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Executive summary

Background
This evidence base has been produced to help inform the 2014/15 update to Gloucestershire's Local Transport Plan (LTP). The study has drawn upon existing evidence from a range of sources in order to:

- Provide a source of evidence to inform future LTP updates;
- Ensure the future LTP is updated to reflect the existing policy and delivery framework and priorities;
- Ensure transport investment focuses on key challenges facing Gloucestershire as captured through its existing LTP, emerging core strategies, the Council Strategy 2011-2015 and the developing GFirst Local Enterprise Partnership (LEP) Strategic Economic Plan (SEP);
- Provide a summary of the main issues, challenges and strategy themes likely to be important in the future LTP Strategy.

Objectives
A detailed policy review of relevant development strategies for the County has been undertaken and from this, four strategic goals are evident. These include:

- Securing conditions for economic growth in Gloucestershire:
- Conserving and enhancing Gloucestershire’s unique natural and built environment;
- Establishing communities that are given equal opportunity to benefit from economic prosperity; and
- Creating healthy, safe and engaged communities.

These objectives have focused the development of this evidence base, with all the challenges and strengths identified in the study linked back to these objectives.

Challenges
This review has identified the specific challenges for transport within Gloucestershire that the LTP will need to overcome in order to deliver the strategic goals and the desired outcomes. These challenges are considered throughout the review. A summary of the key challenges linked to the LTP objectives have been provided below.

Figure 0.1  Transport Challenges within Gloucestershire

- Provide the right connections to facilitate economic growth
- Reduce car dependency by managing travel demand and encouraging modal shift
- Support innovative and financially sustainable travel alternatives for those most at risk of social exclusion in rural areas
- Improve the road safety record of our most dangerous roads
- Ensure transport networks are resilient to extreme weather conditions
- Ensure that communities are given equal opportunities to benefit from economic prosperity
- Protect communities from the adverse impacts of transport
- Preserve and enhance Gloucestershire’s unique natural and built environment
- Reduce transport’s contributions to CO2 emissions
- Create healthy, safe and engaged communities
- Tackle obesity and other health issues by supporting measures that encourage active travel
- Serve the transport needs of an ageing population
Risks
Failing to overcome the key challenges identified in this review will potentially undermine the delivery of the LTP objectives. The implications for not alleviating these challenges include:

Secure Conditions for Economic Growth

- Poor transport connections, services and network efficiency prevent people from taking up employment, undermining links between people, places, businesses and supply chains. This threatens the potential for economic growth and may serve to deter investment;
- Worsening network efficiency and reliability deters growth and investment;
- Continued high reliance on the car contributes to congestion and delay, undermining economic competitiveness; and
- Poor resilience to extreme weather events impacts on economic productivity.

Conserve and enhance Gloucestershire’s Unique Natural and Built Environment

- Car use damages the natural environment through pollutants such as noise and air pollution; and
- Without modal shift, targets for CO₂ emissions reductions cannot be achieved.

Ensure that Communities are given Equal Opportunity to Benefit from Economic Prosperity

- Poor transport links to communities, particularly those without access to a car, can be a cause of social inequality, by acting as a geographical barrier to accessing services, goods and employment that others can.

Create Healthy, Safe and Engaged Communities

- Without adequate transport services, sections of the elderly population may face issues of social exclusion;
- Dangerous roads damage social wellbeing, whilst loss of life-serious injury has economic impacts; and
- Discouragement of walking and cycling leads to inactive lifestyles with subsequent impacts on public health.

What does an effective transport system look like and what will it achieve?

Having identified the challenges and risks to achieving the strategic objectives for the LTP, the final process in the review has been to consider what outcomes Gloucestershire should aspire to for its transport network and systems, with the consequential impacts. These are detailed on the following page.

Next Steps
The evidence presented within this review will be used to inform the next LTP Strategy update. This will take place during 2014/15, with the updated LTP to be adopted by Gloucestershire County Council in early 2015. The strategy update will consider the contents of this evidence review when considering any change to the existing LTP Strategy, including plan objectives, policies and area-based strategies. This review process will include stakeholder consultation to ensure all views are considered when updating the LTP strategy, ensuring it is reflective of local need.
Objective
Securing conditions for economic growth in Gloucestershire
A transport network that facilitates economic growth and provides Gloucestershire with an economic advantage, broadening travel to work horizons, enabling all people equal opportunity for prosperity and ensuring business are well connected to their customers and supply chains.

Impact
A reliable and efficient transport network, with minimal congestion and competitive journey times
A resilient transport network that can withstand extreme weather events
A reduction in use of private vehicles and a rise in the use of sustainable modes

Objective
Preserve and enhance Gloucestershire’s unique natural and built environment
Reduction to the adverse impacts of private vehicle use (including freight), including CO\(_2\) emission reductions and improvement to noise and air pollution

Impact
Ensure traffic uses the right roads, thus protecting the high quality natural environment from the adverse impacts of poor route choice
A reduction in the use of private vehicles with a corresponding rise in active modes of travel
A shift towards the use of low carbon modes

Objective
Ensure that communities are given equal opportunities to benefit from economic prosperity
An efficient transport network that enables people to work and access the places they need and doesn’t prevent them from working
Innovative and financially sustainable transport solutions for rural communities and those without access to a car

Impact
A safe and reliable transport network that is an enabler for economic prosperity and encourages sustainable modes of travel

Objective
Create healthy, safe and engaged communities
A transport network that serves all, which is affordable in terms of delivery and inclusive in terms of use
Improved safety on roads in the County
A well connected network of cycle and walking routes with appropriate supporting infrastructure

Impact
Safe communities that benefit form the health advantages of active travel modes and have access to suitable public transport systems
1. **Overview**

1.1. **Context**

A high quality, sustainable transport infrastructure is crucial to achieving economic prosperity and competitiveness, vibrant and inclusive communities, and sustainable environments. Whilst the current Local Transport Plan (LTP) objectives (A Greener Healthier County; Sustainable Economic Growth; A Safer and Secure Transport System; and Good Access to Services) are consistent with aiding delivery of these wider outcomes, it is important that the LTP strategy evolves to reflect the significant changes to transport and planning policy frameworks since 2010.

Gloucestershire County Council (GCC) has a statutory responsibility under the Local Transport Act 2008 to prepare and review policies in a LTP. Utilising existing evidence from a range of sources, this document has been prepared to inform subsequent updates to the Gloucestershire LTP, covering the period up to 2031.

The purpose of this report is to:

- Provide a source of evidence to inform future LTP updates;
- Ensure the future LTP is updated to reflect the existing policy and delivery framework and priorities;
- Ensure transport investment focuses on key challenges facing Gloucestershire as captured through its existing LTP, emerging core strategies, the Council Strategy 2011-2015 and the developing GFirst Local Enterprise Partnership (LEP) Strategic Economic Plan (SEP);
- Provide a summary of the main issues, challenges and strategy themes likely to be important in the future LTP Strategy.

Although not developed for this purpose, it should be noted that this document will also be of value in supporting ongoing development and delivery of the Gloucestershire SEP and national funding challenge bids.

1.2. **Document Structure**

This document is structured as follows:

- The Gloucestershire Vision (Chapter Error! Reference source not found.);
- Transport and Growth (Chapter 3);
- Transport and People (Chapter 4);
- Transport and the Environment (Chapter 5);
- Modal Analysis: Active Travel Modes (Chapter 6);
- Modal Analysis: Bus Transport (Chapter 7);
- Modal Analysis: Rail (Chapter 8);
- Modal Analysis: Highway (Chapter 9);
- Freight (Chapter 10); and
- Key Findings and Conclusions (Chapter 11).

A set of supporting appendices have also been prepared to that provides additional technical detail relevant to the evidence presented in this main report.
2. Policy Review

2.1. Introduction

A fundamental litmus test for Gloucestershire’s LTP will be the extent to which it is consistent with and aids the delivery of the County’s existing and future social, economic and environmental aspirations for the County. This chapter summarises the key findings from a broader review of the following documents:

- Emerging District Local Plans;
- The Gloucestershire Health and Wellbeing Strategy;
- Corporate Climate Change Strategy;
- The Department for Transport’s Business Plan; and
- The National Planning Policy.

Additionally, the review has been mindful of current changes being made to local transport planning and delivery mechanisms. The evidence base has been prepared in parallel to ongoing developments in the Strategic Economic Plan (SEP) being developed by the Local Enterprise Partnership (LEP).

2.2. Emerging Priorities

The policy review (see Appendix A for more detail) was of key current policy frameworks was undertaken to better understand the overall strategic priorities for Gloucestershire. It is evident that in general terms there is local policy focus on the following key themes:

- Securing conditions for economic growth in Gloucestershire;
- Conservation and enhancement of Gloucestershire’s unique natural and built environment;
- Establishing communities that are given equal opportunity to benefit from economic prosperity; and
- Create healthy, safe and engaged communities.

A further purpose of this review was to collate a better understanding of the common transport objectives and challenges identified as published in core policy documents. The general objectives and associated strategic transport challenges are summarised in Table 2.1. This review has helped demonstrate that there is a strong degree of consistency in strategic aims and objectives published in different service and spatial planning policies. Table 2.1 further highlights the value that overcoming identified transport constraints will add to achieving the strategic goals listed above.

The remainder of this document focuses on drawing together evidence demonstrating varying extent to which transport infrastructure and services is, or has the potential to be a constraint to achieving such strategic goals. The issues raised are then consolidated into a package of issues and challenges that the future LTP will need to focus upon.
### Table 2.1  Strategic Transport Priorities

<table>
<thead>
<tr>
<th>Strategic Objectives</th>
<th>Strategic Transport Challenges</th>
<th>Potential Benefits</th>
</tr>
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<tbody>
<tr>
<td><strong>Securing conditions for economic growth in Gloucestershire where:</strong></td>
<td>• Providing a modern, reliable and congestion free transport network that meets future travel demand.</td>
<td>• Good quality transport infrastructure will promote Gloucestershire as a place to do business and therefore attract inward investment. Transport can also unlock development sites, facilitating economic growth.</td>
</tr>
<tr>
<td>• Local infrastructure (including transport) does not act as a constraint to unlocking sustainable development.</td>
<td>• Ensure sustainable travel behaviours/choices are promoted in the planning process (particularly relating to walking, cycling and public transport modes).</td>
<td>• Improved business efficiency through reduced travel related overheads.</td>
</tr>
<tr>
<td>• Businesses are well connected to skilled labour, business cluster, supply chains and the customers upon whom they rely to grow and prosper.</td>
<td>• Ensuring transport networks are resilient to extreme weather events such as flooding and high winds.</td>
<td>• Access to business clusters will help achieve LEP growth priorities.</td>
</tr>
<tr>
<td>• Both rural and urban economies are resilient to the adverse local impacts of extreme weather events.</td>
<td></td>
<td>• A healthier more active population corresponds to aiding a more productive economy.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improved footfall in urban retail areas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A transport network resilient to extreme weather events will reduce the risk of economic losses associated with these events.</td>
</tr>
<tr>
<td><strong>Conserve and enhance Gloucestershire’s unique natural and built environment (which acts as a primary contributor to attracting people to live, work and invest in Gloucestershire)</strong></td>
<td>• Encourage sustainable transport behaviours by improving travel choice.</td>
<td>• Increased uptake of sustainable transport modes (walking, cycling and public transport) and effective transport management and delivery will assist in reducing the adverse impact of transport on Gloucestershire’s high quality natural and built environment (such as noise, air quality, landscape)</td>
</tr>
<tr>
<td></td>
<td>• Locating developments in suitable locations to allow access to sustainable transport facilities.</td>
<td>• A reduction in car trips will provide decongestion benefits for local businesses and users.</td>
</tr>
<tr>
<td></td>
<td>• Protecting Gloucestershire’s communities from the adverse impacts of transport (such as poor design, congestion, noise and air quality).</td>
<td>• Increased uptake of walking and cycling for shorter trips will provide decongestion, increased footfall and physical activity benefits.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Developer contributions coordinated to secure improvements to local transport networks.</td>
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### Strategic Objectives

**Ensure that communities are given equal opportunity to benefit from economic prosperity by being well connected to employment, education, training, healthcare and other key services**

- Ensuring suitable transport arrangements are in place to support those most at risk from social exclusion.

**Create healthy, safe and engaged communities**

- Minimise collisions and incidents of crime on transport networks.
- Promote active transport as a means to facilitate healthier lifestyles.

### Strategic Transport Challenges

- Minimise collisions and incidents of crime on transport networks.
- Promote active transport as a means to facilitate healthier lifestyles.

### Potential Benefits

- Businesses have access to a high quality workforce and customer base.
- Reduced car dependency (with associated benefits).
- All residents are able to benefit from economic prosperity and the social benefits it brings.
- Retention of young people and skills in the County.
- Increased levels of economic activity and associated Gross Value Added (GVA) benefits.

- More reliable transport networks – less disruption and loss to the economy from collisions.
- Increased use of sustainable transport modes (particularly walking, cycling and public transport) helps address issues of obesity and associated conditions amongst adult and young population groups; it also helps reduce staff absenteeism which is a direct benefit to local businesses.
3. Transport and Growth

The LTP is intrinsically linked with the strategic employment and housing growth priorities set out in a range of strategy documents specific to Gloucestershire – particularly those defined in the emerging SEP and District Local Plans. As the County grows in economic and population terms, demand for travel increases. Future growth will have direct impacts on the effectiveness of the existing transport network as a means of linking people and places, whilst in turn transport will directly influence where development can be best accommodated. This chapter provides an overview of the growth context relevant to Gloucestershire.

3.1. Geographic Context

Gloucestershire has two main urban settlements, Cheltenham and Gloucester. Each form the main business, commercial, educational, service and cultural centres. These centres are complemented by a number of smaller market towns including Tewkesbury, Stroud, Coleford and Cirencester. These and a number of other smaller settlements effectively function as employment hubs and as providers of services to residents and outlying rural areas. The County is made up of six districts: Cheltenham; Cotswold; Forest of Dean; Gloucester; Stroud; and Tewkesbury. The County borders a number of local authorities including: South Gloucestershire; Wiltshire; Oxfordshire; Warwickshire; Worcestershire; Herefordshire; and Monmouthshire. Birmingham, Swindon and Bristol are also in close proximity. Figure 3.1 provides an overview of the County’s geography as well as population data.

Figure 3.1 Gloucestershire Population Distribution

Figure 3.1 shows that the County’s population is relatively evenly distributed across all districts. However, densities are much more variable, with the highest densities evident in the Cheltenham,  

1 Census 2011
Gloucester and Stroud. According to census classifications, around 78% of the County’s Lower Strategic Output Areas (LSOAs) are classified as village, hamlet or isolated dwelling and are the place of residence to 20% of the County’s population. The spatial distribution of Gloucestershire’s population brings both advantages and disadvantages in terms of transport provision. Higher densities help generate the critical mass needed to secure transport investment, whilst lower density rural areas reduce the opportunity and demand for public transport and services. This can contribute to the exacerbation of social exclusion and congestion issues in built up areas.

