Stage 4 and 5 Transport Assessment

North Somerset Local Plan

North Somerset Council

March 2022

Delivering a better world

Quality information

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1. Introduction

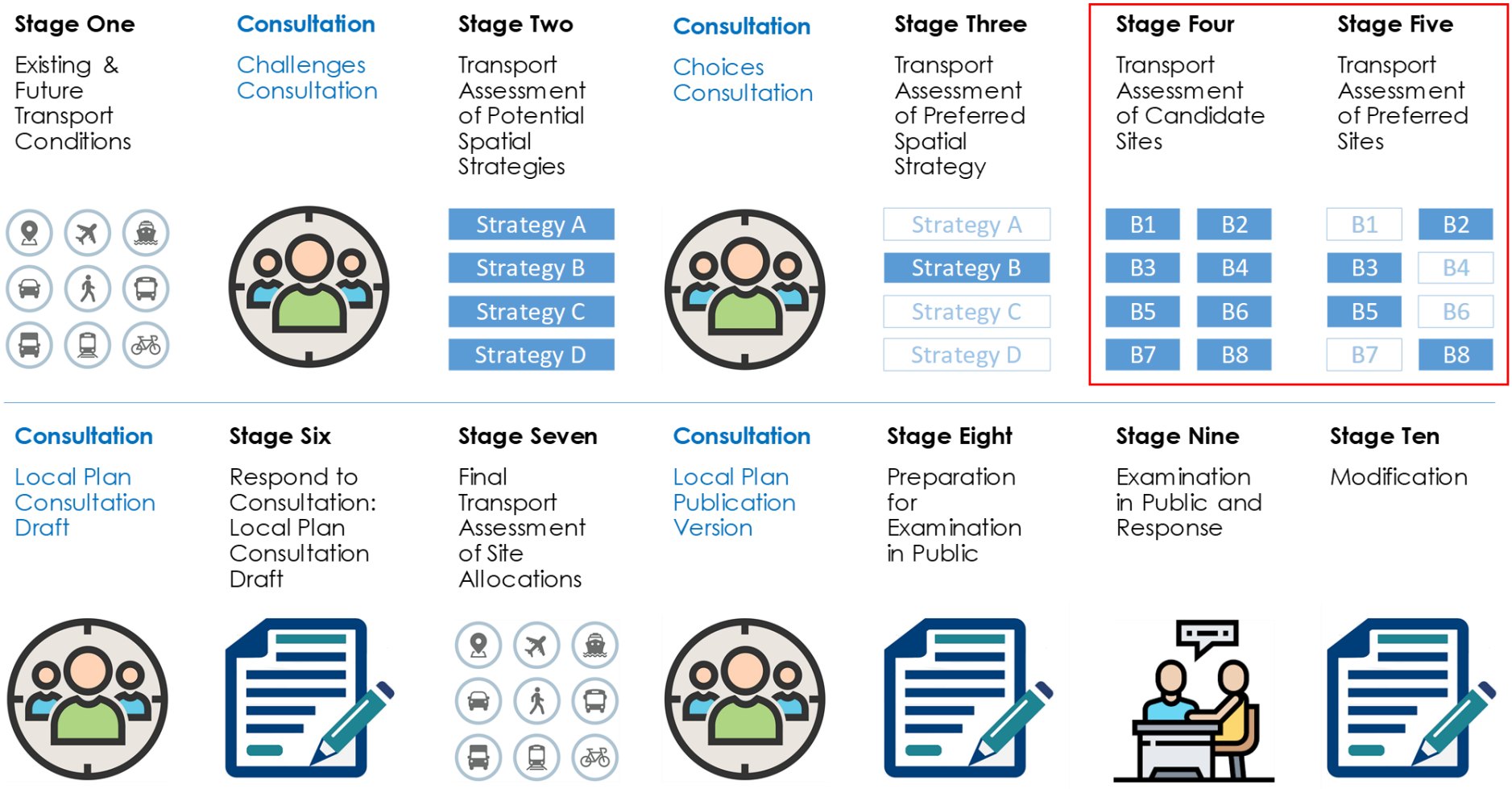
Introduction

1.1 AECOM has been appointed by North Somerset Council (NSC, or 'the Council') to provide transport planning consultancy support to the Local Plan process. NSC is developing a new Local Plan to be submitted for examination in 2022. NSC has declared a Climate Emergency and has set itself the challenging target of reaching net zero carbon emissions by 2030. Land use planning and the transport implications thereof are one of the largest influences the Council has on the district's carbon emissions. The Local Plan requires new development to reduce the need to travel, but also to enable and support sustainable travel and assist existing communities in becoming carbon neutral.

1.2 This Transport Assessment has been written as a non-technical report, accessible to those who may not have prior industry knowledge. Where appropriate, terminology has been defined to provide clarity. The additional modelling reports submitted to the Local Plan Evidence Base provide more technical detail, and relevant signposting is provided throughout this document.

1.3 The Local Plan process is summarised indicatively in **Figure 1-1**.

Figure 1-1: Local Plan Process Summary



Stages 1 to 3: Preferred Spatial Strategy

1.4 Following the completion of stages 1 to 3, as outlined in **Figure 1-1**, a Stage 3 Transport Assessment was produced in April 2021, which assessed and appraised four potential Spatial Strategies which would guide the Local Plan process going forwards. This led to the development of the preferred Spatial Strategy. The Preferred Spatial Strategy can be seen summarised in **Figure 1-2** below.

Figure 1-2: Summary of Preferred Spatial Strategy

1.5 By applying this sequential process of identifying broad locations of growth, the Preferred Spatial Strategy has taken forwards the best elements of each of the spatial strategies to develop a 'hybrid' approach. This is considered to be the optimal approach to accommodate the Local Plan growth in terms of effectiveness, feasibility, and other planning considerations, notably Green Belt Policy. This has established that the growth locations are as follows:

- Through existing planning permissions and commitments, such as Weston Villages;
- Brownfield sites;
- Urban focused housing and employment development with growth concentrated at Weston-super-Mare and Nailsea, outside of the Green Belt;
- Limited development in villages, except where growth would be at a proportionate scale, such as Yatton, Backwell, outside of the Green Belt;
- Limited rural development, mostly in windfall sites; and
- Elsewhere in the Green Belt, well related to existing urban areas in the most sustainable locations, such as the edge of Bristol, Nailsea, Backwell and Portishead.

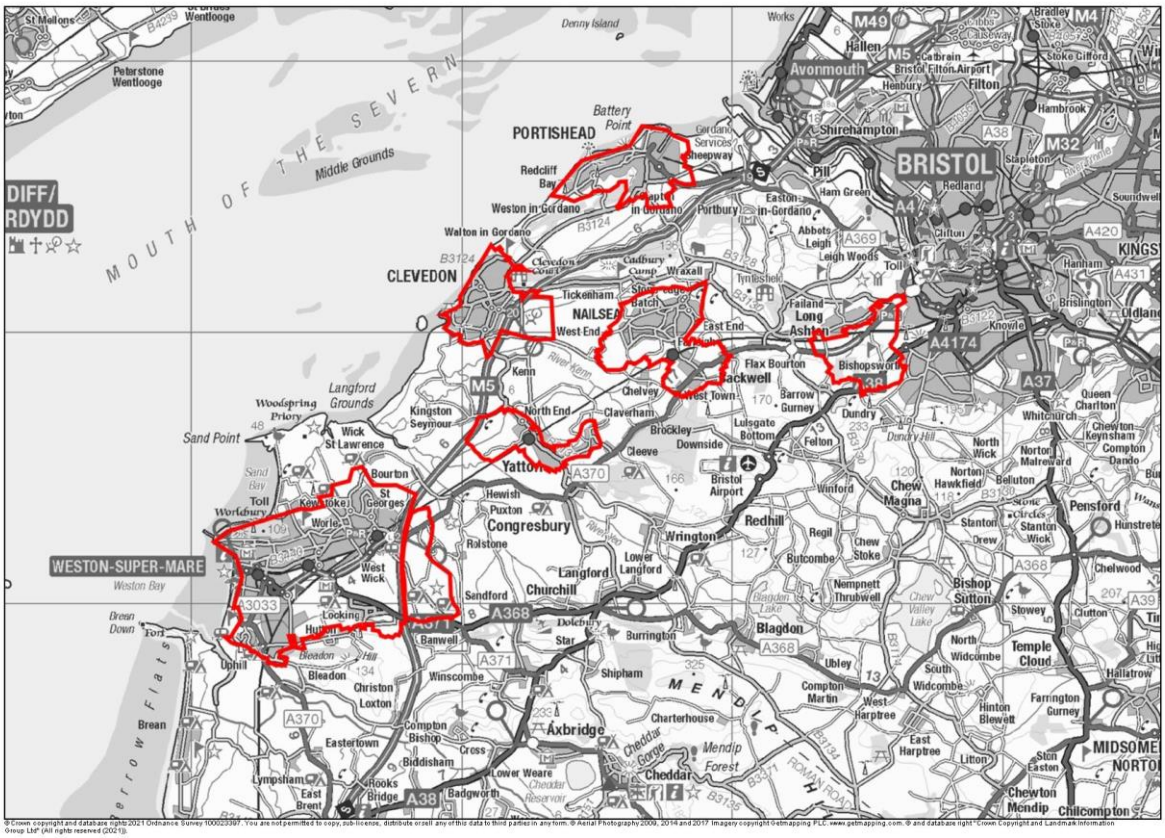
Growth Areas

1.6 The previous stage of work, Stage 3, included an appraisal of four spatial strategies against transport objectives. The outcomes of this appraisal informed NSC in its development of a logical and sequential approach to determine likely

areas for growth within the district for the 'Preferred Strategy'. The growth areas are displayed on **Figure 1-3**, and are as follows:

- Wolvershill;
- Nailsea and Backwell;
- Edge of Bristol; and
- Other Growth Areas (Yatton, Portishead, Clevedon, Weston-super-Mare (West of M5)).

Figure 1-3: Growth Area Locations



1.7 Within each of the growth area locations, a series of 'opportunity areas' have been identified in order to deliver the required level of housing. The opportunity areas identified are deliberately schematic at this stage and are not related to land ownership boundaries. Instead, they allow for comparison to be made between sites during appraisal, and provide a basis for the development of Access and Movement parameters. The opportunity areas within each growth area location are outlined in further detail in Section 3.

1.8 Whilst this Transport Assessment assesses the transport aspects of allocations in isolation at this stage, throughout the Stage 4 and 5 process preliminary works have suggested that some of the opportunity areas will not be taken forward as a result of findings from other disciplines (such as flooding, ecology etc.), and therefore it was unlikely that these sites would be allocated. For the stage 4 and 5 works, the focus has been to study those opportunity areas aligned with the areas proposed for allocation in the Draft local plan. The

housing requirements within each growth area, and in relation to the identified opportunity areas is shown in **Table 1-1**. In some cases these may differ compared to the scale of growth allocated in the draft Local Plan as work on the local plan allocations continues.

Table 1-1: Growth Area Housing Requirements

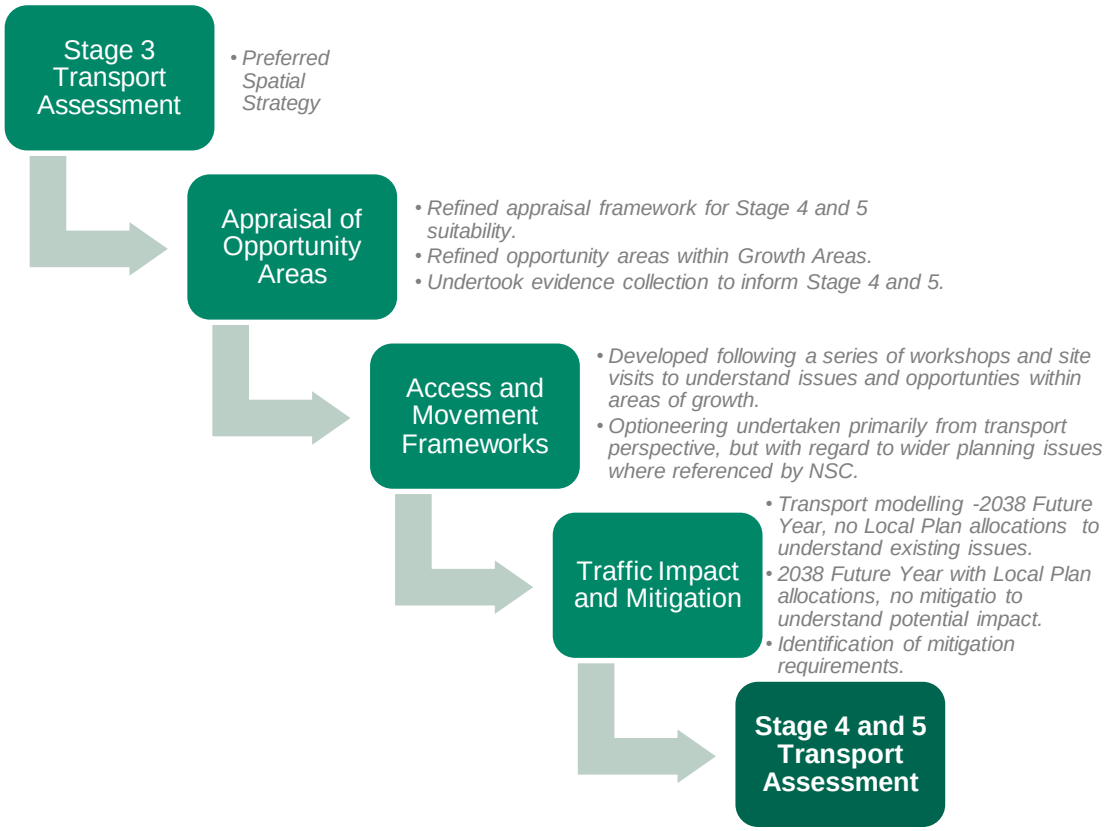
Growth Area	No. of Dwellings
Wolvershill	2,800
Nailsea & Backwell	2,500
Edge of Bristol	3,200
Other Sites	1,410

1.9 In addition to these Growth Areas, a number of other areas have been considered for smaller scale housing development as part of the wider Local Plan development process. This Transport Assessment considers “strategic” growth, and its implications, with the transport inputs to smaller scale developments presented in the Broad Location Templates prepared for the villages, which is included within the Local Plan Evidence Base.

Stage 4 and 5 Process

1.10 A number of key processes have been undertaken to progress the Local Plan process from Stage 3 to the production of this Transport Assessment at Stage 4 and 5, as summarised in **Figure 1-4**.

Figure 1-4: Stage 3 to Stage 4 and 5 Local Plan Process Summary



Stage 4 and 5 Outcomes

1.11 Stage 4 and 5 of the Local Plan process seeks to provide an overarching assessment of candidate sites and determining preferred options to potentially be allocated within the Local Plan. This includes:

- An appraisal of the potential sites against the established Local Plan transport objectives as part of an Appraisal Framework;
- Understanding of the access and movement framework associated with delivery of sites within Growth Areas, including issues and opportunities both in terms of sustainable travel and the highway network;
- Understanding of the impacts of Local Plan housing development in line with the Preferred Spatial Strategy; and
- Consideration and analysis of potential mitigation strategies in order to deliver growth sustainably and address impacts.

THE OUTCOME of this Stage 4 and 5 Transport Assessment will be the **initial appraisal** from a transport perspective, including access and movement, of candidate allocation sites to be taken forward to Stage 6 and 7 of the Local Plan Process, and consideration of high-level mitigation options.

What's Next?

Following the completion of Stage 4 and 5, Stages 6 and 7 will involve more detailed analysis and transport modelling of development scenarios, including sites, access and movement parameters, and mitigation options. This will inform the final Transport Assessment for Local Plan publication for examination, which will present proposed site allocations and a comprehensive mitigation strategy.

Consultation

1.12 This Report is submitted alongside the Reg.18 Consultation Draft of the Local Plan. The consultation is intended to present Options for feedback and to inform the development of the Plan. As set out above, this is a stage in a process and further work is being, and will be, carried out to develop and assess options, which will be informed by this process.

Document Structure

1.13 The Stage 4 and 5 Transport Assessment builds on the work undertaken as part of Stages 1-3, which was presented in the Stage 3 TA. It is intended to be readable as a standalone document, but readers may wish to refer to the Stage 3 TA for further context in some areas if desired.

1.14 Following this introduction, the document includes the following sections:

- **Section 2** details the methodology used, including assessing the choice of opportunity areas using an appraisal framework, developing an access and movement framework for each site, transport modelling and developing mitigation options;
- **Section 3** provides details on the identified growth areas, and summarises the analysis undertaken for each;
- **Section 4** summarises the transport modelling undertaken of growth as a result of Local Plan allocations, and the high-level outcomes of the modelling. It also summarises potential mitigation options to be considered alongside the potential development site allocations; and
- **Section 5** provides a summary of the Stage 4 and 5 TA and next steps in the Local Plan process.

2. Methodology

2.1 This section sets at the methodology used to take the Local Plan Process from Stage 3 to Stage 4 and 5, notable the transport evaluation of Opportunity Areas through use of an Appraisal Framework, development of Access and Movement framework, transport modelling, and identification of potential mitigation measures required to deliver Local Plan Growth.

Appraisal of Opportunity Areas

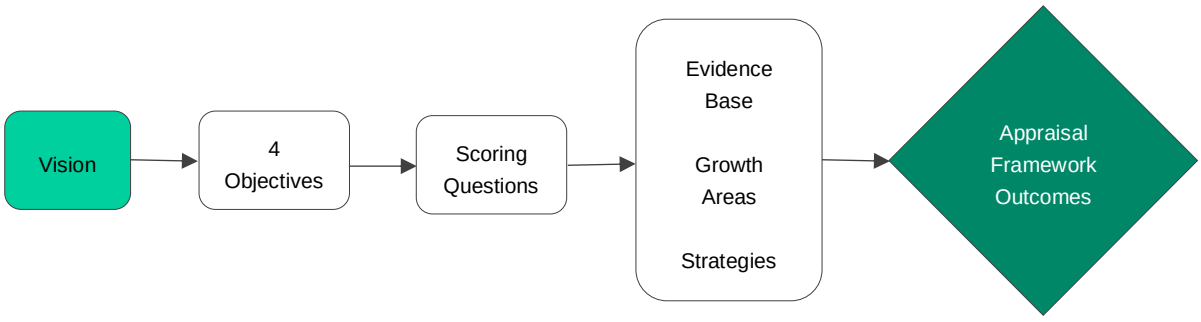
2.2 An initial appraisal framework was developed as part of the earlier stages of the Local Plan process. Four key Transport Objectives were established:

1. To reduce the need to travel, and the distances that people will need to travel, to access key opportunities, facilities and services including employment, leisure and retail.
2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.
3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.
4. To reduce the impact of vehicle travel on the highway network, including in terms of congestion, safety and the quality of our natural and built environment.

2.3 A key focus is to facilitate active travel, which will improve opportunities for travelling by more sustainable modes, as well as encouraging people to travel by active modes which provide health, wellbeing and environmental benefits. Objective 1 seeks to assess distance to local facilities which will help inform what can be accessed by active travel over a reasonable distance, whilst Objective 2 assesses the availability of and potential for active travel routes to accommodate these journeys. The outcome of these objectives will help shape emerging active travel plans for the future.

2.4 This appraisal has been completed in stages. This is summarised in **Figure 2-1**.

Figure 2-1: Appraisal Framework Process Summary



2.5 The Appraisal Framework used to assess Spatial Strategies against the Transport Objectives in Stage 3 has been refined to be better suited to assess Opportunity Areas within Growth Areas in Stage 4 and 5. Key scoring questions were identified to help provide a more targeted appraisal of candidate sites in transport terms. These are shown in **Table 4-4** below.

Table 2-1: Appraisal Framework Scoring Questions

Objective 1	• Proportion of total development within 800m of an existing primary school. • Proportion of total development within 2km of an existing secondary school. • Potential for on-site education provision. • Accessibility to on-site employment. • Distance by walking or cycling to a town centre / significant centre. • Distance by walking or cycling to a local centre (this may include a town centre, or a smaller-scale shopping parade). • Accessibility to on-site retail.
Objective 2	• Accessibility to designated active travel routes. • Potential benefit from planned active travel routes - LCWIP / Coastal Cycle Network. • Potential for creation of new active travel routes / new connections between existing routes for contribution to the wider network.
Objective 3	• Distance by walking or cycling to an existing rail station. • Walking accessibility to existing bus routes. • Opportunity to benefit from or support public transport improvements, in relation to existing or planned schemes.
Objective 4	• Proximity to, and potential impacts (capacity and safety) upon, congestion hotspots. • Potential for mitigation measures to address any congestion hotspots. • Potential to deliver strategic benefits.

2.6 Each Opportunity Area has been appraised in relation to set criteria for each of scoring questions. Overall, the questions are scored using a RAG system, with red indicating a negative impact from the candidate site in relation to the question, and green indicating a positive impact as show in **Figure 2-2**. Given the early stage of the process, it is recognised that there are some areas of the Appraisal Framework where it is not possible to make an assessment, such as the provision of on-site education. If necessary, through the next stages of the Local Plan process, the Appraisal Framework will be updated with relevant information and regularly reviewed in the preparation of the Plan.

Figure 2-2: Appraisal Framework RAG Scoring

2.7 It is recognised that performance against objectives and scoring questions will vary by relative importance, and be weighted differently by decision-makers. We have therefore sought to present a comprehensive picture of the transport characteristics of each Opportunity Area. This allows comparison, but ranking of sites is deliberately not presented to avoid the inherent bias that this could introduce.

2.8 The Appraisal Framework also seeks to consider both existing and future conditions. This includes consideration of planned schemes, and opportunities afforded by the development of the Opportunity Areas themselves. Where there are clear weaknesses to an Opportunity Area against one or more objectives, commentary is provided as to what measures may be needed to improve performance, and whether they are likely to be feasible.

2.9 In addition to informing the selection of Opportunity Areas to be taken forward for allocation in future stages, which naturally also accounts for a wide range of non-transport factors, the appraisal of the Opportunity Areas highlights the strengths and weaknesses of each area. This has informed the development of access and movement frameworks, and will continue to inform the development of site masterplans and mitigation strategies to capitalise on strengths and address weaknesses in terms of the sustainability of the site.

Access and Movement Frameworks

2.10 The previous stage of work, Stage 3, included an appraisal of four spatial strategies against transport objectives. The outcomes of this appraisal informed NSC in its development of a logical and sequential approach to determine likely areas for growth within the district for the 'Preferred spatial Strategy'. Broad locations of development for each Growth Area were provided by NSC, and used to form the basis of initial optioneering of Access and Movement parameters within each location.

2.11 Initial optioneering was informed by transport workshops undertaken with officers from the local planning / highway authority, held on Monday 21st June 2021 and Wednesday 23rd June 2021. The workshops facilitated discussion with regards to the potential transport issues and opportunities associated with the identified areas of growth, and allowed AECOM to collate a substantial level of NSC Officer knowledge gained over many years of experience. These were investigated further during a site visits on Monday 5th July, attended by representatives of both AECOM and NSC.

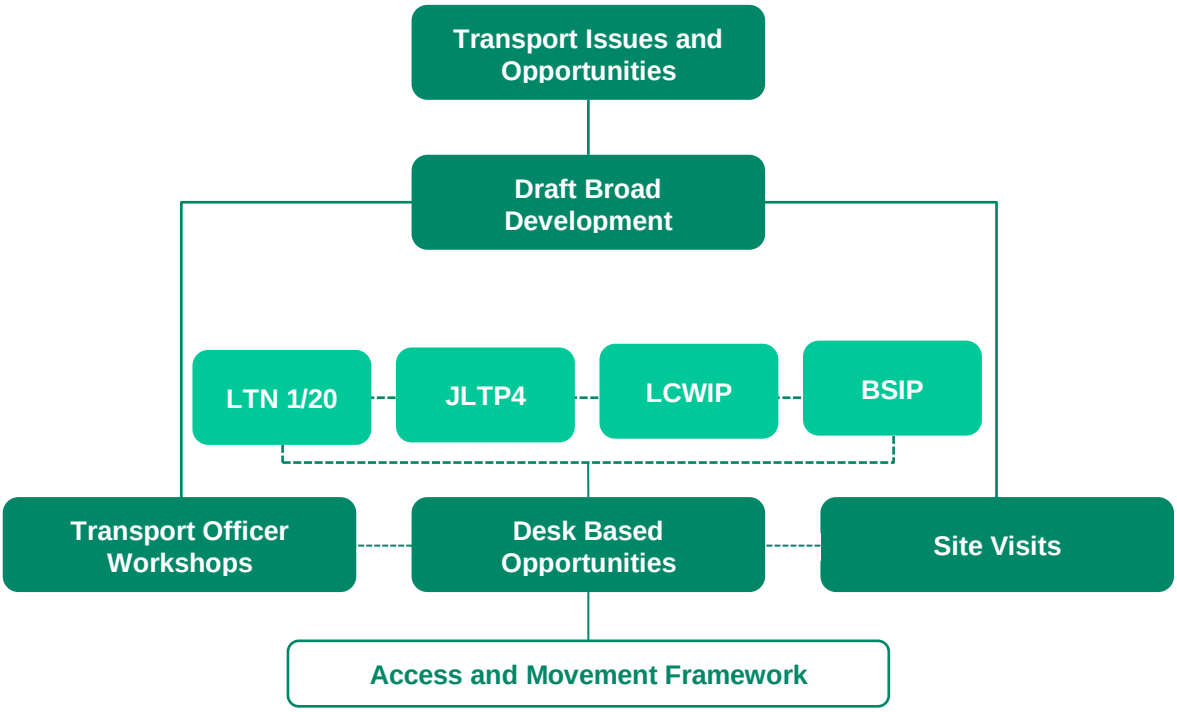
2.12 A further Officer workshop was held on Thursday 5th August, with the purpose of discussing and presenting the emerging Access and Movement Framework options. Discussion arising during and after the workshop was then fed back into the development of the Access and Movement plans for each growth area location. Additionally, further transport analysis and review was undertaken where necessary in the development of access and movement parameter options.

