

## Melksham Bypass OBC

WC\_MBP-ATK-GEN-XX-RP-TB-000009

## Social and Distributional Impact Appraisal

18/11/21

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# Notice

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# Executive Summary

This report details the findings of the Social and Distributional Impact (SDI) Appraisal undertaken for the proposed A350 Melksham Bypass Scheme, designed to improve the A350 at Melksham and Beanacre. The purpose of this scheme is to address longstanding issues of north-south connectivity along the A350. It recognises the important local function that the existing route serves at Melksham and is aimed at addressing key existing and future issues such as journey time delays and poor reliability, accidents, severance, noise and air quality concerns.

The distributional analysis aims to evaluate whether the preferred route, announced in June 2021, unduly favours or disadvantages any particular social or vulnerable group within the study area. An assessment of social impacts derived from the A350 Melksham Bypass scheme is also presented in the report. Understanding the social and distributional impacts is a crucial component of transport scheme appraisals as the benefits on the society are often significant and play a key role in justifying the progression of worthwhile transport projects.

The appraisal has been undertaken in accordance with requirements set out in TAG unit A4-1 (Social Impact Appraisal) and TAG unit A4-2 (Distributional Impact Appraisal) published by the Department of Transport (DfT). The results are presented in a seven-point scale of beneficial, neutral, or adverse.

A summary of the social analysis undertaken is presented below:

- The assessment of accidents, physical activity and severance is appraised as **slight beneficial**.
- Security and accessibility impacts are considered to be **neutral**.
- The cumulative travelling experiences of the quality and ambience of journeys (journey quality) are considered to be **moderate beneficial**.
- The scheme has a **slight adverse** impact on personal affordability.

A summary of findings for the eight distributional impact indicators is provided below (overall impact):

- The overall accidents, air quality and severance DI appraisal is considered to be **slight beneficial**.
- The impact of noise on vulnerable groups is scored as **moderate beneficial**.
- The overall user benefits impact is appraised as **moderate beneficial**.
- The overall personal affordability impact is appraised as **moderate adverse**.

The benefits and disbenefits of the A350 Melksham Bypass are experienced to different extents by different specific social and income groups, including children, older people, Black, Asian and Minority Ethnic (BAME) communities, people without access to a car, people with a disability and people on low incomes. The report analyses whether people who belong to these vulnerable groups are not disadvantaged further by receiving a disproportionately low share of the benefits, or a disproportionately high share disbenefits. This analysis can inform measures to mitigate the impact of the project on those groups.

# 1. Introduction

## 1.1. Purpose of the report

This report details the findings from the Social and Distributional Impact (SDI) Appraisal of the A350 Melksham Bypass scheme. The appraisal has been undertaken in accordance with requirements set out in TAG unit A4-1 (Social Impact Appraisal) and TAG unit A4-2 (Distributional Impact Appraisal) published by the Department of Transport (DfT). This report complements the A350 Melksham Bypass Outline Business Case (WC\_MBP-ATK-GEB-XX-RP-TB-000002); in particular, it supports the Economic Case.

Social impacts (SIs) cover the human experience of the transport system and its impact on social factors not considered as part of economic or environmental impacts. These impacts may positively or negatively influence the preferences, well-being, behaviour or perception of residents and other social groups. The purpose of the Social Impact Appraisal is to evaluate, and where appropriate quantify, these impacts in order that they can be considered relative to other outcomes and where possible mitigated.

On the other hand, distributional impacts (DIs) consider the variance of transport intervention impacts across different social groups. The analysis of DIs is mandatory in the appraisal process and a constituent of the Appraisal Summary Table (AST). Both beneficial and adverse DIs of the transport intervention are considered, along with the identification of social groups likely to be affected. These may include children, older people, people with a disability, Black, Asian and Minority Ethnic (BAME) communities, no car households and people on low incomes. It is important to make sure that the most vulnerable groups are not disadvantaged further by receiving a disproportionately low share of benefits, or a disproportionately high share of the disbenefits. This analysis can inform measures to mitigate the impact of the project on those groups or amendment of the project itself.

The report is organised as follows. Section 1 discusses the project objectives and the project option as described in the Strategic Case. Section 2 presents the results of the approach to the appraisal of the social impacts of the scheme, while Chapter 3 is devoted to a description of the distributional impact appraisal where consideration is given to the impacts on key groups. Chapter 4 describes the main outputs from the appraisal in a matrix and contains summary text to be included within an Appraisal Summary Table.

## 1.2. Background

The A350 is a primary north-south route connecting the M4 with the Dorset coast and Poole port. Through Wiltshire, the A350 passes around the principal settlements of Chippenham and Trowbridge and through the town of Melksham. The section of the A350 through Melksham has been identified as a key constraint on the route, with 30mph sections passing through residential areas with several busy junctions. Projected growth in travel demand along the A350 and locally around Melksham is expected to result in increased traffic volumes using the A350, resulting in a bottleneck through the town.

A route has been identified as the emerging option through the Option Assessment Report (OAR) process and would divert traffic around the town via a route to the east of Melksham. An indicative route is included on figures in this report to allow assessment against the emerging option (see **Figure 1-1**). The bypass would follow a route from the A350 between Lacock and Beanacre in the north to the A3102 east of Eastern Way, then continue south to the A365 east of Bowerhill and south-west connecting to the A350 south of Hampton Park West. This route – currently likely to be a single carriageway – would be circa 9km in length.

The key features of the emerging option that is being proposed are described below:

- The route is approximately nine kilometres long and has a total footprint of around 50 hectares.
- There are four new roundabouts – from south to north, these are: at the A350 just south of Hampton Park roundabout; at the A365; at the A3102; and at the A350 between Halfway Farm and Lacock village (this would upgrade the existing junction with Melksham Road).
- A viaduct is provided over the River Avon and its flood zone, approximately 410 metres in length.
- A bridge carries the bypass over the Wilts and Berks canal (currently not in use), which requires four culverts.
- Four bridges are proposed over the Clackers and Forest brooks.
- Drainage attenuation ponds and other measures are provided to reduce flood risk and avoid pollution.
- Environmental mitigations are included in the scheme, such as vegetation planting along sections of the bypass.

- Existing Public Rights of Way routes for walking, cycling and horse-riding will be adjusted, or new routes provided to ensure connectivity.

**Figure 1-1 – A350 Melksham Bypass Upgrade Scheme**



In addition to the bypass itself, the scheme also includes a package of complementary walking and cycling measures within Melksham town including on and around the existing A350 route (illustrated within **Figure 2-2**). These measures seek to lock in the benefits of the traffic relief provided by the bypass to provide enhanced walking and cycling connections, including between the town centre area and the rail station and retail / commercial areas to the west of the existing A350 route.

As described in the OBC Strategic Case, the five transport objectives of the scheme are:

- 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 and employment growth in the A350 corridor.
- Reduce journey times and delays and improve journey reliability on the following routes through Melksham: A350 South – A3102, A365 West – A365 East, A350 South – A365 West.
- 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, which will help reduce the impact of transport on the environment and support local economic activity.
- Reduce personal injury accident rates and severity for the A350 and Melksham as a whole, to make the corridor safer and more resilient.
- 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.



## 2. Social Impact appraisal

### 2.1. Methodology

Social impacts are defined in the literature as changes in transport sources that positively or negatively influence the preferences, well-being, behaviour or perception of individuals, groups, social categories and society in general<sup>1</sup>. However, most social assessments of transport decisions are often superficial since, in practice, there is little guidance for its comprehensive analysis<sup>2</sup>.

As the Melksham Bypass project is expected to improve the economic, social and environmental well-being of the relevant area, there is a need to better demonstrate the additional benefits derived. Quantifying such social benefits could provide a complete understanding of the extent to which they can be considered in the Value for Money assessment. Understanding the social impacts is a crucial component of transport scheme appraisals as the benefits on the society are often significant and play a key role in justifying or supporting the progression of worthwhile transport projects.

This section presents the results of the Social Impact Assessment prepared for the A350 Melksham Bypass scheme. A proportionate approach to the scheme current stage of development has been undertaken to deliver the analysis. A qualitative assessment of each of the following social impact indicators has been undertaken, supplemented by quantitative measures where appropriate. Where possible, the analysis has been validated by findings from the literature.

As mentioned, the Social Impact Appraisal was undertaken in accordance with requirements set out in TAG unit A4-1 published by the Department of Transport (DfT). These impacts are covered in 8 categories, as shown in **Figure 2-1** below.

**Figure 2-1 – Social Impacts covered in this assessment**



A summary of the approach undertaken to complete this social assessment is presented in **Table 2-1**. Final results are presented in a seven-point scale of beneficial, neutral or adverse in the Appraisal Summary Table (AST).

<sup>1</sup> Geurs, K. T., Boon, W., & Van Wee, B. (2009). Social impacts of transport: literature review and the state of the practice of transport appraisal in the Netherlands and the United Kingdom. *Transport reviews*, 29(1), 69-90.

<sup>2</sup> Bueno Cadena, P. C. (2017). Assessing social and distributional impacts of transportation policies for optimizing sustainability (Doctoral dissertation, Caminos).

**Table 2-1 – Approach for the Social Impact Assessment**

Indicator	Assessment
Physical Activity	According to the guidance, it is proportionate in most cases to appraise most social impacts in a qualitative manner. In this study, social impacts were assessed by means of expert assessment and in active cooperation with the economic appraisal team. Qualitative assessments are supported by available literature and benchmark cases.
Security	
Severance	
Journey Quality	
Accessibility	
Personal Affordability	Commuting and other user impacts will be assessed using TUBA outputs from the modelling team. Based on these results, a high-level qualitative assessment will be provided in the Social Impact Appraisal section. It should be noted that distributional impacts are calculated quantitatively in Section 3.
Accidents	Results for the core safety assessment undertaken as part of the economic case will be utilised for the analysis of collisions. The full analysis is reported in the OBC Economic Case.
Option and Non-Use Values	Not assessed

## 2.2. Physical activity

### 2.2.1. Introduction

Sedentary lifestyles are increasingly becoming a major health risk, and it is estimated that insufficient physical activity causes 1.9 million deaths worldwide annually<sup>3</sup>. Changing mobility behaviors towards more active travel could have huge benefits for physical and mental health. For people who cycle or walk a minimum of 150 minutes a week as recommended by the World Health Organisation (WHO), the risk of mortality is reduced by 10%.

In accordance, TAG unit A4-1 notes that transport and the physical environment both play a major role in the amount of physical activity that people are engaged in on a day-to-day basis. As there is a recognition of the interrelationship between transport, the environment and health, there are currently a number of environmental and transport policy interventions to promote physical activity.

The preferred scheme option being promoted by Wiltshire Council comprises complementary walking and cycling measures within Melksham Town and around the existing A350 route. As a result, it is considered appropriate to assess physical activity benefits derived from the scheme option, and the contribution of such increase to health outcomes.

### 2.2.2. Assessment

TAG Guidance Unit A4-1 requires consideration of the impacts of any travel scheme on physical activity. This is required even if an intervention is unlikely to significantly affect active modes of travel directly.

As mentioned, the scheme plans to enhance 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. The complementary walking and cycling measures will result in a better-connected walking and cycling network for Melksham and encourage greater use of these travel modes. The main components of the complementary measures proposed by the scheme are illustrated in **Figure 2-2**. Indicative measures within the town centre area include the provision of continuous footways at side roads along Bath Road and High Street, 20mph speed limits and visual narrowing of carriageway, cycle parking at key destinations, and three additional pedestrian crossing points. In addition, access to the Melksham Station is expected to be improved by the provision of a signal-controlled pedestrian and cyclist crossing. A complete description of these measures can be found in WC\_MBP-ATK-GEB-XX-RP-TB-000002 (Section 2.7.5).

<sup>3</sup> World Health Organization, 2004, Department of Health Physical Activity and Health Improvement and Promotion, 2004



## 2.3. Security

### 2.3.1. Introduction

Transport interventions may impact the level of security for transport users. TAG Unit A4-1 states that security concerns are greater on roads where motorists are required to slow or stop their vehicles.

Any security impacts derived from the Melksham scheme will mainly affect road users, with no significant changes proposed to public transport routes or facilities. As there are no formal guidelines for road users, a proportionate qualitative assessment of changes in security is provided in this section.

### 2.3.2. Assessment

The design of the new junctions on the bypass route seeks to ensure safe provisions for pedestrians, cyclists and horse-riders through crossing facilities and the use of signal controls. These provisions would improve the safety of road users, in particular cyclists and pedestrians, as they will have dedicated crossing facilities and thus, minimising the possibility of collisions. However, as there is a potential for overlap with Journey Quality, consideration of indicators which reflect both security and journey quality is given only in the journey quality impacts assessment.

Instead, a high-level qualitative assessment of key security indicators has been undertaken in accordance with the requirements of TAG Unit 4-1. A summary of the appraisal is provided in **Table 2-2**.

**Table 2-2 – Summary of security appraisal.**

Security Indicator	Relative Importance	Scheme Impact	Comments
Site perimeters, entrances and exits	Medium	Neutral	The scheme is not expected to have any material impact on site perimeter issues. Changes to entrances and exits proposed in scheme designs are not expected to affect the level of security for transport users.
Formal surveillance	High	Neutral	Scheme design assumed to encourage formal surveillance. However, this indicator is appraised as neutral. This is a conservative assessment given the lack of detailed data available at this stage.
Informal surveillance	Medium	Neutral	Within Melksham town there is a degree of informal surveillance. The bypass will pass through a rural area with more limited informal surveillance. However, the scheme design is assumed to encourage open visibility. Likewise, the impact is appraised as neutral as specific scheme details are not available at this stage.
Landscaping	High	Slight beneficial	As part of the scheme there would be opportunities for landscape planting to be included along the route to help mitigate impacts on the residential and rural areas. The Melksham bypass is aimed at conserving and enhancing the quality of the natural landscape. The impact is appraised as slight beneficial as specific scheme details are not available at this stage.
Lighting and visibility	High	Slight beneficial	Lighting has generally been proposed at the major junctions and at the approaches to these junctions for five seconds driving distance at the expected speed. In some locations, it is proposed that road lighting be extended beyond the five second driving distance. Lighting has also been proposed at all pedestrian underpasses created by the proposed bypass.
Emergency call	Low	Neutral	Provision of emergency phones assumed as part of this scheme. Likewise, the impact is appraised as neutral as specific scheme details are not available at this stage.

As the appraisal has resulted in neutral levels on most security indicators, the overall assessment for security is considered to be **Neutral**. It should be noted that the landscape/lighting improvements are assumed to positively impact the level of security for transport users to some extent. Care should be taken when considering the result of this assessment because the level of data available affecting security are limited at this stage.

## 2.4. Severance

### 2.4.1. Introduction

Community severance is defined in TAG unit A4-1 as the separation of residents from facilities and services they use within their community caused by substantial changes in transport infrastructure, or by changes in traffic flows. Severance primarily concerns those using non-motorised modes, particularly pedestrians. To ensure a consistent approach, the assessment is based on pedestrians only. As the scheme includes changes to the road network and changes in traffic flows, an overall assessment of this impact will need to be considered.

As recognized in literature, motorised traffic using the infrastructure can be a physical barrier, as it reduces the opportunities for crossing the road<sup>4</sup>. On the contrary, the provision of better integrated cycling and pedestrian facilities and crossing points is expected to reduce severance. The difficulty of crossing the road is then influenced by a number of elements, including the width of the roadway, the volume, speed and composition of the traffic, and any street environment adjustments (e.g., traffic lights, pedestrian crossings, pedestrian traffic islands). Finally, street connectivity is one of the main elements of walkability and may be considered as the converse of severance.

A walking, cycling and horse-riding review<sup>5</sup> was conducted for the Melksham Bypass scheme. It has identified that although some Public Rights of Way (PRoW) will be severed, there is an opportunity to provide high-quality crossing facilities as part of the scheme, allowing the Melksham Bypass to connect to the severed PRoW.

### 2.4.2. Assessment

Severance can either be affected by substantial physical changes in transport infrastructure or through changes to traffic conditions. As a result, the assessment is focused on the following key questions:

- 1) Does the proposed scheme infrastructure or complementary measures cause or remove physical barriers between residents and community facilities and services?
- 2) Do changes in traffic flows resulting from the scheme option cause or remove barriers between residents and community facilities and services?

#### Analysis based on scheme designs

The proposed bypass design takes account of existing Public Rights of Way (PRoW) and other facilities currently used by pedestrians, cyclists and horse-riders. Public footpaths that are affected by the scheme will be diverted locally and directed via underpass so connectivity from one side of the route to the other will be provided for walkers, cyclists and horse riders. Therefore, non-motorised users will at most be forced to re-route their journey.

Potential sections of combined footway/cycleway parallel to the new road are shown in **Figure 2-3**. These would be connected to existing footpaths and bridleways, creating more opportunities for residents to access and enjoy the local countryside, and would therefore have a beneficial impact in terms of severance as provisions for non-motorised users would be ensured despite attracted traffic movements.

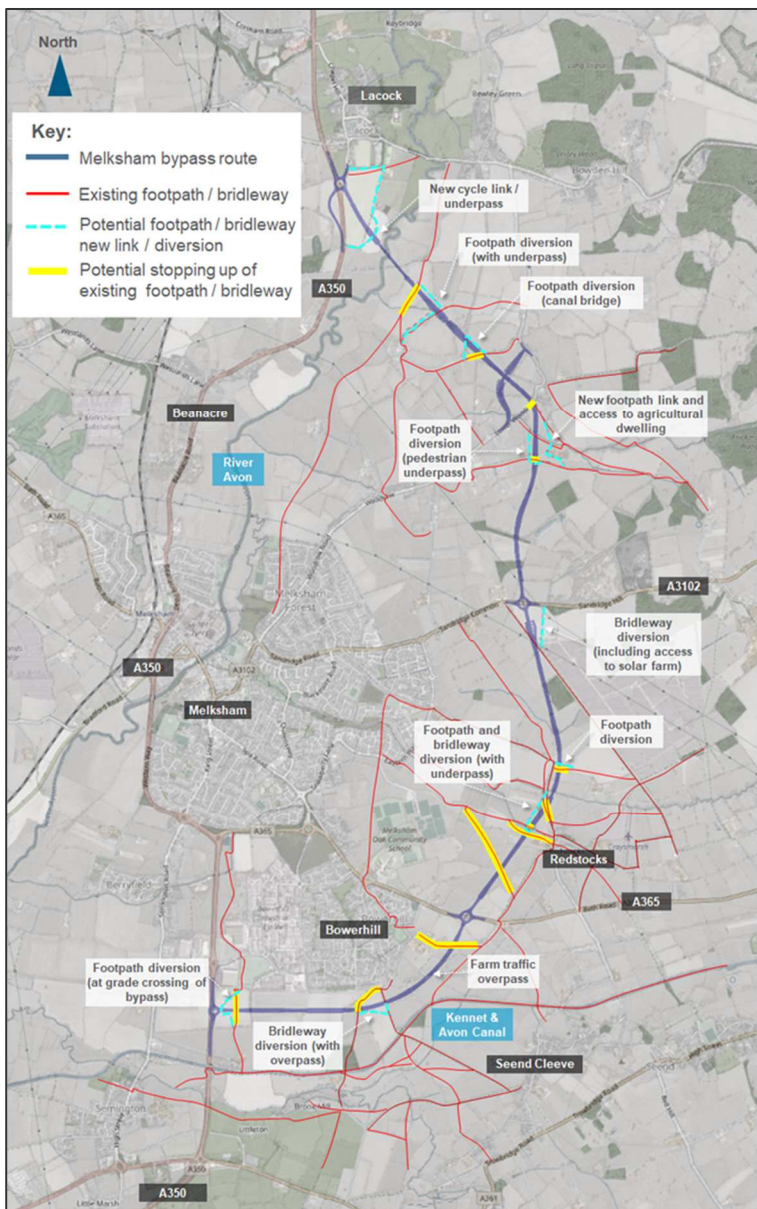
Where direct impacts on existing PRoW are unavoidable, the general principle is to provide alternative facilities, with betterment where possible. The number of crossing points of the bypass has been rationalised – some diversions to routes are proposed, and some routes are proposed to be stopped up (although with alternative connections being maintained where feasible). PRoW connections across the bypass route are predominantly designed with the bypass passing over the PRoW. **Figure 2-3** illustrates the proposed changes to the PRoW network, as per the current design.

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<sup>4</sup> Ancaies, P. R., Jones, P., & Mindell, J. S. (2016). Community severance: where is it found and at what cost? *Transport Reviews*, 36(3), 293-317.