3.2. Drivers of growth

The current economic and housing growth agenda for Gloucestershire is currently being driven through a number of processes being progressed by GCC, the district councils and the LEP. Key strategic documents influencing County’s growth priorities include:

- The LEP’s Emerging SEP for Gloucestershire;
- The developing Gloucestershire Infrastructure Assessment;
- Emerging District Authority Local Plans; and
- Corporate Strategies/Plans.

This section considers the economic and housing growth forecasts for the County using evidence gathered from these documents.

3.2.1. Economy

The draft 2025 Growth Statement prepared by the GFirst LEP forecasts that by 2025 Gloucestershire will have:

- 34,000 extra jobs – an 11% increase on a 2012 base of 308,000 (see Figure 3.2);
- 0.8% jobs growth per annum;
- Productivity improvement of 2% per annum;
- A County GVA of £14.5bn – a 26% increase on a 2007 base of £11.5bn;
- Highest employment growth anticipated in construction, finance, insurance, business administration, accommodation, food, health and care.

Figure 3.2 provides a summary of the County’s growth forecasts from 2012 to 2025.

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1 Forecasts are based on outputs from the Local Economic Forecasting Model developed by Cambridge Economics and the Institute for Employment Research.
Specific opportunities for growth are predicted in a number of sectors where Gloucestershire already has key strengths, including:

- Nuclear energy generation in the energy & water sector. The presence of a nuclear based power generation industry has long been a feature of the local economy and is likely to expand with the prospects of a new reactor being built in close proximity;
- High-tech manufacturing activities, both in aerospace and precision and medical instruments, are locally strong and highly productive;
- Information and communications technology, in particular digital media, which will be supported by improving broadband capability; and
- Service aspects of the knowledge economy (including professional, scientific, technical, financial and insurance) with the potential to further develop, sell and export expertise.

Figure 3.1 presents further details on forecast employment growth by sector.

In addition to the potential growth sectors are sectors that should continue to be actively supported in order to maintain the quality of life in the County and resilience within the local economy, such as health, care, retail, construction and tourism services. These sectors will need to be supported by flexible and relevant transport infrastructure, necessary to ensure that goods, raw materials, people and services can be moved efficiently and ensure that the County’s businesses are as competitive as possible.

3.2.2. Housing and Population

Forecasts of changes in population, household number and household size are presented for each Strategic Assessment Area (SAA)\(^1\) across Gloucestershire in Figure 3.3, covering the period up to 2031.

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\(^1\) SAAs correspond to collections of statistical units called Strategic Output Areas (SOAs) and represent areas with common housing, social demographic, economic and travel to work relationships.
Figure 3.3 Forecast Change in Demographics across Gloucestershire 2012-2031
Household Numbers

Gloucestershire's district authorities, in partnership with GCC and other key partners, are currently considering local housing requirements as part of their Local Plans. As such, detailed information concerning the location, type and amount of housing remains to be confirmed. The Gloucestershire Infrastructure Assessment (GIA) Study, which forms an evidence base to local infrastructure assessments being undertaken for each of the district local plans, has been used as the evidence base for this section.

As summarised in Figure 3.3 and presented in greater detail in Table E.1, over the period 2012 to 2031, the total number of households within Gloucestershire will increase by 55,338 households (21.1%) to 318,030 households. Those SAAs that will see the greatest increase in households include Gloucester City Core Urban Area (56.9%), Southern Gloucester and Urban Fringe (54.9%), Cheltenham West and Southern Fringe (23.9%) and Cheltenham Core and Eastern Area (22.5%).

Household Size

Forecasts of changing household size are summarised in Figure 3.3, with further detail provided in Table E.2. Over the period 2012 to 2031, average household size across Gloucestershire will decline by 0.2% from 2.3 persons per household in 2012 to 2.1 in 2031. It is expected that the biggest decline in household size will be seen in Northern Cotswolds SAA, with a reduction of 0.4 persons per household between 2012 and 2031. Changing household size has a direct impact on transport given that smaller household units create a propensity for more single car trips.

Population

Figure 3.3 summarises the forecast change in population across Gloucestershire, with further details provided in Table E.3. Over the period 2012-2031, the population of Gloucestershire is expected to increase by 52,837 people (9%) to 659,736. Population growth will be focused in and around existing urban areas, such as Gloucester City Core Urban Area (43% increase) and Cheltenham Core and Eastern Area (21% increase).

In contrast, a number of SAAs will experience either a lower level of population growth or population decline. It is expected that the Southern Cotswolds and Cirencester SAA will experience a population decline of 5,252 people (9%); Northern Gloucester Urban Fringe / Northern Severn Vale will see a reduction of 1,587 people (6%); Northern Cotswolds will see a decline of 682 people (3%); and South Vale and Stroud Valleys will see a decline of 2,580 people (2%).

Population Demographics

Table 3.1 details the forecast population demographics for Gloucestershire up to 2031. The data shows that in 2012, the largest age cohort was those aged between 25 and 59, comprising 45% (273,790) of the total population. The next largest age cohort are those aged 60+ comprising 25% (170,068) of the total population. By 2031, those aged between 25 and 59 are expected to comprise 40% (262,783) of the population whilst those aged 60+ are expected to comprise 33% (220,362) of the total population. When compared with 2012 figures, this indicates that Gloucestershire will experience an ageing demographic profile.
Table 3.1 Gloucestershire Demographic Profile (2012-2031)\(^1\)

<table>
<thead>
<tr>
<th>Age Cohort</th>
<th>2012 Population</th>
<th>% of Total Population</th>
<th>2031 Population</th>
<th>% of Total Population</th>
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<td>17</td>
<td>107,904</td>
<td>16</td>
</tr>
<tr>
<td>15-24</td>
<td>71,019</td>
<td>12</td>
<td>68,688</td>
<td>10</td>
</tr>
<tr>
<td>25-59</td>
<td>273,790</td>
<td>45</td>
<td>262,783</td>
<td>40</td>
</tr>
<tr>
<td>60+</td>
<td>157,803</td>
<td>26</td>
<td>220,362</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>606,900</td>
<td>100</td>
<td>659,736</td>
<td>100</td>
</tr>
</tbody>
</table>

3.3. The Implications of Growth for Transport

This section considers the relationship between the economy, housing and population growth and transport. The impacts of the forecast changes in these areas are considered after a brief discussion of recent trends in traffic growth in Gloucestershire.

3.3.1. Recent Traffic Growth in Gloucestershire

Since 2000, the total distance travelled on Gloucestershire highways has shown a net increase of around 10% (as shown in Figure 3.4), an average increase of less than 1% per annum.

Figure 3.4 Change in Million Vehicle Km Travelled in Gloucestershire

\(^1\) GAM (includes growth data as at Oct 2012)
At the onset of the recession, net growth peaked at 14% compared to 2000 levels and since then has shown an initial decline and subsequent stagnation. Further trends of relevance include:

- Total travel is highly reflective of peaks and troughs in the economy – since 2010, total travel in the County has changed very little, coinciding with relatively slow levels of economic growth;
- Whilst there has been an overall net decrease in heavy goods vehicle (HGV) travel of around 16% between 2000 and 2012, there has been a corresponding increase in light goods vehicle (LGV) travel of 45% over the same period;
- Use of pedal cycles has shown a net increase of 4% since 2000;
- The use of motorised two wheelers has increased by close to 10%; and
- Bus and coach kilometres have reduced by almost 20%, though they have been more stable since 2007.

The observed changes in traffic levels (across all user classes) have been higher in the County than nationally, where increases have been closer to 5% over the same period. Higher than national average car ownership levels, combined with Gloucestershire’s dispersed population characteristics, are likely to offer the main explanation for this trend. The absence of a comprehensive local rail network may also be a constraint to reducing growth of goods vehicles on the network over time.

3.3.2. Growth and Transport

The four strategic objectives for Gloucestershire’s LTP must all be achieved in the context of changing economic conditions, household change and population growth. This creates challenges for transport in that transport networks and services must adapt to changing priorities and needs. The evidence presented in this chapter, supplemented with data from the Department for Transport’s (DfT’s) Road Transport Forecasts 2011 publication, is considered in light of Gloucestershire’s strategic objectives in Table 3.2.
## Table 3.2 The Implications of Growth for Transport

<table>
<thead>
<tr>
<th>Objective</th>
<th>Evidence</th>
<th>Implications</th>
</tr>
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</table>
| **Secure conditions for economic growth** | • Nationally, road traffic is expected to grow by between 34 and 55% above 2010 levels by 2035 (in line with pre-recession expectations).  
• The number of LGVs on the national road network is forecast to increase faster than all other vehicle types, at a rate of 88% between 2010 and 2035. This compares to 37% and 43% for cars and HGVs respectively.  
• By 2035, 24% of all traffic will be travelling in very congested conditions in urban areas (compared to a 2010 baseline of 13%), with congestion expected to worsen on all other road types. Commuters, education/personal business, bus and coach trips will suffer most from lost time in congestion, having clear economic implications.  
• A key expectation of the LTP will be to help secure transport networks that enable delivery of sustainable housing (c55,000 new houses) and employment development (34,000 new jobs) - this growth will place significant pressure on existing transport networks (particularly on urban corridors around Cheltenham and Gloucester).  
• Oil prices could increase to $130 per barrel by 2035 (compared to base of $80 per barrel today). Such an increase in oil costs will make petrol based fuels more costly – this places increased pressure on the County to support innovative fuel types including bio-fuel and the uptake of hybrid and all electric vehicles.  
• The changing business environment (such as globalisation and flexible working) will influence how future accessibility/connectivity is provided and to where. | • The LTP will have a critical role in helping mitigate the effects of forecast economic growth on multi-modal network efficiency and reliability. Local transport networks will need to be maintained and enhanced to accommodate this growth without compromising existing levels of network performance reliability within Gloucestershire.  
• Failure to manage travel demand (occurring from expected population growth and changes in demography) will result in worsening and expansion of existing congested networks. This will consequently result in a reduction in the attractiveness of Gloucestershire as a place to live, work, visit and invest.  
• Not supporting alternative fuel types (e.g. electric vehicles) is likely to have economic ramifications and lead to disparities in people’s ability to travel, thereby impacting on social exclusion. |
<p>| <strong>Conserve and enhance Gloucestershire’s unique natural and built environment</strong> | • Irrespective of an increase in traffic demand, CO2 emissions are expected to be around 9% lower (or 9% higher under a high growth scenario) by 2035. For transport, this will be driven by improvements in fuel efficiency, which is expected to improve by 11% - 46% between 2010 and 2035. | • A reduction in CO2 emissions will support the County’s objective to preserve the natural environment. |</p>
<table>
<thead>
<tr>
<th>Objective</th>
<th>Evidence</th>
<th>Implications</th>
</tr>
</thead>
</table>
| Ensure that communities are given equal opportunity to benefit from economic prosperity | - The number of households across Gloucestershire is expected to increase by 55,338 (21.1%) to 318,030 between 2012 and 2031. During the same period, average household size is forecast to fall by 0.2% to 2.1 persons per household.  
- Much of the County’s population growth is expected in the Central Severn Vale settlements of Cheltenham, Gloucester, Tewkesbury and Stroud. However, some areas will see population decline, including the Southern Cotswolds and Cirencester, Northern Gloucester Urban Fringe / Northern Severn Vale, Northern Cotswolds and South Vale and Stroud Valleys. | - Housing and employment growth will increase demand to travel and changing household structures will affect where, when and how people travel – the impacts of additional traffic as the economy recovers is likely to be particularly prevalent on the key urban settlements - particularly around existing congestion hotspots. The LTP should ensure that as household numbers and composition changes, transport networks and services adapt to meet changing demand.  
- Achieving the critical mass for public transport in areas of dispersed population represents a particular challenge for Gloucestershire, thus supporting the case for new developments to be built as part of urban extensions and within existing brownfield sites. |
| Create healthy, safe and engaged communities                              | - Between 2012 and 2031, Gloucestershire’s population is expected to increase by 52,837 people (9%) to 659,736.  
- The County’s population is ageing. By 2031, 33% of Gloucestershire’s total population is expected to be over 60 years of age, compared to 25% in 2012. | - An increasing and aging population will have direct implications for transport provision in the County. GCC needs to adapt to this challenge by ensuring adequate public and social transport networks and services are in place, particularly for the elderly, across the County. |
4. Transport and People

4.1. Introduction

Making transport options affordable, available, accessible and acceptable to all travellers can contribute positively to raising levels of social inclusion, neighbourhood renewal, local prosperity and economic performance. More specifically, high quality transport networks in Gloucestershire can help deliver the strategic objectives identified for the LTP by:

- Improving travel choice for those population groups most at risk from exclusion (rural and urban low income communities, the elderly, young and ethnic groups);
- Improving access to educational, training and work opportunities;
- Reducing health inequalities through better access to health services and increased participation in physical activity; and
- Increasing participation in leisure, retail and cultural activities.

Detailed below are the headline social issues within Gloucestershire. Supporting data and more in depth analysis can be found in Appendix F. It should be noted that there is a specific lack of local empirical evidence around the barriers to travel, other than that which can be inferred through national research and that captured elsewhere in this report.

4.2. Access to Employment

Poor transport choice can prevent people from taking up and keeping employment, and restrict their choice of jobs. Consequently, transport infrastructure is a key enabler of social and economic activity, with some communities potentially losing out over others due to transport provision.

The pattern of employment deprivation across Gloucestershire is largely consistent with overall trends for deprivation in the County, with 7% of all Super Output Areas (SOA) in the County falling within the worst 20% nationally. The most extreme areas of employment deprivation are the urban areas, particularly in Cheltenham, Gloucester and Tewkesbury – although additional pockets can be found in the Cinderford area of the Forest of Dean.

4.2.1. Travel to Work Mode Choice

Table 4.1 provides an overview of current travel to work modal share. Car and van travel is the predominant choice of travel to work in Gloucestershire, with 70% modal share, compared to a national average of 62%. Reflecting their rural nature, car usage is typically higher in the Forest of Dean (77%), Stroud (75%) and Tewkesbury (74%). Cheltenham is the only authority with a lower than average car/van mode share, attributable to the higher usage of active modes.

Rail’s modal share in Gloucestershire, 4%, is lower than the national average of 5%. Bus travel is also lower than average in Gloucestershire, with only the key urban centres of Cheltenham and Gloucester achieving bus modal share comparable with the national average. The areas of Cotswolds, Forest of Dean and Stroud have particularly low bus usage, perhaps due to their rural nature and the accessibility issues considered later in this section. This data suggests that there is an opportunity for both rail and bus to increase their modal share across the County.

