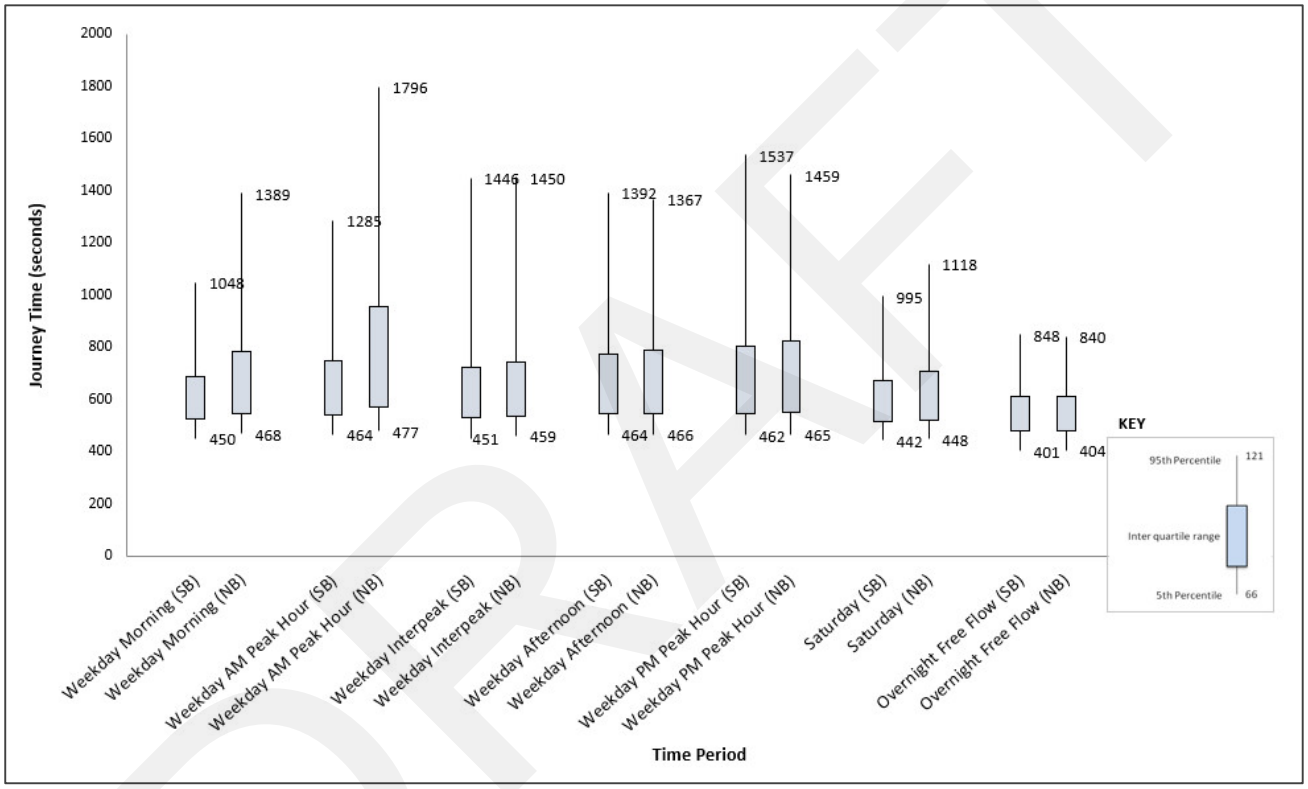
- Most other weekday time periods have a range of around 15 minutes, with weekday morning (0700-0800) southbound having the smallest weekday range at around ten minutes. The journey time ranges on a Saturday and overnight are much smaller.
- For all time periods, the range between the upper quartile and the 95th percentile is greater than the range between the lower quartile and the 5th percentile, suggesting that when there are variations to the journey time, journey time increases are much more significant than journey time decreases, with the potential for large variations in journey times due to delays and congestion.
- The largest interquartile range is again in the weekday AM peak northbound at around six and a half minutes, suggesting that variations in journey time are relatively common for this time period. All other weekday interquartile ranges are around 3 to 4 minutes.

The route is more susceptible to variations in journey time as there are very limited alternative north-south routes. Hence, incidents on the route are more likely to result in significant congestion and delays.

**Figure 4-4 – Journey time reliability along the A350 at Melksham**




*Note – the Interquartile Range is a measure of variability based on splitting data into quartiles (dividing the range of data into four equal parts). The values that split each part are known as the first, second and third quartile. The interquartile range is equal to quartile 3 minus quartile 1. The greater the range, the higher the variability.*

### 4.1.3. Collisions

Between 2015 and 2019, 304 collisions were reported in Melksham, with 72 (37%) of these occurring on the A350. Of the collisions in the Melksham area, approximately 19% were considered fatal or serious collisions – seven resulting in a fatality and another 51 categorised as serious and which required immediate medical attention **(Table 4-5)**.

**Table 4-5 - Personal injury vehicle collisions reported on the A350 in Melksham from 2015 to 2019**

| Year | Number of collisions | % of total | Involved Cyclists | % of total | Involved Pedestrian | % of total |
|---|---|---|---|---|---|---|
| 2015 | 80 | 26% | 10 | 28% | 9 | 33% |
| 2016 | 70 | 23% | 8 | 22% | 4 | 15% |
| 2017 | 48 | 16% | 4 | 11% | 5 | 19% |
| 2018 | 59 | 19% | 6 | 17% | 6 | 22% |
| 2019 | 47 | 15% | 8 | 22% | 3 | 11% |
| Collision severity | | | | | | |
| Fatal | 7 | 2% | 0 | 0% | 1 | 4% |
| Serious | 51 | 17% | 8 | 22% | 6 | 22% |
| Slight | 246 | 81% | 28 | 78% | 20 | 74% |
| Total collisions | 304 | 100% | 36 | 100% | 27 | 100% |

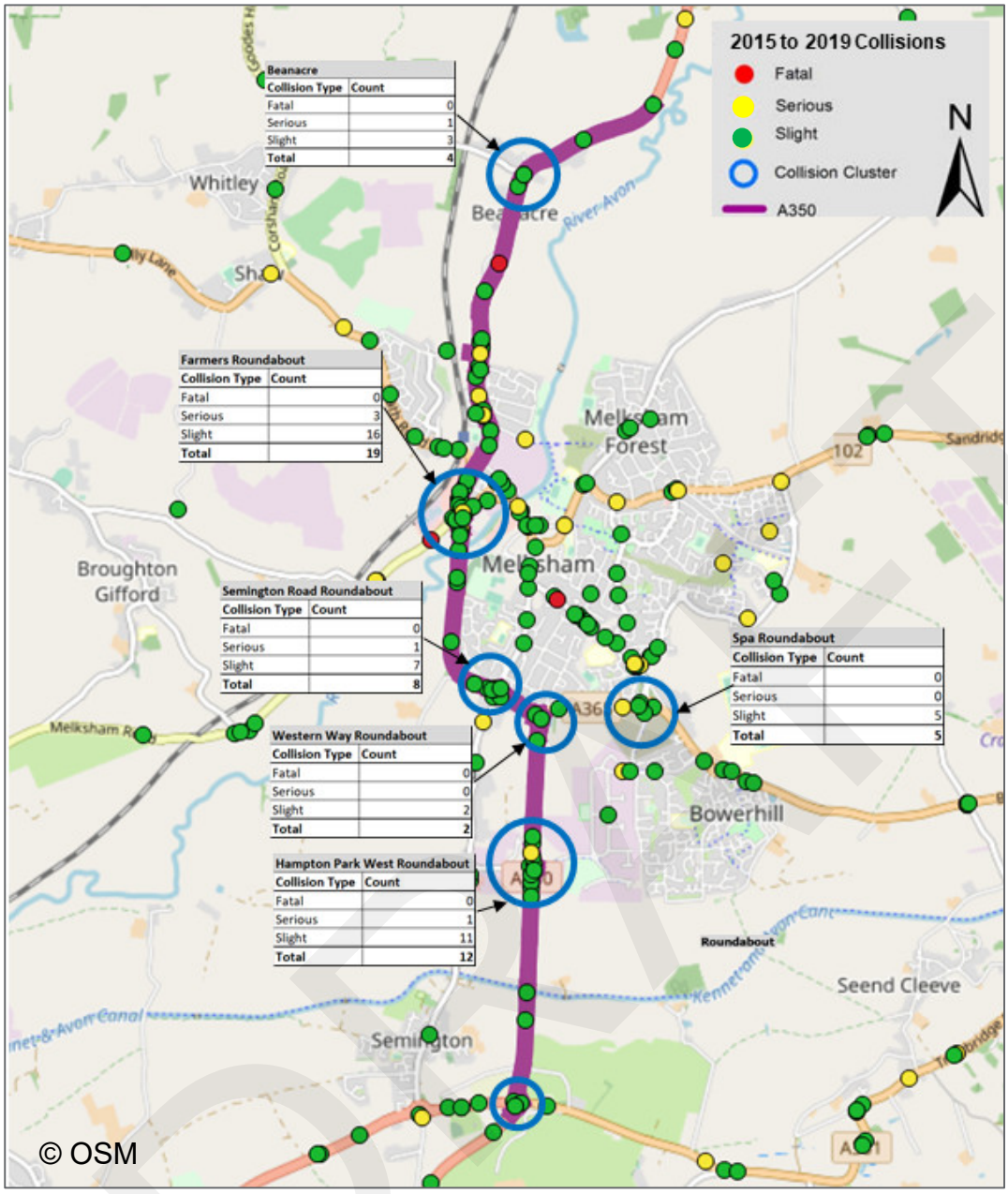
Source: STATS19 Database / Wiltshire Council

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 Road roundabouts, and with high average severity on the A350 **(Figure 4-5)**. There are several clusters of collisions along the A350 at its busiest junctions – especially Farmers Roundabout[22], 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 fatality in Beanacre), as well as the whole town centre route from Farmers to Spa Roundabout via Bank Street, High Street and Spa Road, which also has one fatality.

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 which presents increased potential for accidents.

[22] It should be noted that improvements were made at Farmers Roundabout in late 2019 that may reduce accidents, but this data is not captured here.

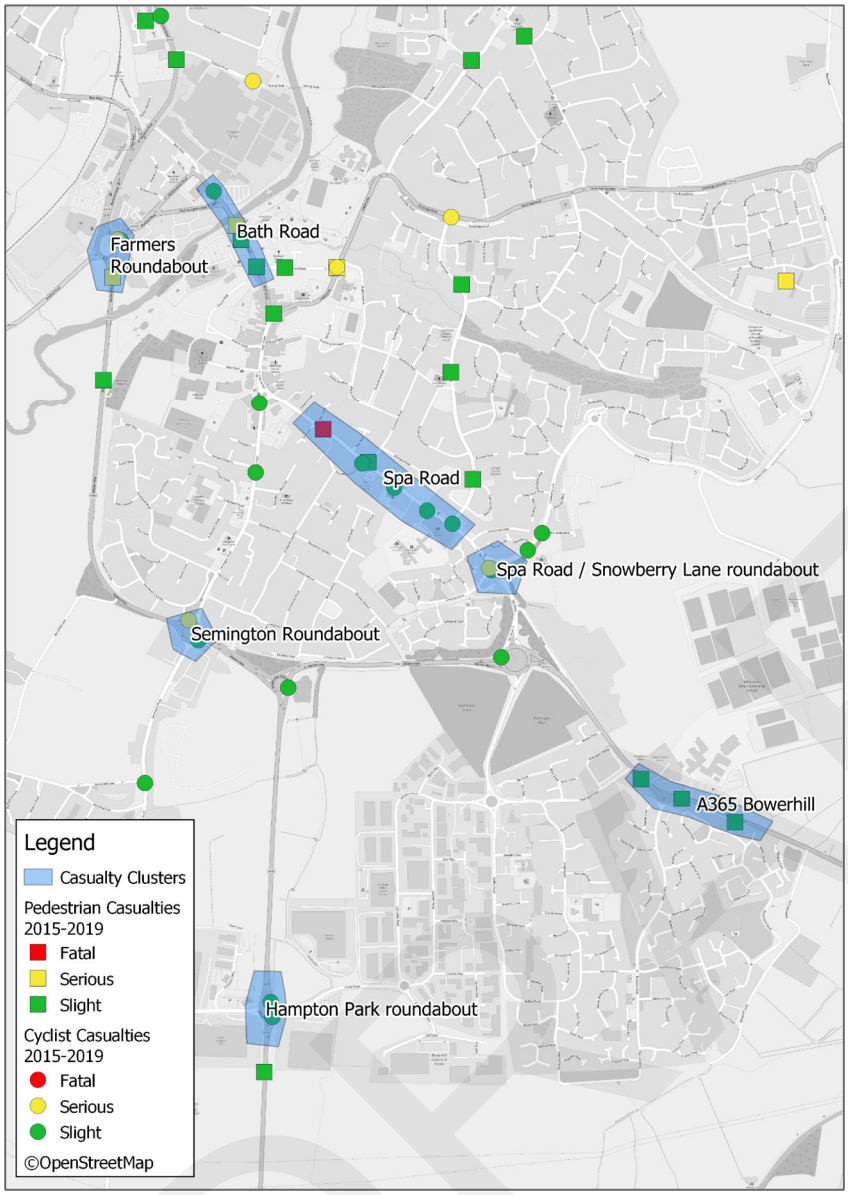
**Figure 4-5 - Personal injury vehicle collisions reported in Melksham 2015 to 2019**




Source: STATS19 Database / Wiltshire Council

Further analysis of collisions within the study area indicates that there were 24 collisions resulting in injury to pedestrians and 33 collisions resulting in injuries to cyclists between 2015 and 2019 **(Figure 4-6)**. The majority of these were classified as slight injury and the vast majority were on routes within urban areas. There was one fatal collision involving a pedestrian. There were no cyclist fatalities in the study area. There were no recorded collisions involving an equestrian within the study area in the five-year period.

**Figure 4-6 - Vehicle collisions with cyclists and pedestrians reported in Melksham 2015 to 2019**




Source: Wiltshire Council

There are clusters of accidents involving pedestrians and cyclists in the centre of Melksham, especially along bath Road and Spa Road, as well as clusters at roundabouts such as Farmers Roundabout[23], Spa Roundabout and Semington Roundabout.

Four pedestrian casualties and one cyclist casualty were recorded along Bath Road. Three of the pedestrian casualties took place at designated crossing points, the fourth pedestrian sustained slight injuries when being hit by a car as they attempted to cross the carriageway at an undesignated crossing point. The cyclist casualty occurred outside of the Cooper Tire factory at the north-east end of Bath Road.

Four cyclist and two pedestrian casualties were recorded along a 500m stretch of Spa Road, from Queensway Drive to New Lawns. All four cyclist casualties were a result of vehicles joining Spa Road from side streets, not seeing the cyclists travelling either north-west or south-east on the main carriageway and colliding with them. A pedestrian was struck by a car when crossing the Coronation Road junction with Spa Road. A collision

[23] It should be noted that improvements were made at Farmers Roundabout in late 2019 that may reduce accidents, but this data is not captured here

involving a pedestrian occurred on Spa Road in close proximity to the junction with Wharf Court. A car struck the pedestrian as they crossed the road, resulting in a fatality.

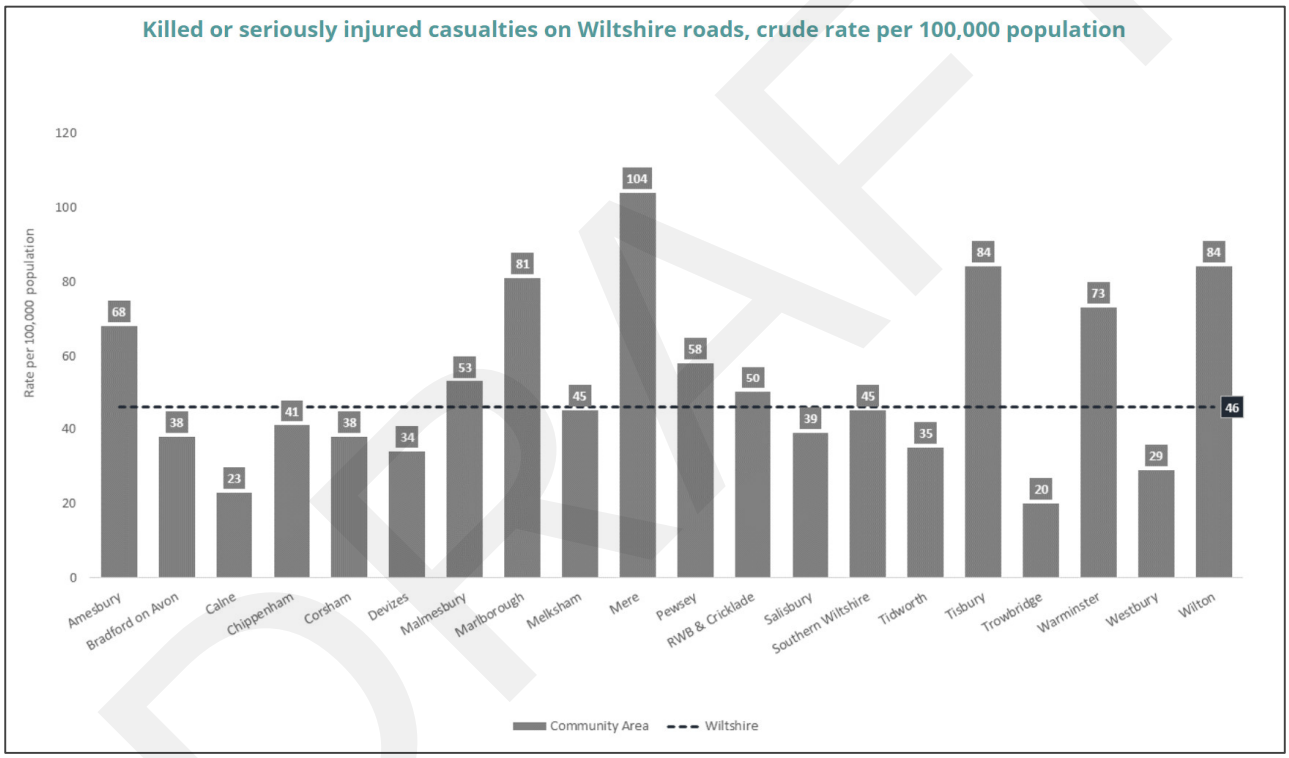
Three collisions involving pedestrians and cyclists occurred at Farmers Roundabout. The pedestrian casualty was the result of a road rage incident. Two collisions involving cyclists occurred on the Farmers Roundabout circulatory carriageway. Both incidents involved cyclists struck by cars either entering or exiting the roundabout, with one resulting in serious injury and the other resulting in slight injury to the cyclist.

In comparison with the A350, there is a much higher proportion of vehicle collisions with pedestrians along Bank St / High St, and with cyclists on the whole town centre route extending along Spa Rd. However, the severity of the collisions experienced along this route is somewhat lower on average, with nearly all of them being classified as slight and only one serious cyclist collision reported along the entire corridor.

In addition to the personal injury, social and financial costs associated with collisions, the high incidence along the A350 will contribute to disruption of traffic flow, especially if account is taken of the potentially larger number of unreported collisions which did not involve personal injury.

Based on accident data for different community areas across Wiltshire the overall accident rate within Melksham is broadly average **(Figure 4-7)**, although as noted above a significant proportion of the accidents within the Melksham are associated with the A350 route.

**Figure 4-7 - Road accidents and safety statistics for Wiltshire (Department for Transport, 2016-2018)**




## 4.1.4. Severance

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. This should be seen in the context of the volume and type of traffic using the route (section 2.2.4), in particular the volume of HGV's.

At Beanacre, the A350 is the main thoroughfare through the village, with no controlled crossing points. Properties are located very close to the road – some less than three metres from the carriageway **(Figure 2-11)**.

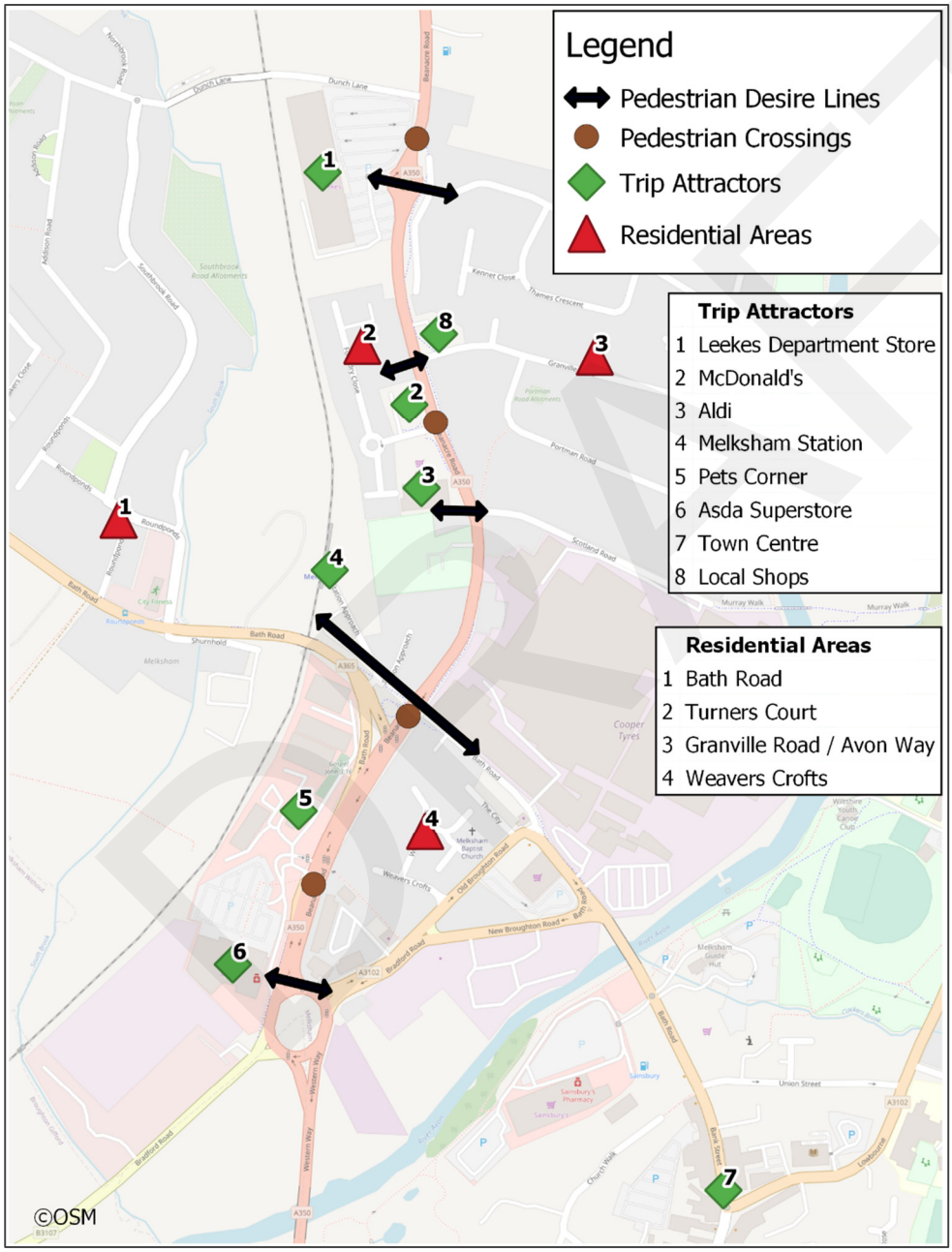
In northern Melksham, the A350 acts as a barrier to pedestrian and cycle movements between the town centre / east Melksham and areas to the west of the River Avon, including various retail and commercial uses, such as the Asda superstore, rail station, Aldi, and Leekes department store **(Figure 4-8)**. The A350 separates housing on the eastern side (Granville Road / Avon Road) and western side (Turners Court). 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 directly opposite at Turners Court. The only pedestrian access to Turners Court is via the signalised crossing at the Aldi / McDonalds junction, 100m to the south.

Between Aldi / McDonalds and Bath Road, the A350 forms the only route connecting northern parts of Melksham with other parts of the town but is very constrained by building frontages on both sides, with no alternative pedestrian or cycle route (**Figure 2-12**).

Access to the rail station is a key issue and a constraint on the ambition to grow the role of rail travel for Melksham. A pedestrian subway provides a 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 and the subway is the only pedestrian route between the town centre and rail station / Bath Road residential areas on the western side. Further south, a controlled crossing at Asda junction) provides access to the superstore and other businesses on the western side of the A350.

**Figure 4-8 - Severance issues in northern Melksham**



Along the southern section of the A350 through Melksham, although crossing points are provided the A350 still forms a barrier between Berryfield / Semington Road and the town centre at Semington Road roundabout (**Figure 2-13**). As noted above, this roundabout is the location of a cluster of vehicle collisions involving cyclists.

The busy nature of the A350, with a relatively high volume of HGVs and peak period congestion, as well as a lack of pedestrian crossings at natural desire lines, 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.

### 4.1.5. Stakeholder feedback on problems and issues

The stakeholder engagement exercise undertaken by Wiltshire Council from November 2020 to January 2021 provided an opportunity to capture stakeholder feedback relating to the significance of current issues with regards to the A350 at Melksham **(Figure 4-9)**. The responses indicated that:

- The highest level of concern was in relation to walking and cycling facilities (57% of respondents). This reflects the identified severance issues on the A350 at Melksham (section 4.1.4). TransWilts highlighted the impact of the A350 on access to the station by walking and cycling.
- Traffic congestion and delays were also identified as an issue of concern for just over 50% of respondents.
- In addition to the more direct transport related issues, approximately 50% of respondents also expressed concern in relation to associated environmental and quality of life impacts.
- Overall, 60% of respondents supported the need for improvement to the A350 at Beanacre and Melksham.

Feedback via open comments generally reflected the above trends. There was reference to the situation around Covid-19 heightening awareness of the impact that traffic levels have on the ability to move around freely by walking and cycling. There were also comments received in relation to the potential longer-term impacts of the Covid-19 situation on traffic levels (e.g. due to increased home working) and whether this might reduce the significance of traffic related issues (see also section 4.2.3).

**Figure 4-9 - Consultation responses to the significance of current issues (Wiltshire Council)**

| | Very concerned | Somewhat concerned | Neutral | Somewhat unconcerned | Very unconcerned |
|---|---|---|---|---|---|
| Road safety | 20.9% | 23.3% | 23.6% | 14.0% | 18.2% |
| Traffic congestion and delays | 30.1% | 20.1% | 18.9% | 15.2% | 15.6% |
| Impact of traffic on residential properties | 26.6% | 21.9% | 23.3% | 12.2% | 16.0% |
| Landscape and scenery | 25.3% | 25.1% | 22.0% | 12.4% | 15.1% |
| Employment and businesses | 11.1% | 21.4% | 35.1% | 16.7% | 15.8% |
| Walking and cycling facilities | **30.5%** | 26.1% | 22.4% | 9.3% | **11.6%** |

## 4.2. Future transport-related problems

The A350 will continue to be a focus for housing and employment growth (sections 2.1.2 and 3.1), and this is expected to result in increased travel demands within and around Melksham and along the A350 corridor itself (section 3.2). Without intervention, this will exacerbate the current identified traffic-related issues with further deterioration in general traffic conditions.

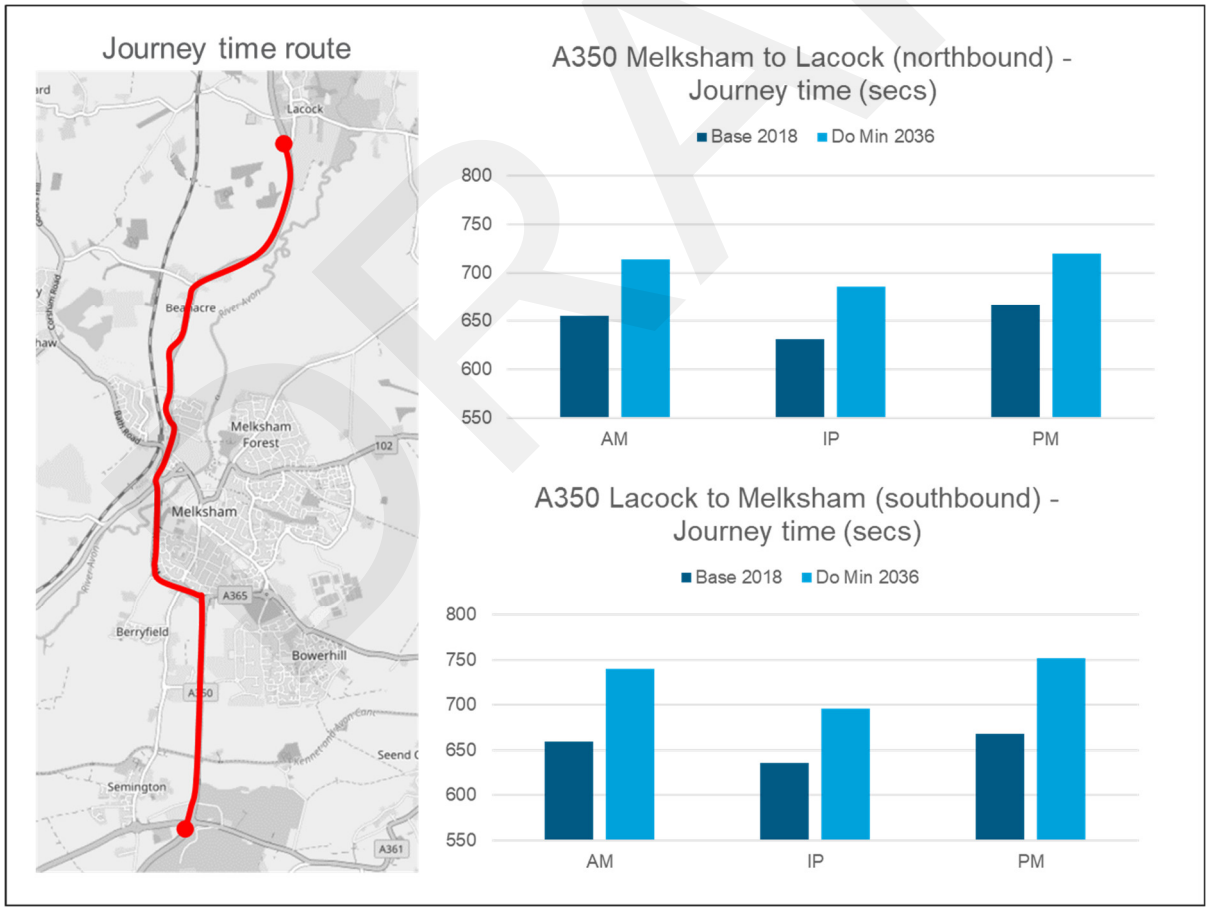
### 4.2.1. Future forecast traffic conditions – Wiltshire Transport Model

Based upon evidence from the Wiltshire Transport Model (core growth scenario) average peak period journey times on the A350 at Melksham are predicted to increase by approximately 10% to 13% between 2018 and 2036 **(Figure 4-10)**. This equates to an additional 1 to 2 minutes journey time per vehicle. The predicted growth in journey time is greater in the southbound direction. The scale of increase in journey times is relatively consistent across all time periods, indicating that traffic levels throughout the day lead to additional delays. This correlates with the predicted greater relative increase in inter-peak travel demands.