<sup>5</sup> WC\_MBP-ATK-HGN-XX-RP-CH-000001.docx

Figure 2-3 – Potential alterations to the Public Rights of Way Network



One of the main scheme objectives is to 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. As a result, a potential package of walking and cycling improvements on and around the A350 and the town centre is proposed to complement the bypass scheme and create a better-connected walking and cycling network for Melksham. It also includes new pedestrian overbridges and underpasses to provide connectivity from one side of the route to the other. The package of complementary measures has three main components:

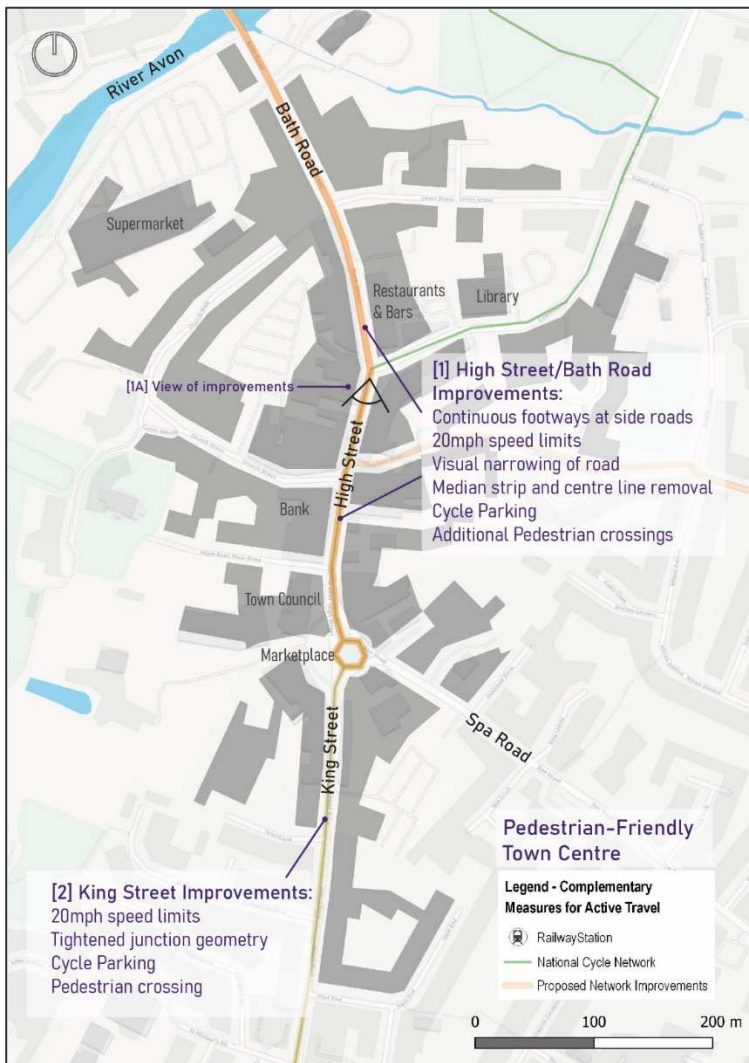
- Measures within the town centre area.
- Measures in relation to improving access to the rail station.
- Measures to improve northern / southern wider connections.

The proposed measures of walking and cycling improvements on and around the A350 and the town centre are shown in **Figure 2-4**. These would help to lock in the benefits from the bypass for traffic relief on the A350 and other routes through:

- Making use of existing walking and cycling connections in Melksham.
- Creating a cohesive walking and cycling network.

- Reducing pedestrian and cyclist casualties.
- Creating more opportunities for active travel.

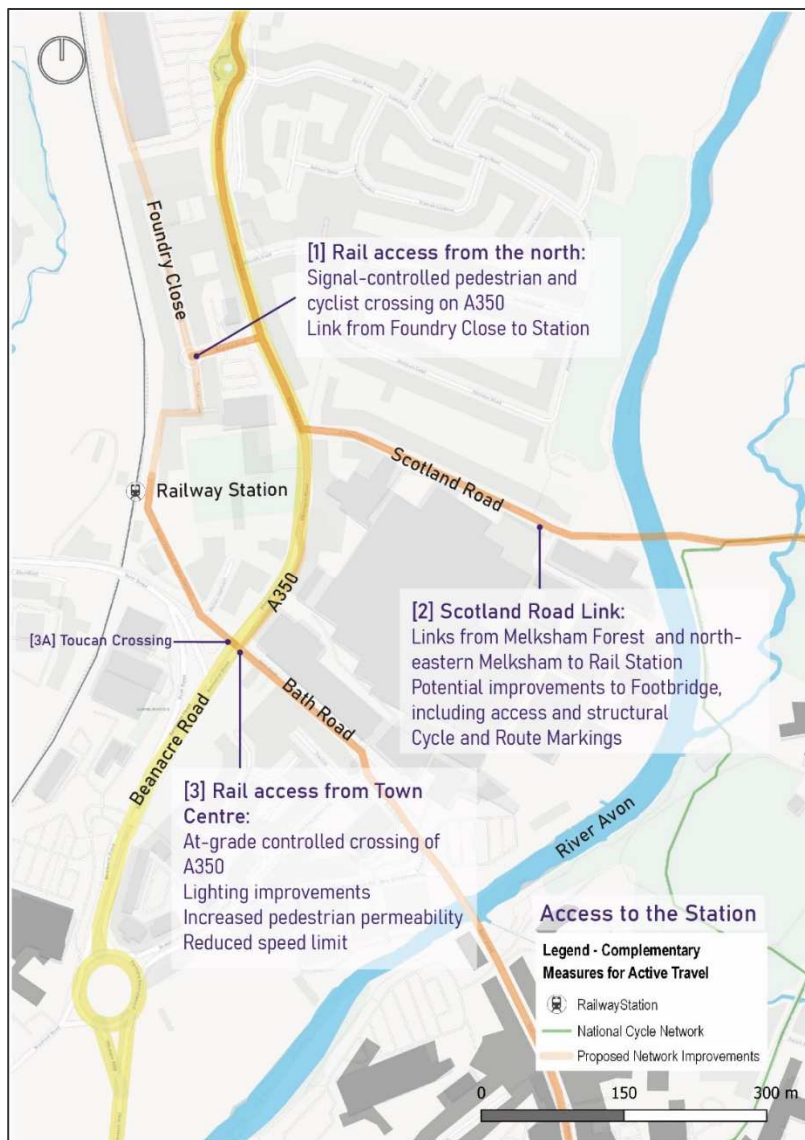
**Figure 2-4 – Complementary walking and cycling measures: pedestrian friendly town centre**



The scheme also aims to better integrate the town to the railway station and retail facilities, which at present are cut off from the rest of the town. The objective is to provide enhanced opportunities for walking and cycling between Melksham town centre and rail station / Bath Road, and along the existing A350 corridor within Melksham, therefore improving access to amenities. The following measures are proposed in order to improve access to the rail station (see **Figure 2-5**).

- Signalled crossing and integration with any future station link from Foundry Close.
- Quiet link via Scotland Road, providing direct access from Melksham Forest and the northern end of the Town.
- At-grade controlled crossing of A350 at Bath Road.
- Continuous footways at side roads along Bath Road and High Street, 20mph speed limits and visual narrowing of carriageway, cycle parking at key destinations, and three additional pedestrian crossing points.
- Tightened junction geometries along King Street to support speed reduction, improved pedestrian crossing provision at roundabout, and additional cycle parking.

Figure 2-5 – Complementary walking and cycling measures: access to Melksham rail station



As there are specific provisions for pedestrian and cycle connections within the town centre area and in relation to the rail station, it is assumed that the assessment is beneficial as severance is expected to be reduced. It should be noted that this assessment is based only on Point 1 of Section 2.4.2. Further analysis based on changes in traffic flows is presented in the following section.

### Analysis based on traffic flows

To supplement the above analysis, traffic flow changes of greater than 10% have been used as a proxy for analysing severance (in line with TAG Unit 4-2). Greater flows can act as barriers to non-motorised movements.

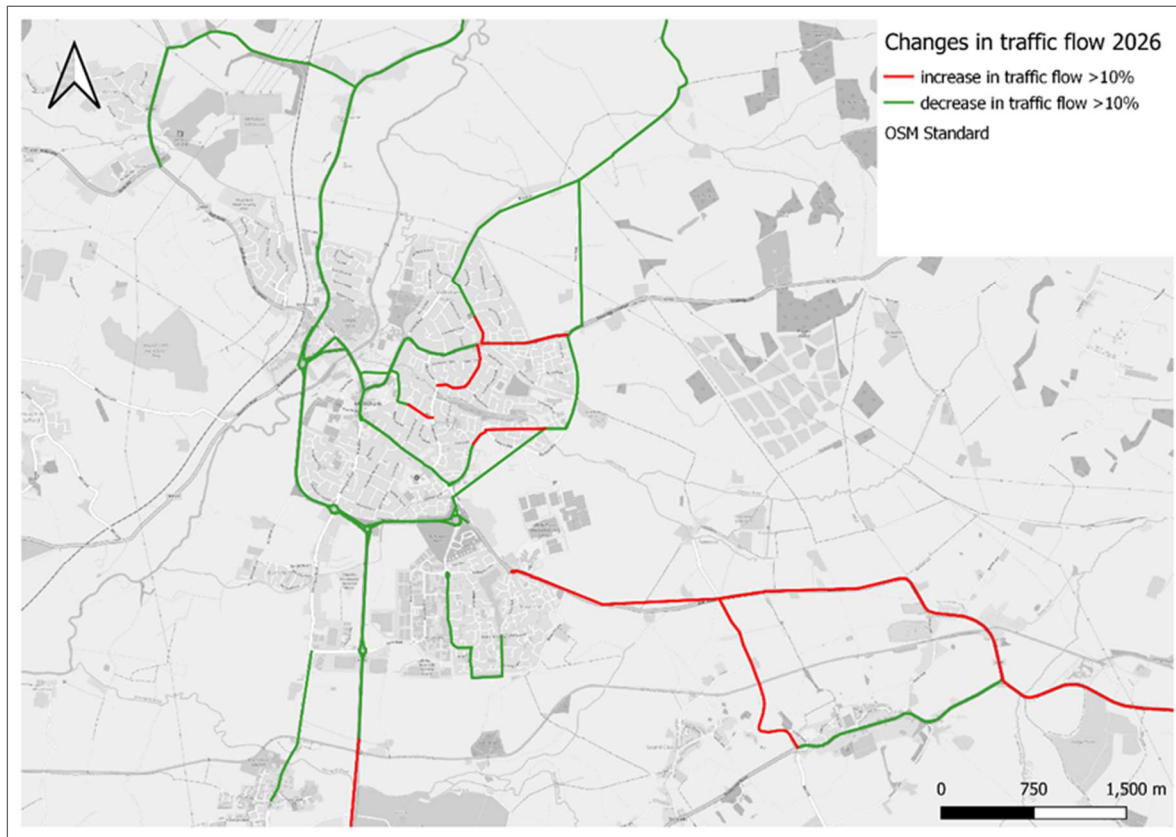
Based on the modelled 24-hour traffic flows assessed against the Reference Case (no scheme), **Figure 2-6** shows the significant changes (>10%) in vehicle flow as a result of the scheme on key links. Severance will only be an issue where traffic flows are significant enough to impede pedestrian movement. It can be observed that most link roads in the vicinity of the scheme will experience a reduction in traffic flow that is equal to or greater than 10%. Therefore, under the assumption that busy roads are a barrier to the movement of pedestrians, this is likely to have a beneficial impact on severance as traffic flows will be reduced.

On the other hand, a number of link roads is predicted to experience a negative effect on traffic flow, increasing by more than 10%, in particular Bath Road in easterly direction and several roads around Melksham. Nonetheless, considering the increases in traffic flow lie predominantly on roads that already contain high traffic



flows, with limited access for residents to cross these roads, it is unlikely for severance to be significantly affected by the scheme.

**Figure 2-6 – Traffic Flow Changes (>10%) to surrounding area of proposed Melksham Bypass Link Roads**



In summary, this severance assessment has examined the key links within the modelled area that are forecast to have a 10% increase or decrease in traffic flow between the do minimum and do something scenarios. As there are significantly more links experiencing a reduction in traffic flow than an increase, the scheme's impact on severance is considered beneficial. It should be noted that this is a partial assessment based on Point 2 of Section 2.4.2.

As the scheme design has included elements to improve local travel permeability, with specific provision for pedestrian and cycle connections and only a few number of links show an increase in traffic flow, the overall assessment on severance is considered to be **slight beneficial**.

## 2.5. Journey quality

### 2.5.1. Introduction

Journey quality is generally understood as the cumulative travelling experiences of the quality and ambience of a journey<sup>6</sup>. As recognised in TAG Unit A4-1, it represents a measure of the real and perceived physical and social environment experienced while travelling and includes factors such as perceptions of safety, information provision and comfort. Specifically, journey quality impacts can be sub-divided into three groups:

- 1) Traveller care: aspects such as cleanliness, level of facilities, information and the general transport environment.
- 2) Travellers' views: the view and pleasantness of the external surroundings in the duration of the journeys; and
- 3) Traveller stress: frustration, fear of collisions and route uncertainty.

<sup>6</sup> Geurs, K. T., Boon, W., & Van Wee, B. (2009). Social impacts of transport: literature review and the state of the practice of transport appraisal in the Netherlands and the United Kingdom. *Transport reviews*, 29(1), 69-90.

TAG Unit A4-1 also states that in most cases travel is a derived demand that arises from people’s desire to access other services or engage in other activities. Therefore, a poor journey experience is easily noticed by travellers. As a consequence, it is important that journeys are made as simple and easy as possible to improve the perceived physical and social environment experienced while travelling, as well as to prevent boredom and associated psychological issues. Research on travel behaviour has shown that journey quality factors are of significant importance and that users are willing to pay to improve the quality of a journey.

Removing strategic North-South traffic from Melksham is one of the main objectives of the A350 Melksham bypass. Capitalising on this reduced through traffic with complementary walking and cycling measures connecting the town centre with the station and these residential areas, is expected to improve journey quality for people walking and cycling. As a result, it is considered appropriate to appraise this impact.

## 2.5.2. Assessment

The assessment of the difference between the journey quality factors for the without-scheme and with-scheme cases is used to inform a qualitative seven-point scale assessment which ranges from ‘large adverse’ through ‘neutral’ to ‘large beneficial’. The following table presents the assessment of the scheme in respect of the journey quality sub-categories.

**Table 2-3 – Journey quality assessment**

Category	Impact Assessment
Traveller care	The proposed bypass design takes account of existing Public Rights of Way (PRoW) and other facilities currently used by pedestrians, cyclists and horse-riders. In addition, a package of walking and cycling improvements on and around the A350 and the town centre are proposed to complement the bypass scheme. These measures are expected to improve traveller care factors, resulting in a better user experience.
Travellers’ views	Sections of the bypass are expected to have a parallel walk / cycle route. These will connect to existing PRoW and create new ‘loops’ for pedestrians and cyclist to use and experience the surrounding rural setting. Travellers on the new bypass route (many of whom will divert from the existing A350 through built-up areas) will also experience rural views.
Traveller stress	More reliable and quicker journey times are anticipated for travellers along the bypass who would have previously had to travel through Melksham. As a consequence, a significant reduction in driver frustration is expected as a result of the scheme. Local traffic using the existing A350 e.g., those travelling to/from Melksham, are also expected to experience journey time savings. Hence, the reduction in the volume of traffic and congestion is also expected to result in more reliable journey times which may positively impact on driver stress. The enhanced walking / cycling facilities within the town area are expected to provide more continuous, higher quality routes, expected to contribute to reduced fear of collisions and route uncertainty.

The active mode appraisal summary within the Economic Case identifies benefits from the scheme relating to journey ambience of £1.95m PVB (2010 prices and values).

Based on this analysis and accounting for the magnitude of journey quality benefits and the qualitative analysis derived from **Table 2-3**, the overall impact assessment for journey quality has been appraised as **Moderate Beneficial**.

## 2.6. Option and non-use values

### 2.6.1. Introduction

An option value is the benefit an individual receives from knowing a service exists should they need to use it. A non-use value stems from the knowledge that other people can use the service providing an altruistic benefit.

As indicated in the guidance (TAG unit 4-1), option values and non-use values relate to the implementation or withdrawal of a public transport service and should only be assessed if the scheme includes measures that will substantially change the availability of transport services within the study area. For example, when as part of

the scheme the opening or closure of a rail service is being proposed or when public bus services are being introduced, reorganised or withdrawn.

As the A350 Melksham Bypass scheme includes no changes to any public transport routes or services provided in the area, no significant impacts are associated with the valuation of option values and non-use values. Therefore, **no further appraisal** is required for this social indicator.

## 2.7. Accessibility

### 2.7.1. Introduction

In the transport arena, accessibility is often used as a social indicator. Accessibility is defined and operationalised in several ways. According to TAG Unit 4-1, accessibility measures are seen as a holistic concept with the potential to reduce social exclusion and address the transportation needs of different groups in society. TAG Unit 4-1 recognises the following aspects (defined as ‘key barriers’) impacting on accessibility:

- 1) The cost of transport;
- 2) The availability and physical accessibility of transport;
- 3) Services and activities located in inaccessible places;
- 4) Safety and security;
- 5) Travel horizons.

One of the scheme objectives is to reduce journey times and delays and improve journey reliability on the A350 through Melksham and Beanacre, improving local and regional north-south connectivity. In addition, the scheme is also anticipated to play a major role in redressing a lack of suitable north-south connections in the strategic network, while tacking with associated safety issues. As a result, it is considered appropriate to appraise the accessibility impact from the social dimension.

### 2.7.2. Assessment

Given that the proposed scheme is a highway-improvement based scheme and has little direct influence on public transport services, a high-level qualitative assessment based on the previously described five key barriers has been undertaken. The following table presents a summary of the assessment of the Scheme in the context of such barriers.

**Table 2-4 – Accessibility assessment**

Barrier to accessibility	Impact Assessment
Cost of transport	Journey time improvements and traffic relief are expected to bring user benefits and, consequently, to change the cost of travel. It should be noted that within the net outcome of user benefits, some people may experience disbenefits, for example through longer journey times. This has to be analysed in the Distributional Impact Assessment.
The availability and physical accessibility of transport	The scheme is not considered to have any impact on access by rail. The introduction of the bypass is not anticipated to alter existing bus routes, which are assumed to continue to operate through Melksham. However, it is possible that bus operators could choose to use the bypass for express services in the future. Likewise, no significant changes to existing bus infrastructure (e.g., bus stops) are expected.
Services and activities located in inaccessible places	Not applicable (all areas are reasonably accessible). The Melksham Bypass scheme will however provide improved north-south connectivity for West Wiltshire and the wider Western Gateway region.
Safety and security	To reduce personal injury accident rates and severity for the A350 and Melksham as a whole is one of the main scheme objectives. To make the corridor safer and more resilient would help to deliver desired strategic and local outcomes. With the proposed changes, people are not expected to be deterred from walking to key services because of the fear of crime or anti-social behaviour.
Travel horizons	The new bypass would lead to wider travel horizons for residents of some nearby areas, providing faster and more reliable journey times for the key A350 to access leisure, employment and education opportunities.

A more detailed analysis on accessibility should be undertaken at later stages of the project. This analysis should be accompanied by a full appraisal of the different five key barriers impacting accessibility in line with TAG unit A4-1. As this assessment has not been undertaken due to the nature of the scheme, the impact on accessibility is then considered to be **neutral**. However, this is considered to be a conservative evaluation given that bus services operating on the network are likely to benefit from traffic reductions as a result of the bypass (which could derive in some small reliability/punctuality benefits). In addition, the reduced severance on the A350 and complementary walking and cycling measures are expected to improve access to the rail station, hence potentially making this a more attractive and viable option.

## 2.8. Personal affordability

### 2.8.1. Introduction

The Melksham Bypass scheme is expected to have a direct and tangible impact on the affordability of travel by car for some users. This section focuses on the monetary costs of travel exclusive of any time saving benefits resulting from the scheme.

Affordability of transportation is primarily a distributional issue as it can be a major barrier to the mobility of certain groups. The assessment presented in this section provides a general consideration of affordability from a wider perspective (net outcomes instead of a complete identification of potential ‘winners’ and ‘losers’).

### 2.8.2. Assessment

Given the nature of the scheme, the potential impact on the cost of travel or the availability of low-cost travel to vulnerable groups is considered to be mainly associated with changes in car fuel and non-fuel operating costs, but also the improved walking and cycling opportunities (as low-cost travel modes) facilitated by the bypass. Other factors such as public transport costs, parking charges, and toll charges are not considered to be of significance.

A reduction in congestion is expected to improve fuel efficiency for some users. However, it should be noted that the introduction of the bypass results in an increase in overall vehicle kilometres travelled. The bypass is approximately 1.5 kilometres longer than the existing A350 route. The traffic modelling predicts an increase in fuel consumption. The analysis of the TUBA outputs to inform the DI appraisal indicates that the Melksham bypass results in a disbenefit (-£775,608)<sup>7</sup> in terms of vehicle operating costs (fuel and non-fuel operating costs) – see **Table 2-5**.

The economic assessment suggests that increases in vehicle operating costs to users outweighs savings that may be experienced by some users. The improved walking and cycling facilities would have a small positive impact by making these modes a more viable low-cost travel option for some (although not directly affecting the cost of cycling). Overall, **slight adverse** impacts are anticipated for personal affordability for commuters and other non-business users. The distributional impacts across income quintiles are assessed and discussed in the separate Distributional Impact Appraisal section (Section 3.8).

**Table 2-5 – Scope of potential changes in cost of travel for the scheme**

Mode	Cost Change	Cost Change Expected	Change Captured in TUBA?	Quantified Impact
Car	Car fuel and non-fuel costs	Yes	Yes	-£775,608
	Road user charges	No	N/A	N/A
	Public parking charges	No	N/A	N/A
	Other car charges/costs	No	N/A	N/A
Non-motorised users	Cycling costs	No	N/A	N/A

<sup>7</sup> It should be noted that user benefits analysed for the purposes of DI appraisal are not directly comparable to the main economic appraisal outputs – see also section 3.7.2)

## 2.9. Accidents

### 2.9.1. Introduction

A transport intervention can influence the number of collisions and resulting casualties. It is important to examine these changes in collisions/casualty levels as there are significant costs associated with collisions for individuals, the government and private businesses. For example, casualty costs include the suffering of individuals and families, loss of economic output and medical costs. Costs of a collision includes damage to vehicles and infrastructure, police cost, legal and insurance costs and in certain cases losses due to extended journey times and road closures. A casualty refers to an individual who was injured in a collision (either slight, serious or fatal severity) and hence there may be more than one casualty in a collision.