Active modes of cycling and walking achieve better than national average mode share proportions. Walking and cycling usage is particularly common in the urban areas of Cheltenham and Gloucester.
Table 4.1  Travel to Work Modes by Authority

<table>
<thead>
<tr>
<th>Region</th>
<th>Work at home</th>
<th>Train</th>
<th>Bus</th>
<th>Driving car/van</th>
<th>Passenger car/van</th>
<th>Bicycle</th>
<th>On foot</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheltenham</td>
<td>6%</td>
<td>1%</td>
<td>6%</td>
<td>56%</td>
<td>5%</td>
<td>7%</td>
<td>18%</td>
<td>2%</td>
</tr>
<tr>
<td>Cotswold</td>
<td>11%</td>
<td>2%</td>
<td>1%</td>
<td>63%</td>
<td>4%</td>
<td>2%</td>
<td>14%</td>
<td>2%</td>
</tr>
<tr>
<td>Forest of Dean</td>
<td>8%</td>
<td>1%</td>
<td>2%</td>
<td>71%</td>
<td>6%</td>
<td>1%</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Gloucester</td>
<td>3%</td>
<td>1%</td>
<td>7%</td>
<td>64%</td>
<td>6%</td>
<td>5%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Stroud</td>
<td>9%</td>
<td>1%</td>
<td>2%</td>
<td>70%</td>
<td>5%</td>
<td>2%</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Tewkesbury</td>
<td>7%</td>
<td>1%</td>
<td>5%</td>
<td>69%</td>
<td>5%</td>
<td>4%</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>England</td>
<td>5%</td>
<td>5%</td>
<td>7%</td>
<td>57%</td>
<td>5%</td>
<td>3%</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>Gloucestershire</td>
<td>7%</td>
<td>1%</td>
<td>4%</td>
<td>65%</td>
<td>5%</td>
<td>4%</td>
<td>12%</td>
<td>2%</td>
</tr>
</tbody>
</table>

4.2.2. Residents’ Travel to Work Movements

Gloucestershire benefits from being relatively self contained in terms of people living and working within the County, with approximately 85% of people working in Gloucestershire also living in the County. Of those trips to workplaces outside of the County, the most common destinations are border counties and urban areas in close proximity to the Cotswolds, Cheltenham and Stroud, including Bristol, Wiltshire, South Gloucestershire, Swindon and Oxfordshire. Of work flows into Gloucestershire, the strongest flows are from Bristol, South Gloucestershire and Swindon. Flows from Worcestershire are also relatively predominant in the north of the County.

Table 4.2 details the principle travel to work movements within Gloucestershire.

Table 4.2  Overview of key District Level Travel to Work Movements (where the resident population travel to)

<table>
<thead>
<tr>
<th>Destination →</th>
<th>Cheltenham</th>
<th>Cotswold</th>
<th>Forest of Dean</th>
<th>Gloucester</th>
<th>Stroud</th>
<th>Tewkesbury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheltenham</td>
<td>71.1%</td>
<td>3.1%</td>
<td>-</td>
<td>9.3%</td>
<td>-</td>
<td>6.7%</td>
</tr>
<tr>
<td>Cotswold</td>
<td>-</td>
<td>71.4%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Forest of Dean</td>
<td>-</td>
<td>-</td>
<td>64.0%</td>
<td>15.0%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gloucester</td>
<td>12.9%</td>
<td>-</td>
<td>-</td>
<td>66.4%</td>
<td>3.5%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Stroud</td>
<td>4.2%</td>
<td>3.0%</td>
<td>-</td>
<td>11.0%</td>
<td>66.9%</td>
<td>-</td>
</tr>
<tr>
<td>Tewkesbury</td>
<td>35.8%</td>
<td>-</td>
<td>-</td>
<td>17.5%</td>
<td>-</td>
<td>37.7%</td>
</tr>
</tbody>
</table>

With exception of Tewkesbury district, where self containment is low, the districts in Gloucestershire generally show self containment levels within the range of 64-72%. The strong pattern of out-commuting from Tewkesbury is likely to be attributable to strong commuting links between Cheltenham and Gloucester from settlements such as Tewkesbury itself, Bishops Cleeve and Churchdown.

For the Forest of Dean, further analysis of the data shows a strong affiliation with Gloucester, Monmouthshire and Herefordshire. Interaction with other districts is likely to be constrained by the dependency on a single river crossing to the west of Gloucester and long journey times from

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1 2011 Census data (Office for National Statistics), Totals exclude those not in employment
2 Gloucestershire Local Economic Assessment Report (2011)
the district to other parts of the County (due to geographical, connectivity, congestion and public transport issues).

4.3. **Access to Education, Training and Skills**

To alleviate social exclusion and improve economic prosperity, GCC has a responsibility to support those wishing to partake in work, education or training, particularly those most at risk from exclusion. As a whole, Gloucestershire benefits from a low level of unemployment and a well qualified population when compared to the national averages, as noted in Figure F.1 and Table F.3, respectively.

Despite these strengths, there are particular causes for concern across the County, as noted by Gloucestershire’s Local Economic Assessment (LEA):

- Further education success rates have decreased over recent years;
- Gloucestershire businesses account for 11% of the total number of skill shortage vacancies in the south west;
- Over a fifth of the County’s employers reported a skills gap in 2009;
- 13% of employees in Gloucestershire are not considered fully proficient by their employer, the highest proportion in the south west; and
- Pockets of deprivation in the County’s urban areas have shown no signs of improvement.

To overcome these issues and maintain and grow Gloucestershire’s economic competitiveness, continued development in the County’s labour force is necessary, particularly in regard to ensuring a high skills base for local employers. Transport plays a role in facilitating this growth by ensuring efficient and affordable links to places of education and training.

In particular, difficulties with transport can prevent people from participating in academic and vocational learning or restrict their choice of quality, subject matter or type of learning provider they use. Difficulties or barriers to travel can include:

- Affordability;
- Availability of transport links to learning, training and employment opportunities at the time of day needed;
- Inconvenient interchange requirements;
- Long journey times on public transport; and
- Availability of suitable cycling and walking infrastructure, which can be a deterrent to using such modes for shorter trips.

Unfortunately there is no local data to suggest whether these or other issues impact on travel choices for those wishing to partake in education or training.

A particular social group for which access to training and education is vital are young people who are not in education, employment or training (NEETs). For an individual, being a NEET can lead to wage scarring, with wider social impacts through lost output, higher welfare payments and lower tax contributions. In the long term, this can be detrimental to wider economic growth as businesses struggle to find labour supplies with the right skill sets and attainment levels to meet their needs. In 2012, 5.2% of Gloucestershire’s 16-18 year old population were classed as NEETs, lower than the English average of 5.7%\(^1\). This group is particularly vulnerable to transport related barriers to education and training given relatively low levels of car ownership in this age category, and as such GCC should pay particular concern to how transport can improve opportunities for NEETs to access training, education and work.

\(^1\) ONS NEET Data (May 2013) based on averages of the quarterly statistics for a year
4.3.1. Access to Compulsory Schooling

GCC has a statutory requirement to ensure that all children are able to access compulsory school age education, and has agreed locally to follow identified best practice\(^1\). To meet this requirement, GCC provide bus passes to individuals who are able to travel to school by public transport (with a shift toward smart cards during 2013/14). The Council also organises routes and pickup points as necessary.

In exceptional circumstances, alternative methods of hired transport are considered. Where hired and public transport would not be suitable, direct assistance with travel costs for parents to make their own arrangements may be considered.

The key challenges that Gloucestershire have in terms of providing access to compulsory education are summarised as follows:

- Providing truly flexible choices for young people is a challenge for the County. Transport provision needs to take into account of the fact that due to varying curriculums or school types (e.g. academies, faith or sports schools), young people may not wish to attend their nearest school, and this needs to be reasonably accommodated. Additionally, after school activities place different demands on transport providers. A lack of adaptation to meet these needs can make transport a barrier to education access for certain communities (particularly vulnerable communities);
- Managing down the costs of school transport (£7.5 million in 2012/13) within the context of a growing population and increasing fuel costs;
- Ensuring new housing growth areas are well connected by walking and cycling routes (where appropriate) to minimise demand on school services provided under statutory regulation; and
- Encouraging young people to take up active modes where convenient as a substitute for car use through means such as Safer Routes to School, Bike It and cycle training. This will help encourage sustainable travel choices amongst the County’s future generation.

These challenges are also applicable to post 16 education, as discussed in the following section.

4.3.2. Access to Post 16 Education

A separate policy applies for students aged 16+ undertaking full time courses in school 6th forms or colleges. GCC works collaboratively with local providers to address access issues including transport and consults on the home to school/college transport policy for students aged 16+. The Council’s Home to School Transport Policy was reviewed in 2011 to remove some of the more discretionary aspects of previous assistance. Transport assistance for most students aged over 16 is a discretionary provision, however, the Authority remains committed to ensuring that all students receive access to education and will continue to meet best practice expectations.\(^8\)

There is an annual charge (£440) to the user for any transport provided by GCC for students aged 16+, and a new application must be made each year, even if they are remaining at a school where they previously received free transport. The County Council will provide help to students who fulfil all of the following:

- Are aged under 19 years old on the 31st August before the start of the academic year (or in the case of continuing courses, were under 19 years old before the start of the academic year in which their course began);
- Are studying on a full time basis (over 16 hours per week);
- Attend the school/academy or college nearest to their home address or continue their education (attended in Year 11) in the sixth form at the nearest school/academy agreed by the County Council to serve their home address (catchment school/academy); and

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\(^1\) Best practice as identified in: the Education Act 1996, the Education and Inspections Act 2006, the Home to School Travel and Transport Guidance and Home to School Travel for Pupils Requiring Special Arrangements Guidance.
- The home to school/college journey is three miles or more, measured by the shortest available pedestrian route.

Whilst there is no local empirical data identifying links between public transport availability and Higher Education College (as opposed to 6th form colleges) participation and attainment, public transport availability is likely to present a significant barrier to educational choice (such that students are not able to attend a course of their choice). Consequently the local economy suffers as businesses do not get labour that matches their requirements.

Access to post 16 education via non car modes is particularly problematic in rural parts of the County, as identified through accessibility mapping shown in Figure 4.1 and Figure 4.2.

Figure 4.1 Non-Car Journey Times to Higher Education Academic Providers 0700-0900
Using this data, the following conclusions regarding public transport and walking access to post 16 learning opportunities can be made:

- Journey times to both academic and vocational learning opportunities are particularly constrained in the Cotswolds where an average of 28% of households have a travel time of greater than 45 minutes, or no service at all, to the nearest provider;
- Journey times from vocational education providers (16:00-18:00) are particularly constrained in the Cotswolds (64% have a journey time of greater than 45 minutes or no access at all). This also an issue in the Forest of Dean, Tewkesbury and Stroud where 38% and 28% respectively have poor access; and
- Lydney and Newent (Forest of Dean); Winchcombe (Tewkesbury), Moreton in Marsh, Stow on the Wold and Northleach (Cotswolds) and Dursley (Stroud) all experience limited public transport access to vocational educational providers.

It is important to note that the accessibility mapping undertaken hides more complex issues where students have a preference or need to access a provider that isn’t closest in geographic terms to where they live or need to access a workplace.

In addition to the challenges noted in the section 4.3.1 (the previous section), which apply to both pre and post 16 education, affordability is a potential concern for young people in post 16 education, particularly for those who have to attend vocational training and learning opportunities not available locally.

4.4. **Access to Private Transport**

Figure 4.3 details car and van ownership levels for the County, districts and England. The number of non car households in Gloucestershire (17%) is significantly below the national average (26%), reflecting the County’s generally rural and affluent nature. It is forecast that as economic growth and prosperity continue, there will be an associated rise in car ownership, although ownership levels in higher income groups may reach a saturation point at which increasing wealth has no impact on car ownership levels.
Personal car ownership is highest in the Cotswolds (87%) and Forest of Dean (86%) districts. Almost half of households in the rural districts of Cotswolds, Forest of Dean and Stroud have access to more than one car. The rural, low density nature of these districts makes public transport provision less viable, thus encouraging higher levels of car ownership. This increases the likelihood of households without access to personal cars suffering from social exclusion by reducing their travel choices and horizons, potentially preventing people from taking up and keeping employment. This is of particular relevance for the elderly, disabled, the sick, unemployed and young people. As such, GCC must recognise the importance of providing convenient and affordable travel choices in these districts. Improvements to public transport provision in these communities would also serve to encourage modal shift by regular car uses.

Cheltenham and Gloucester districts have levels of car ownership closer to the national average. This is likely to be a function of:

- Provision of well established commercial urban and inter-urban bus networks in these areas due to higher population densities;
- Higher mixed land use densities enabling more of the population to take advantage of active modes such as walking and cycling;
- Younger people without access to cars being populated in these areas; and
- Lower income communities being concentrated in urban areas and thus where affordability is likely to be a constraint to car ownership.

Whilst accessibility mapping confirms that most people across the County can access their nearest major centre within 30 minutes by non car modes, public transport modal share is low, suggesting there are other barriers to using public transport (additionally, travel choices to other towns are more limited or require interchange). Evidence presented elsewhere in this report confirms that factors such as affordability, destination and travel time choice, service frequency, ticket flexibility and public transport service information are regarded as common barriers to public transport use in Gloucestershire.

1 2011 Census (ONS)
4.5. Social Exclusion Indicators

In relative terms, Gloucestershire is fortunate not to suffer from the extent of deprivation observed nationally. Just 7% (27) of the County’s LSOAs fall within the country’s lowest 20% of LSOAs in terms of overall deprivation. Figure 4.4 reveals the areas of deprivation in Gloucestershire, with Table F.5 and Table F.6 providing details of deprivation at ward level.

![Geography of Overall Deprivation in Gloucestershire](image)

As shown above, the most deprived LSOAs are largely confined to the Gloucester and Cheltenham urban areas. Other, smaller pockets of income and overall deprivation exist in Tewkesbury, Cinderford and Lydney (Forest of Dean), Stroud and Stonehouse (Stroud) and Cirencester.

It has been noted that those living in rural areas without access to a car face particular difficulties in finding work due to generally poor transport provision and a lack of affordable social housing located nearer to employment opportunities, potentially exacerbating levels of deprivation.

4.6. Transport and Health

Health inequalities arise from differences in the social and economic conditions in which people are born and live. These in turn influence people’s behaviours and lifestyle choices, their risk of illness and the actions they take to deal with illness when it occurs.

The standard of health across Gloucestershire is generally good (when considering a variety of health indicators), particularly in Cheltenham and Stroud. However, there are areas of relatively poor health, notably Gloucester and the Forest of Dean. Of particular concern for GCC should be

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1 Indices of Multiple Deprivation
2 Campaign for Better Transport (2012)
3 Public Health England (2013)
the trend of above average cases of diabetes and issues of child obesity in Gloucester, with this remaining an issue into adult age in Gloucester and the Forest of Dean. Table F.7 has further details on health and quality of life indicators across the County, broken down by district.

