



GLOUCESTERSHIRE SLP
AUTHORITIES SUSTAINABLE
TRANSPORT STRATEGY
*Broad Site Assessment
Report*



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1 Introduction

This report has been prepared by City Science to provide an overview of the transport evidence base that supports the emerging Strategic & Local Plan (SLP). The SLP is being developed by the local authorities of Gloucester City Council, Cheltenham Borough Council and Tewkesbury Borough Council (‘the SLP authorities’) to key stakeholders.

This stage, which is further detailed alongside the wider process (see Section 1.2.1.1), comprises a robust assessment of draft Housing and Economic Land Availability Assessment (HELAA) sites for the SLP area across a range of Development Scenarios. This assessment has been undertaken against six broad spatial strategy options known as ‘development scenarios’, through the development of a bespoke assessment framework. This framework comprises a number of transport planning objectives, sub-objectives and metrics which have been developed in an interactive process through extensive stakeholder engagement.

1.1 Background

The Joint Core Strategy (JCS) 2011 – 2031 was adopted by the SLP authorities in December 2017. The emerging SLP will allocate land for future new housing and employment development and identify the necessary infrastructure to support their delivery. An area map for the SLP is illustrated in Figure 1-1.

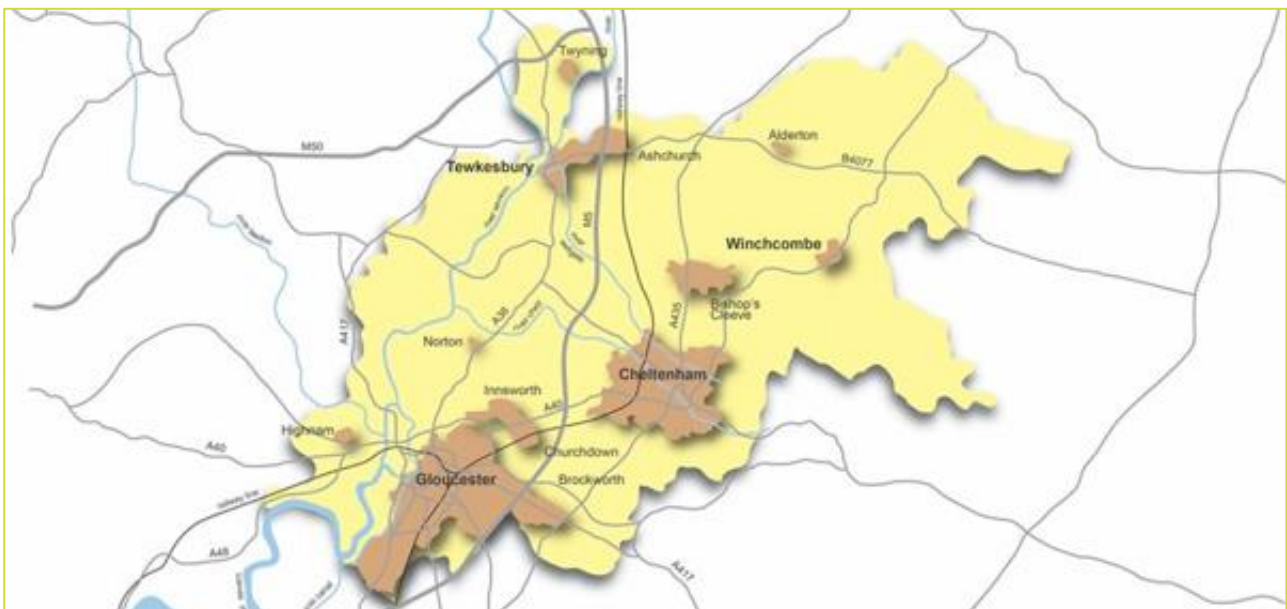


Figure 1-1: SLP Area (Source: [Joint Core Strategy](#))

Development of the SLP commenced in 2023. Although the process is currently at a preliminary stage, it is envisaged that it will be further developed over the coming years before a potential submission to the Secretary of State prior to adoption. Key milestones in the SLP process, as set out within the current Local Development Scheme¹, are illustrated in Table 1-1.

Milestone	Date
Consultation on Development Scenarios and Key Policy Areas (Regulation 18)	December 2023
Consultation on Preferred Options (Regulation 18)	March 2025
Consultation on Pre-Submission (Regulation 19)	January 2026
Submission to Secretary of State (Regulation 22)	April 2026

Table 1-1: SLP Local Development Scheme Key Milestones

¹ Local Development Scheme, TBC, 2023, [Local-Development-Scheme-July-2023.pdf \(tewkesbury.gov.uk\)](#)

1.2 Transport Evidence Base

In line with national planning policy requirements, a transport evidence base is required to support the delivery of the SLP. This evidence base is required to be robust and satisfy the requirements of various key stakeholders including Gloucestershire County Council (GCC) (as the local transport authority) and National Highways (as the Strategic Road Network (SRN) authority). The evidence base will also be considered as part of a future SLP examination process.

1.2.1.1 Transport Evidence Base

As part of development of the emerging SLP, City Science has been commissioned to provide the transport evidence base. The transport evidence base process comprises four steps which are outlined in Table 1-2.

Step	Overview
Step 1. Develop transport objectives	<ul style="list-style-type: none"> Develop transport objectives to determine their alignment with the key principles in the SLP. Produce measurable metrics.
Step 2. Produce updated transport evidence	<ul style="list-style-type: none"> Develop transport evidence base that supports the emerging SLP.
Step 3. Development Scenarios Assessment	<ul style="list-style-type: none"> Undertake spreadsheet-based modelling (e.g. use of Integrated Spreadsheet Model (ISM)) to assess the six development scenarios from a transport perspective. Undertake assessment of the development scenarios using Gloucestershire Carbon Calculator.
Step 4. Preferred Option Transport Strategy	<ul style="list-style-type: none"> Undertake detailed modelling using the SATURN model of preferred spatial strategy. Identify impacts of preferred spatial strategy of development on the existing network. Identify infrastructure schemes that may be required to enable or support preferred spatial strategy. Identify environmental impact, including carbon emissions, of spatial strategy.

Table 1-2: SLP Transport Evidence Base Steps

1.3 Purpose of this Report

The purpose of this **Broad Site Assessment Report** is to summarise the outcomes from the Broad Site Assessment in support of the first Regulation 18 consultation for the emerging SLP. It sets out the outcomes from the high-level assessment of HELAA sites which have been robustly assessed against each of the identified transport planning objectives and their sub-objectives, using a variety of quantified metrics.

The remainder of this report is structured as follows:

- **Chapter two** details the approach and methodology adopted for the Broad Site Assessment.
- **Chapter three** presents each of the identified transport planning objectives, their associated sub-objectives and metrics. It details the process for how each metric has been developed, including their development process and data sources that have been utilised.
- **Chapter four** presents the outcomes of the Broad Site Assessment for each of the development scenarios against each transport planning objective and sub-objective. It also provides a summary of the overall performance of the development scenarios against all four of the transport planning objectives alongside advantages and disadvantages for each development scenario.
- **Chapter five** presents the conclusions of the Broad Site Assessment, outlining recommendations whilst also setting out the next steps of the transport evidence base for the emerging SLP.

2 Broad Site Assessment Methodology

2.1 Sites & Development Scenarios

Various sites have been submitted to the SLP authorities for consideration as development options. These sites are shown in the separate accompanying evidence base known as the HELAA.

The HELAA is a preliminary assessment, including mapping, of individual sites which have been submitted to the SLP Authorities for consideration as development options. It is important to note, however, that the inclusion of land on any accompanying maps or diagrams does not mean it is to be regarded as suitable or even available for development; nor that it will be supported by the Local Planning Authorities. Decisions on preferred options for any sites and locations will only emerge at later stages in the plan-making process.

The draft HELAA sites have been aligned (rather than categorised) against the development scenarios where they are deemed to best fit. It is important to clarify that the sites are aligned for the purposes of performing this assessment and to inform site assessment. Due to the draft nature of the HELAA sites at this stage of the emerging SLP process, the assessment has been undertaken to gauge initial disadvantages and advantages, from a transport perspective, when assessed against each of the transport planning objectives and associated sub-objectives. The draft HELAA sites have been aligned against the six development scenarios (see Table 2-1). Scenarios relate to either a broad geographic location or where a new strategic settlement is proposed, where the associated draft HELAA site(s) could enable their delivery.

1. Urban Concentration	This option would involve much more intense development than would traditionally be expected on urban sites in Gloucester and Cheltenham, particularly on previously developed land. This would include substantial increases in densities; higher buildings even in more sensitive areas such as Conservation Areas; conversions or rebuilding of retail or other town centre properties into housing or mixed-use schemes. This Development Scenario underpins the remainder of the Scenarios. For the purposes of this assessment, they have been assessed separately to eliminate any inflated outcomes from the assessment for the other Scenarios.
2. Urban Extensions	This option would mean seeking to deliver development as urban extensions to the key urban areas of Cheltenham and Gloucester and could include sites which fall within the designated Green Belt. The development strategy of the JCS focused on such extensions as a means of meeting some of the housing needs of Gloucester and Cheltenham. In addition, several areas of land were removed from the Green Belt and “safeguarded” for longer term development needs. Urban extensions may be one of the most effective ways of supporting high quality public transport infrastructure such as the Mass Rapid Transit scheme proposed in GCC’s Local Transport Plan. Nevertheless, it will need to be demonstrated through the SLP if new urban extensions, including the previously ‘safeguarded’ sites, should form part of the preferred development strategy for the SLP area.
3. Urban Extensions, avoiding the Green Belt	This option means seeking to deliver development as urban extensions to the main settlements in the area but avoiding the Green Belt. This scenario has been identified because the government attaches great importance to Green Belt and the NPPF makes clear that its boundaries should only be altered where exceptional circumstances to do so are fully evidenced and justified through a Local Plan. For this reason, the role of the Green Belt in planning for long-term growth is subject of much national debate. Given the existing Green Belt is concentrated around Gloucester and Cheltenham, and between Cheltenham and Bishops Cleeve, it is appropriate to explore, as part of this consultation, the merits and consequences of a strategy which would support urban extensions to the main urban areas but excluding designated Green Belt land. The inclusion of this scenario is not to say that Green Belt considerations are of any greater significance than protected areas such as the Area of Outstanding Natural Beauty, or Sites of Special Scientific Interest. However, such designations have statutory protection whereas Green Belt land is, as a matter of national policy, designated as a means of managing urban growth, rather than providing environmental protection. This scenario would include land which was previously removed from the Green Belt in the SLP and ‘safeguarded’ to meet longer term needs

4. New Strategic Settlements	<p>This option means seeking to deliver development through one or more comprehensive, master-planned new settlements, of a minimum of around 4,000 new homes with supporting infrastructure. Currently, three such potential locations have been identified based on information submitted on behalf of landowners/promoters. The locations are around Boddington on land to the south of the A4109 between the A38 and M5 corridors. A further potential option is presented straddling the boundary of Tewkesbury Borough and the Forest of Dean between Churcham and Highnam in the diagram below. One of the options south west of the SLP area. The third option lies to the east of the M5 at Ashchurch on the edge of the built-up area of Tewkesbury.</p> <p>The latter option – the Tewkesbury Garden Town – was awarded Garden Town status by the Government in 2019. In this context, Tewkesbury Borough Council is currently establishing a programme to work with local people and to plan for a large sustainable new settlement consisting of a wide mix of homes together with the supporting infrastructure required such as schools, health, transport, green infrastructure and other community facilities. Gloucestershire County Council and National Highways are also, as the relevant local highway authorities, drawing up detailed proposals for major improvements to Junction 9 (M5). This would both address existing recognised pressures on the strategic road network as well as potentially provide the additional road capacity necessary to support the development of the proposed Garden Town. The overall planning merits of the proposed Tewkesbury Garden Town will be assessed formally through this SLP process alongside other development options being promoted by others as part of the overall development strategy for the Cheltenham – Tewkesbury – Gloucester area.</p>
5. Rural	<p>This option means distributing growth widely across the rural area by encouraging development at many existing settlements and potentially other rural locations (such as redundant industrial sites or farm complexes). This would mean the smallest of hamlets and villages could contribute to meeting overall development needs, even where they are not currently recognised in the SLP settlement hierarchy as Rural Service Centres or Service Villages. A</p>
6. Sustainable Transport	<p>This option means delivering development in locations along existing and potential high frequency public transport, walking and cycling routes. It draws on the broad objectives of Gloucestershire County Council as the body responsible for managing road and public transport networks. The Local Transport Plan, in particular, promotes sustainable travel. Development under this scenario would need to be integrated in, or linked to, the Gloucestershire cycle spine and the proposed Gloucestershire Mass Rapid Transport system, which is a longer-term aspiration. Furthermore, all the local authorities in Gloucestershire have agreed a Statement of Shared Intent to in principle to reduce carbon emissions from transport in line with science-based targets to achieve net zero ambitions by 2050. Adopting a sustainable transport strategy as part of the SLP would therefore mean prioritising new sites for housing and economic development in locations which would maximise people’s choice to travel by means other than the car to success services, facilities and jobs. This would also tend to reduce the need to travel at all and would help reduce carbon emissions.</p>

Table 2-1: Development Scenarios

For each of the potential new strategic settlements that form development scenario 4, no assumptions have been made regarding the potential delivery of supporting transport infrastructure or key services. All six scenarios include an assumption that the existing urban capacity of Gloucester and Cheltenham would be included.

The assessment results are presented by development scenario as a way of summarising, at a broad level, how the draft HELAA sites perform.

The location of the HELAA sites by Local Planning Authority across the SLP area is shown in Figure 2-1. The images presented overleaf detail the location of the HELAA sites across each development scenario.

