the following sections which consider the business strategy (Section 3.1.5), place based strategies (Section 3.1.6) and wider strategies (Section 3.1.7). These sections explore the degree and nature of alignment between the scheme and key policy documents and objectives, with reference to the cross-cutting priority themes.

**Figure 3-3 - Summary of relevant transport policies and cross-cutting themes**



### 3.1.5. The Business Strategy

The business strategy identifies the strategic priorities and goals of the principal organisations involved in the scheme (section 3.1.2). It demonstrates how the proposal aligns with these institutional priorities.

### 3.1.5.1. Department for Transport and wider government priorities

The strategic priorities of the Department for Transport (DfT) are set out in its Outcome Delivery Plan (2021-2022)<sup>2</sup>, which aligns with broader government priorities, particularly in relation to:

- its [levelling up agenda](#) – spreading opportunity more equally across the UK;
- reducing UK carbon emissions ([Net Zero Strategy](#)) – setting decarbonisation pathways to net zero<sup>3</sup> by 2050; and
- its [plan for growth \(Build Back Better\)](#) - supporting growth through significant investment in infrastructure, skills and innovation (in support of levelling up and net zero).

The alignment of the scheme with DfT’s strategic priorities in its Outcome Delivery Plan is summarised in **Table 3-1**.

**Table 3-1 - Intervention alignment with strategic priorities set out in the DfT’s Outcome Delivery Plan**

Key Policy Priorities	Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
DfT1: Improve connectivity across the UK and grow the economy by enhancing the transport network, on time and on budget.	+++	<b>B</b>
DfT2: Build confidence in the transport network as the country recovers from COVID-19 and improve transport users’ experience, ensuring that the network is safe, reliable, and inclusive.	+++	<b>D</b>
DfT3: Tackle climate change and improve air quality by decarbonising transport.	+	<b>A</b>

The government views **transport connectivity** as a key factor in levelling up and an essential element in the creation of high-performing markets, and increased agglomeration and linkages between key sectors of the economy. DfT’s strategic approach is therefore around enhancing the national strategic transport network, shifting the focus of investment towards major projects that link towns, cities and left behind places outside of London and the South East. The government’s plan for growth (Build Back Better) also highlights the role of the UK’s road network as the “backbone of the economy” and emphasises the importance of investing in the network, to drive productivity improvements through the easing of congestion, and the reduction of journey times.

The concept of the [Major Road Network](#) was introduced by DfT in support of its **Transport Investment Strategy** (DfT, 2017) and supports priorities around improved transport connectivity. The scheme is particularly well-aligned with the related objectives of these, as shown in **Table 3-2** and **Table 3-3**.

<sup>2</sup> <https://www.gov.uk/government/publications/department-for-transport-outcome-delivery-plan>

<sup>3</sup> In June 2019, parliament passed legislation requiring the government to reduce the UK’s net emissions of greenhouse gases by 100% relative to 1990 levels by 2050. Doing so would make the UK a ‘net zero’ emitter.

**Table 3-2 - Intervention alignment with strategic priorities set out in the DfT’s Transport Investment Strategy**

Key Policy Priorities	Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
TIS1: Creating a more reliable, less congested, and better connected transport network that works for the users who rely on it.	+++	B / C
TIS2: Building a stronger, more balanced economy by enhancing productivity and responding to local growth priorities.	++	B
TIS3: Enhancing our global competitiveness by making Britain a more attractive place to trade and invest.	++	B
TIS4: Supporting the creation of new housing.	+	C

The MRN includes the busiest and most economically important local authority ‘A’ roads and forms a middle tier of roads, sitting between the national Strategic Road Network (SRN) and the rest of the local road network. The A350 within Wiltshire has been classified as part of the MRN network owing to its critical role for Wiltshire’s economic well-being and as a major focus of recent and future housing and employment growth plans (see also section 3.1.6.3). The scheme, at the northern end of the A350 corridor, addresses local connectivity as well as a more strategic interface between the MRN and the SRN (M4 corridor) in the South West.

**Table 3-3 - Intervention alignment with strategic priorities set out by the DfT for its Major Road Network.**

Key Policy Priorities	Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
MRN1: Reduce congestion.	+++	B
MRN2: Support economic growth and rebalancing.	+++	B / C
MRN3: Support housing delivery.	+++	C
MRN4: Support all road users.	++	D
MRN5: Support the SRN.	+++	B

Through its [Transport Decarbonisation Plan](#) (TDP) the DfT has set out its priorities for significantly reducing emissions from transport in order to achieve net zero. The TDP reflects an increasing priority for decarbonisation of the transport network, including a greater focus on public transport and active modes, as set out in other strategies such as:

- Gear Change; and
- ‘[Bus Back Better](#)’ - the national bus strategy published in March 2021. This establishes the government’s strategy to delivering better bus services, contributing to economic, social and environmental goals (including commitments to carbon reduction). It required Local Transport Authorities to work in legal partnership with local bus operators to increase the number of people using public transport and to produce a Bus Service Improvement Plan (BSIP).

However, policy established within the TDP continues to support investment in the road network:

*“Continued high investment in our roads is therefore, and will remain, as necessary as ever to ensure the functioning of the nation and to reduce the congestion which is a major source of carbon.”*

The scheme is consistent with the approach to tackling key sources of congestion. It is important that possible effects of schemes on carbon, both positive and negative, are fully considered and transparent<sup>4</sup>.

### 3.1.5.2. Wiltshire Council's strategic priorities

Wiltshire Council's [Business Plan 2022-2032](#) sets an overall mission statement to create strong communities in Wiltshire. As set out in Table 3-4, there are four key policy objectives which have been put in place to achieve this mission, which have at their core a commitment to making a Wiltshire a more enjoyable and prosperous place to live for its citizens. The A350 Chippenham Bypass Improvements particularly aligns with the council's ambition for a thriving economy (Priority 'WC3'), with high quality strategic transport connectivity (as well as digital infrastructure) key to enabling business to operate efficiently and in attracting and retaining high value businesses and investment and enabling people to access goods and services.

**Table 3-4 - Intervention alignment with strategic priorities set out by Wiltshire Council's Business Plan 2022-2032.**

Key Policy Priorities	Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
WC1: The people of Wiltshire are empowered to live full, healthy and enriched lives.	+	D
WC2: Our communities continue to be beautiful and exciting places to live.	++	D
WC3: Our local economy thrives and is supported by a skilled workforce.	+++	B / C
WC4: We lead the way in how councils and counties mitigate the climate challenges ahead.	+	A

Maintaining strong north-south connectivity, by road (A350 corridor) and rail, has been a longstanding priority for Wiltshire Council and this is reflected in local strategies and recent and planned investment (see section 3.1.6). The Business Plan specifically refers to seeking investment in major road programmes to address congestion and air quality at targeted locations. The full dualling of the A350 Chippenham Bypass, as part of the overall strategy to upgrade the A350, has been seen as a strategic priority by Wiltshire Council for many years.

The Business Plan also highlights the need for improving housing supply and delivering the right housing, in support of building a resilient society (Priority 'WC2'). It emphasises the role of an updated Local Plan as an effective policy framework for the sustainable growth of Wiltshire, with strategic infrastructure being a critical enabling factor (see section 3.1.6.3).

In line with national targets to achieve net zero by 2050, Wiltshire Council has also resolved to acknowledge a climate emergency (February 2019) and to seek to make the county carbon neutral by 2030<sup>5</sup>.

<sup>4</sup> This Outline Business Case is supported by a Carbon Management Plan which assesses the whole life carbon impacts of the proposal and identifies carbon reduction measures.

<sup>5</sup> A Global Warming and Climate Emergency Scrutiny Task Group was set up to gather evidence and come up with recommendations on achieving net zero. A commitment was also made to make the council carbon neutral by 2030. A new climate strategy is being prepared to enable the Council to meet these commitments. The Local Transport Plan is currently under review and will seek to align with the targets relating to carbon neutrality whilst also addressing economic prosperity and growth and quality of life.

### 3.1.5.3. National Highways

As part of RIS2, National Highways has been undertaking a strategic study in relation to [M4 to Dorset Coast Connectivity](#). The study is seeking to determine whether there is an alternative strategic corridor to the current SRN (A36/A46), with the A350 corridor being one of those in scope. The study responds to regional concerns relating to poor north-south connectivity – Section 3.1.6 builds upon this context.

## 3.1.6. Place-Specific Strategies

### 3.1.6.1. Overview

The A350 Chippenham Bypass Improvements have an important role in delivering regional objectives for the area (as defined within regional and local policies and strategy), of which transport improvements are a key facilitator. These objectives are consistent with the strategic priorities at an organisational level (section 3.1.5).

A major priority for the area is for the transport network to provide reliable strategic connections between its key economic centres and wider markets, to prevent unreliable and inconsistent transport from becoming a constraint to growth. The investment strategy for the A350 corridor reflects the need to ensure that the A350 route can serve its strategic role efficiently whilst further enhancing overall travel choices, particularly for short to medium distance journeys within the corridor.

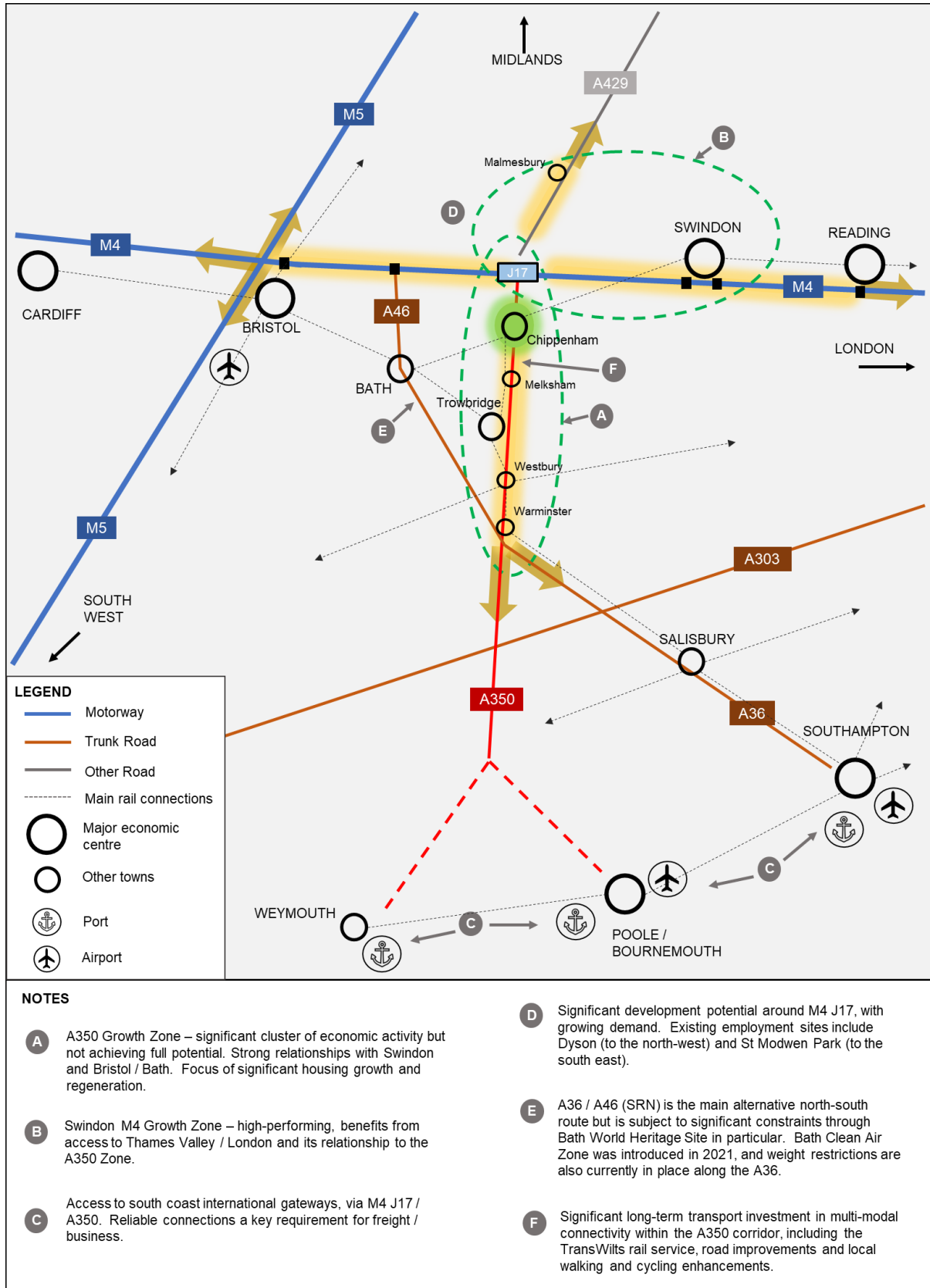
There are few north-south connections across the South West of England. The present strategic road for this area is a mixture of the A36 and A46, via Bath, Warminster and Salisbury. Local authorities in the area have suggested that there is a strategic case for adopting an alternative corridor - the A350 - as the main strategic route for the area; and then beginning a coordinated programme of upgrades to provide a high-quality route linking the M4 to the Dorset Coast including Bournemouth and Poole, with its economically-important port facilities.

With the focus for enabling north-south transit on the A350, rather than other routes, this also presents an opportunity to reduce traffic flows in and around the Wiltshire market towns of Bradford on Avon, Salisbury and Marlborough; amongst others. The reduction in traffic flows in these towns will improve the local environment for cyclists and facilitate a lowering of vehicular capacity on routes allowing for reallocation of highway to active and more sustainable modes of transport.

Key features of regional and local strategy relevant to the proposal are illustrated within **Figure 3-4**.

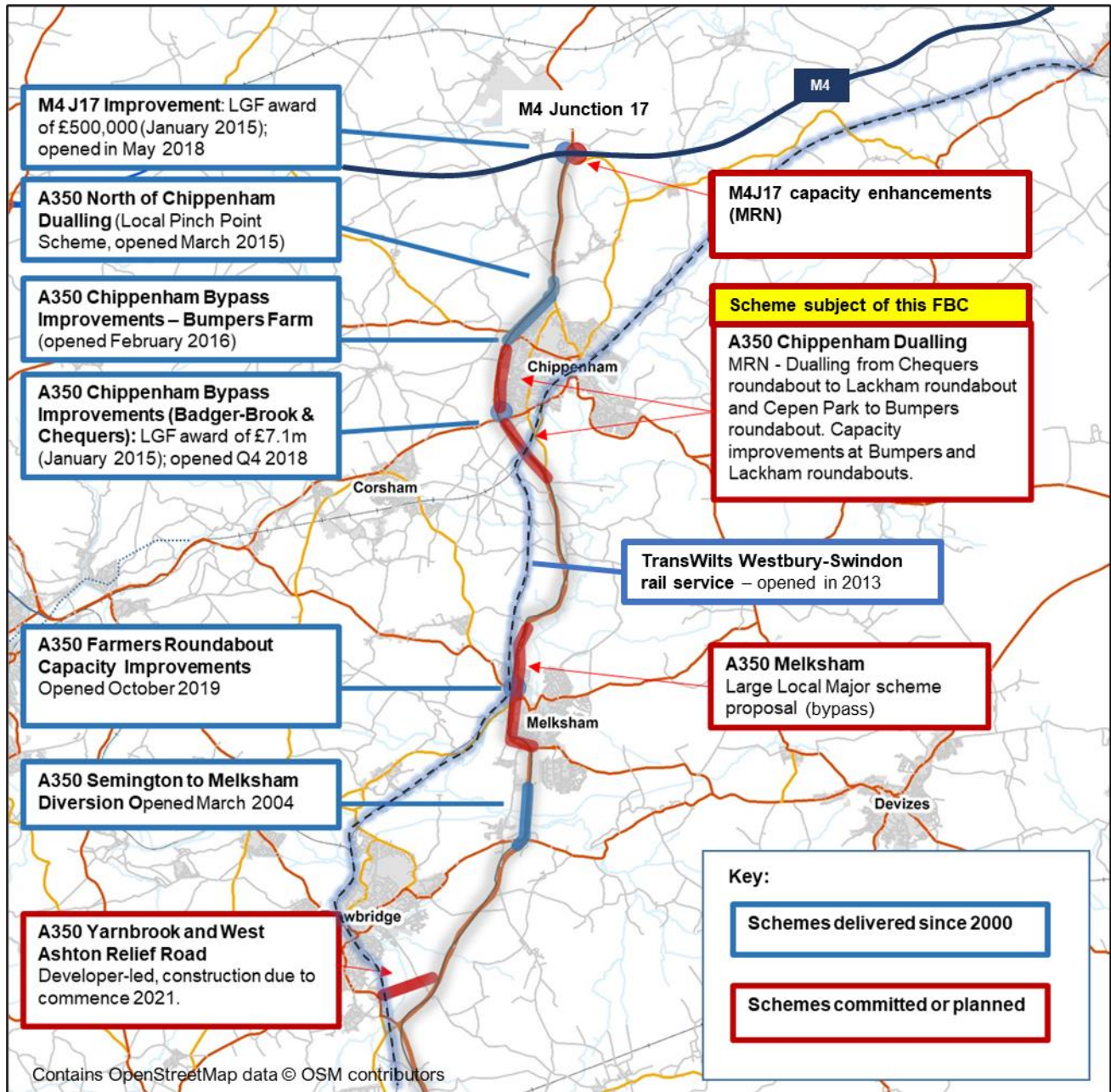


Figure 3-4 – Schematic illustration of the regional / local strategy



The scheme further complements other existing and planned interventions within the area (transport and non-transport) to enhance the contribution towards these objectives, as illustrated in **Figure 3-5**.

**Figure 3-5 – Previously completed and planned transport improvements within the A350 corridor**



The A350 Chippenham Bypass has been subject to previous phases of improvement in recent years, as illustrated in **Figure 3-5**. Further background to these is also provided in section 1.3.

The current scheme would deliver the remaining phases of improvement, to fully upgrade the bypass to dual carriageway and result in the complete dualling of the northern end of the A350 from the M4 to south of Chippenham.

### 3.1.6.2. The role of the scheme in supporting wider regional strategies

At a regional level, the **Western Gateway Sub-national Transport Body** (STB) identifies good connectivity as an essential component of the Western Gateway economy within its [Strategic Transport Plan 2020 to 2025](#) (STP) which has the overall aim of:

*“enabling clean growth and increased use of sustainable transport through a long-term investment programme designed to deliver a well-connected, clean, reliable and resilient strategic transport system; one that closes productivity gaps, provides a better quality of life for people across the region and makes the Gateway area more competitive while respecting its world class natural and built environments.”*

The importance of the A350 corridor, and its links to the SRN, was identified within the associated Regional Evidence Base which underpinned the STP; hence the scheme demonstrates a particularly strong fit with the STP objectives, as show in Table 3-5.

**Table 3-5 - Intervention alignment with regional objectives (Western Gateway Sub-National Transport Body’s Strategic Transport Plan 2020-25)**

Key Policy Priorities		Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
WG1: Ensure effective access of labour markets.	Economic Objectives	+++	B / C
WG2: Enable greater integration between employment clusters.		+++	B
WG3: Enhance business connectivity to international markets.		+++	B
WG4: Improve North-South Connectivity.		+++	B
WG5: Decarbonisation of the strategic transport network.	Environmental Objectives	++	A
WG6: Improve air quality.		++	A
WG7: Adopt fossil-fuel-free transport.		+	A
WG8: Support the sustainable delivery of new homes and employment opportunities.	Social Objectives	+++	C
WG9: Support multi-modal travel options within travel to work areas.		+	B
WG10: Embrace the role of technology in supporting strategic travel.		+	B

The Western Gateway covers some of the country’s most prosperous, fastest-growing conurbations with several high-tech and high value sectors now providing a wide range of employment opportunities in the STB. Despite these concentrations of economic activity, the Western Gateway has several areas and communities that experience poor transport connectivity, especially with respect to corridor connectivity.

The A350 Chippenham Bypass improvements scheme (and its place in a wider A350 corridor package) is an important component of implementing the regional strategy. This includes:

- The need to **maximise the capacity and resilience of the area’s strategic transport corridors**, connecting local, national and international markets. This is required to meet the area’s own ambitions of

delivering **productivity improvements, housing and economic growth** as well as helping other regions and STBs achieve their own objectives.

- Providing improved connectivity and accessibility to attract and retain businesses within the area to support the retention of the working age population.
- Addressing the imbalance in productivity levels within the area – lower productivity in Dorset and Wiltshire is linked to poor connectivity to the major areas of economic activity to the north, e.g. in comparison with the neighbouring authorities of Devon (connected by the M5) and Hampshire (connected by the M3 and A34):
- The A350 corridor has the potential to drive change in the Dorset and Wiltshire economies<sup>6</sup> and benefit the whole of the Western Gateway area through:
  - better access to its coastal international gateway (including for freight traffic to / from the Port of Poole);
  - providing additional strategic resilience and connectivity for north-south movements in the Western Gateway area; and
  - forging significant agglomeration benefits.

The corridor has been identified by the Western Gateway STB as the second highest priority corridor within the region (based on factors such as productivity and new housing and jobs creation). The investment strategy to fulfil its potential is based around:

- a strategic programme of interventions which balance investment in highway infrastructure with a longer-term ambition to improve connectivity by rail;
- an initial phase to upgrading the northern end of the A350 route comprising this A350 Chippenham Bypass improvements scheme, the M4 Junction 17 MRN scheme, plus the LLM scheme at Melksham; and
- subsequent improvements to the central and southern sections of the route to be prioritised within the Western Gateway STB's forthcoming **Long-term Strategic Plan**.

#### 3.1.6.3. The role of the scheme in supporting local strategies

At a more local level, the A350 plays an important role in connecting the market towns of Wiltshire and their inter-connected economies, as well as providing residents with access to the wider SRN, via M4 Junction 17. This supports local objectives and strategies for the Wiltshire area in relation to the transport network, economic growth and housing delivery.

#### **Transport policy in Wiltshire / Chippenham - Wiltshire Local Transport Plan 3 (2011-2026)**

The overarching vision of the LTP3 is *“to develop a transport system which helps support economic growth across Wiltshire’s communities, giving choice and opportunity for people to access essential services.”* There are 18 strategic objectives set out in the plan, of which the 5 set out in Table 3-6 are relevant to the Proposed Scheme.

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<sup>6</sup> A 5% improvement in journey times across the entire A350 corridor from M4 Junction 17 to Poole (representing a scenario with no bottlenecks or restrictions) has been estimated to produce £12.2 billion of agglomeration<sup>6</sup> benefits over a 60 year period ([South of England North-South Connectivity: Economic Study](#), 2016)

**Table 3-6 - Intervention alignment with strategic priorities set out in Wiltshire Council’s Local Transport Plan 3 (2011-2026)**

Key Policy Priorities	Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
SO1: To support and help improve the vitality, viability, and resilience of Wiltshire’s economy and market towns	+++	B
SO4: To minimise traffic delays and disruption and improve journey time reliability on key routes.	+++	B / C
SO8 To improve safety for all road users and to reduce the number of casualties on Wiltshire’s roads.	+	D
SO10: To encourage the efficient and sustainable distribution of freight in Wiltshire.	+++	B
SO12: To support planned growth in Wiltshire and ensure that new developments adequately provide for their sustainable transport requirements and mitigate their traffic impacts.	+++	B / C

Improvements to the A350 Chippenham Bypass were also identified as part of a wider package of measures outlined in the Chippenham Transport Strategy. Key objectives of the transport strategy included maintaining the strategic function of the A350 and encouraging traffic to use more appropriate routes and encouraging shorter distances journeys on foot and by bike.

[Wiltshire Council's Bus Service Improvement Plan](#) is consistent with its Local Transport Plan (LTP) which seeks to enhance the range and quality of alternative modes of travel (including bus). The BSIP was published in October 2021 and sets out the vision for making buses a more attractive option and delivering a 10% patronage uplift by 2024/25, facilitated by an Enhanced Partnership with bus operators. The BSIP identifies a number of proposed measures (subject to funding), including:

- Development of Superbus corridors;
- Targeted bus priority measures;
- Service frequency enhancements; and
- Improvements to ticketing and integration with other modes.

The BSIP sets out a strategy focused on a priority route hierarchy, with defined Superbus corridors having the highest priority. The network south of the M4 (e.g. connecting Chippenham, Melksham, Trowbridge, Westbury) is defined within the Superbus corridors. The potential Superbus corridors within the vicinity of the MRN scheme are the Chippenham-Bath (X31) corridor and the Chippenham-Frome corridor (X34). The X34 corridor is the only defined Superbus corridor which directly interfaces with the scope of the scheme

The BSIP also identifies a number of initial locations for bus priority measures (subject to funding); these initial plans do not include the parts of the network within the scheme scope.

Wiltshire Council's Local Transport Plan (LTP) also sets out the ambition to increase levels of walking and cycling, as the natural choices for shorter journeys or as part of a longer journey – consistent with DfT's Cycling and Walking Investment Strategy and Gear Change strategy. Wiltshire Council has produced a draft county-

wide **Local Cycling and Walking Infrastructure Plan** (LCWIP), identifying overarching principles and key inter-urban routes. Subsidiary LCWIPs for key settlements are in development, including for Chippenham. These are intended to build upon the Town Cycle Network Plans, developed in support of the current LTP, to enhance the quality and attractiveness of walking and cycling routes within the market towns and to/from wider inter-urban routes.

### Economic growth policy and plans in Wiltshire / Chippenham

The [Swindon and Wiltshire Local Industrial Strategy](#) cites the geographical position of the area as a distinct economic advantage, by giving excellent access to the economies in the South East, Bristol and the rest of South West, Midlands, south coast ports and South Wales. However, it recognises that this advantage, and the success of the local economy, is heavily dependent upon vital infrastructure assets: the Great Western Railway; the M4 motorway, and the A303 and A350 roads.

The A350 and M4 (to Swindon) corridors represent two of the three Growth Zones<sup>7</sup> originally identified within the [Swindon and Wiltshire Strategic Economic Plan](#) (refer to **Figure 3-4**). The two Growth Zones jointly account for 74% of the total Swindon and Wiltshire population and 71% of GVA<sup>8</sup> – they reflect priority areas for local jobs and housing creation. The growth strategy seeks to enhance productivity (particularly within the A350 Growth Zone, which is not meeting its full potential) and attract new inward investment to create new local jobs in line with anticipated housing / population growth, as well as safeguarding existing jobs. This is an important factor in achieving sustainable growth. The SWLEP identifies stable and certain infrastructure as being pivotal in attracting and retaining businesses. The A350 Chippenham Bypass improvements scheme is located at the heart of the A350 Growth Zone, but also facilitates connectivity with the M4 corridor Growth Zone, enabling the movement of people and goods between them, as well as providing access to wider regional, national and international markets.

**Table 3-7 - Intervention alignment with strategic priorities set out in the Swindon and Wiltshire Strategic Economic Plan**

Policy/strategy / key priorities	Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
SEP2: Transport infrastructure improvements: we need a well-connected, reliable and resilient transport system to support economic and planned development growth at key locations.	+++	A / B
SEP4: Place shaping - we need to deliver the infrastructure required to deliver our planned growth and regenerate our City and Town Centres, and improve our visitor and cultural offer.	+++	A / B
Invest in the A350 primary route through western Wiltshire to ensure it can fulfil its north-south strategic function and support the significant economic and development growth.	+++	A / B

<sup>7</sup> The SWLEP defines its Growth Zones as “geographic areas with a concentration of people and business that have been shown to contribute towards improved economic performance and productivity, delivering wider economic benefits to the region as a consequence.”

<sup>8</sup> Swindon and Wiltshire Growth Zones, Swindon & Wiltshire LEP - <https://cms.wiltshire.gov.uk/documents/s111736/SEP%20Appendix%201.pdf>

### Housing and employment land policy and plans in Wiltshire / Chippenham

Local planning and land use policy<sup>9</sup> sets a framework for addressing housing needs in Wiltshire in line with the Council’s economic, social and environmental priorities. Achieving these policy objectives requires effective planning and delivery of strategic infrastructure, and the scheme is well-aligned in this regard (Table 3-8). The Core Strategy Development Plan specifically details the need to improve the A350, noting that “*the strategic transport network along the A350 corridor will be maintained, managed and selectively improved to support development growth at Chippenham, Melksham, Trowbridge, Westbury and Warminster.*”

**Table 3-8 - Intervention alignment with strategic priorities set out in Wiltshire Council’s Core Strategy Development Plan**

Key Policy Priorities	Strength of alignment with Phase 4 and 5 A350 Improvement Scheme	Nature of alignment (cross-cutting themes)
SO1: Delivering a thriving economy.	+++	B
SO6: Ensuring that adequate infrastructure is in place to support our communities.	+++	B /C
Core Policy 66: Strategic Transport Network.	+++	B

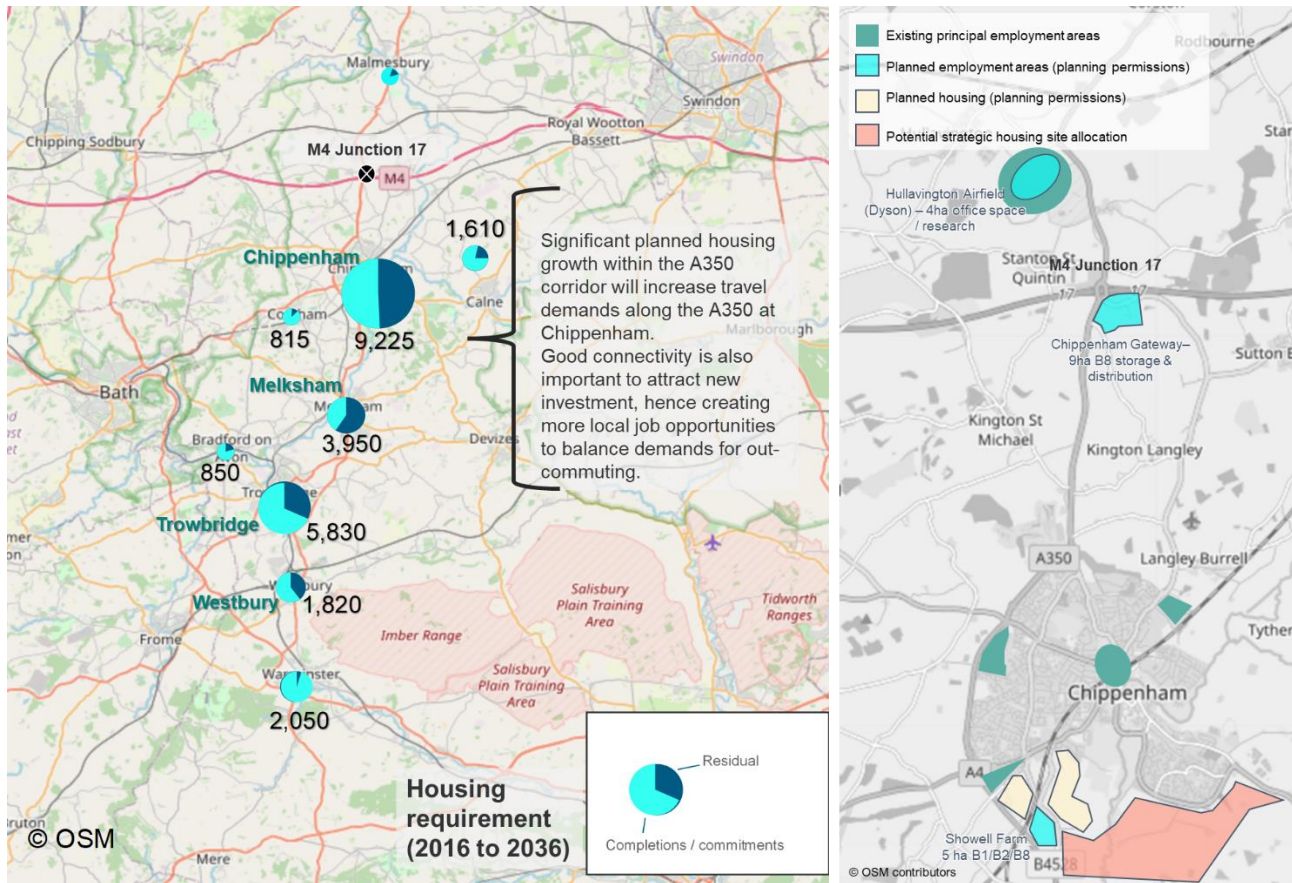
The overall plan to improve the A350 is included in the adopted Wiltshire Core Strategy (Core Policy 66) which states that the improved standard of provision of this road (A350) will aid the employment growth at Chippenham, Melksham, Trowbridge, Westbury and Warminster. Whilst not directly linked to a particular development site, the Core Strategy (adopted February 2015) identifies the A350 as being critical to Wiltshire’s growth agenda. This is also reflected in the Chippenham Transport Strategy (2016) which supports the Chippenham Site Allocations Plan (adopted May 2017).

Local growth plans seek to deliver approximately 30,000 new homes between 2016 to 2036 on and around the A350 corridor<sup>10</sup>. The corridor is due to take 70% of Wiltshire’s total housing requirement, placing a continued **emphasis on the A350 corridor to support increasing travel demands** associated with new housing (**Figure 3-6**) and the need to maintain good connectivity, including to the SRN via M4 Junction 17 at the head of the corridor.

<sup>9</sup> The Wiltshire Core Strategy establishes the spatial strategy and housing requirements for 2006 to 2026 and is the current Local Plan. The [Local Plan Review](#) is ongoing and assesses the future needs for new homes and employment land in Wiltshire over an extended period of 2016 to 2036. The updated Local Plan is expected to be adopted in 2023. An Emerging Spatial Strategy was consulted upon in January 2021.

<sup>10</sup> Based on the Emerging Spatial Strategy, January 2021.

Figure 3-6 – Spatial strategy for housing and employment land



Source: Wiltshire Local Plan: Emerging Spatial Strategy (January 2021)

When completions (since 2016) and existing developable commitments are taken into account, there is a residual requirement (as of April 2019) for additional sites to be identified to accommodate approximately 13,000 dwellings within the A350 corridor up to 2036 (Figure 3-6). The Emerging Spatial Strategy considers larger urban extensions to provide the greatest opportunities to maximise sustainability. Significant site allocations are expected in Chippenham, Trowbridge and Melksham. At Chippenham, sites previously promoted through the Housing Infrastructure Fund (under the DHLUC), known as ‘Future Chippenham’, are expected to contribute to meeting the town’s residual housing requirement.

The current [transport evidence base](#) supporting the Local Plan Review<sup>11</sup> identifies enhancements to the A350 at Chippenham as a necessary infrastructure improvement to support the Emerging Spatial Strategy, as part of a holistic multi-modal transport mitigation package.

### 3.1.7. Wider Strategies

The alignment of the proposal with other relevant objectives is summarised in **Table 3-9**.

<sup>11</sup> Wiltshire Local Plan – Transport Review (January 2021)



**Table 3-9 – Relationship of the scheme with wider plans and objectives**

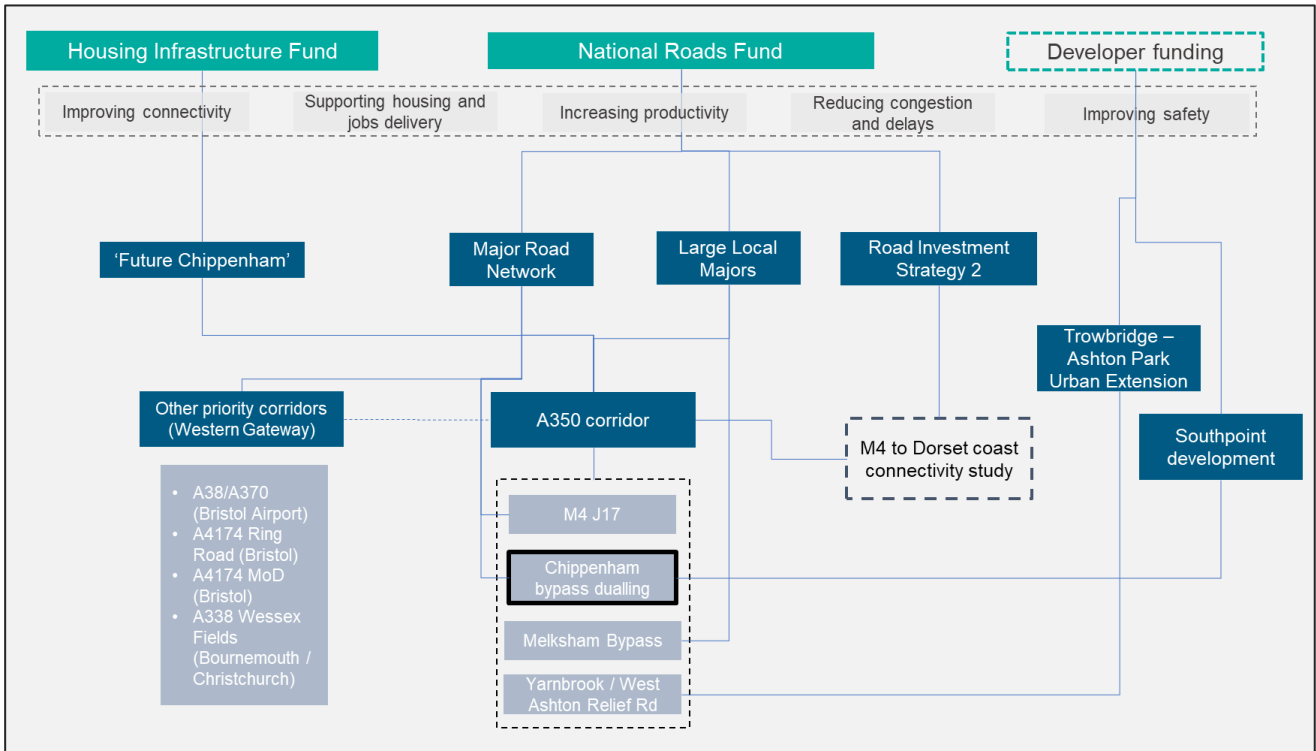
Organisation / strategy / type of objective	Relationship with the A350 Chippenham Bypass improvements scheme
Other surrounding local authorities- e.g. Dorset County Council, Bath & North East Somerset Council, Swindon Borough Council	Other local authorities within the region have collectively promoted enhanced north-south connectivity as a key priority (as reflected in regional strategy) – jointly lobbying government for a strategic review (which has resulted in the strategic connectivity study being undertaken by National Highways).
Active travel – DfT ‘Gear Change’, Local Cycling and Walking Implementation Plans	The scheme aims to support all road users and is informed by a Walking, Cycling and Horse-riding Assessment & Review.
Biodiversity net gain – National Planning Policy Framework, Wiltshire Local Plan Review	National policy sets out that planning should provide biodiversity net gains where possible. The scheme has been developed with regard to this, including through an Environmental Assessment Report and appropriate early engagement with Statutory Environmental Bodies.

### 3.1.8. Project and programme interdependencies

The scheme complements wider investment programmes and portfolios. A thread of strategic alignment was identified in section 3.1.3 (see **Figure 3-2**). Sections 3.1.5 to 3.1.7 identified the role of the scheme in the context of regional and local strategies and associated delivery programmes (in particular through the Major Road Network and Large Local Majors funds) and how the scheme forms part of a coherent investment package focused on the priority A350 corridor (see **Figure 3-5** for instance).

These relationships are further illustrated in **Figure 3-7**; this highlights the synergies and how the A350 Chippenham Bypass improvements scheme helps to enhance wider planned investments (public and private) to maximise the contribution towards common outcomes. Due to its strategic location on the A350 corridor, the scheme has a particularly important role in maximising the benefits of the other planned corridor improvement projects.

**Figure 3-7 – Relationship of the scheme with wider projects and programmes**



## 3.2. The case for change

This section describes the current situation along A350, around Chippenham, and describes the rationale to advance with Phases 4 and 5 of the intervention. It demonstrates why it is considered necessary to change the current situation, with regard to the overall business strategy and strategic priorities established in section 3.1.

### 3.2.1. Key updates since OBC

The case for change is underpinned by a range of data sources. Since the OBC, key data (e.g traffic, development, economy) has been reviewed and updated where appropriate. Impacts of the COVID-19 pandemic have been considered. The overall rationale for intervention remains consistent with the OBC.

### 3.2.2. Existing arrangements

#### 3.2.2.1. Demographic and socio-economic context

Wiltshire is a highly desirable destination to live and work in, as well as for leisure and tourism. According to data from the 2021 ONS Census, it has a population of 510,330 of whom 255,780 people are economically active, representing 61% of the population. Wiltshire Intelligence<sup>12</sup> data shows that the population is forecast to increase to approximately 548,000 by 2040, growth of 7%. Whilst economic prosperity varies across the region, overall Wiltshire is a prosperous local authority, and is ranked in the least deprived 30% of the 317 local authority districts.

<sup>12</sup> Wiltshire Population and Deprivation: <https://www.wiltshireintelligence.org.uk/wp-content/uploads/2022/11/JSNA-2022-Population-and-deprivation.pdf>

Within the Western Gateway area, Swindon and Wiltshire occupy an influential location, with access to major economic centres including London, key airports and coastal ports.

Key characteristics of the area include<sup>13</sup>:

- Approximately 727,000 people live in Swindon and Wiltshire, of which 31% live in Swindon and 69% in Wiltshire (with the A350 Growth Zone having a population of approximately 190,000). The population has grown by 7% (50,000) since 2010, in line with the national average. Population growth of 9% is forecast by 2043.
- The Swindon and Wiltshire economy contributes £21bn annually to the UK economy, equating to 15% of the South West of England's and 1% of England's total output. Historically, Swindon and Wiltshire's GVA growth rates have surpassed the regional and national averages, but this has slowed since 2015, and the LEP area is now on par with growth seen at a national level. In comparison to comparator LEP areas Swindon and Wiltshire has experienced the lowest rate of growth, indicating barriers to growth.
- Swindon and Wiltshire's Growth Zones are the key drivers of the economy. The Swindon M4 Growth Zone is a significant powerhouse, accounting for 61% of total output in the LEP area with productivity above the national average. The economically active population is slightly above the national average.
- The A350 Growth Zone accounts for approximately 25% of total output and is fairly affluent, with only 6% of LSOAs in the area ranked as being within the 20% most deprived in England. However, Wiltshire has a significant productivity gap, with GVA per job in 2019 of approximately £45,000 compared to a national average of approximately £57,000. This is further compounded by slowing growth and declining economic competitiveness.
- The A350 Growth Zone has a high concentration of businesses, with approximately 10,000 businesses (30% of the total business stock in the SWLEP area) and approximately 85,000 employees. The towns along the corridor create an interlinked series of local employment hubs including business parks, trading estates, three campuses of Wiltshire College and key tourist destinations such as Longleat Safari Park and Center Parcs Resort. Manufacturing is a particular strength, and there is a growing logistics sector (transport and storage); both of which rely on good strategic transport connections.
- Other key socio-economic challenges relate to housing, an ageing population and access to services, education and skills.<sup>14</sup>
- The COVID-19 pandemic has had a significant economic impact; Swindon and Wiltshire experienced an estimated loss of £1.7bn in GVA in 2020 due to the pandemic.

Further analysis of social demographics can be found in the Social and Distributional Impacts Report (Appendix B.7).

#### 3.2.2.2. Transport Provision

An overview of transport provision within the area is provided in the following section. A notable feature of the wider transport network serving the area is that east-west connectivity by road and rail is strong, whereas **north-south connectivity is relatively weak** in comparison. This places a lot of **emphasis on the A350 corridor**, between the South Coast and M4. However, investment in the corridor has not kept pace with its increasing significance (particularly given the significant constraints associated with the main alternative route; the A36/A46).

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<sup>13</sup> Information sourced from Swindon and Wiltshire Local Economic Assessment, March 2022

[https://static.swlep.co.uk/swlep/docs/default-source/strategy/economic-priorities/economic-assessment-2022/1-executive-summary-march-2022.pdf?sfvrsn=1b1b5129\\_3](https://static.swlep.co.uk/swlep/docs/default-source/strategy/economic-priorities/economic-assessment-2022/1-executive-summary-march-2022.pdf?sfvrsn=1b1b5129_3)

### Highway network

The main highway network in Chippenham consists of the A350 bypass, and a number of single carriageway routes, many of which are east-west, that converge on the town centre.

- The A350 is a primary north-south connection between the M4 (Junction 17) and the south coast, connecting a number of towns in west Wiltshire. It is primarily a single carriage A road of varying standard, although some small sections are dualled. It is a strategic road, which provides connectivity for longer journeys to, from, and around Chippenham.
- The A4 Bath Road is an east-west route connecting the town of Corsham with the centre of Chippenham. It is a single carriageway route, with varying speed limits, as it moves between town and countryside. It junctions with the A350 at Chequers Roundabout.
- The A420 Bristol Road is an east-west route which routes from Bristol to Chippenham. It junctions with the A350 at the Bumpers Farm Roundabout.
- The B4158 Malmesbury Road is a north-south road which routes from the A350 at the Malmesbury Roundabout to the centre of Chippenham. It is a local road, with a speed limit of 30mph.
- The B4528-B4642 Radial Road is a north-south route connecting the Lackham Roundabout on the A350, to the Bath Road/Brunel Crescent roundabout. It is predominantly a rural road, with a speed limit of 40mph.

### Rail network

Rail (Great Western Mainline and TransWilts line) provides medium to longer distance connections between the West Wiltshire market towns, and to other significant centres (e.g. Swindon, Reading, Bath/Bristol). This offers a competitive travel choice for some journeys, but other journeys by rail are more convoluted.

Chippenham Railway Station, just 2km from the Proposed Scheme, is served by the Great Western Main Line, providing connections to Swindon, Reading and London to the east, and Bristol and South Wales to the West. This provides a service approximately every 30 minutes.

The TransWilts Line routes through Chippenham, connecting the west Wiltshire market towns with Swindon. The route, which runs from Salisbury to Swindon, is run by Great Western Railway, and usually operates an hourly service stopping at Chippenham, as well as places such as Melksham, Trowbridge, and Warminster.