2.13 The development of the Access and Movement Framework is strongly influenced by the contents of:

- LTN 1/20 Cycle Infrastructure Design which sets out the Department for Transports guidance on delivering high quality cycle infrastructure;
- WECA's Joint Local Transport Plan 4 which sets out the area's transport vision and objectives to 2036;
- The North Somerset Council Active Travel Strategy, and WECA's Local Cycling and Walking Infrastructure Plan (LCWIP) which identifies over £400 million of required investment into the active travel network, to be delivered through the West of England Combined Authority (WECA); and
- North Somerset's Bus Service Improvement Plan (BSIP), informed by the West of England Bus Strategy, which covers the period up to 2030, and brings together evidence in order to set ambitions for patronage growth, boost investment in buses and improve socio-economic and environmental outcomes across the region.

2.14 The process of development of the Access and Movement Framework is summarised in **Figure 2-3.**

Figure 2-3: Access and Movement Framework Development



Transport Modelling

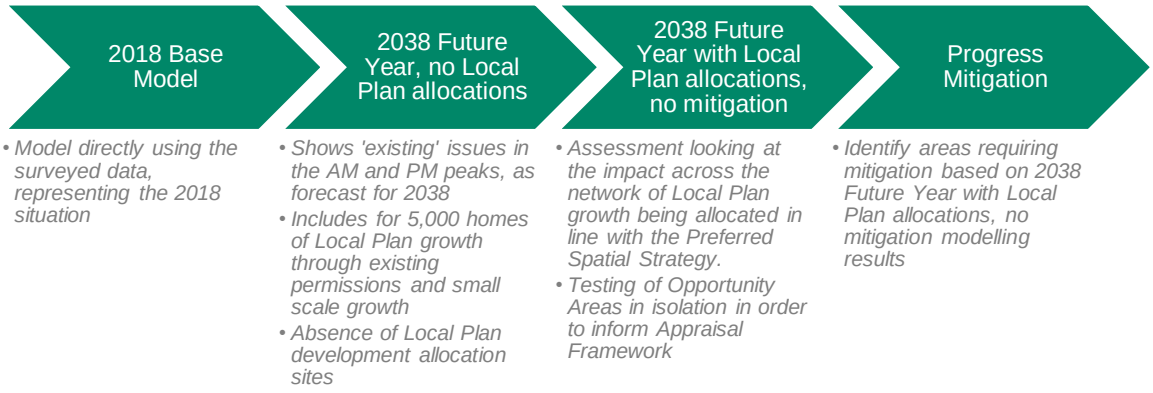
2.15 A strategic transport model has been developed as part of the Stage 4 and 5 Local Plan process in order to assess the potential impacts of candidate sites, as well as the overall effect of Local Plan Growth.

2.16 The overall modelling process includes a highways model, a Public Transport Model, and a Variable Demand Model that effectively incorporates the potential mode shift that could occur to Public Transport as a result of differences in journey times in the future. These elements have been used to inform the strategic transport model.

2.17 A strategic transport model assesses the study area as a whole in terms of trip origin and destination. It calculates the volumes of movement across the District and surrounding area, and assigns it to routes based on distance and journey time. It uses “Dynamic Assignment”, which allows the model to iteratively calculate the level of delay on each route and assign traffic onto the most attractive route for its journey. As a “strategic” model, it provides an indication of levels of traffic flow, and corresponding levels of congestion, at a network wide scale. Where impacts are identified, and mitigation deemed necessary, more localised analysis will need to be undertaken through the next stage of the Local Plan or subsequent planning applications.

2.18 The strategic modelling process is set out in **Figure 2-4**, and demonstrates how the model has been built up from base models using 2018 data.

Figure 2-4: Transport Modelling Process



2.19 A number of scenarios were run as part of the '2038 Future Year with Local Plan allocations, no mitigation' model, including both site specific tests and a model to include the possible combination of Opportunity Areas to be allocated across the region.

2.20 The purpose of the 2038 Future Year with Local Plan allocations, no mitigation model is to understand the strategic impact of Local Plan growth, in line with the Spatial Strategy. It has been used to inform consideration of the locations of likely impacts, and hence the potential mitigation required. In order to include this work within the Stage 4 and 5 TA, it was necessary to commence the modelling early in the process. The selection of Opportunity Areas (see Chapter 3 for references) was done in collaboration with Planning Policy Officers to ensure that it met the Spatial Strategy, but it should not be considered to form a detailed assessment of a selection of sites. Some Opportunity Areas were discounted as the Stage 4 and 5 process progressed for reasons other than transport (e.g. flooding or ecology) and as such, not all sites were modelled in each modelling scenario run, dependent on what stage of modelling was undertaken following these decisions. As such, this scenario represents an assessment of potential growth at a point in time. Further iterations will be undertaken through the Local Plan process prior to submission for Examination.

2.21 An expansion is planned at Bristol Airport to increase passenger numbers from 10 million passengers per annum (MPPA) to 12MPPA. A planning application was refused by NSC Planning Committee in early 2021 and an appeal was subsequently submitted. The appeal decision was made in February 2022 in which the Planning Inspectorate overturned the original decision and granted permission for the airport expansion. This decision was made too late to be included in this draft of modelling, however the potential impacts will be reviewed in advance of the submission of the Local Plan for Examination.

2.22 The purpose of the Site-Specific Tests has been to understand the relative differences in traffic impact between individual sites to inform analysis in the Appraisal Framework, and in some cases to consider access and movement parameters.

Mitigation

2.23 Following analysis of the '2038 Future Year with Local Plan allocations, no mitigation' transport model results, key points on the highway have been identified as requiring consideration for mitigation.

What is meant by Mitigation?

New or upgraded transport measures to go some way to addressing potential negative impacts as a result of the proposed Local Plan allocations.

2.24 The approach to developing mitigation options will be to consider impacts at varying scales ranging from network to local level. The principal of mitigation development has been established as part of this Stage 4 and 5 TA, and will be built on through more detailed design and analysis through Stages 6 and 7.

2.25 Key mitigation principles include:

- Aiming to achieve mode shift through supporting and developing the sustainable travel network;
- Enhance the Public Transport network including delivery of the Bus Service Improvement Plan (see Section 4 for more detail); and
- Key consideration will be to minimise impact on, and prioritise, public transport and active travel networks.

2.26 Options for mitigation are being developed through a collaborative process with key members of NSC, to ensure that a holistic and rounded approach is used to inform options, and to take into account previous analysis and potential projects which may be relevant for inclusion.

2.27 Mitigation as part of the Local Plan forms one of the mechanisms through which NSC are working towards improving sustainable travel, alongside other workstreams such as the studies on the decarbonisation of transport, in line with the Climate Emergency declaration.

Impact of Covid

2.28 The Covid-19 pandemic has the potential to influence trip generation and trip types, as working from home becomes far more widely accepted, and flexible working arrangements now allow more off-peak travel in some circumstances. Whilst the result of this remains to be seen as these new travel behaviours evolve, this TA ensures that a range of trip types and distances can be undertaken sustainably, and does not solely focus on peak hour commuting.

3. Growth Areas

3.1 Likely areas for growth within the District have been determined by NSC in relation to the Preferred Spatial Strategy established during Stage 3 of the Local Plan process. Within each Growth Area, a combination of sites, referred to as 'Opportunity Areas', that enable housing delivery have been assessed against the Council's Transport Vision and Objectives in an appraisal process. This process ultimately helps to inform the selection of areas for potential allocation.

3.2 Due to the scale of housing required for allocation, the following Growth Areas are considered in depth in this report:

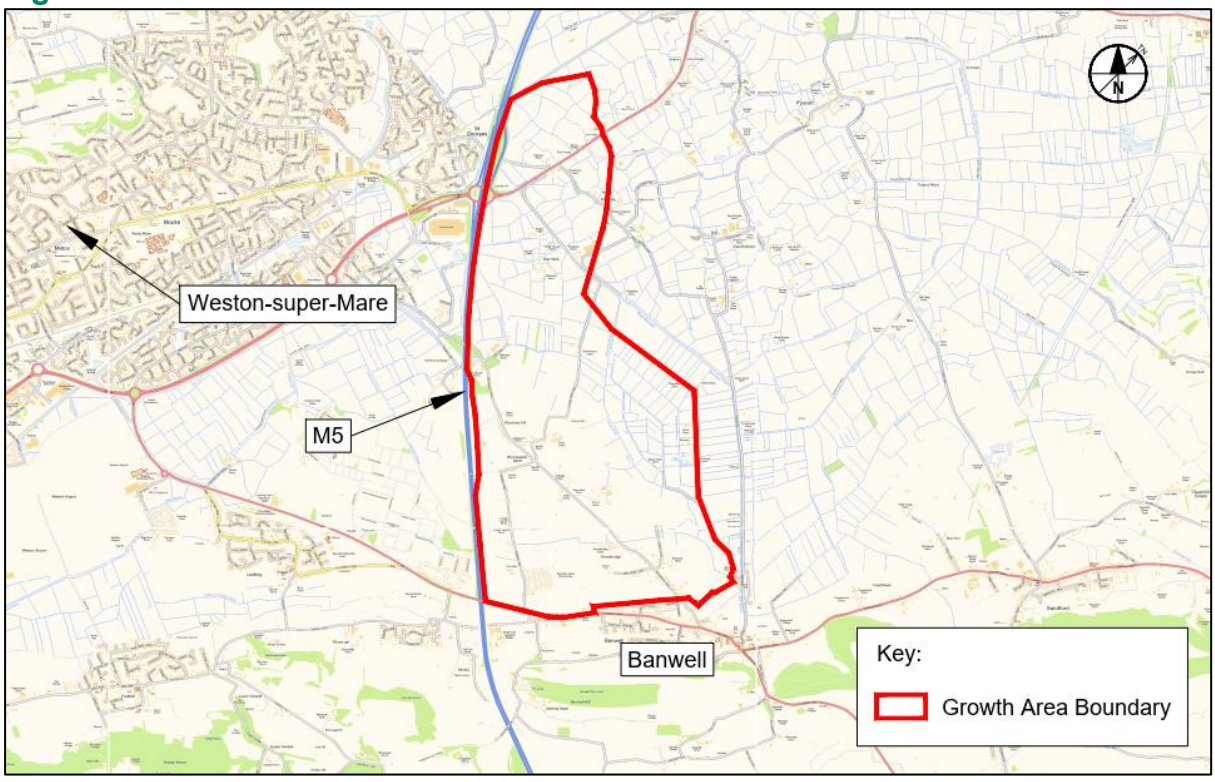
- Wolvershill;
- Nailsea and Backwell; and
- Edge of Bristol.

3.3 This section of the report discusses the analysis undertaken for each of the aforementioned Growth Areas, in terms of appraisal of Opportunity Areas and Access and Movement Frameworks.

Wolvershill

3.4 The boundary for the 'Wolvershill' Growth Area is shown below on **Figure 3-1**.

Figure 3-1: Growth Area – Wolvershill Area of Search

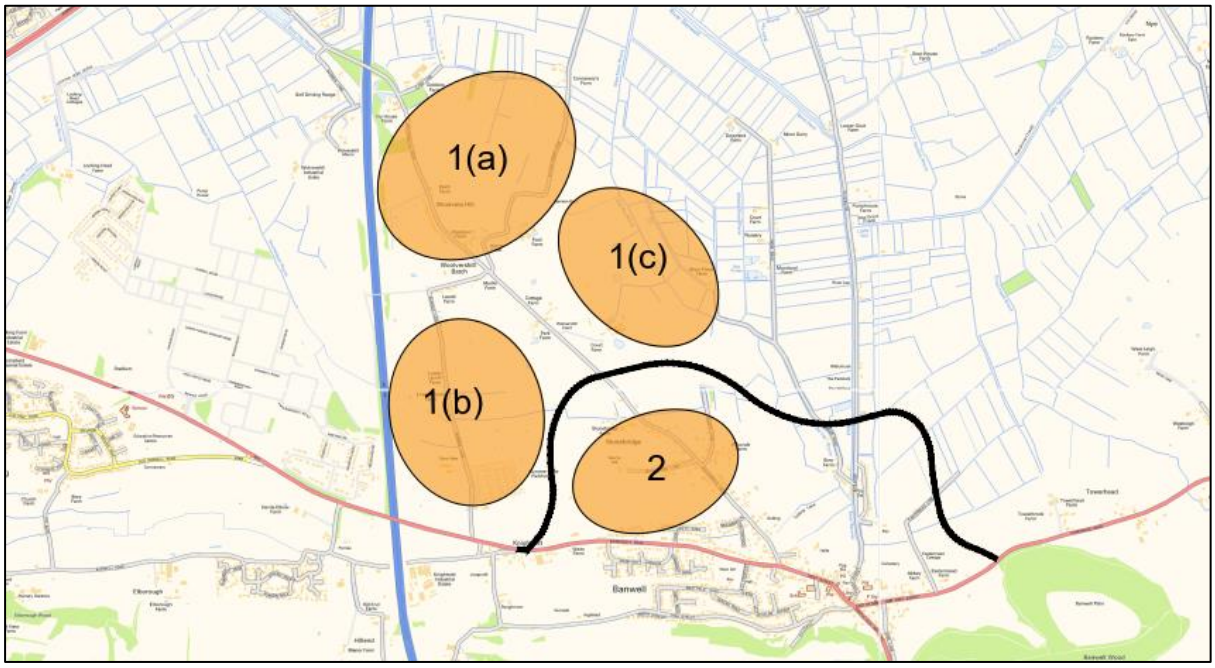


Summary of Opportunity Areas

3.5 The Opportunity Areas for assessment within the Wolvershill Growth Area are shown below on **Figure 3-2**. For the purpose of the appraisal exercise, the areas are referred to as follows:

1) (a) North of Banwell Bypass / North;
   (b) North of Banwell Bypass / Southwest;
   (c) North of Banwell Bypass / Southeast; and
2) South of Banwell Bypass

Figure 3-2: Opportunity Areas – Wolvershill



Issues and Opportunities for Transport Network

3.6 The high-level issues and opportunities in relation to the transport network surrounding the Growth Area and respective Opportunity Areas are summarised in **Table** 3-1.

Table 3-1: Issues and Opportunities – Wolvershill

Issues	Opportunities
• Presence of the M5 creates severance between the Growth Area / Banwell to the east, and Locking Parklands development / Weston-super-Mare to the west. • Constraints on Wolvershill Road Bridge (M5 crossing point, shown on **Figure 3-3**) • Collision hotspot located at Wolvershill Road / A371 Junction. • Capacity issues at M5 Junction 21.	• Potential to use existing agricultural bridge (M5 crossing point, Summer Lane, shown on **Figure 3-3**) to accommodate active travel movements, connecting the Growth Area to Locking Parklands development, including the new secondary school, west of the M5. • Potential, with traffic reductions, to improve Active Travel on Wolvershill Road Bridge, linking the Growth Area to Worle railway station and the district centre at Elmham Way(shown on **Figure 3-3**). • Potential to link Growth Area to existing Strawberry Line cycle route.

Figure 3-3: M5 Crossing Locations

Existing Agricultural Bridge

Wolvershill Road Bridge

Appraisal Framework

3.7 This section sets out outcomes of the appraisal framework for each of the Opportunity Areas, based on the methodology detailed in Section 2. For each objective, the RAG score has been presented along with highlighting any key findings from the appraisal framework process. A copy of the RAG scoring for the Appraisal Framework is shown at **Figure 3-4**.

Figure 3-4: Appraisal Framework RAG Scoring

Objective 1: To reduce the need to travel, and the distances that people will need to travel, to access key opportunities, facilities and services including employment, leisure and retail.

		Education			Employ -ment	Local Centre / Retail		
		Proportion of total development within 800m of an existing	Proportion of total development within 2km of an existing secondary	Potential for on-site education provision	Accessibility to on-site employment	Distance by walking or cycling to a town centre /	Distance by walking or cycling to a local centre.	Accessibility to on-site retail.
Wolvershill	1(a) - North of Bypass / North							
	1(b) - North of Bypass / Southwest							
	1(c) - North of Bypass / Southeast							
	2 - South of Banwell Bypass							

3.8 Some key points from the Appraisal Framework are set out in **Table 3-2**:

Table 3-2: Appraisal Framework Summary – Objective 1, Wolvershill

All Wolvershill Sites:

- Sites are largely comparable in terms of their proximity to existing education facilities, and town centre facilities (W-s-M).
- Site 2 is located in closer proximity to local amenities in Banwell, and sites 1(a) and 1(b) are slightly closer to existing local amenities to the west of the M5.
- Insufficient information available at this stage to inform provision of on-site educational, employment and retail facilities.

Objective 2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.

		Existing	Future Potential	
		Accessibility to designated active travel routes.	Potential benefit from planned active travel routes.	Potential for creation of new active travel routes.
Wolvershill	1(a) - North of Bypass / North			
	1(b) - North of Bypass / Southwest			
	1(c) - North of Bypass / Southeast			
	2 - South of Banwell Bypass			

3.9 Some key points from the Appraisal Framework are set out in **Table 3-3**:

Table 3-3: Appraisal Framework Summary – Objective 2, Wolvershill

All Wolvershill Sites:

- Multi modal and active travel routes within vicinity of all sites (Strawberry Line (Route 26) and Route 33), however missing links to directly link to the candidate sites.
- Good opportunities for improved and new routes, particularly to tie into the railway station, the existing Route 33 and Strawberry Lane, utilising rural roads and new links.
- All sites are broadly comparable in terms of maximising opportunities for active travel, as each could contribute positively to new routes. The Stage 3 TA highlighted the importance of supporting active travel connectivity with any site allocations, as well as considering more 'strategic' routes. Site 1(a) is marginally more reliant on additional links to Banwell Bypass and the A371 than other sites, resulting in a slightly lower score.

Objective 3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.

		Existing		Future Potential
		Proximity to existing rail station	Proximity to existing bus routes	Opportunity to benefit from or support public transport improvements
Wolvershill	1(a) - North of Bypass / North			
	1(b) - North of Bypass / Southwest			
	1(c) - North of Bypass / Southeast			
	2 - South of Banwell Bypass			

3.10 Some key points from the Appraisal Framework are set out in Table 3-4:

Table 3-4: Appraisal Framework Summary – Objective 3, Wolvershill

All Wolvershill Sites:

- A371 including Banwell BSIP route (subject to funding) – Sites 1(a) and 1(c) are further from bus routes than sites 1(b) and 2.
- Wolvershill Road bus route will enhance public transport.
- Walking accessibility to public transport routes better for sites 1(b) and 2, owing to proximity to existing highway network.
- All sites within 5km of Worle Station, site 1(a) has better accessibility than other candidate sites

Objective 4. To reduce the impact of vehicle travel on the highway network, including in terms of congestion, safety and the quality of our natural and built environment.

3.11 In terms of scoring in relation to transport modelling for Wolvershill candidate sites, it has been assumed that Wolvershill Road is "access only" to the northern part of the development, and access to the southern part of the development is via Summer Lane. The northern section of Wolvershill Road is assumed to remain open for access. This is in line with the preferred option for the Access and Movement Framework, set out below.

3.12 Site 2 has not been included as housing within the modelling or access and movement framework as this area is not proposed for allocation within the draft local plan. The draft proposals for this area are for development well-connected to WSM and Banwell, but not for an extension to Banwell in order to retain the separate identity of Banwell. It is therefore important to provide a separation between development and Banwell Village.

		Existing	Future Potential	
		Proximity to, and potential impacts upon congestion hotspots	Potential for mitigation measures to address congestion hotspots	Potential to deliver strategic benefits
Wolvershill	1(a) - North of Bypass / North			
	1(b) - North of Bypass / Southwest			
	1(c) - North of Bypass / Southeast			
	2 - South of Banwell Bypass	*Not Modelled*		

3.13 Some key points from the Appraisal Framework are set out in **Table 3-5**:

Table 3-5: Appraisal Framework Summary – Objective 4, Wolvershill

All Wolvershill Sites:

- Closure of Wolvershill Road to general traffic to create Active Travel and Bus Spine.

1(a) - North of Bypass / North	1(b) - North of Bypass / Southwest	1(c) - North of Bypass / Southeast	2 - South of Banwell Bypass
• Comparable results across sites 1(a), 1(b) and 1(c), assuming Wolvershill Road is "access only". • Moderate impacts on congestion at Banwell Road at its eastern extent at its junction with A371. • Mitigation options and requirements consistent across all sites. Junction capacity improvements, more challenging mitigation to address rural roads.			• Not modelled. However, it would be reasonable to conclude that traffic impact would be proportionate to that of other OAs accessed onto the Bypass.

What are Junction Capacity Improvements?
Changes to the form of a junction, improved junction infrastructure, or upgrades to its operation that results in reduced queuing or delay at a junction.

Appraisal Framework Summary

3.14 A summary of the Appraisal Framework outcomes is shown below. **Table 3-6** identifies key areas where the Opportunity Areas differ in scoring, and what could be needed to improve performance.

			Wolvershill Opportunity Areas			
			1(a) - North of Bypass / North	1(b) - North of Bypass / Southwest	1(c) - North of Bypass / Southeast	2 - South of Banwell Bypass
Objective 1. To reduce the need to travel, and the distances that people will need to travel, to access key opportunities, facilities and services including employment, leisure and retail.	Education	Proximity to existing primary school				
		Proximity to existing secondary school				
		Potential for on-site education provision				
	Employment	Accessibility to on-site employment				
	Local Centre / Retail	Proximity to town / significant centre				
		Proximity to local centre				
		Accessibility to on-site retail				
Objective 2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.	Existing	Accessibility to designated active travel routes				
	Future Potential	Potential benefit from planned active travel routes				
		Potential for creation of new active travel routes				
Objective 3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.	Existing	Proximity to existing rail station				
		Proximity to existing bus routes				
	Future Potential	Opportunity to benefit from or support public transport improvements				
Objective 4. To reduce the impact of vehicle travel on the highway	Existing	Proximity to, and potential impacts upon congestion hotspots				

			Wolvershill Opportunity Areas			
			1(a) - North of Bypass / North	1(b) - North of Bypass / Southwest	1(c) - North of Bypass / Southeast	2 - South of Banwell Bypass
network, including in terms of congestion, safety and the quality of our natural and built environment.	Future Potential	Potential for mitigation measures to address congestion hotspots				
		Potential to deliver strategic benefits				

Table 3-6: Opportunity Area Key Performance Differences and Improvements - Wolvershill

Key Difference in Appraisal Framework Score	Opportunity Area Comments	Potential Options for Improvement
Proximity to existing primary education	Sites 1(a), 1(b) and 1(c) score significantly lower than site 2	• Provision of additional education facilities as part of the Opportunity Area • Ensure active travel and public transport links to existing facilities are enhanced to increase potential accessibility by sustainable modes
Proximity to Local Centre	Sites 1(a), 1(b) and 1(c) score lower than site 2	• Provision of a new local centre as part of the development of the Opportunity Areas / Growth Area
Proximity to public transport	Sites 1(a) and 1(c) are further from bus routes than sites 1(b) and 2	• Provision of additional services and stops within the opportunity areas • Limited opportunities to improve proximity to rail facilities, however access to railway station by active modes could be improved.
Potential to deliver new active travel routes	Site 1(a) more reliant on additional links to Bypass and A371 links than other sites	• Changes in character of surrounding rural lanes to be more amenable to active travel, to facilitate active travel to local amenities • May require additional investment for site 1(a) in comparison to other sites
Potential to deliver strategic benefits	Site 2 scores lower than other sites	• None identified - Sites 1(a), (b) and (c) would directly benefit from closure of Wolvershill Road, whereas site 2 has less direct benefit.

Wolvershill Road Options

3.15 Three options have been considered in regard to vehicular access on Wolvershill Road:

1. Retain Wolvershill Road in current form and use as vehicle access. Design and traffic management measures would be required to manage the impact of vehicles routeing through the centre of the development.
2. Close Wolvershill Road to all vehicles, except for buses. This retains access for residents, buses, cycling, walking & horse riding and provides a car-free high street. Wolvershill Road used as access for northern part of the development.
3. Close Wolvershill Road to all vehicles except for buses, (retain access for residents, buses, walking, cycling and horse riding) but still allow for through-traffic via an alternative, less attractive route within the development towards the eastern edge.