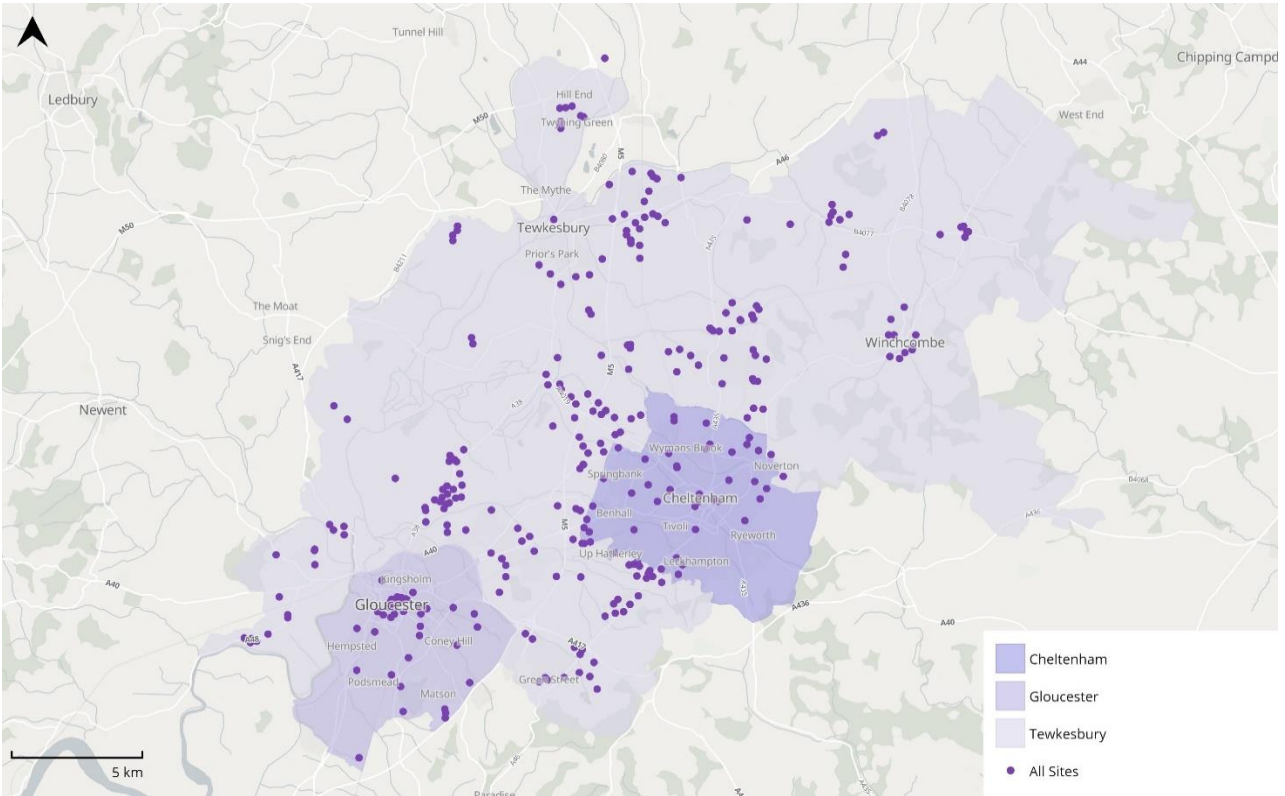


Figure 2-1: HELAA Sites (per Local Planning Authority) Across the SLP Area

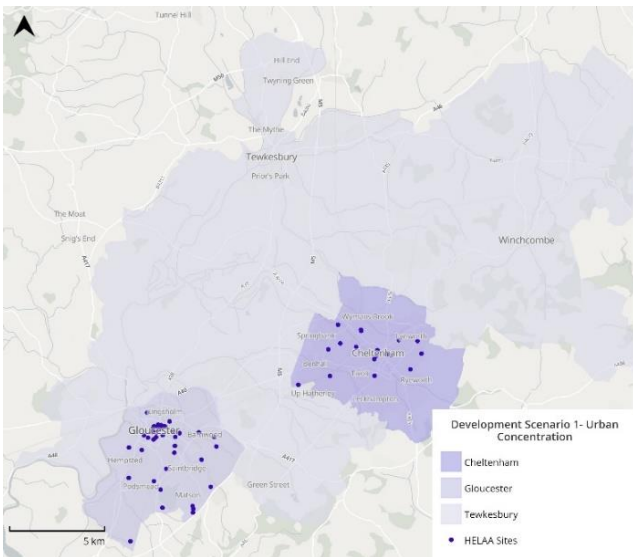


Figure 2-2: Development Scenario 1

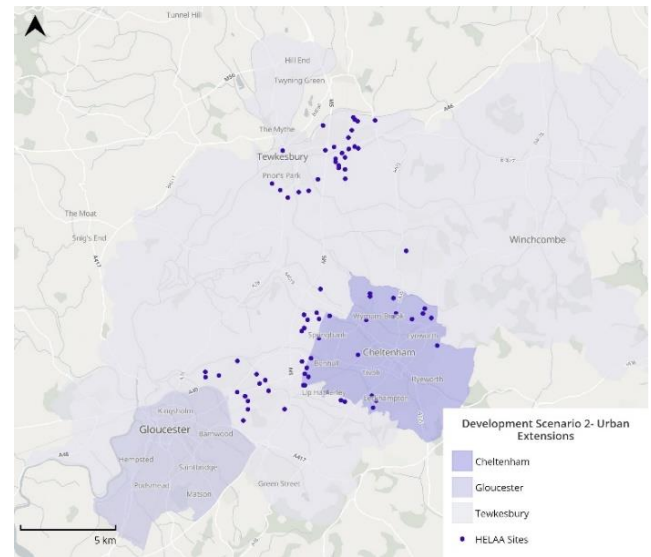


Figure 2-3: Development Scenario 2

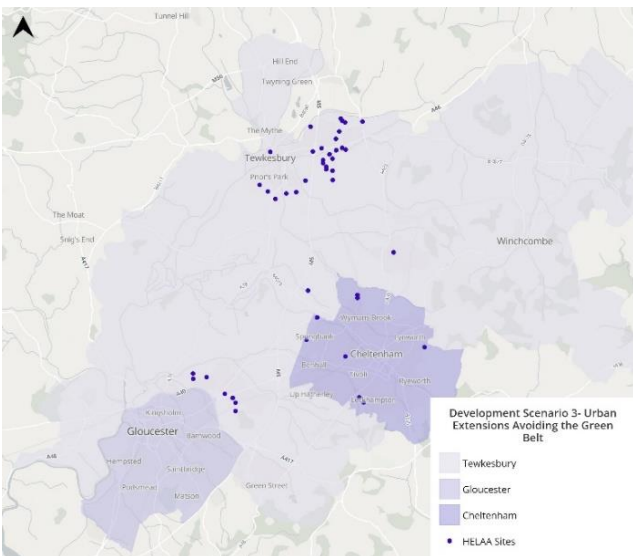


Figure 2-4: Development Scenario 3

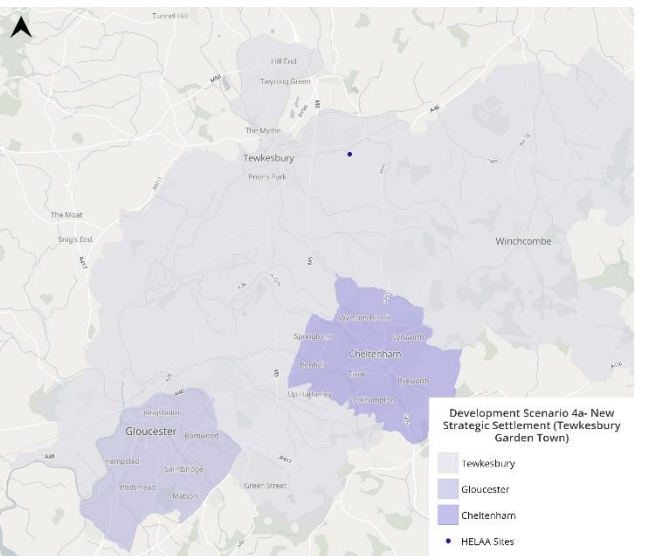


Figure 2-5: Development Scenario 4a

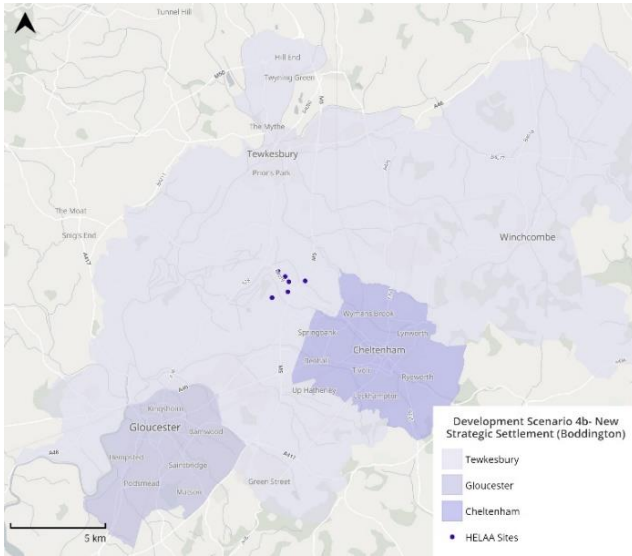


Figure 2-6: Development Scenario 4b

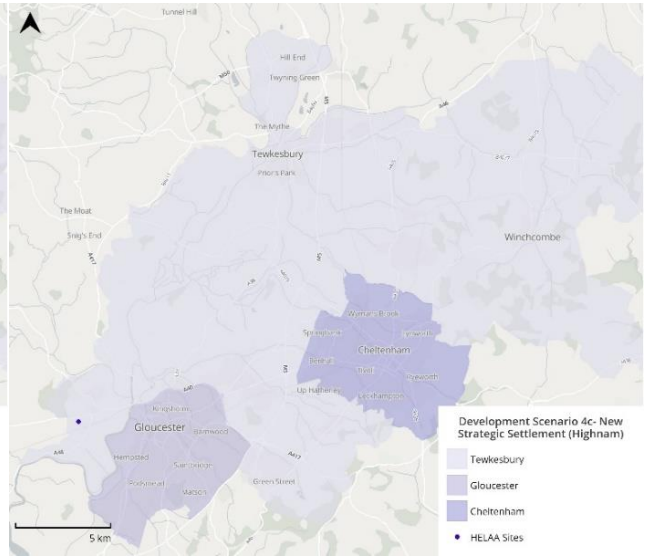


Figure 2-7: Development Scenario 4c

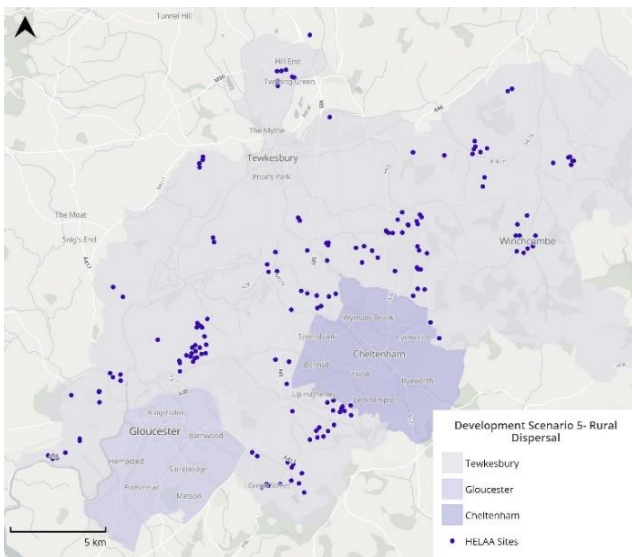


Figure 2-8: Development Scenario 5

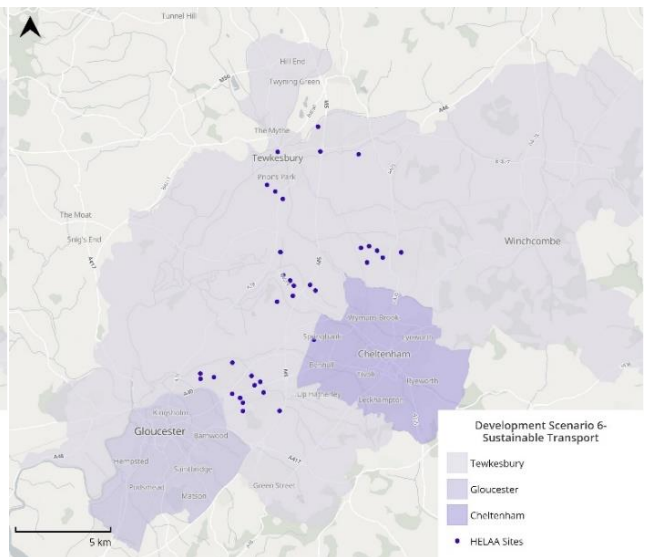


Figure 2-9: Development Scenario 6

2.2 Objectives, Sub-Objectives & Metrics

The Broad Site Assessment is centred around four objectives and eight sub-objectives that underpin the Strategy. These were informed by engagement with GCC, National Highways and other relevant stakeholders, to gain input and ensure that the objectives reflect the priorities of those who will be involved in the delivery of the SLP. The agreed objectives, and related sub-objectives and metrics are outlined in Table 2-2.

Despite being numbered, the objectives are not ranked in any particular order and are numbered simply for ease of reference.

Sub-Objective	Metric
Objective 1 - Reduce Travel Need & Journey Distances	
Maximise access to key services, such as schools, employment, healthcare, and retail, within local communities	Access to key services, including schools, employment, healthcare, and retail within a 20-minute walk
	Access to key services, including schools, employment, healthcare, and retail within a 20-minute cycle
	Access to key services, including schools, employment, healthcare, and retail within a 20-minute public bus journey
Reduce the need for and regularity with which people make journeys of all types	<i>To be addressed at future steps of the study (i.e. Steps 3 and 4)</i>
Objective 2 - Facilitate Viable & Genuine Alternatives to the Private Car	
Ensure commercial viability of public transport through appropriate dwelling density	<i>To be addressed at future steps of the study (i.e. Steps 3 and 4)</i>
Increase public transport mode share for journeys across and out of the SLP area	Number of jobs within a 30-minute public bus journey (door to door)
	Access (walk time) to existing high-quality bus services (based on 30-minute frequency)
	Access (walk and cycle time) to existing railway stations
	Direct access to nearest urban centre by public bus within 30 minutes
Consider bespoke shared transport solutions to connect rural communities to local hubs	<i>To be addressed at future steps of the study (i.e. Steps 3 and 4)</i>
Objective 3 - Deliver Inclusive Community Health & Wellbeing	
Increase active travel mode share for all journeys and journey purposes, including leisure journeys	Cycling infrastructure within a 10-minute cycling journey
	Walking infrastructure within a 10-minute walking journey
	Access to open space within a 10-minute walking journey
Facilitate the re-moding, re-timing & re-routing of last-miles goods and deliveries in town or community centres	<i>To be addressed at future steps of the study (i.e. Steps Three and Four)</i>
Reduce reliance on private vehicle use for local journeys, reducing mode share and car ownership	<i>To be addressed at future steps of the study (i.e. Steps Three and Four)</i>

Sub-Objective	Metric
Objective 4 - Minimise & Mitigate the Residual Negative Impacts from Vehicular Transport	
Transition to zero emission public transport	<i>To be addressed at future steps of the study (i.e. Steps Three and Four)</i>
Minimise road and freight transport-related carbon emissions	Proximity (vehicular journey time) to the SRN junction for freight access
Maintain the safe operation of the SRN & local roads	Performance of the nearest SRN junction
Maintain the efficient operation of the SRN & local roads	Collisions on the SRN and Major Road Network (MRN) within 2km of the site

Table 2-2: Transport Strategy Objectives, Sub-Objectives & Metrics

2.3 Scoring Methodology

2.3.1 Measuring Metrics

The metrics were assessed using an evidence-based process drawing on various data sources, such as spatial data from OpenStreetMap. The most recent data was sought and has been used wherever possible. For example, OpenStreetMap was used to capture current services across the SLP area in 2023.

Data was sought to be provided by the relevant stakeholder or, if not possible, third parties. For example, SRN performance data has been provided by the Department for Transport due to there being an absence of data from National Highways for the SRN within the SLP area.

2.3.2 Scoring Methodology

The score is calculated using an existing spatial data source (e.g. location of a service) and predefined scoring ranges (e.g. quantum of access within a 20-minute walk). Scoring ranges are based on an expected level of provision and stakeholder feedback. Each site has been assessed against the identified metrics. For a given metric, each site segment (see Section 2.3.3) is scored based on its performance using a five-point scale: Very Low (0), Low (0.5), Medium (1), High (1.5) or Very High (2).

2.3.3 Site Segmentation

Where necessary, larger sites have been sub-divided. This is to avoid skewing the results as one part of a larger site may be much closer to existing transport services and infrastructure than another part of a site. This approach also reflects that larger sites are likely to be delivered in distinct phases rather than in totality from the onset.

The site segment scores are then combined across the site. However, for large sites this may not be appropriate. Previous engagement from stakeholders advised that segmentation could mask the very low or high performance of different areas within the sites, and hence these site segments should be assessed separately outside of the Development Scenarios. For the purposes of this report, scores have been averaged first across sites and then secondly across development scenarios to provide an overview of the assessment outcomes and a level of granularity proportionate to this stage of the emerging transport evidence base.

2.3.4 Isochrones

2.3.4.1 Overview

All metrics consider walking, wheeling, cycling, private vehicle and/or public bus travel times to assess accessibility. In order to do this, isochrones for the relevant mode of travel are created from each site segment’s midpoint. Isochrones are bands of equal travel time that show the extent of area that can be reached in a given travel time by a particular mode. The advantage of isochrones is that they use

actual routes that can be taken by the particular mode as opposed to straight line distances. Each isochrone is compared with relevant data to determine the accessibility to the feature being assessed, such as the presence of key services or infrastructure. It is assumed that the sites' residents will likely use their nearest services.

2.3.4.2 Walking & Cycling

Walking and cycling isochrones only assume use of the network where it is possible for that mode, e.g. pedestrians will not be able to walk on the motorway network. Existing walking, wheeling and cycling infrastructure is sourced from OSM so that realistic route choices can be modelled for these modes. Additionally, the gradient (i.e. hilliness) of routes is taken into account when calculating travel times in order to more accurately reflect real-world conditions.

These routes do however assume a straight-line route from the centre to the perimeter of the site to help mimic active travel infrastructure within the site, which cannot be currently incorporated. This approach does not consider time waiting to cross the road for these routes or the requirement to use cycling facilities (such as cycle parking and lockers).

Note that e-bikes are not taken into account in the cycle isochrones and would show a different isochrone due to speed assumptions, particularly on inclines. They have not been included due to a lack of evidence to support the existing and potential future demand for e-bikes.

2.3.4.3 Public Bus

Public transport isochrones can only currently be carried out for public bus. They comprise of walking to and from bus stops, wait times (impacted by service frequency), and the public bus journey itself. The public bus timetabled services and frequencies are sourced from the most recent the Bus Open Data Service (BODs) data.

The walking element uses walking routes to and from bus stops (as opposed to straight line distances). All other assumptions made for walking isochrones apply (see Section 2.3.4.2).

