# A350 Melksham Bypass

## Strategic Outline Business Case

Wiltshire Council

**5 December 2017**

ATKINS

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## Document history

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## Client signoff

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# Executive summary

## Background

This report presents the Strategic Outline Business Case (SOBC) for the A350 Melksham Bypass scheme. It is being submitted to the DfT for informal comments as it is not a part of any formal bidding process. Currently, no further funding to develop the Melksham bypass scheme has been identified, but following any informal comments from the DfT a decision on the next steps including the development of an Outline Business Case (OBC) will be considered.

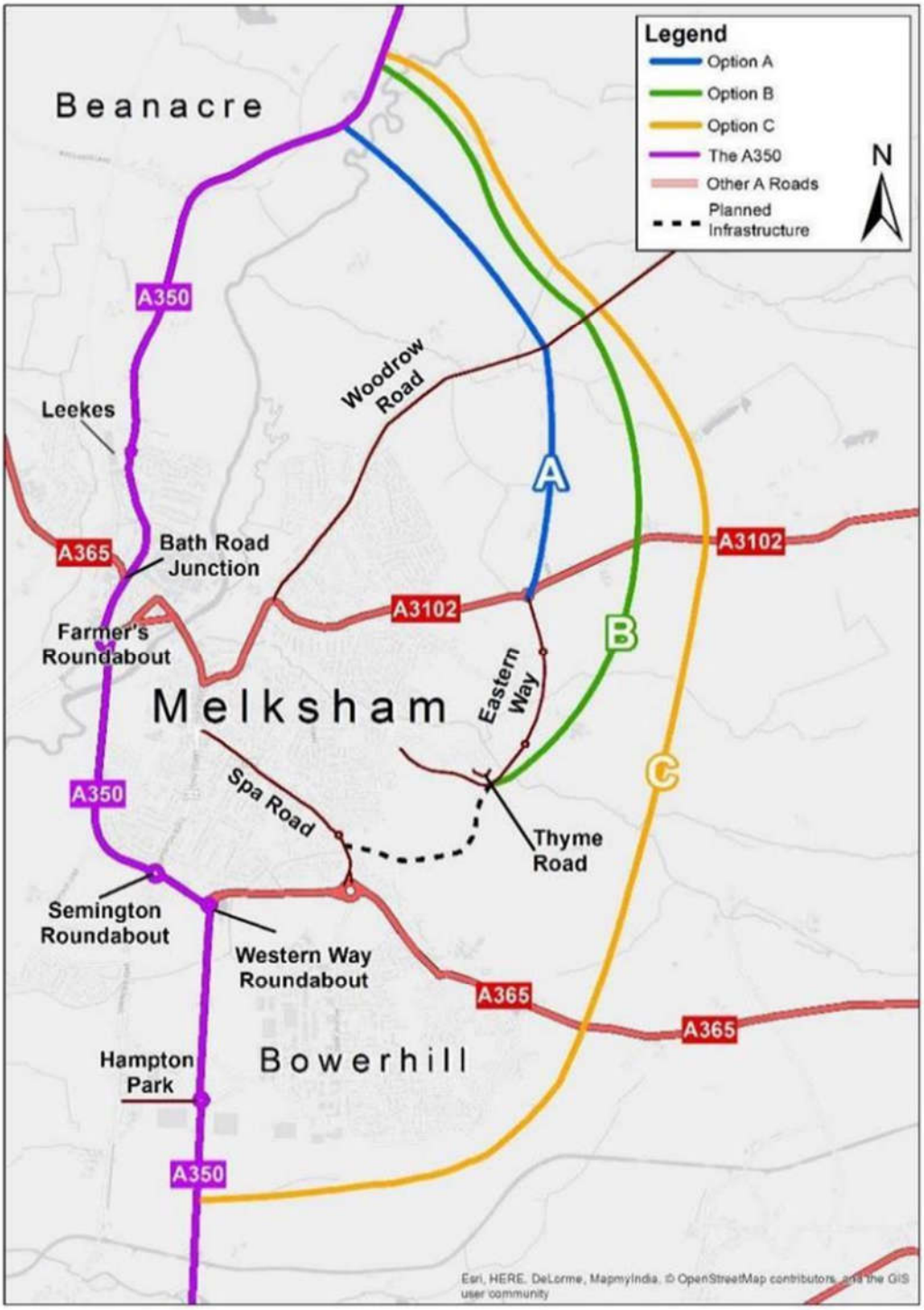
The A350 is a primary north-south route connecting the M4 with the Dorset coast and Poole port. It passes around the principal settlements of Chippenham and Trowbridge via the town of Melksham and neighbouring village of Beanacre. The significance of the A350 in terms of the local and regional economy has been recognised in recent Local Pinch Point Scheme and Local Growth Fund awards for upgrades to the route around Chippenham and Trowbridge (Yarnbrook and West Ashton relief road).

In 2016, Atkins prepared an Interim Options Assessment Report (IOAR) as part of an application to the DfT's Large Local Major Transport Schemes fund. The IOAR considered two eastern bypass options and one western bypass option for the A350 at Melksham. All three options commenced north of Beanacre, with the eastern options then running south towards the A3102 near the new Eastern Way distributor road.

- The first eastern option was a single-carriageway design which then utilised Eastern Way before joining a new section of road connecting Eastern Way to Spa Road north of the Spa Roundabout
- The second eastern option was a dual-carriageway design which bypassed Eastern Way providing a direct route between the A3102 and Spa Road
- The western option was a single-carriageway design routing north of Beanacre then south to the A365 between Shaw and Melksham, then southeast to re-join the A350 west of the Semington Road Roundabout

Following the IOAR, Atkins prepared an Options Assessment Report (OAR) in October 2017 which examined 16 options across 4 themes: demand management; public transportation; online highway improvements; and new bypass options (which included those identified in 2016). This resulted in the short-listing of three potential options for an eastern bypass of the town (as shown in the figure overleaf):

- ***Option A:*** From A350 north of Beanacre to A3102 junction with Eastern Way (then continuing via Eastern Way to Spa Roundabout) – approximately 2.7km in length
- ***Option B:*** From A350 north of Beanacre to A3102 east of Eastern Way, then via new road to Eastern Way south of Thyme Road) then continuing via Eastern Way to Spa Roundabout) – approximately 4.4km in length
- ***Option C:*** From A350 north of Beanacre to A3102 east of Eastern Way, then to A365 east of Bowerhill, then to A350 south of Hampton Park West – approximately 7.8km in length




Note: highway corridors are illustrative only, and do not imply any specific alignment of new roads.

## Strategic Case

The section of the A350 through Melksham has been identified as a key constraint on the route, with 30mph sections passing through residential areas with several busy junctions which provide access to Melksham town centre, retail and commercial sites, and the A365 Bath Road.

It is one of the busiest major roads in Wiltshire, with daily traffic volumes generally above 20,000 vehicles per day, and HGVs accounting for around 8% of all vehicles. Traffic surveys indicate that around half of all traffic is passing through rather than having an origin or destination within the town. Significant peak period congestion and delays are experienced, resulting in increased journey times for both local and long-distance traffic.

Projected growth in travel demand along the A350 and locally around Melksham is expected to result in increased traffic volumes using the A350, with a risk that the A350 through Melksham becomes an increasing bottleneck on the transport network linking these two Principal Settlements in Wiltshire. Two-way traffic volumes on the A350 are forecast by the Melksham Transport Model to increase by up to 27% to the north of Melksham between 2017 and 2041, with average north-south journey times extended by between one and three minutes in the AM and PM peak periods. The Inter Peak period is also expected to become substantially busier, with traffic flows on the A350 equalling or exceeding the current AM Peak flows by 2041.

The key transport problems identified with respect to the A350 at Melksham/Beanacre are:

- ***Limitations of the road network around Melksham*** – the layout of the road network means the A350 serves multiple functions; journeys from towns to and from the north and south of Melksham have to pass through the town via the A350 including the River Avon crossing or face significant diversions
- ***Physical constraints in the 'urban' sections of the A350 in northern Melksham and Beanacre village*** – the A350 passes through residential areas with 30mph limits, is constrained by property frontages on both sides and there are several junctions in northern Melksham used, predominately, by local traffic to access amenities
- ***Insufficient capacity of the A350 through Melksham to cope with current and projected future traffic volumes*** – significant peak period congestion is currently experienced on the Melksham-Beanacre sections, especially around Farmers and Semington Road roundabouts and between Bath Road and Leekes
- ***High accident rates along the A350 through Melksham, with significant clusters around the busiest junctions*** (Farmers Roundabout to Bath Road, and Semington Roundabout) – twelve serious collisions have been recorded between 2012 and 2016, with severity rates generally higher on the A350 compared to other roads in the area
- ***Severance impacts on communities in Beanacre and northern Melksham*** – high traffic volumes using the route (including significant numbers of HGVs) exposes residents to noise and air pollution and pedestrian access to local shops in northern Melksham and the town centre is restricted, which discourages walking and cycling along the corridor.

There are key physical and environmental constraints which will impact on the routing of any eastern bypass around Melksham and Beanacre, including existing settlements, planned developments, River Avon floodplain and the Kennet and Avon canal.

Objectives for the scheme have been identified, and the potential performance of the three options against these assessed as follows:

| Scheme Objectives | Option A | Option B | Option C |
|---|---|---|---|
| Reduce journey times and delays on the A350 through Melksham and Beanacre, allowing for future growth in demand | ✓✓ | ✓✓ | ✓✓✓ |
| Reduce journey times and delays on the following routes through Melksham, allowing for future growth in demand:<br>- A350 South - A3102<br>- A365 West - A365 East<br>- A350 South - A365 West | ✓ | ✓✓ | ✓✓✓ |
| Provide enhanced opportunities for walking and cycling between Melksham town centre and rail station / Bath Road, and along the existing A350 corridor within Melksham | ✓✓ | ✓✓ | ✓✓✓ |
| Reduce personal injury accident rates and severity for the A350 and Melksham as a whole | ✓ | ✓✓ | ✓✓✓ |

| Scheme Objectives | Option A | Option B | Option C |
|---|---|---|---|
| Reduce the volume of traffic including HGVs, passing along the current A350 route in northern Melksham and Beanacre, and avoid negative impacts on other existing or potential residential areas | ✓✓ | ✓✓ | ✓✓✓ |

| Contribution towards achieving scheme objective |
|---|
| ✓✓✓ Strong contribution |
| ✓✓ Moderate contribution |
| ✓ Limited contribution |
| X No contribution |

The assessment indicates that **Option C** strongly supports all five objectives. In comparison, Options A and B still support all five objectives, but the reduced length of bypass and reliance on use of the Eastern Way distributor road and Spa Roundabout route, result in more limited potential to achieve journey time reductions, safety and severance impacts, and may result in reduced redistribution of traffic from the existing A350 route to the new bypass. For options A and B, additional work may also be required to Eastern Way and the Spa Roundabout area to cope with higher traffic volumes and mitigate potential safety and severance impacts.

## Economic Case

The economic case has been prepared in a manner which is considered to be proportionate to the scale of the scheme and appropriate for the SOBC stage. A Melksham Transport Model was developed specifically to forecast transport network impacts and outputs of the model were monetised using the DfT's TUBA software.

The monetised economic benefits of the A350 Melksham Bypass scheme options are likely to outweigh its costs and any negative impacts. These are summarised, including initial Net Present Value, BCRs and Value for Money assessment in the table below:

| | Option A | Option B | Option C |
|---|---|---|---|
| NPPV | £28.1m | £26.5m | £81.7m |
| BCR | 1.95 | 1.69 | 2.20 |
| VfM Category | Medium | Medium | High |

The findings of qualitative assessments are not considered to be significant enough to warrant any increase or decrease in the VfM categories. Potential moderate or major adverse environmental impacts have been identified for all three options with respect to landscape, biodiversity and the water environment but have scope to be reduced or mitigated through the planning and design process. Potential beneficial impacts have also been identified with respect to reliability, wider impacts, noise, air quality, journey quality and severance, and are likely to be greatest under Option C. Options A and B are expected to result in fewer beneficial impacts than Option C since they are forecast to redistribute less traffic away from the existing A350 whilst also significantly increasing traffic volumes close to residential areas in eastern Melksham.

## Financial Case

The financial case presents evidence of the scheme's affordability and how it will be funded. Scheme costs have been calculated in both 2016 prices and outturn prices (including inflation), based on high-level highway and structure costs, and including allowances for risk and uncertainty. A summary of scheme implementation costs is shown below:

| Total Scheme Cost | Option A | Option B | Option C |
|---|---|---|---|
| 2016 Prices | £28.7m | £37.2m | £65.8m |
| Outturn Prices | £34.4m | £44.4m | £78.8m |

At this stage, it is assumed that the funding package proposed for financing the A350 Melksham Bypass scheme comprises of contributions from the DfTs Large Local Major Transport Schemes or Major Road Network fund (95%) and local contributions (5%). However, other sources of funding would be explored as part of any further business case work.

## Commercial Case

Decisions regarding the preferred procurement strategy will be made at Outline Business Case stage, once the requirements of the proposed scheme have been defined with greater certainty. The following key points will be considered:

- Overall scope of works required (i.e. earthworks, highway construction, structures, landscaping)
- Physical scale and location of works
- Need for complex engineering design and environmental mitigation associated with River Avon bridge and floodplain crossing
- Land assembly process
- Utilities diversion requirements.

Consideration will be given to traditional procurement versus alternative approaches such as D&B, and the relative merits of letting a single contract or a series of contracts, which could be split by route section or work type.

## Management Case

The management approach that has been proposed for the A350 Melksham Bypass scheme is proportionate to the overall scheme cost, its deliverability and the level of risk.

A Project Board will be established, comprising of senior Council representatives, to oversee delivery of the scheme. A Senior Responsible Owner and Project Manager will be appointed, with the Project Manager reporting to the Project Board. A risk register has been created and will be reviewed and updated on a regular basis, with risk owners appointed as appropriate to the type of risk and the stage of the scheme when the risk is realised. Public and key stakeholders will be informed of project progress as per the communications plan and encouraged to give feedback during the design process. To ensure the scheme meets the objectives (see Strategic Case) a Benefits Realisation, Monitoring and Evaluation plan has been created. This will ensure that data collection and reporting is focussed on the objectives.

Indicative project milestones (dependent on funding) are listed in the table below.

| Milestone (* = critical path date) | Estimated Date |
|---|---|
| Informal submission of SOBC to DfT | November 2017 |
| Informal comments received from DfT | January 2018 |
| Wiltshire Council decision on continuation to OBC* | April 2018 |
| Development of OBC | May 2018 – October 2019 |
| Public / stakeholder consultation on route options | June - July 2018 |
| Public / stakeholder consultation on preferred route option | Quarter 1 2019 |
| Wiltshire Council approval of preferred route option and OBC* | Quarter 3 2019 |
| OBC submission | Quarter 3 2019 |
| DfT approval to proceed to Full Business Case (FBC)* | Quarter 4 2020 |
| Construction | Q1 2022 – Q1 2024 |

Overall, the A350 Melksham Bypass is considered by Wiltshire Council to be a deliverable scheme, which will ensure that the A350 continues to function as a strategic link and enable economic growth in Wiltshire through targeted investment in transport infrastructure.

# 1. Introduction

## The A350 corridor

1.1. The A350 corridor is a primary north-south route connecting the M4 corridor to the Dorset Coast (including Poole, Weymouth and Bournemouth). Within Wiltshire, the road connects two of the three principal settlements identified in the Wiltshire Core Strategy (Chippenham and Trowbridge) via the town of Melksham and the neighbouring village of Beanacre. Additionally, the corridor provides the main link between the M4, and the main towns and employment areas at Chippenham, Westbury, and Warminster.

1.2. At Beanacre and Melksham, the A350 passes through residential and commercial areas with 30mph speed limits. The high volume of traffic, including HGVs, and number of junctions in this section serving Melksham town centre and retail outlets result in significant peak period congestion, increased journey times, higher risk of collisions and severance impacts on the communities in northern Melksham and Beanacre. It also provides the only crossing of the River Avon in the area apart from historic crossing between Melksham town centre and the Bath Road.

1.3. Significant housing and employment development is planned for the A350 corridor in the coming years, at a rate of around 10,000 new homes per decade, with growth centred on the Chippenham-Melksham-Trowbridge area. The corridor has existing strengths in manufacturing (including furniture, rubber and other specialist products) and there is scope to build on this and develop new service sector activities. The opportunity therefore exists to deliver improvements to the A350 through Melksham and to maximise the potential for economic growth in the corridor.

## Background to the Business Case

1.4. In 2016, Atkins prepared an Interim Options Assessment Report (IOAR) as part of an application to the DfT's Large Local Major Transport Schemes fund. The IOAR considered two eastern bypass options and one western bypass option for the A350 at Melksham. All three options commenced north of Beanacre, with the eastern options then running south towards the A3102 near the new Eastern Way distributor road.

- The first eastern option was a single-carriageway design which then utilised Eastern Way before joining a new section of road connecting Eastern Way to Spa Road north of the Spa Roundabout
- The second eastern option was a dual-carriageway design which bypassed Eastern Way providing a direct route between the A3102 and Spa Road
- The western option was a single-carriageway design routing north of Beanacre then south to the A365 between Shaw and Melksham, then southeast to re-join the A350 west of the Semington Road Roundabout

1.5. Whilst the IOAR was unsuccessful, Wiltshire Council received a positive response from the DfT on the merits of the scheme. The Council subsequently commissioned Atkins to produce a SOBC, utilising some of its 2017/18 NPIF funding allocation to fund. The commission also included an Options Assessment Report (OAR), which examined 16 options across 4 themes: demand management; public transportation; online highway improvements; and new bypass options (including options based on those identified in 2016).

1.6. Overall, the demand management, public transport and online highway improvement options assessed in the OAR did not meet the Strategic Case requirements of at least a moderate beneficial impact with respect to the objectives, and failed on at least one of the other four other business cases. The exception to this was the rail service improvement option, which did not meet Strategic Case requirements but passed against the other four case tests, suggesting it would be worthy of further consideration separately to any bypass scheme.

1.7. Most of the new highway / bypass options met the requirements for the Strategic Case, but some failed overall for the following reasons:

- The three western bypass options performed well on the Strategic and Economic Cases, but were assessed as being unaffordable and therefore unlikely to attract funding. These options would have capital costs estimated at over £100m and require multiple structures for crossings of the River Avon and other floodplains, and the TransWilts rail line.
- The two 'relief road' options which provide only a partial bypass of Beanacre and northern Melksham (utilising the corridor between the rail line and Southbrook Road) did not meet the Strategic Case requirements due to limited potential journey time savings, and additionally were assessed as being technically very high risk and publicly unacceptable due to floodplain impacts and risk of increasing flooding to properties in Southbrook Road / Bath Road area.