Deteriorating and poor general health has a variety of implications on transport. Principally, the need to provide adequate public transport options for the elderly, patients and visitors to access healthcare facilities (either large hospital or community facilities) is vital. The demand for adult care services in Gloucestershire is already increasing and is expected to continue to do so, placing greater pressures on transport service provision. Additionally:

- Poor health can limit travel horizons, leading to exclusion from key services and life choices;
- Transport availability can be a constraint to providing care where family members/associates are providing care for loved ones;
- Supporting access to work for those with a disability can help bring down local benefit dependency and encourage independence;
- An aging population is likely to cause greater numbers of serious car collision injuries, as this population group are typically more prone to injury from collisions; and
- Encouraging greater uptake of active modes at a young age is likely to improve general health in future adult populations.

Despite generally good health levels, obesity in Gloucestershire is generally higher than the national average (around 24%), though there is some variability between districts. The Cotswolds and Cheltenham have lower levels of obesity than the national average, whilst Gloucester and the Forest of Dean are significantly above the national average.

Promoting active travel can offer benefits for health (including obesity) as well as wider socio-economic benefits, including:

- Encouraging modal shift from car to active travel modes can contribute to reducing the risk of heart disease, stroke, cancer, diabetes and other illnesses including those resulting from obesity;
- Measures to improve health through increased active travel modes helps reduce congestion, improve air quality, increase accessibility, reduce illness related absenteeism at work and reduce risk of injury;
- Regular cycling amongst adults can increase an individual's average life expectancy; and
- At school age, active travel is one of the main contributors to achieving the Chief Medical Officer's recommendations for physical activity and maintaining a healthy weight.

**4.7. Transport and Safety**

**4.7.1. Road Collisions**

Over the period 2005 to 2012, the number of vehicle collisions in Gloucestershire has fallen by 34%, with similar decreases in the number of casualties and fatalities as shown in Table 4.3. Positively, this fall has been equitable, with similar reductions on both rural and urban roads. However, there has been an increase in the number of cycle, pedestrian and elderly (65+) casualties resulting in serious or fatal injuries.

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1 Transport and Health Resource, DfT and Department for Health (2011)
### Table 4.3 Key Gloucestershire Accident Trends 2005-2012 (Comparison of 3 Year Rolling Averages)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Casualties</td>
<td>2308</td>
<td>1522</td>
<td>-34.1%</td>
<td>-786</td>
</tr>
<tr>
<td>Total Collisions</td>
<td>1729</td>
<td>1140.3</td>
<td>-34.1%</td>
<td>-589</td>
</tr>
<tr>
<td>Fatal Casualties</td>
<td>43.7</td>
<td>26.7</td>
<td>-38.9%</td>
<td>-17</td>
</tr>
<tr>
<td>Serious Casualties</td>
<td>222.3</td>
<td>202.3</td>
<td>-9.0%</td>
<td>-20</td>
</tr>
<tr>
<td>Cycle KSIs</td>
<td>25</td>
<td>34.7</td>
<td>+38.7%</td>
<td>+10</td>
</tr>
<tr>
<td>Motorcycle KSI</td>
<td>55.3</td>
<td>49</td>
<td>-11.4%</td>
<td>-6.3</td>
</tr>
<tr>
<td>Pedestrian KSI</td>
<td>37.7</td>
<td>39.7</td>
<td>+5.3%</td>
<td>+2</td>
</tr>
<tr>
<td>Rural Collisions</td>
<td>612.3</td>
<td>405</td>
<td>-33.9%</td>
<td>-207</td>
</tr>
<tr>
<td>Urban Collisions</td>
<td>1117.3</td>
<td>735.3</td>
<td>-34.2%</td>
<td>-382</td>
</tr>
<tr>
<td>KSI &lt;Under 16 years</td>
<td>17.7</td>
<td>13</td>
<td>-26.4%</td>
<td>-4</td>
</tr>
<tr>
<td>KSI &gt;65 years</td>
<td>24</td>
<td>30.7</td>
<td>+27.8%</td>
<td>-7</td>
</tr>
</tbody>
</table>

Whilst there has been a strong decrease in casualty numbers across all districts, serious and fatal casualties remain strongly clustered around the most heavily trafficked corridors. Of particular concern is the concentration of accidents in and around the urban settlements of Stroud, Cheltenham and Gloucester. Well designed transport infrastructure and safe service provision can aid in improving safety for all transport modes and thereby reduce the number of injuries occurring in Gloucestershire.

In terms of the impact on other transport users, accidents can be the source of unplanned delays which adversely affect route journey times and disrupt business activity, adding to overhead costs through lost time. Safety issues can also form a barrier to using more sustainable modes including cycling, walking and public transport use.

#### 4.7.2. Crime and Personal Security

Analysis of crime statistics shows that the incidence of crime that may impact on local travellers in Gloucestershire (including the use of rail stations) is relatively low and in line with similar police authority areas (see Table F.8 and Table F.9). Despite this, GCC need to be mindful of personal security on the transport network. Measures to reduce vulnerability to crime on the transport network may include:

- Regular engagement and presence of law enforcement organisations to identify priorities relating to crime on the transport network;
- Improving the quality of the public realm to increase natural surveillance against crime;
- Open walking and cycling networks;
- General provision of appropriate street lighting and CCTV coverage, particularly at public transport interchanges;
- Provision of good cycle parking facilities at key service destinations and interchange hubs to combat cycle theft;
- Educational campaigns to protect people from crime on the transport network;
- On-board CCTV on public transport; and
- Alcohol and drug prohibitions.
4.8. **Constraints and Risks**

Within the context of the strategic objectives identified in Table 2.1, an analysis of the key socio-demographic indicators which transport impacts has been undertaken. Table 4.4 summarises the findings of this research, showing clearly the local socio-demographic issues that transport can help alleviate alongside the implications of not alleviating them.
Table 4.4 The Role of Transport in Alleviating Socio-Demographic Problems

<table>
<thead>
<tr>
<th>Socio-Economic Problem or Constraint</th>
<th>Transport’s Role in Alleviating Problem</th>
<th>Implications of not Alleviating Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure conditions for economic growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• High level of reliance on the car as a means of transport, particularly in the more rural districts of the Forest of Dean, Stroud and Tewkesbury.</td>
<td>• Geographical barriers are one of several causes of deprivation, particularly for more vulnerable groups (the young, elderly, the sick etc) or those without access to private transport. It is important that alternative options are available, such as public transport, to help overcome geographical barriers.</td>
<td>• Whilst on its own transport cannot create economic growth, it can facilitate economic growth and improve business competitiveness by allowing good connectivity between people, businesses and supply chains.</td>
</tr>
<tr>
<td>•Whilst travel to work movements are largely internalised within districts (a positive), within Tewkesbury self containment is low, resulting in further distances to travel to work.</td>
<td>• On routes with high commuter flows the encouragement of modal shift to more sustainable modes can alleviate congestion and improve environmental quality.</td>
<td>• Poor transport choice can prevent people from taking up employment and restrict their choice of jobs, undermining economic growth and lowering an individual's ability to better themselves.</td>
</tr>
<tr>
<td>•Some businesses in the County are reporting a skills gap and a shortage of skilled labour. Access to post 16 education via non car modes is particularly problematic in rural parts of the County.</td>
<td>• Difficulties accessing appropriate transport can prevent people from participating in academic and vocational learning or restrict their choice of quality, subject matter or type of learning provider they use. Difficulties include provision of transport, affordability and inconvenience of interchanges.</td>
<td>• A high reliance on private transport means more cars on the road, contributing to congestion, delay and undermining economic competitiveness. This also impacts on the ability for efficient public transport services to be provided.</td>
</tr>
<tr>
<td>Most people across the County can access their nearest major centre within 30 minutes by non car modes, but public transport modal share is low, suggesting there are other barriers to using public transport.</td>
<td>• Public transport and opportunities for active transport should be well integrated into sustainable communities to encourage modal shift from the car and bring about more active, healthy lifestyles.</td>
<td>• An increasing skills gap and shortage of talented labour can undermine economic competitiveness in the County. Without adequate skills or training people may fall into unemployment, increasing state welfare payments.</td>
</tr>
<tr>
<td>Factors such as affordability, destination and travel time choice, service frequency, ticket flexibility and public transport service information are regarded as common barriers to public transport use in Gloucestershire.</td>
<td>• Geographical barriers are one of several causes of deprivation, particularly for more vulnerable groups (the young, elderly, the sick etc) or those without access to private transport. It is important that alternative options are available, such as public transport, to help overcome geographical barriers.</td>
<td>• Whilst on its own transport cannot create economic growth, it can facilitate economic growth and improve business competitiveness by allowing good connectivity between people, businesses and supply chains.</td>
</tr>
<tr>
<td>• 7% of Super Output Areas in the County fall within the worst 20% nationally for overall deprivation.</td>
<td>• On routes with high commuter flows the encouragement of modal shift to more sustainable modes can alleviate congestion and improve environmental quality.</td>
<td>• Poor transport choice can prevent people from taking up employment and restrict their choice of jobs, undermining economic growth and lowering an individual's ability to better themselves.</td>
</tr>
<tr>
<td>•The most extreme areas of employment deprivation are Cheltenham, Gloucester and Tewkesbury.</td>
<td>• Difficulties accessing appropriate transport can prevent people from participating in academic and vocational learning or restrict their choice of quality, subject matter or type of learning provider they use. Difficulties include provision of transport, affordability and inconvenience of interchanges.</td>
<td>• A high reliance on private transport means more cars on the road, contributing to congestion, delay and undermining economic competitiveness. This also impacts on the ability for efficient public transport services to be provided.</td>
</tr>
<tr>
<td>• Provision of early morning and late evening travel from rural areas to key services and employment opportunities has been flagged as a concern.</td>
<td>• Public transport and opportunities for active transport should be well integrated into sustainable communities to encourage modal shift from the car and bring about more active, healthy lifestyles.</td>
<td>• An increasing skills gap and shortage of talented labour can undermine economic competitiveness in the County. Without adequate skills or training people may fall into unemployment, increasing state welfare payments.</td>
</tr>
</tbody>
</table>

Conserve and enhance Gloucestershire’s unique natural and built environment
### Socio-Economic Problem or Constraint

- High levels of car ownership, particularly in rural areas.
- Poor access to some key services in certain communities, particularly in the Cotswolds and Forest of Dean.
- Those living in rural areas without access to a car face particular difficulties in finding work due to generally poor public transport provision.
- Whilst Gloucestershire is generally a healthy County, there are areas of relatively poor health, notably Gloucester and the Forest of Dean. Of particular concern is the trend of above average cases of diabetes and issues of child obesity in Gloucester.
- Obesity levels in Gloucestershire are relatively high compared to the national average.
- Serious and fatal casualties resulting from vehicle collisions are relatively high around the most heavily trafficked corridors – particularly in Stroud, Cheltenham and Gloucester.

### Transport’s Role in Alleviating Problem

- Provision of public transport and encouragement of active modes of transport can reduce the demand for car travel.
- Transport, along with land use planning, directly impacts access to goods, services and employment. Sparse public transport provision creates geographical barriers and so steps should be taken to improve public transport provision for affected communities.
- Promoting active travel can offer benefits for health (including obesity) as well as wider socio-economic benefits.
- Well designed transport infrastructure can aid in improving safety for all transport modes and thereby reduce the number of injuries occurring in Gloucestershire.

### Implications of not Alleviating Problem

- Transport’s contribution to carbon dioxide emissions in the more rural areas of the County is relatively high. Doing nothing to encourage modal shifts and provide effective alternatives risks not achieving emissions reduction targets and wider environmental impacts.
- Greater social inequality as certain communities cannot access the key services, goods and employment that others can.
- If people cannot access work opportunities then growth potential will be constrained.
- Poor health places greater strain on local healthcare providers.
- Poor health can limit travel horizons, leading to exclusion from key services and life choices.
- Dangerous roads damage social wellbeing.

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Ensure that communities are given equal opportunity to benefit from economic prosperity

Create healthy, safe and engaged communities
5. Transport and the Environment

5.1. Introduction
Transport can have significant implications on both the natural and built environment. This is of particular relevance for Gloucestershire, a largely rural region with three Areas of Outstanding Natural Beauty (AONB). Protection and enhancement of the County’s natural and historical environment is vital to Gloucestershire’s economic prosperity as it attracts people to live, work and visit the County for the purposes of leisure and tourism. Furthermore, access to healthy, natural environments can help:

- Support economic and social regeneration;
- Improve public health;
- Improve educational outcomes;
- Reduce crime and antisocial behaviour;
- Help communities adapt to climate change; and
- Improve quality of life across an entire area.

As such, transport can be both an enabler of environmental benefits (such as public transport reducing the use of private vehicles), but also a cause of disbenefits, through issues such as pollution, noise and air quality. Increases in the occurrence of extreme weather events can also have a detrimental impact on the reliability of the road network and also the safety and well being of its users.

5.2. Transport and Climate Change
Climate change presents very serious risks locally, nationally and globally. The Stern Review\(^1\) highlighted some of the potential economic impacts of climate change and suggested that without immediate action, the overall costs and risks of climate change would be the equivalent of losing at least 5% of global GDP each year. If a wider range of risks and impacts were also taken into account, the estimates could rise to more than 20% of GDP. Clearly, responding to this is of vital importance for the wellbeing and prosperity of Gloucestershire.

The UK’s Climate Change Act (2008), was introduced in response to the Stern Review. The act requires public bodies and statutory undertakers to focus on reducing carbon dioxide (CO\(_2\)) emissions and assess the risks of climate change, to enable people to plan and shape places that are resilient and fit for our present and future climate. In addition to supporting national obligations, reducing carbon emissions offers a number of strategic benefits locally, by:

- Strengthening the resilience and reliability of local transport;
- Maintaining the council’s reputation and avoids adverse publicity;
- Improving efficiency by saving money in the long term through reduced need for expensive maintenance and recovery operations; and
- Supporting the local economy and regeneration by delivering reliable transport.

Across Gloucestershire, transport accounts for 36% of all CO\(_2\) emissions (Figure 5.1), higher than the national average of 29%. In the districts of Tewkesbury (48%), Stroud (45%) and the Cotswolds (40%), transport accounts for significantly higher levels of CO\(_2\) emissions than the national average. Contrary to this, Cheltenham (18%), Gloucester (21%) and the Forest of Dean (22%) perform well.

The largely rural nature of Stroud and the Cotswolds can potentially be the cause of high carbon dioxide emissions from transport, with a reliance on private transport over public transport modes. However, for Tewkesbury the cause is perhaps more complex, possibly due to the semi-

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\(^1\) HM Treasury (2006)
rural nature of the district but also the relatively high levels of out commuting for work (as noted in Section 4.2.2).