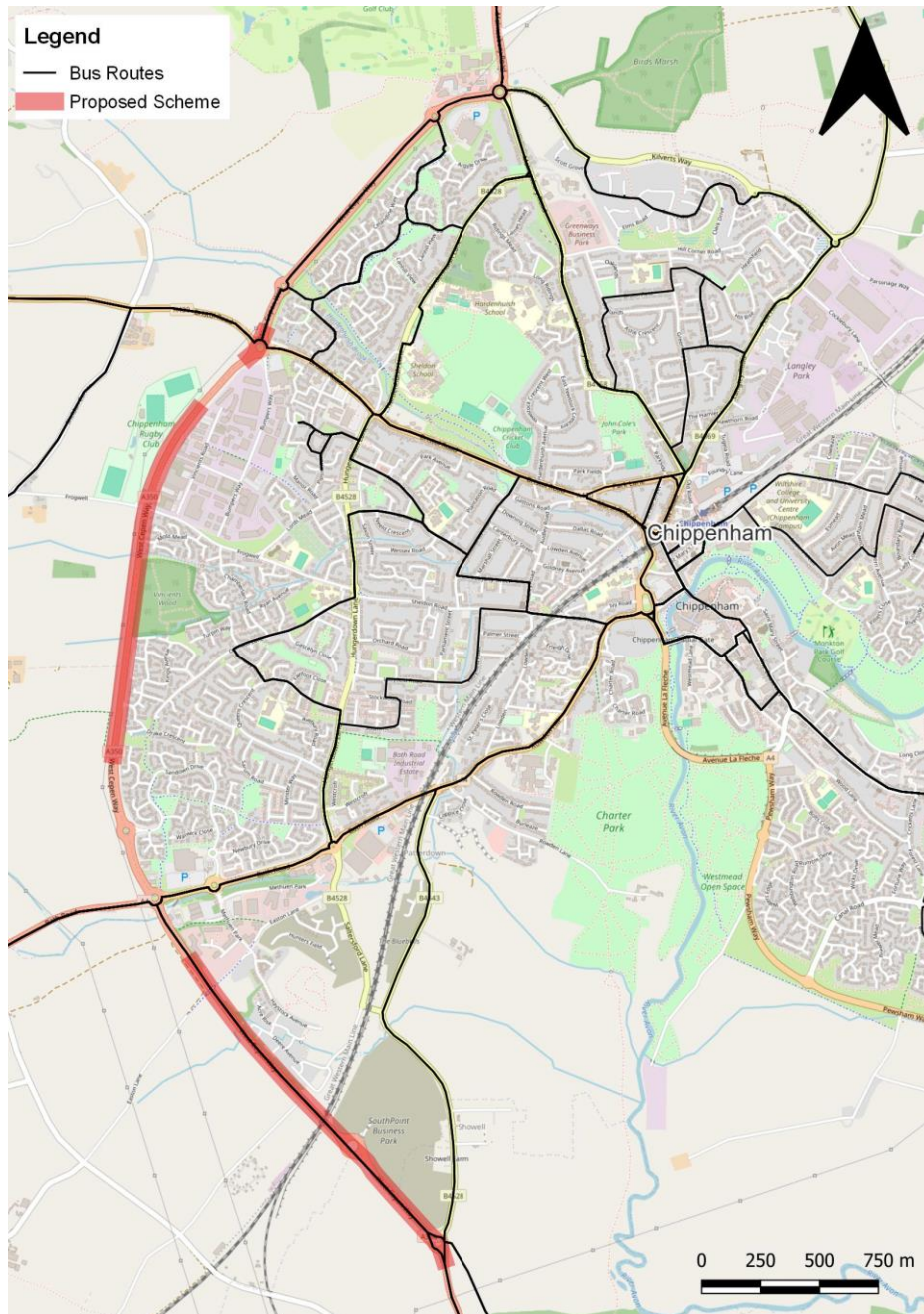
### Bus network

The Wiltshire bus service network has remained largely unaltered for many years. Outside of Salisbury, only 30% of bus services operate on a commercial basis (the remainder being supported by Wiltshire Council). The inter-urban bus network provides reasonable connectivity, although it is typically lower frequency and the need to serve smaller villages en route can lead to less direct services with extended journey times. In the west of the county, the bus plays an important role for inter-urban connections between the market towns.

The network of bus services in Chippenham is illustrated in Figure 3-8, although a number of these operate at low frequencies. There are a limited number of services that use the A350 Chippenham Bypass itself. Service 635/636 (Chippenham-Marshfield/Colerne) is the main bus service that interacts with the scheme, operating east west on the A420 via Bumpers Roundabout at the intersection with the A350 corridor. There is a total of approximately 10 services a day on this section.

Further information in relation to bus provision can be found in Appendix A.6.

Figure 3-8 The location of bus routes across Chippenham, in relation to the Proposed Scheme



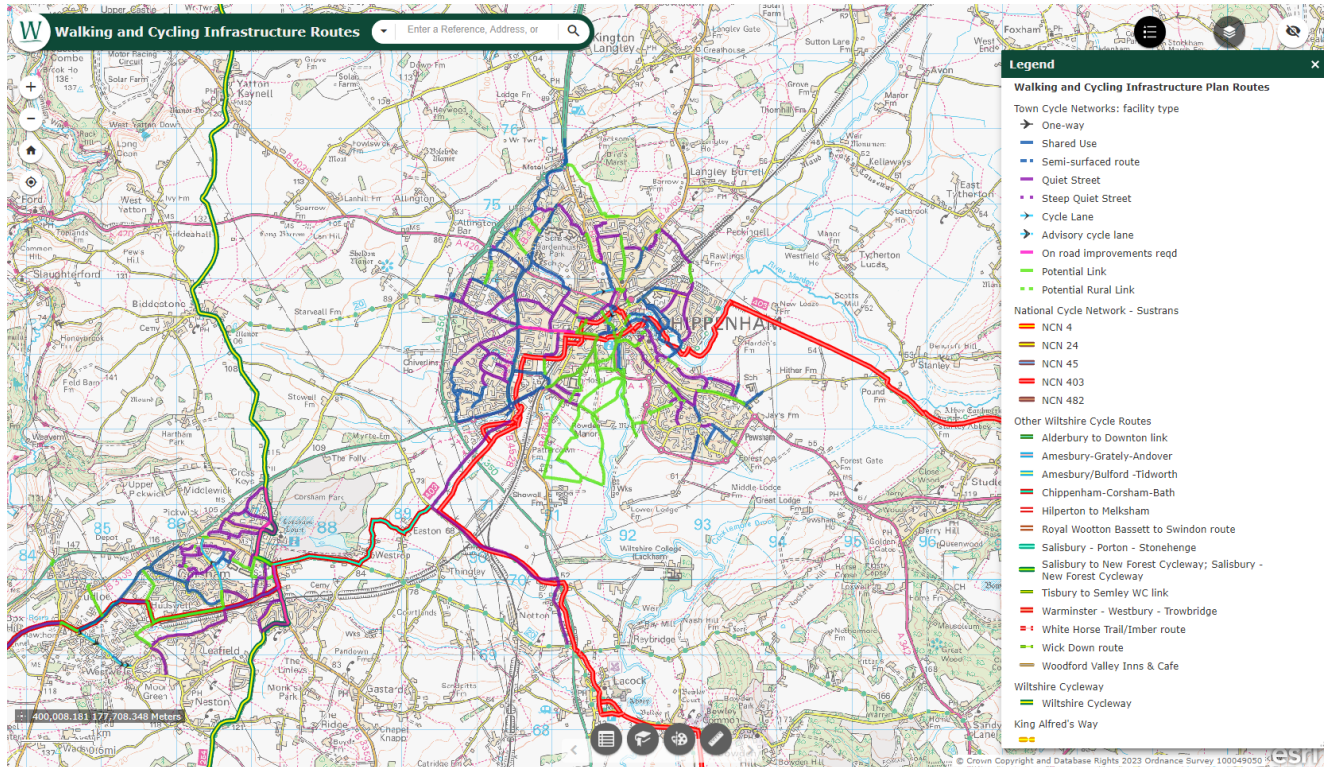
### Active travel network

Active travel plays an important role in serving local, shorter distance trips within the West Wiltshire market towns.

The walking and cycling network is predominantly focused on connecting key local origins and destinations within the town to the east of the A350. Due to the nature of the existing A350 and its peripheral location to the town, there are no cycling and walking routes along its length. There are a small number of east-west connections across the A350.

The main cycle routes (existing and potential) are shown in Figure 3-9. The main north-south route to the west of the town is via the B4528 Hungerdown Lane and Hardenhuish Lane. The main east-west route is via Frogwell, which passes across the A350. NCN route 403 crosses the A350 via a bridge to the south west of the Chippenham urban area and provides connection south to Lacock village and west to Corsham (and onwards towards Bath) via an identified inter-urban route.

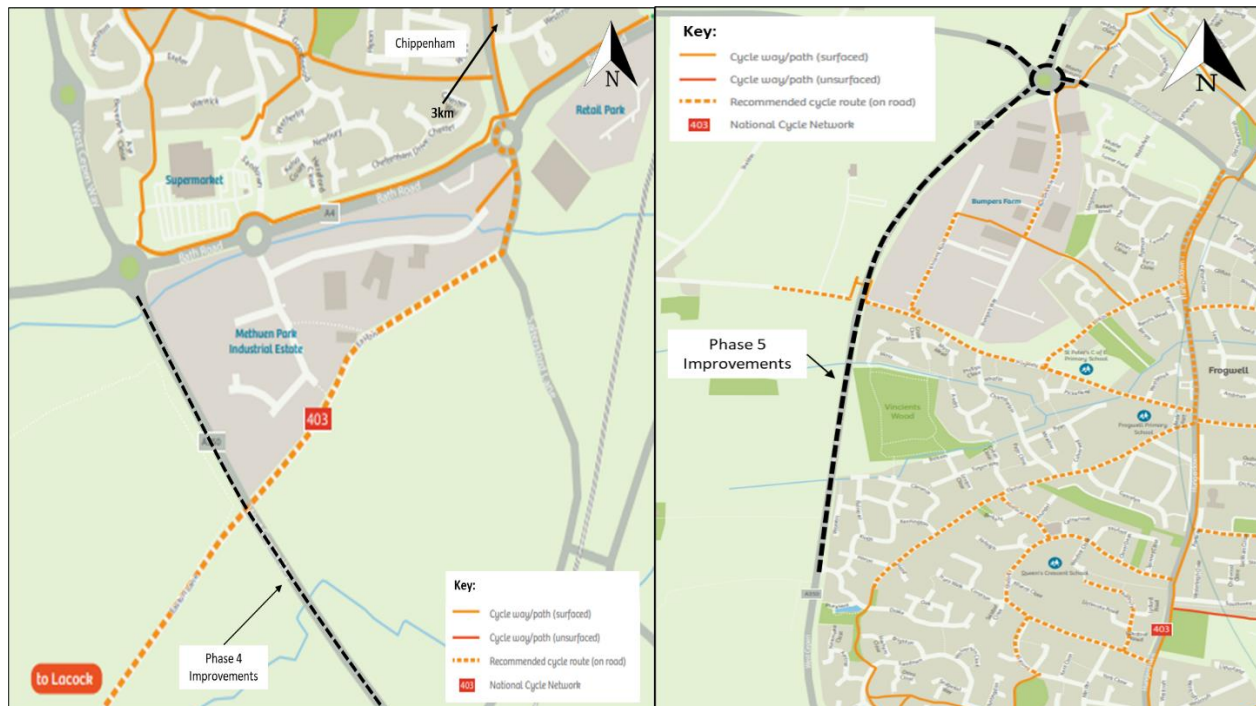
**Figure 3-9 - Key cycle routes in and around Chippenham**



[Walking and Cycling Infrastructure Routes \(arcgis.com\)](https://www.arcgis.com)

The stretch of the A350 between Chequers Roundabout and Lackham Roundabout, where Phase 4 Improvements are planned, is south of Chippenham's urban area, and subsequently, there is a little demand for walking and cycling movements. As seen in Figure 3-10, a National Cycle Network route (NCN 403) crosses over the A350 via a bridge on Easton Lane, with the route providing a connection between many west Wiltshire towns, including Chippenham and Melksham.

Figure 3-10 - Cycle provision in the vicinity of Phase 4 of the Planned Improvements<sup>15</sup>



Between Cepen Park South Roundabout and Bumpers Roundabout, where Phase 5 Improvements are proposed, there is also infrastructure for active travel, as seen in Figure 3-10. A pedestrian / cycle bridge provides a crossing route over the A350, allowing active travellers from the Chippenham side of the carriageway to access amenities such as Chippenham Rugby Football Club on the western side of the carriageway.

There is limited active travel provision at Bumpers Farm Roundabout, apart from a shared-use path, which provides for north-south movements between residential neighbourhoods on the north side of the Bristol Road, to the Bumpers Farm Industrial Estate, and its adjacent retail area, on the south side of the road. In addition, there is a central island on the north arm of the roundabout, allowing pedestrians to cross to the western side of the A350 more easily.

Further information in relation to active travel provision can be found in Appendix A.5.

### 3.2.2.3. Travel patterns

Data indicates that, overall, there is net out-commuting from Wiltshire to surrounding areas<sup>16</sup>. There is a significant flow between Wiltshire and Swindon.

The A350 Growth Zone represents a **major agglomeration of economic activity** and there is a strong relationship between settlements on the corridor generating inter-urban travel; there is therefore a relatively **high degree of self-containment** within the zone (approximately 76% of residents live and work within the zone). However, there is also an important relationship with surrounding economic centres, including Bristol and Swindon, generating in/out commuting and business-related trips. Of the 24% of the A350 Growth Zone residents working outside of the zone, almost half travel to these destinations.

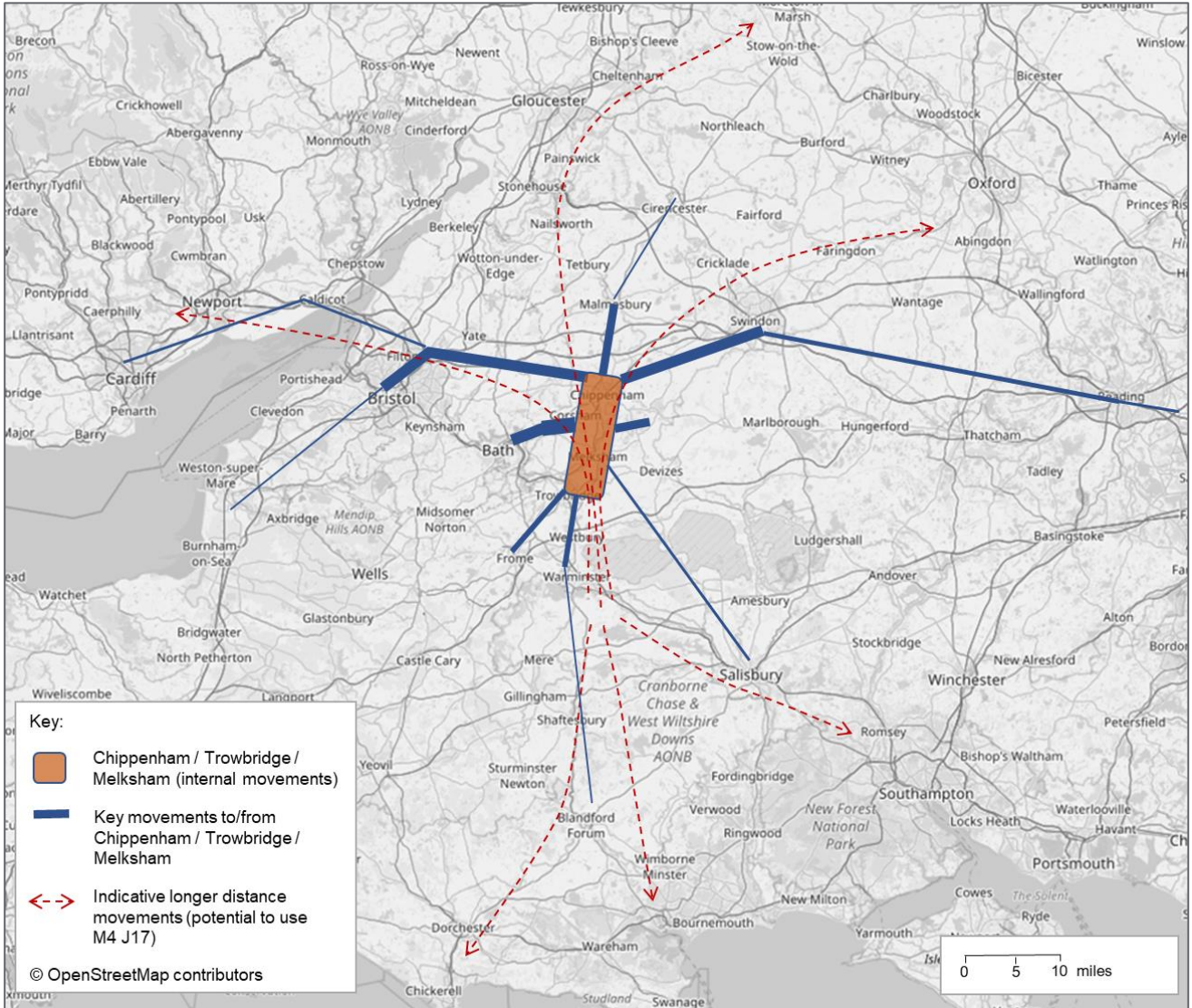
<sup>15</sup> Source: Chippenham Cycle Map, Connecting Wiltshire. Available at: <https://www.connectingwiltshire.co.uk/getting-around/cycling/cycle-maps/routes/>

<sup>16</sup> Based on Census data (2011)

Furthermore, there are longer distance travel demands through Wiltshire – in particular to/from the south coast to the M4 corridor or further north e.g. the Midlands. This includes business and leisure trips, but also freight demand associated with the south coast ports.

**Figure 3-11** provides an illustrative representation of key travel patterns in the context of the scheme, based on interpretation of Census journey to work data and traffic model data.

**Figure 3-11 – Illustrative travel patterns**



The A350 at Chippenham therefore serves a range of purposes, including:

- medium to longer-distance trips between key centres such as Bristol, Swindon, Reading/London and the towns in the northern section of the A350 corridor (Chippenham, Melksham and Trowbridge);
- providing access to employment sites surrounding M4 Junction 17, including short to medium distance trips from the west Wiltshire A350 towns; and
- longer distance trips between areas such as the West/Wales, Midlands, Thames Valley and the South Coast (including the ports at Poole, Southampton and Weymouth).



#### 3.2.2.4. Existing arrangements at A350 Chippenham

The Chippenham bypass, which routes to the west of Chippenham town centre, is an important section of the A350, which serves as a strategic route between the M4 in the north, and Poole in the south.

Originally, the A350 Chippenham Bypass was built as a single carriageway in the 1990's. Although initially built as a single carriageway, the highways boundary was secured and bridges were constructed to future-proof the bypass corridor for the full dualling. Over the past decade a comprehensive programme of A350 dualling and junction improvements has been underway, with Wiltshire Council having already successfully completed the first three phases of the programme. The A350 Chippenham Bypass phases 4 & 5 scheme will build upon this work and will complete the Council's aim to dual the entire Chippenham Bypass

The area covered by Phase 4 is situated between Lackham Roundabout, approximately 3km south of Chippenham town centre, and the approach to Chequers Roundabout, which was dualled as part of the Phase 3 works. The stretch of road is approximately 1.5km in length. Phase 5 covers a section of the A350 between Bumpers Farm Roundabout and Cepen Park South Roundabout, which were dualled as part of the Phase 2 and Phase 3 works respectively. The section lies approximately 2km to the west of the town centre and is 1.4km in length.

Bumpers Farm Roundabout is a five-arm priority roundabout. The A350 runs north-south and the A420 east-west. The roundabout also provides the only access to the Bumpers Industrial Estate, to the south of the junction.

#### 3.2.2.5. Existing traffic demands at A350 Chippenham

Analysis using the Wiltshire Transport Model has informed a profile of the existing traffic demands at the A350 Chippenham (2018 base data). A diagram detailing the traffic flows along the A350 is attached in Appendix A.4.

The data shows that traffic volumes on the A350, during the AM peak (08:00 to 09:00) are highest on the southern arm of the Lackham Roundabout, where flows reach 1182 vehicles on the northbound carriageway and 992 on the southbound carriageway. Flows are also particularly high on the A350, just north and south of Bumpers Farm Roundabout. On the northern arm, NB flows reach 1140 vehicles and SB flows are 966 vehicles, just lower than the figures seen at the Lackham Roundabout.

Flows between Lackham Roundabout and Chequers Roundabout are slightly lower during the AM peak (752 vehicles NB and 477 vehicles SB, reflecting the fact that many vehicles travelling northbound route into Chippenham via the B4528 from Lackham Roundabout and many vehicles travelling southbound route into Chippenham via the A4, from Chequers Roundabout. Bumpers Farm Roundabout is the busiest of the 3 roundabouts connected to the Proposed Scheme with significant vehicles moving east-west through the roundabout on the A420, as well as north-south along the A350.

HGVs account for approximately 10% of all traffic on the A350. This will not reflect more recent factors affecting HGV movements via the A36/A46 at Bath, including the introduction of the Bath Clean Air Zone<sup>17</sup> and also a temporary weight restriction imposed on the Cleveland Bridge (A36). These factors are expected to be associated with an increase in HGV demand on the A350.

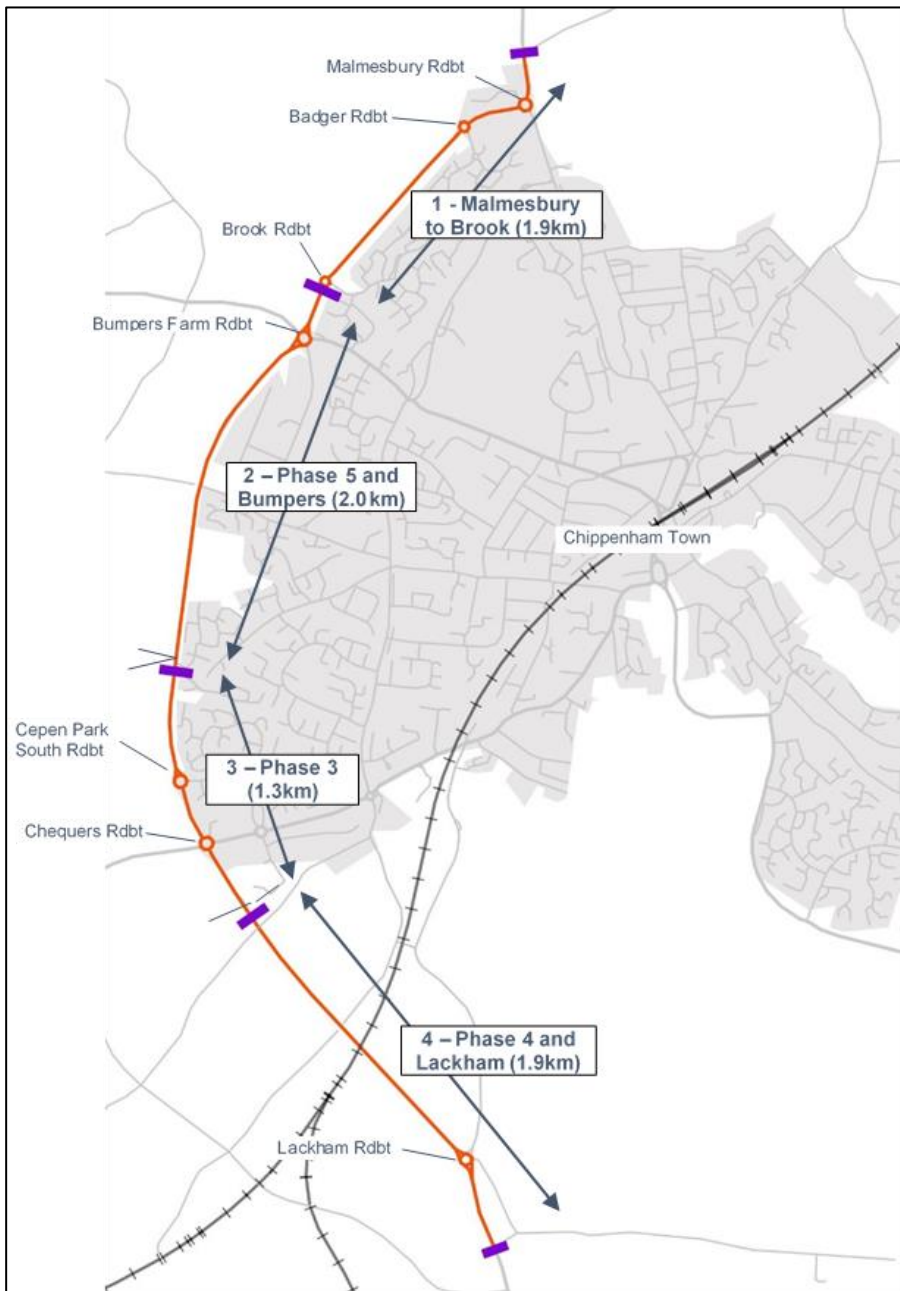
#### 3.2.2.6. Congestion and delays

TomTom Average journey time data for the A350 Chippenham Bypass has been analysed for the period January-February 2019, to capture average journey times following completion of the Phase 3 improvement schemes. The TomTom data was collected in a small period due to it being one of the only windows in which highway works were not being undertaken in the area. The data highlights journey time analysis at seven time periods across the day, across the whole length of the Bypass (see Figure 3-12), thus including the sections which are covered by the Proposed Phase 4 and 5 Improvements.

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<sup>17</sup> <https://www.wiltshire.gov.uk/news/bath-clean-air-zone-correspondence>

Figure 3-12 - Route sections for journey time analysis



The average journey times for both southbound and northbound journeys, across the seven time periods are presented in Table 3-10 and Table 3-11. For southbound journeys, across the full route, journey times are slowest in the AM peak, between 08:30 and 08:45. The journey time of 8:07mins is 1:33mins longer than the time taken in the inter-peak period, between 12:00 and 13:00. A substantial amount of this journey time deviation in the peak periods can be attributed to the 'Phase 5 and Bumpers' section, between Bumpers Farm Roundabout and Cepen Park South Roundabout. This is particularly the case for the AM peaks, where journey times rise to 2:42mins, from just 1:59mins in the inter-peak period. Overall, on the southbound carriageway journey times are slower in the AM peak period, compared to the PM peak hour, which is reflective of traffic flows being less dispersed in the morning.

**Table 3-1010 - Average journey time (minutes) – A350 southbound (Lackham Roundabout to M4 J17)**

Analysis	AM 07:15- 07:30	AM 07:30- 08:30	AM 08:30- 08:45	Inter peak 12:00- 13:00	PM 16:30- 16:45)	PM 16:45- 17:45	PM 17:45- 18:00
Full Route Extent	6:36	7:52	8:07	6:34	6:46	7:29	8:01
Malmesbury to Brook	1:57	2:38	2:39	1:52	2:10	2:34	2:36
Phase 5 and Bumpers	2:02	2:29	2:42	1:59	2:04	2:09	2:11
Phase 3	1:30	1:35	1:39	1:37	1:26	1:38	2:06
Phase 4 and Lackham	1:45	1:50	1:47	1:43	1:45	1:46	1:46

\*Cell colours do not reflect absolute value ranges but have been used as a guide to interpretation with the longest journey times for each route section highlighted red and the shortest in green

For northbound journeys, across the full route, journey times are slowest in the AM peak, between 07:30 and 08:30. The journey time of 8:10mins is 43 seconds longer than the time taken in the inter-peak period, reflecting the fact that journey times are not as variable on the northbound carriageway, as they are on the south. As with the southbound carriageway, journey times on the northbound are slowest in the AM peak period, although the route still suffers from congestion and delay in the PM.

**Table 3-11 - Average journey time (minutes) – A350 northbound (Lackham Roundabout to M4 J17)**

Analysis	AM 07:15- 07:30	AM 07:30- 08:30	AM 08:30- 08:45	Inter peak 12:00- 13:00	PM 16:30- 16:45	PM 16:45- 17:45	PM 17:45- 18:00
Full Route Extent	8:02	8:10	7:34	7:27	7:52	7:52	7:39
Malmesbury to Brook	3:13	2:74	2:45	2:10	2:56	2:53	2:44
Phase 5 and Bumpers	2:03	2:09	2:09	2:03	2:16	2:17	2:13
Phase 3	1:34	1:36	1:32	1:32	1:30	1:33	1:30
Phase 4 and Lackham	1:46	1:46	1:43	1:43	1:44	1:44	1:47

\*Cell colours do not reflect absolute value ranges but have been used as a guide to interpretation with the longest journey times for each route section highlighted red and the shortest in green

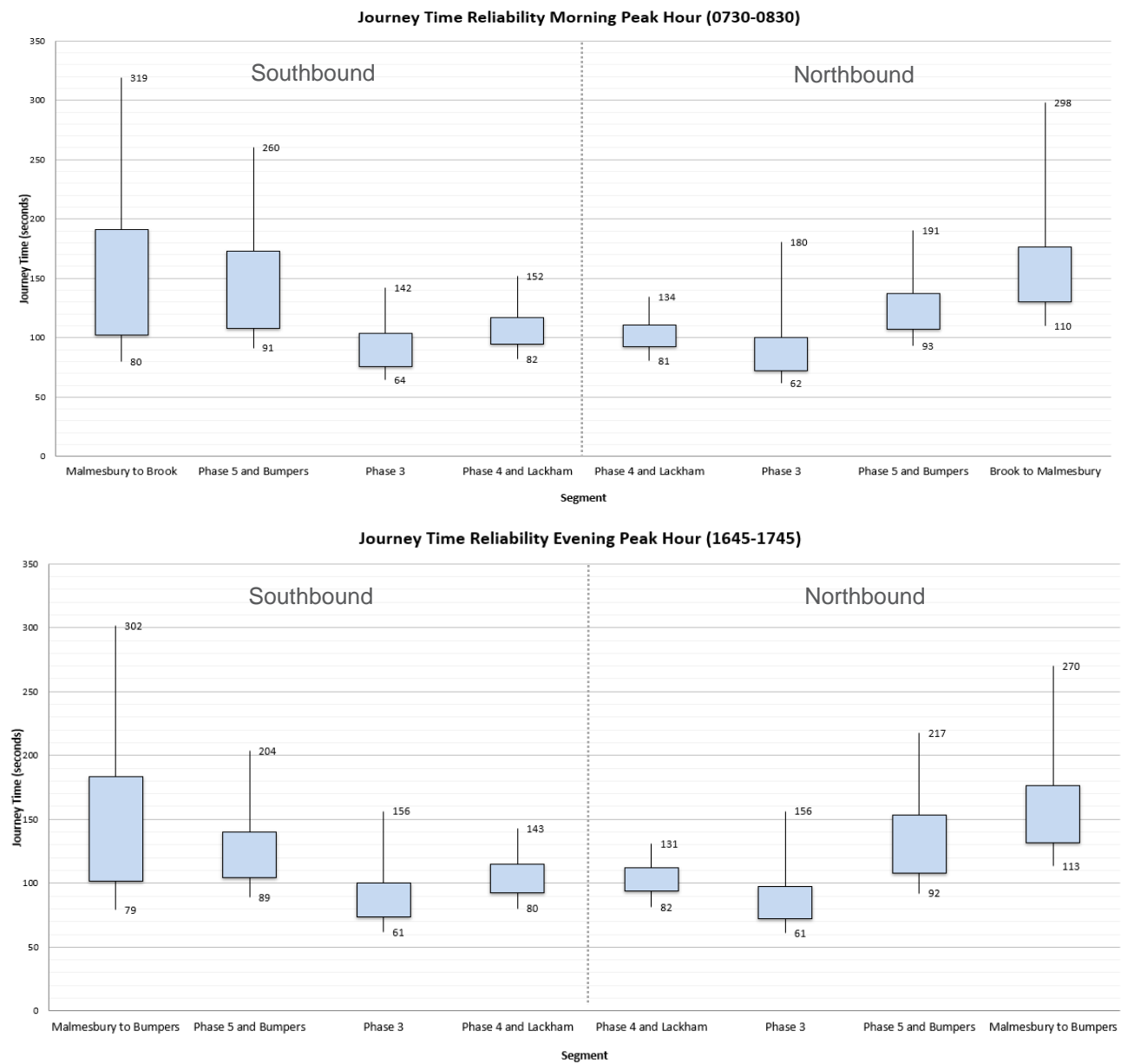
3.2.2.7. Journey time reliability and network resilience

Delays and congestion on the A350 are leading to a lack of journey time reliability, thus forcing individuals and business users to factor additional time into their journey to plan for the worst-case travel time. As a result, it is not just journey time savings that are needed on the A350, but also an increase in journey-time reliability.

Whilst the above figures present the average journey times, the below Figure 3-13 highlights the significant variation in journey times which exist along all sections of the Chippenham Bypass, during the AM and PM peaks. Indeed, reliability issues exist in both the northbound and southbound carriageway, with some journeys taking between 25% and 100% longer than the average travel time, during periods of congestion.

Journey time reliability is worst along sections 1 and 2 in the AM peak (the northern half of the Chippenham Bypass), with journeys taking as much as 100% longer than the average along section 1, and approximately 50% longer along section 2, for both south and northbound traffic. The general trend is the same for both the AM and PM peak, in regard to enhanced journey times.

Figure 3-13 - A350 Chippenham Bypass journey time reliability across the AM and PM peaks

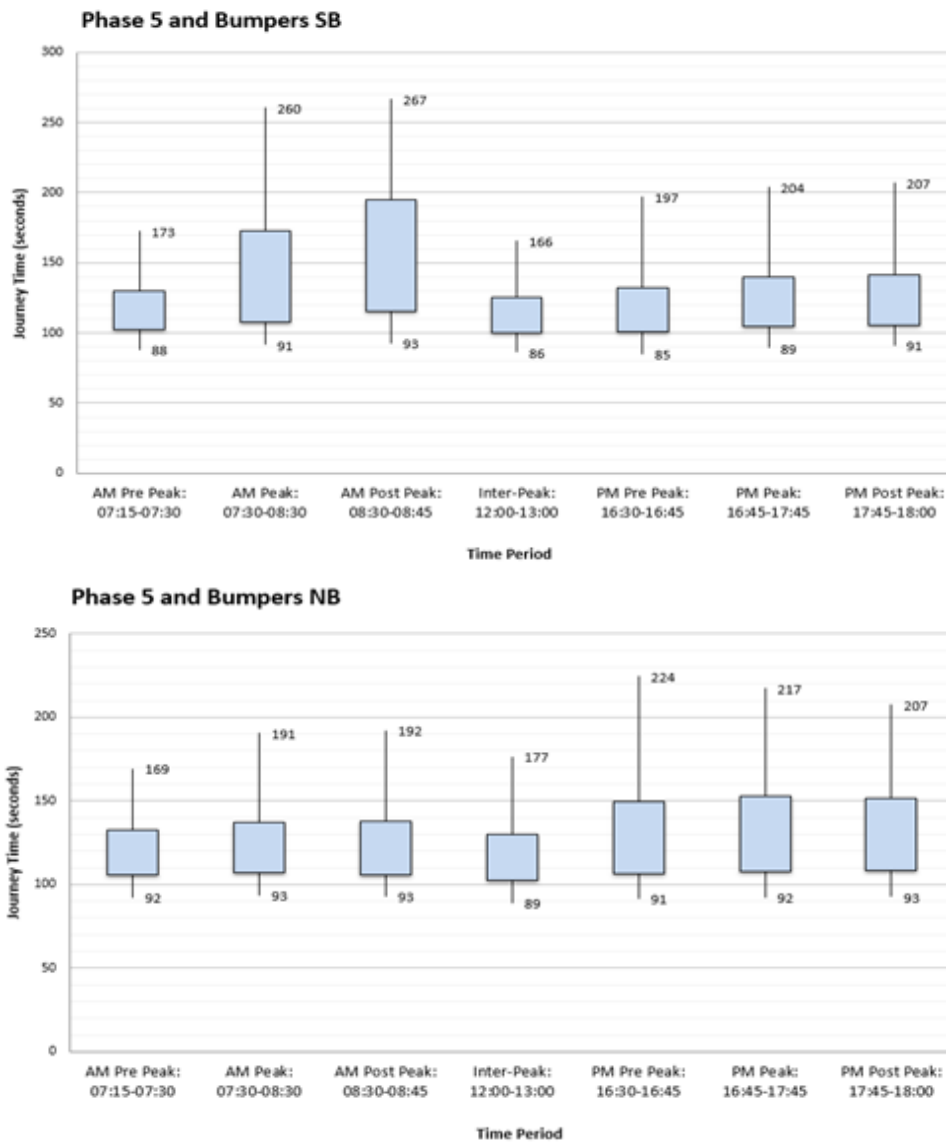


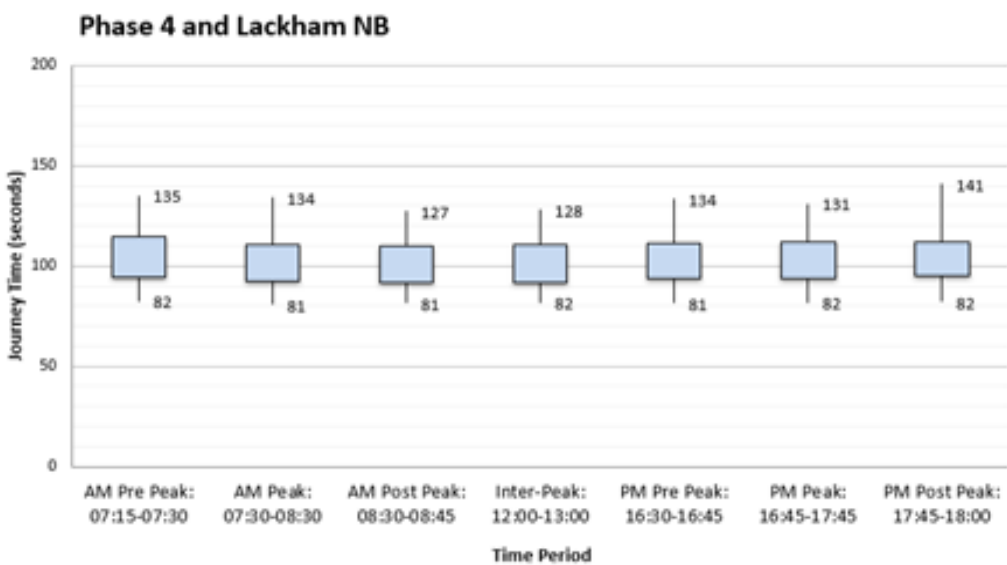
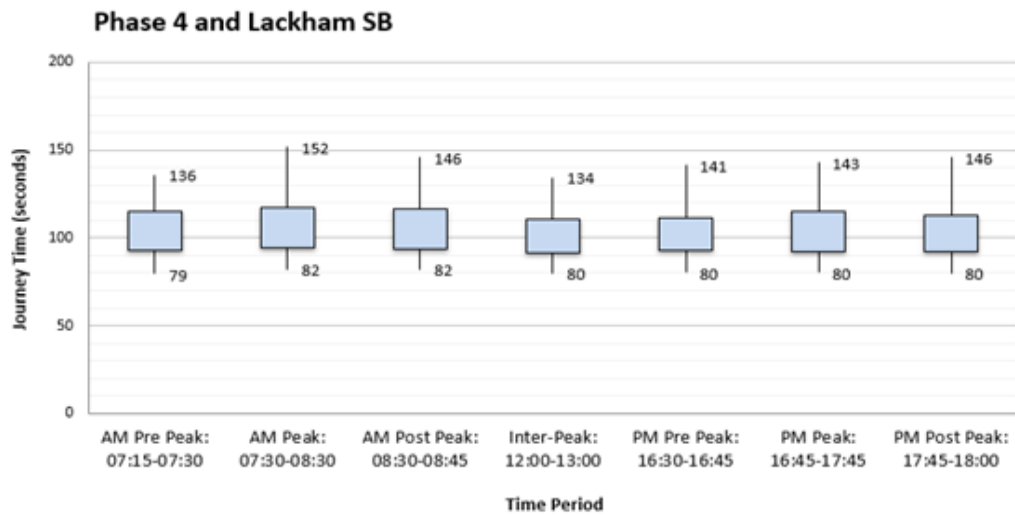
Note - The box plot charts indicate the range of journey time reliability, with the upper quartile (75%ile) indicated by the top of the box and the lower quartile (25%ile) by the bottom; a smaller box equates to greater journey time reliability.

Further analysis of the journey times along the Proposed Scheme (route sections 2 and 4) identifies the following, as seen in Figure 3-14:

- On route section 2 journey time reliability is worse in the peak periods by comparison with the inter-peak.
- Whilst some journey time reliability issues do exist along section 4, there is no significant fluctuation between time periods along this section of the route.
- Journey time reliability along section 2 is a particular problem during the weekday AM (0830-0845) for southbound journeys. Some southbound journeys take 4 minutes 27 seconds, nearly twice as long as the average travel time along this section (2 minutes 42 seconds).
- For northbound traffic travelling along section 2, journey time reliability is worst during the PM (1630-1645) when some journeys take approximately 1 minute 30 seconds longer than average.

Figure 3-14 - A350 Chippenham Bypass journey time reliability across multiple time periods





#### 3.2.2.8. Average speeds

The TomTom data used to record journey time reliability also records average speeds along the entirety of the Chippenham Bypass, as seen in Figure 3-15. This data identifies the delays to traffic travelling northbound, particularly on the approaches to Chequers Roundabout and Bumpers Farm Roundabout. The picture is similar on the southbound carriageway, with traffic against noticeably slowing on the approaches to these roundabouts, reaching average speeds of just 6-15mph on the approach to Bumpers Farm Roundabout, far lower than the national speed limit for A-Roads of 60mph.

Figure 3-15 - A350 average speeds (mph) - weekday AM (07:30-08:30) (TomTom)



A review of average speeds across all time periods for the full route extent, is seen in Table 3-12. Even in the inter-peak periods, where traffic is least congested, average speeds only reach 36mph and 34mph on the south and northbound carriage respectively. In the most congested periods, during the AM peak, speeds drop to below 30mph on the southbound carriageway. Whilst this reduction in average speed is less in the PM peaks, they still drop significantly, to 30mph on the southbound carriageway.

Table 3-12 - Average speeds (mph) along the A350 Chippenham Bypass (TomTom)

Direction	Analysis	AM (07:15-07:30)	AM (07:30-08:30)	AM (08:30-08:45)	Inter Peak (12:00-13:00)	PM (16:30-16:45)	PM (16:45-17:45)	PM (17:45-18:00)
Southbound	Full Route Extent	36	30	29	36	35	32	30
Northbound	Full Route Extent	31	30	33	34	32	32	33

\*Cell colours do not reflect absolute value ranges but have been used as a guide to interpretation with the slowest speeds for each direction of travel highlighted red and the fastest in green

Table 3-13 shows the average speeds across the individual segments of the A350 Chippenham Bypass, during different times of the day. Whilst the data is not uniform, there is a clear trend of average speeds slowing at all sections, during the AM and PM peaks. In the AM period, speeds are slowest within the Malmesbury to Brook section, with average speeds slowing to just 23mph on the southbound, and 24mph on the Northbound. The Phase 4 and Lackham section slows the least during the AM peak, reflecting the results from the journey time analysis, which showed that journey times along the section remain fairly consistent, even in peak times.

In the PM peak, the picture is somewhat different with speeds slowest in Phase 3, where they drop to just 22mph on the southbound carriageway, between 17:45 and 18:00. On the northbound carriageway, speeds are lowest in the Phase 5 and Bumpers section, dropping to 32mph between 16:45 and 17:45. Whilst speeds do slow across all periods in the PM, they do so to a lesser extent compared to that in the AM.

**Table 3-13 Average speeds (mph) broken down by route segment (TomTom)**

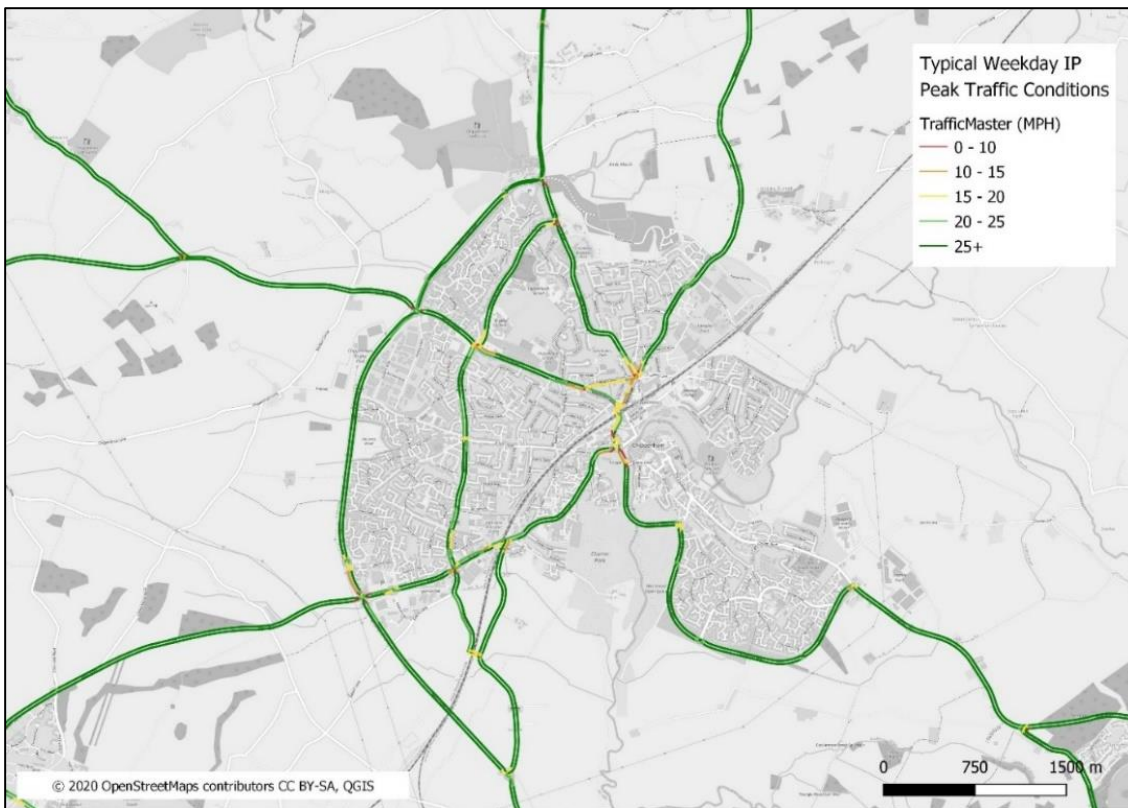
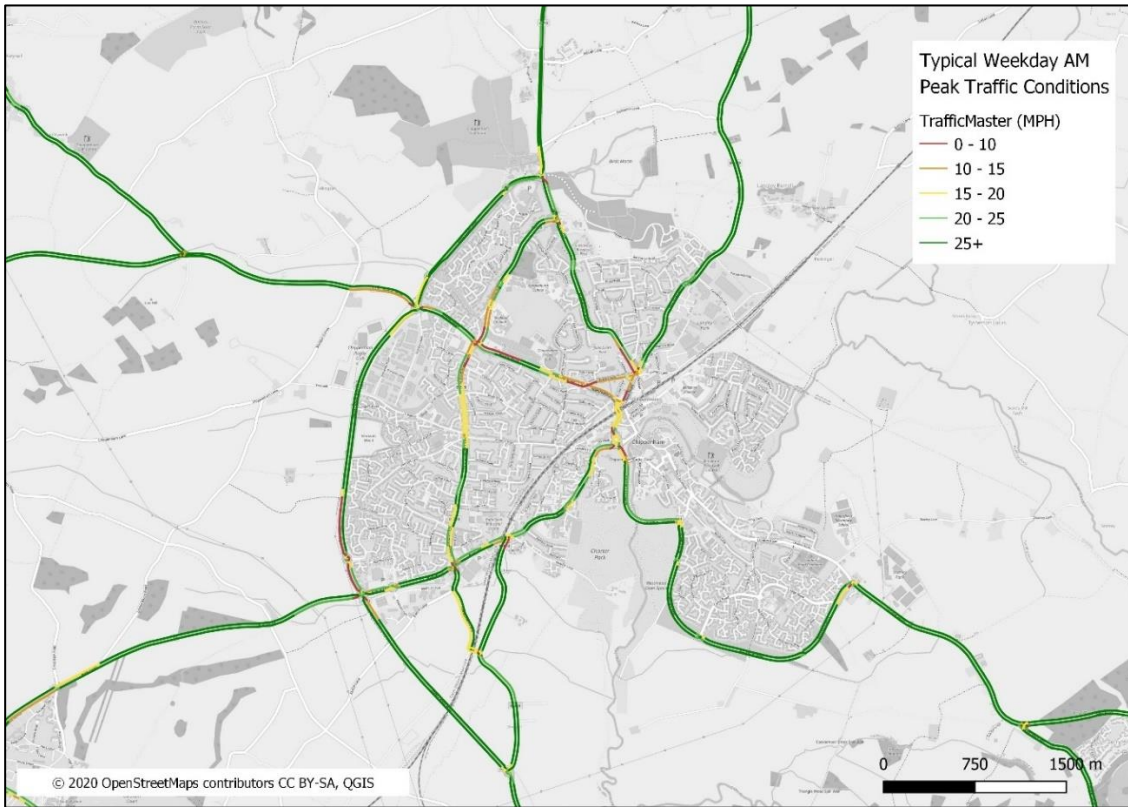
Direction	Analysis	AM (07:15-07:30)		AM (07:30-08:30)		AM (08:30-08:45)		Inter Peak (12:00-13:00)		PM (16:30-16:45)		PM (16:45-17:45)		PM (17:45-18:00)	
		AM	AM	AM	AM	AM	Inter Peak	PM	PM	PM	PM	PM	PM	PM	PM
Southbound	Malmesbury to Brook	32	24	23	33	29	24	24							
	Phase 5 and Bumpers	37	30	27	38	36	34	34							
	Phase 3	32	30	29	29	33	29	22							
	Phase 4 and Lackham	42	40	41	42	42	42	42							
Northbound	Malmesbury to Brook	24	24	28	29	26	27	28							
	Phase 5 and Bumpers	36	34	34	36	32	32	33							
	Phase 3	30	29	30	30	31	30	31							
	Phase 4 and Lackham	41	41	42	42	42	42	40							

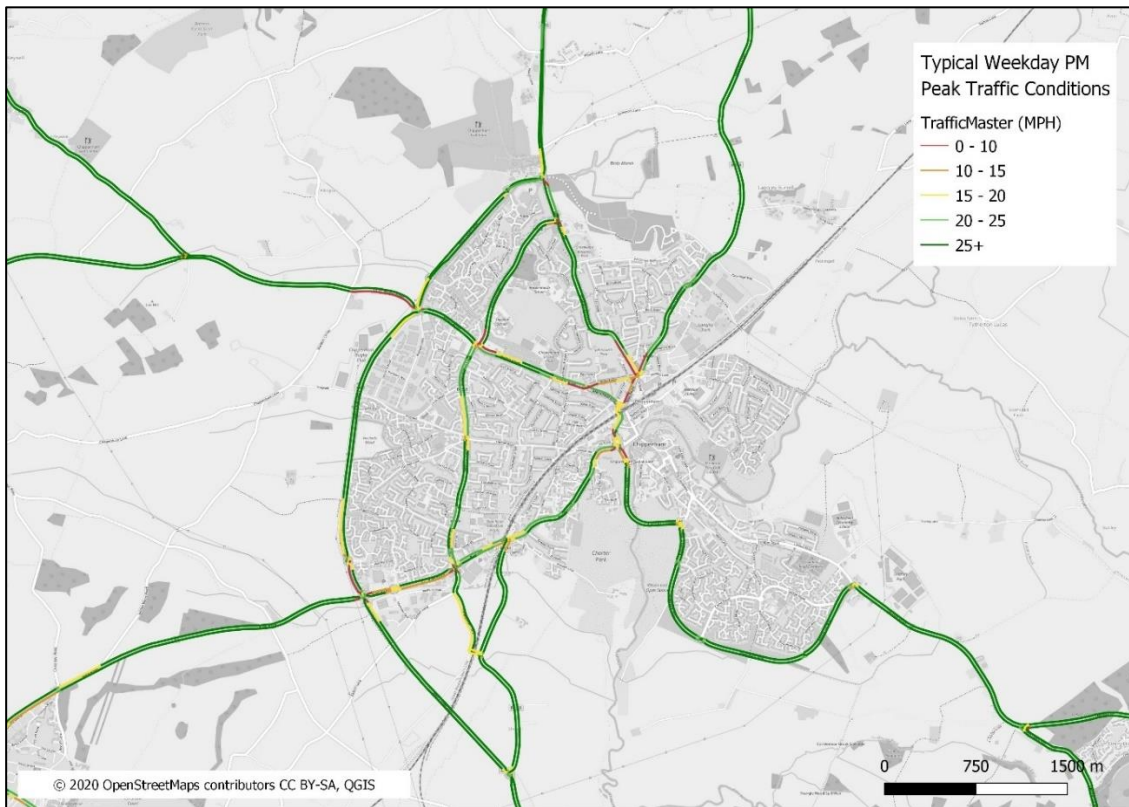
\*Cell colours do not reflect absolute value ranges but have been used as a guide to interpretation with the slowest speeds for each direction of travel and route segment highlighted red and the fastest in green

Whilst the TomTom data highlights network conditions exclusively on the A350, DfT Traffic Master data provides insights into average speeds across the Chippenham highway network during the AM peak, inter-peak and PM peak periods on a typical weekday, as seen in Figure 3-16. As would be expected, the data shows reduced average speeds on the approaches to many of the A350 junctions. As an example, traffic on the A4 is slow at the Chequers Roundabout, where it junctions with the A350 throughout the day, particularly during AM and PM peaks. At Bumpers Farm Roundabout, speeds are also particular slow on the A420 Bristol Road, particularly during the AM peak period.