## The Melksham Bypass scheme

1.8. Three eastern bypass options that were assessed in the OAR met the requirements of all five cases. They are referred to in this report as Option A, Option B and Option C for the short, medium and long options respectively, and are illustrated in Figure 1-1:

- Option A: From A350 north of Beanacre to A3102 junction with Eastern Way (then continuing via Eastern Way to Spa Roundabout) – approximately 2.7km in length
- Option B: From A350 north of Beanacre to A3102 east of Eastern Way, then via new road to Eastern Way south of Thyme Road (then continuing via Eastern Way to Spa Roundabout) – approximately 4.4km in length
- Option C: From A350 north of Beanacre to A3102 east of Eastern Way, then to A365 east of Bowerhill, then to A350 south of Hampton Park West – approximately 7.8km in length.

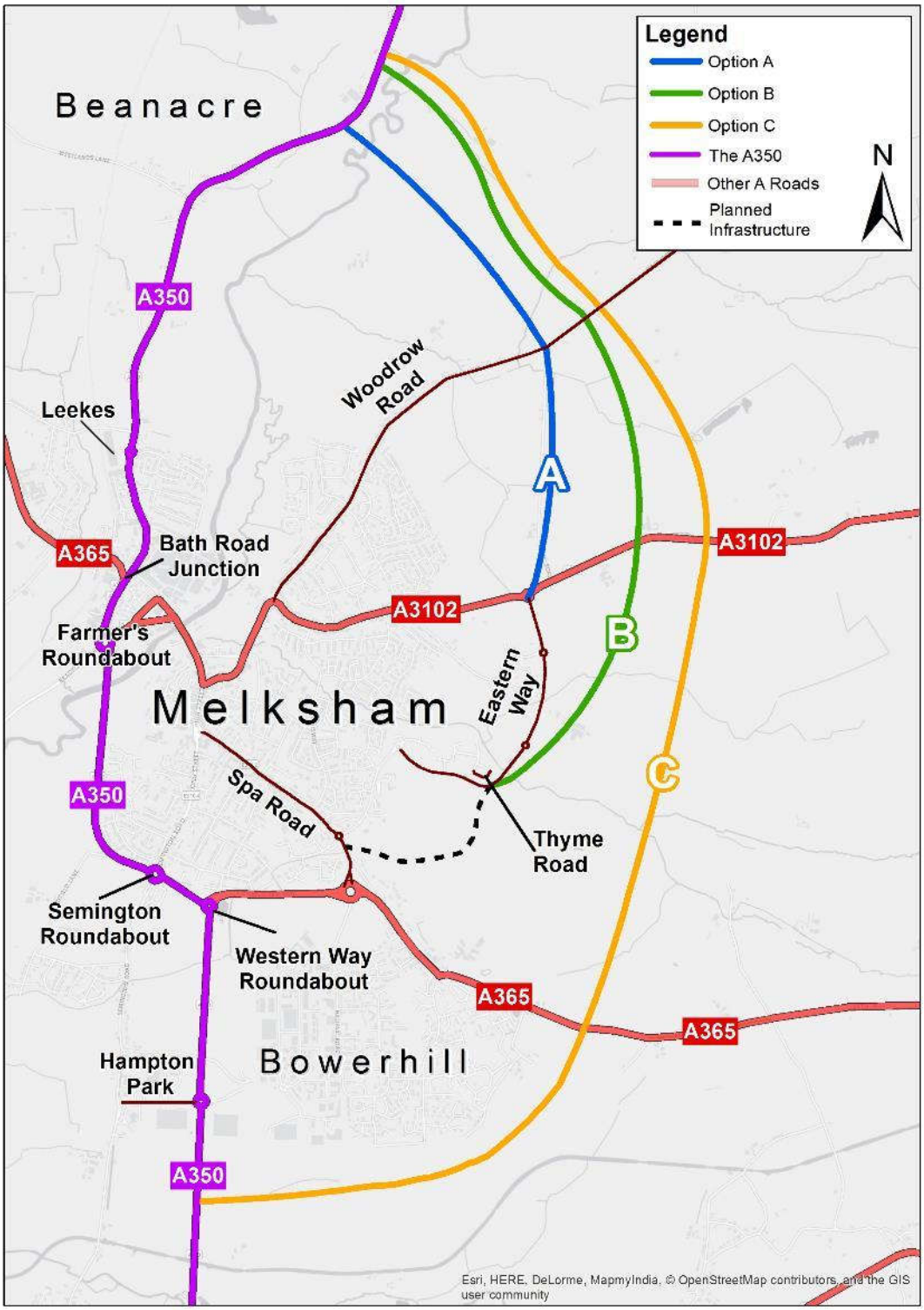
1.9. The OAR considered that a new bypass should be designed as a single-carriageway road with 60mph speed limit, and include roundabout junctions with other main roads including the existing A350. Additionally, Options A and B assume that the extension to Eastern Way to Spa Road, proposed as part of the development of 450 dwellings on land east of Spa Road, is constructed in advance of the bypass scheme and would become part of the bypass route.

1.10. The scheme aims to reduce existing congestion on the A350 and improve journey times for north-south and east-west movements through Melksham, to provide opportunities for improved pedestrian and cycle facilities along with existing A350 route, reduce personal injury accident rates and severance caused by A350 traffic passing through the town (Table 1-1).

**Table 1-1 Transport objectives of the A350 Melksham Bypass scheme**

| | |
|---|---|
| **1** | Reduce journey times and delays on the A350 through Melksham and Beanacre, allowing for future growth in demand |
| **2** | Reduce journey times and delays on the following routes through Melksham, allowing for future growth in demand:<br>- A350 South - A3102<br>- A365 West - A365 East<br>- A350 South - A365 West |
| **3** | Provide enhanced opportunities for walking and cycling between Melksham town centre and rail station / Bath Road, and along the existing A350 corridor within Melksham |
| **4** | Reduce personal injury accident rates and severity for the A350 and Melksham as a whole |
| **5** | Reduce the volume of traffic including HGVs, passing along the current A350 route in northern Melksham and Beanacre, and avoid negative impacts on other existing or potential residential areas |

**Figure 1-1 Indicative highway corridors for Melksham bypass options A, B and C.**




Note: highway corridors are illustrative only, and do not imply any specific alignment of new roads.

## Structure of the document

1.11. This SOBC is structured around the DfT's recommended five cases model for a Transport Business Case:

- **Strategic Case** (Section 2), setting out a clear rationale for the Melksham Bypass, the need for investment in this location, and the scheme options under consideration.
- **Economic Case** (Section 3), identifying the key economic, environmental and social impacts of the scheme and its overall value for money.
- **Financial Case** (Section 4), presenting evidence of the scheme's affordability both initially (for the construction phase) and in terms of ongoing operations, maintenance and renewal. This section includes scheme outturn cost details.
- **Commercial Case** (Section 5), summarising the preferred approach to scheme procurement and justifying the commercial and legal viability of such an approach.
- **Management Case** (Section 6), setting out how Wiltshire Council will ensure that the scheme is delivered successfully – on time and to budget, with suitable governance and risk management processes in place.

# 2. The Strategic Case

## Overview

2.1. This section sets out the 'case for change', by explaining the rationale for making an investment and presenting evidence on the strategic policy fit of the proposed scheme. This section also sets out the scheme options under consideration.

2.2. The Strategic Case establishes the:

- Context for the business case, outlining the strategic aims and responsibilities of Wiltshire Council
- Identification of the problems the scheme will be addressing – including evidence of the extent of the problems, specific barriers / challenges, and how the scheme will overcome them (including the scale of impact)
- Details (and supporting evidence) of the impacts of not progressing the scheme
- A list of specific, measurable, achievable, realistic, time-bound (SMART) objectives for the scheme to address the problems identified
- A description of the key components of the scheme and how it fits with the aims and objectives of Wiltshire Council, the SWLEP, and the Department for Transport (DfT). The local growth agenda will be central to this part of the Strategic Case
- Clarification of what the project is expected to deliver on the ground, including what is in-scope and what is out of scope
- Identification of any high-level constraints affecting the scheme's ability to solve the problems identified
- Identification of any related assumptions or factors (interdependencies) upon which the scheme depends to be successful
- Details of the main stakeholder groups and their contribution to the project - any potential conflicts between different stakeholder groups and their demands will need to be identified

2.3. Information regarding current and future transport problems, needs for intervention, objectives and options for the A350 corridor through Melksham were originally presented in the Options Assessment Report (OAR) for the scheme, prepared in October 2017. The Strategic Case presented below is therefore a summary of the key points made in the OAR.

## Business strategy

2.4. Wiltshire Council, as promoting authority, has key local plans and policies for economic growth, spatial planning and transport that guide decisions on transport infrastructure investment, including any proposals for the A350. These plans and policies are contained in the:

- Wiltshire Core Strategy (adopted January 2015) including the Melksham Area Strategy, as well as the associated Wiltshire Housing Site Allocations Plan
- Wiltshire Local Transport Plan 2011-2026 (LTP3) (March 2011)

2.5. The Swindon and Wiltshire Strategic Economic Plan (March 2014)[1], a Local Enterprise Partnership (LEP) document also includes the Melksham Growth Strategy.

2.6. Any scheme that addresses the identified problems on the existing A350 must align with these plans. The DfT's Transport Investment Strategy is also relevant as it is likely that funding for the

[1] A refreshed Strategic Economic Plan was approved by the SWLEP Board at its meeting on 20 January 2016.

scheme will be sought from the DfT. The relevant strategic objectives from these plans and strategies are presented in Table 2-1.

2.7. Additionally, the A350 improvements must not have a significant negative affect (after mitigation) on wider objectives relating to safety, security and health, equality of opportunity, and quality of life, including the environment, which are generally met by promoting sustainable transport packages.

**Table 2-1 Strategic objectives from key policy documents relevant to the A350 Corridor**

| Document | Summary of Relevant Strategic Objectives |
|---|---|
| DfT Transport Investment Strategy | • DfT1: Creating a more reliable, less congested, and better-connected transport network that works for the users who rely on it.<br>• DfT2: Building a stronger, more balanced economy by enhancing productivity and responding to local growth priorities.<br>• DfT3: Enhancing our global competitiveness by making Britain a more attractive place to trade and invest.<br>• DfT4: Supporting the creation of new housing. |
| Swindon and Wiltshire Strategic Economic Plan | • SEP2: Transport infrastructure improvements - we need a well-connected, reliable and resilient transport system to support economic and planned development growth at key locations.<br>• 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. |
| Wiltshire Core Strategy | • WCS1: Delivering a thriving economy.<br>• WCS3: Providing everyone with access to a decent, affordable home.<br>• WCS4: Helping to build resilient communities.<br>• WCS6: Ensuring that adequate infrastructure is in place to support our communities. |
| Wiltshire Local Transport Plan | **Goal: Support Economic Growth**<br>• LTP1: Support and help improve the vitality, viability and resilience of Wiltshire's economy and market towns.<br>• LTP4: Minimise traffic delays and disruption and improve journey time reliability on key routes.<br>• LTP10: Encourage the efficient and sustainable distribution of freight in Wiltshire.<br>• LTP12: Support planned growth in Wiltshire and ensure that new developments adequately provide for their sustainable transport requirements and mitigate their traffic impacts.<br>**Goal: Reduce Carbon Emissions**<br>• LTP2: Provide, support and promote a choice of sustainable transport alternatives.<br>• LTP11: Reduce the level of air pollutant and climate change emissions from transport.<br>• LTP13: Reduce the need to travel, particularly by private car.<br>**Goal: Contribute to Better Safety, Security and Health**<br>• LTP8: Improve safety for all road users and to reduce the number of casualties on Wiltshire's roads. |

| Document | Summary of Relevant Strategic Objectives |
|---|---|
| | • LTP9: Reduce the impact of traffic speeds in towns and villages.<br>• LTP14: Promote travel modes that are beneficial to health.<br>**Goal: Promote Equality of Opportunity**<br>• LTP5: Improve sustainable access to a full range of opportunities particularly for those people without access to a car.<br>**Goal: Improve Quality of Life and a Healthy Natural Environment**<br>• LTP3: Reduce the impact of traffic on people's quality of life and Wiltshire's built and natural environment.<br>• LTP7: Enhance Wiltshire's public realm and street scene.<br>• LTP18: Enhance the journey experience of transport users. |

# Travel demand on the A350 at Melksham

2.8. Automatic Traffic Count (ATC) and Automatic Number Plate Recognition (ANPR) surveys were undertaken in June 2017 at various locations around Melksham. Daily (24-hour) traffic volumes on the A350 are generally above 20,000 vehicles per day, increasing to over 33,000 vehicles per day between Farmers Roundabout and the Bath Road junction, making it one of the busiest sections of road in Wiltshire excluding the M4.

2.9. The ATC and ANPR data, indicates that around 40% of all traffic entering or leaving Melksham on the A350 via Beanacre is through-traffic, with the remaining 60% starting or ending their journey in Melksham. Further analysis of the data indicates that the proportion of through-trips is around 10% higher in the peak periods, so that half of all peak traffic is passing through rather than starting or ending trips in Melksham at these times. Also, trips to/from Bowerhill and Semington were counted as starting/ending in Melksham, so including these as through-traffic would further increase the proportion of through-trips.

2.10. HGV flows on the A350 through Melksham were recorded at 1,300 – 1,600 per day, representing 6-7% of all traffic. Again, the ANPR survey indicates that around 50% of these are passing through rather than starting or ending journeys in Melksham.

2.11. The ATC data indicates that there is a notable 'tidal flow' on the A350 through Melksham, with a higher northbound flow in the AM Peak (0700-1000), and higher southbound flow in the PM Peak (1600-1900). The Inter Peak flow (1000-1600) is approximately two-thirds of the AM/PM Peak flow, indicating that the route remains busy through most of the day. HGV numbers increase rapidly in the morning and remain fairly constant throughout the day until around 1600.

# Problems identified and impact of not changing

## Journey times, delays and congestion

2.12. There is a risk that the strategic role of the A350 in enabling population and economic growth in West Wiltshire could be undermined by delays and congestion which result in increased transport costs for businesses and residents. Analysis of 2013-14 TrafficMaster data by Wiltshire Council indicated that along the A350 (from Warminster in the south to M4 Junction 17 in the north) journey times in the morning peak hour are 46% higher than off-peak for northbound journeys, and 40% higher for southbound journeys. The evening peak northbound journey times are 34% higher than off-peak journeys and 37% for southbound journeys.

2.13. The Beanacre-Melksham section of the A350 is the only part of the route north of Westbury where it passes through significant settlements including 30mph zones. The central section in Melksham between Farmers Roundabout and Leekes Department Store poses particular challenges due to physical constraints including housing frontages on to the road, and a succession of busy junctions which provide access to Melksham town centre, Asda superstore, A365 Bath Road and Leekes, along with other retail and housing developments.

2.14. Journey time data collected by TomTom from satellite navigation devices for the A350 through Melksham has been analysed for the period April 2015 - February 2016 (excluding the time when roadworks were identified as occurring in these months). A summary of the average total journey times across the seven time-periods is provided in Table 2-2.

2.15. Compared to free-flow journey times of around 5m 40s, during the peak and inter-peak periods journeys take typically 2-3 minutes longer, and extend by up to 3m 30s – to around 9 minutes in total – during the AM peak northbound and PM peak southbound. (The difference between northbound and southbound journey times reflects the tidal flow on the A350, with more people travelling north in the AM peak and reverse in the PM peak.)

**Table 2-2 A350 Average journey times through Melksham (Northbound)**

| Analysis | Overnight (free-flow) | Weekday morning (0700-0800) | Weekday AM peak hour (0800-0900) | Weekday Inter-peak (0900-1500) | Weekday afternoon (1600-1700) | Weekday PM peak hour (1700-1800) | Saturday (1100-1300) |
|---|---|---|---|---|---|---|---|
| **Northbound** | | | | | | | |
| Time | 05:41 | 07:25 | 09:14 | 07:46 | 07:44 | 07:58 | 08:10 |
| Difference from free-flow | - | 01:44 | 03:33 | 02:05 | 02:04 | 02:17 | 02:29 |
| % | - | 31% | 63% | 37% | 36% | 40% | 44% |
| **Southbound** | | | | | | | |
| Time | 05:39 | 06:50 | 07:13 | 07:20 | 08:23 | 08:57 | 07:11 |
| Difference from free-flow | - | 01:11 | 01:35 | 01:41 | 02:44 | 03:18 | 01:33 |
| % | - | 21% | 28% | 30% | 49% | 59% | 27% |

Data collected anonymously from vehicles with TomTom satellite navigation devices. Journey times are measured from north of Beanacre to south of Western Way roundabout.

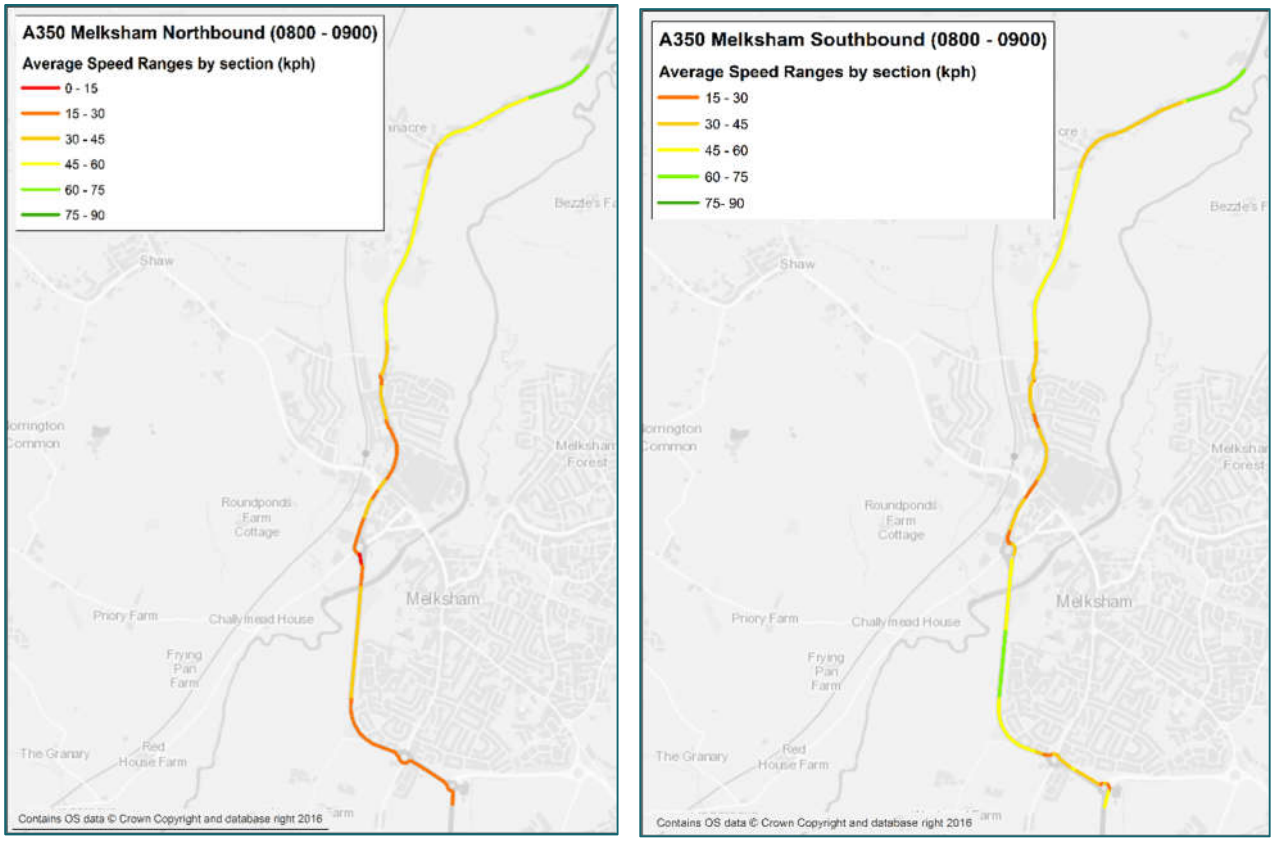
2.16. Journey time breakdowns per section (reported in the OAR) confirm that the section from Farmers Roundabout to Leekes is the most problematic with journey times extended by 50-90% for most of the peak and inter-peak periods. Journey times extended by over 100% above the free-flow are also experienced on the section from Western Way to Farmers Roundabout northbound in the AM peak. In comparison, the section through Beanacre performs relatively well, with delays generally only adding 10-30% to journey times.