Figure 5.1 Proportion of Total Gloucestershire CO\textsuperscript{2} Emissions caused by Transport\textsuperscript{1}

![Proportion of Total Gloucestershire CO\textsuperscript{2} Emissions caused by Transport](image)

5.2.1. The Impact of Climate Change on Transport

Through CO\textsuperscript{2} emissions, transport is a principle cause of climate change and in turn climate change causes significant threats and constraints to the transport network. Possible impacts of climate change on transport include:

- Damage to infrastructure due to increased temperatures, flood damage, rising sea levels and high winds (rail lines, power cables, road asphalt, stations etc); and
- Increased traveller discomfort and reduced safety as travellers must contend with difficult conditions.

Table G.1 elaborates on local transport’s vulnerabilities to climate change – this is informed by national research on climate change vulnerabilities.

These potential impacts became reality following the 2007 flooding in Gloucestershire which impacted 5,000 homes and businesses, stranded 10,000 motorists on the County’s road network and stranded 500 commuters at Gloucester train station. It was estimated that the cost to repair the County’s road network totalled £25million. National research suggests that these extreme weather events are becoming more prevalent and hence it is vital that the transport networks are resilient to such events in the future – particularly if inward investment is to be encouraged.

This event showed the potential threats caused by climate change and the weaknesses in the transport network. There are particular parts of the network where, if they were impacted by climate change, there would be significant wider impacts due to the lack of easy alternative

\textsuperscript{1} Department for the Environment, Food and Rural Affairs. Figures based on data in https://www.gov.uk/government/publications/local-authority-emissions-estimates
routes. Examples include the limited crossing of the River Severn and Wye and routes through the Stroud Valleys. Gloucestershire’s highway network also need to be resilient to travel demand shocks such as motorway/trunk road closures, emergency unplanned network repairs, major events such as the Cheltenham Gold Cup and tourist traffic.

5.2.2. Reducing Transport’s Contribution to CO\textsuperscript{2} Emissions

The Climate Change Act 2008 committed the country to reducing its carbon emissions by 34% by 2020 and by at least 80% by 2050 (below the 1990 baseline). Table 5.1 shows the progress made on per capita CO\textsuperscript{2} reductions over the period 2005 to 2011. Per capita emissions are at their lowest in the urban districts of Cheltenham and Gloucester and at their highest in Tewkesbury, Stroud and the Cotswold. However, there is clear evidence from Stroud that reducing transport related emissions is possible when starting from a high base, with the district having the second greatest level of reduction in emissions (6.33%).

<table>
<thead>
<tr>
<th>Location</th>
<th>3 Year Rolling Average (Kt CO\textsuperscript{2} per capita)</th>
<th>Observed % reduction 2009* vs. 20052</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheltenham</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Cotswolds</td>
<td>4</td>
<td>3.7</td>
</tr>
<tr>
<td>Forest of Dean</td>
<td>2.5</td>
<td>2.3</td>
</tr>
<tr>
<td>Gloucester</td>
<td>1.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Stroud</td>
<td>4.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Tewkesbury</td>
<td>5.4</td>
<td>5</td>
</tr>
<tr>
<td>Gloucestershire</td>
<td>2.9</td>
<td>2.6</td>
</tr>
<tr>
<td>England, Wales &amp; Scotland Average</td>
<td>2.2</td>
<td>2</td>
</tr>
</tbody>
</table>

5.2.3. Actions to Reduce Transport Related CO\textsuperscript{2} Emissions

In common with most local authorities, there is no bespoke approach to developing low carbon transport in Gloucestershire. However, key actions taken by GCC to reduce CO\textsuperscript{2} emissions include:

- Securing Local Sustainable Transport Fund (LSTF) funding for twelve electric vehicle charging points in Cheltenham and Gloucester. At present none of these have been installed;
- The LSTF team (Think Travel) are engaging with local employers who already have a keen interest in sustainability and are industry leaders; and
- There is a pipeline of schemes to introduce energy efficient LED street lighting and traffic signals, street light dimming and switch off, reduction in fleet mileage and installation of solar panelled parking meters.

Whilst reducing transport related emissions may be a challenge in areas with a high dependency on private modes of transport, improvement must be made to prevent climate change having significant impacts on the County and to deliver the wider benefits that reductions in emissions will bring. The actions noted above show that work has already begun to encourage more sustainable modes of transport in the County. To support this, it is recommended that a low carbon mitigation and adaptation strategy is integrated into the future LTP, setting out focussed

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2 Refers to DECC aim to reduce total carbon emissions from 137 mtCO\textsuperscript{2} equivalents to 116 mtCO\textsuperscript{2} equivalents between 2009 and 2030 c15% reduction.
transport policies necessary to make progress towards challenging carbon reduction targets up to 2050.

5.3. **Noise and Vibration**

Noise is a natural consequence of a mature and vibrant society. However, it can have major implications for quality of life, health, economic prosperity and the natural environment. Government policy on noise is set out in the Noise Policy Statement for England (NPSE). Its aims are to:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.

As a local highway authority, GCC has a responsibility to adopt approaches to controlling the impact of noise from road traffic, including:

- Control of noise at source (including vehicle emission limit values);
- Planning controls – through transport and land use planning mechanisms;
- Compensation and insulation - in the case of new or improved highways; and
- Maintenance.

Local Noise Mapping required as part of the National Noise Action Plan is yet to be prepared for Gloucester and Cheltenham, and as such noise monitoring data for the County is poor. Previous mapping prepared by DEFRA suggested those at greatest risk from noise pollution live along major transport corridors such as the M5, M50, A46 and A417. Once completed, GCC will be tasked with identifying 'important' areas for which appropriate mitigation measures to be implemented. In the meantime, GCC aims to manage local noise issues through:

- Managing HGV movements such that impact on local communities is minimised;
- Encouraging sustainable and active transport modes as a means by which to reduce vehicle kilometres travelled; and
- Working with the Highways Agency (HA) to ensure they minimise the impact of trunk road traffic on affected communities.

5.4. **Air Quality**

To help protect people’s health and the environment, district authorities in Gloucestershire measure air pollution against national air quality objectives. Generally, air quality in Gloucestershire is good. However, the County has seven areas declared as Air Quality Management Areas (AQMAs), these being:

- Barton Street in Gloucester City (since August 2005);
- Priory Road/St. Oswald’s Road in Gloucester City (August 2005);
- Painswick Road North in Gloucester City (October 2007);
- Birdlip (A417), Air Balloon Roundabout in Cotswold District (April 2008);
- Cheltenham Borough-wide AQMA (November 2011);
- Tewkesbury Town Centre in Tewkesbury Borough (December 2008); and
- Lydney Town Centre in the Forest of Dean District (July 2010).

The AQMAs listed above have been formed to address nitrogen dioxide ($\text{NO}_2$) exceedances resulting from traffic related emissions. Long term exposure to $\text{NO}_2$ may decrease lung function and increase the risk of respiratory symptoms. Furthermore, sensitive groups such as young children or people with asthma or other respiratory illnesses are more likely to be affected by elevated $\text{NO}_2$ levels. Draft action plans have been prepared for Lydney Town Centre and Birdlip A417 AQMAs, which both have identified mitigation options that are yet to be progressed, these include:

- Highway engineering options;
- Speed restrictions;
- Restriction of vehicle movements;
- Travel plans;
- Promotion of walking and cycling;
- Improvements to the public transport offer; and
- Planning controls.

### 5.5. Biodiversity

There are a diversity of habitats within and associated with the County highway network (see Table G.2), with routes often passing through, over or next to grasslands, woodland, wetlands, rivers and estuaries. Without proper planning, implementation and asset management, transport networks can have negative impacts on biodiversity, including habitat loss and fragmentation, hydrological change, disturbance and the introduction of new habitats.

The Gloucestershire Highways Biodiversity Plan (GHBP) comprises of recommended actions and procedures to help GCC implement its statutory duty to conserve biodiversity. The strategic objectives of the GHBP are:

- To raise awareness of biodiversity matters affecting highways work;
- To ensure highway activities operate within wildlife law;
- To reduce the extra costs and delays from not identifying biodiversity issues at the earliest appropriate stage; and
- To set out practical and realistic activities that will contribute to the protection and enhancement of biodiversity.

The plan is a reference for all GCC and Highways staff involved with County roads and Public Rights of Way and should be a useful reference document for the LTP when considering transport's implications on biodiversity.

### 5.6. Flooding

The Local Flood Risk Management Strategy for Gloucestershire has identified areas that are most vulnerable to flooding on the basis of:

- Number of properties vulnerable to flooding using the locally agreed surface water information for 1 in 30 and 1 in 200 year rainfall events;
- Areas predicted to be vulnerable to groundwater flooding (using Environment Agency (EA) groundwater flooding maps);
- Number of significant flooding incidents in the past 30 years; and
- Total number of flooded properties in the past 30 years.

From this, 21 flood priority locations have been identified as summarised below:

- Cheltenham: Oakley;
- Cotswolds: Cirencester, Moreton in Marsh, Fairford, Lechlade, Chipping Campden, Weston Subedge and Northleach;
- Forest of Dean: Cinderford and Coleford;
- Gloucester: Kingsholm, Wootton, Westgate, Matson and Robinswood;
- Stroud: Stroud and Cam; and
- Tewkesbury: Bishops Cleeve, Woodmancote, Winchcombe, Northway and Tewkesbury.

The LTP should consider the implications of transport investment on infrastructure and services in these areas, for example in ensuring road and rail networks can withstand significant flooding.

### 5.7. Land Use Planning and Transport

Effective land use planning offers a number of opportunities to manage travel behaviours and demand. GCC currently engages with district planning authorities as a consultee to review the
transport implications of planning applications requiring a transport assessment. The County’s Manual for Gloucestershire Streets (2013), sets out the relationship between transport and land use and the methods for delivering well planned communities, including:

- Creating safe and secure layouts which minimise conflict between traffic, cyclists and pedestrians, avoiding street clutter and, where appropriate, establishing Home Zones;
- Wherever possible, locate developments such that the need to travel is minimised and the use of sustainable transport modes are maximised;
- Allow for the efficient delivery of goods and supplies, so supporting business; and
- Ensuring major trip generators are located close to networks best able to cope with demand.

In developing the LTP, GCC should be mindful of this relationship between effective land use planning and transport. Examples of land use planning projects with transport implications that the County supported in 2012 include:

- Gloucester Regeneration - Gloucester Quays, Kings Square and Greyfriars in particular;
- Cheltenham Development Task Force;
- Cinderford Town Centre and Northern Quarter;
- Newent Town Centre;
- Cirencester Market Place proposals;
- Brimscombe Port and Ebley Wharf in Stroud;
- Foundry site in Lydney;
- Delivering the Tewkesbury High Street road safety scheme and supporting the master planning process; and
- Phase 2 of Onslow Road in Newent.

5.8. Constraints and Risks Associated with Transport’s Links to the Environment

If not effectively managed, the complex relationship between transport and the environment can place significant constraints and risks on achieving the strategic objectives identified for the County’s LTP, as discussed in Table 5.2.
Table 5.2 Constraints and Risks Associated with Transport’s Links to the Environment

<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
</table>
| Secure conditions for economic growth | • The adverse impacts of climate change, including increased temperatures and the likelihood of extreme weather events have the potential to significantly affect the resilience of Gloucestershire’s transport networks.  
• Delivering effective transport networks and services to support growth whilst balancing sustainability and environmental concerns. | • A weakened transport infrastructure can directly impact on economic productivity either as function of weather related disruption/property damage or indirectly through loss of inward investment due to heightened flood risks being a deterrent.  
• Increased cost of recovery operations and maintenance.  
• Either undermining economic growth by placing too much focus on the environment or significantly harming the environment (and thereby the economy) by allowing unrestricted growth in car use and allowing damaging transport infrastructure to be built. |
| Conserve and enhance Gloucestershire’s unique natural and built environment | • Lowering transport’s contribution to CO2 emissions.  
• Poor air quality in AQMA areas.  
• Increasing demand for travel by unsustainable modes.  
• Poorly designed, implemented and managed transport infrastructure will damage biodiversity and the wider environment. | • Accelerated climate change with impacts on the natural environment and wider economic implications.  
• Failure to meet national targets for CO2 emission reduction.  
• Poor air quality can cause damage to both the natural and built up environment, leading to a reduction in tourism as the natural environment becomes less attractive. |
| Create healthy, safe and engaged communities | • Poor air quality in the identified AQMA will impact on the health of communities. | • Increase in air quality related health issues will add demand to health and care facilities. |
6. Modal Analysis: Active Travel Modes

6.1. Introduction
Walking, cycling and equestrian travel have the capacity to support the strategic objectives identified for Gloucestershire’s LTP through the primary and wider benefits they stimulate, including:

- Improved health as active travel modes have clear health benefits;
- Reductions in highway congestion and delay when car trips are replaced with trips using active travel modes;
- Improved footfall in urban retail areas, supporting the local economy;
- Reduced reliance on motorised transport helps maintain Gloucestershire’s high quality natural and built environment (such as noise, air quality, urban and rural landscapes) – a key attribute attracting people and businesses to live and work in the County;
- Cycling and walking are intrinsic to supporting Gloucestershire’s tourism industry;
- Decreasing social exclusion – walking and cycling are affordable modes of transport and many measures which encourage usage will also benefit those who find it difficult to access other modes of transport (particularly young people);
- Increased use of sustainable transport modes (particularly walking, cycling and public transport) helps address issues of obesity and associated conditions amongst adult and young population groups;
- Active travel modes are valued by dynamic businesses; and
- Increasing personal security – increased numbers of people walking will increase the level of informal surveillance on the streets, making people feel safer.

6.2. Current Situation

6.2.1. Demand
Census 2011 travel to work data provides a useful indication of the relative importance of walking and cycling as modes of travel in the County. Table H.1 provides detailed information on Gloucestershire’s travel to work modes, with the key points detailed below:

- For travel to work trips, the mode share of cycling and walking in the County is 14.4%, marginally higher than the 12.7% average for England;
- Cycling’s modal share is highest in Cheltenham (6.4%), Gloucester (4.9%) and Tewkesbury (4.3%), with each being above the English average of 2.9%; and
- Walking’s modal share is highest in Cheltenham, but also above national average in the Cotswolds and Gloucester – the former indicates the importance of having a safe walking environment in rural market town locations.

6.2.2. Current Cycling and Walking Initiatives
GCC are currently progressing a range of activities aimed at increasing walking and cycling use in the County. These initiatives have taken the following approaches:

- Personal travel planning (PTP) for households in Cheltenham and Gloucester;
- A touring Bike Hub which offers complimentary safe checks on bicycles as well as information on the best cycling routes;
- Workplace travel planning (WTP) to help inform employees of their travel choices and encourage modal shift away from single occupancy vehicles;
- Business travel grant scheme (BTG) which provides cycling facilities and storage to allow employees to travel to work by bike;
- Engaging with schools, colleges and universities to provide cycle infrastructure and information; and
Providing information in the form of local cycle and walking route maps. For the cycle routes, the quality of the information provided varies significantly with the best level of information being made available for routes around Cheltenham and Gloucester. It is likely that the overall usefulness of these routes to different users will dependant on user competency. As highlighted above there is no systematic record of explicit constraints to greater use of these routes.