The A350 Melksham bypass scheme comprises different elements including a full eastern bypass (single carriageway) with four junctions and supplementary highway improvement works to the adjacent network, including a short section of dualling and junction improvement to the south of the bypass. These improvements would likely lead to a change in traffic flow and speed. In accordance, these are likely to affect accident rates.

An assessment using the DfT's Cost Benefit Analysis – Light Touch (COBA-LT) tool was undertaken within the core model area. The assessment examines the costs associated with a collision and the resulting casualties. A comparison is made between the forecast collisions with the scheme and the forecast collisions without the scheme to show the resulting change in costs stemming from the scheme.

Results for the core safety assessment undertaken as part of the economic case will be utilised for the analysis of collisions. The full analysis is reported in the OBC Economic Case (WC\_MBP-ATK-GEB-XX-RP-TB-000002).

### 2.9.2. Assessment

As mentioned, a COBA-LT assessment was undertaken for the proposed scheme, taking into account anticipated traffic growth within the area as well as the proposed scheme interventions. **Table 2-6** reproduces the economic, collision and casualty summary result outputs of the COBA-LT analysis.

**Table 2-6 – COBA-LT assessment collision summary**

		Do Minimum	Do Something	Scheme Saving (DS-DM)
Collision Summary		11,622	11,374.7	247.4
Casualty Summary	Fatal	130.2	137.3	-7.1
	Serious	1,609.8	1,606.8	3.0
	Slight	14,119.9	13,874.7	245.1
Economic Summary (£m)		406.94	404.80	2.14

As the previous table shows, the provision of a bypass is expected to reduce collision rates overall. The scheme would result in a reduction in accidents across the study area over the 60-year assessment period (247.4 accidents saved). There is an expected significant reduction in slight casualty rates (245.1) and a slight reduction in serious casualty rates (3.0). However, the scheme will result in a slight disbenefit in terms of fatal casualties (-7.1). This may be associated with people travelling at faster speeds along the bypass.

Calculations indicate a total safety-related benefit of £2.14m and an overall beneficial reduction in accidents. However, the overall reduction represents a very small proportion of the total number of accidents across the study area. There are also small accident benefits associated with the complementary walking and cycling measures. As a result, the accident impacts have been scored as **slight beneficial**. An assessment of the changes in accidents in relation to the proportions and locations of children, older people and young adults in the scheme area is provided in the Distributional Impacts Appraisal (see section 3.2).

The economic assessment also considers a COBA-LT sensitivity test (using localised rates from existing A350 south as the basis for the new bypass rather than default assumptions which may not be representative). The sensitivity test produces improved accident savings (a reduction of approximately 580 collisions, giving a benefit of £18m). It also results in a reduction of 3 fatal casualties. Based on this sensitivity, the accident impacts would be appraised as **moderate beneficial**.

## 3. Distributional Impact appraisal

Distributional impacts relate to the extent to which there are differences in the way impacts affect different groups in society. For example, the noise impacts of an intervention will affect different groups of households, with some experiencing increases, and others decreases.

In accordance with requirements set out in TAG unit A4-2 published by the Department of Transport (DfT), a three-step approach has been applied to undertake the distributional impact appraisal of the A350 Melksham Bypass scheme – see **Table 3-1**.

**Table 3-1 – Distributional Impact appraisal process**

Step	Description	Output	
1	Screening	Identification of likely impacts for each indicator.	Screening Proforma
2	Assessment	Confirmation of the area impacted by the transport intervention (impact area). Identification of social groups in the impact area. Identification of amenities in the impact area.	DIs social groups statistics and amenities affected within the impact area
3	Appraisal of Impacts	Core Analysis of the impacts (including providing an assessment score for each indicator based on a seven-point scale – large beneficial to large adverse). Full appraisal of DIs and input into AST.	Appraisal worksheets and AST inputs

Source: DfT (2020). TAG unit A4-2 Distributional Impact Appraisal.

This chapter presents detailed findings from the screening process (Step 1) and the approach for the full appraisal (Steps 2 and 3) of the proposed scheme. The approach ensures that the DI appraisal is proportionate to the scale of the project and follow a process to ascertain whether a full DI appraisal is required. The eight indicators considered within the DI appraisal are:

- Accessibility;
- Collisions;
- Air Quality;
- Affordability;
- Noise;
- Security;
- Severance; and
- User Benefits.

The following sub-sections present an overview of the different steps considered within the appraisal.

### 3.1.1. Step 1 – Screening

Step 1 consists of a screening exercise that should be undertaken in order to identify whether a full appraisal is required. In order to ensure a proportionate approach, the analysis is carried out for each of the eight distributional impact indicators.

Supporting socio-demographic mapping for the study area has been included within Appendix A. The screening exercise is summarised in a proforma table, as outlined below. The screening proforma can be found in Appendix B. Finally, Appendix C identifies amenities that are in geographic areas that could be affected by proposed measures, and which may attract vulnerable groups within the impact area for each of the eight DI indicators.

### 3.1.2. Step 2 – Assessment

Step 2 consists of a detailed spatial analysis to confirm the overall geographical area experiencing impacts and consider which specific areas are relevant to the appraisal. This step also requires consideration of the socio-economic, social and demographic characteristics of social groups in the impact area. Data sources used for the socio-demographic mapping and population statistics are summarised in **Table 3-2**.

**Table 3-2 – Socio-demographic data sources**

Vulnerable Group	Data Source
Resident Population	ONS Population Estimates (2019)
Income Deprivation	IMD Income Domain (2019)
Children	ONS Population Estimates (2019)
Elderly	ONS Population Estimates (2019)
Disability	DWP DLA Claimants (2018)
Black and Minority Ethnic (BME)	ONS QS201EW Ethnic Group (2011)
Women	ONS Population Estimates (2019)
No car households	ONS KS404EW Car or Van Availability (2011)

The analysis uses common datasets and plots the proportions of vulnerable groups within the impacted area for each indicator. **Table 3-3 Error! Reference source not found.** sets out the groups of people to be identified in the analysis for each indicator, as defined in TAG Unit A4-2.

**Table 3-3 – Scope of socio-demographic analysis for DIs (Step 2b)**

Social Group	User Benefits	Noise	Air Quality	Collisions	Security	Severance	Accessibility	Affordability
Income Distribution	✓	✓	✓				✓	✓
Children: aged <16		✓	✓	✓	✓	✓	✓	
Young Adults: aged 16 to 24				✓			✓	
Older People: aged 70+				✓	✓	✓	✓	
Population with a disability					✓	✓	✓	
Population of Black Minority Ethnic origin					✓		✓	
Households without access to a car						✓	✓	
Households with dependent children							✓	

Source: DfT (2020). TAG unit A4-2 Distributional Impact Appraisal.

This step also requires the identification of amenities in the impact area including schools, hospitals, community facilities and other places where people (including vulnerable groups) may congregate during the day such as public parks. Appendix C presents the results of the identification of local amenities that will be used by vulnerable groups in the area.

### 3.1.3. Step 3 - Appraisal of impacts

This step examines information collated in the previous steps to assess the potential impacts of the intervention on each indicator’s social groups. An assessment score is given for each indicator and each of the social groups under consideration. The seven-point scoring system follows the standard DfT appraisal measures:

**Table 3-4 – Key to individual Distributional Impact appraisal**

Description	Score
Beneficial and the population impacted is significantly greater than the proportion of the group in the total population.	<b>Large Beneficial</b>
Beneficial and the population impacted is broadly in line with the proportion of the group in the total population.	<b>Moderate Beneficial</b>
Beneficial and the population impacted is smaller than the proportion of the group in the total population.	<b>Slight Beneficial</b>
There are no significant benefits or dis-benefits experienced by the group.	<b>Neutral</b>
Adverse and the population impacted is smaller than the proportion of the group in the total population.	<b>Slight Adverse</b>
Adverse and the population impacted is broadly in line with the proportion of the group in the total population.	<b>Moderate Adverse</b>
Adverse and the population impacted is significantly greater than the proportion of the group in the total population.	<b>Large Adverse</b>

Source: DfT (2020). TAG unit A4-2 Distributional Impact Appraisal.

The analysis to be undertaken in Step 3 provides an assessment score for each indicator and each of the social groups under consideration. In addition, a qualitative assessment will be provided for each indicator to describe the key impacts in each case. These will be summarised in the DI appraisal matrix.

## 3.2. Accidents

### 3.2.1. Step 1 – Screening

#### Comments

TAG Unit 4-2 indicates that a distributional appraisal is needed if the scheme is introducing changes in alignment that may have positive or negative safety impacts, or if any links are forecast to experience significant changes in vehicle flow, speed, or proportion of HGV traffic.

The introduction of a new bypass is expected to result in significant changes in vehicle flow in some areas of the road network. This may impact on the rate and severity of accidents in the area. The new bypass will also be of a different (higher) standard compared to parts of the existing network. Changes in accident levels, particularly for vulnerable groups, will need to be examined further to assess the full impact.

#### Outcome

**Continue to full appraisal.** A COBALT assessment needs to be undertaken in order to identify the impacts to accident rates. Characteristics of the population and facilities surrounding these areas of predicted impact will also need assessing.

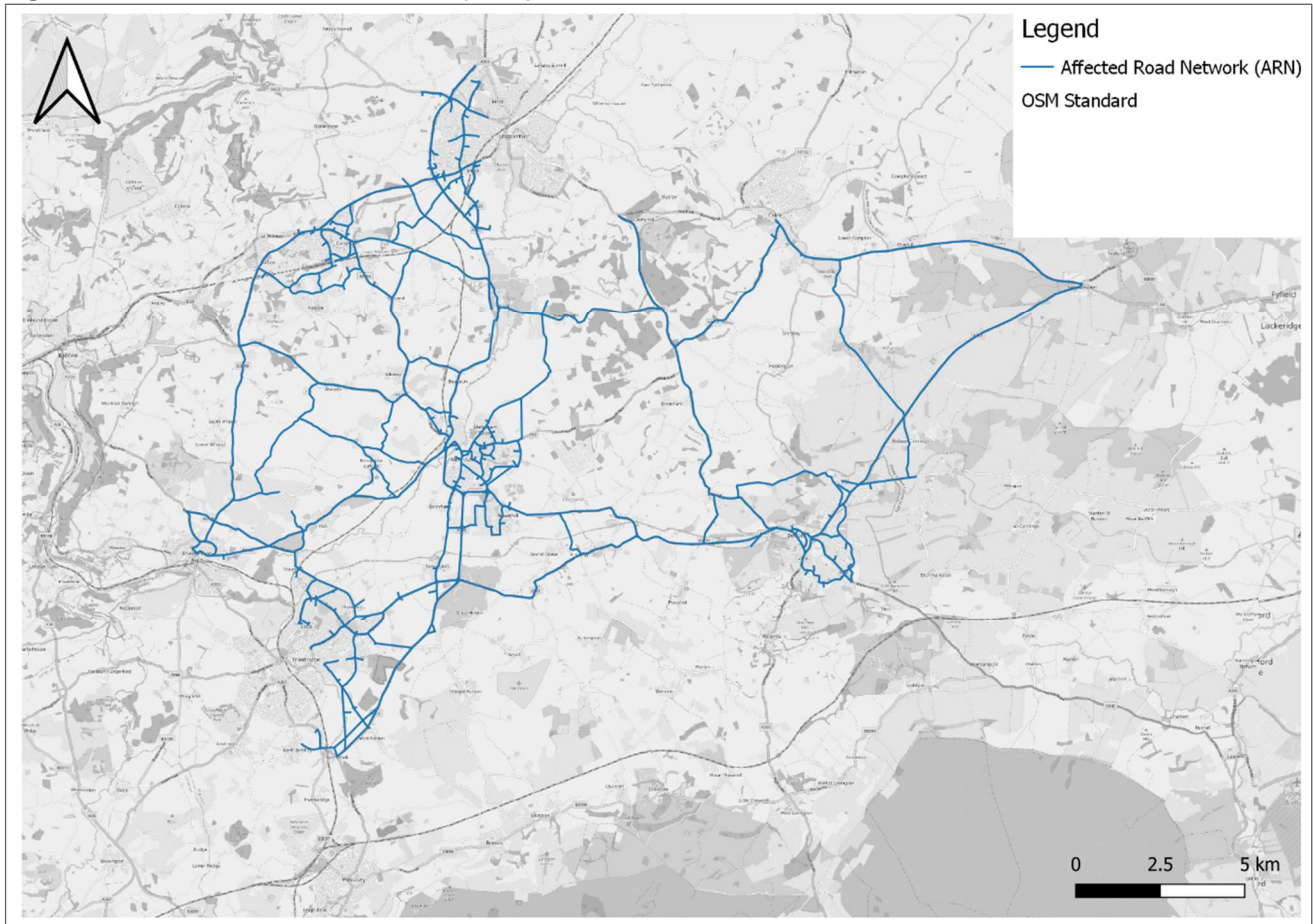
### 3.2.2. Step 2 – Assessment

#### Step 2a: Confirmation of impacted area

The approach for this DI appraisal of collisions uses data from the Cost and Benefit to Accidents – Light Touch (COBA-LT) modelling outputs in order to identify the impact on collisions of the scheme. The collision impact area comprises links and casualties that lie within the Affected Road Network (ARN), as shown in **Figure 3-1**. Analysis is then undertaken to identify all the links within the ARN that are forecast to experience greater than 10% change in collisions as a result of the scheme, as determined by the COBA-LT assessment.



Figure 3-1 – Affected Road Network (ARN)



#### Step 2b: Identification of social groups in impact area

There are several potential vulnerable groups in terms of accidents including children and younger people (under 16 years old), young male drivers (ages between 16 and 25) and older people (over 70 years old), as well vulnerable road users such as pedestrians, cyclists and motorcyclists. There is also evidence that people living in more deprived areas are more vulnerable to accidents on the highway network.

An accident analysis has been undertaken to identify concentrations of vulnerable groups that may be impacted as a result of the Melksham Bypass Scheme by using STATS 19 data on casualties for the five years from 2015 to 2019 on all links within the impact area (including increase, decrease and no change / negligible links). This data profiles casualties by age, gender and type of road user and is used to identify the baseline conditions in terms of victim typology in the impact area. Furthermore, the proportion of accident casualties in the most and least deprived quintiles has also been assessed. **Table 3-5** presents this data at a national and impact area level for comparison.

**Table 3-5 – Casualty data between 2015 and 2019**

Casualty Type	All Casualties (national rate)		All Casualties (impact area)	
	Number of casualties	%	Number of casualties	%
<b>Vulnerable Users</b>				
Pedestrians	115,618	13.6%	104	9.6%
Cyclists	90,076	10.6%	104	9.6%
Motorcyclists	90,299	10.6%	138	12.7%
Male drivers aged 16-25	92,917	10.9%	113	10.4%
<b>Vulnerable Groups</b>				
Under 16	89,837	10.5%	68	6.3%
People aged 70+	57,940	6.8%	88	8.1%
<b>Deprivation</b>				
Casualty from 20% Most deprived LSOAs in UK	169,499	19.0%	19	1.8%
Casualty from 20% Least deprived LSOAs in UK	107,643	12.0%	282	26.0%
<b>Total Casualties</b>	<b>850,132</b>	<b>100.0%</b>	<b>1086</b>	<b>100.00%</b>

**Table 3-5** illustrates that the percentage of casualties which occurred within the 20% most income deprived LSOAs is significantly lower than the national average (1.8% compared to 19.0%). In contrast, the percentage of casualties from the least deprived LSOAs is significantly higher than national average.

The proportions of casualties from motorcyclists and the elderly are slightly higher within the scheme area than across the whole of England. Pedestrians, cyclists and casualties involving young male drivers are broadly consistent with national casualty rate. The proportion of casualties that are under the age of 16 is lower in the scheme study area (6.3%) to the national figures (10.5%).

#### Step 2c: Identification of amenities in impact area

Melksham, directly to the west of the bypass, is home to a range of amenities serving its residents. Numerous retail facilities, schools and hospitals are likely to be amongst the most attractive destinations in the area and all lie within the vicinity of the affected road network meaning that access is likely to involve some use of the affected road network (see Appendix C).

### 3.2.3. Appraisal

The COBA-LT assessment showed an overall reduction in the number of collisions and resulting casualties as a result of the scheme. **Table 2-6** in the Social Impact Appraisal section of the report summarises the changes in the number of collisions and casualties and the resulting impact in costs.

**Table 3-6** below summarises the casualties that have been involved in accidents between 2015 and 2019 by vulnerable user type, age group and the overall deprivation quartile and have been calculated by the forecast change in accident rates (i.e., split by highway links forecast to experience benefits or disbenefits in accidents).

**Table 3-6 – Profile of existing casualties (2015 to 2019) across links with a forecast change in collision rate greater than 10%**

Casualty Type	Links with forecast >10% increase in collision rate (Disbenefit)		Links with forecast >10% decrease in collision rate (Benefit)	
	Number of casualties	%	Number of casualties	%
<b>Vulnerable User</b>				
Pedestrians	3	0.3%	25	2.1%
Cyclists	5	0.4%	21	1.8%
Motorcyclists	8	0.7%	32	2.7%
Male drivers aged 16-25 <sup>3</sup>	9	0.8%	28	2.4%
<b>Vulnerable Groups</b>				
People aged under 16	5	0.4%	14	1.2%
People aged 70+	3	0.3%	16	1.4%
<b>Deprivation</b>				
20% Most deprived LSOAs in UK	0	0.0%	4	0.3%
20% Least deprived LSOAs in UK	19	1.6%	28	2.4%
<b>Total casualties</b>	81	-	250	-

There are more accidents that have occurred on links that are forecast to experience a benefit from the scheme. On links predicted to have a decrease in accident rates, there is a higher percentage in all vulnerable user and user groups. The analysis found no casualties from the 20% most income deprived LSOAs which occurred on links with greater than 10% increase in accidents and 19 from the 20% least income deprived LSOAs. On links that are forecast to experience a benefit from the scheme, there were 4 casualties from the 20% most income deprived LSOAs and 28 from the 20% least income deprived.

#### Outcome and Qualitative Comment

The COBA-LT assessment shows an overall expected reduction of 247.4 accidents as a result of the scheme. A reduction in serious and slight casualties of 3.0 and 245.1, respectively, is also anticipated over the 60-year COBA-LT assessment period.

The analysis of road casualty and accident data has shown that of the affected network, the majority of roads experience a benefit in terms of accidents, as there are more links that will experience a decrease in accident rates ('benefit') than those experiencing an increase ('disbenefit'). Detailed analysis of existing accident data demonstrates that accidents involving the vulnerable groups are more likely to occur on links experiencing a decrease in accident rates as a result of the scheme. However, the proportion of accidents involving each user is small compared to the number of accidents across the impact area. Hence, any impact to accidents as a result of the scheme is not expected to be large.

There are below national average proportion of historical casualties involving income deprived residents across the collision impact area. Nonetheless, there is a greater prevalence of income deprived residents involved in casualties across links forecast to have a decrease in collision rate. Therefore, the collision impact for income deprived residents is considered slight beneficial. Likewise, the percentage difference in casualties between decreased and increased links across the impact area is less than 1% for children. Therefore, a slight beneficial impact to accidents for this children and younger people as a result of the scheme is also anticipated.

As shown in **Table 3-5**, there are slightly above national levels of motorcyclist and people aged 70+ casualties in the scheme impact area. In addition to this, the proportion of casualties that were involved in accidents which occurred within the 20% least deprived LSOAs nationally is significantly higher than the national casualty rates. The forecast change in accidents has shown that accidents involving motorcyclists and older people are all more likely to occur on links experiencing a decrease in accident rates as a result of the scheme. There were

less accidents that occurred on the least deprived 20% of LSOAs, though the majority of these are found on links expected to experience a decrease in accidents. As a result, the assessment for these vulnerable groups is considered moderate beneficial.

There is also a higher prevalence of pedestrian, young male drivers and cyclist casualties across links with a decrease in collision rate than on links with an increase in collision rate. In addition, as shown in **Table 3-5** casualties involving those users in the scheme impact area are broadly consistent with national casualty rate in terms historical collisions. Therefore, the assessment for these vulnerable groups is considered slight beneficial.

Since there are slight beneficial impacts for most vulnerable groups, the overall collision impact of the scheme is appraised as **slight beneficial**.

**Table 3-7 – Collision assessment by vulnerable group**

Group	Outcome
Pedestrians	Slight beneficial
Cyclists	Slight beneficial
Motorcyclists	Moderate beneficial
Young male drivers	Slight beneficial
Older people	Moderate beneficial
Children	Slight beneficial
Most income deprived residents	Slight beneficial
Least income deprived residents	Moderate beneficial
<b>Overall score</b>	<b>Slight beneficial</b>

Sensitivity tests undertaken as part of the assessment have shown that less conservative assumptions, such as those based on localised rates from existing A350 south as basis for the new bypass, predict significantly greater benefits in terms of accidents. Based on a reduction in fatal accidents and higher monetised benefits over the appraisal period, a **moderate beneficial** is anticipated under this scenario.

### 3.3. Air Quality

#### 3.3.1. Step 1 - Screening

##### Comments

There are no areas formally designated as Air Quality Management Areas (AQMA) in relation to the scheme's impact area. Roadside emissions for Nitrogen Dioxide (NO<sub>2</sub>) and PM<sub>10</sub> are both within Government's national air quality objective of 40 µgm-3. However, reduced traffic on the A350 would still provide the opportunity for air quality improvements within adjacent residential and commercial / retail areas.