3.16 Each of these options meets the objectives of a non-car-based development to a greater or lesser extent. **Table 3-7** summarises the pros and cons of each access option.

Table 3-7: Wolvershill Road Vehicle Access Options

Option	Pros	Cons
1. Retain Wolvershill Road in current form and use as vehicle access	• Existing centrally located spine road to serve development access.	• Fails to deliver a 'high street' prioritising people and design over the private car. • Increased vehicular traffic on Wolvershill Road, leading to potential congestion issues once development is in place. • Access strategy prioritises vehicles.
2. Close Wolvershill Road to through vehicles, except for buses.	• Significantly reduces vehicle traffic on Wolvershill Road, for a safer, virtually vehicle-free environment. • Greater potential to reallocate road space on the existing Wolvershill Road bridge over the M5 to active travel. • Prioritises the use of sustainable modes (including Public Transport) to move to/from and through the development.	• Potential to increase traffic on surrounding roads / lanes. • Requires higher capacity junction provision on more strategic routes.
3. Close Wolvershill Road to through traffic, but still allow for through-traffic via a less attractive route	• Retains access but encourages a reduction in vehicle through-movements due to the diversion. • Improves quality of central environment for sustainable modes.	• Maintains vehicular access on Wolvershill Road, with no opportunity to reallocate road space on Wolvershill Road bridge over the M5 to active travel. • Does not prioritise active travel and public transport over car use to the same extent as Option 2.

Modelling of Wolvershill Road "access only"

3.17 Modelling has been undertaken to understand potential differences between the options for Wolvershill Road, both for the road and immediate surroundings, and the wider highway network.

3.18 The modelled impact on congestion hotspots resulting from delivery of sites 1(a), 1(b) and 1(c) are broadly consistent with each other in both the 'Wolvershill Road "retained in current form" and 'Wolvershill Road "access only"' scenarios.

3.19 Figure 3-5 and Figure 3-6 show the difference in traffic flow between the two scenarios 'Wolvershill Road "retained in current form" and 'Wolvershill Road "access only"' with local plan allocations. The width of the line is indicative of the degree of change in traffic flow, with green indicating a reduction in traffic flow, and blue representing an increase in traffic flow. These plots demonstrate that the key outcome of Wolvershill Road becoming "access only" is a redistribution of traffic across the network. It should be noted that the model at this stage cannot represent the potential mode shift, i.e. traffic flow reduction, that it likely to occur as a result of prioritising sustainable modes over the ease of private car travel. This will be taken account of within subsequent iterations of the modelling and inform the assessment to be submitted for examination, by understanding the amount of mode shift and subsequent reduction of car trips.

Figure 3-5: Traffic Flow Difference Plot AM Peak Hour - 'Wolvershill Road "access only" - 'Wolvershill Road "retained in current form"' scenarios

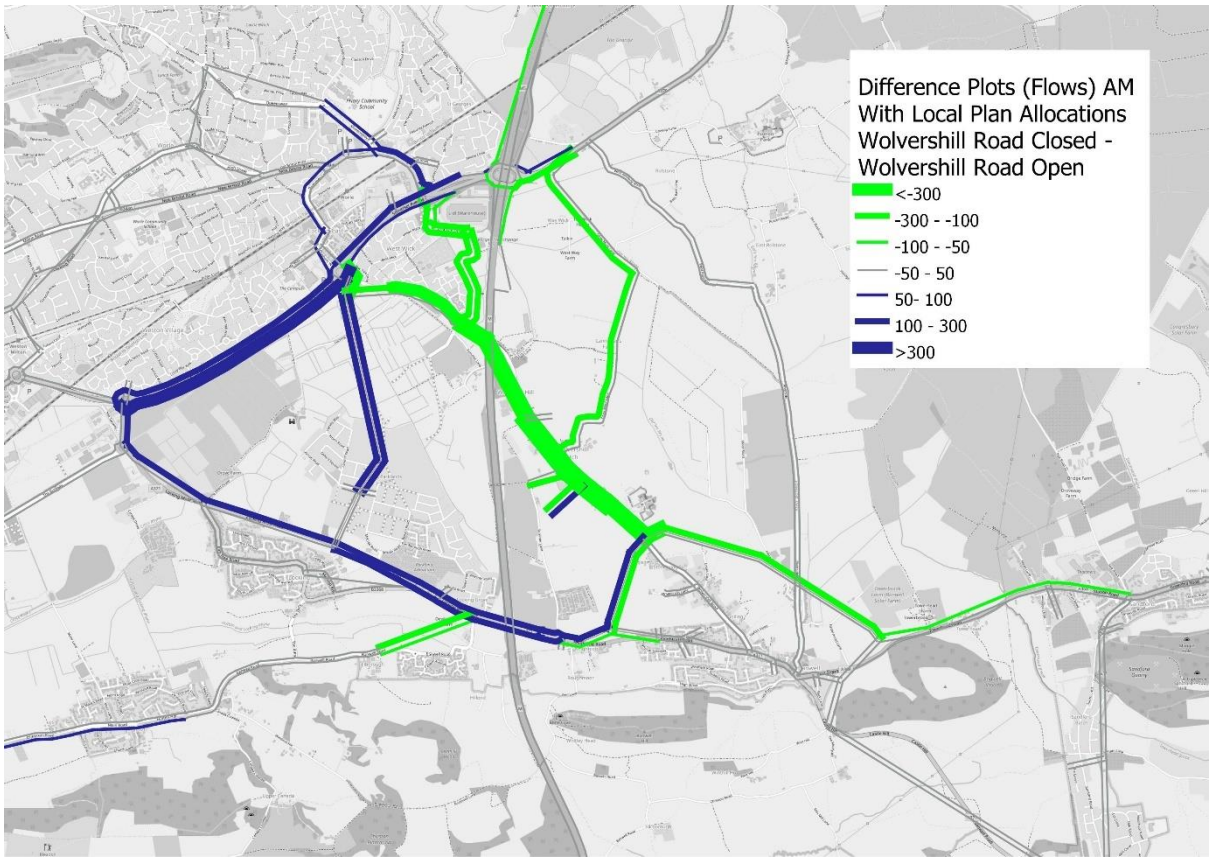
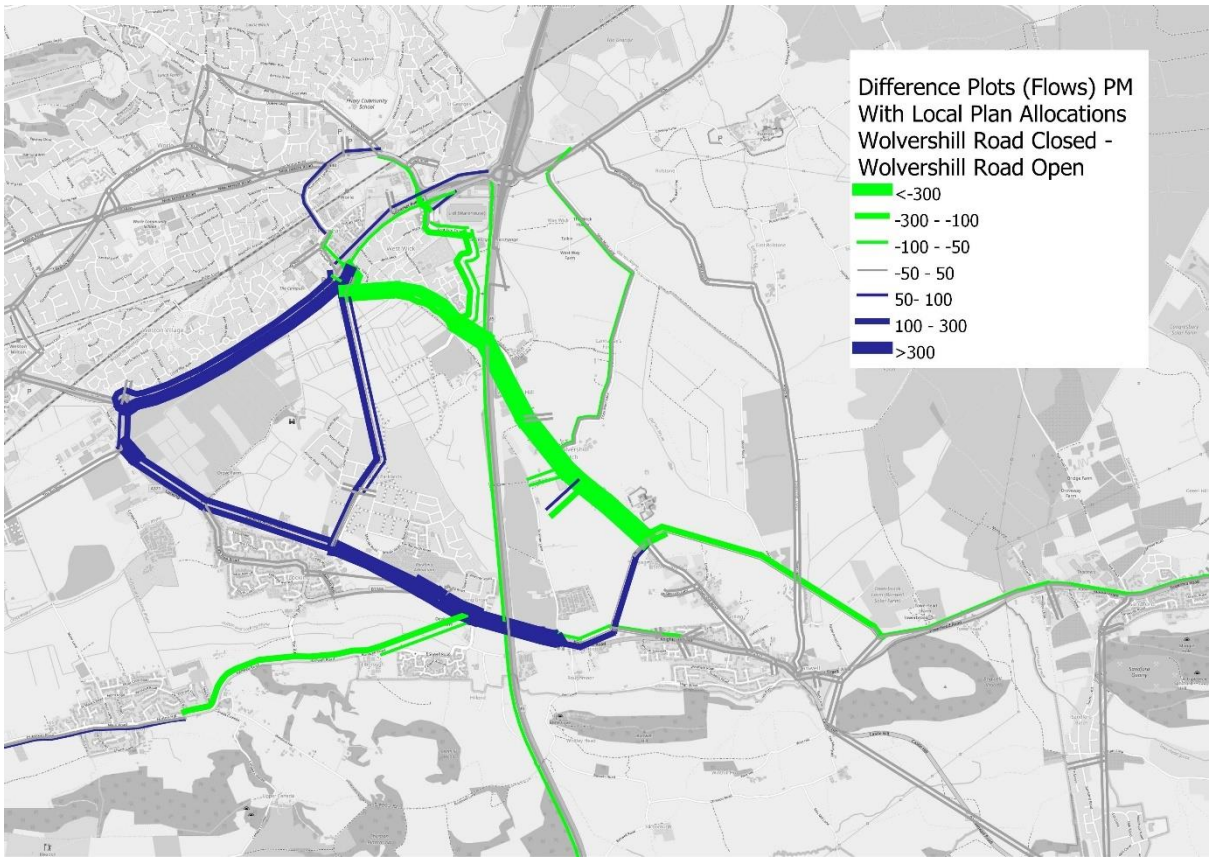


Figure 3-6: Traffic Flow Difference Plot PM Peak Hour - 'Wolvershill Road "access only" - 'Wolvershill Road "retained in current form"' scenarios



3.20 Across both the AM and PM peak hours, reduced traffic flows are seen along the A368 east of the bypass, Banwell bypass east of Wolvershill Road, Banwell Road on its approach to the A371 at its northern extent, along Silver Moor Lane, and Scot Elm Drive between Wolvershill Road and the A370 near Junction 21 of the M5.

3.21 A corresponding increasing in traffic flows are seen on the A371 west of Banwell Bypass, the A370 north of Airport Roundabout, and the north south link between the A371 to the south and Churchland Way to the north,

3.22 For the most part, increases in traffic are limited to higher order roads which are more appropriate to carry longer distance traffic, particularly the A370 and A371. It is noted that there are potentially increases in traffic on more sensitive roads, particularly the North South Link through Locking Parklands. The potential to introduce measures to reduce the use of these routes will need to be considered in future assessment stages.

Preferred Option

3.23 As a result of considering three options for Wolvershill Road, the preferred option at this stage is Option 1, to make Wolvershill Road “access only” for general traffic, meaning that it cannot be used to drive between Worle and the Banwell Bypass. This is promoted for multiple reasons:

- It will support sustainable travel through creating an active travel and public transport focused community, with sustainable modes prioritised over private car usage.
- Allows delivery of high quality public space and quality design without the impact of needing to cater for the private car.
- It allows the creation of a “High Street” style local centre, with an attractive car-free environment.
- It provides bus priority and contributes to the delivery of a wider public transport network.
- Through reducing traffic volumes, Wolvershill Road towards the existing village of Banwell can become an attractive cycling and walking route between the new and existing communities. Wolvershill Road towards Worle can become an attractive cycling and walking route between the new community and Worle Railway Station and the district centre at Elmham Way.

3.24 Other options for Wolvershill Road have not been definitively ruled out at this consultation stage. However for the purposes of analysis and modelling, the preferred option has been applied for the access arrangements to the Wolvershill Growth Area at this stage.

Access and Movement Parameters

3.25 The emerging Access and Movement Framework options for the Wolvershill Growth Area are shown at **Figure 3-7** and discussed in **Table 3-8**, and summarised by transport mode. As mentioned in point 3.12, Site 2 has been

excluded from inclusion within the local plan for reasons other than Transport. As such, the access and movement framework is based on the inclusion of sites 1(a), (b) and (c).

3.26 At this stage, a preferred transport option, containing a selection of interventions has been developed, with a number of potential alternatives included alongside this. The preferred option includes a network of attractive Active Travel Routes, features flexibility for bus services, and seeks to prioritise sustainable travel over car usage.

Figure 3-7: Access and Movement Framework – Wolvershill

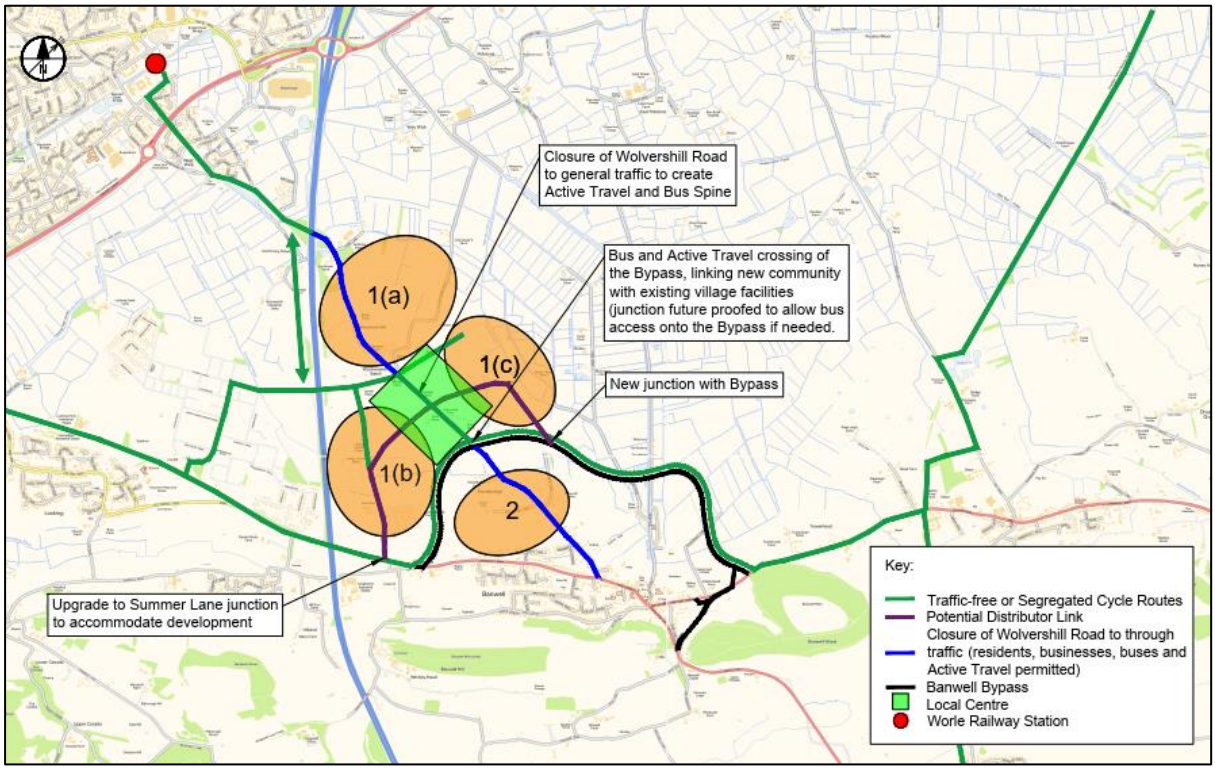


Table 3-8: Access and Movement Parameters – Wolvershill

Transport Mode	Preferred Option	Alternative
	• Car-free High Street, and Wolvershill Road becoming an Active Travel Spine. • Summer Lane, to the west of the new internal multi-modal distributor link, to become an active travel route (with access to properties maintained / through movements prohibited by vehicle filters), crossing the M5 via existing bridge and connecting with Locking. • Agricultural bridge access to Secondary School & Locking Parklands, as well as Worle Station & Elmham Way.	• The agricultural bridge has been considered for use by buses but is not wide enough to function as both a bus and active travel route. Sufficient alternatives exist for buses and therefore it is prioritised for active travel.

What is meant by Multi-Modal?

A route designed to accommodate all modes of travel, typically with excellent walking and cycling facilities as well as facilitating vehicles.

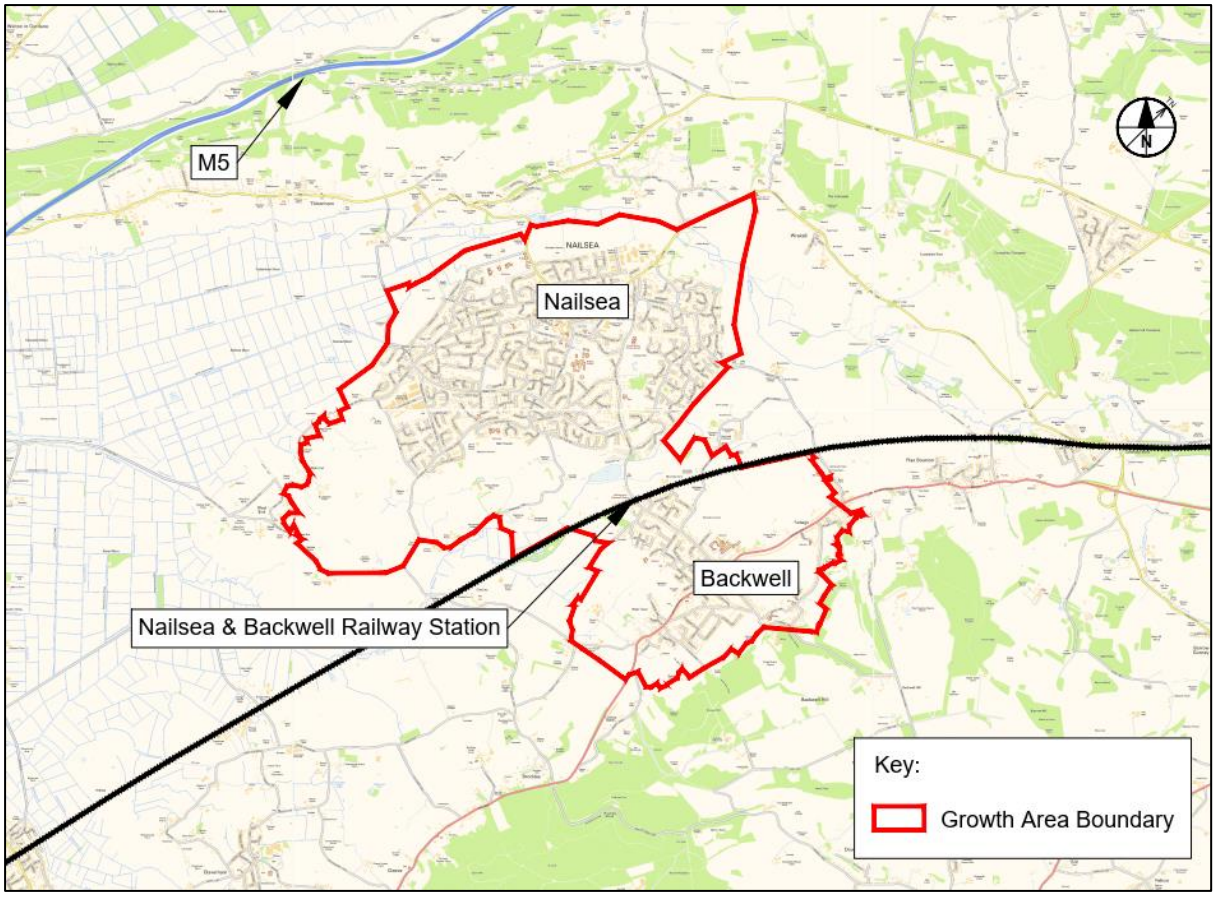
Transport Mode	Preferred Option	Alternative
	• Silver Moor Lane, to the east of the new internal multi-modal distributor link, to become a more attractive route for walkers, cyclists and horse riders through reducing vehicle speeds and associated infrastructure to reduce its attractiveness to vehicles (ensuring access to properties is maintained). • Active travel enhancements on route to Worle Station. This would need to include enhancements on the existing bridge over the M5, subject to investigation. • Active travel facilities on Banwell bypass (being provided by the bypass) to connect with proposed facilities on A371. • A371 cycling & walking improvements linking to Locking Parklands and Locking Village. • Connections to Strawberry Line to the east either via existing tracks accessed via Silver Moor Lane or via Banwell Bypass / upgraded provision on A368.	
	• Buses provided priority along Wolvershill Road, as well as an internal link between the Summer Lane access and the access onto the Bypass East of Wolvershill Road, all provide significant flexibility and priority to deliver an attractive bus network. • Provides flexibility for bus routeing for numerous options for loop arrangements. These all include routeing along Wolvershill Road and the A371, with multiple options within the development and Banwell, supported by bus-only sections to provide priority and limit congestion. Bus priority at specific access junctions may need to be investigated.	• A potential bus connection into Locking Parklands over the existing M5 Agricultural Bridge has been considered but not taken forwards due to effect on quality of the bridge as an active travel route.

Transport Mode	Preferred Option	Alternative
	• Vehicular access from an upgraded Summer Lane/A371 junction, and a new junction on the Bypass to the east of Wolvershill Road. • Internal distributor link between these junctions. • Wolvershill Road would become 'Access Only' between internal multi-modal distributor link and Banwell bypass, with an appropriate vehicle filter to prohibit through movements by vehicular traffic. • Use of rural lanes by general traffic to be reviewed holistically to determine suitable routes.	• Alternatives to Wolvershill Road becoming "access only" include an alternative general traffic route parallel to Wolvershill Road which provides the connection but is less direct and attractive to general traffic, or a traditional approach of providing vehicular access between Wolvershill Road and the Bypass, with traffic management on Wolvershill Road to regulate vehicular speed and dominance.

Nailsea and Backwell

3.27 The boundary for the 'Nailsea and Backwell' Growth Area is shown below on **Figure 3-8.**

Figure 3-8: Growth Area – Nailsea and Backwell Area of Search



Summary of Opportunity Areas

3.28 The Opportunity Areas for assessment within the Nailsea and Backwell Growth Area are shown below on **Figure 3-9**. For the purpose of the appraisal exercise, the areas are referred to as follows:

1. Nailsea Northern Extension;
2. West of Station Road / North of Railway Line;
3. East of Station Road / North of Railway Line;
4. West of Station Road / South of Railway Line;
5. East of Station Road / South of Railway Line; and
6. Nailsea Western Extension.

Figure 3-9: Opportunity Areas – Nailsea and Backwell

Issues and Opportunities for Transport Network

3.29 The issues and opportunities in relation to the transport network surrounding the Growth Area and respective Opportunity Areas are summarised in **Table 3-9**.

Table 3-9: Issues and Opportunities – Nailsea and Backwell

Issues	Opportunities
• Backwell Crossroads is a heavily congested, physically constrained junction. • Presence of railway line causes severance between Nailsea and Backwell, and currently has a limited number of vehicular and Active Travel crossing points. • Poor walking facilities on Station Road. • Station Road Rail Bridge can cause congestion due to one-way working, and is a constraint on the bus network due to height restriction precluding double-decker buses.	• A370 public transport corridor. • Rail Station provides access to train services to Bristol, Weston-super-Mare, and further afield. • Potential to improve Active Travel connections to Festival Way cycle route, providing access into Bristol. • Improvement of accessibility to bus services operating between Nailsea and Backwell. • Creation of, or improvement to existing, railway crossing points which prioritise Active Travel modes and reduce severance between Nailsea and Backwell. • Walking improvements planned for Station Road, Clevedon Road and the B3130 as part of LCWIP (Routes W18 & W19). • Cycling improvements planned for Station Road, Festival Way and the B3130 as part of LCWIP (Routes C13 & C14).

Issues	Opportunities
	• Potential to improve facilities at Nailsea and Backwell Railway Station, particularly catered towards Active Travel users.

Appraisal Framework

3.30 This section sets out outcomes of the appraisal framework for each of the candidate sites, based on the methodology detailed in Section 2. For each objective, the RAG score has been presented along with highlighting any key findings from the appraisal framework process. A copy of the RAG scoring for the Appraisal Framework is shown at **Figure 3-10**.

Figure 3-10: Appraisal Framework RAG Scoring

Objective 1: To reduce the need to travel, and the distances that people will need to travel, to access key opportunities, facilities and services including employment, leisure and retail.

		Education			Employ-ment	Local Centre / Retail		
		Proportion of total development within 800m of an existing	Proportion of total development within 2km of an existing secondary	Potential for on-site education provision	Accessibility to on-site employment	Distance by walking or cycling to a town centre / significant centre.	Distance by walking or cycling to a local centre.	Accessibility to on-site retail.
Nailsea & Backwell	1 - Nailsea Northern Extension							
	2 - West of Station Road / North of Railway Line							
	3 - East of Station Road / North of Railway Line							
	4 - West of Station Road / South of Railway Line							
	5 - East of Station Road / South of Railway Line							
	6 - Nailsea Western Extension							

3.31 Some key points from the Appraisal Framework are set out in **Table 3-10**:

Table 3-10: Appraisal Framework Summary – Objective 1, Nailsea and Backwell

All Nailsea & Backwell Sites:

- All sites within proximity of Nailsea School (secondary) and / or Backwell School (secondary)
- Insufficient information available at this stage to inform provision of on-site educational, employment and retail facilities.