More detailed information on the initiatives to encourage cycling and walking in Gloucestershire are included in Section H.3.

6.3. **Accessibility**

Assuming there were no local physical and psychological constraints to their uptake, accessibility mapping shows there is strong potential to increase uptake of cycling and walking as a means of travel in built up areas across Gloucestershire (see Figure H.1). Approximately 40% of the population are within potential walking distance of major towns and 82% within potential cycling distance of a major centre. Informal feedback received from local residents as part of the PTP programmes which have taken place highlight that the most well-received resources were active travel maps and cycling maps, providing residents with information which they would not have access to otherwise.

6.3.1. **Cycling**

Cycling is a viable alternative to car journeys for many short trips although we recognise that it will not meet the needs of all travellers or journeys. Nationally, most journeys are local, with two-thirds of car trips being less than five miles in length\(^1\). Given this, most of our every day journeys could be walked, cycled or made by public transport - and it’s local transport that has the biggest impact on our quality of life, our health and whether or not we can get to work, school and essential local services.

However, safety is a serious concern preventing the uptake of cycling, with 65% of non-cyclists responding to the British National Attitudes Survey stating that it is too dangerous for them to cycle on the roads, while 72% of respondents were in favour of 20mph speed limits on residential streets.

At present there does not appear to be a coherent record or methodology for identifying psychological and physical constraints to walking and cycling use in the County. As such, it is difficult to identify in any great detail at this stage where investment is best prioritised. Further evidence is therefore required to better understand where real suppressed demand for cycling exists, the physical and psychological barriers to more cycle use and how cycling could be better integrated with other modes e.g. shared cycle bus facilities, congestion strategy, bus interchange policies etc. Given that budgets for monitoring of walking and cycling issues are constrained, GCC should seek to bring together key themes centrally from the range of bespoke surveys taking place across the County as part of GCC’s Local Sustainable Transport Fund (LSTF) initiative. This will help draw together a more comprehensive understanding of walking and cycling barriers across the County.

A number of weaknesses and challenges have been identified by the Cheltenham and Tewkesbury Cycling Campaign, the Gloucestershire Bike Project and a review of District Local Plans and the Central Severn Vale Transport Study, as detailed below:

**Cycle Infrastructure**

- Cycle lanes are seen as intermittent and limited in number, particularly on common journey routes. Where they are provided, many stop in the middle of the road, causing confusion and danger to both cyclists and drivers. Infrastructure concerns have been noted for the following routes:

\(^1\) Sustrans (2013)
There are gaps in provision along the A40 corridor between Cheltenham and Gloucester;
Formal routes are limited between Tewkesbury and Cheltenham and along the corridor linking Cheltenham, Brockworth and Gloucester;
Apart from the cycle path adjacent to the Over Causeway, there are no formal cycling routes along the A40 from the Forest of Dean into Gloucester city centre;
On the Honeybourne Line cycle path, beyond St George's Place there is no clear route into the town centre, with poor signage, legibility and conflict with road traffic; and
There are no alternatives to the prohibitive conditions of the A417 and the B4215 as well as other key arterial cycle desire lines connecting Gloucester and Cheltenham to neighbouring settlements.

The lack of utility/cycle routes, such as between Gloucester and Stroud;
Cycle routes are poorly marked and up-to-date maps are rarely produced;
The condition of the road network, particularly potholes;
One-way systems and lack of 20mph zones in Cheltenham are a potential deterrent to cycling;
Traffic management and local pedestrianisation schemes can reduce the directness of routes making it less attractive to users;
Lack of cycle parking infrastructure can be a deterrent to cycle use; and
In Cheltenham and Stroud significant on-street commuter parking leads to environmental and safety problems on the streets affected, which can be a deterrent to cycling.

Safety and Security

General traffic volumes and high vehicle speeds can deter potential cyclists; and
Where provided, the security of parking for bikes in the city is a concern.

Other Psychological and Confidence Issues

Lack of adult urban cycle training which could improve confidence and encourage modal shift; and
Lack of willingness on drivers parts to accept that they share the road with cyclists, coupled with a lack of education for drivers and cyclists.

6.3.2. Walking

Walking is a free and healthy mode of transport that is integral to all journeys. Table 4.1 has already shown that the modal share of journeys to work by foot is higher across Gloucestershire (12%) than the national average (11%). Gloucestershire needs to work from this strength by ensuring communities are permeable, readable and safe and thereby encourage walking. In particular there may be opportunity to encourage modal shift from car to foot for shorter journeys. This will have multiple benefits for individuals in terms of health and for the economy, in turns of reduced congestion – benefits which are discussed in detailed in section 6.1.

The Gloucestershire Highways Manual identifies a number of local generic constraints to walking, as detailed below:

Busy main roads can be unattractive and inhospitable, especially where pedestrians have to use a narrow footway immediately alongside a carriageway used by large vehicles;
Conversely, pedestrian and cycle routes away from carriageways used by motor vehicles can be perceived as poor in terms of personal security;
Topography, directness of route, route continuity, and the existence or not of street lighting and natural surveillance are other factors that can have a significant influence on the success of such routes in terms of encouraging walking; and
An unattractive public realm (poor natural surveillance) in built up areas may also be a deterrent to walking in such areas, which can have a direct impact on retail and leisure businesses in urban areas.

The importance of a high quality, attractive public realm has been emphasised with the focus on recent and current projects which are centred on improving linkages and providing better quality public spaces which offer a sense of place. For example, the recent redevelopment of Gloucester
Quays and Kimbrose Triangle has served to link Gloucester Docks and Quays with Gloucester City Centre. Similarly, improvements at Boots Corners, associated with the Cheltenham Transport Plan, will improve the public realm and permeability by active travel modes. There are further links to the planned Kings Quarter development in Gloucester City Centre and the improved interchange facilities this will offer.

Public Rights of Way (PROW) are roads, paths or tracks that are open to everyone and can run through towns, countryside or private property. Gloucestershire has about 3,509 miles of public rights of way, one of the largest networks managed by any County. GCC is responsible for:

- Maintenance of surfaces, signposts & bridges;
- Maintaining the 'Definitive Map' and processing modifications & diversions; and
- Administration of Gloucestershire Local Access Forum.

PROW are integral to economic activity in Gloucestershire, providing key linkages for businesses and encouraging tourism. They should be embedded with sustainable communities and be well integrated with sustainable transport networks and community facilities to make them more accessible and discourage the use of the car. New developments (more specifically developer contributions) are an opportunity to design cycling and walking infrastructure into the built environment, in terms road space, traffic management, cycle parking provision and trip end facilities (showers, lockers etc).

Effective PROW networks can stimulate investment through the spending activities of visitors, with recreational routes helping in particular to support rural businesses. Functional routes, however, serve an important amenity for communities, for example in providing walking routes to schools.

There is a lack of locally specific data regarding weaknesses or concerns about the PROW network. Further local engagement with stakeholders is needed to determine what improvements are needed and how these should be prioritised. Summary of Key Issues

The key points identified in this chapter on active travel are summarised below.

**Strengths**

- For travel to work trips, the County’s modal share of cycling and walking is relatively strong when compared to the national average; and
- There are already a number of activities being promoted to encourage the uptake of active travel modes, including personal and workplace travel planning.

**Weaknesses**

- Provision of cycle infrastructure in the County is not ideal, with intermittent cycle lanes, poor route markings and a lack of cycle parking infrastructure being some examples; and
- The lack of data and an intimate understanding of demand for active travel modes in the County.

**Opportunities**

- Encouraging active travel should be a priority for the LTP given the clear health benefits alongside the wider socio-economic benefits including:
  - Economic benefits from tourism and greater footfall in retail areas;
  - Reduced demand on the highway network when active travel is undertaken instead of the use of a private vehicle; and
  - Increased social inclusion as these are affordable modes of transport.
- As new housing and employment developments are built there will be an opportunity to integrate and promote active travel modes within these sustainable communities; and
- Accessibility mapping shows there is strong potential to increase uptake of cycling and walking as a means of travel in built up areas across Gloucestershire.

**Threats**
- The lack of a coherent dataset related to local active travel modes, such as information on the psychological and physical constraints to walking and cycling use in the County, is a key restraint as it makes identifying key areas for focus and investment to be prioritised very difficult; and
- Concerns over safety are a serious threat to increasing the uptake of cycling (though this is not specific to the County).

6.4. **Constraints and Risks Walking and Cycling Provision Poses to Achieving the LTP’s Strategic Objectives**

Having reviewed Gloucestershire’s walking and cycling provision and identified a number of weaknesses, we must consider how these may impact on the strategic objectives identified for the County’s LTP and evaluate the likely impacts of not alleviating the problems identified. This analysis is presented in Table 6.1.
Table 6.1  Constraints and Risks Walking and Cycle Provision Poses to Achieving the LTP’s Strategic Objectives

<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure conditions for economic growth</td>
<td>- A poor quality public realm will discourage walking in urban areas.</td>
<td>- Lower footfall in urban areas can impact on retail, service and leisure businesses, with clear economic ramifications for local communities and local authorities (through tax revenue).</td>
</tr>
<tr>
<td></td>
<td>- Recreational routes that are poorly maintained may discourage tourism and thereby impact on visitor spending.</td>
<td>- Lower visitor spending levels will damage local businesses and the tax revenues of local authorities.</td>
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<tr>
<td></td>
<td>- If walking and cycling are discouraged, there is likely to be a rise in privately owned vehicles using the highway network, adding to congestion, delay and increased journey times.</td>
<td>- A congested highway network deters investment and causes detriment to local businesses through productivity losses.</td>
</tr>
<tr>
<td></td>
<td>- A lack of a clear evidence base concerning the PROW network.</td>
<td>- Without a clear evidence base of how the PROW network is currently performing and being used means targeted investments cannot be effectively undertaken and therefore the quality of the network may deteriorate, discouraging use and having economic impacts.</td>
</tr>
<tr>
<td>Conserve and enhance Gloucestershire’s unique natural and built environment</td>
<td>- An inadequate cycle and walking network will discourage use of these modes and could therefore increase the number of vehicle trips on the highway network.</td>
<td>- Greater numbers of vehicles on the roads causes environmental impacts such as increased noise and pollution; this will lead to deterioration in Gloucestershire’s natural environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Congestion in town centres will detract from visitor experiences of the natural and built environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inability to promote Gloucestershire as a destination.</td>
</tr>
<tr>
<td>Ensure that communities are given equal opportunity to benefit from economic prosperity</td>
<td>- Accessibility using a range of modes is key to preventing social exclusion and ensuring equal opportunity to benefit from economic development and prosperity.</td>
<td>- Not ensuring accessibility to all communities will result in disparities in the ability to access goods, services, facilities and employment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The inability to access other areas easily will impact negatively on economic development, damaging perceptions of Gloucestershire as being an attractive place to work or do business.</td>
</tr>
</tbody>
</table>
### Strategic Objective

Create healthy, safe and engaged communities

<table>
<thead>
<tr>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Poor design or provision of walking and cycling routes can cause concerns over actual or perceived safety (for example, lack of street lighting), discouraging walking and cycling.</td>
<td>• Poor design and provision of routes and infrastructure will discourage communities from walking and cycling, and as such are more likely to suffer the health consequences of leading inactive lifestyles. This has consequences on local health care facilities as well as economic ramifications.</td>
</tr>
<tr>
<td>• Poor cycle storage infrastructure, particularly in urban areas, can discourage cycling.</td>
<td>• Lack of information and promotion of walking and cycling will mean that Gloucestershire cannot make best use of the facilities already available.</td>
</tr>
<tr>
<td>• Lack of confidence amongst (potential) cyclists.</td>
<td>• Poor design can impact on actual and perceived safety, impacting on a community’s quality of life.</td>
</tr>
<tr>
<td></td>
<td>• A lack of confidence and training can lead to less active, unhealthy lifestyles and a greater reliance on private vehicles.</td>
</tr>
</tbody>
</table>
7. Modal Analysis: Bus

7.1. Introduction
Local bus services and community transport play a key role in enabling communities to function and the local economy to prosper. Furthermore:

- Strong public transport networks increase opportunities to access work and services, facilitating economic development and improving quality of life – this is particularly the case for population groups without means to access private transport, such as the elderly, mobility impaired, rural communities and young people.
- Environmental improvements resulting from reduced car use (particularly in air quality, noise and pollution);
- Improved road safety as public transport options are statistically safer than using the car;
- Congestion and reliability enhancements as more cars are taken off the road (with decongestion providing advantages to businesses);
- Equality benefits as public transport options are more affordable and accessible to lower income users (though in turn they suffer more if services are reduced);
- Encourages active life styles; and
- Can contribute towards enhancement of the built environment through good design.

7.2. Current Situation

7.2.1. Demand
In Gloucestershire, approximately 21 million trips a year are made on privately run local bus services, of which two million are on subsidised bus services. Around 100 services (10% of all services) are wholly or partly funded by GCC, as without subsidy these services would not be commercially viable. A further one million trips are made on the three Park & Ride services and 220,000 trips on community transport. A summary of Gloucestershire’s strategic bus network is illustrated in Figure 7.1.
Passenger trips by bus have increased in recent years, as shown in Figure 7.2. This illustrates the growing importance of bus as a travel means in the County. Despite continued growth between 2003/04 and 2010/11, there was an observed drop in demand in 2011/12, likely the impact of national changes in concessionary travel provision and reductions in service coverage following the bus review implemented in 2011.
7.2.2. **Service Provision**

Daytime services on routes within and between Cheltenham and Gloucester mainly operate on a commercial basis (without the need for subsidy), with the remainder being financially supported by the council. A significant number of contracted school transport services also operate across Gloucestershire, transporting in the region of 8,000 young people per day across the County.

Table I.1 provides a summary of the services operating mostly without subsidy. The commercial network predominantly services movements within and between the County’s main urban hubs and services during core day time hours. Additional subsidised services and community transport schemes are also provided to serve non peak demand, sparse rural areas and vulnerable users (elderly and disabled/non car owners).

An overview of the cross boundary services in operation in the County is provided in Table I.2. Additionally, there are long distance services provided by National Express and Megabus, linking Gloucestershire predominantly with Hereford and London.

7.2.3. **Accessibility**

On the basis that many key work, retail, leisure, education and healthcare provisions are based in urban centres, access times to the County’s main hubs provide a useful indicator of overall levels of accessibility in the County.

Accessibility mapping presented in Figure 7.3 shows that a large proportion of Gloucestershire’s population is able to access a main centre during core commuting hours. Cotswold district has the poorest relative accessibility, likely the results of the sparse nature of resident population residing within this district. Community transport schemes are key to addressing the transport needs of those without the availability of personal transport located in the areas of the main inter-urban network. Table I.3 provides further details of accessibility within the County.

