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Stage 3 Transport Assessment

North Somerset Local Plan

North Somerset Council

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Quality information

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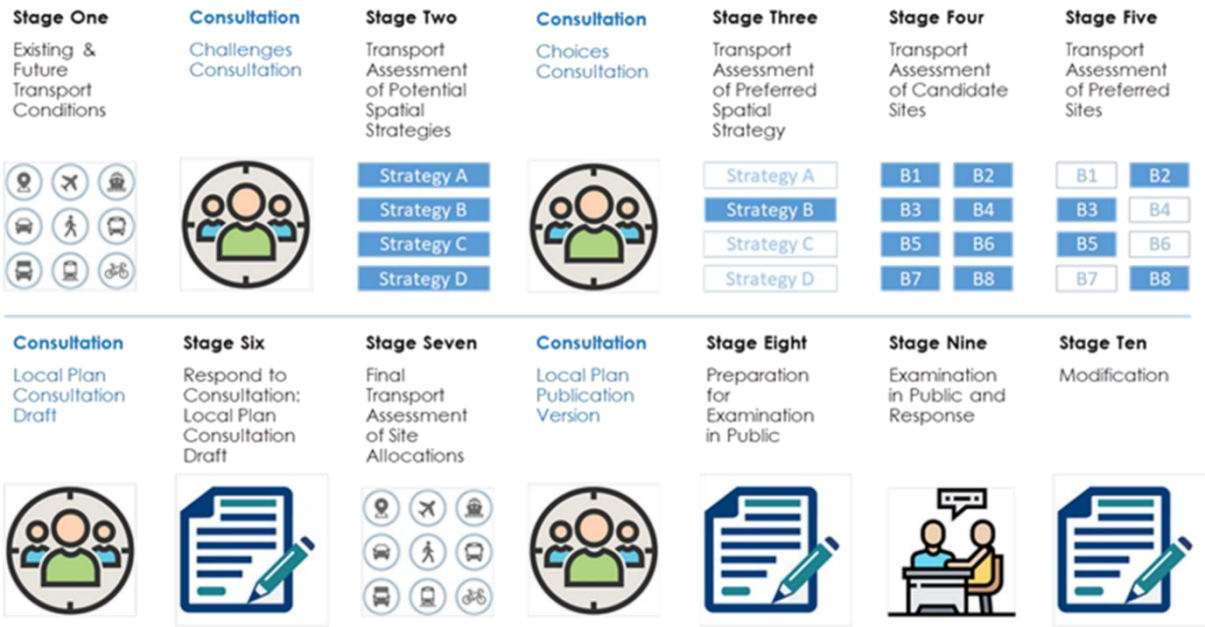
1. Introduction

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 becoming carbon neutral.

1.2 As part of development of the Local Plan, the Council needs to identify a Spatial Strategy for delivering housing and employment growth, and subsequently allocate development sites within that Strategy. The Local Plan process is summarised indicatively in Figure 1.

Figure 1: Local Plan Process Summary



1.3 This report presents the findings of Stage Three of the above process. The Council has identified four potential Spatial Strategies which require assessment and appraisal from a transport perspective. Each Strategy represents a different approach to delivering the housing and growth requirements of the Local Plan. This appraisal draws distinctions between the strategies in transport terms, including which has the least need for travel, and is best placed to deliver public transport, cycling and walking. The Strategies are set out in detail in Chapter 4, and include:

1) Retain Green Belt;

2) Urban Focus;

3) Transport Corridors; and

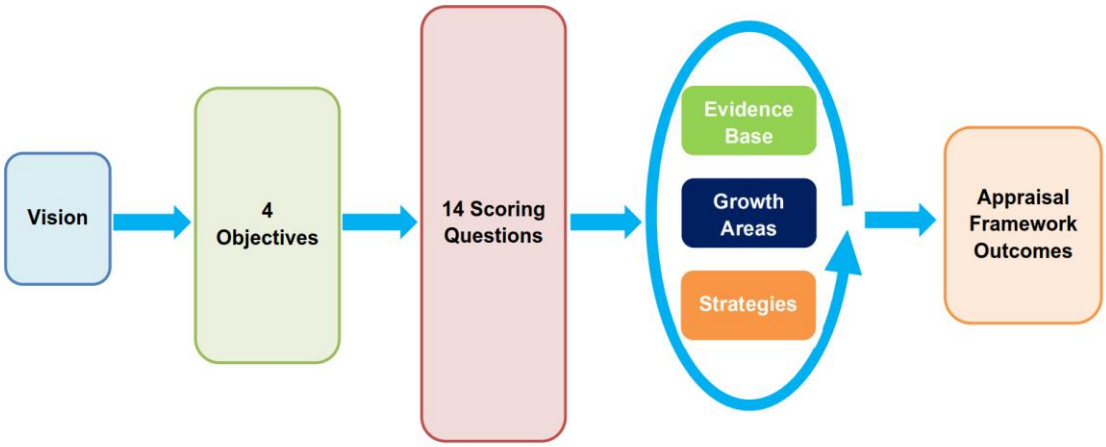
4) Greater Dispersal.

1.4 Developed in partnership with North Somerset Council, this Spatial Strategy Transport Assessment sets out the methodology and findings of the appraisal of four Spatial

Strategies. This analysis will be developed into a Stage Three report which will include consideration of potential hybrid options and opportunities to improve scoring of worse performing strategies through mitigation, to lead to the identification of a Preferred Spatial Strategy.

1.5 This appraisal has been completed in stages. This is summarised in Figure 2.

Figure 2: Appraisal Framework Process Summary



1.6 An evidence base identifies the existing challenges and transport issues and opportunities in North Somerset and in the wider region that have an influence on the allocation of growth in the district. This establishes the current conditions of walking, cycling, public transport, traffic, environment and carbon. A review of likely future conditions highlights schemes which are realistically likely to be in place by 2038 and inform the assessment of each of the potential Spatial Strategies.

1.7 A Vision and four Objectives were developed, linking back to best practice, Adopted Policy and emerging priorities identified through consultation, leading to the development of an Appraisal Framework. The Appraisal Framework includes 14 questions aligned with the Vision and Objectives, with appraisal against each question linked directly to the Evidence Base.

1.8 The Spatial Strategy Transport Assessment sets out these stages in the following sections:

- Section 2 summarises and highlights the existing and future conditions, and the challenges associated with them
- Section 3 sets out the Vision and Objectives
- Section 4 describes the appraisal methodology
- Section 5 outlines the results of the appraisal
- Section 6 provides concluding remarks

2. Current and Future Conditions

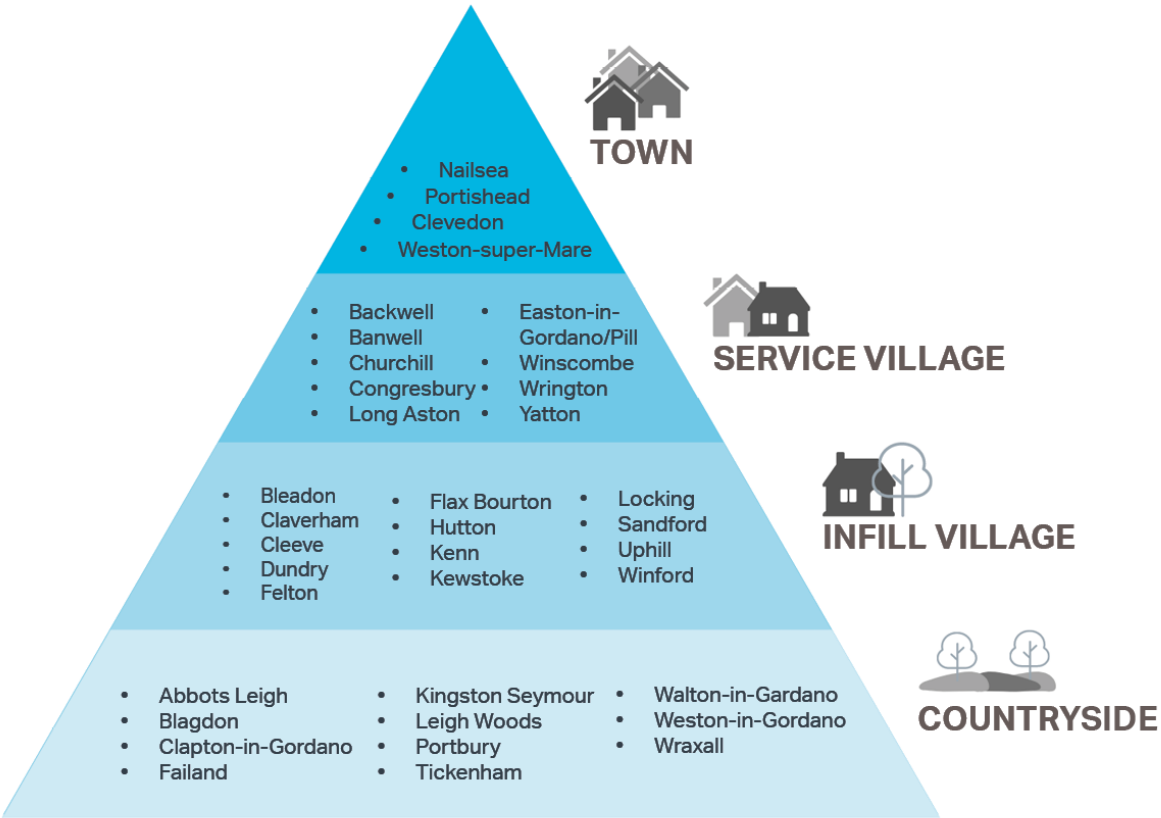
2.1 This section provides a short overview of the current conditions in North Somerset and also setting out proposed future transport schemes. The information presented below is a summary of an evidence review exercise, undertaken at the start of the strategy development process. More location specific evidence is referenced for each of the growth areas in Chapter 4. The full evidence review is provided in Appendix A.

Social Context

2.2 North Somerset has four primary towns which account for approximately 60% of North Somerset's population; Weston-super-Mare (primary town in North Somerset), Portishead, Clevedon and Nailsea. These settlements play a key role within the district, providing services used by a wider catchment. They have the highest level of infrastructure and are well connected in terms of transport links.

2.3 These towns are at the top of the settlement hierarchy within North Somerset. Whilst not in North Somerset, Bristol is a major regional city in the West of England and exerts significant influence on North Somerset as a major centre. A settlement hierarchy is a way of categorising settlements to recognise their different roles and functions, and the scale of facilities, services, amenities and employment available at each, shown in Figure 3. It is important in considering the degree to which a place can locally support the needs of existing and future residents without longer distance travel.

Figure 3: North Somerset Settlement Hierarchy

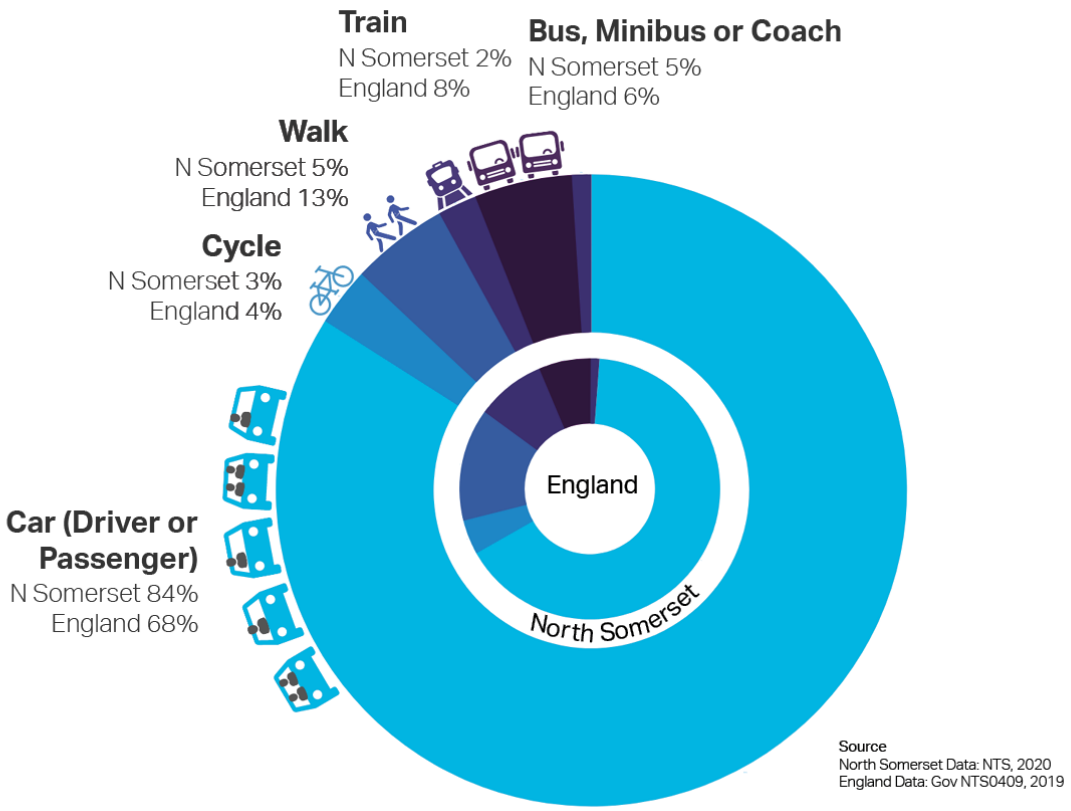


2.4 North Somerset is a generally prosperous authority, with relatively low levels of deprivation, with the exception of parts of Weston-super-Mare, particularly concentrated in the town centre.

2.5 87% of households have access to at least one car. Lowest levels of car ownership are in the main towns, whereas rural and inter-urban areas have the highest levels of car ownership per household, with some rural areas having car ownership levels double the UK average.

2.6 Over three quarters (84%) of people travel to work by car, which is significantly higher than the England (68%) average (Figure 4). Conversely, only 3% of people travel to work by bus, and 2% by train, which is less than half of the England averages of 7% and 5% respectively.

Figure 4: Mode share



2.7 Commuting patterns of the four main towns have been analysed. Clevedon, Nailsea and Portishead show a high level of out-commuting to Bristol. Weston-super-Mare shows significantly higher levels of self-containment, albeit Bristol still exerts a reasonable draw.

2.8 Broadband speeds have an influence over the potential to reduce the need to travel, especially if people have the opportunity to work from home. A review of current broadband speeds was undertaken and shows urban locations have access to the fastest broadband speeds available, whereas villages lower down in the settlement hierarchy have much slower internet speeds. Villages along the main highways tend to have faster broadband speeds than more rural villages.

Transport

Active Travel

2.9 The district benefits from a range of strategic active travel routes including several NCN routes such as the Festival Way (Route 33) and Route 41, connecting both Nailsea and Portishead to Bristol via majority off-road infrastructure, albeit Route 41 is not paved in places including along the River Avon. The Strawberry Line (Route 26) runs north-south through the district. NSC is currently working on additional routes and missing links in the network, including strengthening connections between Weston-super-Mare and Clevedon.

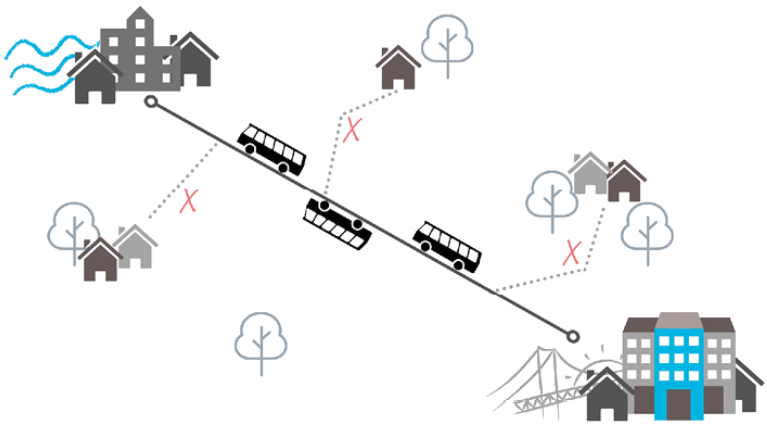
2.10 There are also a large number of Public Rights of Way (PROWs) providing a network of leisure routes. However, the M5 and Bristol to Weston-super-Mare rail line form barriers to movement as limited crossing points are available.

Bus

2.11 Buses provide essential access to education, work and leisure for many, including those who do not have access to a car. To encourage ease of usage, Travelwest offers travelcards to make travel easier across the district and further afield in the WECA authorities.

2.12 The A370 and A369 offer a good level of bus service and frequency between the main towns of Clevedon, Portishead and Nailsea in North Somerset, and Bristol. The two park and rides in the area (Portway and Long Ashton) operate at least 4 services an hour 6 days a week. There is also a reasonable level of bus coverage in and around Weston-super-Mare.

2.13 Connections on the A38 are limited, including on the A368/A371 between Churchill and Weston-super-Mare. Villages that are off the main radial routes into Bristol typically have poor bus connectivity.



The majority of **bus services exist on the main radial routes** between Bristol and Weston-super-Mare. There are **limited bus services to infill villages**

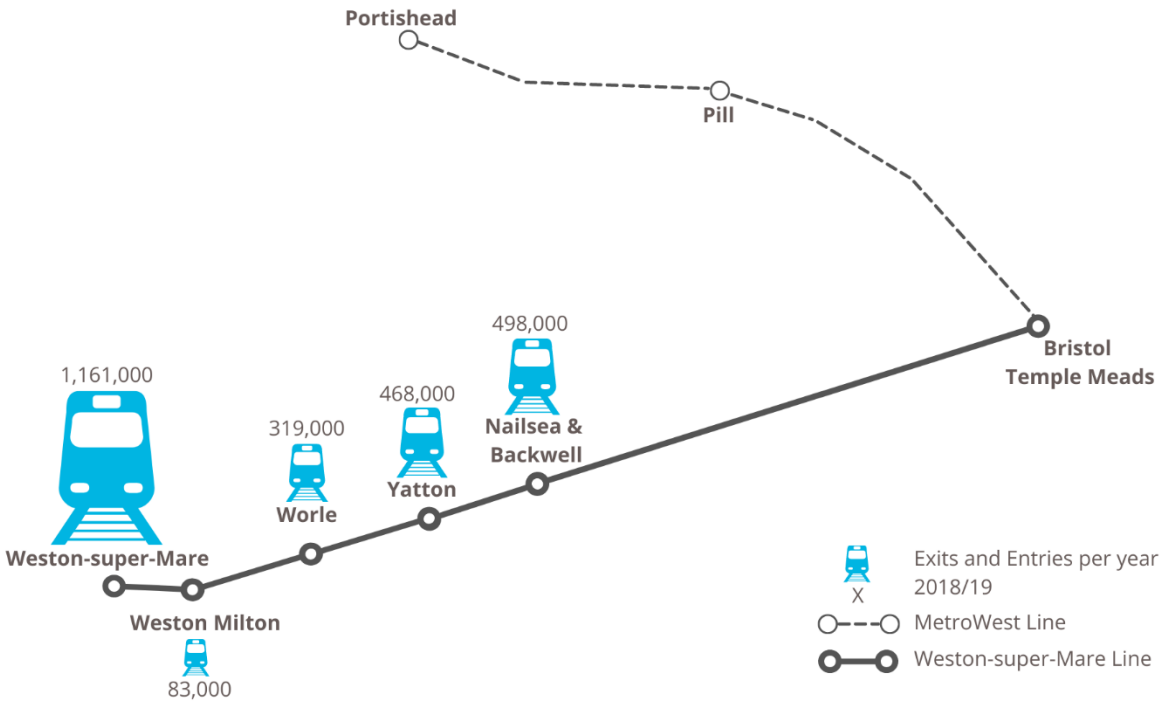
Rail

2.14 The rail network through North Somerset comprises the Great Western Railway (GWR) route between Weston-super-Mare and Bristol city centre. This route includes the following rail stations within North Somerset; Weston-super-Mare, Weston Milton, Worle, Yatton, and Nailsea & Backwell. There are approximately 2-3 services per hour between Weston-super-Mare and Bristol Temple Meads, with approximate journey times of between 20-30 minutes depending on service The current network provides reasonable connections to Bristol Temple Meads and further afield locations such as Taunton, Cardiff Central and Penzance.

2.15 Constraints on rail provision include reduced off-peak service frequency, congestion on the rail line due to mixed speed services, and a bottleneck on the Weston-super-Mare

branch with a single loop which acts as a passing point, albeit that provides an overtaking opportunity for faster CrossCountry services.

2.16 The MetroWest Phase One project includes re-opening of passenger rail services at a rate of one per hour between Portishead and Pill Rail Stations, and Bristol Temple Meads.



Highway

2.17 A large proportion of trips in the district are taken by car, and therefore having a safe and efficient road network is important. The M5 routes north-south through North Somerset, with three motorway junctions connecting to three of the towns; Weston-super-Mare (Jn21), Clevedon (Jn20), and Portishead (Jn19). The A370 and A38/A368 are also key spine routes providing the principal connections to settlements in the district. As a result, there is often congestion on these roads, impacting on safety, bus journey times and localised air quality.

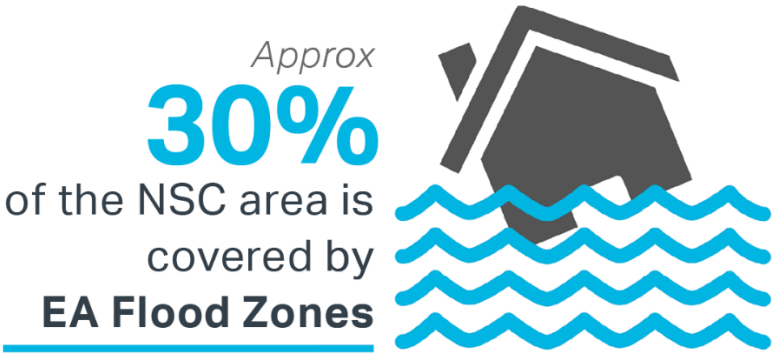
2.18 North Somerset Council is committed to encouraging the widespread use of electric cars, vans and bikes as part of the Go Ultra Low West project[1]. The Revive public charging network is constantly expanding through this project across the West of England, and by the end of 2021, Portishead will have a new rapid charging hub, allowing drivers to recharge their cars in minutes rather than hours. Public charging points are focused in the main towns and service villages; however the constant expansion of the public charging network will provide a more ubiquitous network that serves all communities.

[1] https://travelwest.info/electric-vehicles/go-ultra-low-west

Environment

Constraints

2.19 Traffic and travel demand generated by housing growth has the potential to impact on the built and natural environment as well as simply the transport network. North Somerset is subject to a number of environmental designations, including AONB (Areas of Outstanding Natural Beauty), SSSIs (Sites of Special Scientific Interest) and Conservation Areas. A large proportion (30%) of North Somerset is also subject to varying categories of flood risk, greatly influencing where development can be.



Carbon

2.20 Transportation accounts for 42% of North Somerset's carbon footprint (NSC, 2020) and therefore is a key area of focus within any response to climate change. Integrated transport and spatial planning will need to reduce the need to travel, improve low carbon travel options, and support the Climate Emergency. Thus, the impact of growth on transport related carbon emissions is a key consideration within the selection of the final Spatial Strategy, identifying an option that aligns best with the sustainable development vision of NSC.

3. Transport Vision and Objectives

Introduction

3.1 The Transport Vision and Objectives set the basis for decision-making and ensure that those decisions link back to best practice, Adopted Policy and emerging priorities. This includes Joint Local Transport Plan 4 (JLTP4), the Climate Emergency declaration, and outcomes from NSC's Challenges Consultation.

3.2 The Vision sets out what we want to achieve in transport terms, and the objectives guide how we expect transport to contribute towards the Vision. The way the Vision and Objectives have been applied to the Appraisal Framework in this report is bespoke to the Spatial Strategy selection stage of the Local Plan process. Whilst assessment and appraisal will evolve in later stages of the process, the Vision and Objectives are intended to remain consistent and guide the transport assessment of the Local Plan throughout its development.

Vision

3.3 Transport, even sustainable transport, is not an end in itself. Transport is important in terms of what our transport system can enable, e.g. mobility and access, and how it can contribute to wider societal benefits such as health and wellbeing, and placemaking. How that is achieved, and the degree to which Spatial Strategies contribute to this, is established through defining Objectives. The Vision sits above the Objectives, and informs them, as well as creating a coherent narrative for what we are trying to achieve through the plan-making process. The Transport Vision is consistent with the Local Plan Vision as a whole, but is needed to inform the development of transport specific objectives and appraisal.

3.4 A review of the issues, priorities and objectives of the Local Plan Challenges and Choices documents has identified the following key topic areas for inclusion within a Vision:

- Sustainable access to opportunities.
- Optimal use of land and minimise impact to landscape.
- Protect landscape.
- Zero carbon and renewable energy generation.
- Cohesive, connected community.
- Health and wellbeing.
- Green infrastructure.
- Effective adaptation to the impact of climate change.
- Affordable housing.
- Regeneration / protection of town centres.

3.5 Clearly it is not possible to include each of the elements above in a coherent transport Vision. The proposed Vision below aims to encapsulate as many of the key points as possible, prioritising those where transport can have the greatest influence:

> *Growth that positively contributes towards zero-carbon mobility to reduce the impact of climate change, create better places and support the development of connected, inclusive and healthy communities.*

Objectives

3.6 The Objectives each contribute to the delivery of the Vision and follow the principles of the Sustainable Travel Hierarchy, i.e. reducing the need to travel, supporting travel by sustainable transport modes, and minimising the impact of residual vehicle trips. The degree to which each Spatial Strategy contributes towards each objective has been appraised using a series of questions with transparent criteria identified.

3.7 The Appraisal Framework primarily considers the degree to which growth can be delivered in as sustainable manner possible, but also includes the potential for patterns of growth to support improvements to sustainability opportunities available to existing and future communities. The objectives are as follows, with brief commentary:

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.

3.8 This is intended to cover the ability for Spatial Strategies to enable people to be within walking/cycling distance of facilities, whether that be new facilities within large development sites or existing facilities in close proximity. It captures both the ability of developments to provide supporting facilities, and also for homes to be located close to existing facilities, as the transport outcome is similar. This also considers the ability for Spatial Strategies to create a critical mass of population to enable existing communities to become more sustainable through the provision of facilities. It supports the aspiration to create “15 minute communities”, where walking and cycling are the natural choice for these short trips.

3.9 Appraisal questions cover both areas, as well as working from home potential, noting that the provision of suitable design and infrastructure measures to enable home working will come later in the process, unless there are significant existing disparities in the communications network.

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

3.10 Objective One covers the ability to provide patterns of growth which support walking/cycling through access to key facilities in short distance. Objective Two focuses on the network itself, such as barriers to walking and cycling and the availability of infrastructure. It considers both local infrastructure, with the level of detail increasing as we move through the Local Plan process, and strategic infrastructure such as inter-urban routes including Festival Way. It utilises the Propensity to Cycle tool to objectively assess the potential of strategy areas to support cycling based on existing levels of use, and the degree to which each area can support increases in cycling in “Go Dutch” and “e-bike” scenarios.

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

3.11 This covers bus and rail modes, and includes access to existing and future public transport networks. It consider the ability for the pattern of development to support improvements to services, such as along key movement corridors, whilst recognising whether there are potential constraints to increasing the capacity of those networks. It also considers potential future schemes within plans and programmes.

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.

3.12 This includes review of the relative car dependency of the Spatial Strategies, which is informed by the appraisal against the previous objectives, to consider the degree to which the strategy will add vehicle trips to the network. Sensitive areas, such as

villages, environmentally sensitive areas and congestion hotspots have been identified, and a qualitative appraisal made of the degree to which traffic from each Strategy is likely to impact on these areas. Consideration of impact is not limited to congestion, and includes how traffic dominance can affect the ability to create better places. The potential impact of growth on congestion is included within this objective, including potential safety impacts of increased congestion, such as on the Strategic Road Network (SRN).

3.13 This includes a review of whether any mitigation exists in plans or programmes for potential issues. At this stage, the potential for Spatial Strategies to mitigate traffic impacts is considered at a high level, for example large scale development with focused impact is likely to present greater ability to deliver mitigation than multiple smaller areas creating a high level of dispersed impact.

4. Appraisal Methodology

Introduction

4.1 The Appraisal Framework has been designed to articulate the impacts of the growth approaches in terms of transport. This section discusses the characteristics, benefits and the disbenefits of each potential growth area within the district, to build a narrative that explains the assessment of the four Spatial Strategies using the Appraisal Framework.

Alternative Growth Approaches – Spatial Strategies

Overview

4.2 Four potential Spatial Strategies have been identified by NSC. These are:

1) Retain Green Belt;

2) Urban Focus;

3) Transport Corridors; and

4) Greater Dispersal.

4.3 All four approaches are capable of delivering the 20,475 dwellings currently required by the government, taking into account the major constraints in the district, such as flood risk and environmentally sensitive areas. Circa 5,000 dwellings of this requirement is identified through the following, and is included as common within each approach:

- An estimate of around 2,000 of these dwellings could be developed on brownfield sites within the four main towns of Weston-super-Mare, Clevedon, Portishead and Nailsea.
- Small scale sites coming forward within other areas identified through the Neighbourhood Plans and/or outstanding planning permissions. This is assumed to be in the region of 3,000 dwellings.

4.4 This leaves a net figure of 15,475 dwellings to deliver through the Local Plan, with different patterns of growth set out in the four Spatial Strategies. A brief description follows, highlighting the characteristics of the potential growth areas in the growth approaches. The growth areas, and levels of housing apportioned therein, represent the building blocks for each of the Spatial Strategies.

4.5 The Spatial Strategies apportion growth at a range of scales from up to 500 homes to over 5,000 homes. The assessment of the Spatial Strategies includes an assumption that larger scale development in growth areas will be able to support provision of a greater number and range of facilities than smaller scale development, although it is not possible or appropriate at this stage to specify exactly what supporting facilities would be provided by each growth area. In practice, this will vary on a site by site basis, but it is a reasonable assumption at this stage of strategy development that larger sites will support a greater level of self-containment than smaller sites.

4.6 It is noted that growth is not specified as being delivered by a certain number of sites. However, it is reasonable to assume that the Local Plan and Development Management processes have the capability of ensuring comprehensive planning and cumulative assessment of growth areas such that suitable mitigation and supporting facilities are secured for the growth area as a whole, rather than sites in isolation.

4.7 Within each approach, employment locations have a commonality, with the only difference being that no employment is located at Royal Portbury Dock in the Retain Green Belt Strategy; New sites will be located around sites at M5 J20 (Clevedon) and J21 (Weston-super-Mare), although work is ongoing to explore the scale of employment, change that the plan needs to support, and the types of employment growth that the area is likely to experience. Larger scale residential growth areas including, but not limited to, those of 1,500 dwellings or above, are assumed to also deliver a level of employment.

Area Characteristics

4.8 A summary of the transport characteristics of each potential area of growth in the district is outline below. Whilst Weston-super-Mare and Clevedon are categorised as main towns, the strategies do not allocate substantial levels of new growth in Clevedon or in Weston-super-Mare west of the M5 and there is limited differentiation between strategies in these areas. Therefore Weston-super-Mare (west of the M5) and Clevedon are not specifically discussed in this section, with the East of M5 near Banwell area discussed separately.

4.9 This section refers to the Propensity to Cycle Tool (PCT) and in particular the ambitious “Go Dutch” and “E-bikes” scenarios. These scenarios are presented to demonstrate relative potential between growth areas, rather than as forecasts. The quality of cycle infrastructure will be an important determinant on achieving significant growth in cycling, and there is a difference in quality between routes suitable for leisure use, and attractive commuting routes. In order to achieve significant mode shift, commuter routes would need to be attractive year round and LTN1/20 compliant, including proper surfacing, suitable widths and segregation, well-lit and with good natural surveillance.

East of the M5 near Banwell

- A new bypass has been confirmed (anticipated to be completed by 2024) to mitigate the effects of increased traffic in the area and relieve traffic through Banwell, as well as support the proposed growth. This does however suggest a potential for the growth here to be a car dominated as the new infrastructure is designed to alleviate congestion, as well as the proximity of the development to the M5.
- Nevertheless, the growth is close to Worle rail station, which provides access to Weston-super-Mare and Bristol and offers potential to attract increased levels of patronage. The M5 does however cause severance issues east-west, especially if travelling by active modes. NSC is seeking to improve pedestrian and cycle connectivity across the M5 through the improvements delivered through Locking Parklands, Banwell Bypass and housing development. Without mitigation this has the potential to disrupt that movement, and push people to travel by vehicular modes.
- Due to the proximity of the growth area to the main town of Weston-super-Mare, the development has the potential to provide good connections via bus, particularly along the A371, and therefore access to the amenities and facilities that Weston-super-Mare offers. The existing bus routes along the A370, if accessible to the housing growth, also provide an alternative sustainable connection to Bristol, further opening up services and opportunities.
- There is limited pedestrian infrastructure on the A371 in the near vicinity of the area and local roads, and growth areas are greater than a 2km walking distances of nearby facilities and services, albeit good pedestrian/cycle access is expected to be achievable to Locking Parklands and associated facilities. Nevertheless, there is a good PROW network in this area, however, this primarily supports leisure rather than utility travel.

- The percentages that cycle to work in this area, taken from the Propensity to Cycle Tool (PCT)[2] 2011 Census dataset, are one of the lowest in the district. In the Go Dutch[3] scenario, there is the potential for cycling levels to increase in this area up to 9%. The PCT is a relative measure and provides a consistent basis for comparison of potential to increase cycling uptake. The 9% increase in the Go Dutch scenario is low in comparison with the rest of the district. This is potentially anomalous given proximity to Weston-super-Mare, but is likely to be contributed to by the severance effect of the M5 and limited existing local infrastructure, which are likely to result in a constraint, to a degree, to the level of cycle uptake.
- Current broadband speeds in this area are shown to be <10Mbps available compared to superfast and ultrafast broadband speeds in the main urban centres. This impacts the ability for homeworking and reducing the need to travel, especially in peak times.

Around Churchill

- Of all the larger (i.e. above 500 dwellings) growth areas proposed in the four approaches, this proposed growth area is the furthest from one of the four main towns, and therefore a more expansive range of services and facilities. The villages of Winscombe, Churchill, and Sandford, nearby will provide a limited selection of amenities, but still require the need to travel, which is likely to be predominately by car if other attractive alternatives are not provided.
- The A38 is the main transport link near this potential growth area. Although bus services are limited on this stretch of road, large scale growth could provide opportunity to improve bus services on the A38, connecting the development to both Weston and Bristol. However, this improvement would be from a low baseline and could require a reasonable amount of development before service are enhanced to an attractive level.
- There is limited scope to connect the potential growth area to the rail network, given its significant distance from rail line. The nearest stations are Yatton and Worle, which provide rail services to Weston-super-Mare and Bristol.
- This growth area is near to one of the main strategic active travel routes in the area; the Strawberry Line. This provides connections to Yatton and Cheddar, with proposals to connect to Clevedon. However travel is still required to access this off-road shared use facility and the scale of opportunities that it connects the growth area with are relatively limited, particularly in terms of its potential as a commuter route.
- There is limited pedestrian infrastructure on A368 and local roads, and growth areas are greater than a 2km walking distances of nearby facilities and services. Nevertheless, there is a good PROW network in this area, however, this primarily supports leisure rather than utility travel.
- PCT levels of cycling using the 2011 Census dataset shows that levels of cycling are on par with the rest of the district, at approximately 3% of commuters. The E-bikes[4] scenario highlights the potential for the number of commuters travelling by bicycle to rise to around 14%. The Go Dutch scenario highlights the potential for cycling activity to increase up to 19%.
- Broadband speeds in this area are currently poor, with access to speeds of <10Mbps available. This is a similar speed to the proposed growth area near Banwell.

[2] The PCT is a tool to show areas that have the greatest potential to grow cycle mode share and not a predictive tool.
[3] Go Dutch' scenario, whereby cycling levels equivalent to the Netherlands are reached in England and Wales (allowing for English and Welsh hilliness and trip distances).

[4] • Ebikes takes Go Dutch even further, and uses additional data on how e-bike ownership encourages longer trips and overcomes hilliness.

Nailsea / Backwell area

- These proposed growth areas are close to the main town of Nailsea and therefore a reasonable level of amenities, facilities and services. Nailsea and Backwell have good links to Bristol and the employment opportunities in the city, albeit relatively low employment density in the towns themselves.
- The proposed growth areas, especially south of Nailsea are nearby to Nailsea and Backwell rail station. This station provides connections to both Weston-super-Mare and Bristol, and beyond, opening up greater opportunities to employment and other services.
- The A370 is a good corridor for bus routes, already providing connections between Nailsea and Backwell, Bristol and Weston. Development in the area has the potential to improve bus services further, providing an additional travel option to rail and car, by connecting to the main towns as well as the villages off the A370.
- The Nailsea and Backwell area benefits from access to one of the main strategic active travel routes in the district; the Festival Way. This largely traffic-free route directly links Nailsea and Bristol, via Flax Bourton and Long Ashton, opening up a safe and reliable walking and cycling route for leisure and utility purposes. Pedestrian infrastructure is present on majority of roads, albeit narrow and intermittent in places.
- The percentages that cycle to work in this area, taken from the PCT 2011 Census dataset, is one of the highest in the district, potentially as a result of the Festival Way and relative proximity to Bristol. In the E-bikes scenario, commuter cycling levels have the potential to increase to 20% and in the Go Dutch scenario, there is the potential for cycling levels to increase to 30%.
- Broadband speeds in this area are good, with ultrafast speeds available in Nailsea and Backwell and could easily be extended to the growth areas adjacent to these urban centres.

Portishead

- Potential developments on the outskirts of Portishead allow the growth area to have access to the services and facilities available in Portishead. From Portishead, there are good links between Clevedon and Bristol via bus, and development may offer potential to enhance this service further.
- Portishead is also in close proximity to the M5 J19, and therefore the easy access to the motorway network can encourage vehicular traffic if sustainable methods of travel are not sufficiently provided and promoted.
- The MetroWest Phase 1 project is proposing to re-open the Portishead rail line, upgrading the existing freight line for an hourly local passenger rail services. The plans include a new rail station at Portishead, and the reopening of the former station at Pill. These new stations opens up the north east of the district, connecting to Bristol.
- The Portishead to Bristol Cycle route is mainly traffic free, connecting Pill and Easton-in-Gordano to Portishead and Bristol, albeit a large proportion of the route is unpaved and can be unattractive to some users as a result. There is also a good PROW network within Portishead. The potential developments are within walking distance to facilities and services in Portishead, and pedestrian infrastructure is present on large majority of roads.
- PCT levels of cycling using the 2011 Census dataset shows that levels of cycling are on par with the rest of the district, at approximately 3% of commuters. The E-bikes scenario highlights the potential for the number of commuters travelling by bicycle to rise to around 14% in this area. The Go Dutch scenario highlights the potential for cycling activity to increase up to 24%.
- Broadband speeds in the area of this potential growth location are shown to be good, with super- and ultra-fast speeds available.

Edge of Bristol

- The potential growth development on the south west of Bristol provides direct access to the facilities, amenities, employment and services within Bristol, albeit it is recognised that many of these destinations are in Central Bristol, which will be outside of walking distance for many residents.
- Its proximity to Long Ashton and suburbs on the edge of Bristol also provides an alternative more local set of amenities to the centre of the Bristol, with greater potential to be within walking distance. The proposed size of the potential development on the edge of Bristol, albeit varying in scale between strategies, provides an opportunity for an element of self-containment through providing essential services and amenities, reducing the need to travel, and encouraging active travel within the development.
- A number of bus services connect this area to Bristol, as well as the other main towns in North Somerset. The A370 near Bristol provides a common channel for bus services before dispersing across the network to towns and villages in North Somerset. This network opens up sustainable access to a wide range of opportunities across the district. It is also likely that development in this location would be able to link with metrobus services within Bristol, and potentially benefit from the Bristol City Centre to Bristol Airport Mass Transit route.
- The closest rail station to this potential growth area is Parson Street, with Bristol Temple Meads (BTM) located reasonably close and well connected by Public Transport. BTM is a regional rail hub which provides connections to major cities across the country via the national rail network.
- Active travel links include connections alongside Metrobus from the Long Ashton Park and Ride towards Bristol City Centre, the path parallel to the South Bristol Link Road, and the Festival Way. These routes can support and encourages active travel in the area. It is likely that growth in this location would be able to connect into these routes and facilitate cycle travel into Bristol, and access to other parts of North Somerset.
- The percentages that cycle to work in this area, taken from the PCT 2011 Census dataset, is one of the highest in the district (~7%), potentially as a result of its proximity to Bristol and reasonable infrastructure. In both the E-bikes and Go Dutch scenario, commuter cycling levels have the potential to increase up to 40%.
- Broadband speeds in this area are superfast and ultrafast, benefiting from the close proximity to Bristol.

Village locations

- Growth in the village locations generally offers few sustainable transport opportunities. There are limited bus services and proximity to the rail line in North Somerset is lacking, with limited exceptions such as Yatton. Nevertheless, there are some villages in the district that are an exception and do have good travel links and some existing services that could be improved with a level of growth:
  - Yatton – the rail station provides connections to Weston-super-Mare and Bristol. The Strawberry Line also connects Yatton to Cheddar, with proposals to connect to Clevedon.
  - Flax Bourton and Long Ashton – the Festival Way active travel route connects Nailsea/Backwell and Bristol via a predominately off-road path. Long Ashton also has good bus links to Bristol and Nailsea and Backwell.
  - Easton in Gordano – The cycle route between Bristol and Portishead provides a mainly off-road route to Portishead and Bristol, albeit much of it is unpaved. The future MetroWest Phase 1 project will also provide rail connections to Bristol from Portishead.
- Village locations tend to have limited access to local facilities and amenities. This is a downside to growth in smaller locations, as residents need to travel to access basic

services in larger, neighbouring villages and towns. This is often by car because sustainable travel services are also limited or not provided, such as in Dundry or Failand. Therefore growth in village locations, without significant provision of supporting facilities, presents a major risk of contributing to car-dominated environments as a result of a lack of basic services and alternative travel options.

- Local villages are generally within walking distance of the proposed growth locations, however there is limited pedestrian infrastructure on the main and local roads to connect the villages. There are numerous PROW links, however, mostly supports recreational activity rather than utility to access key services and facilities.
- Growth in multiple village locations is likely to result in dispersed traffic impacts, i.e. lower levels of impact in multiple locations, when compared with focused growth locations. However, longer distance traffic journeys from villages would still funnel onto key corridors such as the A370 and A38, and have a cumulative impact at congestion points.
- 2011 Census commuter cycling levels in the east of the district are higher than those villages in more rural locations (8% vs between 0-3%). In the E-bikes scenario, villages close to Bristol and along the route to Portishead have the potential for cycling levels to increase up to 30%. Villages in the middle of the district (in a vertical band stretching from Tickenham to Churchill) have the potential for cycling levels to increase to 14% with lower levels of growth in villages south of Weston-super-Mare (6%). In the Go Dutch scenario, similar patterns arise, with levels of cycling growth elevated further, seeing potential percentage increase to 40% in villages between Bristol and Nailsea and Portishead, between a 15% and 24% increase in the middle of the district and a smaller increase of 9% in the villages south of Weston-super-Mare.
- Broadband speeds in the village locations will have varied speeds. Currently the villages that are closer to the A370, such as Yatton, Failand, Flax Bourton, and near the A369 such as Abbots Leigh and Easton-in-Gordano have superfast broadband speeds or higher. Villages that are more rural, such as those south-east of Weston-super-Mare and Churchill have much slower internet speeds, and have just have access to standard broadband.

Spatial Strategies

4.10 NSC have identified four alternative approaches for identifying how new growth in the area could be delivered. The approaches take a holistic view of how development could be realised, however are not definitive. The purpose of this Stage 3 Report is to appraise each of the approaches to determine the preferred approach.

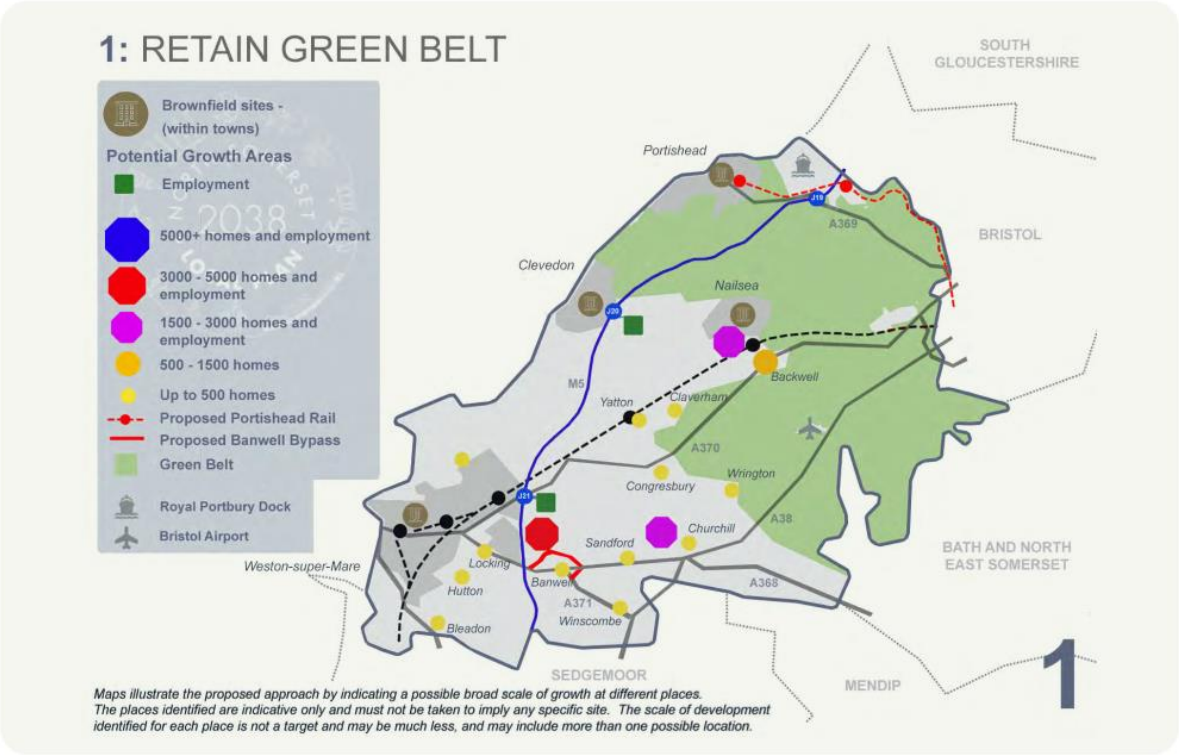
4.11 Each of the four approaches set out below is illustrative only, indicating the possible pattern and potential scale of development which might be required. The maps give a visual impression where growth might take place, but do not identify specific locations for growth, nor the potential capacity. The Appraisal Framework has used the broad distribution of growth shown in these diagrammatic maps when assessing against the criteria.

4.12 A brief description and diagrammatic map of each approach is set below.

1 – Retain Green Belt

4.13 The Green Belt covers approximately 40% of North Somerset, generally between Bristol and the edges of Clevedon, Nailsea and Yatton. This approach assumes the new development in the area is located outside of the Green Belt, as shown in Figure 5, taking environmental constraints into consideration.

Figure 5: Retain Green Belt



4.14 This Retain Green Belt growth approach includes:

- Urban extensions generally to the south/south west of Nailsea.
- Growth to the north and east of Weston on land east of the M5 and a new settlement near Churchill.
- Multiple small growth areas, including to the west of Backwell and at a number of other village locations.
- There is little growth potential proposed at Clevedon and Portishead, other than within the existing urban areas, given the Green Belt and flooding constraints in these areas.

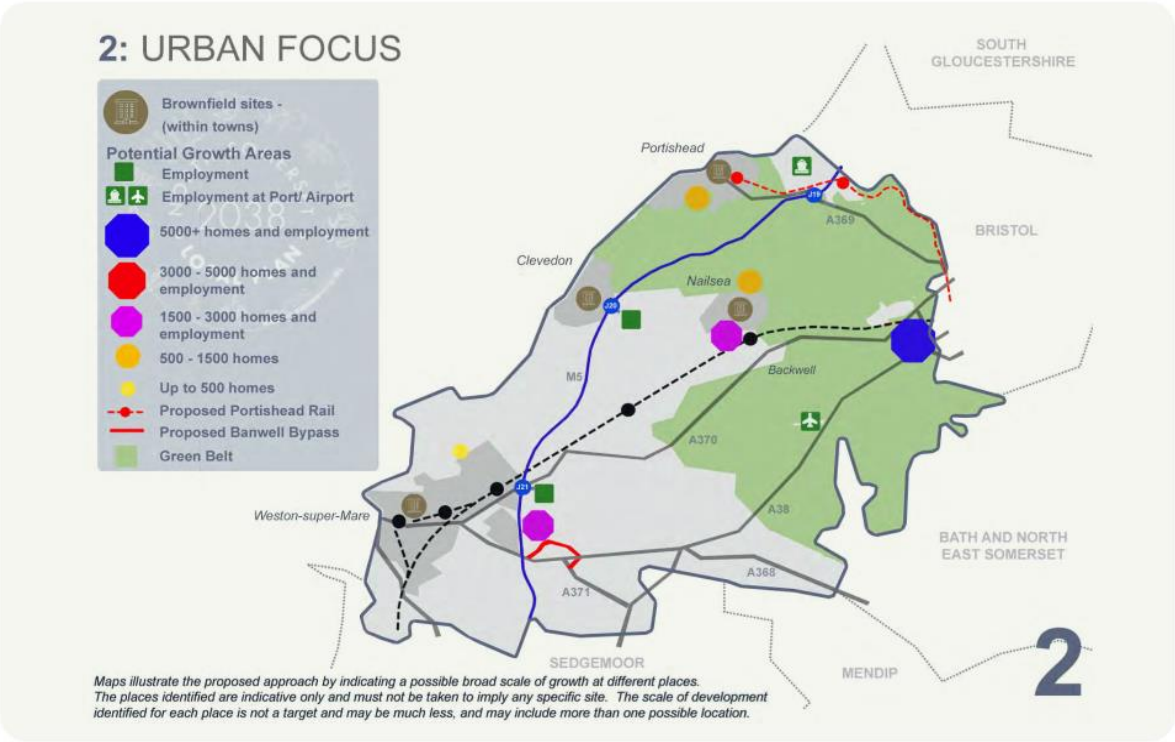
2 – Urban Focus

4.15 This approach seeks to maximise growth close to the largest urban centres (Weston-super-Mare, Clevedon, Nailsea and Portishead), where services and facilities are already located (Figure 6).

4.16 The Urban Focus approach includes the following potential growth:

- A large potential opportunity to the south west of Bristol in the Green Belt.
- An opportunity at Weston-super-Mare on land east of the M5, plus smaller opportunities.
- Potential for significant growth at Nailsea.
- Smaller scale development at Portishead given constraints.
- Brownfield regeneration at the towns, mainly through mixed use development

Figure 6: Urban Focus

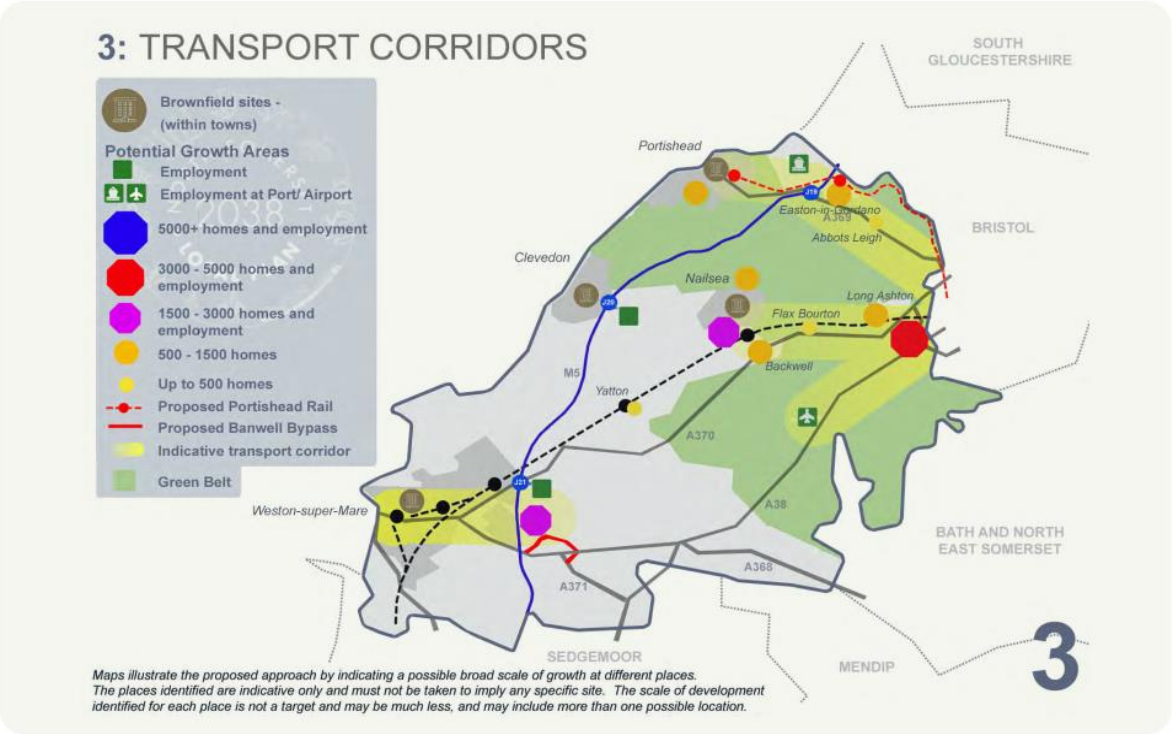


3 – Transport Corridors

4.17 This approach focuses locating potential growth areas on existing or enhanced public transport corridors. The following corridors (shown in Figure 7) have been identified where there is potential for new growth to be linked to the main urban centres of Weston-super-Mare and Bristol:

- The A370/rail corridor connecting housing and employment at South West Bristol and other locations towards Nailsea, and by rail connecting Yatton.
- The A369/rail corridor connecting Bristol, Portishead and Easton-in-Gordano.
- The A38 corridor to the airport.
- Improvements to transport corridors at Weston, particularly linking potential development east of M5 (housing and employment) to the town and the rail network.