2.17. Overall, the analysis indicates that the key parts of the A350 experiencing congestion and delays are from south of Farmers Roundabout to Leekes on the northern edge of Melksham, with significant delays occurring in both directions throughout the AM and PM peak and inter-peak periods. Also, there is evidence in the PM peak of southbound traffic experiencing delays in the northern section through Beanacre, and the southern section through Semington and Western Way Roundabouts.

2.18. Whilst performance is generally better in the northern section through Beanacre, with a 30mph limit for a large part of this section, average vehicle speeds remain low (typically 50-53kph / 31-33 mph) compared to sections of the A350 outside Melksham-Beanacre. Average speeds indicated by the TomTom data for the whole route through Melksham are illustrated in Figure 2-1. This

confirms that lowest speeds relate in part to the sections with 30mph limits, but that the delays experienced at various junctions through the central section (Farmers – Bath Road – Leekes) and southern section (Semington – Western Way) have the greatest impact on average speeds and journey times.

**Figure 2-1 Average vehicle speed recorded on A350 through Melksham in AM Peak (0800 - 0900)**




## Collisions

2.19. Between 2012 and 2016, 223 collisions were reported in Melksham, with 85 or about 40% of these occurring on the A350. Of these 85 collisions, approximately 15% were considered fatal or serious collisions – one resulting in a fatality and another 12 categorised as serious and which required immediate medical attention (Table 2-3).

2.20. The greatest concentration of vehicle collisions around Melksham appears to be along the A350 and the NW/SE route through the town centre between Farmers and Spa Roundabouts, but with greater numbers of serious injuries on the A350. This is highlighted on Figure 2-2, showing several clusters of collisions along the A350 at its busiest junctions – especially Farmers Roundabout and Bath Road – but also at Semington Road, Western Way, Spa and Hampton Park West Roundabouts. There are also sections of the A350 through Melksham and Beanacre village which appear prone to collisions (including one fatal in Beanacre), as well as the whole town centre route from Farmers to Spa Roundabout via Bank Street, High Street and Spa Road.

2.21. Examining the collision clusters that occur at these junctions on the A350, the number one cited cause is the failure to look properly by the driver, with 38 of the 53 collisions in the junction clusters citing that as a major cause. The secondary dominant cause of these collisions was due to drivers being in a rush or driving recklessly, as well as a failure to judge the other vehicles speed or distance. The high concentration of these types of collision on the A350 probably reflects a combination of high traffic volumes, congestion and close separation of junctions on the section north of Farmers Roundabout, leading to increased risks from driver frustration and lapses

of concentration. For a vehicle passing through Melksham on the A350, from Hampton Park West to Leekes, a total of six major and two minor junctions must be negotiated.

**Table 2-3 Personal injury vehicle collisions reported on the A350 in Melksham from 2012 to 2016**

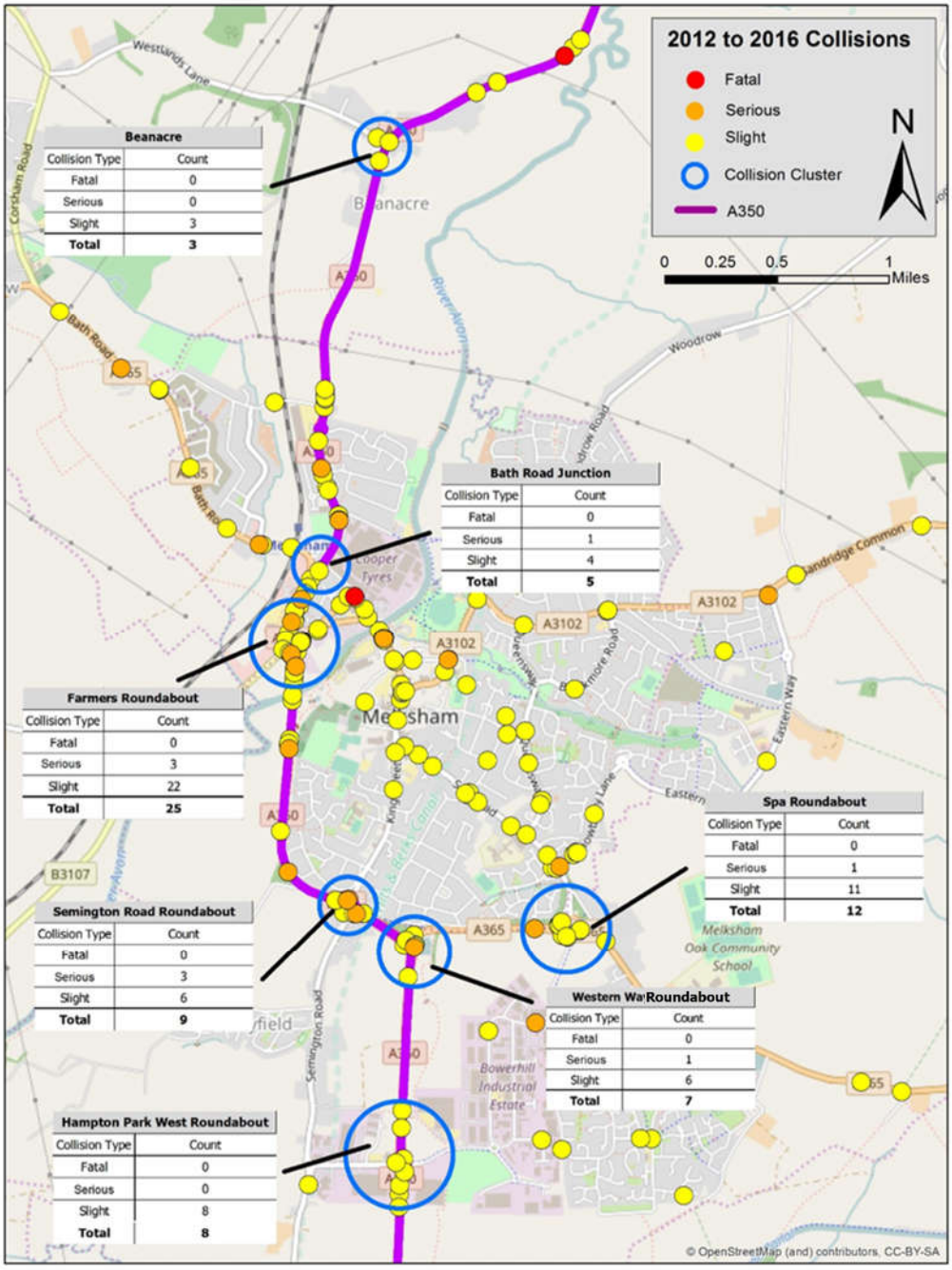
| Year | Number of collisions | % of total | Involved Cyclists | % of total | Involved Pedestrian | % of total |
|---|---|---|---|---|---|---|
| 2012 | 13 | 15% | 0 | 0% | 0 | 0% |
| 2013 | 14 | 16% | 2 | 20% | 1 | 17% |
| 2014 | 18 | 21% | 3 | 30% | 2 | 33% |
| 2015 | 22 | 26% | 3 | 30% | 2 | 33% |
| 2016 | 18 | 21% | 2 | 20% | 1 | 17% |
| **Collision Severity** | | | | | | |
| Fatal | 1 | 1% | 0 | 0% | 0 | 0% |
| Serious | 12 | 14% | 3 | 30% | 4 | 67% |
| Slight | 72 | 85% | 7 | 70% | 2 | 33% |
| **Total Collisions** | **85** | **100%** | **10** | **100%** | **6** | **100%** |

Source: Wiltshire Council

2.22. Of the 85 collisions occurring on the A350, six of them involved injury to pedestrians and a further ten involved injury to cyclists, with a much greater proportion of collisions resulting in serious injury than is the case for collisions only involving motor vehicles (7 out of the 12 collisions resulting in serious injuries on the A350 involved either pedestrians or cyclists). Two clusters of these collisions are evident around Farmers Roundabout and Semington Road Roundabout.

2.23. In addition to the personal injury, social and financial costs associated with collisions, the high incidence along the A350 results in frequent disruption in the flow of traffic, especially if account is taken of the potentially larger number of unreported collisions which did not involve personal injury. This leads to increased congestion and journey times in addition to that which occurs in normal traffic conditions.

**Figure 2-2 Personal injury vehicle collisions reported in Melksham 2012 to 2016**




**Source: Wiltshire Council**

## Severance

2.24. The sections of the A350 which pass through built-up areas in Beanacre and Melksham create problems of severance for residents living in these areas. At Beanacre, the A350 is the main thoroughfare through the village, with no controlled crossing points. As evident from Figure 2-3, houses are located very close to the road – some less than three metres from the carriageway.

2.25. In the northern Melksham section, the A350 separates housing on the eastern side (Granville Road / Avon Road) and western side (Turners Court – see Figure 2-4a). A precinct of local shops (Premier food store, restaurant and takeaway) is also located on the east side of the A350 at Granville Road, with no walking route or crossing point from housing opposite at Turners Court.

The only pedestrian access to Turners Court is via the crossing at the Aldi/McDonalds junction, 100m to the south.

2.26. The section between Aldi/McDonalds and Bath Road is the most constrained due to building frontages either side with no alternative pedestrian or cycle route (Figure 2-4b). A pedestrian subway provides a safe crossing point between the town centre and Bath Road (including the rail station) but may present security concerns for some users as it is fenced in on the western side. There is no at-grade crossing at the Bath Road junction, so the subway is the only pedestrian route between the town centre and rail station / residential areas on the western side.

**Figure 2-3 A350 through Beanacre village (Google Streetview)**


**A) North of Westlands Lane Junction** **B) South of Westlands Lane Junction**

**Figure 2-4 A350 through Melksham - northern section (Google Streetview)**


**A) North of Aldi/McDonalds Junction** **B) South of Aldi/McDonalds Junction**

2.27. The southern section of the A350 through Melksham is less problematic, but although crossing points are provided it still forms a barrier between Berryfield / Semington Road and the town centre at Semington Road roundabout. As noted above, this roundabout is the location of a cluster of vehicle collisions involving cyclists.

2.28. The busy nature of the road, with a relatively high volume of HGVs and peak period congestion impacts significantly on residents living in northern parts of the town. It restricts their access to local shops and the town centre, discourages walking and cycling, and exposes them to higher noise levels and poorer air quality than would be experienced in other parts of Melksham.

## Future transport-related problems

2.29. The primary concern for the future is that the projected growth in travel demand along the A350 and locally around Melksham will result in increased traffic volumes using the A350. The projected traffic growth is the result of national level trends in population, household and employment growth, plus concentration of growth locally around the key settlements in the A350 corridor. Some of this growth will be centred on Melksham itself, but with the neighbouring towns of Chippenham and Trowbridge also expected to grow there is a risk that the A350 through Melksham becomes an increasing bottleneck on the transport network linking these two Principal Settlements in Wiltshire.

2.30. Changes in vehicle flows and journey times on the A350 through Melksham forecast by the Melksham Transport Model are presented in Table 2-4. This indicates that two-way traffic volumes on the A350 are expected to increase by up to 27% to the north of Melksham, with average north-south journey times extended by between one and three minutes in the AM and PM peak periods. In line with TEMPro growth forecasts, the Inter Peak period is also expected to become substantially busier, with traffic flows on the A350 equalling or exceeding the current AM Peak flows by 2041.

**Table 2-4 Forecast changes in two-way hourly vehicle flows (PCUs) and average journey times (mm:ss) on the A350 through Melksham for 2017, 2023 and 2041**

| | 2017 | 2023 | 2041 | Change 2017 to 2041 | Percent change 2017 to 2041 |
|---|---|---|---|---|---|
| **AM Peak (0700-1000)** | | | | | |
| Existing A350 North Melksham/Beanacre | 1,550 | 1,634 | 1,974 | 424 | 27% |
| Existing A350 South Melksham/Bowerhill | 1,853 | 1,965 | 2,023 | 170 | 9% |
| Existing A350 Central Melksham | 2,071 | 2,228 | 2,304 | 233 | 11% |
| Northbound average journey time | 10:00 | 10:56 | 13:21 | 03:21 | 34% |
| Southbound average journey time | 09:42 | 10:02 | 10:59 | 01:17 | 13% |
| **Inter Peak (1000-1600)** | | | | | |
| Existing A350 North Melksham/Beanacre | 1,281 | 1,305 | 1,550 | 269 | 21% |
| Existing A350 South Melksham/Bowerhill | 1,704 | 1,840 | 1,957 | 253 | 15% |
| Existing A350 Central Melksham | 1,934 | 2,113 | 2,276 | 342 | 18% |
| Northbound average journey time | 09:21 | 09:57 | 10:38 | 01:17 | 14% |
| Southbound average journey time | 09:21 | 09:36 | 09:42 | 00:21 | 4% |
| **PM Peak (1600-1900)** | | | | | |
| Existing A350 North Melksham/Beanacre | 1,593 | 1,668 | 1,991 | 398 | 25% |
| Existing A350 South Melksham/Bowerhill | 2,107 | 2,179 | 2,224 | 117 | 6% |
| Existing A350 Central Melksham | 2,232 | 2,379 | 2,480 | 248 | 11% |
| Northbound average journey time | 10:06 | 10:52 | 11:48 | 01:42 | 17% |
| Southbound average journey time | 10:16 | 10:53 | 11:53 | 01:37 | 16% |

Source: Melksham Transport Model. Validated base year is 2017; 2023 and 2041 are modelled forecast years. Data presented for the Do Minimum scenario. Journey times are measured from Lacock (A350 / Melksham Road junction) to Semington (A350 / A361 junction).

2.31. Increased traffic volumes and congestion on the A350 through Melksham are likely to have significant secondary impacts:

- Increased risk of collisions between vehicles and with cyclists and pedestrians

- Increased severance for residents living in the northern part of the town along the A350 and in Beanacre village, with potentially increased noise and air pollution
- Increased delays and journey times for bus services
- There is also the possibility of increased traffic volumes attempting to use the alternative routes through the town centre (i.e. Bank Street, High Street, Spa Road) to bypass queues on the A350. This would be of particular concern given the function of these roads serving residential and town centre retail areas, and the relatively high incidence of traffic collisions with pedestrians and cyclists on these roads currently. Increased through-traffic on these roads would impact on town centre businesses and hinder future efforts to regenerate the area.

## Summary of identified problems and impact of not changing

2.32. Based on the evidence presented above, the key transport problems identified with respect to the A350 at Melksham/Beanacre are:

2.33. **Limitations of the road network around Melksham.** The layout of the road network means the A350 serves multiple functions. It is the main north-south route through the town and crossing over the River Avon, as well as the main east-west through route (between A365 Western Way and Bath Road), and provides access to the town centre and retail developments along the A350 itself for local traffic. There are no viable alternatives for most of these journeys; the town centre route via Bank Street, High Street and Spa Road is not suited to through-traffic, and there is no alternative north-south route north of Farmers Roundabout. If the A350 is blocked in this area, traffic can face significant diversions either to the east or west.

2.34. Journeys between the key towns of Trowbridge, Westbury and Warminster to the south, and Chippenham, Corsham and M4 to the north therefore have to pass through Melksham or face a significant diversion. The same is true for journeys on the A365 between Devizes and Bath, which pass through Melksham on the A350 between Western Way and Bath Road, and longer distance north-south journeys such as from the M4 corridor to Poole and the Dorset coast.

2.35. **Physical constraints in the 'urban' sections of the A350 in northern Melksham and Beanacre village.** In these areas, the A350 passes through residential areas with 30mph limits and is constrained by property frontages on both sides. In addition, through traffic must negotiate several junctions in north Melksham predominantly used by local traffic to provide access to major supermarket, household and fast food retailers which have developed along the A350. These are the only sections passing through 30mph residential areas between the M4 and Westbury.

2.36. **Insufficient capacity of the A350 through Melksham to cope with current and projected future traffic volumes.** Significant peak period congestion is currently experienced on the Melksham-Beanacre sections, especially around the Farmers and Semington Road Roundabouts and on the section in northern Melksham between Bath Road and Leekes. The proposed signalisation of Farmers Roundabout and associated works will deliver some improvements, but delay and journey times are forecast to increase again due to projected demand growth by the mid-2020s. By 2036, car driver demand in the Melksham area is forecast by TEMPro to grow by up to 16% in the AM and PM peak periods, and by 20% in the Inter Peak period; this will result in Inter Peak demand in 2036 reaching current AM peak levels, with the implication that congestion and delays will become widespread throughout the day.

2.37. **High accident rates along the A350 through Melksham, with significant clusters around the busiest junctions** (Farmers Roundabout to Bath Road, and Semington Road Roundabout). Mostly these are slight, but 12 serious collisions have been recorded between 2012 and 2016, and severity rates are generally higher on the A350 compared to other roads in the area, especially for collisions involving pedestrians or cyclists. Future increases in demand and congestion are likely to lead to further increases in accident rates.

2.38. **Severance impacts on communities in Beanacre and northern Melksham.** The high traffic volumes using the route (including significant numbers of HGVs) exposes residents to noise and air pollution, restricts pedestrian access to local shops in northern Melksham and the town centre, and discourages walking and cycling along the corridor.

2.39. Collectively, these problems have the potential to create wider negative impacts and economic and social outcomes (Table 2-5).