Without intervention, the model forecast data suggests that by 2036 all through-traffic on the A350 at Melksham would incur a total additional 55,000 vehicle hours of journey time on this section over the course of a year. In indicative monetary terms, this has a value of approximately £0.7 million annually to transport users.[24]

The WTM core growth scenario does not reflect the emerging Local Plan Review development sites (yet to be adopted by Wiltshire Council) which are expected to have a strong focus around the A350 corridor, including north of Melksham at Chippenham and to the south at Trowbridge. Inclusion of these would be expected to further increase traffic volumes and predicted journey times on the A350 at Melksham given that the level of inter-urban movement currently observed would be expected to increase proportionately with the increased demand.

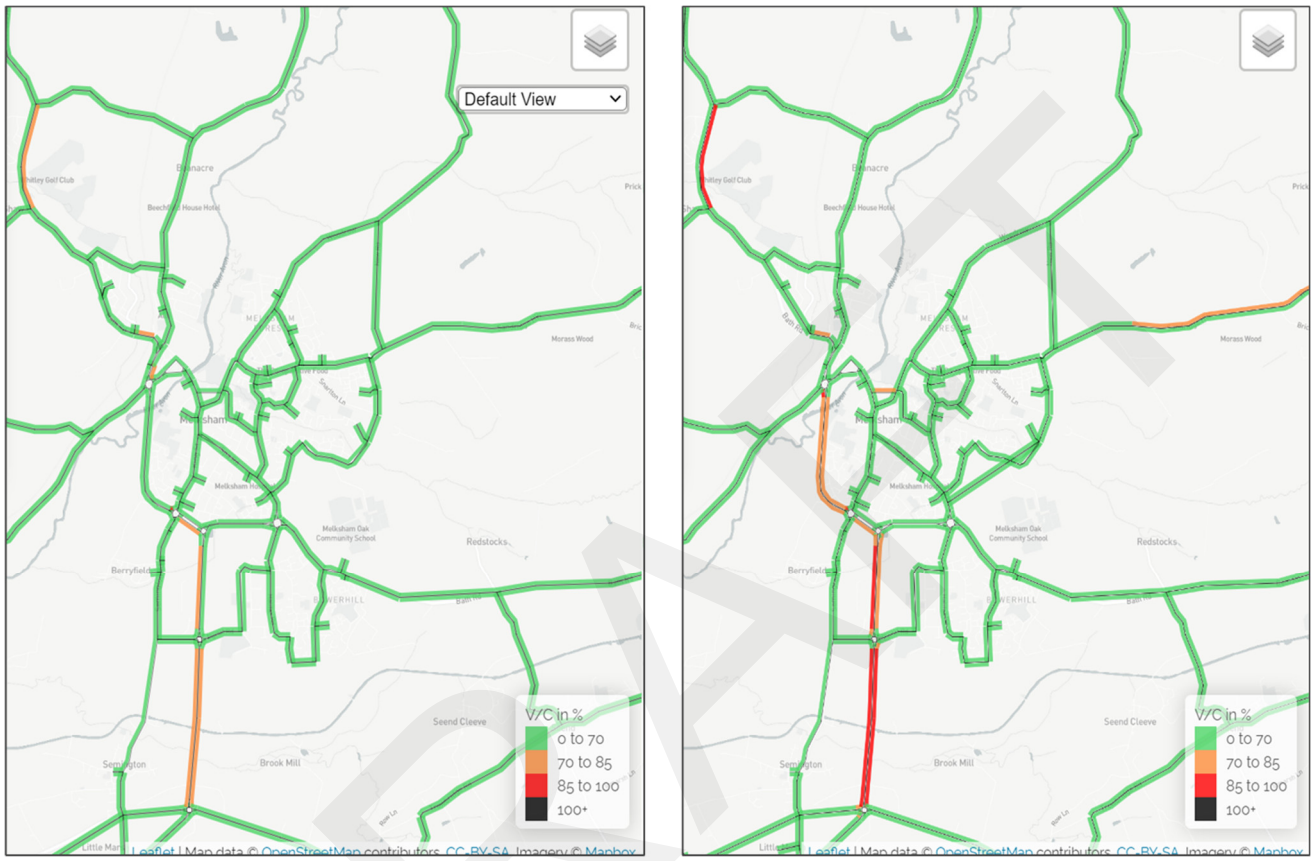
**Figure 4-10 - Forecast change in journey times between 2018 and 2036, without intervention (Wiltshire Transport Model)**




[24] Assuming 10,000 daily through-trips, an average 80 seconds additional delay, and 253 days of the year. Value of Time of £12 / hr based on TAG Databook.

The Wiltshire Transport Model also provides an indication of future traffic conditions in terms of the capacity of the road network **(Figure 4-11)**. Typically, up to 85% volume to capacity ratio is considered to be an acceptable level of operation. Beyond this, significant delays and poor journey time reliability are far more likely. From 2018 to 2036 a marked change in the predicted volume to capacity ratio is evident on the A350 at Melksham, with sections tipping over 85% (particularly to the south of Melksham). This reflects the increased pressure from the predicted areas of greatest traffic growth (section 3.2.3).

**Figure 4-11 - Volume to capacity ratio for 2018 (left) and 2036 (right), PM peak period (Wiltshire Transport Model)**




## 4.2.2. Future issues in relation to public transport, walking and cycling

Aspirations for further improvements to rail transport in the corridor, whilst beneficial, are unlikely to have a significant impact on traffic volumes given the relatively limited number of trips that would be attracted to rail. There is a clear future role for rail in facilitating journeys between town centres in the A350 corridor and connections for longer distance journeys to/from the M4 corridor and London, but the main residential and employment areas in the A350 corridor developed over the last few decades have been in locations that are distant from the rail line. There may be potential to grow the amount of Park and Ride traffic using the rail services at Melksham, but road access to the station from most of the town is via the A350.

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 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.

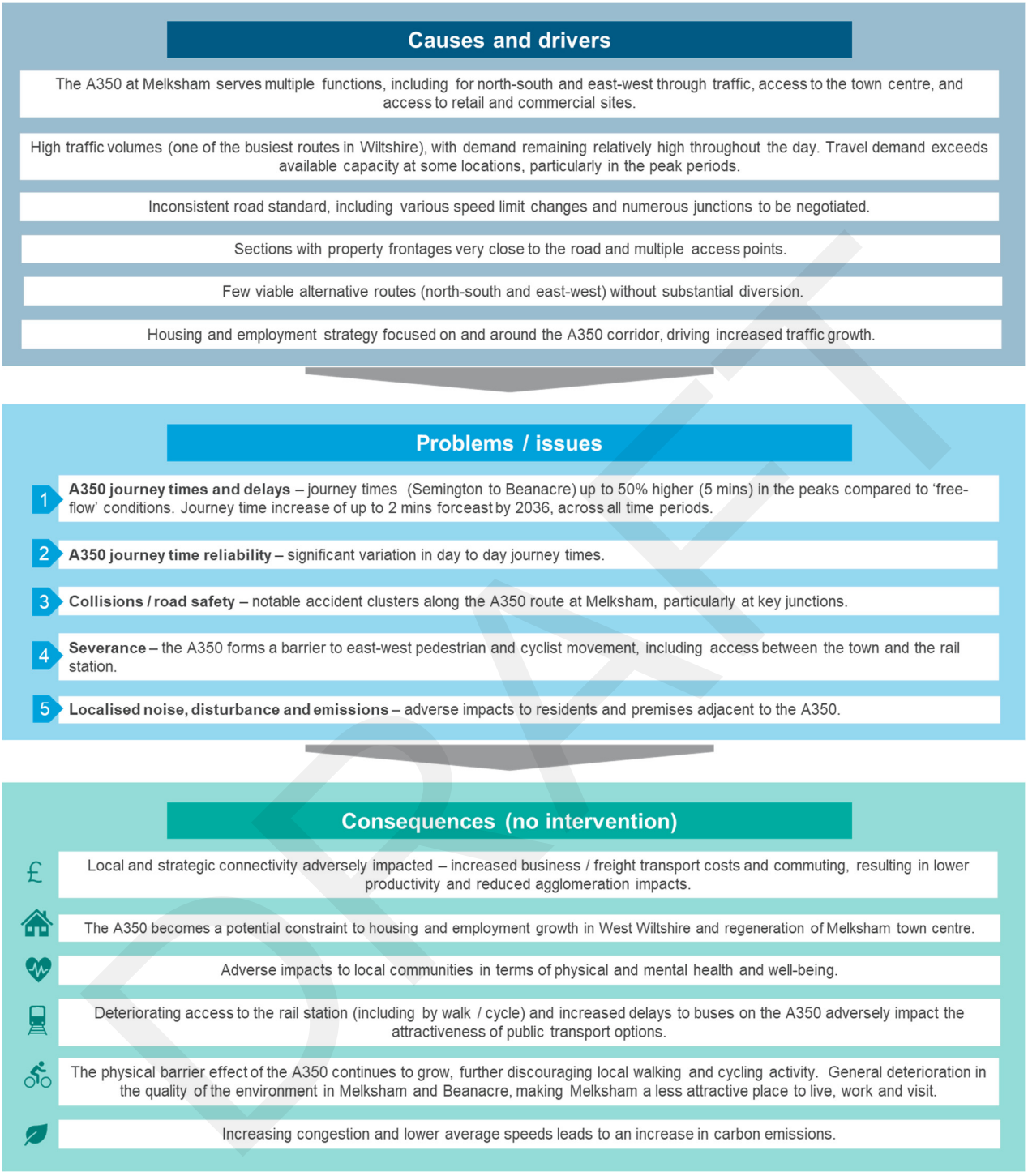
### 4.2.3. Covid-19 – potential impacts on future transport-related problems

There are potential longer-term implications from the Covid-19 pandemic. This includes an expected rise in home working which could potentially affect longer-term travel trends, such as less intensive peak demands. There is extensive research and analysis being undertaken in relation to this at a national level. It is expected that the Government will revise future traffic and economic growth figures (or potential alternative scenarios for these), such as through updates to WebTAG (the Department for Transport's guidance on appraisal of transport schemes). The business case will be undertaken in line with prevailing guidance at the time.

## 4.3. Causes and consequences of the identified issues

The key current and future transport issues have been identified and demonstrated through supporting evidence to establish the need for intervention in relation to the A350 at Melksham. The underlying causes and drivers related to these issues, in addition to the consequences of not addressing them, is an important further step to facilitate the consideration and identification of appropriate transport solutions **(Figure 4-12)**. Transport solutions should seek to address the identified underlying causes and drivers.

**Figure 4-12 - The relationship between identified problems, underlying causes and consequences of no intervention**




The problems and issues are closely linked with the relevant local, regional and national policy objectives (section 2.1), such that the consequences of not addressing them are framed in terms of the impact on achieving these policy outcomes – these not only cover transport policy outcomes, but also those relating to the economy, environment, health and well-being and quality of life. This process demonstrates that if the problems associated with the A350 at Melksham are not addressed, and persist or worsen, then adverse impacts would be expected against these wider outcomes.

Of particular note is the threat to the efficient operation of the A350 corridor such that its role in providing local and strategic connectivity within west Wiltshire and the wider Western Gateway area would increasingly

become compromised (particularly if other planned improvements on the A350 also do not materialise). The potential significance of this is demonstrated through the fact that the A350 Growth Zone accounts for 24% of the total GVA for Wiltshire and Swindon[25] - strong north-south connectivity is a key priority for the economic success of the west Wiltshire towns and the wider region. Furthermore, the A350 will be a key consideration in the ability to deliver future housing and jobs, including additional sites to be considered through the ongoing Local Plan Review.



[25] Western Gateway Sub-National Transport Body (2020) Draft Strategic Transport Plan.

# 5. Identifying objectives and geographical scope

The definition of objectives is an essential part of the option development process as it provides a clear set of outcomes which a scheme investment should meet. The setting of objectives relates to the identified problems and issues (Chapter 4). Objectives established within the 2017 OAR have been reviewed and updated where appropriate in light of the latest policy context and enhanced evidence base relating to problems and issues. The approach follows WebTAG guidance in establishing a hierarchy of objectives, including: strategic outcomes; high-level objectives; and specific transport objectives. Measures of success are also identified and these inform assessment of the Strategic Case for each transport option.

## 5.1. Objectives from key policy documents

In formulating the hierarchy of objectives, attention has been paid to ensure that:

- they address the transport problems identified in Chapter 4; and
- they relate to the strategic objectives of the key policy documents reviewed in Chapter 2 (e.g. DfT Transport Investment Strategy, Western Gateway STB Strategic Transport Plan, Swindon and Wiltshire Local Economic Plan, Wiltshire Core Strategy and Local Transport Plan).

The strategic objectives relevant to the A350 corridor contained in these policy documents are presented in **Table 5-1**. Several consistent themes are evident across these objectives:

- Supporting economic growth (DfT2, DfT3, WG1-5, SEP2, WCS1), including new housing developments (DfT4, WG6, WCS3, LTP12) and town centre regeneration (SEP4, WCS4, LTP1, LTP7)
- Improving transport connectivity, reliability and resilience (DfT1, WG2, WG3, WG5, SEP2, WCS6, LTP4, LTP10, LTP18)
- Reducing negative impacts of traffic, including accidents, pollutant emissions and severance (WG7, WG11, LTP3, LTP8, LTP9, LTP11)
- Promoting alternatives to travel by car (WG10, WCS6, LTP2, LTP5, LTP13, LTP14).

**Table 5-1 - 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. |
| Western Gateway SNTB Strategic Transport Plan | Economic Objectives:<br>WG1: Ensure the effective operation of labour markets.<br>WG2: Enable greater integration between employment clusters.<br>WG3: Enhance business connectivity to international markets.<br>WG4: Support growth of international gateways.<br>WG5: Improve North-South connectivity.<br>Social Objectives:<br>WG6: Support the delivery of new homes and employment opportunities.<br>WG7: Support multi-modal travel options for urban travel to work areas.<br>WG8: Embrace the role of technology in supporting strategic travel.<br>Environmental Objectives:<br>WG9: The Decarbonisation of the strategic transport network. |

| Document | Summary of Relevant Strategic Objectives |
|---|---|
| | WG10: Support the adoption of fossil-fuel-free transport.<br>WG11: Improve air quality. |
| 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 reduce the number of casualties on Wiltshire's roads.<br>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. |

## 5.2. Strategic outcomes

The policy context review (Chapter 2) identified relevant priorities relating to regional / national economic growth, local economic prospects, physical / mental well-being and quality of life. The identification of problems and issues (Chapter 4) demonstrated how, left unaddressed, the transport problems associated with the A350 at Melksham would adversely impact against these priorities. The strategic outcomes for this scheme therefore reflect these priorities, and also contribute to the wider strategic objectives **(Table 5-1)**:

- Sustainable population and economic growth in the A350 corridor, with positive impact on regional and national economic productivity;

- Sustainable population and economic growth around Melksham / Bowerhill, supporting a revitalised town centre; and
- Improved physical and mental wellbeing for users of the A350 and residents of Melksham.

## 5.3. High-level objectives and transport objectives

Five linked high-level objectives and transport objectives have been identified **(Table 5-2)**. These support the strategic outcomes and aim to specifically address the transport problems identified in Chapter 4. Their individual contribution to wider strategic objectives is also demonstrated.

**Table 5-2 - High-level and transport objectives**

| High-level objective | Transport objective | Contribution to wider strategic objectives* |
|---|---|---|
| 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 and improve journey reliability on the A350 through Melksham and Beanacre, improving local and regional north-south connectivity, and supporting future housing growth in the A350 corridor | DfT: 1, 2, 3<br>WG: 1, 2, 5, 6<br>SEP: 2<br>WCS: 1, 6<br>LTP: 1, 4, 10, 12, 18 |
| Improve connectivity for other through journeys via Melksham (to/from Bath, Calne and Devizes) | Reduce journey times and delays and improve journey reliability 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 | DfT: 1, 2, 3<br>WG: 1, 2<br>SEP: 2<br>WCS: 1, 6<br>LTP: 1, 4, 10, 12, 18 |
| 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 the rail station / Bath Road, and along the existing A350 corridor within Melksham and Beanacre, to increase active travel and reduce the impact of transport on the environment | DfT: 2, 3, 4<br>WG: 7, 10, 11<br>SEP: 4<br>WCS: 1, 3, 4, 6<br>LTP: 1, 2, 5, 7, 12, 13, 14, 18 |
| Reduce personal injury accidents on the road network | Reduce personal injury accident rates and severity for the A350 and Melksham as a whole | DfT: -<br>WG: -<br>SEP: -<br>WCS: 4<br>LTP: 3, 4, 8 |
| 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 to reduce severance, whilst avoiding negative impacts on other existing or potential residential areas | DfT: -<br>WG: 7<br>SEP: 4<br>WCS: 4<br>LTP: 1, 3, 7, 8, 9, 11 |

*Numbers refer to those used in Table 5-1.

Four of the five objectives seek to reduce journey times and delays, personal injury accident rates, and the volume of traffic on certain parts of the road network. These should be interpreted as relating to the difference between the 'with scheme' and the 'without scheme' scenario in the year after scheme opening or completion.

## 5.4. Measures for success

The transport objectives should be SMART, i.e. Specific, Measurable, Agreed upon, Realistic and Time-bound. The identification of measures for success helps to define a more tangible outcome and is important when

considering the effectiveness of potential solutions (**Table 5-3**). It also provides the basis for future monitoring and evaluation of the scheme.

Initial targets have been identified for each objective. These should be reviewed as the project progresses. At this stage the initial targets have been established following consideration of the baseline data relating to the current and future situation, as presented in Chapters 3 and 4. For example, the average journey and peak delay time reduction targets 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 journey time targets, whereas those which only use part of the existing A350 have much lower targets.

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.

Most of the measures should 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.

**Table 5-3 - Measures for success**

| Transport objective | Measures for success (including indicative initial targets) |
|---|---|
| Reduce journey times and delays and improve journey reliability on the A350 through Melksham and Beanacre, improving local and regional north-south connectivity, and supporting future housing growth in the A350 corridor | Reduce average Inter Peak journey times on the A350 between Lacock and Semington from the year after scheme opening *(Indicative initial target – 10% to 20% reduction)*<br><br>Reduce average Peak journey times experienced on the A350 between Lacock and Semington from the year after scheme opening *(Indicative initial target – 20% to 30% reduction)* |
| Reduce journey times and delays and improve journey reliability 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 | Reduce average Peak journey times between Semington (A350) and Sandridge (A3102) from the year after scheme opening<br>Reduce average Peak journey times between Shaw (A365 W) and Bowerhill (A365 E) from the year after scheme opening<br>Reduce average Peak journey times between Semington (A350) and Shaw (A365 W) from the year after scheme opening<br>*(Indicative initial target – 10% reduction)* |
| Provide enhanced opportunities for walking and cycling between Melksham town centre and the rail station / Bath Road, and along the existing A350 corridor within Melksham and Beanacre, to increase active travel and reduce the impact of transport on the environment | Increase walking and cycling journeys between town centre and rail station / Bath Road from the year after scheme opening<br>Increase walking and cycling journeys along the existing A350 corridor (between Bath Road and Leekes) from the year after scheme opening<br>*(Indicative initial target – 10% increase)* |
| Reduce personal injury accident rates and severity for the A350 and Melksham as a whole | Reduce personal injury accident rates on A350 between Lacock and Semington with lower average severity in the five years after scheme opening *(Indicative initial target – 20% to 30% reduction)*<br><br>Reduced personal injury accident rates for Melksham overall, with lower average severity in the five years after scheme opening *(Indicative initial target – 10% reduction)* |
| Reduce the volume of traffic including HGVs passing along the current A350 route in northern Melksham and Beanacre to reduce severance, whilst avoiding negative impacts on other existing or potential residential areas | Reduce average daily and peak traffic volumes using existing A350 route in northern Melksham and Beanacre from year after scheme opening *(Indicative initial target – 30% to 50% reduction)*<br><br>Reduce average daily HGV numbers using existing A350 route in northern Melksham and Beanacre from year after scheme opening *(Indicative initial target – 40% to 50% reduction)*<br><br>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. |

## 5.5. Summary of objectives

The overall hierarchy of strategic outcomes, objectives and measures for success is summarised in **Table 5-4**.

**Table 5-4 - Hierarchy of strategic outcomes, objectives and measures for success**

| Strategic Outcomes | High-level objectives | Transport objectives | Measures for success (including indicative initial targets) |
|---|---|---|---|
| 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 and improve journey reliability on the A350 through Melksham and Beanacre, improving local and regional north-south connectivity, and supporting future housing growth in the A350 corridor | 1. Reduce average Inter Peak journey times on the A350 between Lacock and Semington from the year after scheme opening *(Indicative initial target – 10% to 20% reduction)*<br>2. Reduce average Peak journey times experienced on the A350 between Lacock and Semington from the year after scheme opening *(Indicative initial target – 20% to 30% reduction)* |
| | Improve connectivity for other through journeys via Melksham (to/from Bath, Calne and Devizes) | Reduce journey times and delays and improve journey reliability 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 | 1. Reduce average Peak journey times between Semington (A350) and Sandridge (A3102) from the year after scheme opening<br>2. Reduce average Peak journey times between Shaw (A365 W) and Bowerhill (A365 E) from the year after scheme opening<br>3. Reduce average Peak journey times between Semington (A350) and Shaw (A365 W) from the year after scheme opening<br>*(Indicative initial target – 10% reduction)* |
| 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 the rail station / Bath Road, and along the existing A350 corridor within Melksham and Beanacre, to increase active travel and reduce the impact of transport on the environment | 1.Increase walking and cycling journeys between town centre and rail station / Bath Road from the year after scheme opening<br>2.Increase walking and cycling journeys along the existing A350 corridor (between Bath Road and Leekes) from the year after scheme opening<br>*(Indicative initial target – 10% increase)* |
| 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 with lower average severity in the five years after scheme opening *(Indicative initial target – 20% to 30% reduction)*<br>2. Reduced personal injury accident rates for Melksham overall, with lower average severity in the five years after scheme opening *(Indicative initial target – 10% reduction)* |
| | 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 to reduce severance, whilst avoiding negative impacts on other existing or potential residential areas | 1. Reduce average daily and peak traffic volumes using the existing A350 route in northern Melksham and Beanacre from year after scheme opening *(Indicative initial target – 30% to 50% reduction)*<br>2. Reduce average daily HGV numbers using existing A350 route in northern Melksham and Beanacre reduced from the year after scheme opening *(Indicative initial target – 40% to 50% reduction)*<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 |

## 5.6. Defining the geographical scope

The geographical area of impact has been determined through:

- an understanding of the geographical scope of the travel demands and key origins and destinations (Chapters 2 and 3); and
- an analysis of the geographical extent of current and future transport problems and underlying drivers (Chapter 4).

The analysis supporting the definition of the geographic scope includes the distribution of origins and destinations of users of the A350 at Melksham taken from the Wiltshire Transport Model **(Figure 5-1).**

The main study area is defined as the Melksham urban area, including the A350 corridor from north of Beanacre to Semington **(Figure 5-2).**

The expected wider area of influence includes the Melksham urban area, plus the wider A350 corridor between the M4 Junction 17 and the A36 at Warminster, including the settlements of Chippenham, Trowbridge, Westbury, Calne and Devizes.