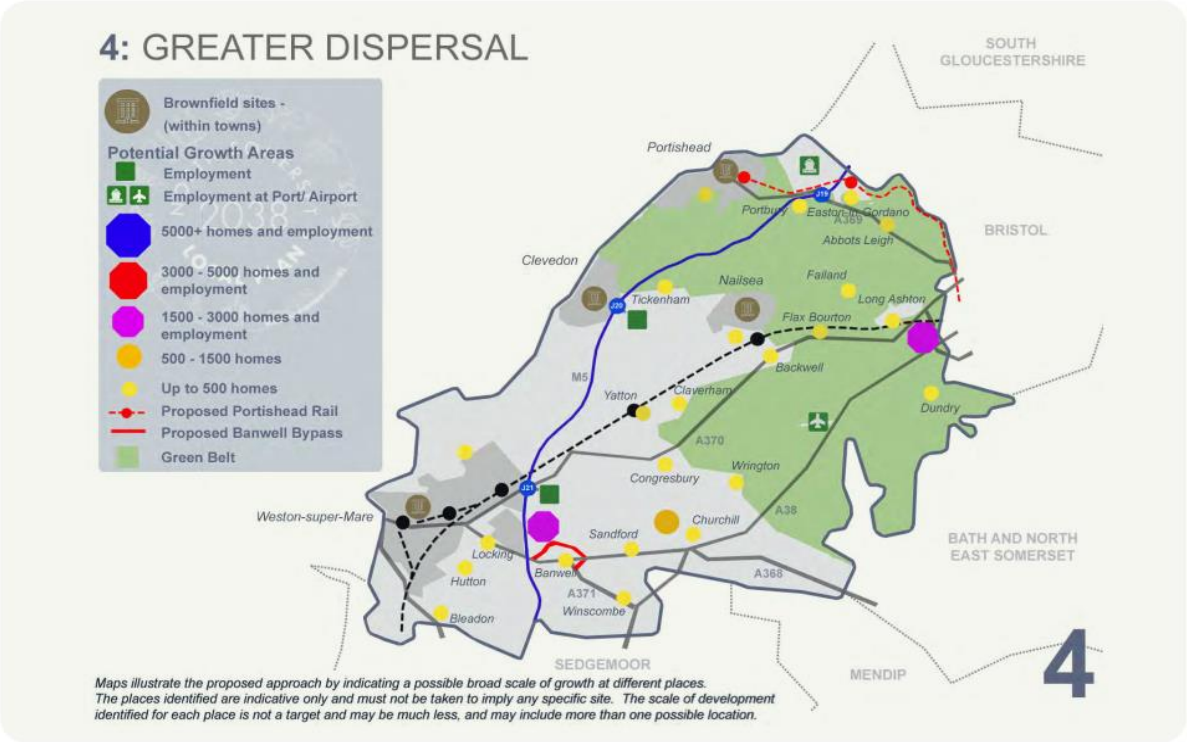
Figure 7: Transport Corridors



4 – Greater Dispersal

4.18 As shown in Figure 8, This approach identifies a relatively broad and even spread of development across North Somerset, with multiple smaller growth areas rather than a smaller level of larger growth areas.

Figure 8: Greater Dispersal



Appraisal Framework

4.19 A bespoke set of scoring questions was developed to reflect each objective (chapter 3) and based around a measurable dataset, provided in the evidence base. A set of criteria was developed for each question to enable an assessment of the objective to be made; the Appraisal Framework is provided in Appendix B. The four objectives and their corresponding scoring questions is set out below

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.**
   a. Will this strategy provide developments large enough to provide on-site schools? If not, are the development locations in the strategy in close proximity to existing schools?
   b. Will the Strategy provide new on-site employment opportunities? If not, are the development locations in the strategy in close proximity to existing employment?
   c. Will this strategy provide developments large enough to provide on-site retail and other facilities? If not, are the development locations in the strategy in close proximity to existing retail and other facilities?
   d. What is the average broadband availability in the development locations in the strategy?
2. **To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.**
   e. Are strategic active travel routes in close proximity to growth areas in the strategy?
   f. How does the strategy score against PCT Census 2011 Scenario at an LSOA level?
   g. How does the strategy score against PCT Go Dutch Scenario at an LSOA level?
   h. How does the strategy score against PCT ebikes Scenario at an LSOA level?
3. **To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.**
   i. How accessible are the strategies to the nearest rail stations by foot/ bicycle?
   j. How accessible is the bus network from the growth areas?
   k. Does the strategy align with existing and planned Public Transport schemes? (e.g. LRT, MRT, P&R etc)
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.**
   l. Are growth areas in the strategy likely to impact on congestion hotspots, in terms of both capacity and safety?
   m. Are there any schemes that mitigate existing highway issues near growth areas in the strategy?
   n. To what degree is traffic from growth areas likely to impact on environmentally sensitive areas?

4.20 The Appraisal Framework aims to provide a strategic assessment of growth areas, and not an assessment of individual sites and their internal layouts, as that is not possible at this stage. Where appropriate, the growth areas within each strategy have been overlain onto maps showing information from the evidence report and have aided the appraisal. These are provided for each strategy in Appendix C.

4.21 As stated, no information is available at this stage on specific sites that will come forwards within each Spatial Strategy, or site parameters such as masterplanning,

density, layout or transport strategies. This Stage 3 Transport Assessment therefore appraises the potential for growth to be delivered sustainably. It should be noted that there is a risk that, as with all development, that potential is not realised as sites come forwards if they are not planned and delivered sustainably. Future stages of the Local Plan development process will need to set the strategic parameters within which sits will be expected to come forwards to realise that potential.

4.22 Walking potential is heavily linked to distance to facilities, such as education, employment, retail, as well as any major barriers. As such, the correlation of growth areas with existing towns and villages is a key indicator in the potential for walking to be an attractive mode of travel. This was considered within criteria a-d and i-k. At site selection stage (Stage 4), walking potential will be assessed in greater detail when more is known about the precise location and design of the sites and distances to destinations and route quality can be assessed.

4.23 Higher broadband speeds are often linked to the potential to work from home and reduce the need to travel, and as such, the availability of broadband (d) has also been included in criteria. Nevertheless, the assessment is based on existing broadband speeds, and developments brought forward will be required to provide fast internet speeds as part of a levelling up initiative in the UK to install high-quality digital infrastructure from the outset[5]. The potential to deliver this will be influenced by the quality of existing infrastructure.

4.24 Appraisal of walking potential predominantly considers distance to facilities at this stage, as well as strategic active travel route. Appraisal of cycling also considers other factors as there are greater opportunities to travel further distances by bicycle than by foot. Assessment of different PCT scenarios (f-h) is therefore presented to determine the potential growth in cycling as a mode share, being mindful that the PCT is not a predicative tool and patterns of growth may differ in reality to those displayed in the different scenarios. The proximity to strategic active travel routes has therefore been assessed assuming there is a correlation of potential for update of walking and cycling (e).

4.25 Notwithstanding this, longer distance cycling trips may not be attractive or feasible for some, who may choose to travel by car or public transport for longer journeys. Thus, the potential to enable cycling through reducing trip distances is inherently assessed under Objective 1, whilst question (e) under Objective 2 appraises the ability to support cycling (and walking) for longer distance trips through access to strategic routes.

4.26 The questions displayed under Objective 3 (i-k) assumes a correlation between the proximity to the bus/rail network and the potential for bus/rail travel and improvement in services. A 1km buffer around the existing bus services and a 2km buffer around the rail stations in North Somerset/ South West Bristol has guided assessment against this as it provided a visual representation of theoretically what is within an acceptable walking distance[6], in the absence of specific site locations. These distance buffers to existing bus and rail infrastructure helps show how well the strategies align with planned public transport schemes. These planned transport schemes have been defined by North Somerset as committed and the strategies have been appraised as if these schemes are delivered as early stage infrastructure. There will be, however, potential for larger growth areas to deliver mitigation, such as enhanced bus services. This is likely to occur over a number of years, rather than be in place upon the delivery of the first number of dwellings.

4.27 At this stage in the Local Plan process, it is difficult to quantify the performance of Strategies against Objective 4 as it is not proportionate to utilise a traffic model and to

[5] https://www.gov.uk/government/news/new-build-homes-to-come-gigabit-speed-ready, accessed 24/02/21.
[6] 2km is considered the maximum acceptable walking distance, set out in the CIHT Guidelines for Providing Journeys on Foot, 2000.

examine congestion locations in detail. This will be undertaken in subsequent stages of work. Analysis is therefore necessarily qualitative. Considerations include the likelihood of development to be car reliant, dispersal or focusing of impacts, and mitigation schemes which are identified as "more than likely" or "near certain." For this reason, the scoring range under this objective has ranged from minor adverse to minor beneficial as there is insufficient evidence at this stage to describe the performance of any strategy as moderate adverse or moderate beneficial.

4.28 The questions established above enabled the objectives to be critically appraised and qualitatively scored. It is a proportionate approach that enabled fair and consistent appraisal of each of the growth approaches.

4.29 A five-point scale was used to appraise each question, providing a measurable assessment of the scale of impact. The Appraisal Framework includes criteria against each question for each scale of impact:

Scale of impact				
Moderate Adverse impact	Minor Adverse impact	Neutral impact	Minor Beneficial impact	Moderate Beneficial impact

4.30 By colour coding the appraisal of each growth strategy, a stand-out visual assessment could be made for each strategy. A collaborative approach with NSC colleagues has allowed a consensus to be built between the qualitative scores, leading to an overall impact appraisal for each strategy, which is set out in Chapter Five.

Covid-19

4.31 Evidently, the Covid-19 pandemic has had a dramatic impact on the way we live our lives, the way we work and the way we travel. However, the medium and long term repercussions are yet unclear. Whether this should have an impact on the way that the Preferred Spatial Strategy is selected has been considered.

4.32 Significant changes in journey purpose followed the national lockdowns introduced in March 2020 in response to the Covid-19 pandemic. This resulted in a dramatic reduction in trips and CO_2 emissions[7], especially from cars and aviation. As 'stay at home' restrictions eased, walking and cycling became important modes for accessing local shops and services, and for exercise while other forms of physical activity remained restricted (e.g. gyms and group participation sports).

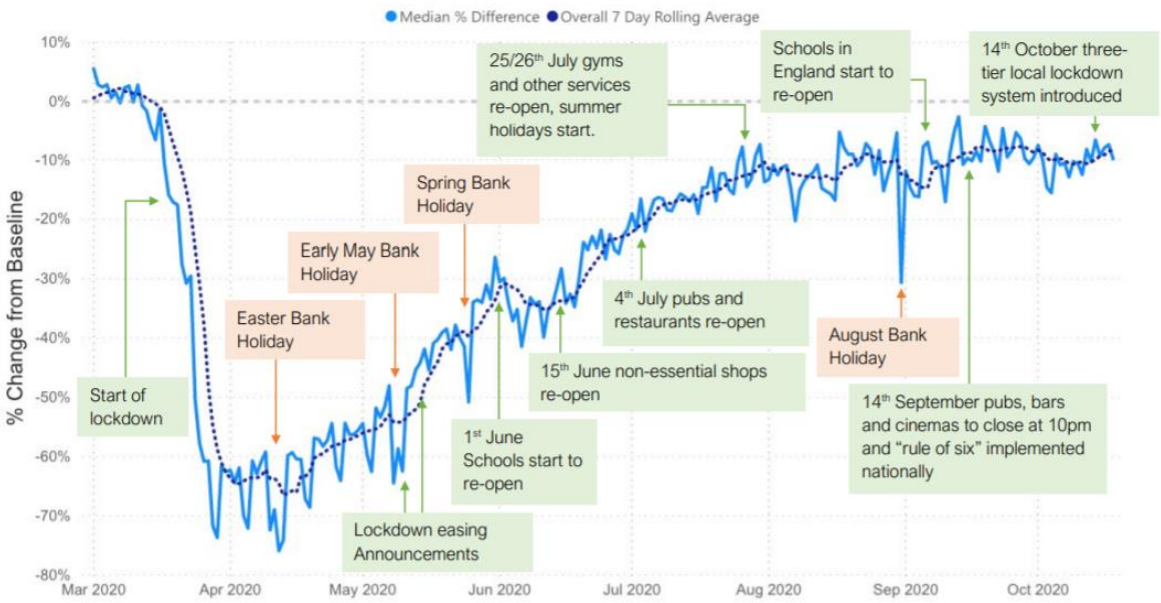
4.33 There has been widespread speculation whether these behaviours would endure. However, Figure 9 illustrates the rapid return of road vehicle use, with emissions increasing to close to pre-pandemic levels[8] as travel behaviours stabilised and weather declined into winter. The time period in Figure 9 illustrates the period of going from "normality" to full lockdown to relatively limited restrictions. Subsequently, greater restrictions were introduced through a series of tiered local lockdowns from October 2020 and a national lockdown on 5th January 2021. At the time of writing, significant restrictions remain, and therefore more recent data than October 2020 would not enable a comparison between full and low restrictions.

[7] McGrath, M (2020) 'Climate change: Scientists fear car surge will see CO_2 rebound', BBC News, 19 May. Available online https://www.bbc.co.uk/news/science-environment-52724821 Accessed 28.10.2020
[8] UK Air Quality Data Inventory. Available online https://uk-air.defra.gov.uk

4.34 Although home working has been widely reported, in practice over 70% of the workforce cannot do so[9] and many sectors are reliant on people being physically present. In April 2020, 46.6% of people did some work at home. By w/e 25th October 2020, that proportion was 29%. Thus, whilst we have seen increases in home working, and it is reasonable to assume that this it will remain higher than pre-Covid levels, we must take care not to overstate the effects of this when considering the sustainability of development locations. It is also worth noting that many trips on the network, even at peak times, are not commuting trips. The 2019 National Travel Survey (NTS502) shows that approximately half (54%) of trips undertaken 0700-0759 hours were for commuting or business. That figure drops to 23% for 0800-0859 hours.

4.35 Furthermore, car use has replaced public transport for some travellers due to concerns of exposure to the virus[10], with uncertainty over the longevity of this trend, despite emerging evidence that public transport is Covid-secure[11]. Whilst cycling peaked in May 2020 at 210.7% above the February 2020 baseline, that had fallen to 7.32% by October 2020.

Figure 9: Change in national daily average traffic volumes since 1st March 2020 across all sources compared to baseline (first week of February 2020)[12]



4.36 There are myriad factors which are likely to have affected traffic levels in different ways, and which will influence traffic levels in the short, medium and long term and there is significant uncertainty regarding longer term outcomes. What the data does demonstrate though, is that whilst travel patterns are changing, it is not a safe assumption that levels of traffic will reduce naturally as a result of external factors. Sustainable land use planning remains vitally important as a key policy lever to reduce car reliance, and hence the importance in choosing a Preferred Spatial Strategy for growth which embeds sustainability into development.

[9] ONS (2020) 'Coronavirus and homeworking in the UK labour market' Available online https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/coronavirusandhomeworkingintheuklabourmarket/2019 Accessed 28.10.2020

[10] DfT (2020), National Travel Attitudes Study: Wave 4 (Provisional), 8 October

[11] Culbertson, A and Aguilar-Garcia, C (2020), 'Coronavirus: Why public transport could be safer than we thought', Sky News 7 October. Available online https://news.sky.com/story/coronavirus-why-public-transport-could-be-safer-than-we-thought-12091657 Accessed 28.10.2020

[12] Transport Technology Forum (2020), 'Covid-19 Local authority travel and transport data - Weekly Digest 19 Oct 2020'. Available online https://www.ttf.uk.net/wp-content/uploads/2020/10/20-LA-travel-and-transport-data-Weekly-Digest-19-Oct-20.pdf. Accessed 28.10.2020

4.37 It is recognised that certain trends are likely to endure, such as increases in the numbers of people working remotely, and an increase in the importance of leisure and education trips in comparison with traditional commuting. This is accounted for in the structure of the Appraisal Framework. Furthermore, the transport appraisal looks at the relative sustainability of each of the strategic approaches to growth in order to determine the most sustainable of the options.

5. Appraisal Results

5.1 The appraisal of each of the Spatial Strategies is shown in Figure 10. It highlights the overall appraisal for each of the objectives, using the five-point scale. The detailed appraisal of each question for the four strategies is shown in Figure 11.

Figure 10: Summary of appraisal by objective

Strategy	1. Reduce the need to travel and travel distances	2. Supporting Active Travel	3. Supporting Public Transport	4. Traffic Impact
1 - Retain Greenbelt				
2 - Urban Focus				
3 - Transport Corridors				
4 - Greater Dispersal				

Key

Scale of impact				
Moderate Adverse impact	Minor Adverse impact	Neutral impact	Minor Beneficial impact	Moderate Beneficial impact

Figure 11: Summary of appraisal by question

Strategy	1. Reduce the need to travel and travel distances, making journeys more suitable for walking, and cycling.				2. Supporting Active Travel				3. Supporting Public Transport			4. Traffic Impact		
	a) Education	b) Employment	c) Other amenities	d) Broad-band / WFH	e) Strategic Walk/cycle routes	f) Existing Cycling	g) "Go Dutch" Cycling	h) "Ebikes" Cycling	i) Rail Stations	j) Bus Corridors	k) Future PT	l) Traffic Impact - Congestion	m) Mitigation schemes	n) Traffic Impact - Environment
1 - Retain Greenbelt														
2 - Urban Focus														
3 - Transport Corridors														
4 - Greater Dispersal														

5.2 The appraisal across a range of objectives and scoring questions points to a clear ranking of the Spatial Strategies, highlighting which of the strategy produces the most beneficial impacts in relation to the objectives.

Retain Greenbelt

Urban Focus

Transport Corridors

Greater Dispersal

5.3 The following sections provide a summary of the rationale for the appraisal of each of the Strategies.

Retain Greenbelt

5.4 Retain Greenbelt scored as the third best Spatial Strategy. Generally the strategy scored negatively on Objectives One and Three, and neutral on Objectives Two and Four.

- **Objective 1 – Reduce The Need To Travel and Travel Distances**
  - The larger number of smaller dispersed potential growth areas results in a moderate level of development situated further away from education, employment and retail, which are focussed around the four key towns in the district. Smaller developments are also less likely to be able deliver new facilities, schools and employment, and therefore longer travel distances will be required to reach these essential services.
  - This strategy does not currently support a good potential to provide high quality broadband, as growth areas near villages lower down in the settlement hierarchy have much slower internet speeds. This potentially reduces the ability to work from home and also increases the need to travel.
- **Objective 2 – Supporting Active Travel**
  - The existing levels of cycling[13] are poor in this strategy, linked to the greater spread of the growth areas, further from the existing urban areas. Most notably, the growth area east of the M5 near Banwell is situated in an area with low levels of cycling to work, and this strategy allocates a higher level of housing in this location than other Strategies.
  - This strategy scored favourably with the potential to have a growth in cycling levels similar to those seen in the Netherlands (Go Dutch Scenario).

[13] Existing levels of cycling uses data from 2011 census, and may not be accurate of more recent trends.

  - There is some correlation of strategic active travel routes with the growth areas, albeit with some gaps in accessibility. The growth areas in Yatton, Claverham, Sandford and Winscombe are in close proximity to the Strawberry Line, and the development around Nailsea and Backwell offers potential to connect with the Festival Way. The growth areas east of Weston-super-Mare have limited access to strategic active travel routes, and access is inhibited by the rail line and the M5.

- **Objective 3 – Supporting Public Transport**
  - There is reasonable potential for some growth areas to benefit from existing bus services on the A370 and in the Weston-super-Mare area. A moderate proportion of the growth areas within the strategy are within 1km (as the crow flies, not defined to routes) of bus network, however services on the A371/A368/A38 are limited at present. The level of service could be improved with the level of demand from the growth areas neighbouring this stretch of road, but this is likely to occur over a number of years.
  - A low proportion of the growth areas within this strategy are within 2km of a rail station. This could potentially increase the number of car trips, particularly, long distance commuting which could not be bridged by rail service, given the distance to major service centres and employment areas.

- **Objective 4 – Traffic Impact**
  - The growth in this strategy is maximised in proximity to the Banwell Bypass scheme, which has the potential to mitigate some traffic impact. However, the degree to which that scheme could accommodate this level of growth is as yet unclear.
  - The dispersed nature of growth is likely to mean that vehicular trips would be dispersed across the network, likely resulting in smaller impacts in multiple locations at the points where traffic loads onto the network. However, such trips are likely to be funnelled onto key route corridors.
  - There is also a moderate correlation of growth areas with congestion hotspots. Given the limited access to public transport, there is a likelihood of car dependency. Car-reliance of some of the areas of growth is likely to create negative impacts, such as social isolation, for residents who are not able to drive, in addition to the transport and environmental effects of car usage.

Urban Focus

5.5 Urban Focus has come out the most favourable of the spatial strategies. This strategy scored the highest on Objective One (Reducing the need to travel and travel distances) and Objective Four (Traffic Impact), and equal highest on Objectives Two and Three.

- **Objective 1 – Reduce The Need To Travel and Travel Distances**
  - Potential growth areas are situated closer to existing urban centres, such as Portishead, Nailsea and Backwell, Long Ashton, and south west of Bristol. As a result, there is likely to be good access to services and employment, and reduced distances needed to access these opportunities.
  - Employment within the potential larger growth areas is next to the existing urban areas and could support the wider functioning of the town and be well-connected to transport infrastructure and nearby workforce.
  - There is greater potential for active travel as distances to local key facilities, amenities, education and employment are shorter.

  - The growth areas also offers a good potential to provide high quality broadband, which can support home working and reduce the need to travel.
  - This strategy provides growth through the fewest, largest growth areas of each of the strategies. Larger growth areas have greater potential to achieve element of self-containment, providing essential services and amenities, and potential to deliver new education facilities and additional employment, reducing the need to travel, and encouraging active travel.

- **Objective 2 – Supporting Active Travel**
  - Growth in Portishead, Nailsea and Backwell and the edge of Bristol provide an opportunity to connect into the strategic active travel routes in the area; The Festival Way (Route 33) connecting the potential growth south west of Bristol and Nailsea to Bristol, and the Portishead to Bristol route (Route 41).
  - There is the largest propensity to cycle in the 'Go Dutch' scenario whereby cycling levels equivalent to the Netherlands are reached in England and Wales. The other PCT scenarios also showed the greatest potential next to urban areas, and therefore these proposed growth areas.
- **Objective 3 – Supporting Public Transport**
  - There are a high proportion of the growth areas within the strategy that are within a 2km distance of a rail station, and a very high proportion of the growth areas within the strategy within 1km of a bus network. This increases the potential for sustainable travel modes, but also the potential for an improvement in services.
  - The growth areas also align well to existing and planned public transport schemes, providing the demand to make improved services more viable. However, there is a risk that sustainable transport measures could take longer to deliver in larger growth areas, if a significant proportion of development requires completion for full service levels to be delivered.
- **Objective 4 – Traffic Impact**
  - The planned major transport schemes, listed in Appendix A, are likely to mitigate a moderate proportion of highway issues resulting from growth areas.
  - There is still be some correlation between the growth areas and congestion hotspots. Larger volumes of traffic from one area can place stress on the highway network, resulting in congestion and poorer air quality if not mitigated.

Transport Corridors

5.6 Transport Corridors is the second most favourable Spatial Strategy, performing positively but not to the same extent as Urban Focus. It scored the same on Objective 2 (Supporting Active Travel) and 3 (Supporting Public Transport), but slightly less favourably on Objectives 1 and 4.

- **Objective 1 – Reduce The Need To Travel and Travel Distances**
  - Potential growth areas are mostly situated closer to existing urban centres, such as Portishead, Nailsea and Backwell, SW of Bristol. As a result, there is reasonable access to services and employment, and reduced distances needed to access these opportunities. Nevertheless, there are growth areas within this strategy in smaller locations with limited facilities, potentially resulting in longer distance trips from these areas to access opportunities and facilities, leading to a more car-reliant environment.

  - Employment within the potential larger growth areas next to the existing urban areas could support the wider functioning of the settlements and be well-connected to transport infrastructure and nearby workforce.
  - There are existing secondary schools in Weston-super-Mare, Portishead and Nailsea, reducing the distances required to travel to school, however there are a number of growth areas that are not in close proximity to existing secondary schools, and are not likely to be large enough to deliver a secondary school. A more linear pattern of development on key transport corridors could result in longer trips to local schools and services and discourage active travel.
  - This strategy offers good potential to provide high quality broadband, which can support home working and reducing the need to travel.

- **Objective 2 – Supporting Active Travel**
  - Growth areas in Portishead, Nailsea, Backwell and the edge of Bristol provide an opportunity to connect into the strategic active travel routes in the area; The Festival Way (Route 33 and the Portishead to Bristol route (Route 41). There are also a number of smaller proposed growth areas on the Festival Way, and adjacent to the Strawberry Line (Route 26).
  - This is the best performing strategy in terms of existing cycling levels, with reasonable potential for growth in the e-bikes and Go Dutch PCT scenarios.
- **Objective 3 – Supporting Public Transport**
  - There are a high proportion of the growth areas within the strategy that are within a 2km distance (as the crow flies, not defined to routes) of a rail station, and a very high proportion of the growth areas within the strategy within 1km of a bus network. Development focused on public transport corridors enables early residents to benefit from existing public transport services, as well as providing opportunities for further investment in quality services on these corridors. Development in Portishead and Easton-in-Gordano is likely to benefit from the opening of the Portishead-Bristol Rail line through MetroWest. Nevertheless, whilst the railway corridor is attractive, it is difficult to secure significant capacity and improvements in quality.
  - The growth areas also align well to existing and planned public transport schemes, providing the demand to make the schemes more viable. However, there is a risk that sustainable transport measures could take longer to deliver in larger growth areas, if a significant proportion of development requires completion for full service levels to be delivered.
- **Objective 4 – Traffic Impact**
  - The planned schemes are likely to mitigate only a low proportion of highway issues from growth areas.
  - There may still be some correlation between the growth areas and congestion hotspots. Larger volumes of traffic from one area can place stress on the highway network, resulting in congestion and poorer air quality if not mitigated.

Greater Dispersal

5.7 Greater Dispersal is the least favourable Spatial Strategy. It scored negatively across all four objectives, with the worst score against Objective 1.

- **Objective 1 – Reduce The Need To Travel and Travel Distances**

  - The larger number of smaller potential growth areas are not as well connected to main urban centres, nor existing secondary school locations, employment and retail. Smaller developments are also less likely to be able deliver new schools and employment, and therefore longer travel distances will be required to reach these essential services.
  - This strategy does not currently support a good potential to provide high quality broadband, as growth areas near villages lower down in the settlement hierarchy have much slower internet speeds. This reduces the ability to work from home and also increases the need to travel.

- **Objective 2 – Supporting Active Travel**
  - This strategy has a moderate proportion of growth areas that are not well connected with active travel routes. There are a number of smaller proposed growth areas on the Festival Way (Nailsea, Backwell, Flax Bourton and Long Ashton) and adjacent to the Strawberry Line (such Yatton, Claverham, Sandford and Winscombe), however, the majority of growth areas are not in close proximity to active travel routes.
  - The PCT scenarios show good potential in cycling growth near growth areas on the edge of Bristol and around Nailsea and Backwell. However, overall, there are a number of growth areas, especially south of the district, that have smaller potential for growth in cycling, especially in the Go Dutch scenario.
- **Objective 3 – Supporting Public Transport**
  - This strategy sees a significant level of growth with limited access to rail network and key bus corridors.
  - Peripheral and dispersed locations are not as well-connected to the sustainable transport network, and could result in increased car trips. There is especially the potential for long distance commuting with limited opportunity to provide attractive public transport services, given the distance to major service centres and employment areas.
- **Objective 4 – Traffic Impact**
  - The dispersed nature of growth is likely to mean that vehicular trips would be dispersed across the network, likely resulting in smaller impacts in multiple locations at the points where traffic loads onto the network. However, such trips are likely to be funnelled onto key route corridors.
  - Longer distances to key services and limited opportunity to travel by public transport will result in an increase in vehicle trips and an over-reliance on cars. Planned highway schemes are likely to only mitigate a low proportion of highway issues from growth areas.

Carbon appraisal

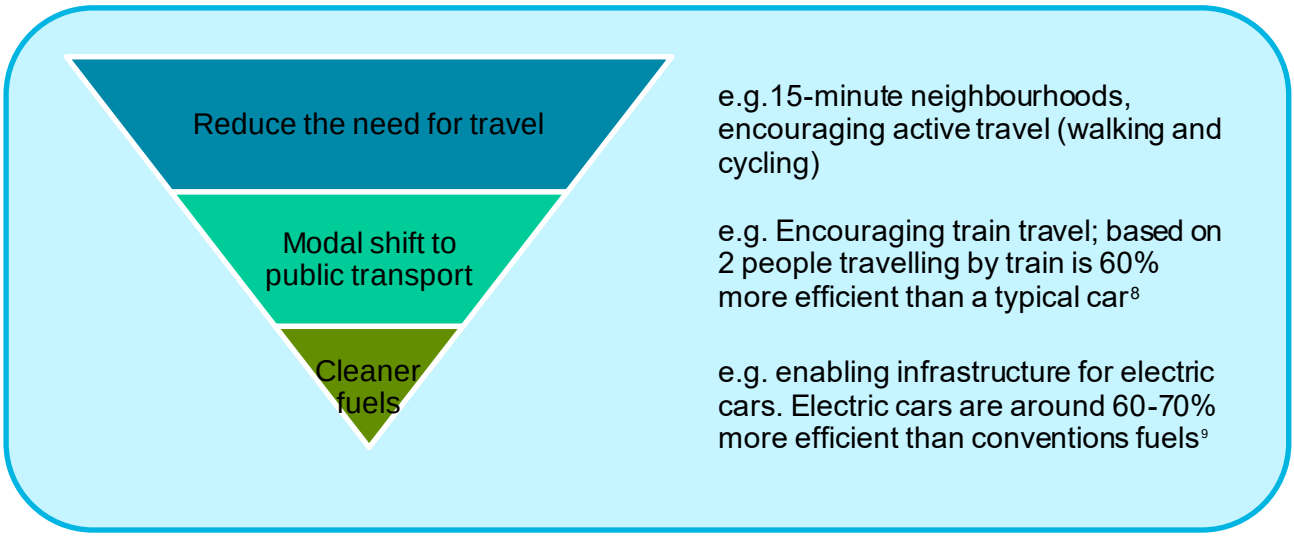
5.8 The carbon impact should be a key consideration within the selection of the final Spatial Strategy, identifying an option that aligns with the sustainable development of NSC, through environmental, social and economic wellbeing, as well as support of the Local Plan and National Net-Zero Targets. From a broader sustainability perspective, the selected Spatial Strategy needs to align with North Somerset's Climate Emergency Strategy. The key focus of this particular study is to **reduce emissions from transport,** but the selected Spatial Strategy will also influence wider ambitions; Supporting North Somerset's ambition to **become a Net Zero carbon council** by 2030 and **adapt to climate change**. For instance, focusing new developments within existing urban space will protect the **carbon stores** of wider greenfield assets. In addition, 'Local Living' strengthens the focus on sustainable infrastructure, which

integrates **renewable energy generation** and **energy efficient buildings**, whilst acting as an enabler for circular economy practices (**repair, reuse and recycle**).

5.9 The 'Terms of Reference: Carbon Neutrality' technical note, which forms part of the Evidence Base report included at Appendix A, identified that applying a business as usual approach would result in an increase in transport emissions. Therefore, to achieve net zero targets, all new developments need to be designed to be low-carbon and sustainable transport initiatives deliverable alongside growth to facilitate transformational modal shift from existing and future users in order to reach Net Zero.

5.10 Figure 12 provides a hierarchy for action, although in reality spatial planning should take account of all three decarbonisation routes, in order to achieve Net Zero transport emissions. The Spatial Strategy selection stage of plan development offers great potential to "design in" sustainability, particularly in terms of reducing the need to travel and mode shift to sustainable modes.

Figure 12: Transport Carbon Hierarchy



5.11 North Somerset's transport vision has a strong focus on carbon. Each of the scenarios have been appraised against four objectives, all of which inherently address implications in terms of transport emissions. In line with the transport hierarchy (Figure 1) these objectives are ordered in priority of action and ability to influence carbon impact;

- 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.
- To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.
- To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.
- 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.

[14] Based on BEIS 2020 Carbon Conversion Factors per km travelled. Efficiency will continue to improve as the rail sector decarbonises, introducing electric trains.
[15] Based on BEIS 2020 Carbon Conversion Factors. Efficiency will continue to improve as the National Grid decarbonises. https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019

Table 1 provides a qualitative analysis of the four Spatial Strategy options with regards to their carbon impact.

Table 1: Carbon Impact of Options

Rank	Option	Carbon Impact	
1	Urban Focus	By maximising local living this reduces the distance people need to travel to access facilities (e.g. employment, leisure), increased opportunities for active travel (walking, cycling). Increase in urban cycling infrastructure provide opportunities for mode shift (e.g. cars to e-bikes). Further opportunity for modal shift through high quality public transport routes for travelling further afield.	
2	Transport Corridors	Provides a robust transport network (mix of private vehicles and quality public transport) between developments and facilities, reducing distance travelled. The option is more reliant on modal shift (e.g. car to train) than Urban Focus.	
3	Retain Green Belt	Likely to result in an increase in transport related carbon emissions, due to some reliance on private vehicles to access facilities, services and employment and lower levels of access to quality public transport.	
4	Greater Dispersal	Highly likely to result in an increase in transport related carbon emissions. Encourages reliance on private vehicles to access facilities, services and employment, lower levels access to public transport and travel distances too far for active travel.	

5.12 The use of a strategic transport model in the next phase of the project will enable the carbon impacts of Local Plan growth options to be fully quantified, enabling more detailed carbon analysis.

5.13 The outcomes of the RAG assessment, as summarised in Table 1 do not account for the unknown effect of UK's recovery from the Covid-19 pandemic and how behaviours have changed towards travel. UK carbon emissions showed a reduction of 7% in 2020[16] as a result of the pandemic; transport was a key contributor to this reduction. Whilst some new characteristics will continue to have a positive impact on travel (e.g. flexibility to continue working from home), others may have a negative effect (e.g. people are less willing to use public transport). However, the principles discussed and summarised against each strategy option will remain similar.

5.14 Encouraging options for 'local living' – Urban Focus and Transport Corridors – allows for greater flexibility in lifestyle whilst minimising carbon impact. The impact of Greater Dispersal may be reduced as people continue to work from home, however it is likely to still be greater than 'local living' options in relative terms.

[16] https://www.bbc.com/news/science-environment-55261902

6. Mitigation for Alternative Strategies

Introduction

6.1 It is a requirement of Plan-Making that due consideration is given to the potential to introduce mitigation. With mitigation, poorly performing strategies, in terms of initial options appraisal, could improve to the point where they become reasonable alternative options. The primary purpose is to ensure that options are not discounted without sufficient consideration as to whether they could be made appropriate, even where they are not in their current form.

6.2 In this case, the Retain Green Belt and Greater Dispersal Spatial Strategies perform poorly against the Appraisal Framework. Therefore, potential measures have been investigated to consider whether, with these additional measures, the performance of these Strategies could be improved to the point that they become comparable with better performing Strategies. This would allow them to become reasonable options within the decision-making process on the Preferred Spatial Strategy.

6.3 The Appraisal Framework shows that, whilst Urban Focus is the best performing Strategy, the Transport Corridors Strategy also performs positively overall. Transport Corridors can therefore be reasonably considered by decision makers as part of the development of the Preferred Strategy, without additional measures.

6.4 This section of the report outlines the principles around the exercise, discusses potential enabling measures and re-appraises poorly performing strategies. In depth discussion on measures required for each objective and the feasibility of the measures considered can be found in Appendix D.

General Principles

6.5 For a Spatial Strategy to be considered as a reasonable option, sufficient mitigation would be needed to enable it to score at least “minor beneficial” on the majority of appraisal questions, with the exception of Objective 4 – Traffic Impact, where a neutral score is sufficient.

6.6 Regardless of the ultimate Spatial Strategy chosen, the Local Plan will need to be accompanied by a package of strategic transport mitigation in order to deliver the scale of housing growth required. This exercise is not to develop the overall mitigation package, but to determine whether there are enabling measures which could provide sufficient improvements to poorly performing strategies to enable them to perform comparably with the better performing strategies.

6.7 The enabling measures are strategic in nature and have been considered from the perspective of their impact in terms of improving the transport appraisal performance of a strategy, and the feasibility of a measure. The purpose of the exercise is to identify measures to improve the performance of strategies to be comparable with the performance of other strategies without intervention, i.e. on Day 1 of the Local Plan.

6.8 It is also noted that the Covid-19 pandemic has changed many aspects of the way that we live, work and travel, and the medium to long term outcomes of this are as yet unclear. This is discussed in depth in Chapter 4. Whilst there are undoubtedly important emerging trends, the choice of Spatial Strategy remains a key element of planning for sustainable growth. Thus the importance of a sustainable Spatial Strategy as demonstrated by performance against the Appraisal Framework is not significantly diminished by potential emerging travel trends.

Enabling Measures

6.9 Appendix D provides further detail on the consideration the performance of strategies against each of the objectives, and sets out potential enabling measures which could address deficiencies. The enabling measures are aimed at addressing specific parts of the strategies, rather than at growth areas which are common to other strategies or perform reasonably well in sustainability terms. This is summarised in this section.

6.10 The overarching reasons for the Retain Green Belt Strategy scoring poorly in comparison with Urban Focus and Transport Corridors are:

- Missed opportunity for development on the edge of Bristol, which both benefits from size of development and proximity to Bristol;
- Significant size settlement at Churchill near relatively few existing facilities; and
- Reasonable degree of dispersal, with multiple smaller areas of growth near few existing facilities.

6.11 Greater Dispersal includes some development on the edge of Bristol and in villages with reasonable proximity, but has a higher degree of dispersed growth near few existing facilities. The Greater Dispersal Strategy includes a reasonable level of growth at Churchill near relatively few existing facilities. It is a lower level of growth than in the Retain Green Belt Strategy and therefore, there will be a reduced opportunity to provide additional facilities and transport services, thus making the area a less sustainable location.

6.12 Enabling measures for these strategies would therefore need to predominantly address disadvantages of dispersed growth patterns, and the sustainability of Churchill as a location for significant growth. One of the most effective ways to do this would be to increase the availability of local amenities to enable shorter trip distances to support active travel, but also to improve public transport to reach larger destinations such as Bristol and the main towns.

6.13 Active travel improvements, such as infrastructure to support safe cycling, would be of benefit. However, distances are likely to remain a barrier to mass uptake of active travel for some trips, even with infrastructure and e-bikes. Reducing travel distances, and thus enabling a greater proportion of trips to be undertaken by active travel, would require a significant increase in facilities at Churchill to the level of a main town, and increases in facilities at villages where growth is proposed. The ability for the scale of development proposed in each location to support the services commercially, particularly early in the Plan period, is a key risk to achieving this. Investment in high quality broadband could support increases in home working, reducing the need to travel.

6.14 As stated, the ability for infrastructure to increase walking and cycling trips is potentially limited by the distances involved. A network of safe and local connections will be needed between growth areas and villages to support shorter distance trips. Connecting growth east of the M5 as far as Churchill with Weston-super-Mare through safe cycling infrastructure may be feasible through connections delivered through Locking Parklands development and HIF enabled development east of the M5, cycle infrastructure through the Banwell Bypass, and additional interventions to join up sections of route. Connecting Churchill and dispersed growth areas with Bristol would be challenging in terms of achieving high levels of uptake due to distances involved.

6.15 Public transport is likely to be the most effective way to achieve large scale sustainable transport of people to larger destinations such as Bristol and the main towns, from growth in villages, given the distances involved. It is likely to be reasonably feasible and viable to extend the Weston-super-Mare bus network to connect with villages east of the M5 and growth at Churchill, albeit service quality will be limited early in the Plan

period. A high quality bus service along the A38 between Bristol and Churchill, and potentially linking with Weston-super-Mare as an additional bus corridor, would be key to supporting sustainable travel for Churchill and nearby villages given the draw that Bristol exerts. This could potentially link with schemes such as Metrobus and Mass Transit, and may need to be supported by interchange opportunities to provide access for developments dispersed away from the A38 corridor. Bus priority infrastructure may be needed to improve the attractiveness and reliability of such services.

6.16 A strategic review of school locations could be undertaken alongside the Local Plan process, with the potential for new school sites to reduce travel distances for some education trips. This would be common to all Strategies, but if progressed as an enabling measure then delivery early in the plan period would be a requirement. Based on locations of growth and schools, a secondary school in the centre of the district around the Yatton/Congresbury area may have potential to reduce overall distances for school travel.

Strategy Performance – with Enabling Measures

6.17 The Retain Green Belt and Greater Dispersal Strategies have been re-appraised for a scenario in which the catalytic enablers referred to in Appendix D are implemented, and are in place early in the Local Plan period. The feasibility of this assumption is also discussed in Appendix D. For ease of reference, this re-appraisal is presented alongside the appraisal of the four original Spatial Strategies without catalytic enablers. This can be seen in Figure 13 and Figure 14.

Figure 13: Performance of Strategies with Enabling Measures – by Objective

Strategy	1. Reduce the need to travel and travel distances	2. Supporting Active Travel	3. Supporting Public Transport	4. Traffic Impact
1 - Retain Greenbelt				
2 - Urban Focus				
3 - Transport Corridors				
4 - Greater Dispersal				
Mitigation Testing				
1a – Retain Greenbelt (with enablers)				
4a – Greater Dispersal (with enablers)				

Key

Scale of impact				
Moderate Adverse impact	Minor Adverse impact	Neutral impact	Minor Beneficial impact	Moderate Beneficial impact

Figure 14: Performance of Strategies with enabling measures - by question

Strategy	1. Reduce the need to travel and travel distances				2. Supporting Active Travel				3. Supporting Public Transport			4. Traffic Impact		
	a) Education	b) Employment	c) Other amenities	d) Broadband / WFH	e) Strategic routes	f) Existing Cycling	g) "GoDutch" Cycling	h) "Ebikes" Cycling	i) Rail Stations	j) Bus Corridors	k) Future PT	l) Traffic Impact - Congestion	m) Mitigation schemes	n) Traffic Impact - Environment
1 - Retain Greenbelt														
2 - Urban Focus														
3 - Transport Corridors														
4 - Greater Dispersal														
Mitigation Testing														
1a - Retain Greenbelt (with enablers)														
4a - Greater Dispersal (with enablers)														

6.18 The revised Appraisal Framework shows the level of improvement which would be enabled were the catalytic enablers to be in place early in the Plan period. Overall, Retain Greenbelt would go from a slight negative to a marginal positive appraisal. Greater Dispersal would go from strong negative to slight negative. The same conclusions apply when considering the Strategies in terms of Objectives or individual scoring questions.

6.19 The addition of catalytic enablers would not change the ranking of the Strategies. Urban Focus and Transport Corridors (both without enabling measures), would remain higher ranked than Retain Greenbelt and Greater Dispersal Strategies with enabling measures.

Summary

6.20 In summary, a range of measures has been identified which would improve the performance of the Retain Green Belt and Greater Dispersal Strategies. The most effective measures to encourage sustainable transport are likely to include providing more facilities locally to reduce travel distances, and improving public transport opportunities for longer distance trips.

6.21 Formerly, Retain Green Belt was appraised as a slight negative overall, and this has improved to a marginal positive. Greater Dispersal has improved from strong negative to slight negative. However, both Strategies perform materially worse than Urban Focus and Transport Corridors, even with the addition of enabling measures.

6.22 In summary, a wide range of measures has been identified, as detailed in Appendix D. However, the degree of improvements offered, coupled with feasibility challenges, is insufficient to merit either the Greater Dispersal or Retain Green Belt Strategies being further considered for inclusion in decision making on the Preferred Strategy.

7. Preferred Strategy

Introduction

7.1 The Appraisal Framework shows that, whilst Urban Focus is the best performing Strategy, the Transport Corridors Strategy also performs positively overall. Even with the mitigation measures assessed in Chapter 6, the Greater Dispersal and Retain Green Belt Strategies still perform less favourably and have not been taken forward in the development of the Preferred Strategy.

7.2 As such, the Urban Focus and Transport Corridors Strategies can be reasonably considered as a sound basis, in transport terms, to derive components from which to build the Preferred Spatial Strategy. Site selection and strategic mitigation measures will be developed through technical appraisal and analysis in subsequent Local Plan stages.

7.3 The choice of the Preferred Spatial Strategy draws upon a wide range of factors, and necessarily includes broader planning considerations than solely transport. There is a wider suite of evidence and analysis prepared by NSC which sets out in greater depth the rationale for the Strategy as a whole.

7.4 This section summarises the approach taken to determining the broad locations of growth in the Preferred Strategy, and presents the Transport Appraisal of the Preferred Strategy.

Preferred Strategy Growth Approach

7.5 The Challenges and Choices consultation in 2020 resulted in a set of revised priorities that NSC will adhere to when considering locations for future housing and employment growth. They focus on sustainable development and contribute to the challenging target for the Council to reach net zero carbon emissions by 2030. These can be seen in Figure 15.

Figure 15: NSC Revised Local Plan Priorities

7.6 Reflecting on these priorities, the consultation responses, and the outcomes of the assessment of the four original Spatial Strategies, a logical and sequential approach has been developed to determine likely areas for growth within the district for the Preferred Strategy (Figure 16). It broadly aligns with the settlement hierarchy, as shown in Figure 3, supporting growth which targets the towns and urban areas that contain the greatest range of services, facilities and job opportunities, as well as brownfield and regeneration opportunities. Growth closer to existing amenities reduces the need to travel car and encourages sustainable modes of travel, hence contributing to NSC's zero carbon ambition and sustainable development priorities.

Figure 16: Approach to Identify Broad Growth Locations

7.7 The focus of growth locations in the Preferred Strategy is on the expansion of main towns, following a similar pattern of growth shown in the Urban Focus Strategy, with additional elements of the Transport Corridors Strategy. This will be through existing permissions anticipated to be delivered during the Plan period (Step 1) and opportunities within the four main towns (Step 2). This growth builds on areas where services and facilities are already located and sustainable transport links are well established. Town Expansion (Step 3) sees areas of growth well located in relation to the four main towns (outside of the Green Belt), whereas Other Sustainable Settlements (Step 4) focuses on settlements outside of the Green Belt, such as Service Villages, that also have good facilities and accessibility by sustainable transport links.

7.8 Once the opportunities for growth have been maximised within and near urban areas outside of the Green Belt, appropriate and proportionate growth is then sought in more rural settings (Step 5). Development within rural villages/ areas will be appropriate in scale and limited to local opportunities. Rural areas will not be seen as a contingency for growth that cannot be delivered elsewhere in more sustainable locations.

7.9 The penultimate step is to demonstrate all other reasonable alternatives have been explored (Step 6). This includes assessment of areas with environmental constraints, such as flooding, opportunities within neighbouring authorities and new rural communities. The final step (Step 7), if there is still capacity to be identified, is to

consider Green Belt opportunities, relating to urban areas and in areas that cause least impact to the Green Belt.

7.10 By applying this sequential process of identifying broad locations of growth, the most feasible outcome is likely to be a hybrid option of the Urban Focus and Transport Strategies. 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. Subject to further testing, the growth locations are likely to be 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.
- Limited rural development, mostly in windfall sites
- Elsewhere in the Green Belt, well related to existing urban areas in the most sustainable locations, such as the edge of Bristol, Nailsea and Portishead.

Appraisal

7.11 This Preferred Strategy has been assessed using the Appraisal Framework, set out in Chapter 4. Figure 17 highlights the overall appraisal of the Preferred Strategy against the objectives and Figure 18 shows the detailed appraisal of each question.

Figure 17: Appraisal against objectives

	1. Reduce the need to travel and travel distances	2. Supporting Active Travel	3. Supporting Public Transport	4. Traffic Impact
Preferred Strategy				

Figure 18: Appraisal against scoring questions

Strategy	1. Reduce the need to travel and travel distances, making journeys more suitable for walking, and cycling.				2. Supporting Active Travel				3. Supporting Public Transport			4. Traffic Impact		
	a) Education	b) Employment	c) Other amenities	d) Broad-band / WFH	e) Strategic Walk/cycle routes	f) Existing Cycling	g) "Go Dutch" Cycling	h) "Ebikes" Cycling	i) Rail Stations	j) Bus Corridors	k) Future PT	l) Traffic Impact - Congestion	m) Mitigation schemes	n) Traffic Impact - Environment
Preferred Strategy														

Key

Scale of impact				
Moderate Adverse impact	Minor Adverse impact	Neutral impact	Minor Beneficial impact	Moderate Beneficial impact

Objective 1 – Reduce the Need to Travel and Travel Distances.

7.12 The Preferred Strategy scores the most favourably for Objective 1; reducing the need to travel and reducing travel distances. Potential growth areas are situated closer to existing urban centres, such as Weston-super-Mare, Portishead, Nailsea and the edge of Bristol. As a result, there is likely to be good access to services and employment, and reduced distances needed to access these opportunities, supporting active travel choices. Employment within the potential larger growth areas is next to the existing urban areas and will also support the wider functioning of the town.

7.13 Growth near urban areas also benefits from the existing well-connected sustainable transport network, which is in place from Day 1 and encourages sustainable and active travel habits. Good links result in a greater potential for active travel as distances to local key facilities, amenities, education and employment are shorter. Larger scale growth areas have a greater potential to achieve element of self-containment, providing essential services and amenities, and potential to deliver new education facilities and additional employment, reducing the need to travel, and encouraging active travel further.

7.14 High-speed broadband already exists in the main urban areas, and development in, and around the urban areas requires less investment than growth that is more dispersed across the district. Nevertheless, there is a government commitment to ensure super-fast broadband in new-build homes.

Objective 2 – Supporting Active Travel

7.15 Urban focused growth provides an opportunity to connect into the strategic active travel routes in the area; The Festival Way (Route 33) connecting the potential growth south west of Bristol and Nailsea to Bristol, and the Portishead to Bristol route (Route 41).

7.16 The PCT shows a promising level of growth for ‘existing’ and ‘Go Dutch’ scenario, but it is important to remember that the PCT is not a predictive tool, and increased levels of cycling are as a result of measures and infrastructure to cause a mode shift. The PCT does also not compensate for leisure and utility trips, which if trends follow that seen during the Covid-19 pandemic, may have greater importance in the future. Strong performance under Objective 1, reducing travel distances, will support increased levels of cycling for a range of trip types.

Objective 3 – Supporting Public Transport

7.17 Proximity to existing urban areas increases the potential for sustainable travel modes due to the increased likelihood of having access to the rail and bus network within walking or cycling distance. Nevertheless, with increased demand as a result of growth, there is a potential for an improvement in viable services. Development in Yatton and Backwell, in addition to more urban locations, is likely to have good access to public transport.

Objective 4 – Traffic Impact

7.18 The Preferred Strategy is likely to perform similarly to Urban Focus in terms of traffic impacts. The planned major transport schemes, listed in Appendix A, are likely to mitigate a moderate proportion of highway issues resulting from growth areas. The “Near Certain” and “More than Likely” schemes have been included in the assessment and assumed to be delivered early on in the Plan period. Nevertheless, there may still be some correlation between the growth areas and congestion hotspots, however the full scale of the impact will be assessed during Stages 4 and 5 of the Local Plan process.

Overall

7.19 The overall performance of the Preferred Strategy is comparable with Urban Focus. Both Strategies achieve six moderate beneficial scores, seven minor beneficial scores, and one neutral, although there are slight differences in which questions those scores are achieved against.

7.20 This therefore shows that the Preferred Strategy performs strongly from a transport perspective and represents an appropriate Spatial Strategy to form a sustainable basis for planning for growth.

8. Conclusions

8.1 This report presents the transport findings of Stage Three of North Somerset Councils Local Plan Process. Four initial Strategies have been assessed and appraised from a transport perspective to determine which Strategy elements should form the basis of the Preferred Spatial Strategy to best meet the vision and objectives.

8.2 The appraisal drew upon the evidence base, which identified the existing challenges and opportunities in North Somerset. A review of future transport schemes which are likely to be delivered and consideration of the potential impact of Covid-19 also informed the appraisal.

8.3 A five-point scale was used to appraise each strategy against the scoring questions developed under each of the objectives to provide an assessment of the degree to which each Spatial Strategy meets the vision and would most contribute towards zero-carbon mobility.

8.4 The appraisal suggested that the Urban Focus Spatial Strategy was the highest performing in transport terms, with the Transport Corridors approach also scoring favourably. Retain Green Belt and Greater Dispersal both performed poorly, with Greater Dispersal being the worst performing of the four Strategies.

8.5 To ensure reasonable consideration of alternatives, potential mitigation measures were identified to evaluate the degree to which the performance of the Retain Green Belt and Greater Dispersal Strategies could be improved. These measures were termed “catalytic enablers” to reflect the fact that they were needed to bring the strategies up to a starting point where they could be considered acceptable, rather than being mitigation for the growth itself.

8.6 Even with these measures, it was deemed that the Retain Green Belt and Greater Dispersal Strategies were insufficient to merit being further considered as reasonable alternatives to either Urban Focus or Transport Corridors Strategy. Furthermore, there would be a number of cost, time and deliverability risks to the implementation of the measures, further reducing the feasibility of either of these poorly performing Strategies to represent reasonable alternatives.

8.7 As such, the Urban Focus and Transport Corridors Strategies can be reasonably considered as a sound basis, in transport terms, to derive components from which to develop the Preferred Spatial Strategy, with site selection and strategic mitigation measures developed through analysis in subsequent Local Plan stages.

8.8 The choice of the Preferred Spatial Strategy itself draws upon a wide range of factors, and necessarily includes broader planning considerations than solely transport. There is a wider suite of evidence and analysis prepared by NSC which sets out in greater depth the rational for the Strategy as a whole.

8.9 NSC has reviewed its priorities, consultation responses, and the outcomes of the assessment of the four original Spatial Strategies, to develop a logical and sequential approach to determine likely areas for growth within the district for the Preferred Strategy. From a transport perspective, this is effectively a combination of the Urban Focus and Transport Corridors Strategies.

8.10 The overall performance of the Preferred Strategy is comparable with Urban Focus. Both Strategies achieve six moderate beneficial scores, seven minor beneficial scores, and one neutral, although there are slight differences in which questions those scores are achieved against.

8.11 This therefore shows that the Preferred Strategy performs strongly from a transport perspective, and represents an appropriate Spatial Strategy to form a sustainable basis for planning for growth.

8.12 Future stages of the Local Plan process will include site sifting and allocation. Transport modelling will be undertaken to assess the impact of combinations of site allocations in Stages 4 and 5 of the Plan process, and this will be used to inform strategic mitigation requirements to form part of the Local Plan.