**Table 2-5 Impacts and outcomes resulting from identified transport problems**

| Impact | Outcome |
|---|---|
| Increased congestion and delays on the A350 at Melksham makes journeys between key settlements in the corridor plus longer distance north-south journeys (i.e. between M4 and South Coast) more difficult, impacting on business / freight transport costs and commuting, and resulting in negative agglomeration impacts. | Reduced regional and national economic productivity, with lower economic and population growth in the A350 corridor. |
| Increased traffic volumes, congestion, delays, accidents and severance make Melksham unattractive place to live, work and visit. | Economic and population growth around Melksham is constrained, potentially impacting on efforts to regenerate the town centre. |
| Walking and cycling is discouraged in favour of car travel with potential impacts on health. High accident rates also have negative health impacts. | Reduced physical and mental wellbeing, with subsequent costs to society (i.e. lower productivity, higher healthcare costs). |

## Objectives

2.40. To solve the problems outlined above, strategic outcomes were identified which led to five SMART objectives for improvements on the A350 to the east of Melksham having been identified. The overall hierarchy of strategic outcomes, objectives and measures for success is summarised in Table 2-6.

**Table 2-6 Hierarchy of strategic outcomes, objectives and measures for success**

| Strategic Outcomes | High-level objectives | Transport objectives | Measures for success |
|---|---|---|---|
| Sustainable population and economic growth in the A350 corridor, with positive impact on regional and national economic productivity | Improve north-south connectivity between the M4 and South Coast, and provide capacity for growth in the A350 corridor between Trowbridge / Westbury and Chippenham / M4 | Reduce journey times and delays on the A350 through Melksham and Beanacre, allowing for future growth in demand | 1. Average Inter Peak journey times on A350 between Lacock and Semington reduced by 15% in the year after scheme opening<br>2. Average Peak journey times experienced on A350 between Lacock and Semington reduced by 30% in the year after scheme opening |
| | Improve connectivity for other through journeys via Melksham (to/from Bath, Calne and Devizes) | Reduce journey times and delays on the following routes through Melksham, allowing for future growth in demand:<br>- A350 South - A3102<br>- A365 West - A365<br>- A350 South - A365 West | 1. Average Peak journey times between Semington (A350) and Sandridge (A3102) reduced by 5% in the year after scheme opening<br>2. Average Peak journey times between Shaw (A365 W) and Bowerhill (A365 E) reduced by 10% in the year after scheme opening<br>3. Average Peak journey times between Semington (A350) and Shaw (A365 W) reduced by 10% in the year after scheme opening |
| Sustainable population and economic growth around Melksham / Bowerhill, supporting a revitalised town centre | Improve connectivity within Melksham / Bowerhill, particularly for walking and cycling journeys to Melksham town centre and along the existing A350 corridor through Melksham | Provide enhanced opportunities for walking and cycling between Melksham town centre and rail station / Bath Road, and along the existing A350 corridor within Melksham | 1. Walking and cycling journeys between town centre and rail station / Bath Road increased by 10% in the year after scheme opening<br>2. Walking and cycling journeys along the existing A350 corridor (between Bath Road and Leekes) increased by 10% in the year after scheme opening |
| Improved physical and mental wellbeing for users of the A350 and residents of Melksham | Reduce personal injury accidents on the road network | Reduce personal injury accident rates and severity for the A350 and Melksham as a whole | 1. Reduce personal injury accident rates on A350 between Lacock and Semington by 30% with lower average severity in the five years after scheme opening<br>2. Reduced personal injury accident rates for Melksham overall by 10% with lower average severity in the five years after scheme opening |
| | Reduce severance impacts of traffic on communities in Melksham / Bowerhill and Beanacre | Reduce the volume of traffic including HGVs, passing along the current A350 route in northern Melksham and Beanacre, and avoid negative impacts on other existing or potential residential areas | 1. Average daily and peak traffic volumes using existing A350 route in northern Melksham and Beanacre reduced by 30% in the year after scheme opening<br>2. Average daily HGV numbers using existing A350 route in northern Melksham and Beanacre reduced by 50% in the year after scheme opening<br>3. No increase to general or HGV traffic on other residential roads in Melksham (Semington Road / King Street, Spa Road (north of Snowberry Lane), Lowbourne / Sandridge Road) in the year after scheme opening |

2.41. The reduction targets for average journey time and peak delays consider the extent to which each route is currently subject to congestion and delay; those which pass through the full length of the A350 through Melksham and Beanacre have the highest potential journey time savings, whereas those which do not pass through significant areas of congestion have much lower potential journey time savings.

2.42. The potential to reduce existing traffic volumes in northern Beanacre and Melksham takes account of the current mix of through and local traffic in the area, and provides the basis for the accident reduction target on the A350. The wider accident reduction target for Melksham takes account of the proportion of personal injury accidents which occur on the A350, and the potential for reductions on the A350 and any new highway provision such as a bypass.

2.43. Most of the measures could be assessed in the year after scheme opening, i.e. comparing journey times and traffic volumes observed before and after. Although any impact on accident rates may also occur within the first year, it will take time to accumulate sufficient data for a robust analysis, and it will be more appropriate to compare the five-year periods before and after scheme opening rather than a single year.

## Scope

2.44. The scheme comprises consideration of potential bypasses of the A350 to the east of Melksham and Beanacre. Improvements elsewhere on the A350 or on the surrounding road network are not included as part of this SOBC. The scheme is expected to act as one of the key enablers for improving north-south connectivity along the A350 and support urban expansion around Melksham, therefore accelerating economic growth along the A350 corridor.

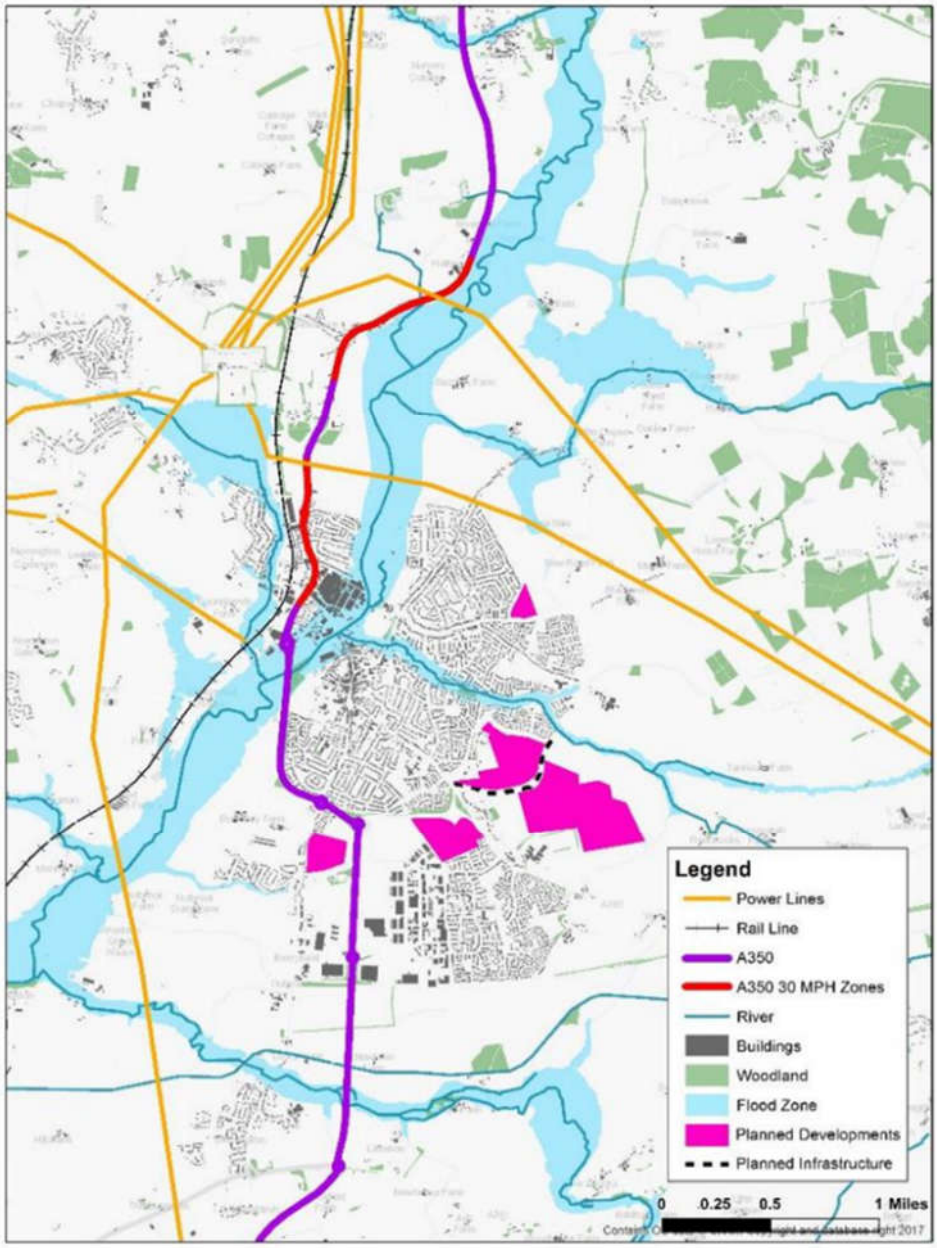
2.45. The geographical scope of the scheme is the Melksham and Beanacre area shown in Figure 1-1. Most of the traffic flow impacts are expected to be contained within this area, but the resulting economic benefits will be felt across a much wider area extending throughout the A350 corridor between the Chippenham and Warminster, and including the key settlements and employment areas at Trowbridge and Westbury.

## Constraints

2.46. The key physical and environmental constraints which will impact on the routing of any eastern bypass around Melksham and Beanacre are shown in Figure 2-5 and include:

- The existing settlements of Melksham, Beanacre, and Bowerhill, plus properties to the east of Melksham (e.g. along Woodrow Road and Sandridge Common), and the historic village of Lacock to the north
- Planned developments on the eastern and southern fringe of Melksham (planning permission exists for over 800 homes across four sites)
- The planned Melksham Health and Wellbeing Centre (southeast of Eastern Way and which includes indoor and outdoor sports facilities, GP surgery, library and community space)
- The floodplains of the River Avon and Clackers Brook
- The Kennet and Avon Canal
- Power lines which connect with the Melksham sub-station.

**Figure 2-5 Key physical and environmental constraints in the Melksham area**




## Inter-dependencies

2.47. With significant housing and employment development planned for the A350 corridor areas in the coming years, a good opportunity exists to deliver transport improvements and to maximise the potential for economic growth in the area. The developments should act as a catalyst to address existing transport issues before capacity is further exceeded.

2.48. The strategic location occupied by Melksham between the two Principal Settlements of Chippenham and Trowbridge presents an opportunity to improve transport connections at the heart of the A350 corridor, creating agglomeration benefits for industry and supporting the continued growth of the existing manufacturing cluster in the Melksham-Westbury area. Improving the A350 through Beanacre/Melksham would complement other upgrades to the route being progressed at Chippenham and Trowbridge which are designed to reduce congestion and support the development of housing and employment sites in these towns.

2.49. Bypassing Melksham would also reduce severance between the town centre and areas to the west of the A350 (including the rail station and recent supermarket developments), creating an opportunity to re-design the existing A350 corridor through the town, and support efforts to regenerate the town centre.

2.50. There are several planning permissions that have been granted for new residential developments on the southern and eastern fringes of Melksham. None of these are dependent on the construction of a bypass, and they are expected to be mostly completed by the time a bypass would be opened.

2.51. However, the planned development of 450 dwellings on land east of Spa Road (as seen in Figure 2-5) includes provision of an extension to the existing Eastern Way distributor road, linking it to a new roundabout to be constructed on Spa Road between the existing Spa and Snowberry Lane roundabouts. This has received planning permission and is expected to be delivered in phases up to 2026. It would form part of the new A350 route under Options A and B, and may also require design changes to enable it to handle higher traffic volumes and to mitigate potential noise impacts on nearby housing. This would not be necessary under Option C, as it bypasses the entire length of Eastern Way.

## Stakeholders

2.52. Wiltshire Council is leading the development of improvement works on the A350, to reduce journey time, reliability and collision issues. There are many interested parties in this project, many of whom have an active part in the delivery process. Wiltshire Council has undertaken preliminary engagement with some key local stakeholders about the A350 Melksham Bypass, with proposals and support for the Melksham Bypass having existed for several years. The Council would intend to undertake initial public consultation on the potential bypass options at an early stage in any subsequent OBC process. Further rounds of public consultation are anticipated as design work progresses.

2.53. Landowners along the proposed bypass corridors and residents living in eastern Melksham, including the areas around Woodrow Road, Forest, Sandridge Common, Eastern Way, Spa Road and Bowerhill are most likely to be adversely impacted by the construction of an eastern bypass. They will require specific attention throughout the consultation process to ensure that their concerns are understood, and that the design process is informed to minimise and/or mitigate adverse impacts.

2.54. Landowners, businesses and residents living along the existing A350 route through Beanacre and Melksham will also require to be consulted regarding any proposals for improvements to the route following the opening of a bypass, which could include traffic calming measures, improved pedestrian crossings and paths, improved cycle routes, and potential reallocation of road space from motor vehicles to non-motorised users.

2.55. The Swindon and Wiltshire Local Economic Partnership (SWLEP) and/or Department for Transport (DfT) will have a significant role in the delivery process, as they are likely to provide a large part of the scheme's funding. Both will need to be involved throughout the design process and business case development to ensure the scheme provides Value for Money and meets the relevant objectives.

2.56. The proposed crossings of the floodplains of the River Avon and Clackers Brook will require the support of the Environment Agency and compliance with the Water Framework Directive. Early engagement with the Environment Agency will be sought to identify issues that will need to be addressed including requirement for mitigation measures such as compensatory flood storage.

2.57. Other key stakeholders that will be consulted throughout scheme development include:

- Historic England
- Natural England

- Melksham Without Parish Council
- Melksham Neighbourhood Plan
- Melksham Town Council

## Options

2.58. Three specific highway options for the next phase of works on the A350 Melksham Bypass have been identified (Figure 1-1), following the assessment and sifting process undertaken in the OAR:

- Option A: From A350 north of Beanacre to A3102 junction with Eastern Way (then continuing via Eastern Way to Spa Roundabout) – approximately 2.7km in length
- Option B: From A350 north of Beanacre to A3102 east of Eastern Way, then via new road to Eastern Way south of Thyme Road (then continuing via Eastern Way to Spa Roundabout) – approximately 4.4km in length
- Option C: From A350 north of Beanacre to A3102 east of Eastern Way, then to A365 east of Bowerhill, then to A350 south of Hampton Park West – approximately 7.8km in length.

2.59. The options have been assessed against the scheme objectives to compare their relative performance in the Strategic Case (Table 2-7).

**Table 2-7 Assessment of Options against Objectives**

| Scheme Objectives | Option A | Option B | Option C |
|---|---|---|---|
| Reduce journey times and delays on the A350 through Melksham and Beanacre, allowing for future growth in demand | ✓✓ | ✓✓ | ✓✓✓ |
| Reduce journey times and delays on the following routes through Melksham, allowing for future growth in demand:<br>- A350 South - A3102<br>- A365 West - A365 East<br>- A350 South - A365 West | ✓ | ✓✓ | ✓✓✓ |
| Provide enhanced opportunities for walking and cycling between Melksham town centre and rail station / Bath Road, and along the existing A350 corridor within Melksham | ✓✓ | ✓✓ | ✓✓✓ |
| Reduce personal injury accident rates and severity for the A350 and Melksham as a whole | ✓ | ✓✓ | ✓✓✓ |
| Reduce the volume of traffic including HGVs, passing along the current A350 route in northern Melksham and Beanacre, and avoid negative impacts on other existing or potential residential areas | ✓✓ | ✓✓ | ✓✓✓ |

| Contribution towards achieving scheme objective |
|---|
| ✓✓✓ Strong contribution |
| ✓✓ Moderate contribution |
| ✓ Limited contribution |
| **X** No contribution |

2.60. The assessment indicates that **Option C** strongly supports the objectives of the scheme as it contains a complete bypass of both Melksham and Beanacre, which should:

- Improve connectivity on the strategic A350 corridor, by reducing journey times for travellers on the A350 through Beanacre and Melksham

- Reduce journey times for other through journeys via Melksham – especially A350 South to A3102, but also journeys to/from A365 West due to reduced traffic volumes at Farmers Roundabout and the Bath Road junction
- By significantly reducing traffic volumes on the existing A350 route through Melksham and Beanacre, provide an opportunity to improve facilities for pedestrians and cyclists in northern Melksham and crossing facilities to the rail station / Bath Road area
- Reduce the number of personal injury accidents on the A350, by providing a safer alternative route which minimises the number of junctions and potential for collisions with non-motorised users for through traffic
- Significantly reduce severance for communities in northern Melksham and Beanacre, including reduced noise levels, disturbance from HGVs and improved air quality, whilst avoiding negative impacts on communities in eastern and southern Melksham

2.61. In comparison to Option C, Options A and B still support all five objectives, but the reduced length of bypass and reliance on using the Eastern Way distributor road and Spa Roundabout route, result in more limited potential to achieve journey time reductions, safety and severance impacts, and may result in reduced redistribution of traffic from the existing A350 route to the new bypass. For options A and B, additional work may also be required to Eastern Way and the Spa Roundabout area to cope with higher traffic volumes and mitigate potential safety and severance impacts.

2.62. For these two options, in addition to the bypass itself, additional work may be required to Eastern Way and the Spa Roundabout area to cope with higher traffic volumes and mitigate potential safety and severance impacts.

2.63. At this stage, the design of all three options is assumed to be a single-carriageway road with national speed limit (60 mph) on non-urban sections, reducing to 40 mph on urban sections. Initial assessment of dual-carriageway variants indicated that the relatively minor journey time benefits would not justify the additional cost of such, and that a single-carriageway bypass is also likely to provide sufficient capacity for projected flows, at least on the non-urban sections. However, it may be prudent to make provision for future upgrade to dual-carriageway in the design of the route in terms of alignment and land purchase.

2.64. As part of the scheme development, for all three options it is anticipated that measures will also be considered to improve the bypassed A350 in Beanacre and Melksham to make it more attractive for pedestrians and cyclists, and improve connectivity between the town centre, rail station and Bath Road area.

# 3. The Economic Case

## Outline

3.1. This section identifies the key economic, environmental and social impacts of the proposed scheme and presents the overall value for money. This effectively shows the extent to which the scheme's benefits outweigh its costs, whether monetised or not. The economic, environmental, social, public accounts and distributional impacts of the scheme have all been appraised following the principles contained within the DfT's transport appraisal guidance (WebTAG), in a manner which is proportionate to the total scheme cost.