**Figure 5-1 - Modelled distribution of trips using the A350 northbound at Melksham (Wiltshire Transport Model, 2018 Base AM Peak Period)**

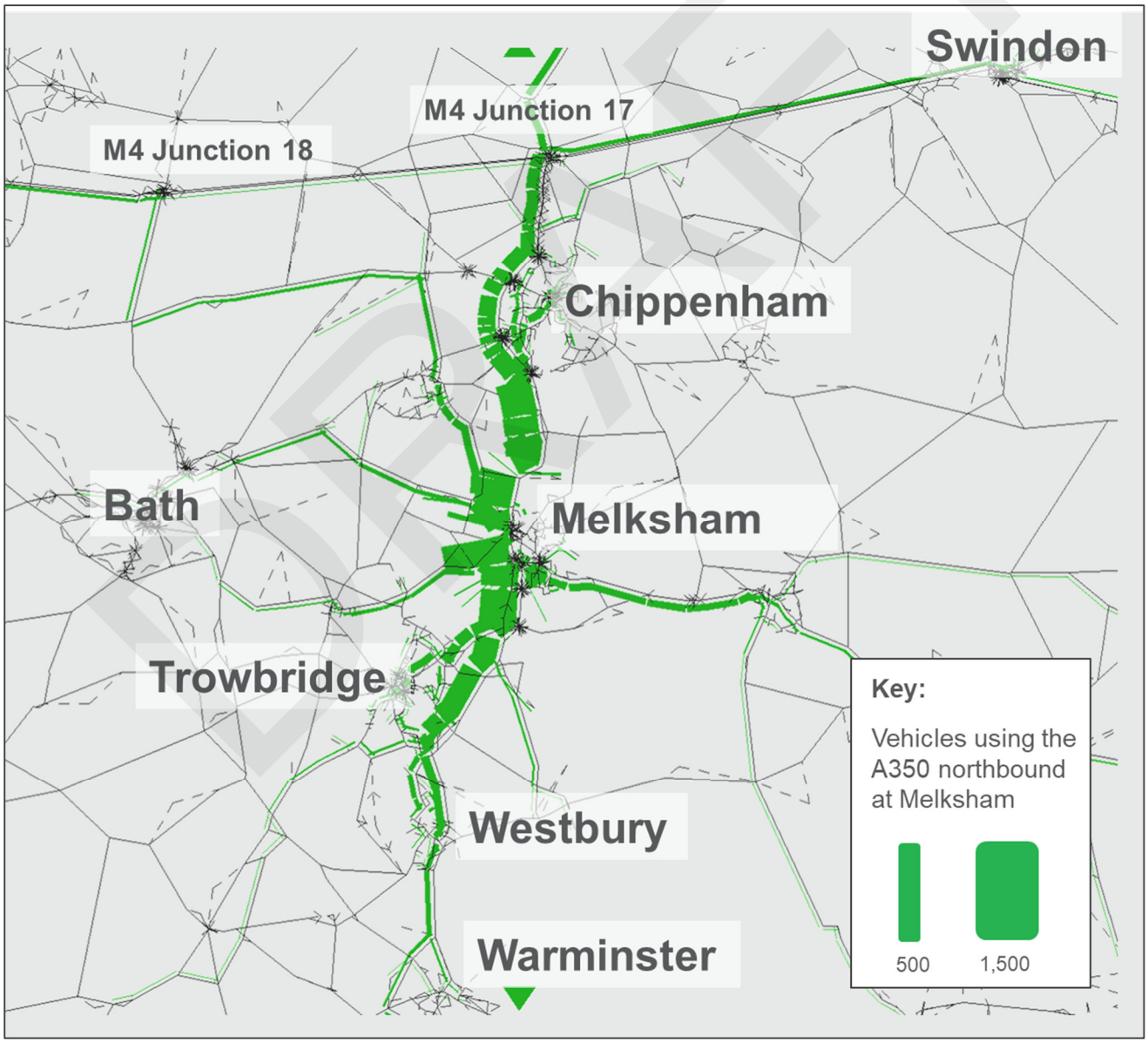
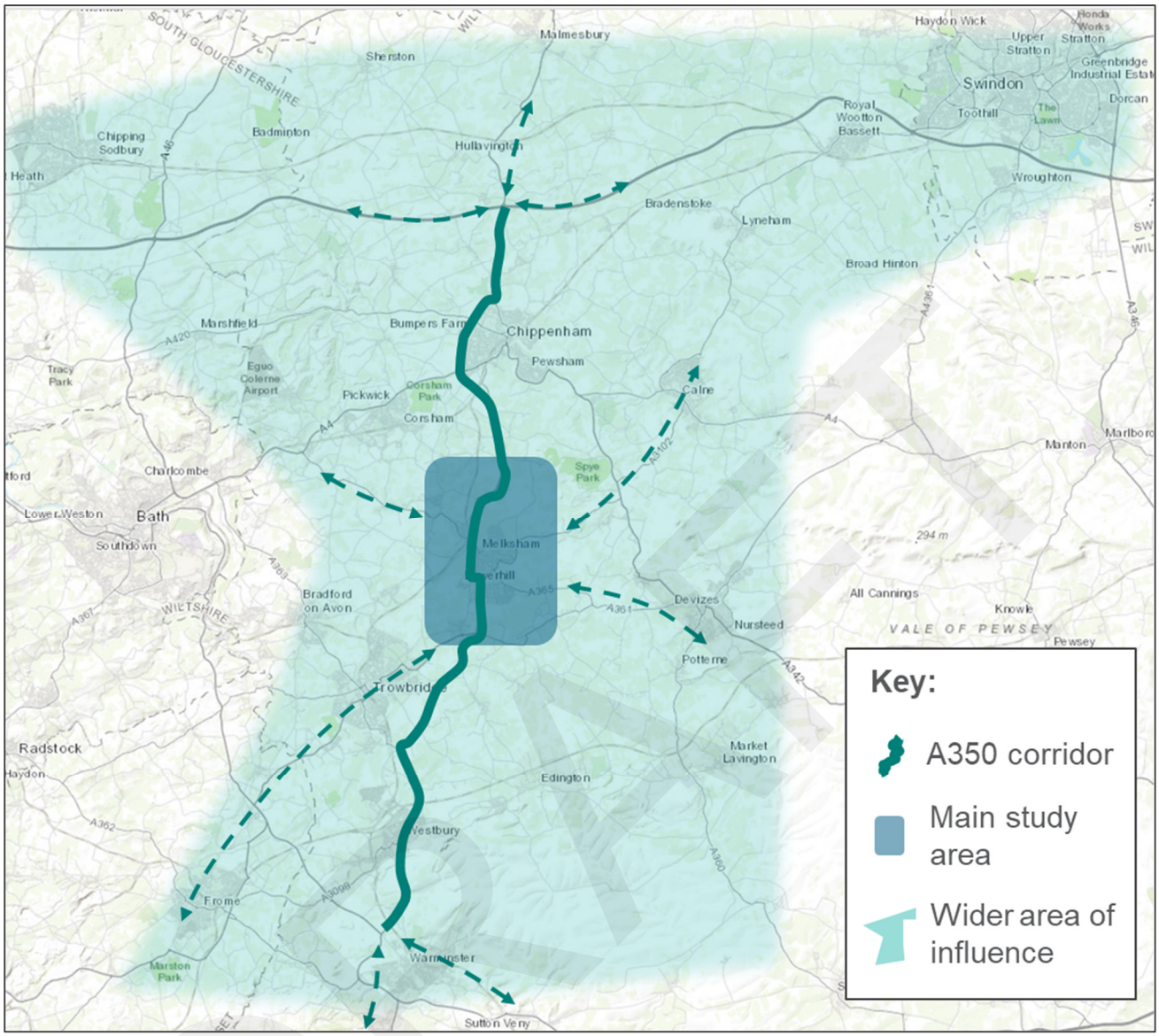


**Figure 5-2 – Geographical scope – main study area and wider area of influence**

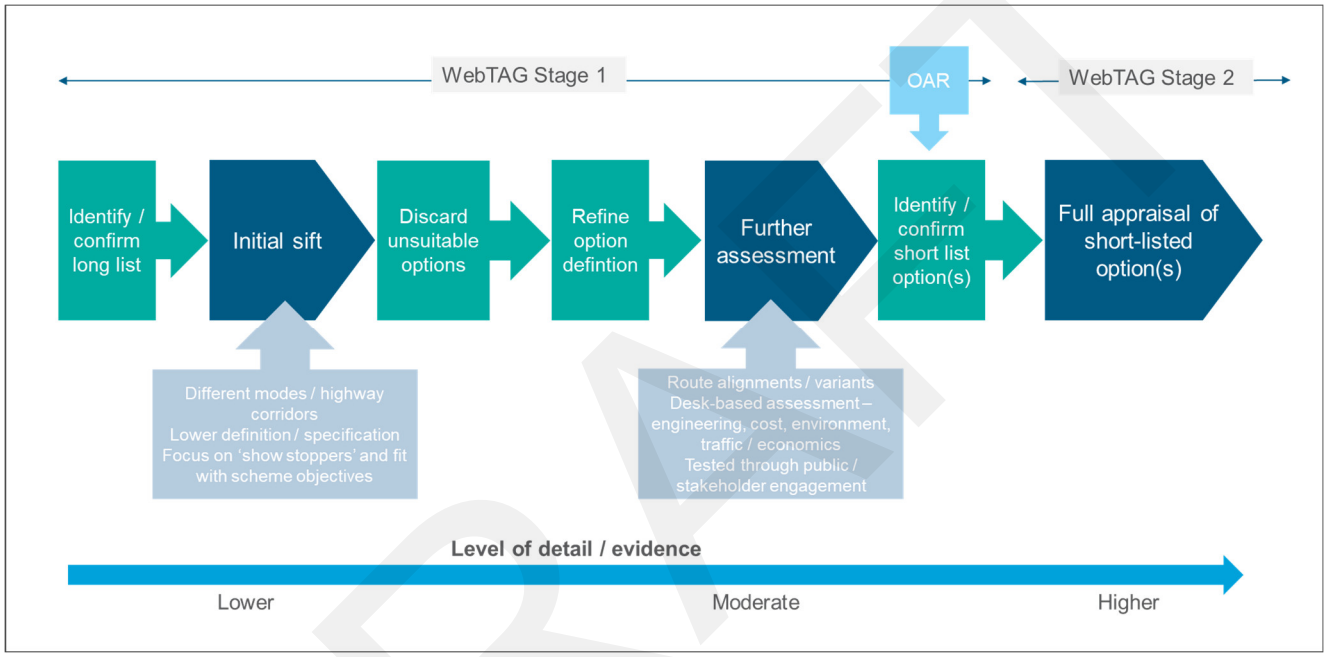


# 6. Option generation, sifting and assessment process

## 6.1. Overview of the approach

The purpose of the option development and assessment process **(Figure 6-1)** is to undertake a transparent and auditable process by which potential options are narrowed down to identify the best performing option(s). This involves: starting with a broad range of potential solutions to the identified problems and issues; comparing and assessing these in a consistent manner; sifting out unsuitable options; refining the scope of the remaining options; undertaking further assessment; and drawing conclusions on which option(s) should be taken forward for full appraisal as part of the business case.

**Figure 6-1 – The approach to options development and assessment**




The options assessment work undertaken for the 2017 OAR has been reviewed and updated to ensure that it aligns with the latest policy context and problems, issues and objectives. It also incorporates additional evidence and analysis not previously available.

Key principles applied to the process include:

- A strong relationship to the problems, issues and objectives identified and evidenced in Chapters 2, 3 and 4;
- Providing clear rationale for discounting of options; and
- Applying proportionality dependent upon the stage of the process (in line with TAG guidance) – hence, the earlier sifting stage relies more on a desk-based approach and additional analytical tools (including traffic modelling) are introduced during the further assessment stages.

## 6.2. Tools, inputs and evidence

The option development and assessment process draws upon a range of inputs, including:

- Transport and other data and analysis collated during the problems and issues stage;
- Stakeholder engagement and public consultation – in particular, an engagement exercise undertaken by Wiltshire Council between November 2020 and January 2021;
- Spreadsheet analysis;
- Use of the Wiltshire Transport Model;

- Desk-based environmental assessment;
- Feasibility design and engineering; and
- Costing / risk assessment.

# 7. Generating options

## 7.1. Approach

The purpose of option generation is to develop a range of alternative measures or interventions that could achieve the objectives set out in Chapter 5. To do so, options also need to address the underlying causes of the relevant problems and issues identified in Chapter 4.

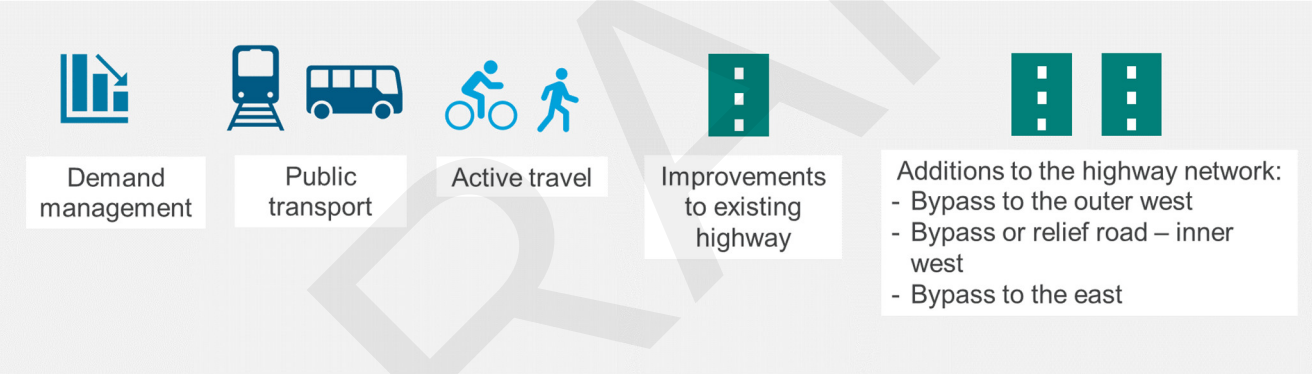
## 7.2. Option identification

One of the key underlying issues identified in Chapter 4 is the high level of travel demand on the A350 at Melksham and the limitation of the current road layout to cater for this demand efficiently. It is important to take a broad perspective on potential solutions, and in this context they might generally cover: a) reducing demand; b) increasing capacity; or c) a combination of both.

Reducing demand might tackle the transport challenge by direct policy intervention to restrict vehicles or through imposing a cost to vehicle travel / use. Increasing the capacity of the transport network potentially balances travel demand across different routes / infrastructure / modes. For example, investment on the public transport network can potentially reduce highway demand through modal shift and targeted highway improvements may also relocate traffic from the congested area.

The initial options list generated from the 2017 OAR has been reviewed – this was developed under the three strategic themes of demand management, public transport investment and highway investment to ensure a fair representation of each of these types of intervention. The list was subsequently refined and re-structured into five themes **(Figure 7-1)**.

**Figure 7-1 – Option themes**



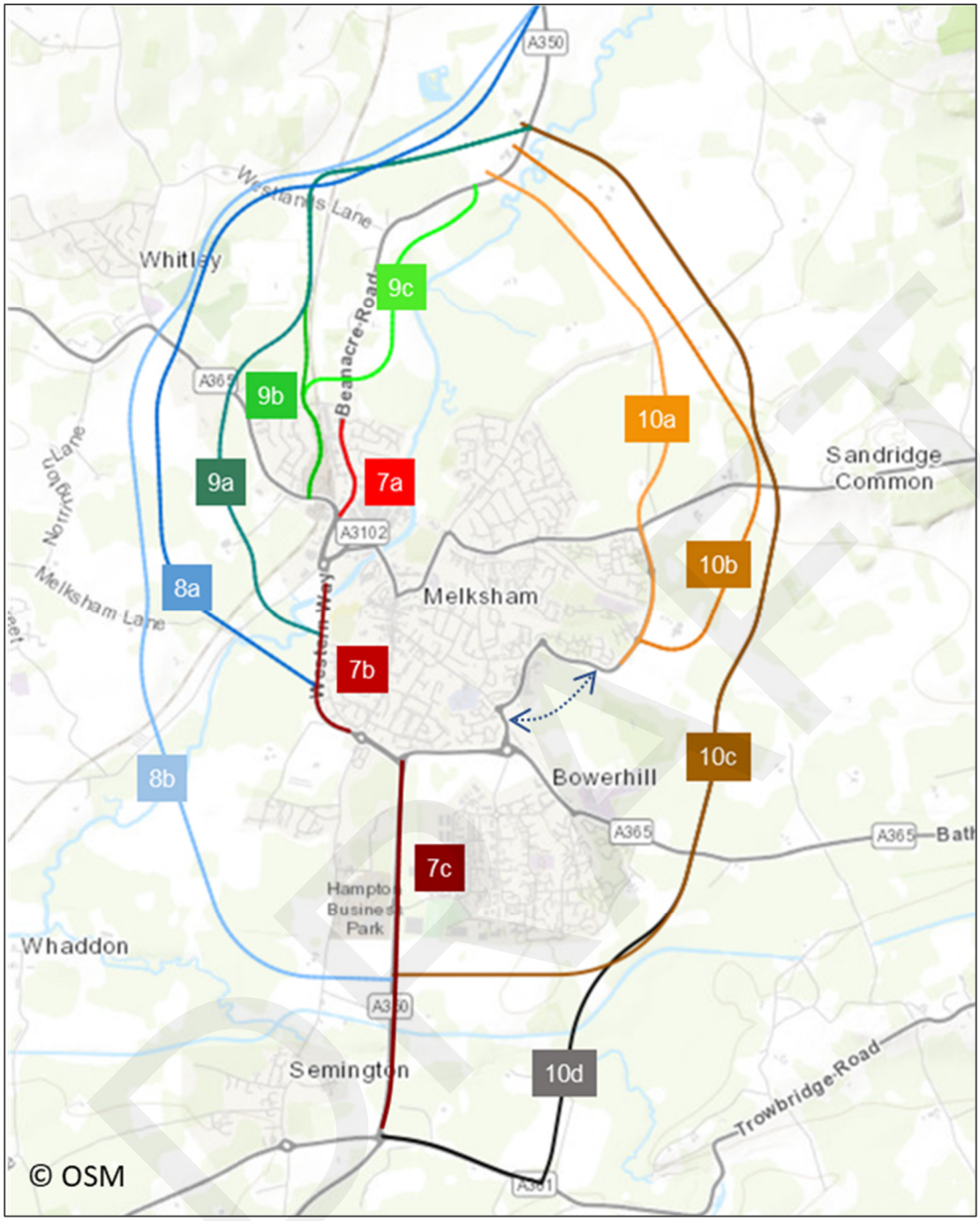

At the initial stage of the process, options are strategic in nature and relatively conceptual. The intention is that different options represent reasonably discrete interventions. The level of specification of options increases throughout the options development and assessment process and is detailed within Chapters 8 to 10.

The full initial list of options under the five themes is presented in **Table 7-1**. Highways-based options are illustrated in **Figure 7-2**.

**Table 7-1 - Strategic themes and options**

| Theme | No. | Strategic option | Comments |
|---|---|---|---|
| Demand manage-ment | 1 | Workplace Parking Levy | A workplace parking levy (WPL) is an annual fee that can be charged to employers by the local authority for spaces used for employee parking. The only current UK scheme was introduced in Nottingham in 2012, and generates income of around £9m per year which has been invested in the city's tram network, railway station and bus services. |
| | 2 | Road user charging | This would involve charging drivers for the roads on which they drive – applied to either a specific section of road or a wider network. The two current UK urban-area schemes (London, Durham) both use Automatic Number Plate Recognition to identify vehicles entering the charging zone. |
| | 3 | HGV restrictions - e.g. lorry ban or peak hour restrictions | This would include HGV restriction signage as well as cameras or other enforcement methods to restrict HGV access along the A350. |
| Public Transport | 4 | Rail service / infrastructure improvements - i.e. hourly frequency via Melksham and/or additional commuter services in AM/PM peak hours | Additional rail services on the TransWilts line could provide a more attractive alternative for journeys in the A350 corridor (including those to/from Trowbridge, Melksham and Chippenham), and connections for longer distance journeys along the Great Western Main Line. |
| | 5 | Bus service / infrastructure improvements | Additional bus services or infrastructure improvements would aim to make bus services more attractive for journeys within the A350 corridor and locally around Melksham. |
| Active travel | 6 | Improved walking / cycling routes | New cycle and pedestrian routes could allow these modes to travel more freely throughout Melksham, particularly when accessing/crossing or moving along on the A350. |
| Existing Highway Network | 7a | Additional lanes / widening: A350 northern section (Leekes-Bath Rd) | Widening the existing A350 in northern Melksham, i.e. targeted lane widening and junction improvements, to improve traffic flow in the area. |
| | 7b | Additional lanes / widening: A350 southern section (Farmers Rdbt-Semington Rd) | Widening the existing A350 south of Farmers Roundabout to Semington roundabout, i.e. conversion of this section to dual-carriageway. |
| | 7c | Upgrade to dual carriageway Western Way to Littleton Rbt | Widening of the existing A350 to dual carriageway south of Western Way to Littleton Roundabout at Semington. |
| Bypass Outer West | 8a | Western Bypass Short | From A350 north of Beanacre to A365 west of Shaw Farm, then to A350 north of Semington Road Roundabout. |
| | 8b | Western Bypass Long | From A350 north of Beanacre to A365 west of Shaw Farm, then to A350 south of Hampton Park West. |
| Bypass or Inner Relief Road – Inner West | 9a | Inner Western Bypass | From A350 north of Beanacre, west of village/rail line to A365 east of Shaw Farm, then to A350 south of Farmers Roundabout. |
| | 9b | Relief Road West | From A350 north of Beanacre, west of village/rail line to A365 west of rail station. |
| | 9c | Relief Road East | From A350 north of Beanacre, east of village to cross A350 between Beanacre & Melksham, then west of rail line to A365 west of rail station. |
| Bypass East | 10a | Inner Eastern Bypass | From A350 north of Beanacre to A3102 junction with Eastern Way, then via Eastern Way to south of Cranesbill Road Roundabout. |
| | 10b | Outer Eastern Bypass Short | From A350 north of Beanacre to A3102 east of Eastern Way, then via new road to Eastern Way at Cranesbill Road Rounabout. |
| | 10c | Outer Eastern Bypass Medium | From A350 north of Beanacre to A3102 east of Eastern Way, then to A365 east of Bowerhill, reconnecting to the A350 south of Hampton Park West |
| | 10d | Outer Eastern Bypass Long | From A350 north of Beanacre to A3102 east of Eastern Way, then to A365 east of Bowerhill, reconnecting to the A350 at Littleton Roundabout. |

**Figure 7-2 – Initial highway corridor options 7a to 10d**




Note – route corridors are indicative and are not intended to represent any specific alignment

### 7.2.1. Options for new highways routes

Options relating to new highway routes were initially based on a conceptual corridor rather than any specific alignment (acknowledging that there are likely to be variants to each, which would become more of a factor in the later stages of assessment should the option progress). Corridor options were developed from those presented in the 2017 OAR, with additional high-level concept design informing their scope. Options therefore represent potentially feasible routes, taking into account key constraints. An overview of the specification of the highways options is provided in Appendix A. Also, for simplicity at this stage, it is assumed that each bypass option would be designed as a single-carriageway route; dual carriageway variants are considered further in Chapter 8.

## 7.3. Stakeholder input to option generation

Stakeholder input has informed the identification of potential options. Relevant suggestions from stakeholders identified by Wiltshire Council have been considered in the context of the options assessment process, including the level of definition of options at the initial stage. **Table 7-2** summarises the main stakeholder suggestions and the conclusions relating to whether, and how, these would be incorporated.

**Table 7-2 – Stakeholder inputs to option generation**

| Suggestion | Source | Comments |
|---|---|---|
| New highway route based on option 10c but with the route continuing south across the Kennet & Avon Canal. | Melksham Area Board (March 2020) | Given the current refresh and update of the OAR it was considered appropriate to include this within the full options list (included as option 10d), with the route connecting to the existing A361. |
| Similar to option 10d, but with the southern connection to tie in directly to the Littleton Roundabout. | Wiltshire Council consultation (Nov 2020 to Jan 2021) | Following review this was considered to be a potential variant of option 10d (rather than a discreet option in its own right). This would be considered in more detail should the strategic option progress to further assessment. |
| Similar to option 10d, but with the southern connection to tie in to the A350 south of Littleton Roundabout. | Wiltshire Council consultation (Nov 2020 to Jan 2021) | Following review this was considered to be a potential variant of option 10d (rather than a discreet option in its own right). This would be considered in more detail should the strategic option progress to further assessment. |
| Focus on the A36 / A46 route (rather than the A350), including the construction of a new connection between these routes to the east of Bath. | Wiltshire Council consultation (Nov 2020 to Jan 2021) | This would primarily be a matter for Highways England (being part of the Strategic Road Network) and Bath and North East Somerset Council and is considered to be outside of the scope of this study. The geographical definition of the study area in Chapter 5 and traffic analysis in Chapter 2 has also identified that a large amount of the demand on the A350 at Melksham is to / from and between the West Wiltshire towns. |
| Various specific / detailed comments around walking and cycling provision within and surrounding Melksham. | Wiltshire Council consultation (Nov 2020 to Jan 2021) | To be considered in more detail should the strategic options relating to walking and cycling progress to further assessment. |
| Various specific / detailed comments in relation to highway design, including environmental mitigation | Wiltshire Council consultation (Nov 2020 to Jan 2021) | Many of these would be applicable to any highway based option (particularly new road construction). To be considered at the appropriate stage of option development. |

# 8. Initial sift of options

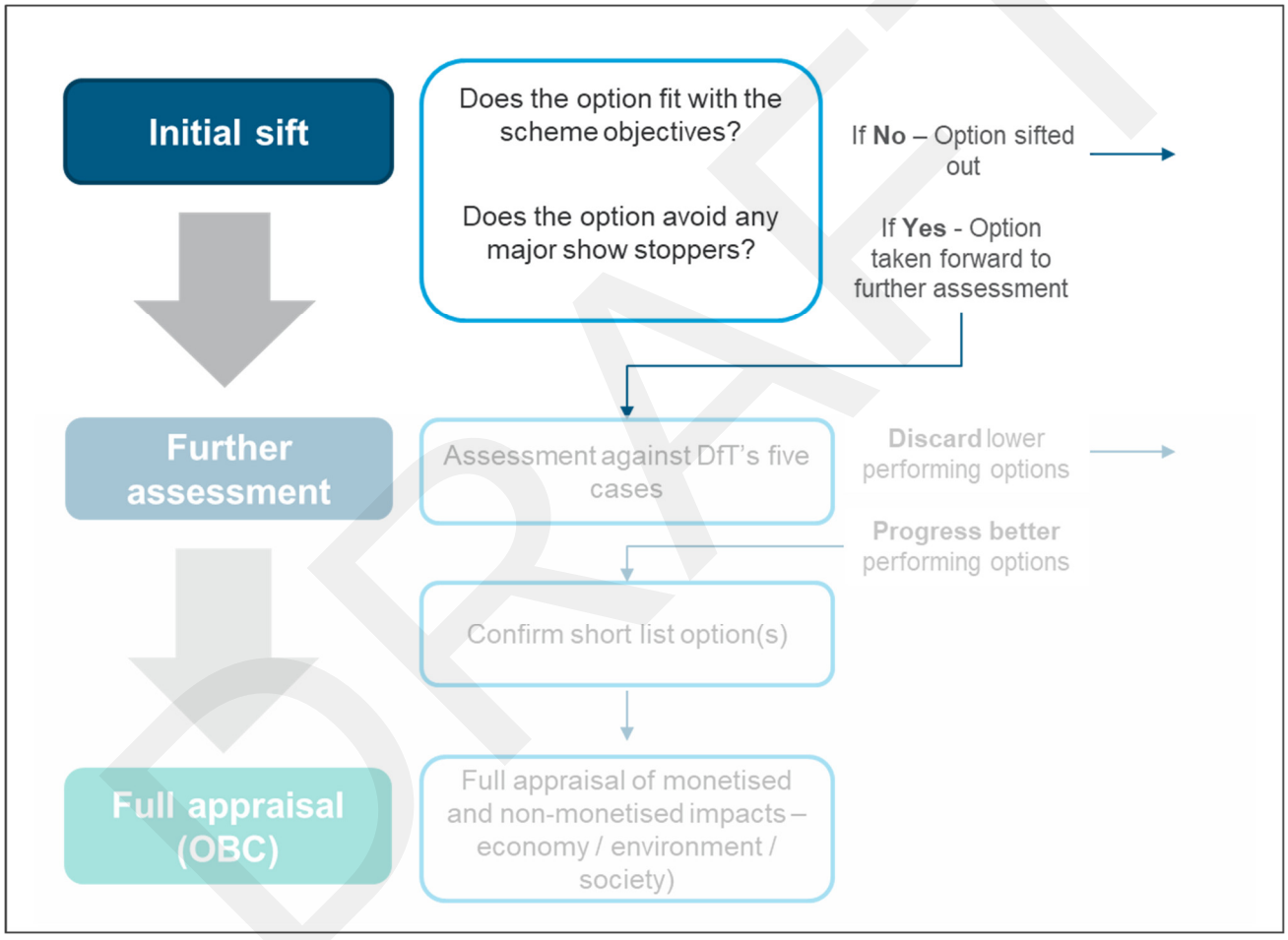
## 8.1. Purpose of the initial sift

The initial sift aims to identify any options which:

- would clearly fail to meet the key objectives identified for intervention;
- do not fit with existing local, regional and national programmes and strategies, and do not fit with wider government priorities; and
- would be unlikely to pass key viability and acceptability criteria (or represent significant risk).

In doing so, the initial sift therefore ensures that options to progress to further assessment are suitable **(Figure 8-1)**.

**Figure 8-1 – Sifting and assessment approach**




## 8.2. Initial sift methodology

Options have been assessed against criteria focused on the strategic fit with objectives and wider outcomes and key viability and acceptability criteria **(Table 8-1)**. Viability and acceptability considerations include:

- severe adverse environmental impacts which cannot be mitigated against or where the cost of doing so is proportionally too high;
- technically unsound or very high risk;
- financially unaffordable; and
- unacceptable to stakeholders and the public.

**Table 8-1 - Assessment approach for the Initial sift**

| Criteria | Sub-criteria | Assessment approach |
|---|---|---|
| Strategic fit with scheme objectives **(Table 8-2)** | Effectiveness of the intervention, i.e. to what extent the option can address the identified problems and contribute to the objectives identified for the scheme. | Assessed on a 6-point scale (against each transport objective):<br>• 0 (Neutral) – not anticipated to have notable positive impact, possibly with undesirable consequences<br>• 1 (very small impact) – would have a very small positive impact, possibly with undesirable consequences<br>• 2 (minor impact) – would have a modest overall impact<br>• 3 (moderate impact) – expected to have a reasonably significant impact with respect to the identified objective or outcome<br>• 4 (significant impact) – expected to have a very significant impact with respect to the identified objective or outcome<br>• 5 (fully addressed) – expected to fully address the identified objective or outcome, without any undesirable consequences. |
| Fit with wider strategic outcomes **(Table 8-3)** | Economic growth | Assessed on 5-point scale (for each sub-criteria):<br>• -2 – very poor fit, adverse contribution more likely<br>• -1 – poor fit, adverse contribution possible<br>• 0 – moderate fit<br>• 1 – good fit, positive contribution possible<br>• 2 – very good fit, positive contribution more likely |
| | Health & well-being | |
| | Housing delivery | |
| | Equality and inclusion | |
| | Carbon neutrality | |
| Viability and acceptability ('show stoppers') **(Table 8-4)** | Economic impact | Risk of undesirable / unacceptable impacts.<br>Score on 5-point scale (for each sub-criteria):<br>• 1 – almost certain to materialise<br>• 2 – high risk<br>• 3 – medium risk<br>• 4 – low risk<br>• 5 – almost certain not to materialise |
| | Environmental impact | |
| | Technical feasibility | |
| | Affordability | |
| | Stakeholder and public acceptance | |

The initial sift is a high-level exercise which reflects the large number of options under consideration at this initial stage. The assessment is largely qualitative, but draws upon the baseline evidence, high-level engineering and environmental reviews, benchmarking and professional judgement.

## 8.3. Initial sift results

### 8.3.1. Initial sift - fit with scheme objectives

The assessment of the options for their fit with the scheme objectives is presented in **Table 8-2**.