Figure 3-16 - Typical weekday traffic conditions, 2018 (TrafficMaster)





### 3.2.2.9. Safety performance and collisions

Collisions can have an adverse impact on the operation and resilience of the A350 increasing journey times along the route. The poor journey time reliability created by such incidents can also force drivers to travel through the residential areas of Chippenham, leading to an impact on local traffic, as traffic is pushed onto local roads which are less able to cope with high traffic volumes. The associated increased traffic volumes on local roads is also linked to higher collisions, associated with queuing and congested traffic.

Figure 3-17 - Collisions along the A350 Chippenham Bypass between 2018 and 2022, by severity.



Analysis of STATS19 data has been conducted for the five years 2018-2022, which highlights collision severity, as well as collision frequency, as presented in Figure 3-17 and Table 3-14. Over the 5-year period, 56 casualties were recorded, with a total of 65 casualties. Of these, 1 was fatal, occurring between Cepen Park South roundabout and Bumpers Farm Roundabout; 7 were classified as serious; and other 48 were classified as slight.

There is a noticeable collision cluster at three of the main roundabouts along the Chippenham Bypass, at Malmesbury Roundabout, Bumpers Farm Roundabout and Chequers Roundabout. A collision cluster is defined as a site that has recorded three or more 'injury collisions' within a three-year period and a 35-metre radius. The most concentrated of these clusters is at Chequers Roundabout, where 13 collisions occurred at the roundabout itself, or on its approach arms, whilst 9 collisions occurred at Bumpers Farm Roundabout. Wiltshire Council have identified shunting as the cause of these accidents, incidents which are commonly associated with congested traffic, as well as poor signalling / observation. This highlights how congestion is likely causing safety issues on the A350 Chippenham Bypass. In addition, several collisions can be identified along the stretch of the A350 where the bypass switches from one lanes to two, and vice-versa, on the approach to a number of the roundabouts along the Proposed Scheme, implying a potential safety risks associated with lane transitions. These merge points will be removed completed as a result of the Proposed Scheme, highlighting its potential safety benefits.

The findings above are in line with those in the Chippenham Transport Strategy, which identified the persistent presence of a collision cluster at the Bumpers Farm Roundabout. The strategy identified how rear end shunts, associated with queuing traffic, make up a significant amount of the collisions, highlighting the impacts that congestion on the approach arms of the roundabout are having on safety, at the Bumpers Farm Roundabout.

Table 3-15 presents the collision rate per year by severity index for the scheme area, which is 14.29%, below the national average for this type of road.

**Table 3-14 - Accidents in the scheme area by severity and number of casualties (STATS19, 2018-2022)**

Year	Accidents				Casualties			
	Fatal	Serious	Slight	TOTAL	Fatal	Serious	Slight	TOTAL
2018	0	0	7	7	0	0	7	7
2019	0	3	12	15	0	4	15	19
2020	0	1	8	9	0	1	10	11
2021	0	1	14	15	0	1	17	18
2022	1	2	7	10	1	2	7	10
Total	1	7	48	56	1	8	56	65

**Table 3-15 - Accident rate per year and Severity Index**

Date Range	Calculation	Fatal	Serious	Slight	TOTAL	Severity Index
2018-2022	No. of accidents	1	7	48	56	14.29%
	Accident rate per year	0.2	1.4	9.6	11.2	

Table 3-16 compares the accident rates in the scheme area with the national average. Reducing the frequency of collisions along the A350 is an important objective for the scheme (see section 3.2 for instance). Improving road safety remains a key objective of the Council, especially in a largely rural county with significant lengths of carriageway A class roads, which nationally tend to have a worse safety record than other road types. Dualling busy key sections of the A350 Major Road Network in Wiltshire is consistent with the Council objective to improve road safety.

**Table 3-16 Comparison of accident single rate in the scheme area against national averages.**

Date range	Area	Calculation	Fatal	Serious	Slight	TOTAL	Severity index
2018-2022	Scheme area (6.27km)	No. of accidents	1	7	48	56	14.29%
		Accident rate per year	0.2	1.4	9.6	11.2	
2022	National*	No. of accidents	1,711	28,031	105,738	135,480	21.95%
		Accident rate per billion vehicle miles	5	91	413	328	

\* National Statistics: (RAS0201) Reported road casualties Great Britain, annual report: 2022.

### 3.2.2.10. Impacts of COVID-19

Changing work and travel habits, which have evolved as a result of the COVID-19 pandemic have the potential to influence future travel patterns and demands, including at the A350 Chippenham Bypass. A full data collection exercise along the Proposed Scheme has not been undertaken since the end of the most significant impacts of the lockdown, due to time constraints. However, data from across England's highways network including within Wiltshire, shows that traffic demands on the SRN and the MRN have returned to within 90% of

pre-pandemic levels and our continuing to rise. This correlates well with insights from Wiltshire Council and some further spot locations on the A350, where recent counts indicate traffic levels are within at least 90% of pre-pandemic levels, and in some instances, they have surpassed them. This continuity in traffic levels has been reflection in the calculations in the economic dimension.

### 3.2.2.11. Forecast changes in Travel Demands

The Wiltshire Transport Model (WTM)<sup>18</sup> forecasts a 28% increase in 12-hour vehicle trips between 2018 and 2036 for potential 'in-scope' demand (i.e. sector movements with higher potential to use the A350 at Chippenham). This is based on a core growth scenario (population and land use assumptions)<sup>19</sup>, reflecting committed developments and in line with national population and traffic growth projections. The forecast traffic demand growth varies between locations (Table 3-17). The growth in trips to/from Chippenham is of particular significance. The forecasts do not specifically consider impacts of COVID-19 on traffic growth.

**Table 3-17 Forecast change in 'in-scope' vehicle trips (2018 to 2036, 07:00 to 19:00)**

Location	Change in origin trips	% change (2036-2018)	Change in destination trips	% change (2036-2018)
Chippenham (town and rural hinterland)	5,362	+20%	5,132	+20%
Melksham	774	+23%	803	+22%
Trowbridge	1,853	+31%	1,695	+31%
Swindon (and surroundings)	2,615	+34%	3,314	+26%
Malmesbury	439	+9%	638	+11%
West of England (Bristol, Bath, North Somerset, South Gloucestershire)	7,212	+21%	6,563	+21%
Dorset	2,016	+27%	2,075	+26%
All 'in-scope' trips (includes additional locations to those shown above)	47,630	+28%	47,630	+28%

Source – Wiltshire Transport Model

### 3.2.3. Business needs and service gaps

The current issues and limitations relating to the A350 Chippenham Bypass, combined with expected growth in travel demands, present a barrier to achieving local, regional and national strategic priorities (as set out in section 3.1). Table 3-18 provides a summary to demonstrate these relationships, which are explored further below. Section 3.2.4 further considers the future impacts without intervention ('business as usual').

<sup>18</sup> The Wiltshire Transport Model (WTM) is the current forecasting tool relevant to the A350 corridor in west Wiltshire. It is a highways model focused on the Wiltshire area but has a national coverage. The WTM takes local planning and land use assumptions together with TEMPro inputs to predict traffic demands in future forecast years. See the Economic Dimension and Appendix B2 for more details.

<sup>19</sup> The WTM core growth scenario reflects land use or transport supply changes with a high degree of certainty (in this case mainly reflecting the current Wiltshire Core Strategy), with overall growth across the modelled area controlled to TEMPro. The WTM is used to further consider alternative growth scenarios as part of the Economic Case.

**Table 3-18 - Business needs relating to the A350 Chippenham Bypass improvements scheme**

Business Need	Constraint due to existing transport arrangements on the A350 Chippenham Bypass				Wider
	Peak period traffic delays	Poor journey time reliability	Capacity constraints (increasing traffic demands)	Safety / collisions	A36/A46 subject to significant constraints
Increase the economic competitiveness and productivity of firms operating in the vicinity of the A350 Chippenham Bypass	xxx	xxx	xxx	x	x
Meet local housing / employment demand in line with the spatial strategy for West Wiltshire	xx	xx	xxx	x	x
Improved north-south connectivity (holistic approach)	xx	xx	xxx	x	xxx
The safe operation of the MRN	xx	xx	xx	xxx	xxx
Reduce congestion on local roads in Chippenham	xxx	xxx	xx	xx	xx

xxx – higher impact / xx – medium impact / x – lower impact

### 3.2.3.1. Increase the economic competitiveness and productivity of firms operating in the vicinity of the A350 Chippenham Bypass

The A350 is a key strategic route for the economic development of Chippenham, and the wider Wiltshire and Western Gateway, region. It is a critical element of the Swindon and Wiltshire Local Economic Plan (SWLEP) and is identified as a 'growth zone' highlighting its importance. The report identifies the need for infrastructure improvements along the A350 to support future economic growth noting that productivity is slightly lower along the A350 corridor, compared to the national average. Congestion and poor journey time reliability is one of the factors that leads to low productivity, and thus tackling these transport issues is key to unlocking economic growth in the region. It also imposes additional costs to existing and prospective businesses and reduces the attractiveness of the area for new inward investment.

A key priority of the plan is to deliver significant job growth at the strategic employment sites along the corridor to provide high quality jobs for local people. A resilient A350 is key to this, in enabling workers to reliably commute to and from employment sites, using the MRN.

### 3.2.3.2. Meet local housing / employment demand in line with the spatial strategy for West Wiltshire.

As discussed in section 2.1.7, significant housing growth is planned in Chippenham over the coming decades. The Local Plan Review identifies a need for 46,000 new dwellings and 26 ha of employment land between 2016 and 2036, in Wiltshire. Within Chippenham more specifically, over 9000 new dwellings are said to be required, over the same period.

This planned future housing, and the associated jobs growth, which is likely to come with it, will significantly increase pressure on the A350 Chippenham Bypass. The single carriageway sections of the Bypass lacks the available capacity, particularly during peak periods, to accommodate the additional traffic demands, without significant adverse impacts on existing transport users.

### 3.2.3.3. Improved north-south connectivity to enable firms to access new customers and workers.

At a strategic level, efficient north-south connectivity between the south coast (including its international gateways) and the M4 is a key priority for the Western Gateway STB and is subject to an ongoing study by

National Highways. As part of the MRN, the A350 provides a primary north-south connection, and is important for freight movements, as well as personal travel. Wiltshire Council have taken a holistic approach to improving north-south connectivity, implementing improvements to rail services, alongside the improvements to the A350, which have been made around Chippenham (Phases 1 to 3) and to the south of Melksham.

Such improvements are all part of the strategic aim to better connect the north and south of Wiltshire, boosting productivity, and unlocking economic growth, as firms are better able to access wider regional markets and labour pools. Without the intervention, the capacity and safety issues of the single carriageway sections of the Chippenham Bypass are likely to become a 'bottleneck' on the A350 corridor, putting at risk the full benefits of wider investment along the corridor being realised.

#### 3.2.3.4. The safe operation of the MRN

Safety is a critical operational objective and reducing the risk of death and serious injuries on the MRN is a key objective of the Department for Transport. Wiltshire Council also have targets relating to collision reduction, a target in line with the UK Government's policy around 'Vision Zero.' The evidence indicates a number of collision clusters along the A350, which are associated with areas of high congestion and lower average speeds.

The impact of collisions on the MRN are two-fold; not only do they risk individuals' health and safety, they also cause disruption to other users, increasing journey times and reducing productivity. The lack of alternative north-south routes means that the network is particularly sensitive to the impact of collisions. A reduction in collisions on the A350 is thus critical to the effective performance of the overall highway network in the region.

#### 3.2.3.5. Reduce congestion on local roads in Chippenham

As a bypass, the A350 around Chippenham has a particularly important role in not only reducing the journey times of strategic traffic on the A350 corridor, but also in ensuring that local roads within Chippenham remain unburdened by the unnecessary through traffic of freight traffic, which causes congestion and increases the journey time for local journeys. The efficient and reliable movement of traffic on the A350 Chippenham Bypass is critical to keeping strategic traffic off the local roads, and subsequently, the existing constraints on the Bypass are problematic.

### 3.2.4. Impact of not changing

Failure to address the problems arising from the existing arrangements (presently, and in future years) would result in adverse consequences for the MRN/SRN, affecting transport users, businesses and wider society.

#### 3.2.4.1. 'Business as Usual' scenario

The 'Business as Usual' scenario from the OBC has been reviewed and is assumed to comprise:

- Regular asset maintenance related activities on and around the A350 Chippenham Bypass;
- Implementation of a new junction on the A350 in relation to the Southpoint development, on the section of the A350 south of Chequers Roundabout;
- No other significant changes to the transport network or transport services (which would have a significant bearing on the problems);
- Transport mitigation associated with new developments (of sufficient size/impact) determined on a case by case basis (in accordance with planning regulations).

#### 3.2.4.2. Consequences of no intervention

Without the A350 Chippenham Bypass improvements, rising congestion will impact north-south connectivity in Wiltshire and undermine the strategic role of the A350 as an important freight and commuter route connecting the MRN to the SRN and the wider Western Gateway area.

Existing issues include slow and unreliable journey times in peak periods and poor safety at congested roundabouts on the A350 Chippenham Bypass. Assuming no capacity enhancements are implemented, these issues will persist and be further exacerbated following the delivery of new housing and employment growth

planned for the Chippenham area over the next 10-20 years. This is forecast to result in increased congestion along the A350 Chippenham Bypass and the local road network.

The problems and issues identified (see Figure 3-18) are closely linked with the relevant local, regional, and national policy objectives (see section 3.1). The Wiltshire LTP, WCS and CSAP all recognise the importance of the A350 providing sufficient capacity to support future growth. It has been frequently acknowledged that forecast transport network issues could hinder economic growth due to the detrimental impact this may have on the attractiveness of the Chippenham area which could prevent investment from developers and businesses.

Without the A350 Chippenham Bypass improvements, the A350 will prejudice the Wiltshire LPR and Future Chippenham growth agenda, and impact on the A350's strategic role. With these growth agendas the need for dualling has been realised, and without this the planned economic growth for the region will be compromised.

**Figure 3-18 - Summary of need for intervention and impact of not changing**

## Causes and Drivers

- The A350 at Chippenham fulfills **multiple functions** including north-south through traffic, access to the M4 and access to the town.
- **High traffic volumes**, with 28,500 vehicles per day using the A350 north of Bumpers roundabout.
- **Inconsistent road standard** with sections of dual and single carriageway
- **Housing and employment strategy** focused around the A350, driving increased traffic growth.

## Problems and Issues

- **A350 journey times and delays** - Long journey times in peak periods with southbound journeys along the full stretch of the A350 Chippenham Bypass taking approximately 1 minute and 33 seconds longer during the AM peak hour compared with inter-peak travel conditions which equates to approximately 20% of the AM (0830-0845) journey time.
- **A350 journey time reliability** - Poor journey time reliability in peak periods, along the stretch of road between Bumpers and Cepen Park South roundabouts with some journeys taking 100% longer than average.
- **Average speeds** - Average speeds along the full stretch of the A350 Chippenham Bypass up to 7 mph slower during peak periods compared with the inter-peak, caused by the congestion pinch-point at Bumpers roundabout.
- **Collisions / road safety** - Collisions related to congestion at key junctions with a total of 47 accidents occurring along the A350 Chippenham Bypass in the 5 years between September 2013 and July 2018.

## Consequences (No Intervention)

- Capacity on the A350 will **constrain additional housing and employment growth** planned for the Chippenham strategic sites. Reduced attractiveness of the town centre for businesses. Increased business costs, lower productivity and reduce access to labour markets.
- **Strategic role of the A350 threatened** with potential negative connectivity and economic impacts for Chippenham, the west Wiltshire towns and north-south connectivity in the Western Gateway STB area.
- **Increasing rerouting onto parallel roads** during peak periods, leading to further impacts on journey quality, air quality and safety of local routes.

### 3.2.4.3. The need for government intervention

A strategic and holistic approach to the A350 is required to fully meet the identified business needs of Wiltshire Council and DfT. The 'Business as Usual' scenario would result in a number of limitations and undesirable outcomes, as identified above. Wiltshire Council is not able to fully fund a strategic intervention from its own resources (including existing / anticipated developer contributions). A more piecemeal approach to completion of the A350 Chippenham Bypass dualling is not considered to be desirable, including due to:

- greater disruption to users, due to multiple construction / works phases; and



- a lack of strategic planning and certainty, which would adversely impact business confidence and inward investment and could impact the viability of the preferred growth strategy for Wiltshire (through the Local Plan Review process).

As demonstrated within the Strategic Context (Section 3.1.5.1) the scheme presents a strong alignment with the DfT's MRN fund and complements other MRN / LLM scheme proposals on the A350 corridor. Intervention is required now to avoid the 'Business as Usual' issues identified above and to ensure that upgrades to the A350 are delivered in a co-ordinated manner which provides the best overall value against investment.

### 3.3. The investment proposal

This section sets out the scheme objectives, the scope of the scheme and its expected benefits. It provides an overview of how the preferred scheme option has been determined, including the role of stakeholder input. It also highlights some of the key considerations associated with the implementation of the Proposed Scheme, including key risks, constraints and inter-dependencies.

#### 3.3.1. SMART Spending Objectives

The scheme objectives define what the investment seeks to achieve and what success looks like. The objectives have been developed in order that:

- they **address the transport problems and issues** identified in section 3.2.3; and
- they **relate to the relevant strategic objectives and business strategy / needs** (section 3.1) - including those of DfT, Wiltshire Council, National Highways, Western Gateway STB and Swindon and Wiltshire Local Enterprise Partnership).

A hierarchy of objectives has been developed, including high-level objectives, specific transport objectives and related measurable outcomes.

##### 3.3.1.1. High-level and transport objectives

Linked high-level objectives and transport objectives have been identified in Table 3-19. The table demonstrates the relationship to particular strategic objectives (as detailed within the Strategic Context – section 3.1) and the overall business need in the context of the problems and issues associated with the existing arrangements. This helps to illustrate a thread of strategic alignment between the A350 Chippenham Bypass improvements scheme and wider strategic priorities.

**Table 3-19 - Objectives and measures of success**

High-level objectives	Transport scheme objectives	Business need addressed <sup>20</sup>	Contribution to strategic objectives <sup>21</sup>	Measures of success (basis for monitoring and evaluation)
Reduce congestion  Support the SRN	Improve journey time reliability and reduce total delay along the A350 Chippenham Bypass (supporting journeys on the MRN and to/from the M4 SRN).	1, 4, 5	DfT: 1 / NH: 2 / SEP: 2 / LTP: 4 / WG: 5	Change in peak period (AM/PM) journey times along the A350 at Chippenham  Change in day to day variability of peak period journey times
Support economic growth and rebalancing	Protect the strategic role of the A350 for north-south connectivity and thus also: <ul style="list-style-type: none"> <li>- preserve its key role as part of the advisory freight route network</li> <li>- minimise traffic reassigning onto the local road network</li> </ul>	1, 3, 4, 5	DfT: 2 / SEP: 2 / LTP: 10 / WG: 2,5 / WCS: 1 / WBP: 1	Change in traffic flows on the A350 at Chippenham, and parallel local north-south routes  Change in average / maximum queue lengths at Bumpers Rbt, by approach arm  Changes in the number and severity of collisions on the A350 and adjacent routes
Support housing delivery	Support planned and future growth in the A350 Corridor and in the A350 and Swindon M4 SWLEP Growth Zones, including the Wiltshire Core Strategy and CSAP and Wiltshire Local Plan Review.	1, 2	DfT: 3 / NH: 2 / SEP: 2 / LTP: 12 / WG: 6 / WCS: 3 / WBP: 1	Approval of Wiltshire Local Plan Review Progress of strategic sites in the A350 and M4 Swindon Growth Zones
Support all road users	Reduce the frequency of collisions along the A350 Chippenham Bypass and parallel routes	4, 5	DfT: 1 / NH: 1,5 / LTP: 8	New / expanded businesses and significance of the A350 operation to investment decisions

<sup>20</sup> Numbering refers to Table 3-18.

<sup>21</sup> Numbering refers to various tables in Section 3.1.5 and Section 3.1.6.

### 3.3.1.2. Measures of Success

The transport objectives have been considered in a 'SMART' context (i.e. Specific, Measurable, Agreed upon, Realistic and Time-bound). The identification of measures of success (Table 3-19) helps to define a more tangible outcome and informs the approach to monitoring and evaluation of the scheme, as set out in the Management Dimension (Section 7.12) and the Draft Monitoring and Evaluation Plan (Appendix E7) – this will include the identification of targets and associated timescales.

### 3.3.2. Scope

The following section sets out what constitutes a successful delivery of the spending objectives, and explicitly identifies what the investment will not be delivering.

The overall scheme scope comprises link and junction capacity enhancements on the A350 Chippenham Bypass, specifically from Chequers Roundabout to Lackham Roundabout (Phase 4) and Bumpers Roundabout to Cepen Park South Roundabout (Phase 5). This also includes changes to walking and cycling provision in the immediate vicinity of the A350 works, where appropriate. The scope is consistent with that at the OBC stage.

Improvements elsewhere on the A350, including those completed previously, or improvements to the surrounding transport network are not included within the scheme scope. This includes the new access junction on the A350 (section south of Chequers Roundabout) related to the Southpoint development.

#### 3.3.2.1. Core investment scope

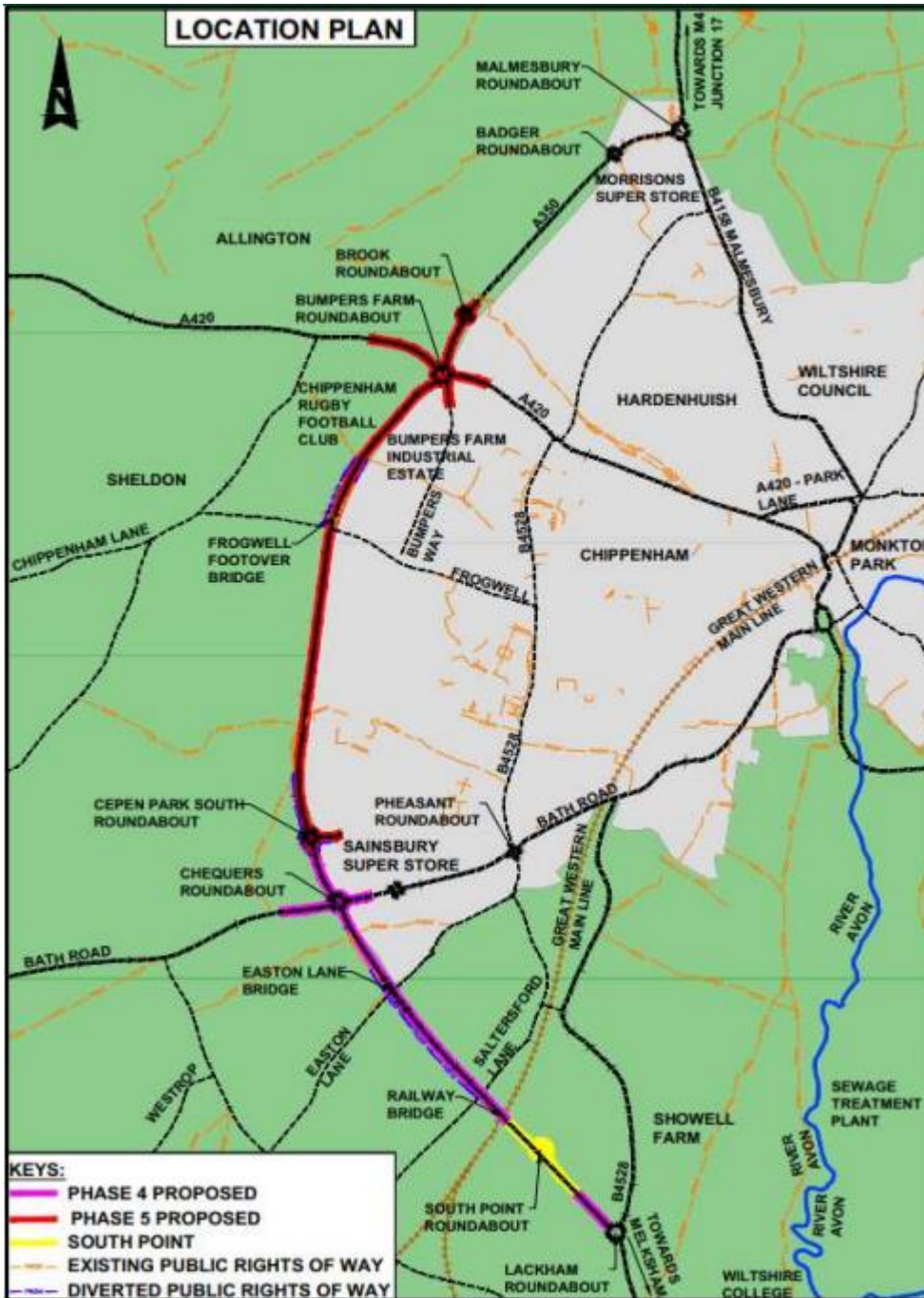
Based on the final design, the scope of investment comprises the following, also illustrated in Figure 3-19:

- **Bumpers Farm Roundabout improvements** - additional lanes and highway capacity on the A420 approaches and exits in both directions. Also additional lanes on A350 northbound approach to the roundabout. Traffic signals will be provided on each of the A420 and A350 arms, and signal-controlled pedestrian and cycle crossings will be added to the northern A350, and eastern A420 arms.
- **Phase 4 dualling (Chequers to Lackham)** - widening the A350 to two lanes in both directions, between Chequers and Lackham roundabouts. A new roundabout at the Southpoint development has recently been built by a developer, and the Phase 4 works will tie into that new junction.
- **Phase 5 dualling (Bumpers Farm to Cepen Park South)** - widening the A350 to two lanes in both directions between Bumpers Farm and Cepen Park South roundabouts. This is the section which passes the rugby club.
- **Lackham roundabout capacity enhancements** - the scheme will complete the dualling of the A350 from the M4 to Lackham Roundabout. There will be some minor changes at the Lackham roundabout to improve traffic flows there.

The scope of the scheme does not involve any changes to the structures across the A350, as there were future proofed for dualling at the time of original construction.

Detailed scheme design drawings are presented in Appendix A.3.2.

Figure 3-19 – Scope of the A350 Chippenham Bypass Phases 4&5 improvements scheme



### 3.3.2.2. Changes to speed limits

The new dualled sections of the A350 will generally have a national speed limit, which is appropriate given the strategic importance of the route, and the role the A350 plays within the wider highway network.

However, speed limits will be reduced at various locations in response to factors including:

- Safety;
- the exiting bypass layout and design constraints;

- the relatively close proximity of some junctions; and
- the need to include for Public Rights of Way changes and crossing locations.

In general terms, the relatively straight dual carriageway sections of the bypass will be subject to national speed limit. However, reductions to 40 / 50mph will be introduced where appropriate.

### 3.3.2.3. Pedestrian and cycle facilities

Elements of the scheme scope involving changes to existing provision for pedestrians and cyclists are set out below. As part of the scheme development a Walking, scheme. The purpose of the report is to provide a review of the design proposals for walking cycling and horse riding that have been included in the detailed design. Previously identified opportunities for improvements from the assessment phase have been reviewed in light of the completed detailed design.

It is not proposed to include pedestrian and cyclist routes alongside this section of the A350 as there are better and safer routes through the adjacent residential areas.

#### **Bumpers Roundabout**

The existing A350 crossing to the north of the roundabout will be upgraded to be traffic signal-controlled. It will be located between two roundabouts which are relatively close together. Traffic speeds will naturally tend to be lower and better controlled here, which will improve the safety for those using the crossing. The new facilities will also tie in and supplement the existing routes.

#### **Drake Crescent - Public Rights of Way Changes**

The current crossing at the end of Drake Crescent is well-used. The new dual carriageway will cut off access at his location, so we will be replacing this facility with a new crossing to the south of the Cepen Park South Roundabout. The new crossing will be signal-controlled and placed between two roundabouts where the traffic speed is naturally lower; therefore, enhancing the safety for people wishing to access to the countryside from the residential areas. Connections to existing public routes will be maintained and new ones provided where needed, both to the residential area and to the existing rights of way network west of the A350.

#### **Chippenham Rugby Club - Public Rights of Way Changes**

The current crossing of the A350 at the Rugby Club will be cut off by the new dual carriageway. To ensure the public rights of way connection is maintained, the pedestrian route will be diverted south on both sides of the A350 and will cross over at the existing Frogwell Footbridge. This will provide for a safer crossing facility. Styles and fences will be replaced by gates where possible to aid accessibility.

#### **Saltersford Lane - Public Rights of Way Changes**

An existing pedestrian desire line exists along the alignment of Saltersford Lane, just to the north of the Railway bridge. This informal crossing location will be affected by the new dual carriageway construction. A connection will be provided between the Saltersford Lane area and Easton Lane which has recently been closed to vehicular traffic and is now a safe pedestrian and cycle link across the A350.

### 3.3.3. Strategic Benefits

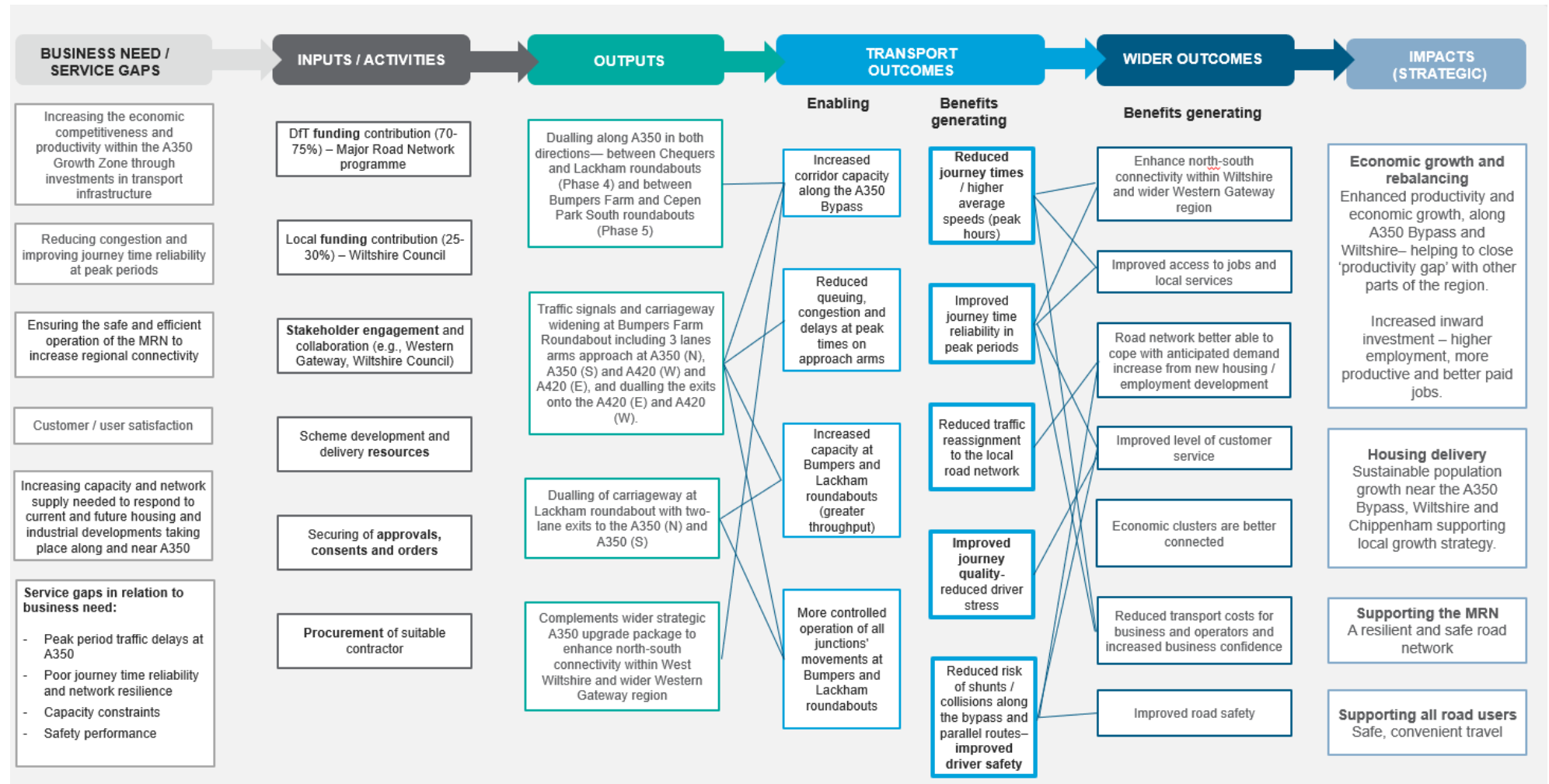
The anticipated outcomes and benefits resulting from the A350 Chippenham bypass have been reviewed and updated from the OBC, using the latest evidence base developed for the FBC. The scheme is shown to be effective in addressing the spending objectives (as identified in Section 3.3.1), leading to further outcomes and benefits making a positive contribution towards strategic priorities (as identified within the Strategic Context).

This section draws upon evidence which is consistent with the Economic Dimension. Full analysis of the scheme impacts, and assessment of its value for money, is addressed within the Economic Dimension.

#### 3.3.3.1. Theory of change

A clear causal chain has been established linking: business need / service gaps (problems); project inputs (resources and activities); project outputs (specific deliverables); transport outcomes; intermediate outcomes; and strategic impacts. This is illustrated in Figure 3-20 in the form of a logic map.

Figure 3-20 - Intervention logic map



At a simplified level, the primary logic flow can be summarised as follows:

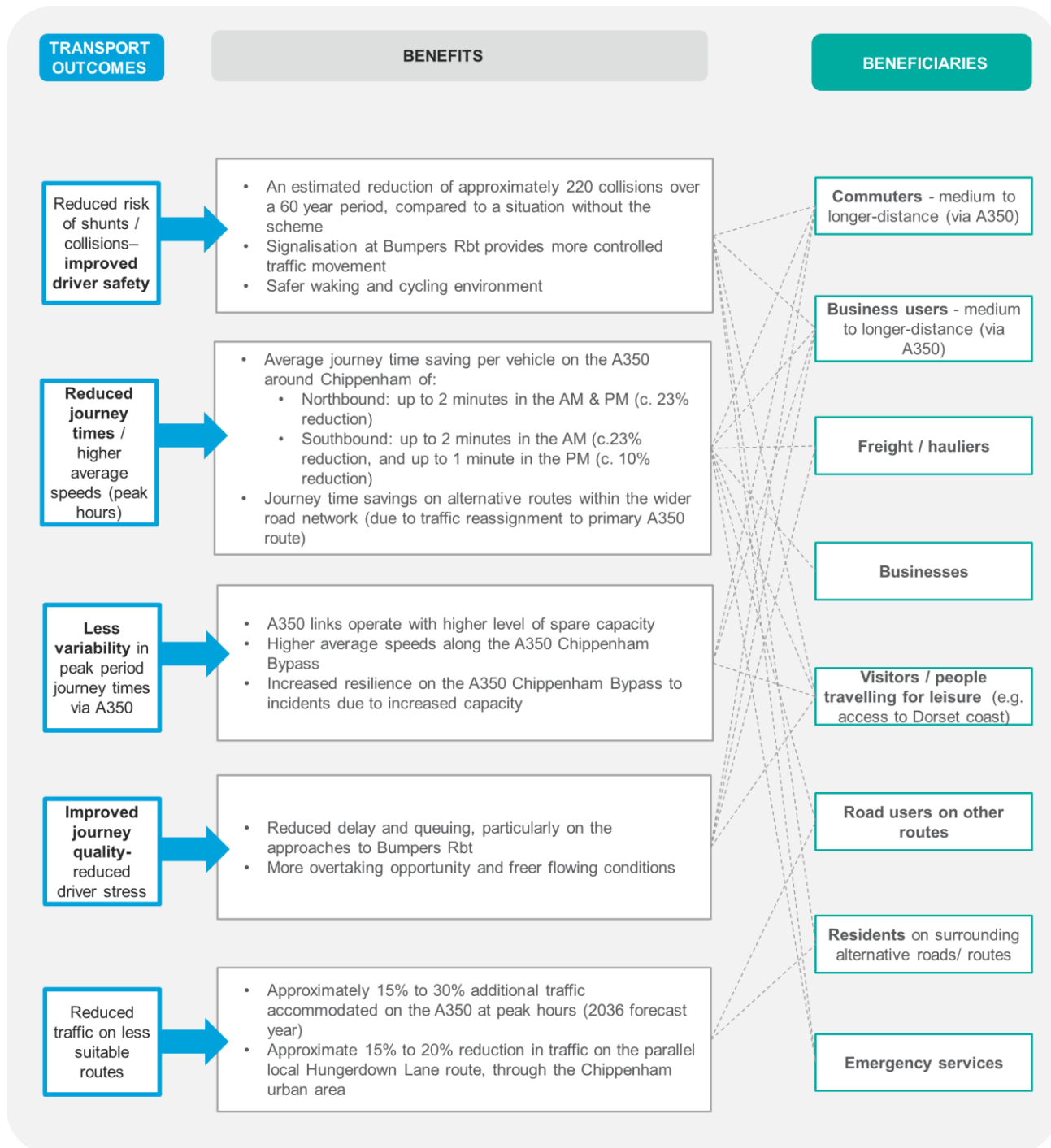
- The scheme will deliver **capacity improvements** along the A350 at Chippenham, including **junction improvements** at Bumpers Farm and Lackham roundabouts to directly address current and future issues related to **congestion, journey time delays / reliability and collisions (safety)** on a key north south connector.
- The outputs delivered through the investment will overcome the problems by **providing additional capacity**.
- This will this section of the A350 to **cope better with expected demands (particularly in the peak periods), allow greater traffic throughput** and also regulate traffic flows.
- This supports a range of directly related transport outcomes, including: **reduced delay** (less congestion); more comfortable and **reliable journeys; reduction in collisions; and changes in traffic flows**.
- In combination with the wider portfolio of A350 schemes promoted by Wiltshire Council (at M4 J17 and Melksham) this section of the A350 would be substantially upgraded to a standard more compatible with its strategic function.
- **Faster and more reliable journey times** between the A350 / A429 and the M4 corridor (SRN) will provide **improved north-south connectivity** for West Wiltshire and the wider Western Gateway region – a key priority Wiltshire Council, the Western Gateway STB and other local authorities within the region.
- This **facilitates increased economic activity and interaction**, better connecting people and businesses to markets and international gateways (e.g. Port of Poole), better connecting the two key Growth Zones in Wiltshire, thus boosting economic productivity. In turn, this **makes the area more attractive to businesses and people, encouraging further investment**.
- Improved capacity at Chippenham also means that the network is **more able to cater for the additional demand from new housing** within the A350 corridor without significant adverse impacts on existing users.

#### 3.3.3.2. Outcomes and benefits

The scheme outcomes will deliver a range of benefits across transport users and non-transport users. Figure 3-21 focuses on the transport outcomes and demonstrates the nature of the benefits and the expected beneficiaries. This draws upon quantified evidence, where applicable, in particular outputs from the Wiltshire Strategic Transport Model.



Figure 3-21 - Primary scheme benefits



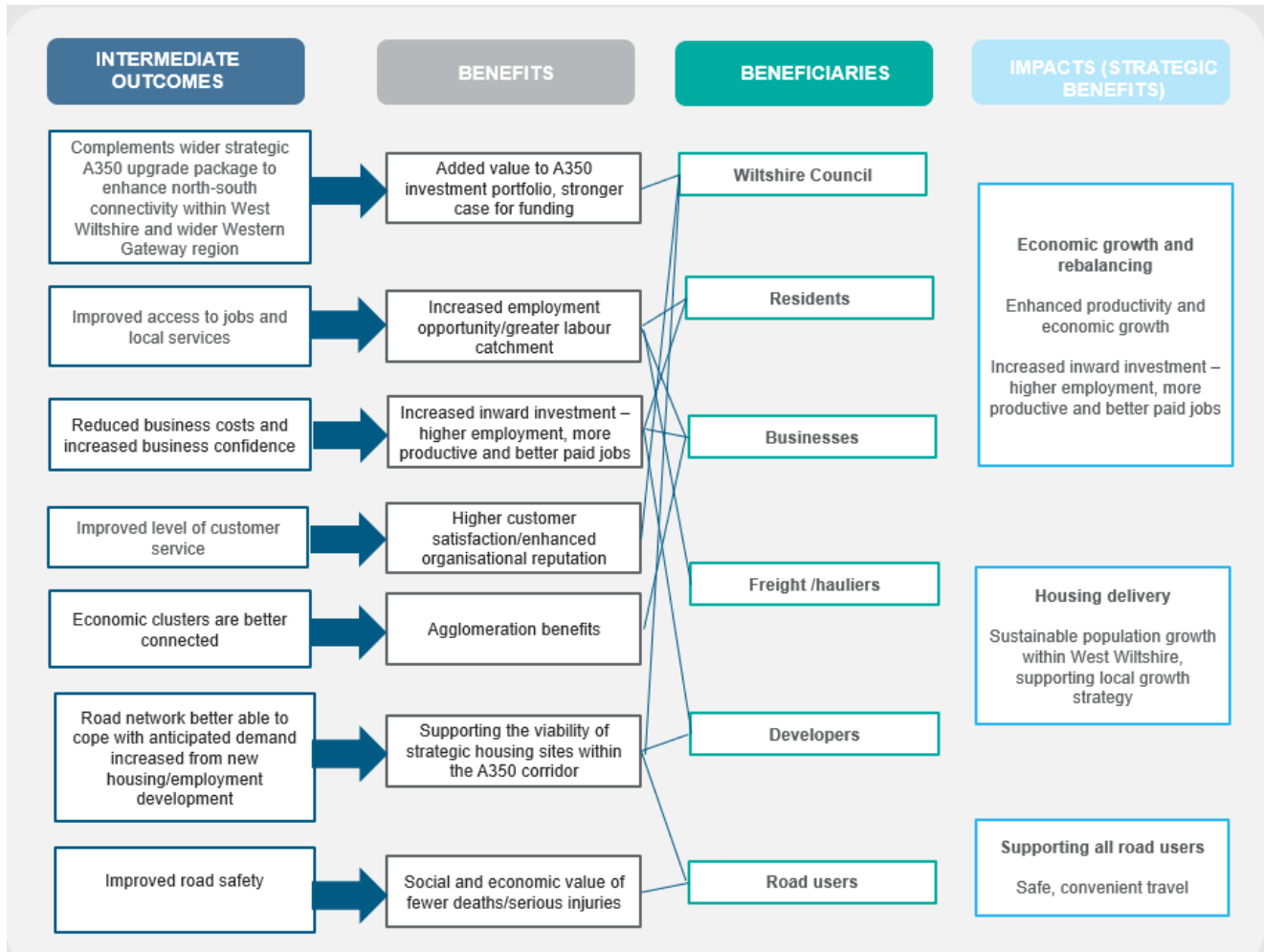
There is a broad range of expected beneficiaries. The scheme will benefit up to approximately 30,000 vehicles per day at present levels<sup>22</sup>. Furthermore, benefits are not expected to be limited to users of the A350. For instance, reducing the likelihood of traffic re-routing away from the A350 (e.g. to parallel routes in the

<sup>22</sup> 2019 AADT at DfT site 77987 north of Bumpers roundabout. Source: DfT.

Chippenham urban area) will provide benefits to other users across the wider network and potential residents / businesses on those routes.