Air quality poses a risk to health, for certain groups in particular children under 16. As a result, there is a need to examine the outputs from the air quality assessments to ascertain the distribution of impacts across income groups and children in the area.

##### Outcome

Continue to full DI appraisal.

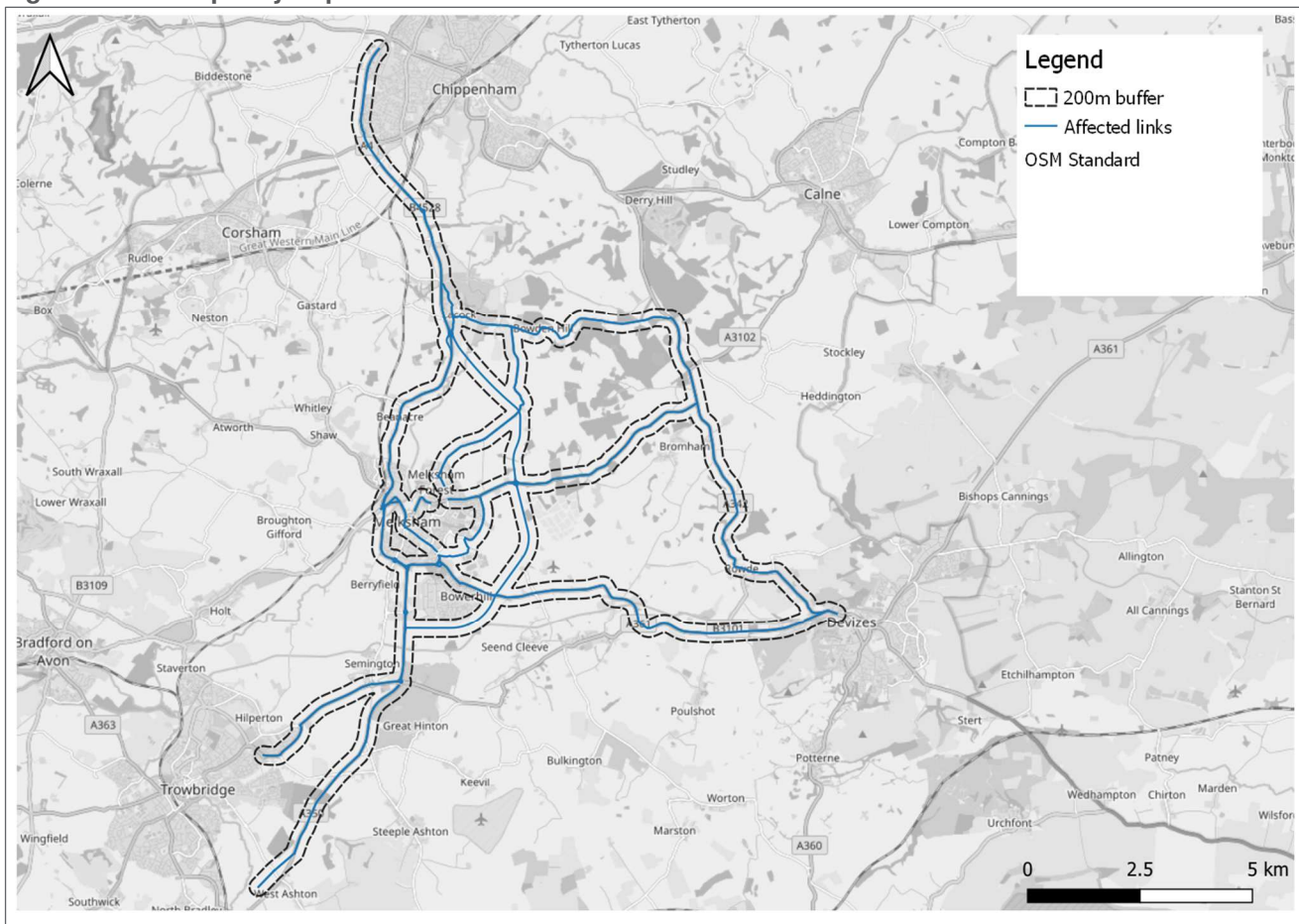
#### 3.3.2. Step 2 - Assessment

##### Step 2a. Confirmation of Impacted Area.

TAG Unit 4-2 states that the impact area should be defined through the air quality analysis, which should be undertaken in accordance with the requirements of TAG Unit A3. In this instance, the air quality impact area

includes all OAs/LSOAs within 200m of modelled receptors for the assessment of impacts to NO<sub>2</sub> and PM<sub>2.5</sub> concentrations, as shown in **Figure 3-2**.

**Figure 3-2 – Air quality impact area**



### Step 2b: Identification of Social Groups in Impact Area

Ambient air pollution can have significant adverse effects on public health. Long-term exposure to air pollution can cause chronic conditions such as cardiovascular and respiratory diseases. Children and infants are particularly vulnerable to the effects of poor air quality and therefore concentrations of children under 16 years of age and the locations of schools within the assessment area have been considered to assess the likely impacts on this group. In addition, the appraisal of air quality DIs also requires an examination of impacts across income deprivation in the area.

**Table 3-8** shows the proportions of each income quintile and children for the air quality impact areas in comparison to national values. There are above the English average proportions of residents with income quintiles 3, 4 and 5 (least deprived). In comparison to the national average, there is a slightly higher proportion of children in the air quality impact area.

**Table 3-8 – Vulnerable population concentrations nationally and in the air quality impact area**

Group	National Average	Impact Area
Quintile 1 (most deprived)	20.0%	2.3%
Quintile 2	20.0%	11.7%
Quintile 3	20.0%	24.0%
Quintile 4	20.0%	33.3%
Quintile 5 (least deprived)	20.0%	28.7%
Children (under 16)	19.1%	20.0%

**Step 2c: Identification of Amenities in Impact Area**

Within the air quality impact area there are 12 schools which may attract a higher level of children to the area. Any changes in air quality are likely to have a larger impact at these locations as children will spend time outside during breaks in the school day. Additionally, children, particularly young children, are more vulnerable to pollution as they are at a developmental stage of growth.

**3.3.3. Step 3 – Appraisal**

The DI appraisal for air quality identifies the winners and losers as a result of the implementation of the scheme and demonstrates the overall net disbenefit/benefit on the population within the impact assessment area. **Table 3-9** presents an examination of the distribution of the number of residents experiencing improvement, deterioration or no change in air quality compared to what may be expected based on the proportion of the populations within each income quintile.

**Table 3-9 – Change in annual PM<sub>2.5</sub> concentrations by income quintile**

	Income quintile					Total
	Most deprived	→			Least deprived	
	1	2	3	4	5	
No. of properties with improved air quality	0	480	2106	1716	574	4876
No. of properties with no change in air quality	147	121	970	536	5	1779
No. of properties with deteriorating air quality	0	130	451	1639	504	2724
No. of net winners/ losers	0	350	1655	77	70	-
Total number of winners/losers across all groups	2152					
Net winners/losers in each group as % of total	0.0%	16.3%	76.9%	3.6%	3.3%	0%
Share of total population in the impact area	2.3%	11.7%	24.0%	33.3%	28.7%	100%
<b>Assessment</b>	<b>Neutral</b>	<b>Moderate beneficial</b>	<b>Large beneficial</b>	<b>Slight beneficial</b>	<b>Slight beneficial</b>	

Within income quintile 1 there are 147 properties experiencing no change in PM<sub>2.5</sub> concentrations and 0

properties experiencing positive or negative impacts in air quality terms. As a result, the air quality assessment is considered neutral for this income group.

Positive impacts are experienced in air quality terms by the households in income quintile 2. Since this proportion of the benefit (16.3%) is in line (+/- 5%) with the proportion of group in the total (11.7%), it is appropriate to give a score of moderate beneficial for this income group. In contrast, within income quintile 3, there is a greater number of properties experiencing a decrease in PM<sub>2.5</sub> concentrations than an increase. As a result, there is a large beneficial air quality impact for this income group.

The least deprived quintile has a 28.7% share of the total population in the impact area, but only 3.3% of the 'net winners' in terms of reduced PM<sub>2.5</sub> concentration levels. In this case the proportion of net winners is significantly smaller than the proportion of the population as a whole, and it is appropriate to give a score of slight beneficial. This analysis is also applicable for residents in income quintile 4.

Finally, there are slightly above national average proportions of children within the air quality impact area. Within OAs with the 20% highest proportions of children nationally there are more receptors with decreased PM<sub>2.5</sub> concentrations or no change in PM<sub>2.5</sub> concentrations than with increased levels. Therefore, any impact to air quality for children residing in the area is expected to be broadly similar and hence, as a conservative approach, there is a moderate beneficial impact for children overall.

**Table 3-10 – Change in annual NO<sub>2</sub> concentrations by income quintile**

	Income quintile					Total
	Most deprived	→			Least deprived	
	1	2	3	4	5	
No. of properties with improved air quality	147	590	3058	2072	574	6441
No. of properties with no change in air quality	0	11	0	66	1	78
No. of properties with deteriorating air quality	0	130	469	1753	508	2860
No. of net winners/losers	147	460	2589	319	66	-
Total number of winners/losers across all groups	3581					
Net winners/losers in each group as % of total	4.1%	12.8%	72.3%	8.9%	1.8%	100.0%
Share of total population in the impact area	2.3%	11.7%	24.0%	33.3%	28.7%	100.0%
<b>Assessment</b>	<b>Moderate beneficial</b>	<b>Moderate beneficial</b>	<b>Large beneficial</b>	<b>Slight beneficial</b>	<b>Slight beneficial</b>	

Within income quintile 1 there are 147 more properties with decreased NO<sub>2</sub> concentrations. This represents a 4.1 % of net difference between receptors with increasing and decreasing NO<sub>2</sub> concentrations. Quintile 1 is then scored as moderate beneficial as the proportion of the population experiencing benefits is in line with the proportion of the population of the group overall (i.e., within +/-5%). Similarly, the proportion of 'net winners/losers' in the second most deprived quintile is in line with the proportion of the population of the group

overall (with a 11.7% share of the total population). It is therefore appropriate to give a score of moderate beneficial.

Within income quintile 3, there is a higher number of properties with improved air quality (NO<sub>2</sub> concentrations) than with a deterioration. As a result, quintile 3 is scored as large beneficial as the proportion of the population experiencing benefits within this quintile is greater than the proportion of the population of the group overall (and more than 5% greater).

Finally, for quintiles 4 and 5, the percentage of net winners is significantly smaller than the share of total population (33.3% and 28.7, respectively). Therefore, the impact on these income groups is considered as slight beneficial.

Finally, there are above national average proportions of children and 12 schools within the air quality impact area. Within OAs with the 20% highest proportions of children nationally there are more properties with decreased NO<sub>2</sub> concentrations than increased NO<sub>2</sub> concentrations. Therefore, any impact to air quality for children residing in the area is expected to be broadly similar and hence, as a conservative approach, there is a slight beneficial impact for children overall.

### Outcome and Qualitative comment

Overall, the A350 Melksham Bypass scheme has a positive effect in air quality terms. The impacts which occur are predominantly within income quintile 3, with a greater number of properties with decreased PM<sub>2.5</sub> and NO<sub>2</sub> concentrations. However, the scheme also results in positive net change in perceptible air quality for all the other income quintiles and children. In summary, there is a slight beneficial impact to air quality for children and for the most and least income deprived residents (quintiles 1, 4 and 5). In addition, moderate and large benefits are expected for quintiles 2 and 3. As a result, the overall impact to air quality is considered slight beneficial.

**Table 3-11 – Air quality assessment by income quintile**

Vulnerable Group	Outcome
Quintile 1 (most deprived)	Slight beneficial
Quintile 2	Moderate beneficial
Quintile 3	Large beneficial
Quintile 4	Slight beneficial
Quintile 5 (least deprived)	Slight beneficial
Children (under 16)	Slight beneficial
<b>Overall</b>	<b>Slight beneficial</b>

## 3.4. Noise

### 3.4.1. Step 1 – Screening

#### Comments

The scheme will support policy objectives around local regeneration and improved quality of life by reducing adverse impacts related to air quality and noise levels for residents along the current route. The route has been designed to minimise the number of properties potentially impacted.

Although the bypass aims to move the majority of traffic away from residential areas in central Melksham, changes in traffic flows indicate that there will be potential noise impacts. As a result, noise impacts will need to be further appraised to determine their effect on nearby residents.

#### Outcome

Continue to full DI appraisal.

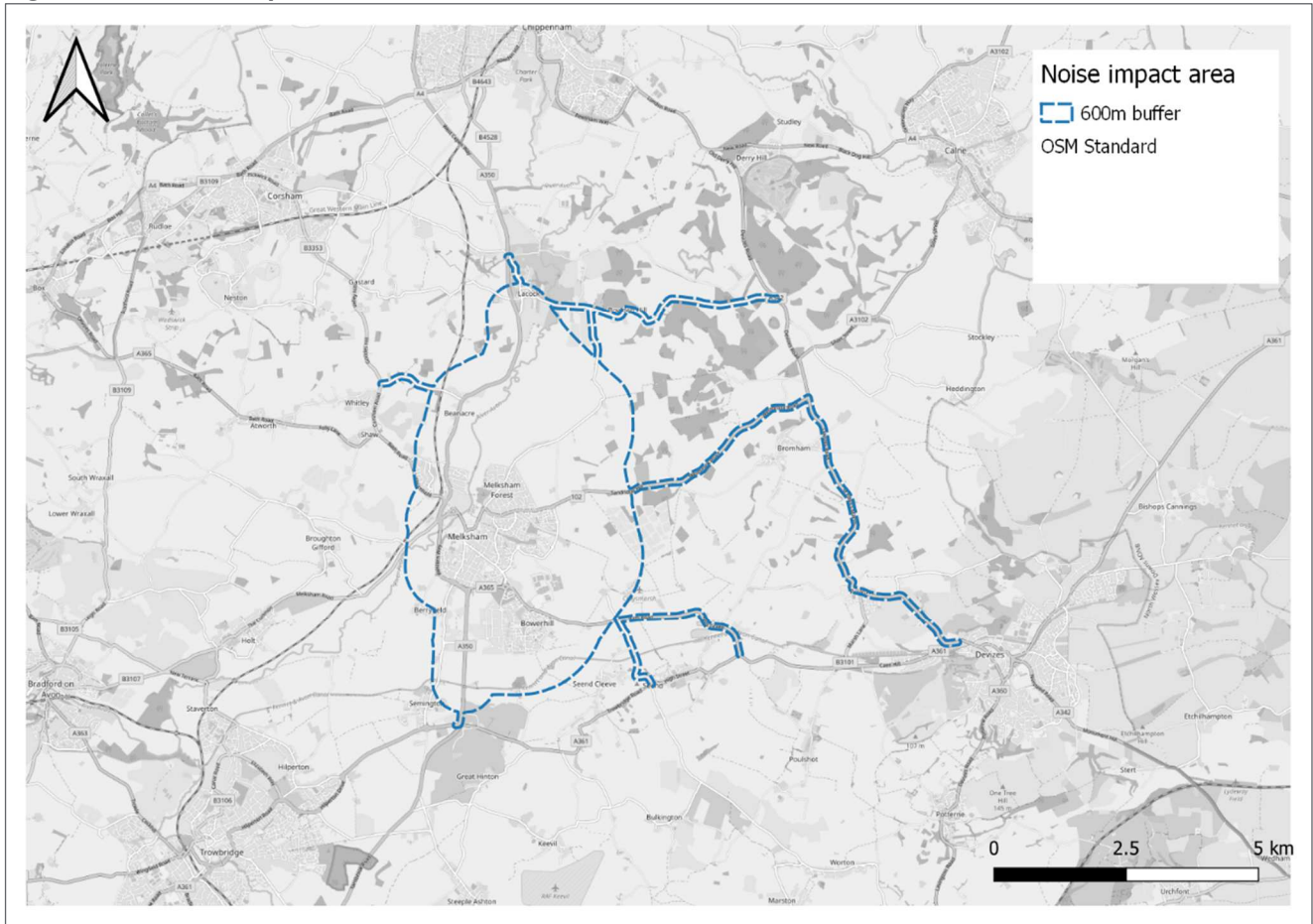


### 3.4.2. Step 2 – Assessment

#### Step 2a – Confirmation of impacted area

TAG Unit A4-2 outlines that noise impacts are likely to occur where an intervention results in changes to traffic flows or speeds, or where the physical gap between people and traffic is altered. LA111 Noise and Vibration defines the noise impact area as a 600m buffer of new road links or road links physically changed or bypassed by the project. The study area also considers the area within 50m of other road links with potential to experience a short-term basic noise level change of more than 1.0dB(A) as a result of the project. In this instance, the noise impact area is shown in **Figure 3-3**.

**Figure 3-3 – Noise impact area**



#### Step 2b – Identification of social groups in impact area

Children are particularly vulnerable to the effects of noise and therefore concentrations of under 16s and the location of schools within the assessment area have been considered. Similarly, the appraisal of noise also requires an examination of impacts to elderly people and across income deprivation in the area. **Table 3-12** shows the proportions of income deprived households for England and for children and elderly people over England and Wales as well as for the noise impact area.

Within the impact area, the proportion of income quintile 1 (20% most income deprived) is significantly lower when compared to the national average. Within the noise impact area, there are higher proportions of income quintile 3, 4 and 5. The proportion of children is in line with the national average while the proportion of elderly residents is above the average for England and Wales.

**Table 3-12 – Vulnerable population concentrations nationally and in the noise impact area**

Income Group	National Average	Impact Area
Quintile 1 (most deprived)	20.0%	3.3%
Quintile 2	20.0%	12.7%
Quintile 3	20.0%	30.5%
Quintile 4	20.0%	28.9%
Quintile 5 (least deprived)	20.0%	24.5%
Children (under 16)	19.1%	19.8%
Elderly (over 70)	13.5%	18.0%

**Step 2c: Identification of Amenities in Impact Area**

The desktop analysis identified 8 schools and no homes within the noise impact area which suggests the presence of children, but less elderly people in the area. There are also retail stores located around Melksham town centre, which may attract a range of people, including most vulnerable groups such as children and the elderly.

**3.4.3. Step 3 - Appraisal**

The DI appraisal has considered the likely population affected by significant changes in noise levels. In this instance a significant impact to noise is defined as a change in noise levels in excess of 1dB in the short term (2028 opening year). **Table 3-13** shows the number of properties with improved or worsened noise levels as a result of the scheme within each income quintile.

**Table 3-13 – Change in noise by income quintile**

	Income quintile					Total
	Most deprived	→			Least deprived	
	1	2	3	4	5	
No. of properties with increased noise levels	6	105	651	1957	7	2726
No. of properties with decreased noise	462	699	2505	1256	647	5569
No. of properties with no change	75	892	942	629	71	2609
No. of net winners/ losers	456	594	1854	-701	640	
Total number of winners/losers across all groups	2843					
Net winners/losers in each group as % of total	16%	20.9%	65.2%	-24.7%	22.5%	100.0%
Share of total population in the impact area	3.3%	12.7%	30.5%	28.9%	24.5%	-
<b>Assessment</b>	<b>Large beneficial</b>	<b>Large beneficial</b>	<b>Large beneficial</b>	<b>Moderate adverse</b>	<b>Moderate beneficial</b>	-

This shows that there are more receptors forecast to experience a decrease in noise levels than an increase. However, there is a significant number of receptors expected to experience no change in noise levels as a result of the bypass. In all the income quintiles except quintile 4, beneficial impacts are experienced by more households than negative noise impacts. The lowest income group (comprising areas with the worst income deprivation) is positively affected, with 16% of the net numbers experiencing an improvement (with a share of 3.3% of the total population). Likewise, income quintiles 2 and 3 are scored as large beneficial as the proportion of the population experiencing benefits within these quintiles is greater than the proportion of the population of the group overall (and more than 5% greater).

The 4th quintile is negatively impacted by the scheme, with 24.7% of net winners/losers in terms of reduced noise levels. As this proportion is in line with than the proportion of the population as a whole, it has been scored as moderate adverse. Finally, the least deprived quintile has a 24.5% share of the overall population and 22.5% of those who experience decreased noise levels. In this case the proportion of those experiencing a benefit is broadly in line with the proportion of the population of the group in the total population and it is appropriate to give a score of moderate beneficial.

There are slightly above national average proportions of children and 8 schools within the noise impact area. However, most of these schools are located around the centre of Melksham where noise levels are expected to decrease. Additionally, the highest concentrations of children nationally are located around the town centre. Therefore, there may be a moderate beneficial impact to noise for some children attending these schools.

The proportion of elderly people within the noise impact area is above the national average and there are OAs within the impact area with the 20% highest proportion of elderly residents nationally. These are located to the south and east of the impact area. Since there are more properties with decreased noise levels within areas with high proportions of elderly residents, an overall benefit to noise for elderly people is anticipated. The noise impact for this social group has therefore been appraised as moderate beneficial.

#### Outcome and Qualitative Comment

The DI assessment demonstrates whether the noise impacts as a result of the proposed scheme are distributed evenly and contextualises who the likely winners and losers are in terms of vulnerable groups. Overall, the A350 Melksham Bypass scheme has beneficial noise impacts. The most deprived areas, in income terms, experience high benefits in relation to share of the population. Moderate beneficial impacts are also anticipated for the least deprived residents. Noise levels are also predicted to decrease on areas with prevalence of children and the elderly by LSOA.