3.2. This section contains the following elements:

- A description of how the scheme's value for money has been established and the options and scenarios (Do-Minimum and Do-Something) that have been modelled
- Details of the key assumptions that have been made, regarding the assumed delivery of other nearby schemes or developments
- A Value for Money Statement, in line with the DfT's latest Value for Money Assessment guidance
- Details of how different variables will affect the value for money assessment
- Commentary on the scheme's expected economic, environmental, social and public accounts impact
- Completed Appraisal Summary Tables

3.3. An important aspect of the economic case is the Value for Money Statement. This is based on summing the monetised discounted impacts and comparing them against discounted costs to establish an initial BCR, which implies an initial value for money band (poor, low, medium, high, or very high), in line with WebTAG. This band is then adjusted to account for impacts where qualitative or quantitative, but not monetised, information is available.

## Options appraised

3.4. The three bypass options outlined in Section 2 have been appraised. Other "low cost" options (including public transport and demand management) were considered in the OAR but rejected as they have minimal impact on addressing the problems identified with respect to the A350 in Melksham. The eastern bypass options were assessed as likely to provide the greatest economic benefits, at a lower cost and environmental impact than western options and have therefore been progressed for further assessment in the SOBC.

3.5. Options A and B provide lower-cost options based on only a partial bypass, in comparison to the full bypass Option C. In keeping with the "proportionate" approach to scheme appraisal, this Business Case will not include the appraisal of any scheme other than the three options.

3.6. As specific road alignments and junction designs have not yet been determined for the options, for modelling and appraisal purposes the following assumptions have been made:

- New carriageway lengths were determined based on the highway corridors identified in Figure 1-1
- All new highways were assumed to be single-carriageway with 60mph speed limits
- New junctions formed with the existing A350, Woodrow Road, A3102, Eastern Way and A365 were assumed to be medium-sized roundabouts
- The existing road network (including Eastern Way and the Spa Roundabout area) is unchanged, although it is assumed that the proposed southern extension to Eastern Way is

completed in advance of any of the bypass options. (As noted above it is likely that changes would be required to Eastern Way / Spa Roundabout under Options A and B, but they have not been modelled or costed at this stage.)

3.7. A summary of the configuration of the three options is provided in Table 3-1.

**Table 3-1 Assumed configuration of options appraised**

| | Option A | Option B | Option C |
|---|---|---|---|
| **Length of new carriageway** | 2700m | 4400m | 7800m |
| **Design speed** | 60 mph | 60 mph | 60 mph |
| **New junctions / roundabouts** | 1. A350 north of Beanacre<br>2. Woodrow Road<br>3. A3102 / Eastern Way | 1. A350 north of Beanacre<br>2. Woodrow Road<br>3. A3102 east of Eastern Way<br>4. Eastern Way (south of Thyme Road) | 1. A350 north of Beanacre<br>2. Woodrow Road<br>3. A3102 east of Eastern Way<br>4. A365 east of Bowerhill<br>5. A350 south of Bowerhill |
| **Use of existing road network to form part of bypass** | Eastern Way from A3102 to Spa Road; Spa Road to Western Way Roundabout | Eastern Way from south of Thyme Road to Spa Road; Spa Road to Western Way Roundabout | - |

# Approach and assumptions for appraisal

## Approach to appraisal

3.8. The proposed methodology for assessing scheme value for money is set out in the Appraisal Specification Report.

3.9. The following key principles apply in the ASR:

- 60-year economic appraisal period, for consistency with other transport scheme assessments across the UK and in line with WebTAG
- 2023 (assumed opening date whilst undertaking appraisal) and 2041 modelled forecast years include background traffic growth derived from the South West Regional Transport Model which includes a local uplift on demand generated by known housing developments that have received planning permission in the western Wiltshire area, other sites identified in the Wiltshire Housing Site Allocations Plan Consultation Draft and the adopted Chippenham Core Strategy to 2026, and assumed continuation of housing build-out rates post-2026
- Three modelled time-periods to represent a week-day average with an AM Peak hour (average 0700-1000), Inter-Peak (Average 1000-1600) and PM Peak House (1600-1900)
- Journey time savings across the network for each of the Do Something options compared to the Do Minimum generated by a SATURN traffic model – the Melksham Transport Model which is based on a cordoned version of the South West Regional Transport Model, with more detailed representation of the highway network in the Melksham area calibrated and validated against traffic flow data captured by ATC and ANPR surveys in 2017, and TomTom / TrafficMaster journey time data for a range of journeys through Melksham[2]
- Use of the DfT program TUBA to convert the forecast savings in journey times between Do Minimum and Do Something scenarios into monetary values for the weekday AM and PM

[2] A full description of the modelling approach is provided in the separate A350 Melksham Bypass Traffic and Economics Assessment Report.

peak, utilising values of time and vehicle operating costs from the WebTAG Data book (July 2017)

- The modelled hours were expanded to represent benefits across the year on the assumption of 253 weekdays per year, and discounted to 2010 values as per WebTAG guidance.

3.10. The outturn cost and the Present Value of Costs (PVC) for each option has been estimated using the following information, in line with WebTAG:

- The base cost, which is the basic costs of a scheme before allowing for allowing for risks, but including realistic assumptions of changes in inflation over time (i.e. cost increases above the growth in 'economy-wide' inflation)
- Adjustment for risk, which at this early stage comprises a risk allowance of 10% added to the base cost estimates
- Adjustment for optimism bias (at 44% of the risk-adjusted base cost), to reflect the well-established and continuing systematic bias for estimated scheme costs and delivery times to be too low and too short respectively, and results in the risk and optimism bias-adjusted cost-estimate.

3.11. Appendix A contains the Traffic & Economics Assessment Report (TEAR) detailing the approach to appraisal.

3.12. The proposed bypass routes pass through predominantly open farmland, and will require crossing of the River Avon and Clackers Brook floodplains. At this stage, a qualitative assessment of probable environmental impacts has been made, but it is anticipated that a full Environmental Impact Assessment will be required as part of the planning process.

3.13. Social and distributional impacts have also been assessed qualitatively at this stage.

## Value for Money statement

3.14. The Value for Money Statement summarises the impact of the transport intervention under consideration. It uses the HM Treasury Green Book method of cost-benefit analysis, by weighing the benefits against the costs to indicate whether the scheme offers 'value for money'. Qualitative, quantitative and monetised information can be used in preparing the statement. This section contains the Value for Money Statement in line with the DfT's Value for Money Assessment guidance.

3.15. The Value for Money Statement in this section should be read in conjunction with the Transport Economic Efficiency table, Public Accounts Table and Analysis of Monetised Costs and Benefits tables in Appendix B. The Appraisal Summary Table for each option are contained in Appendix C and identify the full set of scheme impacts across the economic, environmental, social and public accounts categories.

### Value for Money (VfM) summary

3.16. A summary of Value for Money for the three scheme options is presented in Table 3-2.

**Table 3-2 Value for Money assessment table**

| Assessment Type | Option A | Option B | Option C | Detail |
|---|---|---|---|---|
| **Present Value of Benefits (PVB)** | £57.75m | £64.85m | £149.61m | 2010 prices, discounted to 2010 in line with DfT guidance. |
| **Present Value of Costs (PVC)** | £29.66m | £38.33m | £67.94m | 2010 prices, discounted to 2010. Includes Optimism Bias at 44%. |
| **Net Present Public Value (NPPV)** | £28.09m | £26.52m | £81.66m | The NPPV indicates by how much the benefits of a scheme exceed the costs. This NPPV is for the 'initial BCR'. |
| **Initial BCR** | 1.95 | 1.69 | 2.20 | Not adjusted for other non-monetised impacts due to initial stage of appraisal |
| **Qualitative Assessment** | Major Adverse to Moderate Beneficial | Major Adverse to Moderate Beneficial | Major Adverse to Moderate Beneficial | There are potentially beneficial impacts in a number of areas (reliability, wider impacts, noise, air quality, journey quality and severance), but also anticipated Moderate Adverse impacts to landscape and biodiversity, and Major Adverse impact on the water environment (although these have the potential to be mitigated). |
| **Key Risks, Sensitivities** | £1.87m | £2.42m | £4.29m | Key risks identified include tender prices exceeding estimates. To cater for this and other eventualities, a risk budget has been included in scheme costs. This is equivalent to 10% of base costs. |
| **VfM Category** | Medium | Medium | High | Monetised assessments suggest that the VfM category should be Medium or High for the proposed scheme. |

3.17. The following headline conclusions can be drawn from the initial economic appraisal results:

- Option C has the highest BCR and is most likely to present High Value for Money, with a Net Present Value of £82m PV and BCR of 2.2
- Options A and B are more likely to present Medium Value for Money, with Net Present Values between £26m to £28m PV and BCRs between 1.7 and 2.0.
- The overall qualitative assessment for all three options is major adverse to moderate beneficial. Many beneficial impacts have been identified, but they are potentially offset by moderate or major adverse impacts to landscape, biodiversity and the water environment. There is however scope to reduce or mitigate these impacts through the planning and design process to ensure that the benefits outweigh the adverse impacts.

### VfM: Transport network user benefits

3.18. The Melksham Transport Model was used to calculate the predicted benefits for each of the three options in the forecast years: 2023 and 2041. This section will briefly outline the findings, including the forecast changes to journey time, changes to vehicle flow and a summary of the user benefits.

Journey time

3.19. Time savings for journeys along both the existing A350 and bypass routes have been calculated for the AM and PM Peak periods in the 2041 forecasted year and are presented in Table 3-3.

**Table 3-3 Forecast journey time changes along the existing A350 and bypass routes in 2041 (mm:ss)**

| Time | Route | Do Minimum | Do Something Option A | Do Something Option B | Do Something Option C |
|---|---|---|---|---|---|
| AM Peak (0700-1000) | A350 Northbound | 13:21 | -01:27 | -01:01 | -03:25 |
| | Bypass Northbound | - | -01:08 | -01:14 | -05:02 |
| | A350 Southbound | 10:59 | -00:37 | -00:30 | -00:32 |
| | Bypass Southbound | - | -00:45 | -00:47 | -02:35 |
| PM Peak (1600-1900) | A350 Northbound | 11:48 | -01:02 | -01:03 | -02:06 |
| | Bypass Northbound | - | -00:52 | -01:18 | -03:23 |
| | A350 Southbound | 11:53 | -00:39 | -00:38 | -01:28 |
| | Bypass Southbound | - | -00:52 | -00:50 | -03:10 |

Source: Melksham Transport Model. Journey times are measured from Lacock (A350 / Melksham Road junction) to Semington (A350 / A361 junction).

3.20. The results show that all three bypass options provide journey time savings in both directions and along both the new bypass and existing route of the A350. Journey time savings are most significant in the northbound direction, in particular in the AM Peak period. Option C provides the largest journey time savings (up to five minutes in the AM Peak northbound via the bypass), but the savings resulting from Options A and B are much lower (generally between 30 and 90 seconds).

Vehicle flow

3.21. Forecast vehicle flows demonstrate further how the scheme is expected to encourage traffic onto the bypass and reduce traffic on the existing A350 through Melksham and Beanacre, and on other parts of the road network.

3.22. Table 3-4 shows the modelled two-way flows at key points within the model in Passenger Car Units (PCUs) for the 2041 AM Peak period. The flows indicate that all three options reduce the flow along the existing Melksham A350 route, with the largest reductions forecast under Option C, consistent with the flows along the bypass.

**Table 3-4 Forecast two-way vehicle flows in 2041 AM Peak (PCUs)**

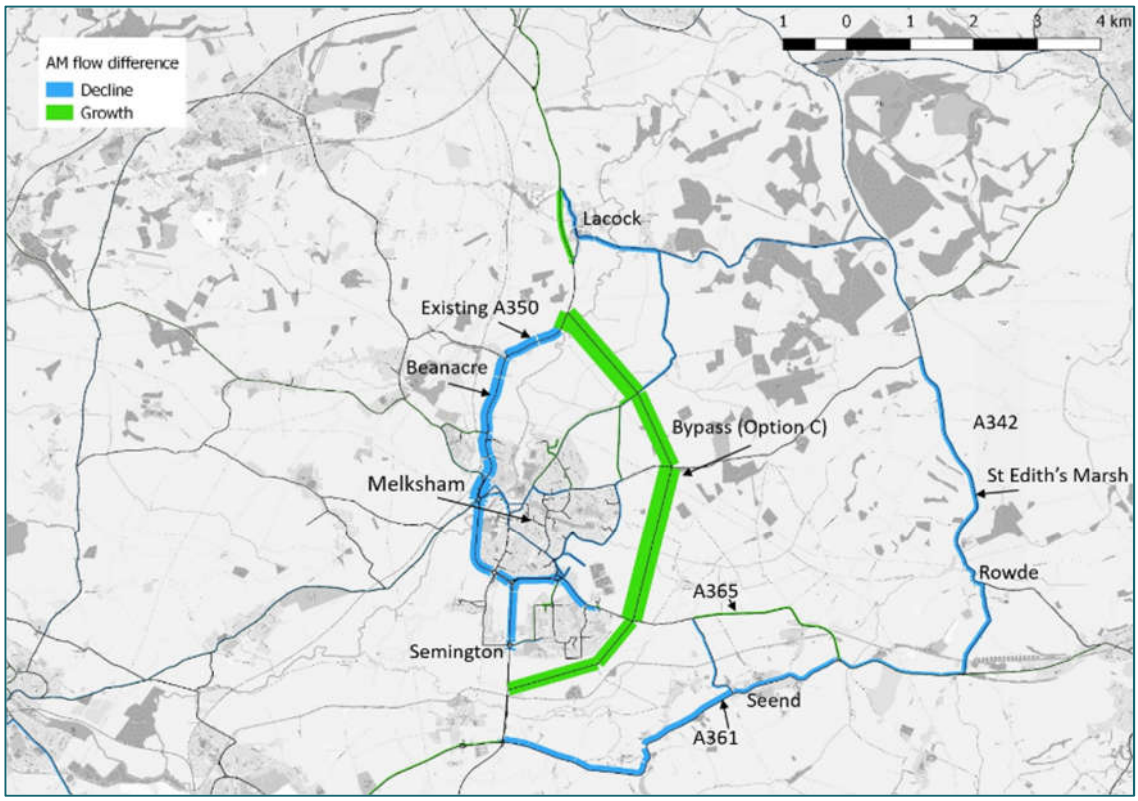
| Route | Do Minimum | Do Something Option A | Do Something Option B | Do Something Option C |
|---|---|---|---|---|
| A350 (North of Bypass) | 1974 | 2276 | 2833 | 2788 |
| Existing A350 North Melksham | 1974 | 1520 | 1480 | 1163 |
| Existing A350 Central Melksham | 2304 | 1835 | 1765 | 1604 |
| Existing A350 South Melksham | 2023 | 1958 | 1967 | 1549 |
| Northern Section of Bypass | - | 948 | 1171 | 1494 |
| Central Section of Bypass | - | - | 1179 | 1566 |
| Southern Section of Bypass | - | - | - | 959 |
| A350 (South of Bypass) | 2383 | 2369 | 2833 | 2788 |

Source: Melksham Transport Model.

3.23. The change in vehicle flows by link for Option C compared to the Do Minimum for the AM peak in 2041 is illustrated in Figure 3-1, with green representing an increase in traffic and blue a decrease. This indicates a forecast reduction in vehicle flows on the following:

- The existing A350 route via Melksham and Beanacre
- Western Way, Spa Road and Eastern Way in Melksham
- Routes south and east of Melksham including A361 (east of A350 junction) and A342 via the villages of Seend, Rowde and St Edith's Marsh
- Minor roads northeast of Melksham including Woodrow Road, Forest Lane, Bowden Hill and The Wharf, plus West Street and Cantax Hill in the village of Lacock.

**Figure 3-1 Forecast change in traffic flow - 2041 AM Peak (Option C)**




h

3.24. A similar distribution of traffic flow changes is forecast in the PM Peak. The model also indicates potential diversion of traffic passing through Bradford-on-Avon between Trowbridge and Chippenham / Corsham, however due to limitations in the model the impacts in these areas have been excluded from the user benefit analysis.

3.25. Increases in traffic flow on the existing road network are forecast to be limited mainly to the A350 north and south of the bypass, the A361 between Trowbridge and Semington and A365 east of Melksham.

User benefits

3.26. The two main contributing factors to user benefits are the travel time savings and vehicle operating cost savings. There are no parking or toll costs included in the model, therefore travel time savings equates solely to in-vehicle time. The Net Present Values of travel time and operating cost benefits are given in Table 3-5.

**Table 3-5 Present Value of Benefits for the scheme options**

| | Option A | Option B | Option C |
|---|---|---|---|
| Travel Time Benefits | £54.6m | £63.7m | £143.7m |
| Vehicle Operating Cost Benefits | £6.8m | £2.0m | £10.6m |
| Total User Benefits | £61.4m | £63.8m | £147.3m |

3.27. The calculated user benefits include journey time and vehicle operating costs savings for journeys passing through Melksham or via the alternative routes to the east of the town shown in Figure 3-1, but at this stage exclude any benefits in Trowbridge and Bradford-on-Avon due to limitations with the model representation in these areas. The PVBs should therefore be viewed as conservative estimates of the overall scheme user benefits, especially for Option C.

## VfM: Costs

3.28. At this stage, only high-level scheme cost estimates are available, although these have been based on the length of new carriageway to be constructed, junctions and key structures required, preparatory and land purchase costs, and include a risk allowance of 10%. There is potentially greater uncertainty regarding the costs for Options A and B given they do not include changes to the existing highway network that may be required along Eastern Way and Spa Road to accommodate higher traffic volumes.

3.29. Given these factors, and in accordance with DfT guidance, the costs presented in the Economic Case include Optimism Bias at 44%. Costs are presented in the form of Present Value of Costs (PVC), in 2010 market prices, and discounted to 2010 using the HM Treasury discount rates, in accordance with DfT WebTAG guidance.

3.30. It should be noted that the PVC does not represent the actual investment cost and should therefore not be used in any request for funding. The PVC is for economic appraisal purposes only. Information on outturn scheme costs is presented in the Financial Case (Section 4).

3.31. The PVCs for the three bypass options are presented in Table 3-6.

**Table 3-6 Present Value of Costs for the scheme options**

| Option A | Option B | Option C |
|---|---|---|
| **£29.66m** | **£38.33m** | **£67.94m** |

### VfM: Indirect tax revenues

3.32. Indirect tax revenues are generated through fuel duty and other changes incurred by transport users and providers. None of the A350 Melksham Bypass options have road tolls or public transport implications, therefore the only impact on indirect tax revenues is through changes in fuel costs. As the scheme provides a more efficient route for traffic there is a reduction in vehicle operating costs, resulting in reductions to indirect tax revenues amounting to £3.7 million PV for Option A, £0.8 million PV for Option B and £4.8 million PV for Option C (60-year Net Present Values).

### VfM: BCR

3.33. The PVBs, PVCs, Benefit Cost Ratios (BCRs) and Net Present Public Values (NPPVs) for each option are shown in Table 3-7.