1 - Nailsea Northern Extension	2 - West of Station Road / North of Railway Line	3 - East of Station Road / North of Railway Line	4 - West of Station Road / South of Railway Line	5 - East of Station Road / South of Railway Line	6 - Nailsea Western Extension
• Proximity to Kingshill Church School (primary) • Good proximity to Nailsea town centre.	• Proximity to Hannah More Infants School. • Reasonable proximity to Nailsea town centre.	• Proximity to St Francis Catholic Primary School, Backwell School and West Leigh Infants School. • Reasonable proximity to Nailsea town centre.	• Proximity to West Leigh Infants School as well as Backwell School. • Poor proximity to Nailsea town centre, good proximity to Backwell centre.	• Proximity to Backwell School as well as West Leigh Infants School. • Poor proximity to Nailsea town centre, good proximity to Backwell centre.	• Not within 800m of primary school. • Reasonable proximity to Nailsea town centre, reasonable proximity to Backwell centre.

Objective 2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.

		Existing	Future Potential	
		Accessibility to designated active travel routes.	Potential benefit from planned active travel routes.	Potential for creation of new active travel routes.
Nailsea & Backwell	1 - Nailsea Northern Extension			
	2 - West of Station Road / North of Railway Line			
	3 - East of Station Road / North of Railway Line			
	4 - West of Station Road / South of Railway Line			
	5 - East of Station Road / South of Railway Line			
	6 - Nailsea Western Extension			

3.32 Some key points from the Appraisal Framework are set out in **Table 3-11**:

Table 3-11: Appraisal Framework Summary – Objective 2, Nailsea and Backwell

1 - Nailsea Northern Extension	2 - West of Station Road / North of Railway Line	3 - East of Station Road / North of Railway Line	4 - West of Station Road / South of Railway Line	5 - East of Station Road / South of Railway Line	6 - Nailsea Western Extension
• No planned benefits from LCWIP, Coastal Cycle Network. • Some potential for E-W movements. • Potential for development to make improvements to routes to the town centre from North Nailsea area.	• Missing links to Festival Way and Avon Cycleway. • LCWIP ambitions to provide improved walking / cycling link between Nailsea and Backwell centres. • Planned links Avon Cycleway to Festival Way (Route 33). • Potential N-S link in conjunction with site 4. • Link via Youngwood Lane to town centre. Potential to provide link to the railway station	• Proximity to Festival Way. • LCWIP ambitions to provide improved walking / cycling link between Nailsea and Backwell centres. • Planned links Avon Cycleway to Festival Way (Route 33). • Link to Nailsea town centre via existing cycle infrastructure on Station Road. Potential to provide link to railway station.	• Missing links to Festival Way and Avon Cycleway • LCWIP ambitions to provide improved walking / cycling link between Nailsea and Backwell centres. • Planned links Avon Cycleway to Festival Way (Route 33). • Potential N-S link in conjunction with site 2.	• Proximity to Festival Way • LCWIP ambitions to provide improved walking / cycling link between Nailsea and Backwell centres. • Planned links Avon Cycleway to Festival Way (Route 33). • Potential to provide link along south of railway line.	• Limited accessibility to active travel routes • Existing Avon Cycleway runs adjacent to south of site, but no links to Festival Way.

Objective 3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.

		Existing		Future Potential
		Proximity to existing rail station	Proximity to existing bus routes	Opportunity to benefit from or support public transport improvements
Nailsea & Backwell	1 - Nailsea Northern Extension			
	2 - West of Station Road / North of Railway Line			
	3 - East of Station Road / North of Railway Line			
	4 - West of Station Road / South of Railway Line			
	5 - East of Station Road / South of Railway Line			
	6 - Nailsea Western Extension			

3.33 Some key points from the Appraisal Framework are set out in **Table 3-12**:

Table 3-12: Appraisal Framework Summary – Objective 3, Nailsea and Backwell

1 - Nailsea Northern Extension	2 - West of Station Road / North of Railway Line	3 - East of Station Road / North of Railway Line	4 - West of Station Road / South of Railway Line	5 - East of Station Road / South of Railway Line	6 - Nailsea Western Extension
• Reasonably poor accessibility to existing rail facilities. • Some potential to access existing bus routes • Limited potential for public transport improvements.	• Excellent accessibility to existing rail station • Limited accessibility to bus routes. • Excellent potential for public transport improvements including benefit from the BSIP A370 route.	• Good accessibility to existing rail facilities. • Limited accessibility to bus routes • Excellent potential for public transport improvements including benefit from A370 BSIP route	• Good accessibility to existing bus and rail facilities. • Excellent potential for public transport improvements including benefit from A370 BSIP route	• Good accessibility to existing bus and rail facilities. • Excellent potential for public transport improvements including benefit from A370 BSIP route	• Poor accessibility to existing bus and rail facilities. • Poor potential for public transport improvements including benefit from A370 BSIP route

Objective 4. To reduce the impact of vehicle travel on the highway network, including in terms of congestion, safety and the quality of our natural and built environment.

		Existing	Future Potential	
		Proximity to, and potential impacts (capacity and safety) upon, congestion hotspots	Potential for mitigation measures to address congestion hotspots	Potential to deliver strategic benefits
Nailsea & Backwell	1 - Nailsea Northern Extension			
	2 - West of Station Road / North of Railway Line			
	3 - East of Station Road / North of Railway Line	*Not Modelled*		
	4 - West of Station Road / South of Railway Line			
	5 - East of Station Road / South of Railway Line			
	6 - Nailsea Western Extension			

3.34 Some key points from the Appraisal Framework are set out in **Table 3-13**:

Table 3-13: Appraisal Framework Summary – Objective 4, Nailsea and Backwell

All Nailsea & Backwell Sites:

- Very limited options for changes to Station Road itself, would require significant infrastructure.
- Excellent potential for strategic benefits, particularly a combination of sites 2 to 5.

1 - Nailsea Northern Extension	2 - West of Station Road / North of Railway Line	3 - East of Station Road / North of Railway Line	4 - West of Station Road / South of Railway Line	5 - East of Station Road / South of Railway Line	6 - Nailsea Western Extension
• Minimal increase at key points including Station Road / Backwell Crossroads , Wraxall Hill, Portbury Lane. Emerging congestion on Brockley Lane in PM peak. • Unlikely that walking and cycling provisions will have much benefit	• Significant impact at Station Road / Backwell Crossroads AM. • Moderate impact on Station Road / Backwell Crossroads , and A370 between Brockley Lane and Chelvey Road. Slight increase on	• Not modelled as does not form part of proposed allocation in draft local plan. Area is mostly within the flood zone. Reasonable to conclude that impacts would be comparable with Site 2. • Excellent potential for strategic benefits,	• Significant impact on A370 AM and PM. • Slight increase on Station Road / Backwell Crossroads , Wraxhall Lane and Brockley Combe Road in AM peak. • Slight increase on Brockley Combe Road,	• Slight increase on A370 west in AM and PM peaks. • Slight increase on Brockley Combe Road and emerging congestion on A370 east of Station Road in PM peak.	• Significant impact on A370 west of Station Road in AM peak. • Emerging congestion on A370 east of Station Road and Brockley Lane in PM peak.

All Nailsea & Backwell Sites:

- Very limited options for changes to Station Road itself, would require significant infrastructure.
- Excellent potential for strategic benefits, particularly a combination of sites 2 to 5.

1 - Nailsea Northern Extension	2 - West of Station Road / North of Railway Line	3 - East of Station Road / North of Railway Line	4 - West of Station Road / South of Railway Line	5 - East of Station Road / South of Railway Line	6 - Nailsea Western Extension
• Minor junction capacity improvements. • A highway link between the B3130 Clevedon Road to the west of the site and the B3130 Clevedon Road to the east of the site would be provide some strategic benefit to allow carriage space reallocation on High Street and Stockway North to active travel	Wraxall Hill and Portbury Lane in PM peak.	particularly a combination of sites 3, 4 and 5.	Portbury Lane. and A370 east of Brockley Lane in PM peak.		

Appraisal Framework Summary

3.35 A summary of the Appraisal Framework outcomes is shown below. **Table 3-14** identifies key areas where the Opportunity Areas differ in scoring, and what could be needed to improve performance.

			Nailsea and Backwell Opportunity Areas					
			1 - Nailsea Northern Extension	2 - West of Station Road / North of Railway Line	3 - East of Station Road / North of Railway Line	4 - West of Station Road / South of Railway Line	5 - East of Station Road / South of Railway Line	6 - Nailsea Western Extension
Objective 1. To reduce the need to travel, and the distances that people will need to travel, to access key opportunities, facilities and services including employment, leisure and retail.	Education	Proximity to existing primary school						
		Proximity to existing secondary school						
		Potential for on-site education provision						
	Employment	Accessibility to on-site employment						
	Local Centre / Retail	Proximity to town / significant centre						
		Proximity to local centre						
		Accessibility to on-site retail						
Objective 2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.	Existing	Accessibility to designated active travel routes						
	Future Potential	Potential benefit from planned active travel routes						
		Potential for creation of new active travel routes						
Objective 3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.	Existing	Proximity to existing rail station						
		Proximity to existing bus routes						
	Future Potential	Opportunity to benefit from or support public transport improvements						

			Nailsea and Backwell Opportunity Areas					
			1 - Nailsea Northern Extension	2 - West of Station Road / North of Railway Line	3 - East of Station Road / North of Railway Line	4 - West of Station Road / South of Railway Line	5 - East of Station Road / South of Railway Line	6 - Nailsea Western Extension
Objective 4. To reduce the impact of vehicle travel on the highway network, including in terms of congestion, safety and the quality of our natural and built environment.	Existing	Proximity to, and potential impacts upon congestion hotspots						
	Future Potential	Potential for mitigation measures to address congestion hotspots						
		Potential to deliver strategic benefits						

Table 3-14: Opportunity Area Key Performance Differences and Improvements – Nailsea and Backwell

Key Difference in Appraisal Framework Score	Opportunity Area Comments	Potential Options for Improvement
Proximity to existing education	Site 6 scores very poorly compared to other sites.	• Provision of additional education facilities as part of the Opportunity Area • Ensure active travel and public transport links to any existing facilities are enhanced to increase potential accessibility by sustainable modes
Proximity to Active Travel routes	Sites 3 and 5 (east of Station Road) score higher than sites 2 and 4 (west of Station Road), but with good potential for improvements.	• Provide additional links to connect to Festival Way, as well as good connectivity to local facilities.
Opportunity to benefit from or support public transport improvements	Sites 1 and 6 score lower than sites 2-5	• Sites 2-5 have potential to benefit from BSIP improvements. Site 1 could benefit from enhanced services between Clevedon and Bristol, but would need greater investment and may not be able to achieve comparable service frequency. Site 6 would be significantly more challenging to deliver improvements.
Potential to deliver strategic benefits	Sites 1 and 6 score lower than sites 2-5	• A route across Site 1 connecting the B3130 Clevedon Road could be investigate, but “strategic” benefits are likely to be lower in scale than for Sites 2-5. • None identified for Site 6 – limited scope for strategic benefits, given accessibility and proximity to other sites and active / public transport routes

Access and Movement Parameters

Rail Crossing

3.36 A key determinant towards the Access and Movement Framework will be the location of a proposed railway crossing between Nailsea and Backwell. There is a requirement for the consideration of a new crossing, for the following reasons:

- Limited existing crossing points of the railway line between Nailsea and Backwell.
- Opportunity to reduce walking / cycling distances between residences and facilities in Nailsea and Backwell.
- Opportunity to improve bus services to Nailsea, including facilitating double decker buses.
- Opportunity to improve HGV access and network resilience to Nailsea.

- Potential to reduce traffic flows in sensitive areas such as Station Road and Backwell Crossroads and encourage mode shift. This could enable improvements to Station Road to improve the environment, including for walking and cycling. This is particularly pertinent as a route to the station and bus routes, and heavy usage by school children.
- Opportunity to create new links between development sites to the north and south of the railway line.

3.37 Thus, the potential to provide an additional rail crossing point is being considered as a strategic measure to address the issues above. The following options are under consideration:

- **Do Nothing** – Existing highway network retained, with all development land available.
- **Do Something 1**: East Multi-Modal – Creation of new multi-modal crossing as part of development east of Backwell, forming a north-south link between Station Road and the A370. This is likely to be in the form of an overline bridge, albeit an alternative of an underline bridge is being investigated.
- **Do Something 2**: East Active Travel – Utilises existing crossing at Backwell Common and existing agricultural crossings for Active Travel. No new crossing infrastructure. Development east of Backwell would be vehicular cul-de-sac access from the A370, with through-routes for Active Travel.

What is meant by Multi-Modal and Active Travel?

Multi-Modal: A route designed to accommodate all modes of travel, including bus, car, freight, and active travel.

Active Travel: A route designed to accommodate walkers, cyclists, horse riders and micro-mobility such as e-scooters.

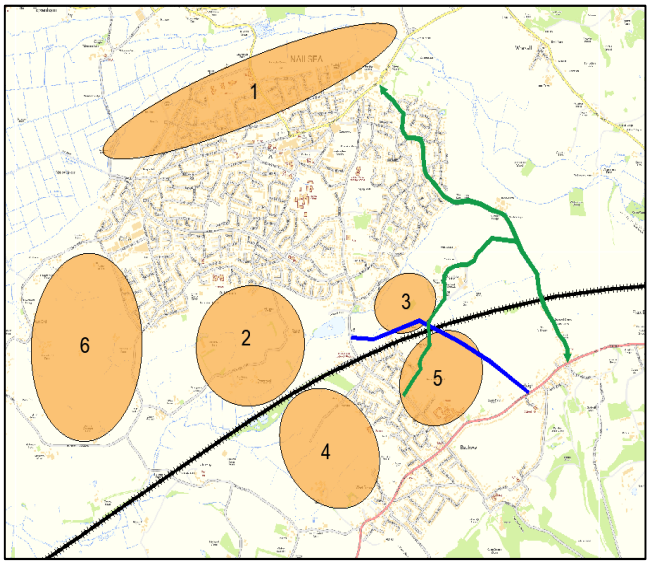
- **Do Something 3**: West Multi-Modal – Creation of new multi-modal crossing (underline bridge) as part of development west of Backwell, forming a north-south link between A370 and Nailsea, likely at Station Road north of the Rail Line.
- **Do Something 4**: West Active Travel – Creation of new Active Travel crossing as part of development west of Backwell, forming a north-south link between A370 and Youngwood Lane / The Perrings.
- **Do Something 5**: Widen existing rail crossing bridge on Station Road.

3.38 AECOM has carried out a high-level review of the potential engineering requirements and the transport case. Environmental considerations have been advised by NSC Environmental colleagues, through discussion with AECOM. The engineering feasibility, as well as the transport and environmental case for each option has been reviewed, and is provided as a summary in **Table 3-15**. Options 'Do Something 1' to 'Do Something 4' are shown on **Figure 3-11**.

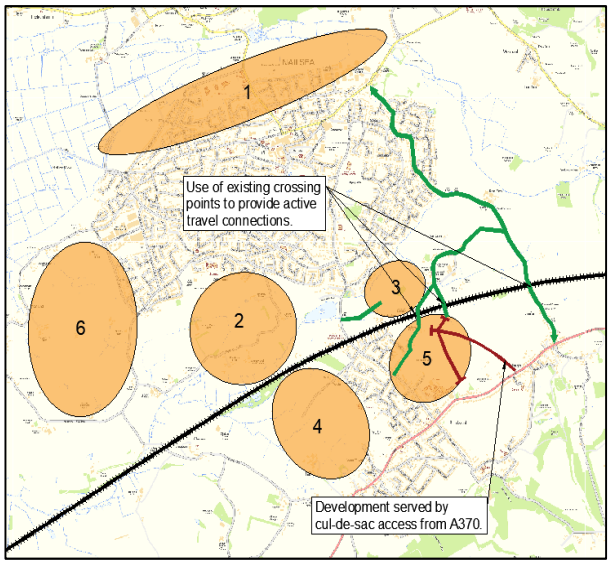
Figure 3-11: Rail Crossing Options

Key: Multi-Modal Link; Active Travel Link; Cul-de-sac; Railway Line

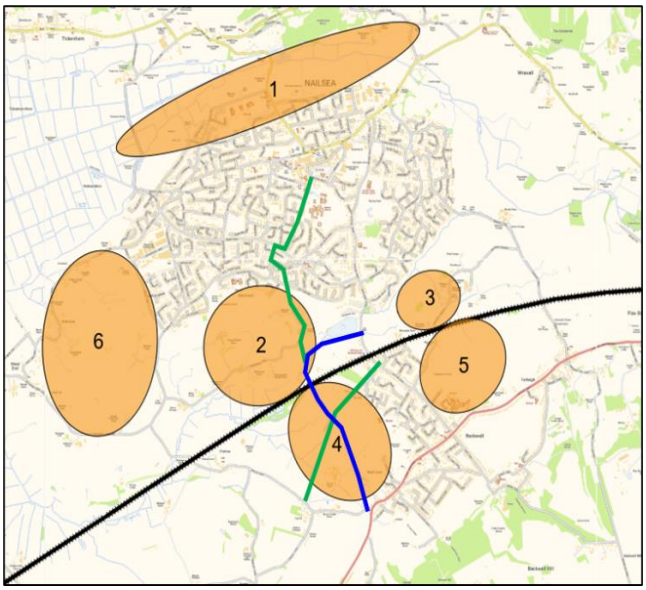
Do Something 1: East Multi-Modal



Do Something 2: East Active Travel



Do Something 3: West Multi-Modal



Do Something 4: West Active Travel

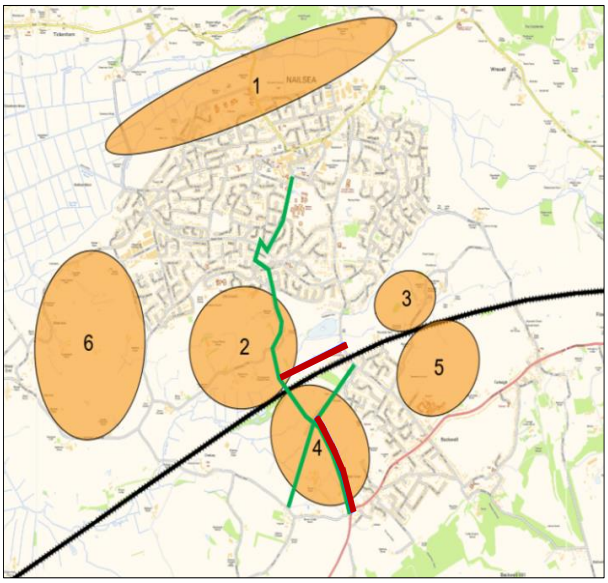


Table 3-15: Review of Rail Crossing Options

Do Nothing

Engineering Case

- No new infrastructure required.

Transport Case

- Increased traffic flows on constrained network with planned growth, with significant impacts.
- No new infrastructure for bus service routeing.
- No new infrastructure targeted towards active travel.

Environmental Case

- No environmental impact.

Do Something 1: East Multi-Modal

Engineering Case

- Eastern crossing would either require a c.12m high structure over the rail line, or a road under which would require a road height of minus 2.5-3m, with substantial drainage issues.
- Principal of overline bridge construction likely to be more favourable to NR than underline (east or west)
- Challenges with height of embankment / substantial ramp structure.
- NSC would need to deliver and maintain,

Transport Case

- Provides alternative route to reduce flows at Station Road / Backwell Crossroads. Best of all options for diverting traffic from Backwell Crossroads.
- Some bus services likely to divert onto new link, bypassing Station Road and Backwell Crossroads, improving journey times. Provides bus linkage between Nailsea and A370
- Development site opportunity to enhance accessibility to Festival Way cycle route.
- Will improve active travel conditions, but not prioritise over car trips.

Environmental Case

- Most visually intrusive option in terms of visual impact.
- Some potential for adverse impact on ecology.
- Located in Green Belt.

- Likely highest carbon construction.
- Outside of flood plain.
- Potential for noise, air quality impacts and contamination.

Do Something 2: East Active Travel

Engineering Case

- Existing crossing points, no new infrastructure required.

Transport Case

- Unlikely to result in significant reductions in traffic flow on Station Road / Backwell crossroads to facilitate the delivery of housing development.
- Potential for mode shift as a result of prioritising north-south active travel connections over vehicles.

Environmental Case

- No new structure, therefore very little environmental impact.

Do Something 3: West Multi-Modal

Engineering Case

- Underline bridge less favourable to NR than overline options
- Engineering likely to be feasible
- Slight lowering of adjacent ground required for road profile – drainage issues and potential effects on the flow of the River Kenn would need further investigation.
- NR to deliver and maintain.
- Likely to require third party land.

Transport Case

- Provides alternative route to Station Road, with reduced flows, albeit less benefit for Backwell Crossroads than DS1
- Opportunity to divert bus services onto new link, with some congestion improvements and journey time benefits, albeit less so than the option to the east. Less of a network improvement than to the east.

  New crossing on west side of Backwell would provide significant active travel benefit over existing situation, suited to north-south desire lines.

Environmental Case

- Located in existing flood zone, with highway drainage unlikely to gravitate to nearest watercourse. Most complex option in terms of drainage and flood risk.
- Some visual impact, as it is likely that a structure will be required alongside the rails.
- Potential for greatest impact in terms of ecology, with proximity to sensitive areas.
- Potential for noise, air quality impacts and contamination.
- Carbon implications, but lower than eastern option.

Do Something 4: West Active Travel

Engineering Case

- As per Do Something 3, with a reduced height & width requirement.
- Likely accommodated within the existing height of the embankment. As a box culvert is unlikely to require structure above the rails.
- Would be built slightly raised to overcome drainage and floor issues, which becomes possible over Do Something 3 due to reduced height requirement.

Transport Case

- Unlikely to provide sufficient congestion relief at Station Road and Backwell Crossroads to facilitate delivery of housing development.
- Potential for mode shift as a result of enhanced north-south active travel connections, albeit unlikely to result in significant reductions in traffic flow.
- New crossing on west side of Backwell would provide significant active travel benefit over existing situation, suited to north-south desire lines.

Environmental Case

- North side of railway in flood zone; second most complex in terms of drainage and flood risk.
- Least visual impact of all structure options.
- Proximity to sensitive species and habitats.

Do Something 5: Widen Existing Rail Crossing

Engineering Case

- NSC has advised land to the south is in their control.
- Engineering feasibility not investigated at this stage.
- Widening may be possible, but providing additional height clearance for double-decker buses is unlikely.

Transport Case

- Would not provide sufficient congestion relief at Station Road and Backwell Crossroads to facilitate delivery of housing development.
- Potential to improve active travel route between Backwell and Nailsea, which is currently served by narrow footway and cycling with traffic.
- Main traffic congestion point is Backwell Cross-roads, so additional capacity at this point may not affect vehicle flow patterns, or result in additional vehicles using Station Road and increasing congestion at Backwell Cross-roads.
- Additional traffic on Station Road would be detrimental to the active travel environment.
- Could improve bus journey times and reliability, but not enable use of double decker buses.

Environmental Case

- Environmental considerations not reviewed at this stage.

3.39 The emerging Access and Movement Framework for the Nailsea and Backwell Growth Area is discussed in **Table 3-16**, and summarised by transport mode. At this stage, the elements listed in the table are set out as strategic transport requirements for Nailsea and Backwell, in order to mitigate the impact of housing development. The intention is that all development sites which come forwards within the growth area will be expected to contribute towards the strategic transport requirements, either through direct delivery or S.106 contributions.