**Table 8-2 – Initial sift for strategic fit with scheme objectives**

| No. | Strategic Option | Reduce journey times and delays on the A350 through Melksham and Beanacre | Reduce journey times and delays on other routes through Melksham | Provide enhanced opportunities for walking and cycling | Reduce personal injury accident rates and severity for the A350 and Melksham | Reduce the volume of traffic passing along the current A350 route |
|---|---|---|---|---|---|---|
| | | Fit with objectives (0 neutral, to 6 fully addressed) | | | | |
| 1 | Workplace Parking Levy | 1 | 1 | 1 | 1 | 1 |
| 2 | Road user charging | 2 | 2 | 2 | 1 | 3 |
| 3 | HGV restrictions | 1 | 1 | 1 | 1 | 2 |
| 4 | Rail service / infrastructure improvements | 2 | 1 | 0 | 1 | 1 |
| 5 | Bus service / infrastructure improvements | 2 | 2 | 2 | 1 | 1 |
| 6 | Improved walking / cycling routes | 0 | 1 | 4 | 2 | 2 |
| 7a | Additional lanes / widening: northern section (Leekes-Bath Rd) | 1 | 1 | 0 | 1 | 0 |
| 7b | Additional lanes / widening: southern section (Farmers-Semington Rd) | 2 | 2 | 0 | 1 | 0 |
| 7c | Dualling Western Way to Littleton Rbt | 3 | 1 | 0 | 1 | 0 |
| 8a | Western Bypass Short | 4 | 4 | 3 | 3 | 4 |
| 8b | Western Bypass Long | 5 | 4 | 4 | 4 | 5 |
| 9a | Inner Western Bypass | 3 | 2 | 3 | 3 | 4 |
| 9b | Relief Road West | 3 | 1 | 2 | 2 | 3 |
| 9c | Relief Road East | 3 | 1 | 2 | 2 | 3 |
| 10a | Inner Eastern Bypass | 3 | 3 | 3 | 3 | 3 |
| 10b | Outer Eastern Bypass Short | 4 | 3 | 3 | 3 | 3 |
| 10c | Outer Eastern Bypass Medium | 5 | 4 | 4 | 4 | 4 |
| 10d | Outer Eastern Bypass Long | 5 | 4 | 4 | 4 | 4 |

Key findings in relation to the fit with scheme objectives include:

- The strongest alignment with the objectives is demonstrated by the 'new highways' options. These generally have a moderate to high impact across all of the objectives (options 9b and 9c being an exception).
- The outer western bypass (8a, 8b) and eastern bypass (10a, 10b, 10c, 10d) options are identified as having the strongest alignment with objectives overall, including greater potential for traffic relief and improved journey times.
- The demand management, public transport and, to an extent, the online improvements to the A350 are identified as having a more modest impact with respect to the objectives.
- The on-line improvements (7a, 7b and 7c) demonstrate a lower fit in terms of the objective to reduce traffic volumes through Melksham and Beanacre, and in terms of accident reduction.

### 8.3.2. Initial sift - fit with wider strategic outcomes

**Table 8-3** presents the results for the fit with wider strategic outcomes. This is a qualitative assessment of the extent to which each option is considered to align with broader policy objectives.

**Table 8-3 – Initial sift for fit with wider strategic outcomes**

| No. | Strategic Option | Economic growth | Health, well-being | Housing delivery | Equality and inclusion | Carbon neutrality |
|---|---|---|---|---|---|---|
| | | Fit with wider outcomes (-2 very poor fit / adverse, to +2 very good fit / positive) | | | | |
| 1 | Workplace Parking Levy | -1 | 0 | 0 | -1 | 0 |
| 2 | Road user charging | -1 | 0 | 1 | -2 | 1 |
| 3 | HGV restrictions | -1 | 0 | 0 | 0 | 0 |
| 4 | Rail service / infrastructure improvements | 1 | 1 | 1 | 1 | 1 |
| 5 | Bus service / infrastructure improvements | 1 | 1 | 1 | 1 | 1 |
| 6 | Improved walking / cycling routes | 1 | 2 | 1 | 1 | 1 |
| 7a | Additional lanes / widening: northern section (Leekes-Bath Rd) | 1 | 0 | 1 | 0 | 0 |
| 7b | Additional lanes / widening: southern section (Farmers-Semington Rd) | 1 | 0 | 1 | 0 | 0 |
| 7c | Dualling Western Way to Littleton Rbt | 1 | 0 | 1 | 0 | 0 |
| 8a | Western Bypass Short | 1 | 0 | 1 | 0 | 0 |
| 8b | Western Bypass Long | 2 | 1 | 2 | 0 | 0 |
| 9a | Inner Western Bypass | 1 | 0 | 1 | 0 | 0 |
| 9b | Relief Road West | 1 | 0 | 1 | 0 | 0 |
| 9c | Relief Road East | 1 | 0 | 1 | 0 | 0 |
| 10a | Inner Eastern Bypass | 1 | 0 | 1 | 0 | 0 |
| 10b | Outer Eastern Bypass Short | 1 | 0 | 1 | 0 | 0 |
| 10c | Outer Eastern Bypass Medium | 2 | 1 | 2 | 0 | 0 |
| 10d | Outer Eastern Bypass Long | 2 | 1 | 2 | 0 | 0 |

### Fit with wider outcomes – key findings

Key findings in relation to the fit with wider outcomes include:

- The rail, bus, walking and cycling options all demonstrate a good fit across all of the wider outcomes.
- The assessment indicates potential poorer alignment of the demand management measures in terms of equality and inclusion. Lower income groups and those with less potential to change to alternative travel modes (including rural communities) could be more adversely impacted by this option.
- The longer bypass options are identified as having a strong alignment with economic growth and housing delivery outcomes due to the greater connectivity benefits and journey time improvements associated with these.
- In relation to carbon neutrality, the high-level nature of the assessment at this stage is limited to a pragmatic consideration of the overall alignment with this outcome relative to each option.
    - Options such as walking and cycling and bus and rail demonstrate a good fit with policy aims to reduce carbon emissions owing to lower (or zero) emissions per trip. The overall scale of impact would be dependent upon the number of vehicle trips replaced.
    - For any options involving new or improved infrastructure there would be a carbon impact associated with construction (carbon footprint), but this is likely to be greater for the road-based options. There would be some scope for mitigation and offsetting to be considered through the design process, such as sustainable lighting and tree planting.
    - For the road-based options, improved traffic flow would be expected to improve fuel efficiency (particularly for bypass options), although this could be offset, at least in part, by increased vehicle kilometres associated with an increase in route length plus any additional traffic induced following delivery.

## 8.3.3. Initial sift - viability and acceptability

This focusses on the likelihood of unacceptable issues which could prevent delivery of the option. The assessment is informed by stakeholder feedback on the potential options.

### Stakeholder feedback

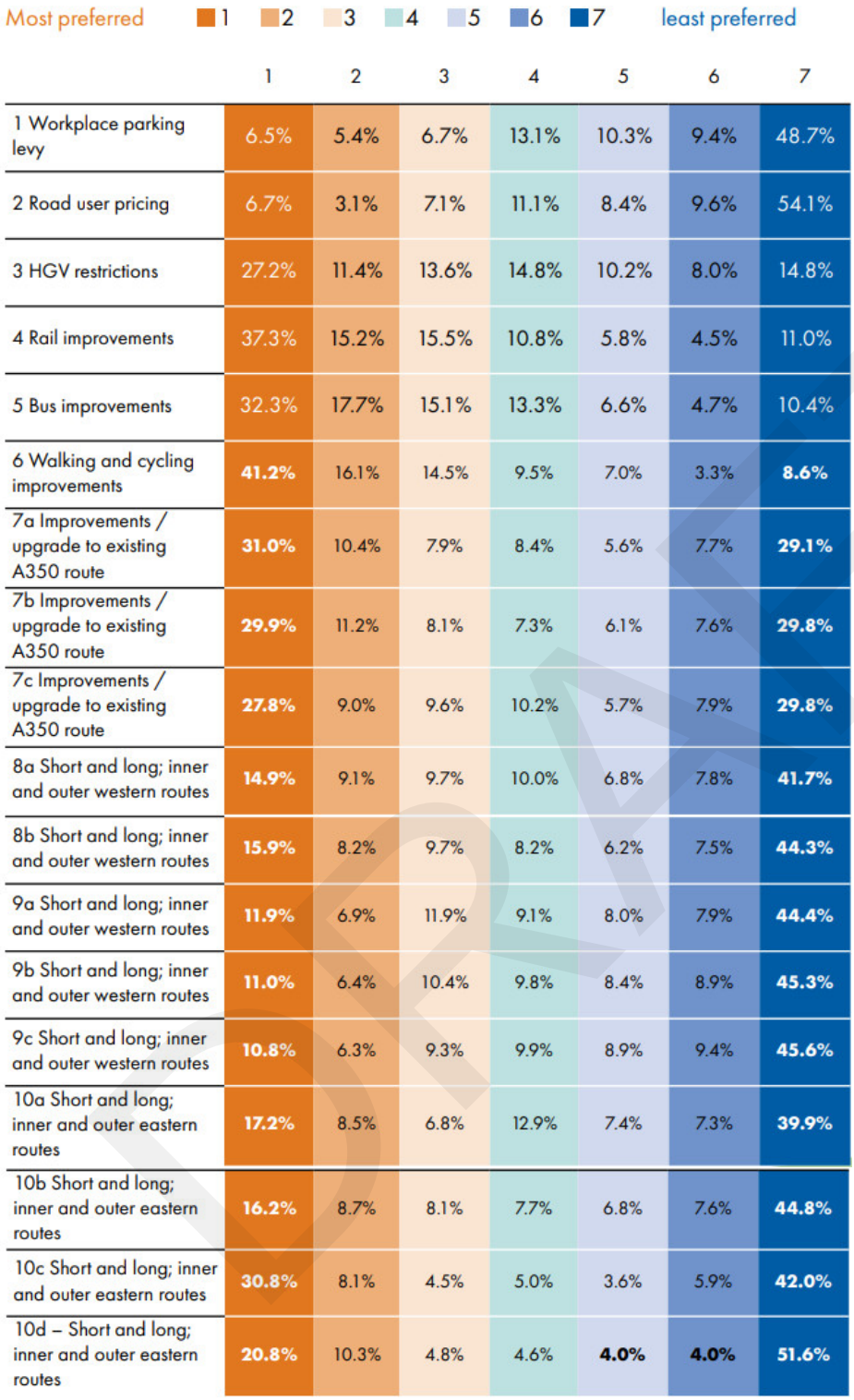
As part of Wiltshire Council's consultation exercise the public and wider stakeholders were asked for their views on the potential options **(**Error! Reference source not found.**)** and this has also been taken into account for the initial sift (particularly in terms of the likely acceptability). The consultation responses indicated that:

- Of the non-road options (based on the first choice of option) the most preferred options were: walking and cycling improvements (41%); rail improvements (37%) and bus improvements (32%);
- Road User Pricing and Workplace Parking Levy had the least support of any option (6.7% and 6.5%);
- Improving the existing A350 (options 7a, 7b, 7c) had a similar level of support (30%) to the most preferred 'new highway' option – the long eastern bypass (10c); and
- Of the other 'new highway' options, the western route options 9a, 9b and 9c had the least support (11.9%, 11.0% and 10.8%).

The main factors influencing choice around the road-based options were generally the potential impact on the countryside and residential properties. There were a range of other factors given, including cost, effectiveness, adverse effects of alternative routes, and the potential or otherwise of in-fill housing development.

Stakeholder feedback is also considered further as part of the further assessment (Chapter 9).

**Figure 8-2 – Stakeholder feedback on preferences for potential options (Wiltshire Council consultation, Nov 20 to Jan 21)**




| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 Workplace parking levy | 6.5% | 5.4% | 6.7% | 13.1% | 10.3% | 9.4% | 48.7% |
| 2 Road user pricing | 6.7% | 3.1% | 7.1% | 11.1% | 8.4% | 9.6% | 54.1% |
| 3 HGV restrictions | 27.2% | 11.4% | 13.6% | 14.8% | 10.2% | 8.0% | 14.8% |
| 4 Rail improvements | 37.3% | 15.2% | 15.5% | 10.8% | 5.8% | 4.5% | 11.0% |
| 5 Bus improvements | 32.3% | 17.7% | 15.1% | 13.3% | 6.6% | 4.7% | 10.4% |
| 6 Walking and cycling improvements | **41.2%** | 16.1% | 14.5% | 9.5% | 7.0% | 3.3% | **8.6%** |
| 7a Improvements / upgrade to existing A350 route | **31.0%** | 10.4% | 7.9% | 8.4% | 5.6% | 7.7% | **29.1%** |
| 7b Improvements / upgrade to existing A350 route | **29.9%** | 11.2% | 8.1% | 7.3% | 6.1% | 7.6% | **29.8%** |
| 7c Improvements / upgrade to existing A350 route | **27.8%** | 9.0% | 9.6% | 10.2% | 5.7% | 7.9% | **29.8%** |
| 8a Short and long; inner and outer western routes | **14.9%** | 9.1% | 9.7% | 10.0% | 6.8% | 7.8% | **41.7%** |
| 8b Short and long; inner and outer western routes | **15.9%** | 8.2% | 9.7% | 8.2% | 6.2% | 7.5% | **44.3%** |
| 9a Short and long; inner and outer western routes | **11.9%** | 6.9% | 11.9% | 9.1% | 8.0% | 7.9% | **44.4%** |
| 9b Short and long; inner and outer western routes | **11.0%** | 6.4% | 10.4% | 9.8% | 8.4% | 8.9% | **45.3%** |
| 9c Short and long; inner and outer western routes | **10.8%** | 6.3% | 9.3% | 9.9% | 8.9% | 9.4% | **45.6%** |
| 10a Short and long; inner and outer eastern routes | **17.2%** | 8.5% | 6.8% | 12.9% | 7.4% | 7.3% | **39.9%** |
| 10b Short and long; inner and outer eastern routes | **16.2%** | 8.7% | 8.1% | 7.7% | 6.8% | 7.6% | **44.8%** |
| 10c Short and long; inner and outer eastern routes | **30.8%** | 8.1% | 4.5% | 5.0% | 3.6% | 5.9% | **42.0%** |
| 10d – Short and long; inner and outer eastern routes | **20.8%** | 10.3% | 4.8% | 4.6% | **4.0%** | **4.0%** | **51.6%** |

The results for viability and acceptability are presented in **Table 8-4**.

**Table 8-4 – Initial sift against viability and acceptability ('show stoppers')**

| No. | Strategic Option | Economic Impact | Environmental Impact | Technical feasibility | Affordability | Stakeholder & Public acceptance |
|---|---|---|---|---|---|---|
| | | Risk of unacceptable impacts (1-almost certain to 5-highly unlikely) | | | | |
| 1 | Workplace Parking Levy | 2 | 4 | 3 | 4 | 1 |
| 2 | Road user charging | 2 | 5 | 2 | 4 | 1 |
| 3 | HGV restrictions | 2 | 2 | 3 | 4 | 2 |
| 4 | Rail service / infrastructure improvements | 5 | 5 | 2 | 3 | 4 |
| 5 | Bus service / infrastructure improvements | 5 | 5 | 4 | 4 | 4 |
| 6 | Improved walking / cycling routes | 5 | 5 | 4 | 4 | 5 |
| 7a | Additional lanes / widening: northern section (Leekes-Bath Rd) | 3 | 2 | 2 | 3 | 2 |
| 7b | Additional lanes / widening: southern section (Farmers-Semington Rd) | 3 | 2 | 2 | 3 | 3 |
| 7c | Dualling Western Way to Littleton Rbt | 5 | 3 | 4 | 3 | 4 |
| 8a | Western Bypass Short | 5 | 3 | 2 | 3 | 3 |
| 8b | Western Bypass Long | 5 | 2 | 2 | 2 | 3 |
| 9a | Inner Western Bypass | 5 | 3 | 1 | 2 | 2 |
| 9b | Relief Road West | 5 | 2 | 1 | 2 | 2 |
| 9c | Relief Road East | 5 | 2 | 1 | 2 | 2 |
| 10a | Inner Eastern Bypass | 5 | 3 | 4 | 3 | 3 |
| 10b | Outer Eastern Bypass Short | 5 | 3 | 3 | 3 | 3 |
| 10c | Outer Eastern Bypass Medium | 5 | 3 | 3 | 2 | 3 |
| 10d | Outer Eastern Bypass Long | 5 | 2 | 2 | 2 | 3 |

### Viability and acceptability – key findings

Key findings in relation to viability and acceptability include:

- The demand management measures are unlikely to be acceptable to stakeholders, as the financial implications of the measures are to be directly borne by the users, either through road use charging or parking charges, whereas alternative options represent a benefit without a direct financial burden.
- A higher risk is also identified for demand management measures in terms of potential economic impacts, such as for local businesses. There are wider potential implications in terms of business competition and relocation. Furthermore, there is a relatively high risk that traffic (including HGVs) would divert from the A350 to other less suitable roads in an attempt to avoid charges / restrictions.
- The bypass options would be expected to have mixed support, which is evident from the consultation findings. Communities more directly affected by a route are more likely to oppose it. At this stage, and in the context of broad corridors rather than specific alignments, none of the options have been identified as 'almost certain' to have unacceptable impacts, although the risk associated with the bypass options is higher than other options.
- None of the options have been determined with certainty as having unacceptable environmental impacts at this stage. This is not to say that there are not adverse environmental impacts associated with the options. A higher risk is expected in relation to the longer bypass options in particular. Environmental impacts are to be assessed in greater detail for those options progressed to further assessment. The potential scope for environmental mitigation will be a further consideration.
- In terms of technical feasibility, options 9a, 9b and 9c are considered to have a particularly high risk and could also face public opposition due to the use of the corridor between the rail line and Southbrook Road in Melksham which forms the floodplain for the South Brook tributary of the River Avon. This part of the corridor is prone to flooding, and already constrained by the rail line on the eastern side and housing at Southbrook Road on the western side. Even if a technical solution could be designed for a new highway through this corridor, the cost is likely to be proportionally high (compared to the likely benefits) and the risk of increased flooding to properties and other infrastructure in the area could still be high. For option 9a, the crossing/junction with Bradford Road close to sewage works would present greater technical challenge than options 8a/b as this is within the River Avon floodplain, with recent history of flooding at this location.
- Affordability has been considered in the context of the Large Local Major funding opportunity, which is specifically intended for large scale schemes. None of the options have been identified as being unaffordable in this context. There is a higher risk associated with the more substantial longer bypass options, due to the likely higher investment cost, higher amount of local funding contribution (as a proportion of total cost), and higher ongoing maintenance liability associated with new carriageway.

## 8.4. Initial sift outcomes

Findings from the assessment against scheme objectives, wider outcomes, viability and acceptability were considered together. The headline results and outcomes are presented in **Table 8-5**. Whilst scoring has been used as part of the process this is intended to be a guide and there is an element of judgement applied in relation to which options are proposed to progress and which are to be discarded at this stage. This includes whether options could potentially have merit in combination with other options, even if on their own they are unlikely to meet the objectives, and whether they may be progressed in a different form. Such instances are represented by the amber colour in **Table 8-5**. Further explanation on the reasons for progressing or discarding options at the initial sift stage is provided in section 8.4.1 and section 8.4.2.

**Table 8-5 – Outcomes of initial option sift**

| No. | Strategic option | Average score for strategic fit with objectives | Average score fit with wider outcomes | Average score for viability | Total average score (indicative purposes only) | No. of 'more than likely' risks | Progress to further assessment? |
|---|---|---|---|---|---|---|---|
| 1 | Workplace Parking Levy | 1.0 | -0.4 | 2.8 | 3.4 | 1 | No |
| 2 | Road user charging | 2.0 | -0.2 | 2.8 | 4.6 | 1 | No |
| 3 | HGV restrictions | 1.2 | -0.2 | 2.6 | 3.6 | 0 | No |
| 4 | Rail service / infrastructure improvements | 1.0 | 1.0 | 3.8 | 5.8 | 0 | No |
| 5 | Bus service / infrastructure improvements | 1.6 | 1.0 | 4.4 | 7.0 | 0 | Yes* (see 8.5.1) |
| 6 | Improved walking / cycling routes | 1.8 | 1.2 | 4.6 | 7.6 | 0 | Yes* (see 8.5.1) |
| 7a | Additional lanes / widening: northern section (Leekes-Bath Rd) | 0.6 | 0.4 | 2.4 | 3.4 | 0 | Yes* (see 8.5.1) |
| 7b | Additional lanes / widening: southern section (Farmers-Semington Rd) | 1.0 | 0.4 | 2.6 | 4.0 | 0 | |
| 7c | Dualling Western Way to Littleton Rbt | 1.0 | 0.4 | 3.8 | 5.2 | 0 | |
| 8a | Western Bypass Short | 3.6 | 0.4 | 3.2 | 7.2 | 0 | Yes |
| 8b | Western Bypass Long | 4.4 | 1.0 | 2.8 | 8.2 | 0 | Yes |
| 9a | Inner Western Bypass | 3.0 | 0.4 | 2.6 | 6.0 | 1 | No |
| 9b | Relief Road West | 2.2 | 0.4 | 2.4 | 4.8 | 1 | No |
| 9c | Relief Road East | 2.2 | 0.4 | 2.4 | 4.4 | 1 | No |
| 10a | Inner Eastern Bypass | 3.0 | 0.4 | 3.6 | 7.0 | 0 | Yes |
| 10b | Outer Eastern Bypass Short | 3.2 | 0.4 | 3.4 | 7.0 | 0 | Yes |
| 10c | Outer Eastern Bypass Medium | 4.2 | 1.0 | 3.2 | 8.2 | 0 | Yes |
| 10d | Outer Eastern Bypass Long | 4.2 | 1.0 | 2.8 | 8.0 | 0 | Yes |

*Note – Amber / 'Yes*' indicates progression to further assessment, but not as a discreet option, or not in its current form. Section 8.5.1 provides further details.*

### 8.4.1. Options to progress to further assessment

From the initial sift a set of options has been identified as the most suitable to progress to further assessment **(Table 8-6)**. These align well with scheme objectives and without any major viability and acceptability issues

identified at this stage. The subsequent stage of assessment to consider these options in more detail is covered in Chapter 9.

**Table 8-6 – Options to progress to further assessment**

| No. | Strategic option | Reasons for progressing to further assessment |
|---|---|---|
| 5 / 6 | Walking / cycling and bus improvements | These were identified as being unlikely to deliver the scale of impact required against the objectives as options in their own right. However, these present a good fit with objectives and wider outcomes and are well supported by stakeholders. The relatively frequent bus services (half-hourly) that already exist on main inter-urban routes provide limited scope for further improvements without ongoing revenue support. But other options could support / enhance use of these modes. In combination with other highways options to be progressed they have potential to enhance benefits as complementary measures, in particular associated with any decrease in traffic levels on the A350 and other routes. |
| 7a/b/c | Improvements to existing A350 | Individually, these options were identified as being unlikely to deliver the scale of impact required against the objectives. There are also some potential viability issues associated with delivering improvements on relatively constrained sections of the existing A350 route (particularly in relation to 7a and 7b).<br>However, these options had similar levels of support to bypass options and could potentially be less expensive. They have been judged to warrant further consideration in combination (as an 'online improvement package'). |
| 8a | Western bypass short | These options are taken forward as they were identified as having a moderate or significant impact in terms of achieving the scheme objectives and addressing the underlying causes of the problems more comprehensively than other options. They all have some challenges in terms of viability and acceptability (including potential environmental impact), to be considered further during the next stages of assessment. |
| 8b | Western bypass long | |
| 10a | Inner eastern bypass | |
| 10b | Outer eastern short bypass | |
| 10c | Outer eastern medium bypass | |
| 10d | Outer eastern long bypass | |

## 8.4.2. Reasons for options discarded at the initial sift

Discarded options are not considered to have a sufficient case to progress to further assessment. It should be noted that these conclusions are based on the particular context and objectives of this project only and their suitability or merits may be considered differently in an alternative context. A summary of the reasons for discarding these options is provided in **Table 8-7**.

**Table 8-7 – Options discarded at the initial sift**

| No. | Strategic option | Reasons for discarding |
|---|---|---|
| 1 | Workplace Parking Levy | Expected to only have a minor impact with respect to the objectives. This could be used to generate revenue for investment in other transport infrastructure and services, but a relatively small financial cost will not cause many people to leave their cars in favour of other modes. As such, this is likely to only have a small impact on car based demand around Melksham and on the A350.<br>There are currently no restrictions to parking on the street and it would need to be combined with residential parking scheme for all of Melksham to be effective. Based upon the consultation findings. There is likely to be strong opposition by the public and stakeholders. It could also adversely impact local businesses with |

| No. | Strategic option | Reasons for discarding |
|---|---|---|
| | | a risk of business re-location, which could harm the local economy and potentially exacerbate out-commuting from the A350 corridor.<br>Despite it being a relatively affordable option, it does not directly address journey times, collisions, severance or produce improved connectivity. |
| 2 | Road user charging | Expected to have a minor to moderate impact with respect to the strategic case objectives – a moderate reduction in travel demand might be achievable, but it is likely to be associated with other adverse impacts, including risk of economic impact (e.g. relative economic competitiveness of businesses within the area). It is likely to be a technically challenging option with limited flexibility which is unlikely to be acceptable to the public (as indicated by the consultation exercise). There are potential equality and inclusion impacts associated with the imposition of a charge. The likely resultant traffic re-routing to avoid a charge could have wider adverse impacts on local communities, thus offsetting benefits from removing traffic in Melksham. Revenue generated would also likely be significantly absorbed by high operating costs. |
| 3 | HGV restrictions | This is a relatively low cost option that would remove much of the HGV traffic from Melksham (accounting for approximately 7% of all traffic). However, the option directly opposes the policy of improving the corridor for HGV traffic and there is some risk of adverse economic impact (e.g. increased costs to businesses / hauliers). It is a technically challenging option with limited flexibility as there is a lack of alternative suitable routes for HGVs. Whilst providing some benefits to those living adjacent to the A350 through Melksham, it is likely to be a case of shifting the issue elsewhere. |
| 4 | Rail service / infrastructure improvements | Demonstrates a good fit with wider policy outcomes, but in terms of addressing the scheme objectives the scale of impact likely to be realistically achievable is not expected to be of the magnitude required to significantly address the identified problems (e.g. in terms of modal shift). Overall, the number of trips that transfer from cars to rail is expected to be fairly low (even with 600,000 annual rail users, 10 times the current amount, this would remove less than 1,600 cars per day from the A350, which is less than 10% of daily traffic). Further increasing frequencies is likely to require significant infrastructure improvement (e.g. double track).<br>The option is likely to have a role to play as part of the wider strategy for Melksham and West Wiltshire. Notwithstanding it not being progressed as a discreet option, other options to be progressed are expected to support the role of rail travel within Melksham – for example, options 5 / 6 (walk, cycle, bus measures) and highway options, which could improve access to the rail station by different modes. |
| 9a | Inner Western Bypass | Expected to have a moderate impact with regards to the strategic case objectives. However, the expected scale of cost, technical feasibility challenges and potential environmental impact related to required floodplain and rail and road crossings mean that this option is not identified for progression. |
| 9b | Relief Road West | This bypass option avoids Beanacre but then re-joins the A350 at Bath Road junction, putting a significant volume of traffic back onto the A350 north of Farmers Roundabout. It is therefore expected to only have a minor impact with regards to the strategic case objectives, along with limited flexibility, high technical risks, potential environmental impacts and low public acceptability, particularly with respect to the route between Southbrook Road and rail line which is prone to flooding and could have an adverse impact (noise, air quality, flooding) on residences in Southbrook Road. Due to the technical challenges the cost is expected to be high in relation to the scale of impact / benefits. |
| 9c | Relief Road East | This bypass option avoids Beanacre but then re-joins the A350 at Bath Road junction, putting a significant volume of traffic back onto the A350 north of Farmers Roundabout. It is therefore expected to only have a minor impact with regards to the strategic case objectives, along with limited flexibility, high technical risks, potential environmental impacts and low public acceptability, |

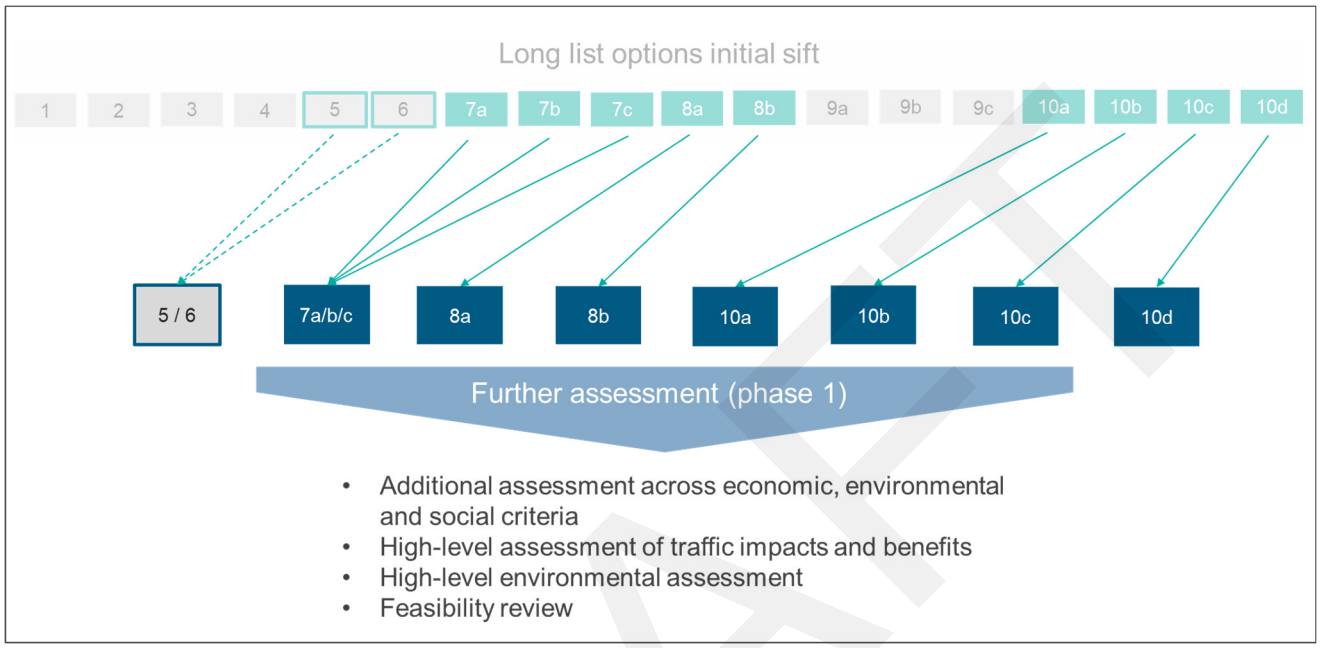
| No. | Strategic option | Reasons for discarding |
|---|---|---|
| | | particularly with respect to the route between Southbrook Road and rail line which is prone to flooding and could have an adverse impact (noise, air quality, flooding) on residences in Southbrook Road. Due to the technical challenges the cost is expected to be high in relation to the scale of impact / benefits. |

# 9. Further assessment (phase 1)

## 9.1. Further assessment

The further assessment builds upon the initial sift (Chapter 8) and considers the remaining options against criteria from each of the five cases in more detail **(Figure 9-1)**.