In contrast, the proportion of residents in income quintile 4 experiencing increased noise is broadly in line with the proportion of the population of the group in the total population and it is appropriate to give a score of moderate adverse.

In summary, there is a large to moderate beneficial noise impact for children, the elderly and for the most income deprived residents. In addition, moderate disbenefits are expected for quintile 4. As a result, the overall impact to noise is considered moderate beneficial.

**Table 3-14 – Noise assessment by income quintile**

Group	Outcome
Quintile 1 (most deprived)	Large beneficial
Quintile 2	Large beneficial
Quintile 3	Large beneficial
Quintile 4	Moderate adverse
Quintile 5 (least deprived)	Moderate beneficial
Children (under 16)	Moderate beneficial
Elderly (over 70)	Moderate beneficial
<b>Overall</b>	<b>Moderate beneficial</b>

## 3.5. Security

### 3.5.1. Step 1 – Screening

#### 3.5.1.1. Comments

Based on available information at this stage, a security assessment based on the design element was undertaken as part of the Social Impacts Appraisal (see Section 2.3).

There are no significant planned changes to public transport waiting/interchange services as part of the scheme. Changes to pedestrian or cyclist facilities along the route are not expected to have any material impact on security issues in the area.

As security is likely to be minimally affected as a result of the scheme, no further assessment of security distributional impacts is required.

#### 3.5.1.2. Outcome

No further appraisal needed.

## 3.6. Severance

### 3.6.1. Step 1 – Screening

#### Comments

As shown in the Social Impact Appraisal Section (Section 2.4), the scheme aims to 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. This is expected to have an overall positive impact on severance.

On the other hand, physical changes in road alignment and traffic re-assignment across the road network could have an adverse impact to severance as pedestrians may have to travel further to cross the road. The scheme will also result in a number of links on the road network experiencing an increase in traffic flows. This could also impact on severance in the area.

As a result, the impact of the scheme to severance will need to be examined further to assess the full impact. This information can then be used to identify scheme measures that will impact on severance levels in the local area.

#### Outcome

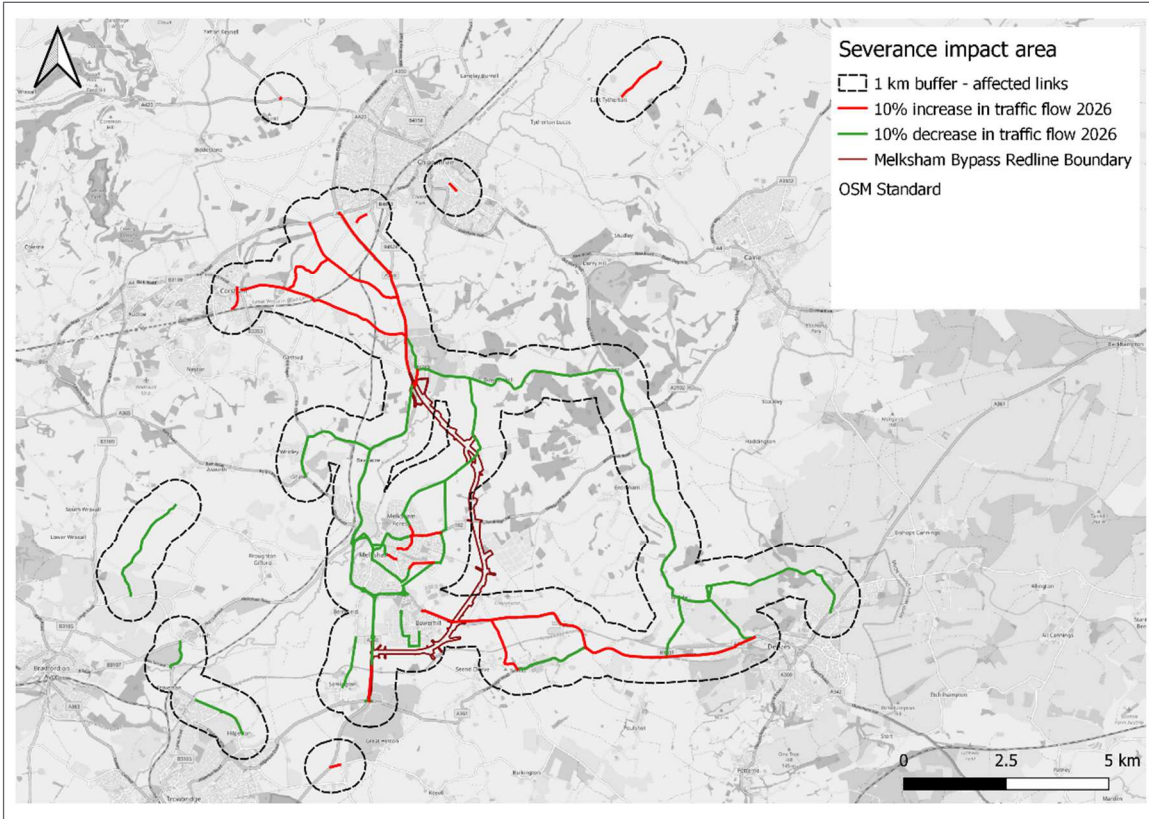
**Continue to full appraisal.** The impact on groups that are potentially vulnerable to the effects of severance will need to be examined for each package. Such groups include people without access to a car, older people, children and people with disabilities.

### 3.6.2. Step 2 – Assessment

#### Step 2a: Confirmation of Impacted Area

TAG Unit A4-2 recommends the impact area for severance to include any location with physical changes in road alignment or where links on the road network will experience significant changes (>10%) in traffic flows, speed or HGV content. Building on this recommendation, an impact area including all LSOAs within 1km of affected links was defined for undertaking the severance assessment, as shown in as shown in **Figure 3-4**. This assessment has been based on an examination of changes in traffic flow (24-hour AADT).

**Figure 3-4 – Severance impact area**



**Step 2b: Identification of Social Groups in Impact Area**

Certain groups are particularly vulnerable to the effects of severance, including no car households, older people, children and people with disabilities. Analysis has been undertaken to assess the proportions of these vulnerable groups within the scheme areas compared to the national average.

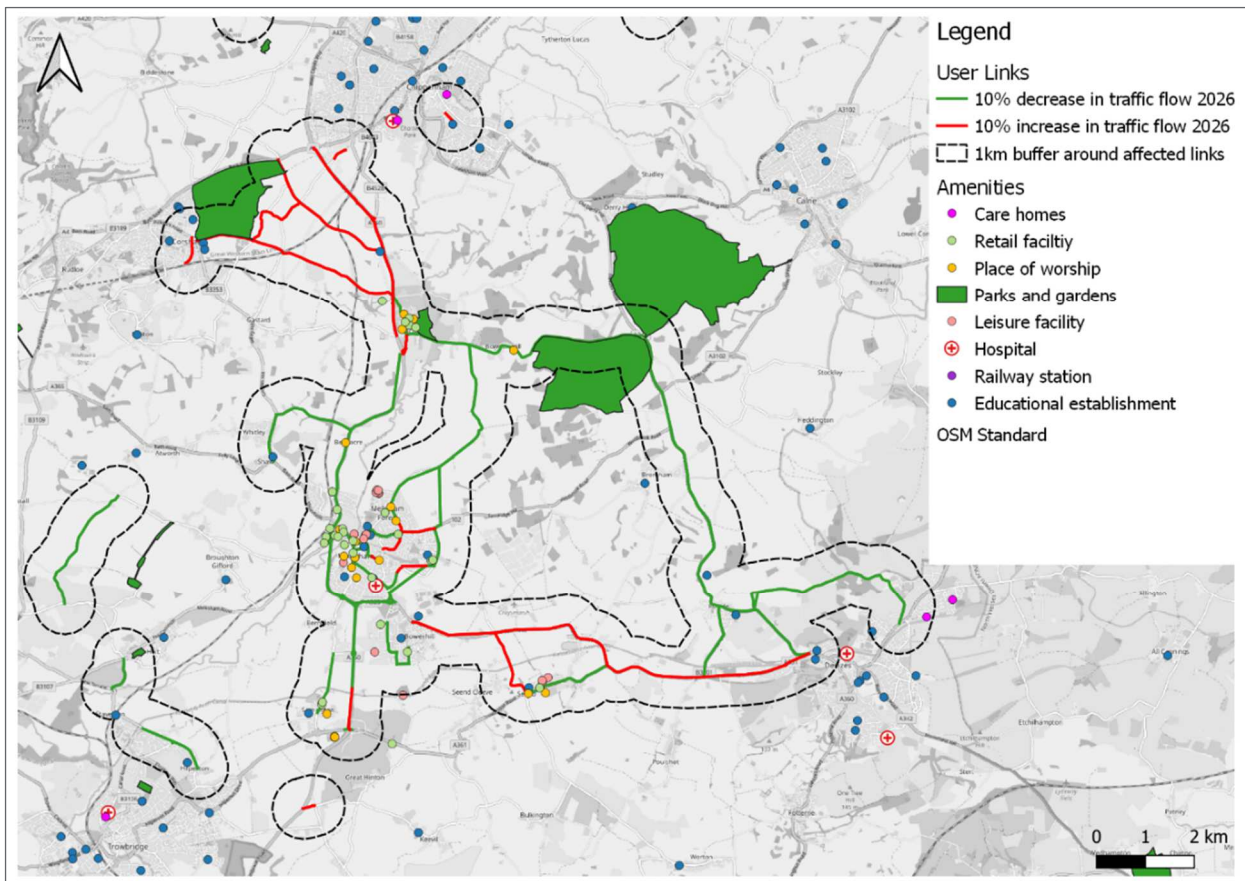
**Table 3-15** shows the proportions of vulnerable groups for England as well as the severance impact area. Within the study areas, there are below the national average proportions of children and households without access to car or van. The proportion of elderly residents and disability allowance claimants is higher compared to the average for England.

**Table 3-15 – Proportions of vulnerable groups within England and the severance impact area**

Vulnerable Group	England	Severance impact area
Children (aged under 16)	19.1%	18.6%
Older People (aged 70+)	13.5%	15.8%
Disability Living Allowance Claimants	2.9%	3.7%
Proportion of households without access to a car or van	26.1%	15.2%

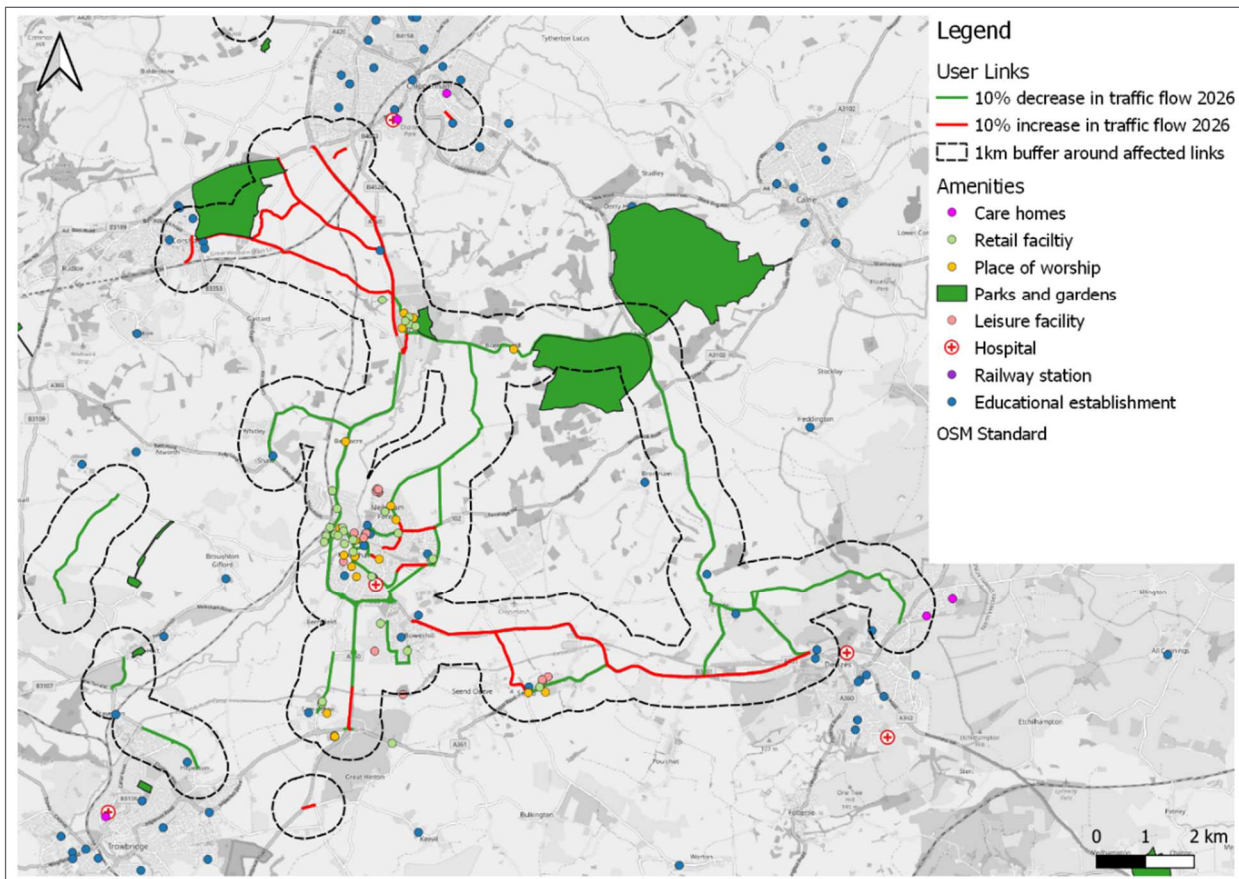
**Step 2c: Identification of Amenities in Impact Area**

Within the severance study area, there are a number of amenities which are likely to be used by vulnerable groups. There are 23 educational establishments, 1 hospital, 1 nursing home, 12 places of worship – see



below. Some of these amenities may suggest the presence of vulnerable groups such as elderly people and children.

Figure 3-5 – Location of amenities within the severance impact area



### 3.6.3. Step 3 – Appraisal

The scheme seeks to 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. At Melksham, the A350 serves multiple functions. It is not only the main north-south route through the town, but also the main east-west through route (between A365 Western Way and Bath Road). It also provides access to the town centre and retail developments along the A350 itself for local traffic. Traffic flows are high - approximately 35,000 vehicles daily (Annual Average Daily Flow). Heavy Goods Vehicles (HGVs) account for approximately 7% to 9% of traffic<sup>8</sup>. Based on survey data collected in 2017, approximately 40% of all traffic entering or leaving Melksham on the A350 via Beanacre is through-traffic, with the remaining 60% starting or ending its journey in Melksham. Of the 40% through-traffic, approximately 25% are north-south movements.

The scheme will pass through mostly rural areas, so it is unlikely that the increased traffic on the new route would affect access to amenities. As previously mentioned, a number of PRow (footpaths and bridleways) are likely to be severed by the potential scheme route. There is therefore an opportunity to provide high-quality crossing facilities. Where diversion is unavoidable, there is an opportunity for diversions to be as short as possible and cater to the desire line for users. For any connecting PRow there is an opportunity to change the status of footpaths to bridleways if the connecting facilities are of an appropriate designation. Therefore, the impact on severance is likely to be minimal.

As previously mentioned, the scheme also aims to 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. These would reduce severance for pedestrians and improve access to amenities in the vicinity.

<sup>8</sup> [A350 Melksham bypass - Wiltshire Council](#)

In order to conduct a more detailed analysis on the potential impacts of the scheme on specific groups who are vulnerable to severance (i.e., elderly, children, no car households and DLA claimants), road links with a significant change in AADT and the prevalence of vulnerable groups are presented **Figure 3-6** to **Figure 3-9**.

Figure 3-6 – Links with a change in traffic flow and the 20% highest proportions of Children as compared to the average in England

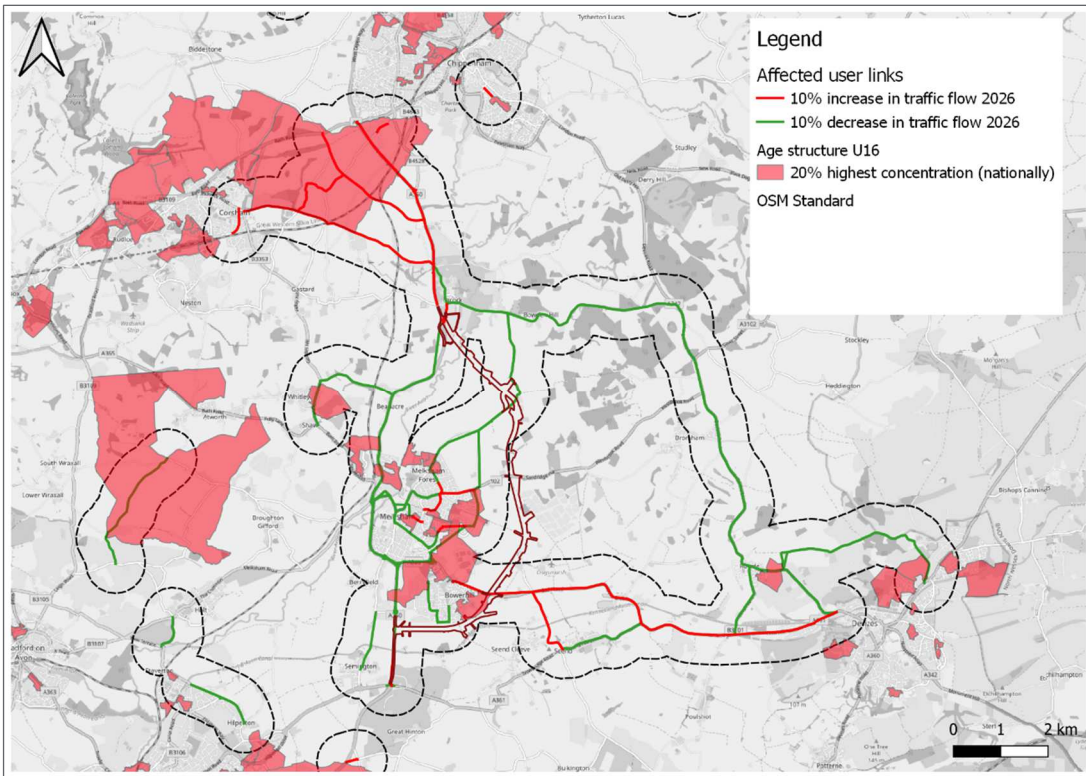


Figure 3-7 – Links with a change in traffic flow and 20% highest proportions of elderly population

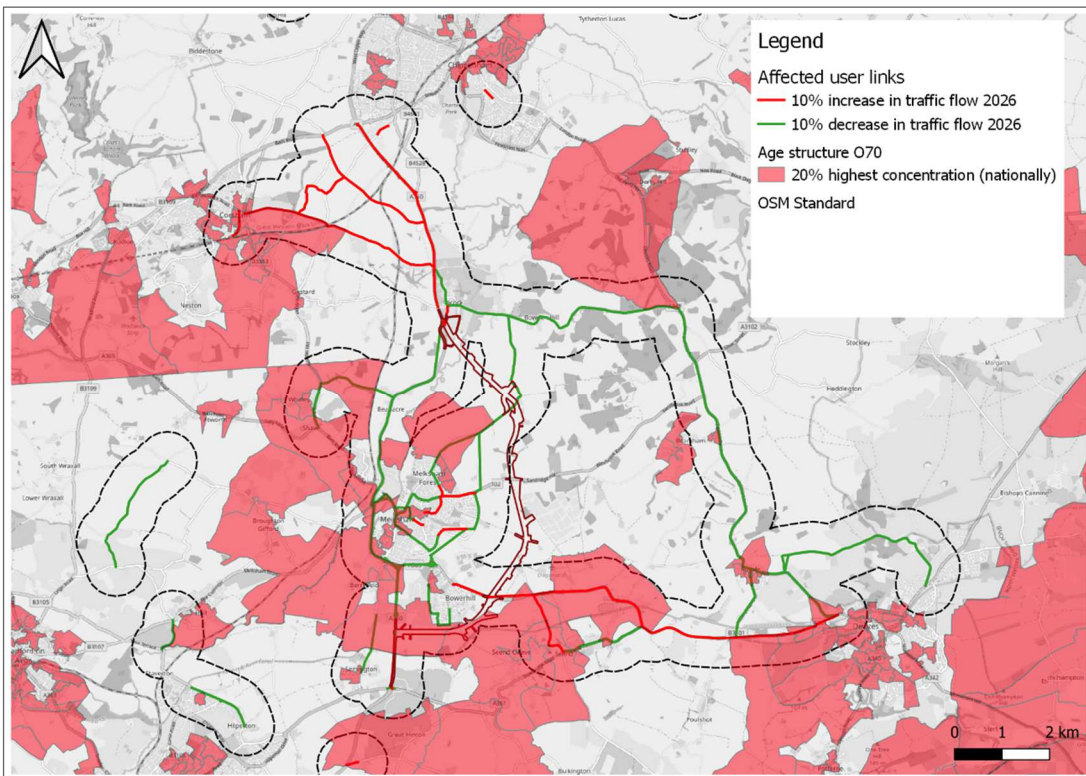




Figure 3-8 – Links with a change in traffic flow and 20% highest proportions of DLA claimants as compared to the average in England