Appendix A – Evidence Review

1. Evidence Review Note

Project:	**North Somerset Local Plan**		
Subject:	**Evidence Review**		
Prepared by:	**Ben Higson / Ben Burton**	Date:	**11/02/2021**
Checked By:	**JR**	Date:	**08/03/21**
Verified By:	**RA**	Date:	**23/02/21**
Approved By:	**CC**	Date:	**08/03/21**

1.1 Overview

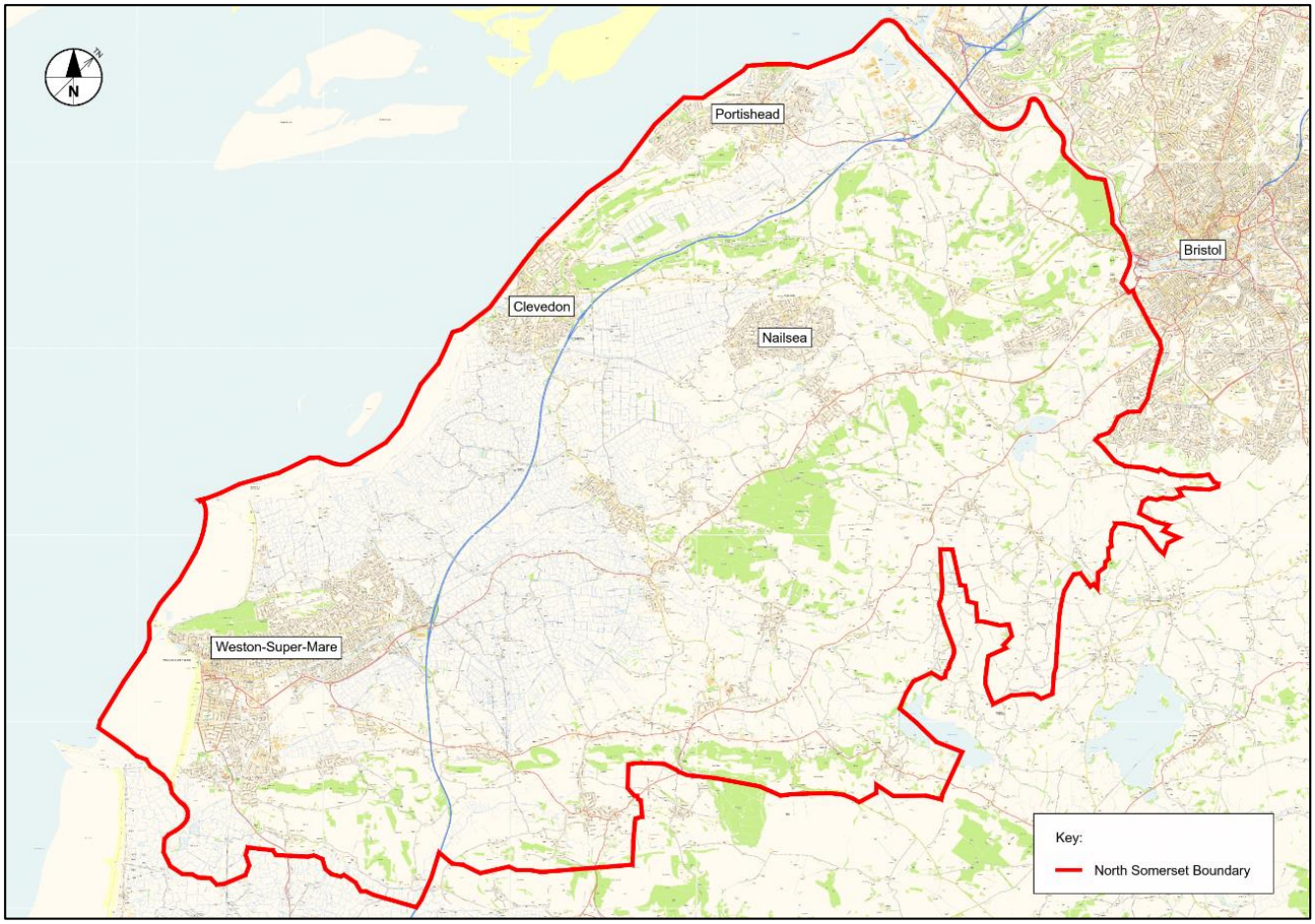
AECOM has been commissioned by North Somerset Council (NSC) to provide transport consultancy services in relation to the emerging Local Plan. This evidence review sets out the existing and future transport characteristics without the Local Plan, identifying challenges and choices. This evidence review will underpin the Appraisal Framework (AF), which will be developed to assess the Spatial Strategy Options to inform the selection of a preferred Spatial Strategy.

2. Local Context

2.1 Study area

North Somerset is a unitary district in Somerset, however, is administered independently of it. It is bounded to the North by the city and council of Bristol, to the East by Bath and North-East Somerset (B&NES) and to the South by Mendip and Sedgemoor. North Somerset comprises two parliamentary constituencies, Weston-super-Mare and North Somerset. The North Somerset Study Area is shown on Figure 1.

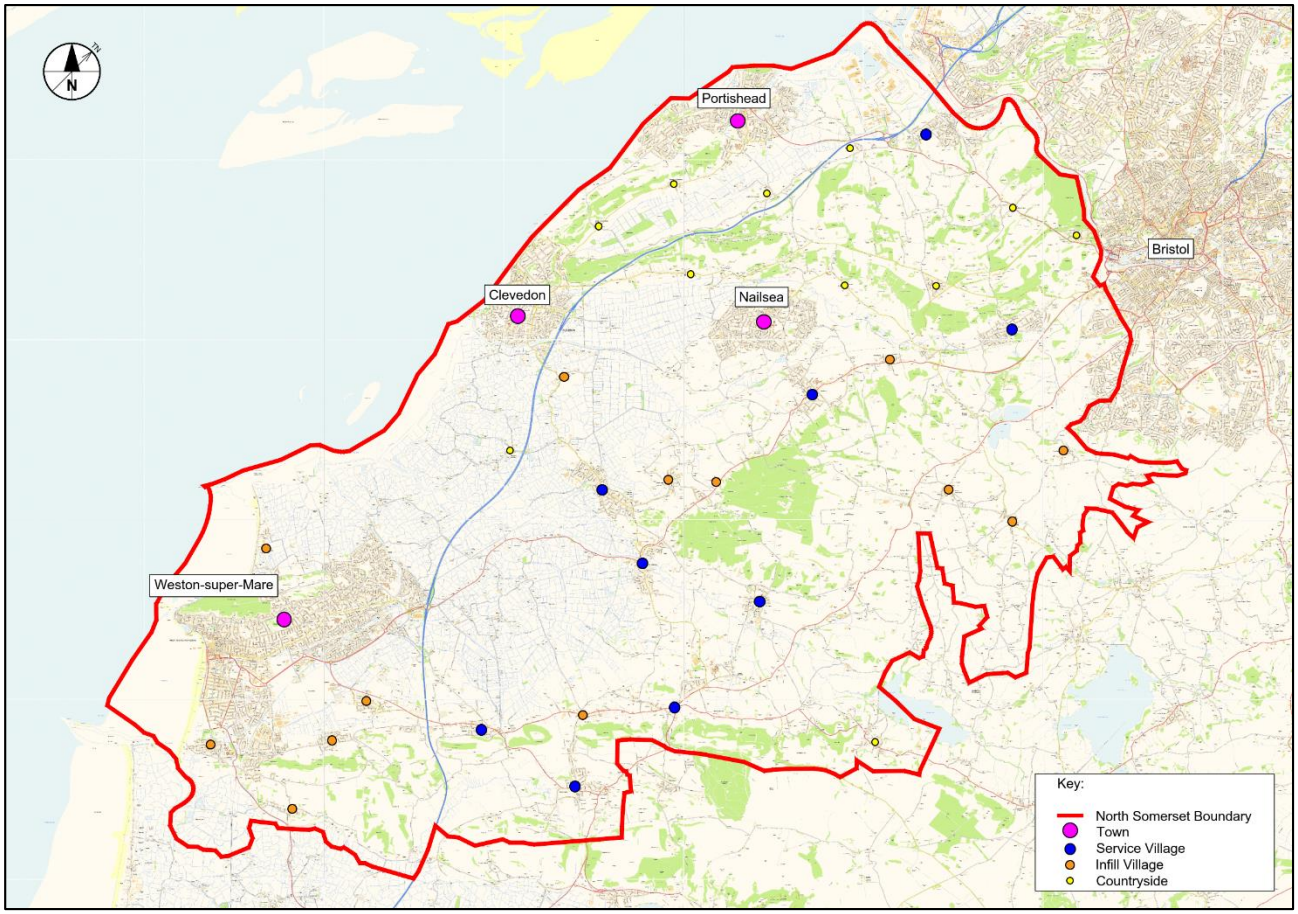
Figure 1: North Somerset Study Area



2.2 Settlement Hierarchy

Figure 2 shows the existing settlement hierarchy across North Somerset. At the top of the hierarchy are settlements that play a key role within the district, providing services used by a much wider catchment, have the highest level of infrastructure and are well connected in terms of transport links. Whilst not in North Somerset, Bristol is a major regional city in the West of England and exerts significant influence on North Somerset as a major centre.

Figure 2: North Somerset Settlement Hierarchy



A hierarchy can help better determine what role each settlement can play in addressing the future housing needs of the district. The settlement hierarchy outlines the towns of Weston-super-Mare, Portishead, Nailsea and Clevedon as key settlements within the district. Table 2-1 summarises the existing settlement hierarchy within North Somerset.

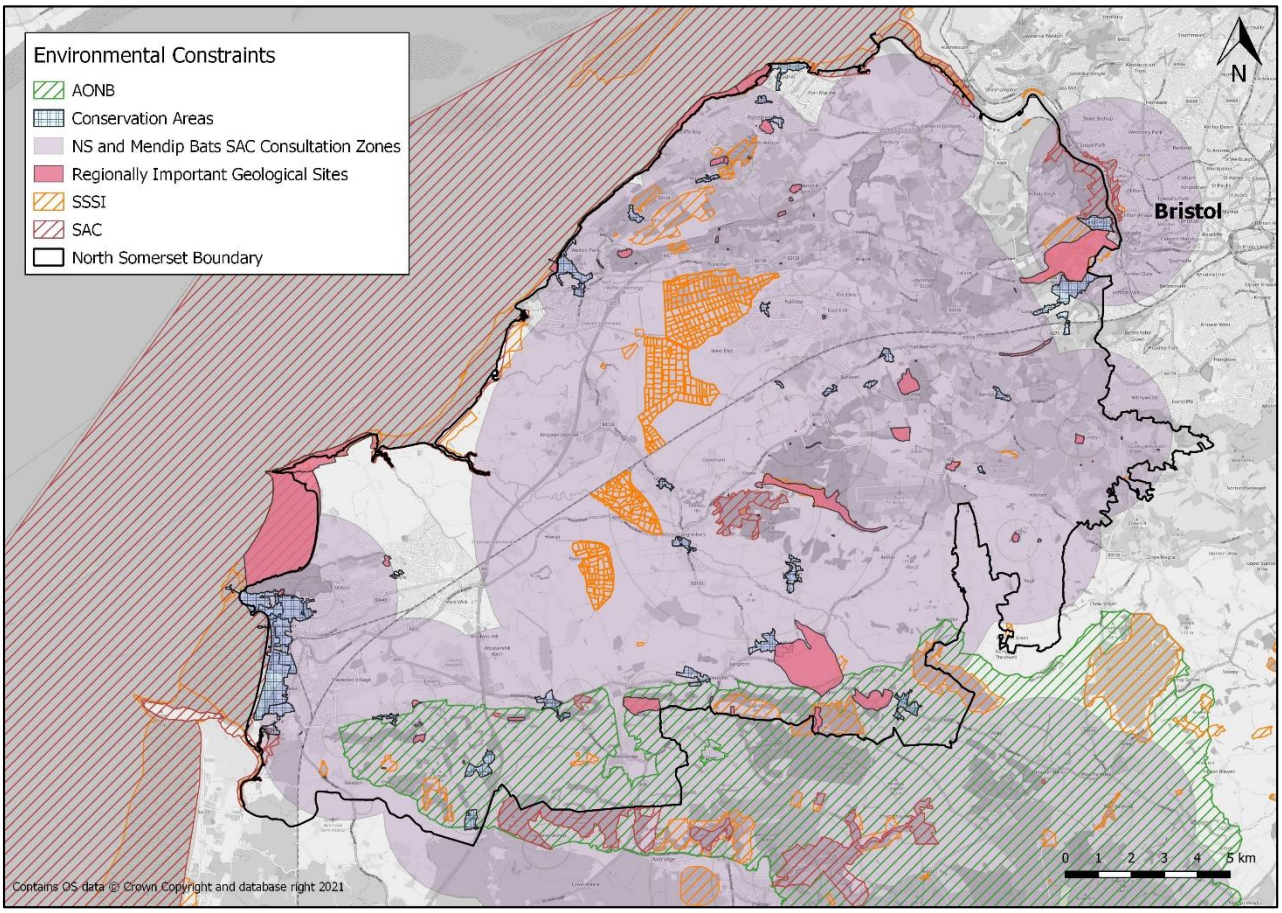
Table 2-1: Settlement Hierarchy

Position in Hierarchy	Settlement
Town	Weston-super-Mare, Portishead, Nailsea and Clevedon
Service Village	Backwell, Banwell, Churchill, Congresbury, Easton-in-Gordano/Pill, Long Ashton, Winscombe, Wrington and Yatton
Infill Village	Bleadon, Claverham, Cleeve, Dundry, Felton, Flax Bourton, Hutton, Kenn, Kewstoke, Locking, Sandford, Uphill and Winford
Countryside	Abbots Leigh, Blagdon, Clapton-in-Gordano, Failand, Kingston Seymour, Leigh Woods, Portbury, Tickenham, Walton-in-Gordano, Weston-in-Gordano and Wraxall

2.3 Environmental Constraints

North Somerset is subject to a number of environmental constraints, all of which can be impacted as a result of additional vehicle trips from of new developments. The constraints in North Somerset include AONBs (Areas of Outstanding Natural Beauty), SSSIs (Sites of Special Scientific Interest) and Conservation Areas, North Somerset and Mendip Bats Special Areas of Consultation (SAC), and regionally important geological sites. The environmental constraints are shown on Figure 3.

Figure 3: Environmental Constraints



The Mendip Hills form a large AONB at the southern extent of the district. There are a number of conservation areas located across the district, including a large part of Weston-super-Mare, Clevedon, Portishead and southwest Bristol. The majority of North Somerset, excluding small areas surrounding Bristol and to the northeast of Weston-super-Mare, is allocated as a SAC, designated because of its importance for Greater and Lesser Horseshoe Bats.[1]

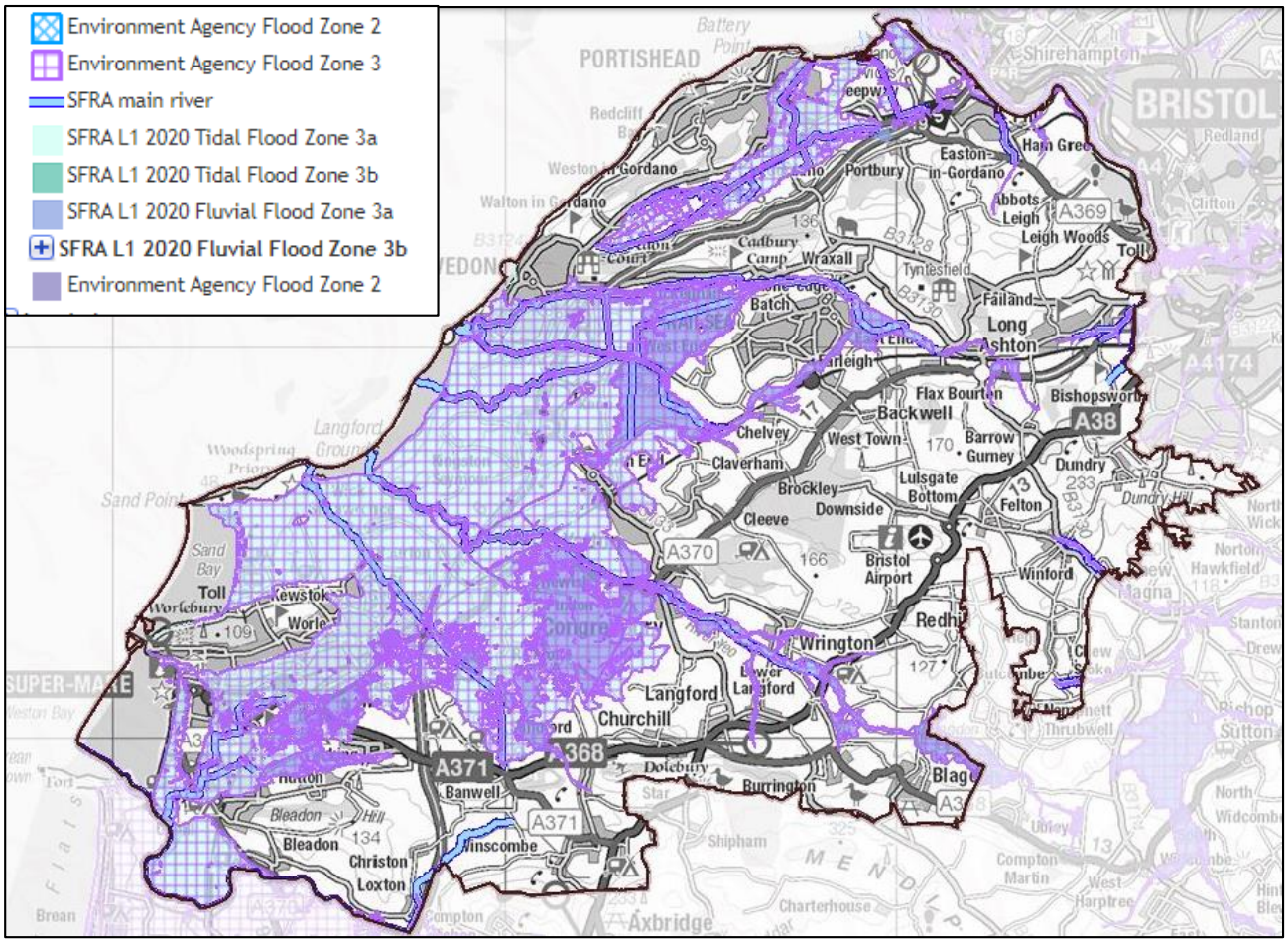
There are a number of regionally important geological sites, with the largest located on the coastline to the north of Weston-super-Mare. There are also large sites in southwest Bristol, Langford and Churchill, and south of Bristol Airport between the A370 and A38. There are large SSSIs located to the west and southwest of Nailsea, to the west of Congresbury, and at Puxton. To the east of Congresbury lies a large SAC based around Cadbury Hill.

A large proportion of North Somerset is floodplain, greatly influencing where development can be. Approximately 30% of the NSC area is covered by EA Flood Zones, equating to approximately 33% of the population are currently at high risk of fluvial or tidal flooding, particularly in the west of the district. The flood zones are shown in Figure 4.

Understanding where these environmental constraints lie is an important factor when considering locations for development. Increased traffic growth from developments can negatively impact on the existing environmental assets of an area, especially if the growth area is not already well served by existing infrastructure.

[1] North Somerset and Mendip Bats Special Area of Conservation (SAC) SPD, 2018

Figure 4: North Somerset Flood Zones



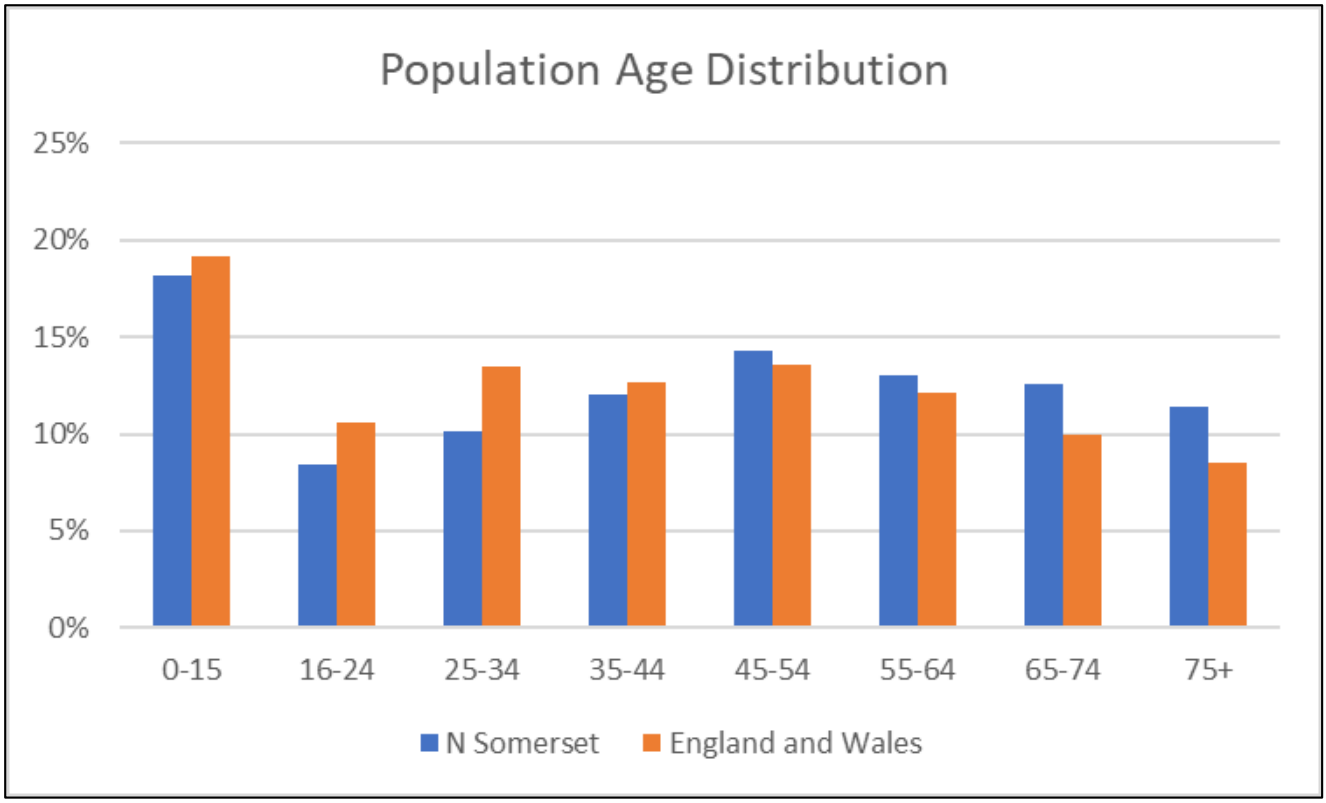
3. Demographics

3.1 Population

The current population for North Somerset is 215,000[2] (2019 estimates), accounting for roughly 40% of Somerset's total population. North Somerset's primary town is Weston-super-Mare accounting for just over 30% of the population, followed by Portishead (11%), Clevedon (10%) and Nailsea (7%)[2]. In total, over 60% of North Somerset's population live in the main towns, influencing the future transport provision and infrastructure.

Figure 5 below highlights the age range of North Somerset[2], with comparison made to the distribution for England and Wales. Overall, North Somerset's age distribution is broadly comparable to national figures, albeit there is a larger proportion of elderly people; those aged over 64 account for 24% of the population, in comparison to 19% for England and Wales. 49% of people in North Somerset fall between the ages of 25 and 64, which is 3% lower than for England and Wales.

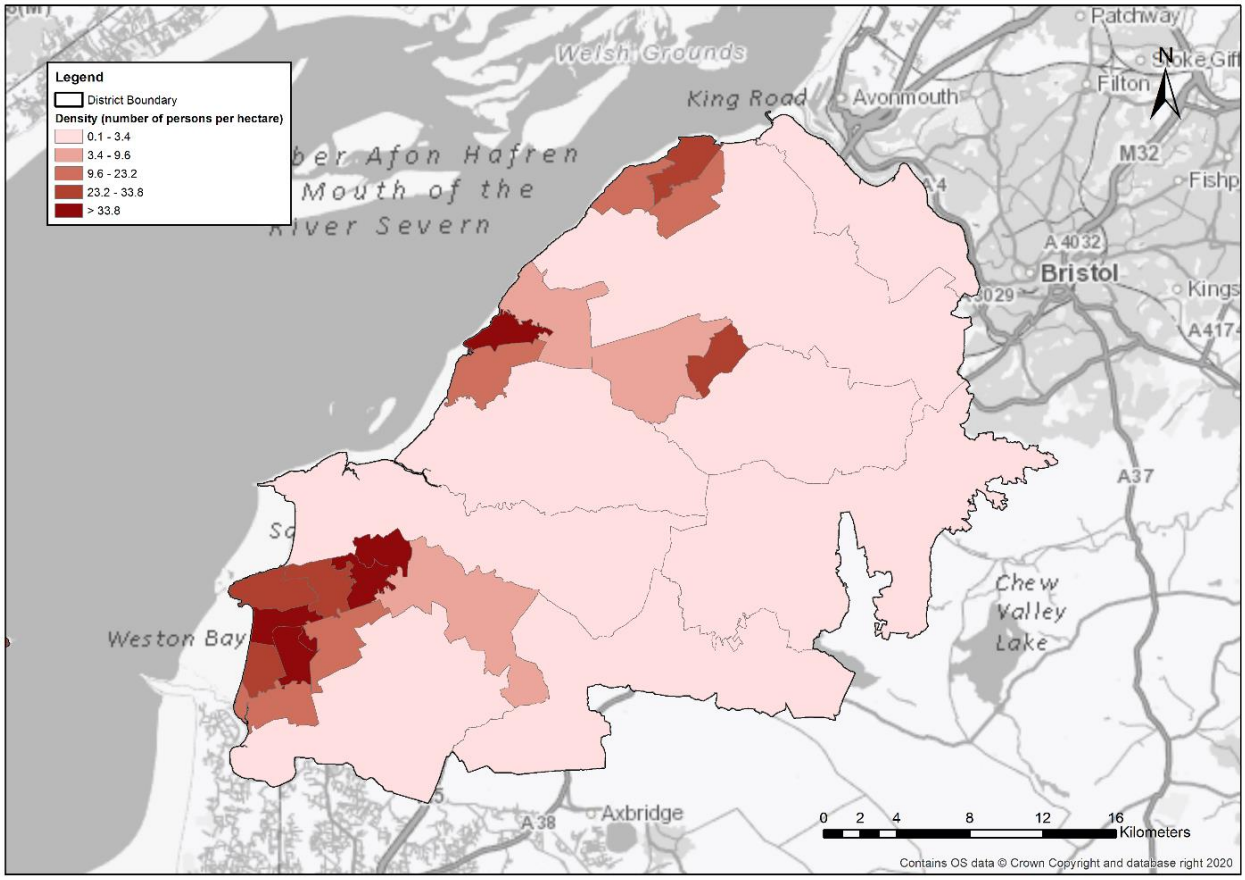
Figure 5: Population Age Distribution of North Somerset District



The population density distribution map of the output areas within the North Somerset District is displayed in Figure 6. This has been calculated from 2011 Census data[3] and gives an indication of the spatial distribution of population within the area. Due to the largely rural nature of the district, the highest population densities are within the main towns: Weston-super-Mare, Nailsea, Portishead and Clevedon. This corresponds with approximately two-thirds of the population living in the main towns.

[2] Office for National Statistics, 2019
[3] Office for National Statistics (KS101EW)

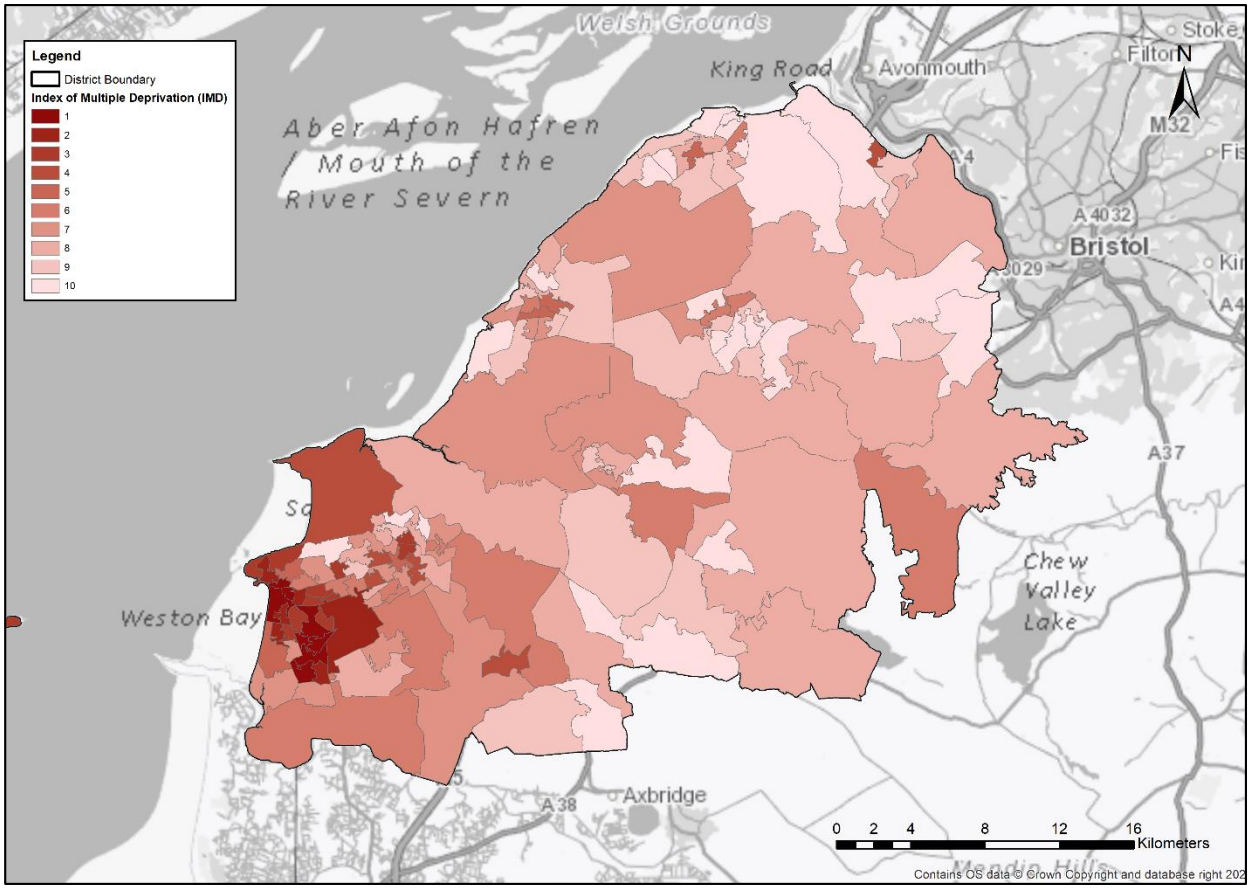
Figure 6: North Somerset Population Density



3.2 Indices of Multiple Deprivation

The Indices of Multiple Deprivation (IMD) provide a measure of relative deprivation at a small scale local area level i.e. Local Super Output Area (LSOA), across England and Wales. The IMD 2019 is the most recent release. The IMD measures relative deprivation by comparing each LSOA to all others in the country, with areas ranked against each other, from 1 (the most deprived area) to 32,844 (the least deprived area). Figure 7 demonstrates Indices of Multiple Deprivation scores, with 1 representing an area which is within the 10% most deprived, and 10 representing an LSOA within the 10% least deprived.

Figure 7: North Somerset District Indices of Multiple Deprivation (2019[4])



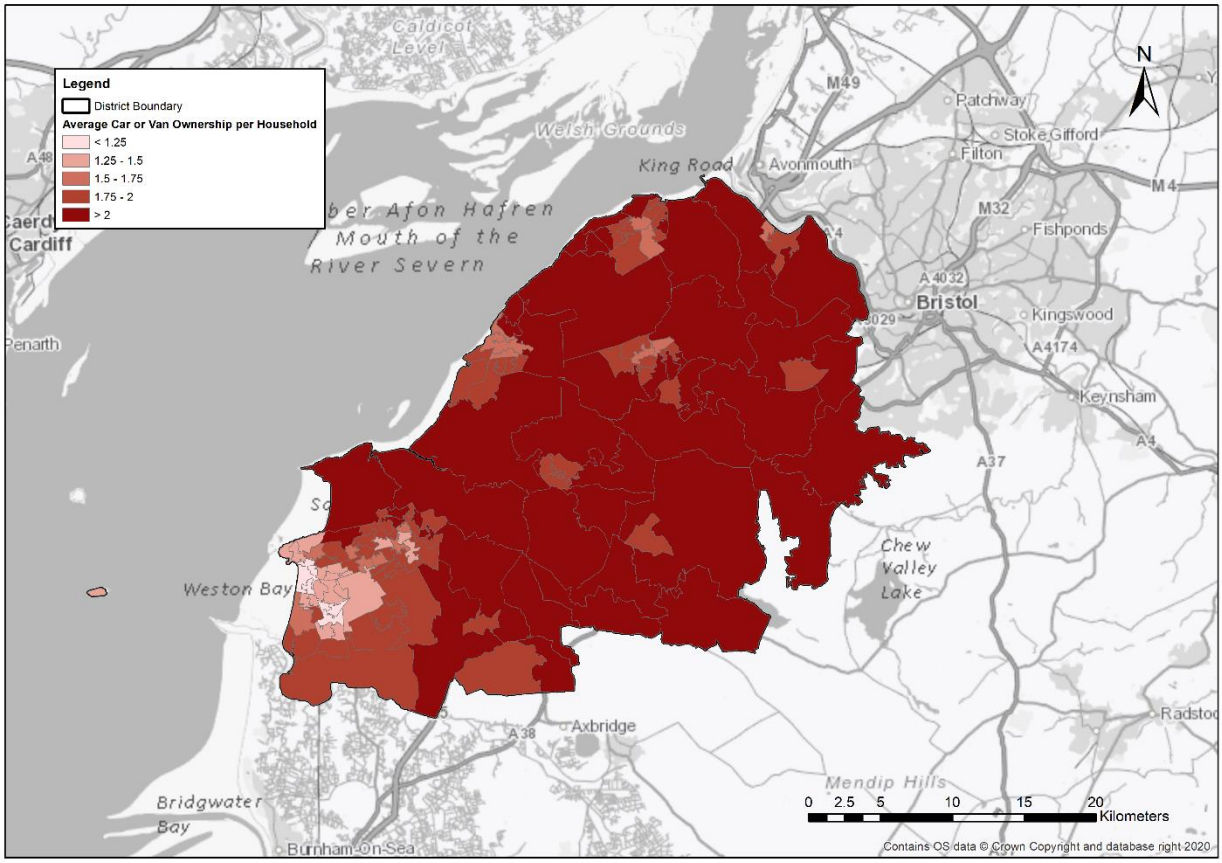
As a district, North Somerset experiences varying levels of deprivation. The most deprived areas are shown to be in parts of Weston-super-Mare, particularly concentrated towards the town centre, where a number of LSOAs classified within the top 20% of deprived areas in England and Wales. The least deprived areas are to the east of Portishead, and to the south west of Bristol, such as Long Ashton. The majority of the district falls outside of the top 60% most deprived areas in England and Wales. It is important to ensure that these areas, as well as regeneration and new development areas, are well connected by alternative modes, including bus, walking and cycling to increase accessibility to services that can improve social mobility.

[4] Office for National Statistics: English Indices of Deprivation 2019

3.3 Car ownership

The car ownership per household within North Somerset is highlighted in Figure 8. It shows the spatial distribution of car and van vehicles per household across the area at the time of the last census (2011)[5].

Figure 8: Car Ownership, per household (2011 Census)

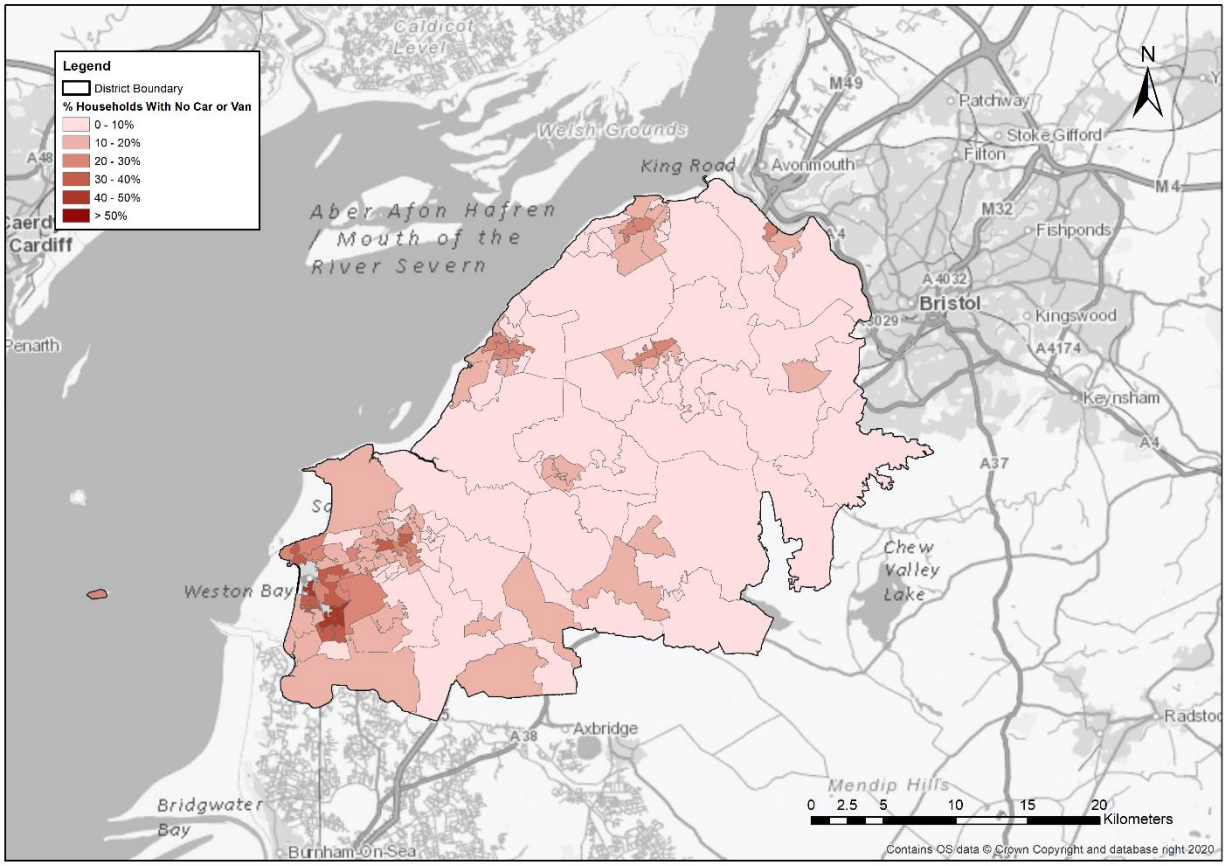


Almost half (47%) of LSOAs in North Somerset have an average of >2 cars per household, compared to the UK average of 1.2 cars per household. The more rural and inter-urban areas occupying the majority of the district show the highest car ownership per household, correlating with lower deprivation levels. Limited alternative transport options in rural areas, such as public transport, may also be contributing to this high car ownership. It should also be noted that the data is available as an average for a wide area, and there will be households and areas within these LSOAs with lower car ownership levels. Affordability of car ownership is a key contributor to social exclusion, particularly in areas with limited alternative options, which may be masked by the coarseness of the data set.

Car ownership is lowest within the more urban areas of Nailsea, Portishead, Clevedon and particularly Weston-super-Mare where amenities are within walking or cycling distance and where there is access to more public transport options. This is further demonstrated by Figure 9 which shows the percentage of households within each LSOA that have no access to a car or van. All of the LSOAs containing 50% or more households without a car or van are located within Weston-super-Mare. The low car ownership in Weston-super-Mare also corresponds to the higher deprivation as shown in Figure 7, and is likely to be due to both affordability and availability of alternative travel options.

[5] Office for National Statistics (KS404EW)

Figure 9: Percentage of Households With No Car or Van Availability (2011 Census)

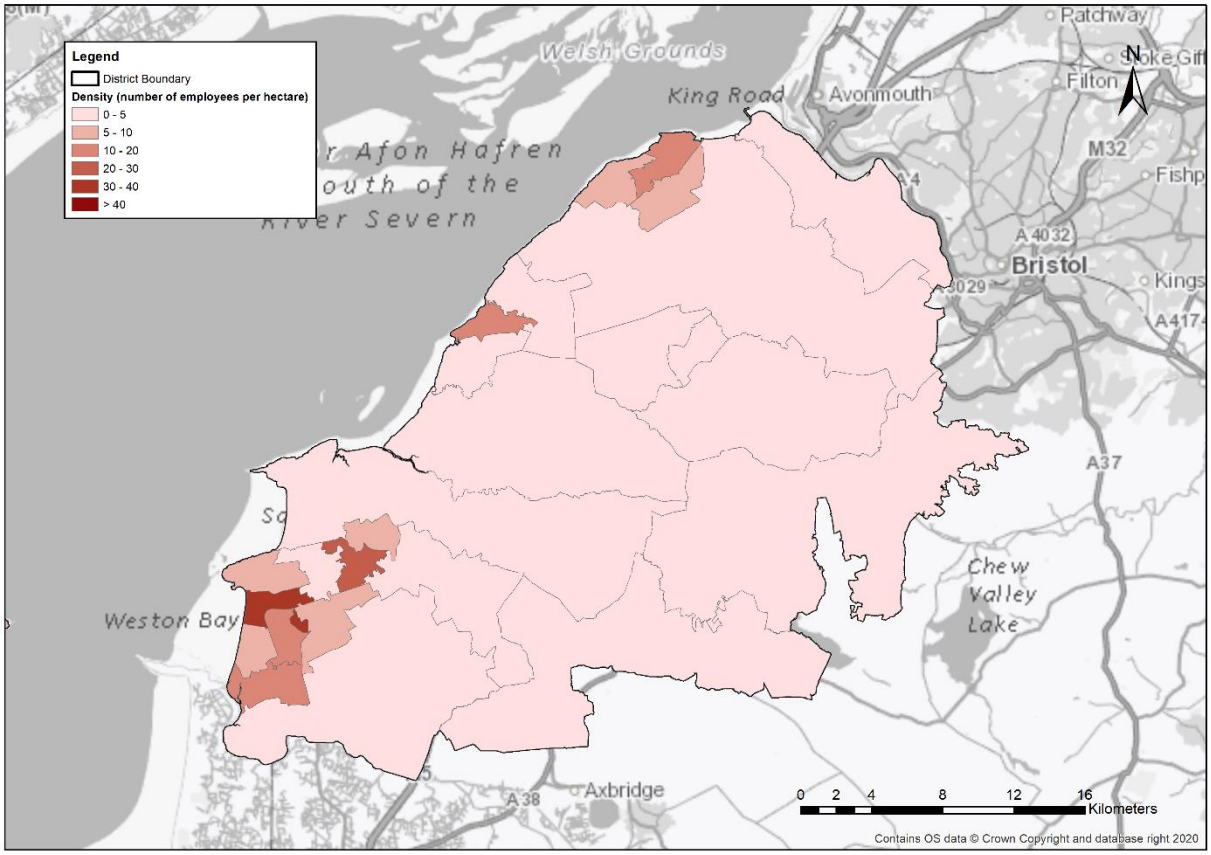


3.4 Employment Distribution

Employment density is a measure of employment (employees) per hectare, showing the location of built up employment areas and helping to visualise what areas are likely to attract trips in the peak periods. In some urban areas, employment areas represent a major part of built-up areas but include little to no residential population.

However, from the employment distribution map shown in Figure 10, it is evident that the main employment areas within North Somerset are generally located within the areas with the greatest population density, with the exception of Nailsea, which has relatively low levels of employment density compared with the other main towns, perhaps due to a greater balance of land use in favour of residential.

Figure 10: North Somerset Employment Distribution (2019 data[6])



3.5 Commuting Patterns

Journey to Work (JTW) data is collected as part of the Census and describes aspects of commuting behaviour. This data provides a valuable insight into the mode choice of both residents and commuters in and out of North Somerset.

3.5.1 Mode Share

Sustainable trips include those taken by train, bus, as a passenger in a car, bicycle or on foot. Table 3-1 shows the modal split for journeys to work in North Somerset using 2011 Census data.

Over three quarters of people in North Somerset travel to work in a car or van; the majority of which drive. This is a significantly higher percentage than the England average of which 71% of people travel by car or van. This is commensurate with Figure 8, which shows a large majority of the district has access to two cars or more, highlighting the relative car dominance in the district.

The next highest mode share in North Somerset is walking, followed by cycling. Active travel modes (walking and cycling) are both higher than the national average, however significantly lower than the mode share in neighbouring Bristol. This could be due to the high cycle commuting into Bristol from Long Ashton, Flax Bourton, Nailsea and Backwell, Public transport modes (bus and train) only account for 5% of mode share, in comparison to a national average of 11%.

[6] Office for National Statistics (2019) Business Register and Employment Survey

Table 3-1: Journey to Work Mode Share (2011 Census)

Travel to Work Method	Clevedon	Nailsea	Portishead	Weston -super- Mare	North Somerset	City of Bristol	England (Excluding London)
Walk	13%	11%	9%	14%	13%	21%	12%
Cycle	4%	3%	2%	4%	4%	8%	3%
Bus, Minibus or Coach	3%	3%	3%	5%	3%	10%	7%
Train	1%	4%	1%	3%	2%	2%	4%
Car (Driving or Passenger)	78%	77%	84%	72%	77%	57%	71%
Motorcycle, Scooter or Moped	1%	1%	1%	1%	1%	1%	1%
Other	0%	1%	0%	1%	0%	1%	2%
Total	100%	100%	100%	100%	100%	100%	100%

Travelwest conducts an annual travel to work survey across the west of England, which provides a more up-to-date overview of mode share at local authority level, but with a significantly smaller sample size. The most recent survey took place in Spring 2020 and covered business in Bristol, Bath & North East Somerset, North Somerset and South Gloucestershire. The resulting mode share for North Somerset as a whole is outlined in Table 3-2. The latest National Travel Survey has been used to provide updated mode share figures for England, including London.

Table 3-2: Journey to Work Mode Share (Travelwest 2020/ NTS 2019)

Travel to Work Method	North Somerset	England
Walk	5%	13%
Cycle	3%	4%
Bus, Minibus or Coach	5%	6%
Train	2%	8%
Car (Driving or Passenger)	84%	68%
Other	1%	1%
Total	100%	100%

The Travelwest survey results show a difference in the level of car commuting than the 2011 census, from 77% to 84%. However, commuting by walking has decreased from 13% to 5%, whereas travel by bike and public transport modes show little change. Nevertheless, these surveys have different collection methodologies and sample sizes, and hence highlighting the difference in the results.

3.5.2 Travel to Work

Census JTW data can be used to analyse commuting patterns within the district. This provides an understanding of where residents of certain areas choose to work, and vice versa. Commuting patterns between to and from the main towns within the district are shown on Figure 11 and summarised in Table 3-3.

Figure 11: Journey to Work Commuting Patterns

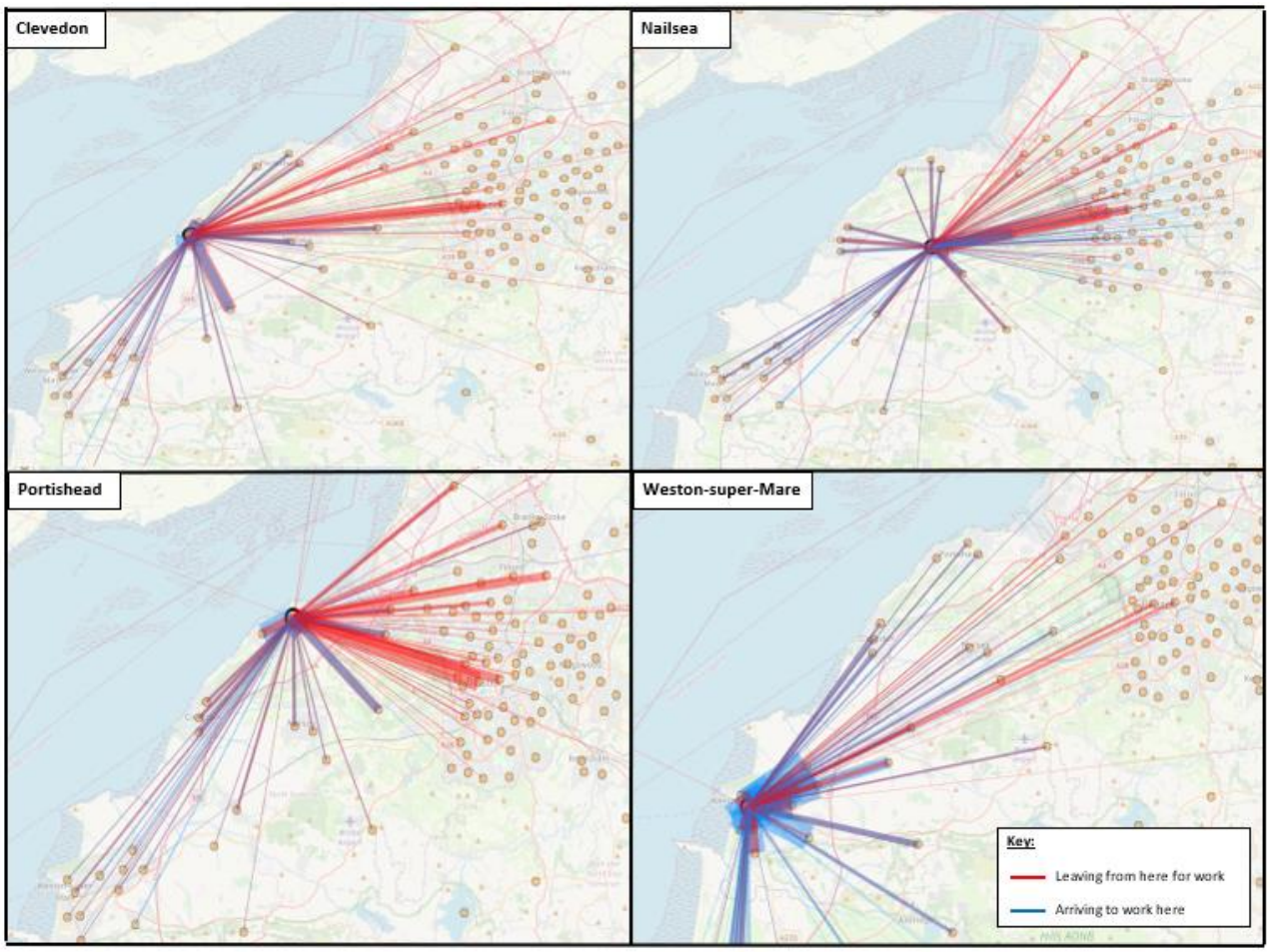


Table 3-3: Journey to Work Commuting Patterns

Location	As Residence	As Workplace
Clevedon	Majority of people work in Bristol and Portishead	Those who work in Clevedon arrive from Yatton, Portishead and Weston-super-Mare.
Nailsea	Majority of people work in Bristol.	Those working in Nailsea arrive mainly from Southwest Bristol, with some trips from Weston-super-Mare, Portishead and Clevedon.
Portishead	The majority of people living in Portishead work in central and northern parts of Bristol.	Commuters mainly arrive from rural areas to the south of Portishead, but also from West Bristol, Clevedon and Nailsea.
Weston-super-Mare	Majority of people live and work in Weston-super-Mare, or work in Bristol.	Majority of people working in Weston-super-Mare are from Weston itself and Clevedon to a lesser extent.

There is a clear pattern showing much of the population commuting to a place of work outside of where they live. There is distinct draw to employment in Bristol from Clevedon, Nailsea and Portishead, highlighting the

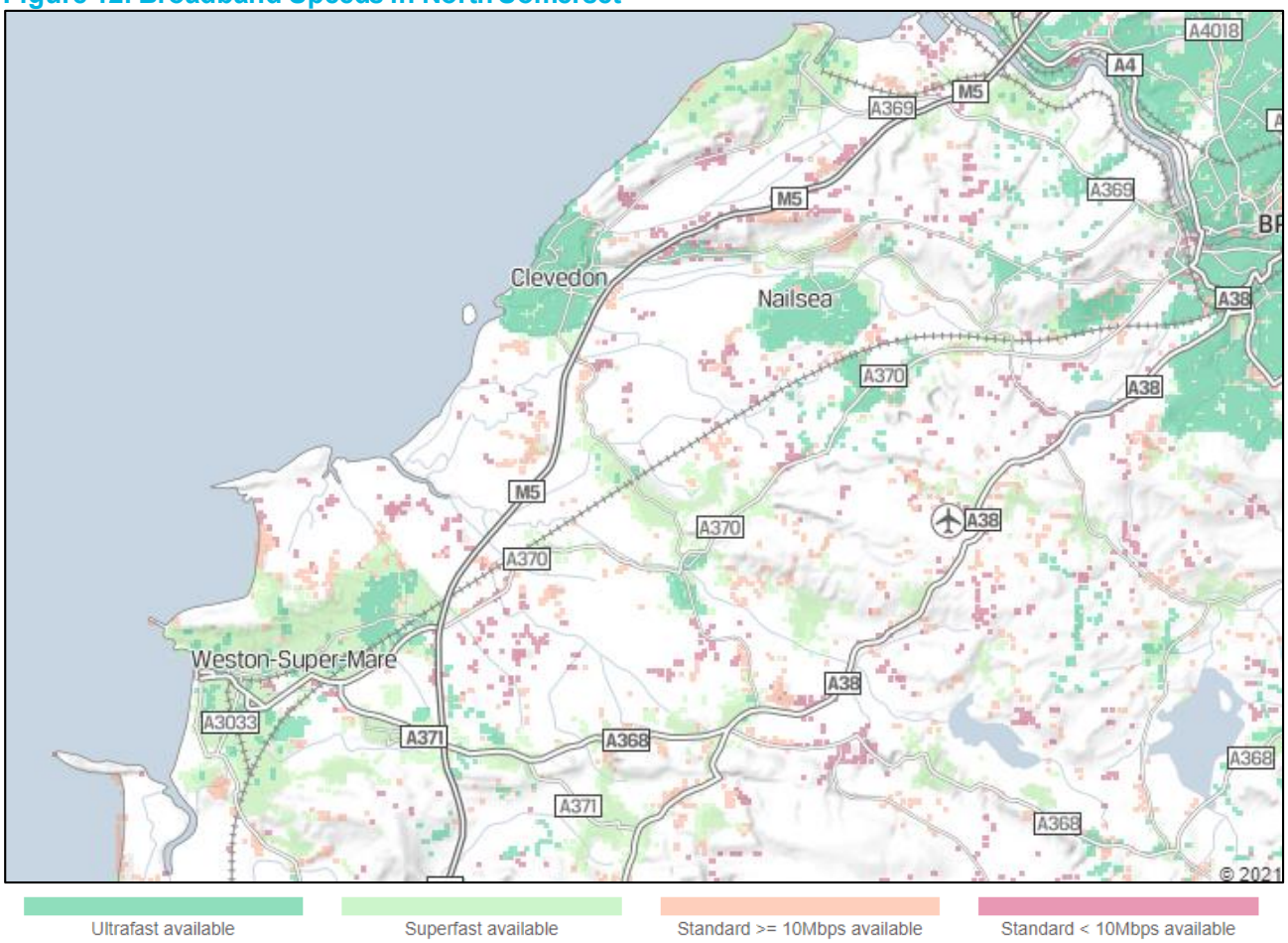
influence of Bristol on commuting travel patterns. Weston-super-Mare exhibits substantial levels of self-containment compared to the other main towns in North Somerset, but also shows commuting to employment south in Burnham-on-sea and Highbridge (not shown in Figure 11).
Overall, these commuting patterns show reasonable levels of movement between urban centres.

3.6 Broadband speeds

Broadband speeds across North Somerset are shown on Figure 12.

Urban locations such as Nailsea, Clevedon and Weston-super-Mare, as well as the outskirts of Bristol are shown to have the fastest broadband speeds available. Large parts of Weston-super-Mare and Portishead have access to superfast, but not ultrafast broadband speeds.