**Figure 9-1 – Further assessment (phase 1)**



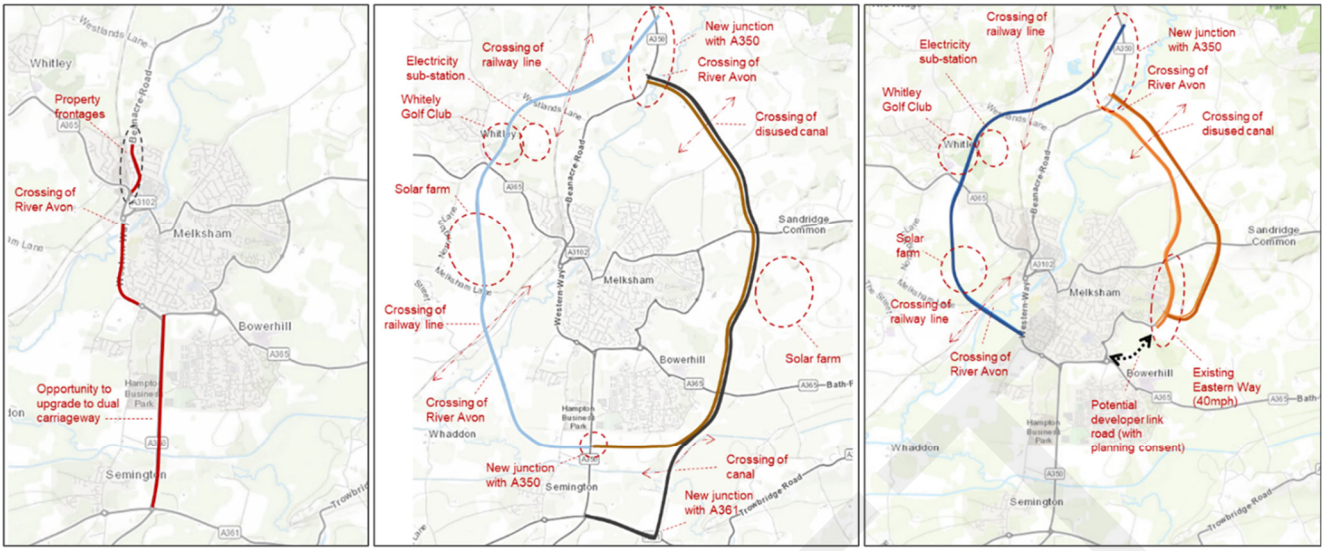

As illustrated in **Figure 9-2**, the options subject to further assessment include:

- Long bypass options (options 8b, 10c and 10d);
- Shorter bypass options (options 8a,10a and 10b); and
- On-line improvements package (option 7a / b / c).

The high-level design specification for these options, based on indicative route corridors, is included in Appendix A. This includes approximate route length, footprint, number of junctions, and number and type of structures.

In addition, all options are considered in relation to a potential package of complementary walking, cycling and bus measures (option 5 / 6), as per the conclusions from the initial sift stage. The different options could support such a package to different degrees, and this is considered within the further assessment.

**Figure 9-2 – Options subject to further assessment**




## 9.2. Further assessment methodology

The assessment approach at this stage is broader than for the initial sift **(Table 9-1).** The approach applies the principles of the Options Assessment Framework recommended within TAG[26] in a proportionate manner. The assessment draws upon additional quantitative and qualitative evidence and analysis, including:

- Spreadsheet analysis and initial transport modelling outputs;
- Engineering feasibility assessment; and
- High-level environmental assessment.

The focus of the assessment is to distinguish the relative benefits and impacts of the options under consideration - it is not intended to necessarily present the absolute performance of an option (although the assessment can provide a useful indication).

A prudent approach to scoring has been adopted that reflects the quality of information on which scores are being based but ensures any key risks associated with options are highlighted.

[26] The Transport Appraisal Process – Appendix A Option Assessment Framework (DfT, May 2018)

**Table 9-1 - Assessment criteria for options further assessment**

| Case | Criteria | Sub-criteria | Comments on assessment inputs | Assessment approach |
|---|---|---|---|---|
| Strategic Case **(Table 9-2)** | Strategic fit with objectives | Effectiveness of the intervention, i.e. to what extent the option can address the identified problems and contribute to the objectives identified for the scheme. | Supported by spreadsheet analysis and initial traffic modelling with regards to potential scale of journey time changes / delay reduction and potential changes in traffic volumes. | Assessed on 6-point scale (against each transport objective):<br>• 0 - Neutral<br>• 1 - very small impact<br>• 2 - minor impact<br>• 3 - moderate impact<br>• 4 - significant impact<br>• 5 - fully addressed |
| Economic Case **(Table 9-3)** | Impact on economy | Business users and transport providers – impact on journey costs | Spreadsheet analysis | Assessed on 7-point scale:<br>• 1 – large adverse to 7 – large beneficial |
| | | Reliability | Qualitative assessment | |
| | | Wider impacts | Qualitative assessment – expected changes in journey times between key settlements | |
| | Impact on the environment | Noise | High-level environmental assessment. Predominantly desk-based providing a qualitative assessment applying the main principles of DMRB and TAG in a proportionate manner. | Assessed on a 7-point scale:<br>• 1 – large adverse to 7 – large beneficial |
| | | Air quality | | |
| | | Greenhouse gases (Climate effects) | | |
| | | Landscape | | |
| | | Townscape / planning | | |
| | | Historic environment | | |
| | | Biodiversity | | |
| | | Water environment | | |
| | Impact on society | Non-business users | Spreadsheet analysis | Assessed on a 7-point scale:<br>• 1 – large adverse to 7 – large beneficial |
| | | Physical activity | Qualitative assessment – drawing upon Propensity to Cycle Tool / STRAVA | |
| | | Journey quality | Qualitative assessment | |

| Case | Criteria | Sub-criteria | Comments on assessment inputs | Assessment approach |
|---|---|---|---|---|
| | | Accidents | Analysis of existing / historical accident trends and locations.<br>Modelled changes in traffic volumes | |
| | | Security | Qualitative assessment | |
| | | Severance | Modelled changes in traffic volumes on different links<br>STRAVA – indication of walk/cycle activity including key routes | |
| | | Access to services | Qualitative assessment | |
| Economic Case – indicative value for money **(Table 9-5)** | Indicative value for money | Scale of potential benefits against scale of expected cost (BCR) | Spreadsheet analysis generating indicative PVB<br>Cost estimates | Assessed against the DfT Value for Money categories:<br>• Very high<br>• High<br>• Medium<br>• Low<br>• Poor<br>• Very poor |
| Financial Case **(Table 9-4)** | Affordability | Indicative construction costs | Cost estimation – high-level unit rate cost estimates produced on a consistent basis across options. Informed by design specification. | Indicative cost estimate presented for each option |
| | | Indicative maintenance costs | Qualitative assessment of relative magnitude of expected whole life costs. Informed by design specification, including: route length, carriageway area, number and type of structures and junctions. | Score on 5-point scale:<br>• 1 – low<br>• 5 – high |
| | Cost risk | Risks of cost increases | High-level feasibility review of each option | Score on 5-point scale:<br>• 1 – high risk<br>• 5 – low risk |
| | Practical feasibility | Implementation timetable, key risks, technical complexity | High-level feasibility review of each option | Score on 5-point scale: |

| Case | Criteria | Sub-criteria | Comments on assessment inputs | Assessment approach |
|---|---|---|---|---|
| Management (Delivery) Case **(Table 9-4)** | Public acceptability / interest | Motor vehicle users, public transport users, pedestrians / cyclists, residents, environmental advocates etc. | Public / stakeholder consultation exercise feedback, plus feasibility review | • 1 – low<br>• 5 – high |
| Commercial Case | Procurement routes | Level of difficulty / risk | | Score on 3-point scale:<br>• 0 – high<br>• 1 – medium<br>• 2 - low |

## 9.3. Further assessment results

### 9.3.1. Further assessment - Strategic Case

The initial sift provides the basis for further assessment against the scheme objectives. This has been reviewed in light of additional analysis available with respect to potential journey time savings and traffic flow changes, including from initial transport model outputs. This helps to provide a more refined consideration of the likely scale of impact of different options.

The assessment against the scheme objectives is summarised in **Table 9-2**.

**Table 9-2 – Further assessment – strategic fit**

| Option | 7 a/b/c | 8a | 8b | 10a | 10b | 10c | 10d |
|---|---|---|---|---|---|---|---|
| Assessment criteria | Existing A350 improvements | Western bypass short | Western bypass long | Eastern bypass – inner short | Eastern bypass - short | Eastern bypass - long | Eastern bypass – long (south of K&A canal) |
| Fit with objectives (0 neutral, to 6 fully addressed) | | | | | | | |
| Reduce journey times and delays on the A350 through Melksham and Beanacre | 3 | 4 | 5 | 3 | 4 | 5 | 5 |
| Reduce journey times and delays on other routes through Melksham | 3 | 4 | 4 | 3 | 4 | 4 | 4 |
| Provide enhanced opportunities for walking and cycling | 1 | 3 | 5 | 3 | 3 | 5 | 5 |
| Reduce personal injury accident rates and severity for the A350 and Melksham | 2 | 3 | 4 | 3 | 3 | 4 | 4 |
| Reduce the volume of traffic passing along the current A350 route | 0 | 4 | 5 | 4 | 4 | 5 | 5 |

### Key findings for further assessment – strategic fit (Strategic Case)

Key findings in relation to the relative performance of each of the options include:

- The long bypass options perform the strongest across the five objectives. They have potential to achieve higher journey time benefits (3 to 4 minutes saving per vehicle for the main north-south movement) and provide the greatest traffic relief to the existing A350 (approximately 40% to 60% reduction), whilst also drawing traffic from other surrounding routes. This provides increased opportunity for enhancing local walking and cycling provision on and around the existing A350 and high street / town centre. Consequently, the inclusion of the potential complementary package of walking and cycling measures would have a particularly strong fit with these options through locking in the benefits of the traffic reduction on the existing A350 and surrounding routes.
- The shorter bypass options are not expected to be as effective as the full bypass options, but could still achieve a meaningful contribution towards the scheme objectives. Expected journey time savings are less for the main north-south movement (1 to 2 minutes) and they are less effective at serving other through movements. These options are expected to achieve a good level of traffic reduction (although less than the longer bypass options, and the shorter options would not address traffic volumes on the A350 south of Semington Road roundabout. Of the shorter bypass options, 8b is expected to have a slightly greater beneficial impact against the objectives compared to options 10a and 10b.
- The combined online improvement option (7a/b/c) is expected to have a moderate positive impact in terms of journey time improvement; in part due to the fact that existing speed limits are assumed to remain the same and that a significant number of junctions would remain along the route (even if improved, or rationalised, where practicable). The competing demands and adjacent land uses along the existing A350 limits the scale of improvement that could practically be achievable. The online road improvements also fail to address the objective of reducing traffic volumes on the A350 and other routes and hence tackle severance issues. Opportunities for enhanced walking and cycling would be expected to be limited without compromising the ability to meet other objectives. Giving increased priority to pedestrians and cyclists is likely to restrict the extent of improvement that could be achieved to traffic flow and journey times within the constraints of the existing corridor. Consequently, the potential complementary package of walking and cycling measures is likely to be less effective and less feasible in relation to the online improvement option.
- Most options are assessed as having a moderate contribution towards the objective for accident reduction. Bypass options would contribute towards this objective through provision of an alternative route, avoiding the large number of junctions and potential conflict points on the existing A350. The on-line improvements option is considered to have less scope for accident reduction compared to the bypass options.

## 9.3.2. Further assessment – Economic Case (impacts on economy, environment, society)

The assessment against impacts on economy, environment and society is summarised in **Table 9-3**.

**Table 9-3 – Further assessment – economy, environment and society**

| Option | 7 a/b/c | 8a | 8b | 10a | 10b | 10c | 10d |
|---|---|---|---|---|---|---|---|
| Assessment criteria (1 – large adverse, to 7 – large beneficial) | Existing A350 improvements | Western bypass short | Western bypass long | Eastern bypass – inner short | Eastern bypass - short | Eastern bypass - long | Eastern bypass – long (south of K&A canal) |
| **Impacts on the economy** | | | | | | | |
| Business users and transport providers | 5 | 6 | 7 | 6 | 6 | 7 | 7 |
| Reliability | 4 | 6 | 7 | 5 | 5 | 7 | 7 |
| Wider impacts | 5 | 6 | 6 | 5 | 5 | 6 | 6 |
| **Impacts on the environment** | | | | | | | |
| Noise | 2 | 5 | 6 | 5 | 5 | 6 | 5 |
| Air quality | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Greenhouse gases | 3 | 4 | 2 | 3 | 3 | 2 | 2 |
| Landscape / townscape | 3 | 2 | 2 | 3 | 2 | 3 | 2 |
| Historic environment | 4 | 2 | 1 | 4 | 3 | 1 | 1 |
| Biodiversity | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| Water environment | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| Option | 7 a/b/c | 8a | 8b | 10a | 10b | 10c | 10d |
|---|---|---|---|---|---|---|---|
| Assessment criteria (1 – large adverse, to 7 – large beneficial) | Existing A350 improvements | Western bypass short | Western bypass long | Eastern bypass – inner short | Eastern bypass - short | Eastern bypass - long | Eastern bypass – long (south of K&A canal) |
| **Impacts on society** | | | | | | | |
| Non-business users | 5 | 6 | 7 | 6 | 6 | 7 | 7 |
| Physical activity | 3 | 5 | 5 | 5 | 5 | 5 | 5 |
| Journey quality | 5 | 6 | 7 | 5 | 5 | 7 | 7 |
| Accidents | 4 | 5 | 6 | 5 | 5 | 6 | 6 |
| Security | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Severance | 2 | 4 | 5 | 4 | 4 | 5 | 4 |

### Key findings for further assessment – impacts on the economy (Economic Case)

All options are assessed as having beneficial impacts on the economy. Key findings include:

- **Benefits to business users and transport providers** are assessed as being higher for the longer bypass options (8b, 10c, 10d). This reflects the potential for greater journey time savings (section 9.3.1) for trips to / from Melksham, between the West Wiltshire settlements, plus longer distance traffic (thus reducing the time cost incurred for these users). In terms of vehicle operating costs, all options might be expected to result in a slight reduction overall. Opposing impacts are expected in terms of fuel cost and vehicle (wear and tear) costs – higher average speeds would likely improve fuel efficiency and reduce fuel costs, but a longer travel distance (for the bypass options) would likely increase vehicle costs.
- **Reliability benefits** are assessed as being highly beneficial for the longer bypass options and slight to moderate beneficial for the shorter bypass options. This reflects the provision of a higher standard, more free-flowing route with fewer junctions / access points. The increased capacity provided also introduces a greater level of resilience for the transport network (e.g. in the case of incidents on the network). For option 7a/b/c this would not be the case and it is likely to be difficult to achieve significant improvement to the existing reliability issues on the route.
- In relation to **wider impacts**, improvement to north-south movements would generally be considered to enhance connectivity within West Wiltshire and the wider region by reducing journey times between the various employment centres along the corridor. This has potential to drive agglomeration benefits. The longer bypass options are assessed as having the highest beneficial impact and are more consistent with creating a step change to the standard of the A350 route at Melksham which is more in line with policy relating to the strategic role and function of the corridor.

### Key findings for further assessment - impacts on the environment (Economic Case)

- The high-level environmental assessment has identified adverse impacts against most of the environmental topics for all options. The exception is for noise, where removal of traffic from the route through Melksham (where there are identified Noise Impact Areas) is expected to deliver noise benefits (notwithstanding some offsetting around any new alignment) - noise impacts are assessed as beneficial for all options except 8a, and 7a/b/c (which would not remove traffic from the existing A350).
- Of the bypass options, option 10a has been identified as having the least significant adverse environmental impacts overall – this is considered to reflect the shorter length of new carriageway (limited to the north of the A3102) involving less land take and fewer river crossings. Option 10b has similar impacts to 10a, but has a larger land take.
- Option 8b (long bypass to the west) and option 10d (long bypass to the east, crossing the Kennet and Avon Canal) are assessed as having the most significant environmental impacts overall; they both require large amounts of land take (10d has the greatest requirement out of all the options) and multiple river crossings. Some significant environmental concerns were raised in relation to option 10d through the consultation exercise. These related, in particular, to the potential adverse impacts on the setting of the Kennet and Avon Canal and its associated biodiversity. Option 8b passes through a golf course and solar farm, passes near to residential areas and also passes through a pocket of ancient woodland. The online improvement option (7a/b/c) would not result in loss of greenfield land, compared to the other bypass options.
- All options require crossing of the River Avon and its flood plain (potential widening of existing structure in the case of option 7a/b/c) with potential to adversely impact the water environment.
- Option 8b (long bypass to the west) and options 10c and 10d (long bypass options to the east) have been identified as having a potential large adverse impact on the historic environment (cultural heritage). Given the indicative nature of the corridors at this stage, this reflects the potential to impact the setting of a number of listed buildings and other sensitive receptors.
- The assessment reflects a high degree of uncertainty at this stage. Mitigation could have a significant role to play in terms of the environmental impacts. All environmental impacts would be subject to a more detailed assessment for any option that is progressed and it is possible that assessment findings could change with the consideration of further data, evidence and analysis.

### Key findings for further assessment - impacts on society (Economic Case)

- All options are assessed as having a beneficial impact on **commuting and other users**, in terms of journey time / cost savings (see also 9.3.1), which are expected to materialise throughout the day (not limited to the peak periods). The scale of impact is expected to be greatest for the longer bypass options and least for the online improvements option (7a/b/c).
- In terms of **physical activity**, all bypass options are assessed as having a slight beneficial impact. This assumes that any existing walking / cycling facilities (e.g. Public Rights of Way) impacted by the bypass

route would be reinstated to at least an equivalent standard of provision, and takes account of the opportunities presented by reduced traffic volumes on the existing A350 and within the town. The inclusion of the potential complementary package of walking and cycling measures would be expected to provide additional physical activity benefits, particularly in relation to the longer bypass options which provide the greatest scope to support such measures due to the more substantial traffic reduction on existing routes. Option 7a/b/c may result in adverse impacts in this regard as it would not reduce traffic volumes and the need to prioritise online improvements for traffic flow on the existing route could further impact on the quality of the walking and cycling environment and discourage active travel.

- For **journey quality**, beneficial impacts have been identified across all options. The longer bypass options are expected to provide the greatest benefit due to the overall increase in the standard of the route from Beanacre through to Semington with less delay and fewer junctions contributing to a better experience and reduced driver stress. The bypass routes would also geenrally offer improved views of the rural landscape compared to the existing A350 route. Slight benefits have been assessed for options 7a/b/c and 10a, for which the extent of route length improvement is reduced. In the case of 7a/b/c the slight beneficial impact would be associated with improved traffic flow as opposed to traveller views.
- **Accident benefits** are assessed positively in relation to all options except 7a/b/c. For the bypass options benefits are expected in terms of the transfer of traffic from the existing accident cluster sites identified on the A350 to an alternative route of a higher specification and with a less complex driving environment. This would be most beneficial in relation to the longer bypass options (notwithstanding higher vehicle speeds). For options 10a and 10b the increase in traffic on the existing network to the east of Melksham (e.g. Spa Road, Eastern Way) is likely to offset at least some of the reduced likelihood of collisions on the existing A350. For option 7a/b/c a neutral impact has been determined as the scope for significant safety enhancement is likely to be limited if other outcomes relating to vehicle journey time are to be achieved.
- In terms of **severance impacts**, option 7a/b/c performs the least well of the options. The existing severance issues on the A350 would not be addressed (around the station area and northern Melksham in particular) due to no reduction in traffic volumes and the need to prioritise the traffic movement. Widening of the carriageway could exacerbate existing issues and the introduction of additional high-quality crossing facilities is likely to be problematic in the context of the overall constraints present. The longer bypass options would contribute to tackling severance on the existing A350 by reducing traffic volumes significantly. Any adverse severance impacts as a result of the new road alignment are less certain at this stage, but it is assumed that any severed walking or cycling routes would be reinstated with adequate crossing provision. Options 8a and 8b, to the west of Melksham, could introduce some severance issues in relation to the communities of Shaw and Whitely and their connections with Melksham town. Options 10a and 10b, whilst tackling severance on the existing A350 route, present a risk of introducing severance issues to the eastern side of the town as they would attract more traffic on to the existing network in this area (with particular considerations in terms of connections between the east of the town and Melksham Oak Community School).

### 9.3.3. Further assessment – Financial Case

The assessment results in relation to the financial case are presented in **Table 9-4.**

**Table 9-4 – Further assessment – financial and management (delivery) cases**

| Option | 7 a/b/c | 8a | 8b | 10a | 10b | 10c | 10d |
|---|---|---|---|---|---|---|---|
| Assessment criteria | Existing A350 improvements | Western bypass short | Western bypass long | Eastern bypass – inner short | Eastern bypass - short | Eastern bypass - long | Eastern bypass – long (south of K&A canal) |
| **Financial Case** | | | | | | | |
| Indicative outturn cost | £70m | £115m | £180m | £85m | £100m | £135m | £160m |
| Indicative scale of maintenance costs (60 yrs) | Low | Medium | High | Low to medium | Medium | Medium to high | High |
| Funding allocation (indicative) | DfT: £60m<br>Local: £10m | DfT: £98m<br>Local: £17m | DfT: £153m<br>Local: £27m | DfT: £72m<br>Local: £13m | DfT: £85m<br>Local: £15m | DfT: £115m<br>Local: £20m | DfT: £136m<br>Local: £24m |
| **Management (delivery) Case**<br>(5-point scale: low to high) | | | | | | | |
| Cost risk/ uncertainty | Medium | Medium to high | High | Medium to high | Medium to high | Medium | High |
| Delivery complexity | Medium to high | High | High | Medium | Medium | Medium | Medium to high |
| Stakeholder acceptability risk | Medium | High | High | Low to medium | Low to medium | Medium | Medium |
| Public acceptability risk | Low to medium | Medium to high | Medium to high | Medium | Medium | Low to medium | Medium to high |

### Key findings - indicative outturn costs and cost certainty (Financial Case)

Indicative outturn costs for each option have been derived based upon:

- a high-level construction cost estimate;
- indicative benchmarked uplifts (percentage) applied to account for: preparatory, supervision and land costs;
- risk allowance; and
- inflation.

Of particular importance for this stage of assessment is that the costs have been prepared on a consistent basis across all options as the main intention is to determine the relativity between options. The level of cost risk has also been assessed qualitatively for each option to provide an indication of the level of uncertainty.

The indicative outturn cost estimates range from approximately £70 million (option 7a/b/c) to approximately £180 million (option 8b). As expected, costs are higher for the longer bypass options. Of these, option 10c has the lowest indicative cost estimate (£135m). Of the shorter bypass options, option 10a has the lowest cost estimate (£85m) – it has been assessed as having a medium to high cost risk, principally due to the potential need for additional enhancements to the existing network to the east of Melksham. Option 8b has the highest cost estimate of the shorter bypass options (£115m). in general, the options to the west of Melksham have a higher cost and also a higher degree of cost uncertainty.

### Key findings - maintenance costs (Financial Case)

For any significant infrastructure project it is also important to consider the ongoing costs associated with maintenance of the new asset(s). This has been assessed in terms of an indicative scale of cost associated with renewals and general highway maintenance, taking into account the extent of new carriageway and the number of structures (Appendix A provides the design specification for the options under consideration). Options 8b and 10d have been assessed as having the most significant maintenance costs and are the longest routes with the most structures involved. Option 7a/b/c is considered to have the least maintenance implication reflecting that these are online improvements, notwithstanding that carriageway widening would increase the maintainable asset.

### Key findings - funding allocation (Financial Case)

At this stage, a simple assumption is made that the targeted funding route (DfT Large Local Majors fund) would be the primary funding source. A local contribution is typically sought, and it is assumed that there would be a local contribution of 15% of the investment cost. This assumption is consistent for all options.

## 9.3.4. Further assessment – delivery and commercial case

The assessment results in relation to the delivery and commercial case are presented in **Table 9-4.**

### Key findings - delivery complexity (Management Case)

All the options under consideration will have their own delivery challenges. The purpose of the assessment is to distinguish the relative complexity between the options. All options have been subject to an engineering realism review.

The highest complexity is considered to be associated with the options to the west of Melksham (8a and 8b). Contributing factors include the need to cross the railway line in two separate locations. In particular, at one location the need to cross the rail line, the B3107 and the River Avon in close proximity could result in the requirement for a very substantial structure(s). TransWilts has also expressed the view that any railway crossings should allow for the line to be restored to a double track, which could further add to the structure requirements. Additionally, there are expected to be unavoidable impacts on the Roundponds Farm Solar Park and Whitely Golf Club (with the electricity sub-station also being in close proximity). The route also navigates through two HT lines and pylons which presents challenges in developing a compliant alignment considering horizontal and vertical clearances. Overall, there is considered to be less flexibility for options to the west to overcome engineering and other challenges, such as land availability.

After the western options, options 10d and 7a/b/c have the next highest complexity. The challenges around 7a/b/c are mainly associated with the northern section which is particularly constrained and is likely to require land take affecting adjacent properties. The southern element of this option (7c) is considered to be of lower complexity as the road was constructed with future dualling in mind. Option 7a/b/c would also involve greater disruption to A350 traffic during construction than bypass options due to the need for traffic management throughout the period of construction works. Option 10d poses some challenges particularly in relation to crossing the Kennet and Avon Canal.

Options 10a, 10b and 10c are considered to be of moderate complexity overall. Options 10a and 10b are less complex in terms of the new bypass carriageway construction, but both of these options rely upon existing roads to the east of Melksham, which may require improvements, and also have a strong inter-dependency with the link road extension to Eastern Way planned as part of the Bloor Homes housing development.

#### Key findings - public and stakeholder acceptability (Management Case)

The level of risk associated with public and stakeholder acceptability has been assessed qualitatively for each option. This has been informed by the consultation exercise undertaken by Wiltshire Council (concluding January 2021) and other ongoing engagement with key stakeholders. In relation to the options under consideration key points include:

- The consultation responses expressed a general preference for the bypass options to the east of Melksham. This was evident within the quantified responses (refer to Figure 8-2), in addition to general comments.
- The longer bypass options were more preferred than the shorter bypass options.
- Option 10c (long bypass option to the east) was the most preferred of the bypass options based on the quantified responses. Melksham Town council and Melksham Without Parish Council expressed support for option 10c.
- The online improvements received a similar level of support to option 10c – hence they are considered to have relatively low risk in terms of public acceptability, although potentially higher risk in terms of wider stakeholder acceptability, such as business premises potentially directly impacted in the northern section.
- The least preferred option from the consultation responses was option 10d, with the main reason being due to the crossing of the Kennet and Avon Canal considered to result in detrimental impacts to the local setting, environment and wildlife.

### 9.3.5. Further assessment – indicative value for money

An indicative assessment of the potential value for money of each option has been made based upon the expected scale of benefits and the estimated costs of implementation, plus ongoing maintenance costs (assuming a 60 year period). Whilst benefits (in terms of monetisation) will be driven significantly by journey time savings the scope for other benefits / disbenefits has also been considered based upon the assessment undertaken against economic, environmental and social criteria.

**Table 9-5 – Further assessment – indicative value for money**

| No. | Strategic option | Indicative value for money category | Comments |
|---|---|---|---|
| 7a/b/c | Online improvements | Poor | The scale of benefits, particularly in terms of journey time savings is likely to be low compared to the cost. Lower scale of wider benefits expected. |
| 8a | Western Bypass Short | Low / Medium | Moderate benefits, but set against a relatively high cost. |
| 8b | Western Bypass Long | Low | Higher benefits linked to greater journey time savings, but set against a particularly high cost. |
| 10a | Inner Eastern bypass Short | Medium / Low | Moderate benefits and a medium cost. |
| 10b | Outer Eastern Bypass Short | Low / Medium | Similar benefits to option 10a, but at a higher cost. |
| 10c | Outer Eastern Bypass Long | Medium | Expected to produce the more favourable balance between the scale of benefits (similar to 8b and 10d) and cost. |
| 10d | Outer Eastern Bypass Long | Low / Medium | Higher benefits, similar to 10c, but with a higher cost. |

### 9.3.6. Further assessment - overview

An overview of the further assessment for all seven options is presented in **Table 9-6**. This is illustrative only, but is intended to assist with comparison of the assessment against each option. It should be read and interpreted in conjunction with the assessment sections 9.3.1 to 0. The outcomes and conclusions of the further assessment are provided in section 9.4.