Figure 3-22 provides a similar analysis of the intermediate outcomes (extending from the transport outcomes) and the resultant impacts. This demonstrates how the transport outcomes facilitate wider economic and social outcomes and benefits, ultimately contributing to the strategic priorities for Wiltshire Council, DfT and National Highways.

**Figure 3-22 - A350 Chippenham wider scheme benefits**



At this level, there are benefits of a more strategic nature, falling to wider society or at an organisational level. For instance, improved connections between the SRN / MRN and greater network resilience is expected to contribute positively on customer satisfaction levels. Some of these more strategic impacts are less direct in nature, and may arise over a longer timeframe, although the scheme is considered to have a positive contribution to these.

Once the scheme is delivered it will support planned development throughout the A350 corridor. In terms of the immediate locality, increasing capacity along the A350 Chippenham Bypass is critical for unlocking housing and employment growth in Chippenham – the LPR identifies a need for approximately 20,000 dwellings up to 2036 within the Chippenham HMA, of which around 9,000 are identified for Chippenham. This will require a step change increase in capacity on the A350 Chippenham Bypass and its junctions.

### 3.3.4. Key Stakeholders Views and Requirements

#### 3.3.4.1. Key stakeholders / stakeholder groups

Key stakeholder groups and their involvement or interest in relation to the scheme are summarised in Table 3-20. Wiltshire Council seeks to manage the different stakeholder needs and expectations in a balanced manner, alongside the need to ensure that the scheme will also continue to meet its primary objectives.

**Table 3-20 - Key stakeholders and their involvement / interest in the scheme**

Stakeholder group	Key stakeholders	Involvement / interest
General public	Residents in Chippenham and local commuters who use the A350.	Potential beneficiaries of the scheme. Potential for positive / adverse impacts resulting from the scheme – either directly or indirectly, e.g. localised noise impacts.
Businesses	Businesses in Chippenham and the surrounding area. Bumpers Farm Industrial Estate Business Forum Wiltshire Chamber of Commerce Hauliers	Potential beneficiaries of the scheme – in terms of reduced business costs and / or improved employee and customer access. Potential for positive / adverse impacts resulting from the scheme – either directly or indirectly.
Developers	E.g. Southpoint	Promoters of development with expected impacts on the A350 Chippenham Bypass. Improvements could unlock potential developments.
Statutory and non-statutory environmental bodies (SEB)	Historic England Natural England Environment Agency	Appropriate early engagement with SEBs regarding any potential adverse environmental effects.
Town and parish councils	Chippenham Town Council	Representing the views and interests of residents and businesses.
Transport operators	E.g. bus operators	Potential impact of the scheme (construction and operation) on service operation.
Walking / cycling / horse-riding groups	Wiltshire Council's Public Rights of Way Officer, Head of Rights of Way and Countryside, Definitive Map and Highway Records Manager and Countryside Access Officer. British Horse Society. The Ramblers. Sustrans. Local cycling / walking groups: i.e. Chippenham Cycle Network Development Group.	Interest in the provision for pedestrians, cyclists and horse-riders and impacts of the scheme on existing Public Rights of Way Provision of inputs to specific scheme design aspects.
Regional bodies	Western Gateway Sub-national Transport Body Swindon and Wiltshire Local Enterprise Partnership	Interest in the role of the A350 improvements in supporting regional transport and economic priorities.
Local media	Wiltshire Times Gazette and Herald BBC Wiltshire BBC Points West ITV West Country	Dissemination of information in relation to the Proposed Scheme. The media is an important means of raising awareness / interest and encouraging participation in consultation and engagement activities.

Stakeholder group	Key stakeholders	Involvement / interest
Political representatives	Local MP, Michelle Donelan Wiltshire Council members specifically Chippenham and Villages Area Board	Represent the interests of local constituents
Funding approval	Department for Transport	Considers the overall strength of the business case (including value for money) in making recommendations to ministers with regards to central government funding for the scheme.

#### 3.3.4.2. Stakeholder activity undertaken

At a broader level, a policy of selective improvements to the A350 has been included in the council's development plans for many years, including in the current Wiltshire Core Strategy. These have been subject to extensive public consultation. The A350 Chippenham Bypass was also the subject of a planning application, statutory orders and a public inquiry in the 1990's for the full dual carriageway scheme.

Specific stakeholder engagement has also been undertaken during the scheme development. Activities which have informed the scheme development to date and the FBC include:

- Focussed stakeholder meetings, briefings and liaison – including with DfT and political representatives.
- Delivery of letters to local businesses and residential areas within the Bumpers Farm Roundabout area.
- Development of a web-based scheme information portal – providing updates on scheme progress, key scheme details and FAQs, with the opportunity to submit feedback / comments.
- Public webinar held on the 11<sup>th</sup> January 2023, which included a question and answer opportunity.
- Presentation to the Chippenham Area Board on the 16<sup>th</sup> January 2023 and to Chippenham Town Council on the 26<sup>th</sup> January 2023.
- Display placed in Chippenham Library for the duration of the public engagement, with the opportunity for the public to fill in the questionnaire.
- Engagement with walking, cycling and horse-riding groups as part of the WCHAR process.
- Specific engagement with any affected landowners / residents in proximity affected by the scheme.

A number of these activities were included as part of a public engagement exercise held by Wiltshire Council between November 2022 and February 2023<sup>23</sup>.

In total, 344 questionnaire responses were received with three responses from key stakeholders (Chippenham Town Council, Chippenham Rugby Club and Chippenham Cycle Network Development Group), as well as multiple comments from the public and local councillors.

#### 3.3.4.3. Stakeholder feedback

Full findings from the public engagement exercise are documented in Wiltshire Council's Public Engagement Report, which was published in February 2023 and available on the scheme web page. A good volume of feedback has been received by Wiltshire Council in response to the stakeholder engagement activities. This is likely due to the location of the A350 Chippenham Bypass, in close proximity to Chippenham's 36,000 residents and its role within the Major Road Network, meaning the road is significant both locally and regionally.

Key findings from the engagement exercise include:

- In total, 46% of respondents expressed support for the scheme, whilst just 35% did not, with the remainder either neutral or not answering the question.

<sup>23</sup> Details are available on the scheme web page: <https://www.wiltshire.gov.uk/highways-improvements-a350>

- Support for the scheme was generally higher for respondents living outside of Chippenham (50%), although the difference was small. Local businesses were strongly supportive of the scheme, with 10 out of 14 business respondents supporting the Planned Improvements.
- There was a strong understanding amongst stakeholders of why Wiltshire Council is prioritising improvements along the A350 Chippenham Bypass and of those respondents who supported the scheme, stakeholders stated that improving journey-time reliability and reducing congestion was a key reason.
- Of those stakeholders which presented concerns with the Proposed Scheme, the key reasons put forward were its cost, its environmental impact and noise impact.

### 3.3.5. Options

This section provides an overview of the background to the identification of the preferred scheme option (see section 3.3.2), now subject to full approval through this FBC.

#### 3.3.5.1. Option Assessment Report, January 2014

Upgrading of the A350 Chippenham Bypass was considered within the Major Transport Schemes OAR (January 2014). The shortlisted options assessed against the DfT's 'five cases model' were:

- Chippenham Bypass dualling and junction improvements;
- Chippenham Bypass targeted junction and short link improvements; and
- Parallel priority lanes for high occupancy vehicles, PSVs and HGVs.

The preferred option was "*Bypass dualling with junction improvements*" performing most strongly against the DfT criteria and predicted to most effectively address the problems identified on the A350, delivering improvements in journey time reliability and effectively enabling housing and employment growth.

As identified previously, dualling of the Chippenham Bypass has been implemented in several phases as new government funding streams have become available. Phase 3 was completed in January 2019, with a funding award from the Local Growth Fund. Further options development work therefore focused on the remaining Phases 4 and 5.

#### 3.3.5.2. Updated Options Assessment Report, April 2019

Five specific highway options for the next phase of works on the A350 Chippenham Bypass were identified in the updated Options Assessment Report (OAR), completed April 2019. Dualling of all remaining single carriage stretches of the Chippenham Bypass, complemented by improvements to Bumpers and Lackham roundabouts was concluded as the Preferred Option E in the OAR, presented alongside four lower cost options based on the scheme components:

- **Preferred Option E - Combined option:** Options A and D combined which will result in bypass dualling across the full stretch of the orbital route identified as 'Cumulative Route 2' in the revised Chippenham Transport Strategy;
- **Option A – Phase 4 Dualling and Lackham roundabout:** Widening the A350 to dual 2-lane between Chequers roundabout and Lackham, extending southbound from dualling works completed during Phase 3 of the A350 improvement programme; and capacity improvements at Lackham roundabout including dualling of all approach arms and dualling exits to the A350 North and South;
- **Option B - Chippenham Bypass dualling, Phase 5:** Widening the A350 to dual 2-lane along the full stretch between Cepen Park South and Bumpers roundabout, connecting the dualling completed during phases 2 and 3 of the A350 improvement programme;
- **Option C - junction capacity improvements at Bumpers Farm:** Capacity enhancements to A350 Bumpers roundabout including: increasing the circulatory from 2 lanes to 3; signalling all approach arms; increasing approach arms from A350 (S), A420 (W), A350 (N) and A420 (E) to 3 lanes; and dualling the exits onto the A420 (E) and A420 (W); and

- **Option D - Chippenham Bypass dualling Phase 5** plus junction capacity improvements: Options B and C combined.

Both the Preferred Option E and four Options A-D were mapped against the scheme objectives (see Table 3-21). This shows that the strongest option is the full combined option, Preferred Option E.

**Table 3-21 Assessment of options against objectives**

Scheme Objectives	Option A	Option B	Option C	Option D	Preferred Option E
Protect the strategic role of the A350, by increasing the road capacity to improve north-south connectivity and minimise traffic reassigning onto the local road network	✓	✓✓	✓✓	✓✓✓	✓✓✓
Improve journey time reliability and reduce total delay along the A350 Chippenham Bypass	✓	✓✓	✓✓	✓✓✓	✓✓✓
Reduce the frequency of collisions along the A350 Chippenham Bypass and parallel routes	✓✓	✓✓	✓✓	✓✓	✓✓✓
Improving journey time reliability on the A350 to preserve its key role as part of the advisory freight route network	✓	✓✓	✓✓	✓✓✓	✓✓✓
Increase the capacity of the A350 Chippenham Bypass to support planned growth (Core Strategy and CSAP) and future growth (emerging Local Plan)	✓✓	✓✓	✓✓	✓✓	✓✓✓
Improve journey time reliability and reduce total delay along the A350 Chippenham Bypass which may otherwise discourage inward investment towards new and existing employment sites in Chippenham	✓	✓✓	✓✓	✓✓✓	✓✓✓

**Contribution towards achieving scheme objective**

- ✓✓✓ Strong Contribution
- ✓✓ Moderate Contribution
- ✓ Limited Contribution
- X No Contribution

All constituent components of the full combined option are considered to be required to ensure an overall strong strategic fit.

Economic appraisal undertaken at OBC stage (see section 4.3.2 for further details) identified a strong value for money for the full combined options, although some reduced scope options (in particular Option C) produced a higher potential value for money in their own right.

Notwithstanding this, there is a wider strategic rationale in relation to Wiltshire Council progressing the full combined option (Preferred Option E), which relates back to the strategic context and case for change presented within the earlier sections of this Strategic Dimension chapter:

### **Maintaining and improving the A350 has been a longstanding aim for Wiltshire Council**

Several adopted policy documents outline the county's aims for the A350, in particular the Wiltshire Core Strategy, Chippenham Site Allocations Plan (and supporting Chippenham Transport Strategy), and the Local Transport Plan.

### **Dualling of this respective section of the A350 was considered at its original inception**

At its initial inception in the 1990's all structures and highway boundaries were designed to accommodate the potential for future capacity expansion works. All stakeholder consultation upon initial delivery of the Chippenham Bypass scheme therefore incorporated the potential for dualling.

### **The A350 is a strategic route which is integral to north-south connectivity across the South West of England**

Improving the A350 reflects a long-held county aspiration which is supported by the 'Case for Action' (2017) submitted to Government by Wiltshire, Dorset, and Bath and North-East Somerset Councils. It makes the case for the strategic and economic role of the A350 to be recognised nationally, and for investment in the route beyond dualling around Chippenham to address key pinch-points such as Beanacre/Melksham and Westbury.

### **Dualling will complete the continuity of the A350 around Chippenham**

The full combined option ensures a consistent level of service along the A350 Chippenham Bypass. It was considered that it would be more acceptable to deliver a combined scheme which minimises the longer term disruption from multiple works. This is consistent with the aims and objectives of Wiltshire Council and the Western Gateway STB.

#### **3.3.5.3. Post OBC option development**

The full combined option was subsequently progressed through detailed design, including a public engagement exercise. During this phase of further scheme development, the following have informed the final scheme scope and design:

- Updated operational assessment of the Bumpers Roundabout junction, using a VISSIM microsimulation model, to optimise the layout and configuration;
- Further analysis of the OBC modelling and appraisal outputs in relation to the southern section of the scheme resulted in the extent of capacity enhancement at Lackham Roundabout being reduced as Wiltshire Council considered this to not be essential for the MRN scheme based on the negligible additional benefit provided; and
- Refinement to more specific design elements, including around pedestrian and cyclist provision, and with reference to stakeholder feedback and recommendations from the Walking, Cycling and Horse-riding Assessment and Review (WCHAR) and Road Safety Audit.

The above has informed the final scheme design presented in this FBC which has formed the basis of the procurement exercise, with a preferred bidder now identified.

#### **3.3.5.4. Consideration of buses and bus users through option development**

Consideration of bus provision is addressed within the supporting information provided in Appendix A.6. Key summary points include that:

- The scheme development has had regard to the existing bus service provision and relevant local bus strategy, in particular the Wiltshire Bus Service Improvement Plan.
- The scheme optimises capacity for all traffic. Given the low number of buses (and low levels of queuing predicted with the scheme in place) this is considered to provide the most efficient approach, rather than providing dedicated bus lanes, for example, which would necessitate reduced capacity for general traffic due to the site constraints which limit the scope for additional carriageway space.

- There are approximately 20 buses a day operating via the Bumpers Farm roundabout (east-west on the A420), provided by the 95/95a, 635 and 636 services. The signalisation of the roundabout allows for inclusion of bus priority technology to prioritise the green phase of an arm on detection of an approaching bus. This would further help to support bus journey time reliability. The associated benefits to the Bumpers Way arm, particularly during the PM peak, will also be beneficial to bus operations due to the bus operator (Faresaver) depot located within the industrial estate.
- The dualling of the A350 between Chequers Roundabout and Lackham Roundabout will also provide some benefit to the X34 service, principally through enhanced reliability.
- The proposed A350 Chippenham improvement scheme seeks to protect strategic connectivity and facilitate growth within the A350 corridor. The scheme will also help encourage traffic to remain on the A350, rather than cutting through Chippenham itself. This will help to manage traffic levels on existing and potential local bus routes and provide greater opportunity to enhance bus operation, journey times and reliability.

#### 3.3.5.5. Consideration of active travel provision through option development

The consideration of active travel users is addressed within the supporting information provided in Appendix A.5. Key summary points include that:

- Provision for active travel users has been considered through the option and scheme development process and has had regard to the existing and potential future context in relation to active travel provision and demands with reference to local plans and strategies such as the Local Cycling and Walking Infrastructure Plan.
- The scheme has also been informed by a Walking, Cycling and Horse-riding Assessment and Review (WCHAR).
- The scheme has been developed with regard to its interaction with existing /planned walking and cycling provision and activity. Walking and cycling activity is relatively low, primarily due to the peripheral location. The main demands are leisure based between the west of Chippenham town and countryside to the west of the A350.
- Appropriate amendments to walking and cycling infrastructure have been developed and incorporated within the scheme design to maintain connectivity (see section 3.3.2.3). These are also intended to improve pedestrian and cyclist safety.
- The scheme will ensure the efficient functioning of the strategically important A350 route and thus help to manage traffic levels within Chippenham town, which is the focus of the existing and planned walk/cycle network.

#### 3.3.6. Risks

Project risks have been reviewed and updated from the OBC as part of the risk management strategy (see Management dimension, section 7.11). This reflects the current stage of scheme development, with the scheme ready to be implemented subject to full approval of DfT funding.

The latest Risk Register (Appendix E.4) provides a full record of identified risks (including risk owners), assessment of impact (including cost / programme) and likelihood, and control measures.

A summary of some of the most significant risks to achieving the scheme objectives is provided in Table 3-22, with risks categorised as business, service, or external risks.



**Table 3-22 - Key risks associated with scheme implementation.**

Risk	Detail / potential impact	Likelihood / assumptions
<b>Business risks – within or impacting the principal organisations (Wiltshire Council / DfT)</b>		
Loss of political support / significant change in strategic priorities	Project termination or significant changes. Possible reputational damage.	Low – strong commitment at national, regional and local levels. Scheme is well advanced and ready for delivery.
Negative stakeholder feedback	Possible reputational damage.	Low – early and regular engagement with the primary stakeholders, including local residents and businesses.
Unable to meet local funding contribution	DfT funding capped. Additional cost increase to be met by Wiltshire Council funds. Potential impact on scheme affordability / viability if not met.	Low / Medium – local funding to be met through Community Infrastructure Levy funds (see Financial Dimension).
<b>Service risks - associated with the design, build and financing of the project</b>		
Contractor performance	Risk that despite the stringent procurement procedure and assessment processes that the selected contractor does not meet expectations and performance is not as good as anticipated.	Low - careful consideration has been given to managing the contractor's performance using suitably experienced supervising staff, performance milestones and key performance indicators to ensure that the contract requirements are met.
Skills / capacity	Increasing workloads in the public and private sectors, and national skills shortages, are causing resourcing concerns across the construction industry which could affect delivery of the scheme.	Low - the proposed staffing and resourcing of the works have been considered in the assessment of the bids which should reduce these risks.
Utilities and environment	Previous experience indicates that major risks associated with implementing a scheme of this type are that there will be delays in public utilities carrying out diversion of their plant, or that environmental constraints will cause delays.	Low - these risks will be reduced as much as possible by the careful programming of the works and by carrying out a package of advance work where feasible.
Ground conditions	There are some financial risks associated with this type of contract, especially because of unforeseen circumstances, including ground conditions and public utilities apparatus.	Low / Medium - the design work and the site investigations that have been carried out in advance have reduced these risks and should enable any residual risks to be managed effectively.
Delivery of other schemes / works within the scheme area	Scheduling of other works within the scheme area could impact construction / traffic management and result in delays.	Low – the delivery programme has been planned to avoid potential clashes. The construction is scheduled to commence following completion of the Southpoint developer scheme on the A350.
<b>External risks - risks that affect all society, and are not connected directly to the programme or project</b>		
Cost inflation	General inflation resulting in increased price of materials and labour, beyond current inflation assumptions for scheme costing. Potential impact on affordability.	Low / Medium – Inflation has been causing concern in the construction industry recently. The proposed contract includes provision for the linking of prices to construction indices. This can cause some uncertainty regarding final costs as they would increase in the event of high inflation, but it removes the risk of the bidders

Risk	Detail / potential impact	Likelihood / assumptions
		increasing their initial bid prices disproportionately if they must carry those inflation risks.
Significant policy / regulatory shift	Major change in policy stance delays or disrupts progress, or leads to curtailment - e.g. Welsh Government review of road projects in light of Net Zero agenda.	Low – no current indications of major policy changes which could disrupt the project and the Government has recently increased its support for motorised vehicles in its ‘Plan for Drivers.’
Actual future traffic demands vary significantly from forecast	Potential reduced effectiveness against investment objectives.	Low / Medium– the scheme remains effective under a variety of traffic growth conditions. The actual outturn growth will influence the resultant benefits and overall value for money, as implied by the economic appraisal.
Covid-19 pandemic resurgence (or similar)	Potential delays to delivery / construction (e.g. periods of ‘lockdown’).	Low – increased preparedness for based on recent experience, but not possible to fully mitigate.

### 3.3.7. Constraints

Constraints are the internal / external conditions and agreed parameters within which the programme must be delivered, over which the A350 Chippenham Bypass improvements project has little or no control. **Table 3-23** identifies the high-level constraints which have the potential to affect the project, including in terms of influencing the identification and development of the scheme and its successful implementation.

**Table 3-23 - High-level constraints associated with scheme implementation.**

High level constraint	Type	Potential project considerations / implications
Major Road Network fund eligibility criteria	External - funding	Typical DfT contribution of £20m to £50m. Alignment with MRN fund objectives. Requirement for minimum local funding contribution of c.15%.
Compliance with planning legislation (under the Town & Country Planning Act)	External - regulations	Following a public inquiry in the 1990s, the A350 dual carriageway Chippenham bypass scheme was granted planning consent. Although initially built as a single carriageway, the highways boundary was secured and bridges were constructed to future-proof the bypass corridor for the full dualling.
Compliance with environment regulations	External - regulations	Relevant permissions (e.g. land drainage discharge consent) factored into delivery programme.
Requirements for project assurance	Internal / External – due diligence	Approval required via 3 stage DfT business case process. Wiltshire Council project assurance processes apply. Delivery programme must accommodate necessary assurance processes.
Availability and capacity of Wiltshire Council staff resources	Internal - resourcing	Resources split across several major projects. AtkinsRéalis providing additional resource capacity and expertise.
Procurement regulations which apply to local authority project delivery	External / internal - procurement	The need to adhere to Public Contracts Regulations 2015, and Procurement Policy Note 08/20. Procurement undertaken in compliance (Commercial Dimension).
Requirements to demonstrate carbon impacts	External - due diligence	The need to consider and assess the whole life carbon impacts of the project, including development of the Carbon Management Plan.

High level constraint	Type	Potential project considerations / implications
Requirement for 10% biodiversity net gain (Environment Act) <sup>32</sup>	External - regulations	Habitat creation / enhancement to be accommodated either on site or off site.

### 3.3.8. Key assumptions

The key assumptions which underpin the evaluation and assessment of the A350 Chippenham Bypass Phase 4 and 5 Improvements include:

- The delivery programme and start of construction works assumes full approval for DfT funding is received by April 2024.
- Potential medium to longer-term impacts of the COVID-19 pandemic on travel patterns are not reflected within central growth forecasts, although appropriate sensitivity tests have been undertaken and reported within the Economic Dimension.
- Potential housing/employment sites associated with the emerging Wiltshire Local Plan Review are not accounted for within the central growth assumptions.

### 3.3.9. Inter-dependencies

There are no key inter-dependencies between implementation of this project and delivery of other projects or programmes. The project delivery is scheduled to follow completion of the new junction on the A350 associated with the Southpoint development.

The successful delivery of the scheme will still depend on some factors which are outside of the immediate control of the project environment. Table 3-24 provides a summary of some of these key dependencies. Although these are ultimately beyond the control of the project team, they are reflected in project planning and will be managed to minimise the project exposure.

**Table 3-24 - Internal and external dependencies for successful scheme implementation**

Key dependency	Type	Details	Key project delivery interactions
Securing funding	Internal / External	DfT / ministerial approval for Central Government funding, plus local contribution (developer / WC)	Scheme development; business case; commencement of construction
All relevant formal consents and orders in place	External	Including traffic regulation orders in connection with installing traffic signals or other traffic management measures connected to the scheme.	Commencement / completion of construction

## 3.4. Summary and recommendation

### 3.4.1. Strategic context and case for change

Section 3.1 demonstrated that the Proposed Scheme has a strong alignment with strategic priorities and strategies at a local, regional, and national level. In particular, it has an important role in decreasing journey times and improving journey time reliability for local and strategic traffic, thus unlocking economic growth in Chippenham and the wider Wiltshire region, by enhancing productivity and enabling housing growth. The improved performance of the A350 should also allow it to better fulfil its role as a strategic bypass, thus reducing 'rat-running' through Chippenham contributing to safer, greener and less congested local roads, which will benefit local residents significantly.

Section 3.2 has demonstrated a clear and robust case for change, highlighting why the Proposed Scheme is necessary to overcome the specific transport barriers, such as peak period congestion, poor reliability, and safety concerns, which are limiting the attainment of strategic priorities.

### 3.4.2. Identification of the preferred option

Building upon the strategic context and case for change, specific investment objectives have been identified, supported by measures of success, which represent key desired outcomes. The Proposed Scheme represents the optimal option, fitting well with multiple strategic priorities and investment objectives and balancing between affordability (see Financial Dimension), deliverability (Management and Commercial Dimension) and overall value for money (Economic Dimension). A range of stakeholders have been consulted and have had an integral role in the development and identification of the preferred option. The process of developing the final design has had consideration for all users, including active travel users, and has taken into account the context, in relation to existing provision and demands.

### 3.4.3. Implementation of the preferred option

Risks, constraints and dependencies associated with the delivery of the Proposed Scheme have been examined. Wiltshire Council will act as the lead delivery organisation, working closely with multiple stakeholders who will be involved in the construction and delivery of the Proposed Scheme. Key dependencies include ensuring the necessary technical and political approvals are secured and the funding approved. Apart from these, no major delivery obstacles have been identified although external factors such as price inflation and the potential for a significant policy or regulatory shift will need to be closely monitored. The scheme will be implemented through Permitted Development rights and there are no land requirements, as the Proposed Scheme is being developed within existing highway boundaries.

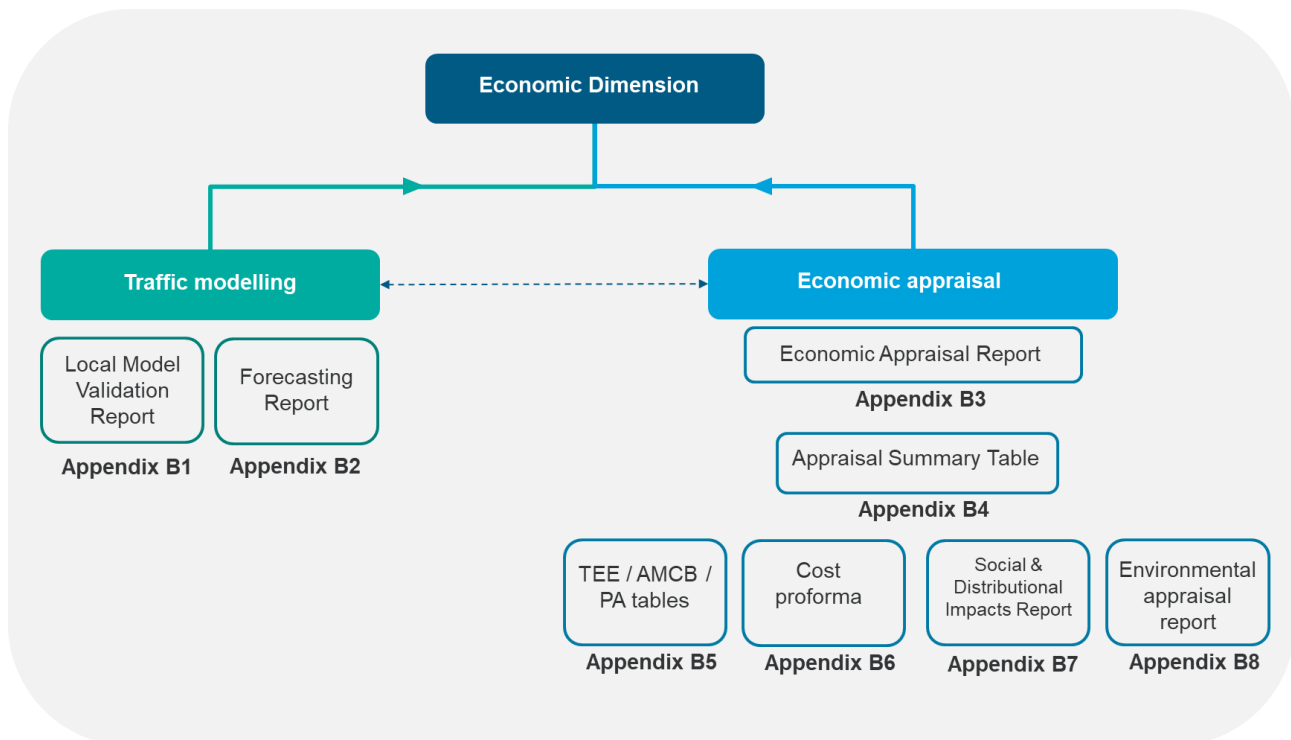
## 4. Economic Dimension

### 4.1. Introduction

The Economic Dimension assesses scheme options for the project and determines overall Value for Money, taking into account economic, environmental, social and distributional impacts. It reconfirms the preferred option for implementation which meets the business need identified in the Strategic Dimension.

The Economic Dimension is supported by a suite of related documents which provide full technical details in support of the key content and outputs contained within this chapter:

**Figure 4-1 Key documents supporting the Economic Dimension**



The Economic Dimension directly relates to other parts of the FBC:

- The overall need for the scheme and the expected outcomes and benefits identified within the **Strategic Dimension** are evidenced through the economic appraisal (in monetary terms, or otherwise quantitatively / qualitatively);
- The scheme costs and funding information presented within the **Financial Dimension** are an important input to the value for money assessment; and
- The scheme delivery timescales set out in the **Management Dimension** define the profile of benefits and costs for the economic appraisal.

The Economic Dimension chapter provides:

- An overview of the approach to modelling and economic appraisal (including benefits and costs);
- Details of the appraisal outcomes for economic, environmental and social impacts, including monetised and non-monetised impacts;

- Treatment of uncertainty in the appraisal; and
- Value for Money Statement.

## 4.2. Key updates since OBC

The OBC identified a shortlist of potential options and presented an appraisal of these, identifying a preferred option and presenting an assessment of the value for money. This option has subsequently been progressed through detailed design and procurement. This FBC reconfirms the value for money of the scheme based on its current status, which is ready for delivery. The FBC economic assessment is undertaken on a largely consistent basis to the OBC, but reflects updates in appraisal parameters / assumptions and revised traffic growth forecasts based on the latest national projections which have been released since the OBC.

## 4.3. Options

### 4.3.1. Longlist analysis

The **Options Assessment Report** (in line with the TAG Transport Appraisal Process) provides a full account of the background to the identification and assessment of potential options. This considered a range of strategic approaches and supported the identification of the shortlist, based around highway improvement measures on the A350 Chippenham Bypass. These were subject to appraisal through the OBC. The OAR is included at Appendix A.1 for reference.

### 4.3.2. Shortlisted options and preferred option

At the OBC stage, several options were assessed. These reflected incremental options based around improvements to the A350 Chippenham Bypass – from junction improvements only, dualling of different sections, and a combined full scope. Details of this stage and the strategic alignment of the options is addressed in the Strategic Dimension, section 3.3.5.2.

The OBC economic case presented a full appraisal for the following options:

- junction capacity improvement at Bumpers Roundabout only; and
- a full combined option which built upon this to also include dualling of the A350 between Bumpers Roundabout and South Cepen Park, and between Chequers Roundabout and Lackham Roundabout (including capacity enhancements).

The headline assessment findings of these options are shown in Table 4-1.

**Table 4-1 Summary of economic assessment of options presented in the OBC**

	Assessment Type	Bumpers Roundabout only	Full combined option
Level 1 impacts / initial BCR	Present Value of Benefits (PVB)	£55.7m	£82.0m
	Present Value of Costs (PVC)	£7.0m	£25.5m
	Net Present Public Value (NPPV)	£48.6m	£56.5m
	<b>Initial BCR</b>	<b>7.90</b>	<b>3.22</b>
Level 2 impacts / adjusted BCR	Present Value of Benefits (PVB)	£61.8m	£89.7m
	Present Value of Costs (PVC)	£7.0m	£25.5m
	Net Present Public Value (NPPV)	£54.8m	£64.3m
	<b>Adjusted BCR</b>	<b>8.78</b>	<b>3.52</b>

Whilst the Bumpers Roundabout only option produced a higher BCR, the full combined option was progressed by Wiltshire Council as the preferred option based on its stronger strategic fit, overall alignment with the MRN objectives and higher level of overall benefits. Further information in relation to this is provided within the Strategic Dimension, section 3.3.5.2. The OBC was subsequently approved by DfT in November 2021 based upon this preferred option.

The full combined option was therefore subsequently progressed through detailed design, including a public engagement exercise. During this phase of further scheme development, the following have informed the final scheme scope and design:

- Updated operational assessment of the Bumpers Roundabout junction, using a VISSIM microsimulation model, to optimise the layout and configuration;
- Further analysis of the OBC modelling and appraisal outputs in relation to the southern section of the scheme resulted in the extent of capacity enhancement at Lackham Roundabout being reduced as Wiltshire Council considered this to not be essential for the MRN scheme based on the negligible additional benefit provided; and
- Refinement to more specific design elements, including around pedestrian and cyclist provision, and with reference to stakeholder feedback and recommendations from the Walking, Cycling and Horse-riding Assessment and Review (WCHAR) and Road Safety Audit.

The above has informed the final scheme design presented in this FBC which has formed the basis of the procurement exercise, with a preferred bidder now identified.

## 4.4. Methodologies, assumptions and data

### 4.4.1. Defining the methodology - scheme rationale and scope of impacts

The overall approach to transport modelling and appraisal has been developed in line with the context of the DfT Transport Appraisal Guidance (TAG). TAG promotes a proportionate and flexible approach. In determining an appropriate methodology for the project, the nature of the scheme and its expected impacts have been taken into account, with reference to the logic map presented within the Strategic Dimension. This ensures that the scope of the Economic Dimension is clearly informed by the Strategic Dimension.

The following key factors are relevant to the modelling and appraisal methodology and influence the approach applied:

- The scheme addresses existing and future congestion issues (primarily during peak periods) through the provision of increased capacity on a key section of the MRN (A350) which provides local connectivity and wider strategic connectivity, via the SRN (M4).
- The extent of the scheme is relatively localised and the changes to the highway network involve carriageway widening to provide an additional lane in each direction, in addition to specific amendments to the Bumpers Roundabout junction layout and operation.
- Immediate effects (particularly congestion reduction and reduced delays) will be experienced along the A350 Chippenham Bypass. However, due to its location and strategic function the potential impacts on users are more widespread, including north-south regional connections between the M4, West Wiltshire and beyond to the south coast.
- Furthermore, journey time changes via the A350 Chippenham Bypass could affect travel patterns, including traffic routing decisions across the wider network, including within the Chippenham urban area.
- Journey time savings to highway users are expected to account for the primary benefits source.

### 4.4.2. Transport modelling and appraisal overview

#### 4.4.2.1. Modelling tool

The appraisal of the scheme has been conducted using the Wiltshire Transport Model which was developed from the South West Regional Transport Model. The Local Model Validation Report (LMVR) is located in Appendix B.1, and the Traffic Forecasting Report is located in Appendix B.2.

The strategic model is a highway (SATURN) model with a base year of 2018. The model was developed with the intention of being a donor model for localised scheme testing. This results in a more manageable product which is suitable for multiple sensitivity and scheme tests and reduced error resulting from model noise and wider regional uncertainty, along with continuity of approach across all submissions. The cordon model developed for this FBC is considered to provide an appropriate representation of the traffic conditions within the scheme area and suitable for the purposes of appraising the scheme impact. This is evidenced within the LMVR and the Traffic Forecasting Report, including details of checks undertaken such as fit with observed traffic flows and journey time.

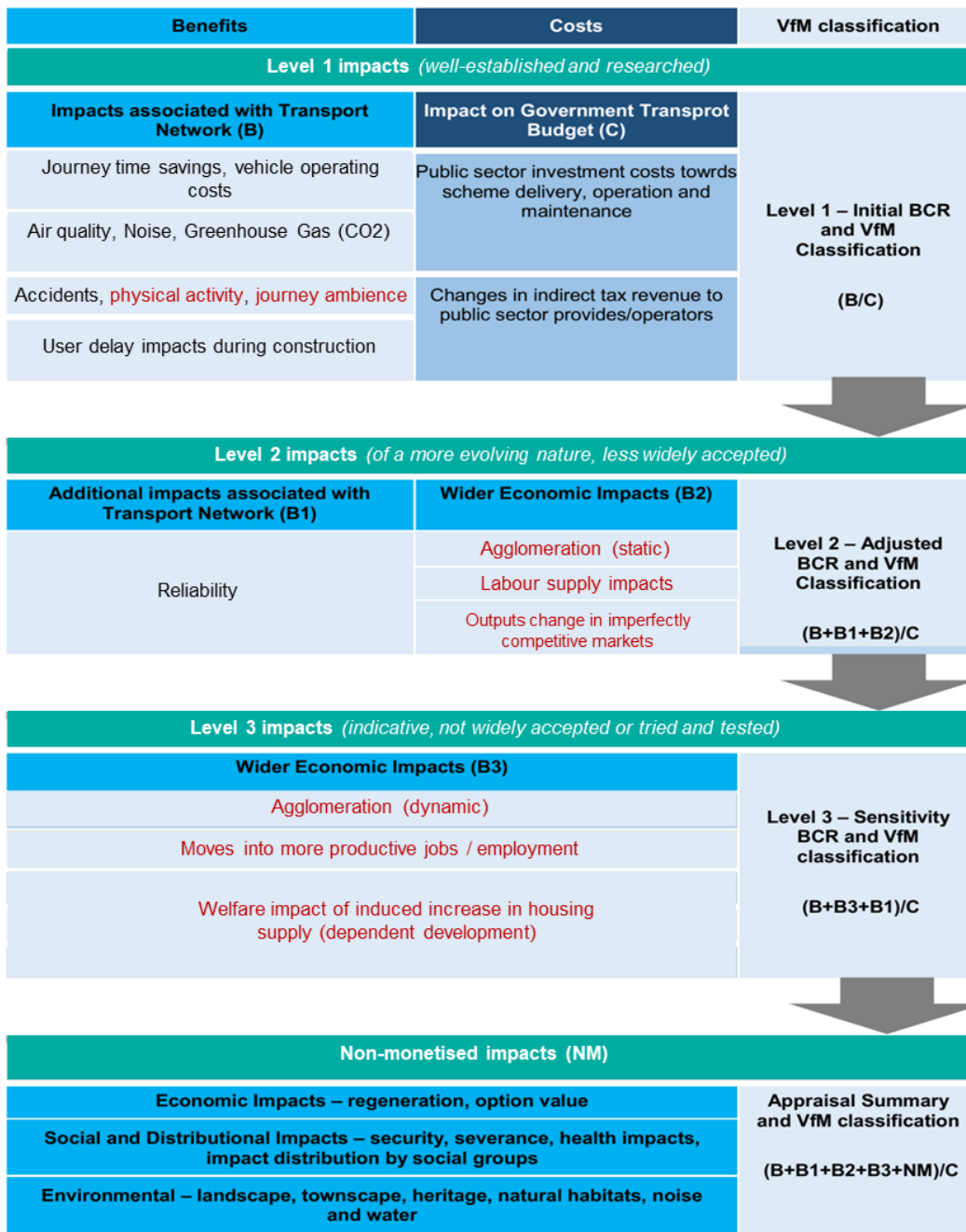
Peak Hour models were developed from the original Peak Period model in 2018, as detailed in the latest Local Model Validation Report (Appendix B.1). The approach to producing with and without scheme cordon models for use in the economic appraisal is detailed in the attached Economic Appraisal Report (Appendix B.3). This also demonstrates the suitability of the approach.

#### 4.4.2.2. WebTAG approach to assessing Value for Money (VfM)

The overall Value for Money (VfM) assessment is based on a tiered approach to considering appraised economic, environmental and social impacts (benefits and costs), reflecting different levels of analytical certainty (Figure 4-2). These are subsequently considered alongside uncertainty and other remaining factors to derive the final VfM category.



Figure 4-2 - Approach to Value for Money assessment



Note- includes all typical monetised and non-monetised impacts. Those in red are not monetised for the A350 Chippenham Bypass Phases 4&5 scheme.

The appraisal approach for the scheme focuses on a robust assessment of the Level 1 monetised impacts, expected to account for the large majority of benefits.

- All Level 1 impacts are monetised, with the exception of physical activity and journey ambience which are of less relevance to the scheme and are assessed qualitatively. Total Level 1 impacts inform an Initial BCR.
- Level 2 impacts for reliability are monetised. Wider economic impacts have been assessed for increased economic output in imperfect competitive market in accordance with TAG Unit A2.2. Other wider economic impacts are assessed qualitatively. Level 2 impacts inform an adjusted BCR.
- Level 3 impacts are considered indicative by DfT; they inform a sensitivity BCR. Level 3 impacts, which involve land use change, have not been assessed.
- All relevant non-monetised impacts are assessed qualitatively

#### 4.4.2.3. Key parameters and assumptions (modelling and appraisal)

Key parameters and assumptions relating to the overall modelling and appraisal approach are set out below. Further detail can be found in the attached Economic Appraisal Report (Appendix B.3).

#### Forecast years

The scheme impacts have been assessed using a cordon of the latest peak hour models for the following forecast years:

- **2026** – representing the scheme opening year.
- **2036** – representing the design year (and aligning with the planning horizon for the emerging Wiltshire Local Plan Review).
- **2051** – representing the horizon year.

#### Scenarios

Scenarios tested are summarised in Table 4-2. The economic appraisal is predominantly based on a Core scenario, reflecting land use and transport supply changes with the greatest certainty. Alternative scenarios assist with uncertainty and sensitivity analysis. Each scenario is tested without the scheme ('Do minimum') and with the scheme ('Do something') in order to allow an assessment of the impacts attributable to the scheme.

**Table 4-2 - Scenarios developed to appraise the economic impact of the different options**

Scenario Name <sup>1</sup>	Demand assumptions	Infrastructure Supply assumptions
Core <sup>2</sup> Do Minimum	NTEM growth including all committed development as per the Uncertainty Log	All committed transport infrastructure as per the Uncertainty Log
Core Do-Something		Junction capacity improvements at Bumpers Farm roundabout + Dualling Phase 4 & 5
Sensitivity tests		
Low Growth Do Minimum	Reduction in core demand based upon formula outlined in M4.2	All committed transport infrastructure as per the Uncertainty Log
Low Growth Do-Something		Junction capacity improvements at Bumpers Farm roundabout + Dualling Phase 4 & 5
High Growth Do Minimum	Addition in core demand based upon formula outlined in M4.2	All committed transport infrastructure as per the Uncertainty Log
High Growth Do-Something		Junction capacity improvements at Bumpers Farm roundabout + Dualling Phase 4 & 5
Covid Test Do Minimum	Reduction in core demand using	All committed transport infrastructure as per the Uncertainty Log

Scenario Name <sup>1</sup>	Demand assumptions	Infrastructure Supply assumptions
Covid Test Do-Something	adjustment factors derived from observed counts in 2018 and 2022.	Junction capacity improvements at Bumpers Farm roundabout + Dualling Phase 4 & 5

1. All scenarios have been completed for 2026, 2036 and 2051
2. TAG central traffic forecast which is based on known schemes or land use changes, as recorded in the Uncertainty Log.

Additional 'Covid Impact', 'High Growth' and 'Low Growth' sensitivity tests, based on covid impacted traffic growth, high and low growth forecasts for 2026, 2036 and 2051, have been conducted. 'High Growth' and 'Low Growth' were carried out in line with the TAG Unit M4 where a proportion of the base year demand is added to (high growth) or subtracted from (low growth) the Core growth scenario.

### Appraisal period

Impacts and costs arising from implementation of the scheme are monetised across a **standard 60-year appraisal period** in line with TAG Unit A1.1. The planned scheme opening year is 2026, hence the **appraisal period runs from 2026 to 2085**.

Benefits accrued between 2026 and 2051 are interpolated based on known values from the 2026, 2036 and 2051 modelled years. Benefits accrued after the last modelled year (2051) are assumed to remain constant up until 2085.

### Modelled time periods and annualisation

The modelled time periods are AM peak hour (0800-0900), PM peak hour (1700-1800) and an average inter-peak hour (10:00-16:00).

In order to expand to represent benefits across the year (on the assumption of 253 weekdays per year) a set of annualisation factors have been applied (Table 4-3), consistent with the OBC.

**Table 4-3 - Annualisation factors**

Time Period	Peak to Period Factor*	Annualisation Factors
AM	2.00	506
IP	8.00	2024
PM	2.00	506

\*Peak to period factors were calculated based on data collected to develop the model, including ATC data.

Benefits are claimed for weekdays only and benefits associated with the 'off-peak' period, weekends and bank holidays are excluded. This reflects a conservative assessment.

### TAG data book

The TAG data book provides the primary reference source of standard modelling and appraisal values. At the time of model development to inform the economic appraisal, the prevailing version of TAG Databook was V1.20.2 (January 2023). To ensure consistency between modelling and appraisal this version of the TAG Databook forms the basis for the appraisal of benefits and costs which have been derived from the transport model unless otherwise stated.

Sensitivity testing using the most recent TAG Databook at the time of writing this FBC (Databook v1.21, May 2023) has been performed to indicate the impacts of changes to underlying assumptions over this period on that group of benefits. The modelling itself has not been rerun to reflect these changes however.

Assessment of impacts which are not derived from the transport model have been based on Databook v1.20.2 throughout.

### **Discounting and price base**

All benefits and costs have been assessed over a 60-year project lifetime (ending in 2082) and then discounted back to a common base year (2010) in market prices.

Discount rates of 3.5% and 3.0% have been applied to standard benefits and costs for years 1 to 30 and 31 to 60 from the current year (2023) respectively. Discount rates for life and health-related impacts starting at 1.5% have been applied within the available appraisal tools as applicable. The price base is also 2010. All prices in the appraisal have been adjusted for inflation to be shown in 2010 prices. All benefits and costs are therefore shown in present values for a 2010 base year, at 2010 prices.

### **Annual Average Daily Traffic flows**

24-hour AADT values are required for the COBA-LT, distributional impacts, noise and air quality assessments. These have been derived from the modelled hours using calculated expansion factors established for the WTM. Details of the relevant factors for conversion to AADT can be found within the Traffic Forecasting Report.

#### **4.4.2.4. Monetised impacts – appraisal tools and approach**

The key methods and tools employed for monetising impacts are summarised in Table 4-4. Supporting documentation providing further details is signposted, which much of this being available within the Economic Appraisal Report (**Appendix B.3**).

**Table 4-4 - Summary of monetisation appraisal methods**

Impact level	Impact	Appraisal method
Level 1	Transport User Impacts	DfT's TUBA programme – including journey time and operating cost savings for all user types. <i>Analysis presented in Appendix B.3</i>
	Greenhouse Gas Emissions	The national highways air quality spreadsheet model v9, based on Defra vehicle emission factor toolkit (EFT v11.0) following the guidance presented in TAG Unit A3 Chapter 4. <i>Analysis presented in Appendix B.8</i>
	Indirect Taxation Revenues	DfT's TUBA programme <i>Analysis presented in Appendix B.3</i>
	Noise	In accordance with TAG Unit A3 Chapter 2, methodology based upon the DMRB LA 111 'noise and vibration', revision 2, May 2020. Road traffic noise levels have been determined using a noise model built in NoiseMap v5.2 <i>Analysis presented in Appendix B.8</i>
	Air Quality	Design Manual for Roads and Bridges (DMRB) LA105 Air Quality and a quantitative appraisal following the impact pathway approach in accordance with TAG Unit A3 Chapter 3 using the National Highways air quality spreadsheet model v9 (based on Defra vehicle emission factor toolkit EFT v11.0). <i>Analysis presented in Appendix B.8</i>
	Collision Impacts	DfT's COBALT spreadsheet. <i>Analysis presented in Appendix B.3</i>
	Construction Impacts	Temporary traffic management restrictions during construction defined and modelled in SATURN (10 months duration). Journey time impacts assessed through DfT's TUBA, with annualisation applied reflecting the duration.
Level 2	Increased Economic Outputs in Imperfectly Competitive Markets	Calculated following guidance in TAG Unit A2.2 'Induced Investment', whereby a 10% uplift is applied to the business user conventional transport benefits from the raw TUBA output. <i>Analysis presented in Appendix B.3.</i>
	Journey Time Reliability	Python process using "urban roads" method set out in TAG Unit A1.3 calculating reliability benefits for the modelled years, using TUBA input matrices. <i>Analysis presented in Appendix B.3</i>

#### 4.4.2.5. Non-monetised impacts approach

Where there is no established method for monetising impacts, or it is not considered proportionate to do so, the impact has been assessed using a seven-point scale to denote the magnitude and nature of the impacts, ranging from large adverse to large beneficial (as per TAG). This is informed by a variety of evidence sources and analytical judgement.