**Figure 7.3** Access to Primary Urban Centres (Weekday Access 07:00am-09:00am)

7.2.4. **Bus User Satisfaction**

Bus passenger satisfaction levels have increased from 41% in 2000 to 60% in 2011/12, in line with the forecast target, as shown in Figure I.1.
This trend is reinforced by results from the Bus Review survey that concluded that whilst most users were satisfied with the timetable aspects of their service, many made detailed comments about the wider quality and issues associated with local bus service provision. Table I.4 presents the results in detail, with the key findings presented below:

- 82% of respondents agreed that the cost of supporting bus services should be affordable;
- 83% of respondents agreed that the priority should be to focus bus funding on meeting essential needs (elderly and disabled 21%; access to healthcare provision 18%);
- 77% of respondents supported the concept of more flexible ticketing;
- 60% agreed that information on public transport should be more accessible;
- 39% agreed that they would prefer to change buses and have a more frequent bus service rather than have a direct route with less frequent buses;
- When asked what they would do if their service was withdrawn, 34% said they would make the trip by car, 32% would not make the trip at all and 16% would rely on a taxi; and
- 11% of respondents stated they would have to quit/change jobs if their service was removed.

In 2011, GCC undertook a detailed review of local bus service provision in the County as a means by which to identify savings of £2 million to contribute to the Meeting the Challenge programme. Consultation feedback from 1,500 residents across the County showed significant support for the core principles of focusing rural transport on the nearest major settlement, funding services that provide access to essential health, education and employment locations and ensuring that services are financially sustainable. Findings from the review also suggested that a majority of residents would be prepared to trade off lower frequency direct services for enhanced frequency connecting services using good interchange facilities.

### 7.2.5. Community Bus Services

Community transport is part of the voluntary sector and plays an important role in filling gaps in services not provided by local buses and trains (the mainstream public transport network), as well as meeting the more specific needs of particular groups or individuals in the community. Where conventional bus services are not viable this is likely to involve using existing or new community transport services which are supported by the council. A strategic priority for GCC is to ensure that residents in communities currently served by subsidised transport will continue to have access to essential services during the week.

Between 2011 and 2013 GCC provided £0.5 million in annual grants to support community transport providers, enabling users to make over 200,000 trips on community transport per annum. GCC’s strategy is to enhance the role of community transport, in particular by:

- Providing access to sparsely populated areas where subsidy levels for conventional bus services are too high; and
- Providing more accessible services for elderly and disabled people.

A summary of community transport service provision in the County is provided in Table I.5. A review of user feedback has not been included in this study, but is recommended as a means of determining where the service meets local need and where it does not.

### 7.2.6. Park and Ride

There are currently three Park and Ride sites within Gloucestershire, with one serving Gloucester (Waterwells) and two Cheltenham (Arle Court and the Race Course). Collectively these sites provide over 1,500 spaces with linked bus services operating at a frequency of every 10-15 minutes. Another bus based Park and Ride site is planned for Elmbridge Court to alleviate congestion on major corridors into Gloucester and Cheltenham. An additional Park and Ride service will be trialled as part of the Pinch Point works at C&G and Walls roundabout. This service will operate between 0700 and 1900 providing a regular service to Barnwood Business Park from Waterwells via Gloucester City Centre. Given the high car dependency in the County, combined with significant existing and future congestion on urban networks, consideration to additional Park and Ride sites linked with key growth locations could be worthwhile. Also
encouraging local businesses to invest in Park and Ride is another option to help promote accessibility to key strategic sites within the County.

A review of user feedback has not been included in this study, but is recommended as a means of determining where the service meets local need and where it does not

### 7.3. Network Constraints

A number of challenges facing bus service provision in the County have been identified, as summarised below.

#### Service Provision

- Current services are focussed on radial movements, however, orbital movements are likely to become more important as areas on the edge of key settlements are developed for housing and employment – particularly in Cheltenham and Gloucester;
- Further targeted consultation is needed with those residents who lack personal means of travel to understand which aspects of public transport in Gloucestershire are most in need of improvement (such as service timings and passenger information);
- Interchange between bus and rail is likely to be an opportunity for improvement in the future. Particular opportunities might include developing bus services to:
  - Forest of Dean to Severn Tunnel Junction station for Bristol, Cardiff and Newport;
  - Lydney for access to Newport (assuming rail capacity constraints can be addressed);
  - Cotswolds to Moreton in Marsh for Oxford and London; and
  - Cam and Dursley/Berkeley to Bristol Parkway.
- Whilst there are a number of cross border bus services to main centres outside of the County, most operate at a frequency of less than one per hour. This is particularly relevant for routes to Hereford, Bristol, Oxfordshire, Monmouthshire, Warwickshire and Worcestershire, though more evidence is needed to assess the real demand for cross border bus services.

#### Passenger Information and Service Cost

- A focussed information strategy is needed to ensure local residents have the information they need to make informed modal choice decisions; and
- Measures need to be introduced to improve ticket affordability, simplicity and flexibility, with steps already being undertaken to develop smart card capability in the County.

#### Bus Interchange Facilities

- A lack of data limits our understanding of the quality of bus interchange facilities other than in Gloucester, with a particular need for information regarding interchange facilities in Cheltenham, Stroud, Tewkesbury and the rural market towns. However it is understood that there is a countywide need for enhancements to the quality of bus interchange facilities to create more seamless journeys; and
- Gloucester’s bus station is of dated design, with the bus station and nearby rail station being unwelcoming and providing a poor impression to visitors. The station has suffered from a lack of investment, however, it has been incorporated into plans for the regeneration of Kings Quarter.

#### Other Issues

- More evidence is required to understand user perspectives on the strengths and weaknesses of local bus services. With a better understanding of key issues in addition to service success factors the future LTP strategy can ensure best practice is adopted to maximise use of sustainable modes.
7.4. **Summary of Key Issues**

The key points identified in this chapter on bus transport provision in Gloucestershire include:

**Strengths**
- Between 2003/04 and 2010/11 there was continual growth in demand on the County’s bus network. However in 2011/12 demand fell, most likely due to national changes in concessionary travel provision and reductions in service coverage following the bus review implemented in 2011;
- Accessibility mapping shows that countywide, 95% of households can access their nearest urban centre within 30 minutes travel time by bus; and
- Bus passenger satisfaction has increased, though there is room for further improvement.

**Weaknesses**
- A number of areas for improvement have been identified, with some key points including:
  - There is a need for a better understanding of which aspects of public transport in Gloucestershire are most in need of improvement (from a user perspective);
  - Measures need to be introduced to improve ticket affordability, simplicity and flexibility; and
  - Gloucester’s bus (and rail) station is in need of improvement.

**Opportunities**
- Effective public transport provision is an enabler for communities to reach the services, goods and employment they need. There are many socio-economic benefits related to bus provision, including:
  - Better access to work and services facilitates economic development and improves quality of life by broadening travel capabilities;
  - Social inequality is reduced as public transport options are more affordable and accessible to lower income users;
  - Congestion and reliability enhancements as more cars are taken off the road; and
  - When used in place of private vehicles, public transport has environment benefits.
- Enhancing community transport services will improve travel capabilities for many people in rural areas, particularly the elderly and young;
- Increasing the number of park and ride spaces in the County provides an opportunity to reduce the number of private vehicles in urban areas, with the associated benefits; and
- The extent and importance of cross border services to key centres in Oxfordshire, Wiltshire, Monmouthshire and Worcestershire needs to be considered within the context of 2011 travel to work data as it becomes available, this will help Gloucestershire businesses to extract labour from a wider catchment.

**Threats**
- After a fall in passenger demand in 2011/12 there is risk that changes to concessionary travel provision and service coverage may lead to a continued fall in demand; and
- Failure to improve public transport provision in rural areas is a significant threat to achieving the LTP’s strategic objectives, especially in improving economic wellbeing for all.

7.5. **Constraints and Risks Bus Services Pose to Achieving the LTP’s Strategic Objectives**

Having identified Gloucestershire’s bus service and network weaknesses, we must consider how these may impact on the strategic objectives identified for the County’s LTP and evaluate the likely impacts of not alleviating the problems identified. This analysis is presented in Table 7.1.
Table 7.1 Constraints and Risks Bus Services Pose to Achieving the LTP’s Strategic Objectives

<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
</table>
| Secure conditions for economic growth                  | • Whilst detail of employment and housing development sites is yet to be confirmed, a key challenge looking ahead will be to integrate and enhance core bus corridors within these developments – this is particularly important in the Central Severn Vale urban areas where networks are already congested. This may involve a shift in thinking for bus providers to include orbital as well as radial bus networks, as areas on the edge of key settlements are developed for housing and employment – particularly Cheltenham and Gloucester.  
  • The frequency of cross-border bus provision is relatively low, whilst integration between bus and rail can be improved. | • Without an integrated public transport service, the use of private vehicles will increase, placing pressure on the highway network. Congestion, delays and increased journeys time may result, having economic ramifications for individuals as well as creating economic disadvantages for businesses. This can lead to reduced growth and investment.  
  • Failure to integrate bus transport into new developments will limit economic growth opportunities as connectivity options will be weak for those without access to private transport, reducing an individual’s ability to travel to work and services.  
  • Poor bus transport connectivity to economic centres places a constraint on growth, for example by limiting opportunities for tourism and retail service growth. |
| Conserve and enhance Gloucestershire’s unique natural and built environment | • Many bus interchanges are of poor quality, particularly Gloucester bus station which has poor public realm quality and does not act as an attractive gateway to the City. | • Degradation to the built environment in Gloucester and reduced growth and investment resulting from a poor perception of the city. |
| Ensure that communities are given equal opportunity to benefit from economic prosperity | • Feedback from users (2011 GCC Bus Review) suggests that travel provision is not always sufficiently flexible to cater for the range of travel demands outside of the 09:00-17:00 day. | • Poor travel provision outside core business hours has implications for night time economies, shift workers and evening hours hospital access. This can undermine economic growth opportunities and drive social inequality issues if communities do not have equal opportunities to access employment, goods and services. |
| Create healthy, safe and engaged communities           | • A focussed information strategy is needed to ensure local residents have the information they need to make informed modal choice decisions. | • A lack of information provision can lead to an over reliance on private transport modes which generally leads to deteriorating health alongside increasing demand placed on the highway network. Engaged communities need to have the right information to make the right choices.  
  • A negative impact on health and wellbeing will be exhibited with declining use of bus services as access to and from bus stops is generally by active travel modes. |
8. Modal Analysis: Rail

8.1. Introduction

Having an efficient passenger and freight rail network, with strong internal and external connectivity, is vital for Gloucestershire to be competitive in economic terms. For business, effective rail networks link them with the supply chains, customers and specialist knowledge (both within and outside of the County) that are critical to securing growth. More specifically, Gloucestershire’s rail network is a vital component in delivering connectivity to major growth centres including the Midlands, London, Bristol and the M4 Corridor. Furthermore, it potentially offers access to national gateways such as Birmingham, Bristol and London airports. An overview of the Gloucestershire passenger rail network is illustrated in Figure 8.1.

**Figure 8.1** Principle Routes and Stations in and around Gloucestershire

8.2. Current situation

8.2.1. Station Demand

Rail travel in Gloucestershire has more than doubled over the last 10 years, as shown in Table 8.1. Approximately two thirds of all rail travel is from Cheltenham Spa or Gloucester. Service frequencies, especially to the lesser used stations, have generally improved in the last ten years and there may also be some under-estimation of demand where stations are unstaffed.
8.2.2. **Service Gaps**

The frequency of service is a key factor influencing the attractiveness of rail services, as higher frequencies mean more choice. Service frequencies are broadly hourly or higher on the majority of routes through the County, although there are some stations and corridors which are relatively poorly served, as identified in Table 8.2.

### Table 8.2 Identified Gaps in Service Provision

<table>
<thead>
<tr>
<th>Station or Corridor</th>
<th>Issues/Gaps</th>
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</table>
| Ashchurch for Tewkesbury Railway Station | • Broadly two hourly services between Worcester Shrub Hill and Bristol Temple Meads (and beyond), plus some longer distance services on the Nottingham to Cardiff Central corridor.  
• An example of a gap in service provision is the southbound service towards Cheltenham Spa, with no departures from Ashchurch for Tewkesbury between 07:05 and 09:25, which may make a journey to work in the Cheltenham or Gloucester area by rail unattractive. |
| Gloucester Railway Station | • Most long-distance services from the North / Midlands to South-West England do not call at Gloucester. Because of its location off the main line, a stop at Gloucester for these services adds 10-15 minutes to the journey time.  
• A journey from Gloucester to Bristol / South-West England by rail either involves changing at Cheltenham Spa for a fast service or use of a slower direct service (with more intermediate stops). |
| Lydney Railway Station | • Two hourly services between Maesteg and Cheltenham Spa, plus longer distance services on the Nottingham to Cardiff Central corridor approximately every three hours.  
• As at Ashchurch for Tewkesbury, the level of service means there are frequently long gaps between trains. |
| Gloucester / Cheltenham to Worcester Corridor | • Trains are operated only every two hours.  
• Given the proximity and relatively large population of these two important regional centres, located less than 30 miles apart, this frequency of service is very poor. |

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1 Office of Rail Regulation (ORR) Station Entry and Exit data (2013)  
2 Gloucestershire Rail Strategy Review (2013)
### Cheltenham Spa & Gloucester to London Corridor (via Stroud Valley line)

- Direct services every two hours between Cheltenham Spa and London Paddington, via Gloucester and Stroud, with additional services in the peaks. Every other hour, a shuttle is operated between Cheltenham Spa, Gloucester and Swindon (for connections to London Paddington).
- As of 2017, an hourly through service will be operated between Cheltenham Spa, Gloucester, Stroud and London Paddington improving connectivity between the County and the Thames Valley/London and bringing the level of service into line with other cities in the UK at a similar distance from London.

### 8.2.3. Service Punctuality

On a national level, 25% of rail users cited rail service reliability and punctuality as the main factors of importance. As shown in Table 8.2, the punctuality of the three train companies operating within Gloucestershire is comparable to the national average of 89%: Such reliability is beneficial in terms of attracting new business investment, particularly where businesses rely on interaction with supply chains and customers based outside of the County.

**Figure 8.2** Train Operating Company Punctuality in Gloucestershire

![Train Operating Company Punctuality in Gloucestershire](image)

1. Cross Country: 86.4%
2. First Great Western: 88.0%
3. Arriva Trains Wales: 92.8%
4. National Average: 89.0%

### 8.2.4. Journey Times

To maximise rail patronage and encourage modal shift, rail needs to be competitive with road based travel during peak periods. Speed of journey is another important determinant of attractiveness for rail travel, especially for people commuting and for business travel. Rail journey times generally compare favourably with highway journey times. The (fastest) rail journey from Gloucester to London Paddington has a time of 1 hour 54 minutes, which is faster than a “free flow” highway journey time of 2 hours 34 minutes. Rail journey times to most major centres including Birmingham, Bristol, Cardiff and Swindon from Cheltenham and Gloucester are relatively attractive when compared to car journey times. The future rail strategy must therefore ensure that this relative speed advantage is maintained.