Figure 12: Broadband Speeds in North Somerset[7]



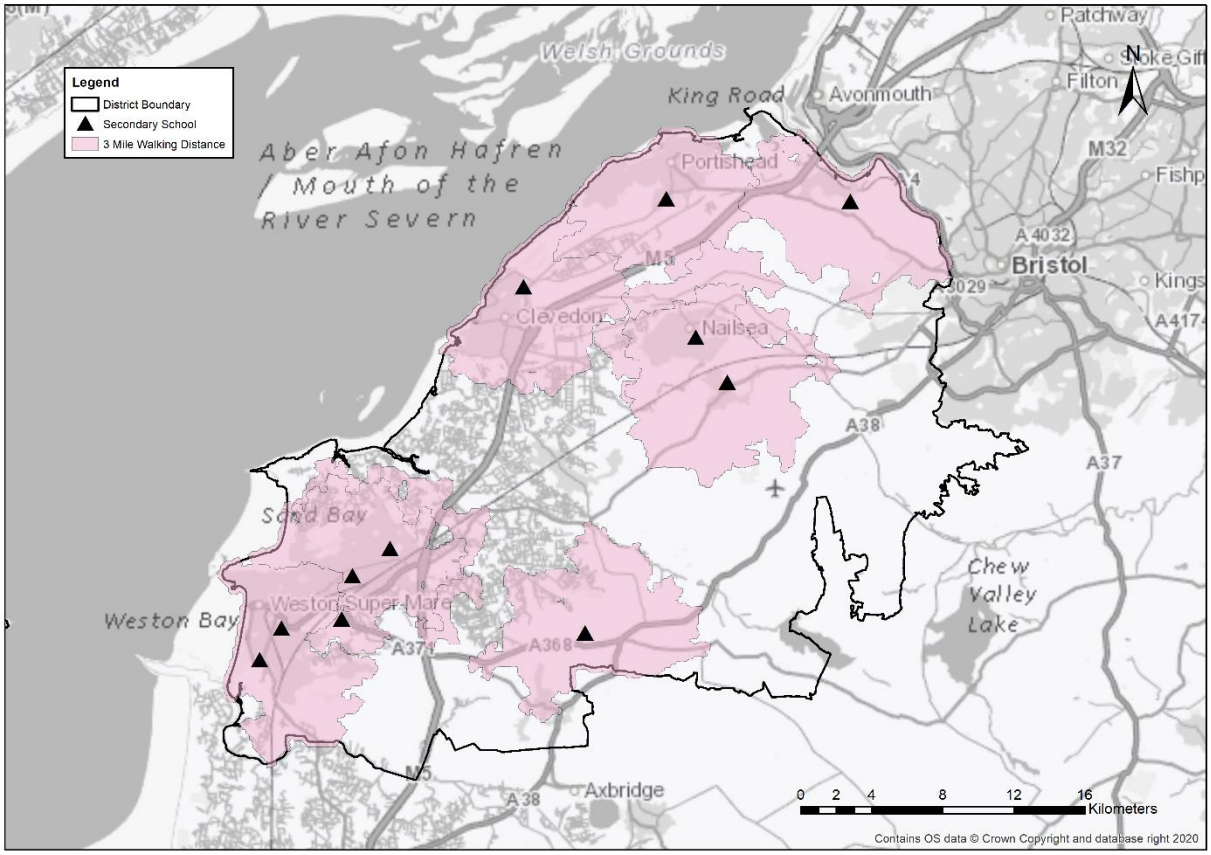
Broadband speeds in the village locations will have varied speeds. Currently the villages that are closer to the A370, such as Yatton, Failand, Flax Bourton, and near the A369 such as Abbots Leigh and Easton-in-Gordano have superfast broadband speeds or higher. Villages that are more rural, such as those south-east of Weston-super-Mare and Churchill have much slower internet speeds, and just have access to standard broadband. It is important to note that these are existing broadband speeds, and developments brought forward will be requried to provide fast internet speeds as part of a levelling up initiative in the UK to install high-quality digital infrastructure from the outset [8].

[7] Source: https://checker.ofcom.org.uk/broadband-coverage. Data extracted January 2021
[8] https://www.gov.uk/government/news/new-build-homes-to-come-gigabit-speed-ready, accessed 24/02/21.

3.7 Schools

Figure 13 shows the locations of secondary schools across North Somerset. The map includes three mile walking distance isochrones[9] around each school, to demonstrate the level of local accessibility by active modes. There are secondary schools located in each of the primary towns within the district, with a particular concentration in Weston-super-Mare. Walking distance buffers demonstrate that a large proportion of the district is within walkable distance of a secondary school, with the exception of a belt within the central and eastern part of the District. Developments further from towns will result in several possibilities; children will need to travel to school by means likely other than walking or cycling, such as education trips being by car or Home To School Transport (HTST) or developments will be required to support the delivery of new schools.

Figure 13: Secondary School Map with 3-mile buffer



A similar map of primary schools has not been developed at Spatial Strategy stage as it is considered that there is sufficient potential for the development of growth areas to support local provision of primary school places, whether through expansion, new schools, or using existing spare capacity. This issue will need to be evaluated in more granular detail at site allocation stage.

[9] Three miles has been chosen as an indicator as NSC has a statutory duty to provide Home To School Transport (HTST) for pupils living more than three miles by safe walking route from a secondary school. At this strategic stage, a route review to determine which routes are "safe" has not been undertaken.

4. Existing Transport Networks

4.1 Active Travel

4.1.1 Cycling

An interactive cycle map is available via the NSC website[10], presenting the routes around the area. Highways have been graded along a colour spectrum according to cycling amenity. The cycle network is mainly on-road, with limited connected traffic-free routes available.

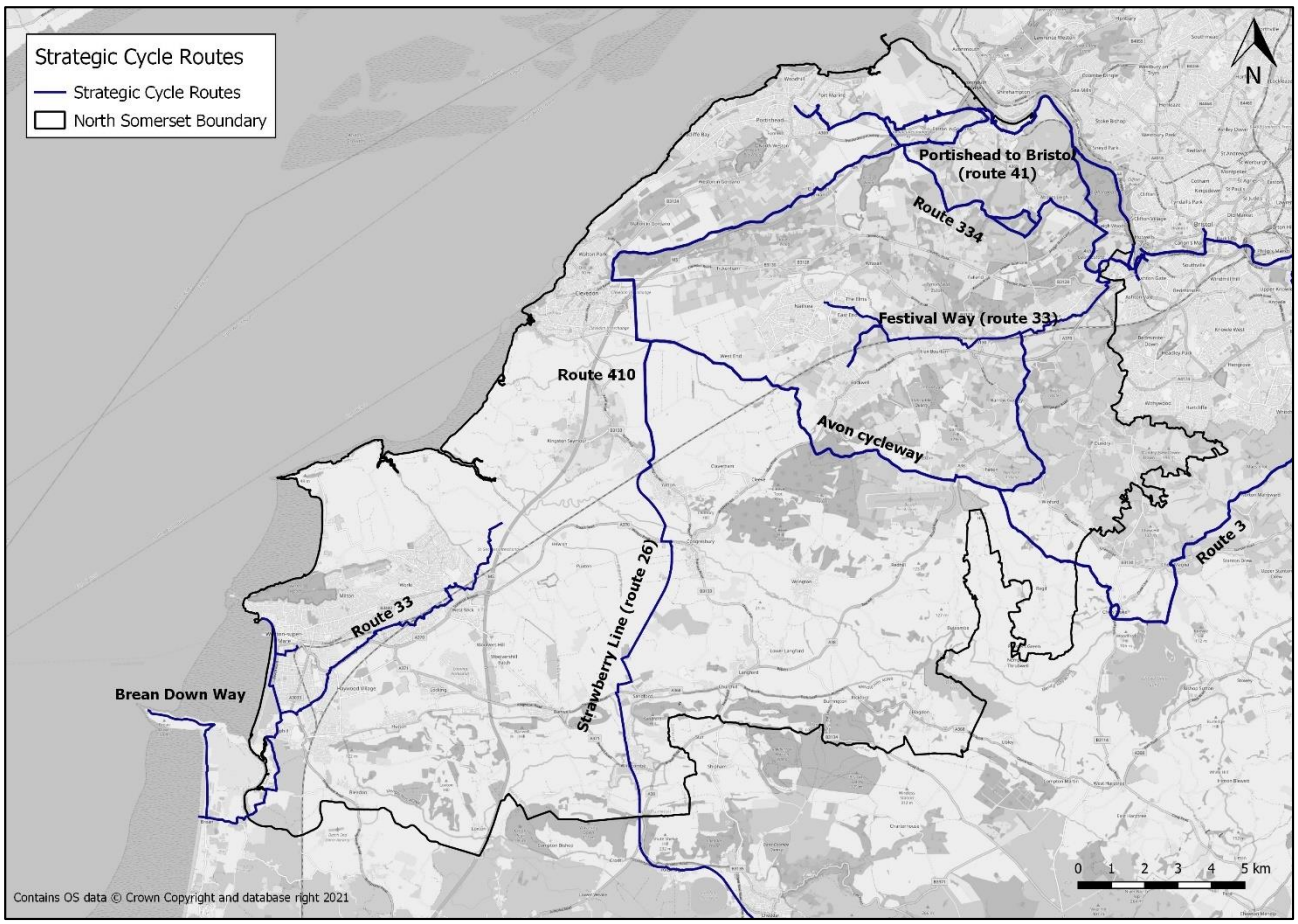
The National Cycle Network (NCN) is present in the district, with the following routes available:

- NCN 26 – Runs from Portishead, connecting Clevedon and Cheddar;
- NCN 33 – Runs between Bristol and Nailsea, and at Weston-super-Mare;
- Avon Cycleway – An 85-mile circular route around the city of Bristol, including through Clevedon and south of Nailsea; and
- NCN 334 – Runs north-south to the west of Bristol, between Ashton Gate and Portbury.

A map of the strategic cycle network (NCN) in North Somerset is included in Figure 14.

There are good strategic cycle links into Bristol and Weston-super-Mare, but few connections from the south-east, potentially due to M5 acting as a barrier. NSC is currently working on additional routes and 'missing links' in the network, including enhancing connections between Weston-super-Mare and Clevedon that avoid the A370.

Figure 14: North Somerset Strategic cycle routes

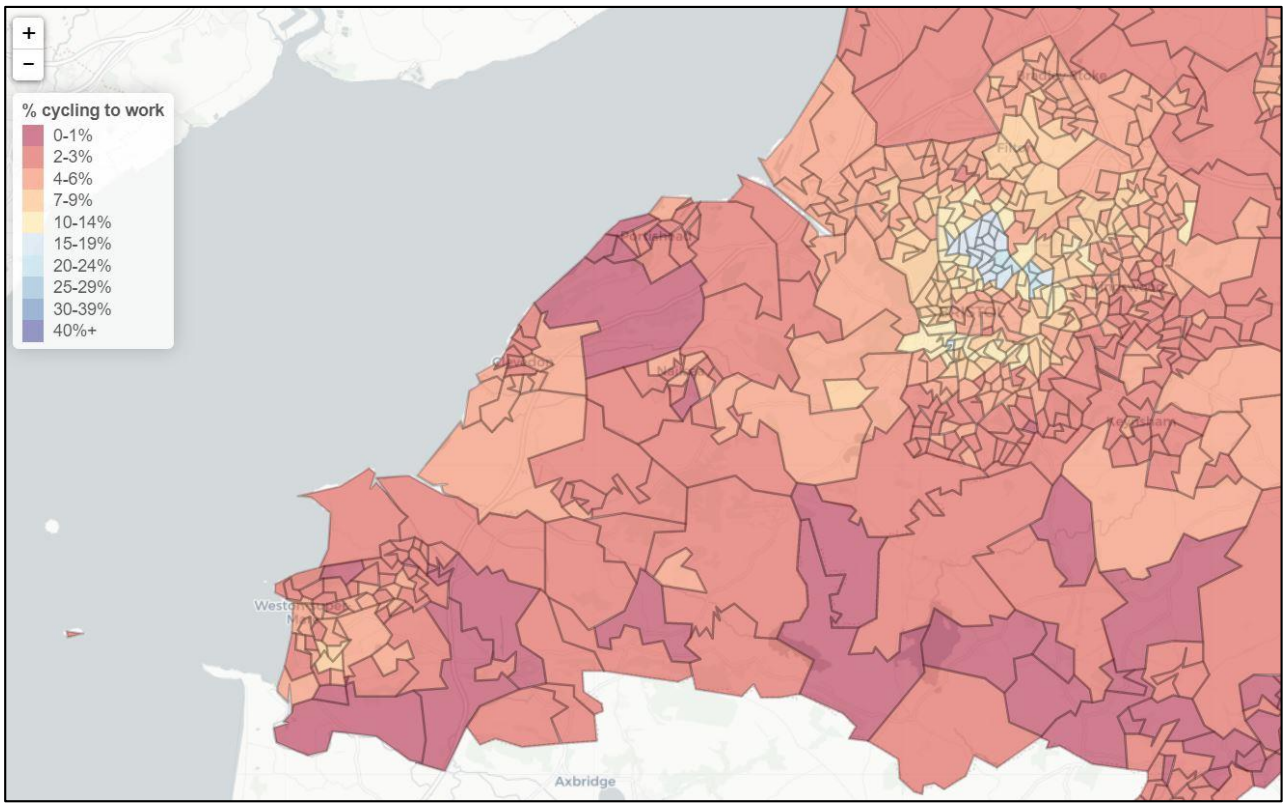


[10] http://map.n-somerset.gov.uk/cycleroutes.html

PCT

The National Propensity to Cycle Tool (PCT) is an online and interactive planning support tool to provide an evidence base to inform investment in cycling. It shows different future scenarios, but also the cycle to work levels captured during the 2011 Census. Figure 15 shows the distribution of cycling levels across North Somerset, with Bristol also shown as a comparison.

Figure 15: PCT – 2011 Census



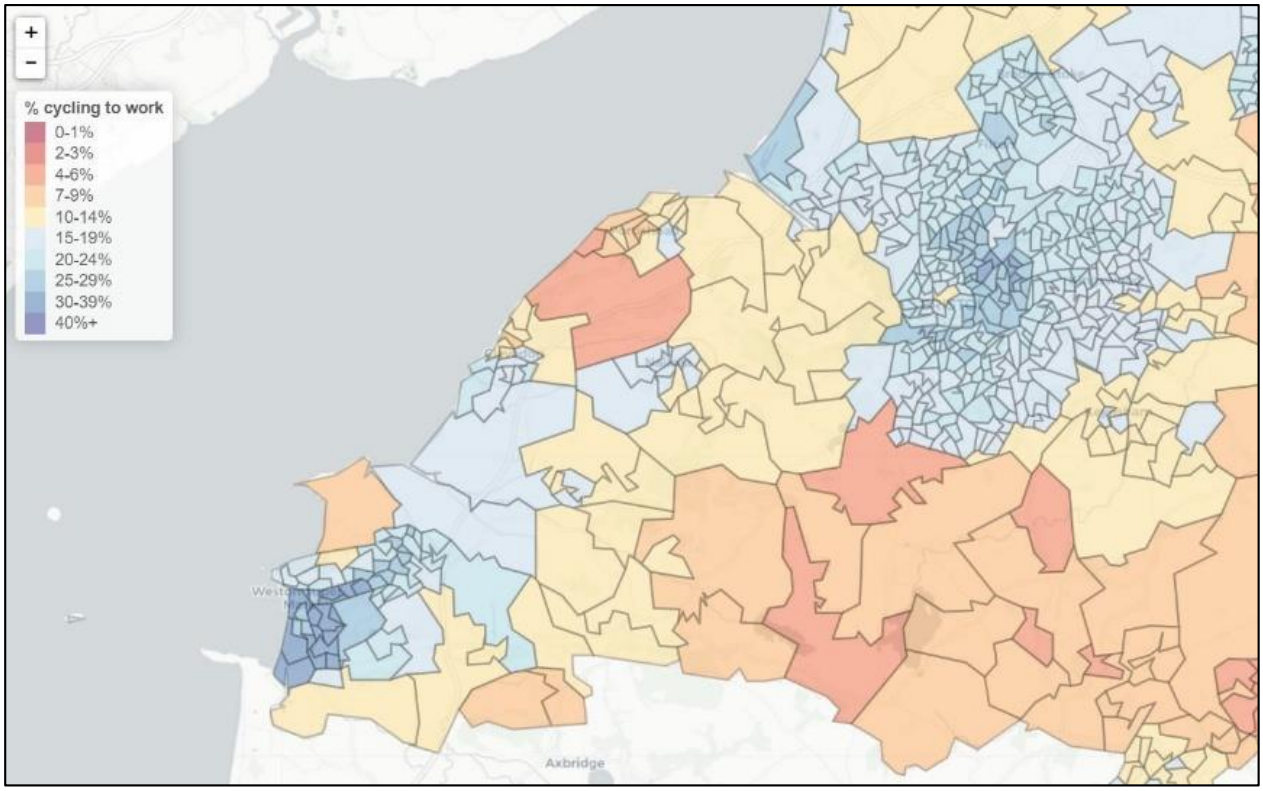
The 2011 Census mapping shows that the majority of the district has between 0 and 6% of people cycling to work. Closer to Bristol City centre and its surrounding areas, cycling uptake is above 10%, likely due to shorter distances to work and greater provision of infrastructure. The levels of cycling are particularly low in the areas between Portishead and Clevedon, as well as the surrounding areas to the south and east of Weston-super-Mare.

In addition to showing the cycle to work levels from the 2011 census, the PCT also provides a relative measure of potential for cycling levels to increase under different scenarios. It shows what the rate of cycling could feasibly look like in different parts of cities and regions, and illustrates the associated increase in cycle use on the road network.

Different visions of the future are represented through a number of scenarios, which can be applied at various scales. The following PCT scenarios have been presented for the North Somerset area at Lower Super Output Area (LSOA) level, and are presented in Figure 16 and Figure 17:

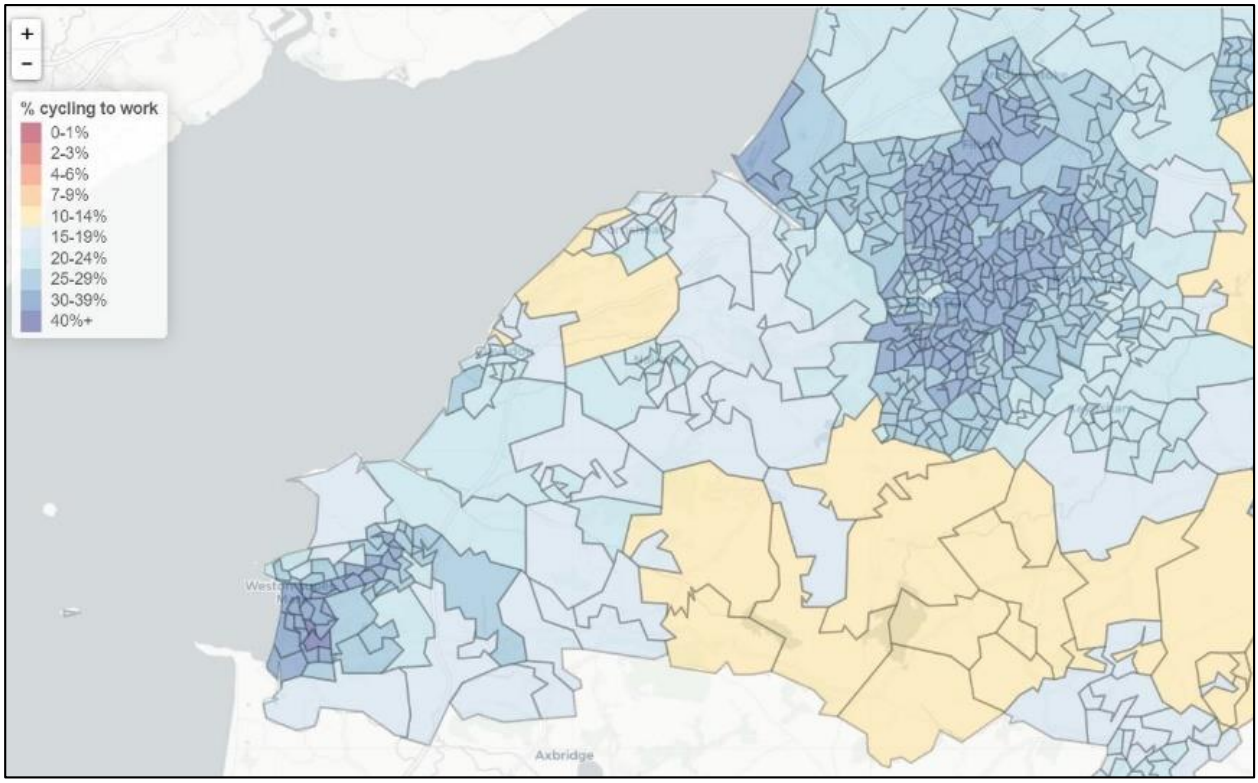
- Go Dutch – Shows what would happen if areas had investment bringing the same infrastructure and cycling culture as the Netherlands; and
- E-bikes – Models the additional increase in cycling that would be achieved through the widespread uptake of electric cycles, reducing topography and distance as barriers to cycling uptake, built as an extension of the Go Dutch scenario.

Figure 16: PCT – Go Dutch Scenario



When the Go Dutch scenario is applied, the overall levels of cycling increase with the majority of the district seeing a minimum of 10% of people cycling to work. This increases in the main towns, such as Weston-super-Mare which would see cycling levels rising above 30%. There is also a distinct increase in cycling in the areas surrounding the City of Bristol, with the majority of these areas above 15%, compared to less than 10% in the Census.

Figure 17: PCT – E-bikes Scenario



Built on an extension of the Go Dutch scenario, the E-bikes scenario shows a further increase in the overall levels of cycling in North Somerset. The majority of the district has cycling levels above 15%, and notably shows no areas with fewer than 10% of people cycling to work. Urban centres of Weston-super-Mare show levels of cycling greater than 30%. The areas straddling two key corridors within North Somerset, the A38 and A370, show cycling levels above 15%, compared to the Census scenario, where the majority of these areas have less than 5% of people cycling to work.

4.1.2 Walking

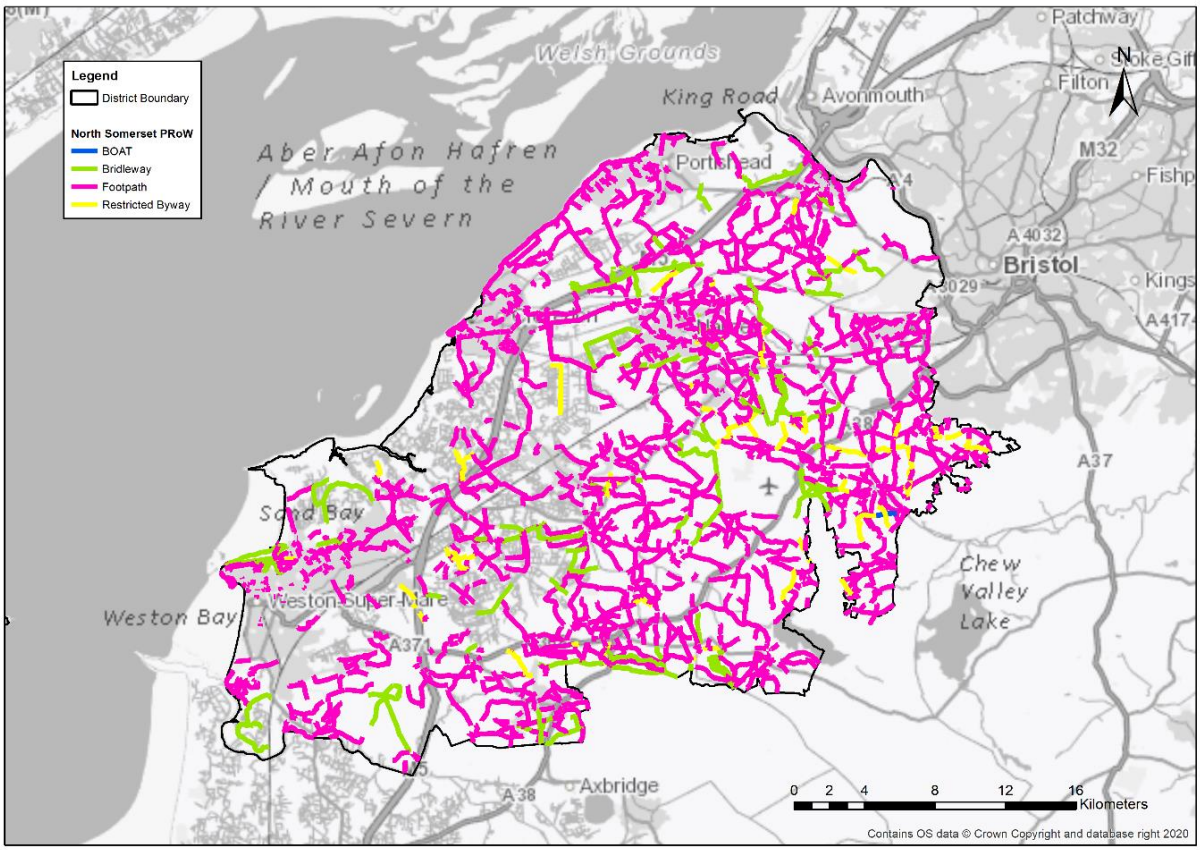
Figure 14 above shows the strategic active travel routes, available to pedestrians, cyclists and equestrians.

There are also a number of Public Rights of Way (PRoWs) in North Somerset, which are available to view on an interactive map, via the NSC website[11]. Figure 18 shows an extract from the interactive map, with the coloured lines representing bridleways and footpaths in the district, demonstrating a wide availability of walking routes. The majority of PRoWs in the district are footpaths.

The presence of the M5 motorway, A370 and A38 is likely to have an impact on the levels of walking interconnectivity between locations in the district, with limited crossing points on these roads , and the presence of the rail line.

[11] http://map.n-somerset.gov.uk/dande.html

Figure 18: North Somerset PRoW Mapping



4.2 Bus Services

4.2.1 Bus Network

A timetable of the primary bus services operating within North Somerset is set out in Table 4-1, with corresponding route maps shown in Figure 19 and Figure 20.

Table 4-1: North Somerset Bus Timetable[12]

Service	Route	Operator	Days	First Service	Last Service	Approximate Frequency
1	Weston-super-Mare centre – Knightstone - Sand Bay	First in Bristol Bath & the West	Mon-Sun	07:35	18:52	30 mins
3	Worle - Weston Centre - Bournville - Searle Crescent	First in Bristol Bath & the West	Mon-Fri	06:41	20:38	12 mins
			Sat	06:51	20:38	20 mins
			Sun	08:50	19:09	30 mins
5	Hutton - Uphill Hospital - Weston Centre - Worle	First in Bristol Bath & the West	Mon-Fri	05:37	00:13	60 mins
			Sat	07:00	00:15	
			Sun	07:46	00:14	

[12] Timetable valid from January 2021. Service levels and frequency are likely to change post Covid-19 pandemic.

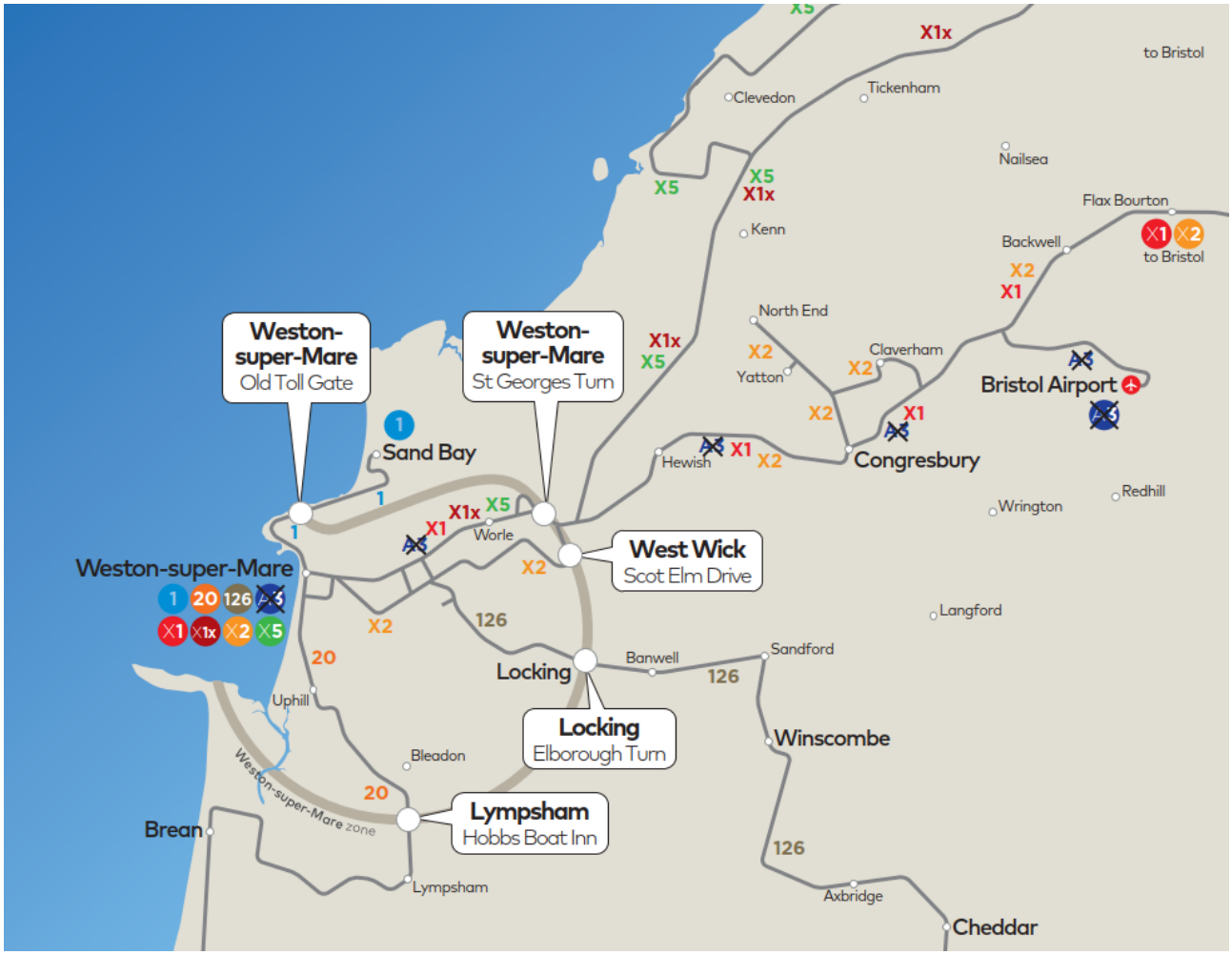
Service	Route	Operator	Days	First Service	Last Service	Approximate Frequency
7	Worle - Weston Centre – Haywood Village	First in Bristol Bath & the West	Mon-Fri	05:59	23:36	12 mins
			Sat	07:00	23:37	20 mins
			Sun	07:45	21:22	30 mins
20	Weston-super-Mare - Brean - Burnham-on-Sea	First in Bristol Bath & the West	Mon-Sat	07:39	21:06	30 mins
			Sun	09:05	20:06	60 mins
126	Weston-super-Mare -Cheddar - Wells	First in Bristol Bath & the West	Mon-Fri	05:28	20:28	60 mins
			Sat	07:08	19:11	120 mins
505	Long Ashton P & R – Clifton - Southmead Hospital	HCT Group	Mon-Fri	06:05	23:06	30 mins
			Sat	06:05	22:54	30 mins
			Sun	10:00	19:18	60 mins
A2	Bristol Airport – Bedminster – Temple Meads - Broadmead	First in Bristol Bath & the West	Mon-Sun	03:10	03:02	30 mins
M2	Long Ashton P&R - Cabot Circus - Long Ashton P&R	First in Bristol Bath & the West	Mon-Fri	06:00	19:34	15 mins
			Sat	06:55	19:34	20 mins
U2	Bristol Centre – Long Ashton – Barrow Common – Redhill - Langford Veterinary College	First in Bristol Bath & the West	Mon-Fri	07:13	18:59	60 mins (University Service)
X1	Weston-super-Mare - Worle – Backwell – Flax Bourton - Bristol city centre	First in Bristol Bath & the West	Mon-Fri	05:10	00:39	15 mins
			Sat	05:50	00:39	30 mins
			Sun	06:55	00:39	30 mins
X2	Bristol city centre - Congresbury - Weston-super-Mare	First in Bristol Bath & the West	Mon-Fri	06:48	19:32	60 mins
			Sat	07:37	19:00	120 mins
X3	Bristol city centre – Abbots Leigh - Portishead	First in Bristol Bath & the West	Mon-Fri	07:28	19:35	60 mins
			Sat	07:50	19:33	
			Sun	08:33	18:30	
X4	Bristol - Pill - Sheepway - Portishead	First in Bristol Bath & the West	Mon-Fri	07:25	17:39	2 Services
X5			Mon-Fri	05:18	21:36	60 mins

Service	Route	Operator	Days	First Service	Last Service	Approximate Frequency
	Weston-super-Mare - Clevedon - Portishead - Bristol	First in Bristol Bath & the West	Sat	06:28	21:39	
X6	Bristol - Failand - Tickenham - Clevedon - Walton St Mary	First in Bristol Bath & the West	Mon-Fri	06:00	19:48	60 mins
			Sat	08:10	19:12	120 mins
X7	Bristol - Nailsea - Clevedon	First in Bristol Bath & the West	Mon-Fri	05:30	00:14	60 mins
			Sat	06:38	00:14	
			Sun	07:38	00:14	
X8	Bristol city centre - Long Ashton - Backwell - Nailsea	First in Bristol Bath & the West	Mon-Fri	07:30	19:36	90 mins
X9	Bristol city centre - Long Ashton - Backwell - Nailsea	First in Bristol Bath & the West	Mon-Fri	05:35	01:02	30 mins
			Sat	07:35	01:02	
			Sun	07:45	00:00	

Source: Travelwest, First Group (January 2021)

Figure 19: Bus Network

Figure 20: Weston-super-Mare zone bus network



The A370 and the A369 offer a good level of service and frequency between the main towns of Clevedon, Portishead and Nailsea in North Somerset and neighbouring Bristol. Figure 19 highlights this stronger level of service, particularly east of the district between Backwell and Bristol.
Connections on the A38 are limited, including on the A368/A371 between Churchill and Weston-super-Mare. Villages that are off the main radial routes into Bristol has poor bus connectivity, linking back to high car ownership in more rural areas.

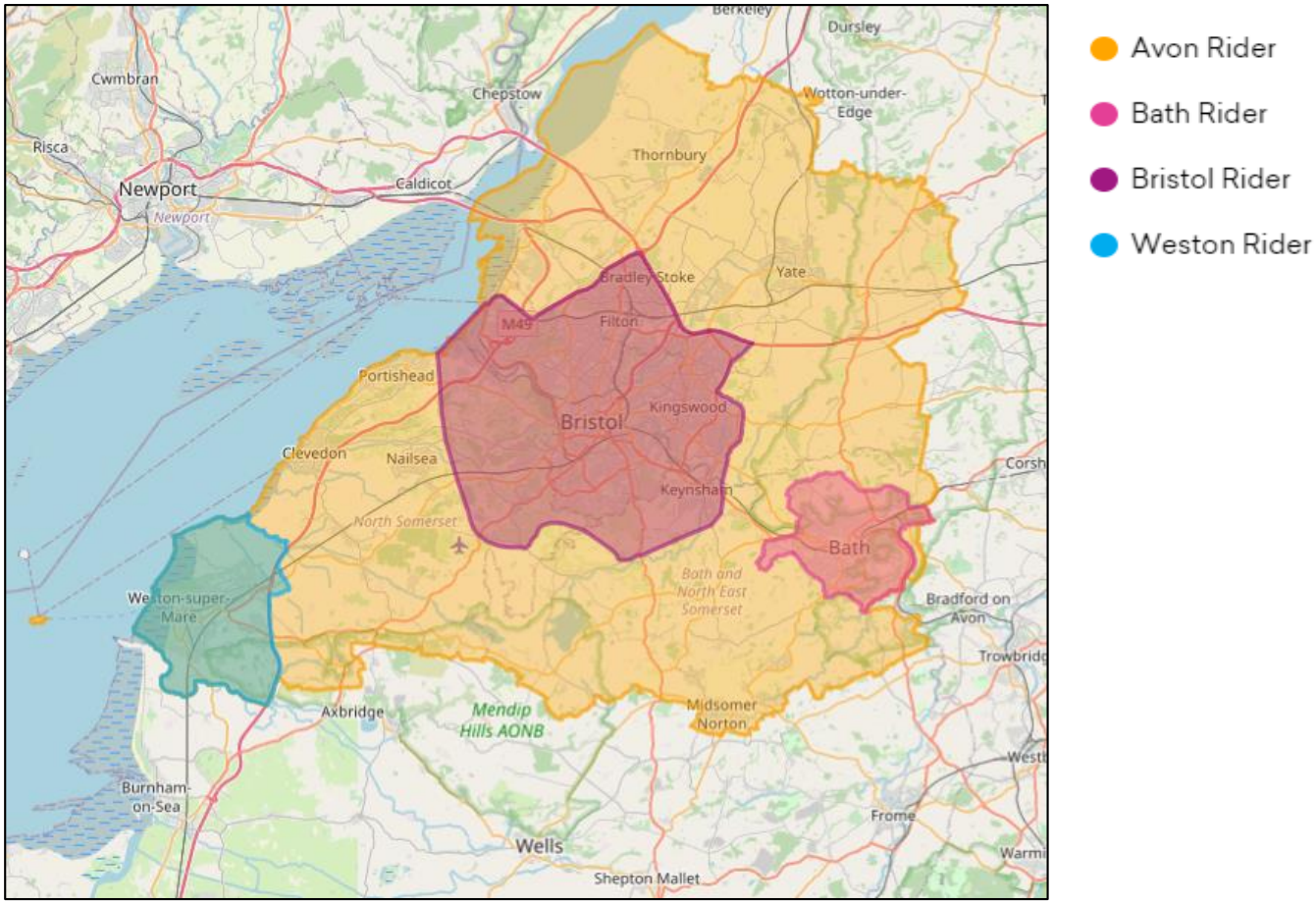
The majority of services operate at a minimum of an hourly frequency on weekdays, with a decreased service offering on weekends. Metrobus service M2 offers a weekday frequency of 15 minutes, along with service X1, which routes between Bristol and Weston-super-Mare. Services 3 and 7 offer a weekday frequency of 12 minutes for routes between Weston-super-Mare and Worle.

North Somerset also has a number of regular bus services to a variety of key destinations throughout the South West Region. These include regular services to Bristol and Bath, which offer the potential for onward connections to regional destinations further afield.

4.2.2 Ticketing

The Travelwest Website sets out the areas available for Multi-operator Rider Tickets. This is illustrated in Figure 21 and detailed below.

Figure 21: Bus Rider Ticket Areas across North Somerset



Source: Travelwest

As shown in Figure 21, the North Somerset Study Area encompasses the Avon Rider, Weston Rider and Bristol Rider ticket areas. These areas provide for all-day multi-operator bus tickets and the flexibility to travel. The conditions for each ticket type is described in more detail below.

All day Multi-Operator tickets

- Valid for travel on the day of issue and up to 2.59am the following morning.
- No limit to the number of journeys you can take – all you have to do is show your ticket to the bus driver when you get on.
- Not valid for tour buses, express coaches, or bus services for special events.
- Bought on any bus operating in that Rider ticket area – including Park & Ride services.

Avon Rider

- Covers the area of the former county of Avon.
- Provides access for travel on the following bus operators; Allbus, Bath & NE Somerset Passenger Transport, Bath Bus Company (except tour buses), Bristol Community Transport, Carmel Bristol, Citistar, CT Coaches, Eurotaxis, Faresaver. First West of England, Somerbus and Stagecoach West.

Bristol Rider

- Covers the Bristol Urban Area, and comprises roughly a six-mile radius of the city centre. This is the same area as First's Bristol Zone.
- Provides access for travel on the following bus operators; Abus, Bath Bus Company (except tour buses), Bristol Community Transport, CT Coaches, Eurotaxis, First West of England and Stagecoach West.

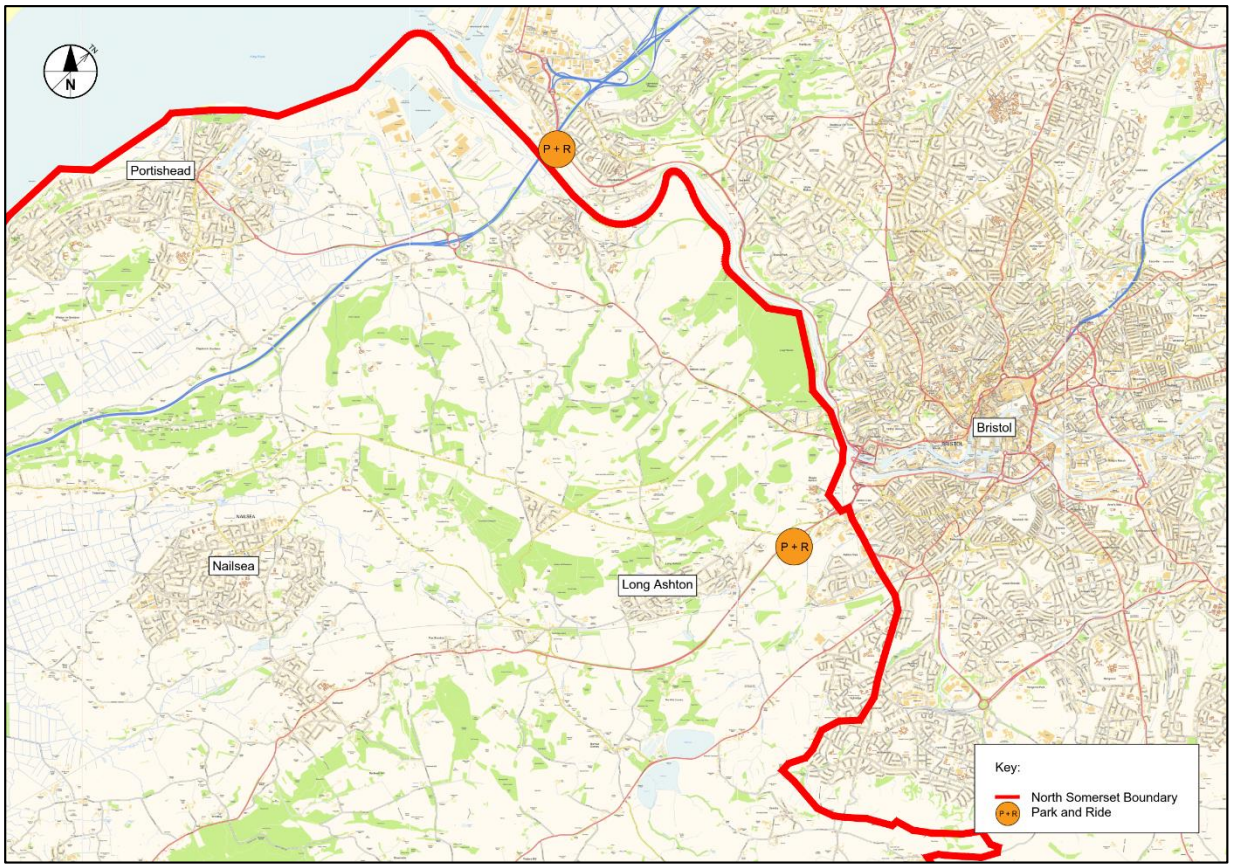
Weston Rider

- Covers the western area of North Somerset encompassing the Weston-super-Mare urban area.
- Provides access for travel on the Citistar and First West of England bus operators.

4.3 Park and Ride

Current Park and Ride (P&R) locations are detailed on the Travelwest Website and are set out in Figure 22 as follows. These are located to the North East extent of the North Somerset study area, and comprise the Portway P&R (North) and the Long Ashton P&R (South).

Figure 22: North Somerset Park & Ride Locations



The services for each park and ride are described in more detail below.

Portway Park & Ride;

- Services every 12-15 minutes for direct access to Bristol City centre, via Shirehampton, Sea Mills, Stoke Bishop and Hotwells.
- Services operates seven days a week, and run 6:15am – 9pm Monday – Friday, 6:15am – 8:30pm Saturdays and 9:30am – 6pm Sundays and Bank Holidays.
- Approximately 500 parking spaces, open 6am – 9:40pm Monday to Saturdays and 9am – 6:40pm Sundays. It is understood that this is likely to expand in the short term as part of the Portway Station project, with details still to be confirmed.

Long Ashton Park & Ride;

- Metrobus Service M2 to Bristol city centre every 12-15 minutes and the 505 bus service to Clifton, Bristol Zoo and Southmead Hospital every 15-30 minutes.
- M2 service operates 6am – 9:20pm Monday to Saturday;

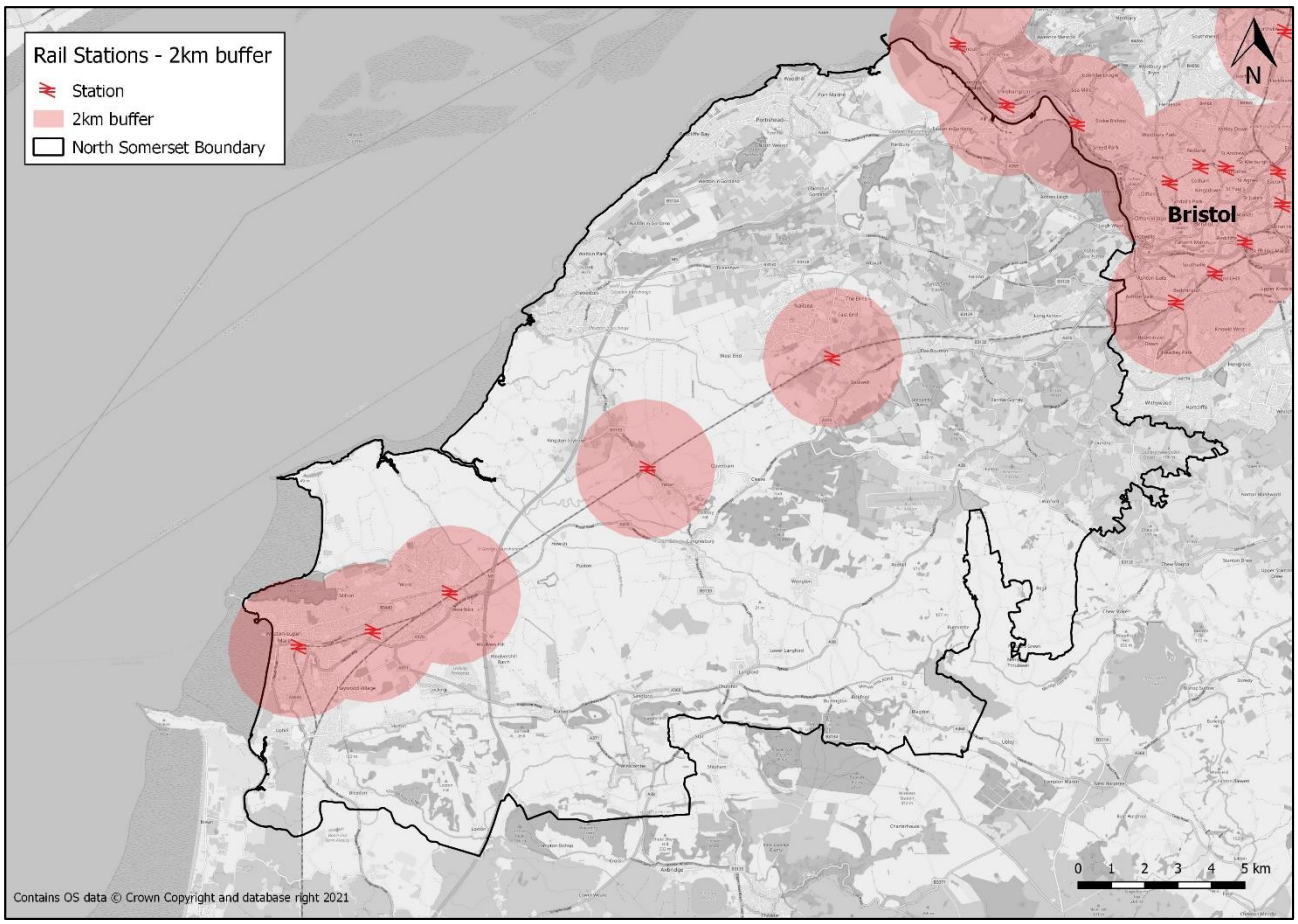
- The 505 service operates 6am – 8:50pm Monday to Saturday and operates to Bower Ashton from 10am – 7pm Sundays.
- Approximately 1,500 parking spaces, open 5:30am – 10:45pm Monday to Saturdays.

The P&R sites provides an opportunity for people in North Somerset to travel sustainably into Bristol, reducing congestion and improving air quality in the neighbouring conurbation. Nevertheless, the journey to the P&R sites from North Somerset is mostly taken by car.

4.4 Rail

Figure 23 shows the location of railway stations across the North Somerset Area, with a 2km area buffer, which has been chosen to provide an indicator of active travel potential.

Figure 23: Rail Stations across North Somerset



The rail corridor through North Somerset is part of the original Bristol and Exeter Railway. Weston-super-Mare is situated on a short loop off the main line.

The following railway stations are located within North Somerset; Weston-super-Mare, Weston Milton, Worle, Yatton, and Nailsea & Blackwell. The available facilities at each station are set out below in Table 4-2.

Table 4-2: Station Facilities in North Somerset

Facility	Weston-super-Mare	Weston Milton	Worle	Yatton	Nailsea & Backwell
Car Parking	120 spaces	30 spaces	180 spaces	154 spaces	268 spaces
Cycle Storage	52 spaces	8 spaces	78 spaces	20 spaces	20 spaces
Staffing / Ticket Office	Yes	No	Yes	Yes	Yes
Self-service Ticket Machines	Yes	No	Yes	Yes	Yes
CCTV	Yes	Yes	Yes	Yes	Yes
Customer Help Points	Yes	Yes	Yes	Yes	Yes

Source: National Rail (2021)

The corridor is used by non-stopping long distance CrossCountry services between the major stations in the South West and the Midlands (and beyond) as well as regional Great Western Railway (GWR) 'semi-fast' services between Taunton and Cardiff/Gloucester and local GWR stopping services. Freight also uses the corridor. In a typical off-peak hour (pre-Covid) there is one 'all stations' service between Weston-super-Mare and Filton Abbey Wood via Bristol Temple Meads, and one regional service between Taunton and Cardiff (calling all stations in North Somerset except Weston Milton). These services are supplemented in the peak and in occasional off-peak hours by extensions of GWR London-Bristol services to Weston-super-Mare and calls in CrossCountry services.

The journey time from Weston-super-Mare to Bristol Temple Meads is between 16 and 33 minutes depending on the calling pattern of the service.

Parson Street, Bedminster and Bristol Temple Meads stations provide access to Bristol City Centre. From Bristol Temple Meads, a wealth of regional and national connections are available by rail.

4.4.1 Station Usage

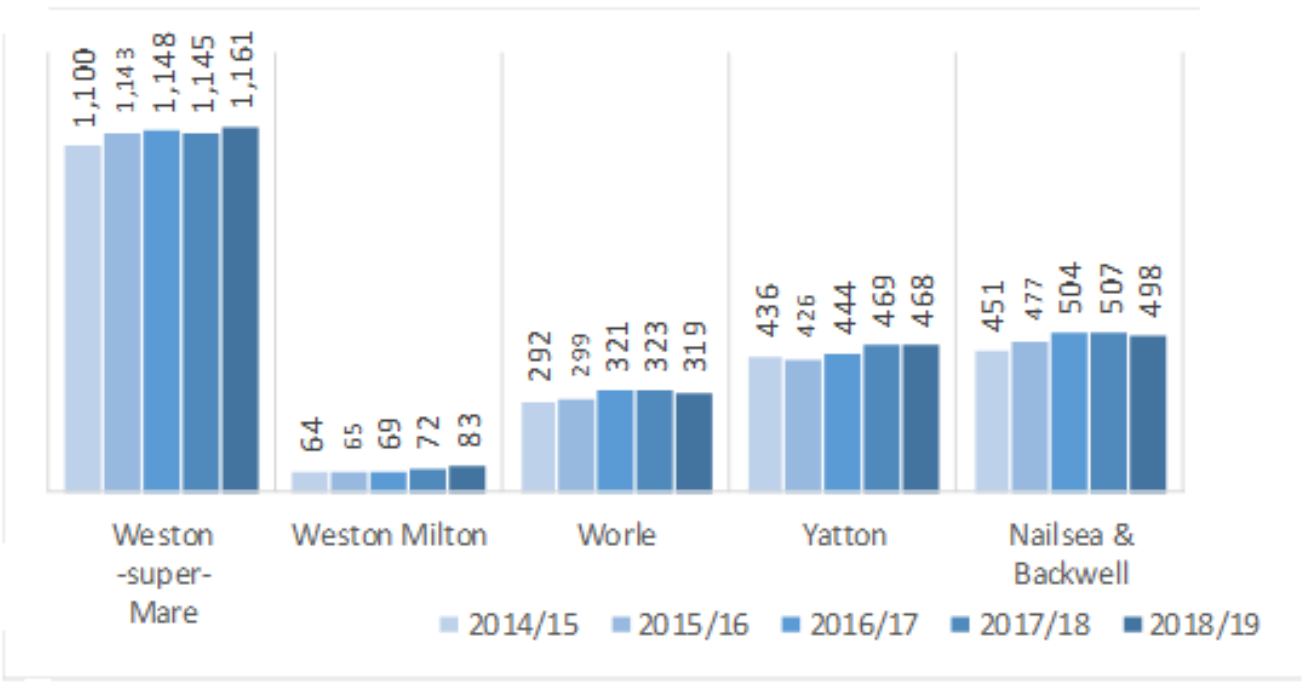
Figure 24 and Table 4-3 outline the levels of passenger use at each of the railway stations in the North Somerset area.

Table 4-3: Average Weekday Usage Estimate for North Somerset Stations

	Average Weekday Entries & Exits				
Station	**2014/15**	**2015/16**	**2016/17**	**2017/18**	**2018/19**
Weston-super-Mare	3,568	3,709	3,723	3,715	3,766
Weston Milton	209	212	223	233	268
Worle	946	970	1,042	1,046	1,035
Yatton	1,413	1,383	1,440	1,522	1,517
Nailsea & Backwell	1,462	1,546	1,635	1,646	1,615

Source: Office of Rail and Road (2020)

Figure 24: Entries and Exits at Bristol to Weston-super-Mare line (000s)



Source: Office of Rail and Road (2020)

Weston-super-Mare experiences the highest amount of passenger usage, averaging circa 4,000 daily entries and exits. The station with the lowest amount of passenger use is Weston Milton, followed by Worle. Both Yatton and Nailsea & Backwell stations have comparable figures, in terms of station usage.

4.4.2 Ticketing

A large range of single/return, peak/off peak and season tickets is available for all rail journeys. Train-specific Advance fares are also available for longer distance journeys.

The Travelwest Website sets out information on 'Cost Savers', to allow for cheaper and more flexible ticketing for regular users of both rail and bus, with the following multi-modal tickets being offered:

- Freedom Travelpass – One ticket that allows for unlimited travel on all train and most bus services in Bristol, Bath, North Somerset and South Gloucestershire. Tickets are available to buy for a day, a week, or a calendar month.
- PlusBus – A discount price bus pass that can be bought alongside a train ticket, allowing for unlimited travel around the urban area of the rail-served town or city.