The non-monetised impacts assessed qualitatively for the scheme are:

- Wider economic impacts;
- Physical activity;
- Journey ambience;
- Security;
- Severance;
- Accessibility;
- Affordability;
- Townscape;
- Historic environment;
- Landscape;
- Biodiversity; and
- Water environment.

Option and non-use values<sup>24</sup> is not considered relevant in the context of the scheme.

The overall consideration of the appraisal (as part of the Value for Money Statement) determines whether these impacts, either individually or collectively, are likely to materially alter the overall value for money of the scheme.

## 4.5. Social Cost-Benefit Analysis

### 4.5.1. Scheme costs (Present Value of Costs)

Details of the scheme base costs (construction and operating costs) are provided in the Financial Dimension. This section discusses the treatment of those costs for appraisal. Estimation of the costs of transport schemes is important for decisions on scheme funding and is a crucial part of the scheme appraisal process. Unrealistic cost estimates that subsequently rise will adversely affect the robustness of the assessment of affordability and value for money of a scheme.

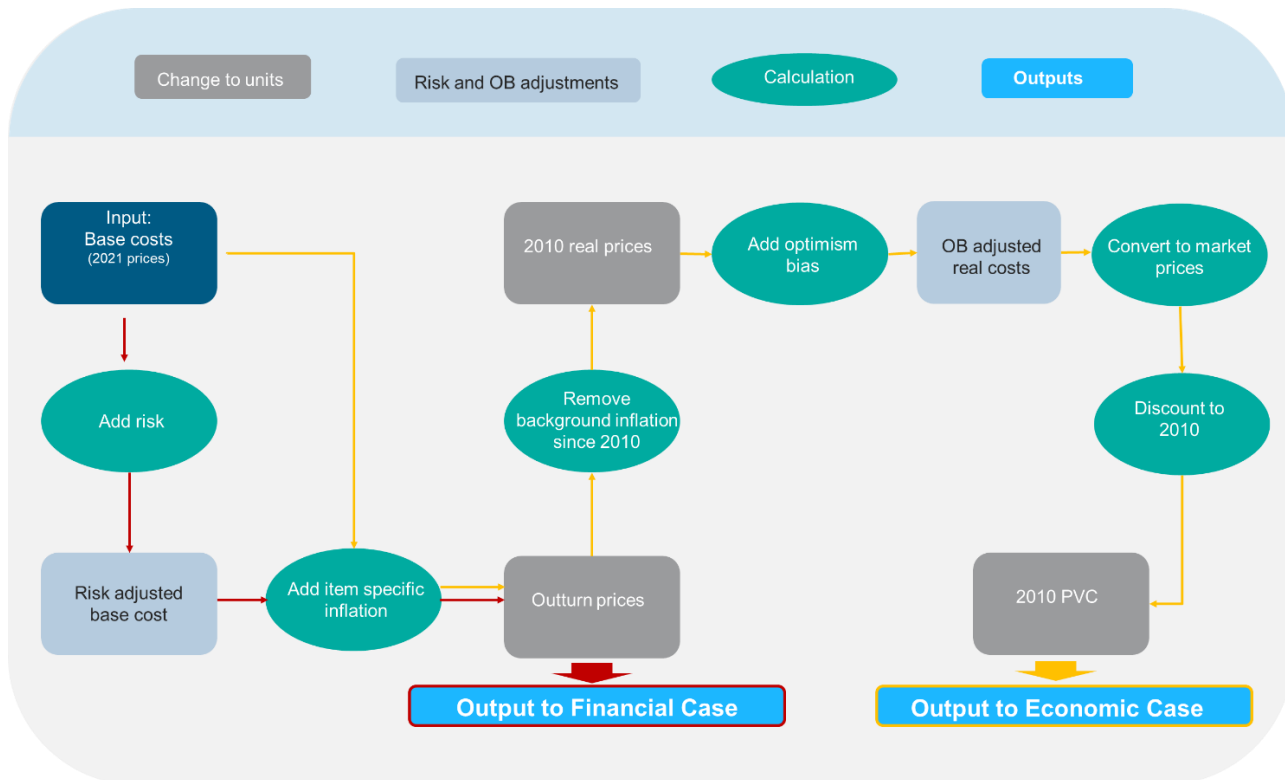
The derivation of the Present Value Cost (PVC) of the scheme (for use within the economic appraisal) follows TAG Unit A1.2. The process is summarised in Figure 4-3, including the conversion to 2010 real prices; application of optimism bias; conversion to market prices; and discounting to 2010.

The preparation of costs differs between the Economic and Financial Dimensions. The red arrows in the figure indicate the process to prepare costs for the Financial Dimension and blue arrows indicate the method used for the Economic Dimension.

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<sup>24</sup> Option values and non-use values relate to the implementation or withdrawal of a public transport service and should only be assessed if the scheme includes measures that will substantially change the availability of transport services within the study area.

Figure 4-3 - Overview of the approach to cost appraisal



The forecast construction cost is £31.10 million in Q3 2023 prices, with a further £12.80 million required for maintenance and renewals<sup>25</sup> over the 60-year appraisal period. This translates into a total PVC (inclusive of construction, maintenance and renewal costs over a 60-year period) of **£20.77 million**. The breakdown of the PVC calculation is presented within Table 4-5.

Table 4-5 - A350 Chippenham Bypass PVC calculation (£millions)

£ millions	Capital cost	Maintenance cost	Total cost
Base cost totals over 60-years (Q3 2023 prices)	24.37	12.80	37.17
Inflated to outturn and rebased to 2010 real prices	24.14	15.63	39.77
Optimism bias contribution	4.83	6.41	11.24
Optimism bias adjusted cost	28.97	22.03	51.01
Uplifted to market prices	34.48	26.22	60.70
Discounted to 2010 values <b>PVC (scheme costs)</b>	<b>16.13</b>	<b>4.63</b>	<b>20.77</b>

The development of the PVC follows these key steps:

- Investment costs are taken (excluding risk and sunk costs) and adjusted to the last full year.

<sup>25</sup> Maintenance and renewal costs are additional to any costs which would be required should the M4 Junction 17 scheme not go ahead.

- Inflation is applied.
- Rebased to 2010 real prices using the GDP deflator (remove background inflation).
- Optimism bias of 20% is applied to capital costs in line with the recommended value for roads schemes at FBC. An uplift of 41% has been applied to renewal and maintenance costs to reflect uncertainty over longer term cost forecasts.
- Optimism bias adjusted factor costs are converted to a market price unit of account using a factor of 1.19.
- Values are discounted to 2010 Present Value Costs (PVC) in line with TAG guidance.

Preparatory costs were inflated in line with Retail Price Index (RPI) from TAG and construction costs were inflated in line with the Tender Price Index (TPI) from BCIS.

These values were then deflated to 2010 prices and values using the annual parameters GDP deflators.

Further details of derivation of the PVC are presented in the Economic Appraisal Report (**Appendix B.3**), including the PVC cost proforma and Public Accounts table.

This is a central forecast for the PVC, but includes uncertainties related to delivery of the scheme and to the wider economy. Sensitivity testing around this central estimate is set out in Section 4.7.6.

#### 4.5.2. Monetised impacts – Level 1 (initial BCR)

This section presents the key outcomes of the appraisal of Level 1 monetised impacts from a UK social welfare perspective. It presents an overall summary, and then considers each impact in turn. Impacts are presented for the core scenario (see section 4.4.2.3); alternative scenarios are considered through the uncertainty analysis. The scope of this analysis is consistent with the impacts identified in the logic map (see also section 4.4.1). Further details can be found in the Economic Appraisal Report (**Appendix B.3**).

##### 4.5.2.1. Summary of monetised impacts - Level 1 (initial BCR)

The total Present Value of Benefits (PVB) of all Level 1 monetised impacts is **£66.39m**. The breakdown across the various impacts is summarised in Table 4-6. Set against the PVC, this produces an initial BCR of 3.20.

**Table 4-6 - Calculation of initial BCR (£m, 2010 present prices and values)**

Impact / measure	£ (2010 prices)
User benefits and business impacts	69.55
Construction Impacts	-3.48
Greenhouse gases, air quality and noise	-6.53
Collisions	7.29
Indirect tax revenues	-0.45
Present Value of Benefits (PVB) (Level 1)	66.39
Present Value of Costs (PVC)	20.77
<b>Initial BCR</b>	<b>3.20</b>

##### 4.5.2.2. Transport network user benefits

Transport model outputs for the scheme impacts in the 2026, 2036 and 2051 forecast years were input to DfT's TUBA software. The calculated benefits are presented in Table 4-7. These include the Present Value of Benefits (PVB) of travel time and vehicle operating cost savings for the scheme, split by trip purpose. The results show forecast benefits in travel time and vehicle operating costs (VOC) as a result of reduced delay and time spent in traffic queues.



**Table 4-7 - Present value of user benefits and business impacts (£m, 2010 prices and values):**

Benefit stream	PV (£m)
Travel time: Business	22.03
Travel time: Commuting	18.84
Travel time: Other	26.01
<b>Travel time: Total</b>	<b>66.89</b>
Vehicle Operating Costs	2.67
<b>Total (travel time + VOC)</b>	<b>69.55</b>

Travel time benefits are spread relatively evenly between different user groups. Other users (e.g. social and leisure) account for the greatest proportion of travel time benefits (approximately 39% of total travel time benefits), with business slightly lower; whilst commuting users account for 28% of the total.

A benefit to users is calculated in terms of vehicle operating costs (comprising fuel and non-fuel) operating costs. Benefits are forecast to be generated associated with reduced time spent in traffic queues and congestion. Some trips will change routes as a result of the scheme which would otherwise have typically used slower but more direct routes resulting in slightly lower fuel consumption.

#### 4.5.2.3. Construction Impacts

Transport users incur additional costs when the transport network is undergoing construction and/or maintenance works. There are four typical costs associated with these works: delay (value of time), vehicle operating costs, carbon emissions and accidents.

Construction impacts have been assessed in the SATURN model, with outputs run through TUBA to generate the monetised impact. Two temporary traffic management (TTM) phases have been modelled, assumed to have a duration of 10 months in total from May 2024 to March 2025.

Full details of the assumptions are provided in the Economic Appraisal Report (Appendix B.3).

A summary of the phases of construction and their planned impacts on network operation along with the considered annualisation factors are set out in Table 4-8. The annualisation factors indicate the total number of hours (hours per day x number of days) affected by each phase of works.

**Table 4-8 Phases of construction**

Phase	Description	Activity sequence	Start	End	Annualisation factor considered
1	Lane closure: A420 (east) to Bumpers Lane closure: Bumpers Way to A350 (S/Bound)	1	May-24	Aug-24	AM=192, IP=384, PM=192
2	Construction of traffic islands at Bumpers farm roundabout	2	Sep-24	Mar-25	AM=505, IP=1009, PM=505

The construction disbenefit has then been estimated by undertaking a TUBA assessment for the period of construction, applying these assumptions. The outcomes are presented in Table 4-9.

**Table 4-9 Present Value of indirect construction impacts (Core scenario)**

Impact	Construction Delays (£m)		Total
	TTM 1	TTM 2	
Time benefits	0.03	-3.06	-3.03
Fuel vehicle operating costs	0.00	-0.42	-0.42
Non-fuel vehicle operating costs	0.00	-0.21	-0.21
Indirect taxation revenues	0.00	0.19	0.19
<b>Construction impact PVB</b>	<b>0.02</b>	<b>-3.50</b>	<b>-3.48</b>

All values are in 2010 prices and values

The impact of the construction period on user benefits is -£3.48m. These disbenefits are associated with journey time delays and vehicle operating cost, as the traffic management will require temporary reassignment of carriageway space for the works to take place.

#### 4.5.2.4. Greenhouse gasses, air quality and noise

Full details of the assessment of greenhouse gases, air quality and noise can be found in the Environment Appraisal Report (Appendix B.8).

Changes in GHG emissions were assessed following the guidance presented in TAG Unit A3 Chapter 4. The traffic data and emissions data prepared for the air quality study area were also used to calculate total emissions of CO2 with and without the scheme. The national highways air quality spreadsheet model v9, based on Defra vehicle emission factor toolkit (EFT v11.0) was used to calculate regional emissions.

The Noise appraisal has been carried out in accordance with TAG Unit A3 Chapter 2 methodology. The operational noise study area and operational noise impacts have been established based upon the DMRB LA 111 'noise and vibration', revision 2, May 2020. Road traffic noise levels have been determined using a noise model built in NoiseMap v5.2. The noise model includes 3,592 noise sensitive receptors within the operational noise study area. NoiseMap incorporates the prediction methodology set out in the Calculation of Road Traffic Noise (CRTN). Night-time road traffic noise levels have been calculated using 'Method 3' from the Transport Research Laboratory (TRL) report 'Converting the UK traffic noise index LA10,18h to EU noise indices for noise mapping'.

A desk-based study has been completed using the principles outlined in TAG Unit A3 Chapter 3 published May 2023. The appraisal has included an examination of local air quality constraints within 200 m of the Scheme extent and the affected road network (ARN) in line with the Design Manual for Roads and Bridges (DMRB) LA105 Air Quality and a quantitative appraisal following the impact pathway approach in accordance with TAG Unit A3 Chapter 3. This approach was adopted given the realignment of the road away from properties and hence a likely change in exposure.

The monetised impacts of the scheme on noise, air quality and GHG emissions are given in Table 4-10.

**Table 4-10 - Present value of greenhouse gas (GHG) emissions, air quality and noise (£m, 2010 prices and values)**

Monetised environment impact	PV (£m)
Greenhouse gas emissions	-5.99
Noise	-0.56
Air Quality	0.03
<b>Total</b>	<b>-6.53</b>

All entries are present values discounted to 2010, in 2010 prices

#### 4.5.2.5. Collisions

The accident benefits assessment was undertaken using the DfT’s Cost Benefit Analysis – Light Touch (COBALT) spreadsheet model, in accordance with TAG guidance. COBALT software version v 2.4 has been used with economic parameters file based on TAG Data Book January 2023, v1.20.2.

The COBALT assessment provides an analysis of the likely impact of a highway scheme on the number and severity of accidents, including a monetised impact for inclusion in the BCR and Value for Money assessment.

COBALT forecasts the number of accidents on each road link for the Do Minimum and Do Something scenarios over the 60-year appraisal period, based on the product of the accident rate, the road length and the forecast annual traffic flow. Relationships and data contained in COBALT take account of changes in accident and casualty rates over time.

The inputs used for COBALT are summarised below, along with their source:

- 24 Hour Annual Average Daily Traffic (AADT) flows and speed limits for all links in the Affected Road Network (ARN) area for the Do Minimum and Do Something scenarios for the two modelled years – 2026 and 2041.
- Link details, including link length and road type, have been determined from the strategic traffic model network.
- The “link and junction combined” approach has been adopted, which is the standard approach for developing a COBALT assessment from data extracted from strategic models.
- COBALT default accident rates (based on national average rates per million vehicle-kilometres) applied.

The assessment is based on a comparison of collisions by severity and associated costs across the scheme area in the ‘with’ and ‘without’ scheme case.

The results are presented in Table 4-11, showing an expected economic benefit of **£7.92 million** associated with collision savings under the proposed scheme option.

**Table 4-11 - COBA-LT - present value of collisions (£m, 2010 prices and values)**

COBALT summary	COBALT monetised assessment (£m)		
	2026	2041	Total for all Years
Total Without-Scheme costs	19.22	14.01	723.15
Total With-Scheme costs	18.95	13.86	715.86
<b>Total collision benefits</b>	<b>0.27</b>	<b>0.15</b>	<b>7.29</b>

It is recognised that there is a safety concern in the scheme area as a result of high and increasing demand, and whilst collision frequency may be lower than the national average, addressing road safety remains a policy priority for Wiltshire Council across the authority area and needs to be considered in all new schemes being developed.

#### 4.5.2.6. Indirect tax revenues

Indirect tax revenues are incurred by transport users and providers, in the form of fuel duty and other user charges.

TUBA has been used to calculate changes in indirect tax revenues and the results are presented in Table 4-12. For the Preferred Option, the scheme is expected to deliver a marginal disbenefit to the transport user of **-£0.85 million** from small increases in indirect tax revenues.

**Table 4-12 - Indirect tax revenues (£m, 2010 prices and values)**

	PV (£m)
Indirect tax revenues	-0.45

### 4.5.3. Monetised impacts (Level 2 – adjusted BCR)

#### 4.5.3.1. Summary of monetised impacts (Level 2 – adjusted BCR)

The adjusted benefit-cost ratio (BCR) includes all ‘Level 1’ economic impacts (section 4.5.2) plus ‘Level 2’ economic impacts which consist of journey time reliability and the wider economic impact of increased output in imperfectly competitive markets. This is summarised in Table 4-13.

The addition of Level 2 impacts increases the Net Present Value (PVB) to **£78.34 million**, producing an Adjusted BCR of **3.77**.

**Table 4-13 - Calculation of adjusted BCR (£m, 2010 present prices and values)**

Impact in £m / measure	PV (£m)
<b>Level 1 impacts – total Present Value of Benefits</b>	<b>66.39</b>
Level 2 impacts - Journey time reliability	9.50
Level 2 impacts - Increased output in imperfectly competitive markets	2.45
<b>Total Present Value of Benefits (Level 1 and 2 impacts)</b>	<b>78.34</b>
Present Value of Costs (PVC)	20.77
<b>Adjusted BCR</b>	<b>3.77</b>

#### 4.5.3.2. Journey time reliability

The reliability impacts of the scheme were estimated using a Python process that applies the formula in TAG Unit A1.3 on reliability for urban roads. This provides an estimate of the change in the level of journey time variability depending on the change in average journey time for each origin/destination pair due to the scheme and the demand and distance between each pair. All economic and scheme-specific parameters used for the calculation of the reliability impacts (such as values of time, annualization factors, user class definition, etc) are consistent with the TUBA assessment of the scheme. Only weekday impacts are included, and no benefits are counted for journeys of less than 0.5 km in length. Results are presented in Table 4-14 showing journey time reliability savings of **£9.50 million** for the proposed option.

The scheme’s impact on the variability of journey times is represented through changes in the standard deviation, and is estimated using the formula:

$$\Delta\sigma_{ij} = 0.0018(t_{ij2}^{2.02} - t_{ij1}^{2.02})d_{ij}^{-1.41}$$

where:

$\Delta\sigma_{ij}$  is the change in the standard deviation of journey time from i to j (seconds); and

$t_{ij1}$  and  $t_{ij2}$  are the journey times, before and after the change, from i to j (seconds).

The reliability benefit for every movement within the study area is then calculated using the formula:

$$Benefit = -\frac{1}{2}\sum_{ij} \Delta\sigma_{ij} * (T_{ij}^0 + T_{ij}^1) * Reliability Ratio * Value of Time ,$$

where  $T_{ij}^0$  and  $T_{ij}^1$  are the number of trips before and after the change respectively, and the Reliability Ratio is assumed to be 0.4, in line with TAG guidance.

With reference to the urban roads reliability calculation formula summarised above, because the standard deviations of journey times take into account the changes in journey times per origin-destination distance, the reliability benefits can be disproportionately affected by journey time changes on short-distance trips, while potentially damping the reliability impacts calculated on long-distance trips. Although the effects of short-distance trips generally do not have any significant impact on the conventional user benefits assessed in TUBA, they can result in unrealistic reliability impacts when using the urban roads reliability calculation formula. It has therefore been considered appropriate to reduce the effect of those movements on reliability, by filtering out trips with distance less than 0.5 kilometre.

**Table 4-14 - Journey time reliability (£m, 2010 present prices and values)**

Journey reliability impact	PV (£m)
Business User Impact	3.06
Other User Impact	6.44
<b>Total</b>	<b>9.50</b>

#### 4.5.3.3. Increased output in imperfectly competitive markets

Following the guidance in TAG Unit A2.2 'Induced Investment', in the presence of a market failure – the market structure affecting the level of competition (imperfectly competitive market), there would be additional sources of welfare on top of the usual changes in the level of output which should be captured. Following guidance in TAG, this was quantified for each option through a 10% uplift of the business user conventional transport benefits and is presented in Table 4-15.

**Table 4-15 - Increased output in imperfectly competitive markets (£m, 2010 present prices and values)**

Impact	PV (£m)
Increased output in imperfectly competitive markets	2.65

#### 4.5.4. Non-monetised impacts

##### 4.5.4.1. Non-monetised impacts: Wider Economic Impacts

TAG defines Wider Economic Impacts as a set of impacts, which are additional to conventional transport economic impacts, that can arise when the economy is not functioning efficiently. As a result, additional benefits (or disbenefits) will arise as the impact of transport improvements is transmitted into the wider economy.

These impacts include productivity gains resulting from improvements in how well businesses are connected to each other as well as potential employees, and benefits arising from structural changes as businesses and households relocate.

These are not captured in the conventional economic appraisal based on journey time savings and so need to be captured separately using a defined set of calculations drawing on travel cost and trip matrices and additional economic data and parameters.

The scheme is expected to generate positive wider economic impacts, by reducing journey times for business trips, freight and commuters. This will bring down costs to businesses enabling increased competitiveness, greater agglomeration impacts and provide access to a wider labour market enabling increased productivity. Individuals will also benefit from access to jobs which are better paid or more suited to their individual requirements.

The improved capacity of the junction may help to enable increased levels of development as the network becomes more congested in the future, but the scheme does not directly enable any currently planned development.

These benefits however are expected to contribute a relatively low proportion of the total value of the scheme's impacts and so, given the complexity of assessing the wider economic impacts, it has not been considered proportionate to monetise them.

#### 4.5.4.2. Non-monetised impacts: Environment Impacts

The assessment of non-monetised environment impacts follows TAG Unit A3 and applies the qualitative environmental capital approach<sup>26</sup>:

- Step 1 – consider potential impacts and the area of impact
- Step 2 – identify key environmental resources with potential to be impacted by the scheme and identify their features
- Step 3 – for each resource, define the scale, significance, and value
- Step 4 – estimate the magnitude of impact and provide an assessment score for each feature.
- Step 5 – derive an overall assessment using a seven-point scale (large adverse to large beneficial)

This approach is common for each environment topic, with specific considerations taken into account for each in line with TAG. Table 4-16 provides a summary of the qualitative assessment scores.

**Table 4-16 – Non-monetised impacts summary - Environment**

Non-monetised impact - Environment	Qualitative assessment score
Landscape	Neutral
Townscape	Neutral
Historic environment	Slight adverse
Biodiversity	Slight adverse
Water environment	Slight adverse

Further details on the findings of the individual assessments are set out in the Appraisal Summary Table (**Appendix B.4**) and full assessment details are set out in the Environment Appraisal Report (**Appendix B.8**).

None of the non-monetised environmental impacts have been assessed to be more significant than slight adverse. This reflects that the scheme is predominantly within the existing highway boundary, and that it is an increment to existing highway infrastructure as opposed to an entirely new piece of infrastructure being introduced into the local environment.

There is a potential loss of a small area of habitats which have medium and low biodiversity and earth heritage value that support various species including bats, reptiles and breeding birds.

The scheme will potentially result in an increase in impermeable road area. This could potentially impact the water quality of Pudding Brook, a tributary of Hardenhuish Brook, Ladyfield Brook, tributaries of Ladyfield Brook and an unnamed watercourse. However, the drainage design includes mitigation measures such as filter drains and ditches which will reduce the concentration of pollutants entering these watercourses.

In relation to historic environment, the assessment indicates that whilst impacts to as yet unknown and known undesignated assets are likely, there will be no direct impacts to any designated assets, and only minor changes to the settings of designated assets.

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<sup>26</sup> The environmental capital approach was developed by the statutory environmental bodies Natural England (formerly the Countryside Agency and English Nature), English Heritage and the Environment Agency in co-operation with DfT

#### 4.5.4.3. Non-monetised impacts: Social Impacts

Non-monetised social impacts have been assessed qualitatively, in line with TAG A4.1, using a seven-point scale (large beneficial to large adverse).

The results of the social impacts appraisal are summarised in Table 4-17. Full details can be found within **Appendix B.7 – Social and Distributional Impacts Report**.

**Table 4-17 - Non-monetised impacts summary - Social**

Non-monetised impact - Social	Comments	Qualitative assessment score
Physical Activity	<p>Key impacts of the scheme have been assessed as follows:</p> <ul style="list-style-type: none"> <li>Enhancements to walking and cycling crossing facilities and provision will allow for safe crossing of the A350, and connections into the wider active travel network. This can encourage greater uptake of walking and cycling and higher levels of activity.</li> <li>General improvements in traffic conditions on the A350 and other local routes as a result of the scheme could make driving a more attractive mode for some short distance trips (particularly within the main Chippenham urban area) currently undertaken on foot or by cycle.</li> </ul> <p>Overall, it is considered that these two effects are largely counter-balanced.</p>	Neutral
Journey Quality	<p>There is a moderate beneficial impact to fear of potential collisions, frustration and environment as a result of the scheme. This is due to the predicted decrease in collisions, the improved journey time reliability and the enhancements in road conditions resulting in smoother quality of ride. There is also a slight beneficial impact to facilities and route uncertainty since the scheme will improve and upgrade the provision of pedestrian crossings and it will include new signage.</p> <p>There is a neutral impact to traveller views as the loss of landscape resources due to the new road construction will be balance by mitigation measures that are expected to limit this impact.</p>	Slight beneficial
Security	<p>The scheme is not expected to have any material impact on site perimeter issues. Emergency phones and CCTV provision are not proposed as part of the scheme. The main security impacts of the A350 Chippenham Bypass MRN scheme occur as a result of improvements to lighting, landscaping and informal surveillance.</p>	Slight beneficial
Personal Affordability	<p>It is assumed that public transport fares are not affected. Additionally, the scheme will not implement any charges on users for using the road and will not result in any changes to parking charges.</p> <p>The scheme decreases the costs associated with operating a car for medium/high income groups while the low income groups see no change in terms of affordability benefits.</p>	Slight beneficial
Severance	<p>Overall, there are a number of links within the Chippenham urban area with reduced traffic flows. In addition there is improvement in the pedestrian facilities, including several controlled crossings which will make it easier for pedestrians to cross the A350.</p>	Moderate beneficial
Accessibility	<p>East-west bus movements at Bumpers Roundabout would benefit from some journey time reduction, but these services are low frequency.</p> <p>Traffic reductions within the Chippenham urban area could result in some small benefits to bus journey time and reliability.</p>	Neutral

## 4.6. Distributional analysis

### 4.6.1. Approach

A distributional impacts appraisal has been carried out to understand the transport impacts of the scheme and their effects in relation to individual social groups. The appraisal has been conducted in line with the three-stage process defined in TAG A4.2:

- Step 1: Screening – determining the relevance of impacts in relation to the scheme;
- Step 2: Assessment – defining the social groups and amenities affected within the scheme impact area; and
- Step 3: Appraisal – core analysis of the impacts to derive appraisal scores.

The Social and Distributional Impacts Report (**Appendix B.7**) provides full details of the methodology and outputs.

### 4.6.2. Key outcomes

A summary of the results for each of the Distributional Impact indicators is provided below in Table 4-18.

**Table 4-18 - Summary of the Distributional Impacts Assessment**

Indicator	Key impacts – qualitative statements	Overall assessment
Collisions	The analysis has shown that the majority of roads experience a benefit in terms of collisions. Detailed analysis of existing collision data demonstrates that collisions involving the vulnerable groups are likely to occur on links experiencing an increase in collision rates as a result of the scheme.	Slight beneficial
Air quality	A <b>neutral</b> assessment was outlined for air quality for children as there are both links with decreased traffic flows and receptors with increased NO <sub>2</sub> levels.	Neutral
Noise	Since there are more properties with decreased noise levels within areas with high proportions of elderly residents, an overall <b>slight adverse</b> to noise is anticipated for this social groups.	Slight adverse
Security	Security was screened out; therefore a full appraisal was not carried out.	N/a
Severance	Older people and children were appraised as moderate beneficial impact in terms of severance due to decreases in traffic flows on links in proximity to concentrations of these groups. There are lower concentrations of those with a disability in proximity to the scheme and the impact has been assessed as <b>slight beneficial</b> .	Slight beneficial
User benefits	Beneficial user benefits favour income quintiles 3, 4 and 5, with neutral impacts for income quintiles 1 and 2.	Moderate beneficial
Accessibility	Accessibility was screened out; therefore a full appraisal was not carried out.	N/a
Personal affordability	There are beneficial affordability impacts for income quintiles 3, 4 and 5, and neutral impacts for income quintiles 1 and 2.	Slight beneficial



## 4.7. Uncertainty analysis

### 4.7.1. Approach to considering uncertainty

Uncertainty is inherent within the appraisal of any transport scheme. There are many ‘what ifs’ in relation to how the transport system will evolve in the future, particularly with the potential for emerging trends in behaviour and technology to drive significant change over time. The use of transport models, a fundamental aspect of scheme appraisal, can also introduce uncertainty to transport analysis, through the data, assumptions and model specifications required.

In order to consider uncertainty within the appraisal of the scheme, a proportionate approach has been taken reflecting key principles within TAG and the DfT Uncertainty Toolkit<sup>27</sup> (TAG Supplementary Guidance).

The Uncertainty Toolkit recommends consideration of the overall level / significance of uncertainty associated with the scheme. Based on the categorisation guidance provided in the Uncertainty Toolkit, the scheme is considered to fall within the ‘low’ category (Table 4-19).

**Table 4-19 – Uncertainty impact categorisation**

	Indicative impact		
	Low	Medium	High
<b>Impact on public finances through budget cost or revenue risk</b>	Tier 3 e.g. < £50m	Tier 2 e.g. £50 - £500m	Tier 1 e.g. > £500m
<b>Corporate risk</b>	Limited / risk of minor embarrassment	Risk of minor loss in confidence	Risk of major loss in confidence
<b>Value for Money</b>	Solidly within a value for money category	Close to a value for money category boundary	Bordering two value for money categories
<b>Level of uncertainty</b>	Input assumptions low range of uncertainty. Short lifetime, e.g. <5 years	Input assumptions medium range of uncertainty. Medium lifetimes, e.g. 5 – 50 years	Input assumptions high range of uncertainty. Long lifetimes, e.g. > 50 years

### 4.7.2. Assessing uncertainty

The uncertainty impact categorisation helps to inform the type and proportionality of the approach to considering uncertainty. The approach adopted for the scheme applies elements of the following techniques (as covered in the Uncertainty Toolkit) in a proportionate manner:

- Judgement-based;
- Scenarios;
- Sensitivity testing; and
- Switching values analysis.

Two key areas of uncertainty in transport modelling and appraisal have been considered:

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<sup>27</sup> It should be noted that a key component of the Uncertainty Toolkit - the Common Analytical Scenarios – was released in August 2022. Due to the timing, the Common Analytical Scenarios have been considered in a qualitative manner. Other key principles from the Uncertainty Toolkit are applied in a proportionate manner.

- **input uncertainty** (e.g. relating to potential variance around demand and supply assumptions, at a local and national level); and
- **modelling and appraisal specification uncertainty** (e.g. relating to uncertainty around specific values or parameters which may influence model forecasting and / or appraisal calculations).

#### 4.7.3. Covid impact sensitivity

A scenario to capture the Covid impact is detected to test the sensitivity of overall decrease in flows across the network given the reduction in car trips caused by post-pandemic traffic trends. It was observed within the traffic model that this decrease tends to be higher along main roads such as A350, Bath Rd, A420 and B4069 which are main roads in Chippenham, however the magnitude of this changes is smaller than in the high or low growth scenarios. More details of the traffic flow impacts can be found in Section 8.3 of the Traffic forecasting report. Traffic changes caused by the COVID-19 pandemic was observed to have no major impacts on the scheme and traffic flows and V/C ratio have an overall decrease due to the slightly lower demand, and there are no considerable changes in delays.

A TUBA assessment was carried out to capture the benefits likely to occur due the covid impact in the traffic model. Table 4-20 shows the comparison of the TUBA benefits of the Core scenario and the covid impact benefits.

**Table 4-20 - Present value of highway user benefits (£m, 2010 prices and values)**

TUBA benefits	Core	Covid Impact
Travel time - business	22.03	17.78
Travel time - commuting	18.83	14.86
Travel time - other	26.02	20.12
Fuel operating costs	2.07	1.56
Non-fuel operating costs	0.60	0.71
Indirect taxation revenues	-0.45	-0.78
<b>PVB (TUBA)</b>	<b>69.10</b>	<b>54.25</b>
AQ,GHG, Noise	-6.53	-6.53
Construction Impact	-3.48	-3.48
Accidents	7.29	7.29
<b>Total PVB</b>	<b>66.39</b>	<b>51.54</b>
PVC	20.77	20.77
<b>BCR</b>	<b>3.20</b>	<b>2.48</b>

It is observed that the TUBA benefits of the Covid impact sensitivity test reduce by around £15million, which can be attributed to the reduction in overall demand and slight changes in delays. The BCR for the covid impact is observed to be 2.48.

#### 4.7.4. Demand sensitivity

The demand sensitivity scenarios detailed within this section include demand-side scenario tests which consider uncertainty in relation to traffic growth. The two growth scenarios tested are:

- Low growth scenario
- High growth scenario

Table 4-21 illustrates how benefits develop over time in these low and high growth scenarios relative to the Core scenario and Table 4-21 shows how the breakdown of benefits by journey purpose compare between these scenarios.

**Table 4-21 Summary of demand-side alternative scenario (£m, 2010 present prices and values)**

Measure	Core	Low Growth	High Growth
Scheme cost (PVC)	£20.77	£20.77	£20.77
PVB – level 1 and 2 impacts	£78.34	£22.84	£177.30
Adjusted BCR	3.77	1.10	8.54

Based on these demand-side scenarios, the Adjusted BCR has a range between 1.10 and 8.54. The outcomes indicate that the scheme BCR is sensitive to low growth and high growth conditions.

#### 4.7.5. Value of time sensitivity

As a significant proportion of the scheme benefits are related to travel time benefits it is appropriate to consider uncertainty and sensitivity in relation to the values of time assumed. The core assessment uses default assumptions as per TAG Databook v1.20.2. The sensitivity test follows guidelines set out in TAG A1.3 to assess the impact of higher and lower values of time. TAG recommends that work time savings and non-work time savings are treated separately with a range of +/-25% applied to the values of business and commuting time and +/-60% applied to values of time for other trip purposes. This range represents a 95% confidence interval based on the studies which have informed the TAG forecasts of values of time. A summary of how this affects the forecast benefits is set out in Table 4-22.

**Table 4-22 Summary of values of time sensitivity (£m, 2010 present prices and values)**

Measure	Core	Work		Non-work	
		+25% business user benefits	-25% business user benefits	+25% commuter / +60% other	-25% commuter / -60% other
Travel time benefits - business	£22.03	£27.54	£16.52	£22.03	£22.03
Travel time benefits - commuting	£18.83	£18.83	£18.83	£23.54	£14.13
Travel time benefits - other	£26.02	£26.02	£26.02	£41.63	£10.41
Total travel time benefits	£66.88	£72.39	£61.38	£87.20	£46.56
PVB – level 1 and 2 impacts	£78.34	£83.85	£72.83	£98.66	£58.02
Scheme cost (PVC)	£20.77	£20.77	£20.77	£20.77	£20.77
<b>Adjusted BCR</b>	<b>3.77</b>	<b>4.04</b>	<b>3.51</b>	<b>4.75</b>	<b>2.79</b>

The outcomes of the sensitivity test indicate an overall range of BCR from 2.79 to 4.75. The scheme BCR is most sensitive to changes in non-work values of time.

#### 4.7.6. BCR sensitivity

The results of the BCR sensitivity test have been calculated for the adjusted BCRs considering  $\pm 10\%$  in costs and benefits, as summarised in Table 4-23 and Table 4-24 respectively.

**Table 4-23 - BCR sensitivity testing – costs (£m, 2010 present prices and values)**

Sensitivity tests	PVC (£m)	PVB (£m)	BCR
10% lower costs	18.69	78.34	4.19
Calculated costs (Core scenario)	20.77	78.34	3.77
10% higher costs	22.84	78.34	3.43

**Table 4-24 - BCR sensitivity testing – benefits (£m, 2010 present prices and values)**

Sensitivity tests	PVC (£m)	PVB (£m)	BCR
10% lower benefits	20.77	70.50	3.39
Calculated benefits (Core scenario)	20.77	78.34	3.77
10% higher benefits	20.77	86.17	4.15

The results of the BCR sensitivity tests demonstrate that an increase/decrease of costs or benefits by 10% would not impact the overall VfM category, 'High', of the adjusted BCR for the option considered.

#### 4.7.7. Switching value analysis

Considering the scale of change required from either benefits or costs in isolation to result in a change in value for money categorisation, based only on the monetised benefits of the scheme, Table 4-25 sets out a switching value analysis.

**Table 4-25 – Switching Value Analysis**

VfM category (BCR)	PVB	PVC	BCR	VfM
Core	78.34	20.77	3.77	High
Minimum Variation to Benefits	41.50 (-47%)	20.77	<2	Medium
	83.00 (+6%)	20.77	>4	Very High
Minimum Variation to Costs	78.34	39.00 (+88%)	<2	Medium
	78.34	19.60 (-6%)	>4	Very High

The switching values analysis indicates that for the VfM to drop from High to Medium either the benefits would need to fall by 47% or the costs rise by 88%. For the VfM to change to Very High the benefits would need to rise by 6% or the costs fall by 6%.

Taking into account the consideration of uncertainty, this indicates that there is a reasonable degree of certainty around the Core Adjusted BCR (and resultant High VfM category), but that there is also a reasonable likelihood of the scheme VfM moving into a Very High VfM category, and a possibility of the scheme VfM moving into a Medium VfM category.

## 4.8. Wider analysis

### 4.8.1. Place-based analysis

As set out in the Strategic Dimension, the scheme is part of a holistic strategy to enhancing north-south connectivity, including a series of upgrades to the principal A350 corridor (part of the Major Road Network) between the M4 and the South Coast. At a spatial level, the appraisal of the scheme demonstrates benefits to the west Wiltshire towns (i.e. comprising the A350 Growth Zone) and the wider Western Gateway region.

#### 4.8.1.1. User benefits and traffic related impacts

Section 4.5.2.2 demonstrates that user travel time benefits represent a significant proportion of the overall social welfare benefit. The distribution of benefits (over the 60-year appraisal period) between geographic sectors is presented in Figure 4-4 and Table 4-26.

**Figure 4-4 - Distribution of Travel Time Benefits**

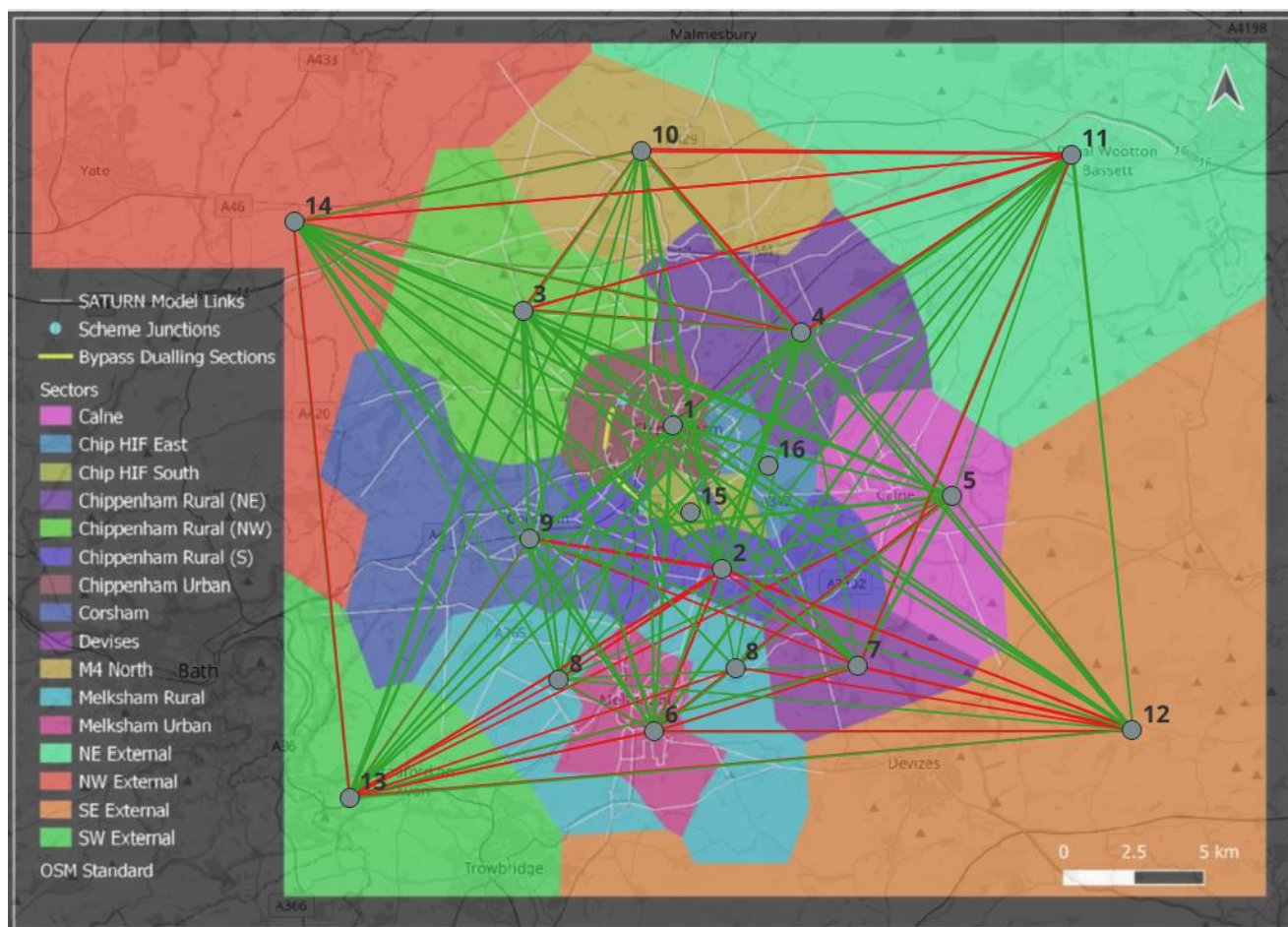


Figure 4-4 and Table 4-26 show the sectorised origin-destination movements which are forecast to generate the most significant benefits (green) and disbenefits (red). This indicates that the largest benefits calculated are for the sectoral movements originated and destined to the sector Chippenham Urban. This is followed by sectoral movements between Corsham and Melksham Urban where the scheme improvements are directly benefited. A range of longer distance movements passing through the scheme or surrounding area are also forecast to experience time savings. Some marginal disbenefits are observed for the forecast for trips around the Chippenham rural sectors.

Table 4-26 - Distribution of Travel Time Benefits (£000s, 2010 present prices and values)

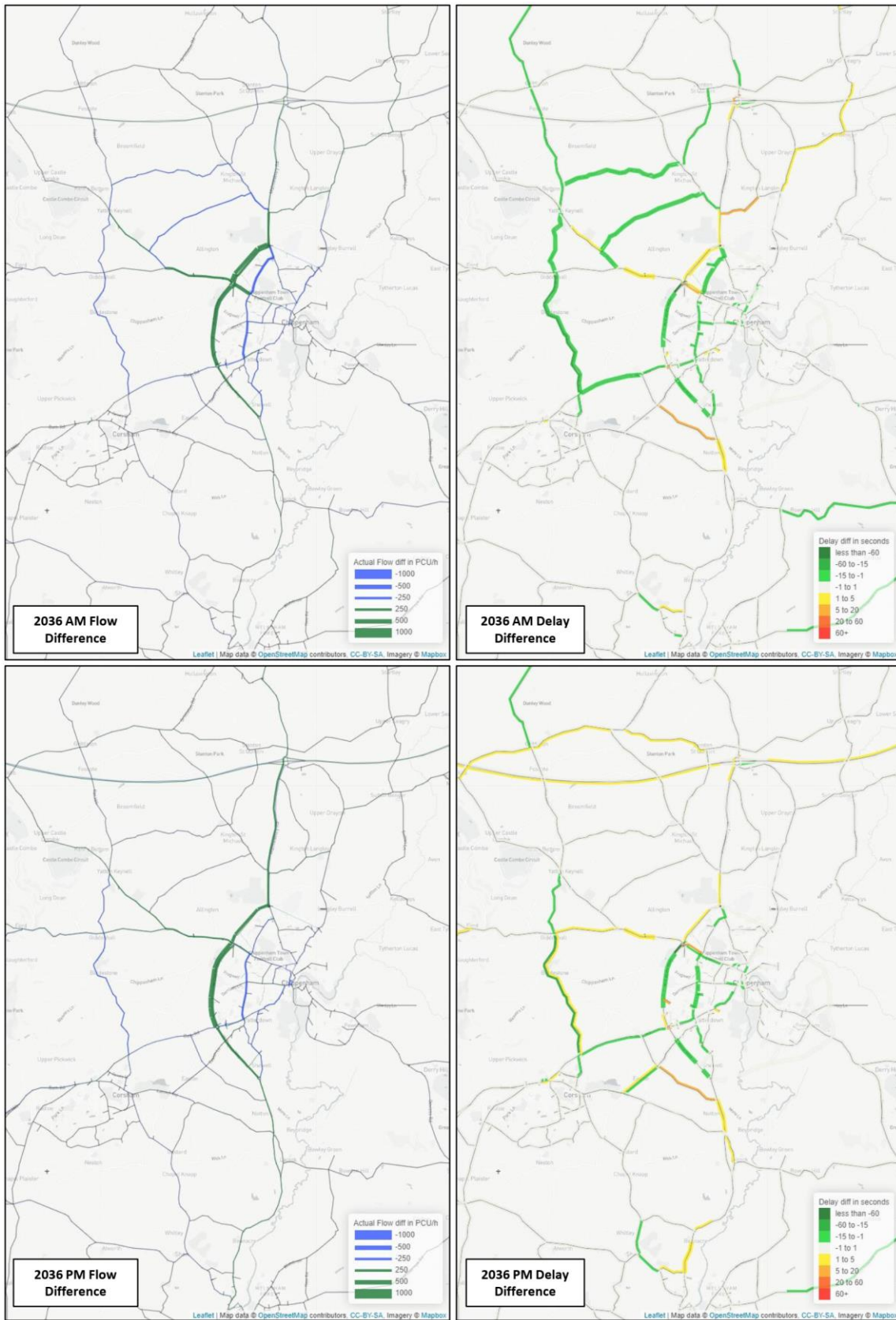
		Destination																Total	
		1	15	16	2	3	4	5	6	7	8	9	10	11	12	13	14		
Origin	Chippenham Urban	1	21,359	0	0	1,284	2,261	1,710	1,932	2,016	193	456	1,242	571	4,762	2,513	1,135	5,765	47,200
	Chip HIF South	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Chip HIF East	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Chippenham Rural (S)	2	278	0	0	2	312	150	11	-11	0	-3	-40	80	666	-15	-57	672	2,042
	Chippenham Rural (NW)	3	718	0	0	92	0	13	75	55	4	14	14	1	-88	74	5	13	990
	Chippenham Rural (NE)	4	286	0	0	69	-4	7	2	92	0	31	81	-5	-100	59	73	-225	363
	Calne	5	302	0	0	8	133	13	15	-4	1	-3	8	0	17	-5	-26	141	599
	Melksham Urban	6	362	0	0	-24	202	292	47	-47	16	-31	64	169	1,438	29	-42	877	3,351
	Devises	7	1	0	0	-2	19	1	5	-4	0	0	-1	0	1	-9	-5	18	23
	Melksham Rural	8	112	0	0	-6	63	88	6	2	2	0	10	39	510	9	-1	219	1,051
	Corsham	9	614	0	0	-7	143	566	15	27	0	1	-22	116	2,049	27	-151	739	4,118
	M4 North	10	60	0	0	23	-2	-4	0	35	0	8	7	0	-181	19	11	-241	-265
	NE External	11	768	0	0	258	-7	-3	0	383	-1	203	476	-39	0	317	295	-2,618	31
	SE External	12	232	0	0	-47	286	209	42	-221	-3	-81	1	102	1,373	15	-56	236	2,088
	SW External	13	256	0	0	-41	138	463	27	-138	3	-29	58	143	1,855	43	0	49	2,827
	NW External	14	1,625	0	0	249	9	295	105	398	2	64	121	13	-559	145	-1	0	2,467
	Total		26,972	0	0	1,857	3,553	3,800	2,283	2,582	216	631	2,019	1,189	11,741	3,221	1,178	5,644	66,885

#### 4.8.1.2. Traffic related impacts

Based upon the traffic modelling predictions, the traffic rerouting effects are expected to provide some beneficial impacts for parallel routes through the Chippenham urban area, and also surrounding rural routes and communities. These beneficial impacts are associated with changes in traffic volumes, delays and localised noise and air quality effects. The other implication of this effect is higher traffic levels on the A350, plus primary route connecting to it, including the M4 (via Junction 17).