3 Broad Site Assessment Metrics

3.1 Introduction

This chapter sets out the metrics (being progressed at this stage) in relation to their sub-objective and objective, describing how they are measured and the distribution of the scores at this initial stage of the emerging SLP and its associated HELAA sites against each development scenario.

These outcomes have been presented for each development scenario to enable the results to be presented in a clear-format and to provide the opportunity to understand, at this initial stage of the process for the emerging SLP, the potential transport advantages and disadvantages.

Whilst the adopted Broad Site Assessment framework utilises a five-point scale whereby each banding is categorised by a whole number, not all the outcomes from the assessment are integers (e.g. 0,1,2) with many being reported to within a single decimal place (e.g. 0.7).

To eliminate the risk of any over / underreporting of the Broad Site Assessment results, these results have been banded into a lower bound (e.g. high) and upper bound (e.g. very high). This provides a more holistic overview of the outcomes from the Broad Site Assessment which also reflects the high-level assessment of the draft HELAA sites at this initial stage. For the purposes of the assessment, the lower bound outcomes have been used to ensure that the overall conclusions are based on conservative estimates and are therefore robust. If upperbound values were used for the final assessment, there is potential that the scale of the outcomes may be overrepresented and therefore overstate the performance of the development scenarios when assessed against each transport planning objective and sub-objectives.

3.2 Objective 1: Reduce Travel Need & Journey Distances

Metrics for Objective 1 focus on the potential for self-contained, short sustainable trips within and around the sites.

Objective	Sub-Objective	Metric
Reduce Travel Need & Journey Distances	Maximise Access to Key Services, Facilities and Amenities within Local Communities	Access to key services, including schools, employment, healthcare, and retail within a 20-minute walk
		Access to key services, including schools, employment, healthcare, and retail within a 20-minute cycle
		Access to key services, including schools, employment, healthcare, and retail within a 20-minute public bus journey

Table 3-1: Metrics for Objective 1

3.2.1 Sub-Objective: Maximise Access to key services, facilities & amenities within Local Communities

3.2.1.1 Metric: Access to Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Walk

Walking and wheeling access to key services, facilities and amenities (hereby referred to as “services”) is essential in reducing journey distances and encouraging sustainable modes, whilst encouraging self-containment within communities. For this metric, walking isochrones (as discussed in Section 2.3.4) were created for each site. The key services considered are:

- Healthcare²
- Retail³

² Any amenity that falls under clinic, hospital or pharmacy or any “healthcare” tag in OSM

³ Any building or land use that falls under retail or a “shop” tag in OSM

- Employment⁴
- Schools⁵

Scores have been derived for sites based on whether residents can access at least one of each of these key services within a 20-minute walking journey, as outlined in Table 3-2. Assuming that residents will use their nearest existing service, this metric gives an indication as to how accessible these are to those walking or wheeling.

Score	Criteria
Very Low (0)	Access to none of the services
Low (0.5)	Access to one service only
Medium (1)	Access to two of the four services
High (1.5)	Access to three of the four services
Very High (2)	Access to all of the four services

Table 3-2: Metric Scoring Criteria

Development Scenario	Access to key services, including schools, employment, healthcare, and retail within a 20-minute walk	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	Medium	High
Urban Extensions avoiding the Green Belt	Medium	High
New Strategic Settlement (Tewkesbury Garden Town)	Low	Medium
New Strategic Settlement (Boddington)	Low	Medium
New Strategic Settlement (Highnam)	Very Low	Low
Rural Dispersal	Medium	High
Sustainable Transport	Medium	High

Table 3-3: Access to Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Walk

⁴ Any land use that is commercial or industrial in OSM

⁵ Any amenity that falls under school in OSM

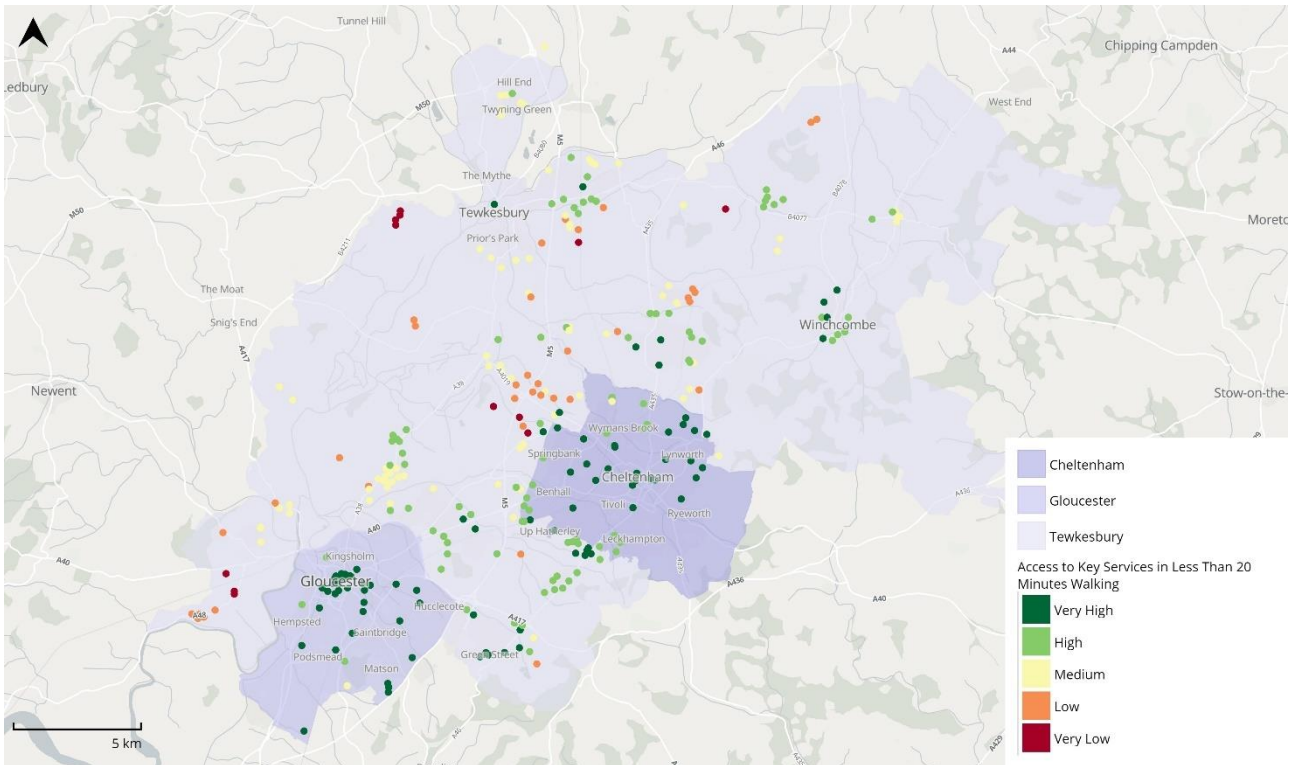


Figure 3-1: Access to Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Walk

3.2.1.2 Metric: Access to Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Cycle

This metric uses the same methodology as for services above (walking in Section 3.2.1.1), but with cycling isochrones. The metric applies the isochrones for cycling as described in Section 2.3.4.2, therefore utilising all cyclable links.

Sites are scored using the same criteria as given in Table 3-2. Assuming that residents will use their nearest service, this metric gives an indication as to how accessible existing key services are to people cycling.

Development Scenario	Access to key services, including schools, employment, healthcare, and retail within a 20-minute cycle	
	Lower Bound	Upper Bound
Urban Concentration	Very High	Very High
Urban Extensions	High	Very High
Urban Extensions avoiding the Green Belt	High	Very High
New Strategic Settlement (Tewkesbury Garden Town)	Very High	Very High
New Strategic Settlement (Boddington)	High	Very High
New Strategic Settlement (Highnam)	High	Very High
Rural Dispersal	High	Very High
Sustainable Transport	High	Very High

Table 3-4: Access to Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Cycle

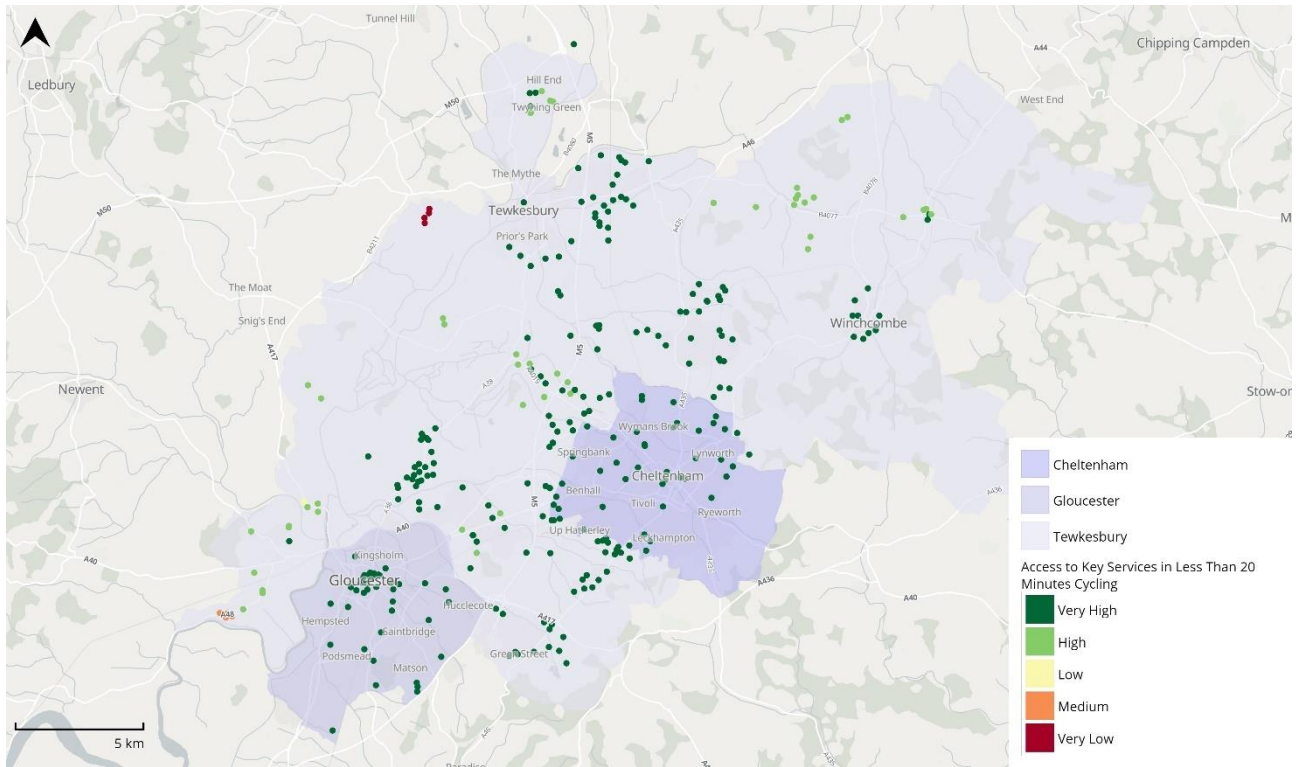


Figure 3-2: Access To Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Cycle

3.2.1.3 Metric: Access to Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Public Bus Journey

This metric uses the same methodology as for walking (see Section 3.2.1.1) and for cycling (see Section 3.2.1.2) but instead uses public bus isochrones.

The metric uses current morning peak timetabled bus services sourced from the BODS. This does not represent actual, observed public transport times and therefore does not take into account performance, for example journey time reliability or frequency of service, the latter accounted for in a separate metric (see Section 3.3.1.2).

Sites are scored using the same criteria as given in Table 3-2.

Development Scenario	Access to key services, including schools, employment, healthcare, and retail within a 20-minute public bus journey	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	High	Very High
Urban Extensions avoiding the Green Belt	Medium	High
New Strategic Settlement (Tewkesbury Garden Town)	Low	Medium
New Strategic Settlement (Boddington)	Low	Medium
New Strategic Settlement (Highnam)	Low	Medium
Rural Dispersal	Medium	High
Sustainable Transport	Medium	High

Table 3-5: Access to Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Public Bus Journey

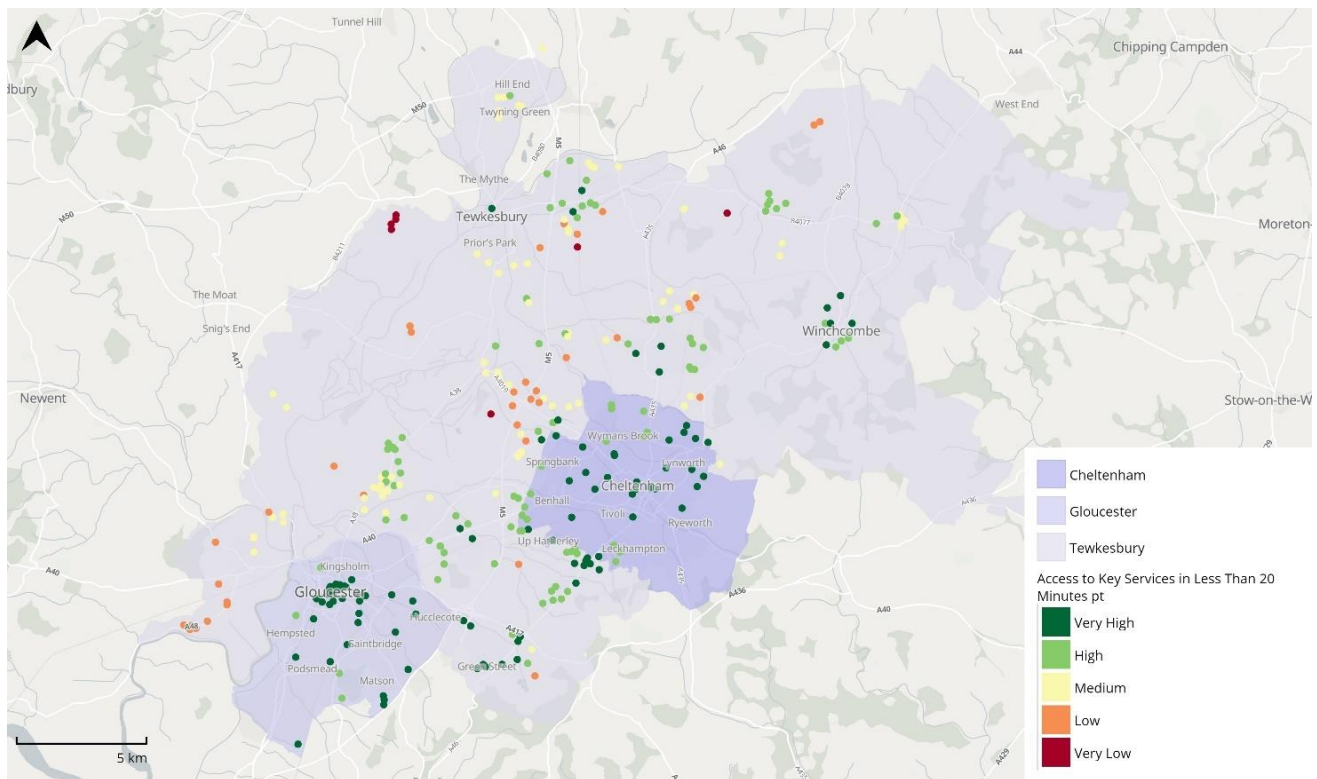


Figure 3-3: Access To Key Services, Including Schools, Employment, Healthcare & Retail Within a 20-Minute Public Bus Journey

3.3 Objective 2: Facilitate Viable & Genuine Alternatives to the Private Car

Metrics for this objective look at existing and potential public transport accessibility, including as a means to access employment, as an alternative to private vehicle use for these journeys.