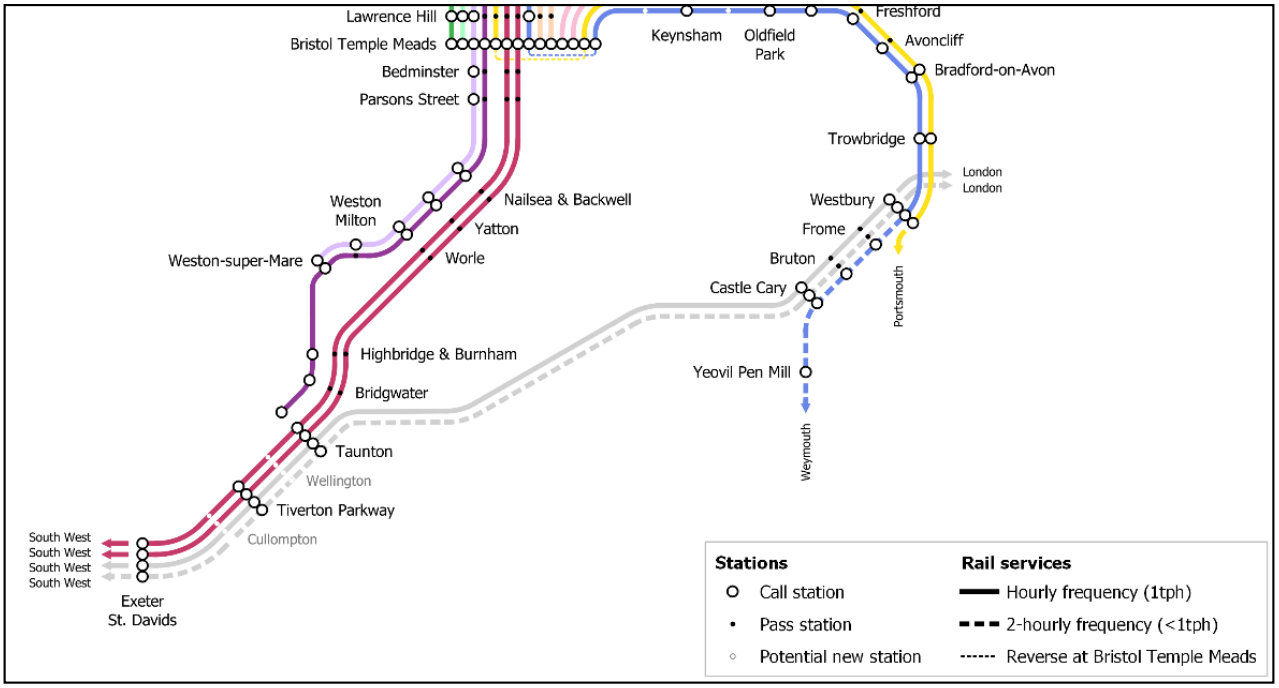
4.4.3 Issues and Constraints

Existing issues and constraints with rail provision in North Somerset are identified in the following paragraphs.

Poor off-peak service frequency

Figure 25 highlights that typically in the off-peak the majority of stations are only served by two trains an hour. Weston Milton only receives an hourly service. This is considerably below the desired 'turn up and go' frequency required to provide an attractive alternative to driving. In the peak and occasional off-peak hours, service frequencies are slightly higher, but not for all stations.

Figure 25: December 2019 Off-Peak Service Diagram



Mixed speed of services

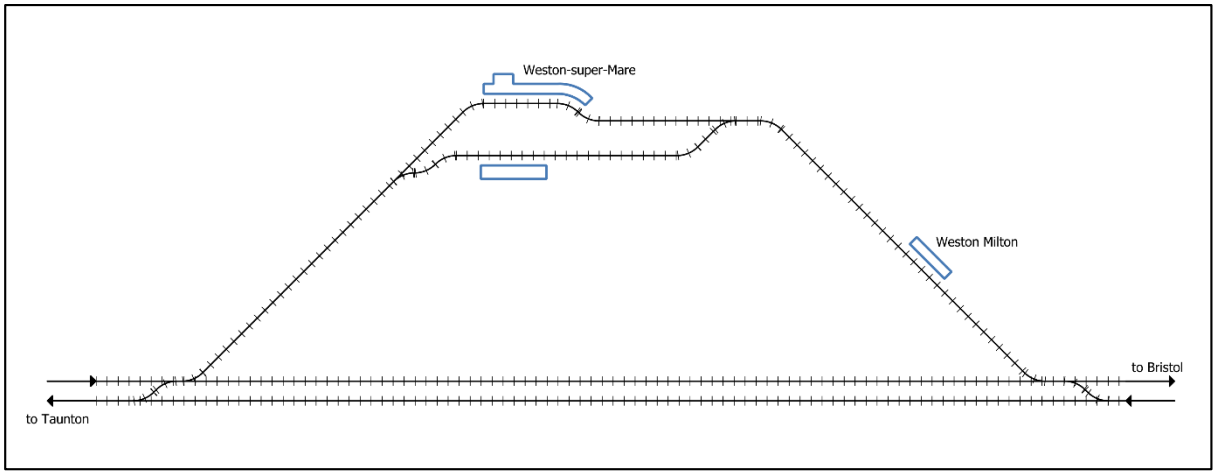
The line south west of Bristol consists predominantly of a pair of uni-directional mainline tracks. These have to accommodate the mix of non-stop long-distance CrossCountry express services and local/regional stopping services (both roughly half-hourly in each direction) as well as freight (roughly two hourly in each direction) and occasional through-services to/from London. Signalling and other constraints mean the minimum headway (the time gap between trains) in Network Rail's Timetable Planning Rules in this stretch of the network is 4 minutes. Therefore, the faster trains catch up with the slower ones and cause congestion on the line. An overtaking 'loop' exists at Yatton, however the additional time required to slow down to enter and exit the loop makes it unattractive for other than 'on the day' unplanned overtaking movements.

Future services to Portishead (part of the MetroWest project set out in Chapter 5) will also share a section of this line between Parson Street and Bristol Temple Meads, which has a third track, the 'up relief' line, only in the Bristol bound direction. This will add to the congestion on this stretch of line, although uncommitted proposals exist to re-instate four tracks along this section.

Single line loop at Weston

In addition to the headway and two-track constraints above, a further bottleneck on services running south of Bristol Temple Meads is the Weston-super-Mare branch; a single track 'loop' with a passing point at Weston-super-Mare station. This restricts the number of services that can call at Weston-super-Mare. The 'loop' however, does provide an overtaking opportunity for express services such as the CrossCountry services to pass those that stop at Weston-super-Mare, as shown in Figure 26.

Figure 26: Weston-super-Mare Track Schematic



4.5 Electric Vehicle Charging

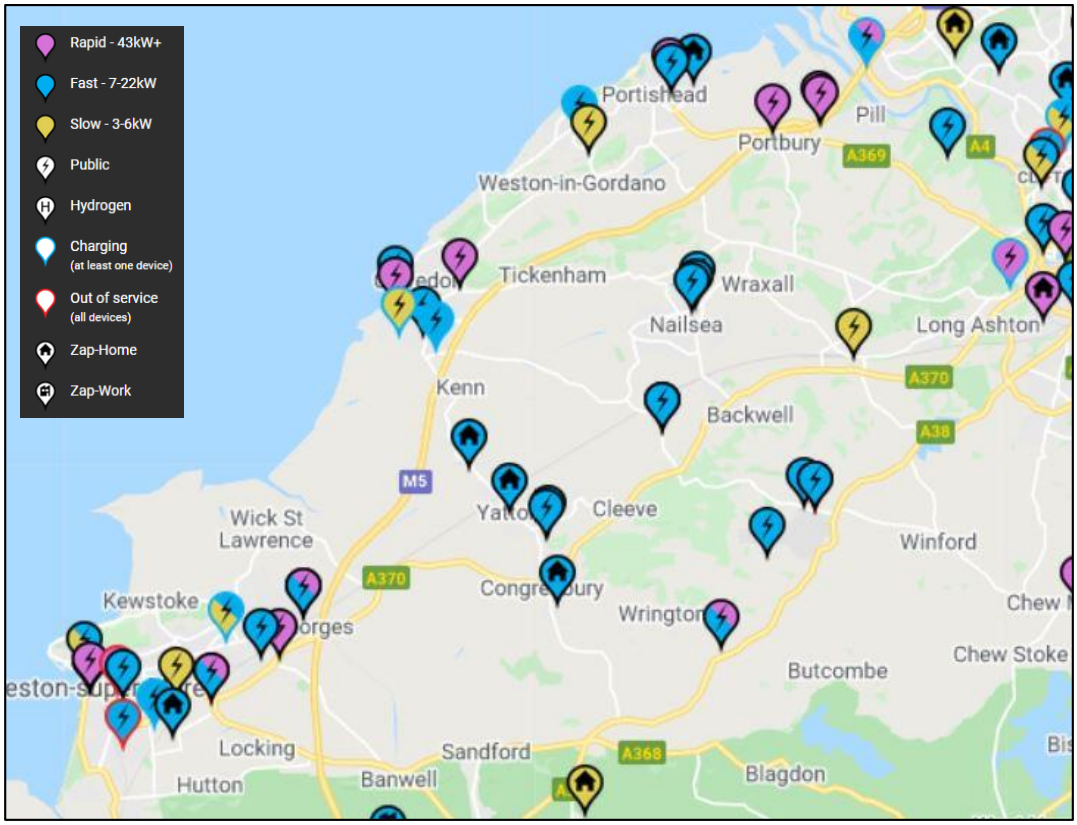
The West of England contains approximately 150 public use charge points. The Travelwest Website sets out the current Electric Vehicle Charging Points available within and around North Somerset on an interactive map. An extract of this map is shown on Figure 27. Charging points are available at key destinations across the district, including:

- Bristol Airport;
- Carlton Street car park within Weston-super-Mare;
- Long Ashton Park & Ride;
- Sainsbury's Portishead;
- Asda Clevedon;
- Tesco Superstore Clevedon; and
- Avon & Somerset Police HQ.

North Somerset are committed to encouraging the widespread use of electric cars, vans and bikes as part of the Go Ultra Low West project[13]. The Revive public charging network is constantly expanding through this project across the West of England, and by the end of 2021, Portishead will have a new rapid charging hub, allowing drivers to recharge their cars in minutes rather than hours. Public charging points are focused in the main towns and service villages; however the constant expansion of the public charging network will provide a more ubiquitous network that serves all communities.

[13] https://travelwest.info/electric-vehicles/go-ultra-low-west

Figure 27: Electric Vehicle Charging Points around North Somerset

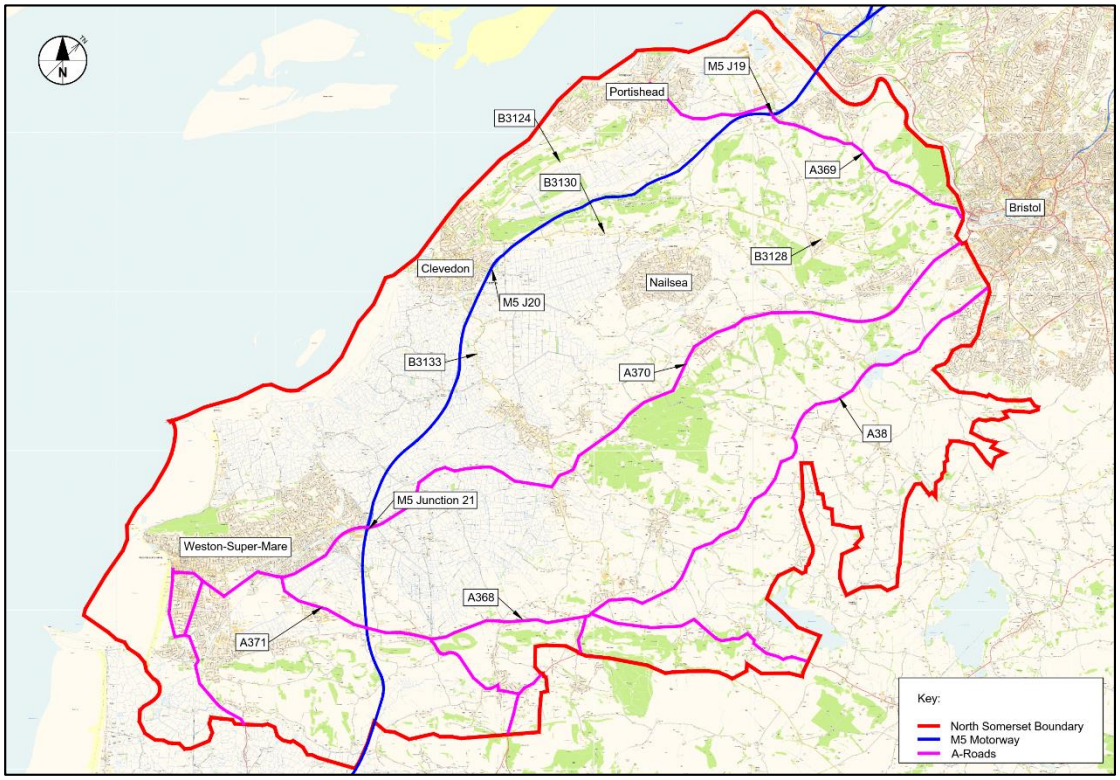


Source: Go Ultra Low, via Travelwest

4.6 Highway

The highway network within North Somerset is shown on Figure 28. The following paragraphs outline the key strategic corridors in the area.

Figure 28: North Somerset Highway Network



The M5 motorway routes in a north-south alignment through the district, running from Birmingham to Exeter with a range of junctions to access strategic locations along the route. There are three motorway junctions in the district; M5 Junction 19 (Easton-in-Gordano), M5 Junction 20 (Clevedon) and M5 Junction 21 (Weston-super-Mare). To the north of Bristol, the Almondsbury interchange links the M5 with the M4; a key connection providing access to a number of destinations external to North Somerset.

Connecting to the M5 are two key radial highway routes, the A38/A368 and A370, which provide routes through North Somerset, between Bristol and Weston-super-Mare. The A38 also provides access to Bristol Airport and onwards into Somerset. Toward the north of the District, the A369 provides a key route between West Bristol and Portishead. The River Avon provides a physical barrier between North Somerset and Bristol, with only the Clifton Suspension Bridge providing connections to the west of the A370 and east of the M5.

Connections between the M5, A370 and A38 are made through a series of local roads. The most notable ones include:

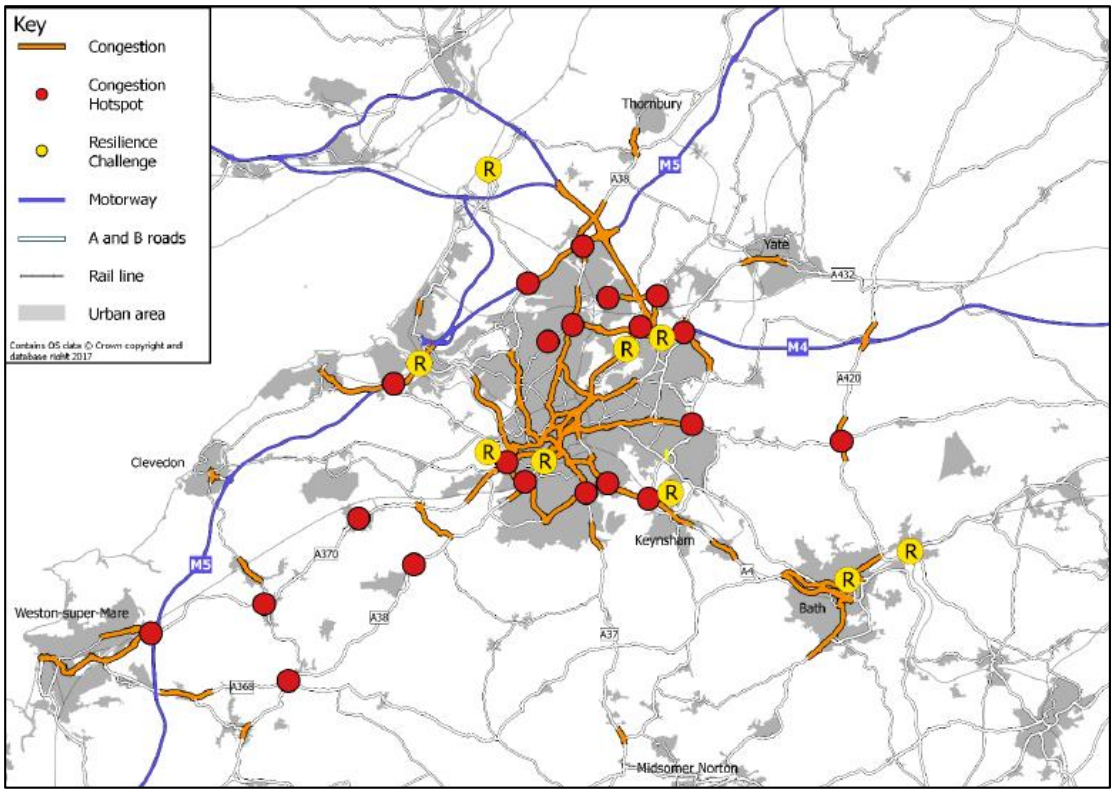
- B3130, connecting Nailsea to Clevedon;
- B3133, connecting Clevedon to Yatton and the A38/A368 to the south;
- B3124, connecting Portishead to Clevedon; and
- B3128, between Long Ashton and Portishead.

4.6.1 Congestion

The West of England Joint Transport Study (JTS) provides an overview of existing congestion on the West of England road network, which encompasses North Somerset. Congestion can be defined where the traffic demand is approaching or greater than capacity of the highway.

Figure 29 shows the congestion hotspot map included in the JTS, which has been derived from transport model data and observed conditions on the road network. The map also displays locations which are vulnerable to network disruptions such as accidents, due to network resilience challenges.

Figure 29: Congestion in the West of England



Source: West of England Joint Transport Study (October 2017), Figure 3-5

The map shows there to be a number of congestion hotspots in the district, namely around Junctions 19 and 21 of the M5, the A370 and A38 corridors, and at a number of entry points towards Bristol City Centre. There is congestion present on the local networks surrounding urban locations within North Somerset, such as Portishead, Clevedon and Weston-super-Mare, as well as on a section of the B3130 through Barrow Gurney which is likely used for movements between the A38 and A370 corridors.

NSC has a strategic highways assignment model which will be updated and refined to assess the Local Plan. The current model is an enlarged and refined version of a previous SATURN model that has been updated to cover a wider validation area which encompasses the main highway network within the North Somerset authority area, as well as part of the highway network in Somerset. The data has been sourced from the North Somerset Strategic Highway Model Local Model Validation Report (LMVR) report produced in September 2020. Model updates have been proposed by AECOM to enhance its ability to inform the North Somerset Local Plan process, and these updates will be undertaken at the next stage of the Local Plan process.

The current model baseline (2018) capacity results broadly correspond with the congestion hotspot map from the JTS (Figure 29). The M5 is shown to operate between 70 and 80% capacity within the district, whilst links around urban areas such as Weston-super-Mare, Portishead, Clevedon and the edge of Bristol are more highly saturated. Links facilitating movements between the A38 and A370 corridors, such as Downside Road (to the north of Bristol Airport) and Drove Way (between Churchill and Weston-super-Mare) operate at almost full capacity and are therefore associated with high levels of congestion.

4.6.2 Road Safety

Within the North Somerset District there have been 1,634 reported accidents over a five-year period (2015-2019), shown in Figure 30. Of these, 27 were fatal, 190 were classed as 'serious' and 1,417 were classed as 'slight'.

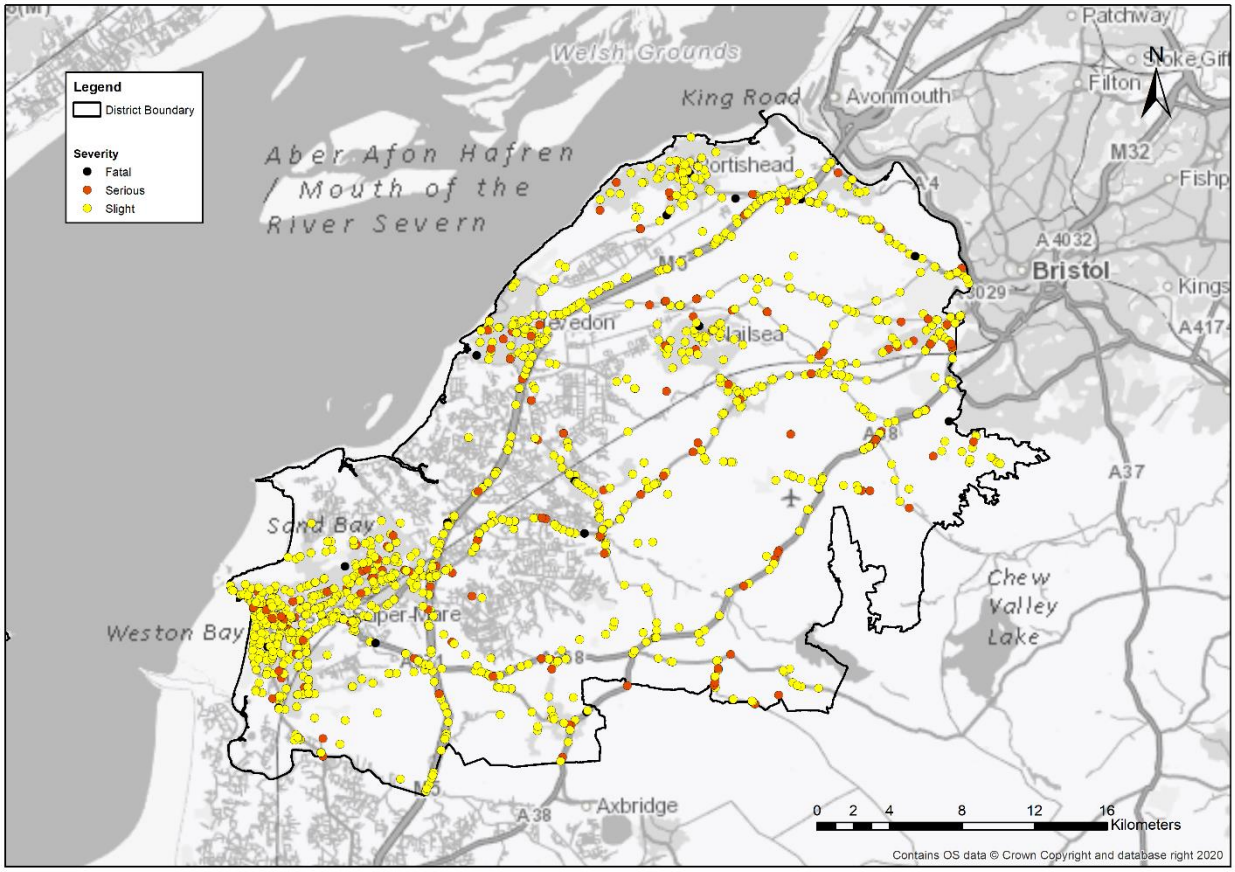
In total, 2,268 casualties were reported over this 5-year period, outlined in more detail in Table 4-4. Of these casualties, 234 were pedestrians, 250 were cyclists and 1,784 were vehicle-based. There were eight pedestrian fatalities and three cyclist fatalities. The majority of accidents occurred on major roads within the district.

Table 4-4: North Somerset Collision Casualties figures (2015-2019)

Severity	Pedestrians	Cyclists	Vehicles	Total
Fatal	8	3	17	28
Serious	37	45	126	208
Slight	189	202	1,641	2,032
Total	234	250	1,784	2,268

Future stages of Site Allocation and planning applications will need to be undertaken granular analysis into local road safety issues and potential mitigation in the vicinity of development sites.

Figure 30: Accidents within North Somerset between 2015 and 2019[14]



[14] STATS19

5. Future & Proposed Transport Schemes

This section of the report provides a review of the existing and proposed transport corridors / projects / schemes in place within North Somerset. Evidence for these has been taken from the following Policy Documents:

- Local Cycling & Walking Infrastructure Plan (LCWIP);
- Joint Local Transport Plan 4 (JLTP4); and
- North Somerset Transport Modelling Uncertainty Log (as of Jan 2021).

The JLTP4 sets out a number of Early Investment schemes, in order to ensure programmes can be delivered in the short, medium and long-term of the JLTP4 period up to 2036. These have been included in North Somerset's Uncertainty Log[15]. An uncertainty log is a record of all infrastructure and development opportunities (strategic and local level), as well as future aspirations of the council. It is a live document and is updated periodically to allow for new developments and infrastructure plans to be recorded, and to update the certainty of identified developments as they progress through the planning process.

There are four probabilities describing the likelihood (degree of uncertainty) of a scheme or development going ahead:

- Near Certain (NC): The outcome will happen or there is a high probability that it will happen.
- More than Likely (MtL): The outcome is likely to happen but there is some uncertainty.
- Reasonably Foreseeable (RF): The outcome may happen, but there is significant uncertainty
- Hypothetical (H): There is considerable uncertainty whether the outcome will ever happen.

Typically, schemes with a probability of Near Certain or More than Likely would form part of a core scenario, when used for future forecasting. The probability of schemes (at the time of writing) as set out in the Uncertainty Log, is referenced in brackets. Schemes identified as Hypothetical have not been referenced in this report.

5.1 Active Travel

The following schemes are proposed within North Somerset, and relate to Active Travel modes.

5.1.1 LCWIP

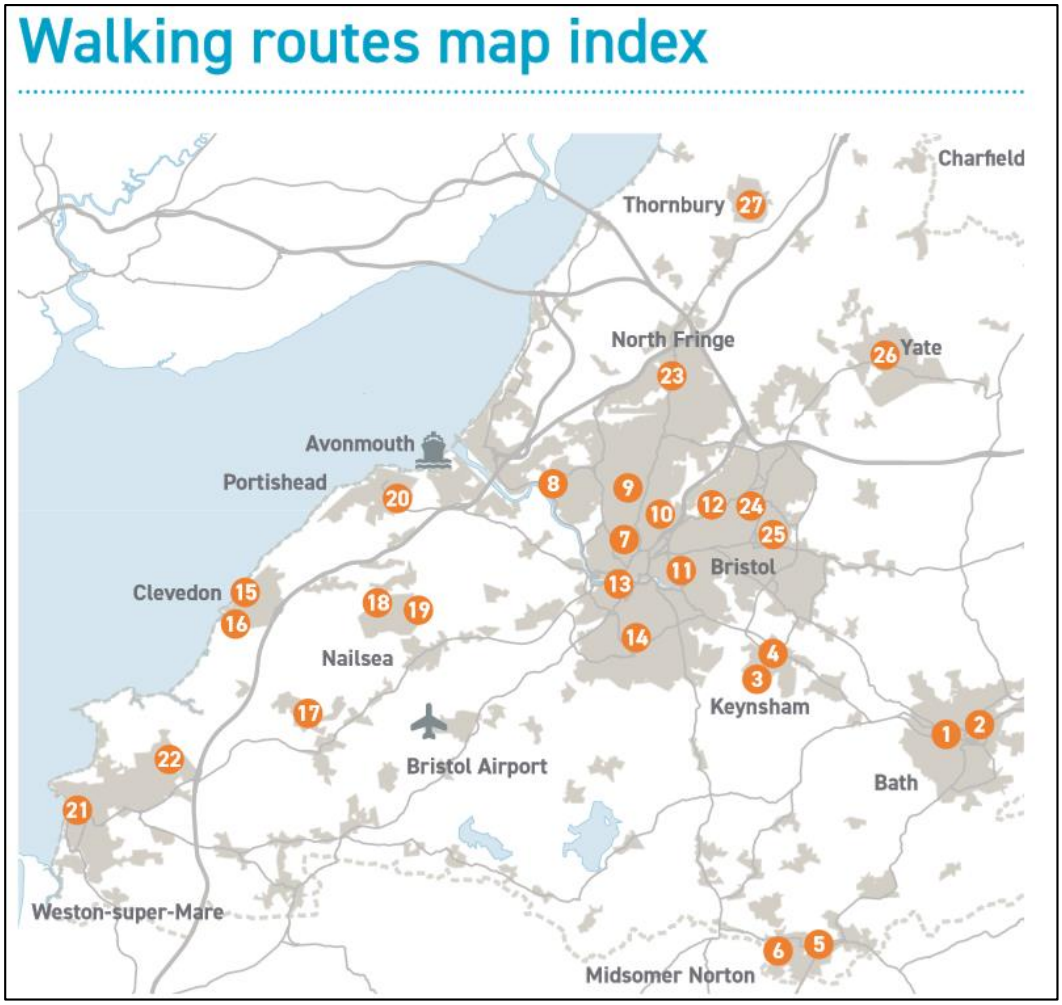
The West of England Local Cycling and Walking Infrastructure Plan (LCWIP) identifies over £400 million of required investment into the active travel network, to be delivered through the West of England Combined Authority (WECA).

Walking

A number of improvements to walking routes are proposed within the LCWIP. An overview of the Walking Routes contained within the LCWIP is shown in Figure 31.

[15] The following sections include opportunities set out in the uncertainty log, as of January 2021.

Figure 31: Walking Route Audit Map



Source: LCWIP – page 26

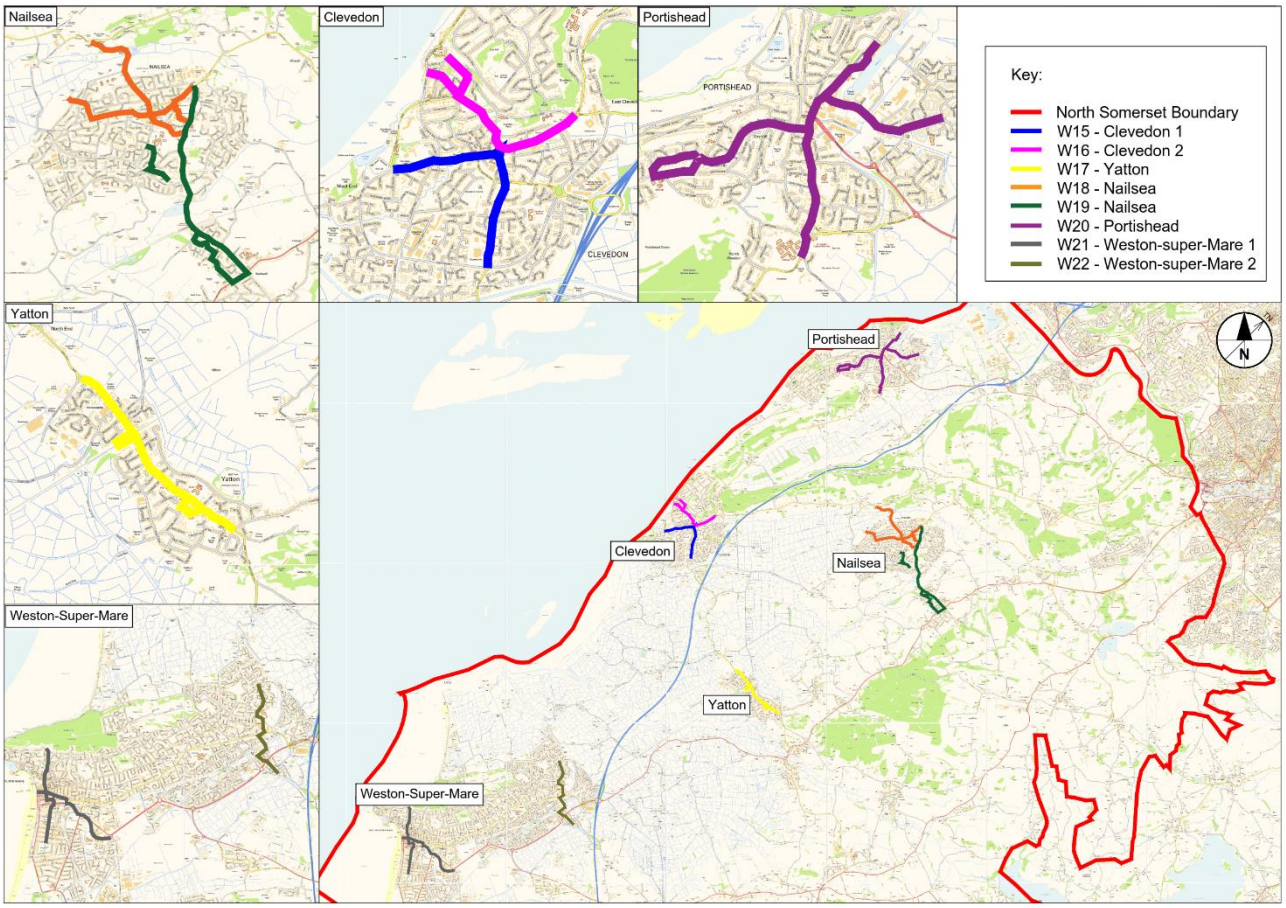
Based on the North Somerset study area, Walking Routes 15, 16, 17, 18, 19, 20, 21 and 22 have been identified as relevant to this Evidence Base. The walking routes are set out in Table 5-1 and presented in Figure 32.

Table 5-1: Walking Routes – West of England LCWIP 2020-3026

LCWIP Reference	Location / Route	Status	Document Reference
LCWIP W15	1st route through Clevedon town centre	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 56-57
LCWIP W16	2nd route through Clevedon town centre	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 58-59
LCWIP W17	Yatton town centre	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 60-61
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 W20	Portishead town centre In conjunction with cycle improvement proposals	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 66-67
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

Figure 32: LCWIP Walking Routes



The measures included in the walking route proposals include:

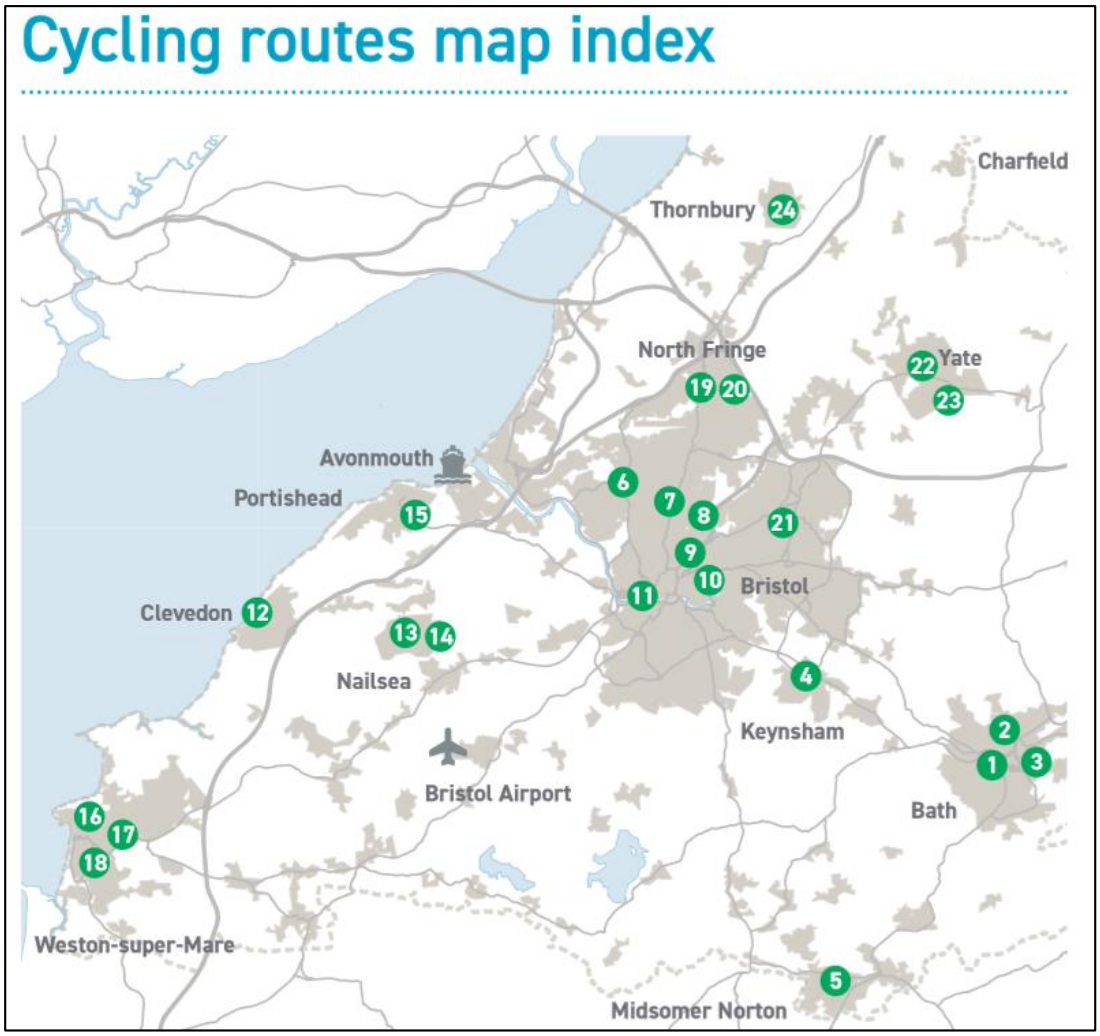
- Providing continuous footways;
- Reducing side road junction widths;
- Traffic calming measures;
- Public realm improvements;
- Footway build-outs;
- Removal of parking;
- Widening footways;
- Zebra crossings;
- Enforceable double yellow lines;
- Raised table junctions;
- Redesigned junctions; and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

The relevant walking routes within the LCWIP and outlined here are subject to detailed analysis of consultation responses; further design and technical work; scheme/ route specific consultation; and funding requirements. Further details of the specific measures to be implemented for the routes can be found within the LCWIP, as referenced in Table 5-1.

Cycling

A number of improvements to cycling routes are proposed within the LCWIP. An overview of the Cycling Routes contained within the LCWIP is shown in Figure 33.

Figure 33: Cycle Route Audit Map



Source: LCWIP – page 27

Based on the Study area, the Cycling Routes 12, 13, 14, 15, 16, 17 and 18 have been identified as relevant to this Evidence Base. In addition, Route 11 has been included due to its proximity to the study area. The cycling routes are set out in Table 5-2 and presented in Figure 34.

The measures included in the cycle route proposals include:

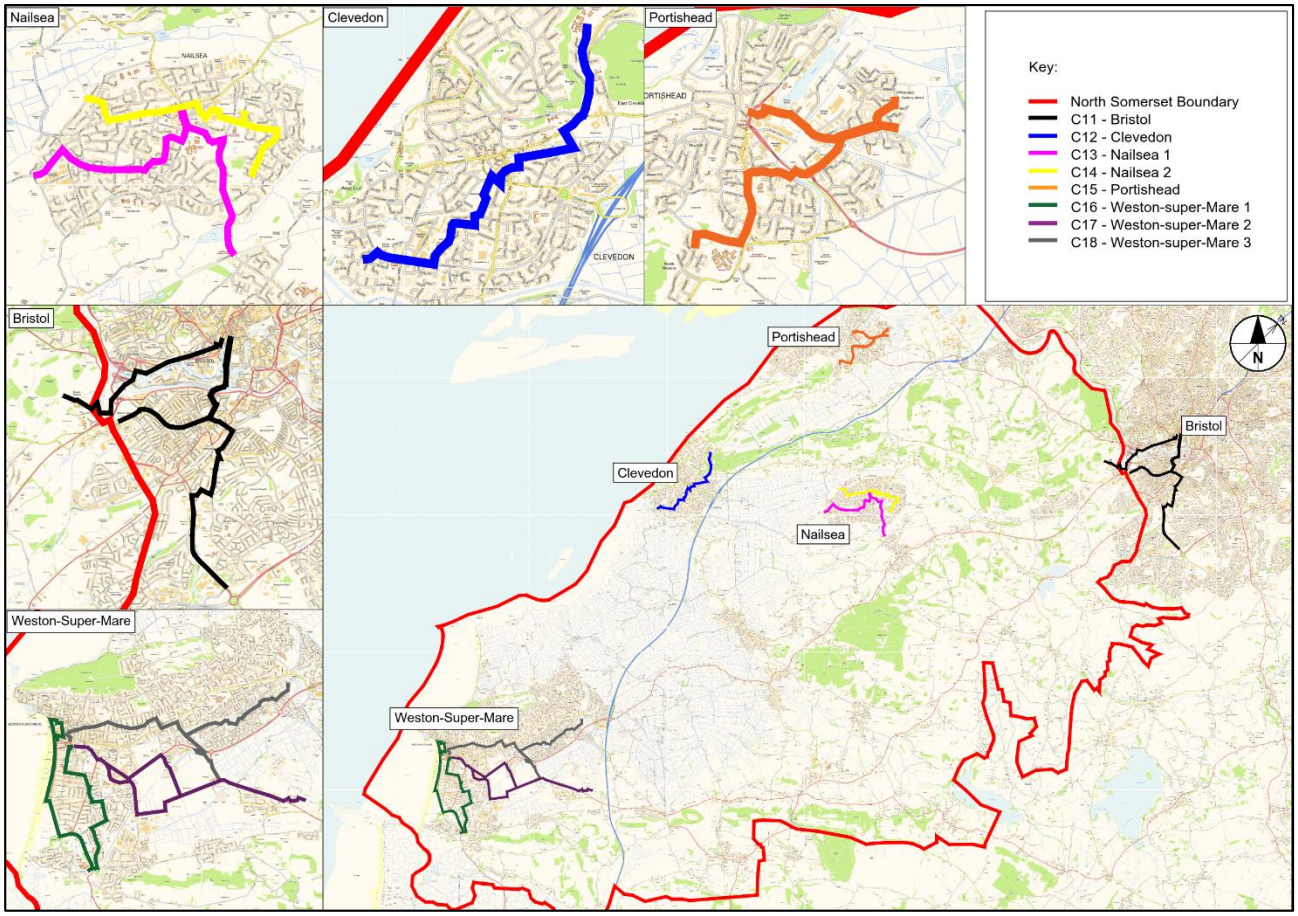
- Smoothways;
- Quiet streets' as per Weston-super-Mare town centre SPD;
- Upgrade crossings;
- Mandatory Cycle Lanes;
- Widen footways;
- Remove barriers to cycling;
- Closure of Bridges to motor traffic;
- De-clutter paths;

- Segregated cycle paths with kerbs;
- Reducing traffic flows;
- Reduce speed limits;
- Designed roundabouts;
- Resurfacing; and
- Improve lighting.

Table 5-2: Cycling Route proposals – West of England LCWIP 2020-3026

LCWIP Reference	Location / Route	Status	Document Reference
LCWIP C11	Westward from Bristol city centre (Route 7) South-westward from Bristol city centre (Route 8) Southward from Bristol city centre (Route 9)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 102-103
LCWIP C12	North-eastward from Clevedon town centre (Route 1) South-westward from Clevedon town centre (Route 2)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 104-105
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 C15	South-eastward from Portishead town centre (Route 1) Through Portishead town centre (Route 2)	Subject to consultation responses, Detailed design work & Funding	LCWIP Page 110-111
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

Figure 34: LCWIP Cycling Routes



The relevant cycle routes within the LCWIP and outlined here are subject to detailed analysis of consultation responses; further design and technical work; scheme/ route specific consultation; and funding requirements. Further details of the specific measures to be implemented for the routes can be found within the LCWIP, as referenced in Table 5-2.

5.1.2 Early Investment schemes Under Development

Active Travel schemes relevant to the North Somerset Study detailed within the JLTP4 area are set out below.

E9 – Interurban Cycle Routes (RF)

These are strategic cycle routes across the region to supplement those detailed in the Corridor Scheme Packages to mitigate growth. Many of these will be delivered along the metrobus corridors and some will be identified through the West of England LCWIP. The Interurban cycle routes which form part of scheme E9 will not be included within the LCWIP. Routes identified in addition to the LCWIP routes are as follows:

- Strawberry Line Cycle Route
- North Somerset Coastal Towns Cycle Route, particularly the WSM to Sand Bay and Sand Bay to Clevedon sections

5.2 Rail

The following rail projects are already underway, with the view to being delivered in the next five years (2020-2025).

MetroWest:

- *MetroWest Portishead Line:* upgrading the existing freight line for passenger services and installation of new line to Portishead, with new stations at Pill and Portishead served by one train an hour in each direction;
- *MetroWest Severn Beach Line:* infrastructure interventions to enable an increase from an irregular roughly hourly service on the Severn Beach line to a regular half hourly service to Avonmouth (hourly to Severn Beach);
- *MetroWest Westbury Line*: increase in frequency of stopping service from 1 to 2 tph, in addition to fast/semi-fast services to Portsmouth and Yeovil/Weymouth;
- *MetroWest Henbury Line:* upgrade of the freight line for passenger services with three new stations at Ashley Down, North Filton and Henbury providing an hourly service from Bristol Temple Meads to Henbury; and
- *MetroWest Yate & Gloucester Line*: Half hourly services between Bristol Temple Meads and Yate, with an extension to Gloucester under review.

Longer-term rail projects have also been identified from a variety of sources, including the JLTP4 and previous studies carried out by Network Rail. The following potential projects are considered to be relevant to North Somerset:

- *Extension of MetroWest to the south:* additional 1 train per hour stopping service to Weston-super- Mare, Taunton or Exeter;
- *Upgrading Worle station to Weston-super-Mare parkway station*: creation of a strategic Park and Ride/ multi-modal interchange serving the town and M5 to act as interchange to Airport for services from the south;
- *New stations*: New stations on the Bristol-Weston corridor eg Ashton Gate and Flax Bourton;
- *Line re-opening*: between Frome and Radstock;
- *Enhanced "turn up and go" style services for Henbury and Portishead lines*: Half hourly services, with an opportunity to raise frequencies to three or four trains per hour; and
- *Rolling stock plan*: A plan to decarbonise the train fleet, meet existing and future demand.

5.3 Multi-Modal

Multi-Modal transport schemes relevant to the North Somerset Study detailed within the JLTP4 area are set out below.

5.3.1 Transformational Major Scheme Details

Transformational infrastructure in the form of Mass Transit is identified within the JLTP4 for five different corridors in the West of England area. The following scheme is relevant to North Somerset:

T1 – Bristol City Centre – Bristol Airport (RF)

The scheme is a segregated mass transit route connecting Bristol Airport and South Bristol with city centre. Through the current mass transit studies and the Bristol South West Economic Link project (BSWEL) (see Scheme Ref. E1 below), various options are being considered for assessment.Those options which perform well against an initial set of criteria will then be developed into more detailed option variants for further assessment.

Options are being considered for bus, metrobus, tram, tram-train, mass transit (fully segregated underground running) and heavy rail. The route will be determined in order to balance maximising patronage against engineering costs.The heavy rail option assessment includes a potential heavy rail link from Bristol Temple Meads.

5.4 Highway

Highway schemes relevant to the North Somerset Study detailed within the JLTP4 area are set out below.

5.4.1 Early Investment schemes Under Development

The following Early Investment schemes are proposed within the JLTP4 and form packages that relate to highways infrastructure improvements:

E14 - Regional Electric Vehicle Charging Network (MtL)

This scheme aims to increase public charging infrastructure, including through the 'Go Ultra Low West' (Source West) EV charging infrastructure programme.

E20 - Banwell Bypass (MtL)

This bypass is north of Banwell, linking the A371 with A368. The bypass will enable potential development opportunities north of Banwell and support the delivery of Weston Villages; provide a more suitable strategic route for HGVs, and most importantly provide significant improvements to air quality and public realm in the centre of the village. This new infrastructure is a key element of the Bristol South West Economic Link (BSWEL).

6. Carbon

Transportation accounts for 28% of UK greenhouse gas emissions (DfT, 2020), and 42% of North Somerset's carbon footprint (NSC, 2020) and therefore a key area of focus within any response to climate change. Integrated transport and spatial planning will reduce the need to travel, improve low carbon travel options, and support the Climate Emergency.

The UK's transport decarbonisation plan will be published later in 2021, but the 'call for action' publication (DfT, 2020) highlights the need for 'place-based solutions' founded on an understanding of emission 'hot-spots' and analysis of how and why emissions occur in a specific location.

The North Somerset Corporate Plan (2020-2024) outlines the council's priorities for the county. The overarching vision is for a 'open, fairer and greener' North Somerset. Key climate goals include:

- To be a carbon neutral council and area by 2030; and
- To have a transport network which promotes active, accessible and low carbon travel.

Becoming 'Carbon Neutral' means that total greenhouse gas (GHG) emissions released are equal to or less than the emissions removed from the environment. This can be achieved by a combination of emission reduction and offsetting. To become carbon neutral, carbon footprint first needs to be identified. A Technical Note has been produced showing North Somerset's transport carbon footprint, and is provided in Appendix A

The carbon impact should be a key consideration within the selection of the final Spatial Strategy, identifying an option that aligns with the sustainable development of NSC, through environmental, social and economic wellbeing, as well as support of the Local Plan and National Net-Zero Targets.

Appendix A - Carbon Neutrality Technical Note

Specification No.	Client name North Somerset Council	Client reference	Discipline
Project name NSC Local Plan	**Date** 25/01/2021	**Project number** 60647102	**Reference addition number** 1
Prepared by Hayley Maynard	**Issued to** NSC	**Checked by** Richard Adams	**Verified by** Chris Carter

Revision History

Revision	Revision date	Details	Authorised	Name	Position
1	04/02/2021		C Carter	Chris Carter	AD

Terms of Reference: Carbon Neutrality

Purpose

The purpose of this document is to provide a definition of Carbon Neutrality and provide policy context for the consideration of carbon within North Somerset's transport spatial strategy.

Definition

The term 'Carbon Neutrality' means that total greenhouse gas (GHG) emissions released are equal to or less than the emissions removed from the environment. This can be achieved by a combination of emission reduction and offsetting.

Policy Context

International Legislation

The Paris Agreement

The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gas emissions mitigation, adaptation and finance starting in the year 2020. It requires all signatories to strengthen their climate change mitigation efforts to keep global warming to well below 2°C this century and to pursue efforts to limit global warming to 1.5°C.

National Legislation

The Climate Change Act 2008

The Climate Change Act 2008 (hereafter referred to as the 'Act') provides a framework to meet the UK's GHG emission reduction goals through legally binding national carbon emission caps within five-year periods. The Act was amended in 2019 to revise the existing 80% reduction target and legislate for a net zero emissions by 2050 (2050 Target Amendment, Order 2019). A trajectory for the UK to achieve its carbon reduction targets is set out through a series of 5-year carbon budgets which provide maximum emissions limits for greenhouse gas emissions.

The Sixth Carbon Budget was published for consideration by Government on the 9th December 2020. It presents a significant decrease in emission from the 5th carbon budget to take account of the UK's net zero target.

Regional Policy

North Somerset Climate Emergency Strategy 2019

North Somerset declared a climate emergency in 2019. North Somerset's Climate Emergency Strategy outlines the council's response and initial action plan for tackling climate change.

Key principles:

- Become a net zero carbon council;
- An energy efficiency-built environment;
- Renewable Energy Generation;
- Repair, reuse, reduce and recycle;
- Replenish our carbon stores;
- Reduce emissions from transport; and
- Adapting to climate change.

North Somerset Corporate Plan 2020-2024

The North Somerset Corporate Plan (2020-2024) outlines the council's priorities for the county. The overarching vision is for a *'open, fairer and greener'* North Somerset.

Key climate goals include:

- To be a carbon neutral council and area by 2030; and
- To have a transport network which promotes active, accessible and low carbon travel.

Role of Spatial Planning on Carbon Neutrality

Transportation accounts for 28% of UK greenhouse gas emissions (DfT, 2020), and 42% of North Somerset's carbon footprint (NSC, 2020) and therefore a key area of focus within any response to climate change.

Integrated transport and spatial planning will reduce the need to travel, improve low carbon travel options, and support the Climate Emergency.

The UK's transport decarbonisation plan will be published later in 2021, but the 'call for action' publication (DfT, 2020) highlights the need for 'place-based solutions' founded on an understanding of emission 'hot-spots' and analysis of how and why emissions occur in a specific location.

Considerations for interventions:

- Remove the need for travel (e.g. positioning housing and schools locally)
- Modal shift – improving public transport (e.g. rail links) and promoting active travel (e.g. NSC's Active Travel Strategy).
- Facilitating the transition to low-carbon vehicles (e.g. electric charging points).

North Somerset Transport Baseline

The baseline for the project is North Somerset's 2018 carbon footprint (published 2020) (NSC, 2020). Figure 1 shows the split of transport emissions within North Somerset, modelled on BEIS sub-national energy data.

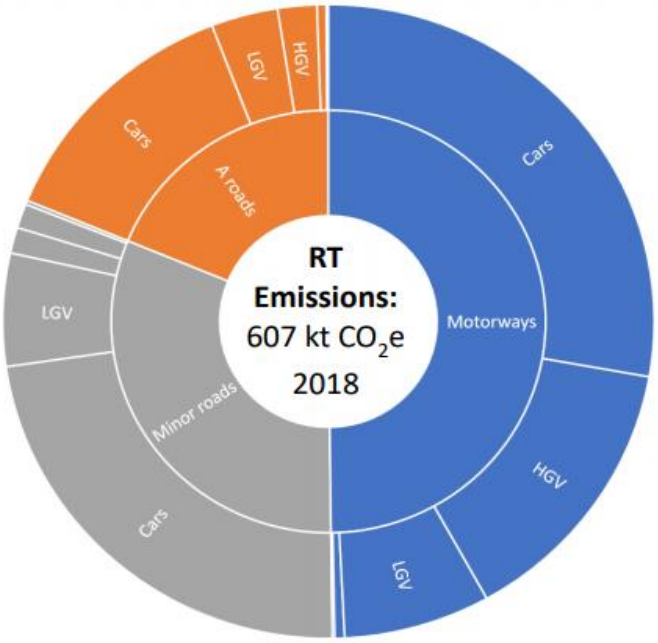


Figure 1: North Somerset's Transport Emissions Baseline (2018) ***Source: NSC***

Notes:

- The scope of the local plan excludes Nationally Significant Infrastructure (e.g. Motorway and Airport) and therefore this element is out of scope.
- The NSC transport emissions excludes electric vehicles (emissions associated with electricity where considered within the domestic/non-domestic buildings section of the GHG Report).

A high level 'business as usual' / 'do nothing' baseline has been developed to 2030 (Table 1 and Figure 2), showing a 44% increase in total transport emissions without intervention. The model is based on the following assumptions:

- **Vehicles types and fuel efficiencies**
  - The split of vehicle types has been estimated based on graph.
  - As electric vehicles were excluded from the NSC Baseline, an uplift was applied based on the WebTag database (national vehicle split for 2018 show electricity vehicles made up 0.7% cars and 0.23% LGVs).
  - Efficiency of fuels (petrol and diesel) will remain constant to 2030 - compared to 2018 BEIS emission factors.
  - The WebTAG database (v1.13.1, June 2020) was used to model the shift in vehicle types (i.e. shift to electric vehicles)
  - As the 'other' vehicle category is unspecified, it has been assumed that this continues to represent a constant percentage of emissions.
- **Population Change**
  - England's population is projected to increase by 5% between 2018 and 2028; an annual growth rate of 0.4% (ONS, 2019).
  - Within the baseline model, total distance travelled is assumed to increase at 0.4% a year with a 'business as usual' / 'do nothing' scenario.
- **Decarbonisation of the National Grid**
  - The UK target is for 100% renewable electricity by 2050. Current projections estimate an emissions intensity of 41 gCO2e/kWh by 2035 (BEIS, 2019), compared with 283 gCO2e/kWh in 2018. This equates to an 85% reduction.
  - Emissions associated with electric vehicles are have been included using BEIS emission factors for battery EVs for 2018. Decarbonisation of the National Grid has been factored in by applying an 5% reduction in this emission factor annually.

Local transport initiatives (e.g. NSC's Active Travel Strategy) and effect of **behavioural change** have not been considered within this initial baseline but will factor once options for spatial strategies are identified.

Note: the business as usual model does not account for any changes as a result of the Covid-19 paramedic.