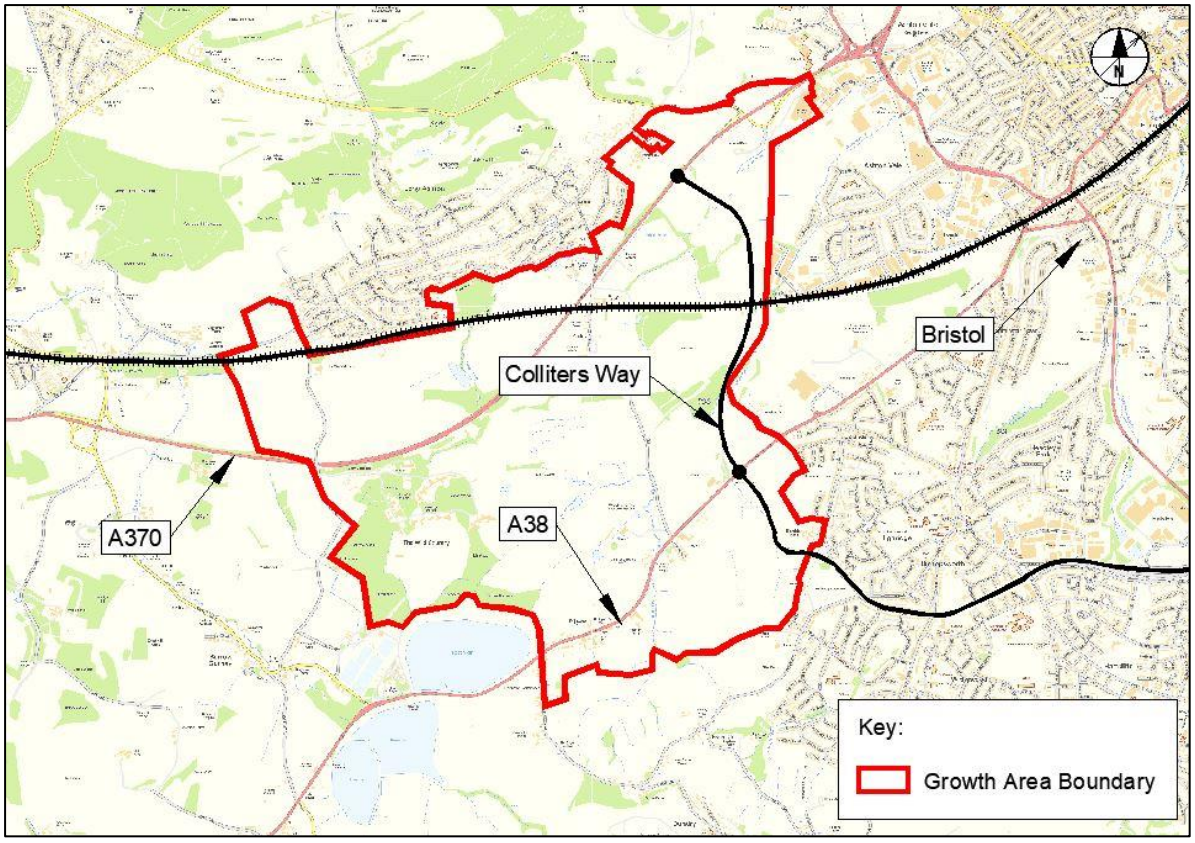
Table 3-16: Access and Movement Parameters – Nailsea and Backwell

Theme	Detail
	• Significant Improvements to active travel routes within and between Nailsea and Backwell, including access to the railway station, use of Youngwood Lane as a north-south connection, and LCWIP schemes. • Management of country lanes to encourage walking, cycling and horse riding, facilitating travel in particular between existing towns and education establishments. • High quality extension of Festival Way active travel route along an east-west alignment between Chapel Hill and Chelvey Road, to serve new development in Backwell and better connect rural lanes to the west of Backwell with the off-road alignment along the railway towards Flax Bourton, without use of the A370 or significant diversion from desire lines.
	• Improvements to bus priority, service frequency, and interchange infrastructure on the A370 High Frequency Bus Corridor. • Improved public transport connections between Nailsea and the A370, enabling interchange. • Access improvements for Nailsea and Backwell Station, and increased provision for cycle parking, bus interchange, and car parking.
	• Package of demand management measures to improve sustainable travel opportunities and reduce car dependency in the area, to alleviate congestion through mode shift. Could include improvements to public transport, personalised travel planning, and investigating car clubs. • Strategic measures designed to alleviate traffic impacts on Station Road, and traffic congestion at the Backwell Cross-Roads. This is likely to include a strategic rail crossing providing an alternative multi-modal route between Nailsea and the A370, and associated measures to discourage traffic from using Station Road, subject to further feasibility review and environmental assessment.

Edge of Bristol

3.40 The boundary for the 'Edge of Bristol' Growth Area is shown below on **Figure 3-12**.

Figure 3-12: Growth Area – Edge of Bristol Area of Search

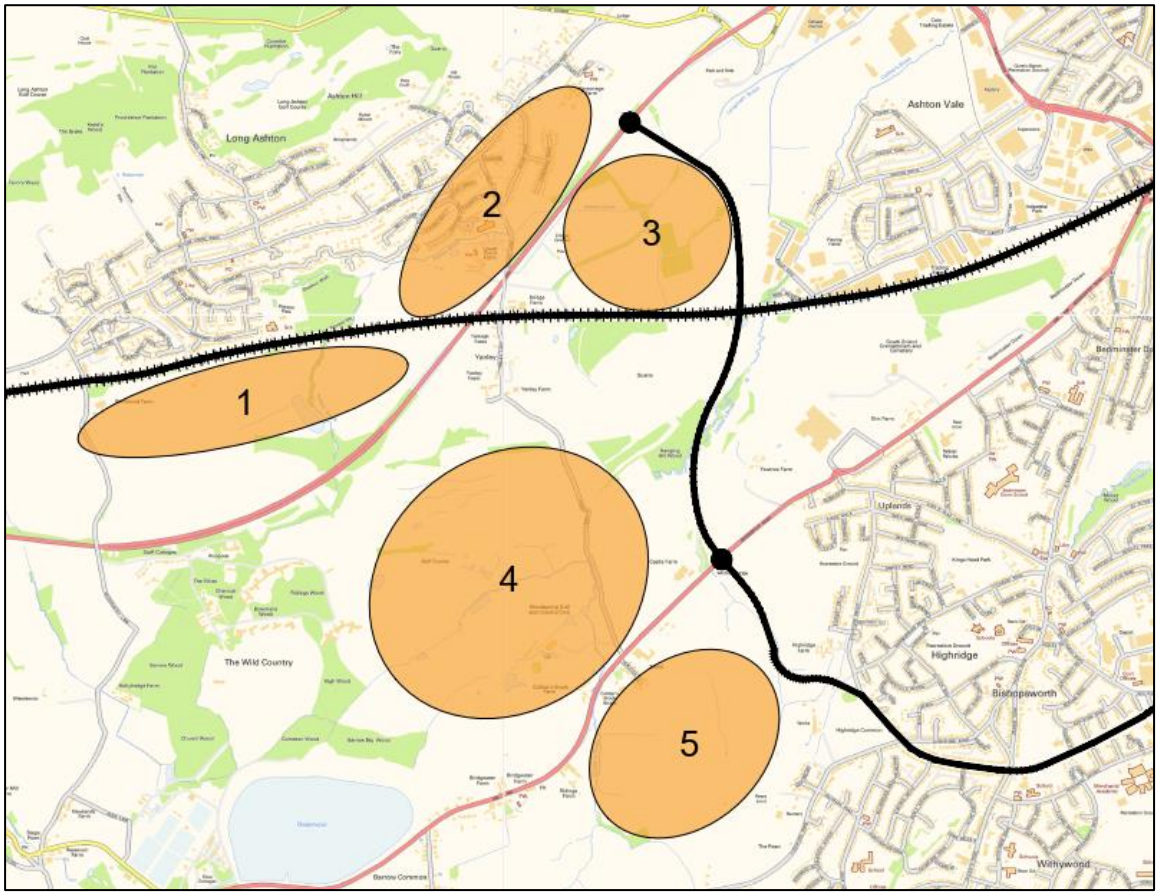


Summary of Opportunity Areas

3.41 The Opportunity Areas for assessment within the Edge of Bristol Growth Area are shown below on **Figure 3-13**. For the purpose of the appraisal exercise, the areas are referred to as follows:

1. North of A370 / South of Railway Line;
2. North of A370;
3. South of A370 / West of A4174;
4. North of A38; and
5. South of A38.

Figure 3-13: Opportunity Areas – Edge of Bristol



Issues and Opportunities for Transport Network

3.42 The issues and opportunities in relation to the transport network surrounding the Growth Area and respective Opportunity Areas are summarised in **Table 3-1.**

Table 3-17: Issues and Opportunities – Edge of Bristol

Issues	Opportunities
• Severance issues caused by the A38, A370, Colliters Way and the railway line. • Limited local facilities within close proximity • Traffic congestion and air quality issues on routes into central Bristol. • Active travel routes into the existing urban area, e.g. towards Parson Street Station require improvement.	• Prospect to capitalise on nearby MetroBus route and incorporate mass transit in due course (Airport to Bristol Centre via A38), via diversions into the development. • Potential to incorporate a new transport interchange within the development. • Potential to create a central transport spine through the development, via Yanley Lane. • Opportunity to directly connect into the city centre and south Bristol, to Festival Way cycle route, as well as creating connections to nearby Active Travel routes such as the Malago Greenway. • Sufficient scale to deliver local facilities.

Appraisal Framework

3.43 This section sets out outcomes of the appraisal framework for each of the Opportunity Areas, based on the methodology detailed in Section 2. For each objective, the RAG score has been presented along with highlighting any key

findings from the appraisal framework process. A copy of the RAG scoring for the Appraisal Framework is shown at **Figure 3-14**.

Figure 3-14: Appraisal Framework RAG Scoring

Objective 1: To reduce the need to travel, and the distances that people will need to travel, to access key opportunities, facilities and services including employment, leisure and retail.

		Education			Employ-ment	Local Centre / Retail		
		Proportion of total development within 800m of an existing	Proportion of total development within 2km of an existing secondary	Potential for on-site education provision	Accessibility to on-site employment	Distance by walking or cycling to a town centre / significant centre.	Distance by walking or cycling to a local centre.	Accessibility to on-site retail.
SW Bristol	1 - North of A370 / South of Railway Line							
	2 - North of A370							
	3 - South of A370 / West of A4174							
	4 - North of A38							
	5 - South of A38							

3.44 Some key points from the Appraisal Framework are set out in **Table 3-18**:

Table 3-18: Appraisal Framework Summary – Objective 1, Edge of Bristol

All Edge of Bristol Sites:

- Predominantly more than 5km to Bristol City Centre, slightly better proximity from sites 1, 2 and 3 than 4 and 5.
- Long Ashton and Ashton Gate act as local centres for from sites 1, 2 and 3.
- Insufficient information available at this stage to inform provision of on-site educational, employment and retail facilities, although it is likely that a Growth Area of this scale could address some existing limitations in terms of these facilities.

1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
• Site predominantly within 800m of Birdwell Primary School	• Site more than 800m from Primary School, but within proximity of Birdwell Primary School	• Site predominantly within 800m of Luckwell Primary School • Proximity to Ashton Park	• No primary schools within 800m of site • No secondary schools within 2km of site	• No primary schools within 800m of site • No secondary schools within 2km of site

All Edge of Bristol Sites:

- Predominantly more than 5km to Bristol City Centre, slightly better proximity from sites 1, 2 and 3 than 4 and 5.
- Long Ashton and Ashton Gate act as local centres for from sites 1, 2 and 3.
- Insufficient information available at this stage to inform provision of on-site educational, employment and retail facilities, although it is likely that a Growth Area of this scale could address some existing limitations in terms of these facilities.

1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
• No secondary schools within 2km of site	and Luckwell Primary School • Proximity to Ashton Park School (secondary)	School (secondary)		

Objective 2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.

		Existing	Future Potential	
		Accessibility to designated active travel routes.	Potential benefit from planned active travel routes.	Potential for creation of new active travel routes.
SW Bristol	1 - North of A370 / South of Railway Line			
	2 - North of A370			
	3 - South of A370 / West of A4174			
	4 - North of A38			
	5 - South of A38			

3.45 Some key points from the Appraisal Framework are set out in **Table 3-19**:

Table 3-19: Appraisal Framework Summary – Objective 2, Edge of Bristol

All Edge of Bristol Sites:

- N/A

1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
• Good proximity to Festival Way • Potential for routes, but issues of severance to overcome.	• Good proximity to Festival Way • Some minor benefit from LCWIP proposals between Long Ashton P&R and Bristol • Potential for routes, but issues of severance to overcome.	• Good proximity to Festival Way • Some minor benefit from LCWIP proposals between Long Ashton P&R and Bristol • Potential for routes, but issues of severance to overcome.	• Largely missing links to Festival Way and other walking and cycling routes • Work needed on active travel connections into Bristol. • Potential for routes, but issues of severance to overcome.	• Largely missing links to Festival Way and other walking and cycling routes • Work needed on active travel connections into Bristol. • Connections into Bristol could include links to Malago Greenway.

All Edge of Bristol Sites:

- N/A

1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
	Conversion of Long Ashton P&R into multi-modal hub to encourage active travel.	Conversion of Long Ashton P&R into multi-modal hub to encourage active travel.	Creation of multi-modal hub to encourage active travel as part of development. • Could use Yanley Lane to connect into Long Ashton	• Potential for routes, but issues of severance to overcome.

Objective 3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.

		Existing		Future Potential
		Proximity to existing rail station	Proximity to existing bus routes	Opportunity to benefit from or support public transport improvements
SW Bristol	1 - North of A370 / South of Railway Line			
	2 - North of A370			
	3 - South of A370 / West of A4174			
	4 - North of A38			
	5 - South of A38			

3.46 Some key points from the Appraisal Framework are set out in **Table 3-20**.

Table 3-20: Appraisal Framework Summary – Objective 3, Edge of Bristol

All Edge of Bristol Sites:

- Closest rail station is Parson Street, which is typically greater than “standard” walking distance, but within cycling distance, from all sites.
- Excellent connectivity by bus to all sites.

1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
• Issues of accessibility to site for public transport improvements on A370 or A38	• Potential benefit from improvements along A370.	• Potential benefit from improvements along A370. .	• Potential benefit from metrobus extension from Long Ashton P&R. • Well located for Mass Transit proposals and enhanced public transport along the A38.	• Potential benefit from Mass Transit proposals and enhanced public transport along the A38. • Reasonably close to potential interchange on Opportunity Area 4.

All Edge of Bristol Sites:

- Closest rail station is Parson Street, which is typically greater than "standard" walking distance, but within cycling distance, from all sites.
- Excellent connectivity by bus to all sites.

1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
			• Opportunity to provide interchange between sustainable transport modes.	

Objective 4. To reduce the impact of vehicle travel on the highway network, including in terms of congestion, safety and the quality of our natural and built environment.

		Existing	Future Potential	
		Proximity to, and potential impacts (capacity and safety) upon, congestion hotspots.	Potential for mitigation measures to address congestion hotspots	Potential to deliver strategic benefits
SW Bristol	1 - North of A370 / South of Railway Line			
	2 - North of A370	*Not modelled*		
	3 - South of A370 / West of A4174			
	4 - North of A38			
	5 - South of A38			

3.47 Site 2 has not been included as housing within the modelling or access and movement framework as it is not considered to form a part of potential strategic growth proposals on the edge of Bristol being more closely related to Long Ashton.

3.48 Some key points from the Appraisal Framework are set out in **Table 3-21**.

Table 3-21: Appraisal Framework Summary – Objective 4, Edge of Bristol

All Edge of Bristol Sites:

- Strategic Benefits are likely to be in the form of a package of sustainable transport measures which would be delivered with input from all sites coming forwar2038 Future Year with Local Plan allocations, no mitigation. Sites are differentiated below where additional benefit can be achieved specifically due to their geographic location.

1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
• Moderate impact at B3128 / A370 in the AM peak, as well as minor impact at Dundry Lane, Hartcliffe Way, Kings Head Lane, and Hengrove Way. • Minimal impact in the PM peak on existing points of congestion. • Potential for junction capacity improvements • Less benefit from mass transit and 'big ticket' mitigation items such as multi-modal interchange hubs in comparison to other sites.	• Not modelled	• Significant impact on Colliters Way in AM and PM peak. • Moderate impact on Hengrove Way, Dundry Lane and Barrow Lane in the AM Peak. • Moderate impact on Bedminster Rd and King Georges Rd in the PM peak • Potential for junction capacity improvements • Scope for significant sustainable travel improvements, and benefit from mass transit/metrobus. • Potential for improved multi - modal interchange.	• Significant impact on Colliters Way. Minor-moderate impacts Hartcliffe Way, Kings Head Lane, A370 south of B3128 and Dundry Lane as well as emerging congestion on Barrow Street and A38 adjacent to junction. • Moderate impact on A38 south of Barrow St, north of Barrow Street, King Georges Road and Colliers Way. Emerging congestion on A38 south of Barrow Street. • Similar increase in congestion to site 3, however impact is the result of significantly more dwellings therefore per dwelling impact is less severe. • Potential for junction capacity improvements • Scope for significant sustainable travel improvements, and benefit from mass transit/metrobus. • Potential for multi-modal transport hub. • Potential for multi-modal transport interchange to facilitate sustainable travel, plus metrobus and Mass Transit. • Site 4 offers greater potential than Site 5, as the better location for interchange and greater opportunity to provide public transport routes through the site to the benefit of a higher number of future residents.	

Appraisal Framework Summary

3.49 A summary of the Appraisal Framework outcomes is shown below. **Table 3-22** identifies key areas where the Opportunity Areas differ in scoring, and what could be needed to improve performance.

			Edge of Bristol Opportunity Areas				
			1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
Objective 1. To reduce the need to travel, and the distances that people will need to travel, to access key opportunities, facilities and services including employment, leisure and retail.	Education	Proximity to existing primary school					
		Proximity to existing secondary school					
		Potential for on-site education provision					
	Employment	Accessibility to on-site employment					
	Local Centre / Retail	Proximity to town / significant centre					
		Proximity to local centre					
		Accessibility to on-site retail					
Objective 2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.	Existing	Accessibility to designated active travel routes					
	Future Potential	Potential benefit from planned active travel routes					
		Potential for creation of new active travel routes					
Objective 3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.	Existing	Proximity to existing rail station					
		Proximity to existing bus routes					
	Future Potential	Opportunity to benefit from or support public transport improvements					
Objective 4. To reduce the impact of vehicle travel on the highway	Existing	Proximity to, and potential impacts upon congestion hotspots					

			Edge of Bristol Opportunity Areas				
			1 - North of A370 / South of Railway Line	2 - North of A370	3 - South of A370 / West of A4174	4 - North of A38	5 - South of A38
network, including in terms of congestion, safety and the quality of our natural and built environment.	*Future Potential*	Potential for mitigation measures to address congestion hotspots					
		Potential to deliver strategic benefits					

Table 3-22: Opportunity Area Key Performance Differences and Improvements – Edge of Bristol

Key Difference in Appraisal Framework Score	Opportunity Area Comments	Potential Options for Improvement
Proximity to existing facilities, notably education	Sites 4 and 5 score lower than Sites 1-3	• Provision of additional education facilities as part of the Opportunity Area • Ensure active travel and public transport links to any existing facilities are enhanced to increase potential accessibility by sustainable modes
Proximity to Active Travel routes	Sites 1 and 5 score lower than sites 2-4	• Sites 1 and 5 are more impacted by severance (by major roads and the railway line for site 1), and therefore require investment in active travel improvements to mitigate these barriers
Opportunity to benefit from or support public transport improvements	Site 1 scores lower than other opportunity areas	• Site 1 is located within Long Ashton and therefore has less potential to benefit from major public transport improvements (mass transit) • Enhance the active travel links to bus stops that benefit from frequent stops and mass transit • Provide enhanced public transport provision through Long Ashton

Access and Movement Parameters

3.50 The draft Local Plan proposes growth across Sites 4 & 5, with Sites 1-3 not taken forwards at this time due to non-transport related reasons. Site 2 is not considered to form a part of potential strategic growth proposals on the edge of Bristol being more closely related to Long Ashton. Whilst Sites 1 and 3 do not form part of the draft local plan proposals, they do form part of the wider broad location area of search, hence why they were included within the modelling process which fed into the Appraisal Framework, but are not subsequently included within the Access and Movement framework.

3.51 The Growth Area, here after referred to as Yanley Lane, will deliver c.3,200 homes and a range of other uses across a substantial site. Transport factors will be critical to delivering sustainable development, however, there are multiple masterplanning considerations which dictate the spatial layout of development. Masterplanning exercises are progressing, along with discussions with wider stakeholders such as Bristol City Council and WECA on specific issues such as public transport including metrobus and Mass Transit. At this stage, we consider it important to set out the key transport principles which the development needs to incorporate, but to remain open minded on exact locations and how it fits into the overall masterplan. AECOM and NSC Transport Officers remain actively engaged in the masterplan process and will ensure that these principles are translated spatially in a sustainable manner. The key transport principles for the Yanley Lane Growth Area are discussed in **Table 3-23**, noting that this is not an exhaustive list, and summarised by transport mode.

Table 3-23: Access and Movement Parameters – Yanley Lane

Theme	Detail
	• Local Centre with substantial level of local facilities for "local living." To include attractive walking and cycling linkages. • High Density development in the most sustainable locations, including the local centre and in proximity to public transport services.
	• Network of LTN1/20[1] compliant Active Travel links connecting the different parts of the site, as well as with Parsons Street Station, nearby residential areas including Bishopsworth and Long Ashton, and Central Bristol. • LTN-style (Low Traffic Neighbourhoods/Liveable Neighbourhoods) measures within the scheme to connect people to local centre and interchange. • Active travel routes alongside Colliters Way (routeing north to the A370 and east towards Hartcliffe / Hengrove), connecting to wider active travel network, including the Malago Greenway Cycle Route. • Northwards active travel provision along Feeder Road and alongside Metrobus infrastructure to be investigated and improved if feasible. • Yanley Lane to potentially become a Quiet Lane, albeit with some steep topography, with an onward active travel route between the A38 and A4174, enhancing north-south connectivity between Long Ashton and Bishopsworth.
	• Multi-modal interchange between sustainable travel modes, aligned with the Future Mobility Zone "Transport Hub" concept.
	• Extension of metrobus routes from Long Ashton P&R to be delivered early in the development programme. This could include a new bus connection between the Colliters Way and the P&R via Feeder Road, or directly into the metrobus infrastructure, subject to further investigation. Siting of a new interchange would require further investigation. • Connectivity with wider bus network being brought forward through BSIP, to include local, radial and orbital services. • Incorporation of a Park & Ride function into central Bristol will need to be investigated, but care will need to be taken to avoid excessive levels of surface car parking which could compromise delivery of sustainable transport and placemaking. • High quality public transport into central Bristol, likely through diversion of Mass Transit into the site. Mass Transit proposals are currently unknown with multiple shortlisted options for the route between Bristol City Centre and the Airport. A desirable outcome would be a route that diverts into the edge of Bristol site, and ties into a new interchange, supporting multi-modal connectivity.
	▪ Multi-modal connections will need to be created to serve the development, whilst the strategic movement functions will continue to be fulfilled by the A38, A370 and A4174 ▪ Vehicular access to the site from the A38 and A4174, but no through route for general traffic. The potential to use a link between the two strategic links as a prioritised bus corridor should be explored. ▪ Measures to reduce the severance of the major traffic corridors including the A38 and A4174 will need to be investigated and implemented. Pedestrian/Cycle crossing of each of these links will be critical to removing this as a barrier to active travel.

[1]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/951074/cycle-infrastructure-design-ltn-1-20.pdf

Theme	Detail
	▪ Parking to be minimised in the heart of the development, for placemaking and to balance the ease of car journeys with sustainable modes.

4. Transport Modelling and Mitigation

4.1 A strategic transport model has been developed as part of the Stage 4 and 5 Local Plan process in order to assess the potential impacts of candidate sites, as well as the overall effects of Local Plan growth. Details of the modelling methodology is set out in Section 2.

What is a Strategic Transport Model?
A representation of the highway network, which assesses the study area as a whole in terms of trip origin and destination. It calculates the volumes of movement across the District and surrounding area, and assigns it to routes based on distance and journey time.

4.2 This section of the report describes the evolution of the model without any Local Plan allocations between 2018 and 2038, and then focusses predominantly on the modelling results of the Local Plan allocations scenario across the study area. The 2038 modelling scenario with Local Plan allocations has been developed at a point in time in the Local Plan progress, in order to provide an indication of potential impacts for the Reg.18 Consultation. It is intended to identify the impacts of Local Plan growth, in accordance with the Spatial Strategy. It will be updated and refined as more detail is developed on growth proposals.

4.3 **At this stage in the process, mitigation has not been included within the models.** This is to establish the impact which requires mitigation, and will inform the development of the mitigation schemes. Mitigation will include measures to achieve mode shift, as well as changes to the Highways network.

4.4 Following analysis of the changes between the '2038 Future Year, no Local Plan allocations' and '2038 Future Year with Local Plan allocations, no mitigation' models, locations of potential impact have been identified, based both on increases in congestion, and absolute levels of congestion. The key metric used in this assessment is Vehicles/Capacity (V/C), which is effectively the relationship between the capacity of a link, usually constrained by a junction, and the number of vehicles forecast to use it. A higher V/C value indicates increased congestion, with a value greater than 100% indicating that the link is anticipated to exceed "absolute" capacity. Typically, V/C values over 90% mean that links are approaching capacity to the extent that they can experience periods of over-saturation. Thus being over 90% is taken to mean exceeding "practical" capacity.

4.5 This report seeks to summarise and present clearly the findings of the modelling to a non-technical audience. Modelling reports are included within the evidence base for the Local Plan Consultation.

Transport Modelling

Model Development 2018 to 2038 (without Local Plan allocations)

4.6 The 2018 strategic model provides a representation of the highway network in 2018 based on traffic survey data. The 2018 model represents a 'pre-Covid' base model.

4.7 There has always been a degree of uncertainty in traffic forecasts predicted by transport models as a result of national uncertainty (for example as a result of variations in national economic projections and fuel price trends) and local uncertainty including from proposed developments and anticipated transport schemes. National Guidance[2] describes the recommended approach to dealing with uncertainty and the use of alternative scenarios (e.g. low and high traffic growth). Additional guidance was released in July 2020[3]. Whilst national growth projections have been updated post-Covid lockdown, there is currently no guidance that requires post-Covid lockdown traffic flows to be used as the basis for developing transport models. There is also variation in daily / weekly traffic flows which can lead to uncertainties in collecting reliable transport data.