Objective	Sub-Objective	Metric
Facilitate Viable & Genuine Alternatives to the Private Car	Increase Public Transport Mode Share for Journeys Across and Out of the SLP Area	Number of jobs within a 30-minute public bus journey
		Access to existing high-quality bus services
		Access to existing railway stations
		Direct access to nearest urban centre by public bus within 30 minutes

Table 3-6: Metrics for Objective 2

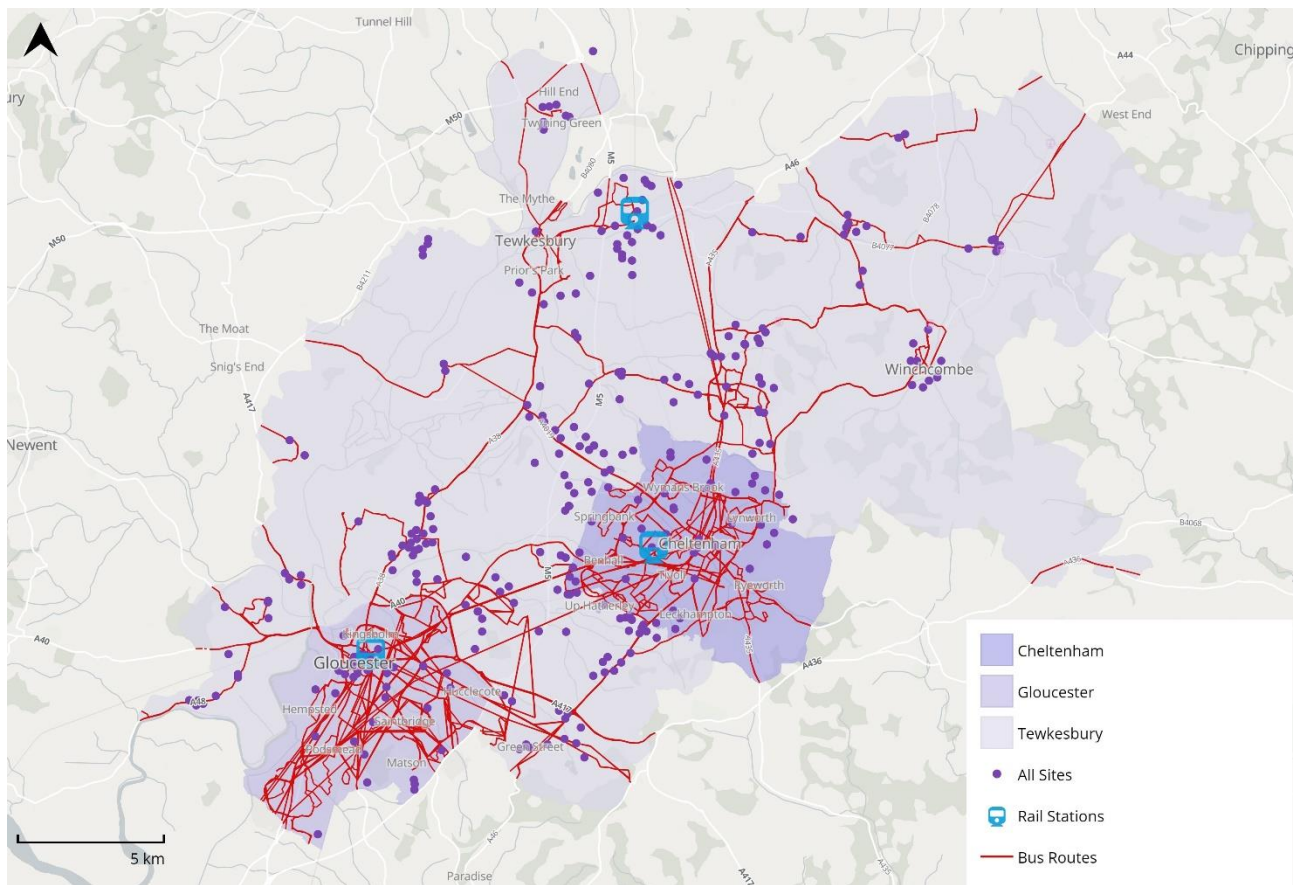


Figure 3-4: Public Transport Networks

3.3.1 Sub-Objective: Increase Public Transport Mode Share for Journeys Across and Out of the SLP Area

3.3.1.1 Metric: Number of Jobs Within 30-Minute Public Bus Journey

Public transport accessibility for commuting is relevant when considering the shift from private car, since access to jobs is a high priority as the commuting trip is a regular journey for many people. The COVID-19 pandemic has resulted in many people working from home. However, the long-term effects on commuting patterns are currently unknown. For the purposes of this assessment, we have not assumed any working from home scenarios.

This metric considers the number of jobs within a 30-minute bus journey. The same routing model and isochrones for public bus is used as in Section 3.2.1.3. For employment, the metric uses the latest available Census information at the time (2021).

Development Scenario	Number of Jobs within 30-minute Public Bus Journey	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	Medium	High
Urban Extensions avoiding the Green Belt	Medium	High
New Strategic Settlement (Tewkesbury Garden Town)	Low	Medium
New Strategic Settlement (Boddington)	Very Low	Low
New Strategic Settlement (Highnam)	Very Low	Low
Rural Dispersal	Low	Medium
Sustainable Transport	Medium	High

Table 3-7: Number of Jobs Within 30-Minute Public Bus Journey

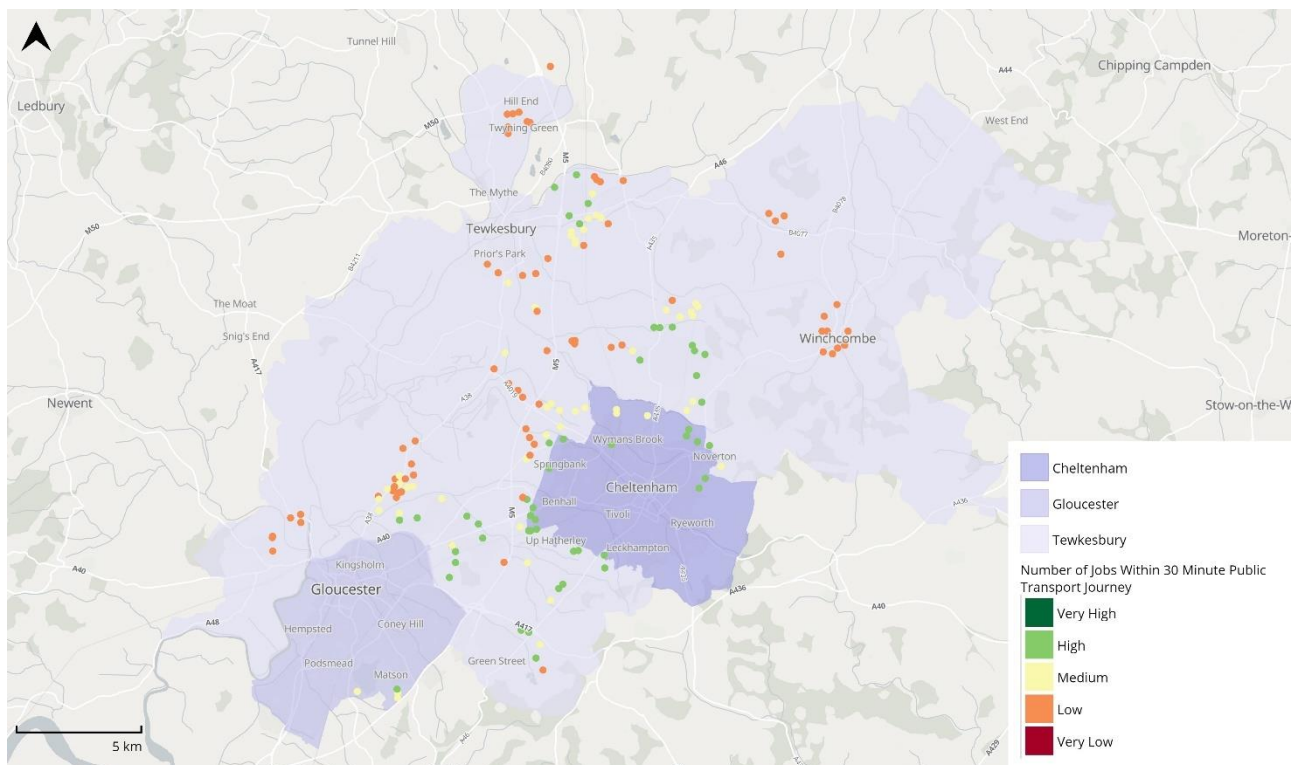


Figure 3-5: Number of Jobs Within 30-Minute Public Bus Journey

3.3.1.2 Metric: Access to Existing High-Quality Bus Services

For this metric, ‘quality’ bus services are defined as any bus route that operates services within a 30-minute frequency in the weekday morning peak, period (07:00-10:00) reflecting the semi-rural character of the SLP area. Access to existing bus routes is assessed as within a 30-minute walk.

Development Scenario	Access to existing High-Quality Bus Services	
	Lower Bound	Upper Bound
Urban Concentration	Very High	Very High
Urban Extensions	High	Very High
Urban Extensions avoiding the Green Belt	High	Very High
New Strategic Settlement (Tewkesbury Garden Town)	Medium	High
New Strategic Settlement (Boddington)	High	Very High
New Strategic Settlement (Highnam)	Very Low	Very Low
Rural Dispersal	Medium	High
Sustainable Transport	High	Very High

Table 3-8: Access to Existing High-Quality Bus Services

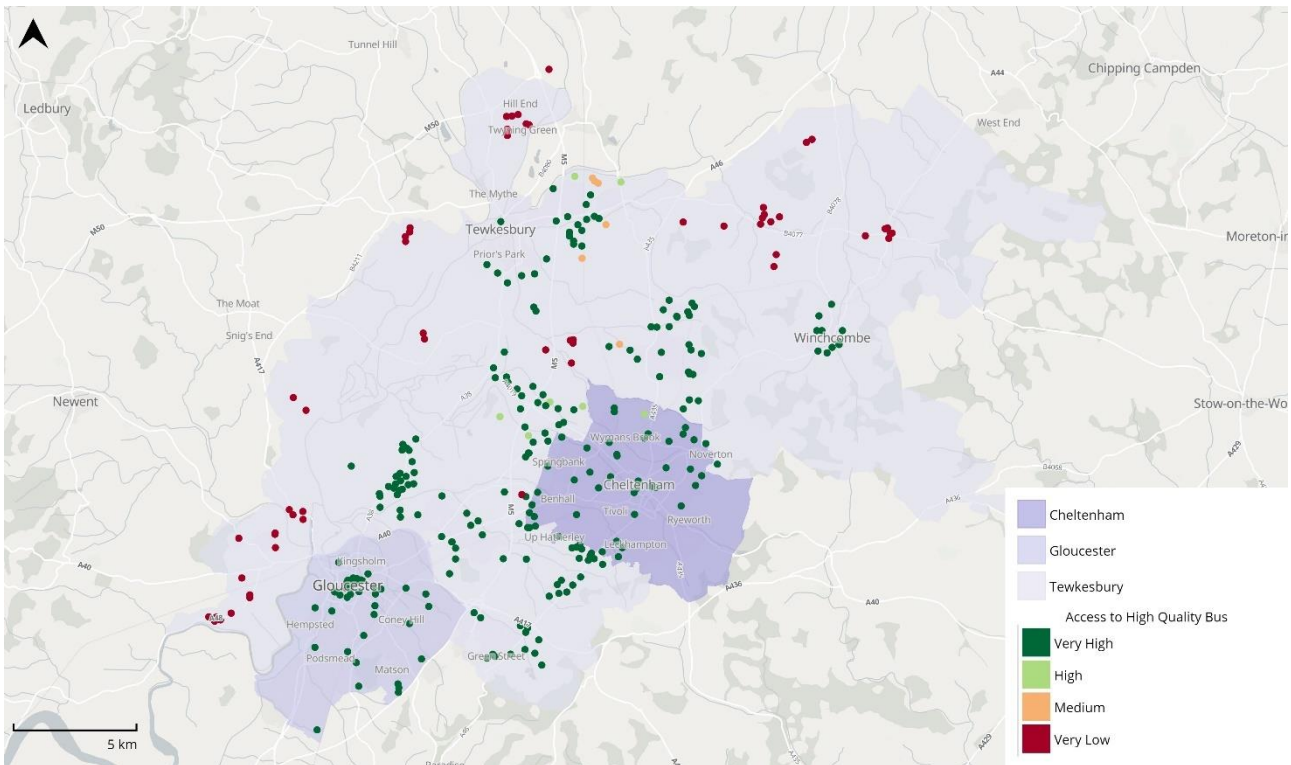


Figure 3-6: Access to Existing High-Quality Bus Services

3.3.1.3 Metric: Access to Railway Stations

This metric assesses walking and cycling access to railway stations from each site. This metric considers access to existing railway stations (i.e. Gloucester, Cheltenham and Ashchurch for Tewkesbury). It assesses whether a railway station is accessible within a 30-minute walking or 20-minute cycling isochrone from each site.

Development Scenario	Access to Railway Stations	
	Lower Bound	Upper Bound
Urban Concentration	Medium	High
Urban Extensions	Low	Medium
Urban Extensions avoiding the Green Belt	Low	Medium
New Strategic Settlement (Tewkesbury Garden Town)	Medium	High
New Strategic Settlement (Boddington)	Very Low	Very Low
New Strategic Settlement (Highnam)	Very Low	Very Low
Rural Dispersal	Very Low	Low
Sustainable Transport	Very Low	Low

Table 3-9: Access to Railway Stations

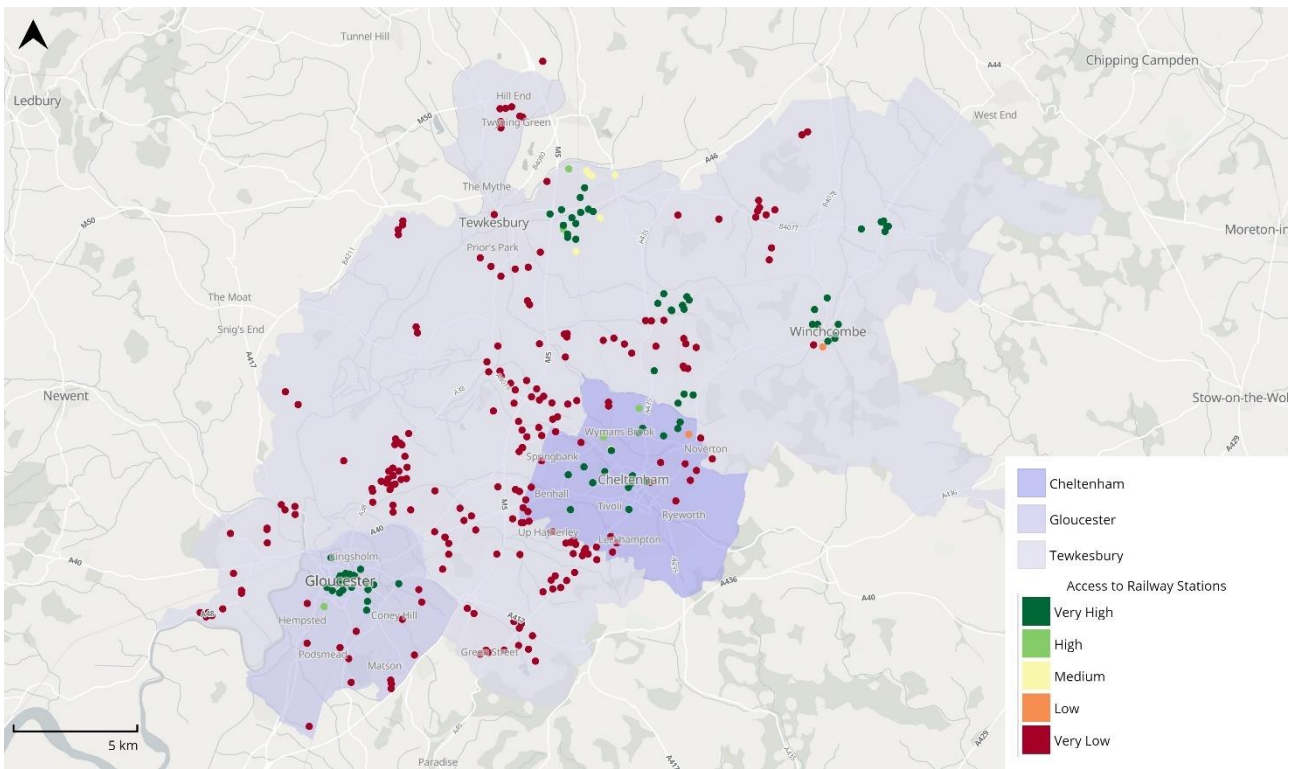


Figure 3-7: Access to Railway Stations

3.3.1.4 Metric: Direct Access to Nearest Urban Centre by Public Bus Within 30 Minutes

This metric considers whether a site has access to any urban centre (City of Gloucester, Tewkesbury, Cheltenham) by bus within a 30-minute journey but without interchange (therefore assumes only one bus journey is required). The public bus isochrone assumptions (see Section 2.3.4.3) apply, including a walk to and from the bus stop included within the 30 minutes. It should be noted that the assessment will still consider access even where a public bus trip is not required and instead this journey to an urban centre can be walked within the 30 minutes.