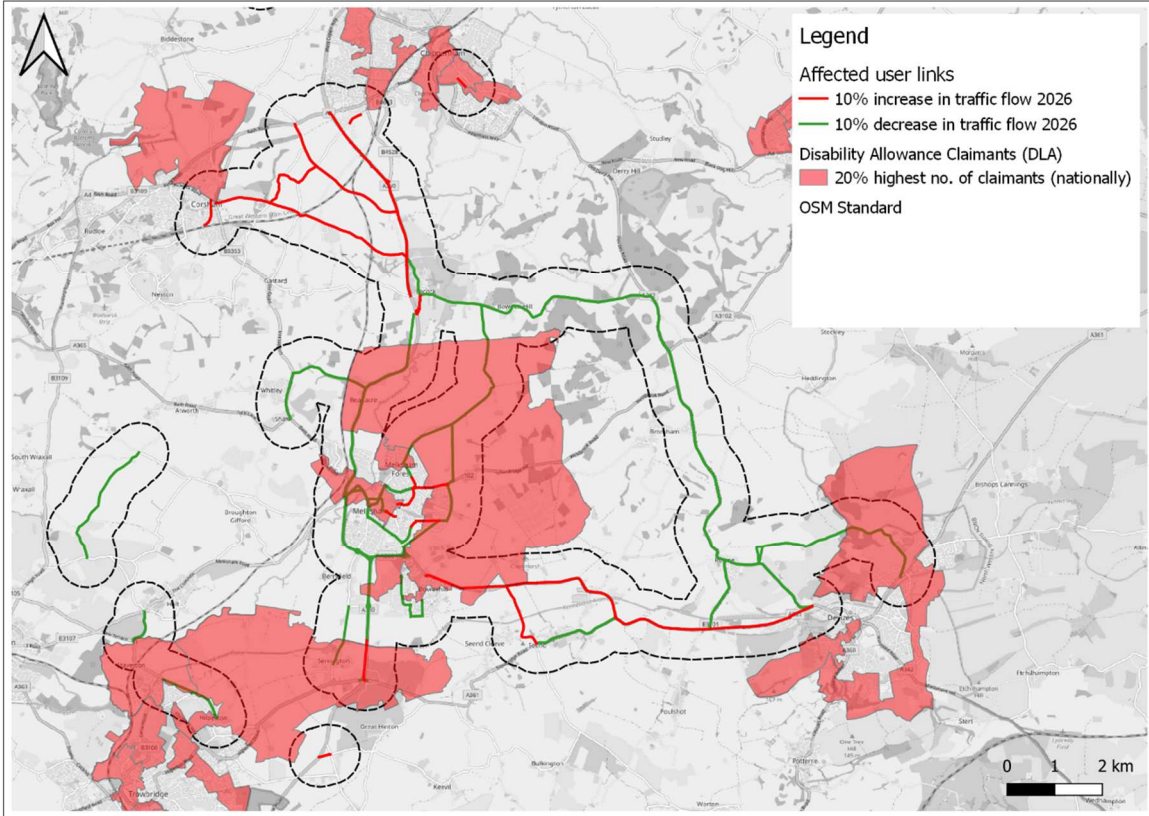
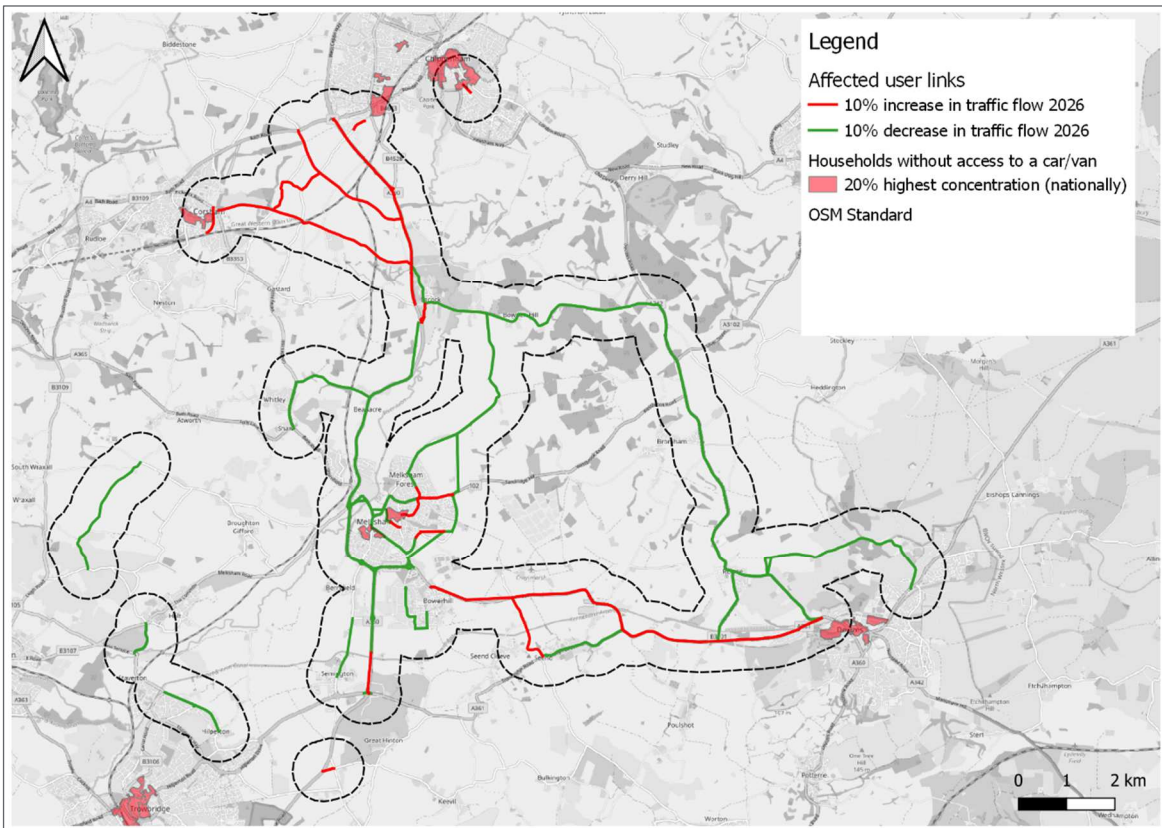
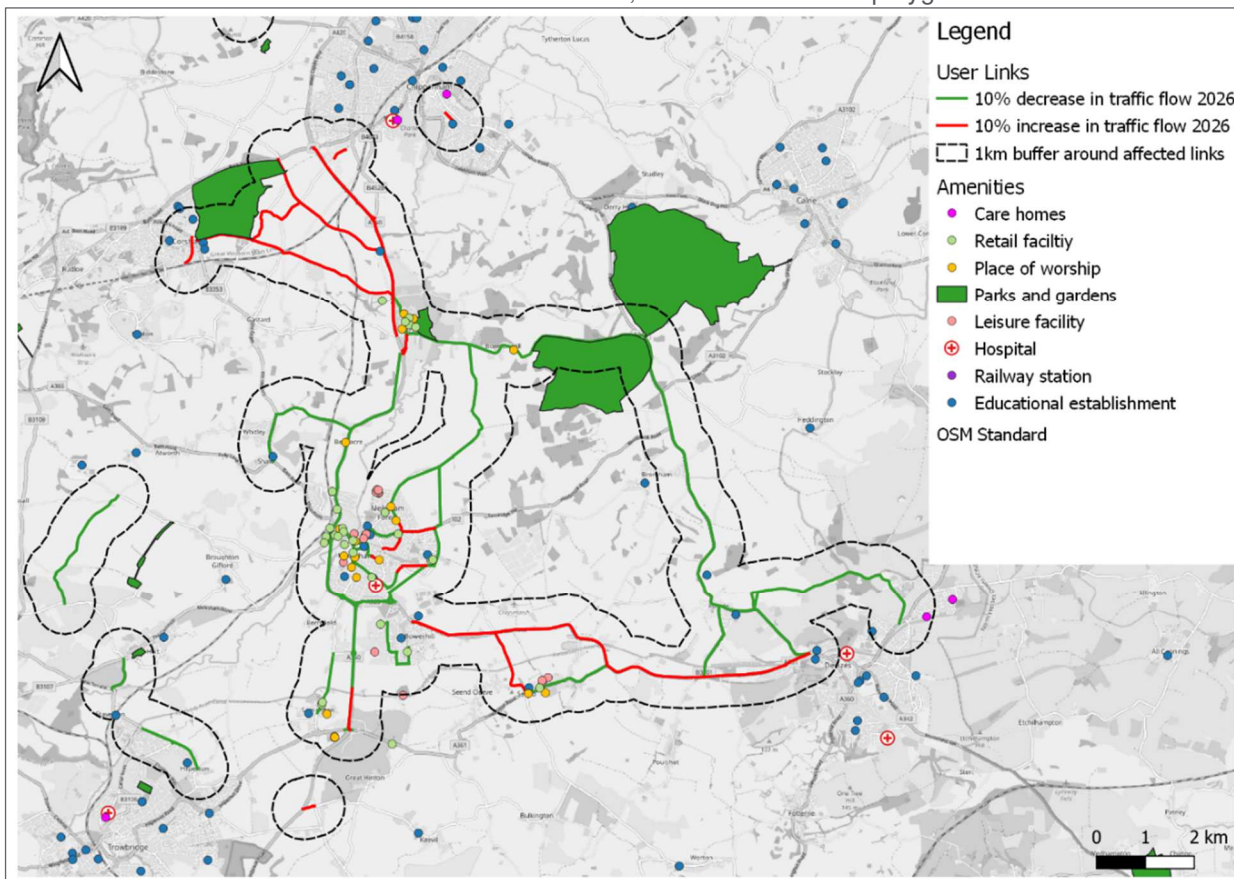


Figure 3-9 – Links with a change in traffic flow and 20% highest proportions of households with no access to a car/van as compared to the average in England



### Children

Children are considered to be vulnerable to severance as they are more likely to cross the road at dangerous crossing points and find it difficult to judge the speed of traffic, hence putting themselves at risk of road accidents. These groups often experience longer journey times or are often required to use pedestrian routes that are inappropriate and difficult to use. The scheme aims to reduce severance around the centre of Melksham by reducing traffic flow, and traffic speed. **Figure 3-6** shows that some of the highest concentrations of children are around the centre of Melksham, and user links in this area are forecasted to experience a decrease in traffic flow by a change greater than 10%. Additionally, children may wish to cross other routes with decreased traffic flow to access amenities in the area, such as schools or playgrounds.



shows that most educational establishments are located close to links with a decrease in traffic flow, consequently meaning that children will experience benefits in terms of severance. There will be a beneficial impact to severance for children wishing to cross these roads. On the other hand, user links to the north and south of the scheme area are forecasted to experience an increase in traffic flow, with an increase of 10% or greater. Therefore, high concentrations of children living in the north and south of the scheme area could experience negative impacts in terms of severance.

Overall, in areas with high concentration of children, there are more links that are forecast to have a decrease in traffic flow. Therefore, it is prudent to conclude that children will experience a **slight beneficial** impact in terms of severance. This analysis also takes into account that, as discussed in section 2.4, there are numerous complementary walking and cycling measures being introduced as part of the scheme (see **Figure 2-2**, **Figure 2-4** and **Figure 2-5**). These measures are likely to have a beneficial impact for children in terms of severance as pedestrian access will be provided to local amenities such as schools and playgrounds.

### Elderly

Similar to children, older people are considered vulnerable to changes in severance. As shown in **Figure 3-7**, there are areas with high proportions of elderly residents in the centre of Melksham and to the south of Melksham. In Melksham, there is a decreased traffic flow along the A350, A365, Spa Road and Beanacre Road. Elderly residents may wish to cross these roads to access local amenities such as retail stores in the town centre or healthcare facilities such as the Melksham Hospital. Therefore, a beneficial impact to severance is anticipated for elderly residents in Melksham. In addition, the analysis has shown that there is specific

provision for pedestrian and cycle connections within the town centre area and in relation to the rail station, then a relief of severance is expected.

However, there are also high proportions of elderly residents in areas to the south west of Melksham, along Bath Road (where the traffic flow is expected to increase). Within these areas there are no amenities which elderly residents may walk to. Therefore, increased traffic flows on these routes will have a minimal adverse impact on severance for elderly people in this area. The overall assessment for the elderly is likely to be **slight beneficial** as minimal increases in severance are broadly offset by a relief of severance as a result of decreased traffic flows.

#### Disabled residents

**Figure 3-8** shows that there are high concentrations of Disability Living Allowance (DLA) claimants in and around Melksham, where there are also links with a significant change in traffic flow as a result of the scheme. Although the majority of these routes are expected to experience a decrease in traffic flow, there are also some routes with increased flows (e.g., Bath Road in a south-easterly direction). Since there are more roads that are forecast to have a decrease in traffic flow than an increase in areas where there are high proportions of DLA claimants, a beneficial impact is expected. Furthermore, complimentary footways are being introduced as part of the scheme (see **Figure 2-2** **Figure 2-4** and **Figure 2-5**). This is especially significant for roads in the vicinity of the town centre where traffic is forecast to increase, however there are provisions for footways around the town centre to ensure safe crossing for pedestrians. The latter will offset the negative impacts of increased traffic on severance, and consequently the overall impact of severance on DLA claimants is considered to be **slight beneficial**.

#### No car households

There are very small proportions of no car households where there is also a change in traffic flow caused by the scheme – see **Figure 3-9**. Additionally, concentrations of this group tend to be located along links where a decrease in traffic flow can be seen. Households without access to a car are more likely to walk to access amenities and therefore be impacted by changes to severance. In areas with high proportions of no car households there are more links with decreased traffic flows. Since pedestrians may perceive that it is easier to cross a road with a lower traffic flow, there will be a **slight beneficial** impact to severance for no car households overall.

#### Outcome

The main area expected to benefit from a reduction in severance is around Melksham and Beanacre, on the A350 and A365 where there are relatively high concentrations of older people, children, and disability living allowance claimants, as well as amenities likely to attract these groups such as schools and hospitals. Elsewhere to the north and southwest of the scheme area, there are high concentrations of older people and children who receive both benefit and dis-benefits as a result of changes to severance due to the scheme.

The overall severance assessment is therefore considered to be **slight beneficial**.

**Table 3-16 – Severance assessment for vulnerable groups**

Vulnerable Group	Assessment
Children (aged under 16)	Slight beneficial
Older People (aged 70+)	Slight beneficial
Disability Living Allowance Claimants	Slight beneficial
Proportion of households without access to a car or van	Slight beneficial
<b>Overall</b>	<b>Slight beneficial</b>

## 3.7. User Benefits

### 3.7.1. Step 1 – Screening

#### Comments

Currently, journey time is negatively impacted by high levels of congestion experienced on the A350, particularly at peak hours. The new bypass is intended to improve traffic flows between origins and destinations. As journey times will be reduced, local residents will also benefit. The longer distance on the bypass may negatively impact vehicle costs, but this is likely to be outweighed by the positive time cost impacts.

#### Outcome

Continue to full DI Appraisal. The distribution of user benefits across different income groups will need to be examined in further detail

### 3.7.2. Step 2 – Assessment

#### Step 2a: Confirmation of Impacted Area

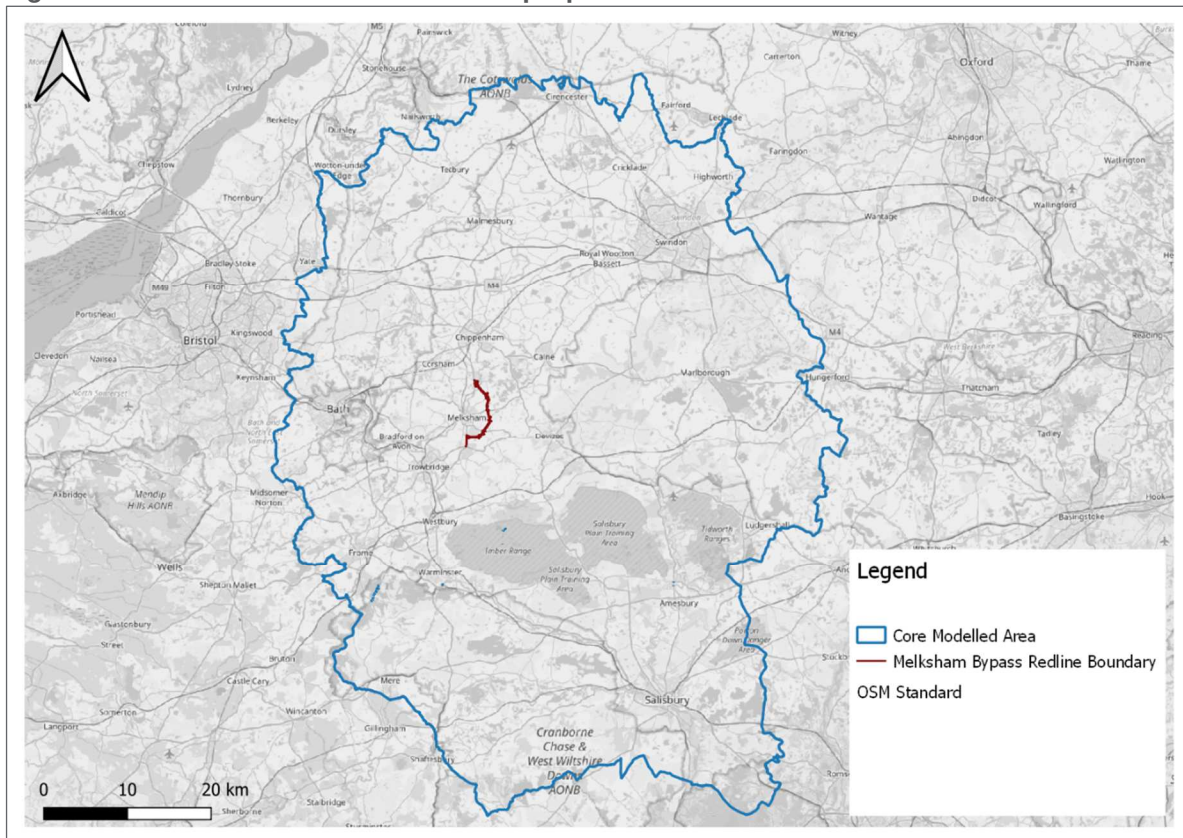
The assessment area for user benefits is defined as the Area of Detailed Modelling from the transport model – see **Figure 3-10**. The user benefits assessment considers the change in the cost of travel (including time and financial base costs) for users of the transport network, both for cars and for public transport. The user benefit DI appraisal has been undertaken using a sub-set of the main TUBA outputs and follows TAG Unit 4.2<sup>9</sup>. TUBA user benefits analysed for the purposes of the DI appraisal are based on the following:

- Home based trips (using AM origins as home location and PM destinations as home location);
- Home based trips calculated using 'commuting and other' trips (i.e., excluding business travel);
- Only internal to internal trips within the impact assessment area; and
- 60-year appraisal period.

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<sup>9</sup> For these reasons the user benefits considered for the purposes of the DI appraisal are not directly comparable to those within the main economic appraisal.

Figure 3-10 – Core Modelled Area for the purposes of the DI assessment



### Step 2b: Identification of Social Groups in Impact Area

In the case of User Benefits, it is necessary to understand the income distribution of users within the scheme area. This has been undertaken by mapping variations in income deprivation using data from the Indices of Deprivation (IoD 2010) Income Domain at Super Output Area level, according to their national rank.

**Table 3-17** shows that within the impact area, the proportion of residents within the most deprived income quintile is significantly below the national average. The proportion of residents in quintiles 2 and 3 is also below the national average whereas the proportion of residents in quintiles 4 and 5 is above the national average.

**Table 3-17 – Proportions of income groups within the user benefits impact area**

Income Group	England	Impact Area
Quintile 1 (most deprived)	20%	7.1%
Quintile 2	20%	11.8%
Quintile 3	20%	17.5%
Quintile 4	20%	32.3%
Quintile 5 (least deprived)	20%	31.3%

### Step 2c: Identification of Social Groups in Impact Area

Identification of amenities for the user benefits DI appraisal is not required according to the TAG guidance.

## 3.7.3. Step 3 – Appraisal

**Table 3-18** compares the relative proportion of benefits and disbenefits against the proportion of the population in each income quintile. A final assessment per quintile has been made based on the table system for grading of transport user benefits DIs set out in TAG Unit 4-2.

**Table 3-18 – Overall user benefits for commuters and other non-business trips across income quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Total population	61,248	102,841	151,913	280,521	271,860	868,383
Proportion of each group	7.1%	11.8%	17.5%	32.3%	31.3%	-
Total benefits	£206,582	£373,475	£510,375	£1,189,288	£1,021,648	£3,301,368
Distribution of benefits	6.3%	11.3%	15.5%	36.0%	30.9%	-
Sum of disbenefits	-	-	-	-	-	-
Distribution of disbenefits	-	-	-	-	-	-
Overall	£206,582	£373,475	£510,375	£1,189,288	£1,021,648	£3,301,368
<b>Assessment</b>	<b>Moderate Beneficial</b>	<b>Moderate Beneficial</b>	<b>Moderate Beneficial</b>	<b>Moderate Beneficial</b>	<b>Moderate Beneficial</b>	<b>Moderate Beneficial</b>

There is a beneficial impact in relation to user benefits for each income group as a result of the scheme. Specifically, the user benefits accrued are weighted more towards the least vulnerable income quintile 4 and 5. However, all income quintiles are scored as moderate beneficial as the proportion of benefits experienced in these quintiles is in line with the proportion of these groups represented in the impact area. There is no disbenefits across all income quintiles.

Following the assessment, it can be concluded that the overall user benefits DI appraisal is considered to be **moderate beneficial**, as all quintiles receive net benefits, and those in lower income quintiles are not disproportionately negatively impacted.