4.8 From the 2018 base, a forecast has been developed representing the local highway network in 2038, without any local plan allocations, but accounting for other development and anticipated future travel behaviours using an industry standard methodology. **Figure 4-1** and **Figure 4-2** show the 2018 base model in the AM and PM peaks, whilst **Figure 4-3** and **Figure 4-4** show the '2038 Future Year, no Local Plan allocations' model in the AM and PM peak, to demonstrate the evolution of network conditions from 2018 to 2038, without any Local Plan allocations.

[2] Transport Appraisal Guidance (TAG) Unit M4 (https://www.gov.uk/government/publications/tag-unit-m4-forecasting-and-uncertainty)

[3] 'Appraisal and Modelling Strategy - A route map for updating TAG during uncertain times' (https://www.gov.uk/government/publications/appraisal-and-modelling-strategy-a-route-map-for-updating-tag)

Figure 4-1: 2018 Base Model AM Peak Hour

Figure 4-2: 2018 Base Model PM Peak Hour

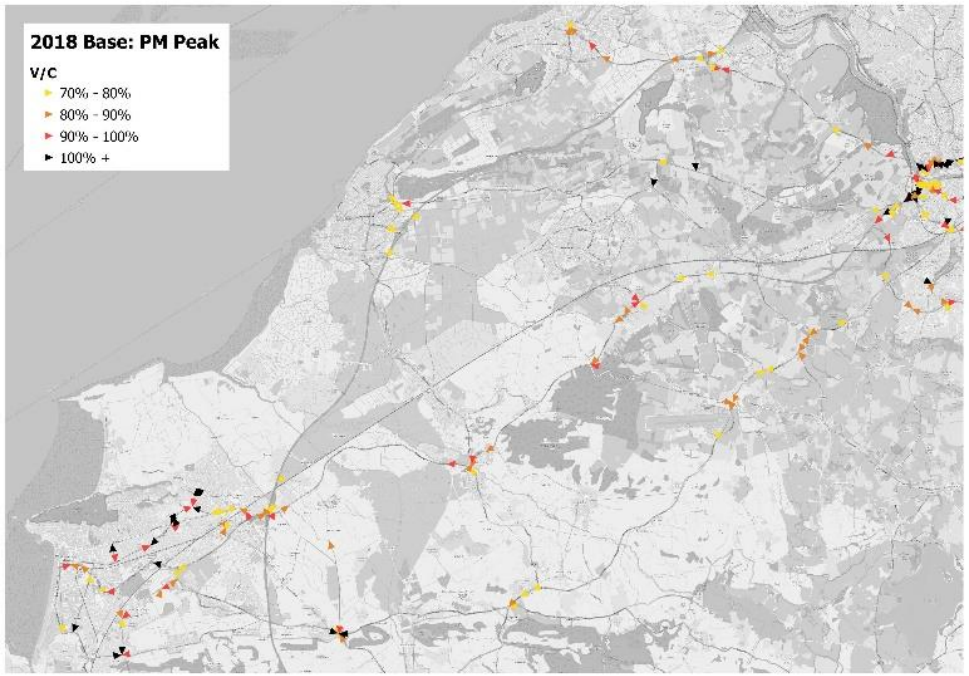


Figure 4-3: 2038 Future Year, no Local Plan allocations Model, AM Peak Hour

Figure 4-4: 2038 Future Year, no Local Plan allocations Model, PM Peak Hour

2018 to 2038 Model Summary

4.9 **Figure 4-1** to **Figure 4-4** show the AM and PM peak hour strategic modelling results for the 2018 base scenario and the '2038 Future Year, no Local Plan allocations' scenario.

4.10 The modelling outputs show the volume/capacity (V/C) as a percentage for links on the network. The V/C value represents the modelled capacity of links on the highway network as a proportion of the capacity of that link. A higher V/C value indicates increased congestion, with a value greater than 100% indicating that the link is anticipated to exceed "absolute" capacity. Typically, V/C values over 90% mean that links are approaching capacity to the extent that they can experience periods of over-saturation. Thus being over 90% is taken to mean exceeding "practical" capacity.

4.11 There is a general increase in traffic across the network between 2018 and 2038 due to background traffic growth including from the 5,000 homes delivered within the '2038 Future Year, no Local Plan allocations' scenario through existing permissions and small scale growth that it is reasonable to expect will be built without the Local Plan

4.12 **Figure 4-1** and **Figure 4-2** show that a number of locations across the study area experience existing congestion, with various links being over "absolute" or "practical" capacity. These are summarised below.

4.13 In Weston-super-Mare, there is existing congestion showing in the 2018 model along the A370, Locking Road, at the Winterstoke Road / Banwell Road junction, Junction 21 of the M5, along The Runway, Riverside and on Drove Road. Congestion in Banwell is addressed in the 2038 scenarios by the delivery of the Banwell Bypass.

4.14 In Nailsea and Backwell, the 2018 model shows congestion at Station Road crossroads and at the junction of Brockley Combe Road and the A370.

4.15 In the Yanley Lane growth area, congestion is shown in the 2018 model along Long Ashton Bypass, the A370, Colliters Way, the Cumberland Basin, around the Kings Head Lane / Bishopsworth Road / Church Road junction, and at the Barrow Lane / A38 junction.

4.16 Other notable areas of congestion shown in the 2018 model include around Tickenham Road and Northern Way in Clevedon, Junction 19 of the M5, Portbury Lane and Wraxhall Hill north of Nailsea, the A370 approach to Congresbury, the A370 / High Street and the A370 / Smallway junctions in Congresbury, and Wyndham Way in Portishead.

4.17 **Figure 4-3** and **Figure 4-4** show that the V/C of the majority of these links increase between the 2018 and '2038 Future Year, no Local Plan allocations' scenarios, as well as a number of other links going over "practical" capacity between 2018 and 2038. Congestion shown within the '2038 Future Year, no Local Plan allocations' scenarios is detailed in **Table 4-1**.

High Level Summary

This section presents a summary of the outputs of the '2038 Future Year, no Local Plan allocations' and '2038 Future Year with Local Plan allocations, no mitigation' assessment outputs for the AM and PM peak hours respectively.

2038 Future Year, no Local Plan allocations

4.18 **Figure 4-5** and **Figure 4-6** show the '2038 Future Year, no Local Plan allocations' modelling results for the AM and PM peak hours respectively. A summary of the V/C value for each scenario is presented at **Table 4-1** for the AM and PM peak hour. For the purposes of this summary, links in Bristol have not been included.

4.19 The '2038 Future Year, no Local Plan allocations' scenario shows 'existing' issues in the AM and PM peaks. It includes for 5,000 homes of Local Plan growth through existing permissions and small-scale growth. Local Plan development allocation sites are not included in the '2038 Future Year, no Local Plan allocations' scenario.

What Does the Model Show?

The modelling outputs show the volume/capacity (V/C) as a percentage for links on the network. The V/C value represents the modelled capacity of links on the highway network as a proportion of the capacity of that link. A higher V/C value indicates increased congestion. V/C >100% indicates that the link is anticipated to exceed "absolute" capacity. V/C >90% is taken to mean exceeding "practical" capacity.

The model incorporates the capacity at junction stoplines. Some junctions have limited capacity to start with and V/C is a function of level of capacity and number of vehicles, rather than solely number of vehicles.

Figure 4-5: '2038 Future Year, no Local Plan allocations' AM Peak Hour

Figure 4-6: '2038 Future Year, no Local Plan allocations' PM Peak Hour

Table 4-1: Strategic Model Summary – '2038 Future Year, no Local Plan allocations'

		2038 AM Peak	2038 PM Peak
Links Absolute Capacity: Wolvershill	Over	• Winterstoke Road / Broadway mini roundabout • Devonshire Road SB • Worle High Street / Milton Road junction • Worle High Street / New Bristol Road junction • Queensway / Ebdon Road Roundabout • A370 approach to M5 J21 Roundabout • Banwell Road at A371 junction east of Hutton	• Winterstoke Road / Broadway mini roundabout • Devonshire Road SB • A370 west of Hildesheim Bridge • A370 Marchfields Way • B3440 Locking Road / Locking Moor Road signalised junction • Queensway / Ebdon Road Roundabout • Worle High Street / Milton Road junction • Worle High Street / New Bristol Road junction • New Bristol Road / Station Road / Moor Lane signalised junction
Links Absolute Capacity: Nailsea & Backwell	Over	• Brockley Combe Road junction onto A370 • Portbury Lane SB • Station Road SB onto crossroads with A370	• Wraxall Hill • Portbury Lane
Links Absolute Capacity: Yanley Lane	Over	• Long Ashton Road EB to B3128 • Barrow Lane NB onto A38 • A4174 King Georges Road NB at Highbridge Road signalised junction	• A370 north of Colliters Way • Kings Head Lane junction with Church Road / Bishopsworth Road
Other Key Areas of Congestion (Over 80% V/C)		Wolvershill: • A370 • The Runway • Locking Road – Weston-super-Mare and Worle • Elmham Way and Summer Lane Yanley Lane: • A38 south of Barrow Street • A370 / B3128 junction links • Bishopsworth Road NB at A38 junction • Kings Head Lane at Bishopsworth Road / Church Road junction • Hartcliffe Way NB at A38 • Dundry Lane NB at A38 junction Other: • A370 / High Street Congresbury signalised junction • A370 Weston Road, Congresbury • New Road / A38 junction, Shipham • Winscombe Hill at A38 junction	Wolvershill: • The Runway • Winterstoke Road / The Runway mini roundabout • Locking Road / Ashcombe Road junction • Banwell Road EB at A371 junction east of Hutton • A370 Flowerdown Bridge Nailsea & Backwell: • Station Road cross roads • A370 west of Station Road cross roads • Brockley Combe Road / A370 junction • B3129 at B3129 / B3130 / Station Road cross roads Yanley Lane: • A3029 Winterstoke Road SB • A38 south of Barrow Street Other: • A38 / A368 cross-roads, Langford • Winscombe: – Winscombe Hill – A371 Sidcot Lane

2038 Future Year with Local Plan allocations, no mitigation

4.20 **Figure 4-7** and **Figure 4-8** show the '2038 Future Year with Local Plan allocations, no mitigation' modelling results for the AM and PM peak hours respectively. This has helped inform the summary for each scenario presented at **Table** 4-2 for the AM and PM peak hour. For the purposes of this summary, congestion in Bristol has not been included. The summary identifies points where existing points of congestion are likely to be exacerbated by the addition of Local Plan allocations, and where new points of congestion (V/C value >80%) have developed. Typically, a V/C over 90% would result in consideration of whether mitigation is required. However, 80% has been used in this assessment as the modelling is at an early stage and so a broader identification of potential impacts has been undertaken. This will be refined in future stages.

4.21 The '2038 Future Year with Local Plan allocations, no mitigation' scenario shows the impact across the network of Local Plan growth being allocated in line with the Preferred Spatial Strategy in the AM and PM peaks, prior to development and application of mitigation.

Figure 4-7: '2038 Future Year with Local Plan allocations, no mitigation' AM Peak Hour

Figure 4-8: 2038 Future Year with Local Plan allocations, no mitigation PM Peak Hour

Table 4-2: Strategic Model Summary –2038 Future Year with Local Plan allocations, no mitigation

	2038 AM Peak	2038 PM Peak
Local Plan Allocations Impact: Wolvershill	• Banwell Road east / A371 junction • North South link at A371 junction • A371 between Banwell Bypass and North South link • Churchland Way west at A370 • Locking Road / Milton Road / High Street / New Bristol Road junctions • Locking Road / Locking Moor Road signalised junction • The Runway • Airport Roundabout • M5 J21 and approach routes	• North South link at A371 junction • A371 between Banwell Bypass and North South link • Locking Road / Milton Road / High Street / New Bristol Road junctions • B3440 / High Street Worle • M5 J21 and approach routes • A370 in particular Marchfields Way EB and WB, Flowerdown Bridge, and Somerset Avenue. • Summer Lane / Diamond Batch Roundabout • A371 Banwell Road / Knightcott Road junction, Banwell, east of Bypass roundabout
Local Plan Allocations Impact: Nailsea & Backwell	• A370 south link at Station Road Crossroads • Wraxall Hill • B3128 Clevedon Road around Portbury Lane and Wraxhall Hill • Hannah More Road at Queen's Road junction	• Station Road Crossroads • B3129 Beggar Bush Lane cross road junction with Clevedon Road • B3128 Tickenham Hill arm of Tickenham Hill / B3130 Clevedon Road junction, north of Nailsea • Brockley Combe Road / A370 junction
Local Plan Allocations Impact: Yanley Lane	• A38 / Barrow Lane / Barrow Street area • Long Ashton Road / B3128 / A370 junctions • Colliters Way • Kings Head Lane • Whitchurch Road • B3130 Barrow Street / A370 junction	• A38 / Barrow Lane / Barrow Street area • Bridge Road / A369 Abbots Leigh Road / A369 Rownham Hill / Ashton Court Estate • B3128 Clevedon Road west of Beggar Bush Lane • B3129 Beggar Bush Lane arm of Weston Road / Beggar Bush Lane Clevedon Road junction • Colliters Way
Local Plan Allocations Impact: Other	• Winscombe A38 Junctions • General congestion on the A38 – particularly around Churchill, and Bristol Airport. • Wyndham Way AM • Tickenham Road / Northern Way Junction • A370 / High Street Junction, Congresbury • A370 / Smallway Junction, Congresbury	• Langford A38 / A368 junction • Winscombe A38 junctions • General congestion on the A38 – particularly around Churchill, Bristol Airport, north of Langford. • Tickenham Road / Northern Way Junction • Northern Way • M5 Junction 20 • A370 / High Street Junction, Congresbury • A370 / Smallway Junction, Congresbury

Mitigation

Mitigation Principles

4.22 The approach to developing mitigation options has been to consider network scale down to local scale measures, i.e. to work towards a sustainable movement network, at a strategic scale and use this to inform development of local mitigation options.

4.23 At a network level, this includes:

- Developing an Active Travel Masterplan, utilising the Local Cycling and Walking Infrastructure Plan (LCWIP[4]), which forms the starting point for identifying active travel improvements, and other potential schemes; and
- Bus Service Improvement Plan (BSIP[5]), which sets out NSCs ambitions for patronage growth, through a series of infrastructure investments and service enhancements and provides a starting point for considering where public transport improvements will be most beneficial and effective across the region.

4.24 In terms of congestion, it may be that some level of resultant or residual congestion is considered 'acceptable', as the focus will be on prioritising public transport and active travel networks, and achieving mode shift. The key focus will be to ensure impact on these sustainable travel modes as a result of development is minimised. NSC is working towards rebalancing priority between vehicles and active travel users at all junctions, and this change in balance to prioritise active travel users is likely to be a blanket measure across all mitigation schemes and scenarios, rather than limited to particular routes and networks.

Active Travel

Active Travel Masterplan

4.25 A comprehensive Masterplan containing schemes related to Active Travel across North Somerset is being developed as a Network Plan in order to understand where existing / planned / potential schemes are relevant to the development of Local Plan allocation sites. The Active Travel Masterplan includes schemes such as those identified in the LCWIP (outlined later in this section), as well as pipeline schemes that have been identified in policy such as the Joint Local Transport Plan 4 (JLTP4) and localised Supplementary Planning Documents (SPD).

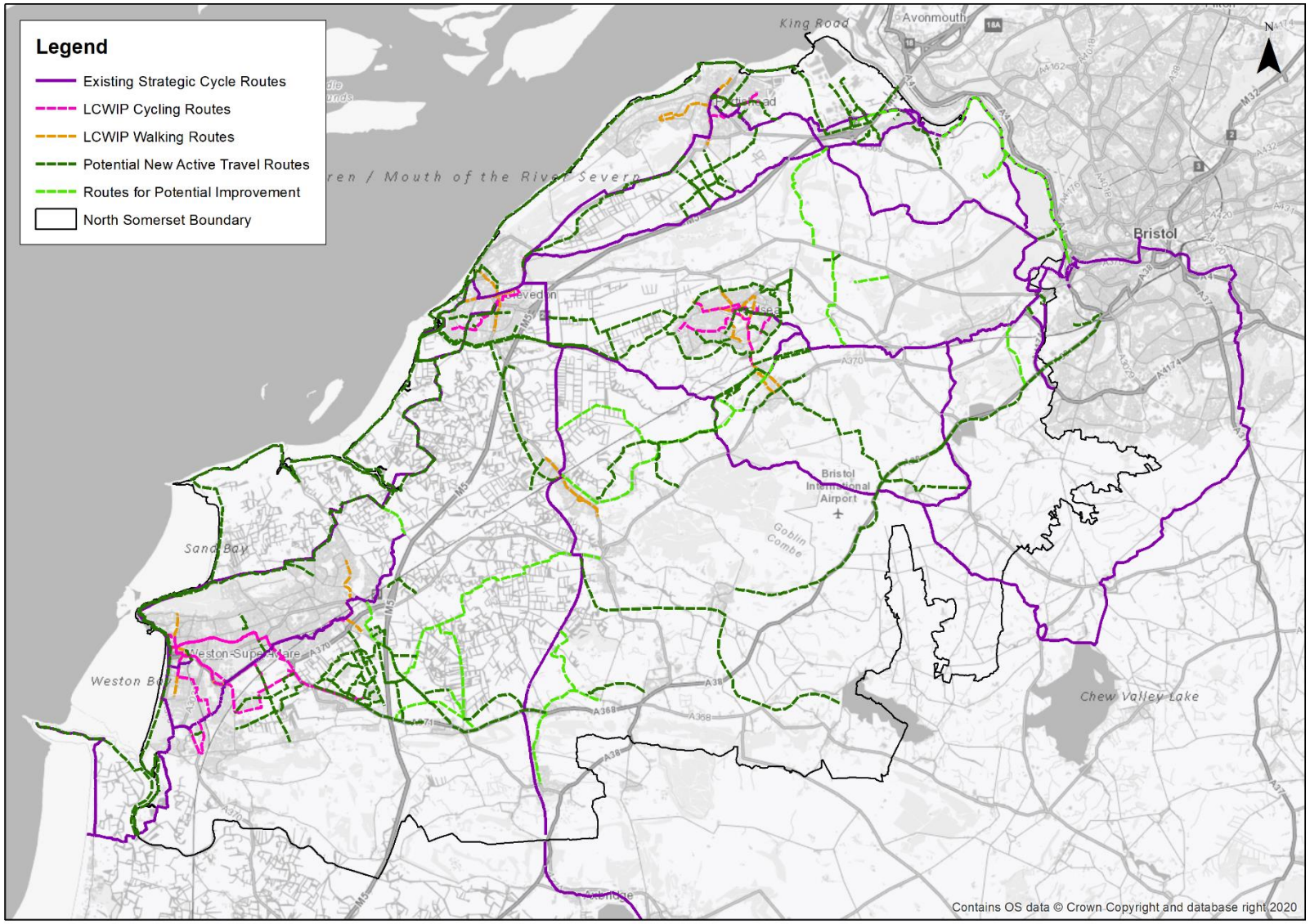
4.26 The Active Travel Masterplan provides a comprehensive understanding of the existing cycle routes in North Somerset and how they interact with proposed areas for growth and Local Plan allocation. It also allows for gaps in provision to be identified, particularly where meaningful connections can be made between existing designated cycle routes. Once identified, opportunities to create new connections or improve existing routes can be delivered at a scale that is local to the proposed growth areas, whilst supporting the development of the wider cycling network. Development coming forwards will need to contribute positively

[4] https://travelwest.info/app/uploads/2020/02/LCWIP-West-of-England-Local-Cycling-and-Walking-Infrastructure-Plan-2020-2036-VJan21.pdf

[5] https://www.westofengland-ca.gov.uk/wp-content/uploads/2021/12/Combined-Authority-Bus-Strategy-updated-Sept-2021.pdf

to the enhancement of the Active Travel network through new connections and/or improvements to existing routes. An extract of the Network Plan is shown at Figure **4-9.**

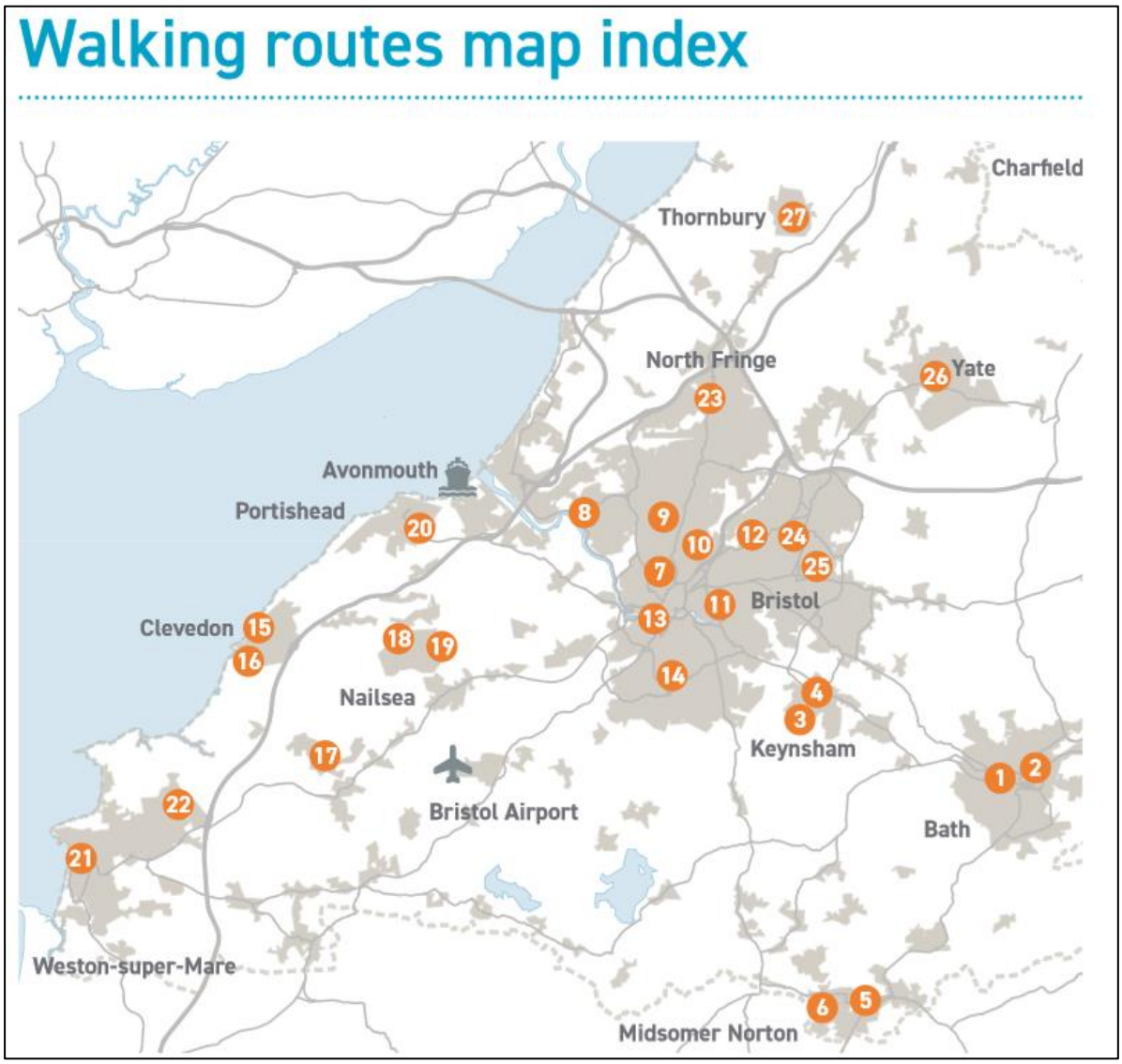
Figure 4-9: Active Travel Network Plan



Local Cycling and Walking Infrastructure Plan (LCWIP)

4.27 The West of England Local Cycling and Walking Infrastructure Plan (LCWIP) identifies over £400 million of required investment into the active travel network, to be delivered through the West of England Combined Authority (WECA). As part of the plans, a number of improvements to walking and cycling routes are proposed within the LCWIP. An overview of the walking and cycling routes contained within the LCWIP is shown in **Figure 4-10** and **Figure 4-11** respectively.