Development Scenario	Direct Access to Nearest Urban Centre by Public Bus	
	Lower Bound	Upper Bound
Urban Concentration	Medium	High
Urban Extensions	Very Low	Low
Urban Extensions avoiding the Green Belt	Very Low	Low
New Strategic Settlement (Tewkesbury Garden Town)	Very Low	Low
New Strategic Settlement (Boddington)	Very Low	Very Low
New Strategic Settlement (Highnam)	Very Low	Very Low
Rural Dispersal	Very Low	Low
Sustainable Transport	Very Low	Low

Table 3-10: Direct Access to Nearest Urban Centre by Public Bus Within 30 Minutes

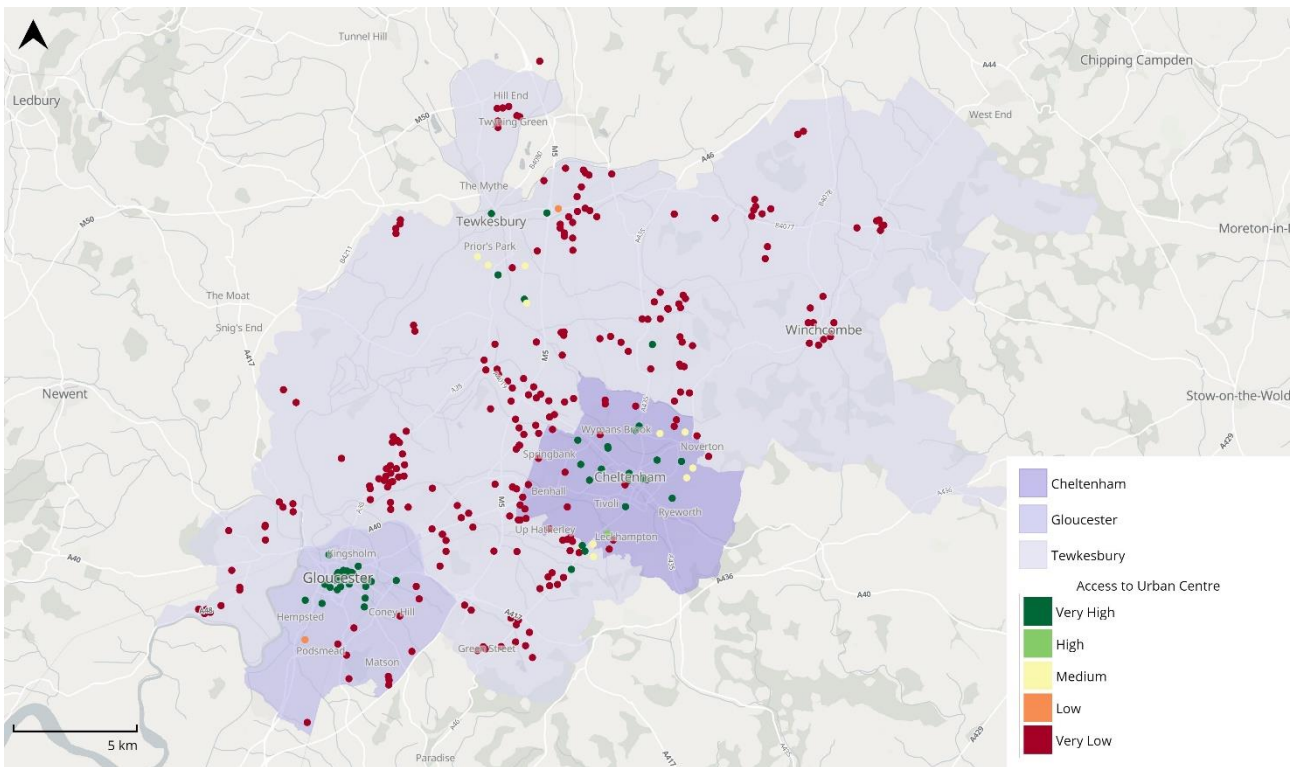


Figure 3-8: Direct Access to Nearest Urban Centre by Public Bus Within 30 Minutes

3.4 Objective 3: Deliver Inclusive Community Health & Wellbeing

Metrics for this objective look at existing and potential active travel infrastructure around the sites, in order to prioritise active travel design and link key destinations with routes to walk, wheel and cycle.

Objective	Sub-Objective	Metric
Deliver Inclusive Community Health & Wellbeing	Increase Active Travel Mode Share for all Journeys and Journey Purposes, including Leisure	Cycling infrastructure within 10-minute cycling journey
		Walking and wheeling infrastructure within a 10-minute walking journey
		Access to open space within a 10-minute walking journey

Table 3-11: Metrics for Objective 3

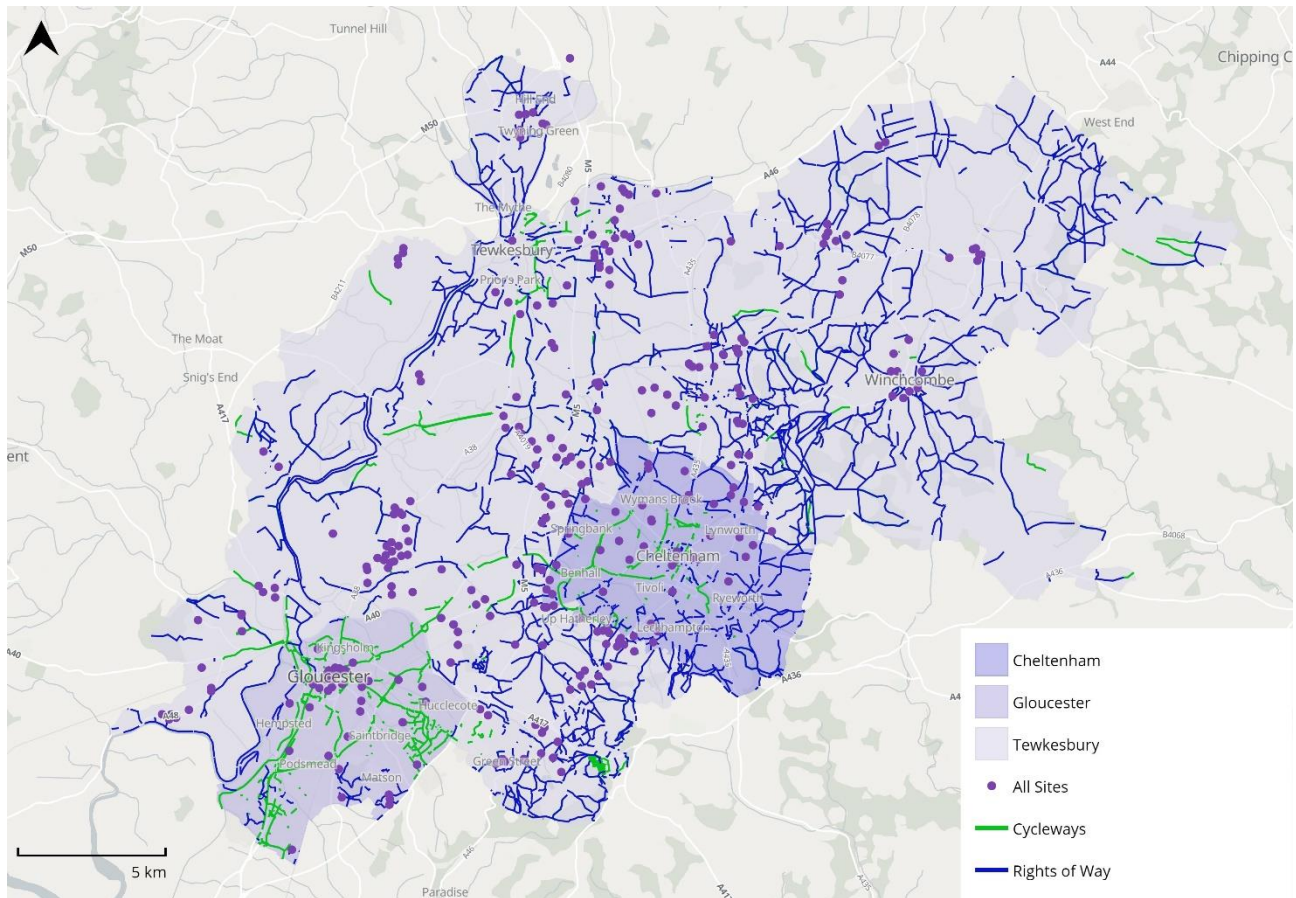


Figure 3-9: Active Travel Networks

3.4.1 Sub-Objective: Increase Active Travel Mode Share for all Journeys and Journey Purposes, including Leisure

3.4.1.1 Metric: Cycling Infrastructure Within a 10-Minute Cycling Journey

Dedicated cycling infrastructure, such as cycle lanes and segregated paths, is key to increasing the mode share of cycling for both leisure and commuting journeys. Well-planned, high-quality cycle networks which integrate with existing facilities outside of the site boundaries increase network coverage and encourage cycling uptake by new residents as well those currently living within the local area.

However, this metric assesses each site based solely on the amount of cycling infrastructure currently around each site, using data sourced from OpenStreetMap. The metric considers the length of cycling infrastructure within a 10-minute cycling isochrone around each site.

Development Scenario	Cycling Infrastructure within a 10-minute Cycling Journey	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	Medium	High
Urban Extensions avoiding the Green Belt	Medium	High
New Strategic Settlement (Tewkesbury Garden Town)	Low	Medium
New Strategic Settlement (Boddington)	Very Low	Low
New Strategic Settlement (Highnam)	Very Low	Low
Rural Dispersal	Low	Medium
Sustainable Transport	Medium	High

Table 3-12: Cycling Infrastructure Within a 10-Minute Cycling Journey

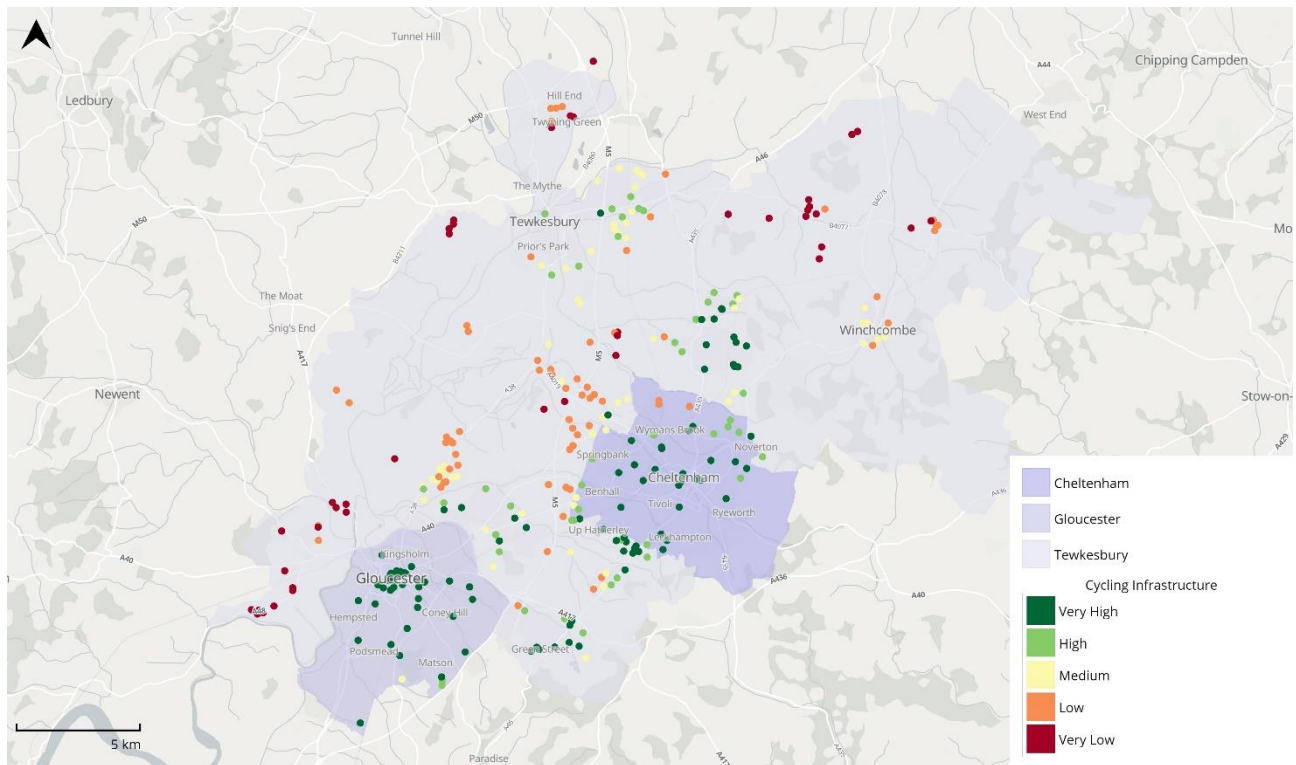


Figure 3-10: Cycling Infrastructure Within a 10-Minute Cycling Journey

3.4.1.2 Metric: Walking and Wheeling Infrastructure Within a 10-Minute Walking Journey

Similarly to the cycling infrastructure, walking and wheeling infrastructure, such as Public Rights of Way, is key to increasing the mode share of walking and wheeling. Walking and wheeling infrastructure within the sites is expected to be improved with each development, and in a similar theme to cycling infrastructure, will result in better integration of the networks, thereby increasing network coverage and encouraging walking and wheeling uptake by new residents as well as those living within the local area.

However, this metric assesses each site based solely on the amount of walking and wheeling infrastructure currently around each site, using data sourced from OpenStreetMap. The metric considers the length of the walking infrastructure⁶ within a 10-minute walking isochrone around each site.

Development Scenario	Walking Infrastructure within a 10-minute Walking Journey	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	Medium	High
Urban Extensions avoiding the Green Belt	Medium	High
New Strategic Settlement (Tewkesbury Garden Town)	Low	Medium
New Strategic Settlement (Boddington)	Very Low	Low
New Strategic Settlement (Highnam)	Very Low	Low
Rural Dispersal	Medium	High
Sustainable Transport	Low	Medium

Table 3-13: Walking Infrastructure Within a 10-Minute Walking Journey

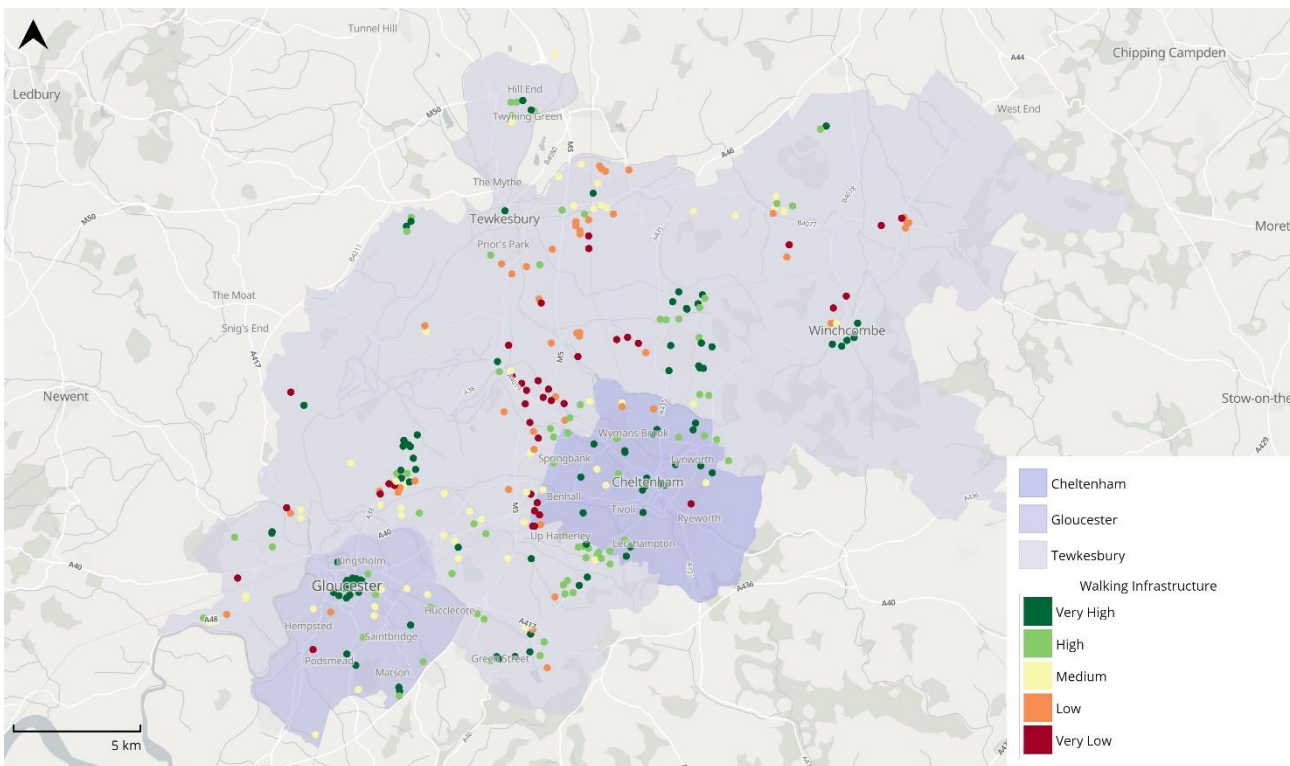


Figure 3-11: Walking Infrastructure Within a 10-Minute Walking Journey

⁶ Sites score very low (<1km), low (1-2.2km), medium (2.2-3.3km), high (3.3-4.7km), very high (>4.7km), ensuring a roughly even number of sites in each category

3.4.1.3 Metric: Access to Open Space Within a 10-Minute Walking and Wheeling Journey

Access to open space within walking distance of a site is key to encouraging walking and wheeling for leisure purposes; this could have the effect of increasing active travel for leisure and incentivising people to walk and wheel, which has the potential to contribute towards improved health outcomes as a result of increased physical activity levels.