**Table 9-6 – Further assessment – overview**

| Option | 7 a/b/c | 8a | 8b | 10a | 10b | 10c | 10d |
|---|---|---|---|---|---|---|---|
| Assessment criteria | Existing A350 improvements | Western bypass short | Western bypass long | Eastern bypass – inner short | Eastern bypass - short | Eastern bypass - long | Eastern bypass – long (south of K&A canal) |
| Strategic fit (objectives) | Minor to moderate fit | Moderate to strong fit | Strong fit | Moderate fit | Moderate fit | Strong fit | Strong fit |
| Impact on the economy | Slight beneficial | Moderate beneficial | Mainly moderate to large beneficial | Moderate beneficial | Moderate beneficial | Mainly moderate to large beneficial | Mainly moderate to large beneficial |
| Impact on the environment | Mainly slight adverse | Mainly slight adverse | Mainly slight to moderate adverse | Mainly slight adverse | Mainly slight adverse | Mainly slight to moderate adverse | Mainly moderate adverse |
| Impact on society | Moderate adverse to moderate beneficial | Mainly slight beneficial | Mainly moderate beneficial | Mainly slight beneficial | Mainly slight beneficial | Mainly moderate beneficial | Mainly moderate beneficial |
| Indicative value for money | Poor | Low / Medium | Low | Medium / Low | Low | Medium | Low / Medium |
| Cost (indicative) | £70m | £115m | £180m | £85m | £100m | £135m | £160m |
| Practical feasibility | Medium to high complexity | High complexity | High complexity | Medium complexity | Medium complexity | Medium complexity | Medium to high complexity |
| Acceptability | Medium risk | High risk | High risk | Low to medium risk | Low to medium risk | Medium risk | Medium risk |
| Risk / uncertainty | Medium | High | High | Medium | Medium | Medium | High |

## 9.4. Further assessment outcomes

Further assessment has been undertaken to consider the relative performance of the options taking into account a wide range of criteria in line with DfT guidance (TAG). Public and stakeholder feedback has also been taken into account. Conclusions have been drawn with regards to the likely better performing options which show the greatest potential to be taken forward for further consideration **(Table 9-7)**.

**Table 9-7 - Conclusions of the further assessment (phase 1)**

| No. | Strategic option | Comments | Proceed to further assessment Phase 2? |
|---|---|---|---|
| 7a/b/c | Online improvements | As a combined option there is potential to deliver some capacity and journey time improvement. However, the scale of impact is expected to be limited by existing speed restrictions and what could feasibly be achieved at some of the more constrained sections. To overcome these constraints, if feasible, would increase scheme costs. Compared to the likely scale of benefits it is considered that this option would offer a lower overall value for money.<br>Notwithstanding this, the assessment has identified that the southern element (7c – dualling between Western Way and Littleton Rbt) is more deliverable and that there could be merit in considering this in conjunction with a shorter bypass option – see also section 9.4.1. | No<br>(Discounted as a discreet option, but 7c to be considered in conjunction with other progressed options) |
| 8a | Western Bypass Short | This option performs well against the primary scheme objectives. It provides a complete bypass of Beanacre and most of Melksham, with the potential to reduce north-south journey times by approximately 2 minutes and to also reduce journey times between A350 (south) and A365 (west). However, the route corridor is subject to a number of constraints and this increases the delivery risk and technical complexity. The route would directly impact Whitley Golf Course and Roundponds Farm Solar Park. The structures required for rail, road and floodplain crossings would be expected to result in some adverse landscape and visual impacts due to the scale and height of the structures. Some localised adverse impacts are also likely, associated with properties in closer proximity to the route corridor, such as around A365 Bath Road and the village of Shaw.<br>Whilst this option is the better performing of the shorter bypass options, the significantly higher costs and delivery challenges mean that on balance it is not considered as favourable to take forward. | No |
| 8b | Western Bypass Long | This option performs well against all of the primary scheme objectives. It also has a good fit with a potential complementary package of walking and cycling (and possible bus) measures.<br>Similar to option 8a, the route corridor for this option faces a number of constraints which present delivery complexities. The estimated cost is the highest of all options. Given that this option performs similarly to option 10c (long bypass to the east), but with a higher estimated cost and with greater technical and environmental risk, it is considered that there is not a strong enough case to take the option forward. | No |
| 10a | Inner Eastern bypass Short | This option performs moderately well against the primary scheme objectives, although the scale of benefit is lower than longer bypass options. The lower footprint would result in a reduced scale of overall visual impact and loss of land. It would still be necessary to cross the River Avon floodplain.<br>This is also a lower cost bypass option, and likely to have a greater potential to deliver a more favourable Value for Money compared to options 8a and 10b. There is merit in progressing this option for further consideration (phase 2 further assessment).<br>Notwithstanding this, the assessment has identified challenges associated with this option which will need to be considered. This includes increased traffic volumes through the Spa Road area and Eastern Way, plus the inter-dependency with the planned developer link road. | Yes |

| No. | Strategic option | Comments | Proceed to further assessment Phase 2? |
|---|---|---|---|
| | | There would be scope to consider an enhanced version of this option, in conjunction with option 7 (on-line improvements) – in particular option 7c, dualling of the A350 between Littleton Roundabout and Western Way. | |
| 10b | Outer Eastern Bypass Short | This option performs slightly better than 10a in terms of traffic impacts, but worse than the longer bypass options (10c, 8b), and also option 8a.<br>Whilst benefits would be slightly greater than 10a, the cost of 10b is higher and there would be a greater loss of farmland and potential visual / amenity impacts around Sandridge Common. The overall value for money is likely to be less than 10a. The option also received slightly less support than 10a through the consultation exercise. | No |
| 10c | Outer Eastern Bypass Long | This option performs well against the primary scheme objectives. It also has a good fit with a potential complementary package of walking and cycling (and possible bus) measures. Estimated potential journey time benefits are in the region of 3 minutes saving per vehicle for the main north-south movement (AM peak). This option is predicted to draw the most traffic from other routes. The estimated reduction in traffic on the existing A350 is approximately 40%-60%. Smaller reductions are predicted on other routes including the High Street and Eastern Way.<br>The relative flexibility of this corridor is good – offering better scope to avoid or minimise impacts on key constraints and to maintain a high design standard. It received the highest level of support of the bypass options from the consultation exercise.<br>This option has the lowest expected cost of the long bypass options under consideration, whilst likely to have similar benefits to options 8b and 10d. It has potential to deliver the most favourable value for money position of all the options. There is merit in progressing this option for further consideration (phase 2 further assessment).<br>Environmental impacts will be an important factor in the further consideration of this option, including scope for mitigation. | Yes |
| 10d | Outer Eastern Bypass Long | This option performs well against the primary scheme objectives and similar to option 10c. However, it has a higher estimated cost and additional impacts are likely, particularly in relation to the the crossing of the Kennet and Avon canal and Semington Brook at the southern end, and the likely need for additional enhancements to the A361 and Littleton Roundabout presents additional delivery challenges compared to option 10c. The option was the least preferred of the bypass options from the consultation exercise, with some significant objections being raised. | No |

### 9.4.1. Short-listed options to proceed

In conclusion, option 10a (short eastern bypass) and option 10c (long eastern bypass) have been identified to be progressed. As these are still defined as indicative corridors at this stage **(Figure 9-3)** there is a need to further develop these options to a greater level of design specification in order to inform further consideration. This is set out in Chapter 10.

**Figure 9-3 – Indicative corridors subject to further consideration of route alignments – option 10a (left) and 10c (right)**


## Potential for dualling the A350 south of Melksham

As noted in **Table 9-7**, the assessment has identified the potential to consider dualling of the section of A350 between Western Way south of Melksham and Littleton Roundabout at Semington (which has been referred to as option 7c) – particularly in conjunction with option 10a (although a reduced section could be considered in conjunction with option 10c also).

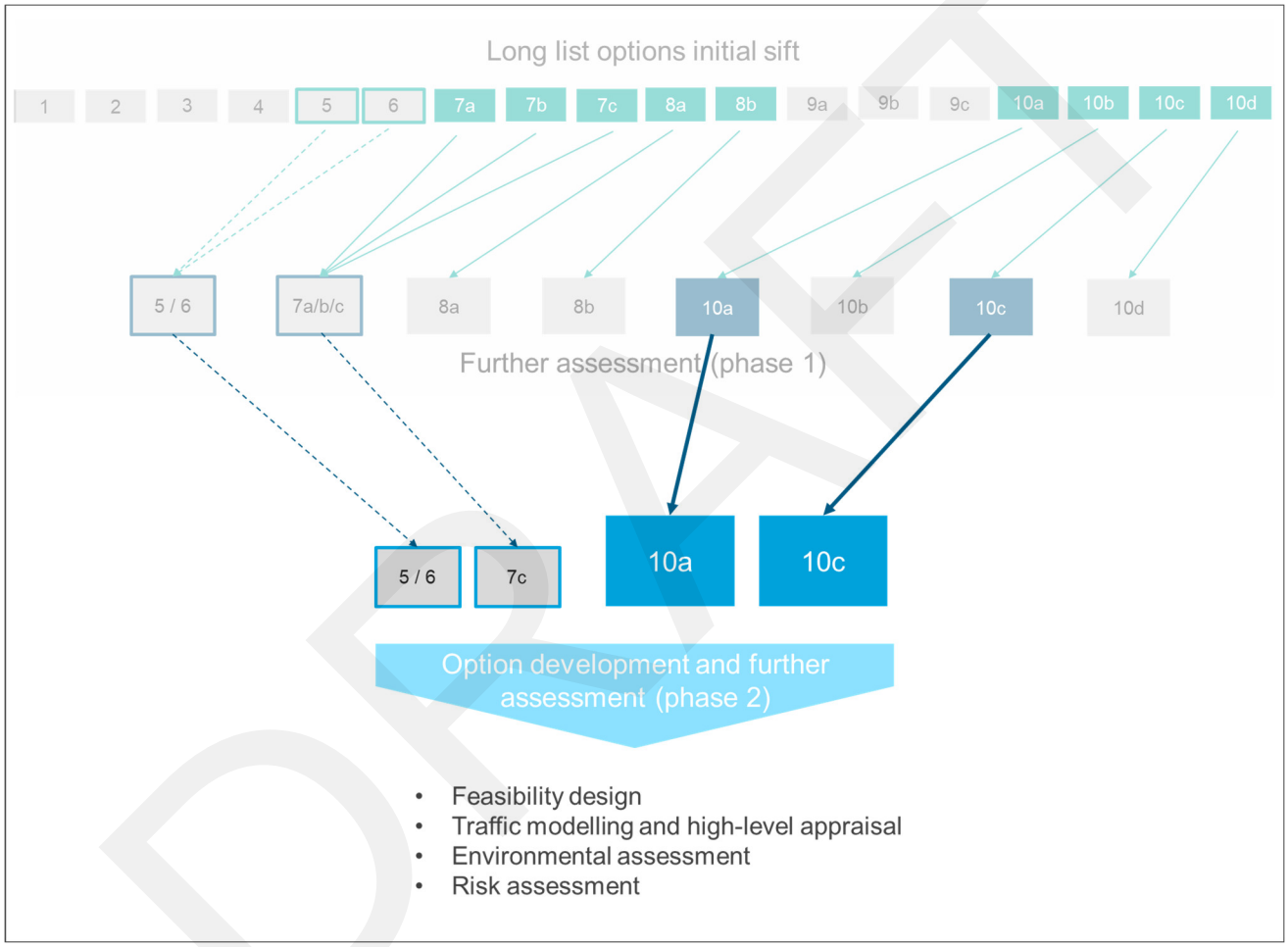
## Complementary measures

The initial sift identified the potential role of complementary measures related to walking, cycling (and possibly bus) in supporting potential bypass options. The further assessment (phase 1) has identified that these have a good case for inclusion and could play an important role through locking in the benefits of traffic reduction on the A350 and other routes in Melksham. It is recommended that this is progressed for further consideration alongside options 10a and 10c, whilst recognising that the longer bypass option (10c) is expected to have a stronger fit with such a package.

# 10. Option development and further assessment (phase 2)

The purpose of this stage of the process is to further develop the understanding of the shortlisted options 10a and 10c and to refine their specification **(Figure 10-1)**. This enables conclusions to be drawn with regards to the scope of options to be subject to full appraisal as part of the business case. This stage supplements the further assessment outlined in Chapter 9 – it is not intended to repeat this but to expand or update on elements of the assessment where appropriate and where additional data, evidence and analysis facilitates this.

**Figure 10-1 – Option development and further assessment (phase 2)**



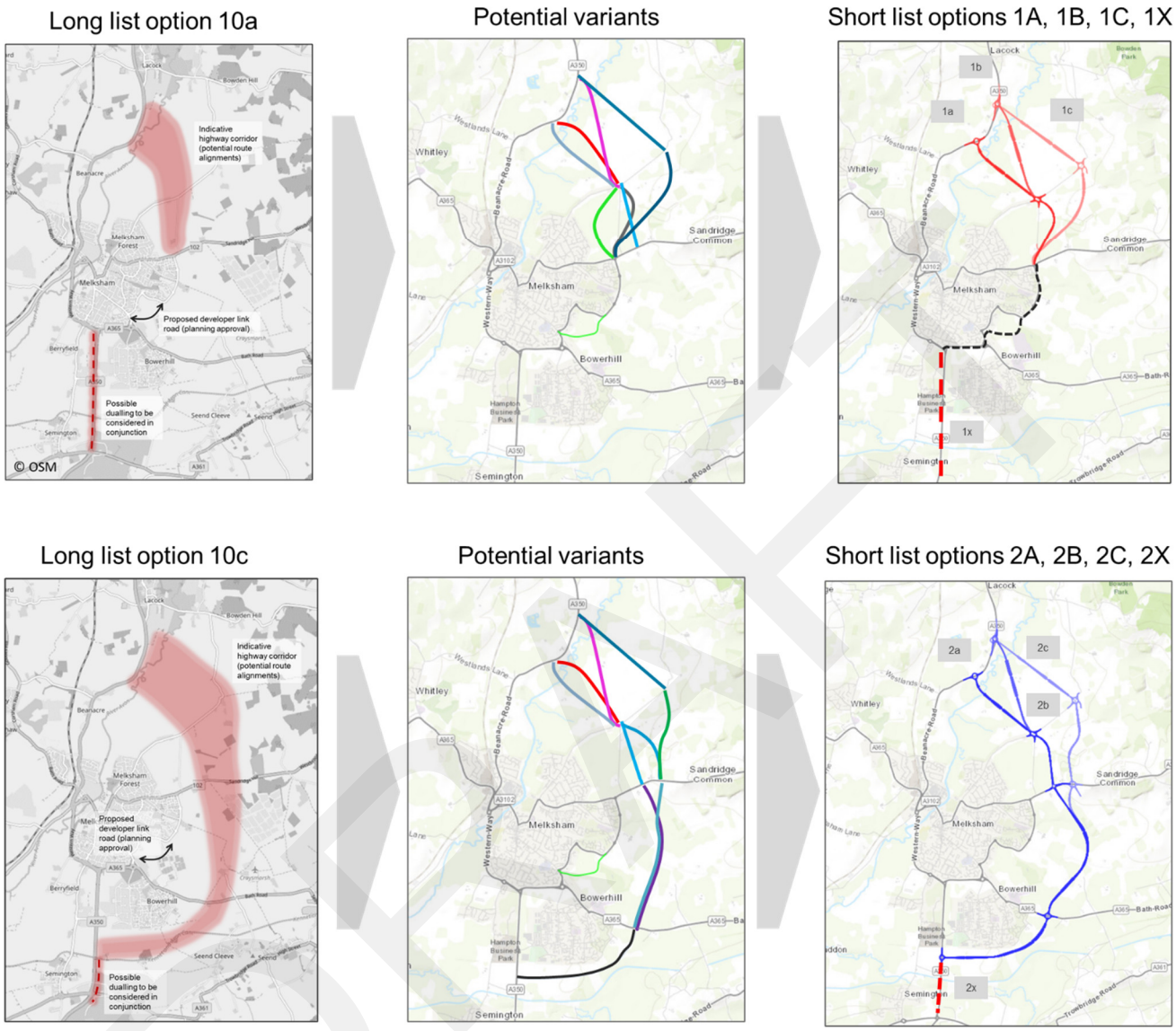

## 10.1. Option development

Options 10a and 10c have been identified for further development. Up to this stage, the options have been defined in terms of indicative corridors. In order to support a more detailed understanding of the potential impacts the indicative corridors have been developed into potential route alignments **(Figure 10-2)**. Three alternative route alignments have been identified in relation to each of options 10a and 10c (referred to as options 1 and 2 henceforth). These are the result of a design review exercise to arrive at broadly viable alternative route alignments, and each option has been developed to level of feasibility design (section 10.1.1 to 10.1.3).

Generally, the greater potential variance for route alignment is at the northern end and this includes consideration of the siting of the northern junction with the A350, particularly given the proximity to the River

Avon and the presence of Halfway Farm to the western side of the A350. For option 2, south of the A3102 the alignment for the three variants is largely the same.

**Figure 10-2 – Development of indicative corridors to broadly viable route alignments**




## 10.1.1. Design specification

The design process informing the development of options has considered:

- DMRB Standards (100kph/120kph);
- LiDAR topographical data;
- Walking, Cycling and Horse riding Assessment and Review (WCHAR);
- Existing utility apparatus;
- Constraints (e.g. land use, ecological, environmental);
- Initial traffic modelling;
- Initial local junction modelling;
- Planning permissions and site allocations; and
- Potential requirement for future dualling – based on the initial assessment a single carriageway design is assumed, but the ability to potentially accommodate future dualling is considered.

### 10.1.2. Environmental considerations and land use / ownership

Further reviews of environmental features and land use / ownership have informed the design development process, in addition to a high-level walkover survey of the area. As far as practicable (based on the information at this stage) the alignments seek to avoid directly impacting residential land, land of heritage and commercial importance and environmental features. The environmental assessment has been updated to consider the potential route alignment options more specifically.

### 10.1.3. Stakeholder input

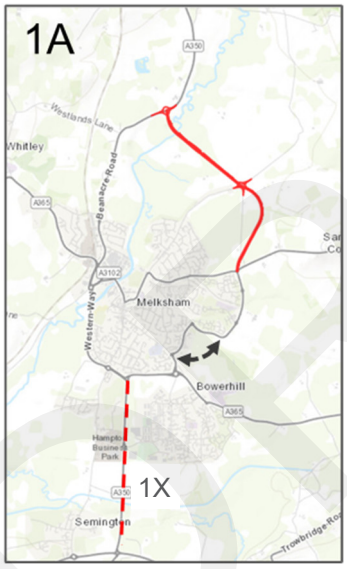
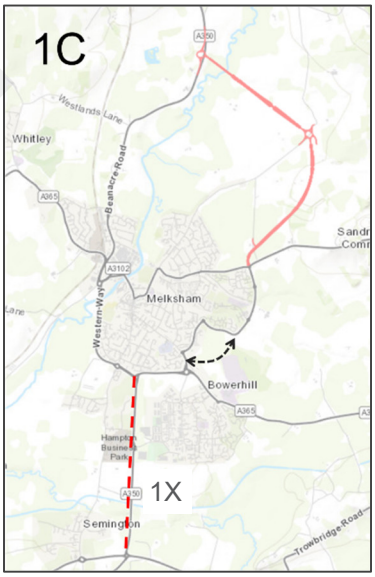
Where relevant information has been available from stakeholders this has been used to inform the option development. Various meetings have taken place with some of the stakeholders, including Wiltshire Council officers in relation to Public Rights of Way and historical assets.

## 10.2. Options 1A, 1B, 1C and 1X (intermediate eastern bypass)

The three potential route alignments identified in relation to the intermediate eastern bypass (option 1) are summarised in **Table 10-1**. Full details are included in Appendix B.

Option 1 is considered in the context of the planned developer link road at the southern end of Eastern Way (black arrow marking). This is assumed to be in place without option 1 (and hence is not included in the scope of option 1), but this does therefore create an inter-dependency. The incremental inclusion of dualling between Western Way and Littleton Roundabout is also considered (dashed red line), referred to as option 1X.

**Table 10-1 - Overview of options 1A, 1B and 1C (intermediate eastern bypass)**

| | Option 1A | Option 1B | Option 1C |
|---|---|---|---|
| Route alignment |  |  |  |
| Scope | • C. 3.1km length<br>• C.17.2ha footprint<br>• Viaduct – 180m<br>• A350 northern tie-in located south of Halfway Farm<br>• 1 viaduct (River Avon)<br>• 1 canal (disused) bridge<br>• 2 culverts<br>• 2 junctions (plus 1 modified) | • C. 3.4km length<br>• C.18.4ha footprint<br>• Viaduct – 315m<br>• A350 northern tie-in located north of Halfway Farm<br>• 1 viaduct (River Avon)<br>• 1 canal (disused) bridge<br>• 2 culverts<br>• 2 junctions (plus 1 modified) | • C. 4.1km length<br>• C.21.6ha footprint<br>• Viaduct – 410m<br>• A350 northern tie-in located north of Halfway Farm<br>• ‘Outer’ alignment<br>• 1 viaduct (River Avon)<br>• 1 canal (disused) bridge<br>• 2 culverts<br>• 2 junctions (plus 1 modified) |

## 10.3. Options 2A, 2B, 2C and 2X (full eastern bypass)

The three potential route alignments identified in relation to the full eastern bypass (option 2) are summarised in **Table 10-2**. Full details are included in Appendix B. The incremental inclusion of dualling of the short section of the A350 between the southern bypass junction and Littleton Roundabout is also considered (dashed red line), referred to as option 2X.

**Table 10-2 - Overview of options 2A, 2B and 2C (full eastern bypass)**

| | Option 2A | Option 2B | Option 2C |
|---|---|---|---|
| Route alignment |  |  |  |
| Scope | • C. 7.9km length<br>• C.47ha footprint<br>• Viaduct – 180m<br>• A350 northern tie-in located south of Halfway Farm<br>• 'Inner' alignment at A3102<br>• 1 viaduct (River Avon)<br>• 1 canal (disused) bridge<br>• 4 culverts<br>• 5 junctions | • C. 8.3km length<br>• C.48.1ha footprint<br>• Viaduct – 315m<br>• A350 northern tie-in located north of Halfway Farm<br>• 'Inner' alignment at A3102<br>• 1 viaduct (River Avon)<br>• 1 canal (disused) bridge<br>• 4 culverts<br>• 5 junctions | • C. 8.7km length<br>• C.49.4ha footprint<br>• Viaduct – 410m<br>• A350 northern tie-in located north of Halfway Farm<br>• 'Outer' alignment at A3102<br>• 1 viaduct (River Avon)<br>• 1 canal (disused) bridge<br>• 4 culverts<br>• 5 junctions |

## 10.4. Further assessment (phase 2) approach

The approach focuses on the main areas of further development and where supplementary data, evidence and analysis is available. It applies these to the further consideration of options 1 and 2 and the route alignment variants (to identify relative differences between these).

The main areas of focus include:

- Traffic impacts – informed by further traffic modelling (Wiltshire Transport Model);
- Environmental impacts – informed by further high-level environmental assessment (primarily desk-based);
- Costs - informed by the more detailed design information;
- Delivery and risk assessment – informed by further engineering and risk review; and
- Initial value for money – informed by all of the above.

The further assessment in relation to these areas is presented in section 10.5.

## 10.5. Further assessment (phase 2) results

### 10.5.1. Traffic impacts

The Wiltshire Transport Model (WTM) has been used to further assess the forecast traffic impacts of the short-listed options. The assessment is based on a 2036 forecast year core growth scenario, with comparison made against a 'do minimum' scenario (without scheme).

The strategic model identifies relatively little difference between the different route alignments associated with each of the short-listed options (e.g. between 1A / 1B / 1C and between 2A / 2B / 2C), with the main variable being the slight difference in overall route length. This indicates that the traffic-related benefits / impacts are unlikely to be a major factor in the assessment of the different route alignments, but it is still considered important to take into account the updated modelling outputs relating to option 1 (intermediate eastern bypass) and option 2 (full eastern bypass) more generally. Given this, the headline outputs are presented in terms of representative results in relation to the main options **(Table 10-3)**. Any additional observations on potential differences in relation to the different route alignments are made where relevant. The incremental A350 dualling is also considered separately for the intermediate bypass (option 1X) and the full bypass (option 2X).

Additional traffic modelling outputs are provided in Appendix E.

**Table 10-3 - Headline modelled impacts – options 1A, 1B, 1C, 1X and 2A, 2B, 2C, 2X**

| Criteria | Option 1 A / B / C | Option 1X | Option 2 A / B / C | Option 2X |
|---|---|---|---|---|
| Journey time saving north-south (secs) | 30-60 secs (4-8%) | 80-120 secs (11-16%) | 140-200 secs (19-25%) | 140-200 secs (19-25%) |
| Journey time saving east-west (secs) | 30-60 secs (6-11%) | 30-60 secs (6-11%) | 40-80 secs (7-15%) | 40-80 secs (7-15%) |
| Average speed north-south (kph) | 50-55 kph | 53-58 kph | 63-68 kph | 63-68 kph |
| A350 traffic volume change - south (pcus) – AM (av. pk hr) | NB: +4% (+60 pcus) | NB: +8% (+115 pcus) | NB: -60% (-850 pcus) | NB: -60% (-850 pcus) |
| | SB: +6% (+80 pcus) | SB: +11% (+150 pcus) | SB: -55% (-780 pcus) | SB: -55% (-780 pcus) |
| A350 traffic volume change – central (pcus) – AM (av. pk hr) | NB: -25% (-400 pcus) | NB: -25% (-400 pcus) | NB: -40% (-640 pcus) | NB: -40% (-640 pcus) |
| | SB: -35% (-580 pcus) | SB: -35% (-580 pcus) | SB: -40% (-640 pcus) | SB: -40% (-640 pcus) |
| A350 traffic volume change – north (pcus) – AM (av. pk hr) | NB: -40% (-350 pcus) | NB: -40% (-350 pcus) | NB: -60% (-570 pcus) | NB: -60% (-570 pcus) |
| | SB: -60% (-530 pcus) | SB: -60% (-530 pcus) | SB: -65% (-590 pcus) | SB: -65% (-590 pcus) |
| Eastern Way traffic volume change (pcus) – AM (av. pk hr) | NB: +60% (-330 pcus) | NB: +62% (-350 pcus) | NB: -70% (-400 pcus) | NB: -70% (-400 pcus) |
| | SB: +130% (+580 pcus) | SB: +134% (+600 pcus) | SB: -70% (-325 pcus) | SB: -70% (-325 pcus) |

Key observations from these model outputs include:

- Confirmation that the overall scale of the expected impacts for the full eastern bypass (options 2A / 2B / 2C) is notably greater than the shorter bypass option (both in terms of journey time savings and overall traffic reductions across the existing network).
- The journey time savings for the main north-south movement are about 3 times greater for options 2A / 2B / 2C compared to options 1A / 1B / 1C. The journey time saving for east-west movement (between A365 east and A365 west) is more comparable.
- Whilst options 1A / 1B / 1C provide a good level of traffic relief to the existing A350 on the central and northern sections, the substantial increase in traffic on Eastern Way is evident. Significant modelled delays were not identified but the volume to capacity ratio on this part of the network does increase substantially.
- Options 1A / 1B / 1C do not address traffic levels or conditions on the A350 to the south of Melksham. In the 'do minimum' this section demonstrates emerging capacity issues due to the volume of traffic. Option

1X is the incremental option including dualling of this section. The impact of this is notable in terms of the improved north-south journey time saving, whilst the traffic volumes on this southern section increase.

- The modelled journey time savings for options 1A / 1B / 1C are constrained to an extent by the existing speed limits and junctions to the east of Melksham and the impact of increased traffic levels on this section of the network. There could be some scope to further optimise the network, but based on the model outputs it is unlikely to make a significant difference to the journey time savings.

As noted previously, there is not a significant difference between the modelled impacts of the different route alignment variants. In relation to both 1A / 1B and 2A / 2B there was some evidence to suggest that the junctions with the A3102 and Lower Woodrow Road were not performing as effectively as those for the 1C / 2C alignments. Whilst some caution should be applied in the interpretation of this (as further optimisation may be achievable), it does align with the fact that the alignment taken by 1A / 1B and 2A / 2B is more constrained at these locations and this could therefore limit the optimal provision. Based on the model outputs the more outer alignments (1C and 2C) are likely to result in a slight increase in vehicle kilometres compared to 1A / 1B and 2A / 2B.

The modelling assessment does indicate that the section of A350 south of Melksham (Western Way to Littleton Roundabout) has emerging link capacity issues by the 2036 forecast year. With the full eastern bypass options, whilst approximately two thirds of this section is bypassed, the section between the southern bypass connection with the A350 and Littleton Roundabout is not. The modelling also indicates that the bypass draws some additional traffic from other routes, hence it could further increase the pressure on this section. Consequently, dualling of this section, as per option 1X, (and potentially some improvement to Littleton Roundabout) will need further consideration. Based on the current modelling, whilst significant delays do not materialise by 2036, this section is likely to be very sensitive to changes in traffic flow and also beyond 2036 (or under a higher growth scenario) it is more likely that the modelled impacts would be more significant.