**Table 3-7 BCRs and NPPVs for the scheme options**

| Option | PVC | PVB | NPPV | BCR |
|---|---|---|---|---|
| A | £29.7m | £57.8m | £28.1m | 1.95 |
| B | £38.3m | £64.8m | £26.5m | 1.69 |
| C | £67.9m | £149.6m | £81.7m | 2.20 |

### VfM: Sensitivity

3.34. Sensitivity tests have been calculated for each of the option BCRs considering ±10% in costs and benefits, as summarised in Table 3-8 and Table 3-9. At this stage, low and high growth sensitivity tests have not been completed.

**Table 3-8 BCR sensitivity testing - costs**

| Option | Sensitivity tests | PVC (£000) | PVB (£000) | BCR |
|---|---|---|---|---|
| A | 10% lower costs | £ 26,690 | £ 57,751 | 2.16 |
| | Calculated costs | £ 29,656 | £ 57,751 | 1.95 |
| | 10% higher costs | £ 32,622 | £ 57,751 | 1.77 |
| B | 10% lower costs | £ 34,494 | £ 64,845 | 1.88 |
| | Calculated costs | £ 38,327 | £ 64,845 | 1.69 |
| | 10% higher costs | £ 42,160 | £ 64,845 | 1.54 |
| C | 10% lower costs | £ 61,149 | £ 149,606 | 2.45 |
| | Calculated costs | £ 67,943 | £ 149,606 | 2.20 |
| | 10% higher costs | £ 74,737 | £ 149,606 | 2.00 |

**Table 3-9 BCR sensitivity testing - benefits**

| Option | Sensitivity tests | PVC (£000) | PVB (£000) | BCR |
|---|---|---|---|---|
| A | 10% lower benefits | £ 29,656 | £ 51,976 | 1.75 |
| | Calculated benefits | £ 29,656 | £ 57,751 | 1.95 |
| | 10% higher benefits | £ 29,656 | £ 63,526 | 2.14 |
| B | 10% lower benefits | £ 38,327 | £ 58,361 | 1.52 |
| | Calculated benefits | £ 38,327 | £ 64,845 | 1.69 |
| | 10% higher benefits | £ 38,327 | £ 71,330 | 1.86 |
| C | 10% lower benefits | £ 67,943 | £ 134,645 | 1.98 |
| | Calculated benefits | £ 67,943 | £ 149,606 | 2.20 |
| | 10% higher benefits | £ 67,943 | £ 164,567 | 2.42 |

### VfM: Environmental and social impact

3.35. The findings of the qualitative assessments are not considered to be significant enough to warrant any increase or decrease in the value for money categories. The potential moderate or major adverse environmental impacts that have been identified for landscape, biodiversity and water environment have scope to be reduced or mitigated through the planning and design process. There is also scope to ensure the scheme delivers net benefits in terms of noise, air quality and severance impacts.

## Qualitative assessment

### Economy

Reliability impact on business users

3.36. The scheme is expected to produce reliability benefits approximately in proportion to journey time benefits. Reliability impact is therefore considered to be **Slight Beneficial** (Options A and B) to **Moderate Beneficial** (Option C).

Regeneration

3.37. Although the scheme is expected to support economic growth across the A350 corridor, none of the options are connected to specific regeneration sites. By reducing traffic volumes passing through Melksham it will however indirectly support the Council's aims to regenerate the town centre. For all options, the scheme's likely impact on Regeneration is therefore considered to be **Neutral to Slight Beneficial**.

Wider Impacts

3.38. Given Melksham's location at the centre of the A350 corridor, the scheme has the potential to produce Wider Impacts such as static agglomeration benefits, approximately in proportion to journey time benefits. The impact is therefore considered **Slight Beneficial** (Options A and B) **to Moderate Beneficial** (Option C).

### Environmental

3.39. For each of the seven environmental aspects, an appraisal of the scheme has been undertaken to identify whether significant beneficial or adverse environmental effects are likely to arise.

Noise

3.40. The noise aspect considers the effects of the highway changes on the noise levels and, where appropriate, any consequential annoyance within the vicinity of the scheme. All three options are expected to increase daily traffic flow in the areas around the new bypass route, whilst simultaneously reducing traffic flow along the existing A350.

3.41. Options A and B would result in increases in traffic volumes and construction activity along Eastern Way within 200m of housing areas resulting in potential adverse impacts to a large number of households, but only a relatively small reduction (c.20%) in traffic volumes along the existing A350. At this stage, the impact of Options A and B is therefore considered to be **Slight to Moderate Adverse.**

3.42. Option C would result in increases in traffic volumes and construction activity on a route which is mostly 200m or more from major housing areas, so the potential for adverse impacts is substantially reduced. Conversely, it is expected to result in a larger reduction in traffic volumes (c.40%) and associated noise impacts along the existing A350 through Melksham and Beanacre, with beneficial impacts also in rural villages including Lacock, Rowde and Seend. The impact of Option C is therefore assessed as **Slight to Moderate Beneficial.**

Air Quality

3.43. As with the noise assessment, the location and scale of impact will be dependent on the alignment of the bypass, with Options A and B having the potential for adverse effects on housing areas close to Eastern Way, but only a minor benefit due to relatively small reduction (c.20%) in traffic volumes along the existing A350. The impact of Options A and B is therefore considered to be **Slight to Moderate Adverse.**

3.44. Option C would result in increases in traffic volumes on a route which is further away from major housing areas, so the potential for adverse impacts is substantially reduced. Conversely, it is expected to result in a larger reduction in traffic volumes (c.40%) and $NO_2$ levels along the existing A350 through Melksham and Beanacre, with beneficial impacts also in rural villages including Lacock, Rowde and Seend. The impact of Option C is therefore assessed as **Slight to Moderate Beneficial.**

3.45. There are no Air Quality Management Areas (AQMAs) in the Melksham area that would be impacted by the scheme.

Greenhouse gases

3.46. The scheme is likely to result in changes in journey distances due to traffic re-routing onto the bypass, and increases in average vehicle speed compared to the Do Minimum, producing a small increase in greenhouse gas emissions. Construction of the bypass would also result in additional adverse embedded carbon emissions.

3.47. For all the options, the scheme's impact on greenhouse gases is therefore considered **Slight Adverse**.

Landscape

3.48. There are no national or international landscape designations within 2km of the bypass options, but the following are located within 2km and may be impacted directly or indirectly by the scheme:

- National Cycle Routes and Public Rights of Way
- Ancient Woodland
- Recreational parkland and Registered Parks and Gardens
- Kennet and Avon Canal

3.49. All three options would pass through open agricultural land with mature hedgerows and trees resulting in adverse impact on landscape character, setting, landscape pattern and visual amenity.

3.50. For all options, the scheme's impact on landscape is therefore considered **Moderate Adverse**.

Townscape

3.51. The bypass corridors are in a predominantly rural setting, with limited potential impact on the fabric and cohesiveness of the townscape. Although not visually intrusive in the urban area there

is a risk of adverse impacts particularly for Options A and B due to their proximity to urban areas along Eastern Way and north-east Melksham.

3.52. Conversely, reducing traffic volumes along the existing A350 corridor in Melksham may provide opportunities to improve the townscape in this area.

3.53. Taking these factors into account, for all options, the scheme's impacts on townscape are considered to be **Slight Adverse**.

Heritage of historic resources

3.54. The scheme has the potential to have a slight adverse impact on known historic features on sites to the north, east and south of Melksham with the potential to directly impact on Listed Buildings scattered within rural locations to the east and in the settlement of Bowerhill, south of Melksham.

3.55. Initial appraisal identified slight adverse impacts on the setting of known historic features within 2km of the scheme such as Listed Buildings and Conservation Area at Lacock, Lacock Abbey Registered Park and Garden, Melksham Conservation Area, and Spye Park Registered Park and Garden.

3.56. As there may be some direct and indirect impacts on known nationally designated heritage assets, for all options, the impacts of the scheme on heritage resources are considered to be **Slight Adverse**.

Biodiversity / Ecology

3.57. The scheme has potential for impacts in relation to:

- The Bath and Bradford Avon Bats Special Area of Conservation (approximately 7.2 km, north west) through the loss of commuting or foraging habitat for bats within the local area
- Sites of Special Scientific Interest (SSSIs) present within 1-2km from the Eastern Corridor, including; Spye Park SSSI, Seend Cleeve Quarry SSSI, and the Seend Ironstone Quarry and Road Cutting SSSI. However, no direct impact on these sites is anticipated
- Direct loss and/or disturbance of the priority habitat deciduous woodland, as well as a range of agricultural habitats and associated species
- A new crossing of the River Avon and Clackers Brook may result in loss of bankside habitat and impacts to aquatic species, and minor watercourses and ditches / drains present in the fields around the scheme may be impacted during the construction phase

3.58. Given the large scale of the scheme and greenfield nature of the site, for all options the scheme's impacts on Biodiversity and Ecology are considered to be **Moderate Adverse** during both construction and operation, although there is scope for this to be reduced through mitigation.

Water environment

3.59. All three options cross the floodplain of the River Avon north of Melksham, with Options B and C also crossing the floodplain of the Clackers Brook east of Melksham, and may require compensatory flood storage as a result of the loss of, or impact on, the floodplain. The scheme will lead to an increase in surface water run-off due to its permeability with consequent effects on water quality.

3.60. For all three options, the impacts of the scheme on the water environment are considered to be **Major Adverse** based on it being a new section of road passing through high flood risk areas with increased surface water run-off, although there is scope for this to be reduced through mitigation.

## Social

Reliability impact on commuting and other users

3.61. The scheme is expected to produce reliability benefits approximately in proportion to journey time benefits. Reliability impact is therefore considered to be **Slight Beneficial** (Options A and B) to **Moderate Beneficial** (Option C).

Physical activity

3.62. The scheme currently does not propose any direct changes to walking or cycling routes; however, by reducing the traffic volume experienced on the existing A350 route through Melksham, it may create a more attractive environment for cyclists and pedestrians along the route. Option C provides the greatest potential for this, whilst Options A and B may have some adverse impacts along Eastern Way due to higher traffic volumes forecast in this area.

3.63. The scheme's impact on physical activity is therefore considered **Neutral** (Options A and B) to **Slight Beneficial** (Option C).

Journey quality

3.64. Traveller stress will be reduced as an impact from a reduction in delays and journey times on the new bypass compared to the current situation on the A350. The scheme's impact on journey quality is therefore considered **Slight Beneficial (**Options A and B) to **Moderate Beneficial** (Option C).

Accidents

3.65. The scheme has the potential to reduce personal injury accidents through reduction of traffic at known collision clusters on the existing A350 route through Melksham, and provision of a new route which is less congested and with reduced risk of collisions with cyclists and pedestrians. The benefits of Option C are probably greater than those of Options A and B in this respect given its complete bypass of Melksham.

3.66. Accident impacts have not yet been modelled, but for all options the scheme's impact on accidents is considered to be **Slight Beneficial**.

Security

3.67. The scheme proposes no changes which would improve or degrade security on the highway network. The scheme's impact on security is therefore considered **Neutral**.

Access to services

3.68. No changes to public transport provision or accessibility to services are anticipated as a result of the scheme. For all options, the scheme's impact on accessibility is therefore considered **Neutral.**

Affordability

3.69. The scheme will result in vehicle operating cost savings as presented in Table 3-5. For all options, the scheme's impact on affordability is therefore considered **Slight Beneficial.**

Severance

3.70. Options A and B both result in a modest reduction in traffic volumes (c.20%) and associated severance along the existing A350 in Beanacre and Melksham. However, they also risk increasing severance along Eastern Way and Spa Road.

3.71. Option C results in a larger reduction in traffic along the existing A350 (c.40%), and therefore a larger severance benefit to the communities in northern Melksham and Beanacre (and possibly other villages such as Lacock, Rowde and Seend), without increasing traffic volumes in other residential areas.

3.72. The scheme's impact on severance is therefore considered to be **Slight Beneficial** (Options A and B) to **Moderate Beneficial (Option C)**.

Option values and non-use values

3.73. The scheme does not lead to a change in the availability of transport services or transport options. For all options, the impact on option values and non-use values is therefore considered to be **Neutral.**

### Distributional Impacts

3.74. A full Distributional Impact assessment has not yet been undertaken, but to provide an indication of the potential for both positive and negative impacts, relevant socio-economic data for 500m corridors either side of the existing A350 route and the three bypass options has been extracted and is presented in Table 3-10.

3.75. In passing through Melksham, there are almost 12,000 residents living within 500m of the existing A350. Almost 25% of these residents (mostly in northern Melksham) are living in areas estimated to be in the top 20% most income deprived in the UK, which is therefore higher than the averages for Wiltshire and England. There are also a higher proportion of Disability Allowance claimants living in this area. These groups would potentially benefit from the reductions in traffic volumes and associated noise, air quality and severance impacts along the existing A350 following the construction of a bypass (to a small extent under Options A and B, and a larger extent under Option C).

3.76. There are around 9-10,000 current residents living within 500m of the bypass corridors for Options A and B – mostly in eastern Melksham between Sandridge Common and the Spa area. Most of the socio-economic indicators, for these areas, are lower than the national averages, with the exception of Disability Allowance claimants.

3.77. There are around 6,000 current residents living within 500m of the bypass corridor for Option C – a smaller number in eastern Melksham than for Options A and B, but with the addition of areas on the southern fringe of Bowerhill. As with the other options, this area includes a higher proportion of Disability Allowance claimants than the national average, and a marginally higher proportion of children.

3.78. Overall, the analysis indicates that more people in vulnerable socio-economic groups are likely to benefit from the scheme (due to reduced traffic volumes on the existing A350), than would be adversely impacted by the increases in traffic on a bypass to the east of Melksham. Option C will have the largest benefit in drawing traffic away from the existing A350 as the route completely bypasses the town.

**Table 3-10 Distributional Impacts assessment for the existing A350 corridor and bypass options**

| Socio-economic group | Approximate % of residents within 500m buffer | | | | % of Pop in Wiltshire | % of Pop in England |
|---|---|---|---|---|---|---|
| | Existing A350 | Option A | Option B | Option C | | |
| 20% most deprived areas nationally (income) | 24.9% | 0.0% | 0.0% | 0.0% | 10.5% | 20% |
| Children (<16) | 18.2% | 17.9% | 18.6% | 20.4% | 19.6% | 19% |
| Older People (70+) | 9.8% | 8.6% | 8.1% | 6.0% | 8.3% | 8% |
| Disability Allowance Claimants | 8.2% | 7.2% | 7.2% | 8.0% | 2.1% | 5% |
| No Car Households | 6.3% | 4.7% | 4.7% | 2.4% | 6.2% | 11% |
| Black and Minority Ethnic | 3.0% | 2.3% | 2.4% | 2.5% | 3.3% | 15% |
| **Total Population** | **11,771** | **9,778** | **9,194** | **5,828** | | |

## Summary of economic case

3.79. The economic case has been prepared in a manner which is considered to be proportionate to the scale and preparedness of the scheme and appropriate for the SOBC stage. Transport network impacts have been forecast using the Melksham Transport Model developed specifically for this purpose, based on a cordoned version of the South West Regional Transport Model for an assumed opening year of 2023 and forecast year of 2041. The outputs from the model were

monetised using the DfT's TUBA software. Other economic, social and environmental impacts have been assessed qualitatively, taking account of the transport model outputs where relevant.

3.80. The monetised economic benefits of the A350 Melksham Bypass scheme are likely to outweigh its costs and any quantifiable negative impacts. Options A and B have initial BCRs of 1.69 and 1.95 respectively, indicating Medium Value for Money and Option C has an initial BCR of 2.20, suggesting it would present High Value for Money. Further development of the transport model to include improve representation of the Trowbridge and Bradford-on-Avon areas is likely to result in further benefits for Option C not included in these initial estimates.

3.81. The findings of the qualitative assessments are not considered to be significant enough to warrant any increase or decrease in the value for money categories. The potential moderate or major adverse environmental impacts that have been identified for landscape, biodiversity and water environment have scope to be reduced or mitigated through the planning and design process. There is also scope to ensure the scheme delivers net benefits in terms of noise, air quality and severance impacts.

3.82. Subsequent work undertaken post-appraisal has rescheduled the programme, shifting the opening date from 2023 to 2024. The appraisal undertaken at OBC stage will update the modelling to represent an opening year of 2024.

# 4. The Financial Case

## Outline

4.1. The financial case provides evidence on the affordability of the scheme, how it is to be funded and any technical accounting issues. It includes the financial profile for the scheme and the impact of the proposed investment on budgets and accounts.

4.2. The financial case contains the following key elements:

- The expected implementation cost of the scheme, including the base cost and risk allowance in outturn prices
- A cost profile showing costs for each year

4.3. Consideration of the key financial risks and long-term financial sustainability of the scheme, including robust plans to ensure the affordability of any ongoing costs for operation, maintenance and major capital renewals will be undertaken as part of the Outline Business Case for the scheme.

## Scheme costs

4.4. Scheme costs for Option A were calculated in 2016 prices using a Bill of Quantities and high-level structure costs. The costs for Options B and C were developed from this, based on a pro-rata cost per metre of new carriageway. The scheme cost breakdown is shown in Table 4-1.

**Table 4-1 Scheme costs (2016 prices)**

| Cost Item | Option A | Option B | Option C |
|---|---|---|---|
| **Construction Costs** | £19.5m | £25.2m | £44.7m |
| **Consultancy Costs** | £2.9m | £3.8m | £6.7m |
| **Land Purchase & Compensation** | £0.3m | £0.4m | £0.7m |
| ***Sub-Total*** | ***£22.7m*** | ***£29.4m*** | ***£52.1m*** |
| **Risk Allowance (10%)** | £2.0m | £2.6m | £4.6m |
| **Uncertainty factor (20%)** | £4.0m | £5.2m | £9.1m |
| ***Total*** | ***£28.7m*** | ***£37.2m*** | ***£65.8m*** |

4.5. The methodology for producing cost estimates for Options B and C is likely to result in over-estimation compared to Option A, as a large part of the original costs for Option A relate to the River Avon crossing structure and floodplain embankment.

4.6. However, the scheme costs for Options A and B are based on the construction of the new bypass route only, and do not currently include any allowance for changes which may be required to the existing highway network along Eastern Way and Spa Road which may be required to accommodate higher traffic volumes along this route. The costs for Options A and B are therefore likely to represent under-estimates of overall scheme cost. Neither is any allowance provided in the core estimates to the cost of changes to the existing A350 route through Melksham following opening of the bypass.

4.7. Given these uncertainties, in addition to the 10% risk allowance, an additional ‘uncertainty factor’ of 20% of the base costs has been added to derive the totals shown in Table 4-1. Based on these totals and assuming construction from 2021 to 2023, outturn costs for the three options (including inflation) are estimated as:

- Option A: £34.37 million
- Option B: £44.42 million
- Option C: £78.75 million

4.8. Taking all three Options into account, it is recommended that the outturn cost estimate for Option C (£78.8m) provides an indication of the maximum scheme cost, and should form the basis for budgeting and funding cover.