Figure 4-5 shows the impact of the scheme on traffic flow and delay across the local transport network in the 2036 forecast scenario for both the AM and PM peak periods.

Figure 4-5 - Scheme impact on the transport network compared with the 2036 core scenario



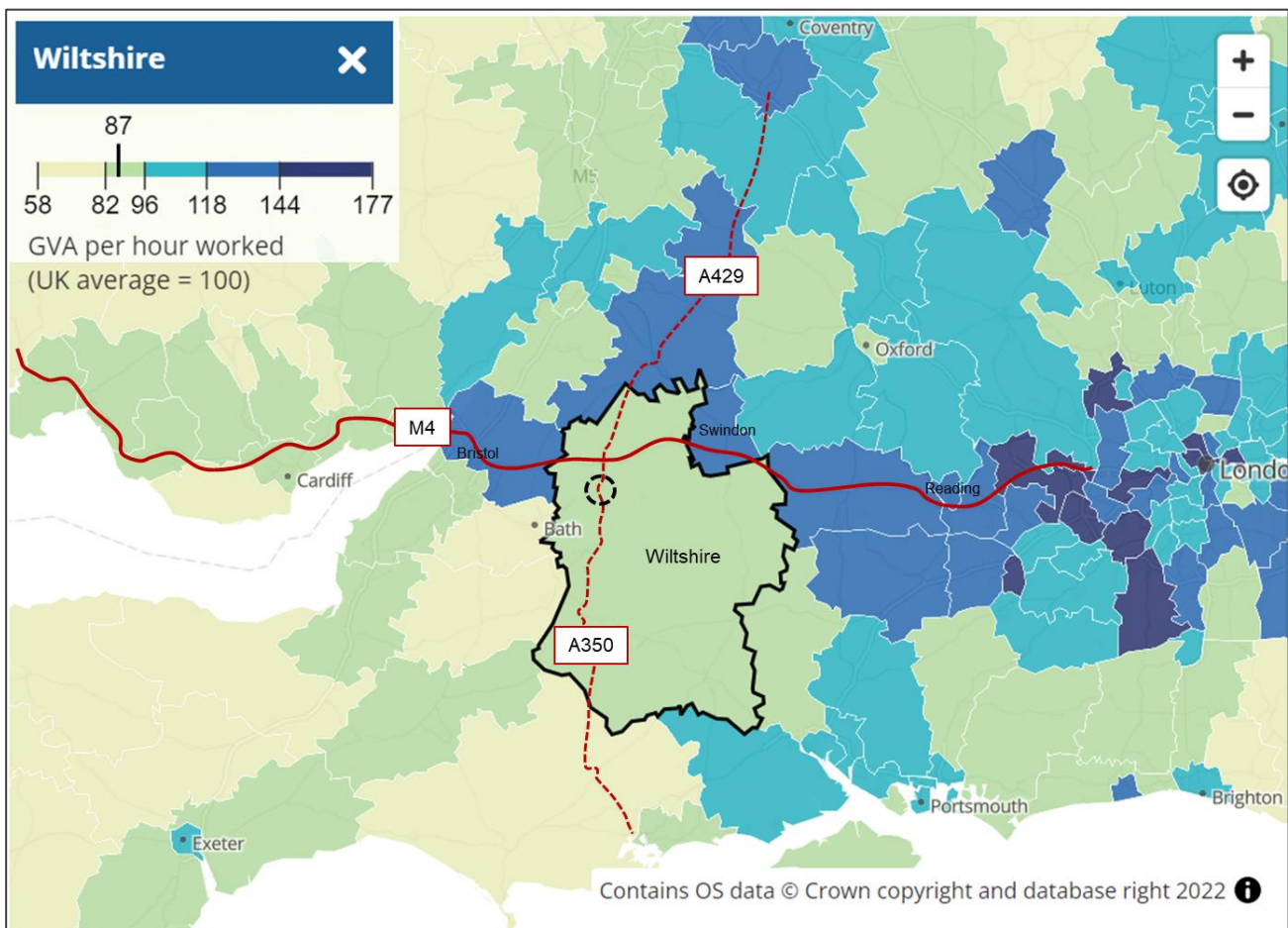


There is reduced delay along the sections of the A350 Chippenham Bypass subject to improvement. Significant delay reductions are evident at Bumpers roundabout despite a significant re-diversion of traffic along the A350 and away from local parallel routes. Signalisation at Bumpers roundabout results in delay decreases benefitting all approaches, in particular on Bumpers Way. The implementation of signals at Bumpers Farm roundabout and increases in traffic flow, does result in some delay increase for some movements. Additionally, increased demand on Bristol Road to the east of Bumpers Roundabout experiences some increase in delay in both directions in the AM, and eastbound in the PM due to demand increases along this route. Slight delay increases are evident at M4 J17 and on approaches to the A350 from the local road network.

#### 4.8.1.3. Closing the productivity gap

A key challenge for the Western Gateway region is closing the productivity gaps affecting parts of the region, including Wiltshire. **Figure 4-6** illustrates this through mapping a GVA index (Office for National Statistics – sub-regional productivity), and highlights the significance of the scheme for maintaining high quality strategic connections between Wiltshire (particularly the west Wiltshire towns) and surrounding areas of higher productivity.

**Figure 4-6 – Sub-regional productivity (Index of GVA per hour worked, 2019, UK =100)**



**Faster and more reliable journey times** resulting from the scheme (compared to the 'Do Minimum') will support **enhanced connectivity** between Wiltshire and key economic centres, including surrounding

Functional Urban Regions<sup>28</sup> such as Swindon, Bristol and Bournemouth / Poole on the south coast, and those farther afield with primary access via the M4, such as the Thames Valley area, Heathrow and London.

The scheme is therefore expected to drive **agglomeration-based productivity improvements** for Wiltshire and the wider Western Gateway region in particular; serving to effectively bring workers and employment opportunities closer together. Workers would have access to a greater range of employment opportunities, whilst employers would have greater access to a more diverse pool of labour (and a greater range of skills). As a result, an associated increase in economic activity would be expected, accompanied by higher levels of output per worker.

These beneficial impacts for the area are particularly relevant when considered in the context of the broader improvement strategy for the corridor, but the scheme is a key component and thus address a constraint to realising the full wider benefits of other investment in the A350 corridor (including the potential MRN scheme at M4 Junction 17, and potential Large Local Majors scheme for Melksham Bypass). As a point of reference, the Western Gateway connectivity study<sup>29</sup> estimated potential total agglomeration benefits of approximately £350 million (over 60 years) associated with enhancement to the A350 corridor as a whole.

#### 4.8.1.4. Delivery of local housing and jobs

##### **Facilitating new housing sites in the A350 corridor**

The significance of the A350 corridor to the spatial strategy for Wiltshire was identified in the Strategic Dimension and effective connections to the M4 SRN are an important factor in the viability of new housing and employment sites within the area. The ongoing Wiltshire Local Plan Review identifies a requirement of approximately 24,000 new homes within the A350 corridor between 2016 to 2036, with a need to identify new site allocations to deliver approximately 10,000 of these. Chippenham has been identified as a key growth area; its convenient access to the M4 (via Junction 17) is a particular strength in terms of attractiveness in the housing market.

The appraisal of the scheme demonstrates its effectiveness in catering for planned and future growth and the associated additional traffic demands. Facilitating new local housing sites would generate economic benefit for the area through Land Value Gain. At a full corridor-wide level, the Western Gateway connectivity study estimated potential Land Value Gain of £156 million associated with enhancement of the A350. The benefit directly attributable to the A350 Chippenham Bypass improvements scheme would be substantially lower than this.

##### **Economic competitiveness and inward business investment**

The Strategic Dimension identified a strong supply of employment land within Wiltshire, and the A350 corridor in particular. As part of the development of its Regional Evidence Base, the Western Gateway STB identified (through business surveys and engagement) transport connectivity as an important factor in business investment decisions within the area. This is due to the impacts of accessibility, reliability and delays on firms' costs, and ultimately their competitiveness. The Swindon and Wiltshire Local Enterprise Partnership identifies significant potential for the A350 Growth Zone.

The beneficial impacts of the scheme on inter-connectivity within the A350 Growth Zone, plus enhanced access to the SRN, will therefore deliver positive effects for the corridor in relation to inward business investment (and retention), job creation and associated economic value. This may involve some displacement of economic activity from elsewhere, either within the Western Gateway region or beyond.

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<sup>28</sup> Functional Urban Regions (FUR) comprising a core and a surrounding hinterland, are defined areas of concentrated economic activity and are identified within TAG (e.g. A2.4) as areas more likely to be associated with agglomeration benefits.

<sup>29</sup> Western Gateway STB Economic Connectivity Study (WSP, 2019) - <https://westerngatewaystb.org.uk/wp-content/uploads/2020/08/wg-reb-appendix-a-Economic-Connectivity-Study.pdf>

As with productivity (agglomeration) and Land Value Gain benefits, the value of the scheme is most usefully considered in relation to its contribution to the wider corridor strategy. The Western Gateway connectivity study estimated the potential for over 8,600 new jobs (direct employment) associated with enhancement to the whole A350 corridor, equating to additional GVA for the area of £2.3 billion over 10 years (with an additionality assumption of 25%). Adjusting this for employment opportunities within the Wiltshire section of the corridor only provides a value of approximately £1.5 billion. The benefit directly attributable to the A350 Chippenham Bypass improvements scheme alone would be substantially lower than this.

#### 4.8.1.5. Other local economic benefits

The scheme is expected to contribute to other economic benefits for the area, including:

- Enhanced connectivity to the region’s international gateways, including the Port of Poole and Bournemouth / Southampton airports; and
- Generating tourism benefits, with improved connectivity via the M4/A350 enhancing the area’s visitor economy including access to the South Coast and major tourist attractions such as Longleat Safari Park (off the A350 at Warminster).

### 4.8.2. Performance against objectives

This section presents the scheme’s performance against the objectives outlined in the Strategic Dimension. Model outputs and qualitative commentary has been provided to assess how well the scheme performs against the objectives. This is presented in Table 4-27.

**Table 4-27 – Performance against objectives**

Objective	Performance against objective
Protect the strategic role of the A350, by increasing the road capacity to improve north-south connectivity and minimise traffic reassigning onto the local road network	Traffic modelling predicts that the scheme is effective in keeping the A350 Chippenham bypass operating more efficiently by a 2036 forecast year, with the key links and Bumpers Roundabout junction operating within capacity. It also indicates that, with the scheme, traffic is less likely to seek alternative north-south routes including through the Chippenham urban area.
Improve journey time reliability and reduce total delay along the A350 Chippenham Bypass (and which may otherwise discourage inward investment towards new and existing employment sites in Chippenham)	Modelling indicates that the scheme will result in reduced journey times along the A350 compared to the Do-Minimum situation (2036 Core Scenario). The scheme will provide improved access to / from the Bumpers Farm Industrial Estate (accessed directly from the Bumpers Roundabout junction). Some small localised delay increase could be experienced during quieter periods of the day, such as the interpeak, as a result of the signalisation of Bumpers Roundabout junction.
Reduce the frequency of collisions along the A350 Chippenham Bypass and parallel routes	Safety assessment performed using COBA-LT indicates that accident numbers across the network will be reduced, leading to an economic benefit. Signalisation of Bumpers Roundabout would be expected to reduce the risk of collisions. The scheme provides safer provision for pedestrians and cyclists across the A350 (and connecting into the wider active travel network).
Increase the capacity of the A350 Chippenham Bypass to support planned growth (Wiltshire Core Strategy and CSAP) and	Indicatively, the increase in BCR under the High Growth alternative demand scenario suggests that the scheme continues to be effective under higher levels of traffic demand (over and above the demand associated with committed developments included in the Core scenario).

Objective	Performance against objective
future growth (emerging Local Plan).	The Chippenham urban area will continue to be a focus of new housing growth in Wiltshire. Potential sites to the south and south west of the town would be expected to take access to the A350 Chippenham Bypass, thus placing increased demands on the route. The general capacity improvements provided by the scheme therefore have a strategic benefit in facilitating future growth.

## 4.9. Appraisal Summary Table

An Appraisal Summary Table (AST) has been produced in line with TAG guidance. The AST collates the key economic, social, environmental and distributional impacts and costs. The completed AST is provided in **Appendix B.4**.

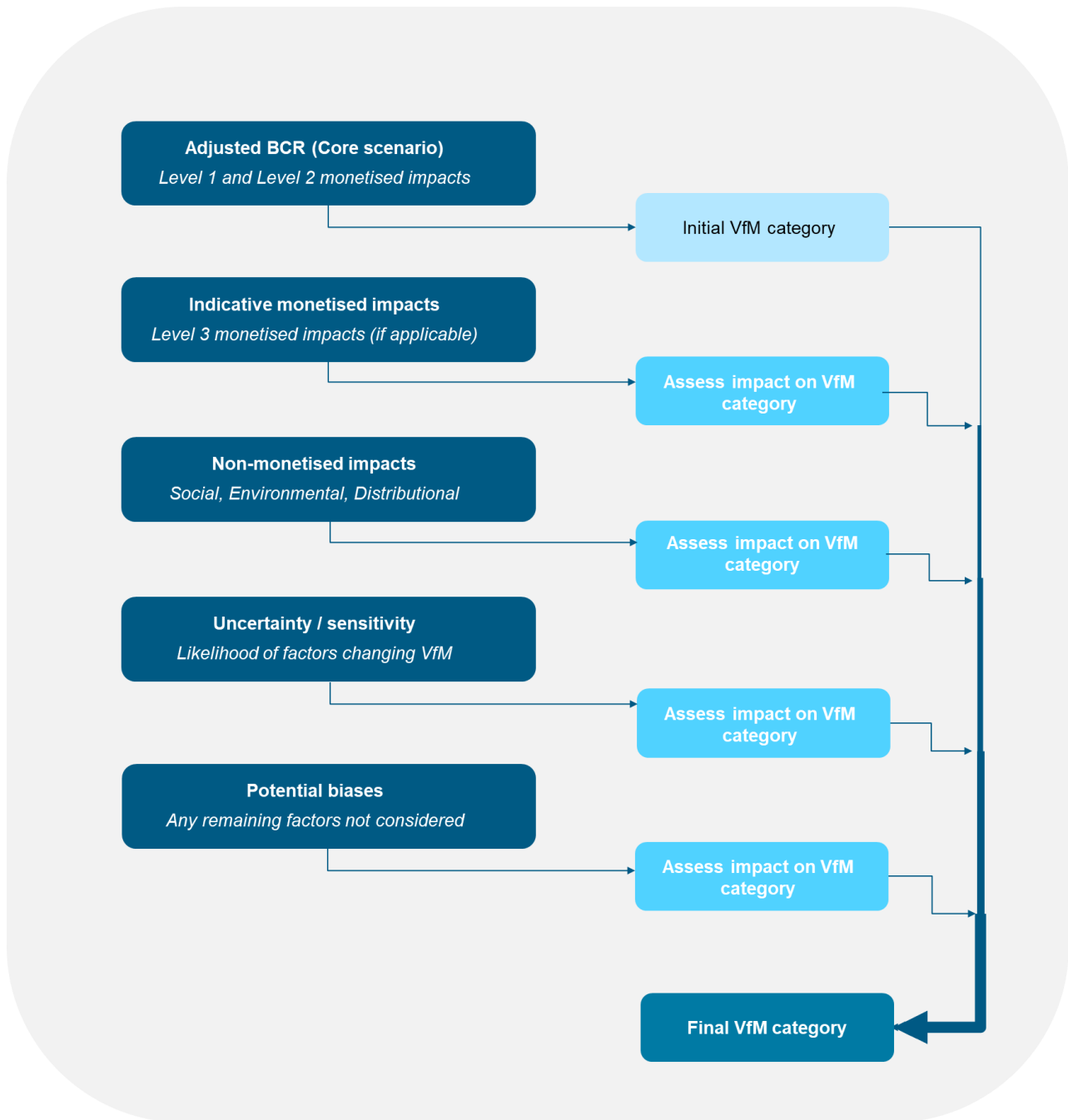
## 4.10. Value for Money

### 4.10.1. Approach

The overall value for money statement provides the key information from the economic appraisal for the scheme presented within the FBC. Evidence is presented in relation to whether the expected costs of the scheme are justified by its expected benefits to the UK public as a whole, including both positive and negative impacts on the economy, society, environment, and public accounts. Monetised, quantitative and qualitative information is used in preparing the statement.

In line with DfT's 'Value for Money Framework' and 'Supplementary Guidance on Categories', the determination of the final VfM category begins with the Adjusted BCR and then considers other monetised and non-monetised impacts and risks / uncertainties, and the likelihood of these resulting in a change to the VfM category (**Figure 4-7**). This draws upon, and should be considered alongside, relevant sections of the Economic Dimension.

Figure 4-7 - Determining the final Value for Money category



Value for Money categories are broadly associated with an implied BCR, as shown in Table 4-28.

**Table 4-28 Value for Money categories**

Value for Money category	Implies
Very High	BCR greater than or equal to 4
High	BCR between 2 and 4
Medium	BCR between 1.5 and 2
Low	BCR between 1 and 1.5
Poor	BCR between 0 and 1
Very Poor	BCR less than or equal to 0

#### 4.10.2. Value for Money Statement

A summary of the VfM assessment for the scheme is presented in Table 4-29.

Table 4-29 - Value for Money Statement

Impact / measure	Core Scenario	Covid Impact	High demand growth	Low demand growth	High Cost	Low Cost	High Business VOT	Low Business VOT	High Non-business VOT	Low Non-business VOT	Notes	
Present Value of Benefits (PVB)	£78.3m	£51.5m	£177.3m	£22.8m	£78.3m	£78.3m	£83.9m	£72.8m	£98.7m	£58.0m	Notes: Includes travel time benefits, vehicle operating costs, indirect tax revenues, accidents, construction impact, noise, air quality, greenhouse gas. Adjusted to include reliability benefits and increased output in imperfectly competitive markets. Benefits captured are associated with the A350 bypass improvement Phase 4&5. Impacts of complementary cycling measures have not been monetised. Standard 60-year appraisal period. Scheme opening in 2026. Costs (PVC) covers investment cost, maintenance and renewals and includes 20% optimism bias.	
Present Value of Costs (PVC)	£20.8m	£20.8m	£20.8m	£20.8m	£22.8m	£18.7m	£20.8m	£20.8m	£20.8m	£20.8m		
Net Present Value (NPV)	£45.6m	£33.48m	£40.8m	£2.1m	£55.5m	£59.7m	£63.1m	£52.1m	£77.9m	£37.2m		
<b>Adjusted BCR</b>	<b>3.77</b>	2.5	8.54	1.10	3.43	4.19	4.04	3.51	4.75	2.79		
<b>VfM Category</b>	<b>High</b>	<i>High</i>	<i>Very High</i>	<i>Low</i>	<i>High</i>	<i>Very High</i>	<i>Very High</i>	<i>High</i>	<i>Very High</i>	<i>High</i>		
<b>Indicative monetised impacts</b>												
<b>VfM Category adjustment</b>	<b>High</b>	No adjustment										
<b>Non-monetised impacts</b>												
Social Impacts	Slight to Moderate beneficial	Social impacts have been individually assessed as being slight beneficial or neutral or moderate beneficial, with the most positive impacts on accidents and severance.										
Environmental Impacts	Neutral to slight adverse	The assessment identifies a relatively modest scale of overall impact related to the non-monetised environment impacts. Water environment, biodiversity and historic environment are assessed as slightly adverse. Landscape and townscape are assessed as neutral impact.										
Distributional Impacts	Slight beneficial to moderate beneficial	Distributional impacts have been assessed as being mostly moderate beneficial or neutral. Accidents and security has been assessed as slight beneficial.										
<b>VfM Category adjustment</b>	<b>High</b>	There is potential for wider impacts to improve the overall VfM with limited variation from other elements of non-monetised impacts. While this may increase performance it is unlikely to change the VfM category.										
<b>Uncertainty / sensitivity</b>												
Key Risks, Sensitivities	BCR range 1.10 to 8.54	High demand growth low demand growth scenarios provide the greatest variation to the Core. This implies the scheme is sensitive to growth uncertainties. Uncertainty/ sensitivity testing shows High to VfM category is likely in most cases, with some potential for a move to Very High VfM (e.g., under high demand, low cost, and high business and non-business value of time assumptions).										
<b>VfM Category adjustment</b>	<b>High</b>	The uncertainty and sensitivity around the Benefit and Cost calculations of the scheme is observed to be within the 'High' VfM category. Although the low cost and the high business VoT sensitivity tests moves the VfM category to Very high, the low growth sensitivity returns a low VfM category. It is therefore considered appropriate to retain the VfM category as High										
<b>Potential bias</b>												
Other factors	-											
<b>VfM Category adjustment</b>	<b>High</b>	High is considered to remain appropriate.										
	VfM category	<b>Poor</b>	<b>Low</b>				<b>Medium</b>			<b>High</b>		<b>Very high</b>
	Likelihood	Very unlikely	Unlikely				Possible			Likely		Possible
<b>FINAL VfM CATEGORY</b>		<b>High</b>										

The key findings from the assessment are:

- The scheme is forecast to produce user benefits of £78.34 million (PVB) over the 60-year appraisal period.
- These benefits are generated by travel time savings of £66.89m and vehicle operating cost benefits of £2.67m due to the proposed scheme generating reductions in congestion which requires less fuel to be consumed and lowers wear and tear on vehicles. Safety benefits of £7.29m are forecast due to increased use of safer roads.
- Disbenefits of the scheme include a £6.0m greenhouse gas emissions and £0.03m increase in particle emissions resulting in adverse impacts on air quality as a result of increased fuel consumption and noise impacts of £0.56m. Indirect tax losses of £0.45m have been calculated relating to expenditure on vehicle operating costs and approximately a £3.48m disbenefit is forecasted as a result of traffic management during the construction period.
- A reliability benefit of £9.10m has been forecast, resulting from reduced congestion, which has been included only in the adjusted BCR.
- The total scheme costs inclusive of construction and maintenance are £20.77m (PVC).
- With consideration of the positive and negative user benefits and non-user benefits the initial BCR is 3.2 which represents 'High' Value for Money (VfM)<sup>30</sup> based on the monetised elements of the assessment. Inclusion of journey time reliability benefits gives an adjusted BCR of 3.77.
- Non-monetised benefits have been captured including social and distributional benefits and additional environmental benefits. These non-monetised impacts have all contributed to the assessment of value for money of the scheme. The qualitative assessment of environmental impacts is neutral. The qualitative assessment of social impacts suggest impacts with be slight to moderate beneficial.

In addition to all of these assessments which have considered the most likely outcomes, various sensitivity tests have been undertaken. These have included scenario modelling to reflect covid impact, high and low demand, high and low cost, high and low value of time scenarios.

These uncertainties have indicated that, there is reasonable probability of variations to circumstances resulting in the VfM category rising to 'Very High'. However, it also indicates a possibility of a 'Low' VfM category in relation to the low growth scenario. Therefore, the final assessment of VfM for the A350 Chippenham Bypass Phases 4&5 scheme is a 'High' VfM category.

## 4.11. Analytical assurance

Appropriate assurance has been applied throughout the development of the Economic Dimension and the technical analysis which informs it. This includes:

- An early scoping meeting with DfT in March 2023 to agree key principles around the modelling and appraisal approach;
- Completion of the DfT Appraisal toolkit, documenting key details of technical methods applied including recognition of potential limitations and exceptions;
- Comparison against OBC outputs;
- Undertaking technical review;
- Undertaking checks of TUBA outputs to ensure that results are logical, including analysis of benefits by time period, journey distance and size of time saving, in addition to a review of TUBA warning messages; and

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<sup>30</sup> According to the DfT Value for Money Framework

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/918479/value-for-money-framework.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918479/value-for-money-framework.pdf)



- Application of sensitivity testing in relation to key areas of uncertainty.

## 4.12. Key findings and recommendations

The Economic Dimension identifies the optimal solution to meet the strategic requirements identified in the Strategic Dimension, including:

- the overall need to address congestion, delays, reliability and safety on a key section of the strategic A350 corridor;
- improving north-south connectivity on a priority transport corridor within the Western Gateway sub-region (linkages between west Wiltshire / South Coast to the M4 / Midlands);
- enhancing productivity and economic competitiveness to realise economic potential; and
- facilitating planned and emerging housing and jobs growth within Wiltshire.

The Economic Dimension demonstrates that:

- A range of potential strategic options have been considered and a highways based solution identified based on alignment with the investment objectives and wider deliverability factors;
- Potential different scales of intervention have been assessed during scheme development – from targeted junction improvement to dualling of links – with the scheme being progressed reflecting a combination of these. Whilst some reduced scope options produced a higher BCR, the full combined option was progressed by Wiltshire Council based on its stronger strategic fit and higher level of overall benefits.
- Typical monetised impacts have been appraised using industry standard methods and generate an adjusted BCR of 3.77 under a core scenario, with a NPPV of £45.6m. This reflects the social welfare benefits at a UK wide level. Travel time benefits account for 85% of PVB. The core BCR equates to a High VfM category.
- There is potential for additional value to be added through contribution to wider economic impacts, with increased capacity at the junction providing scope for higher levels of development and improved journey times for businesses and commuters providing efficiency and agglomeration gains, while also improving access to a wider labour market.
- Other non-monetised social and environmental impacts have been assessed to be of generally neutral or slight impact (beneficial/adverse) and not significant enough to materially impact the VfM category.
- The potential implications of appraisal uncertainty have been assessed and demonstrates that a High VfM category remains the most likely outcome across the circumstances tested, but with a reasonable likelihood of Very High VfM, and the possibility of Medium to Low VfM.
- From a more local, place-based perspective, the scheme delivers benefits to the inter-connected West Wiltshire towns along the A350 corridor by safeguarding and strengthening their linkages with other economic centres and helping to cater for the delivery of planned and future housing / employment growth.
- At a broader sub-regional level the scheme also supports the strategic role of the A350 corridor in providing north-south connectivity between the South Coast, M4 and beyond, particularly when considered in the context of the broader strategy for the corridor and other planned improvements on the A350 at Chippenham and Melksham.

## 5. Commercial Dimension

### 5.1. Introduction

The Commercial Dimension sets out the commercial viability of the A350 Chippenham Bypass Phases 4&5 scheme, based on the project scope as presented within the Strategic Dimension (section 3.3.2).

The design and construction of the scheme has been underpinned by a robust procurement strategy to deliver the constituent parts in a timely, efficient, safe and cost-effective manner.

Information is presented below on the following:

- Procurement strategy and route
- Service requirements and outputs
- Risk allocation and transfer
- Charging mechanisms
- Key Contractual Arrangement
- Personnel Implications
- Accountancy Treatment

### 5.2. Key updates since OBC

At OBC stage, early consideration of the potential procurement stage was established. Following selection of the preferred option through the OBC process and further scheme development this has enabled development of the procurement approach. The procurement process has been undertaken, with the selection of a preferred bidder, in readiness for full approval of funding (via this FBC). Formal contract award would take place following full approval.

### 5.3. Scope and outline specification

The overall scope of the A350 Chippenham Bypass improvements scheme remains largely aligned to that of the OBC. The scope involves selectively widening sections of the A350 Chippenham Bypass, capacity enhancements at Lackham and Bumpers roundabouts and signalisation of Bumpers roundabout. The scheme comprises new carriageway construction, drainage improvements, street lighting removal and installation, signs and road markings. The land required for the scheme is mostly within the highway boundary, a limited number of land parcels are Wiltshire Council holdings with permissions granted for highway use. Elements of the scheme that have evolved since publication of the OBC are enhanced understanding of the environmental mitigation measures and consequential increased landscaping design and adaptation of the scope to accommodate third party development works in the construction of Southpoint Roundabout within the Phase 4 area. These third-party works are programmed to be complete prior to the commencement of the contract works and should pose no issues to delivery of the project other than to contractor's phasing.

The scheme is made up of the following main elements:

- Widening the A350 to dual 2-lane between Chequers roundabout and Lackham;
- Widening the A350 to dual 2-lane along the full stretch between Cepen Park South and Bumpers roundabout;
- Capacity enhancements and signalisation to the A350 Bumpers roundabout; and
- Capacity enhancements to the A350 Lackham roundabout.

Table 5-1 sets out an overview of the project output specification for the scheme.

**Table 5-1 - Project output specification for A350 Chippenham Bypass improvement scheme**

Stage of scheme development	Work Stream	Output
Preparation	Project management support	Provision of sufficient project management capacity, reflecting the dimensions of the scheme
	Highway design	Completion of highway design deliverables including detailed designs
	Structures design	Completion of structures design deliverables including detailed designs.
	Modelling and appraisal	Completion of deliverables for WebTAG compliant Full Business Case
	Environmental advice	Completion of evidence base for Environmental Assessment, liaison with statutory environmental bodies
	Legal team	Provision of specialist legal support for the planning, CPO, SRO, TRO and other legal powers required to deliver the scheme
	Planning advice	Provision of advice to secure permitted development orders
	Communications	Provision of support for stakeholder management and in connection with planning and legal processes
	Land / Property / Agricultural Agent	Provision of support for land negotiation, referencing and assembly
	Commercial	Approach for procurement of construction and operation of scheme as set out below
Construction	Chequers to Lackham roundabout dualling	Construction to deliver highway works. Works completed in accordance with programme
	Cepen Park South to Bumpers Farm dualling	Construction to deliver highway works. Works completed in accordance with programme
	Bumpers Farm roundabout enhancements	Construction to deliver highway works. Works completed in accordance with programme
	Lackham roundabout enhancements	Construction to deliver highway works. Works completed in accordance with programme
Maintenance	Ongoing maintenance of highway and structures	Maintenance to be undertaken in accordance with WC policies/asset management plan

## 5.4. Procurement strategy and route

The procurement process has been completed in accordance with the legislative framework set out within the Wiltshire Council Corporate Procurement Strategy (2012). The process was governed by the Council's own constitutional Contract Procedure Rules (2012) and will be subject to the Council's Procurement Gateway Process.

Under the Procurement Gateway Process, the strategy was subject to review by the Council's Procurement manager, senior Legal officer and senior officers from across the Council. The first stage of Procurement Gateway Board has been undertaken to enable the tender documentation to be released. The second stage to enable the procurement to move to the award procedure stage following review of the award recommendation

has also been completed although the final contract award is dependent upon the notification of funding through the FBC process.

Since leaving the EU at 11pm on the 31<sup>st</sup> of December 2020 the UK is no longer subject to EU procurement law. The UK is however still subject to the World Trade Organization's Government Procurement Agreement (GPA). The GPA requires the majority of contracts to be open to the EU and other trading partners, with transparent award procedures and remedies being available. In order to ensure compliance with the GPA, and to safeguard against disruption, the Public Contracts Regulations 2015 (SI2015/102) (PCR 2015) continue to apply. Wiltshire Council have maintained their existing in public procurement policies in compliance with the PCR.

Wiltshire Council has adopted the main recommendation of the Outline Procurement Strategy (see Appendix C.1). The main recommendations of that report being:

- Use of Traditional Delivery model whereby the preliminary and detailed design is progressed by Wiltshire, prior to the engagement of a contractor,
- a contractual model that utilises NEC4 ECC Option [A][B]; and
- the use of the "Restricted Procedure" under the Public Contracts Regulation 2015.

Subsequent Workshop discussions involving Wiltshire Council/AtkinsRéalis refined the contract form selection to Option B (measured quantities). The prime reasoning behind this decision was with the high level of design development anticipated, the detailed design leads itself to accurate and full measurement which provides a robust system of payment assessment and assessment of change.

A soft market engagement exercise was held on 17 November 2022, which provided the opportunity to assess the market's likely response to the contract models proposed for tender. A total of nineteen potential suppliers attended the on-line event. Following the presentation three suppliers requested to attend 1-2-1 meetings and three suppliers provided written submissions. The 1-2-1 meetings all had the same agenda. Due consideration of feedback was incorporated into the procurement process although no major changes were made as the feedback was overwhelmingly positive.

In accordance with the selected restricted procedure route a Selection Stage Questionnaire was issued to interested parties in April 2023 by Wiltshire's Procurement Team. Eleven companies expressed an interest with nine respondents submitting completed documentation. Following assessment and review five companies were invited to tender. The tender was issued 26th June 2023 via the Client e-tendering portal ([www.supplyingthesouthwest.org.uk](http://www.supplyingthesouthwest.org.uk)).

Tender duration was eight weeks. Through the tender process a clarification process was in operation with technical and contractual enquiry responses return for incorporation into the tenderers bids as appropriate. Whilst the clarification process led to some amendments within the contractual and technical position none of these issues constituted a significant change to the overall procurement and contractual philosophy. Three companies returned compliant bids.

The Wiltshire Council procedures specify that the Lowest Price or Most Economically Advantageous Tender (MEAT) criteria shall be used for Council procurement. Owing to the fact that quality was a very important consideration for the scheme, it was proposed to use the MEAT criteria in the evaluation of tenders. Factors evaluated included the tenderer's organisation, key people and delivery together with their proposals for traffic and pedestrian management, programme, social value and minimising carbon/climate emergency. The precise criteria and the methodology for applying them was made available to contractors with tender documents. Evaluation of the tenderer return was undertaken in line with the procedure outlined in the Invitation To Tender.

The contractor was selected on a combination of qualitative (40%) and price (60%) criteria. The latter including an assessment of cost change through a series of compensation event scenarios. A number of evaluation groups were appointed to review the quality aspects, the individual responses then undergoing a moderation exercise and the resultant score feed into the overall scoring matrix. The highest scoring bidder being nominated as preferred contractor. Contract award should occur following funding approval.

A separate procurement exercise has been completed to appoint an Advanced Works contractor. The necessity of an advanced works package was considered necessary to de-risk the project of environmental

constraints resulting from protected species. The prime considerations being the bird nesting season and potential reptile habitat. Both issues could have considerable negative programme impact. The scope of the advanced works is limited to vegetation clearance, elements of site clearance and removal of overburden soils. The Advanced Works have been procured through Wiltshire Council's Specialist Surfacing & Associated Highway Works Framework Contract 'Lot 10 Minor Civil Engineering and Other Works'. There are nine companies listed against Lot 10 entitled to submit a proposals that were duly notified of the opportunity. A tender submission was returned from one company. The tender was reviewed and was considered to offer value for money, and the award was approved by the Council's Cabinet on 14th November 2023. The contractual appointment was made on 17th November 2023. Works are anticipated to start on site early January 2024. The appointed Advanced Works contractor is also the main works preferred contractor. This circumstance provides a range of benefits in simplifying works interface arrangements.

Procurement of design services through to detailed design was commissioned through the Wiltshire Council Term Highways Consultancy Contract through preparation of a carefully considered scope of works and terms and conditions. Wiltshire Council's contribution to scheme costs was included in the Council's forward capital programme following OBC approval.

The contract will be managed by the Client Officers (Wiltshire's Project Manager and Project Director) with ECC Project Manager, Cost Consultants (including the Quantity Surveyor and Risk Manager roles) and a range of site Supervisors and Clerks of Works additional appointed Wiltshire Council Term Highways Consultancy Contract. An allowance for Client staff cost is included in the site supervision budget estimate to allow for abnormal attendances. This allowance is limited as the majority of Client costs are considered to form part of the normal Wiltshire budget as a business as usual activity.

## 5.5. Service requirements and outputs

For the main works the form of contract will be the NEC4 Engineering and Construction Contract (ECC) Option B (Priced Contract with Bill of Quantities). Secondary options included in the contract are:

- X1 Price adjustment for inflation
- X2 Changes in the law
- X4 Ultimate holding company guarantee
- X7 Delay Damages
- X10 Information modelling
- X11 Termination by the Client
- X13 Performance bond
- X15 The Contractor's design
- X16 Retention
- X18 Limitation of liability
- Y(UK)2 The Housing Grants, Construction and Regeneration Act 1996

Options that have a significant impact on risk allocation are noted below:

- X1 – With the general background of price uncertainty in the market and consistent with feedback from the market engagement exercise it was considered equitable to utilise the inflation clause. The contractor shall be paid inflationary uplifts subject to published indices. The base date selected is November 2023 at the point of FBC submission. Wiltshire accepted this price risk to gain the benefits of supplier interest and competitive pricing.
- X2 - Following major risk events encountered in the market in recent history i.e. Covid and Brexit suppliers are demanding the incorporation of change in law provisions. The risk is considered inequitable for a contract of this duration without its incorporation.

- X7 – Delay damages are incorporated in line with normal practice to protect the Client from direct cost exposure due to Contractor delay.
- X13 – A bond is stipulated to provide protection to the Client in the event of Contractor failure.
- X16 – Retention is used to provide assurance of works completion and quality.

There are an addition number of contract Z clauses (Z1 – Z42) amending the standard contract. Example areas such as Local Government Ombudsman are frequently employed by local authority Client. Consideration of clause detail was undertaken during the tender classification process and certain amendments to be incorporated into the contract award version. Wiltshire’s Legal Team has reviewed and accepted the contract conditions. See Appendix C.2 for the Contract Data and conditions.

Procurement of Statutory Authority Services works will be procured directly by Wiltshire Council to ensure the Local authority discount is recoverable. The contract Scope places requirements on the Contractor to liaise, plan and manage the delivery of the SA works.

The advance works contract was awarded on 17 November 2023.

Management of the works shall be undertaken by the ECC Project Manager and Supervisors, together with additional resource providing cost control/quantity surveying assistance. The contract is to be managed in accordance with the stipulations of the completed Scope and Contract Data that specify acceptance periods and periods of replay among many other prescribed processes.

A software management system CEMAR is anticipated to be used for notification of contract communications.

Anticipated programme is included in Table 5-2 below.

**Table 5-2 Key programme dates**

Event	Start	Finish
FBC submission		December 2023
Advance Works contract start	January 2024	March 2024
FBC Decision (anticipated)		April 2024
Main Contact Award		April/May 2024
Main Contact mobilisation	May 2024	May 2024
Main Contract works	May 2024	November 2025
End of Defects Period		November 2026

The anticipated contract dates utilise the preferred contractor’s tender submission programme. The tender submission requirements of this programme were to take account of the project constraints and be a genuine forecast of the contractor’s delivery and be in compliance with the requirements of the NEC. It is anticipated the submitted programme shall form the basis of the contract Clause 31 issue but is it not contractually binding. The Clause 31 programme that is to be issued within 3 weeks of the start date is permitted to take account of any variables that arise from the start date altering from the Contract Data due to funding announcement and development of Statutory Authority information. The Clause 31 will be assessed by the NEC PM in accordance with the contract.

## 5.6. Risk Allocation

The risk management process has continued to be maintained through the detailed design and procurement stage leading to the submission of the FBC. Reviews and workshops have been delivered by the appointed risk manager at periodic intervals. A strategy of risk mitigation and allocation has been pursued, risk mitigation chiefly occurring through the design process and risk allocation through the contractual drafting.

An example of the allocation process is that of inflation. The recent inflationary pressures that have affected the construction industry and general economy have resulted in price uncertainty and reticence from suppliers to enter lump sum contract. The approach on the A350 is through the inclusion of contract X1 inflation clause, this accepts the issue as a Client risk with a prescribed mechanism to evaluate change. Inflation allowances are applied to base prices within the Financial Dimension and a residual risk identified and included within the risk budget to allow for variance from the forecast index uplifts.

Risk mitigation has been applied to the most significant area of concern raised in the OBC, that of uncertainty of Statutory Authority diversion/protection works. The process of identifying existing equipment and confirming design has continued with most services now having reached C4 stage at the point of tender with remaining development ongoing prior to contract start where it is envisaged all utilities will have confirmed C4 status. The project budget forecast is based on the C4 return and where not available estimate and contingent allowance for the remaining utilities. In addition to base allowance, risk have been assessed for individual utilities around the potential unknown design factors. The risk register also includes wider risks around SA performance. This risk sits with the Client and form part of the project budget. The contract contains Scope obligation on the Contractor for their responsibilities in the interaction with SA and delivery of the contract.

The use of an advanced works contract and Client ownership of the utilities both act a mitigation measures. This is by de-risking the site species and allowing certain service diversion works to be undertaken prior to the start of the main contract.

See the Risk Register in Appendix E.4 for details of all assessed risk.

The Client risk review process will continue throughout the duration of the contract with additional input from the Contractor. The construction contract risk process will be undertaken in accordance with the NEC provisions for Early Warnings with reviews and register production to performed at no more than fortnightly intervals. Where issues are adjudged have potential impact on the Client register they will be evaluated and registered to that document.

Value Engineering is included in the NEC contract using the standard contract drafting, a 50% Client/Contractor share is stipulated. The inclusion of potential value engineering proposals should drive innovation by the contractor and mitigate against potential risks that could affect outturn prices. A 50% is considered equitable to drive Contractor input whilst maintaining Client benefit.

## 5.7. Charging mechanisms

Payment under the main and advanced works will be in line with the standard NEC terms with the inclusions of clause Y(UK)2 that incorporates the legal requirement of the Housing Grants, Construction and Regeneration Act 1996.

The project management, cost consultancy, site supervision and design support will be subject to the payment terms of the Wiltshire Council Term Highways Consultancy Contract.

## 5.8. Key Contractual Arrangement

Contractual clauses are detailed in section 5.3.

The drafting of contract optional and additional clauses has been reviewed by Wiltshire Council's legal team and accepted as compliant with Council policy.

## 5.9. Personnel Implications

The project will be delivered by Wiltshire Council in partnership with the appointed contractor. There are therefore no implications with regards to people management, trade unions, or TUPE regulations.

## 5.10. Accountancy Treatment

The project will be operated under Wiltshire Council's standard procedures. No special arrangements are anticipated.

## 6. Financial Dimension

### 6.1. Introduction

The financial viability of the project has been assessed in relation to:

- The expected implementation cost of the scheme, including the base cost and risk allowance in outturn prices;
- The planned budget profile year on year and the proposed funding arrangements, including different funding sources;
- An assessment of key financial risks (including any risk allowance quantification); and
- Consideration of the long-term financial implications of the scheme, including ongoing costs for operation, maintenance and capital renewals.

The Financial Dimension is prepared in the context of the preferred scheme option, which has been progressed through the procurement stage, with a preferred bidder identified. It presents evidence of the scheme's affordability both now (for the implementation / construction phase) and in terms of ongoing revenue liabilities (whole life costs).

### 6.2. Key updates since OBC

The Financial Dimension is updated from OBC, in particular reflecting the undertaking of the procurement exercise and the selection of the preferred bidder. This FBC therefore reflects a more robust cost estimation. It is also based on latest financial assumptions and projections (including inflation assumptions, for instance). Budget profiles have been updated in line with the latest scheme delivery programme (as documented in the Management Dimension). Following OBC approval, the total DfT contribution to the scheme has been capped at £26.625 million, and this is reflected within the funding arrangements set out in this FBC.

### 6.3. Capital costs and funding

#### 6.3.1. Overview

The total projected outturn scheme cost is £32.315m. This is inclusive of sunk costs to date (to October 2023), which total £3.338m.

Total funding of capital costs is split £26.625m (82%) from DfT, and £5.690m (18%) from Wiltshire Council.

The budget profile and funding arrangements are summarised in Table 6-1.



**Table 6-1 Capital cost profile and proposed funding sources (£ millions)**

Year	Prior to Oct '23 (sunk cost)	2023/24 (from Nov '23)	2024/25	2025/26	2026/27	Total
<b>Cost (actual / budget)</b>	<b>3.338</b>	<b>0.676</b>	<b>12.305</b>	<b>15.876</b>	<b>0.119</b>	<b>32.315</b>
<b>Funding sources:</b>						
DfT – Major Road Network Fund	1.648	0.428	10.953	13.495	0.101	<b>26.625</b>
%	49%	63%	89%	85%	85%	<b>82%</b>
Local - Wiltshire Council	1.690	0.248	1.352	2.381	0.018	<b>5.690</b>
%	51%	37%	11%	15%	15%	<b>18%</b>
Total funding	<b>3.338</b>	<b>0.676</b>	<b>12.305</b>	<b>15.876</b>	<b>0.119</b>	<b>32.315</b>
%	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

### 6.3.2. Central government funding

Funding is provisionally allocated within the DfT's Major Road Network Fund programme, which is part of the National Roads Fund (raised from Vehicle Excise Duty). The project was awarded programme entry status following approval of the OBC in November 2021.

DfT grant funding awarded to date totals £2.076m (up to end FY 23/24). The remaining £24.549m of DfT grant funding is sought via full approval of the FBC. This totals the capped DfT funding contribution of £26.625m (82% of total capital costs).

On approval of the FBC it is anticipated that DfT and Wiltshire Council would agree conditions relating to the provision of the remaining DfT funding grant.

### 6.3.3. Local funding

Wiltshire Council has identified funds from its Community Infrastructure Levy and Section 106 planning obligations as its local funding contribution.

Wiltshire Council funding towards the total scheme cost amounts to £5.690m (18% of total scheme costs) - of which £1.690m is sunk costs (to end October 2023).

As part of the FBC submission to DfT, Wiltshire Council's Section 151 officer is to provide a declaration which confirms that:

- Sufficient budget has been allocated to deliver the scheme on the basis of the proposed local funding contribution;
- Wiltshire Council accepts responsibility for meeting any costs over and above the DfT contribution identified, including potential cost overruns; and
- Wiltshire Council accepts responsibility for meeting any ongoing revenue requirements in relation to the scheme.

### 6.3.4. Capital cost breakdown

The breakdown of the overall projected scheme outturn cost of £32,314,688 is provided in Table 6-2.

**Table 6-2 Capital cost breakdown**

Cost category	Cost (£)	% (Total outturn cost)
Preparatory – sunk costs	3,338,302	10%
Preparatory - planned	427,541	1%
Land and property	-	-
Construction	22,784,647	71%
Site supervision	1,158,676	4%
<b>Sub-total – base cost, excluding risk – Q3 2023 prices</b>	<b>27,709,166</b>	<b>86%</b>
Risk (QCRA)	3,391,302	10%
<b>Total cost – Q3 2023 prices</b>	<b>31,100,468</b>	<b>96%</b>
Inflation	1,214,220	4%
<b>TOTAL OUTTURN COST</b>	<b>32,314,688</b>	<b>100%</b>

The projected outturn cost has been developed by AtkinsRéalis and includes tender prices for the preferred bidder relating to the main construction works. Costs have been prepared to a consistent Q3 2023 price base and inflation has been applied accordingly (assuming scheme completion in September 2025) to generate the final outturn cost.