## 10.5.2. Environmental impacts

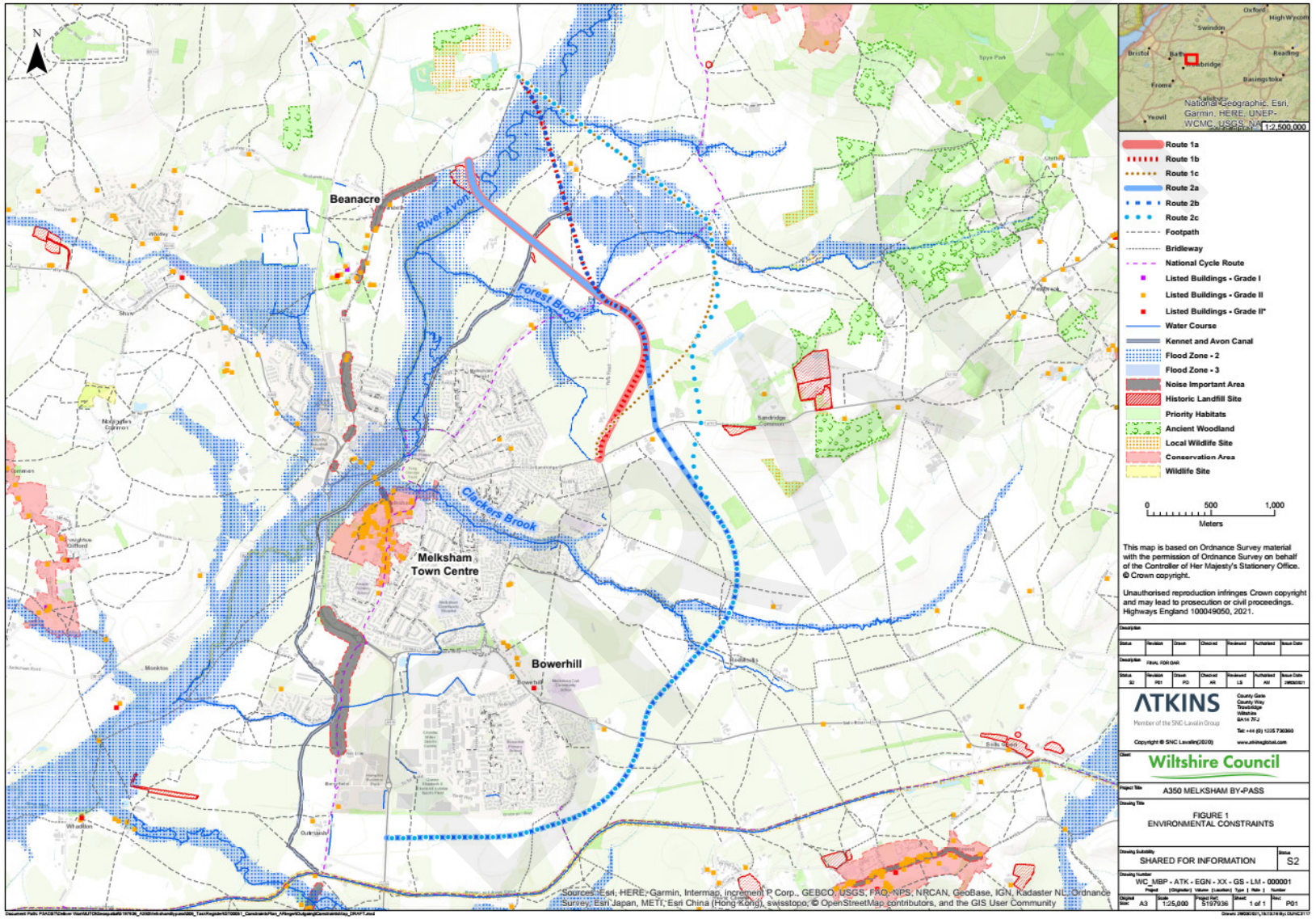
A qualitative high-level assessment of the route options has been undertaken. The assessment has identified key receptors and impacts for each route option based on the use of a seven-point qualitative scale (large adverse [1] to large beneficial [7]). The assessment is based on a worst case without the consideration of mitigation and enhancement measures. The full environmental assessment is presented in Appendix C which includes potential mitigation opportunities. Further design development, surveys and assessment including the implementation of mitigation measures will likely reduce the impacts outlined in the assessment below. A summary is provided in the following sections.

### Relevant environmental constraints

Key environmental constraints are taken into account when considering the impacts of the options to the east of Melksham (**Figure 10-3,** and reproduced at a larger scale in Appendix D). These 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 and Semington to the south;
- The River Avon, Forest Brook, Clackers Brook and their floodplains and various other small tributaries;
- The Kennet and Avon Canal;
- Grade I, II and II* Listed Buildings located in and around Melksham including a pocket to the south of Beanacre and Bowerhill and along Bath Road;
- Six noise important areas located along the A350 between Beanarce and where the A350 meets the A365 with one in Semington and one in the centre of Melksham;
- A solar farm, located to the east of Melksham;
- Pockets of ancient woodland located to the north of Melksham to the west of the A350, and in Sandridge Common to the east of Melksham;
- Four historic landfills; and
- Footway and bridleway paths as well as the National Cycle Route.

**Figure 10-3 – Potential route options and key environmental constraints**



## Headline environmental assessment findings

A summary of the relative assessment against environmental topics across all options is provided in **Table 10-4**. The assessment uses the following scale:

- Large adverse [1]
- Moderate adverse [2]
- Slight adverse [3]
- Neutral [4]
- Slight beneficial [5]
- Moderate beneficial [6]
- Large beneficial [7]

**Table 10-4 – Summary of environmental assessment for route options**

| Topic / Option | | 1A | 1B | 1C | 2A | 2B | 2C |
|---|---|---|---|---|---|---|---|
| Air quality | | 3 | 3 | 3 | 3 | 3 | 3 |
| Noise and vibration | | 5 | 5 | 5 | 5 | 5 | 5 |
| Biodiversity | | 3 | 3 | 3 | 2 | 2 | 2 |
| Water environment | | 2 | 2 | 2 | 2 | 2 | 2 |
| Landscape and visual | | 1 | 1 | 2 | 1 | 1 | 2 |
| Geology and soils | | 1 | 2 | 2 | 1 | 2 | 2 |
| Cultural heritage | | 2 | 2 | 2 | 1 | 1 | 1 |
| Materials and waste | | 2 | 2 | 2 | 1 | 1 | 1 |
| Population and human health | Population (all elements, excluding Agricultural land holdings); Walkers, cyclists and horse-riders | 3 | 3 | 3 | 2 | 2 | 2 |
| | Agricultural land holdings | 2 | 2 | 2 | 1 | 1 | 1 |
| | Human health | 3 | 3 | 3 | 3 | 3 | 3 |
| Climate effects | | 3 | 3 | 3 | 3 | 3 | 3 |
| Climate vulnerability | | 3 | 3 | 3 | 3 | 3 | 3 |

Key overall conclusions from the environmental assessment include:

- Slight adverse impacts for most environmental topics for all options at this stage of the design.
- Significant adverse impacts for all options on landscape and visual receptors – however, these are more significant for options 1A / 1B and 2A / 2B.
- Significant adverse impacts for all options on geology and soils receptors – however, these are more significant for options 1A and 2A due to the route alignment crossing through two historic landfills.
- Significant adverse impacts for all options on cultural heritage receptors – however, these are more significant for options 2A / 2B / 2C due to the route alignment crossing through a larger area which impacts on more heritage assets and archaeological remains.
- Significant adverse impacts for all options on agriculture land holdings (part of the population and human health assessment) - however, these are more significant for options 2A / 2B / 2C due to the route alignment crossing through a larger area of agricultural land.
- Significant adverse impacts on biodiversity receptors for options 2A / 2B / 2C due to having a larger footprint which will result in greater habitat loss and severance - however, there are only slight adverse impacts for options 1A / 1B / 1C.

## Key findings by environment topic

### Air quality

Options 1A / 1B / 1C and 2A / 2B / 2C have been considered on a qualitative basis and have the potential for slight adverse impacts on air quality. There is potential for an increase in air quality pollutant concentrations at receptors within 200 m of the new road infrastructure. Changes in vehicle trips on the wider network include a potential for a reduction in vehicles on A350 between the northern bypass connection and Melksham town centre (all options) and potential for an increase at links adjoining bypass junctions including; the A3102 (heading towards Melksham town centre), Eastern Way (leading towards the A350 south) and potential for a reduction in vehicles on the A350 between the southern bypass connection and Melksham town centre (for options 2a to 2c). Detailed air quality modelling is required to consider the magnitude of any changes in pollutant concentrations and evaluate the potential significance of any project-wide effects.

### Noise and vibration

All six options have been assessed to have slight beneficial impacts on noise and vibration. For options 1A / 1B / 1C there is potential for minor decreases in noise on the A350 through Beanacre and Melksham north of the A3102, however a minor increase may be experienced on Woodrow Road between northeast Melksham and the new road, and there is potential for increases in noise expected at properties located near the route alignments. For Options 2A / 2B / 2C there is potential for minor and moderate decreases in noise on the A350 through Beanacre and west of Melksham, and also on the A3102 east of the new road and on Eastern Way however, a minor increase may be experienced on Woodrow Road between northeast Melksham and the new road and there is potential for increases in noise expected at Bowerhill and some properties located near the route alignments. Mitigation opportunities including barriers and/or surfacing measures to reduce the potential for impact may be possible.

### Biodiversity

Options 1A / 1B / 1C have been assessed to have slight adverse impacts on biodiversity. Options 2A / 2B / 2C have been assessed to have moderate adverse impacts due to having a larger footprint which will result in greater habitat loss and severance. All options will result in the loss of habitats including woodland, hedgerows, arable land, grassland, ponds which will impact a variety of species including dormice, birds, badgers, great crested newt, otter and water vole and bats. Phase 2 surveys will be undertaken to understand the full impacts of a bypass option on biodiversity receptors and what mitigation and enhancements measures will be required. Phase 2 surveys are likely to comprise of the following:

- Bat survey including activity transects, static detector surveys, crossing point surveys and daytime assessments of trees and buildings for bat roosting potential[27]. Potential additional bat surveys as required: tree climbing, roost emergence/re-entry surveys, 'advanced licensed bat survey techniques' such as radio tracking
- Breeding birds[28] and barn owl surveys[29]
- Great crested newts Habitat suitability Index (HSI) assessments[30]
- Badger monitoring surveys
- Dormice[31]
- Otter[32], water vole[33] and crayfish surveys[34]

27 Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London.

28 Ross, K &Latham, J. Breeding Bird Survey (BBS). British Trust for Ornithology.

29 Shawyer (2011) Barn owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment. Developing Best Practice in Survey and Reporting. IEEM, Winchester

30 Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt* (*Triturus cristatus*). Herpetological Journal 10(4), 143-155.

31 English Nature (2006). The Dormouse Conservation Handbook (2nd edition).

32 National Rivers Authority (1993). Otters and River Habitat Management. Conservation Technical Handbook Number 3.

33 Strachan, R., Moorhouse, T. and Gelling, M. (2011) Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit, Oxford and Dean et al., 2016.

34 Peay S (2003) Monitoring the White-clawed crayfish *Austropotamobius pallipes*. Conserving Natura 2000 Rivers Monitoring Series No 1. English Nature, Peterborough

- Hedgerow surveys to determine if any hedgerows are 'important' following criteria within the Hedgerow Regulations 1997 guidance[35]
- Targeted habitat surveys in the summer months to determine the presence of any 'Habitats of Principle Importance'.

**Water environment**

All six options have been assessed to have moderate adverse impacts on the water environment. All options have the potential for direct and indirect water quality impacts to the River Avon, Forest Brook and Clackers Brook (options 2A / 2B / 2C) should road runoff from the option be directed to surface water. The bridge river crossings for the bypass will result in the loss of riparian vegetation, as well as loss of floodplain and flow conveyance, as the proposed bridge crossings will not span the full width of the floodplains. Any culverted channel crossings will result in additional loss of bank and bank form as well as changes in sediment transport and natural processes. Further design development will look at reducing these losses if possible.

**Landscape and visual**

Options 1A, 1B, 2A and 2B have all been assessed to have large adverse impacts on landscape and visual receptors due to changes in the landscape and the proximity of the alignments being close to receptors such as Beanacre and a number of properties. However, Options 1C and 2C which are located further away from receptors have been assessed to only have moderate impacts. All options will result in the loss of vegetation and change field patterns affecting the character of area. New infrastructure including, roads, bridges, earthworks and a viaduct will present changes in views for nearby receptors.

**Geology and soils**

Options 1B, 1C, 2B and 2C have been assessed to have moderate adverse impacts on geology and soils due to the loss of best and most versatile (BMV) classified agricultural farmland and new sources of contamination becoming introduced from construction activities. However, Options 1A and 2A have been assessed to have large adverse impacts as they also cross two historic landfills which may give rise to potential contamination sources.

**Cultural heritage**

Options 1A / 1B / 1C have been assessed to have moderate adverse impacts on cultural heritage and options 2A / 2B / 2C have been assessed to have large adverse impacts due to the routes having a larger footprint which results in physical impacts and changes in setting to more assets. All options will result in physical impacts to archaeological remains known to be located throughout the area as well as setting impacts to designated and non-designated assets including a number of Listed Buildings.

**Materials and waste**

Options 1A / 1B / 1C have been assessed and have a moderate adverse impact and options 2A / 2B / 2C have been assessed to have a large adverse impact. The impact scoring has been based on a desk-based assessment and design information, assuming a worst case scenario of material to be removed being disposed of to landfill and use of virgin aggregates for the fill material. All options are fill positive, therefore requiring materials to be imported as part of the Scheme construction, and all options assume that some of the topsoil will be removed from site. Ground investigation will be required to inform a preliminary waste classification, as well as detailed design and earthworks strategy to further refine the assessment and enable a quantitative impact assessment. It recommended that design and construction is undertaken in line with sustainability principles, seeking to reduce generation of wastes and maximise re-use of material, therefore mitigating the impacts of Scheme with regards to materials and waste.

**Population and human health**

All six options have been assessed to have localised impacts. Slight adverse impacts are predicted overall for population and human health for each option, however the effects on agricultural holdings should be considered separate to the other elements of the assessment, and significant effects are reported, particularly for the longer options 2A / 2B / 2C . The population element of the assessment looks at impacts on private properties and housing, community land and assets, development land and businesses, agricultural land holdings, and walkers, cyclists, and horse riders. All route options result in land take which will result in the loss

35 Available at: https://www.legislation.gov.uk/uksi/1997/1160/contents/made

and severance of agricultural land and potential impacts on local businesses, however no options will result in the demolition of any properties. All options will have temporary localised impacts on PRoW footpaths/ bridleways and footways, and construction of the bypass may cause temporary disruption. No options will result in any significant impacts on community land and assets or development land.
All six options have been assessed to have localised impacts with slight adverse impacts on human health overall from changes to the wider health determinants. The human health element of the assessment looks at impacts on several wider health determinants, including air pollution, noise pollution and vibration, soil and water pollution, access to community facilities and other social infrastructure, access to work and training, and social cohesion.
Overall, options 1A / 1B / 1C would increase traffic on the Eastern Way and A3102, resulting in potential accessibility/severance effects for residents that require access to community facilities in Melksham and Bowerhill, which isn't the case for options 2A / 2B / 2C. However, due to the increased length of options 2A / 2B / 2C these options would result in larger loss and severance of agricultural land and affect a larger number of walkers, cyclists, and horse riding routes.

**Climate effects**

All six options have been assessed to have slight adverse impacts on climate effects. Emission of greenhouse gases from the construction, operation and maintenance of the bypass will contribute to climate change. The scale of these emissions is likely to be small in the context of overall UK carbon budgets. A shorter route (i.e., option 1) will likely be a lower-carbon option than a longer route.

**Climate vulnerability**

All six options have been assessed to have slight adverse impacts on climate vulnerability, however, a full assessment is required to determine the full range of impacts for each option. Hotter summers may result in damage to materials (melting and over expansion) but heavier rain and wetter winters may increase pothole formation. Climate change may increase flood risk and extreme weather may affect the new road infrastructure assets (wind damage) and could more regularly create dangerous driving conditions. The final scheme will implement a wide range of climate vulnerability mitigation measures which will include design modifications (embedded mitigation), such as the inclusion of a climate change allowance in the selection of the design storm size that the drainage infrastructure will be built to withstand.

### Environmental assessment of option 1X and 2X

A high-level environmental assessment of option 1X and 2X which incorporates dualling between Western Way and Littleton Roundabout (option 1X) and dualling between the new roundabout at the end of route 2A / 2B / 2C where it joins the A350 to the A361 Littleton Roundabout (option 2X). The full assessment is provided in Appendix C. For most topics there is no change in the assessment of impacts for each of the six options presented above except for the following:

- Noise and vibration – dualling the A350 for all six options will result in an increase in impacts from Slight beneficial to Slight Adverse for options 1A / 1B / 1C and Moderate beneficial to Slight Adverse for options 2A / 2B / 2C due to a possible increase in road flow speed from congestion relief which could result in an increase in noise level from A350 and impact further local receptors.
- Water environment – dualling the A350 for all six options will result in an increase in impacts from Moderate to Large adverse due to unmitigated increase in water quality risk from an increase in impermeable area and traffic densities associated with the dualling.
- Cultural heritage – dualling of the A350 for Options 1A / 1B / 1C will result in an increase in impacts from Moderate to Large adverse due to more assets being located within the extent of the site than were identified in the full options assessment.

## 10.5.3. Delivery and risk assessment

The further design development for each of the options has facilitated a more in-depth review of the technical feasibility and delivery risk. This also helps to identify any potential key issues around public and stakeholder acceptability. The review considers any distinguishing factors between the different route alignment options, as well as any significant risks or issues which may apply (possibly to a greater or lesser extent) to all options.

### Delivery assessment between alternative route alignments – 1A / 1B / 1C

**Figure 10-4** and **Table 10-5** provide a summary comparison of the delivery assessment for options 1A, 1B and 1C.

**Figure 10-4 – Key delivery factors – route options 1A, 1B and 1C**

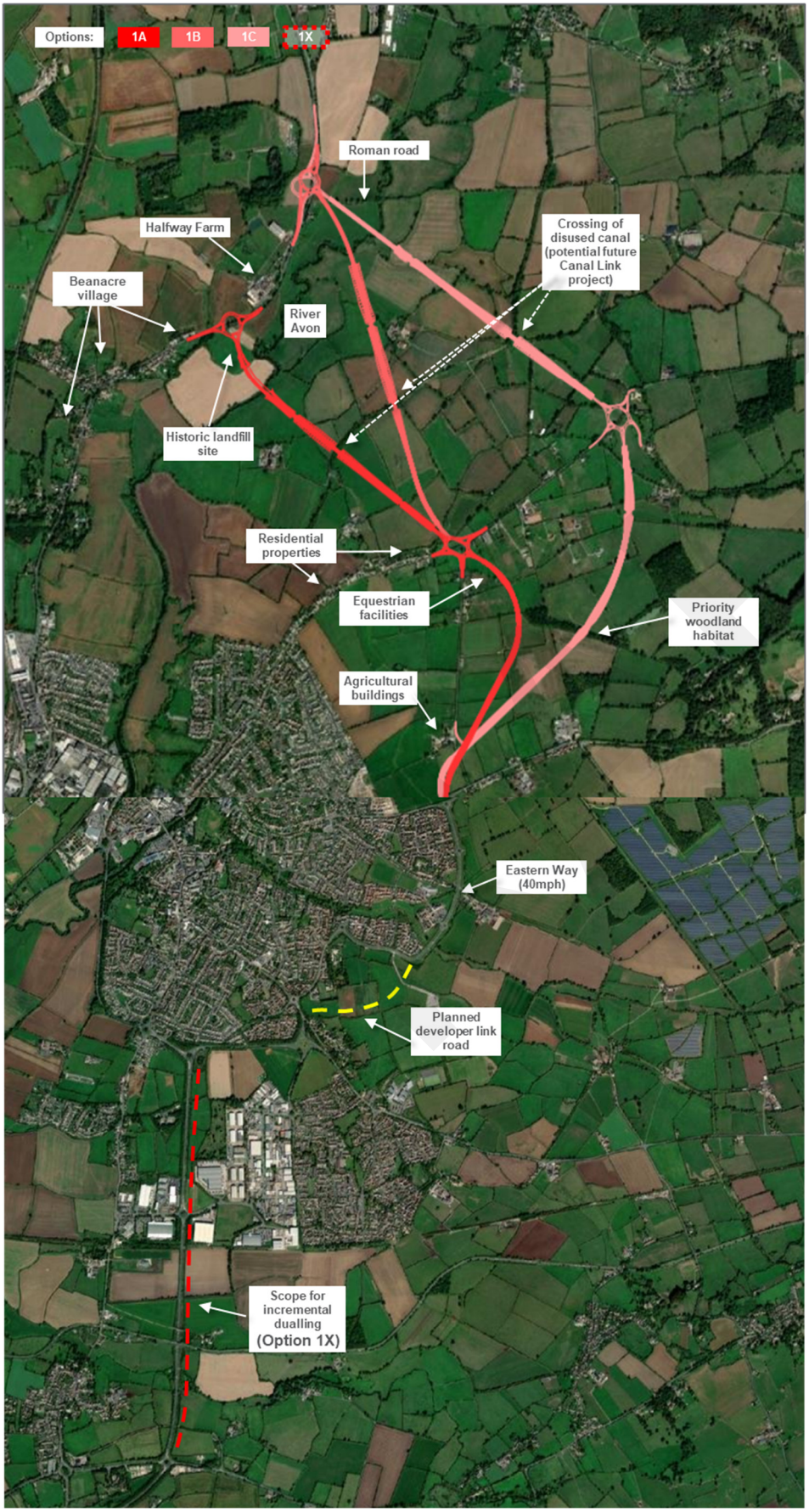


**Table 10-5 – Deliverability – route options 1A, 1B and 1C**

| Option 1A | Option 1B | Option 1C |
|---|---|---|
| **Advantages** | | |
| • Shortest in total length and viaduct length (180m).<br>• Future dualling of the route would be possible as the bypass avoids high voltage overhead line north of Lower Woodrow Road | • Avoids high voltage overhead line crossing the existing A350 south of Halfway Farm<br>• Avoids the historic landfill area<br>• No impact on residential properties located on the extremities of Beanacre Village<br>• Should future dualling of the existing A350 to the north of the bypass junction be required, this could be accommodated<br>• Limited impact on known priority habitats | • Avoids high voltage overhead line crossing the existing A350 south of Halfway Farm<br>• Avoids the historic landfill area<br>• No impact on residential properties located on the extremities of Beanacre Village<br>• Future dualling possible as the bypass avoids high voltage overhead line north of Lower Woodrow Road<br>• The route passes through open countryside so there is minimal adverse impact to new residential and established businesses and agricultural properties on Lower Woodrow road and A3102. |
| **Challenges** | | |
| • Potential long-term impact on future dualling of the A350 (north) due to the route being located south of Halfway farm.<br>• Overhead pylon located within circulatory of roundabout, maintenance bay will be required withing the roundabout (ICD)<br>• The route passes through an area of historic landfill.<br>• Relaxation in horizontal curvature along viaduct to stopping sight distance<br>• The route passes through a tree line just before the Lower Woodrow Road junction.<br>• Junction with Lower Woodrow Road is near residential properties and local businesses. May impact newly established commercial businesses.<br>• The route severs equestrian land requiring relocation and compensation.<br>• Future dualling limited due to adjacent utility pylon and priority habitats.<br>• Adverse noise, air quality and visual impacts to properties along New Road.<br>• Siting the connection of the northern junction with the A350 close to Rivel Avon flood zone. | • Crossing of a roman road is unavoidable.<br>• At grade PRoW's are not considered along the corridor so the road is built on embankment for multiple PRoW crossings. Significant long ranging landscape and visual impacts due to the extent of the structure and low-lying topography. (Section 1).<br>• Adverse impact to adjacent Listed Buildings at Queen field farm.<br>• Junction with Lower Woodrow Road is near residential properties and local businesses. May impact newly established commercial businesses.<br>• The route severs equestrian land requiring relocation and compensation.<br>• Future dualling limited due to adjacent utility pylon and priority habitats.<br>• Adverse noise, air quality and visual impacts to properties along New Road. | • Crossing of a roman road (around the northern A350 tie-in) is unavoidable.<br>• At grade PRoW's are not considered along the corridor so the road is built on embankment for multiple PRoW crossings. Significant long ranging landscape and visual impacts due to the extent of the structure and low lying topography. (Section 1)<br>• Proposed signalised roundabout at lower Woodrow road has large foot print area may impact adjacent properties<br>• Impact to priority habitat north of A3102<br>. |
| **General comments** | | |
| All options avoid denser areas of known archaeology located south east of Melksham.<br>Earthwork quantities are less compared to options 2A / 2B / 2C.<br>Increased pressure on the existing transport network to the east of Melksham may require additional improvements to existing roads such as A3102, Eastern way, Spa road, and Western Way. | | |

In general, the key factors in the relative deliverability of options 1A / 1B / 1C include the siting of the northern junction with the A350, and the differences in land and property constraints between an 'inner' and an 'outer' alignment. Overall, the siting of the A350 junction further north (north of Halfway Farm) is considered to be more favourable due to it being further away from the River Avon and also with fewer residential properties in close proximity; whereas siting the junction south of Halfway Farm encroaches towards properties on the outskirts of Beanacre village. The junction location south of Halfway Farm also results in a link alignment which runs through an area of historic landfill. In addition to the junction location, the 'inner' alignment around Lower Woodrow Road (and the A3102 for option 2A / 2B) generally has a greater concentration of properties and other land uses, such as equestrian facilities. Even with further engineering and mitigation, adverse impacts around this area are likely to be unavoidable and there is considered to be a high probability of strong local objection. The 'outer' alignment (1C and 2C) routes wider and avoids these clusters, and is thus likely to affect fewer properties overall.

Taking into account all factors, option 1C and 2C are considered to be more favourable from a deliverability perspective. They offer a greater degree of flexibility providing increased scope for mitigation and scope to plan for potential future dualling of the route. The exact siting of the northern junction with the A350 is expected to be optimised at the next design stage, such that the existing archaeological feature (Roman Road) is not adversely affected by the proposal.

### Delivery assessment between alternative route alignments – 2A / 2B / 2C

**Figure 10-5** and **Table 10-6** provide a summary comparison of the delivery assessment for options 2A, 2B and 2C.

**Figure 10-5 – Key delivery factors – route options 2A, 2B and 2C**

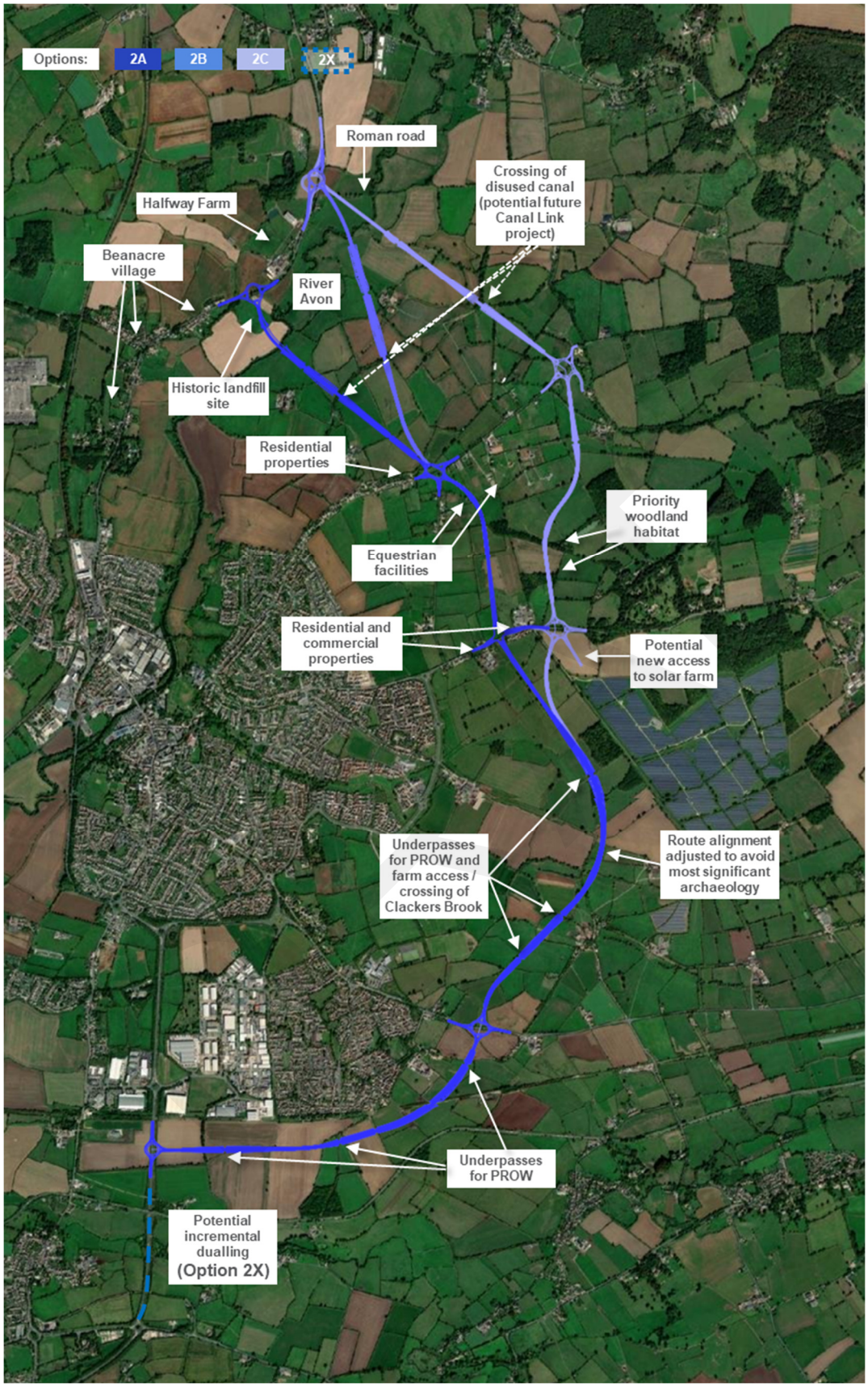


**Table 10-6 – Deliverability – route options 2A, 2B and 2C**

| Option 2A | Option 2B | Option 2C |
|---|---|---|
| **Advantages** | | |
| • Future dualling possible as the bypass avoids high voltage overhead line north of Lower Woodrow Road<br>• Straight horizonal alignment (non-curvilinear) maintains vehicle speed and presents opportunity for overtaking. | • Avoids high voltage overhead line crossing the existing A350 south of Halfway Farm<br>• No impact on residential properties located on the extremities of Beanacre Village<br>• Straight horizonal alignment (non-curvilinear) is achievable which maintains vehicle speed and presents opportunity for overtaking | • Avoids high voltage overhead line crossing the existing A350 south of Halfway Farm<br>• No impact on residential properties located on the extremities of Beanacre Village<br>• Future dualling possible as the bypass avoids high voltage overhead line north of Lower Woodrow Road<br>• The route avoids the clusters of residential / agricultural properties and business premises on Lower Woodrow road and the A3102. |
| **Challenges** | | |
| As per Option 1A, plus:<br>• Siting roundabout with Lower Woodrow Road in very constrained area may result in deviations from standards, leading to potential safety concerns.<br>• Land available to accommodate proposed alignment and future dualling of the bypass at the A3102 junction. This has significant noise and air quality impacts to adjacent properties.<br>• At grade PRoW's are not considered along the corridor so the road is built on embankment for multiple PRoW crossings and flood plain. The landscape and visual impacts are considered of the elevated section but there will be no impact on planning permissions.<br>• Current alignment severs key archaeology monuments (likely settlements) located south east of Melksham | As per Option 1B, plus:<br>• Siting roundabout with Lower Woodrow Road in very constrained area may result in deviations from standards, leading to potential safety concerns.<br>• Land available to accommodate proposed alignment and future dualling of the bypass at the A3102 junction. This has significant noise and air quality impacts to adjacent properties; negative impact on BCR.<br>• At grade PRoW's are not considered along the corridor so the road is built on embankment for multiple PRoW crossings and flood plain. The landscape and visual impacts may affect some residential properties. There will be no impact on planning permissions.<br>• Current alignment severs key archaeology monuments (likely settlements) located south east of Melksham | As per Option 1C, plus:<br>• The landscape and visual impacts to the residential properties of a potential housing site (c.2000 homes)<br>• Current alignment severs key archaeology monuments (likely settlements) located south east of Melksham |
| **General comments** | | |
| Early strategic traffic modelling indicates future capacity issues on the existing A350 north of Littleton roundabout. To support the volume of traffic using the route, future dualling of this section is to be considered. | | |

### Higher-level delivery risks and issues (and opportunities)

There are design and construction risks related to the current level of design specification which affect all options under consideration. Key factors include:

- Structures design complexity - design (and associated costs) are currently based on relatively standardised structure design with limited allowance for bespoke features. The structures design could evolve further as a result of additional survey data and / or engagement with key stakeholders.
- Utilities - statutory service providers information is limited to initial returns. A high level of uncertainty exists until any diversion routes are fixed and firmer cost estimate procured from the individual companies.
- Ecological mitigation and habitat works - the current design and cost estimation are based on limited survey data so result in uncertainty. Ecological mitigation would be subject to consultation with appropriate environmental stakeholder bodies.
- Land ownership and land availability – further investigations and engagement with landowners, key stakeholders and other consultees could result in changes to the route alignment.