This metric assesses how many open spaces can be accessed withing a 10-minute walking isochrone around each site. Open spaces are sourced from OpenStreetMap, by considering parks, greenspaces and open accessible fields.

Development Scenario	Access to Open Space within a 10-minute Walking Journey	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	Medium	High
Urban Extensions avoiding the Green Belt	Medium	High
New Strategic Settlement (Tewkesbury Garden Town)	Low	Medium
New Strategic Settlement (Boddington)	Low	Medium
New Strategic Settlement (Highnam)	Very Low	Low
Rural Dispersal	Medium	High
Sustainable Transport	Medium	High

Table 3-14: Access to Open Space Within a 10-Minute Walking Journey

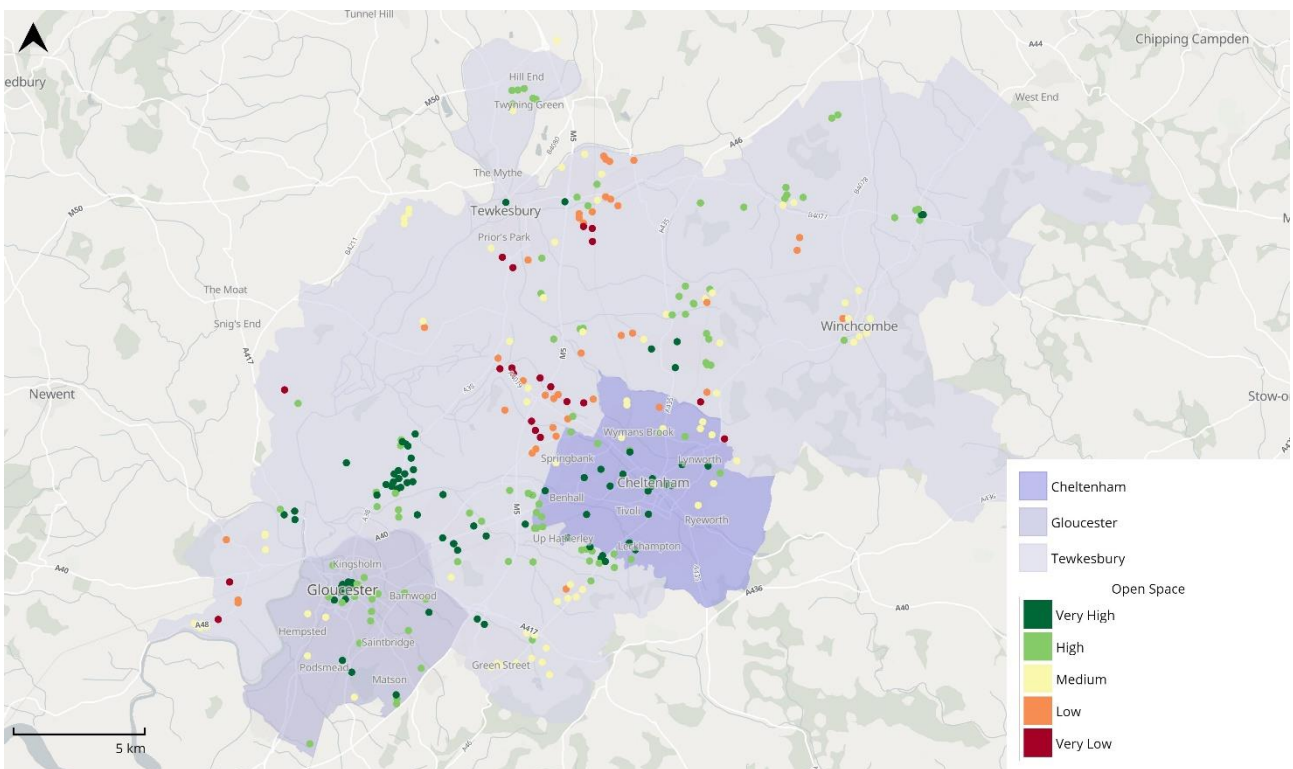


Figure 3-12: Access to Open Space Within a 10-Minute Walking Journey

3.5 Objective 4: Minimise & Mitigate the Residual Negative Impacts from Vehicular Transport

Metrics for this objective consider potential freight emissions as well as the impact on the surrounding MRN and SRN as a result of potential trip generation from the HELAA sites across the SLP area.

Objective	Sub-Objective	Metric
Minimise & Mitigate the Residual Negative Impacts from Vehicular Transport	Minimise Road and Freight Transport-Related Carbon Emissions	Proximity to the SRN junction for freight access
	Maintain the Efficient Operation of the SRN & Local Roads	Performance of the nearest SRN junction
	Maintain the Safe Operation of the SRN & Local Roads	Collisions on the SRN and MRN within 2km of the site

Table 3-15: Metrics for Objective 4

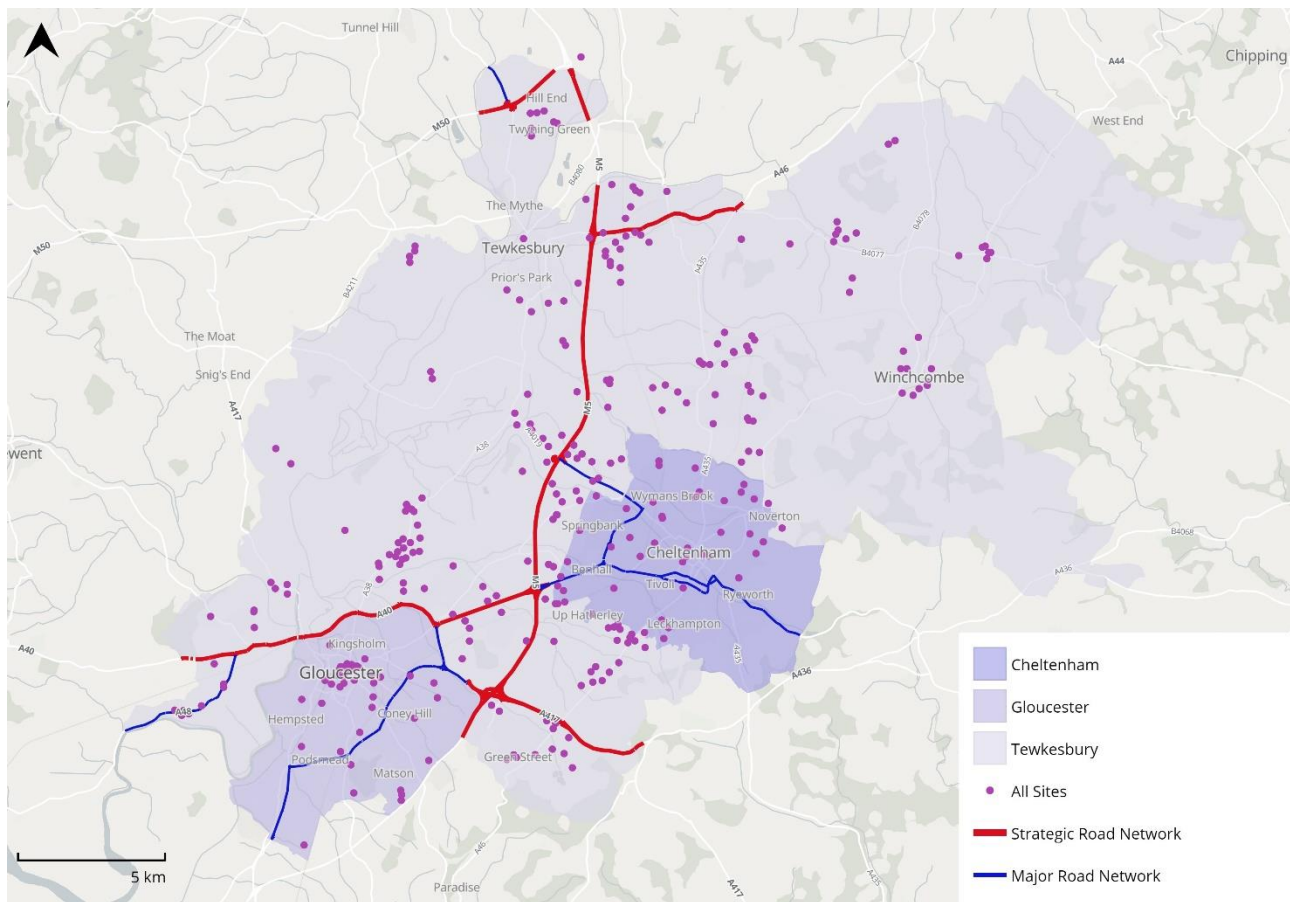


Figure 3-13: MRN & SRN

3.5.1 Sub-Objective: Minimise Road & Freight Transport-Related Carbon Emissions

3.5.1.1 Metric: Proximity to the SRN Junction for Freight Access

During the construction phase of each site, there will be likely be a high level of freight needing to access the site; therefore, the shorter the distance from the SRN, the less environmental impact there will be from these freight vehicles. Once construction is complete and the site is populated, there will also be regular deliveries to homes and businesses within the site. These delivery vehicles will likely need to use the SRN and so the closer any new site is to the SRN, the less environmental impact these deliveries will cause.

As illustrated earlier in Figure 3-13, there are elements of the SRN and MRN and network within the study area; namely the M5 running through the middle, the A417 (from M5 J11a to the Cotswold District Council's boundary), the A46 (from M5 J9 to Tewkesbury Borough Council's north-east boundary), the A40 (M5 J11 to Forest of Dean District Council's western boundary), and a short section of the M50 to the north. Any potential upgrades to the SRN were not included in this analysis.

This metric was calculated using the distance from three points within each site: the closest and furthest point from the closest SRN junction, and the mid-point of the site. For this metric, sites score higher the closer they are to any SRN junction, as it means the site is closer to access for freight, thereby potentially reducing environmental impact.

Development Scenario	Proximity to the SRN Junction for Freight Access	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	Low	Medium
Urban Extensions avoiding the Green Belt	Low	Medium
New Strategic Settlement (Tewkesbury Garden Town)	Medium	High
New Strategic Settlement (Boddington)	High	Very High
New Strategic Settlement (Highnam)	High	Very High
Rural Dispersal	Low	Medium
Sustainable Transport	Medium	High

Table 3-16: Proximity to the SRN Junction for Freight Access

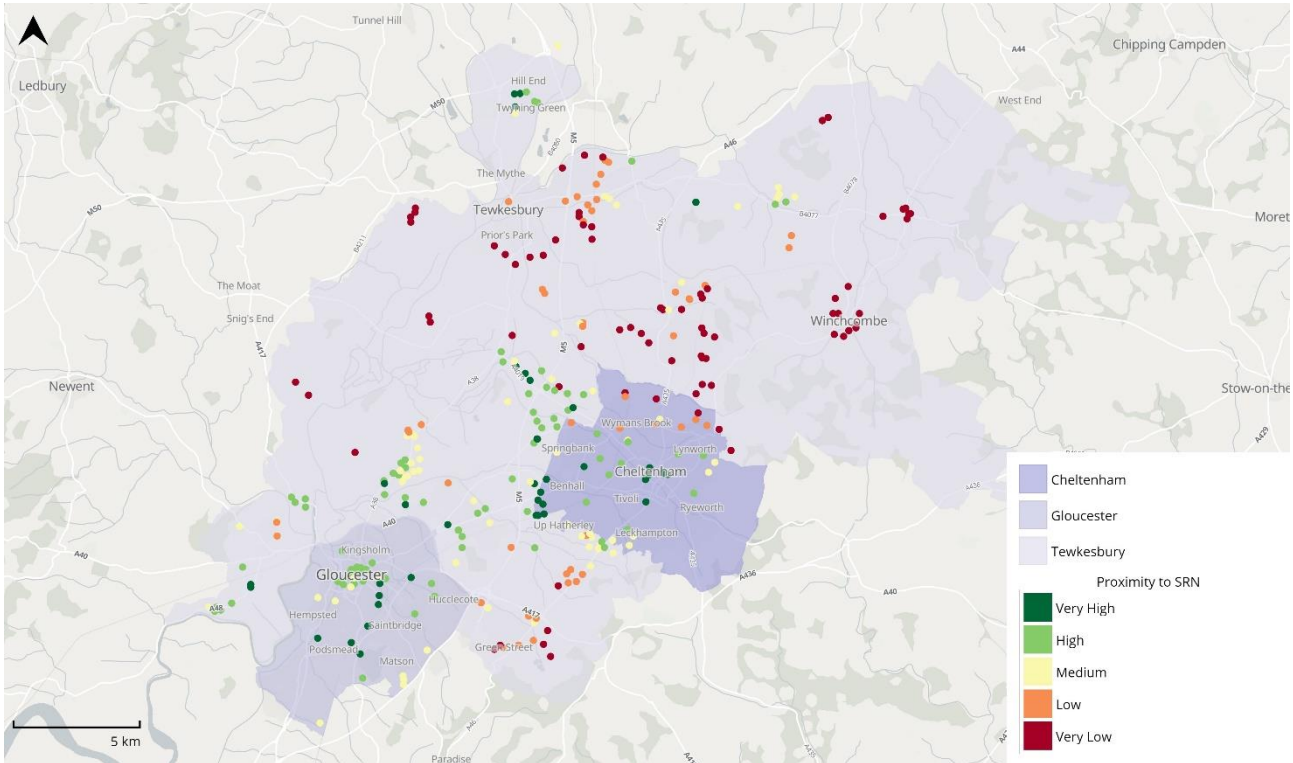


Figure 3-14: Proximity to the SRN

3.5.2 Sub-Objective: Maintain the Efficient Operation of the SRN & Local Roads

3.5.2.1 Metric: Performance of the Nearest SRN Junction

The SRN facilitates the effective movement of goods and people across not only the SLP area but England and the wider UK through providing high-quality strategic road links to urban centres, international and domestic gateways (e.g. ports and airports) and other key destinations such as major employment clusters. As a result of the connectivity and accessibility provided by the SRN, the network generally has a significant catchment area for vehicular demand. At some locations of the network, this can give rise to adverse transport impacts such as congestion not only on the main highway and at key junctions, but also on interfacing local roads with the SRN.

To undertake a high-level assessment of the HELAA sites at the SRN and its interfacing local roads, minimum vehicle speeds have been used as a proxy to inform the current operational performance. This metric has been informed through use of INRIX GPS data provided by the Department for Transport which has utilised minimum vehicle speeds on the SRN (e.g. junctions, links and motorway mainlines) as well as key interfacing local roads to the network. Regarding minimum vehicle speeds, these have been based off the lowest average recorded, either within the morning peak period (07:00 – 10:00) or evening peak period (16:00 – 19:00) to provide a robust and conservative indicator for the current operational performance of the SRN across the SLP area. The peak periods have been chosen to capture the peak hour of demand on the network.