Further details of the different components of the scheme cost, excluding inflation, are provided in sections 6.3.5 to 6.3.9.

### 6.3.5. Preparatory costs

Preparatory costs excluding inflation total £3,765,843. This includes £3,338,302 sunk costs. A breakdown is provided in Table 6-3.

**Table 6-3 Preparatory costs (excluding inflation)**

Item	Sunk cost (£)	Planned cost (£)
Feasibility / OBC	270,197	-
Preliminary design (including surveys)	1,179,803	-
Environmental Assessment (including surveys)	520,000	-
Stakeholder engagement / Statutory Public Consultation:	140,000	-
Detailed design & FBC / procurement	1,228,302	427,541
<b>Total</b>	<b>3,338,302</b>	<b>427,541</b>

### 6.3.6. Construction costs

The construction cost estimate of £22,784,647 (Q3 2023 prices, excluding inflation) is based on tender prices for the preferred bidder, generated from itemised quantities linked to the design information for the scheme. These quantity measurements are based on the principals of the Highways Method of Measurement, following the series and item classification. A summary breakdown of construction costs is provided in Table 6-4.

**Table 6-4 Construction costs (excluding inflation)**

Construction cost element	Cost (£), Q3 2023 prices	% Total
Preliminaries	6,240,741	27%
Roadworks General - Phase 4	1,491,963	7%
Roadworks General - Phase 5 & Bumpers	2,422,470	11%
Drainage and Service Ducts - Phase 4	728,886	3%
Drainage and Service Ducts - Phase 5	1,374,072	6%
Drainage and Service Ducts - Bumpers	575,702	3%
Main Carriageway - Phase 4	1,810,022	8%
Main Carriageway - Phase 5	2,713,971	12%
Main Carriageway - Bumpers	1,281,255	6%
Signs, Motorway Communications and Lighting - Phase 4	271,907	1%
Signs, Motorway Communications and Lighting - Phase 5 & Bumpers	971,328	4%
Landscape and Ecology - Phase 4	90,923	0%
Landscape and Ecology - Phase 5 & Bumpers	133,372	1%
Works for Statutory Authorities - Phase 5 & Bumpers	516,634	2%
Structure - Protection Slab	38,442	0%
Retaining Walls	25,334	0%
Advanced works	566,000	2%
Services (protection & diversion), based on C4 returns	1,531,625	7%
<b>Total</b>	<b>22,784,647</b>	<b>100%</b>

### 6.3.7. Site supervision

The site supervision cost of £1,158,676 (Q3 2023 prices, excluding inflation) is calculated from estimated staff resources for supervision and design support prior to and during the construction period.

### 6.3.8. Risk budget

The approach to risk cost allowance has regard to relevant guidance:

- Department for Transport TAG UNIT A1.2 – Scheme Costs, October 2023; and
- HM Treasury’s The Green Book – Central Government Guidance on Appraisal and Evaluation, 2020. The ‘Supplementary Green Book Guidance’ on Optimism bias produced by HM Treasury was also used.

The project Risk Register is the primary means of identifying, assessing and monitoring risks and mitigation (see the Management Dimension, section 7.11.2). The risk budget provides a cost allowance within the total estimated scheme cost to cover any increased costs that may materialise associated with the identified risks within the Risk Register. Costs may be directly associated with risks, or indirectly associated (as a result of scheme delays for instance). The risk cost allowance has been determined through Quantitative Cost Risk Analysis. Allocation of risk with the main contractor is addressed in the Commercial Dimension, section 5.6.

### 6.3.8.1. Quantitative Cost Risk Analysis

The QCRA uses quantitative scoring of risks as inputs, such as likelihood percentages and three point estimates for the cost and schedule impacts. The EZRisk tool<sup>31</sup> has been used to build and run the QCRA models. Monte Carlo simulation (based upon 2,000 iterations) has produced probability distributions (probability-cost impact S-curve).

Based on the 80th percentile of the QCRA risk cost, the total risk cost allowance is £3,391,302 (Q3 2023 prices, excluding inflation). This also includes allowance for estimating uncertainty.

Table 6-5 identifies the top 8 risks in terms of cost impact (80th percentile) from the QCRA. Further details on the QCRA process can be found in Appendix D1. Further information on risk management throughout scheme development and implementation is provided in the Management Dimension, section 7.11.

**Table 6-5 Top eight risks by cost impact (P80)**

Risk ID	Risk Title	Probability	Risk cost (£)
LR G2	Material disposal classification / Contractor's disposal cost increase	15%	533,505
P5 U6	"Abandoned" Oil Pipeline.	10%	324,750
P5 U4	11kV services crossing and parallel to highway links	10%	241,538
P5 D1	Nat Grid EHV Cable	3%	202,777
LR D1	Final Design Geometry	5%	184,314
G S2	Invasive Plant Species	3%	148,557
BR U4	33kV service crossing scheme	10%	138,803
BR U2	Diversion of BT Services	24%	105,475

### 6.3.9. Inflation assumptions

Investment costs have been prepared in Q3 2023 prices and subsequently inflated to the point of expenditure (in line with the current scheme delivery programme).

For the Financial Dimension, the full rate of inflation has been included in cost forecasts to present outturn costs (as opposed to the Economic Dimension, for which the appraisal considers only real inflation; i.e. the rate of inflation of costs above the rate of background inflation).

The inflation rates used within the outturn scheme cost estimate are summarised in Table 6-6.

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<sup>31</sup> EZRisk is a Microsoft Excel based tool developed by Faithful & Gould that lets you analyse risk using Monte Carlo simulation. A random-number generator picks a random value for each variable within the constraints set by the model. It then produces a probability distribution for all possible outcomes, indicating how likely they are to occur.

**Table 6-6 Inflation rates used in cost calculations**

Cost Category	2023	2024	2025	2026	2027	2028
BACKGROUND INFLATION	2.52%	1.57%	0.96%	1.20%	1.65%	2.30%
Construction	5.14%	2.54%	3.05%	3.02%	3.41%	2.89%
Land	5.14%	2.54%	3.05%	3.02%	3.41%	2.89%
Preparatory	6.36%	1.23%	1.00%	2.08%	2.92%	3.05%
Supervision	6.36%	1.23%	1.00%	2.08%	2.92%	3.05%
Risk	5.14%	2.54%	3.05%	3.02%	3.41%	2.89%
Operating	6.36%	1.23%	1.00%	2.08%	2.92%	3.05%
Traffic related maintenance	5.14%	2.54%	3.05%	3.02%	3.41%	2.89%
Non-traffic related maintenance	5.14%	2.54%	3.05%	3.02%	3.41%	2.89%

Sources:

TAG Databook v1.21 – Table A5.3.1 (May 2023)

Tender Price Index – BCIS (July 2023)

Retail Price Index – ONS (July 2023)

The total scheme cost excluding inflation is £31,100,468. The total outturn scheme cost (with inflation) is £32,314,688. Inflation therefore accounts for £1,214,220.

### 6.3.10. Cost profile

A cost profile (see Table 6-7) has been developed from the scheme delivery programme, as detailed within the Management Dimension (section 7.5). This assumes construction from May 2024 to September 2025.

**Table 6-7 Cost profile (£millions)**

Year	Sunk costs*	2023/24	2024/25	2025/26	2026/27	Total
Preparatory	3.338	0.337	0.086	-	-	3.761
Land	-	-	-	-	-	-
Construction	-	0.338	10.196	13.133	-	23.668
Site supervision	-	-	0.399	0.650	0.119	1.168
Risk	-	-	1.625	2.093	-	3.718
<b>Total</b>	<b>3.338</b>	<b>0.676</b>	<b>12.305</b>	<b>15.876</b>	<b>0.119</b>	<b>32.315</b>

\*Sunk costs to end October 2023

Figure 6-1 and Figure 6-2 illustrate the expenditure profile year-on-year and cumulatively.

Figure 6-1 - Cost profile (year on year)

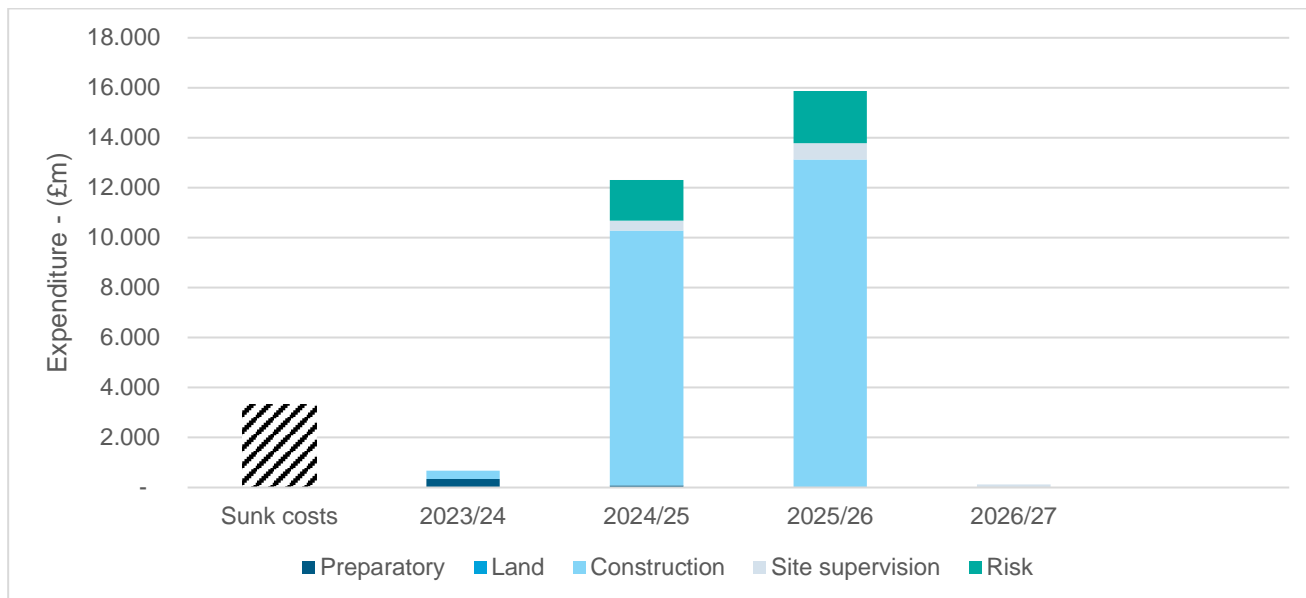
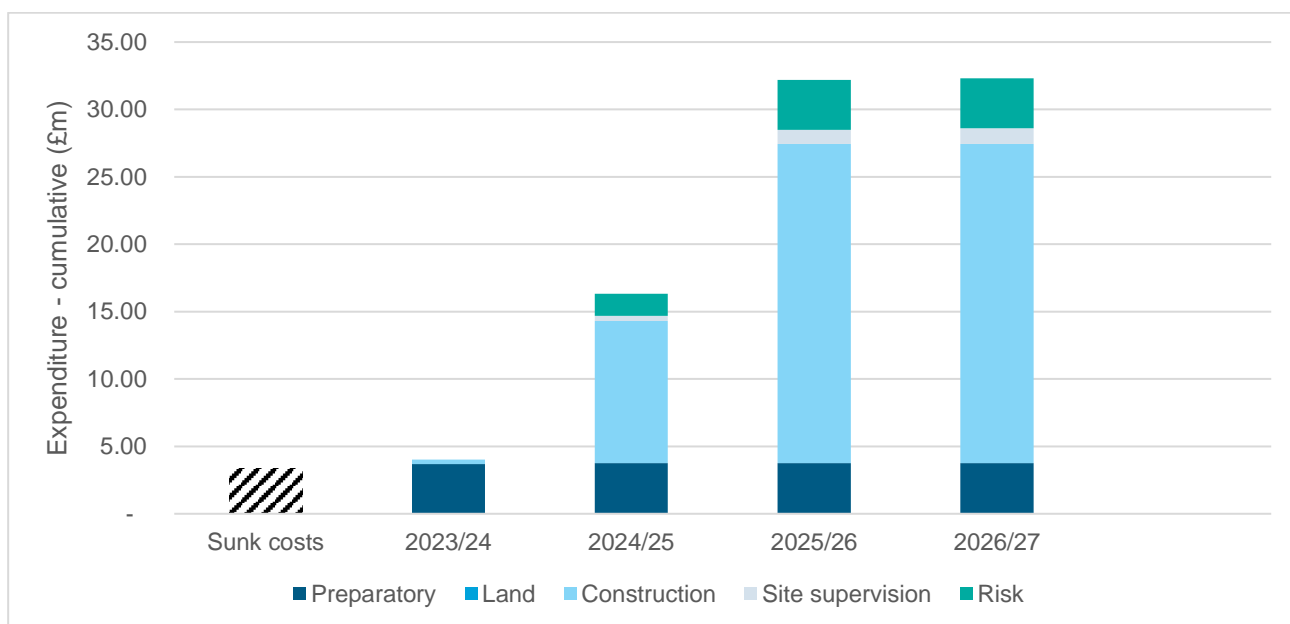


Figure 6-2 - Cost profile (cumulative)



## 6.4. Revenue (whole life) costs and funding

The A350 Chippenham Bypass improvements will give rise to marginal additional revenue liabilities for capital renewals and maintenance (whole life costs), when compared to a future situation without these highway improvements having been made.

These costs, presented in Table 6-8, total £12,802,254 (2023 prices) for a 60 year period and include:

- **Yearly cyclical / routine maintenance:** gully cleaning, street cleaning, grass cutting, winter maintenance, reactive maintenance;

- **Minor maintenance:** including road pavement and footway surfacing; drainage cleansing; and CCTV; and
- **Major maintenance** including full depth road pavement and full depth footway surfacing; drainage cleansing; CCTV; and pipe remedials.

**Table 6-8 Maintenance and renewal costs (60 years, 2023 prices)**

Maintenance type	Frequency	60 year cost (£)
Yearly cyclical / routine maintenance	Annual	1,916,760
Minor maintenance	10 years	4,354,198
Major maintenance	30 years	6,531,296
<b>GRAND TOTAL</b>		<b>12,802,254</b>

Wiltshire Council will be responsible for the maintenance of all new infrastructure created by the scheme, which will be funded through general maintenance budgets.

Whole life costs are also represented within the Economic Dimension and are therefore reflected within the BCR and NPV.

## 6.5. Overall affordability and funding

The overall affordability and funding is summarised as follows:

- The total projected outturn scheme cost is £32.315m, which is inclusive of sunk costs of £3.338m.
- DfT MRN grant funding has been capped at £26.625m on approval of the OBC. This represents 82% of the total projected outturn scheme cost. A total of £2.076m has been awarded to date (up to end FY 23/24). The remaining £24.549m of DfT grant funding is sought via full approval of the FBC - £10.953m in 2024/25 financial year; £13.495m in 2025/26; and £0.101m in 2026/27.
- Local funding contribution from Wiltshire Council will fund £5.690m (18%) of the total scheme outturn cost. A total of £1.691m has been funded to date (October 2023). Remaining Wiltshire Council funding is to be sourced from Community Infrastructure Levy and Section 106 planning obligations.
- Whole life maintenance and renewal costs over 60 years are expected to average approximately £0.214m per annum (2023 prices), to be funded from future Wiltshire Council annual highway maintenance budgets.
- Any cost overruns are to be met by Wiltshire Council.

## 7. Project Management Dimension

### 7.1. Introduction and objectives

The Management Dimension sets out how the A350 Chippenham Bypass Improvements MRN project will be managed in order to ensure successful delivery of the scheme and its associated benefits.

#### 7.1.1. Overview of project delivery status

The proposals for the dual carriageway A350 Chippenham Bypass were the subject of consultations at the planning application stage and at a public inquiry in the 1990s. Following the public inquiry, the statutory orders for the scheme were approved by the Secretary of State. The statutory orders for the scheme included the compulsory purchase of sufficient land to construct the full dual carriageway bypass, including easements for drainage provision, working space to facilitate construction, and landscaping including providing an extension to Vincients Wood which is now a nature reserve. The land along the route was taken into the public highway to facilitate the future dualling.

Initial phases of dualling have already been completed by Wiltshire Council within the last 10 years. The current scheme is of a comparable nature. It is considered to be a relatively conventional highways infrastructure project comprising carriageway widening and junction capacity improvement. The works are in the public highway and no further planning or statutory permissions are required to facilitate the implementation of the project.

The project has now progressed through the procurement process for the main construction works, with a preferred bidder identified, and the stand still period having passed. The contract would be of an industry standard NEC4 Engineering & Construction Contract (Option B). Contract award would follow FBC approval. As noted previously, planning permission is not required for the scheme.

Wiltshire Council has a strong track record of successful delivery of projects of a similar nature and scale. This includes the previous phases of upgrade to the A350 Chippenham Bypass, of a similar nature to the current scheme.

#### 7.1.2. Assessment of project delivery – management objectives

In assessing whether the project is deliverable, the Management Dimension considers the extent to which the proposed project delivery:

- Is based upon realistic and achievable timescales, taking into account any key project / programme dependencies and available resources;
- Is underpinned by clear, transparent governance and lines of accountability and reporting;
- Takes appropriate account of project risks, with robust mechanisms for risk reporting and management;
- Reflects the needs of relevant stakeholders, throughout the whole project lifecycle;
- Ensures the project is subject to appropriate levels of assurance and review (from inception to post implementation), which are integrated into the delivery approach; and
- Demonstrates the process of how stated benefits (as per the Strategic and Economic Dimensions) will be achieved and that there is a clear plan for monitoring and evaluating project outcomes.

### 7.2. Key updates since OBC

This Management Dimension builds substantially upon the project management arrangements outlined in the OBC. In addition to reviewing and updating core project management information from OBC, this FBC further demonstrates how the management arrangements have evolved as appropriate to reflect the current project status (see section 7.1.1).



The project management arrangements have therefore been adapted to effectively oversee the planned implementation phase of the project, bringing together the key parties involved in delivery include Wiltshire Council, it's consultancy partner AtkinsRéalis and the construction contractor.

## 7.3. Project management governance arrangements

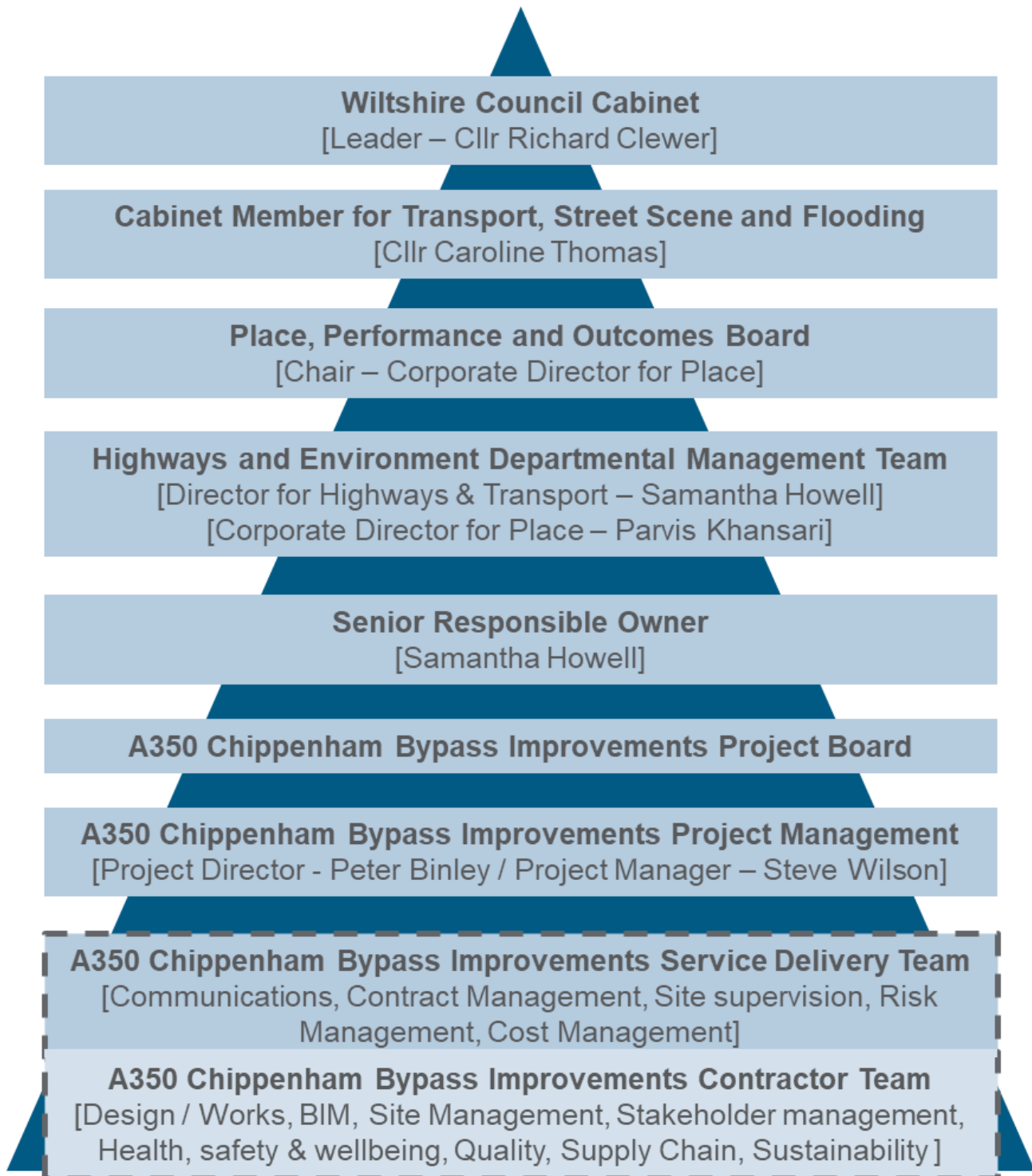
### 7.3.1. Governance

The scheme **will be delivered by Wiltshire Council**. The Council has assembled a **qualified and experienced team** of individuals to steer the project from the scheme development phase through to implementation. The alliancing contract arrangement between Wiltshire Council and its term consultant Atkins enables Wiltshire Council to augment its own skills and experience in-house with Atkins' vast expertise in delivering schemes of this nature and scale for other major clients across the UK. Following the selection of a preferred bidder for the main construction contract, the project governance is being adapted to integrate the contractor team.

The project governance builds upon arrangements successfully used in the delivery of previous major projects. It is designed to encourage **collaborative working** between all parties involved in project delivery, whilst backed by **robust contractual and management arrangements**, with the **full involvement of the Council's Cabinet in carrying out Gateway Reviews** at key stages.

An overview of the scheme governance structure is provided in Figure 7-1. A full organogram can be found in **Appendix E.1**.

Figure 7-1 - Overview of scheme governance



Project governance is provided through a **tiered reporting and management structure** that ultimately reports to Wiltshire Council's **Lead Cabinet Member**. The team will also include the Council's (client side) Project Director and Project Manager.

## 7.3.2. Roles and Responsibilities

### 7.3.2.1. Wiltshire Council Cabinet

The Cabinet is the Council's principal decision-making body. It comprises the Leader of the Council and up to nine Cabinet Members. The Leader is appointed for a four-year term by Full Council, and then selects their Cabinet Members. Each Cabinet Member has responsibility for a defined service area or 'portfolio', which is set by the Leader. Collectively the Cabinet has responsibility for taking the day-to-day decisions within the Council. Cabinet meetings are open to the public, unless exempt or confidential information is being considered. The Cabinet usually meet every month.

### 7.3.2.2. Cabinet Member for Transport, Waste, Street Scene and Flooding

The A350 Melksham Bypass Scheme falls within the service area for Highways and Transport, Street Scene and Flooding. The Cabinet Member responsible for this service area is Cllr Caroline Thomas whose responsibilities include highway improvements, road maintenance, bridges, traffic management, traffic signals, street lighting, drainage, and passenger transport. Individual cabinet Members have powers within the scheme of delegation determined by the Leader in accordance with the constitution.

### 7.3.2.3. Place, Performance and Outcomes Board

Following a recent reorganisation within the Council a Directorate of Place has been established. In order to manage a wide range of projects in development across the directorate a Place Performance and Outcomes Board has been established. The Board is chaired by the Corporate Director for Place or the Corporate Director for Resources.

Membership of the Board comprises:

- Corporate Director for Place
- Corporate Director of Resources
- Directors for Highways and Transport, Communities and Neighbourhoods and Housing and Commercial Development

The Place Performance and Outcomes Board has oversight of the projects to monitor and challenge performance and includes the MRN and LLM schemes within its remit, as well as the Housing Infrastructure Fund and Future High Streets Fund schemes.

### 7.3.2.4. Senior Responsible Owner

The Senior Responsible Owner (SRO) is **Samantha Howell, Director Highways and Transport**. She has many years' experience at a senior level in local government in connection with highways and the environment. He is currently responsible for highways asset management, highways maintenance, sustainable transport and passenger transport, as well as for implementing major highway schemes in Wiltshire. The SRO chairs the Project Board and is responsible for providing **guidance and direction** to the Project Director and Project Manager. The SRO ensures that the project team is progressing the scheme in line with the Scheme Implementation Programme and that outputs and milestones agreed by the Project Board are achieved.

### 7.3.2.5. Project Board

The A350 Chippenham Bypass improvements scheme has a Project Board chaired by the Senior Responsible Owner, and attended by the Project Director and the Project Manager, plus the Section 151 Officer. The Cabinet Member for Highways and Transport, Street Scene and Flooding, Cllr Caroline Thomas and others are invited to attend depending on the stage of the project and any developing issues or risks.

The Project Board provides a consistent approach to project governance and the coordination with other projects. It has a key focus on ensuring project outputs and objectives are met, ensuring that the project remains on target in terms of business, user and technical objectives. It also has overall responsibility for ensuring the scheme is delivered to the agreed budget and programme.

Meetings of the Project Board take place at least monthly but are also linked to key milestones. The Board considers progress through Highlight and Exception Reports (provided by the Project Manager), changes to the risk register, and changes to the Scheme Implementation Programme.

#### 7.3.2.6. Project Director / Project Manager

The Project Director is **Peter Binley, Head of Major Highway Projects** who is a Chartered Engineer and Member of the Institution of Civil Engineers with extensive experience of highway projects with consultants and local government, both in the UK and abroad. His experience in Wiltshire includes the project management and delivery of previous substantial improvements on the A350 at Chippenham, Semington and Upton Scudamore. He currently leads a team focused primarily on the delivery of schemes on the Major Road Network with the support of Atkins as term highway consultants to the council.

The Project Manager is **Steve Wilson, Major Highways Project Engineer**, who has over 30 years post graduate experience in the fields of civil engineering construction, highway engineering, design and contract management, highway maintenance and transport planning. His wide-ranging and extensive experience includes working in the private and public sector, and within the Client, Consultancy and Contracting disciplines. This includes the initial and detailed design, procurement, planning, and the 'buildability' of major projects as well as the management and implementation of highway network maintenance activities. In recent years Steve has played a significant role in the delivery of various major capital highway schemes at Wiltshire Council, including improvement works at M4 Junction 17, the delivery of dualling projects at A350 Chippenham Bypass, and the A350 Farmers Roundabout enhancements at Melksham.

They are responsible for delivering the scheme in line with the agreed controls and procedures set out in the Project Plan. They will report to, and be accountable to, the SRO and the Project Board and provide the interface between the Service Delivery Team and the Project Board. The primary focus of the Project Manager is to ensure that the scheme is delivered on time, within budget and to specification, working under the guidance of the Project Director. The Project Manager is also responsible for preparing Highlight and Exception Reports.

The Project Manager will provide a key interface to the contractor team, primarily through the contractor Project Manager and working closely with the client side Contract Manager.

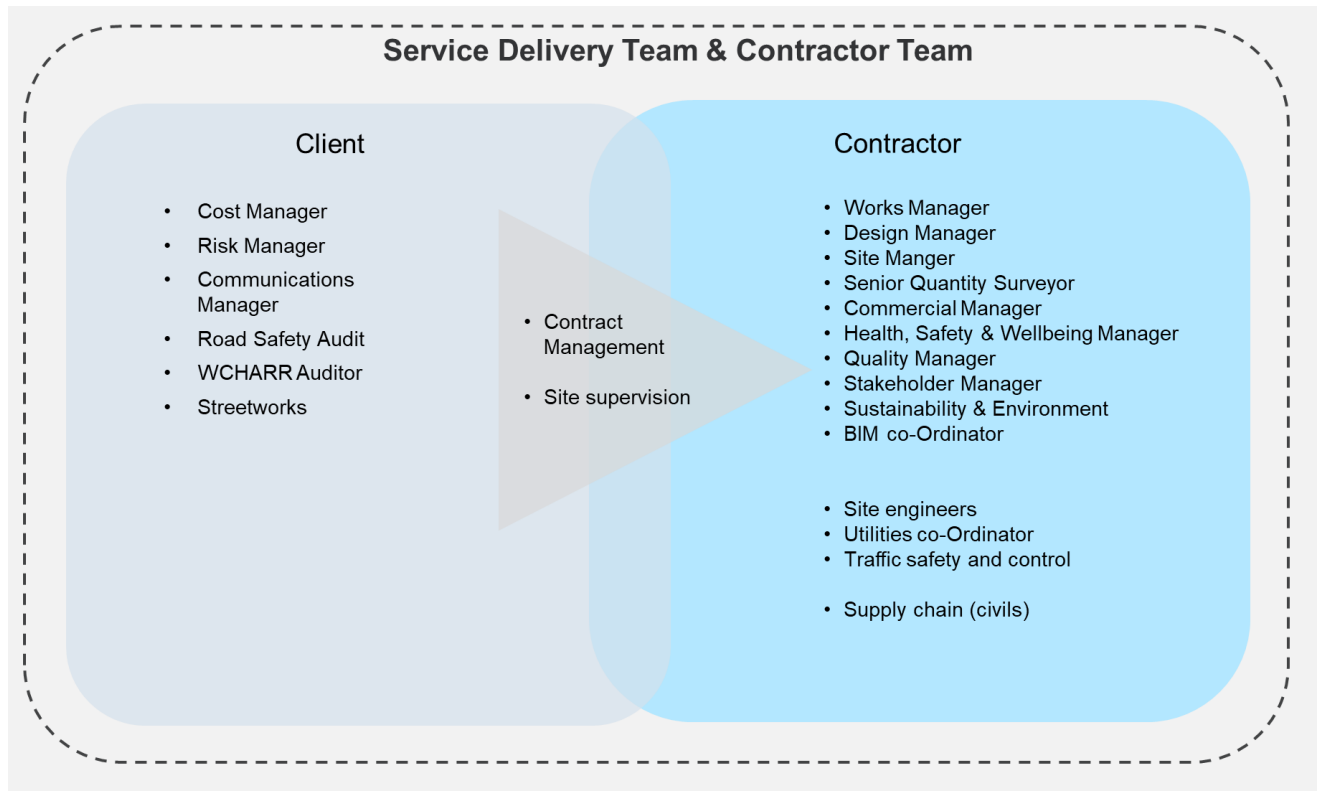
#### 7.3.2.7. Service Delivery Team & Contractor Team

The day-to-day management of the project is by the **Service Delivery Team (SDT)** which is overseen by the Project Manager and comprises **officers from the Council and representatives of the partnering consultants AtkinsRéalis**. The SDT covers a number of specific technical work streams associated with project development and delivery.

Following the completion of procurement and the identification of the preferred contractor for the main construction works, the contractor team (including key subcontractors and suppliers) is to become an extension of the SDT. The client side Site Supervision team (including the NEC Contract Manager) will provide a key interface with the contractor team.

Key functions and roles are illustrated in (Figure 7-2).

Figure 7-2 - A350 Chippenham Bypass Improvements - service delivery team



The SDT meets monthly to review progress, monitor expenditure and quality, and plan future work and resource requirements. The meetings follow a set agenda, which includes monthly flash reports from the design team on progress, risks and issues.

The SDT responsibilities include:

- Progress monitoring against programme;
- Future actions and emerging risks and issues;
- Finances;
- Stakeholder engagement and communications;
- Decisions required by Project Board or others;
- Resources;
- Risk Management;
- Coordination with other major projects; and
- Reports to Project and Programme Boards.

Each work stream has a nominated lead who is responsible for the related technical activities and reports to the Project Manager. Meetings take place as required within these work streams to discuss technical matters and specific aspects of the scheme.

The SDT is the main point of contact during most of the project for other organisations, including the local town and parish councils, public, businesses and other organisations.

## 7.4. Delegated authorities, exception reporting, tolerances, and change control

### 7.4.1. Project reporting

Responsibility for accurate, timely and appropriate communications within the project team rests with the Wiltshire Council Project Manager to ensure that the Project Board is kept up-to-date with programme developments.

The identified Project Manager is responsible for ensuring that the Project Board is provided with sufficient information and that the Project Board clearly understands the information in order to provide the necessary guidance on programme decisions. The Project Manager is responsible for leading the Delivery Team and for reporting to the SRO to ensure that all parties are up-to-date with relevant information.

The SRO is responsible for keeping the Lead Members aware of the development of the scheme towards meeting the project objectives.

Project team meetings are held monthly, with the outcomes escalated to the Project Board

Project progress, expenditure, construction contract rate of expenditure and value for money are all monitored by the relevant members of the project team as a requirement of their day to day roles consultant project manager, cost consultants. This is an approach prescribed in the supplier's terms of engagement by Wiltshire Council's procurement and project management staff.

Ultimately, whether identified by the project team through the established project communication process or escalated to the Project Board / Leadership Team by exception assurance on project governance will be closely monitored and opportunities for appropriate intervention maintained through the project governance process.

Urgent matters such as non-compliances and matters with the potential to affect budget or programme are reported at these meetings or raised as an issue by the project team staff outside the meeting by exception. The project governance structure identifies the route hierarchy by which matters are escalated.

### 7.4.2. Change control

Change control processes are integrated into the overall project management protocols and includes use of early warnings and a change register. Changes are raised and approved in accordance with the project governance hierarchy and levels of authority.

Compensation events relating to the main construction works would follow the procedures and terms set out in the contract which also makes provision for dispute resolution.

## 7.5. Project assurance arrangements

### 7.5.1. Wiltshire Council Cabinet (gateway review)

The project is managed in accordance with the **Council's Constitution and related guidance**. The responsibility for approving progress on the scheme at key stages is undertaken by the **Council's Cabinet**, which has various well-defined responsibilities, including controlling capital expenditure. The Cabinet is part of the Council and is responsible for most day-to-day decisions. Reports to the Cabinet act as a **Gateway Review** at key stages. This provides an audit trail and ensures relevant scrutiny and challenge, visibility and transparency, and compliance.

Reports are presented from the Council's Chief Executive outlining and confirming the background to the scheme, relevance to the Council's Business Plan, main considerations, conclusions and making recommendations. The report covers:

- Public Health,
- Procurement,

- Overview and Scrutiny
- Safeguarding implications
- Equalities,
- Environment and Climate Change,
- Risks of proceeding or not proceeding,
- Workforce implications
- Financial
- Legal implications.

The report is **approved by relevant Directors** or their deputies and by **the Section 151 Officer** before being referred to the Cabinet for decision. Some decisions may be delegated where appropriate to the Cabinet member to consider in conjunction with the Director of Transport and Environment / SRO, having consulted the Director of Legal and Governance and the Section 151 Officer. When major decisions ("key decisions") are to be discussed or made by Cabinet, they are published in the Cabinet's forward work plan. Key decisions include those where a contract exceeds an annual value of £1 million or a total value exceeds £4 million. The contracts for this project would exceed those values and would require Cabinet approval to proceed. The contract procurement process would be approved and monitored by the Council's **Strategic Procurement Board**.

Reports considered by Cabinet are publicly available; any confidential information is included in a Part 2 report which would not normally be publicly available, but which is considered by the Cabinet.

Key gateway decisions already undertaken throughout project development are summarised in Table 7-1.

**Table 7-1 Summary of key decisions / gateways**

Stage or gateway decision point	Date
Agreement to submit scheme to DfT as potential MRN scheme (Western Gateway Sub-national Transport Body)	June 2019
Approval of funding contribution to scheme from Community Infrastructure Fund (Wiltshire Cabinet)	1 Feb 2022
Approval of Council budget including funding contribution to scheme (Wiltshire Cabinet)	15 Feb 2022
Approval to award contract (Wiltshire Cabinet)	14 Nov 2023

Following the approval to award the contract for the main construction works (subject to DfT full approval), no further Cabinet decisions are anticipated to be required. The power to enter into the contract has been delegated to the Cabinet portfolio holder.

### 7.5.2. Overview and scrutiny

Further assurance is provided by the Council's **Overview and Scrutiny management** who review the Cabinet reports before submission and can request it to be referred to the Environment Select Committee for review and comment before Cabinet consider the matter. This makes sure that decisions are taken based on sound evidence, including the views of those with an interest in the matter, and are in the best interests of the people of Wiltshire.

Overview and Scrutiny has powers to require decision-makers to attend meetings and answer questions on any matter under review and also provide written evidence. These can also be from other agencies and contractors, often referred to as partners, who are delivering public services in Wiltshire. They can also seek the advice of experts outside of the council to help it in its work. Overview and scrutiny does not make decisions itself, but

publishes findings and recommendations which must receive a response. Most of its meetings are held in public.

#### 7.5.2.1. DfT assurance and approvals

The scheme is currently being progressed in line with the DfT's guidance regarding the transport business case<sup>32</sup>. This is a three-phase approval process, as illustrated in Figure 7-33.

**Figure 7-33 - The three-phase decision making process.**



This FBC represents Phase Three of the decision-making process. It has reconfirmed the need for intervention and has assessed the strategic fit and potential economic, social and environmental impacts for the preferred option. Based on information presented in the FBC, the DfT will undertake its assurance review and present its findings to Ministers. If approval is granted, Wiltshire Council will proceed with award of the main construction contract to allow construction works to proceed on site following a period of mobilisation.

## 7.6. Project scope, dependencies, interdependencies, and constraints

The A350 Chippenham Bypass Improvements is a stand-alone scheme, which is not dependent upon the completion of other projects or activities.

This is a relatively conventional highways infrastructure project comprising carriageway widening and junction capacity improvement. The works are in the public highway and no further planning or statutory permissions are required to facilitate the implementation of the project.

The proposals for the dual carriageway Chippenham Bypass were the subject of consultations at the planning application stage and at a public inquiry in the 1990s. Following the public inquiry, the statutory orders for the scheme were approved by the Secretary of State. The statutory orders for the scheme included the compulsory purchase of sufficient land to construct the full dual carriageway bypass, including easements for drainage provision, working space to facilitate construction, and landscaping including providing an extension to Vincients Wood which is now a nature reserve. The land along the route was taken into the public highway to facilitate the future dualling.

## 7.7. Contract management

Wiltshire Council is establishing a dedicated contract management team that will be in place before, during and after the scheme contract. The team comprises the following key members:

- Contracts Manager;
- NEC4 Supervisor (site based);
- Clerk of Works; and
- Quantity Surveyor (QS).

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<sup>32</sup> <https://www.gov.uk/government/publications/transport-business-case>



The QS team involved at the design phase is to remain involved during the works, to ensure continuity of the knowledge built up during the scheme development. The contract management team will complete all as-built information and the health and safety file.

The project contract management team (as part of the SDT) are supported and monitored by the **Contract Management Meeting** (CMM) which reviews performance across the Council's highways contracts. CMM is attended by the Council's Director of Highways and Environment, Heads of Service and the local Directors of the term consultant and main contractor. The meetings can be attended by the Cabinet member and other contractors and Council staff are invited to attend as required.

The **Innovation and Collaboration Forum** and the **Environment Forum** support the work of the CMM in connection with those aspects of the Council's highway contracts. A Contract Management Progress Meeting is held monthly with the consultant and contractor to review contract undertakings, key performance indicators, satisfaction scoring, early warning notices and contractual procedures, which are reported to CMM as necessary. This management structure has worked well for many years and has successfully delivered a wide range of service and schemes for the Council.

## 7.8. Project implementation: work packages, product and work breakdown structures

At the current stage of project development the principal work packages required for project implementation (execution of the A350 Chippenham Bypass works) relates to: pre-construction and mobilisation; and the main construction phase. Other activities relating to project closure and project evaluation are addressed in later sections of this chapter.

### 7.8.1. Pre-construction and mobilisation

Key work packages related to pre-construction and mobilisation are summarised in Table 7-2.

**Table 7-2 Pre-construction and mobilisation work packages**

Work package	Description
Consents and approvals	<ul style="list-style-type: none"> <li>Submit land drainage discharge consent applications to Wiltshire Council, as Lead Local Flood Authority.</li> <li>Collaboration with Network Rail, building upon prior discussions, to finalise the construction-stage BAPA.</li> </ul>
Utilities	<ul style="list-style-type: none"> <li>Submit all notices for diversions and new installations early.</li> <li>Finalise agreements for the protection slab above Exolum's pipeline.</li> </ul>
Documentation preparation	<ul style="list-style-type: none"> <li>Preparation of all preconstruction documentation, including the Construction Phase Plan, Quality Plan, Carbon Management Plan and the Communications and Customer Care Plan, Digital Management Plan and Social Value Plan.</li> <li>Site specific RAMS to be prepared ready for construction start.</li> </ul>
Surveys	<ul style="list-style-type: none"> <li>Surveys of existing drainage assets, including CCTV of the culverts in Phases 4 and 5.</li> <li>Locate and survey the LP gas main and all existing manholes, compiling full drainage survey data.</li> </ul>
Mobilisation and site set up	<ul style="list-style-type: none"> <li>Installation of site compounds, welfare, offices and temporary connections.</li> </ul>
Traffic management	<ul style="list-style-type: none"> <li>Collaboration with Wiltshire Council's Highways and Streetworks teams to secure agreement.</li> <li>Submit TTRO Applications, encompassing road closures, off-peak lane closures, and lay-by closures on the A350.</li> <li>Detailed TM method statements and plans. This proactive approach ensures completion of all noticing ahead of the April start.</li> </ul>

Work package	Description
	<ul style="list-style-type: none"> <li>Routine TM Liaison Group meetings to gain input and feedback from key TM stakeholders.</li> </ul>
Advanced works	<ul style="list-style-type: none"> <li>Vegetation site clearance works</li> </ul>

## 7.8.2. Main construction phase

Key work packages related to the main construction phase are summarised in Table 7-3.

**Table 7-3 Main construction work packages**

Work package	Description
Bumpers Farm Roundabout	<ul style="list-style-type: none"> <li>Phase 1: Traffic island removal (May to June 2024)</li> <li>Phase 2: Widening outside of the roundabout and verges (June 2024 to Feb 2025)</li> <li>Phase 3: Construction of new roundabout (Feb to June 2025)</li> <li>Phase 4: Creation of new splitter islands (June to July 2025)</li> <li>Surfacing and Finishing Works (June 2025 to August 2025)</li> </ul>
Phase 4 Dualling	<ul style="list-style-type: none"> <li>Phase 1: Northbound carriageway construction (May 2024 to Jan 2025)</li> <li>Phase 2: Concrete VRS installation (Feb to March 2025)</li> <li>Phase 3: Finishing works to southbound carriageway (March to May 2025)</li> </ul>
Phase 5 Dualling	<ul style="list-style-type: none"> <li>Phase 1: Northbound carriageway construction (May 2024 to April 2025)</li> <li>Phase 2: Concrete VRS installation (April to May 2025)</li> <li>Phase 3: Finishing works (June to September 2025)</li> </ul>

## 7.9. Project plan (schedule)

Key project milestones from the OBC submission to scheme completion are listed in Table 7-4. A full programme Gantt chart can be found in Appendix E.2.

**Table 7-4 Project Milestones**

Milestone	Date
Outline Business Case (OBC) submission	July-19
OBC approval	Nov-21
Public engagement	Dec-22 to Feb-23
Procurement process commenced	April-23
Tender evaluation complete – identification of preferred contractor (main works)	Nov-23
Full Business Case (FBC) Submission	Dec-23
Start of advanced works	Jan-24
FBC approval	April-24
Award of contract	April-24
Pre-construction engagement	April / May-24
Start construction	May-24
Bumpers Rbt: Phase 1 completion	June-24
Bumpers Rbt: Phase 2 completion	Feb-25
Bumpers Rbt: Phase 3 completion	June-25

Milestone	Date
Bumpers Rbt: Phase 4 completion	July-25
Phase 4 Dualling: Phase 1 completion	Jan-25
Phase 4 Dualling: Phase 2 completion	Mar-25
Phase 4 Dualling: Phase 3 completion	May-25
Phase 5 Dualling: Phase 1 completion	April-25
Phase 5 Dualling: Phase 2 completion	May-25
Phase 5 Dualling: Phase 3 completion	Sep-25
Finish construction	Sep-25
Road Safety Audit Stage 3	Oct-25
Scheme opening	Nov-25
Completion of handover to maintenance (Health & Safety file completion)	Jan-26
End of defects period	Nov-26

There are benefits in carrying out some site clearance and earth moving operations before the start of the main contract to avoid delays and additional costs because of seasonal environmental constraints, especially in connection with nesting birds. It is therefore planned that some advance works will be undertaken making use of the Council's existing highway framework contracts. This will reduce the risk of delays and additional costs resulting from potential claims by the main contractor and will increase certainty of delivery to time and price.

The project programme will be kept under regular review throughout the delivery phase, including:

- monthly revisions to the baseline programme including full critical path analysis in line with NEC4;
- weekly updates including as-builts and resourced six-week look-ahead programmes for each section; and
- mid-month programme workshops to collaboratively improve productivity and reduce time and cost.

## 7.10. Stakeholder engagement and communications

### 7.10.1. Overview of approach

Stakeholder communications and PR aspects are managed overall by Wiltshire Council's communications team which is responsible for keeping stakeholders well informed throughout the scheme development and construction process. The scheme has the potential to impact upon those living, working, using services and doing business in the area and beyond. Stakeholder input has played an important role in the development of the scheme to date and will continue to do so prior to and throughout scheme implementation.

The communication objectives are to:

- **inform** stakeholders of the scheme progress and **enable feedback** on the detailed design, to reduce risk and aid scheme approval;
- **communicate and share** information with stakeholders in a **timely and appropriate manner**, building trust and maximising support for the scheme;
- plan and provide **appropriate channels of two-way communication** for identified audiences, to ensure they understand how the Council provides information, and receives and acts on feedback;
- **proactively pre-empt and address potential concerns** and perceptions of the scheme which are inconsistent with the objectives and forecast outcomes;
- attend to the views of stakeholders representing the protected characteristics listed under the **Equality Act 2010, and the Public-Sector Equality Duty**;

- provide **consistent, clear information to those affected by the scheme**, including the nature of scheme-related impacts and how and when it will affect people; and
- use **clear, accessible language** and deliver messages which are tailored to the requirements of specific audiences

The communications approach is similar to previous A350 improvement schemes undertaken by Wiltshire Council. Opportunities will be taken wherever possible to act upon any lessons learned from the communications aspect of these preceding schemes.

Stakeholder engagement has taken place during the scheme development, with the most recent engagement exercise undertaken from December 2022 to February 2023 in relation to the detailed scheme design (see section 3.3.4.2). The scheme is now moving into the delivery phase, during which stakeholder engagement and communications will continue to play an important role.

### 7.10.2. Stakeholder engagement and communications during the delivery phase

When previous improvements have been undertaken on the A350 in this area, such as the Pinch Point scheme at the northern end of the bypass and LGF schemes to dual other sections of the bypass, there has been local stakeholder engagement prior to the construction start to explain the construction processes and programme, as seen in Figure 7-4. It is proposed to carry out similar stakeholder engagement for this scheme, including engaging local newspapers and radio, as well as social media input.