Table 1: "Business as Usual" projected baseline

				Emissions (kt CO2e)												
Emissions Category	**2018 (kt CO2e)**	**Vehicle Type**	**Estimated % in baseline**	**2018***	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
A Roads	113	Cars	65%	73.6	76.8	79.7	82.6	85.5	88.4	91.3	94.0	96.5	98.8	101.0	103.0	104.7
		LGV	20%	22.6	23.6	25.5	25.5	26.5	27.5	28.5	29.4	30.4	31.4	32.4	33.4	34.4
		HGV	10%	11.3	11.8	12.7	12.7	13.2	13.7	14.3	14.9	15.5	16.1	16.7	17.4	18.1
		Other	5%	5.7	5.9	6.2	6.4	6.6	6.8	7.1	7.3	7.5	7.7	7.9	8.1	8.3
Minor Roads	189	Cars	75%	142.1	147.2	152.8	158.4	163.9	169.5	174.9	180.1	184.9	189.3	193.5	197.4	200.7
		LGV	15%	28.4	29.5	30.7	31.9	33.1	34.4	35.6	36.8	38.1	39.3	40.6	41.8	43.1
		HGV	5%	9.5	9.8	10.2	10.6	11.1	11.5	12.0	12.4	12.9	13.5	14.0	14.5	15.1
		Other	5%	9.5	9.8	10.2	10.6	11.0	11.3	11.7	12.1	12.4	12.7	13.1	13.4	13.6
Railways	7	-		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
			Total	**309.5**	**321.3**	**335.0**	**345.6**	**357.9**	**370.1**	**382.3**	**394.0**	**405.2**	**415.9**	**426.2**	**436.0**	**445.1**

**Amended to account for electric vehicles.*

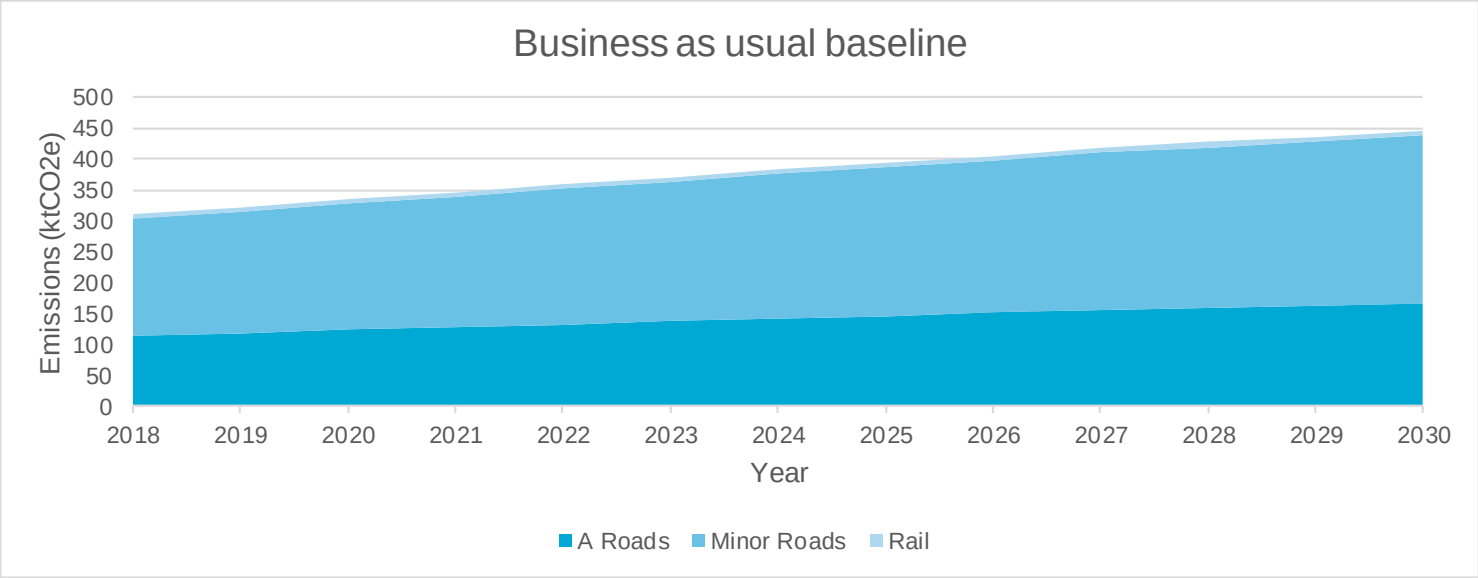
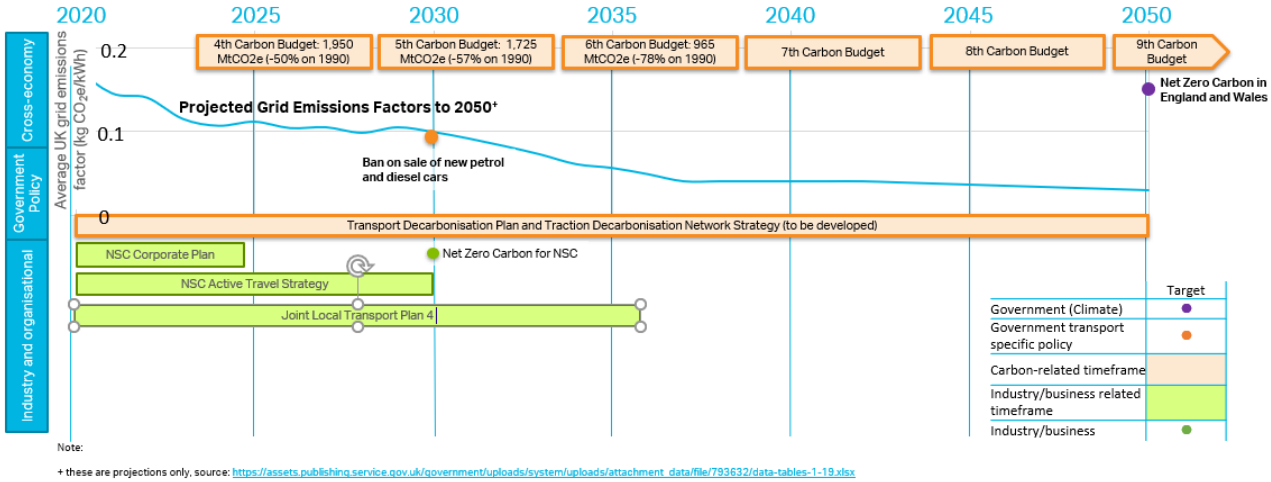


Figure 2: Business as Usual Baseline

The timeline of decarbonisation (Figure 3) identifies key interventions through to 2050 for the transport sector and NSC. This can be developed further as local initiatives and national polices are further developed (the UK Transport Decarbonisation Plan is due to be published Spring 2021).

Figure 3: Timeline for Decarbonisation and Key Factors



Next Steps

The carbon impact should be a key consideration within the selection of the final Spatial Strategy, identifying an option that aligns with the sustainable development of NSC, through environmental, social and economic wellbeing, as well as support of the Local Plan and National Net-Zero Targets. We will carry out a RAG assessment to qualitatively consider the carbon impact of each strategy against NSC's Climate Emergency Strategy and Corporate Plan.

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Appendix B – Appraisal Framework

	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.			
Criteria	***Will this strategy provide developments large enough to provide on-site schools? If not, are the development locations in the strategy in close proximity to existing schools?***	***Will the Strategy provide new on-site employment opportunities? If not, are the development locations in the strategy in close proximity to existing employment?***	***Will this strategy provide developments large enough to provide on-site retail and other facilities? If not, are the development locations in the strategy in close proximity to existing retail and other facilities?***	***What is the average broadband availability in the development locations in the strategy?***
	Poor correlation. High level of development will be situated away from existing secondary school locations reducing opportunities to travel sustainably, with limited opportunities for growth areas to positively contribute to addressing this issue through school delivery. Potential challenges with matching development with primary provision.	High level of development away from existing employment locations with limited potential to address imbalance through provision of employment through growth areas.	High level of development away from existing service centres with limited potential to provide facilities through growth areas.	Low proportion of the growth areas within the strategy have access to standard broadband < 10Mbps
	Moderate level of development away from existing secondary school locations. Some, but limited, potential for growth areas to deliver new schools.	Moderate level of growth away from existing employment locations, with some potential to deliver additional employment.	Moderate level of growth away from existing service centres, but with some potential to deliver local facilities through growth areas.	Moderate proportion of the growth areas within the strategy have access to standard broadband >=10Mbps
	Neutral. Relatively poor correlation with existing secondary schools but with reasonable opportunity for growth areas to deliver new schools through scale of growth areas.	Neutral. Some correlation with existing employment locations	Some correlation with service centres but with significant gaps in access.	High proportion of growth areas are within standard broadband areas (>=10Mbps or better)
	Moderate correlation with existing secondary schools with some potential for growth areas to deliver new schools.	Moderate correlation with existing employment locations with growth areas likely to deliver some additional employment.	Moderate correlation with service centres, with reasonable likelihood that majority of growth areas will be able to deliver local facilities.	Moderate proportion of the growth areas within the strategy are within superfast / ultrafast broadband areas
	Good correlation with existing secondary schools. Growth areas likely to be able to support deliver new primary and secondary facilities to meet demand generated.	Good correlation with important existing employment locations, with good potential to deliver additional employment through growth areas.	Growth areas correlate well with higher level service centres offering a good range of facilities and services. Growth areas likely to be able to deliver local facilities.	High proportion of the growth areas within the strategy are within ultrafast broadband areas

	Objective			
	2. To maximise opportunities to facilitate travel by walking, cycling and e-bikes or emerging personal transport modes.			
Criteria	***Are strategic active travel routes in close proximity to growth areas in the strategy?***	***How does the strategy score against PCT Census 2011 Scenario at an LSOA level?***	***How does the strategy score against PCT Go Dutch Scenario at an LSOA level?***	***How does the strategy score against PCT ebikes Scenario at an LSOA level?***
	Poor correlation between growth areas and active travel routes.	High levels of development in lower scoring PCT areas	High levels of development in lower scoring PCT areas	High levels of development in lower scoring PCT areas
	A moderate proportion of growth areas are not well connected with active travel routes.	Moderate levels of development in lower scoring PCT areas	Moderate levels of development in lower scoring PCT areas	Moderate levels of development in lower scoring PCT areas
	Some correlation of active travel routes with growth areas, albeit with some gaps in accessibility.	Neutral in terms of levels of development in lower and higher scoring PCT areas	Neutral in terms of levels of development in lower and higher scoring PCT areas	Neutral in terms of levels of development in lower and higher scoring PCT areas
	Active travel routes in close proximity to a moderate proportion of growth areas, accessible by walking and cycling	Moderate levels of development in higher scoring PCT areas	Moderate levels of development in higher scoring PCT areas	Moderate levels of development in higher scoring PCT areas
	Yes, high quality active travel routes that connect well with a good proportion of growth areas and serve key destinations.	High levels of development in higher scoring PCT areas.	High levels of development in higher scoring PCT areas.	High levels of development in higher scoring PCT areas.

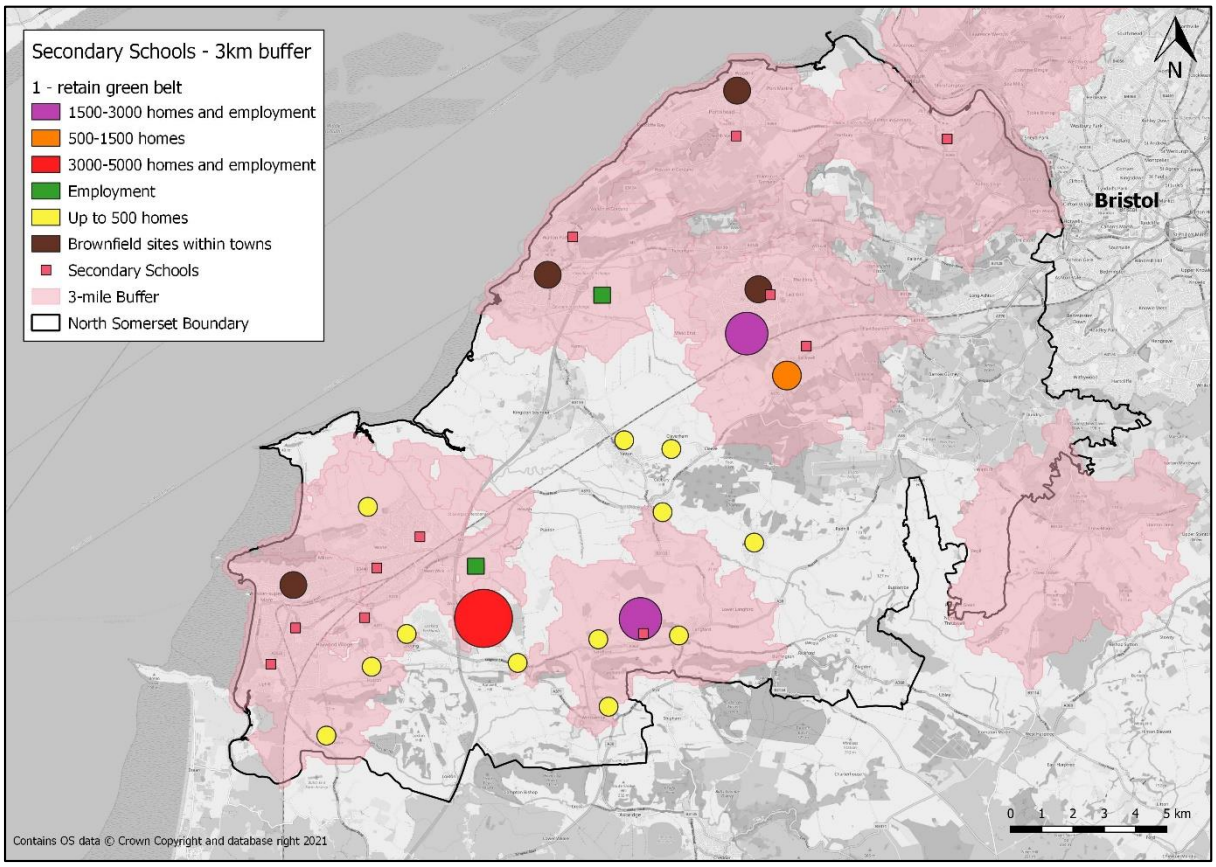
	Objective		
	3. To deliver access to high quality public transport services, supporting mobility across North Somerset and further afield, which is available to all.		
Criteria	***How accessible are the strategies to the nearest rail stations by foot/ bicycle?***	***How accessible is the bus network from the growth areas?***	***Does the strategy align with existing and planned Public Transport schemes? (e.g. LRT, MRT, P&R etc)***
	Very low proportion of the growth areas within the strategy are within 2km of a rail station	Very low proportion of the growth areas within the strategy are within 1km of bus network	Very low proportion of the growth areas within the strategy are within 2km of existing and planned Public Transport schemes
	Low proportion of the growth areas within the strategy are within 2km of a rail station	Low proportion of the growth areas within the strategy are within 1km of bus network	Low proportion of the growth areas within the strategy are within 2km of existing and planned Public Transport schemes
	Moderate proportion of the growth areas within the strategy are within 2km of a rail station	Moderate proportion of the growth areas within the strategy are within 1km of bus network	Moderate proportion of the growth areas within the strategy are within 2km of existing and planned Public Transport schemes
	High proportion of the growth areas within the strategy are within 2km of a rail station	High proportion of the growth areas within the strategy are within 1km of bus network	High proportion of the growth areas within the strategy are within 2km of existing and planned Public Transport schemes
	Very high proportion of the growth areas within the strategy are within 2km of a rail station	Very high proportion of the growth areas within the strategy are within 1km of bus network	Very high proportion of the growth areas within the strategy are within 2km of existing and planned Public Transport schemes

	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		
Criteria	***Are growth areas in the strategy likely to impact on congestion hotspots, in terms of both capacity and safety?***	***Are there any schemes that mitigate existing highway issues near growth areas in the strategy?***	***To what degree is traffic from growth areas likely to impact on environmentally sensitive areas?***
	High correlation between growth areas and congestion hotspots and high risk of car dependency. Strategy likely to have a high impact on multiple congestion hotspots.	No planned schemes that mitigate the existing highway issues	Likely to generate a high level of traffic in multiple sensitive areas
	Moderate correlation of growth areas with congestion hotspots and moderate likelihood of car dependency. Strategy likely to have a moderate impact on congestion hotspots.	Planned schemes are likely to mitigate only a very low proportion of highway issues resulting from growth areas	Likely to generate a moderate level of traffic in multiple sensitive areas
	Some correlation of growth areas with congestion hotspots.	Planned schemes are likely to mitigate only a low proportion of highway issues resulting from growth areas	Some correlation of growth areas with environmentally sensitive areas.
	Strategy has a minor positive effect on the impact of development on congestion in comparison with alternatives through limiting development near the greatest capacity constraints and/or reducing risks of high car dependency.	Planned schemes are likely to mitigate a moderate proportion of highway issues resulting from growth areas	Strategy has minor benefits in terms of limiting traffic impact on environmentally sensitive areas.
	Strategy has a moderate positive effect on the impact of development on congestion in comparison with alternatives through limiting development near the greatest capacity constraints and/or reducing risks of high car dependency.	Planned schemes are likely to mitigate a high proportion of highway issues resulting from growth areas	Strategy has moderate benefits in terms of limiting traffic impacts on minor sensitive areas.

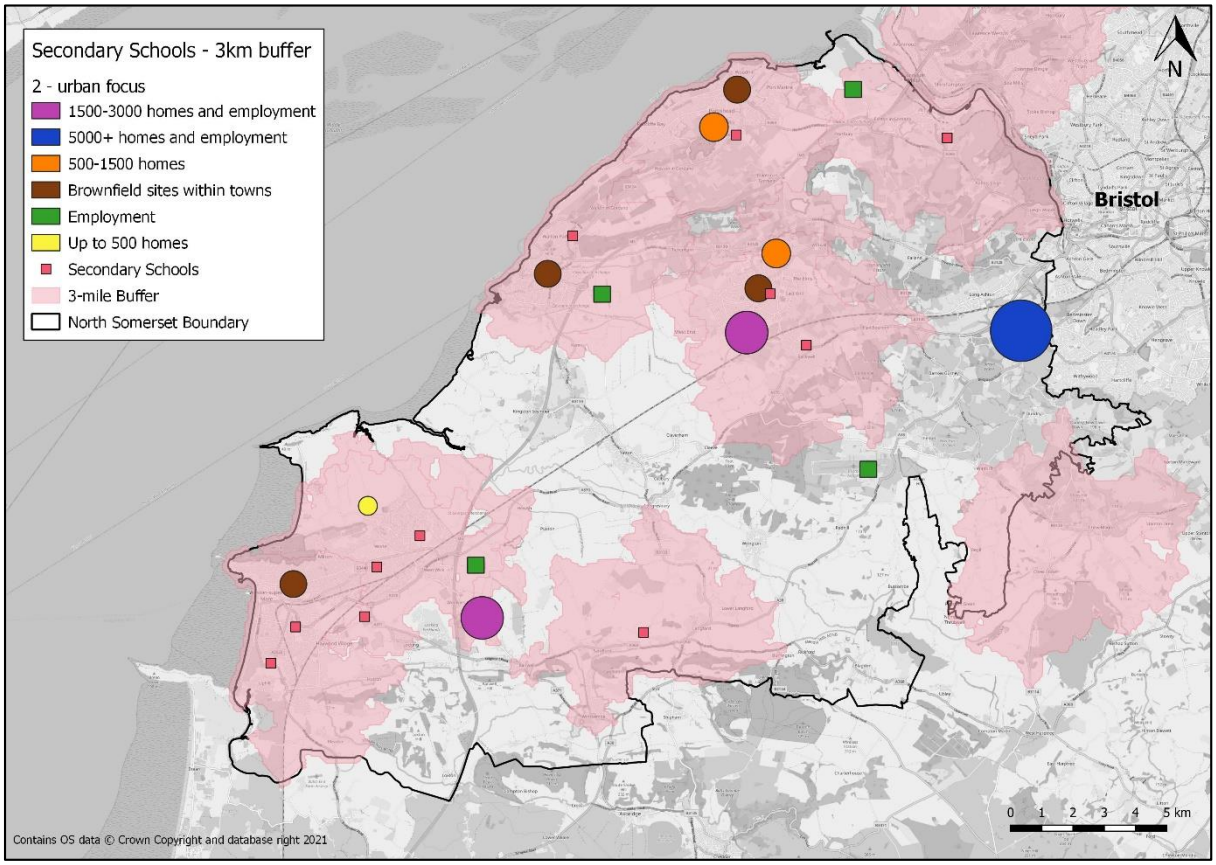
Appendix C – Supporting Evidence

Proximity to Schools

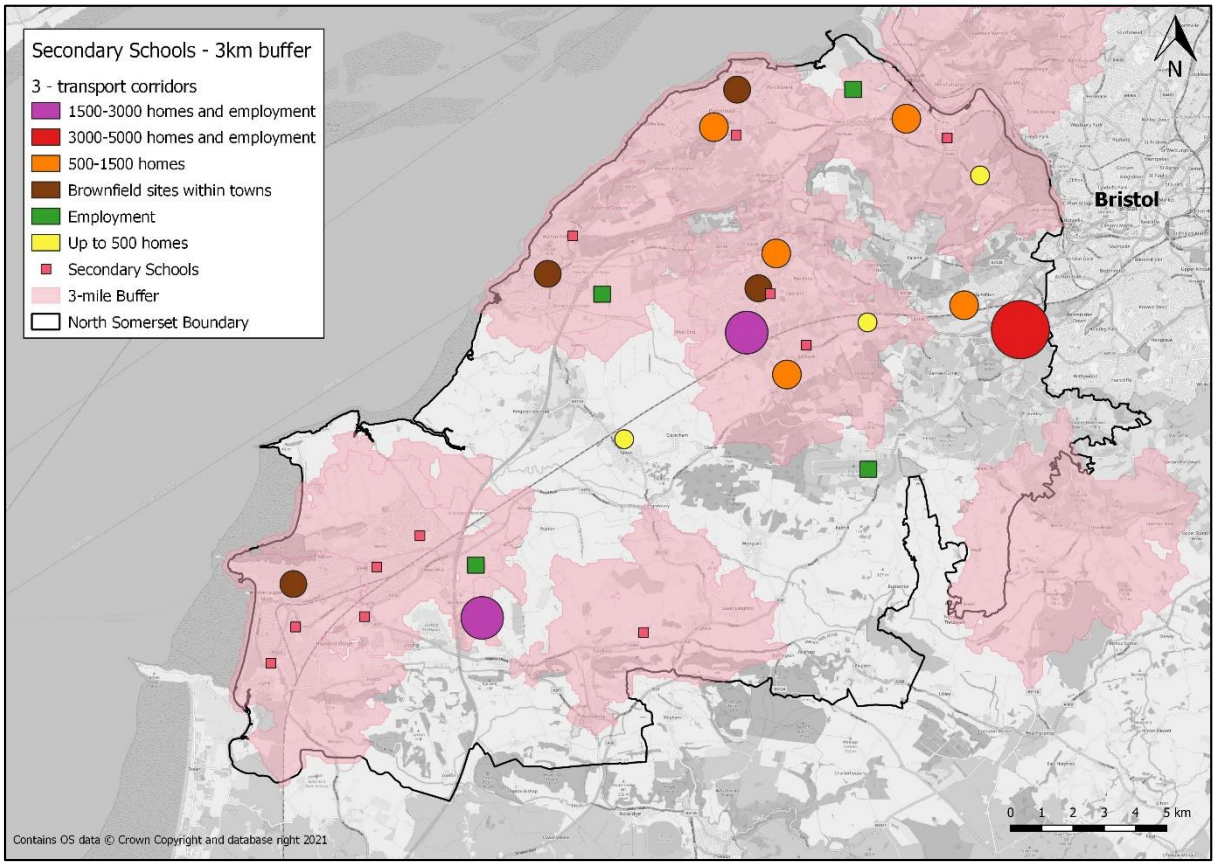
Retain Greenbelt



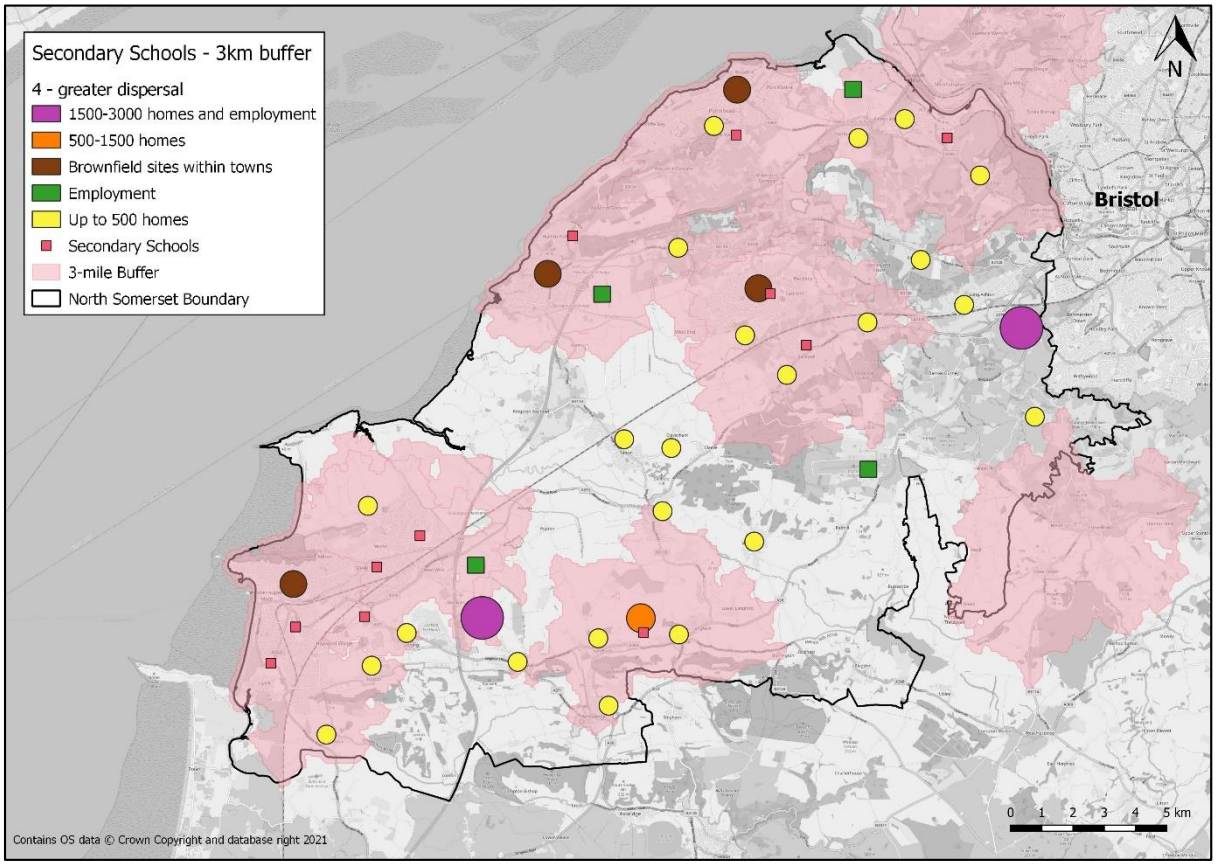
Urban Focus



Transport Corridors

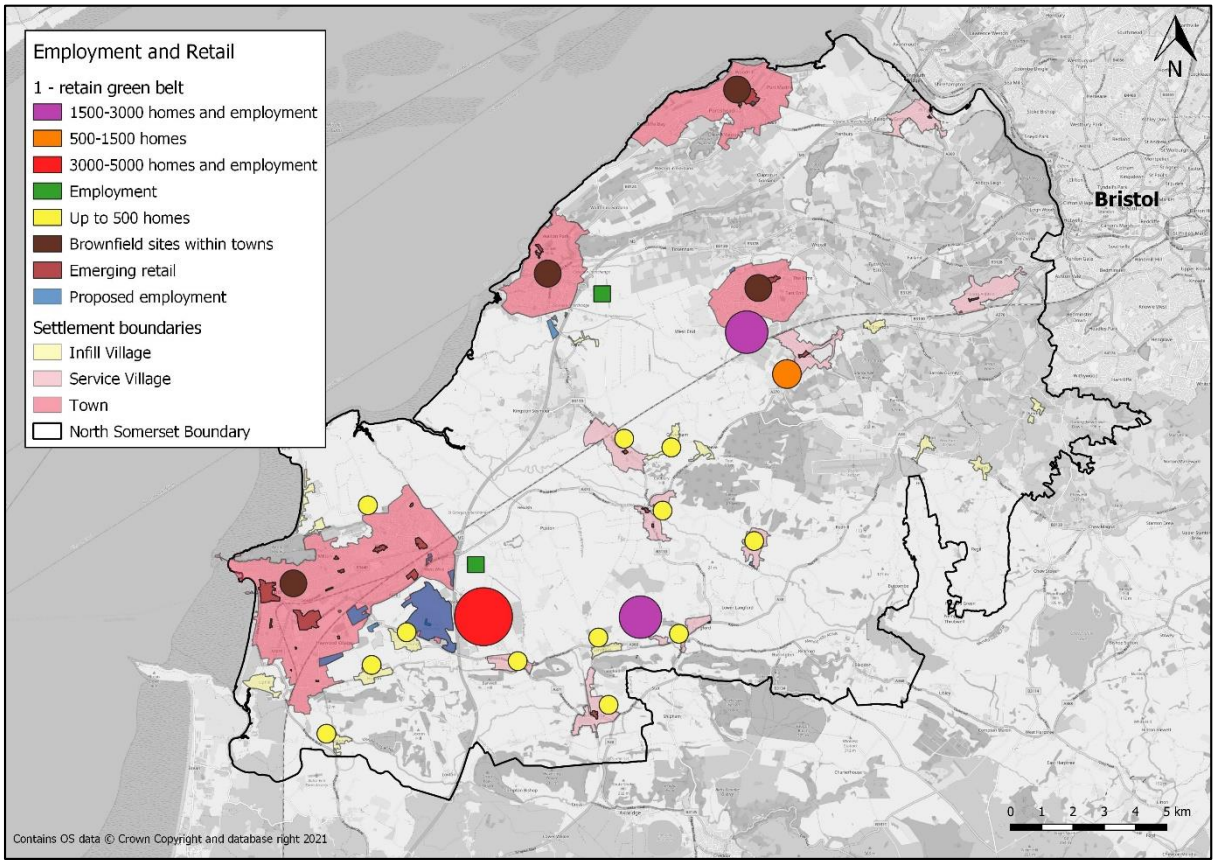


Greater Dispersal

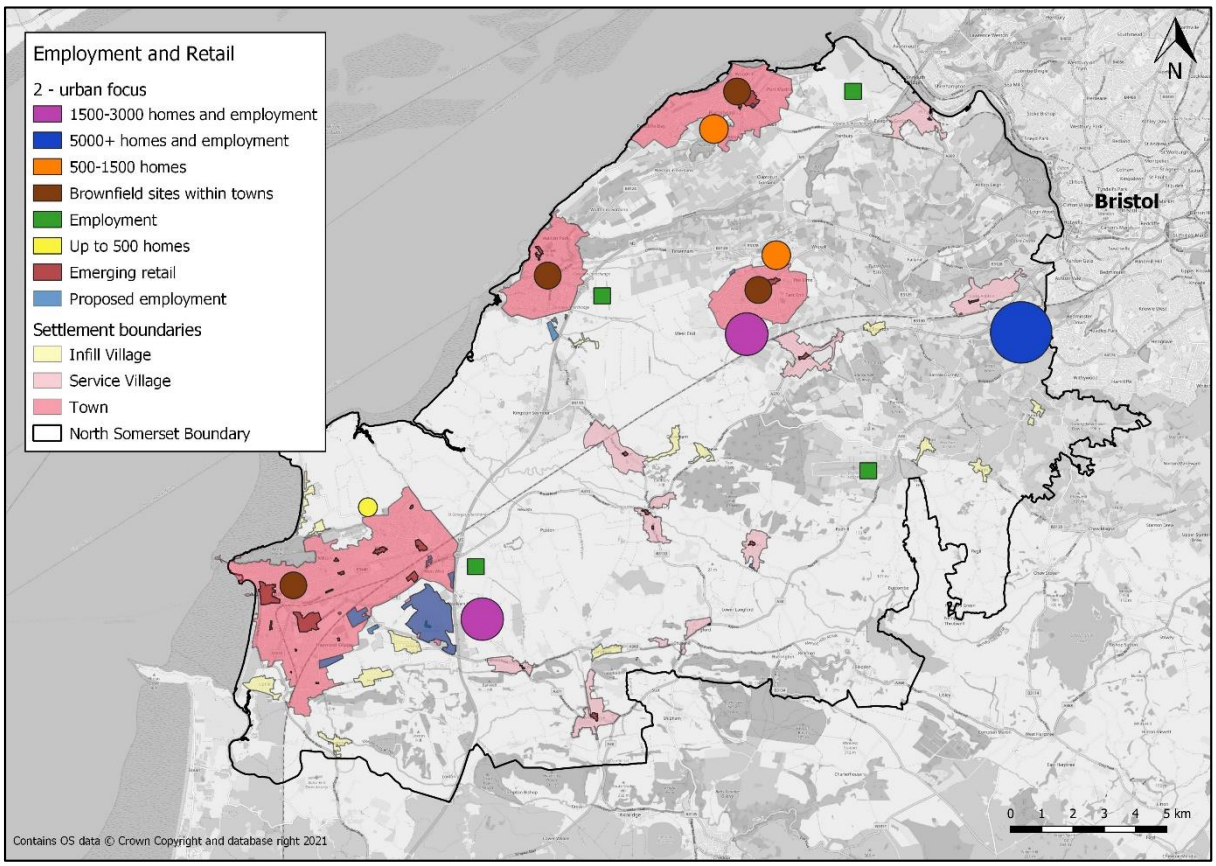


Proximity to Employment and Retail

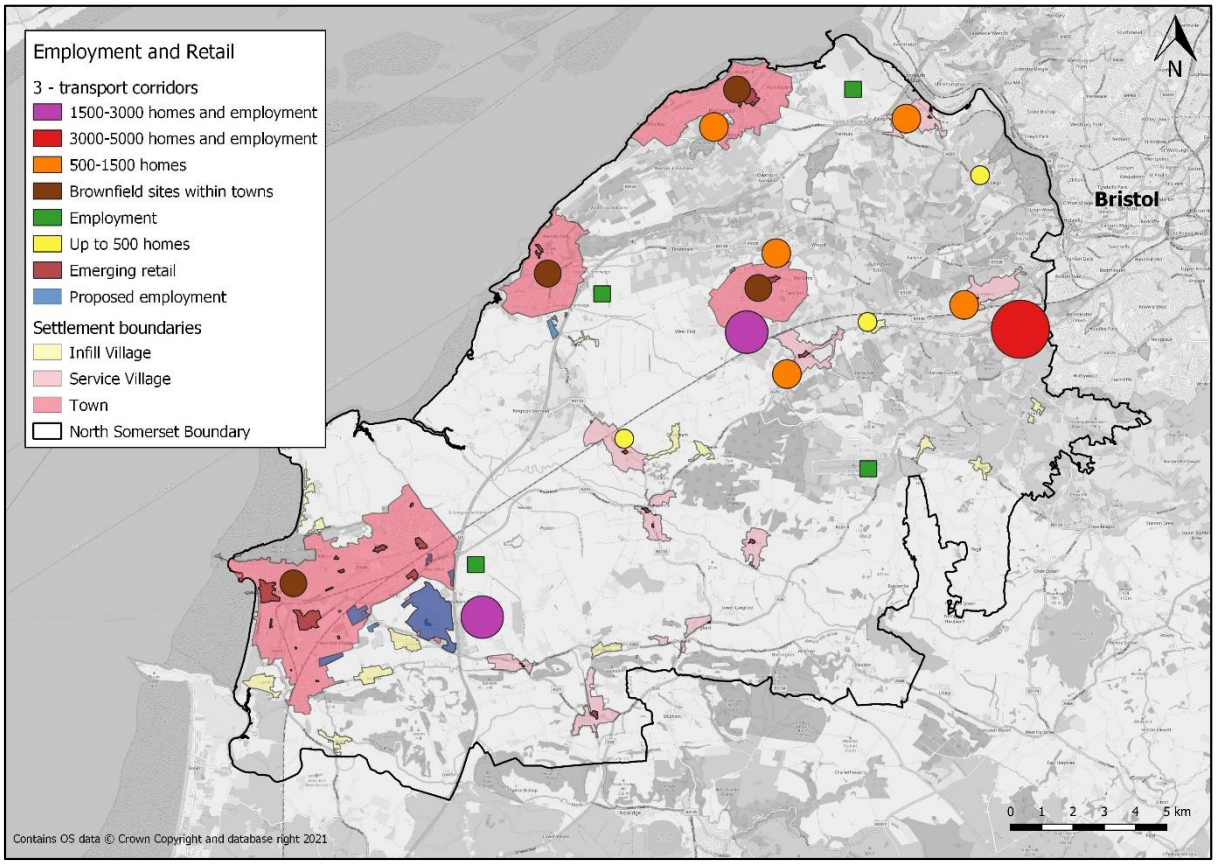
Retain Greenbelt



Urban Focus



Transport Corridors



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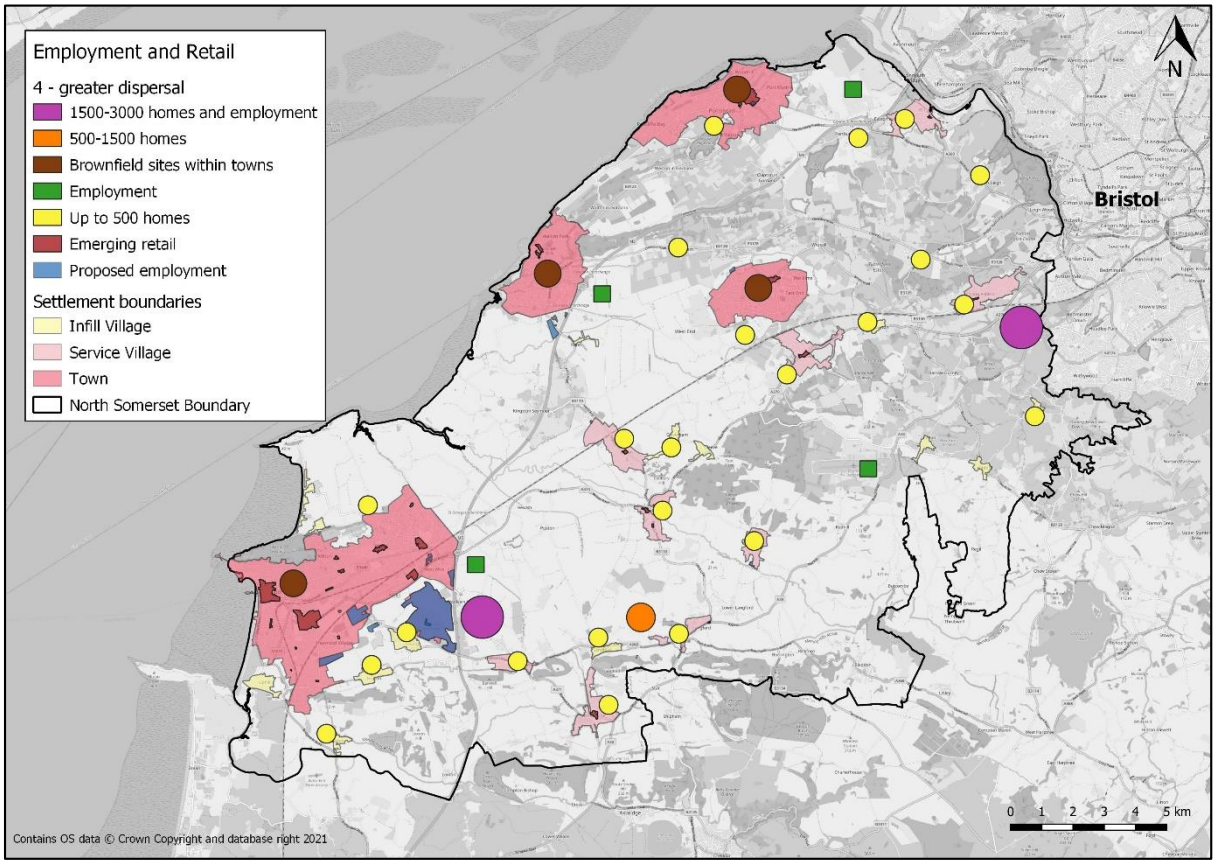
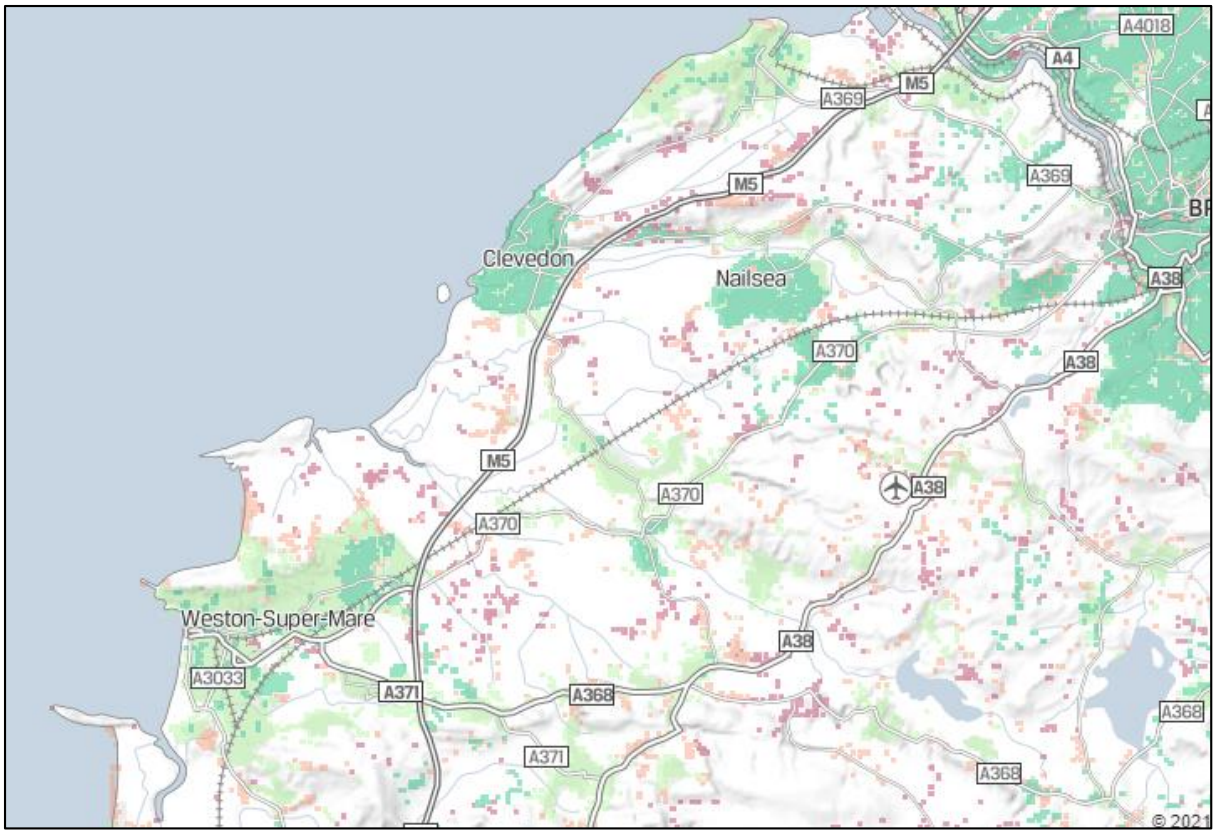


Broadband availability

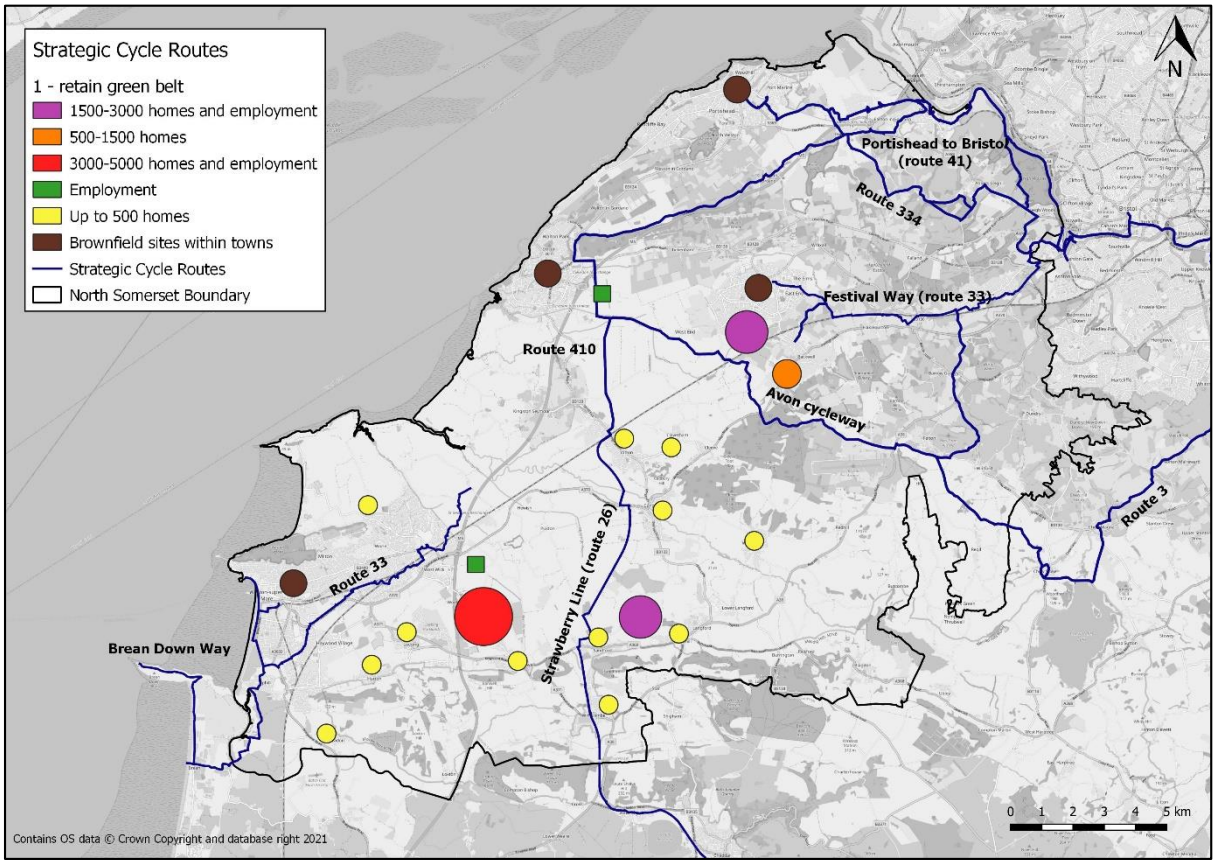


Ultrafast available | Superfast available | Standard >= 10Mbps available | Standard < 10Mbps available

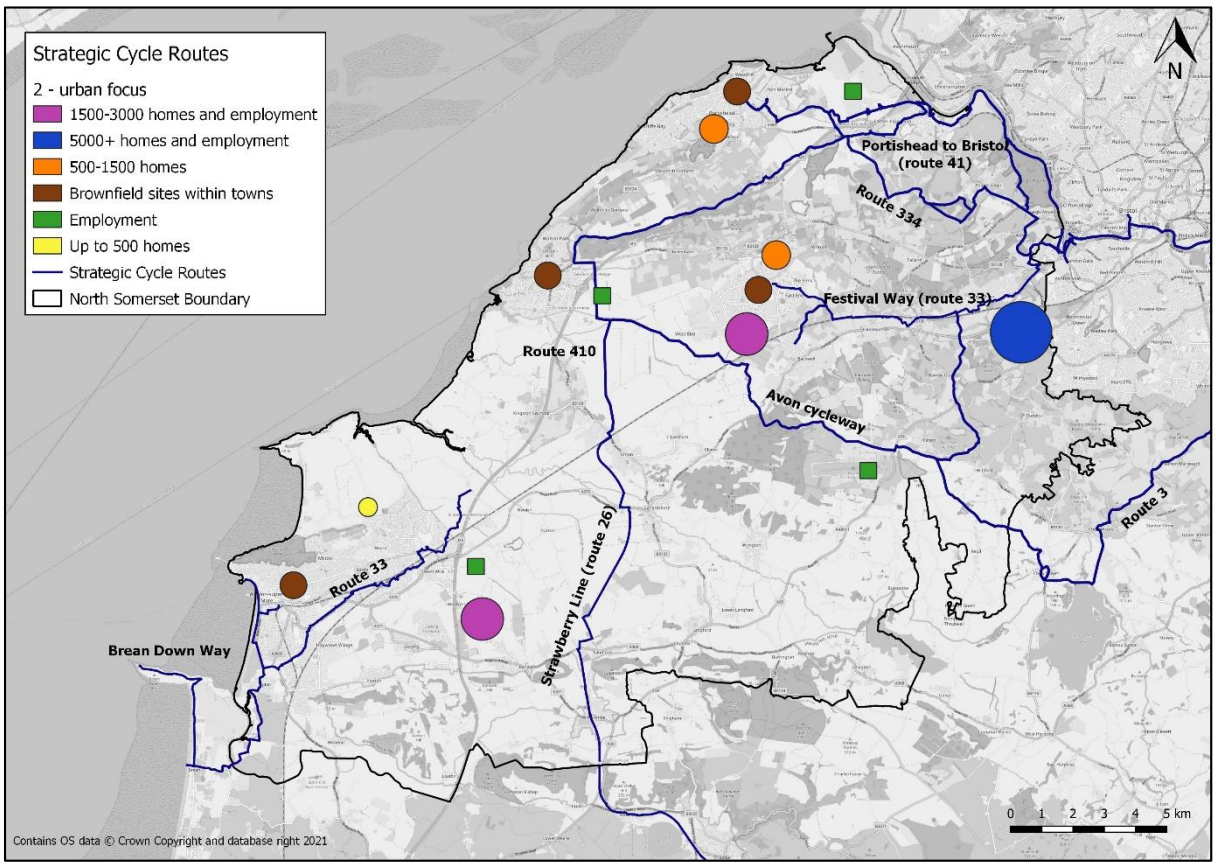
Source https://checker.ofcom.org.uk/broadband-coverage. Data extracted January 2021