4.9. Subsequent work undertaken post-appraisal has rescheduled the programme, shifting the opening date from 2023 to 2024. This would result in an increase in outturn costs due to additional inflation. Allowing an additional 4% for inflation would result in the maximum scheme cost (for Option C) increasing to £81.9 million.

## Cost profile

4.10. Indicative cost profiles have been developed from the scheme cost breakdown for each option, assuming preparation starting in 2018 and construction to from 2021 to 2023 (Table 4-2). Following the rescheduled programme referred to above, the cost profile will be revised at OBC stage, but the impact of this is likely to be a shifting of the main construction costs back by 12 months to 2022-2024, and increases in these outturn costs due to inflation (of the order of 3-4%).

**Table 4-2 Indicative cost profiles for the scheme options (outturn prices)**

| Year | Option A | Option B | Option C |
|---|---|---|---|
| **2018** | £0.92m | £1.18m | £2.10m |
| **2019** | £0.99m | £1.28m | £2.27m |
| **2020** | £1.48m | £1.91m | £3.83m |
| **2021** | £12.51m | £16.17m | £28.67m |
| **2022** | £15.36m | £19.86m | £35.20m |
| **2023** | £3.11m | £4.02m | £7.12m |
| ***Total*** | ***£34.37m*** | ***£44.42m*** | ***£78.75m*** |

## Budgets / Funding cover

4.11. At this stage, it is assumed that the funding package proposed for financing the A350 Melksham Bypass scheme would comprise contributions from the DfT's Large Local Major Transport Schemes or Major Road Network fund and local contributions (from the SWLEP, Wiltshire Council and / or developer contributions)

4.12. If successful in attracting DfT funding, it is expected that the majority of scheme development and construction costs will be met from this source, with a maximum 5% contribution from the local SWLEP, Wiltshire Council and / or developer contributions. DfT guidance indicates that, if the scheme qualifies as a Large Local Major scheme, then separate funding from the Local Growth Fund is not required, although LEPs may still choose to contribute funding to the scheme.

4.13. The proposed funding package is therefore:

- DfT Large Local Major Transport Schemes / Major Road Network Fund – 95%
- Local contributions (SWLEP, Wiltshire Council and / or developer contributions) - 5%.

# 5. The Commercial Case

## Outline

5.1. The commercial case of an SOBC provides evidence on the commercial viability of a proposal and the procurement strategy that will be used to construct the scheme. It also presents evidence on risk allocation and transfer.

## Output based specification

5.2. The A350 Melksham Bypass scheme will involve the construction of a new bypass to the east of Melksham, and, potentially, improvements to the existing A350 route through the town for cyclists and pedestrians. The minimum estimated procurement value of the scheme is £23.4m million for Option A rising to £53.6m for Option C (outturn prices for construction and preliminaries elements only). However, costs which are currently included in the risk budget and uncertainty allowance may be transferred across into the construction costs as the scheme is developed, leading to an increase in the actual value to be procured.

5.3. Preparatory and site supervision aspects will be led by Wiltshire Council, either directly, or indirectly through an existing term contract. Preparatory and site supervision costs are therefore excluded from the value to be procured.

5.4. The outcomes which the preferred procurement strategy must deliver are to:

- Achieve cost certainty, or certainty that the scheme can be delivered within the available funding constraints
- Minimise further preparation costs with respect to scheme design by ensuring best value, and appropriate quality
- Obtain contractor experience and input to the construction programme to ensure the implementation programme is robust and achievable
- Obtain contractor input to risk management and appraisals, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk and improve outturn certainty thereby reducing risks to a level that is ‘As Low As Reasonably Practicable’.

5.5. The outputs which the preferred procurement strategy must deliver are summarised as:

- Construction of the earthworks, structures and main carriageway for the bypass, including any associated footpaths or shared use paths, signage, traffic signals and lighting
- Construction of a bridge and embankment over the River Avon floodplain
- New junctions and realignment of existing junctions where the bypass intersects existing roads
- Resurfacing of the existing A350 carriageway leading to and away from the new bypass
- Improvements to highway drainage system carrier drain
- Repairs to the existing kerbs and steel vehicle restraint barriers along the A350
- Changed the layout of the existing A350 through Melksham to include improved cycle and pedestrian facilities and potential traffic calming measures in northern Melksham and Beanacre.

5.6. For Options A and B, highway improvement works (possibly including widening, junction changes and signalisation, and noise mitigation) may also be required along Eastern Way and Spa Road, which would form part of the new A350 route connected to the bypass.

# Procurement strategy

5.7. The procurement process will be run in strict accordance with the legislative framework set out within the Wiltshire Council Corporate Procurement Strategy (2012). In addition, the process will be governed by the Council's own constitutional Contract Procedure Rules (2012) and will be subject to the Council's Procurement Gateway Process.

5.8. Under the Procurement Gateway Process, the strategy will be subject to review by the Council's Procurement Manager, senior Legal officer and senior officers from across the Council who are highly experienced in strategic procurement and contract management. Express approval must be gained from the Procurement Gateway Board in two stages, firstly to enable the tender documentation to be released and secondly to enable the procurement to move to the award procedure stage following review of the award recommendation.

5.9. The following considerations need to be accounted for in relation to the procurement of the scheme:

- The primary considerations are the supplier's ability to effectively carry out the works and early engagement of the supplier to ensure the inclusion of skills and knowledge at the earliest stage
- Complex engineering design capabilities will be required for the design and construction of the River Avon bridge and floodplain crossing, including provision of compensatory flood storage and environmental mitigation measures during the construction phase
- The land assembly process is likely to form a significant component of the scheme
- There is the possibility there will be a time constraint on the project – due to the constraints on the DfT funding there is a requirement for all funding to be spent on the project within specific financial years
- Consideration for traffic management arrangements during construction – an important element of scheme community relations and short-term environmental impacts
- Supplier environmental credentials
- Evaluation of social and environmental considerations in procurement process, for example use of sustainable materials, disposal of waste materials, use of local sub-contractors and human resources, etc
- Economic considerations in terms of value for money of suppliers

5.10. The main types of procurement strategy for capital works are:

- Traditional: design by client-engaged consultants before tender and separate placement of a contract for the construction works
- Design & Build (D&B): detailed design and construction are both undertaken by the same organisation
- Design & Construct (D&C): a hybrid of 'traditional' and D&B where part of the design is prepared before the contractor is appointed
- Construction management: design by the client's consultants and construction of the works overlap. A fee-earning construction manager defines and manages the work packages. All contracts are between a client and the trade contractors. The final cost of the project may only be accurately forecast when all packages have been let
- Management contracting: design by the client's consultant and construction overlap. A management contractor is appointed early to let elements of work progressively by trade or package contracts ('works packages'). The contracts are between the management contractor and the works contractors. As with construction management, the final cost can only be forecast with reasonable certainty when the last package has been let

- Private Finance Initiative/Public-Private Partnership (PFI/PPP): This procurement route is typically where a public sector client buys services with defined outputs from the private sector on a long-term basis, typically for 25 years. This will typically involve constructing and maintaining the delivered asset, and consequently the supplier is incentivised in this model to have the highest regard to whole-life costing as it has the risk of future operation and maintenance costs for a substantial period of time.

5.11. Decisions regarding the preferred procurement strategy will be made at Outline Business Case stage, once the requirements of the proposed scheme have been defined with greater certainty. Consideration will be given to traditional procurement versus alternative approaches such as D&B, and the relative merits of letting a single contract or a series of contracts, which could be split by route section or work type.

5.12. The detailed procurement strategy can be found in Appendix D.

# 6. The Management Case

## Outline

6.1. Clear and effective management arrangements are key to successful delivery of a major scheme. The management case ensures that the project is deliverable. It demonstrates that timescales and phasing are well established and realistic, that an appropriate governance structure is in place to oversee delivery, that risks have been identified and suitable management processes developed, and that there are robust plans for communications and stakeholder management. The management case also includes measures to ensure that the benefits set out in the economic case are realised and to assess and evaluate the impacts.

6.2. The management case contains the following key elements:

- A governance / organisational structure - identifying key roles and responsibilities (and their skills and experience), including a Senior Responsible Owner (SRO), defined through a suitable structure which includes arrangements for reporting and decision making
- A project plan for the further development, roll-out and implementation of the scheme – with the key outputs and milestones and critical path identified in the form of a Gantt chart
- Details of the reporting, assurance and approval process (including key stage-gates in scheme development / delivery)
- A risk management strategy, setting out how risks have been identified, their likely impact, appropriate mitigation, and how the risks will be managed (and by who)
- A communications strategy – including identification of key stakeholders, their level of participation and the means of involving them
- A benefits realisation plan setting out the approach to ensuring that the stated benefits are delivered
- A monitoring and evaluation plan - identifying suitable performance indicators to monitor progress against the identified scheme outcomes and the means of evaluating the overall effectiveness of the scheme

## Evidence of similar projects

### A350 North of Chippenham

6.3. The A350 North of Chippenham was a £2.7m scheme, submitted in February 2013, funded partly through the Government's Local Pinch Point Fund. The scheme comprised of a combination of road widening and junction improvements, consisting of:

- Widening the A350 to dual two lanes in both directions between the Badger and Malmesbury Road Roundabouts
- Minor adjustments to the Badger Roundabout
- Improvements to Malmesbury Road Roundabout
- Widening A350 to two lanes southbound between Jackson's Lane and Malmesbury Road Roundabout

6.4. The scheme aimed to reduce congestion and increase journey time certainty and savings. The scheme also set out to help achieve Gross Value Added to the local economy of £5.9 million, through the creation of additional jobs.

6.5. The scheme was originally set to be completed in December 2014, but due to design issues this was rescheduled to early 2015. Construction was completed in February 2015, with an outturn construction cost of £3.82m, with extra funding from Wiltshire Council.

### A350 Chippenham Bypass Improvements (Bumpers Farm)

6.6. The Bumpers Farm Improvements, completed in February 2016, was a £3.4 million scheme funded by the Local Growth Fund (LGF). This delivered increased capacity along the A350 Chippenham Bypass near Bumpers Farm roundabout. The scheme consisted of:

- Widening the A350 to dual two-lane between Brook and Bumpers Farm roundabouts
- Additional widening of the A350 for approximately 250m north of Brook roundabout
- Widening the A350 to dual two-lane for a short stretch immediately south of Bumpers Farm roundabout
- Minor widening of Bumpers Farm Industrial Estate entry arm to Bumpers Farm roundabout

6.7. The scheme was programmed for a 38-week construction period. However, despite minor design changes the works were completed 7 weeks ahead of schedule. The scheme quarterly spend profile matched that predicted in the Full Business Case and the project was completed to budget.

### A350 Chippenham Bypass Improvements (Badger-Brook and Chequers)

6.8. The A350 Chippenham Bypass Improvements (Badger-Brook and Chequers) builds upon the A350 Chippenham Pinch Point scheme and Bumpers Farm improvements. The £7.1m scheme is funded by the Government's Growth Fund and is currently in the construction period, with a projected completion date of August 2018.

6.9. The scheme consists of:

- Widening the A350 to dual two-lane between Cepen Park South and Chequers roundabout
- Additional widening of the A350 for approximately 250m north of Cepen Park South roundabout and 250m south of Chequers roundabout
- Widening the A4 Bath Road westbound approach and exit to Chequers roundabout
- Widening the A350 to dual two-lane between Badger and Brook roundabout

6.10. The Badger-Brood and Chequers scheme, on completion, aims to significantly improve journey time reliability, reduce average peak-period journey times and reduce traffic flow on B4528 Hardenhuish Lane and B4528 Hungerdown Lane.

### A350 Yarnbrook and West Ashton Relief Road

6.11. The A350 Yarnbrook/West Ashton improvements is a £17.1m scheme, funded through the Government's Growth Fund, and consists of:

- Construction of 2.5km of new carriageway, including a link to Yarnbrook roundabout
- Conversion of West Ashton signals to a three-arm priority junction
- Existing A350 to be stopped up and landscaped at both ends
- Construction of three new roundabouts (with the A363 Westbury Road; connecting the existing A350 between Yarnbrook and West Ashton, and into Ashton Park to the north; and intersecting the existing West Ashton Road)

6.12. The scheme has been through OBC and is awaiting planning approval. However, the proposed benefits are:

- Reduction in congestion on the A350 corridor at West Ashton and approaching Yarnbrook roundabout

- Improvement to journey time reliability on the A350 corridor
- Facilitation of housing and employment growth in the Ashton Park Urban Extension
- Reduction in the number of road accidents in the Yarnbrook and West Ashton areas

## Programme / project dependencies

6.13. The Melksham Bypass scheme is a stand-alone scheme, which can be delivered as designed and costed regardless of whether other local schemes are progressed. The only significant project dependency is the completion of the proposed extension to Eastern Way (between Thyme Road and Spa Road) which is being constructed by developers as part of a development of 450 new dwellings, and which would form part of the new A350 route under Options A and B. This dependency does not exist for Option C since it provides a complete bypass of the Melksham area.

## Governance, organisational structure and roles

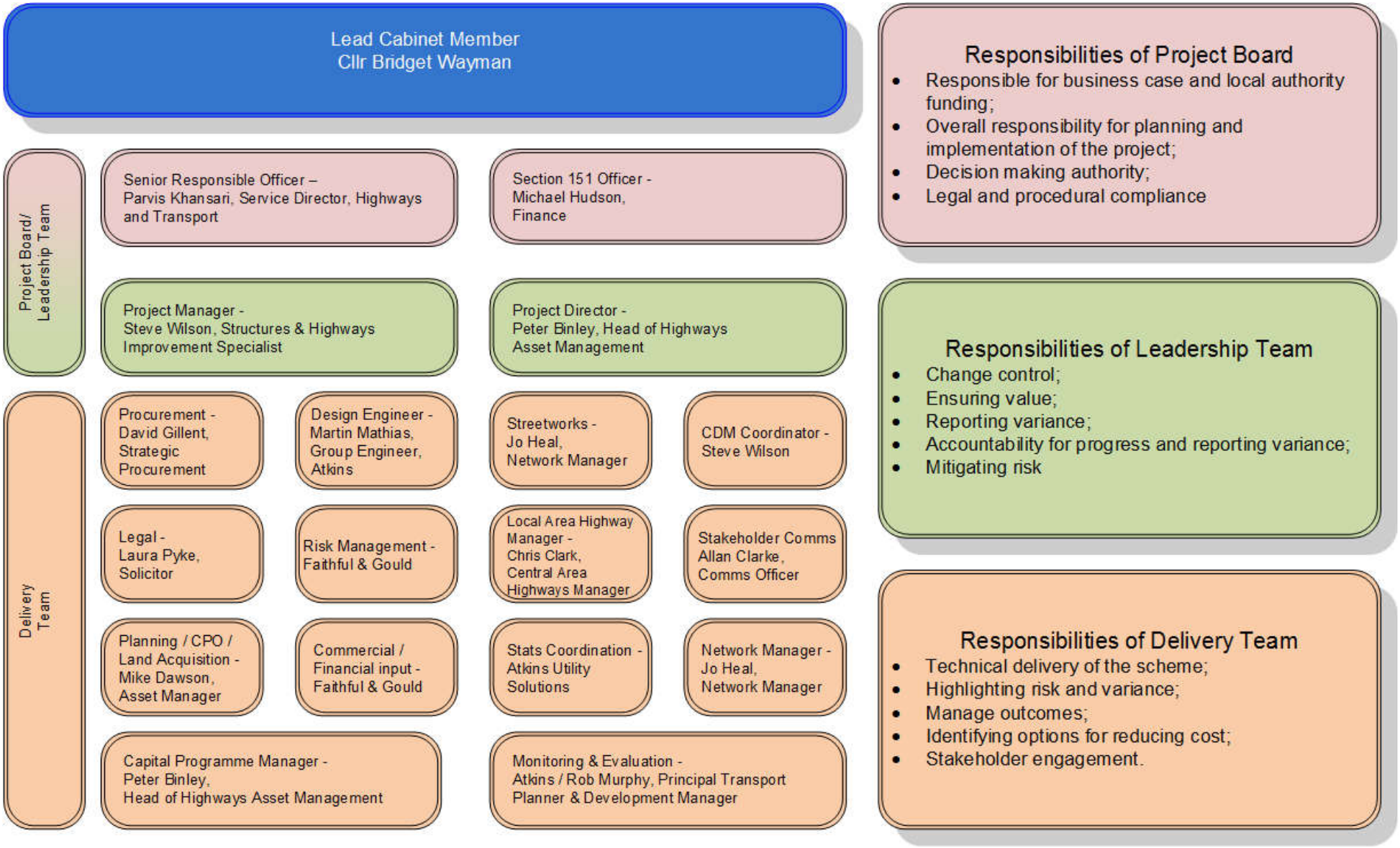
6.14. Wiltshire Council will establish a Project Board (as seen in Figure 6-1) for delivering the Melksham Bypass scheme. The Project Board will take overall responsibility for its delivery and will be formed by Council representatives at sufficiently senior level to have authority to act on behalf of the Council. Meetings of the Project Board will take place at least monthly, but will also be linked to key milestones, where they will consider progress through Highlight and Exception Reports, changes to the risk register, and changes to the Scheme Implementation Programme.

6.15. The Project Board will be led by the Senior Responsible Owner (SRO), Parvis Khansari (Service Director, Highways and Transport). The SRO will be responsible for nominating the Project Board chairperson and for providing guidance and direction to the Project Manager. The SRO will ensure 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.

6.16. Following SOBC approval, which is yet to be determined, the Project Manager will be appointed by the SRO and will be responsible for delivering the scheme in line with the agreed controls and procedures set out in the Project Plan. The Project Manager will report to, and be accountable to, the SRO and the Project Board. The primary focus of the Project Manager will be to ensure that the scheme is delivered on time, within budget and to specification. The Project Manager will also be responsible for preparing Highlight and Exception Reports.

6.17. Figure 6-1 graphically displays the governance, organisational structure and roles:

**Figure 6-1 Project Governance, Organisational Structure, and Roles**



## Programme

6.18. Key project milestones from SOBC submission to scheme completion are listed in Table 6-1, and a full programme Gannt chart in Appendix E. It should be noted that this programme is based on a positive informal response being received from the DfT to the SOBC and the availability of funds to progress the development of the OBC in 2018/19.

6.19. In order to complete scheme construction by 2024 financial year, preliminary design work including route options assessment would be undertaken during 2018, leading to the production of the Outline Business Case for the scheme. Environmental assessment, the planning process and detailed design will be completed by 2022 with an aim for construction period is expected to last approximately two years.