Figure 4-10: LCWIP Walking Routes



4.28 Walking routes 18, 19, 21 and 22 are proposed in areas of North Somerset that are being promoted for development, and could therefore supplement future plans for transport access and movement. Details of the walking routes are set out in **Table 4-3.**

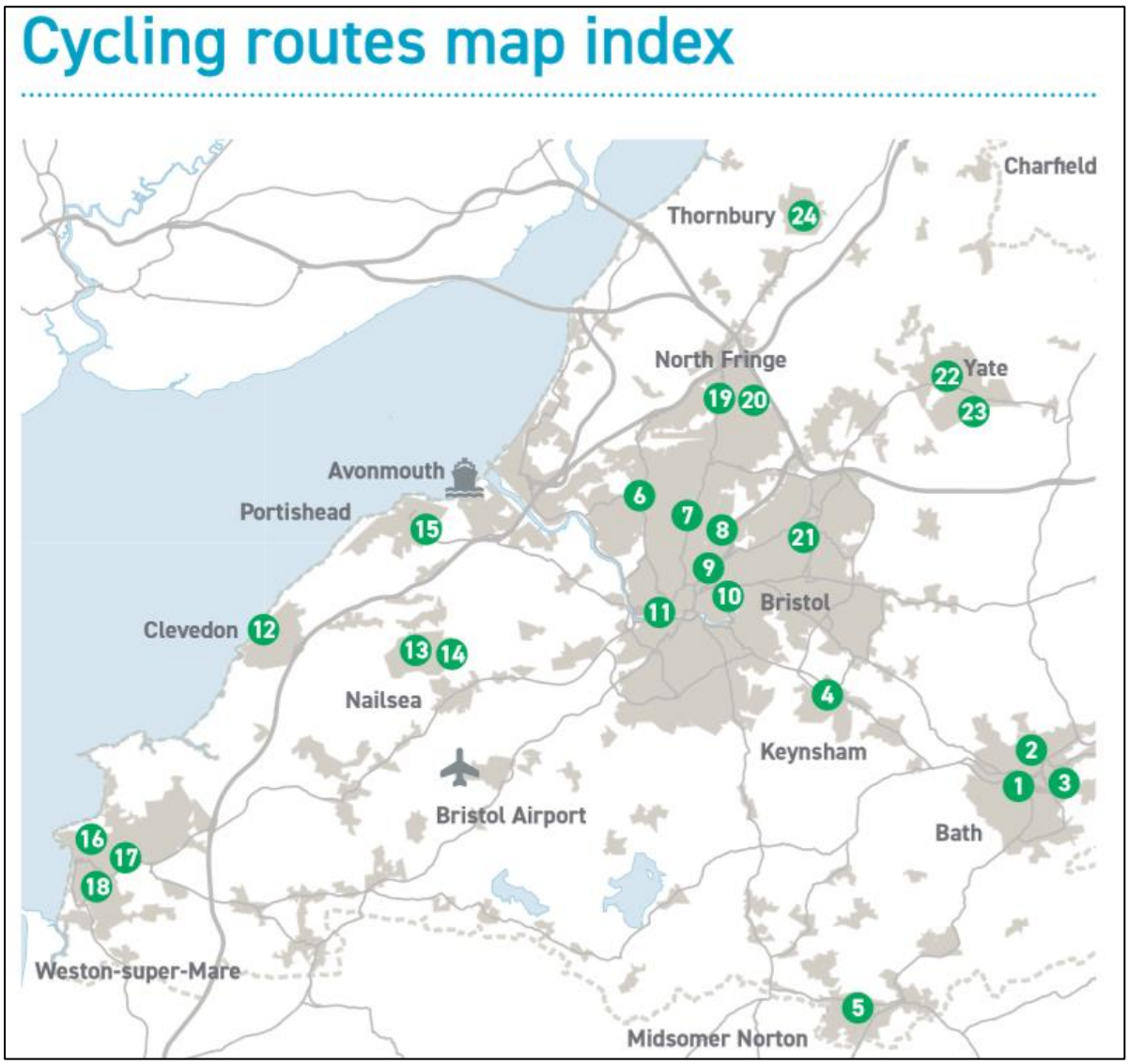
Table 4-3: LCWIP Walking Routes – North Somerset Growth Areas

LCWIP Reference	Location / Route	Status	Document Reference
LCWIP W18	Nailsea town centre In conjunction with cycle improvement proposals	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 62-63
LCWIP W19	Nailsea town centre – Backwell In conjunction with cycle improvement proposals	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 64-65
LCWIP W21	Weston-Super-Mare town centre	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 68-69
LCWIP W22	Weston-Super-Mare town centre (South)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 70-71

4.29 The measures included in the walking route proposals include:

- Providing continuous footways;
- Reducing side road junction widths;
- Traffic calming measures;
- Public realm improvements;
- Footway build-outs;
- Removal of parking;
- Widening footways;
- Zebra crossings;
- Enforceable double yellow lines;
- Raised table junctions;
- Redesigned junctions; and
- Adding benches and handrails to steepest points to improve mobility for all.

Figure 4-11: LCWIP Cycling Routes



4.30 Cycling routes 13, 14, 16, 17 and 18 are proposed in areas of North Somerset that are being promoted for development, and could therefore supplement future plans for transport access and movement. Details of the cycling routes are set out in **Table 4-4.**

Table 4-4: LCWIP Cycling Routes – North Somerset Growth Areas

LCWIP Reference	Location / Route	Status	Document Reference
LCWIP C13	Southward from Nailsea town centre (Route 1) Westward from Nailsea town centre (Route 2)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 106-107
LCWIP C14	Westward from Nailsea town centre (Route 3) Eastward from Nailsea town centre (Route 4)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 108-109
LCWIP C16	Southward from Weston-super-Mare town centre (Route 2) Southward from Weston-super-Mare town centre (Route 5)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 112-113
LCWIP C17	Eastward from Weston-super-Mare (Route 3) Eastward from Weston-super-Mare (Route 7)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 114-115
LCWIP C18	Eastward from Weston-super-Mare (Route 1) Eastward from Weston-super-Mare (Route 4) Eastward from Weston-super-Mare (Route 6)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 116-117

4.31 The measures included in the cycle route proposals include:

- Smoothways;
- Quiet streets' as per Weston-super-Mare town centre SPD;
- Upgrade crossings;
- Mandatory Cycle Lanes;
- Widen footways;
- Remove barriers to cycling;
- Closure of Bridges to motor traffic;
- De-clutter paths;
- Segregated cycle paths with kerbs;
- Reducing traffic flows;
- Reduce speed limits;

- Designed roundabouts;
- Resurfacing; and
- Improve lighting.

Bus

Bus Service Improvement Plan (BSIP)

4.32 The West of England BSIP covers the period up to 2030, and brings together evidence in order to set ambitions for patronage growth, boost investment in buses and improve socio-economic and environmental outcomes across the region. Targets set out in the Plan include performance indicators for:

- Bus journey times;
- Bus service punctuality;
- Number of passenger journeys;
- Customer satisfaction; and
- Bus fleet decarbonisation.

4.33 As part of the delivery plans for bus service improvements, a number of initiatives are set out, providing further detail on how current and future challenges and opportunities can be addressed in the region, including the following:

- A1: Deliver a high frequency, accessible bus network.
- B2/B3: High / medium priority investment corridors, including the A370 and A38 between Bristol and Weston-super-Mare, as well as investment in towns within North Somerset.
- C1: Operator fare reduction and fares simplification package.
- E1: Transport Hubs and wider environment, providing for interchange between bus / rail / community transport.
- E2: Enhancement of bus stops.
- E4: Interaction between bus services and other modes.

4.34 A number of corridors and hotspots have been identified at an early stage of the BSIP process as requiring infrastructure improvements across the North Somerset network. The corridors are shown on **Figure 4-12** and set out below:

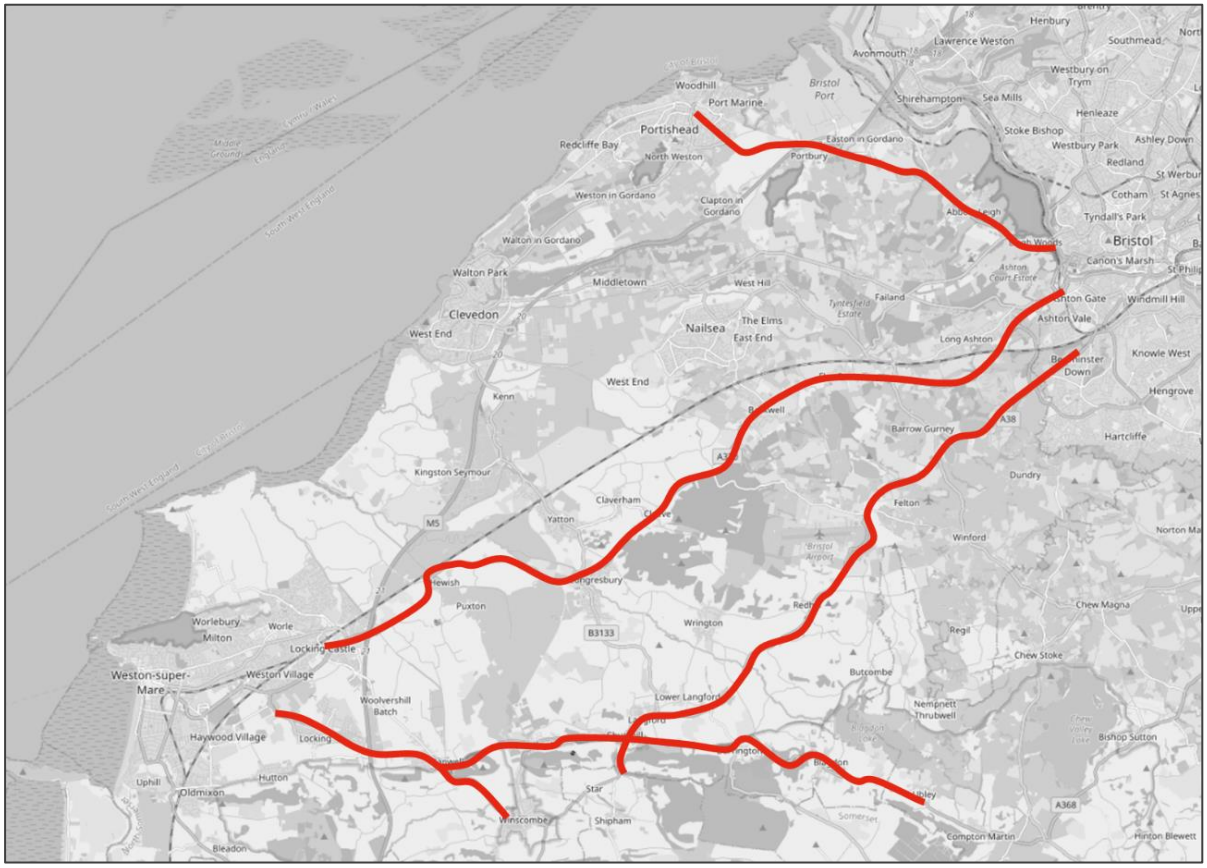
Corridors:

- A370 including Queensway, Smallway signals, Long Ashton Bypass;
- A369 including Portbury Hundred and Sheepway;
- A371 including Banwell but this is very reliant on HIF bid Bypass;
- A368 including Churchill signals but this is very reliant on HIF bid Bypass; and
- A38 including Lime Kiln roundabout.

Additional Hotspots:

- WSM, Summerhouse roundabout, Worle Terminus, M5 J21;
- Portishead;
- Clevedon including Hill Road, Town centre, Moor Lane / Ettlingen Way roundabout;
- Yatton including High Street; and
- Nailsea and Backwell including Silver Street, High Street and Backwell signals.

Figure 4-12: BSIP Corridors for Improvement



4.35 In addition to infrastructure improvements, the bus services themselves will be improved and the attractiveness of service provision will be enhanced through measures including real time information and bus stop improvements. It is proposed as that a minimum frequency of 15 minutes will be achieved in large urban areas, and a minimum frequency of 15 minutes will be achieved for inter-urban areas. In medium and large rural areas, a minimum frequency of 60 minutes is expected. The bus service frequency should be proportional to the scale of population serviced. In smaller rural areas, it is proposed to utilise demand responsive transport and transport hubs to link passengers onto fast frequent services.

4.36 The delivery of service enhancements and infrastructure provision are interlinked, with each facilitating the other. Development which comes forward will be expected to contribute to the delivery of both infrastructure and service enhancements, as appropriate to the developments themselves.

Rail

4.37 A number of studies have recently been undertaken with regard to the rail network, which incorporate North Somerset. These include the Bristol – Exeter Study and Greater Bristol Study. The development of the rail network will support sustainable travel for longer distance and inter-urban trips, and Local Plan growth, particularly in proximity to rail stations. The Local Plan mitigation strategy will need to maximise the benefit of rail improvements, and facilitate First/Last Mile transport to rail stations to ensure that future residents can access these services.

4.38 A key recommendation for North Somerset from the Bristol-Exeter Study is amendments to timetabling to incorporate:

- Increase in frequency of local service from 2 trains per hour (tph) to 3 tph;
- Hourly Weston-super-Mare to London Paddington Service;
- Adjust existing pattern of Cross Country services calling at Weston-super-Mare; and
- Add Worle to Cross Country service.

4.39 These frequency changes will require supporting infrastructure including additional tracks and re-doubling of some lines.

4.40 In addition, it is proposed to extend the Gloucester / Cheltenham to Bristol stopping service onto Weston-super-Mare, to call at all stations except Bedminster and Parson Street between Bristol Temple Meads and Weston-super-Mare, along with potential to extend this further to Highbridge & Burnham at a later date and further potential to extend to Gravity if / when a new station is created.

Areas of Focus

4.41 Following analysis of the strategic modelling in terms of the anticipated congestion points and impact points, a number of key focus areas have been identified within the study area as shown in **Figure 4-13**.

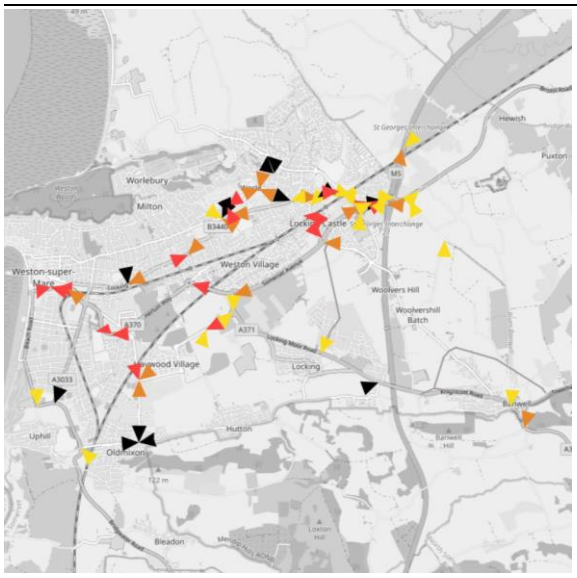
4.42 For each area of focus, a summary table (**Table 4-5** to **Table 4-11**) is provided to highlight the areas of congestion and impact, and potential mitigation for these areas. Although not necessarily highlighted within this summary, locations in the 80-90% range will be kept under review. At this stage, the mitigation ideas are a starting point that will be developed further and modelled or designed as appropriate at Stages 6 and 7 of the Local Plan process. This will incorporate further technical work and feedback from consultation.

Figure 4-13: Mitigation Areas of Focus

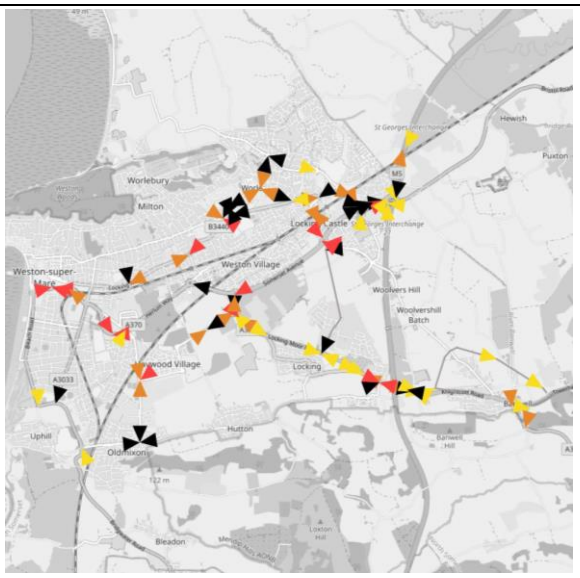
Table 4-5: Weston-super-Mare Impact and Potential Mitigation

Weston-super-Mare

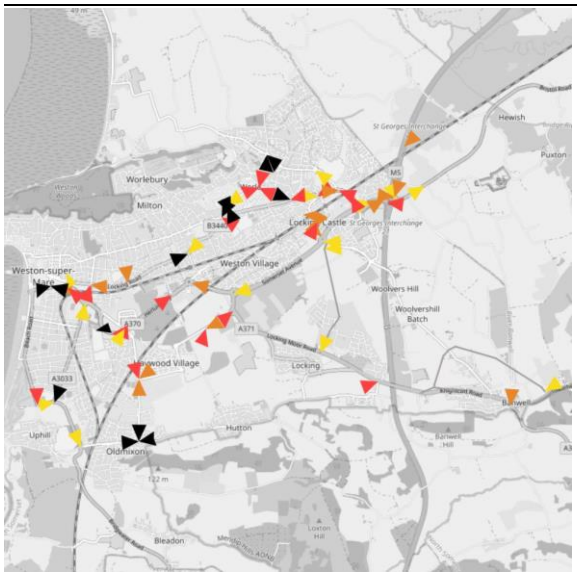
AM Peak - 2038 Future Year, no Local Plan allocations



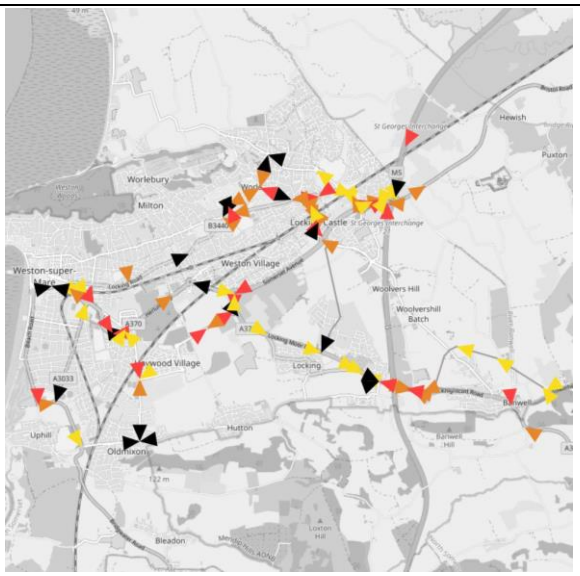
AM Peak - 2038 Future Year with Local Plan allocations, no mitigation



PM Peak - 2038 Future Year, no Local Plan allocations



PM Peak – 2038 Future Year with Local Plan allocations, no mitigation



Summary of Congestion Hotspots:

- Winterstoke Road / Broadway mini roundabout
- Devonshire Road SB
- A370 west of Hildesheim Bridge
- A370 Marchfields Way
- B3440 Locking Road / Locking Moor Road signalised junction
- Queensway / Ebdon Road Roundabout
- Worle High Street / Milton Road junction
- Worle High Street / New Bristol Road junction
- New Bristol Road / Station Road / Moor Lane signalised junction
- A370 approach to M5 J21 Roundabout
- Banwell Road at A371 junction east of Hutton

Summary of Impact Hotspots:

- Banwell Road east / A371 junction
- North South link at A371 junction
- A371 between Banwell Bypass and North South link
- Churchland Way west at A370
- Locking Road / Milton Road / High Street / New Bristol Road junctions
- Locking Road / Locking Moor Road signalised junction
- B3440 / High Street Worle
- M5 J21 and approach routes
- A370 in particular Marchfields Way EB and WB, Flowerdown Bridge, and Somerset Avenue.
- Summer Lane / Diamond Batch Roundabout
- A371 Banwell Road / Knightcott Road junction, Banwell, east of Bypass roundabout
- The Runway and Airport Roundabout
- M5 J21 and approach routes

Mitigation Options

Winterstoke Road / Broadway Mini-Roundabout:

- Capacity improvement scheme to upgrade existing mini-roundabout.
- Potential requirement for traffic signals. This would support use as a bus corridor.
- Design feasibility, including available land, would need to be investigated.

A371 / Banwell Road, West of Summer Lane:

- Junction constraints, lack of gaps to join the A371 from Banwell Road.
- Capacity improvement scheme, incorporating bus priority measures along the A371.

East of Weston Rural Lanes:

- Aim to create a network conducive to active travel. Network to be reviewed holistically to retain access but seek to reduce ‘rat running’. Reducing traffic flows and speeds on links has the potential to create an enhanced active travel network. Study will also need to consider diversions of traffic flows.

Airfield Roundabout:

- A series of design options have previously been developed for Airfield Roundabout, aiming to improve the capacity of the junction. Further refinement of these junction realignment schemes will be undertaken and modelled to determine suitability and impact on junction capacity.

M5 Junction 21

- NSC and National Highways will work together through the Local Plan process to determine requirements at M5 Junction 21. As well as minimizing impacts which could have safety implications, particularly on the Mainline, it will be important to improve public transport and active travel movement through the junction.

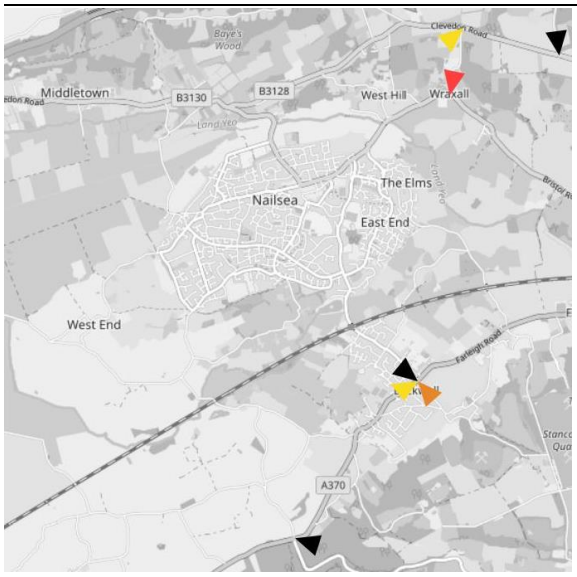
Other Key Corridors

- Consideration of potential impacts on other key corridors such as Locking Road Corridor will be subject to ongoing review as the modelling and mitigation measures are progressed. If required, mitigation measures will be considered.

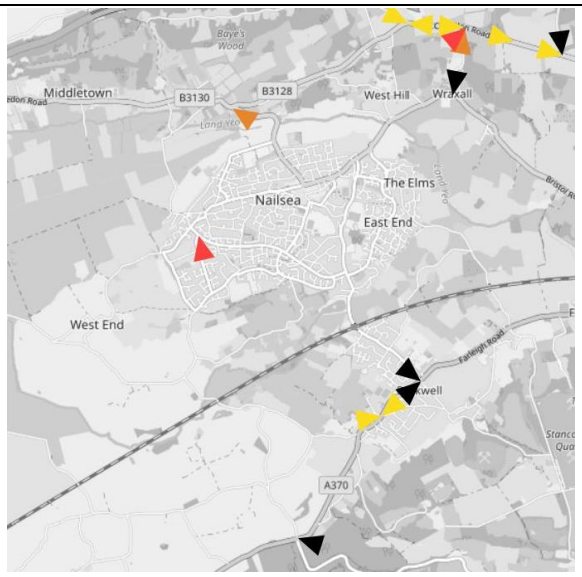
Table 4-6: Nailsea and Backwell Impact and Potential Mitigation

Nailsea and Backwell

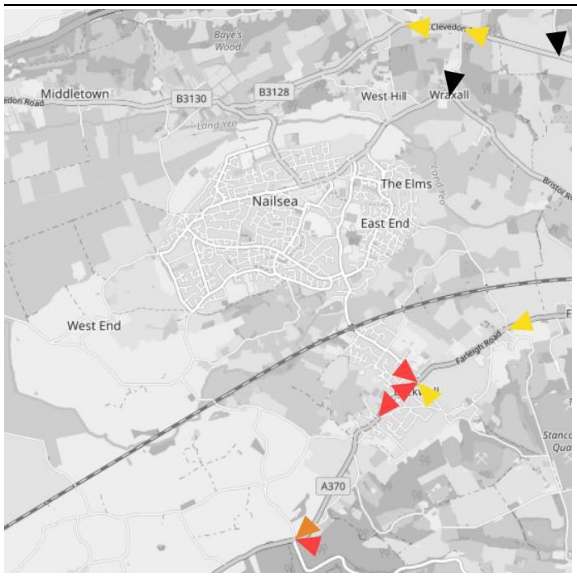
AM Peak - 2038 Future Year, no Local Plan allocations



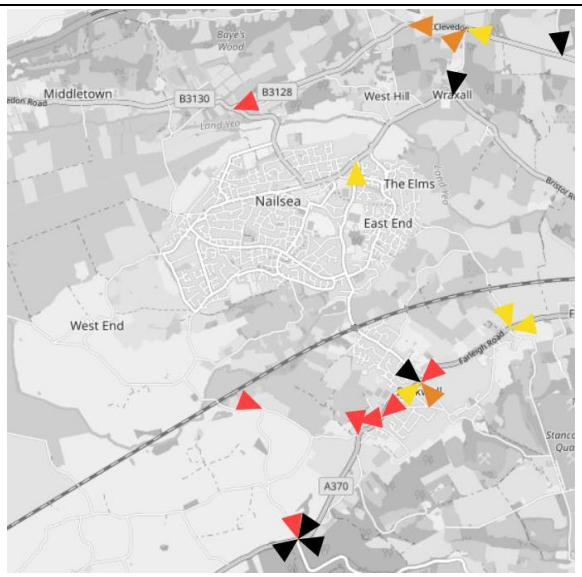
AM Peak – 2038 Future Year with Local Plan allocations, no mitigation



PM Peak - 2038 Future Year, no Local Plan allocations



PM Peak – 2038 Future Year with Local Plan allocations, no mitigation



Summary of Congestion Hotspots:

- Brockley Combe Road junction onto A370
- Portbury Lane SB
- Station Road SB onto crossroads with A370
- Wraxall Hill

Summary of Impact Hotspots:

- Station Road Crossroads
- B3129 Beggar Bush Lane cross road junction with Clevedon Road
- B3128 Tickenham Hill arm of Tickenham Hill / B3130 Clevedon Road junction, north of Nailsea
- Brockley Combe Road / A370 junction
- A370 south link at Station Road Crossroads
- Wraxall Hill
- B3128 Clevedon Road around Portbury Lane and Wraxhall Hill
- Hannah More Road at Queen's Road junction

Mitigation Options

Station Road Crossroads:

- Strategic additional rail crossings being investigated (see Section 3.36 to 3.39).
- Create bus priority on the way into Backwell through new development access junctions.