### 3.7.4. Outcome

The overall net user benefits considered in the DI appraisal are approximately £3.3 million over the 60-year appraisal period. Benefits relate to both travel time and cost. All income quintiles experience net user benefits overall. Since there are beneficial impacts for all income quintiles and a moderate beneficial impact for the most income deprived residents (income quintiles 1 and 2), there is an overall moderate beneficial impact in relation to user benefits for the A350 Melksham Bypass scheme.

**Table 3-19 – Outcome of the user benefit assessment**

Vulnerable Group	User Benefits Assessment
Quintile 1 (most deprived)	Moderate beneficial
Quintile 2	Moderate beneficial
Quintile 3	Moderate beneficial
Quintile 4	Moderate beneficial
Quintile 5 (least deprived)	Moderate beneficial
<b>Overall</b>	<b>Moderate beneficial</b>

## 3.8. Personal affordability

### 3.8.1. Step 1: Screening

#### Comments

The main affordability impact of the scheme relates to changes in vehicle operating costs (fuel and non-fuel costs). Public transport costs, parking charges, and toll charges are not considered to be of significance. The provision of the new bypass is expected to reduce congestion, which could be associated with improved fuel efficiency, and hence a reduction in vehicle operating costs. However, increased distances travelled and increased vehicle speeds could lead to higher vehicle operating costs. Hence, the affordability impact of the scheme will need to be examined.

TUBA outputs by themselves do not show whether these costs are distributed evenly across income groups. As a result, a further analysis should be completed to quantify the potential distribution of affordability impacts amongst different income groups.

#### Outcome

**Continue to full DI Appraisal.** The distribution of affordability impacts across different income groups will need to be examined in further detail.

### 3.8.2. Step 2: Assessment

#### Step 2a: Confirmation of Impacted Area

**Figure 3-10** in the User Benefits section above illustrates the Area of Detailed Modelling (AoDM), which is also the impact area for affordability.

Similar to user benefits, the analysis has been completed for home-based commuting and other non-business trips. The distribution of benefits across different income quintiles (at postcode level) has been analysed, focusing on all trips with a trip originating within the AoDM (i.e., internal trips and internal-external trips).

#### Step 2b: Identification of Social Groups in Impact Area

**Table 3-20** – Proportions of income groups within the affordability impact area shows that within the impact area, the proportion of residents within the most deprived income quintiles (1 and 2) is significantly below the national average. The proportion of residents in least deprived income quintiles is above the national average.

**Table 3-20 – Proportions of income groups within the affordability impact area**

Group	England	Impact Area
Quintile 1 (most deprived)	20%	7.1%
Quintile 2	20%	11.8%
Quintile 3	20%	17.5%
Quintile 4	20%	32.3%
Quintile 5 (least deprived)	20%	31.3%

#### Step 2c: Identification of Social Groups in Impact Area

Identification of amenities for the affordability DI appraisal is not required according to the TAG guidance.

### 3.8.3. Step 3: Appraisal

The analysis for personal affordability mirrors the approach to the user benefit DI appraisal. It therefore uses the same TUBA outputs (see section 3.7.2), but considers the vehicle operating costs (fuel and non-fuel) only.

**Table 3-21** compares the relative proportion of benefits and disbenefits against the proportion of the population in each income quintile. A final assessment per quintile has been made based on the table system for grading of personal affordability DIs set out in TAG Unit 4-2.

**Table 3-21 – Affordability impacts for commuter and other non-business trips across all income quintiles**

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Total population	61,248	102,841	151,913	280,521	271,860	868,383
Proportion of each group	7.1%	11.8%	17.5%	32.3%	31.3%	-
Sum of benefits	-	-	-	-	-	£0
Distribution of benefits	-	-	-	-	-	-
Sum of disbenefits	-£60,960	-£98,609	-£113,866	-£268,257	-£233,916	-£775,608
Distribution of disbenefits	7.9%	12.7%	14.7%	34.6%	30.2%	-
Overall	-£60,960	-£98,609	-£113,866	-£268,257	-£233,916	-£775,608
<b>Assessment</b>	<b>Moderate Adverse</b>	<b>Moderate Adverse</b>	<b>Moderate Adverse</b>	<b>Moderate Adverse</b>	<b>Moderate Adverse</b>	<b>Moderate Adverse</b>

The overall net affordability disbenefit considered in the DI appraisal is -£775,608 over the 60 year appraisal period. As shown in **Table 3-21**, disbenefits are evenly distributed across all income quintiles. All income quintiles are scored as moderate adverse as the proportion of disbenefits experienced in these quintiles is in line with the proportion of these groups represented in the impact area.

#### 3.8.4. Outcome

As there are net disbenefits for all five quintiles, the overall impact on affordability is appraised as adverse. The most deprived quintiles (1 and 2), which are considered to be the most vulnerable in terms of any affordability impacts, do not receive a high proportion of disbenefits. The overall DI appraisal of affordability has been assessed as **Moderate Adverse**.

**Table 3-22 – Outcome of the affordability assessment**

Vulnerable Group	Affordability Assessment
Quintile 1 (most deprived)	Moderate adverse
Quintile 2	Moderate adverse
Quintile 3	Moderate adverse
Quintile 4	Moderate adverse
Quintile 5 (least deprived)	Moderate adverse
<b>Overall</b>	<b>Moderate Adverse</b>



## 3.9. Accessibility

### 3.9.1. Step 1 – Screening

#### Comments

TAG Unit 4-2 states that the appraisal of accessibility focuses on the public transport accessibility aspect of accessing employment, services and social networks. As the A350 Melksham Bypass is not a public transport scheme, accessibility is likely to be minimally affected. As a result, no further assessment of accessibility distributional impacts is required.

It should be noted that based on available information at this stage, a high-level accessibility assessment was undertaken as part of the Social Impact Appraisal (see Section 2.7).

#### Outcome

No further appraisal needed.

## 4. Summary of findings

This report details the findings of the Social and Distributional Impact (SDI) Appraisal undertaken for the A350 Melksham Bypass Scheme. An assessment of the social impacts is presented in accordance with the Department for Transport's Transport Analysis Guidance (TAG) Unit A4-1 'Social Impact Appraisal' (May 2020). The analysis of Distributional Impacts (DIs) was undertaken in accordance with the Department for Transport's Transport Analysis Guidance (TAG) Unit A4-2 'Distributional Impact Appraisal' (May 2020).

Using an approach which is appropriate to the size of scheme and the effort required to collect and develop bespoke data, a qualitative approach was deemed suitable for most social indicators, although a quantitative assessment was undertaken where evidence was available. A summary of findings for the Social Impact Appraisal (**Table 4-1**) is outlined below.

**Table 4-1 – Summary of findings from the Social Impact Appraisal**

Social Impact Appraisal indicators	Assessment
Accidents	Slight beneficial
Physical Activity	Slight beneficial
Security	Neutral
Severance	Slight beneficial
Journey Quality	Moderate beneficial
Option Values and Non-use Values	No assessment required
Accessibility	Neutral
Personal Affordability	Slight adverse

**Table 4-2** presents a summary of the Distributional Impact Appraisal for inclusion in the Appraisal Summary Table. This provides a final assessment for each indicator as a result of the scheme. The variance of impacts across quintiles of income deprivation is shown in **Table 4-3**. Finally, **Table 4-4** provides a summary of the impact of each indicator on vulnerable groups.

**Table 4-2 – Summary of findings from the Distributional Impact Appraisal**

Distributional Impact Appraisal indicators	Assessment
Collisions	Slight beneficial
Noise	Moderate beneficial
Air Quality	Slight beneficial
Security	No assessment required
Severance	Slight beneficial
Accessibility	No assessment required
User Benefits	Moderate beneficial
Personal Affordability	Moderate adverse

**Table 4-3 – Distribution of impacts across income quintiles**

	0-20%	20-40%	40-60%	60-80%	80-100%	Are impacts distributed evenly?	Key Impacts/ Qualitative comments
<b>User benefits</b>	Moderate beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Yes	User benefits impacts are appraised as moderate beneficial for all of the income deprivation quintiles and therefore the impact is distributed evenly.
<b>Noise</b>	Large beneficial	Large beneficial	Large beneficial	Moderate beneficial	Moderate beneficial	No	Noise impacts favour most deprived income quintiles. Residents in the least income quintiles experience moderate beneficial impacts. Therefore, the impact is distributed relatively unevenly.
<b>Air quality</b>	Slight beneficial	Moderate beneficial	Large beneficial	Slight beneficial	Slight beneficial	No	Air quality impacts mostly favour residents in income quintiles 2 and 3. Those in the most deprived income quintile (quintile 1) that may be considered to be the most vulnerable experience a lower proportion of air quality benefits than may be expected from an even distribution.
<b>Affordability</b>	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse	Moderate adverse	Yes	Affordability impacts are appraised as moderate adverse for all of the income deprivation quintiles and therefore although the impact is adverse the impact is distributed evenly

**Table 4-4 – Distribution of impacts across social and user groups**

Impact	Social groups					User groups				Qualitative statement (including any impact on residential population and identified amenities)
	Children and young people	Older people	Women	Disabled	BME	Pedestrians	Cyclists	Motorcyclists	Young males	
<b>Accidents</b>	✓	✓✓				✓	✓	✓✓	✓	The analysis has shown that the majority of roads experience a benefit in terms of accidents, as there are more links that will experience a decrease in accident rates ('benefit') than those experiencing an increase ('disbenefit'). Detailed analysis of existing accident data demonstrates that accidents involving the vulnerable groups are more likely to occur on links experiencing a decrease in accident rates as a result of the scheme.
<b>Noise</b>	✓✓	✓✓								Since there are more properties with decreased noise levels within areas with high proportions of elderly residents and children, an overall moderate benefit to noise is anticipated for these social groups.
<b>Air quality</b>	✓									A slight beneficial assessment was outlined for air quality for children as there are more receptors with decreased PM2.5 and NO2 than with increased levels in areas with the 20% highest proportions of children,
<b>Security</b>										Security was screened out, therefore a full appraisal was not carried out.
<b>Severance</b>	✓	✓		✓						Children, older people and people with a disability were appraised as having a slight beneficial impact in terms of severance due to improvements as a result of complimentary walking and cycling measures around Melksham and the bypass. In addition, the reduction of traffic on local roads is expected to reduce severance for non-motorised users and vulnerable groups.
<b>Accessibility</b>										Security was screened out, therefore a full appraisal was not carried out

✓ Slight beneficial, ✓✓ moderate beneficial, ✓✓✓ large beneficial,

# Appendices



# Appendix A. Socio-demographic assessment figures

This appendix provides a socio-demographic profile of a 1km buffer around the scheme alignment, with maps illustrating specific areas of higher proportions of vulnerable groups, including income deprivation, the elderly (over 70 years old), children (under 16 years old), people with a disability, BAME communities, females, and no car households.

The results of this analysis form the basis for the completion of Step 2b of the DI assessment.

**Figure A-1 – Proportion of Income Deprivation – Census 2011**

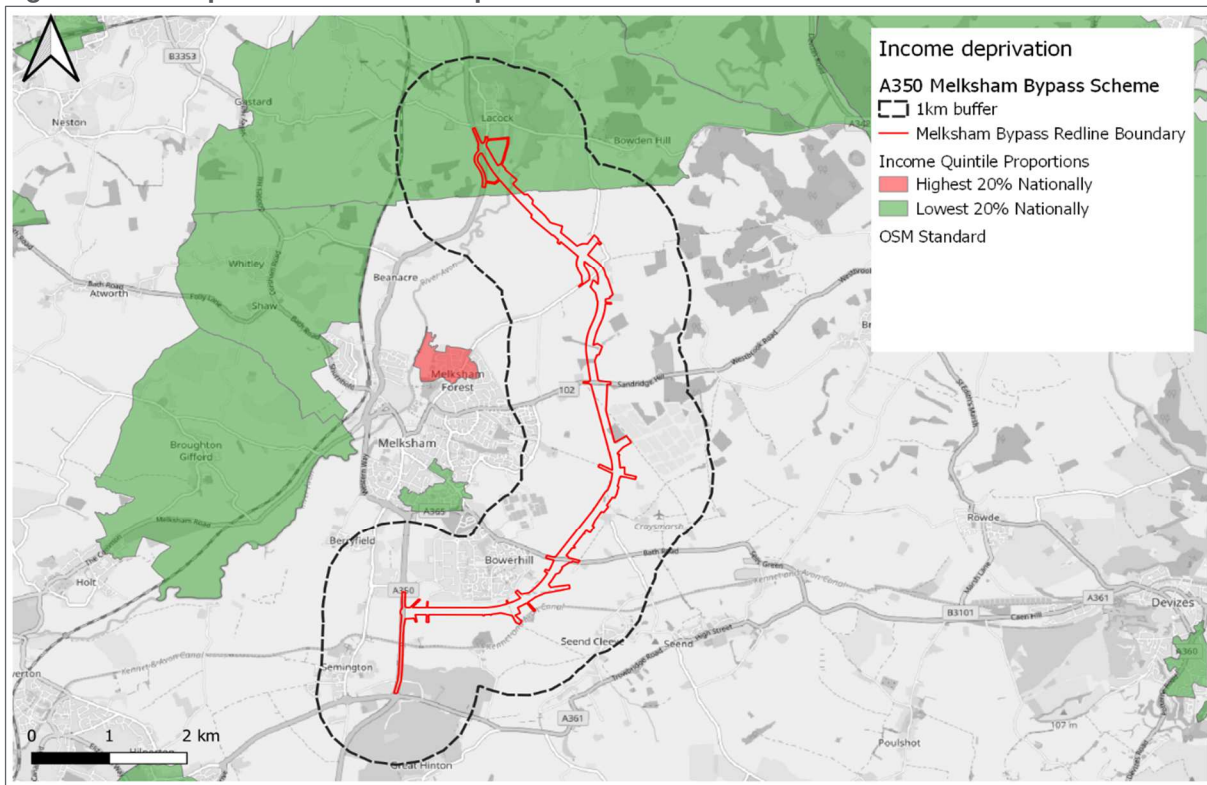


Figure A-2 – Proportion of Older People (aged over 70) – Census 2011

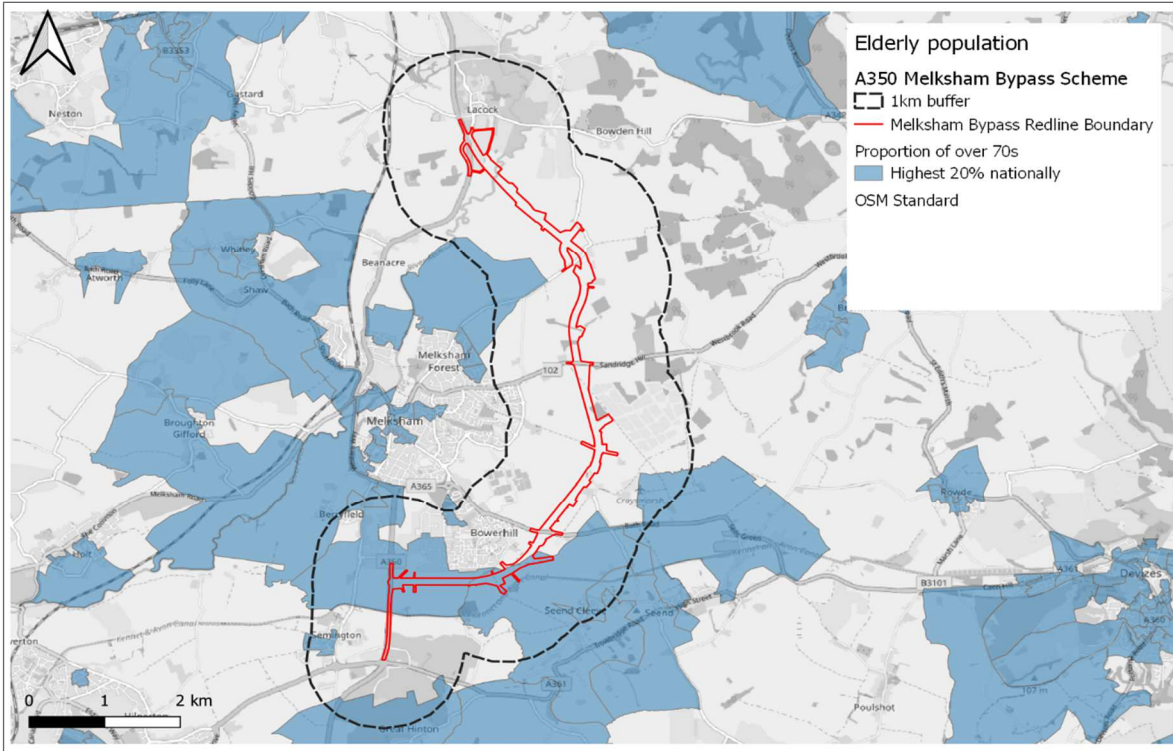
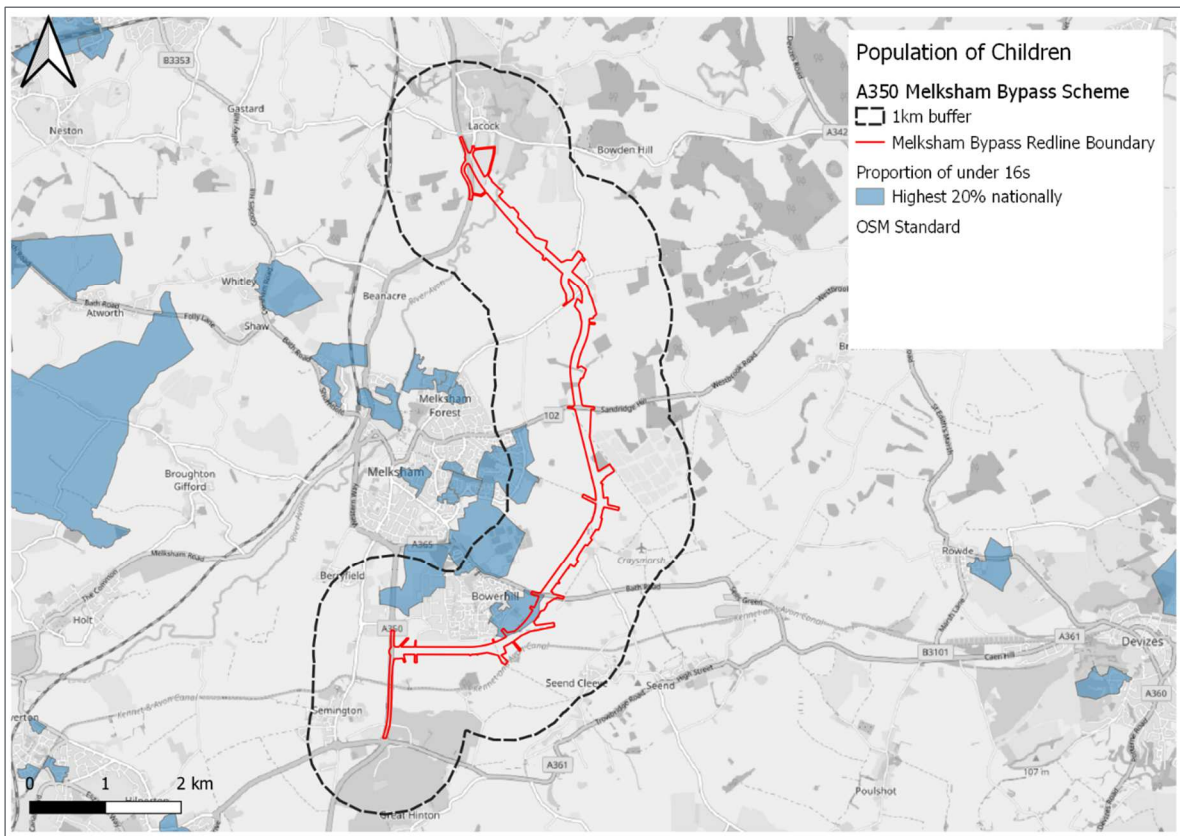
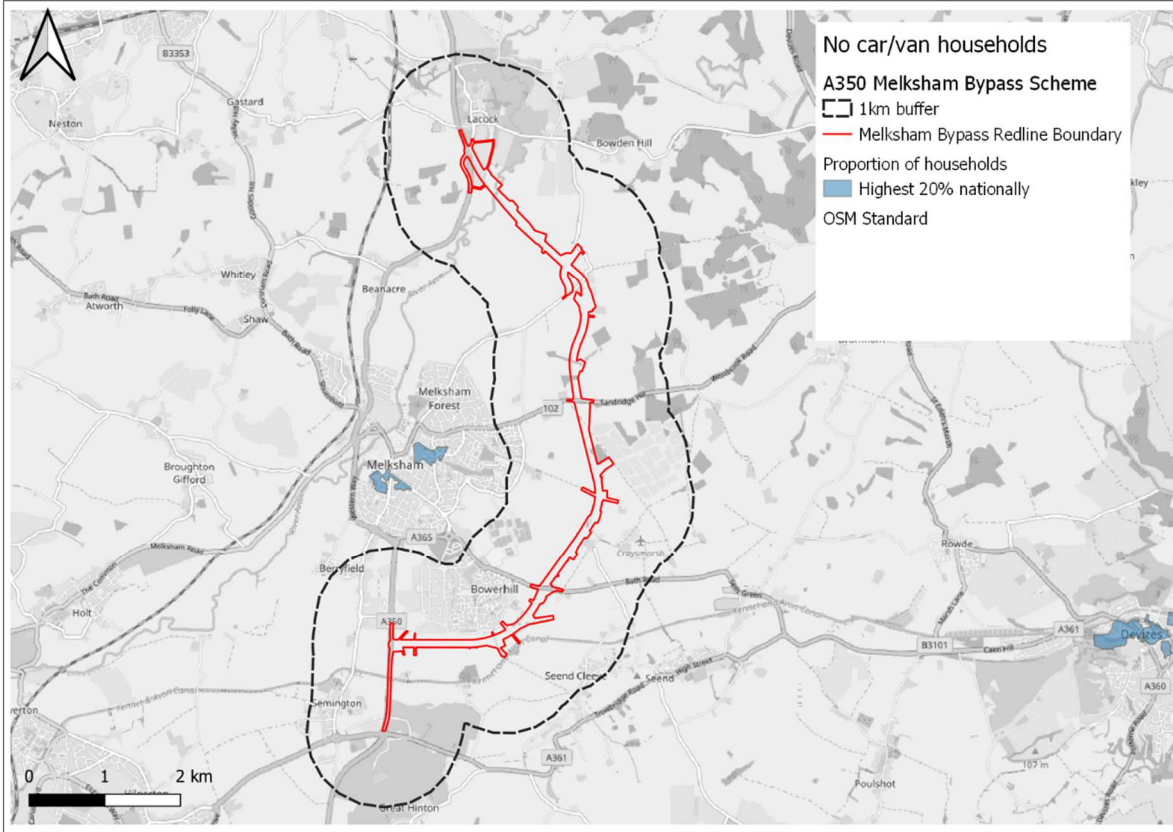