Proximity to Strategic Active Travel Routes

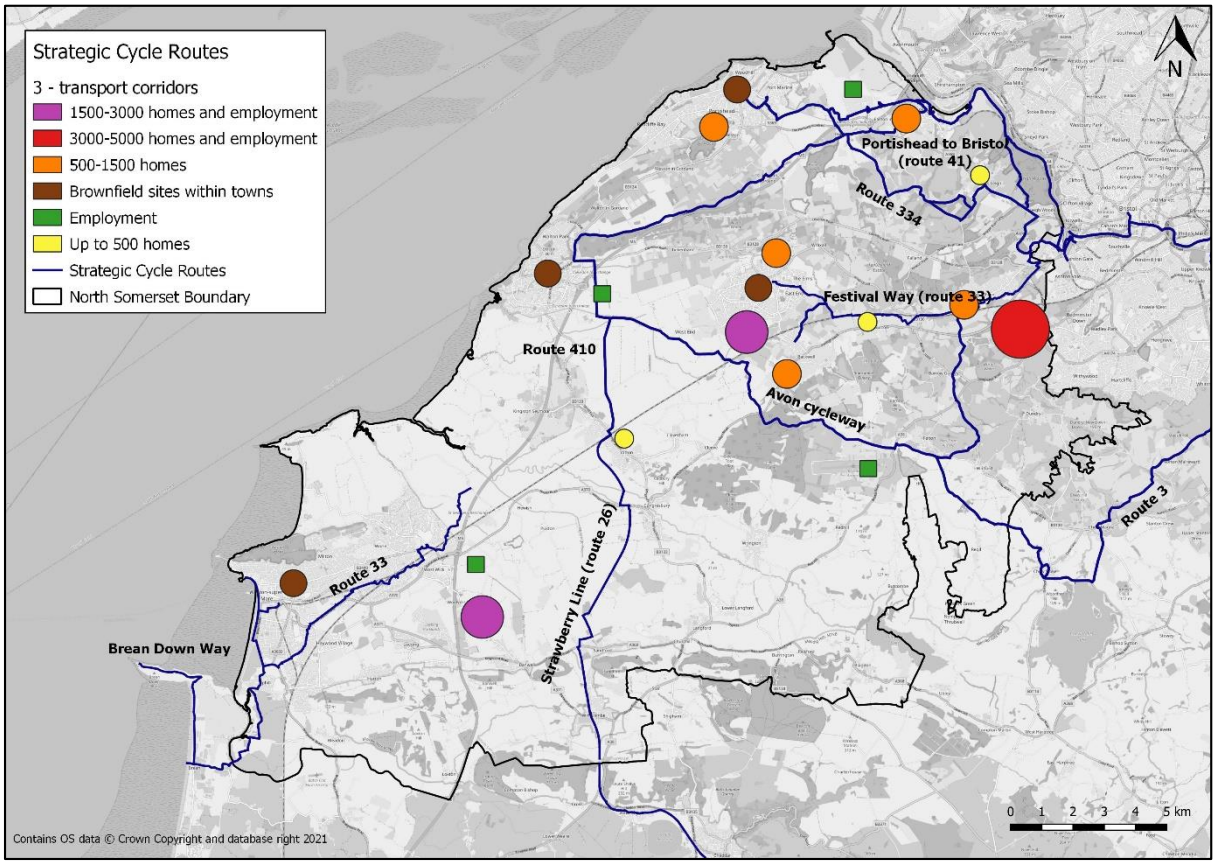
Retain Greenbelt



Urban Focus



Transport Corridors



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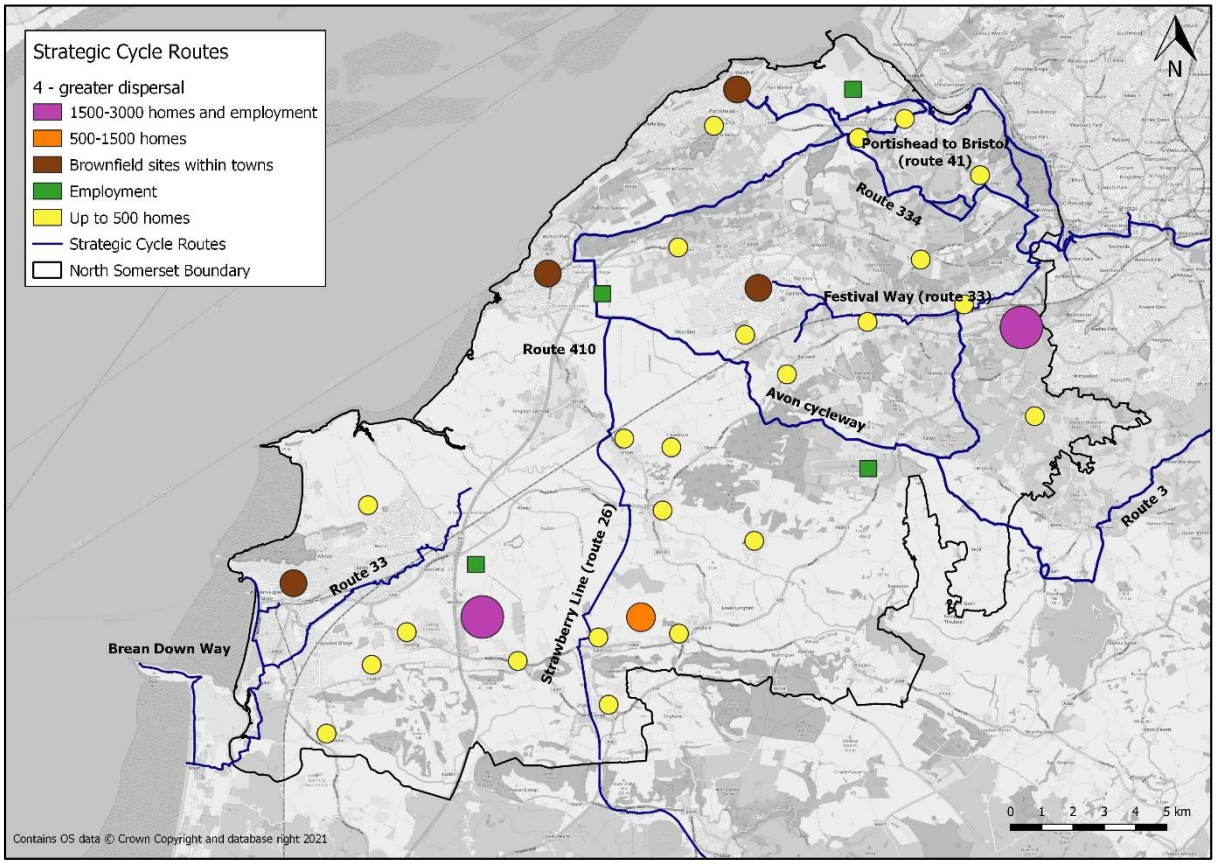
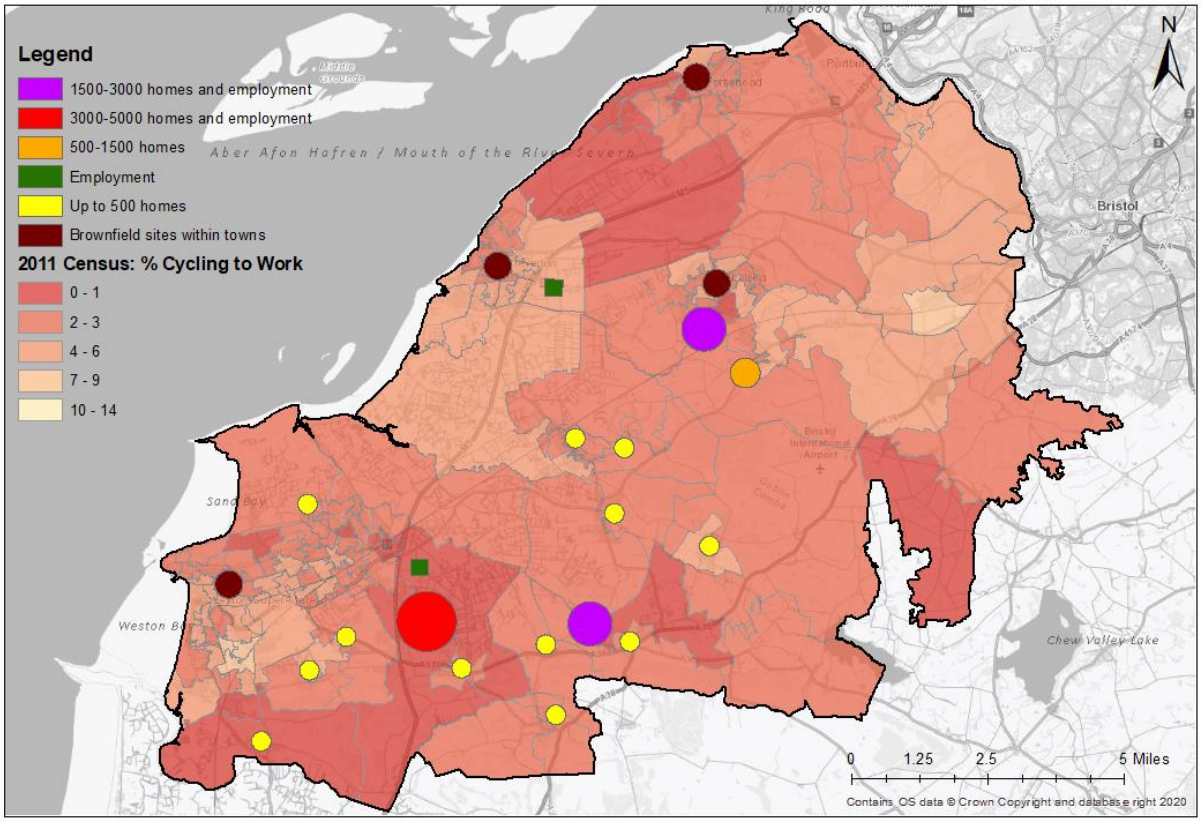
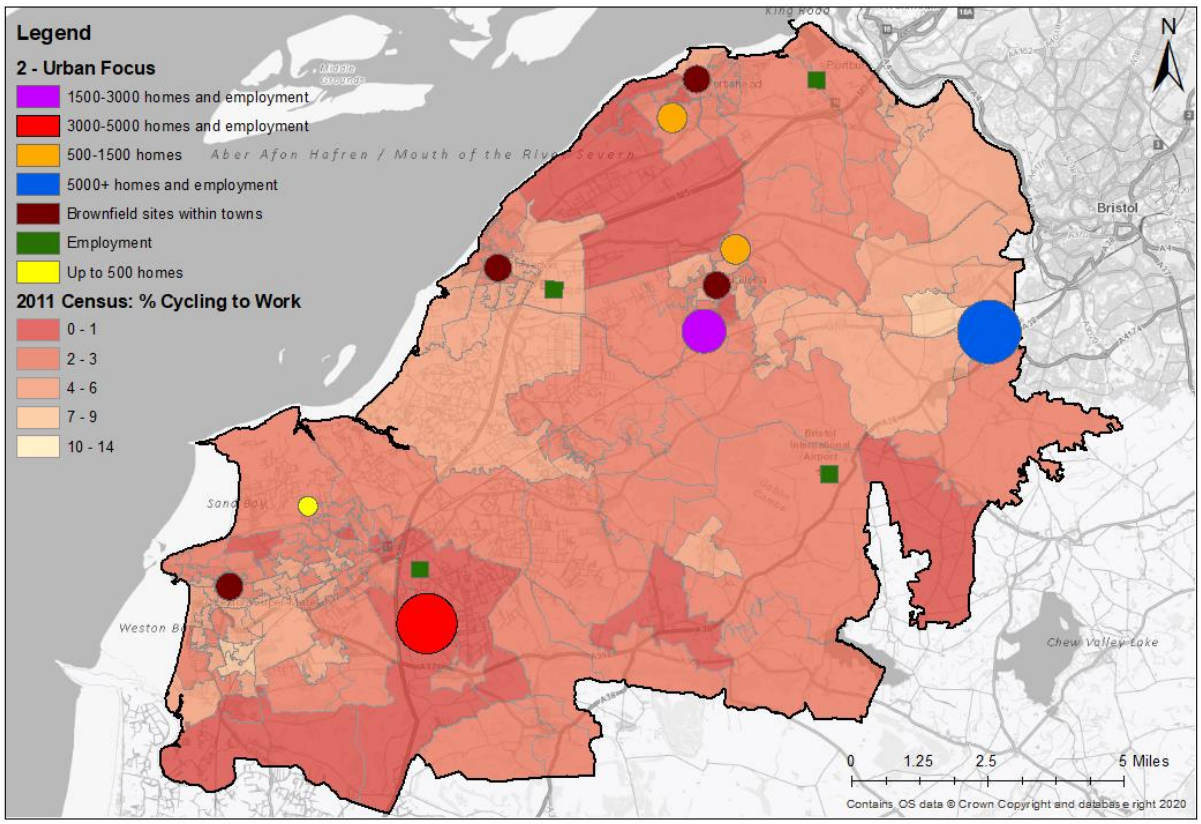


PCT Census 2011

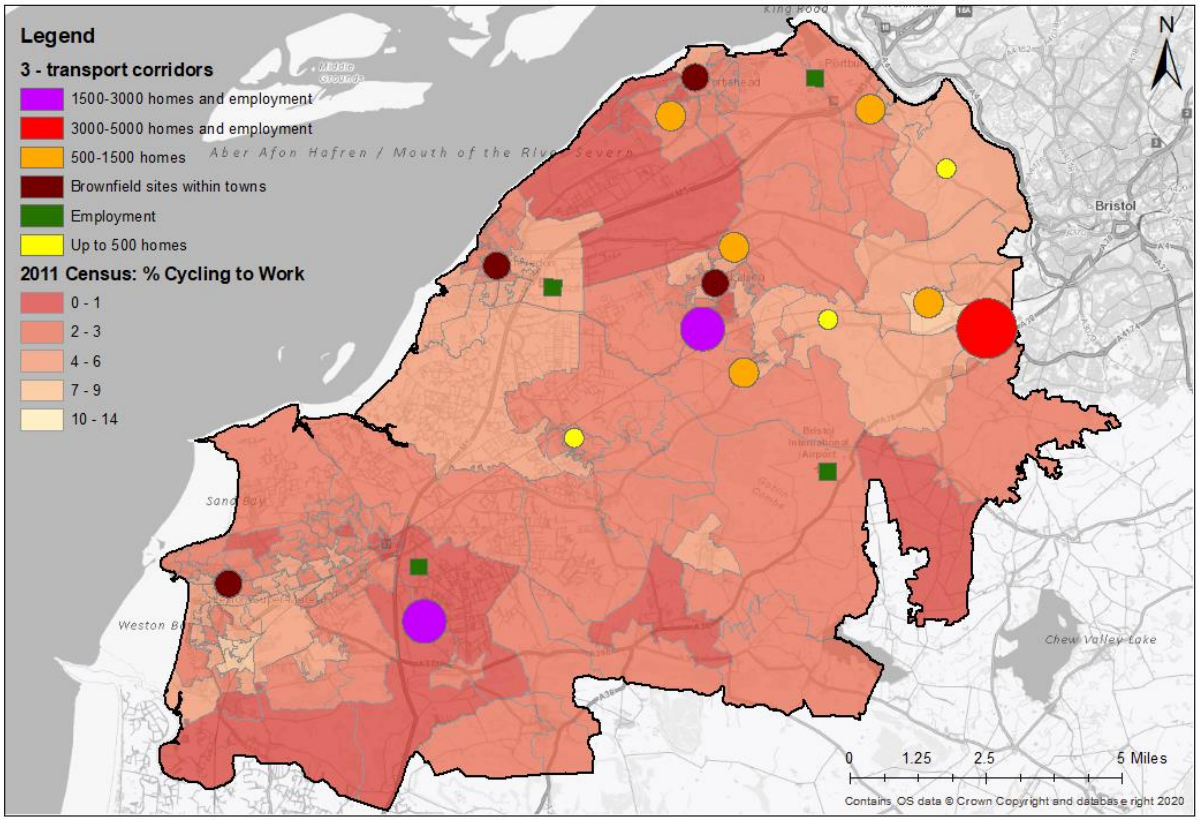
Retain Greenbelt



Urban Focus



Transport Corridors



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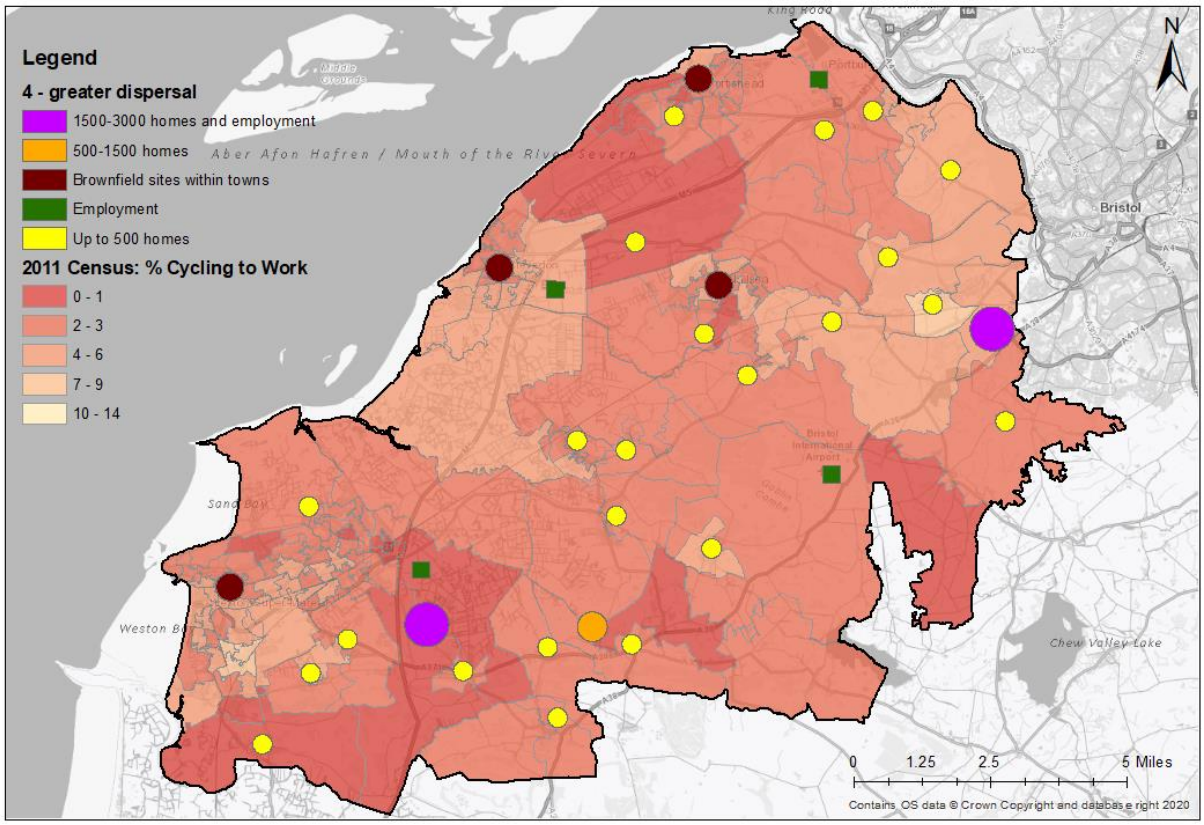
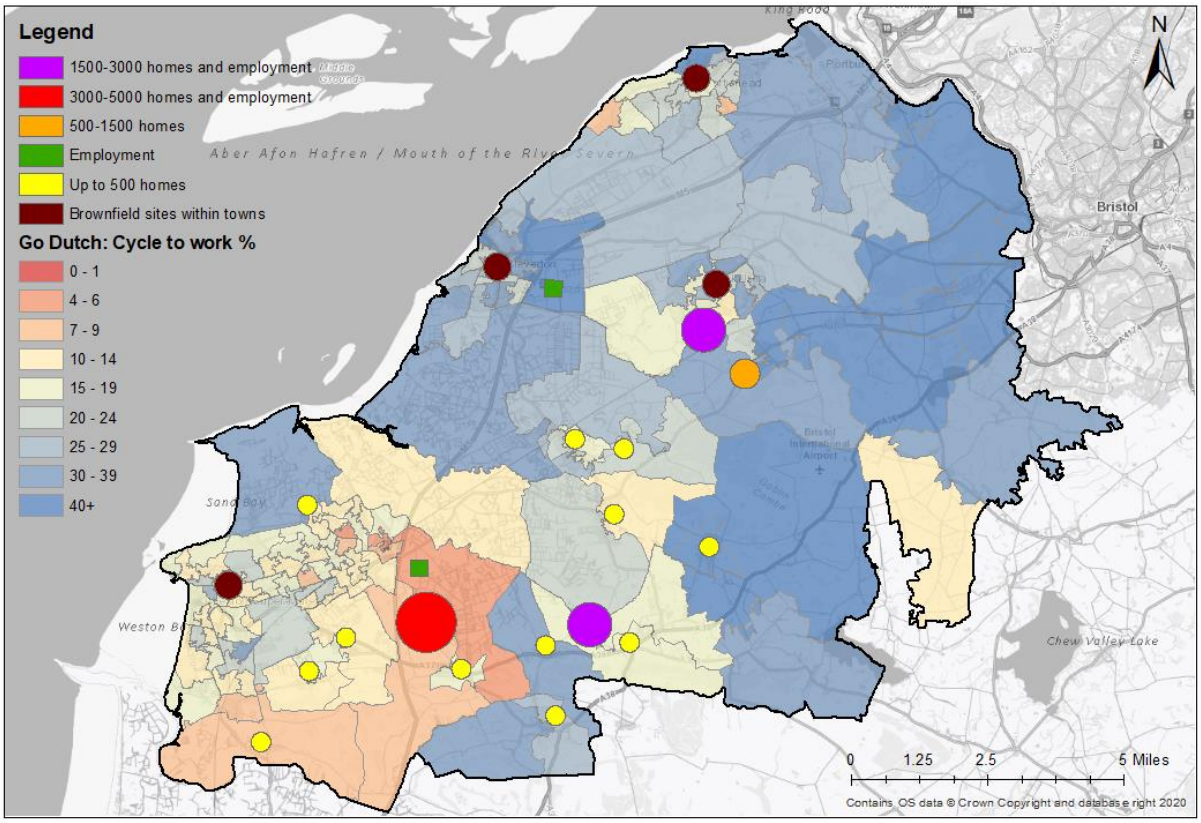


PCT 'Go Dutch' Scenario

Retain Greenbelt



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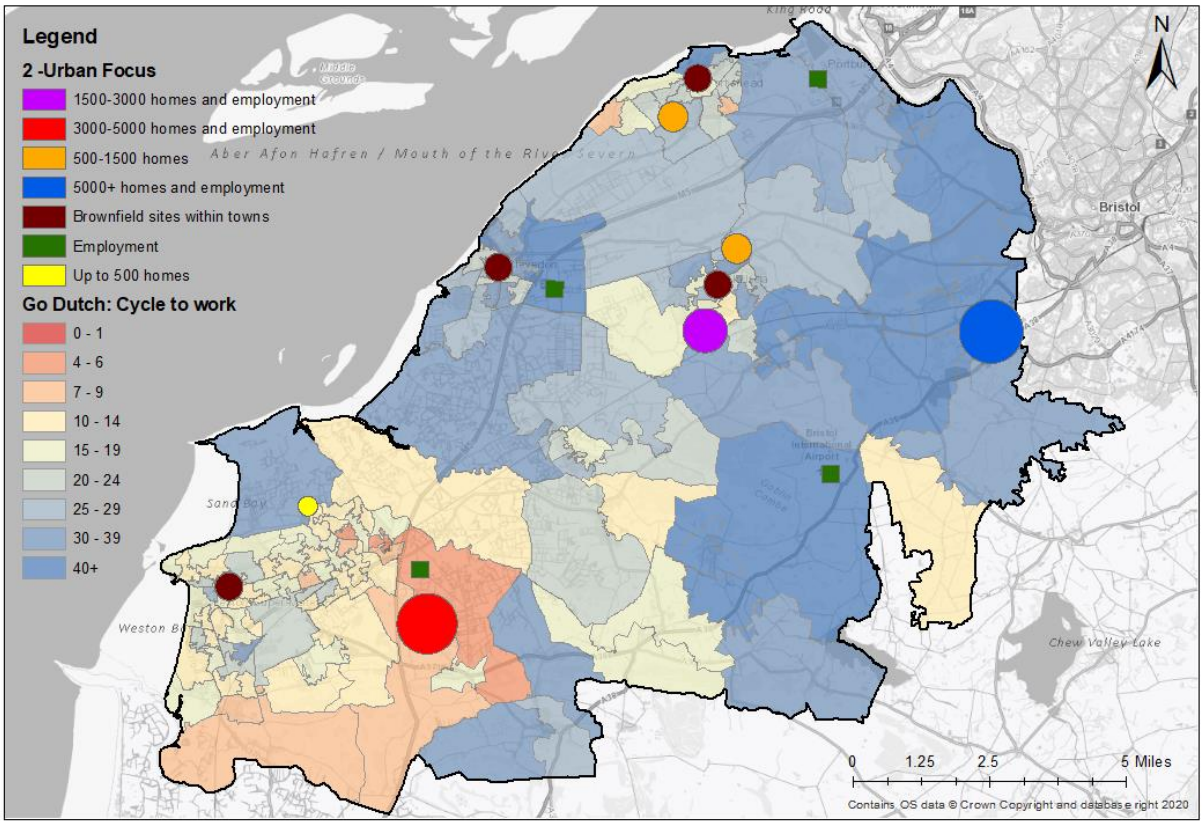
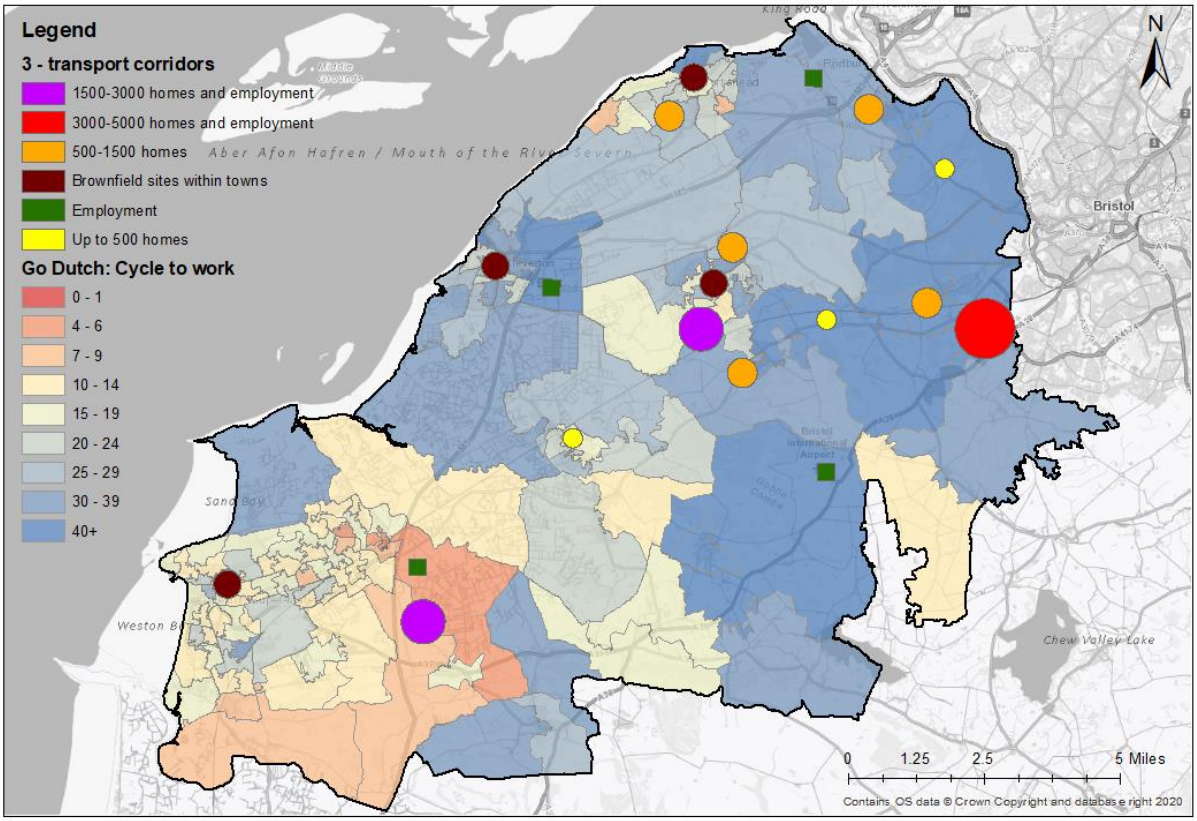


Transport Corridors



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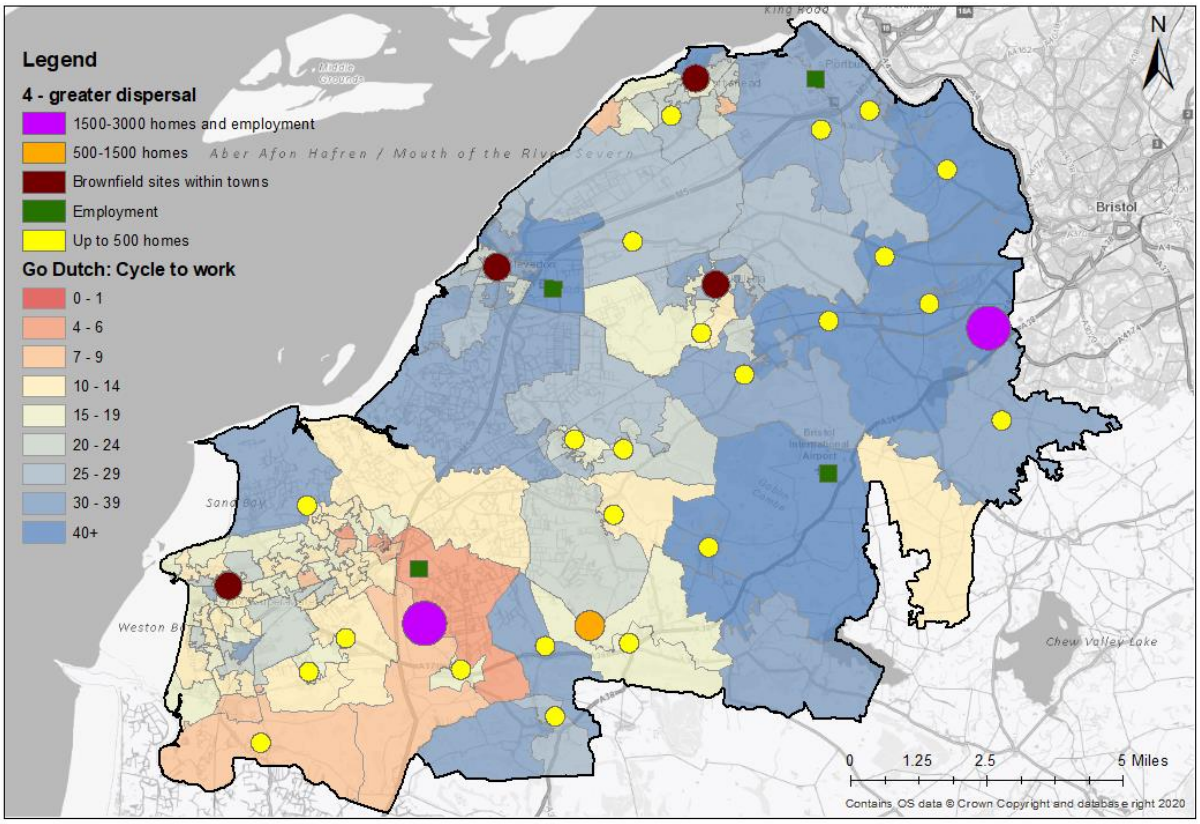
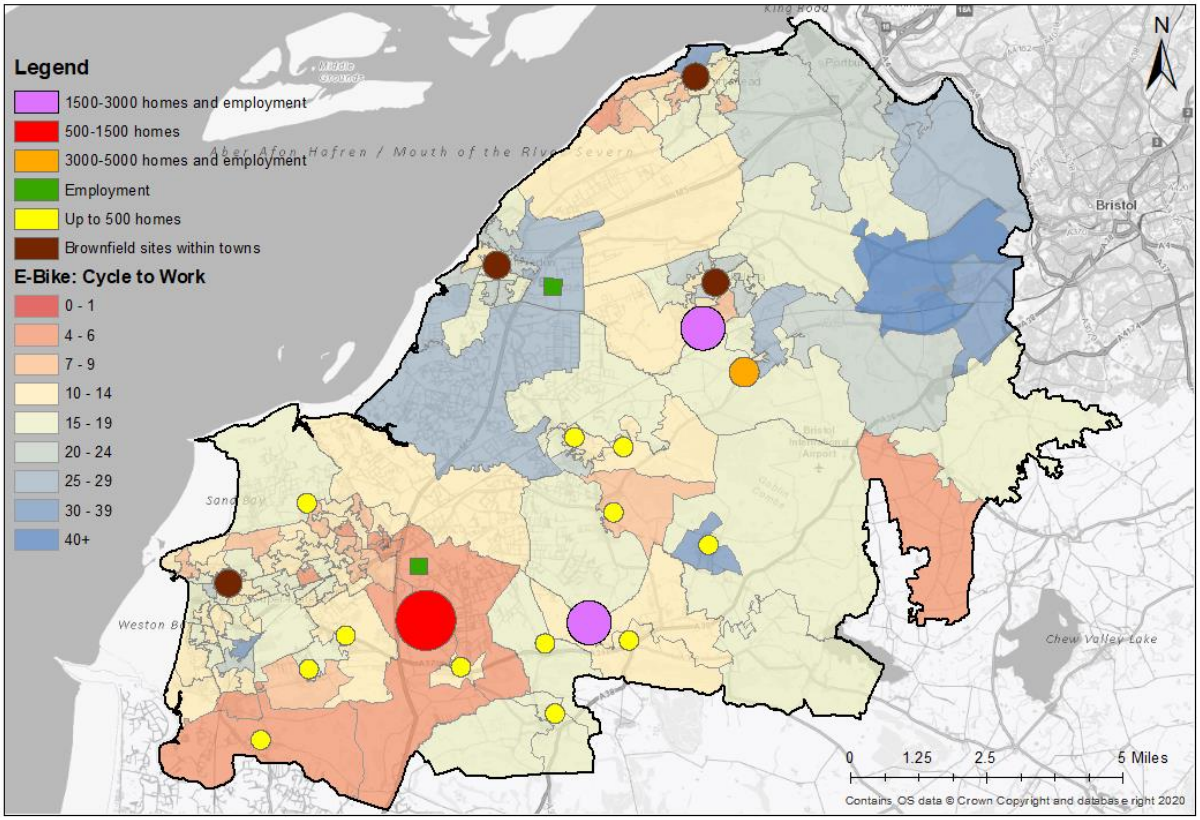
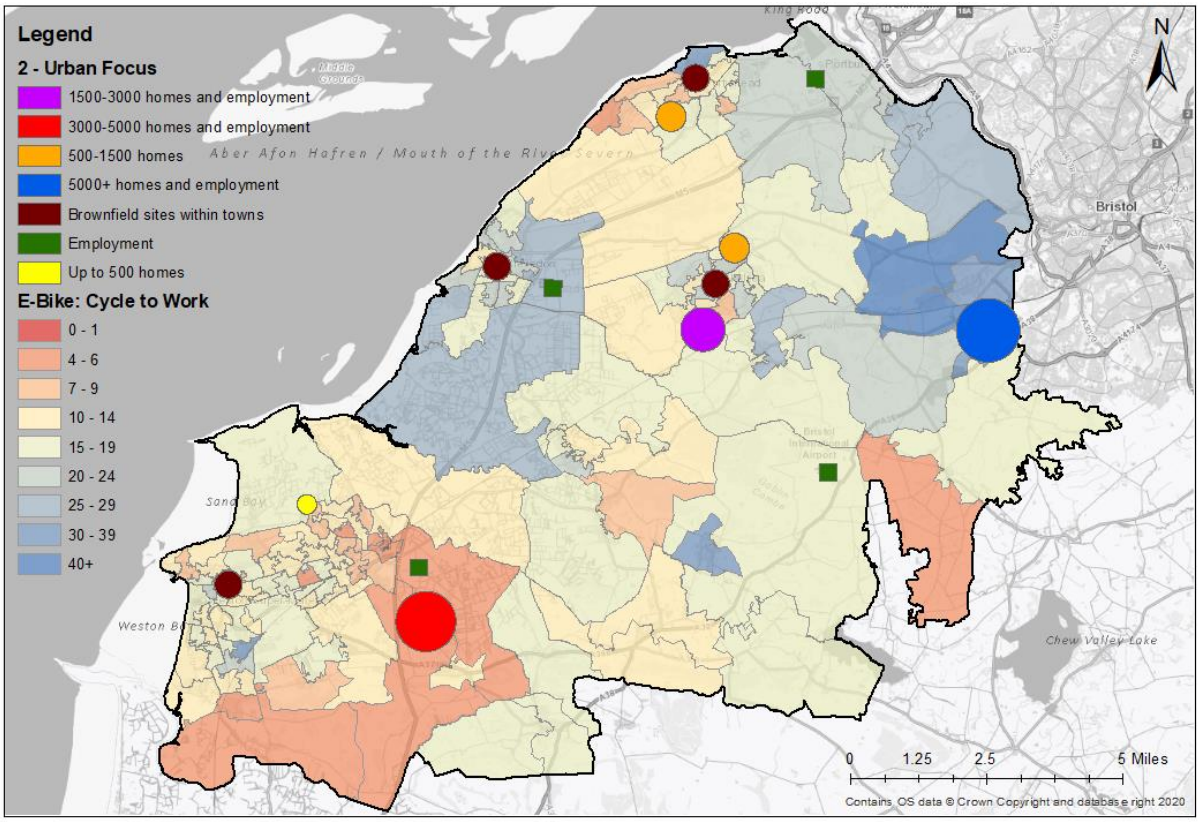


PCT 'E-Bikes' Scenario

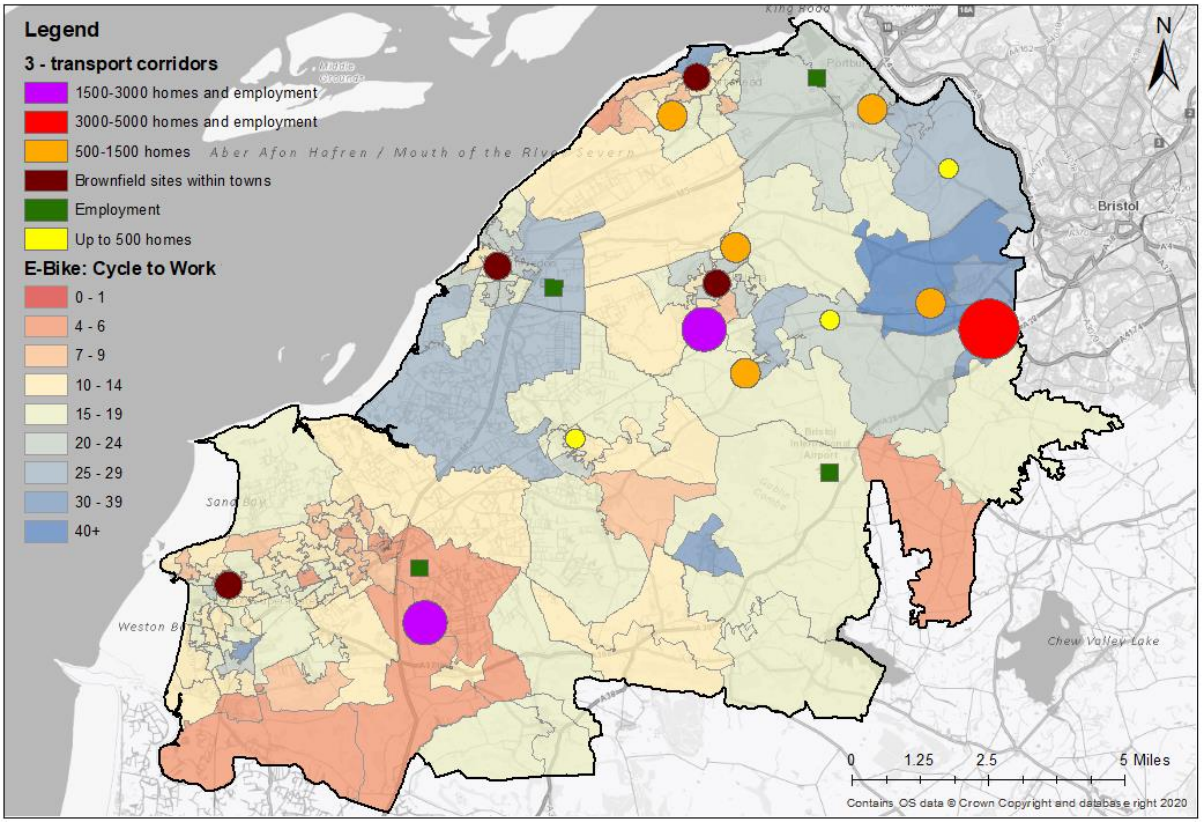
Retain Greenbelt



Urban Focus



Transport Corridors



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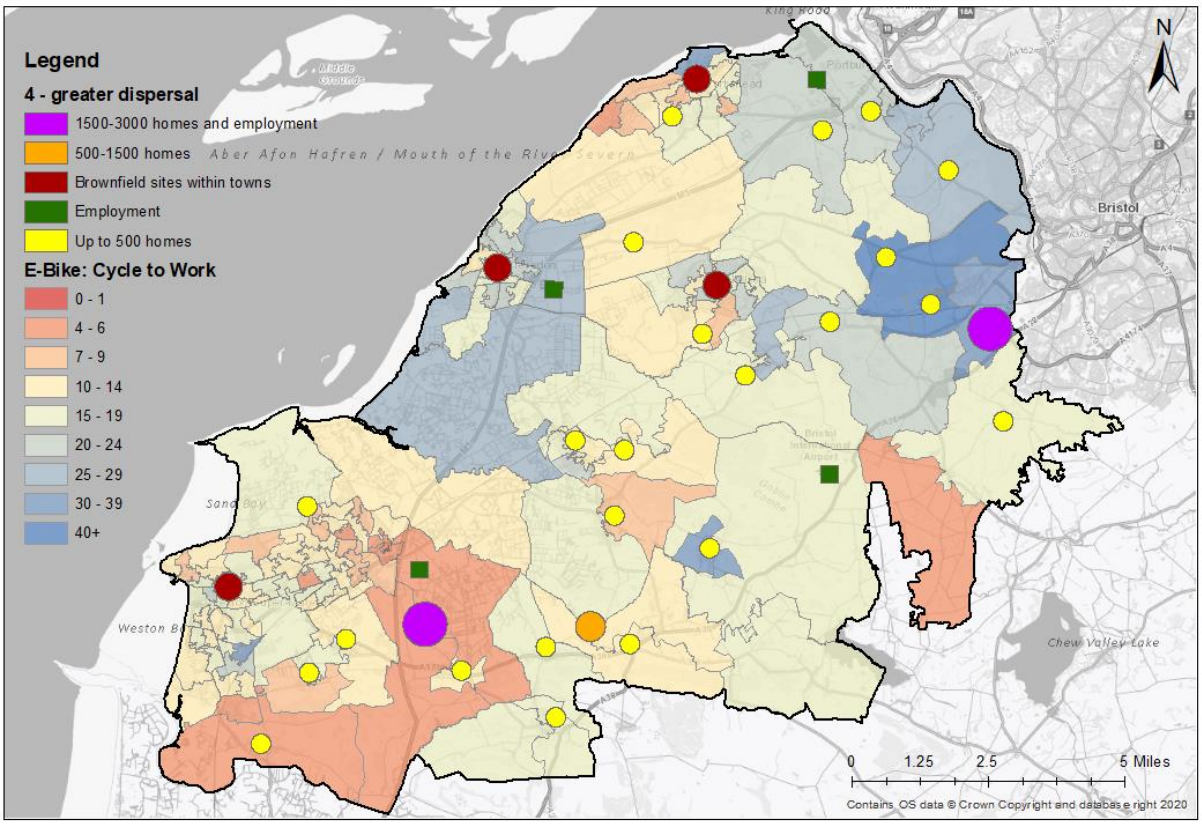
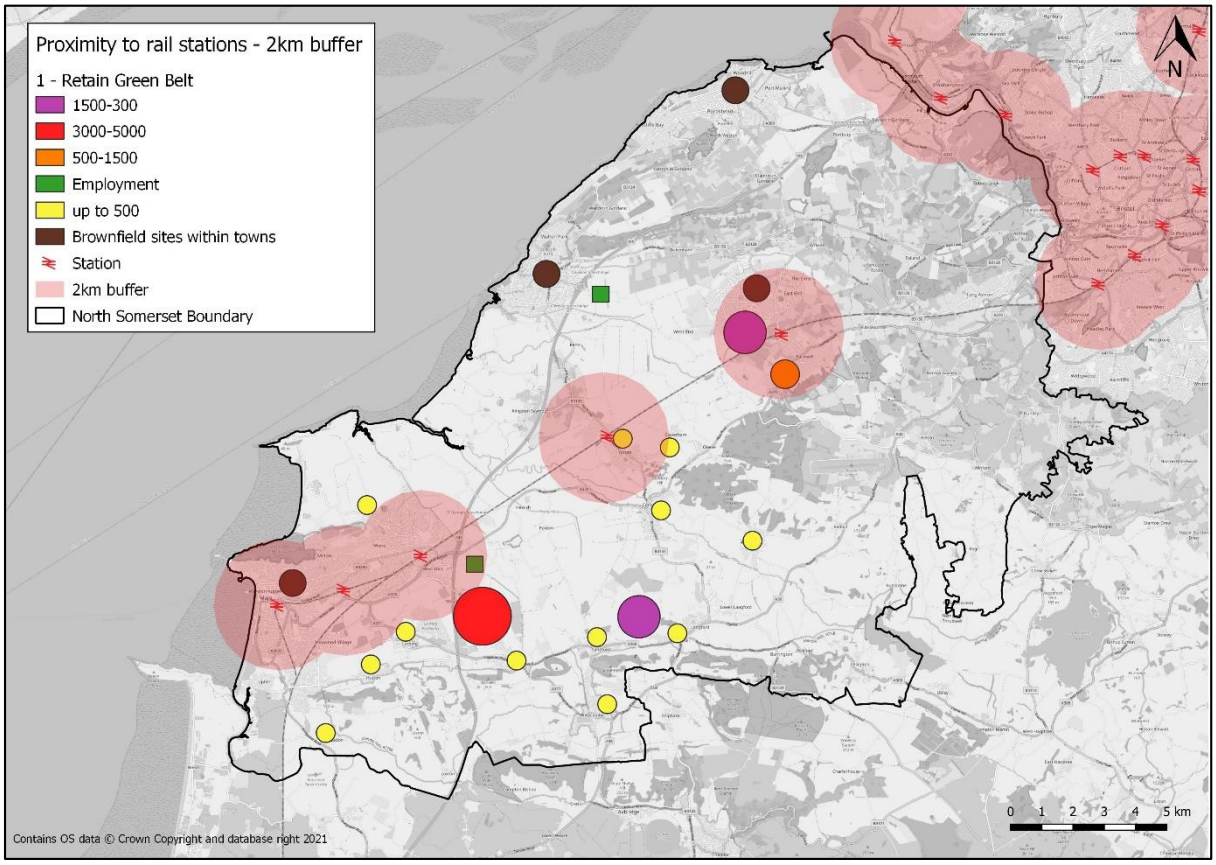


Accessibility to Rail Stations

Retain Greenbelt



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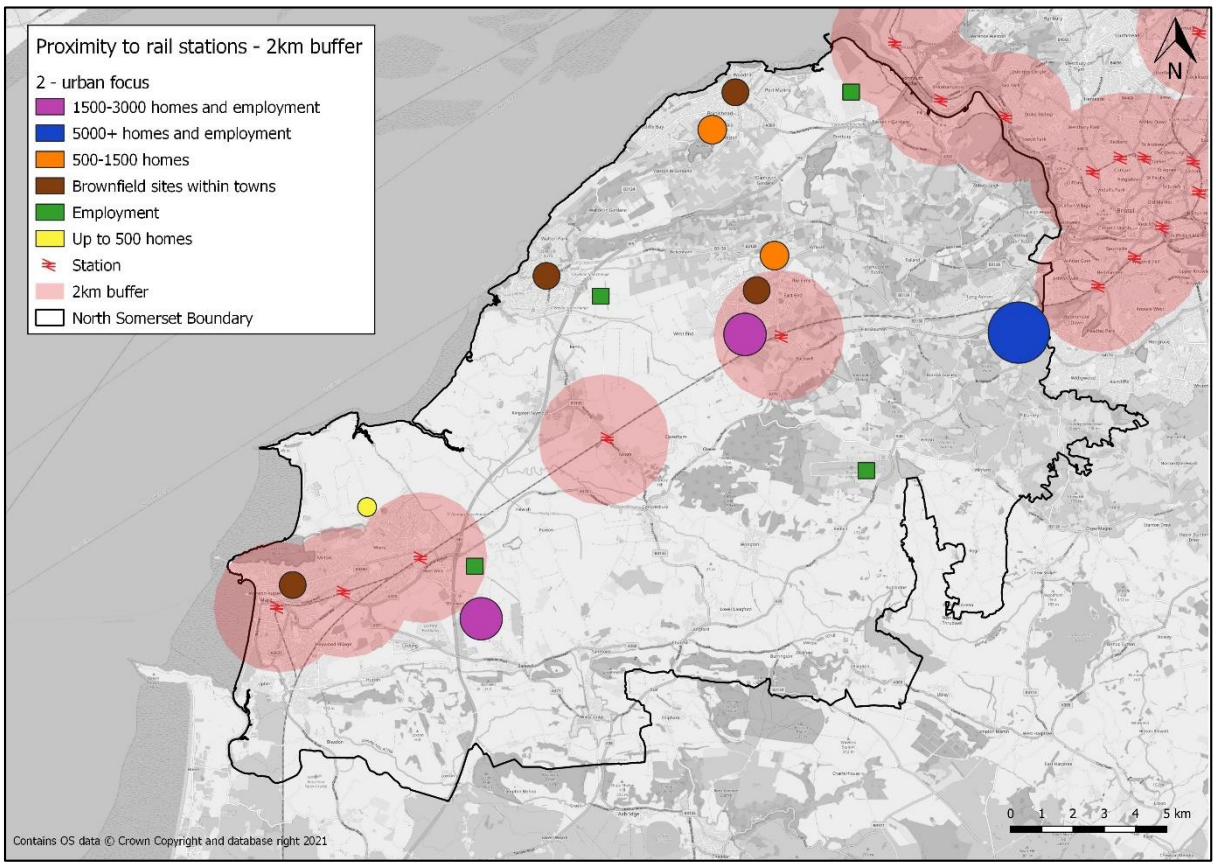
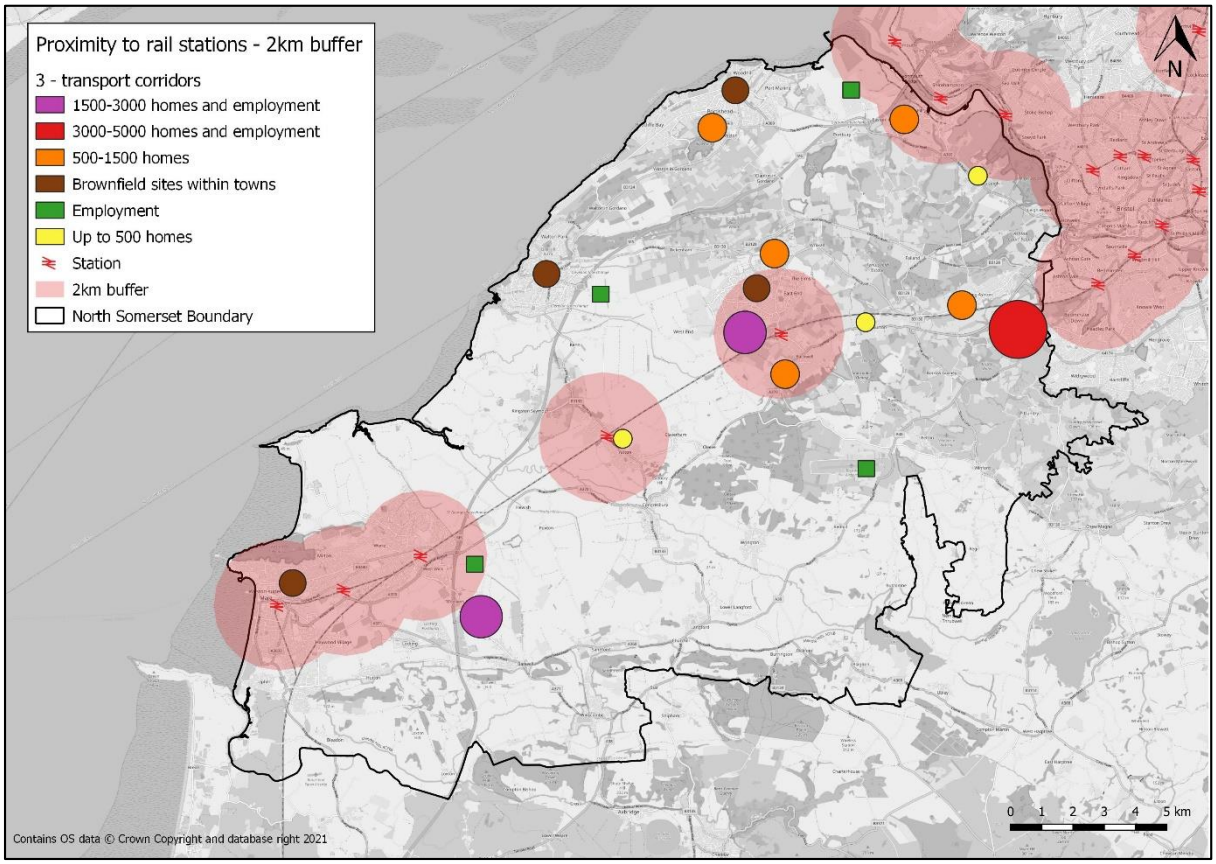


Transport Corridors



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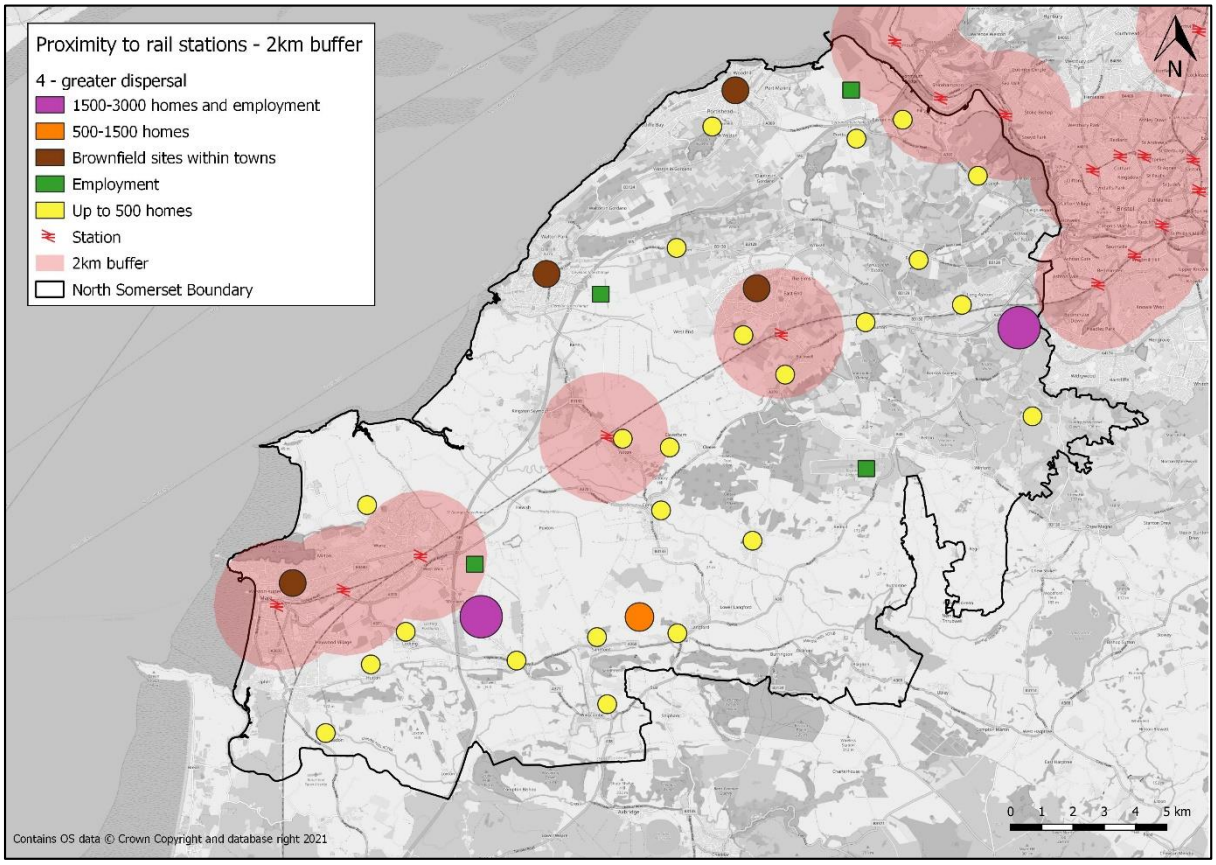
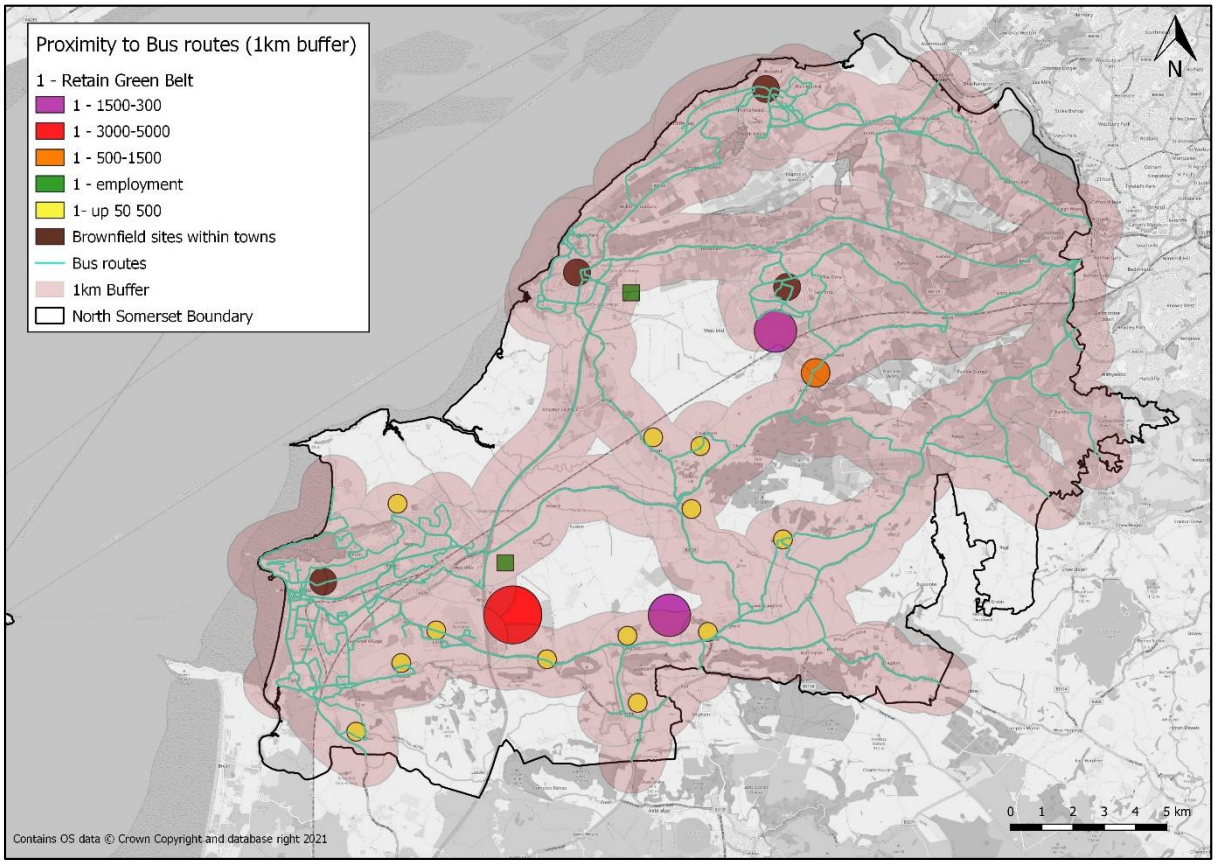