NB: Congestion at Station Road Crossroads is likely causing traffic impact at Hannah More Road and Brockley Crossroads (to an extent), as drivers take alternative routes. Future stage modelling will identify the extent to which a strategic solution to this issue will also reduce traffic on these alternative routes.

Brockley Lane Crossroads:

- Strategic solution to Backwell Crossroads
- Minor junction capacity improvements, e.g. Entry arm flare / slip road.
- Acceptance of capacity issue on Brockley Combe side road arm.
- Consider changes to permitted movements, such as making Brockley Lane exit-only or banning movements, in order to reduce traffic stages.

Clevedon Road B3130:

- Review potential impact on this location through the Local Plan process as link may approach practical capacity.

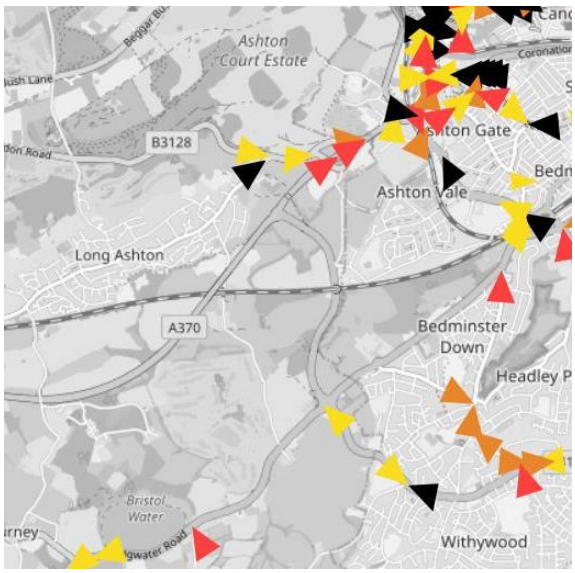
Hannah More Road:

- Strategic solution to Backwell Crossroads
- Junction capacity improvements at Hannah More Road / Queens Road junction
- Walking and Cycling improvements, including condition of footways.

Table 4-7: Yanley Lane Impact and Potential Mitigation

Yanley Lane

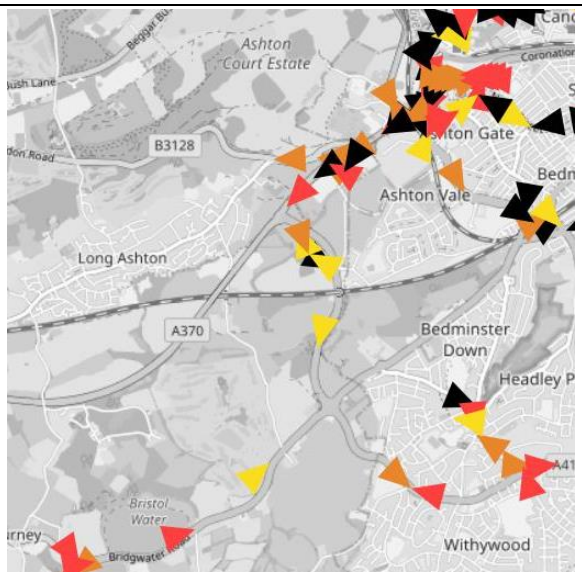
AM Peak – 2038 Future Year, no Local Plan allocations



AM Peak - 2038 Future Year with Local Plan allocations, no mitigation

PM Peak – 2038 Future Year, no Local Plan allocations

PM Peak - 2038 Future Year with Local Plan allocations, no mitigation



Summary of Congestion Hotspots:

- Long Ashton Road EB to B3128
- Barrow Lane NB onto A38
- A4174 King Georges Road NB at Highbridge Road signalised junction
- A370 north of Colliters Way
- Kings Head Lane junction with Church Road / Bishopsworth Road

Summary of Impact Hotspots:

- A38 / Barrow Lane / Barrow Street area
- Bridge Road / A369 Abbots Leigh Road / A369 Rownham Hill / Ashton Court Estate
- B3128 Clevedon Road west of Beggar Bush Lane
- B3129 Beggar Bush Lane arm of Weston Road / Beggar Bush Lane Clevedon Road junction
- Colliters Way
- Long Ashton Road / B3128 / A370 junctions
- Kings Head Lane
- Whitchurch Road
- B3130 Barrow Street / A370 junction

Mitigation Options

General

- Mitigation in the Yanley Lane area has been discussed with BCC and WECA, and will need to be developed in collaboration. As with the NSC Local Plan, it has been agreed that proposals need to focus on sustainable transport schemes, rather than additional traffic capacity, unless there is a justifiable need in the context of supporting sustainable movement.
- Development proposals in the Yanley Lane area will incorporate measures designed to provide sustainable transport enhancements to the benefit of existing users as well as future residents. This includes a transport interchange, a new local centre, metrobus extension, enhancements to the walking and cycling network.
- Mass Transit
- Convert existing car share 2+ lane into bus lane, as part of BSIP
- Conversion of Long Ashton Park & Ride into a multi-modal transport hub.

Long Ashton / B3128:

- Junction capacity improvements through signalisation, with active travel connection across to Ashton Court. This will also benefit bus movements through Long Ashton.

Table 4-8: Churchill / Winscombe / A38 Impact and Potential Mitigation

Churchill / Winscombe / A38

AM Peak – 2038 Future Year, no Local Plan allocations

AM Peak - 2038 Future Year with Local Plan allocations, no mitigation

PM Peak – 2038 Future Year, no Local Plan allocations

PM Peak - 2038 Future Year with Local Plan allocations, no mitigation

Summary of Congestion Hotspots:

- Churchill and Winscombe A38 Junctions
- Winscombe: A371, Winscombe Hill, Church Road
- General congestion on the A38

Summary of Impact Hotspots:

- Churchill, Winscombe and Shipham A38 Junctions
- General congestion on the A38

Mitigation Options

Churchill / Winscombe / A38 Corridor

The initial Local Plan modelling is identifying potential congestion and traffic impacts at the A38 and side road junctions at Churchill, Shipham and Winscombe. There is potential that mitigation schemes may be required in these locations, to support the movement function of the A38, including for public transport services, enhance active travel opportunities, and deliver Local Plan growth. As referenced in the Evidence Base, there are additional major schemes being promoted which will interact with this part of the network, notably the Banwell Bypass and A38 MRN scheme. To ensure this area is considered holistically, the project teams are working, and will continue to work, together to determine potential impacts and requirements for mitigation, and to develop solutions if appropriate.

Table 4-9: North Nailsea / Portishead Impact and Potential Mitigation

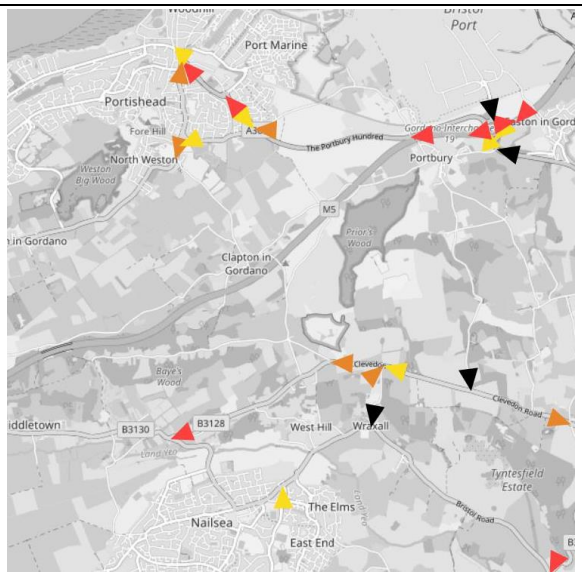
North Nailsea / Portishead

AM Peak – 2038 Future Year, no Local Plan allocations

AM Peak - 2038 Future Year with Local Plan allocations, no mitigation

PM Peak – 2038 Future Year, no Local Plan allocations

PM Peak - 2038 Future Year with Local Plan allocations, no mitigation



Summary of Congestion Hotspots:

- Wraxall Hill
- Portbury Lane
- M5 J19
- Wyndham Way

Summary of Impact Hotspots:

- Wraxall Hill
- Portbury Lane
- M5 J19 (Portbury Hundred and Royal Portbury Dock)
- Wyndham Way

Mitigation Options

M5 Junction 19:

- The potential impacts at and around M5 Junction 19 will be investigated in detail to determine whether a requirement for mitigation exists. The impacts shown in the modelling are on the Portbury Hundred and Royal Portbury Dock Road, but not on the M5 on or off-slips. As there is limited development proposed for Clevedon and Portishead, it is likely that increases in congestion are due to diversions of traffic resulting from congestion elsewhere. Model runs with mitigation will identify the degree to which congestion and mitigation across the network affects traffic flow patterns and strategic impacts in locations such as this.

Wraxall Hill / Portbury Lane:

- Congestion at Wraxall Hill and Portbury Lane will be considered in the context of traffic flow diversions following running the model with mitigation in place.

Wyndham Way:

- There are elements that are showing network pressure, but limited development impact. Issues in relation to approach to constrained M5 on Wyndham Way and Portbury Hundred.
- Due to limited direct development impact, this will be considered in greater detail following running the model with mitigation schemes.

Table 4-10: Clevedon Impact and Potential Mitigation

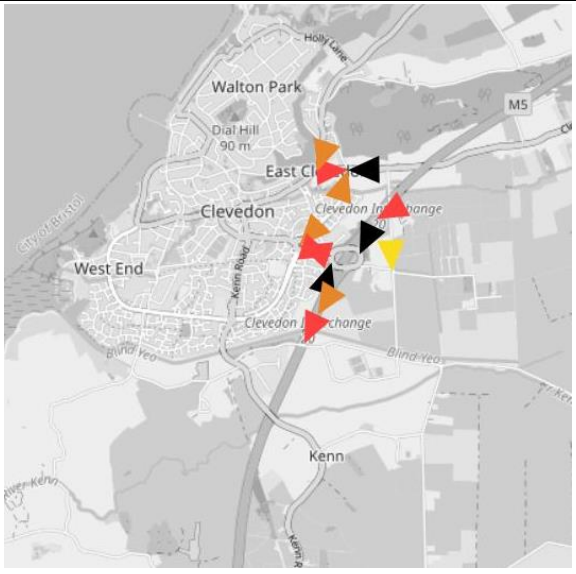
Clevedon

AM Peak – 2038 Future Year, no Local Plan allocations

AM Peak - 2038 Future Year with Local Plan allocations, no mitigation

PM Peak – 2038 Future Year, no Local Plan allocations

PM Peak - 2038 Future Year with Local Plan allocations, no mitigation



Summary of Congestion Hotspots:

- Tickenham Road / Northern Way
- Northern Way
- Central Way / B3133 / Ettlingen Way / Northern Way Roundabout

Summary of Impact Hotspots:

- Tickenham Road / Northern Way
- Northern Way
- Tickenham Road / Northern Way Roundabout
- M5 Junction 20

Mitigation Options

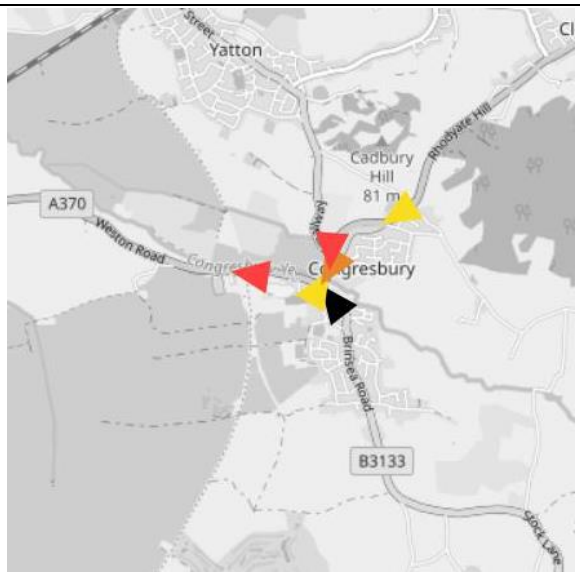
- Limited development proposed for Clevedon and Portishead. Suggests issues at these locations likely arising from North of Nailsea, and pressure on other motorway junctions.
- Due to limited direct development impact, this will be considered in greater detail following running the strategic model with mitigation schemes.
- Junction capacity improvements at the roundabouts – signalize junction / add in bus priority and cycle links / active travel priority.
- Introduction of bus / active travel priority measures.

Table 4-11: Yatton / Congresbury Impact and Potential Mitigation

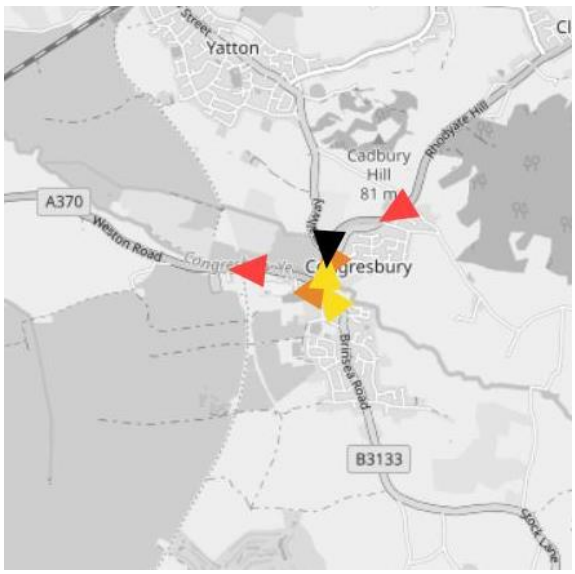
Yatton / Congresbury

AM Peak – 2038 Future Year, no Local Plan allocations

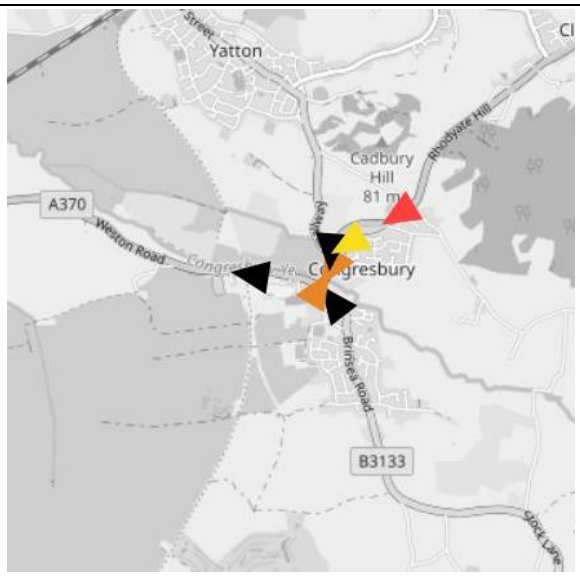
AM Peak - 2038 Future Year with Local Plan allocations, no mitigation



PM Peak – 2038 Future Year, no Local Plan allocations



PM Peak - 2038 Future Year with Local Plan allocations, no mitigation



Summary of Congestion Hotspots:

- A370 / High Street Junction

Summary of Impact Hotspots:

- A370 / High Street Junction
- A370 / Smallway Junction

Mitigation Options

A370 / Smallway & A370 / Wood Hill Junctions

- Capacity improvements will be considered holistically through BSIP proposals, as capacity on the A370 is critical to its operation as a high frequency bus corridor. It is likely that consideration will

be given to restricting allowable movements at these junctions to limit the number of traffic signal stages required at the A370 / Smallway signals, in order to improve the junction's efficiency.

- This would particularly benefit ahead movements on the A370, and improve the ability to deliver quality bus services along the A370 corridor. A local area study to consider network effects, accessibility, design feasibility and junction capacity modelling will be undertaken to determine the deliverability and effectiveness of these proposals.
- The capacity of the A370 at pinch points within the network, including this location and Backwell Crossroads, is likely to affect wider traffic routeing, including choices of motorway junctions. Therefore capacity changes for A370 movements will need to be tested in combination with other network changes in the strategic model. As part of ongoing mitigation development, further data gathering and modelling will be gathered to inform any decisions.

Mitigation Next Steps

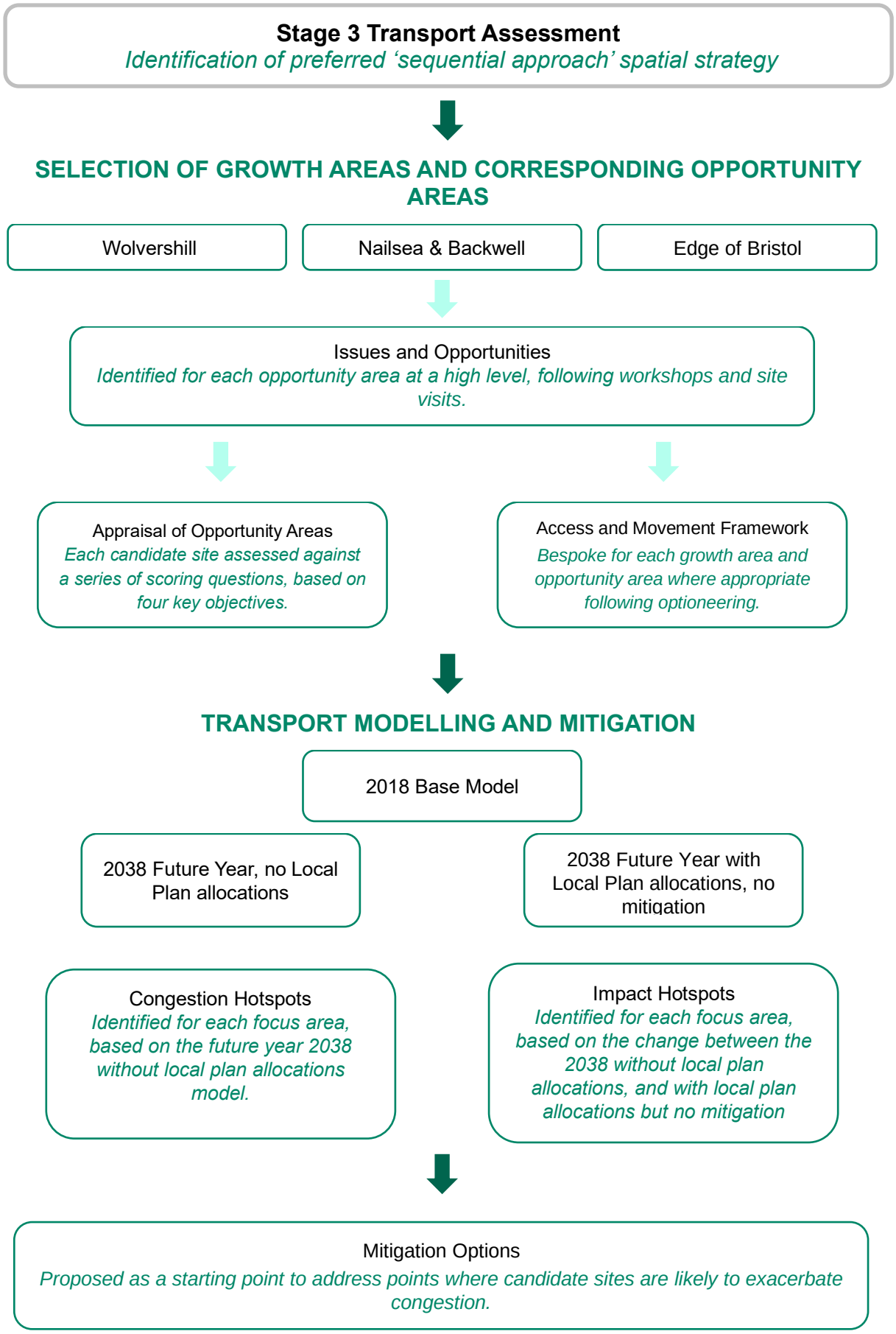
4.43 This section has highlighted the areas of congestion and impact within each focus area, and potential mitigation for these areas as a starting point.

4.44 The next stages for each of these potential mitigation areas will be:

- Further development and refining sustainable transport schemes, including understanding the degree of mode shift, and therefore mitigation, which could be achieved. This will enable us to fully understand the level of mitigation which can be achieved through mode shift, and thus the level of residual traffic which would remain on the network, and its impact. This traffic impact will then be considered against the imperatives to limit the impact on public transport services and sustainable transport, and the effect on congestion, in order to determine any additional mitigation required.
- Where needed, undertake further studies and interrogation of traffic flows to understand in more detail the cause of any existing congestion.
- Undertake optioneering and preliminary design work for any proposed mitigation;
- Undertake appropriate modelling of any proposed mitigation options and further refine designs following analysis of modelling results;
- Update the strategic model with these proposed schemes, to understand the degree to which schemes will result in traffic re-assignment and affect other points in the network (positively or negatively), including if any proposed mitigation schemes will create/solve congestion points at other parts of the network as a result;
- Analyse the strategic modelling results, and potentially run various scenarios to understand what the best combination of mitigations schemes will be for the network as a whole.

4.45 The development of mitigation scheme options will necessarily be an iterative process. It will also need to involve decision-makers and wider stakeholders, as there are choices about the most appropriate way to manage the network. Mitigations will be developed in the context of the Council's declarations of Climate and Nature emergencies. In developing the mitigations priority will be given to public transport, cycling, walking, and measures to reduce the demand for travel and overall carbon emissions. As presented in this report, options and impact assessment are at an early stage, and responses to this consultation will also be considered in the development of schemes.

5. Summary and Next Steps

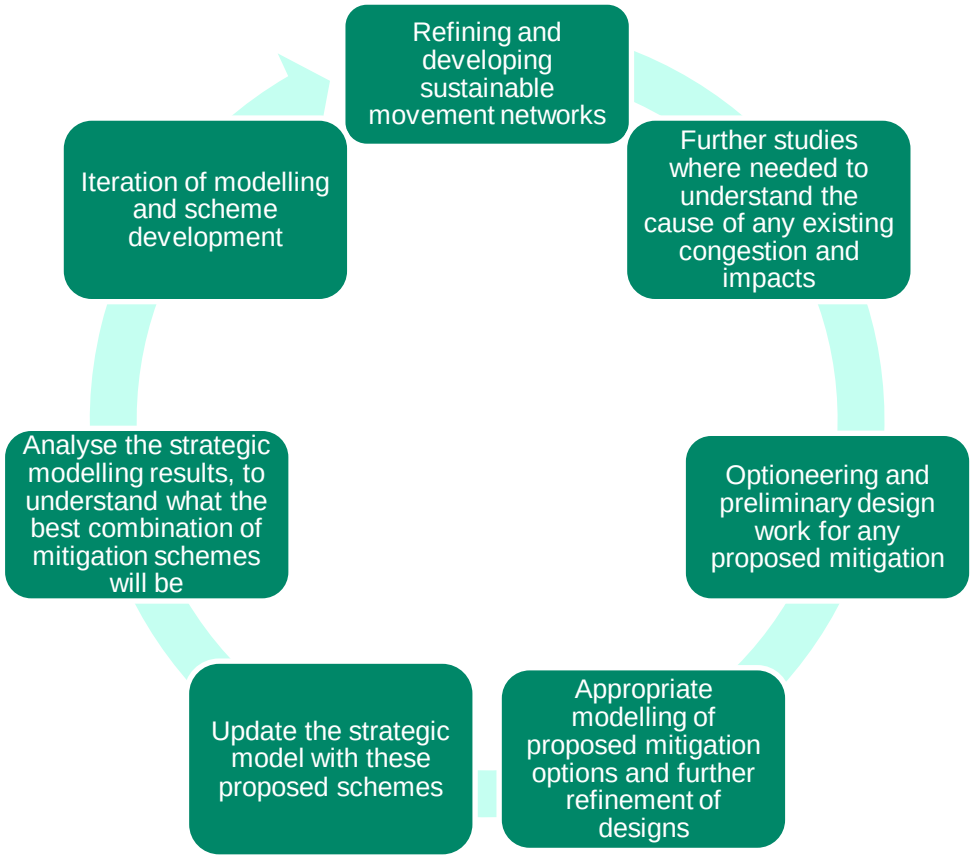


This Stage 4 and 5 Transport Assessment provides an **initial appraisal** from a transport perspective, including access and movement, of candidate allocation sites to be taken forward to Stages 6 and 7 of the Local Plan Process, and consideration of high-level mitigation options.

What's Next?

Following the completion of Stage 4 and 5, Stages 6 and 7 will involve more detailed analysis and transport modelling of development scenarios, including sites, access and movement parameters, and mitigation options.

In terms of mitigation option development this will include:



This will inform the Submission Draft of the Local Plan which will present proposed site allocations and a comprehensive mitigation strategy.

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