Figure 7-4 - Example of good practice in communications during construction

**Good practice in communications during construction**

For the A350 Farmers Roundabout scheme, Wiltshire Council appointed a contractor with a high regard for communications. The contractor employed a public liaison officer who managed the day-to-day communication - this was a key part of the quality questions during the tendering. Regular newsletters were produced by the public liaison officer to keep the public updated on progress.

The newsletter screenshot includes the following content:

- Newsletters 03 - April 2019**
- A350 Farmers Roundabout Improvement Scheme**
- Councillor Site Visit**: On the 3<sup>rd</sup> April 2019 we hosted a site visit for Melksham Town Councillors. The day proved very successful with positive communication and informal discussions centred around the works progress to date. Topics of conversation ranged from the necessity for carrying out trial hole excavations, to identifying and protecting utilities, to the efforts Dyer & Butler are making in minimising disruption to the travelling public whilst ensuring site safety for the workforce. The visiting party were able to see some areas of works which are not readily evident to traffic passing through the site.
- Scheme Works Completed Last Month**: Construction work has been completed on an embankment at the southern end of Farmers Roundabout, allowing the footway to be realigned and the accommodation of a new vehicle maintenance bay. New traffic signal ducting and chambers will be installed in the area leading to the implementation of a new signalised junction. The adjacent new splitter island has been completed which will support the widening of the carriageway of Bradford Road as well as new highway construction. New electrical installations and associated traffic signal ducting has also been installed in preparation for the signalised junction. To the east of Farmers Roundabout, Dyer & Butler have been laying new kerb lines and constructing new footways alongside the A350 southbound carriageway. In advance of a pre-planned three-week phase of overnight working, Dyer & Butler carried out tree and vegetation clearance work on all verges adjacent to Farmers Roundabout. This was undertaken to allow the

**Safe by choice... not by chance**

In order to make general scheme information available to a broad audience and to provide the opportunity for feedback, Wiltshire Council has established a [dedicated website](#) with information on the scheme, including **Frequently Asked Questions**. This will be kept up to date during the implementation phase.

Local **area boards**<sup>33</sup> are another means of keeping local communities informed about the scheme and progress on its implementation. There are area boards covering Chippenham and Malmesbury, which are considered to have the most relevance to the M4 Junction 17 project. There are also **Community Area Transport Groups** (CATGs) associated with the area boards which can consider transport issues in more detail, set priorities and report back to the area boards. Working with these groups has proved very successful on other recent schemes on the A350, particularly on the NPIF scheme at A350 Farmers Roundabout, Melksham.

During the scheme construction period there will be inevitable delays to road users, but the impacts will be minimised as much as possible through the provision of timely, specific and accurate information. This will ensure affected parties are informed of any disruption well in advance and can plan / adapt their journeys accordingly. A variety of communication channels will be utilised including social media and publications.

The contractor for the main construction works will take an active role in stakeholder engagement and communications. This will manage specific stakeholder needs throughout project delivery and provide regular scheme progress updates regarding the proposed start of works, progress during the works, and the temporary traffic management arrangements to be implemented. This includes development of the following:

- **Communications and Customer Care Plan** – states what needs to be done, how often, when and by whom.
- **Digital Management Plan** – details how and when website and social media channels will be used to engage with the wider public. Working alongside Wiltshire’s media team, the contractor will highlight progress, key milestones and positive news stories to generate scheme interest and awareness.
- **Social Value Plan** – states how engagement will be undertaken with local groups and charities to leave positive legacy.

It is also intended that a ‘meet the contractor’ or similar events will be held prior to the start of the main works.

The Council already liaises closely with the businesses on Bumpers Farm Industrial Estate, who have campaigned for many years for the type of improvements to access to the estate which this scheme will deliver. This important employment area will be considered as a key stakeholder and will be the subject of specific focussed consultation to ensure that there is minimum disruption to the estate during the construction phase, and that the benefits of the proposals are understood.

## 7.11. Risk and issues management

### 7.11.1. Risk management approach

Effective risk management is fundamental to successful project delivery and the management of uncertainty.

A full **Risk Management Plan** can be found in **Appendix E.3**. It has been applied at all stages of project execution and is an essential part of the project management.

The Risk Management Plan provides a management framework to ensure that levels of risk and uncertainty impacting the scheme are properly identified, reviewed and managed throughout the project lifecycle. This creates an environment and a context for **pro-actively identifying and dealing with risks** and issues. This includes **prioritising and assessing risk** so that the right resources can be applied in a timely manner for **implementing mitigation plans** to minimise risks or increase opportunities. This applies to recording and communicating these risks, as well as the eventual close-out of specific risks and the project itself.

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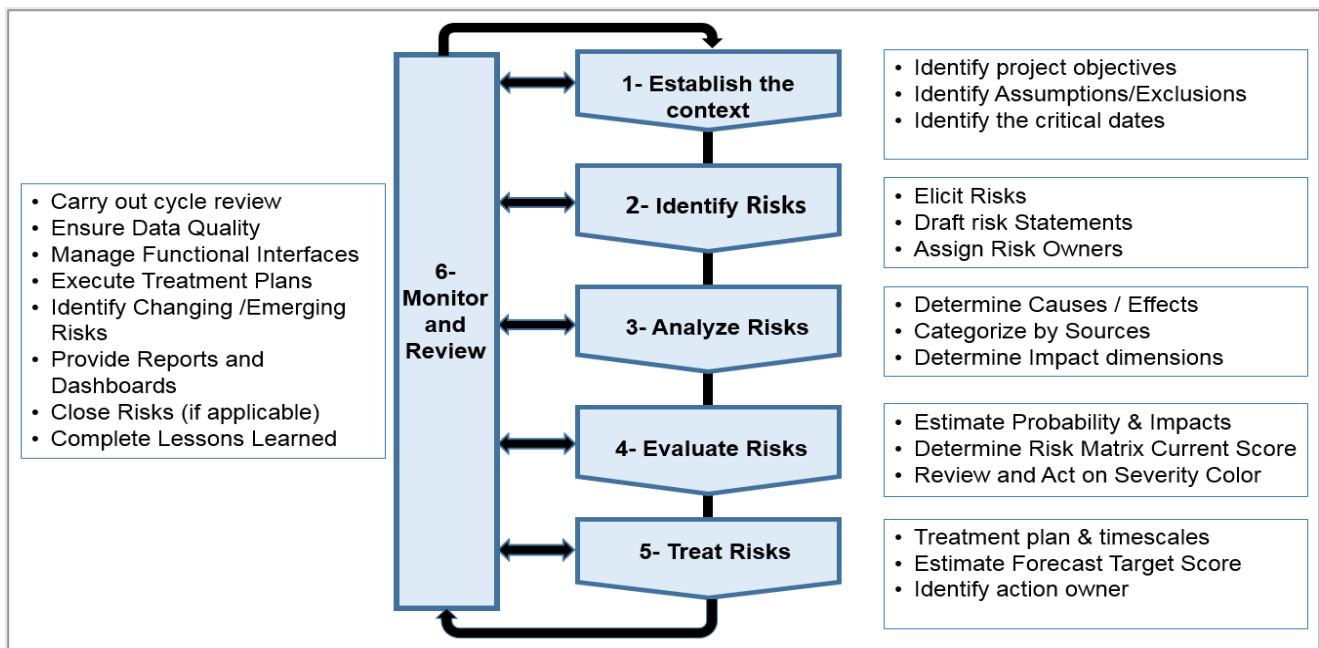
<sup>33</sup> The area boards are a way of working to bring local decision making into the heart of the community and include local Wiltshire Council members, town and parish councils, voluntary and community groups, youth organisations, sports clubs and local charities. Public meetings can be used to launch consultations and stakeholder engagement events as well as providing updates on projects.

The aims of the Risk Management Plan include:

- Assignment of **clear roles and responsibilities** within the project team for risk management.
- Enhanced team communication and **commonality of approach**.
- Assisting the Project Manager to **understand the potential risk exposure**, to develop a **focused treatment plan** to reduce the likelihood of risks occurring or to mitigate the impacts, and to **understand confidence in achieving project targets**.
- Understanding the **resource constraints and time dependencies**.
- Support the **allocation of project contingency funds** and sufficiency of management reserve.
- Increasing the value of the project investment through **identification and exploitation of opportunities**.

The overall risk management approach is summarised in **Figure 7-5**.

**Figure 7-5 - Overview of the risk management process**



Risks are mitigated by a combination of impact reduction and / or probability reduction:

- Risk Avoidance
- Risk Transfer
- Risk Reduction
- Risk Acceptance

### 7.11.2. Risk identification / Risk Register

The Risk Register (**Appendix E.4**) covers identified risk across all scheme components. It has been developed through the use of **risk workshops**, including those undertaken throughout preparation of the FBC. The workshops, led by the Risk Manager, included client and consultant teams representing all aspects of the project delivery, including design, environment, economics, modelling and finance teams. For each risk, a clear understanding of the cause, event and impact has been determined to enable an assessment regarding the rating levels of probability and impact.

### 7.11.3. Risk analysis and evaluation

The Risk Register uses automatic scoring once the risk probabilities and impacts are assessed and quantified, using the relevant banding levels (risk parameters). The only exceptions are performance or quality impacts, where a suitable description of the impact is used for the Risk Owner to determine the qualitative score which is then input directly into the performance / quality impact level field (e.g. a '3' for medium level performance would indicate a significant criterion is not met).

The risk parameters set for qualitative analysis with the Risk Register scoring are shown in Table 7-5.

**Table 7-5 – Risk parameter scoring**

Score Ref	Rank	Probability (%)		Impact Criteria				Project Performance	
				Cost Range (£)		Schedule Range (days)			Reputation
				Min	Max	Min	Max		
5	Very High	75	90	>1M		>90		Major national adverse media coverage.	Unable to deliver critical criteria.
4	High	50	75	500k	1M	60	90	Major local/minor national adverse media coverage.	Major impact on delivery of criteria.
3	Medium	25	50	250k	500k	30	60	Minor local adverse media coverage.	Partial delivery of criteria.
2	Low	10	25	100k	250k	14	30	Complaint trends.	Late or inconsistent delivery of criteria.
1	Very Low	1	10		100k		14	One off, limited complaints.	Negligible impact on criteria.

Risks are further evaluated using a scoring matrix or Probability Impact Diagram (PID), as illustrated in **Figure 7-6**. The highest risk impact score and the probability score is used to obtain a single value Risk Score for each risk. The risks, when reordered from high to low risk scores, ranks them in order of importance, or significance to the project

Figure 7-6 - Risk Probability Impact Diagram

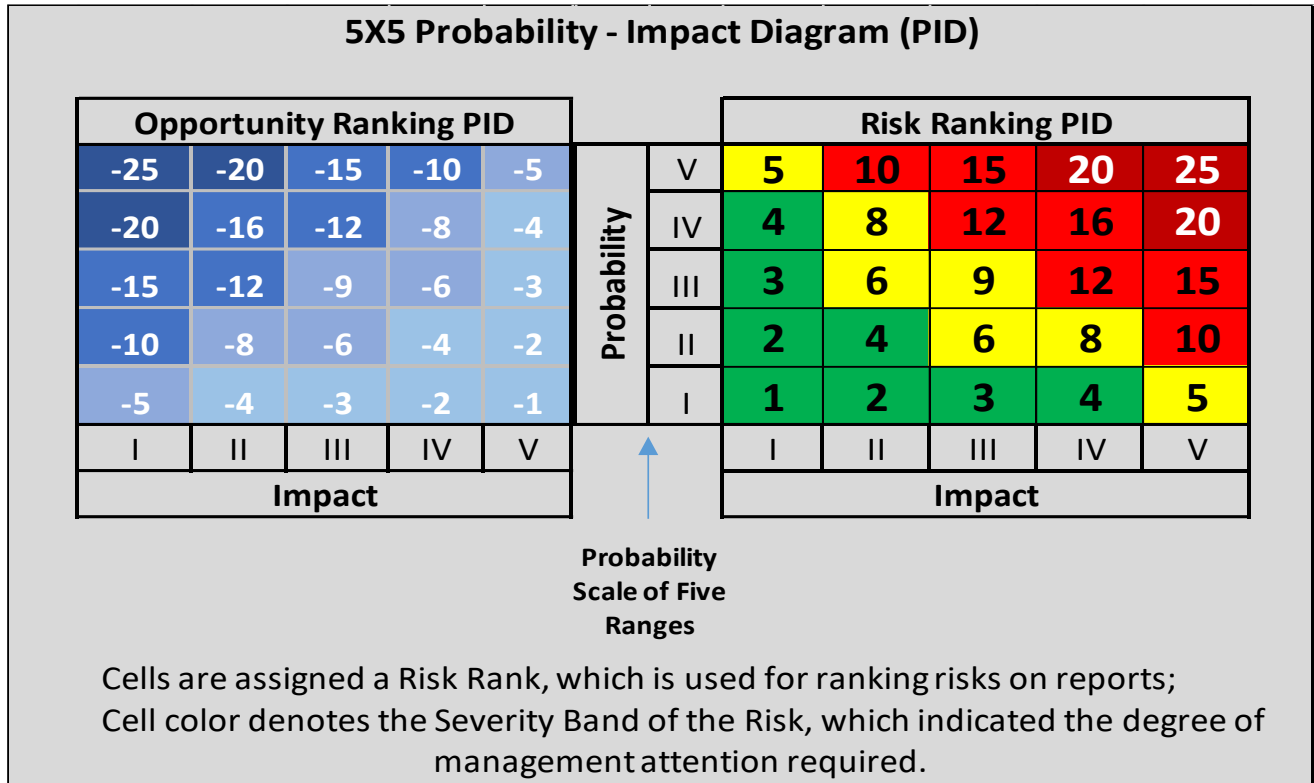


Table 7-6 provides an outline of the minimum actions required of the Project Manager based on the severity score derived from qualitative assessment. These actions include appropriate reporting and escalation of risks within both Wiltshire Council and Atkins.

**Table 7-6 Actions by risk severity level**

Severity	Action
Very High	Escalate to Wiltshire Council Organisational Level.
High	Escalate to Atkins Business Unit and agree on appropriate management with Business Head.
Moderate	Escalate to Wiltshire Council Programme Level and agree on appropriate management with Wiltshire Council Project Manager.
Low	Report to Atkins Business Unit.
Low	Manage at Project Level and report at Wiltshire Council Level.
Low	Manage and report at Project Level.

#### 7.11.4. Risk treatment

The treatment of threats will aim to prevent or reduce project overspend, delayed deliverables or reduced performance levels. It will promote activities that will help to avoid or reduce adverse impacts or the chance of these events happening. In contrast, treatment of an opportunity will aim to improve the chances of realising the opportunity and maximising the cost saving, accelerated timescales or improved quality of the project output.

There are three types of treatment or mitigation actions:



- ACTION - A physical task with a defined deliverable or outcome.
- CONTROL - On-going monitoring, stakeholder engage or procedure changes.
- FALLBACK ACTIONS - A set of actions which will be taken only if the risk happens.

The Risk Register (**Appendix E.4**) sets out the mitigation measures for all current risks and their Risk Owners. Each identified treatment action is assigned an Action Owner responsible for ensuring that the actions are executed to plan within the timescales or costs. The Action Owner reports progress of these actions to the Risk Owner.

The success of the actions taken will be monitored on a regular basis to check effectiveness. If the actions are not improving towards achieving the post-mitigated values, then alternative actions or strategies will be considered.

#### 7.11.5. Risk monitoring and reporting

The identification, definition, analysis, and mitigation plans for risks are captured in the Risk Register, which is managed by the Risk Manager. It is the responsibility of all those on the project to identify risks and notify the Risk Manager so that risks can be properly captured.

The Risk Register is discussed and updated on a monthly basis between the Project Manager and the Risk Manager in order to ensure it is effectively maintained, reflects the current risk profile of the project, and that actions are being tracked and carried out. Changes to the Risk Register are reported to the monthly Project Board meetings.

Risk Review Workshops are carried out with the wider project team to review and update the Risk Register as appropriate. These workshops take place on at least a quarterly basis and will continue throughout scheme development and delivery.

#### 7.11.6. Key risks and mitigation

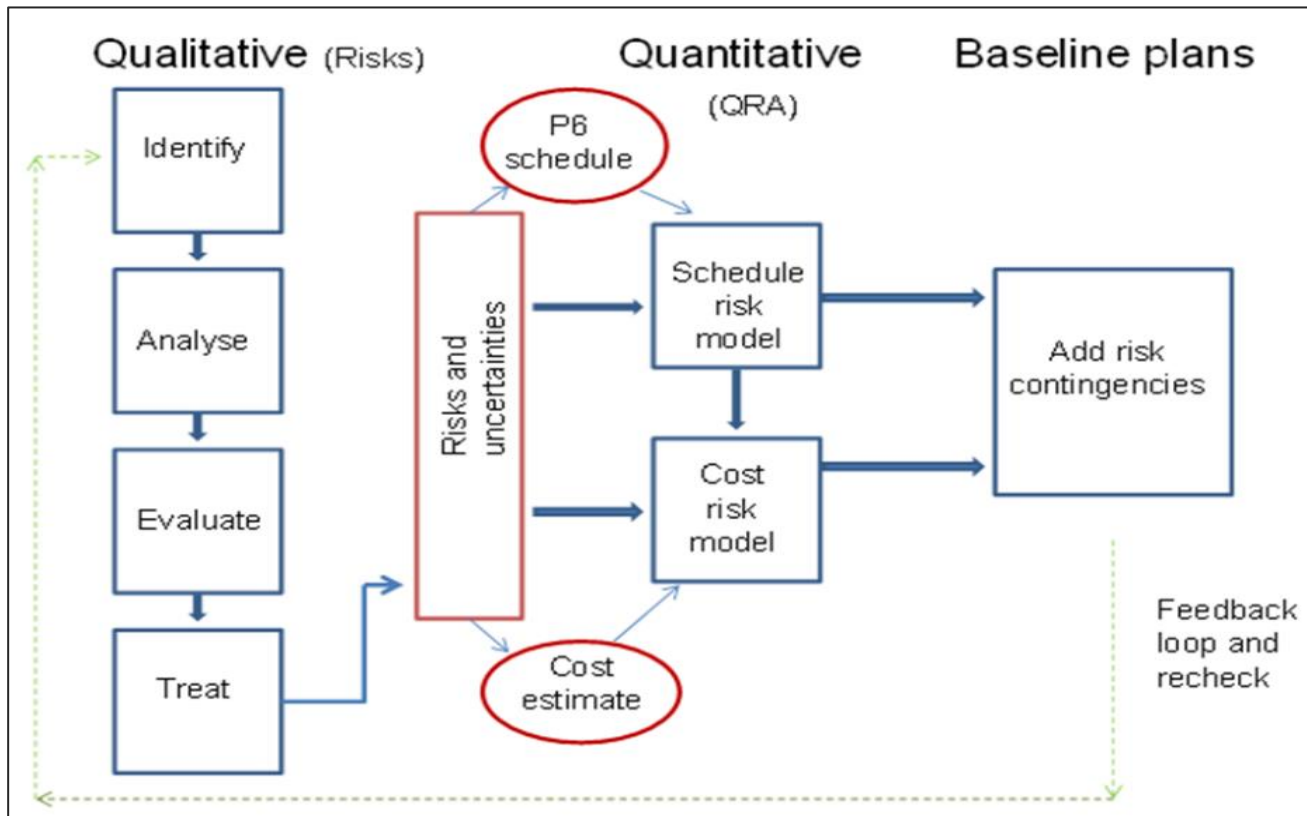
The potential risks associated with major construction projects, especially regarding safety, costs, and delivery are well understood by the Council, and comprehensive site supervision and contract management will be put in place to manage those risks.

The latest project Risk Register is included in Appendix E4. Some of the most significant risks to delivery and realisation of benefits (as well as mitigation approach) are addressed in the Strategic Dimension, section 3.3.6.

#### 7.11.7. Quantified Risk Analysis

Quantified Risk Analysis (**Figure 7-7**) entails the Quantitative Cost Risk Analysis (QCRA) and Quantitative Schedule Risk Analysis (QSRA). Outputs inform the Project Manager of the current level of confidence in achieving the budget, key dates, cost range and earliest and latest achievable dates. The QCRA is updated at key stages to inform the risk cost allowance (see also the Financial Case).

Figure 7-7 Overview of the Quantified Risk Analysis process



### 7.11.8. Contingency plan

Should a situation of early project termination arise this would be managed to minimise adverse impacts, in particular potential financial and reputational implications. Appropriate stakeholder communication would be planned and undertaken to explain the project status and any next steps (as far as known).

Appropriate contingency plans and exit strategies are reflected within the contract documentation for the main construction works (based on standard NEC4 clauses). Should early termination arise the contractor would be required to provide all hard copy and electronic data for the contractor's design including material prepared by a subcontractor, the scope for the contractor's design and site information obtained so far as prepared at termination. In this event, Wiltshire Council would have the right to use such material for completion of the works and / or otherwise to handle such material as it would have been entitled to handle that material prior to termination.

Similarly, terms of the funding agreement with DfT (subject to full business case approval) would make provision for early termination, agreeable to both parties.

Should full approval via the DfT MRN fund not be obtained, Wiltshire Council may seek alternative means of delivering and/or funding the scheme in order to realise the planned benefits.

## 7.12. Benefits management and evaluation

### 7.12.1. Benefits management approach

Benefits management for the project includes the identification, definition, tracking, realisation and optimisation of benefits. It is applied across the project lifecycle, as summarised in Table 7-7. At the FBC stage the focus of the benefits management process is on 'plan to realise'.

**Table 7-7 – Overview of benefits management approach<sup>34</sup>**

Project stage	Business case step	Benefits management process	Benefits management activity (focus)
Policy / strategy	Pre business case	Define success	Early consideration of drivers, objectives and desired outcomes
Feasibility	Strategic Outline Case	Identify and quantify	Identify and prioritise / categorise benefits Establish theory of change and strategic alignment (benefit mapping)
Appraise and select	Outline Business Case	Value and appraise	Modelling and valuation of benefits Outline measurement and reporting arrangements Outline roles and responsibilities
Define	Full Business Case	Plan to realise	Baseline benefits measures and confirm targets Finalise measurement and reporting arrangements Track benefit risks and dependencies
Deliver	n/a	Work to realise	Measure, track and report benefits Implement mitigating action (if required)
Operate, embed, close	n/a		
Operations	n/a	Review performance	Post implementation review Document and disseminate key findings and lessons learned

A draft Monitoring and Evaluation Plan (MEP) has been established (Appendix E.5) to confirm the principal benefits of the scheme, the specific data requirements for measuring the benefits, and to allocate responsibility for evaluating performance against each of the benefits. The MEP has been developed in accordance with DfT requirements<sup>35</sup>.

### 7.12.2. Benefits identification, definition and mapping

Benefits initially identified in the earlier stages of project development have been reviewed and updated through the FBC preparation. This is based upon a revised benefits mapping exercise and identifies the linkages between the project drivers, outputs, outcomes and benefits and links the benefits to the project objectives. This process also identifies how the benefits are accounted for in the Economic Dimension.

Key benefits are highlighted in the Strategic Dimension (see section 3.3.3) and the draft Monitoring and Evaluation Plan identifies the selection of primary benefits for measurement and provides an outline profile of each of these.

The primary benefits include:

- reductions in peak period journey times via the A350 route;
- less variability in day to day journey times;

<sup>34</sup> This approach to benefits management aligns with the framework and practices set out in the Guide for Effective Benefits Management in Major Projects (Infrastructure and Projects Authority, October 2017)

<sup>35</sup> DfT has advised MRN scheme promoters to have regard to the publication “Monitoring and Evaluation Framework for Local Authority Schemes” published in September 2012.

- reduction in the number and severity of collisions;
- improved customer/user satisfaction;
- reduced traffic impacts on less suitable routes (including parallel routes through the Chippenham urban area); and
- increased ability to cater for future housing/ employment growth without adverse impacts to existing users.

Ensuring that these benefits are realised will be central to the success of the overall scheme. Delivery of these benefits is also associated with positive contributions towards wider economic, social and environmental impacts.

### 7.12.3. Benefits measurement

The draft MEP identifies a total of ten outcome based performance indicators to measure the primary scheme benefits, as summarised in Table 7-8. These are in addition to input/output based performance indicators which are intended to measure broader aspects of scheme delivery (see section 7.12.5).

**Table 7-8 – Overview of benefits measurement (outcome-based performance indicators)**

Indicator description	Further disaggregation	Key data requirement	Data collection timing
Change in traffic flow on key links within the study area. – all vehicles / HGVs – each direction – 12hr / AM pk / IP / PM pk	- Links along the main A350 - Links along parallel B4528 / Hardenhuish Lane - Links along A4 / A420 radials	Metric 1 ATC's / MCC	Pre delivery / 1 yr after opening / 5 yrs after opening
Change in total screenline traffic volume. – all vehicles / HGVs – each direction – 12hr / AM pk / IP / PM pk	- North/South screenline 1 - North/South screenline 2 - North/South screenline 3 - East/West screenline 1	Metric 1 ATC's / MCC	Pre delivery / 1 yr after opening / 5 yrs after opening
Change in pedestrian and cyclist demand – 12 hr	- Bumpers Rbt - Drake Crescent / Sandown Drive - Saltersford Lane / Easton Lane - Rugby Club	Metric 1/ 2 MCC	Pre delivery / 1 yr after opening
Change in average journey time along the A350 Chippenham Bypass. – all vehicles – each direction – AM pk / IP / PM pk	- Section 1 - Section 2 - Section 3 - Section 4	Metric 3 TomTom data	Pre delivery / 1 yr after opening / 5 yrs after opening
Change in the variability of journey time along the A350 Chippenham Bypass. – all vehicles – each direction – AM pk / IP / PM pk	- Section 1 - Section 2 - Section 3 - Section 4	Metric 3 TomTom data	Pre delivery / 1 yr after opening / 5 yrs after opening
Change in average journey time across Bumpers Roundabout – all vehicles – AM pk / IP / PM pk	Average of all moves from: - A350 South arm - A350 North arm - A420 West arm - A420 East arm	Metric 3 TomTom data	Pre delivery / 1 yr after opening / 5 yrs after opening

Indicator description	Further disaggregation	Key data requirement	Data collection timing
	- Bumpers Way		
Change in collisions on key links within the study area. - Total - By severity - By user type	- Links along the main A350 - Links along parallel B4528 / Hardenhuish Lane - Links along A4 / A420 radials	Metric 4 STATS19 data	Pre delivery (5 yr average) / 1-5 yrs after opening (5 yr average)
Change in area-wide collisions. - Total - By severity - By user type	- All links within the Chippenham area	Metric 4 STATS19 data	Pre delivery (5 yr average) / 1-5 yrs after opening (5 yr average)
Assessment of business perception of scheme impact	- Connectivity - Journey reliability	Metric 5 Business survey	Up to 1 yr after opening
Change in estimated vehicle related carbon emissions (function of traffic volumes and average vehicle speeds)	- Links along the main A350 - Links along parallel B4528 / Hardenhuish Lane - Links along A4 / A420 radials	Metric 1 ATC's / MCC  Metric 3 TomTom data	Pre delivery / 1 yr after opening / 5 yrs after opening

The measurement of the outcome-based performance indicators is based upon five key data sources (metrics) – these are identified in Table 7-8 together with the planned timing of data collection.

Baseline data (reflecting conditions prior to scheme construction) is planned to be collected between November 2023 and March 2024.

Targets for each outcome based performance indicator will also be established, with reference to the baseline position.

#### 7.12.4. Benefits ownership and governance

Wiltshire Council has overall responsibility for the implementation of the MEP. Scheme monitoring and evaluation will be integrated into the project management and delivery structure.

A Monitoring and Evaluation Lead is to be assigned on the project to be responsible for overall coordination and management of all monitoring and evaluation activity and reporting.

The Monitoring and Evaluation Lead would report directly to the Project Manager. They should be of an appropriate position and hold the relevant skills to be able to directly influence resources and drive the process forward. They will have knowledge of the scheme but will not be heavily involved in the process. This will ensure the avoidance of bias within the reporting procedure. In addition, they will have knowledge and appropriate experience of the appraisal and review process to ensure that the overall scheme objectives are met.

The benefits profiling exercise has identified the relevant benefit owners and associated stakeholders. In most cases, Wiltshire Council is identified as the benefit owner. It will also continue to work closely with stakeholders at a local and regional level to maximise potential wider benefits associated with the scheme, particularly in relation to economic growth. This includes:

- Working with the Western Gateway Sub-national Transport Body in relation to strategic priorities and plans around strategic north-south connectivity and unlocking the potential of the A350 corridor; this includes the M4 to south coast strategic study led by National Highways; and
- Working with the Swindon and Wiltshire Local Enterprise Partnership in relation to the delivery of housing and employment growth within the A350 Growth Zone.

## 7.12.5. Project evaluation and reporting

### 7.12.5.1. Scope of evaluation

Project evaluation will ensure that the whole project lifecycle is reflected and that there is **transparency and accountability** in relation to:

- **Outcomes** - the project benefits / outcomes (drawing upon the benefits measurement set out above);
- **Inputs/outputs** - delivery process (effectiveness of the planning and delivery of the project in terms of inputs and outputs, including use of resources);
- **Inputs/outputs** - delivered scheme (e.g. implementation of planned scope); and
- **Inputs/outputs** - delivery against cost budget and timescales.

This builds upon the benefits realisation and is of particular importance to the main scheme delivery and funding bodies; in particular, the Department for Transport (DfT) and Wiltshire Council (WC), as well as wider stakeholders.

The draft MEP identifies relevant indicators to measure performance against input/output based metrics, in addition to those outcome based metrics summarised in Table 7-8.

### 7.12.5.2. Evaluation stages

- Three primary evaluation stages are planned, as follows:
- **Pre-construction/ baseline stage**, commencing prior to scheme build (Autumn 2023 – Spring 2024).  
The focus of this stage is to collect information and data to accurately establish the conditions prior to scheme implementation - data should be collected prior to any construction.
- **One Year Post Opening Outcome Evaluation** (Spring 2025 - Autumn 2026).  
This stage will focus on the delivery process, delivered scheme and delivery against cost budget and timescales (inputs/outputs), in addition to impacts/benefits of the scheme following completion of construction and the scheme being fully operational.
- **Five Year Post Opening Impact Evaluation** (Spring 2030 - Autumn 2030).  
This stage will track changes since the first evaluation and the longer term impacts of the scheme.

### 7.12.5.3. Reporting and dissemination

Aligned to the evaluation stages, three primary outputs are envisaged:

- Baseline Report;
- One Year Post Opening Report; and
- Final (Five Year Post Opening) Report.

The M&E Lead will be responsible for the preparation of these reports. Draft reports will be subject to the project governance and approvals processes. The approved reports will be shared with the DfT and key stakeholders. Wider dissemination would be via the scheme web page on the Wiltshire Council website. This will be managed by WC's communications department. Local press releases will be issued as appropriate.

Key lessons learned associated with the scheme delivery will be recorded and communicated within the organisation in order to benefit future scheme delivery.

## 7.13. Carbon management

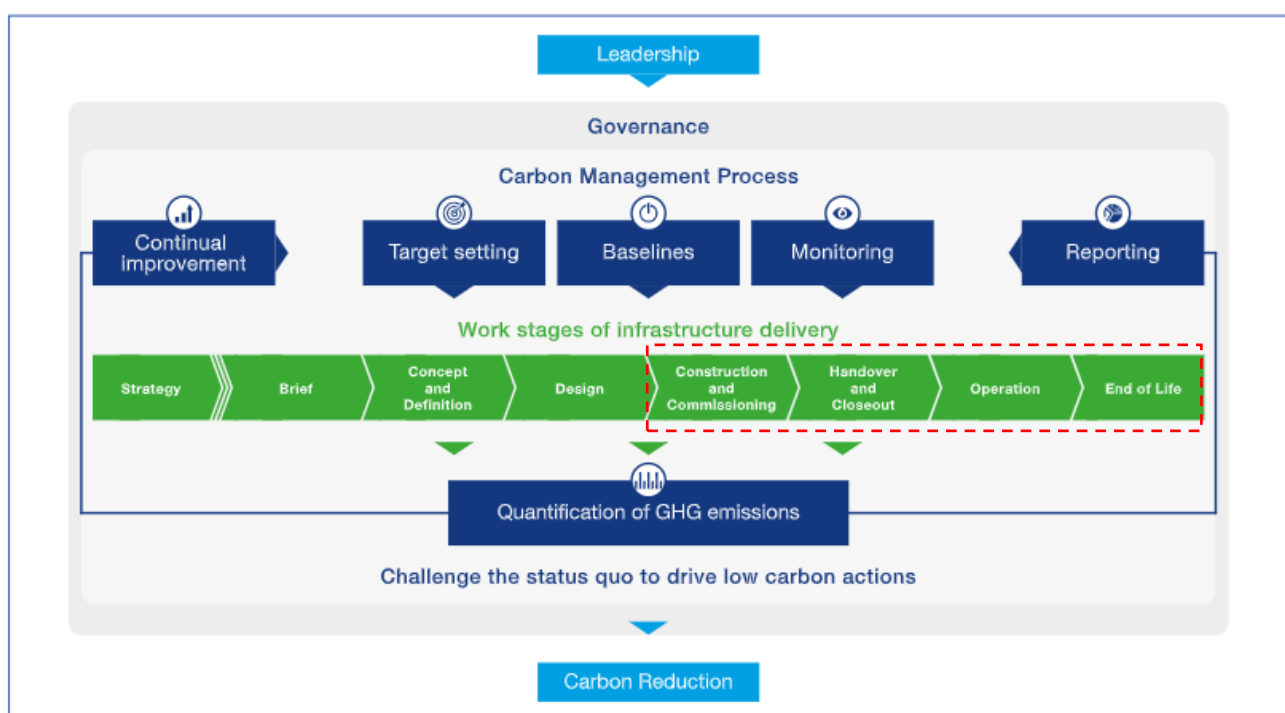
### 7.13.1. Carbon Management Plan

A Carbon Management Plan (CMP) has been developed for the project and provides an overall strategy for monitoring and reducing carbon emissions throughout the project lifecycle. The CMP has established a baseline for carbon emissions and opportunities for whole life carbon reduction (see Appendix E.6).

The choices of materials and construction processes have been made considering the whole life implications and the need to provide a durable and resilient highway network. The scheme has been developed and designed to improve the condition of the network and help build resilience into the highway infrastructure, such that it takes account of the impacts of predicted changes in climate and weather patterns.

Figure 7-8 illustrates the carbon management process and the remaining stages of project delivery (indicated by the red dashed line).

Figure 7-8 - Carbon management process



The CMP has established:

- a baseline carbon impact for construction emissions of 9,363 tCO<sub>2</sub>e and operational emissions of 42,944 tCO<sub>2</sub>e over a 60 year period; and
- a target reduction in carbon emissions during construction of between 15% and 25%.

The CMP did not include specific carbon reduction targets for operational phase emissions, given that these are largely outside the control of the value chain, and will be reduced over time with the decarbonisation of the vehicle fleet.

### 7.13.2. Carbon reduction measures during construction

A copy of the CMP was included in the tender documentation. The bidders were asked to indicate the measures they would take during construction and how they would develop the plan further.

The preferred bidder has identified additional carbon reduction measures which are estimated to result in carbon savings of **2,531 tCO<sub>2</sub>e** – equivalent to a **27% reduction in base capital carbon** (exceeding the target reduction in the CMP).

The additional reduction measures identified span across the strategy of 'build less', 'build clever', 'build efficiently', and 'operate efficiently' and include:

- guaranteeing to recycle 100% site clearance arisings;
- prioritising low-carbon materials;
- minimising transport miles through local delivery and local material sourcing;
- using solar powered Eco-Cabins for site offices and welfare and a fleet of hybrid and electric plant and low-emission machinery;
- using electric site vehicles, car shares, crewcabs and cycle to work policies for site staff; and
- emission sequestration - planting trees in local woodland adjacent to the A350 to balance timber purchase on the project and help them re-forest.

The CMP will be updated to incorporate the additional reduction measures identified by the preferred contractor relating to the main construction works.

### 7.13.3. Carbon management governance

Wiltshire Council has overall responsibility for carbon management relating to the project and the carbon management processes are integrated with the project governance structure, including the supply chain. The Project Manager is responsible for implementing the carbon management process and establishing a RACI Matrix of Carbon Management Responsibility in order to clarify roles and responsibilities.

The contractor will identify a suitably qualified Sustainability Manager (SM) to manage its carbon reduction process, using a Carbon Calculator to measure savings through the project lifecycle, reporting in compliance with the UK Energy Savings Opportunity Scheme.

The contractor will also hold Carbon Workshops which draw on contractor expertise and specialist supply chain to share innovative ideas for specification-compliant materials with lower embodied carbon and opportunities.

## 7.14. Data and information security

From previous security assessment it has been concluded that the project contains nothing that would be considered Sensitive Built Assets (SBA). Furthermore, the project contents are not deemed to require higher UK Government Classification.

Appropriate information assurance standards apply to project controls, throughout the lifecycle, for the nature and size of the project and its data requirements. The Information Protocol follows ISO 19650, the international standard for managing information over the whole life cycle of an asset using Building Information Modelling (BIM). This is overseen by the Information Manager.

Particular processes applied include:

- Project Information Standards;
- Information Management Assignment Matrix;
- Project Information Production Methods and Procedures;
- BIM Execution Plan;
- Common Data Environment – allowing bespoke security settings and enabling exchange of accurate, timely updates via a single source of project-critical data; and
- Master Information Delivery Plan / Task Information Delivery Plan.



The project is undertaken in accordance with the Data Protection Laws, including the Data Protection Act 2018 (and regulations made thereunder), and the UK GDPR.

Furthermore, contractual arrangements acknowledge that Wiltshire Council is subject to the requirements of the Freedom Of Information Act and the Environmental Information Regulations, and contractors are required to assist and cooperate with the Council to enable it to comply with its information disclosure obligations.

## 7.15. Lessons learned and post Implementation review

### 7.15.1. Application of lessons learned

As noted at various points throughout this Management Dimension, the lessons and experience from previous project delivery have provided a valuable input to project development. This has helped to reduce risk and improve efficiency and delivery effectiveness. Lessons and experience from other projects includes:

- The original development and delivery of the A350 Chippenham Bypass (in the 1990's);
- Previous phases of improvement / upgrade to the A350 Chippenham Bypass, which have included dualling of sections in a similar nature to the current scheme; and
- Other A350 improvement schemes delivered by Wiltshire Council, such as at Farmers Roundabout, Melksham.

### 7.15.2. Project review and capturing project lessons

Project lessons are routinely captured and recorded via a lessons learned log as part of the overall project management processes. This is reviewed and updated via the regular SDT meetings.

In line with best practice, project review will extend to post scheme implementation to ensure that the whole project lifecycle is reflected and that there is **transparency and accountability** in relation to the project outcomes, delivery process (including construction), budget and timescales.

The plans for project evaluation are addressed in section 7.12.5, including the planned reporting mechanisms and timescales. A 'One-Year Post Opening Report' would include evaluation of project delivery including: delivery against planned budget and timescales; use of resources; project outputs; and delivery efficiency.

As part of project closure (see also section 7.16) a complete set of project lessons would be confirmed. Wiltshire Council would promote knowledge sharing through dissemination of lessons learned internally, and to wider audiences as appropriate, in order to inform future project delivery.

## 7.16. Project closure

Project closure will be undertaken in accordance with the Project Delivery Plan and Information Protocol.

Prior to completion of the works, the contractor will notify all relevant stakeholders, organise and facilitate a Pre-Opening Inspection (POI) in accordance with the DMRB. Prior to the end of the defects correction period the contractor will notify all relevant stakeholders, and organize and facilitate a Defects Liability Inspection (DLI) in accordance with DMRB.

Following completion of construction responsibility for highway maintenance will transfer to Wiltshire Council. Not less than 3 months prior to the defects date, the contractor and the Council will agree a handover programme for highway maintenance duties. If the Council is unable to accept handover of particular maintenance tasks the contractor will remain responsible for the task until agreement can be secured or the Council releases the contractor from responsibility for maintenance.

The Contractor is expected to submit a comprehensive package of "red line" drawings/markups, specifications/schedules with site amendments, material datasheets and all associated Operation and Maintenance (O&M) manuals for the installed systems. The Contractor is expected to deliver the handover data/Information in prescribed formats and standards.

Other key steps relating to project closure include:

- Confirming contractual obligations are complete;
- Evaluation of project delivery, including actual scheme costs and timescales against forecast (see also section 7.12.5);
- Documentation of residual risks and ongoing liabilities;
- Closure of project finances;
- Completion of lessons log, identifying both positive and negative lessons (see also section 7.15); and
- Archiving of project information.

# Appendices



# Appendix A. Strategic Dimension appendices

Appendix reference	Title
A.1.	A350 Chippenham Bypass Options Assessment Report
A.2.	Walking, Cycling and Horse-Riding Assessment & Review
A.3.	Scheme drawings
A.4.	A350 Traffic Flow Diagram
A.5	Active Travel Supporting Information
A.6	Bus Supporting Information

## A.1. Options Assessment Report

The Options Assessment Report (OAR) documents the process of generating, sifting and assessing a range of options to address the scheme objectives. It is prepared in line with DfT (TAG) guidance.

This report is provided as a separate file.

Please refer to: A1\_Options\_Assessment\_Report.pdf

## A.2. Walking, Cycling and Horse-riding Assessment & Review

The WCHAR provides an evidence-based assessment of the potential needs of non-motorised users in order to inform the design process.

This report is provided as a separate file.

Please refer to: A2\_WCHAR.pdf

## A.3. Scheme drawings

The following drawings are provided as separate files:

### A.3.1. Location Plan

Please refer to: A3.1\_Location\_Plan.pdf

### A.3.2. General arrangement

For the Phase 4 general arrangement, please refer to: A3.2\_Phase\_4\_All\_Sheets.pdf

For the Phase 5 general arrangement, please refer to: A3.2\_Phase\_5\_All\_Sheets.pdf

## A.4. Traffic flow diagram

Please refer to: A4\_Traffic\_Flow\_Diagram.pdf

## A.5. Active travel supporting information

Please refer to: A5\_Active\_Travel\_Supporting\_Information.pdf

## A.6. Bus supporting information

Please refer to: A6\_Bus\_Supporting\_Information.pdf

## Appendix B. Economic Dimension appendices

Appendix reference	Title
B.1.	Local Model Validation Report (SATURN)
B.2.	Traffic Forecasting Report (SATURN)
B.3.	Economic Appraisal Report
B.4.	Appraisal Summary Table
B.5.	Appraisal tables (TEE / AMCB / Public Accounts)
B.6.	Cost proforma
B.7.	Social and Distributional Impacts Report
B.8.	Environment appraisal

## **B.1. Local Model Validation Report (SATURN)**

This report documents the development, calibration and validation of the Wiltshire Transport Model (base model) for use with the A350 Chippenham Bypass Improvements Full Business Case.

This report is provided as a separate file.

Please refer to: B1\_Local\_Model\_Validation\_Report.pdf

## **B.2. Traffic Forecasting Report (SATURN)**

This report documents the development of forecast traffic demands for the Wiltshire Transport Model and its application for forecasting traffic conditions with and without the scheme.

This report is provided as a separate file.

Please refer to: B2\_Traffic\_Forecasting\_Report.pdf

## **B.3. Economic Appraisal Report**

The Economic Appraisal Report (EAR) provides supporting technical details in relation to the economic appraisal.

This is provided as a separate file.

Please refer to: B3\_Economic\_Appraisal\_Report.pdf

## **B.4. Appraisal Summary Table**

The Appraisal Summary Table (AST) provides a summary of the key outcomes of the economic appraisal across all economic, environmental and social impacts.

This is provided as a separate Excel file.

Please refer to: B4\_A350 Chippenham\_AST\_Core Scenario

## **B.5. Appraisal tables**

These appraisal table present key outputs from the economic appraisal in the prescribed format by DfT.

These are provided as a separate Excel file.

Please refer to: B5\_Appraisal\_Tables

## **B.6. Cost Proforma**

The cost proforma presents the costing information for the purposes of the economic appraisal (PVC) in the prescribed format by DfT.

This is provided as a separate Excel file.

Please refer to: B6\_Cost\_Proforma\_November\_2023

## B.7. Social and Distributional Impacts Report

The SDI report provides details of the assessment of social impacts and also relevant distributional impacts, in-line with DfT guidance.

This is provided as a separate file.

Please refer to: B7\_Social\_Distributional\_Impacts\_Report.pdf

## B.8. Environmental Appraisal Report

This report sets out the methodology, assumptions and outputs in support of the assessment of environmental impacts of the scheme, in line with the Economic Dimension.

This is provided as a separate file.

Please refer to: B8\_Environmental\_Appraisal\_Report.pdf

The Environmental Appraisal Report is also supported by standard format TAG worksheets for each relevant environmental impact.

These are provided as separate Excel files.

### B.8.1. Air Quality

Please refer to: B8.1\_Air\_Quality

### B.8.2. Greenhouse gases

Please refer to: B8.2\_Greenhouse\_Gases

### B.8.3. Noise

Please refer to: B8.3\_Noise

### B.8.4. Biodiversity

Please refer to: B8.4\_Biodiversity

### B.8.5. Water

Please refer to: B8.5\_Water

### B.8.6. Landscape

Please refer to: B8.6\_Landscape



## B.8.7. Heritage

Please refer to: B8.7\_Heritage

# Appendix C. Commercial Dimension appendices

Appendix reference	Title
C.1.	Procurement Strategy
C.2.	Contract Data and Conditions

## C.1. Procurement Strategy

This report documents the consideration of the procurement needs of the project and the identification of the preferred procurement approach and delivery model.

This is provided as a separate file.

Please refer to: C1\_Procurement\_Strategy.pdf

## C.2. Contract data and conditions

This is provided as a separate file.

Please refer to: C2\_Contract\_Data\_Conditions.pdf

# Appendix D. Financial Dimension appendices

Appendix reference	Title
D.1.	Quantified Cost Risk Analysis (QCRA)

## D.1. Quantified Cost Risk Analysis

This technical note provides supporting information with regards to the QCRA undertaken to support the derivation of the project risk cost included in the overall cost estimate.

This is provided as a separate file.

Please refer to: [D1\\_Quantified\\_Cost\\_Risk\\_Analysis.pdf](#)

# Appendix E. Management Dimension appendices

Appendix reference	Title
E.1.	Project governance
E.2.	Delivery programme
E.3.	Risk Management Plan
E.4.	Risk Register
E.5.	Draft Monitoring and Evaluation Plan
E.6.	Carbon Management Plan

## E.1. Project Governance

This provides an organogram of the governance of the arrangements for the project.

This is provided as a separate file.

Please refer to: E1\_Project\_Governance.pdf

## E.2. Project delivery programme

This provides a detailed programme for project delivery in Gantt chart form.

This is provided as a separate file.

Please refer to: E2\_Project\_Delivery\_Programme.pdf

## E.3. Risk Management Plan

This report details the processes and protocols established to manage risk related to the project.

This is provided in a separate file.

Please refer to: E3\_Risk\_Management\_Plan.pdf

## E.4. Risk Register

This provides the record of the current set of project risks, including details of each risk, risk owners and identified mitigation.

This is provided as a separate Excel file.

Please refer to: E4\_Risk\_Register.pdf

## E.5. Draft Monitoring and Evaluation Plan

This report sets out the key benefits expected to arise from the scheme and how these will be measured to enable the overall success of the project to be evaluated.

This is provided as a separate file.

Please refer to: E5\_Benefits\_Realisation\_Monitoring\_Evaluation\_Plan.pdf

## E.6. Carbon Management Plan

This report considers the whole-life carbon implications of the project and the key steps identified to minimise the carbon impacts.

This is provided as a separate file.

Please refer to: E6\_Carbon\_Management\_Plan.pdf

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