Accessibility to the Bus Network

Retain Greenbelt



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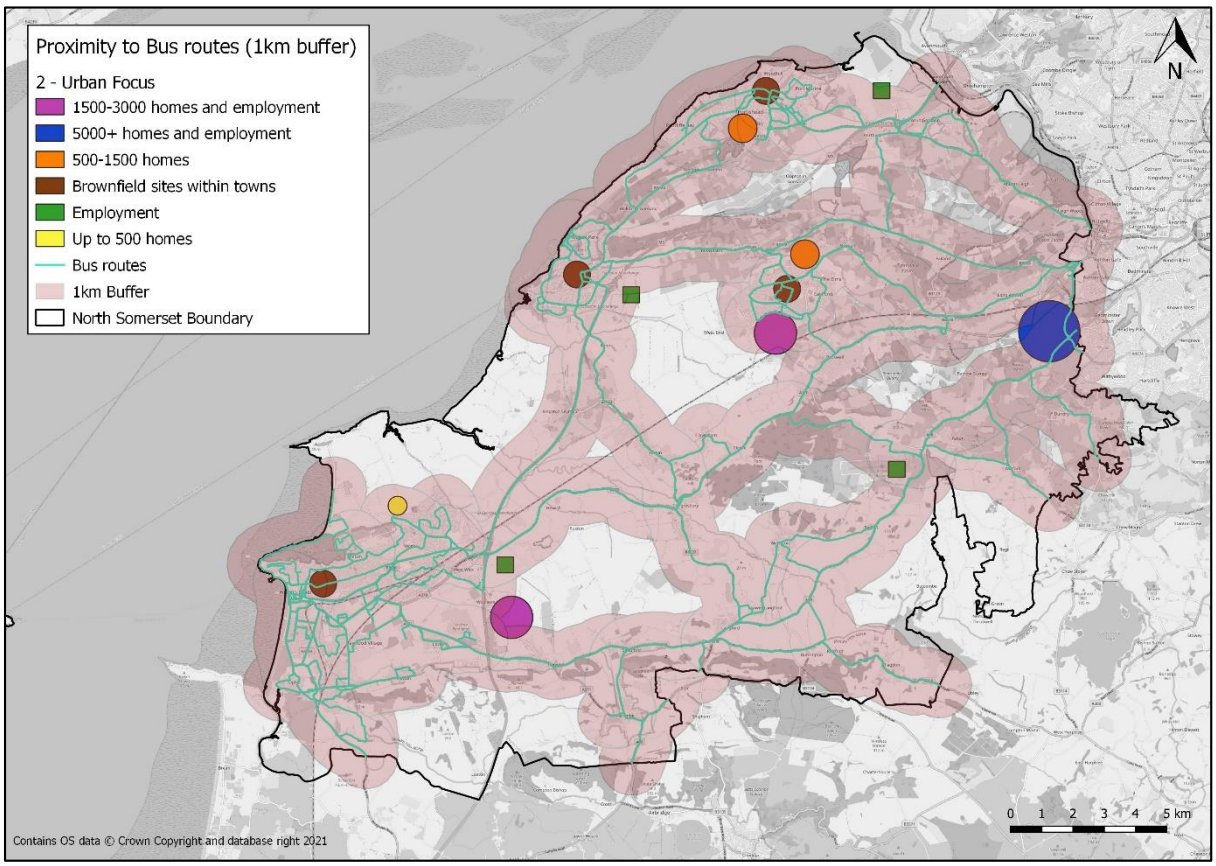
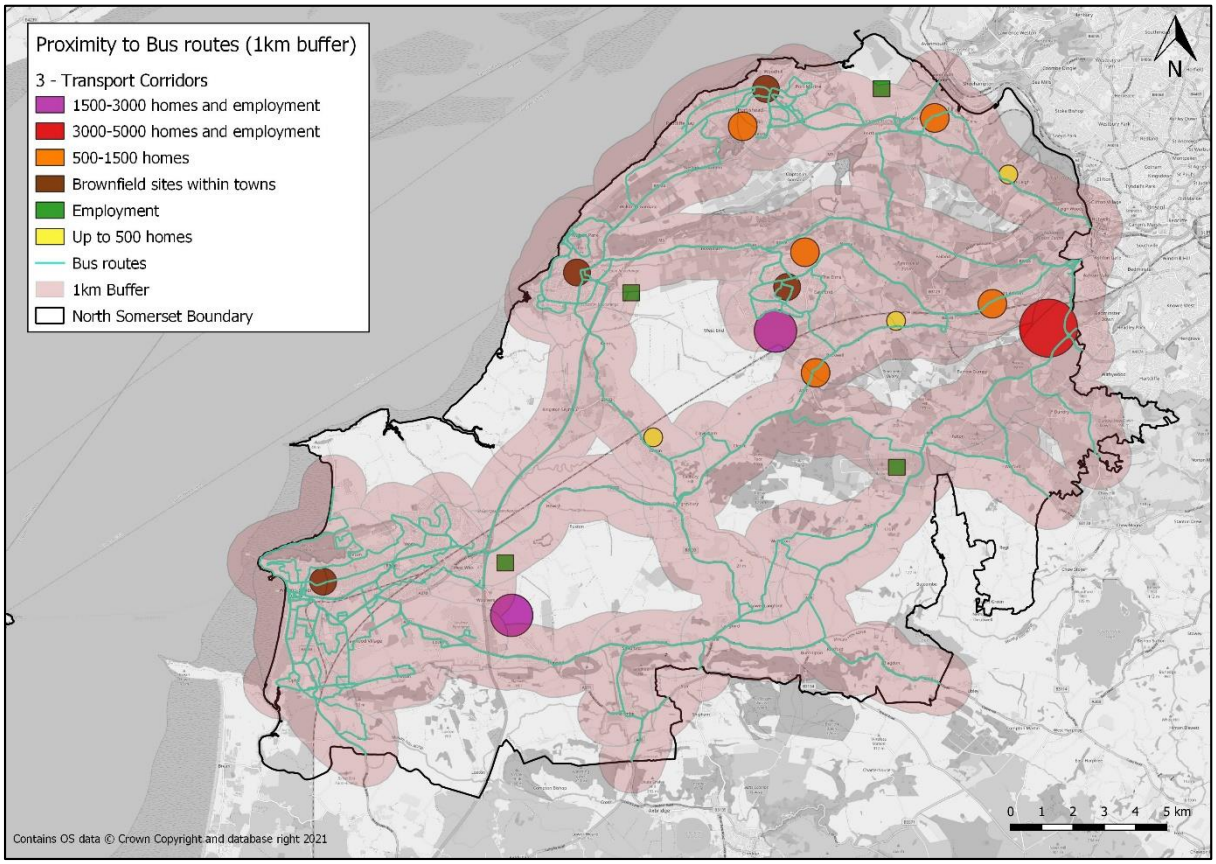
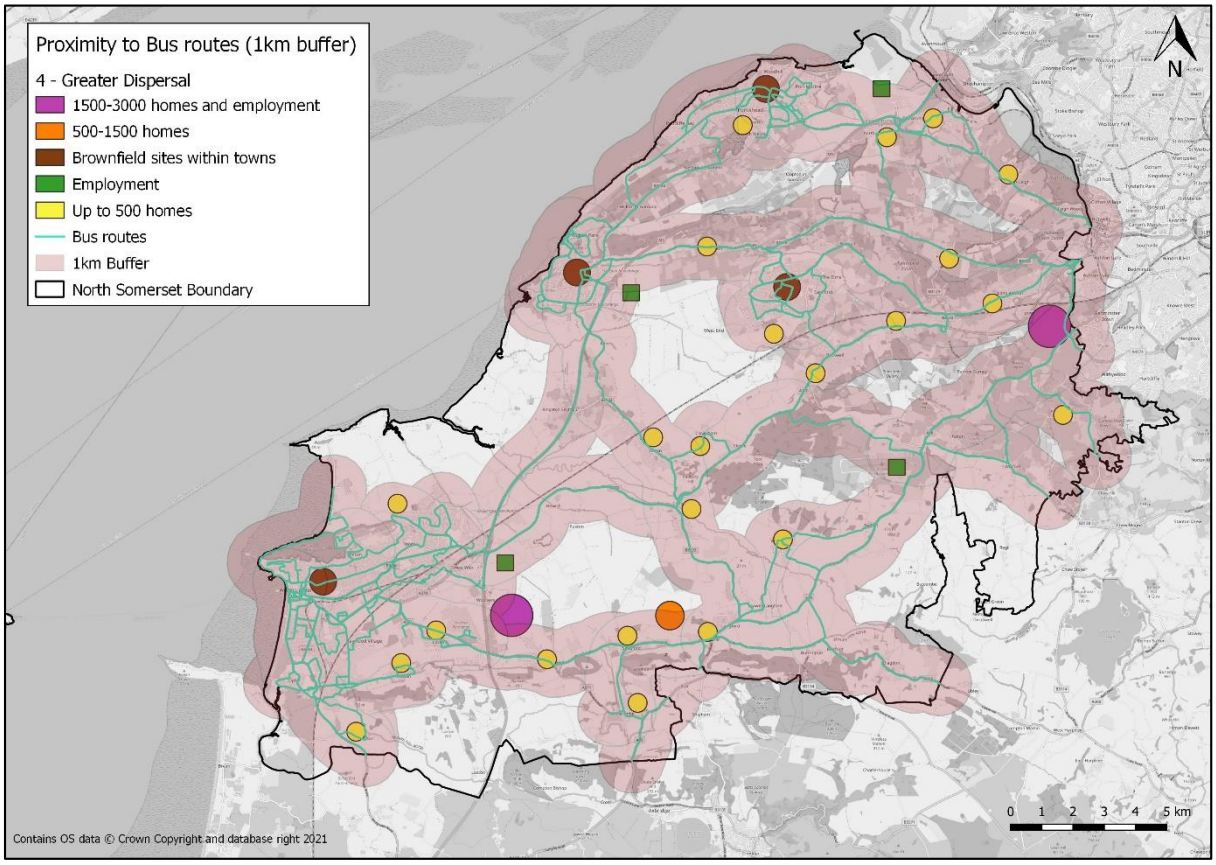


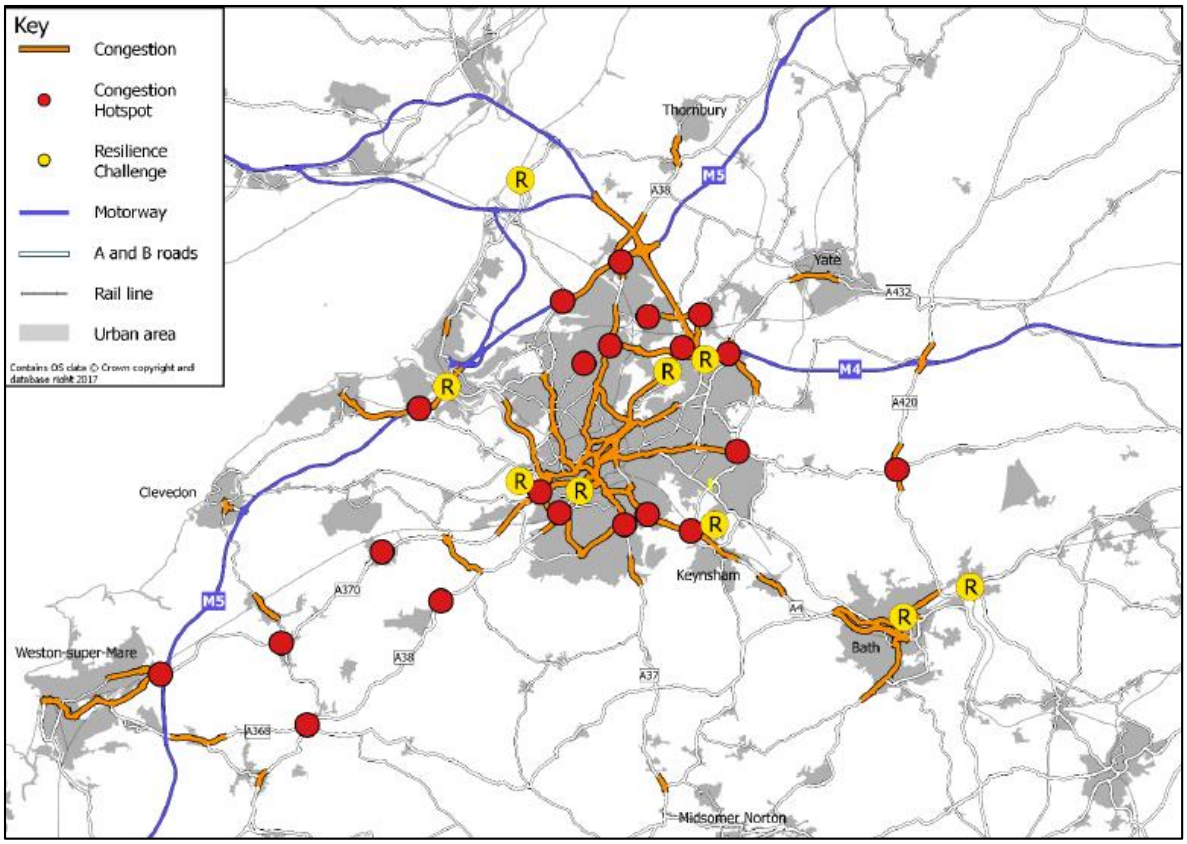
Transport Corridors



Greater Dispersal



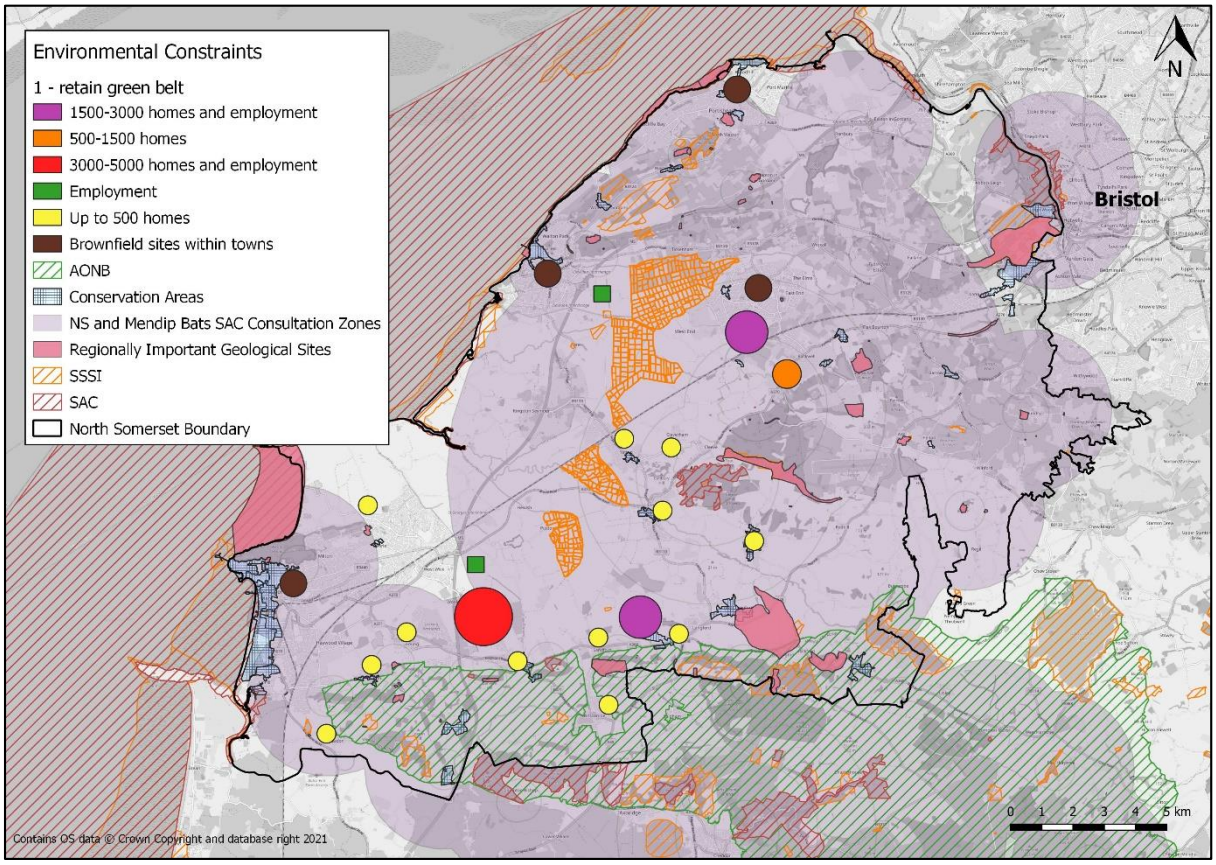
Congestion Hotspots



Source: West of England Joint Transport Study (October 2017)

Environment Constraints

Retain Greenbelt



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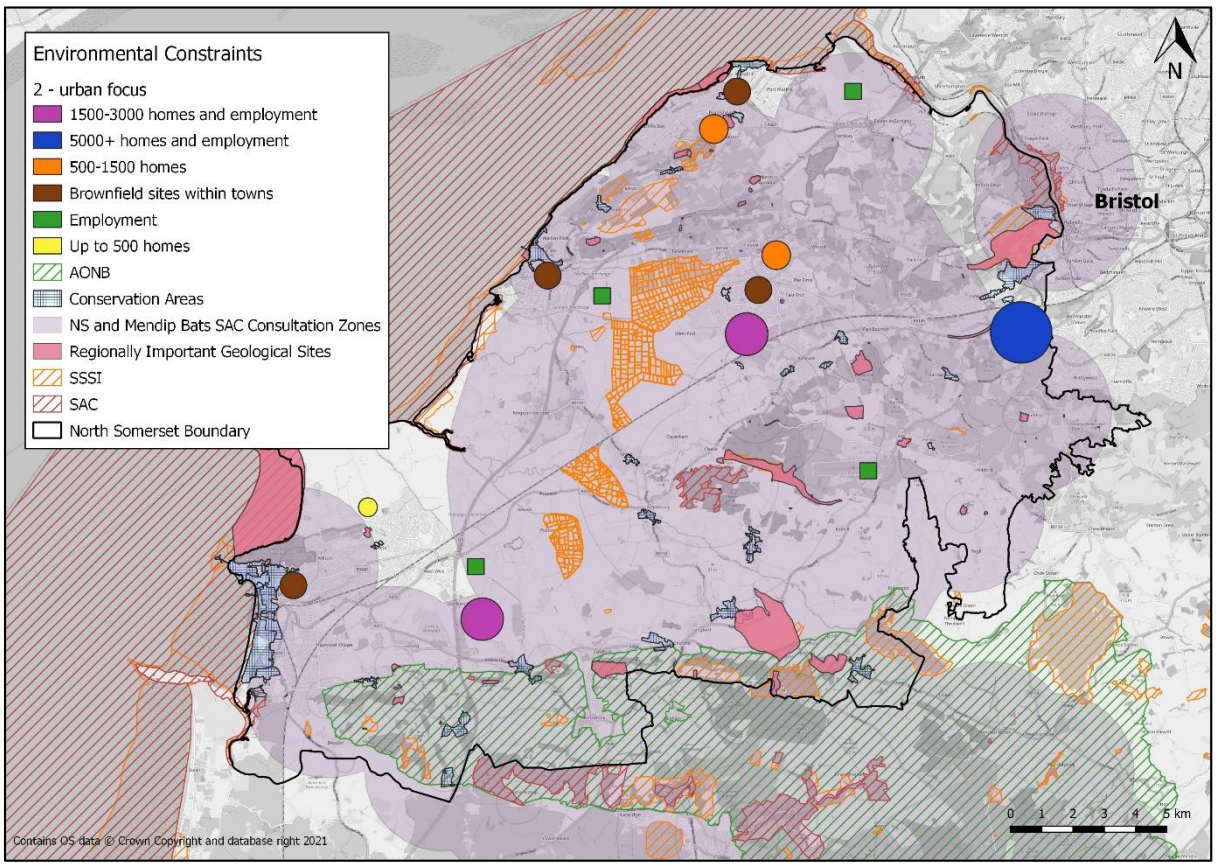
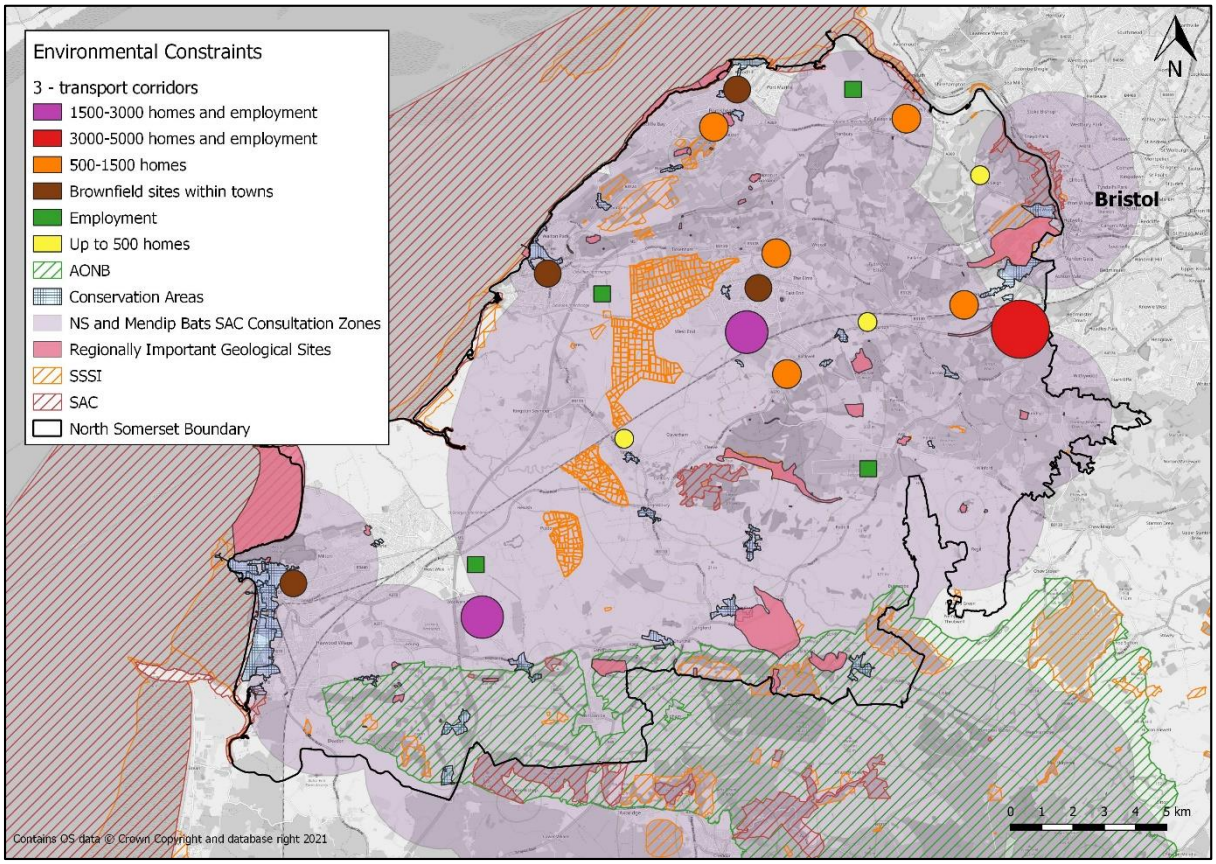


Transport Corridors



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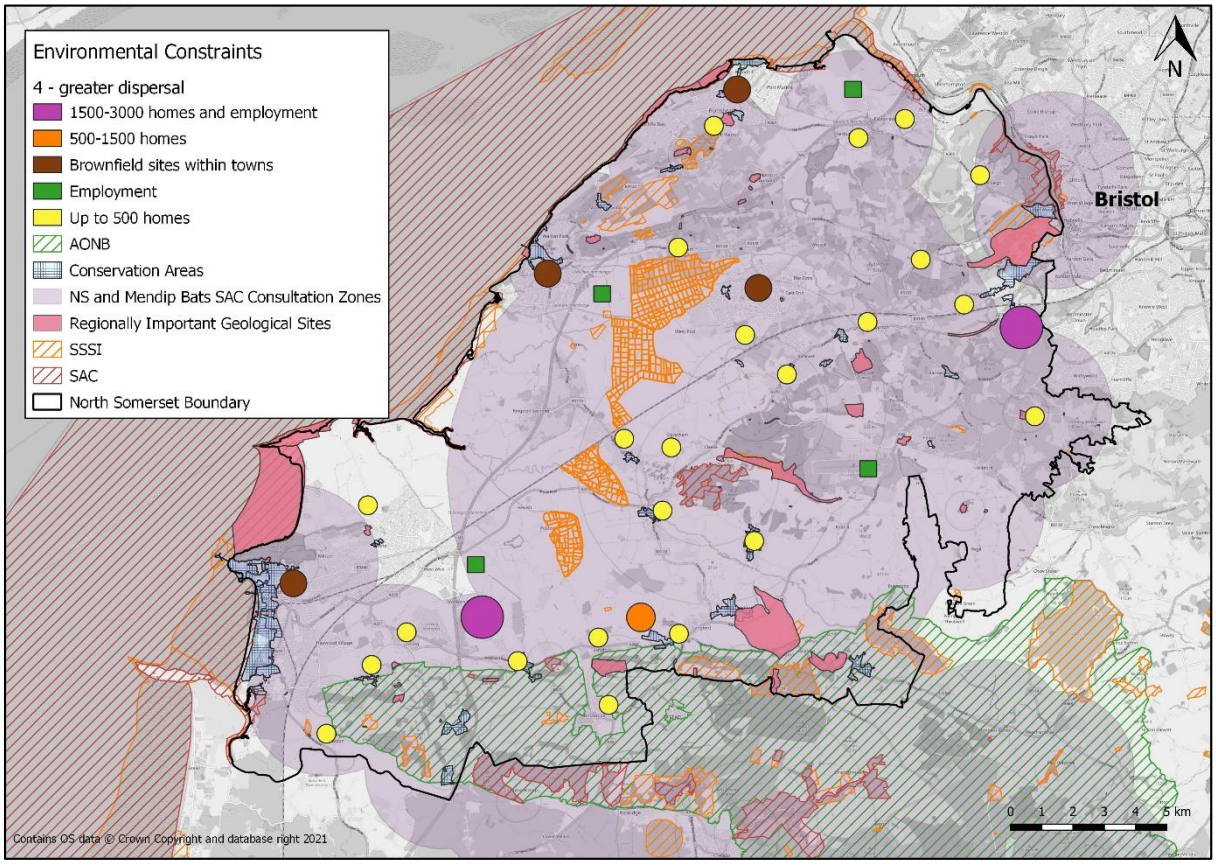

Appendix D – Catalytic Enablers

Project name:
North Somerset Local Plan - Stage 3 Transport Assessment

Project ref:
60647102

Date:
20 April 2021

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JR	**CC**	**RA**	**CC**

Mitigation for Alternative Strategies

Introduction

1.1 This Technical Note outlines the methodology for assessing additional potential measures to improve the performance of Retain Green Belt and Greater Dispersal Spatial Strategies to be comparable with the better performing strategies. Mitigating measures have been identified against each objective, and summarised in terms of effectiveness and feasibility.

1.2 Enabling measures identified at this stage are strategic in nature, to give an understanding of the types of intervention needed. It would not be proportionate to develop mitigation in more detail, prior to decisions being made on strategies to take forwards. In addition to this, the Evidence Report presented in Appendix A of the Stage 3 Transport Assessment includes reference to JLTP4 schemes, identifying the probability assigned by NSC through the Uncertainty Log. Schemes identified as Near Certain or More than Likely have already been included within the Appraisal Framework. This exercise has considered other items in the Uncertainty Log as to whether any previously considered interventions could be reasonably considered as strategic “catalytic enablers” and in line with the transport Vision for the Local Plan.

1.3 Potential catalytic enablers must be considered both from the perspective of their impact in terms of improving the transport appraisal performance of a strategy, and the feasibility of the measures itself. There are a number of factors which affect the feasibility of a measure, including cost, timescale for delivery, and technical deliverability including land ownership, stakeholder acceptability, and engineering challenges. The purpose of the exercise is to identify measures to improve the performance of strategies to be comparable with the performance of other strategies without intervention, i.e. on Day 1 of the Local Plan. Time spent delivering these measures would either delay development or result in delivering sub-optimal development from a sustainability perspective until measures are in place. If catalytic enabling measures incur significant cost, then this could affect the ability of the Local Plan to deliver strategic mitigation or other local priorities, due to viability challenges. Deliverability relates to whether there can be confidence in whether the scheme can be implemented.

1.4 It is also noted that the Covid-19 pandemic has changed many aspects of the way that we live, work and travel, and the medium to long term outcomes of this are as yet unclear. This is discussed in depth in Chapter 4 of the Stage 3 TA. Whilst there are undoubtedly important emerging trends, the choice of Spatial Strategy remains a key element of planning for sustainable growth. Thus the importance of a sustainable Spatial Strategy as demonstrated by performance against the Appraisal Framework is not significantly diminished by potential emerging travel trends.

Catalytic Enablers

1.1 As stated, the mitigation for alternative strategies has been termed “Catalytic Enablers” to reflect that they are measures which would be needed to bring the strategies to the same comparable starting point, rather than to mitigate the growth itself. This section considers the performance of strategies against each of the objectives, and considers potential mitigation which could address deficiencies. The measures proposed focus on the aspects of the Strategies which have scored poorly in comparison with Urban Focus and Transport Corridors, and not growth areas which are common or performed reasonably well in sustainability terms.

Objective 1: Travel Distances

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.

a. Will this strategy provide developments large enough to provide on-site schools? If not, are the development locations in the strategy in close proximity to existing schools?

b. Will the Strategy provide new on-site employment opportunities? If not, are the development locations in the strategy in close proximity to existing employment?

c. Will this strategy provide developments large enough to provide on-site retail and other facilities? If not, are the development locations in the strategy in close proximity to existing retail and other facilities?

d. What is the average broadband availability in the development locations in the strategy?

Retain Greenbelt

1.2 The main reasons for the Retain Greenbelt strategy performing less favourably against this objective, in comparison with other Strategies, are as follows:

- Missed opportunity for development on the edge of Bristol, which both benefits from size of development and proximity to Bristol;
- Significant size settlement at Churchill near relatively few existing facilities; and
- Reasonable degree of dispersal, with multiple smaller areas of growth near few existing facilities.

1.3 Addressing some of these issues would require the delivery of significant levels of employment, retail, leisure and other supporting facilities in Churchill, to a level comparable with a main town. It is noted that this Strategy allocates significant housing in this area, which could deliver a level of supporting facilities. However, it is unlikely that this would be to the same level as one of the main towns, and it would occur over the lifetime of the development, rather than on Day 1.

1.4 It is recognised within the scoring that there is a secondary school at Churchill. There are known issues with the quality of walking and cycling routes to school in the Churchill area, which are being considered through other projects. However, this has not counted against this strategy at this stage in order to be consistent with other Strategies and because opportunities to make routes safer have not been investigated at Spatial Strategy stage. It would therefore not be reasonable or consistent to count this against Churchill.

1.5 Even with additional facilities at Churchill, there would remain a reasonable degree of dispersal and housing located away from the main towns. Such housing is small scale, and unlikely to support significant levels of additional facilities on its own. Therefore, investment would be needed across a wide range of villages to provide additional facilities and services.

1.6 A strategic review of school locations could be undertaken alongside the Local Plan process, with the potential for new school sites to reduce travel distances. This would be common to all Strategies, but if progressed as an enabling measure then delivery early in the plan period would be a requirement. Based on locations of growth and schools, a secondary school in the centre of the district around the Yatton/Congresbury area may have potential to reduce distances for school travel and bring the Strategy to a positive score for Question A. Feasibility analysis would be needed, and deliverability may require proposed growth at Nailsea and Backwell backfilling capacity from Yatton based pupils going to school in Yatton rather than Backwell.

1.7 Fundamentally, Bristol is a significant employment draw for the District, with only Weston-super-Mare exhibiting substantial levels of self-containment. Therefore, the lack of significant growth close to Bristol is likely to mean that a Strategy which inherently provides distance between growth and Bristol will struggle to score positively on Question B. However, the scale of development on the edge of Weston-super-Mare, and thus the potential to look towards Weston-super-Mare for employment, has been considered within the original appraisal.

1.8 Broadband would require investment in areas with lower broadband speeds. Feasibility analysis as to whether this is achievable has not been done at this stage, although it is noted that there will be government requirements on developers to do this. Notwithstanding this, for the purpose of a fair assessment, it is assumed that cost is the sole factor in achieving high quality connectivity. Therefore, the Retain Greenbelt and Greater Dispersal Strategies could achieve high quality connectivity solely with a greater cost outlay.

Greater Dispersal

1.9 The Greater Dispersal Strategy inherently spreads growth across the District. Thus, there is less growth at the main towns and on the edge of Bristol than better performing strategies. Furthermore, the limited scale of development in many places is unlikely to deliver significant levels of supporting facilities. This is particularly the case in Churchill, where a significant level of growth is proposed, but not to the extent that it is likely to be able to provide a substantial level of supporting facilities.

1.10 The approach to improving the performance of this strategy in terms of reducing the need to travel and distances to facilities is comparable with the Retain Green Belt option. This would involve a combination of a significant increase in facilities at Churchill, close to the level of a main town, and uplift in the level of facilities at multiple Service and Infill Villages across the District. A central district school at Yatton/Congresbury would represent an improvement in terms of access to education but may be harder to deliver due to less growth at Nailsea and Backwell than other Strategies.

1.11 Whilst the measures suggested would make a positive contribution, there would still be large pockets of development outside of active travel distances to multiple types of facilities. Furthermore, the ability to deliver increased levels of facilities is diminished by dispersing growth, reducing the chance of achieving critical mass in individual locations.

1.12 As with Retain Green Belt, it is assumed that high quality broadband connectivity could be achieved through upfront financial investment.

Summary of measures

1.13 In summary, the following combination of catalytic enablers are considered to improve the sustainability of both Retain Green Belt and Greater Dispersal Strategies in terms of Objective 1:

- Significant increase in facilities at Churchill to the level of a Main Town;
- Increases in facilities at villages where growth is proposed;

- Central district secondary school at Yatton/Congresbury; and
- Sufficient financial investment in Broadband to ensure high levels of connectivity.

Objective 2: Active Travel

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

e. Are strategic active travel routes in close proximity to growth areas in the strategy?

f. How does the strategy score against PCT Census 2011 Scenario at an LSOA level?

g. How does the strategy score against PCT Go Dutch Scenario at an LSOA level?

h. How does the strategy score against PCT ebikes Scenario at an LSOA level?

1.14 The main arbiters of walking and cycling potential are distance, topography, barriers to movement and infrastructure. Infrastructure can unlock issues relating to barriers to movement e.g. safety, traffic flows and speeds. Infrastructure cannot address distance and topography, although there is potential for e-bikes to reduce these barrier effects. Notwithstanding this, distance and topography will remain significant influences on potential cycling levels and therefore relative comparison between Spatial Strategies remains relevant. Connections into and between villages, towns and Bristol will be important to making walking and cycling the natural choice for shorter distance trips for all trip types, i.e. not just peak hour commuting.

1.15 The greatest existing levels of cycling are close to Bristol, on the Festival Way corridor between Bristol and Nailsea, Central Weston-super-Mare and the area around Clevedon. In terms of cycling potential, the aforementioned areas show significant opportunity to increase levels of cycling, with some other areas scoring positively, such as the area around the Airport. Areas which score poorly include Churchill and Banwell. This is likely to be due to lack of existing cycle infrastructure, the severance effect of the M5 for journeys into Weston-super-Mare, and distance and lack of infrastructure for journeys towards Bristol. Whilst the Strawberry line is a reasonable leisure route and is important for local connections; surfacing, distance and limited intermediate destinations mean that it does currently not function well as a commuter route.

Retain Green Belt

1.16 A high quality, segregated cycle route connecting Churchill, Banwell and villages in between, with Weston-super-Mare and rail stations could increase the potential to cycle for trips originating from these areas. Providing joined-up, safe cycling infrastructure may be feasible through connections delivered through Locking Parklands development and HIF enabled development east of the M5, cycle infrastructure through the Banwell Bypass, and additional interventions to join up sections of route.

1.17 Churchill into Weston-super-Mare is a comparable distance to Nailsea into Central Bristol, which enjoys high levels of cycling. However, the level of employment and facilities, and hence trip attraction, in Bristol compared with Weston-super-Mare is of a different scale. There is a potential cumulative network benefit of this, in terms of linking the Strawberry Line to Weston-super-Mare.

1.18 The potential for a segregated cycle route into Bristol from Churchill has been considered. The most direct route would be along the A38. However, it is recognised that the topography in the vicinity of Bristol Airport also presents a barrier to cycling, however, e-bikes reduce this barrier.

1.19 It could be that the most appropriate route would be along the Strawberry Line to Yatton, quiet lanes to Backwell, and Festival Way to Bristol, with targeted improvements along that route. This latter option would also pass dispersed growth locations at Winscombe, Sandford, Congresbury, Yatton and Claverham.

1.20 However, either option for connections to Bristol would represent a significant travel time and distance, and is therefore relatively unlikely to be a suitable regular commuting option for the majority of people, even with e-bikes.

Greater Dispersal

1.21 The options for Retain Green Belt would also apply to Greater Dispersal.

1.22 Greater Dispersal also includes growth in villages such as Failand, Abbots Leigh, Dundry, Portbury and Easton-in-Gordano. Some of these growth areas can tie into strategic routes, e.g. Portishead to Bristol Route 41, although the surfacing and width of this route can make it unattractive, particularly in winter months. Furthermore, distances involved are likely to limit the potential for mass uptake of active travel for commuting trips into Bristol.

1.23 Making this Strategy an attractive option for walking and cycling is likely to require reasonably substantial interventions to connect development sites to strategic routes and to improve the strategic routes themselves. Many of the rural roads around the dispersed growth areas have high traffic speeds, and therefore segregated provision would likely be required to provide inclusive cycle routes. Creating local connections for this pattern of growth will be important to enabling a range of trips to be undertaken on foot and by cycle, i.e. a network of local connections can support shopping, education and leisure trips.

Summary of measures

1.24 In summary, the following combination of catalytic enablers are considered to improve the sustainability of both Retain Green Belt and Greater Dispersal Strategies in terms of Objective 2:

- High quality segregated cycle route between Churchill and Weston-super-Mare, via Banwell and other villages;
- Longer distance cycle route between Churchill and Bristol; and
- Network of local connections for growth areas with Service Villages and Main Towns.

1.25 It should be noted that it is not possible to update the PCT tool to include the measures suggested above. Therefore, the PCT score for existing cycling levels has been retained, and reasonable professional judgement applied to the “Go Dutch” and “E-bikes” scenario scores to reflect the potential for measures referenced to improve future cycling levels.

Objective 3: Public Transport

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

i. How accessible are the strategies to the nearest rail stations by foot/ bicycle?

j. How accessible is the bus network from the growth areas?

k. Does the strategy align with existing and planned Public Transport schemes? (e.g. LRT, MRT, P&R etc)

Retain Greenbelt

1.26 The key issues with this Strategy in terms of access to rail is that significant levels of growth in the central southern part of the District are not located close to rail stations. It is highly unlikely to be feasible to create a new rail link to serve development in the Churchill area, and therefore this has been discounted as an enabling option.

1.27 The best option to provide access to rail services is likely to be to utilise strategic active travel infrastructure, or bus services, to reach an existing station. In terms of active travel, connections to the Strawberry Line to reach Yatton is likely to be the best

option for Churchill and the dispersed surrounding growth areas. This would likely need some improvements to the Strawberry Line itself to make it attractive to rail passengers. However, it is unlikely that this would be an attractive option in comparison with car use and/or an improved bus service.

1.28 Development in the Banwell area could connect well into the Weston-super-Mare bus network to support trips to Weston-super-Mare. It may be possible to access bus services on the A370 corridor, depending on the exact location of development. Therefore, this part of the Strategy would need relatively limited improvements to perform well.

1.29 The issues with the Retain Green Belt Strategy from a bus access perspective is that the A38 is relatively poorly served by public transport, impacting a number of potential growth areas on this corridor. To score comparably with Urban Focus and Transport Corridors, improved bus services between Churchill and Bristol along the A38 would be needed. These services would need to be viable in the long term, at a reasonable frequency. There could be a good case should these routes extend to also serve Weston-super-Mare, supporting growth to the south and east of Weston-super-Mare, including Banwell. This would form an additional bus corridor between Weston-super-Mare and Bristol to the existing services on the A370.

1.30 Whilst a benefit to wider public transport connectivity, there would need to be consideration of inter-relationships between corridors, e.g. to what extent would A38 patronage be new or diverted from the A370. Furthermore, the need for bus priority measures to support an improved A38 bus service would need to be investigated.

1.31 Extending the Weston-super-Mare bus network to connect with Churchill is likely to be the more viable early delivery option for development at Churchill. This would be valuable for a range of trip types, but may be less effective for commuting trips than an attractive frequency service into Bristol.

1.32 Future routes along the A38 could benefit from, or support, potential Metrobus or Mass Transit proposals which may extend as far as the Airport. However, these future projects are unlikely to be in place towards the beginning of the plan period. The potential to tie into these projects has been included within the original Appraisal exercise set out in Chapter 5.

1.33 There would remain some growth which is relatively poorly connected by bus, but these mitigation measures described above, if available early in the plan period, could result in an overall positive bus accessibility score.

Greater Dispersal

1.34 Improvements set out under Retain Green Belt would apply, although this strategy would have a reduced ability to support bus services commercially due to dispersed growth and a lower scale of development along the Weston-super-Mare – Banwell – Churchill – Bristol axis.

1.35 Some dispersed growth will benefit from access to bus and rail services by its location, although there will be a high level of development which will not. Dispersed growth makes it difficult to achieve critical mass to deliver new services, particularly at an attractive frequency.

1.36 It may be that a Demand Responsive Transport (DRT) or Mobility Hub model could be options to serve multiple dispersed locations and connect into higher frequency corridors or Park & Ride. This could potentially include connecting with a Mass Transit route between Bristol City Centre and the Airport, albeit much of the development is a significant distance from the Airport. However, it is difficult to be sure of whether this is deliverable and viable, and the level to which it could be effective, at this stage. To enable this Strategy to score positively, a DRT/Mobility Hub Strategy would need to be

in place and highly effective from early in the Plan period, and there is significant doubt as to whether this is achievable.

Summary of measures

1.37 In summary, the following combination of catalytic enablers are considered to improve the sustainability of both Retain Green Belt and Greater Dispersal Strategies in terms of Objective 3:

- Extension of Weston-super-Mare bus network and integration with development locations on the A371 and A368;
- Good quality bus service between Weston-super-Mare and Bristol on the A38 via Banwell and Churchill, of a comparable quality to the existing A370 bus corridor. To potentially include bus priority measures and linkages with Metrobus and Mass Transit projects; and
- Mobility Hub/Demand Responsive Transport (DRT) Strategy to connect rural areas to bus and rail corridors. This would need to be more extensive for Greater Dispersal than Retain Green Belt, but would be a benefit to both Strategies.

Objective 4: Traffic Impact

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.

l. Are growth areas in the strategy likely to impact on congestion hotspots, in terms of both capacity and safety?

m. Are there any schemes that mitigate existing highway issues near growth areas in the strategy?

n. To what degree is traffic from growth areas likely to impact on environmentally sensitive areas?

1.38 At this stage in the Local Plan process, it is difficult to quantify the performance of Strategies against this objective as it is not proportionate to utilise a traffic model and to examine congestion locations in detail; this will be undertaken in subsequent stages of work. Analysis is therefore necessarily qualitative. Considerations include the likelihood of development to be car reliant, dispersal or focusing of impacts, and mitigation schemes which are identified as “more than likely” or “near certain.”

1.39 Congestion hotspots and areas of congestion are reasonably well spread through the District and include locations on the A370 and A38, routes into Bristol and Weston-super-Mare, and M5 Junctions 19 & 21. Given this spread, all strategies are likely to have a level of impact on congestion. Whilst traffic will originate from a range of locations, longer distance trips are likely to funnel through congestion points on radial routes. Furthermore, the scale of traffic impact is likely to be heavily influenced by the degree to which car trips can be minimised.

1.40 Appraisal scoring ranges from slight positive to slight negative against this Objective, as the lack of quantitative analysis means that there is not sufficient certainty in performance of strategies to apply either strong positive or strong negative scores. It is therefore reasonable that catalytic enablers would only need to bring poorly scoring strategies up to a neutral level, rather than slight positive as per other objectives.

Retain Greenbelt

1.41 This Strategy scores positively in terms of mitigation due to the scale of development in proximity to the Banwell Bypass, and therefore no further measures are needed as catalytic enablers.

1.42 The Strategy scores poorly on traffic impact in terms of congestion and on the environment, with car reliance being a key factor in achieving a poor score. Therefore,

measures set out under other Objectives would need to score sufficiently positively to address this.

1.43 There is likely to be a high level of car reliance for trips into Bristol, and measures would need to achieve significant mode shift to make the Retain Green Belt Strategy comparable with Strategies with developments near the edge of Bristol. The proximity to a large city has a greater potential for active travel and public transport.

1.44 The impact on the environment is predominantly a result of greater environmental sensitivity in the south of the District, correlating with greater levels of growth. Urban Focus and Transport Corridors would funnel trips directly onto arterial routes and be less likely to result in traffic in more sensitive areas. Mitigation is likely to need to include ensuring direct connections onto the A38 and higher order roads. This is likely to be reasonably achievable for larger growth areas, but may be more challenging for more dispersed growth away from the main corridors.

Greater Dispersal

1.45 The same principles apply to mitigation for this Strategy as for Retain Green Belt. However, the scale of measures needed is likely to be greater due to more dispersed growth inducing higher levels of car reliance. Conversely, the lower scale of development at Churchill in Greater Dispersal, compared with Retain Green Belt, may be a potential limiting factor in deliverability of measures as gaining critical mass would be more challenging.

Summary of Measures

1.46 In summary, the following combination of catalytic enablers are considered to improve the sustainability of both Retain Green Belt and Greater Dispersal Strategies in terms of Objective 4:

- Delivery of measures identified under Objectives 1-3 to reduce car reliance; and
- Measures to provide direct access to higher order roads, in order to reduce use of more environmentally sensitive roads.

1.47 Stages 4 and 5 of the Local Plan process will include more detailed analysis of traffic impact. It is recognised that study of mitigation for traffic impacts has not taken place for any of the Strategies, other than consideration of existing schemes.

Feasibility of Measures

1.48 The feasibility of delivering catalytic enablers is also a factor when considering their application within decision making for the Preferred Spatial Strategy. This will assist in determining whether the improvements are deliverable and the potential scale of time and cost implications:

i. The cost required to deliver enabling measures is likely to have an impact on the scale of mitigation which can be provided for the Local Plan as a whole, and thus has a potential impact on the sustainability of the Plan.

ii. Time required to implement enabling measures has a potential impact on the rate of housing which can be delivered. This represents a risk to housing targets, and/or may necessitate some housing being delivered prior to enabling measures, at sub-optimal levels of sustainability.

1.49 Table 1 below summarises the feasibility of the catalytic enabler measures. Whilst there is a significant level of overlap between Strategies, there are differences and therefore separate columns are provided for each.

Table 1: Feasibility of Catalytic Enabling Measures

Obj.	Catalytic Enabling Measure	Retain Green Belt (RG)	Greater Dispersal (GD)
1	Significant increase in facilities at Churchill to the level of a Main Town.	Requires a substantial uplift in employment, retail and leisure. Commercially challenging to deliver, and sustain, alongside 1500-3000 homes. If achievable, delivery is likely to be reliant on housing growth, and therefore unlikely to be in place early in the Plan period. Unlikely to be a feasible prospect to achieve sufficient levels of self-containment for a number of years, if at all.	As per RG, with further challenges in that fewer homes (500-1500) would be available to sustain this level of facilities and services.
	Increases in facilities at villages where growth is proposed.	Multiple, small-scale locations, but requiring relatively modest increases in day to day facilities. Potentially achievable at some of the village locations. If commercially deliverable, it may be feasible to deliver reasonably early in the Plan period, albeit not likely to be on Day 1. Commercial viability and sustainability likely to be the main risk to delivery.	As per RG, but will require significantly more locations, adding risk that many will not be deliverable. Unlikely to be able to deliver a sufficient level and range of services and facilities in multiple locations so as to be comparable with other Strategies.
	Central district secondary school at Yatton/Congresbury.	Significant uncertainty at this stage. Feasibility is unknown, and a suitable site, funding and delivery mechanism is yet to be identified Likely to rely on contributions from development as it is delivered. Therefore timescale may be dependent on housing trajectory, and thus not a Day 1 measure.	As per RG. However, development in Nailsea and Backwell is likely to be a key funding source for this, and therefore lower levels of development in these areas presents a further risk to financial viability and deliverability.
	Sufficient financial investment in Broadband to ensure high levels of connectivity.	It is assumed that this can be addressed solely through financial investment, and is deliverable on Day 1. There may be feasibility and programme implications, but for the purpose of a robust assessment it is assumed at this stage that cost is the only pertinent factor.	As per RG. Cost outlay is likely to be higher due to dispersal of growth, but this has not been factored against this strategy.

Obj.	Catalytic Enabling Measure	Retain Green Belt (RG)	Greater Dispersal (GD)
2	High quality segregated cycle route between Churchill and Weston-super-Mare, via Banwell and other villages.	NSC has identified that sections of cycle infrastructure are likely to be delivered through Locking Parklands, HIF enabled development east of the M5, and alongside the Banwell Bypass. This reduces the level of additional sections which would be required to provide a joined-up, safe active travel route. Notwithstanding this, measures such as this have the potential to involve multiple land ownerships, stakeholders and consultation. This can add significant lengths of time to planning and delivery and present risks to deliverability. Likely to be a moderately costly measure, but potentially fundable if it unlocks a large scale of development in a sustainable manner. Potential risk to the availability of further funds for other mitigation measures. Notwithstanding this, a forward funding arrangement would be needed to deliver as early as possible in the Plan period. Potential cumulative benefit in terms of linking the Strawberry Line to Weston-Super-Mare.	As per RG, but lower level of development to support the case for this measure.
	Longer distance cycle route between Churchill and Bristol.	Limited potential to achieve large scale cycling uptake due to the distances involved. Would require substantial investment for relatively limited patronage for a route along the A38, with similar risks to above. The Strawberry Line and Festival Way route would require significantly fewer improvements to deliver a safe route between Churchill and Bristol. However, surfacing and sharing with pedestrians affect the attractiveness of the route for potential commuter cyclists. To address these points is likely to require significant financial investment, and may not be desirable to a range of stakeholders.	As per RG, but lower level of development to support the case for this measure.

Obj.	Catalytic Enabling Measure	Retain Green Belt (RG)	Greater Dispersal (GD)
	Network of local active travel connections for growth areas with Service Villages and Main Towns.	Multiple connections would need to be identified and routes would need investigation. At this stage it is difficult to say whether such a network is deliverable and at what timescale and cost. However, given the scale of NSC's ambition to addressing the Climate Emergency, it is a reasonable assumption for the purpose of this exercise that this measure could be prioritised for relatively early in the Plan period. There is a risk at this stage that parts of this network may not be deliverable, and that there will be a cost implication which could ultimately affect the deliverability of other mitigation measures.	As per RG, but the extent of active travel connections needed would be significantly greater. This presents greater cost, timescales and deliverability risks.
3	Extension of Weston-super-Mare bus network and integration with development locations on the A371 and A368.	A modest extension to some routes would be needed to connect development east of the M5 with Weston-super-Mare. The level of service would increase over time, but an initial service should be available on Day 1 for Banwell development. Financial investment and commercial negotiation would be needed to extend to Churchill, although over time an improved level of service is likely to have the potential to be viable. Care would need to be taken to avoid impacting on levels of service for places such as Winscombe, Axbridge and Cheddar.	As per RG, although lower potential to achieve an attractive and commercially viable service level to Churchill due to a lower level of planned development.

Obj.	Catalytic Enabling Measure	Retain Green Belt (RG)	Greater Dispersal (GD)
	Good quality bus service between Weston-super-Mare and Bristol on the A38 via Banwell and Churchill, of a comparable quality to the existing A370 bus corridor.	The A370 is a well-established bus corridor serving multiple destinations between Weston-super-Mare and Bristol, including Worle, Congresbury, Cleeve, Backwell, Farleigh and Flax Bourton. There are also bus priority measures along the A370 into Bristol. By contrast, there are relatively few comparable settlements between Churchill and Bristol along the A38, and most bus routes serve the Airport. Despite the absence of detailed analysis, it is reasonable to assume that it would be significantly commercially challenging to deliver a comparable level of service to the A370, along the A38. Furthermore, if such a service was deliverable, it would be unlikely to be in place at an attractive frequency until a substantial number of houses had been occupied at Churchill, and significant pump priming would be needed. Analysis would be needed on the potential effects on the bus network as a whole, including the extent to which trips between Weston-super-Mare and Bristol would use the A38 rather than the A370. Bus priority requirements, the potential to tie into schemes such as Metrobus and Mass Transit, and the ability to attract patronage from dispersed locations near the corridor, would need to be investigated and delivered as required	As per RG, but with a significantly lower potential to deliver an attractive and commercially viable service level to Churchill due to a lower level of planned development.
	Mobility Hub/Demand Responsive Transport (DRT) Strategy to connect rural areas to bus and rail corridors.	Significant feasibility work would be needed into the design and effectiveness of such a strategy. At this stage there are a significant number of unknowns.	As per RG, but would require greater reliance on such a strategy being both deliverable and effective, presenting a greater level of risk.
4	Delivery of measures identified under Objectives 1-3 to reduce car reliance.	As per individual measures above.	As per individual measures above.

Obj.	Catalytic Enabling Measure	Retain Green Belt (RG)	Greater Dispersal (GD)
	Measures to provide direct access to higher order roads, in order to reduce use of more environmentally sensitive roads.	Appropriate access strategies will be needed for any development sites coming forwards. Lower levels of dispersal than GD suggests that relatively minor investment and/or selection of optimal sites, is likely to be able to minimise the use of lower order, more sensitive roads.	Greater levels of dispersal increases the risks of traffic using inappropriate, environmentally sensitive roads. It may be possible to address this through site selection and access strategies, but the risk is greater and this could require higher levels of financial investment in access infrastructure.

Summary

1.50 This Technical Note has considered the potential enabling measures required to act as mitigation for poorly performing Strategies. This has considered what such measures may entail, how effective they would be, and deliverability. Performance of the Strategies with enabling measures is presented in the Stage 3 TA main report. Significant risks have been identified in terms of deliverability, cost/viability, and the ability to implement measures sufficiently early in the Plan period.