Development Scenario	Performance of the Nearest SRN Junction	
	Lower Bound	Upper Bound
Urban Concentration	High	Very High
Urban Extensions	Medium	High
Urban Extensions avoiding the Green Belt	Medium	High
New Strategic Settlement (Tewkesbury Garden Town)	Medium	Medium
New Strategic Settlement (Boddington)	Very Low	Low
New Strategic Settlement (Highnam)	High	High
Rural Dispersal	Medium	High
Sustainable Transport	Medium	High

Table 3-17: Performance of the Nearest SRN Junction

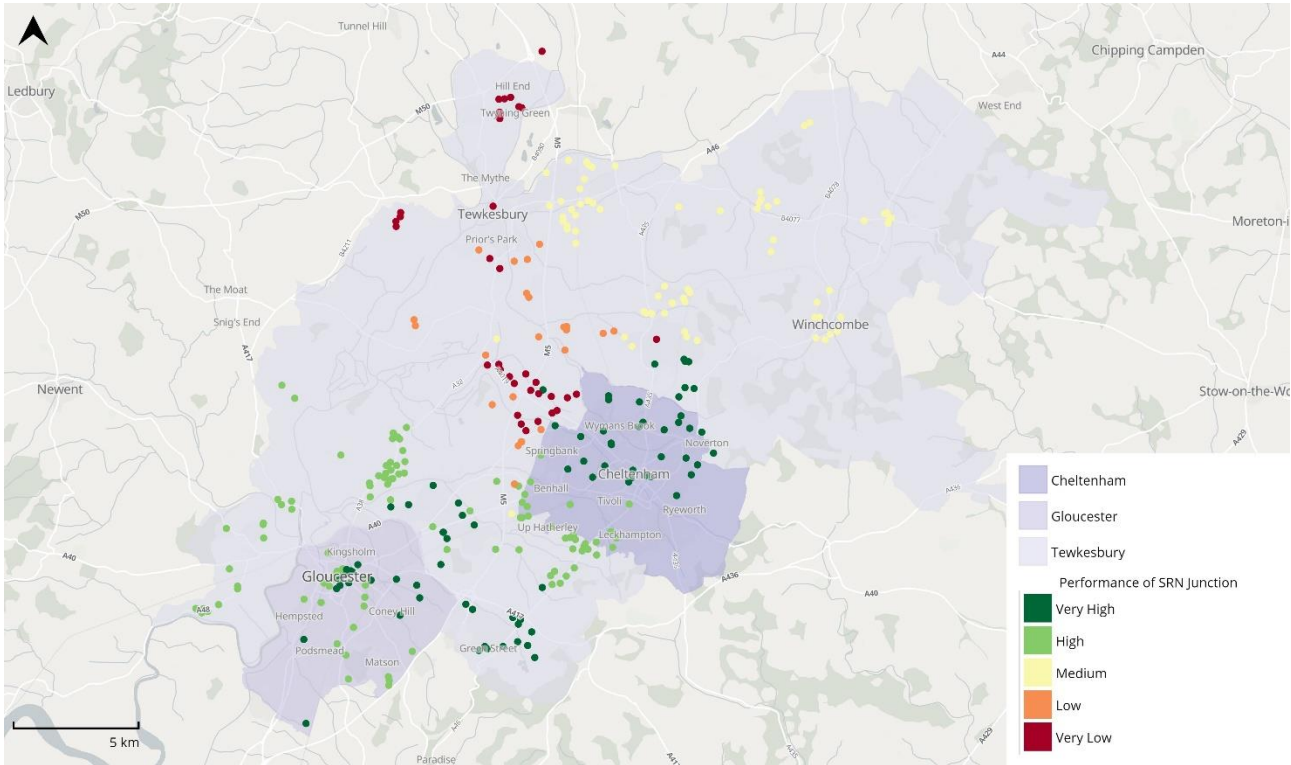


Figure 3-15: Performance of the Nearest SRN Junction

3.5.3 Sub-Objective: Maintain the Safe Operation of the SRN & Local Roads

3.5.3.1 Metric: Collisions on the SRN & MRN Within 2km of the Site

To maintain the safe operation of the SRN and MRN, in line with this sub-objective, it’s crucial that the additional demand created by a developed site minimises impact on the road network in its vicinity. To assess this, the number of collisions within 2km of each of the sites has been utilised using the latest available DfT Road Safety Data on collisions (i.e. 2022). By understanding the existing baseline safety of these networks near to the sites, we can understand how the impact of the site may impact the demand and the level of safety on these networks. A buffer of 2km crow-flies distance from the centre of the site has been used to identify collisions which reflects that at this initial stage of the transport evidence base process, site access arrangements to the existing road network have not yet been considered.

A site will score badly if collisions are high in the area, indicating that the extra demand from the site could cause issues for the SRN and/or the MRN in the area.

Development Scenario	Collisions on the SRN & MRN within 2km of the Site	
	Lower Bound	Upper Bound
Urban Concentration	Very Low	Low
Urban Extensions	Low	Medium
Urban Extensions avoiding the Green Belt	Low	Medium
New Strategic Settlement (Tewkesbury Garden Town)	Medium	High
New Strategic Settlement (Boddington)	Low	Medium
New Strategic Settlement (Highnam)	Very High	Very High
Rural Dispersal	Medium	High
Sustainable Transport	Low	Medium

Table 3-18: Collisions on the SRN & MRN Within 2km of the Site

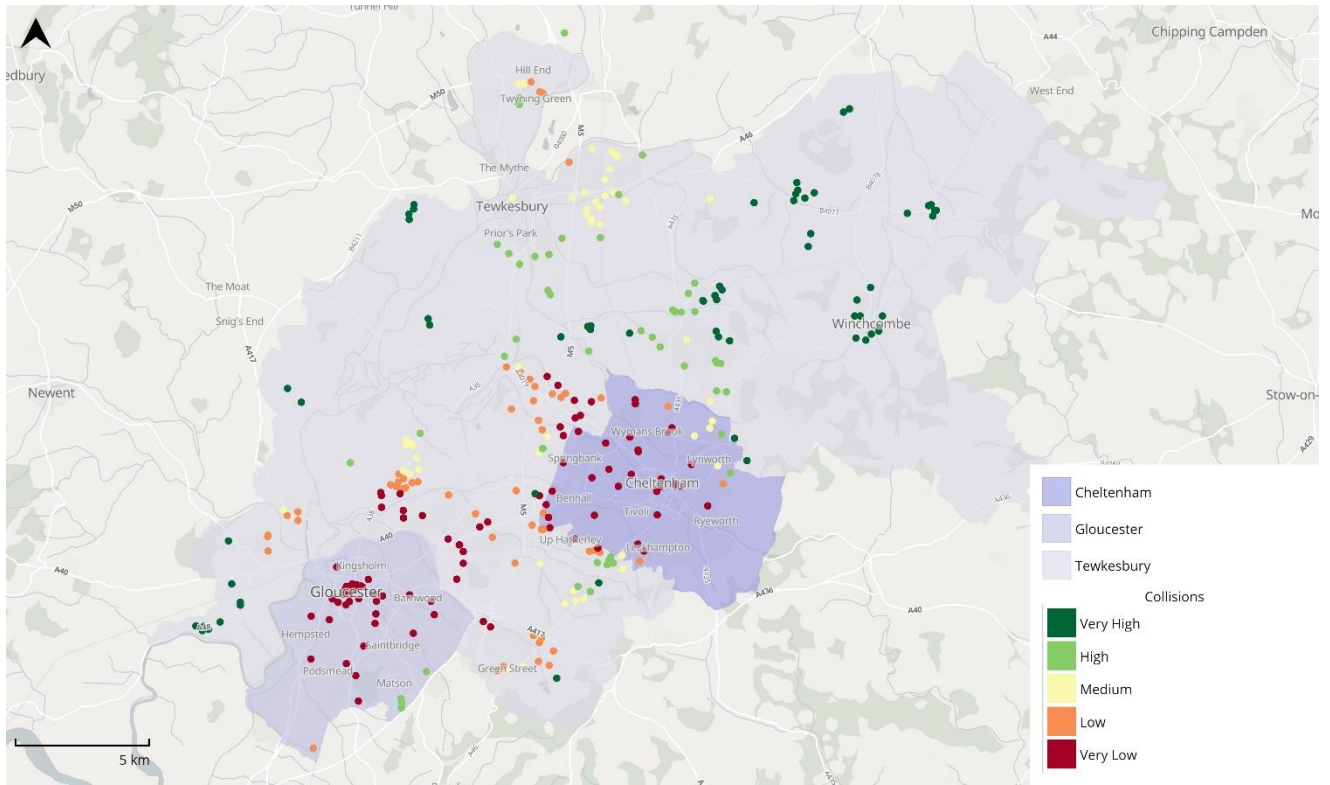


Figure 3-16: Collisions on the SRN & MRN Within 2km of the Site

4 Summary of Broad Site Assessment Outcomes

4.1 Introduction

This chapter provides a summary and overview of the outcomes from the Broad Site Assessment against each of the identified objectives. Results are provided by each development scenario. These summaries utilise the outcomes for each sub-objective and their associated metrics (as presented in Chapter 3) They provide a brief overview of the assessment outcomes whereby the perceived advantages and disadvantages of each development scenario from a transport perspective further detailed in Section 4.6.

4.2 Objective 1: Reduce Travel Need & Journey Distances

The summary outcomes of the Broad Site Assessment from the perspective of Objective 1 and its associated sub-objectives are presented in Table 4-1.

Development Scenario	Sub-Objective: Maximise Access to Key Services within Local Communities			Objective: Reduce Travel Need & Journey Distances
	Access to key services within a 20-minute walk	Access to key services within a 20-minute cycle	Access to key services within a 20-minute public bus journey	
Urban Concentration	Very High	Very High	Very High	High / Very High
Urban Extensions	Medium / High	High / Very High	High / Very High	High / Very High
Urban Extensions avoiding the Green Belt	Medium / High	High / Very High	Medium / High	High / Very High
New Strategic Settlement (Tewkesbury Garden Town)	Low / Medium	High	Low / Medium	Medium / High
New Strategic Settlement (Boddington)	Low / Medium	High / Very High	Low / Medium	Medium / High
New Strategic Settlement (Highnam)	Very Low / Low	High / Very High	Low / Medium	Low / Medium
Rural Dispersal	Medium / High	High / Very High	Medium / High	Medium / High
Sustainable Transport	Medium / High	High	Medium / High	High / Very High

Table 4-1: Broad Site Assessment Objective 1 Summary

The majority of existing services relating to health, education and employment within the SLP area are observed to be located within existing urban areas and / or on the periphery of urban areas (i.e. Cheltenham, Tewkesbury and Gloucester). These urban areas are noted to provide a wider offering and greater extent of services. For this reason, urban concentrations and extensions perform best under the metrics for this objective.

In the case of the proposed new strategic settlements that form development scenario four, the low to medium results provide a useful indication that these sites need to be substantially supported by a broad range of key services within walking access alongside public transport options to key urban centres or areas with services. This is key to ensuring that trips are localised where possible to prevent travel to other areas and contribute towards a culture of car reliance from the onset.

Sites that are either located in more rural areas (e.g. Rural Dispersal Scenario) where such services are, generally, sporadically located and can be harder to access by sustainable modes within the same timeframe, perform less well. This relates to both the distance required to travel and, in the context of public transport, that services tend to be of a lower frequency when compared to more urbanised areas. For the Rural Dispersal Scenario in particular, it is observed that some sites are located either on the periphery or within the local area of existing modestly sized settlements such as Bishop's Cleeve and Winchcombe, which are noted to offer a small offering of key services, facilities and amenities and therefore provide the opportunity for these assets to be accessed by some sustainable modes.

When comparing access by different modes, cycling performs well across all development scenarios, due to the longer distances that can be reached within a 20-minute cycle from sites.

Where there is strong connectivity across multiple sustainable transport modes (i.e. cycling, walking and public bus) it is expected that these will positively contribute towards the overall attractiveness of using sustainable transport modes through providing a wide offering. This scale of positive benefit is reduced where accessibility is only likely realistically achieved through either one or two sustainable transport modes. Increasing the attractiveness of sustainable transport modes through locating new development either adjacent or within proximity to existing networks is likely to encourage uptake of such modes and encourage sustainable travel behaviours, minimising the need to travel by unsustainable modes where possible such as by private car.

4.3 Objective 2: Facilitate Viable & Genuine Alternatives to the Private Car

The summary outcomes of the Broad Site Assessment from the perspective of Objective 2 and its associated sub-objectives are presented in Table 4-2.

Development Scenario	Sub-Objective: Increase Public Transport Mode Share for Journeys Across and Out of the SLP Area				Objective: Facilitate Viable & Genuine Alternatives to the Private Car
	Number of jobs within 30-minutes public bus journey	Access to existing high-quality bus services	Access to railway stations	Direct access to nearest urban centre by public bus within 30 minutes	
Urban Concentration	High / Very High	Very High	Medium / High	Medium / High	High / Very High
Urban Extensions	Medium / High	High / Very High	Low / Medium	Very Low / Low	Medium / High
Urban Extensions avoiding the Green Belt	Medium / High	Medium	Low / Medium	Very Low / Low	Medium / High
New Strategic Settlement (Tewkesbury Garden Town)	Low / Medium	Medium / High	Medium / High	Very Low	Low / Medium
New Strategic Settlement (Boddington)	Very Low / Low	High / Very High	Very Low	Very Low	Low / Medium
New Strategic Settlement (Highnam)	Very Low / Low	Very Low	Very Low	Very Low	Very Low / Low
Rural Dispersal	Low / Medium	Medium / High	Very Low / Low	Very Low / Low	Low / Medium
Sustainable Transport	Medium / High	High / Very High	Very Low / Low	Very Low / Low	Low / Medium

Table 4-2: Broad Site Assessment Objective 2 Summary

Urban concentrations and extensions tend to perform best for this objective due to the proximity to and higher frequency of public bus services in these areas. However, Boddington (one of the New Strategic Settlement Development Scenarios) and the Sustainable Transport Scenario do have relatively good access to existing high quality bus services. The types of sites that would score well for this objective would have good access by walking and cycling to public bus and rail, particularly buses that are high frequency and provide access to urban centres within 30 minutes.

Direct access to an urban centre by public bus scores generally low across all scenarios, except in the urban concentration scenario, due to the lack of public buses and/or the requirement to interchange.

Railway stations within the SLP area are located within the existing major settlements of Gloucester, Tewkesbury and Cheltenham which, for sites outside these urban areas in more rural settings, generates challenges from an accessibility perspective. This means that lower scores are found for most sites except those in the urban concentration scenario.

4.4 Objective 3: Deliver Inclusive Community Health & Wellbeing

The summary outcomes of the Broad Site Assessment from the perspective of Objective 3 and its associated sub-objectives are presented in Table 4-3.

Development Scenario	Sub-Objective: Increase Active Travel Mode Share for all Journeys and Journey Purposes, including Leisure			Objective: Deliver Inclusive Community Health & Wellbeing
	Cycling infrastructure within 10-minute cycling journey	Walking infrastructure within 10-minute walking journey	Access to open space within 10-minute walking journey	
Urban Concentration	Very High	High / Very High	High / Very High	High / Very High
Urban Extensions	Medium / High	Medium / High	Medium / High	Medium / High
Urban Extensions avoiding the Green Belt	Medium / High	Medium / High	Medium / High	Medium / High
New Strategic Settlement (Tewkesbury Garden Town)	Low / Medium	Low / Medium	Low / Medium	Low / Medium
New Strategic Settlement (Boddington)	Low	Very Low / Low	Low / Medium	Very Low / Low
New Strategic Settlement (Highnam)	Very Low / Low	Very Low / Low	Very Low / Low	Very Low / Low
Rural Dispersal	Low / Medium	Medium / High	Medium / High	Medium / High
Sustainable Transport	Medium / High	Medium	Medium / High	Medium / High

Table 4-3: Broad Site Assessment Objective 3 Summary

Sites in the Urban Concentration Scenario benefit from an overall higher provision and coverage of active travel infrastructure and access to open space.

Urban Extensions, Rural Dispersal and Sustainable Transport Scenarios perform medium/high due to some level of active travel infrastructure near the site and some access to open space. However, it may be that, particularly for more rural areas, open spaces have not been defined as such so have not been picked up in the assessment, unlike in urban areas (e.g. a dedicated park). For these Scenarios and the New Strategic Settlement Scenarios, it highlights the need for dedicated active travel infrastructure and open space provided within the proposed sites, communities or settlements.

4.5 Objective 4: Minimise & Mitigate the Residual Negative Impacts from Vehicular Transport

The summary outcomes of the Broad Site Assessment from the perspective of Objective 4 and its associated sub-objectives are presented in Table 4-4.