Figure A-3 – Proportion of Children (under 16) – Census 2011



**Figure A-4 – Proportion of No Car/Van households – Census 2011**



**Figure A-5 – Proportion of Disability Living Allowance (DLA) claimants – Census 2011**

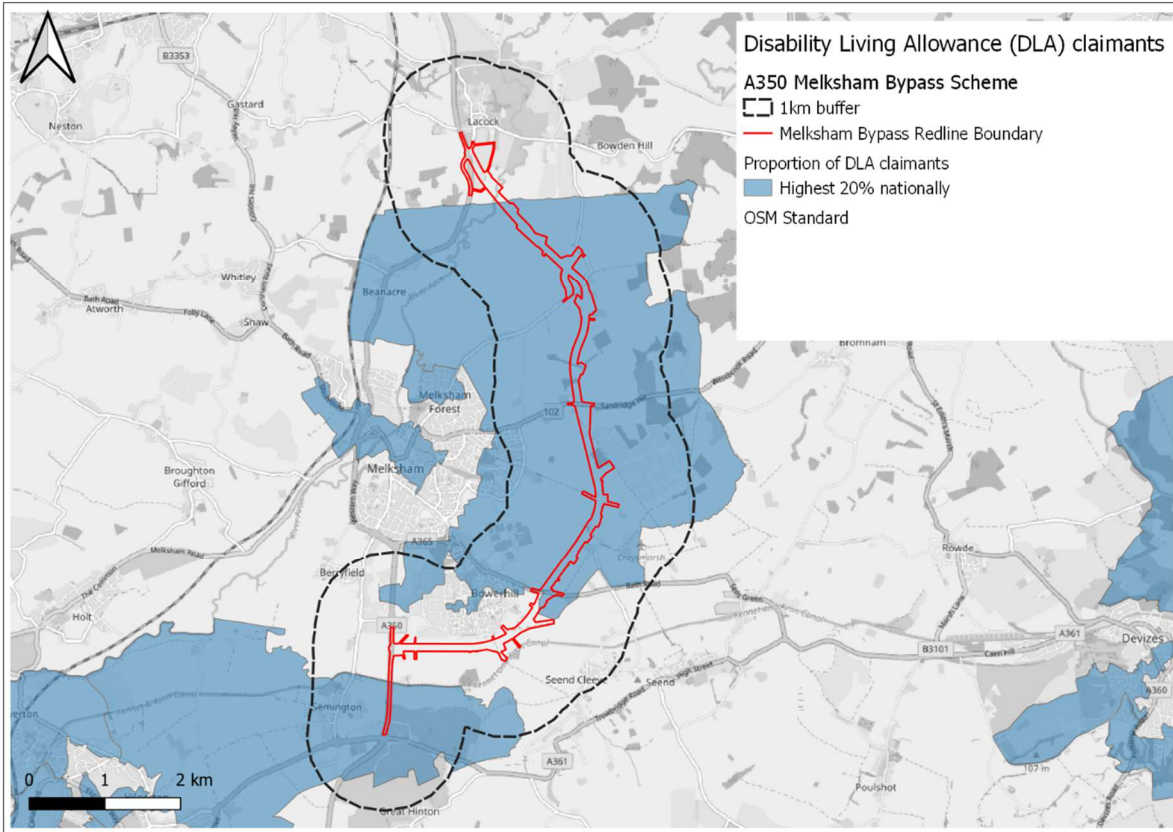




Figure A-6 – Proportion of Females – Census 2011

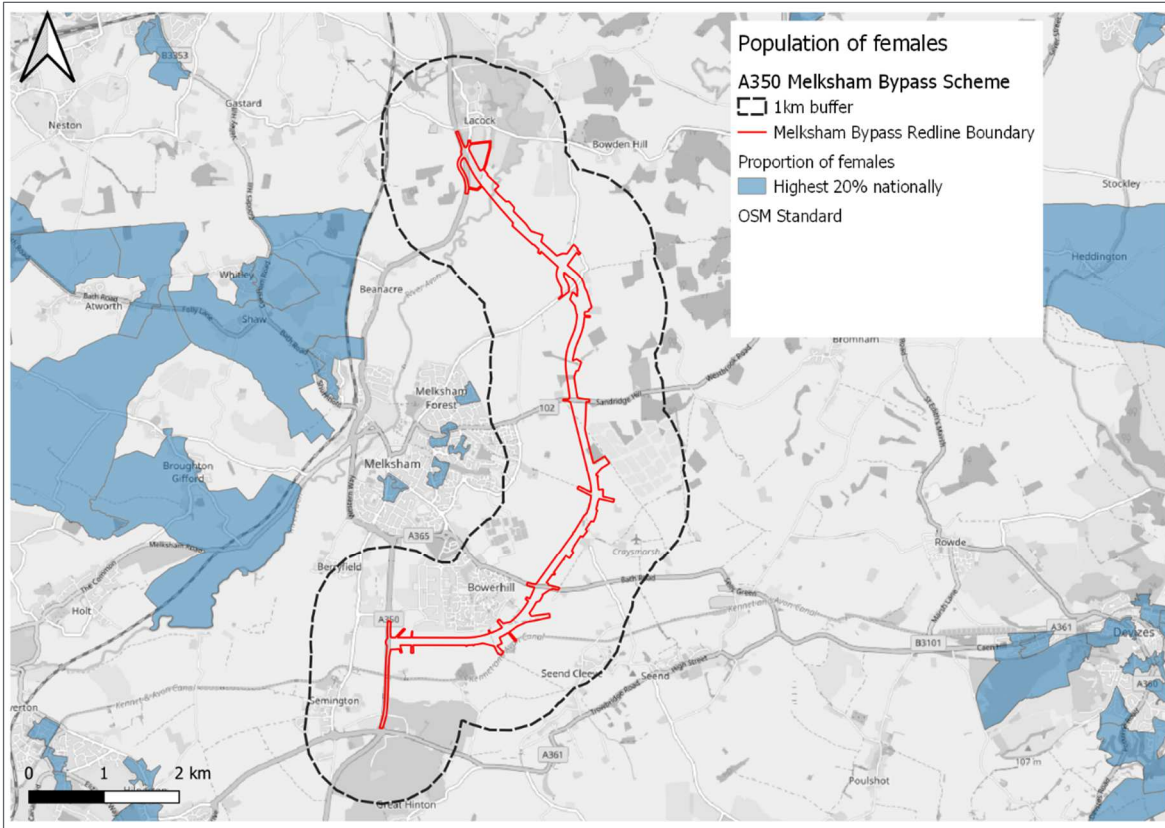
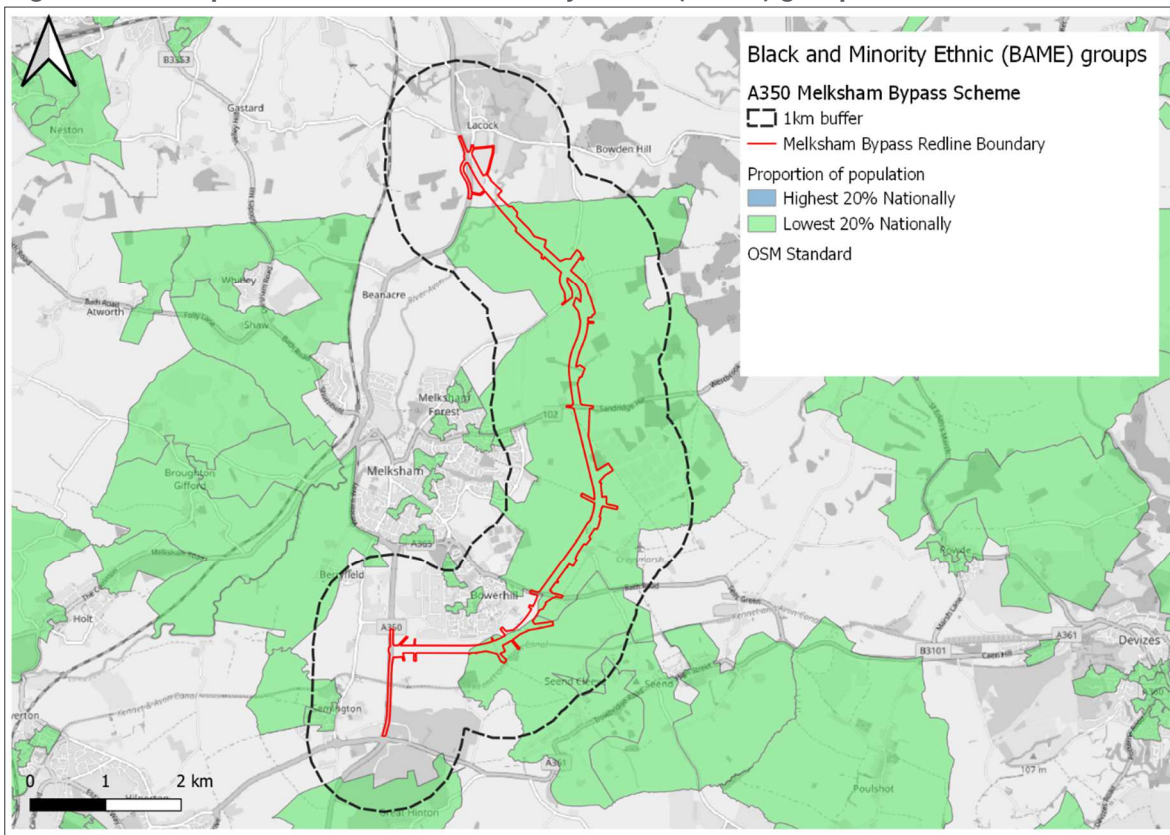


Figure A-7 – Proportion of Black and Minority Ethnic (BAME) groups – Census 2011



# Appendix B. Screening Proforma

## ASSESSMENT OF DISTRIBUTIONAL IMPACTS (DIS) OF TRANSPORT INTERVENTIONS

### Proforma for reporting conclusions of first screening stage (Step 1)

*This form is intended for use by scheme promoters to capture the considerations, assessment, and conclusions of the first screening stage of the DI analysis (Step 1). For a full description of Step 1 please see TAG Unit A4.2. These initial screening tests are not intended to be onerous and should require no additional data collection or analysis. At this stage promoters are only expected to carry out a qualitative assessment, based on their professional judgement and that of the technical specialists responsible for undertaking assessment of noise, air quality, safety, security, severance, accessibility, personal affordability and user benefits.*

**Scheme name:** The A350 Melksham Bypass scheme.

#### **Brief description of scheme**

The A350 Melksham Bypass scheme comprises:

- A full eastern bypass – single carriageway, approximately nine kilometres in length and with four junctions;
- Modifications and enhancements to Public Rights of Way along the bypass route;
- Supplementary highway improvement works to the adjacent network (including a short section of dualling and junction improvement to the south of the bypass); and
- Complementary walking and cycling measures within Melksham Town and around the existing A350 route.

#### **Scheme Objectives**

Five transport objectives have been identified for the scheme, which would help to deliver desired strategic and local outcomes.

- 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 and employment growth in the A350 corridor.
- Reduce journey times and delays and improve journey reliability on other key routes through Melksham (A350 South – A3102, A365 West – A365 East, A350 South – A365 West).
- 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, which help reduce the impact of transport on the environment and support local economic activity
- Reduce personal injury accident rates and severity for the A350 and Melksham as a whole, to make the corridor safer and more resilient
- 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.

Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive/negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
<b>User benefits</b>	The TUBA user benefit analysis software or an equivalent process has been used in the appraisal; and/or the value of user benefits Transport Economic Efficiency (TEE) table is non-zero.	Yes – positive	Currently, journey time is negatively impacted by high levels of congestion experienced on the A350, particularly at peak hours. The new bypass is intended to improve traffic flows between origins and destinations. As journey times will be reduced, local residents will also benefit. The longer distance on the bypass may negatively impact vehicle costs, but this is likely to be outweighed by the positive time cost impacts.	Yes – distribution of benefits across different areas will need to be examined.
<b>Noise</b>	Any change in alignment of transport corridor or any links with significant changes (>25% or < -20%) in vehicle flow, speed or %HDV content.	Yes – the overall impact is expected to be positive, however some areas may experience dis-benefits.	The bypass aims to have an overall positive effect, with the majority of traffic moved away from residential areas in central Melksham. However, some residential areas may also be exposed to increased noise levels from the new bypass.	Yes - noise impact on local areas will need to be examined

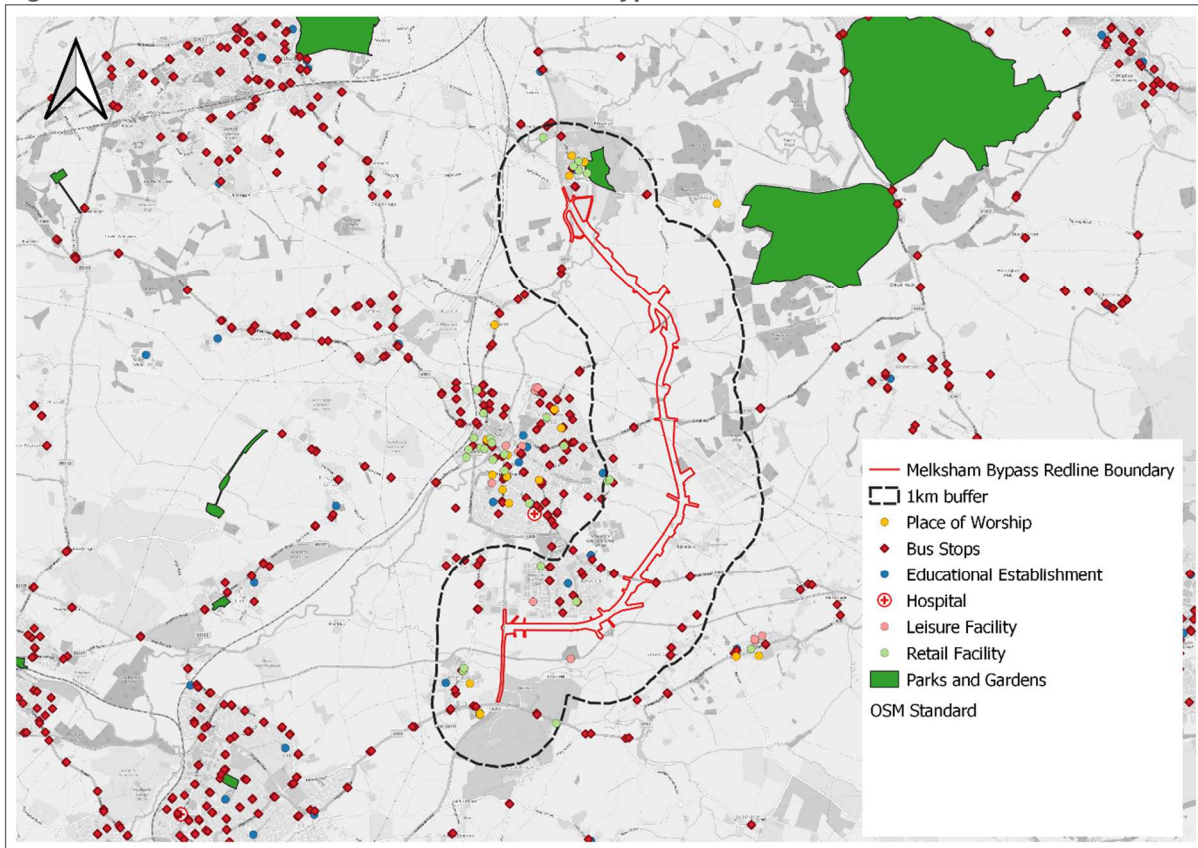
<b>Air quality</b>	<p>Any change in alignment of transport corridor or any links with significant changes in vehicle flow, speed or %HDV content:</p> <ul style="list-style-type: none"> <li>• Change in 24-hour AADT of 1000 vehicles or more</li> <li>• Change in 24-hour AADT of HDV of 200 HDV vehicles or more</li> <li>• Change in daily average speed of 10kph or more</li> <li>• Change in peak hour speed of 20kph or more</li> </ul>	<p>Yes – the overall impact is expected to be positive, however some areas may experience dis-benefits.</p>	<p>Reduced congestion and changes in flow rates will have an impact on emissions in the area.</p> <p>As a consequence, there is a need to examine the outputs from the air quality assessments to ascertain the distribution of impacts across income groups and children in the assessment area.</p>	<p>Yes - air quality impact on local areas will need to be examined</p>
<b>Collisions</b>	<p>Any change in alignment of transport corridor (or road layout) that may have positive or negative safety impacts, or any links with significant changes in vehicle flow, speed, %HGV content or any significant change (&gt;10%) in the number of pedestrians, cyclists or motorcyclists using road network.</p>	<p>Yes – positive</p>	<p>The scheme will reduce traffic flow through central Melksham. As a result, it should reduce the potential for collisions to occur, both between cars and a car(s) and vulnerable users.</p> <p>As the intervention is likely to cause significant changes in vehicle flow, changes in accident levels will need to be examined further to assess the full impact.</p>	<p>Yes - changes in accident levels, particularly for vulnerable groups, will need to be examined.</p>
<b>Security</b>	<p>Any change in public transport waiting/interchange facilities including pedestrian access expected to affect user perceptions of personal security.</p>	<p>No</p>	<p>There are no planned changes to public transport waiting/interchange services. There should be no changes in user perception of personal security since no pedestrianised areas are affected by the scheme. As a result, no further assessment is required.</p>	<p>No</p>

<b>Severance</b>	Introduction or removal of barriers to pedestrian movement, either through changes to road crossing provision, or through introduction of new public transport or road corridors. Any areas with significant changes (>10%) in vehicle flow, speed, %HGV content.	Yes - the overall impact is expected to be positive, however some areas may experience dis-benefits	The scheme is expected to have an overall positive impact on severance, as traffic will be diverted away from the town centre. However, the bypass may have a negative impact on severance for properties close to the new road. Other roads may also experience a change in traffic volume due to traffic redistribution.	Yes - changes to severance, particularly for vulnerable groups, will need to be examined
<b>Accessibility</b>	Changes in routings or timings of current public transport services, any changes to public transport provision, including routing, frequencies, waiting facilities (bus stops / rail stations) and rolling stock, or any indirect impacts on accessibility to services.	No	The scheme does not introduce any new bus stops, timings or services. Therefore, further assessment of accessibility is not required.	No further appraisal needed.
<b>Affordability</b>	In cases where the following charges would occur; Parking charges; Car fuel and non-fuel operating costs (where, for example, rerouting or changes in journey speeds and congestion occur resulting in changes in costs); Road user charges; Public transport fare changes; or Public transport concession availability.	Yes- unknown	The new bypass will result in a number of links experiencing changes in traffic volumes and hence changes in car fuel and non-fuel operating costs might be considered.  TUBA outputs by themselves do not show whether these costs are distributed evenly across income groups. As a result, a further analysis should be completed to quantify the potential distribution of affordability impacts amongst different income groups.	Yes - distribution of benefits across the area will need to be examined

# Appendix C. Identification of amenities in the impact area

The concentration of vulnerable groups is based not only on the resident population but also on trip attractors/amenities that are within the impact area. There are several amenities within the area that will attract vulnerable groups; hence adding to the movement and daytime population of those considered vulnerable to any impacts. Using desktop analysis, the local amenities which are likely to be used by the identified social groups for each DI indicator are identified.

**Figure C1-1 – Amenities in the A350 Melksham Bypass Scheme area**



**Figure C1-1** shows where amenities located within the study area. The area east to the scheme buffer has a higher density of amenities, as would be expected, due to the bypass running through predominantly non-residential areas. The amenities within the buffer boundary include 3 schools, 1 leisure facility, 5 places of worship, 5 medical facilities, 10 retail facilities, and 40 bus stops.

Some of these amenities include:

- Lacock Church of England Primary School
- Forest and Sandridge Church of England Primary School
- Melksham Oak Community School
- Bower Hill Primary School
- St George's School
- Saint Cyriac's Church
- West Wiltshire Crematorium Chapel

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