**Table 6-1 Project milestones**

| Milestone (* = critical path date) | Estimated date |
|---|---|
| Informal submission of SOBC to DfT | December 2017 |
| Informal comments received from DfT | January 2018 |
| Wiltshire Council decision on continuation to OBC* | April 2018 |
| Development of OBC | May 2018 – October 2019 |
| Public / stakeholder consultation on route options | June - July 2018 |
| Public / stakeholder consultation on preferred route option | Quarter 1 2019 |
| Wiltshire Council approval of preferred route option and OBC* | Quarter 3 2019 |
| OBC submission | Quarter 3 2019 |
| DfT approval to proceed to Full Business Case (FBC)* | Quarter 4 2020 |
| Construction | Q1 2022 – Q1 2024 |

6.20. The construction works may (depending on the preferred option) involve the following operations:

- Significant traffic management
- Construction of the new carriageway and junctions
- Construction of bridges and other structures including
- Existing junction upgrades/ changes
- Landscaping
- Demolition of structures.

6.21. Delivering the scheme will likely require the compulsory purchase of land, planning permission, traffic regulation orders and public right of way orders.

## Assurance and approvals plan

6.22. The A350 Melksham Bypass scheme is currently being progressed in line with the DfT's guidance regarding the transport business case.[3] This is a three-phase process, as illustrated in Figure 6-2.

[3] https://www.gov.uk/government/publications/transport-business-case

**Figure 6-2 The three phases of the decision making process**


6.23. This SOBC represents Phase 1 of the decision-making process. It has established the need for intervention and has assessed the strategic fit and potential economic, social and environmental impacts for a range of options, resulting in a short-list of three options which are presented for consideration. Based on the information presented in the SOBC, Wiltshire Council and the DfT will decide whether to proceed to Phase 2 (Outline Business Case).

6.24. The Outline Business Case will concentrate on detailed assessment of the options (and more detailed variants of these, which in this case will include evaluation of specific bypass route alignments) to find the best solution. Following public consultation, route option assessment and preliminary design, full economic and financial appraisals will be undertaken and a preferred option will be identified. The commercial and management cases will also be further developed.

6.25. Based on the information presented in the OBC, the DfT will decide whether to proceed to Phase 3 (Full Business Case). If this is granted, detailed designs and statutory processes will be completed, along with acquisition of land required for the scheme and procurement of the main contractor.

6.26. The Full Business Case will:

- provide details of the project's overall balance of benefits and costs against objectives and set out plans for monitoring and evaluating these benefits when required
- confirm the strategic fit and the case for change
- provide the business and financial rationale for the project
- detail the proposed contract management resourcing, processes and benefit realisation plans;
- show how the return would justify the overall investment of time and money
- continue to be used to align the progress of the project towards achieving business objectives

6.27. Full Business Case approval is anticipated for March 2021. It is at this stage that a formal agreement will be made between the DfT and Wiltshire Council setting out the terms and conditions under which funding is to be spent on the scheme construction, and approval for construction works to proceed is granted.

## Communications and stakeholder management

6.28. While limited engagement with key stakeholders has been undertaken, public consultation for the scheme has not yet been undertaken. However, arrangements will be made for this to take place in early 2018, to inform the route option assessment and preliminary design process. Further rounds of public consultation will take place at key decision points, including selection of the preferred route option and preliminary design, and prior to finalising scheme design.

6.29. Aside from public consultation events, there will be a requirement for on-going engagement with key stakeholders throughout the design process, including landowners, statutory bodies, town and parish councils.

6.30. Press releases will be issued at key points in scheme development to ensure maximum public awareness and encourage attendance and feedback during public consultation phases. A communications plan will be prepared for the construction phase to ensure the public, emergency services and transport operators are informed regarding any impacts on the operation of the highway network, although most of the works will be off-line.

6.31. Announcements and information will also be published on the Wiltshire Council website, and the Council will liaise with the DfT to provide scheme information on their website.

6.32. Table 6-2 below summarises how and when stakeholders will be informed of the scheme and Appendix F details the full communication and stakeholder plan.

**Table 6-2 Stakeholder management**

| Who | How | Inform/involve/consult | When |
|---|---|---|---|
| Cabinet | Briefings | Inform, involve and consult | As necessary, and at key decision points |
| All Councillors | Internal Member documents | Raise awareness and consult | At key points in the project |
| Councillors local to scheme | E-mail updates | Consult and gain buy-in | As necessary, and at key decision points |
| Local MPs and MEPs | One to one briefings | Consult and gain buy in | As necessary |
| Town / Parish Councils and Area Boards | Attendance at meetings | Consult and gain buy in | As necessary |
| Public | Press releases and website | Inform, raise awareness | As project progresses |
| Media and Social Media | Press releases. Twitter account | Inform | As project progresses |
| Emergency services | Regular meetings | Consult and gain buy in | As project progresses |
| DfT | Regular project meetings | Consult and seek approval | At key points in the project |
| Bus and coach operators | Regular meetings | Consult and gain buy in | As project progresses |
| Statutory bodies – Environment Agency, Natural England and English Heritage | Letters and meetings on key aspects of scheme design | Inform, consult and seek approval | As necessary to achieve licenses |

## Project reporting

6.33. 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.

6.34. 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 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.

6.35. The SRO is responsible for keeping the Lead Members aware of the development of the scheme towards meeting the project objectives.

6.36. Project team meetings are held monthly, with the outcomes escalated to the Project Board.

## Risk register and management strategy

6.37. An initial risk register (Figure 6-3) has been prepared for the A350 Melksham Bypass scheme, comprising twelve high-level risks. As the scheme progresses to the OBC stage, the risk register will be developed and used as the basis of a Quantified Risk Assessment which will replace the 10% risk allowance currently included in scheme cost estimates. Risk owners and mitigation measures will be identified, along with cost and time impacts for each risk. The register will be reviewed regularly and will pass to new owners as appropriate.

6.38. The risk management plan describes how risk management will be structured and performed on the project to ensure risks are being managed and controlled at acceptable levels. The objective of the risk management process is to minimise the impact of unplanned incidents on the project, by identifying and addressing potential risks before significant, negative consequences occur. The full risk management strategy can be found in Appendix G.

6.39. The process examined below is considered to be relevant to the delivery of risk products for the SOBC. It is noted that, as the scheme progresses, the methods of assessment may change, most notably with the move to a Quantitative Risk Assessment in the OBC and FBC.

6.40. The risk register was created through discussions with the consultant Project Manager and the design, environment, economic and modelling teams. This will be transferred into a full OBC stage risk register product, augmented by the identification of risks through: ‘brainstorming’, working groups, a regular risk call and risk workshops. For each risk a clear understanding of cause, event and impact is required before an assessment can be made regarding the rating levels of probability and impact can be assigned.

6.41. To assess the effect of a risk, each one will be assigned a level of probability and impact on the project. When combined, according to the 5x5 matrix (Table 6-3), an overall risk rating is calculated. The specific levels of probability and impact for each identified risk will be proposed, discussed and agreed through many of the same channels as identified for risk identification.

6.42. Once risks have been identified and assessed, decisions will need to be made on how best to respond to them. The 5 “T’s” (the concept of applying five basic options for responding to risk) will be adopted and are: treat, transfer, tolerate, terminate and take the opportunity. The proposed mitigation of identified risks will be undertaken by the risk owner.

6.43. The reporting and escalation of risks is an essential element of the management process, therefore a Risk Coordinator will be responsible for updating the Project Manager on a monthly basis. If a high or critical risk is identified, the Project Manager will be informed immediately and discussions will be held to appoint a risk owner and mitigation plan.

6.44. Risk will be reviewed by the Risk Coordinator on a monthly basis through a discussion with discipline leads to summarise the change in the risk register and request information on new risks. Regular one-to-one meetings will also be held between the Risk Coordinator and the discipline leads. Changes to the risk register will also be reported to the monthly Project Board meetings.

**Figure 6-3 Initial risk register**

| Risk Cause | Risk Event | Risk Impact | Probability | Impact | Classification |
|---|---|---|---|---|---|
| Availability of funding | Funding from DfT not provided or withdrawn | The scheme cannot be delivered within the envisaged timescale | 3 | 5 | 15 |
| Protests/objections due to the scheme's environmental impact, private access impact, public rights of way change, induced traffic or the process used to select option not transparent | Stakeholder or public objections to the scheme which may delay the process | There could be delays to the design or construction, with associated cost implications | 3 | 4 | 12 |
| A change in design due to public objection, changes in standards, etc. | Future costs will change, due to changes in design | The scheme may not be able to proceed or additional funding will have to be sourced | 2 | 2 | 4 |
| The traffic modelling and/or appraisal fails to meet WebTAG criteria | The modelling process takes longer than expected | There could be delays to the remainder of the programme, with associated costs | 2 | 2 | 4 |
| Incorrect data supplied or 'noise' in the transport model | The model overpredicts issues in the Do-Minimum | There will be a lack of quality and assurance in the results and potential time and cost implications to resolve | 3 | 2 | 6 |
| The model assumes that some transport and/or development schemes are going ahead and then don't | There are changes to local developments or transport schemes that cause forecast assumptions to be invalid | There are quality issues in the model or potential delays and costs to re-do the transport model | 2 | 1 | 2 |
| There is a large amount of additional infrastructure required to provide a suitable solution including changes to existing road network to cope with increased traffic volumes | An effective solution cannot be obtained within the budget and/or the scheme delivery may require changes to the current road network | The scheme cannot go ahead or additional funding will have to be sought | 3 | 5 | 15 |
| The options all require crossing the River Avon floodplain | River /floodplain crossing requires unforeseen flood or environmental mitigation works | Delays to the design and construction of the scheme and additional costs associated with mitigation works | 3 | 4 | 12 |
| There are variable and unpredictable geological features and/or conditions | The ground conditions may not be suitable for the options | There may be changes to the construction method and/or schedule, or changes to design | 3 | 2 | 6 |
| The environmental survey results in further analysis required | There is a recommendation that the scheme requires an EIA | The application has to be resubmitted, consultation redone, both of which will have cost and programme implications | 2 | 2 | 4 |

| Risk Cause | Risk Event | Risk Impact | Probability | Impact | Classification |
|---|---|---|---|---|---|
| Further environmental surveys result in new findings | There is an unexpected protected species found | The programme and method could change to allow for breeding and/or relocation, with additional costs associated to this | 3 | 2 | 6 |
| Unknown archaeological remains found within or outside of construction area | Archaeological finds require changes to alignment / design | There will be additional costs and delays to design and construction. | 2 | 4 | 8 |

**Table 6-3 5x5 Probability and impact matrix**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PROBABILITY | >80% | Very High (5) | 5 | 10 | 15 | 20 | 25 |
| | 51 to 80% | High (4) | 4 | 8 | 12 | 16 | 20 |
| | 21 to 50% | Medium (3) | 3 | 6 | 9 | 12 | 15 |
| | 6 to 20% | Low (2) | 2 | 4 | 6 | 8 | 10 |
| | <5% | Very Low (1) | 1 | 2 | 3 | 4 | 5 |
| | | **IMPACT** | Very Low (1) | Low (2) | Medium (3) | High (4) | Very High (5) |
| | | Cost | <0.5% | 0.5 to 1% | 1 to 3% | 3 to 5% | >5% |
| | | Schedule | <1% | 1 to 5% | 5 to 10% | 10 to 20% | >20% |

CRITICAL RISK
HIGH RISK
MEDIUM RISK
LOW RISK

# Benefits realisation, monitoring and evaluation plan

6.45. Tracking of the scheme benefits will be a key element in understanding the success of a specific intervention. The realisation of benefits will be reviewed through the Monitoring and Evaluation plan (discussed in the following section and further detailed in Appendix H).

## Scheme objectives, outcomes and impacts

6.46. The objectives and success indicators for the A350 Melksham Bypass scheme are set out in the Strategic Case where a SMART objectives table (Table 2-6) has been produced and further detailed in the Logic Map seen in Figure 6-4. The benefits resulting from reduced journey times, personal injury accident reductions, and mitigation of future development impacts are emphasised using specific, measurable, agreed upon, realistic, and time bound objectives (SMART).

6.47. The Wiltshire Council Project Manager will be the owner, responsible for tracking the benefits being realised and for reporting any exceptions to the Project Board. This will allow early identification of any particular areas where benefits are not being realised as expected, allowing the Project Board to appoint someone with sufficient expertise to oversee remedial actions to try to bring benefits back in line with expectations.

## Benefit monitoring

6.48. The monitoring of the benefits realised against each objective is reviewed within the Monitoring and Evaluation plan. This sets out the necessary data and information requirements to track the performance of objectives.

## Monitoring and evaluation

6.49. Monitoring and evaluation of the scheme will occur 1 year and 5 years after it is implemented by Wiltshire Council. A budget will be established for the monitoring and evaluation of the scheme to take place specifically, monitoring traffic volumes, delays, and collisions experienced on the new bypass as well as the A350.

6.50. A key element of the Monitoring and Evaluation plan is to map the intervention logic. This involves systematically linking key components of an intervention to produce a causal pathway, further explained in Appendix H and graphically displayed in the logic map (Figure 6-4).

6.51. The intervention logic map shows the process by which the scheme outputs will deliver the primary objectives for intervention (shown as light grey coloured boxes), and describes an outline evaluation approach for monitoring the extent to which these are achieved as part of a pre-opening and post-opening monitoring report.

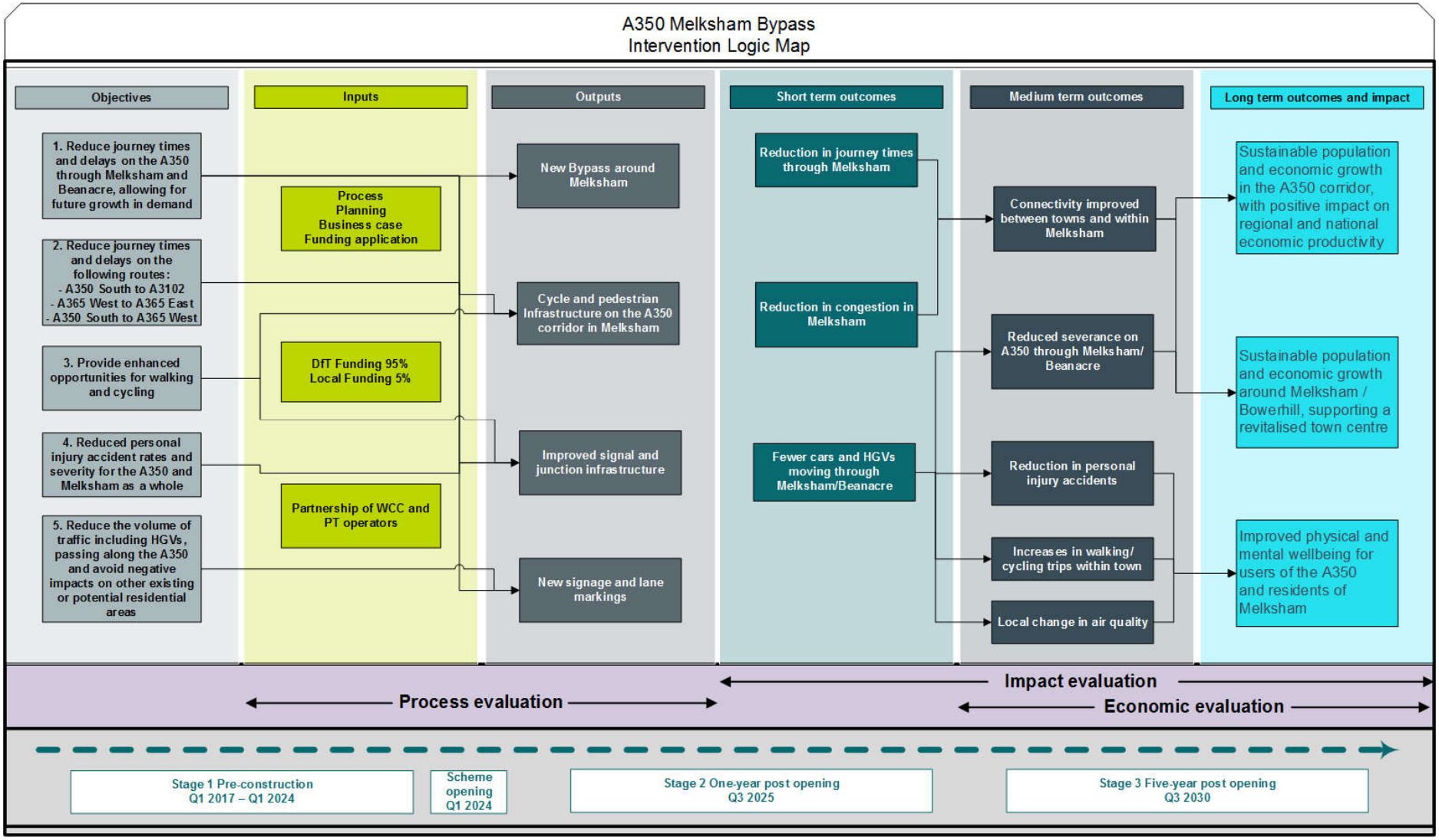
6.52. The map also shows wider and longer-term impacts, which depend on the delivery of the primary objectives.

6.53. Some objectives will be realised immediately or shortly after the scheme opens; such short and medium-term scheme effects are referred to as outcomes. Other objectives such as supporting economic growth and development are less direct and tangible effects of the scheme and are expected to take effect over a longer period; these longer-term effects are called impacts.

6.54. For this reason, the Scheme Monitoring and Evaluation Plan will be undertaken in three distinct stages:

- Stage 1 - Pre-Construction Study
- Stage 2 - One Year Post Opening Process Evaluation, Q3 2025
- Stage 3 - Five Year Post Opening Impact Evaluation Study, Q3 2030

**Figure 6-4 Intervention Logic Map**



## Project management summary

6.55. The management approach that has been proposed for the A350 Melksham Bypass scheme is proportionate to the overall scheme cost, its deliverability and the relatively low level of risk. The key points to note are:

- A Project Board will be established, comprising senior Council representatives, to oversee delivery of the A350 Melksham Bypass. An SRO and Project Manager will be appointed, with the Project Manager reporting to the Project Board
- The Risk Register (Figure 6-3) will be reviewed and updated on a regular basis, with risk owners appointed as appropriate to the type of risk and the stage of scheme delivery at which the risk could be realised
- A Communications Plan (Appendix F) has been prepared to ensure that the public and key stakeholders are kept informed of project progress and to allow for feedback during the detailed design process
- The Benefits Realisation, Monitoring and Evaluation Plan (Appendix H) will ensure that data collection and reporting is focused tightly on the objectives and success indicators that have been set out in the Strategic Case

6.56. Overall, the A350 Melksham Bypass scheme is considered by Wiltshire Council to be a deliverable scheme, which will ensure that the A350 continues to function as a strategic link and that economic growth in Wiltshire is enabled by targeted investment in transport infrastructure.

**Contact name**
Tony Jarvis
Atkins
500 Park Avenue
Aztec West Almondsbury
Bristol BS32 4RZ

**Email** Tony.Jarvis@atkinsglobal.com
**Telephone** 01454 663 148