Development Scenario	Sub-Objective: Minimise Road and Freight Transport-Related Carbon Emissions Proximity to the SRN junction for freight access	Sub-Objective: Maintain the Safe Operation of the SRN & Local Roads Collisions on the SRN and MRN within 2km of the site	Sub-Objective: Maintain the efficient operation of the SRN & local roads Performance of the nearest SRN junction	Objective: Minimise & Mitigate the Residual Negative Impacts from Vehicular Transport
Urban Concentration	High / Very High	Very Low / Low	High / Very High	Low / Medium
Urban Extensions	Medium	Low / Medium	Medium / High	Low / Medium
Urban Extensions avoiding the Green Belt	Low / Medium	Low / Medium	Medium / High	Low / Medium
New Strategic Settlement (Tewkesbury Garden Town)	Medium	Medium / High	Medium	Medium / High
New Strategic Settlement (Boddington)	High / Very High	Low / Medium	Very Low / Low	Medium / High
New Strategic Settlement (Highnam)	High / Very High	Very High	High	High / Very High
Rural Dispersal	Low / Medium	Medium / High	Medium / High	Medium / High
Sustainable Transport	Medium	Low / Medium	Medium / High	Low / Medium

Table 4-4: Broad Site Assessment Objective 4 Summary

Sites under the Urban Concentration Scenario and the Boddington and Highnam New Strategic Settlements are located within closer proximity to existing nodes on the SRN and therefore score high/very high for freight access. They therefore may benefit from greater accessibility and connectivity for freight movements, helping to reduce their associated carbon emissions.

From the perspective of safety on both the SRN and the MRN, there is a moderate to high frequency of collisions near to sites under the Urban Concentration, Urban Extensions, New Strategic Settlement (Boddington) and Sustainable Transport Scenarios.

Showing similar patterns, the poor performance of the SRN, generally reflecting where demand is highest, is particularly present at the junction near to the New Strategic Settlement (Boddington) Scenario.

4.6 Summary

4.6.1 Development Scenario Assessment Overview

The summary outcomes from the Broad Site Assessment, using each of the outcomes from the assessment of each development scenario against the identified transport planning objectives presented in Section 3, are presented in Table 4-5.

Development Scenario	Objective 1 – Reduce Travel Need & Journey Distances	Objective 2 – Facilitate Viable & Genuine Alternatives to the Private Car	Objective 3 – Deliver Inclusive Community Health & Wellbeing	Objective 4 – Minimise & Mitigate the Residual Negative Impacts from Vehicular Transport
Urban Concentration	High / Very High	High / Very High	High / Very High	Low / Medium
Urban Extensions	High / Very High	Medium / High	Medium / High	Low / Medium
Urban Extensions avoiding the Green Belt	High / Very High	Medium / High	Medium / High	Low / Medium
New Strategic Settlement (Tewkesbury Garden Town)	Medium / High	Low / Medium	Low / Medium	Medium / High
New Strategic Settlement (Boddington)	Medium / High	Low / Medium	Very Low / Low	Medium / High
New Strategic Settlement (Highnam)	Low / Medium	Very Low / Low	Very Low / Low	High / Very High
Rural Dispersal	Medium / High	Low / Medium	Medium / High	Medium / High
Sustainable Transport	High / Very High	Low / Medium	Medium / High	Low / Medium

Table 4-5: Summary of Broad Site Assessment for Objectives 1-4 by Development Scenario

A thread of commonality across the assessed HELAA sites and their associated development scenarios is that sites which are located either within or adjacent to areas that benefit from good access to existing sustainable transport networks and services emerge more positively from the Broad Site Assessment. Broadly speaking, Urban Concentration and Urban Extensions perform best due to the existing urban areas of Gloucester, Cheltenham and Tewkesbury which also have a significantly higher frequency and wider offering of health, education, leisure, employment, open space and retail services. They therefore provide the opportunity for these assets to be accessed by sustainable modes.

HELAA sites aligned with Rural Dispersal and Sustainable Transport also perform well due to their good access to existing services and active travel infrastructure. Specifically for sites aligned with Rural Dispersal, the impact on the SRN and MRN is expected to be less than for other development scenarios due to generally not being within proximity to potentially areas of concern from an operational and safety perspective. However, the reciprocal observation is noted for HELAA sites located outside of these existing urban areas in more rural locations experience a more sporadic distribution of key services and a lower provision and offering of sustainable modes coupled with the need to generally travel further distances to access such assets means that sustainable travel may not always be either an attractive and / or viable choice for some.

4.6.2 Development Scenario Advantages & Disadvantages

Considering the aforementioned Broad Site Assessment outcomes presented earlier within this sub-section, these observations have been collated together and further developed in terms of perceived advantages and disadvantages for each development scenario.

4.6.2.1 Urban Concentration

Advantages	Disadvantages
<p>The location of sites within or adjacent to existing urban areas in Gloucester and Cheltenham benefit from there being numerous retail, health, education, leisure and employment opportunities. Additionally, these areas generally have a higher overall provision of sustainable transport and active travel facilities, infrastructure and services. The relative proximity of two key railway stations within both of these urban areas provides the opportunity for moderate to long distance journeys either within or outside the SLP area to be catered by train. The location of these assets, coupled with extensive public transport and active travel networks are likely to present an attractive alternative to the uptake of sustainable transport modes whilst discouraging travel by unsustainable modes such as private car.</p> <p>The availability and choice of sustainable transport modes has the potential to significantly reduce the overall vehicular demand generated by these sites, minimising the contribution of additional vehicular demand on key SRN junctions in the immediate area such as on the M5 and A40 which is likely to reduce the overall adverse vehicular impact. This is also applicable in the case of potential freight movements which due to the general proximity of the SRN to these urban sites, implies that the overall distances to travel from the SRN are minimal.</p>	<p>Location within some of the main Urban Cores across the SLP area in Gloucester and Cheltenham results in the sites being located either within proximity to either the MRN and / or SRN which records a higher volume of vehicle kilometres, and therefore a higher overall volume of collisions when compared to other road types. Increased vehicular demand on these networks which could occur in a modest scale from these sites could exacerbate existing safety concerns with the local road network.</p>

4.6.2.2 Urban Extensions

Advantages	Disadvantages
<p>The location of sites either on the periphery or adjacent to existing urban areas of Gloucester, Cheltenham and Tewkesbury across the SLP area benefit from the existing provision of retail, health, education and employment opportunities. Additionally, these sites also benefit from being located on the periphery of existing sustainable transport networks such as bus and active travel.</p> <p>The moderate distance from sites within this development scenario to key railway stations within these urban areas provides the opportunity for medium to long distance journeys either within or outside the SLP area to be potentially catered by train.</p> <p>Development of these locations are likely to expand the overall coverage of these networks through integration of routes, tying into networks that already provide connectivity and accessibility to a range of key services and opportunities by sustainable modes and therefore through this increased attractiveness, reduce the need to travel by private car and other unsustainable transport modes.</p>	<p>The location of the sites on the periphery of the urban areas of the SLP area in Gloucester, Cheltenham and Tewkesbury means that the distance to the SRN is relatively modest which is likely to require any freight movements to travel a distance from the SRN to access these sites which has the potential to give rise to adverse environmental impacts through emissions generated.</p> <p>These locations in relation to the MRN and SRN have resulted in sites being generally located within proximity to road links and nodes which already experience poor safety performance levels, with any increase in vehicular demand from these sites likely to exacerbate these existing safety concerns.</p>

4.6.2.3 Urban Extensions avoiding the Green Belt

Advantages	Disadvantages
<p>The location of sites either on the periphery or adjacent to existing urban areas of Gloucester, Cheltenham and Tewkesbury across the SLP area benefit from the existing provision of retail, health, education and employment opportunities. Additionally, these sites also benefit from being located on the periphery of existing sustainable transport networks such as bus and active travel.</p> <p>The moderate distance from sites within this development scenario to key railway stations within these urban areas provides the opportunity for medium to long distance journeys either within or outside the SLP area to be potentially catered by train.</p> <p>Development of these locations are likely to expand the overall coverage of these networks through integration of routes, tying into networks that already provide connectivity and accessibility to a range of key services and opportunities by sustainable modes and therefore through this increased attractiveness, reduce the need to travel by private car and other unsustainable transport modes.</p>	<p>The location of the sites on the periphery of the urban areas of the SLP area in Gloucester, Cheltenham and Tewkesbury means that the distance to the SRN is relatively modest which is likely to require any freight movements to travel a distance from the SRN to access these sites which has the potential to give rise to adverse environmental impacts through emissions generated.</p> <p>These locations in relation to the MRN and SRN have resulted in sites being generally located within proximity to road links and nodes which already experience poor safety performance levels, with any increase in vehicular demand from these sites likely to exacerbate these existing safety concerns.</p>

4.6.2.4 New Strategic Settlement (Tewkesbury Garden Town)

Advantages	Disadvantages
<p>Sites within this development scenario benefit from being within relatively close proximity the existing urban area of Tewkesbury and therefore benefit from access to cycling and bus networks that provide connectivity to retail, health, education and employment opportunities. The presence of a key railway station in the local area, Ashchurch for Tewkesbury, enables it to be accessed by sustainable modes, providing the opportunity for moderate to long distance trips either within or outside the SLP area to also be supported.</p>	<p>The semi-rural location of sites that align with this development scenario means that there is an overall lower provision of retail, health, education and employment opportunities that can be accessed within a modest timeframe by walking and public transport. The sites rurality compared to the existing main urban areas of the SLP area (e.g. Gloucester, Cheltenham and Tewkesbury) means that it is difficult for these urban cores to be easily accessed by bus.</p>

4.6.2.5 New Strategic Settlement (Boddington)

Advantages	Disadvantages
<p>Sites within this development scenario benefit from being within relatively close proximity the existing bus network that provides connectivity to retail, health, education and employment opportunities that can be accessed within a modest timeframe. To a lesser degree, these same sites within the wider local area of active travel networks do provide the ability for these opportunities to be accessed however the associated travel times to access these assets has the potential to not be an attractive choice for a proportion of individuals.</p>	<p>The semi-rural location of sites that form this development scenario means that there is an overall lower provision of retail, health, education and employment opportunities that can be accessed within a modest timeframe by walking and public transport. The sites rurality compared to the existing main urban areas of the SLP area (e.g. Gloucester, Cheltenham and Tewkesbury) means that it is difficult for these urban cores to be easily accessed by bus. The proximity of these sites to the SRN coupled with observed low minimum speeds at the nearest junction at the SRN have the potential to exacerbate these existing issues through increased vehicular traffic accessing the network.</p>

4.6.2.6 New Strategic Settlement (Highnam)

Advantages	Disadvantages
<p>The sites within this development scenario are located within relative proximity to the SRN and therefore benefit from short distances require to access the network, with its nearest access junction observed to currently have generally acceptable operational performance levels.</p> <p>The short distances from these sites to the SRN has the potential to reduce the overall carbon emissions associated with freight-based movements.</p> <p>When safety is assessed against both the SRN and MRN, the immediate local area is not observed to have an existing baseline of a high number of collisions.</p>	<p>The semi-rural location of sites that form this development scenario means that there is an overall lower provision of retail, health, education, leisure and employment opportunities that can be accessed within a modest timeframe by active travel and public transport.</p> <p>The sites rurality compared to the existing main urban areas of the SLP area (e.g. Gloucester, Cheltenham and Tewkesbury) means that it is difficult for these urban cores to be easily accessed by bus. The rurality of these sites and the lack of assets and opportunities, coupled with limited opportunities for these to be easily accessed by sustainable modes due to the need to travel modest distances means that travel by such modes is likely to be unattractive when compared to other modes such as by private car.</p>

4.6.2.7 Rural Dispersal

Advantages	Disadvantages
<p>Where sites that form this scenario are located in relatively rural areas of the SLP area, they are generally observed to be relatively remote from the SRN and MRN, and therefore not within proximity to junctions and links that currently experience a notable number of collisions. Whilst vehicular demand from these sites will increase the overall proportion of vehicle kilometres travelled and therefore road collisions, it is unlikely to significantly impact any locations where there are existing safety concerns.</p> <p>Some sites within the scenario are however not observed to be overtly rural in location, due to their location either within the local area of or on the periphery of existing modestly sized settlements such as Bishop’s Cleeve and Winchcombe. These sites are therefore likely to benefit from the existing small local offering of key services, facilities and amenities and enable such assets to be accessed by multiple sustainable transport modes.</p>	<p>Generally, the rural location of the sites that form this development scenario outside of the local area of existing settlements across the SLP area means that these locations do not benefit from a higher concentration of key services and opportunities in relation to urbanised areas of the SLP region. This observation is also broadly applicable to the coverage of networks for public transport (bus) as well as for Active Travel with it being noted that there is no rail provision outside of Gloucester, Cheltenham and Tewkesbury. When considered together, although it is possible in some instances to access key assets by sustainable modes, these are towards the upper bound of appropriate journey times and may not fully present an attractive alternative to unsustainable transport modes such as private car.</p> <p>The rurality of these sites and their moderate distance to the SRN within the SLP area means that any potential freight movements generated by these sites are likely to require travel longer distances when compared to other development scenarios and therefore have the potential to generate a larger scale of adverse environmental impacts.</p>

4.6.2.8 Sustainable Transport

Advantages	Disadvantages
<p>The location of sites within this development scenario are generally observed to be within urban areas and therefore tend to be located either along or within proximity to existing sustainable transport networks and therefore benefit from relatively good levels of existing connectivity and accessibility, particularly regarding access to key services and job opportunities.</p> <p>The Scenario results would improve if sites were to be further aligned with public transport infrastructure, including walking and cycling access to railway stations and public bus direct access to urban centres.</p>	<p>Locations within some of the main Urban Cores across the SLP area in Gloucester and Cheltenham results in the sites being located either within proximity to either the MRN and / or SRN which records a higher volume of vehicle kilometres, and therefore a higher overall volume of collisions when compared to other road types. Increased vehicular demand on these networks which could occur in a modest scale from these sites could exacerbate existing safety concerns with the local road network.</p>

5 Conclusion & Next Steps

This Section presents the Conclusions for the Broad Site Assessment, outlining Recommendations and highlighting the Next Steps on the development of the Transport Evidence Base for the emerging SLP.

5.1 Conclusion

Following the outcomes of the Broad Site Assessment, there is an emerging clear differential between the development scenarios and their associated HELAA sites.

A clear observation across the assessed objectives and their associated sub-objectives, is that sites within any individual development scenario score more positively from the Broad Site Assessment where they are located either in or adjacent to areas that are already well served by multiple sustainable transport modes. This observation is further compounded where these locations are located within a relatively accessible distance to existing key services relating to employment, retail, leisure, open spaces, education and health whereby these assets are concentrated within Gloucester, Tewkesbury and Cheltenham as the key urban centres of the SLP area.

It is however recognised that the Broad Site Assessment outcomes are derived through the assessment of existing infrastructure. It therefore does not capture the positive impacts on transport accessibility and connectivity through potential additional transport infrastructure and the provision of community services to encourage sustainable travel within close proximity of the sites. This may include the provision of a range of services where new settlements may be proposed and linking new transport infrastructure with existing corridors to extend accessibility by sustainable modes.

Of potential merit is the consideration of iterative development. By developing sites that already benefit from an existing overall good provision of sustainable transport connectivity and accessibility, a proportion of planned growth can be delivered sustainably whilst utilising existing transport infrastructure and assets. Following, there is an opportunity for additional sites, potentially of a more rural character where there may be an existing under provision of such assets, to be developed alongside measures such as improved sustainable transport links.

It is clear that any future sites that emerge as part of the Spatial Strategy for the emerging SLP prioritise the ability to capitalise upon existing transport services and infrastructure to not only limit the need for additional infrastructure but to also create attractive conditions from the onset of the development delivery to encourage sustainable travel behaviours and reduce the need to travel unsustainably where possible.

The initial assessment set out in the report assists with identifying more sustainable sites from a transport perspective and that contribute to the objectives set out for this strategy. This will therefore support the further assessments as part of this strategy.

5.2 Next Steps

The Transport Evidence Base for the emerging SLP will continue to be developed over the coming months and, following the first Regulation 18 Consultation, will seek to incorporate feedback which has been raised.

As set out earlier within this report in Section 1.2.1.1, the next step of the process will involve spreadsheet-based modelling to further assess any emerging development scenarios alongside of the Gloucestershire Carbon Calculator to assess the likely carbon impacts. This Broad Site Assessment provides an initial assessment that will help guide the proceeding site assessments for higher performing sites in the context of the proposal spatial growth options.

Following this step (Step 3), the Transport Evidence Base will continue to be shaped which will focus on further assessment of the development scenarios through use of the Gloucestershire SATURN Traffic model which will be used to assist identify the scale and location of infrastructure that is required to support the growth proposals. This Step will also further assess the associated environmental impacts of the development scenarios including, but not exclusively, carbon emissions.



Following the conclusion of Step 4, the Transport Evidence Base will be used to inform the second Regulation 18 Consultation on the preferred Spatial Strategy for the emerging SLP.