These risks would be anticipated to reduce with ongoing mitigation actions taking effect throughout design development.

Potential opportunities which could assist with reducing design risk and mitigating project costs include:

- Viaduct structures optimisation - potential cost reduction exists if structure lengths can be reduced (subject to flood modelling and agreement with the Environment Agency.
- Reuse of excavated materials - a conservative position is currently taken with regards to limited reuse of excavated materials. Should ground investigation data should support a higher level of material reuse then this could present an opportunity for cost savings and also reduced transportation of materials.
- Optimisation of vertical alignment - a reduction in embankment height could lead to significant reduction in quantities of imported fill materials, reduced land take and potentially reduced visual impacts.

## 10.5.4. Costs

Certainty of cost estimation at this stage is proportionate to the level of design specification. Remaining uncertainty is reflected in risk allocation added to the base estimate allowances. Key points relating to the approach to cost estimation at this stage include:

- Itemised quantities based on the principals of the Highways Method of Measurement have been prepared from the feasibility designs developed for each option.
- Unit rates have been applied utilising cost data drawn from recent comparable infrastructure projects and published cost data.
- Construction cost includes provision for preliminaries based on an anticipated programme duration and a projected work methodology. This methodology is assumed to allow construction of all sections of the scheme to proceed without any major phasing or other constraints.
- Additional costs have been estimated in relation to land / property, scheme preparation and supervision.
- Risk has been included based upon the initial Quantified Risk Assessment, which reflects any significant differences in risk between the options. The P80 risk value has been used[36].
- Inflation has been applied with an assumed completion year of 2028 using published civil engineering TPI data.
- Maintenance costs have also been estimated separately to reflect whole life costs, based on a 60-year period. This includes capital renewal as well as ongoing maintenance and upkeep.

A summary of the cost estimates for each of the options is provided in **Figure 10-6**. The incremental elements (option 1X and 2X) are shown separately and need to be considered as additional to any of the other respective options.

Based on the cost estimates key points include:

- Total outturn costs range from approximately £103 million (option 1a) to £204 million (option 2C).

[36] The P80 risk value means that there is an 80% chance of being within that stated risk allowance.

- With regards to the route options 1A / 1B / 1C, the cost increases from option 1A to 1C (with 1C being approximately £16 million (15%) higher than option 1A). The route options 2A / 2B / 2C follow a similar pattern, although the difference between 2A and 2C is less (£13 million, or 7%).
- Risk allowance varies from 21% of base cost (option 2C) to 34% of base cost (option 1B), reflecting the different levels of risk assessed.
- Inflation contributes approximately a further 23% to the base plus risk cost. In relation to the highest cost option (2C), this equates to approximately £41 million.
- Estimated maintenance costs (60-year period) range from approximately £12.5 million (option 1A) to £31.5 million (option 2C). These costs are based at current pricing levels and do not include inflationary uplifts.

It should be noted that the cost estimates for options 1A / 1B / 1C do not include the planned developer link road extension to Eastern Way. Risk cost does include an allowance for potential additional enhancements to the existing network (e.g. Eastern Way) as a result of increased traffic volumes.

**Key elements of the cost estimates are considered to be relatively conservative at this stage. Further design development and value engineering has scope to reduce the costs (see also section 10.5.3).**

## Figure 10-6 – Cost estimates for route options under consideration

| Q1 2019 prices | 1a | 1b | 1c | 1x | 2a | 2b | 2c | 2x |
|---|---|---|---|---|---|---|---|---|
| Construction | £ 51,448,800 | £ 57,281,407 | £ 60,326,730 | £ 20,803,400 | £ 103,683,222 | £ 109,319,094 | £ 114,540,946 | £ 10,667,000 |
| Land & property, preparatory and supervision | £ 9,672,447 | £ 10,543,358 | £ 11,580,219 | £ 3,286,200 | £ 18,539,090 | £ 19,314,930 | £ 20,605,086 | £ 1,685,000 |
| **Base cost total** | **£ 61,121,247** | **£ 67,824,765** | **£ 71,906,949** | **£ 24,089,600** | **£ 122,222,312** | **£ 128,634,024** | **£ 135,146,032** | **£ 12,352,000** |
| Risk | £ 22,711,795 | £ 23,199,424 | £ 22,884,698 | £ 2,842,700 | £ 30,745,191 | £ 29,715,522 | £ 28,062,442 | £ 1,525,898 |
| **Base cost + risk total** | **£ 83,833,042** | **£ 91,024,189** | **£ 94,791,647** | **£ 26,932,300** | **£ 152,967,503** | **£ 158,349,546** | **£ 163,208,474** | **£ 13,877,898** |
| Inflation | £ 18,913,412 | £ 20,542,831 | £ 23,611,377 | £ 11,735,037 | £ 38,085,993 | £ 39,428,328 | £ 40,727,173 | £ 1,458,000 |
| **Investment cost total outturn** | **£ 102,746,454** | **£ 111,567,020** | **£ 118,403,024** | **£ 38,667,337** | **£ 191,053,496** | **£ 197,777,874** | **£ 203,935,647** | **£ 15,335,898** |
| Maintenance - traffic related (cap renewal) | £ 11,870,809 | £ 13,035,128 | £ 13,550,000 | £ 5,330,000 | £ 27,273,924 | £ 28,490,300 | £ 30,343,044 | £ 2,800,000 |
| Maintenance - non traffic related | £ 774,180 | £ 759,240 | £ 660,000 | £ 318,000 | £ 1,328,460 | £ 1,157,460 | £ 1,127,460 | £ 102,000 |
| **Revenue cost total (60 yr period)** | **£ 12,644,989** | **£ 13,794,368** | **£ 14,210,000** | **£ 5,648,000** | **£ 28,602,384** | **£ 29,647,760** | **£ 31,470,504** | **£ 2,902,000** |


Note – revenue costs are presented in current prices.

### 10.5.5. Initial value for money assessment

The initial high-level value for money assessment has been undertaken as an indicative exercise to assist with the identification of the scale of the likely benefits against the expected costs (Benefit Cost Ratio – BCR). The primary inputs to this exercise are the initial transport modelling outputs and the latest cost estimates. The scope is limited to the most commonly attributable monetised benefits generated from the Transport User Benefit Appraisal (TUBA) tool – travel time, vehicle operating costs, and indirect tax revenues.

The cost estimates have been translated into a Present Value Cost (PVC), presented in 2010 prices (as per TAG). The whole life (maintenance) costs have been included. Optimism bias has been applied at 44%.

As noted previously, the differences in modelled impacts between different route alignments are relatively small, and given the level of inherent uncertainty in the modelling at this stage it is not considered appropriate to identify benefits separately for each option. Instead, an expected range of the Present Value of Benefits (PVB) is provided for options 1A / 1B / 1C and options 2A / 2B / 2C), which takes into account some of the uncertainty. Hence, the key differential between the different variants is the cost estimate.

A summary of the assessment is provided in **Table 10-7**. Based on the benefits (PVB) and costs (PVC) an indicative BCR category has been assigned, based on the standard DfT bands. To account for the fact that the benefits are limited to TUBA only, an indication has been provided of the potential BCR category if other relevant monetised impacts were also factored in. It should be noted that overall value for money is not implied solely by the BCR and DfT guidance advises that the full range of benefits and impacts should be taken into account, including non-monetised impacts.

**Table 10-7 – Initial value for money assessment**

| | 1A | 1B | 1C | 1X | 2A | 2B | 2C | 2X |
|---|---|---|---|---|---|---|---|---|
| PVB (£m) – TUBA only | 25 - 40 | 25 - 40 | 25 - 40 | 60 - 75 | 85 - 115 | 85 - 115 | 85 - 115 | 90 - 125 |
| PVC (£m) | 64 | 70 | 72 | 87 | 117 | 123 | 128 | 140 |
| | | | | | | | | |
| BCR category - Indicative TUBA only | 0 to 1 | 0 to 1 | 0 to 1 | 0 to 1 | 0 to 1 | 0 to 1 | 0 to 1 | 0 to 1 |
| Potential BCR category (other benefits) | 0 to 1 | 0 to 1 | 0 to 1 | 1 to 1.5 | 1 to 1.5 | 1 to 1.5 | 1 to 1.5 | 1 to 1.5 |

*Note – options 1X and 2X in the table are incremental. 1X could be applied to any of 1A / 1B / 1C. 2X could be applied to any of 2A / 2B / 2C*

The initial assessment identifies that options 2A / 2B / 2C have the greater potential in terms of value for money of the options considered, with a potential BCR category of 1 to 1.5. For options 1A /1B / 1C, the assessment indicates that the potential BCR may not exceed 1. The incremental addition of the A350 dualling (option 1X) improves the potential value for money position.

The initial assessment is not necessarily representative of any resultant value for money position once full appraisal has been undertaken, but it is presented as a guide at this stage. In particular, transport modelling is an iterative process and the initial assessment will be used to further refine the modelling approach. It will also be necessary to consider alternative demand / supply scenarios to fully understand the performance of the scheme under different land use or transport network assumptions. The approach also only considers the benefits (and costs) of the bypass options at this stage – it has been identified that there is merit in considering a complementary package of walk/ cycle and potentially bus measures and the inclusion of this could generate additional benefits.

Other observations from the initial assessment include:

- Benefits by journey purpose are split approximately: 40% business; 30% commuting; and 30% other. This is similar for all options.
- Benefits by time period are split approximately: 33% AM (0700-1000); 45% Inter-peak (1000-1600); and 22% PM (1600-1900). This is similar for all options.

- The vast majority of TUBA benefits are driven by time benefits. Vehicle operating costs produce a small disbenefit overall – with small benefits in terms of fuel costs offset by higher non-fuel operating costs (associated with increased vehicle kilometres).

## 10.6. Further assessment (phase 2) outcomes

Further assessment has been undertaken in relation to potential route options for a full eastern bypass (options 2A / 2B / 2C and 2X) and an intermediate eastern bypass (options 1A / 1B / 1C and 1X). The assessment has involved more detailed technical work and analysis in respect of: design specification; transport modelling; environmental assessment; cost estimates; delivery and risk; and value for money.

Based upon this further assessment the key conclusions are summarised below.

### 10.6.1. Option 1A / 1B / 1C and 1X (intermediate eastern bypass)

- The transport modelling assessment indicates that the intermediate eastern bypass options could be effective in reducing traffic volumes on the existing A350 (central and northern sections). However, the modelled forecast journey time savings are more modest (30 to 60 seconds per vehicle).
- There is expected to be little difference in terms of overall transport benefits between the different route alignments, but the incremental inclusion of the A350 dualling to the south of Melksham (1X) has been shown to improve the journey time benefits (by up to 60% to 80%).
- The environmental assessment indicates slight to large adverse impacts across most of the environmental criteria for all route options, although 1C has a lower landscape / visual impact.
- The total outturn cost estimate (including risk allowances and inflation) ranges from £103 million (1A) to £118 million (1C). The incremental cost of the A350 dualling south of Melksham is £39 million.
- Whilst the estimated cost of option 1C is higher, the delivery and risk assessment indicates that this 'outer' alignment is likely to be more deliverable, compared to options 1A and 1B – with less impact on properties and land uses, lower risk of public / stakeholder acceptability challenges and greater flexibility.
- Other potential delivery challenges and risks include the inter-dependency with the planned developer link road extension to Eastern Way and the potential adverse impacts of the increased traffic levels on this part of the network as a result of the scheme.
- The initial value for money assessment indicates that the potential BCR range for option 1C could be less than 1. Inclusion of the incremental A350 dualling to the south of Melksham (1X) was shown to have potential to achieve a BCR of above 1.

Overall, based on the further assessment (phase 2) undertaken, of the intermediate bypass options 1A / 1B / 1C the combination of option 1C ('outer' alignment) in conjunction with the A350 dualling to the south of Melksham (1X) is identified as having the greater prospect. Although the estimated cost (£158 million) is less than the full eastern bypass options, and some of the environmental impacts are assessed as not as significant, the scale of the expected benefits is also substantially less, and prospects in relation to the value for money position are lower. Contribution towards the scheme objectives, whilst positive, is also of a lower magnitude. Shorter bypass options received a lower level of support through the consultation exercise compared to the longer bypass options, and there is some further delivery risk and complexity associated with the inter-dependency with the planned developer link road extension to Eastern Way and the potential adverse impacts of the increased traffic levels on this part of the network as a result of the scheme. On balance, within the context of the LLM funding business case submission, it is considered that there is not sufficient merit to progress this option further.

#### Conclusion

It is proposed that options 1A / 1B / 1C / 1X (or combinations of these) do not progress to further appraisal as part of the LLM Outline Business Case submission.

### 10.6.2. Option 2A / 2B / 2C and 2X (full eastern bypass)

- The full eastern bypass options demonstrate a more significant impact against the primary scheme objectives. The transport modelling assessment indicates that a significant reduction (40% to 70%) in traffic volumes on the existing A350 (from Beanacre to south of Melksham) could be expected, in addition to other routes within the town. The modelled forecast journey time savings for the main north-south movement are between 2 to 3 minutes per vehicle (based on an average hour within the peak period).
- As with options 1A / 1B / 1C, there is expected to be relatively little difference in terms of overall transport benefits between the different route alignments.

- The environmental assessment indicates slight to large adverse impacts across most of the environmental criteria for all route options, although 2C has a lower landscape / visual impact. Environmental impacts are assessed as more significant for option 2 compared to option 1, particularly in relation to biodiversity, cultural heritage and agricultural land holdings.
- The total outturn cost estimate (including risk allowances and inflation) ranges from £191 million (2A) to £204 million (2C).
- Similar to option 1, the 'outer' alignment (2C) has been identified as being more deliverable compared to options 2A and 2B.
- The initial value for money assessment indicates that the potential BCR range for option 2C could be between 1 to 1.5. The scheme cost presents a challenge in this regard.
- The transport modelling assessment has identified that the short section of the A350 between the southern bypass junction and Littleton Roundabout presents some emerging forecast capacity issues by the 2036 forecast year. Dualling of this section is relatively feasible, with an additional outturn cost of approximately £15 million. The merits of including this within the scheme requires further consideration.

Overall, based on the further assessment (phase 2) undertaken, of the full eastern bypass options 2A / 2B / 2C the 'outer alignment' option 2C has been identified as having the greater prospects overall taking into account deliverability, risk, and acceptability as well as cost. This option demonstrates a strong fit with scheme objectives and the LLM / MRN objectives and funding criteria; it is expected to produce benefits to residents and road users locally (Melksham town and the surrounding area) as well as at a wider geographical level (West Wiltshire and beyond) associated with the improvement to the A350 corridor. It also enables complementary measures for non-motorised users to be implemented on the existing A350 at Melksham and other adjacent / connecting routes. The long eastern bypass option 10c (from which 2A / 2B / 2C are derived) has received the greatest level of support of the bypass options presented through the consultation exercise. The initial value for money assessment indicates scope to strengthen the position through further optimisation, including through potential cost savings. Some adverse environmental impacts have been identified and these require further consideration. There is scope for environmental mitigation to be incorporated into any further development of the option, as more information and survey data become available.

On balance, within the context of the LLM funding business case submission, there is considered to be merit in progressing the full eastern bypass option 2C for further consideration within the LLM Outline Business Case.

### Conclusion

It is proposed that the full eastern bypass option 2C is progressed to further appraisal as part of the LLM Outline Business Case submission.

Overall conclusions of the OAR and next steps are presented in Chapter 11.

# 11. Conclusions and next steps

Through the development of this OAR a robust process has been applied to:

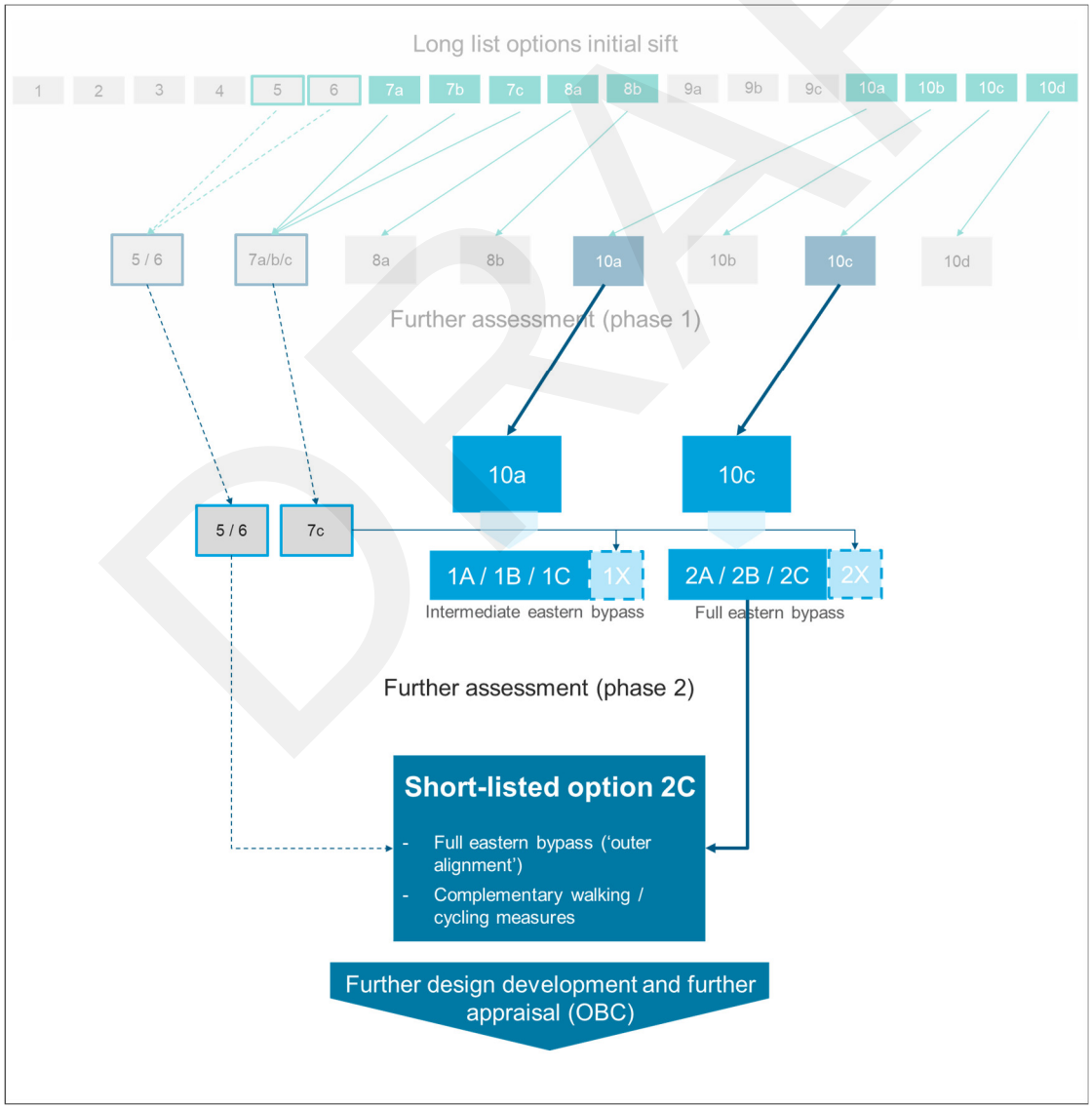
- identify the policy context and current and future problems and issues which establish the need for intervention in relation to the A350 at Melksham (Chapters 2 to 4);
- frame the objectives for intervention, in terms of strategic outcomes and specific transport objectives (Chapter 5); and
- identify a range of potential options (including different transport modes) to meet the objectives (Chapter 7).

The options have been taken through a staged approach to sifting, development and assessment (Chapters 8 to 10). The level of detail and evidence applied has increased with each stage, and at each stage the better performing options have been identified and the reasons for discarding other options recorded.

## 11.1. Short-listed option(s) proposed to progress to full appraisal

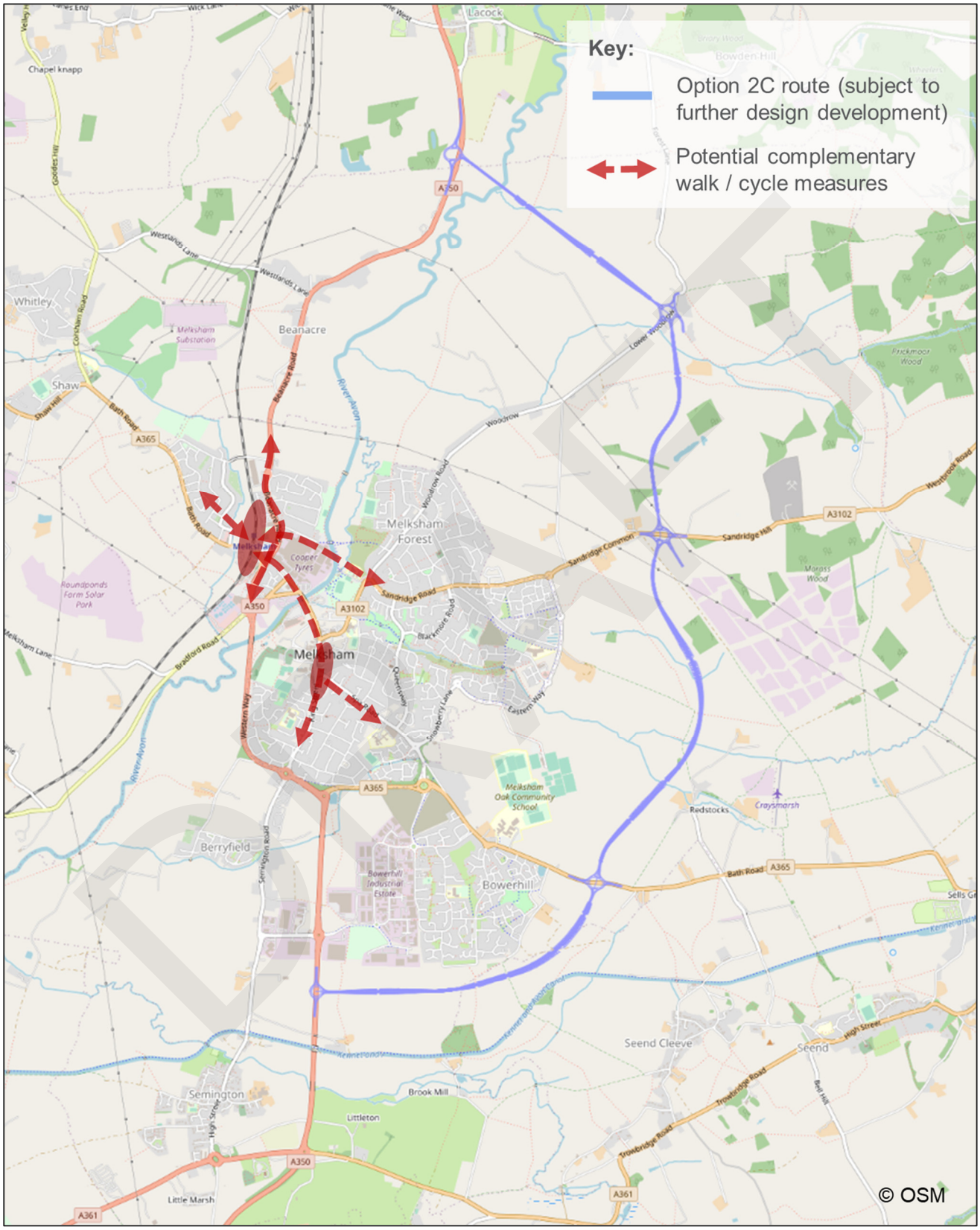
Based on the outcomes of this process **(Figure 11-1)** it is proposed that the most suitable option to progress to further appraisal as part of the LLM Outline Business Case submission comprises the full eastern bypass option 2C ('outer' alignment), plus a package of complementary measures focused on walking and cycling to 'lock in' the benefits of the traffic reduction on the existing A350 and other adjacent routes **(Figure 11-2)**.

**Figure 11-1 – Identification of short-listed option for further appraisal**



The final short-listed option(s) to be considered for the OBC are subject to confirmation by Wiltshire Council following a further consultation exercise.

**Figure 11-2 – Short-listed option 2C (subject to further design development)**



## 11.2. Proposed short-listed option 2C – further development

Further development of option 2C should be undertaken as part of further refining the design specification for consideration within the OBC. This is necessary to facilitate the full appraisal across all economic, environmental and social impacts. This also provides an opportunity to further optimise the scope and design of the scheme based upon the findings from the further assessment (phase 2). Potential factors for further consideration would include:

- The **siting of the northern junction with the A350**, where there are challenges associated with the impacts on the roman road. There is scope to consider locating the junction further north, and potentially taking the bypass alignment over the roman road.
- Reviewing the **need for a full junction at Lower Woodrow Road** – with a view to reducing the impacts on adjacent properties as well as potentially benefiting traffic flow and journey times on the bypass route.
- Undertaking **value engineering** with a view to reducing scheme costs where practicable, which would benefit the value for money position.
- Incorporating further **stakeholder feedback**.
- Reviewing the case for **dualling of the short section of the existing A350** between the southern bypass connection and Littleton Roundabout, based upon forecast traffic flows (including a 'high growth' scenario), benefits / cost, and other potential impacts (e.g. environmental).
- Further developing the scope of a potential **complementary measures package**, with a suggested focus on building upon the traffic reduction benefits of a bypass scheme. This might include improved east/west access for pedestrians and cyclists, improved access to and integration with the rail station, and further supporting measures within the town centre.
- Identifying the scope for **environmental mitigation and enhancement**, particularly where the most significant potential adverse impacts have been identified through the options assessment.
- Seeking to **minimise the carbon footprint**, which might entail: incorporating provision to support electric vehicles (e.g. space for charging points); means of carbon off-setting (e.g. tree planting); low-energy operational features (e.g. solar / wind powered signs and signals); minimising the scale of earthworks; and designing for low-carbon construction methods.

Scheme development would be subject to the formal regulatory processes which apply. In particular, at the relevant stage, the scheme would be subject to a planning application including a full Environmental Impacts Assessment.