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1. Network Rail Performance Statistics [https://www.networkrail.co.uk/about/performance/]. Under the Public Performance Measure (PPM) a short-distance train is only deemed to be “late” if it arrives at the destination five minutes or more after the scheduled time, whilst a long-distance train has to arrive 10 minutes or more behind schedule.
Table J.1 details approximate rail and car journey times for major destinations outside Gloucestershire, alongside the number of services arriving and departing for each destination before 09:00. Whilst the figures presented in the table give an optimistic view of the relative attractiveness of rail as they do not include journey times from a passenger’s point of origin, they do provide a useful insight into the quality of the rail network. The data shows that:

- With the exception of Hereford, journey times by train and car are reasonably competitive (between stations);
- Journey times to London are relatively long from both Gloucester and Cheltenham when compared to regional centres such as Birmingham, Bristol and Leicester which are of similar distance from London; and
- Rail times to major centres including Birmingham, Bristol, Cardiff and Swindon from Cheltenham and Gloucester are relatively attractive when compared to car journey time equivalents.

8.2.5. Station Accessibility

GCC Accessibility mapping prepared in June 2013, shows that journey times to stations by bus in the morning peak are poor in some parts of the County (see Table J.2). This may be a further constraint limiting greater use of early morning rail services to key centres for users without their own means of personal transport. Key points to note include:

- Only 61% of the County population can access a train station within 30 minutes before 09:00 emphasising the need for better public transport connections to local stations during peak periods;
- Residents of the Cotswolds and Forest of Dean have particularly poor access to stations;
- In addition to deep rural areas, Cirencester, Cinderford, Coleford, Northleach and peripheral areas of the principal population centres are most excluded from accessing local stations by public transport; and
- Collectively this poor level of accessibility limits the scope to use rail as a means to travel to work or education. Additionally, this poor level of accessibility is likely to be the cause of car park capacity issues at local stations.

8.2.6. Passenger Satisfaction

Passenger satisfaction is predominantly affected by the standard of train service and the quality of facilities supporting the service (at stations and on board). Data published by Passenger Focus for services operating through Gloucestershire suggests low levels of satisfaction in regard to ticket value and on-train comfort, as shown in Table J.3 and Table J.4. Whilst locally the cost of fares between Stroud, Gloucester and Cheltenham are relatively competitive, affordability of longer distance rail trips is likely to be a barrier to people travelling to destinations outside of the County. Locally it is envisaged that parking availability is more likely to be a constraint to rail use than the cost of parking (as five our stations offer free parking).

Whilst addressing passenger satisfaction concerns is likely to be out of the direct control of the local authority, it is important to note that these issues may present a barrier to further modal shift to rail.

8.2.7. Station Facilities

A desk-based review of station facilities has been undertaken, with the results presented in Table J.5. This review highlighted a number of weaknesses in station facility provision, particularly in meeting requirements of the Disability Discrimination Act (1995).

8.3. Other Network Constraints

Based on information from GCC, Network Rail, local rail operators, interested stakeholders and a desk based review of local station facilities, there are a number of known issues relating to rail provision in the County, as summarised below.

\[1\] Annual Rail Passenger Survey 2013, Passenger Focus
Station Facilities

- There are some outstanding ‘non’ Disability Discrimination Act compliances at most stations including Cheltenham, Gloucester, Kemble, Lydney, Stonehouse and Stroud;
- A recent station audit identified the poor quality of intermodal public transport information a priority to enhance passenger experience; and
- Car park CCTV and general capacity is an issue at most stations including Gloucester and Cheltenham (this could be suppressing use of local stations).

Rail Network

- Gloucester station is located on a spur off the mainline and hence to stop at Gloucester results in a large time penalty (10 minute delay) to traverse the spur in both directions. As such, few long distance services operate through the station;
- Rail times to major international gateways are relatively unattractive compared to the car – good access to airports such as Birmingham and London Heathrow will help increase the County’s presence on the global economic stage;
- Despite being equidistant from London, journey times from Gloucester and Cheltenham to London are relatively long when compared to those times offered from major urban stations including Birmingham New Street, Bristol Temple Meads and Leicester;
- Network constraints around the Birmingham area (Kings Norton) can impact on reliability and frequency of services for trains serving the Midlands, Cheltenham and the South West;
- Pathing constraints at Severn Tunnel Crossing are a barrier to reducing journey times between Gloucester and Cardiff (conflicts with a London Paddington to Cardiff service);
- Low line speeds (15 mph) and departure clashes make operating Gloucester station less flexible;
- Delays in lowering level crossing at Horton Road and regulation with stopping services from Gloucester adversely affects quality of long distance CrossCountry services and incurs delays to passengers;
- Cardiff and Cheltenham station constraints can add complication to timetable planning, restricting scope for service improvement; and
- The Lickey incline (West Midlands) can adversely affect freight movements with knock on effects for passenger services running through the County.

Service Provision

- Train capacity on the Gloucester to Bristol line (via Yate) can become busy, impacting on commuters to Bristol;
- There are currently no intermodal freight facilities on the network, thus there is high dependency on the road network to deliver freight;
- The Ashchurch and Tewkesbury District Rail Promotion Group believe there is more potential for this station to grow and demand for further services; and
- Inbound services arriving from Swindon are low in frequency compared to outbound services in the AM peak. Enhancements of inbound services may help foster better relationships between locally based companies and the M4 corridor. This would also offer a public transport alternative to using the A417 Missing Link.

Other Considerations

- Cheltenham Spa station is located approximately one mile from Cheltenham town centre, in a mainly residential area of Cheltenham this is likely to be a deterrent to local rail usage. A recent scheme has been put forward to the LTB for a new passenger transport interchange and high quality train terminus at Cheltenham station to address local reliability issues, remove bottlenecks for long distance and freight trains, help maintain rail as a viable mode of travel and facilitate future operational needs;
- Gloucester’s railway and bus stations are located on the east side of the city centre in an area that has been identified by the City Council as in need of regeneration. Pedestrian access from the stations to the city centre is through an unattractive and underused area and the railway station is also separated by a three-lane dual carriageway and busy junction. These issues make the entry to the city a difficult and unattractive one for many public transport users. However, the Kings Quarter regeneration proposals offer an opportunity to create a more attractive gateway (and first impression) into the city;
Despite Cirencester being a significant settlement in the south of Cotswolds, the closest rail station is approximately six miles away;

Proposals for Worcestershire Parkway need to be carefully considered in terms of the potential impact on Ashchurch services – train operators are unlikely to incur time penalties at both of these stations; and

More work is needed locally to understand the barriers to rail use for Gloucestershire residents – national and operator trends suggest cost and complex rail fare structures are a deterrent to higher use.

8.4. Summary of Key Issues

The key points concerning rail transport provision in Gloucestershire include:

Strengths

- During the five year period between 2001/02 and 2011/12, rail station patronage across Gloucestershire has increased by 100%;
- With the exception of journeys to Hereford, journey times by train and car are reasonably competitive (between stations); and
- The punctuality of the three train companies operating within Gloucestershire is relatively strong when compared to the national average. Reliability is beneficial in terms of attracting new business investment, particularly where businesses rely on interaction with supply chains and customers based outside of the County.

Weaknesses

- Journey times to London are relatively long from both Gloucester and Cheltenham when compared to regional centres such as Birmingham, Bristol and Leicester which are of similar distance from London;
- GCC Accessibility mapping prepared in June 2013, shows that journey times to stations by bus in the morning peak are poor in some parts of the County, with only 61% of the County population able to access a train station within 30 minutes by bus before 09:00. This highlights that public transport access to stations is likely to be an issue in Gloucestershire;
- Residents of the Cotswolds and Forest of Dean have particularly poor access to stations;
- There are a number of weaknesses in station facility provision, particularly in meeting requirements of the Disability Discrimination Act (1995);
- Poor integration between bus and rail is likely to discourage use of public transport;
- There are currently no intermodal freight facilities on the network, thus there is high dependency on the road network to deliver freight; and
- Cheltenham Spa station is located approximately one mile from Cheltenham town centre, in a mainly residential area of Cheltenham this is a likely to be a deterrent to local rail usage.

Opportunities

- An efficient rail network that connects communities and businesses with the places they need to be aids economic competitiveness and improves quality of life;
- The use of rail for journey to work purposes is relatively low at County level (<1%) relative to the national average of 5%. With the right encouragement, there is significant opportunity for growth in this area;
- Gloucester’s rail (and bus) station is in need of improvement. The Kings Quarter regeneration proposals offer an opportunity to create a more attractive gateway into the city;
- Capacity relief on wider parts of the network provide an opportunity for the County to lobby for local service enhancements; and
- More work is needed locally to understand the barriers to rail use for Gloucestershire residents – such as affordability and complexity of fares.

Threats
- Gloucester station is located on a spur off the mainline and hence to stop at Gloucester results in a large time penalty to traverse the spur in both directions. As such, few long distance services operate through the station, a significant threat for the town; and
- Most station car parks in the County are reaching capacity, suggesting a potential for suppressed demand for rail in Gloucestershire.

8.5. **Constraints and Risks Rail Poses to Achieving the LTP’s Strategic Objectives**

Having identified rail’s service and network weaknesses, we must consider how these may impact on the strategic objectives identified for the County’s LTP and evaluate the likely impacts of not alleviating the problems identified. This analysis is presented in Table 8.3.
Table 8.3  Constraints and Risks Rail Poses to Achieving the LTP’s Strategic Objectives

<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
</table>
| Secure conditions for economic growth                    | - Rail network infrastructure and timetabling constraints, as discussed in detail in Section 8.3, place considerable restrictions on passenger and freight service improvements. In particular, Gloucester and Cheltenham’s poor rail links to London and international airports (in terms of journey times) will restrict passenger growth. Additionally, Gloucester station’s location off the mainline places it a serious disadvantage, particularly in allowing for long-distance connectivity, further undermining growth. There are several other infrastructure restrictions causing performance constraints and preventing service improvement, all of which restrict passenger growth.  
  - On board capacity constraints on the Gloucester to Bristol line.  
  - The lack of an intermodal freight facility on the County’s rail network.  
  - Parking capacity at stations is generally poor, including at Gloucester and Cheltenham, a situation that could be suppressing use of stations.  
  - Poor connectivity between Gloucester station and the city centre and a poor quality of public realm.                                                                 | - Poor connectivity and capacity on the rail network will restrict passenger and freight growth and thereby place restrictions on economic growth by:  
  - Deterring investment within Gloucestershire.  
  - Limiting Gloucestershire’s businesses from having effective connections to customers, employees and supply chains.  
  - Reducing an individuals’ ability to travel to work.  
  - A restriction on rail passenger growth could lead to increased use of private vehicular modes of transport, placing a greater strain on the road network, thereby increasing congestion, delay and carbon emissions.  
  - The lack of an intermodal freight facility means transporting goods from/to the County will be a deterrent to business growth and investment should road base congestion, delays and journey time’s increase.  
  - The lack of a strong gateway to Gloucester station undermines attempts to increase rail passenger usage and deters investment in the city. |
| Conserve and enhance Gloucestershire’s unique natural and built environment | - There are currently no intermodal freight facilities on the network, thus there is high dependency on the road network to deliver freight.  
  - Poor quality of public realm around Gloucester station.                                                                                                           | - Opportunities to reduce carbon emissions by shifting from road to rail are being missed, with subsequent environmental impacts.  
  - A poor public realm deters visitors and does nothing to enhance the County’s built environment.                                                                     |
| Ensure that communities are given equal opportunity to benefit from economic prosperity | - Most stations have DDA compliance issues.  
  - Links between bus and rail are poor and there is a lack of public transport service information at stations.  
  - The location of Cheltenham and Cirencester’s stations is not ideal for allowing good access to all.  
  - Anticipated housing growth in the vicinity of Tewkesbury creates opportunity to enhance service levels for Ashchurch and Tewkesbury and mitigate against any potential increases in traffic generated. | - Failing to ensure equal access to rail services prevents some communities from having equal access to economic opportunities, placing restrictions on their and the County’s growth.  
  - Poor connectivity between public transport services places those reliant on these services at a disadvantage, potentially limiting their opportunities to travel (with subsequent economic impacts in terms of ability to travel to work, etc).  
  - Poor access to stations may leave some communities worse off.  
  - Failure to align transport investments with housing growth areas will lead to increased reliance on the road network resulting in increased congestion, delay and carbon emissions. |
<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create healthy, safe and engaged communities</td>
<td>• Car park CCTV is an issue at most stations.</td>
<td>• Risk that actual or perceived crime levels will increase.</td>
</tr>
</tbody>
</table>
9. Modal Analysis: Highways

9.1. Introduction

Businesses, their supply chains, workers and consumers collectively depend upon good quality highway networks to move goods, deliver services and travel to work and other service facilities. The time taken to undertake a journey affects productivity, in that time spent travelling reduces time available to produce goods or provide services. Longer travel times can also lead to higher variable costs such as staff and fuel overheads. Whilst transport in broad terms accounts for just 4-5% of total input costs (Eddington Study, 2006), this can be much higher for some sectors such as distribution or manufacturing depending on 'just in time' production methods.

Better network coverage allows for increased connectivity, quicker journey times and better access to new locations. This allows businesses to expand their labour pools, benefit from agglomeration impacts and access bigger markets. For commuters, better network connectivity further results in greater employment and key service choices.

9.2. Current Situation

Gloucestershire has approximately 80 miles of motorway/trunk road and in the order of 3,300 miles of local authority owned highway. The network is dominated by the M5 motorway which runs north-south through the County and provides good connectivity to Birmingham, the Midlands, the North, Bristol and the South West and the M4 corridor (Wales and London). Trunk roads managed by the Highways Agency (HA) also include:

- The A40 linking the M5 Junction 11 with Ross on Wye through Gloucester;
- The A417/A419 linking M5 Junction 11a with Swindon and the M4 Corridor;
- A short link of the M50 running north of Tewkesbury; and
- The A46 from M5 junction 9 north-east through County towards Evesham and south Warwickshire.

An overview of Gloucestershire’s transport network is shown in Figure 9.1.
Within the County, a network of local authority managed ‘A roads’ link the urban centres of Cheltenham and Gloucester and key district market towns such as Cirencester, Stow on the Wold, Stroud, Coleford, Cinderford and Tewkesbury. Across rural areas, a network of minor B roads and unclassified routes provide connections between smaller settlements and market towns. A summary of the key strategic highway routes is presented in Table K.1.

9.2.1. **Demand**

The National Travel Survey gives an indication of current journey to work patterns across Gloucestershire, revealing that:

- There is a culture of high car dependency and usage in the County. This in itself could be a constraint to encouraging uptake of sustainable modes of travel as people need to be convinced there are real alternative mode choices available to them (particularly in rural areas where coverage is less comprehensive);
- Travel to Work self containment is high within the County, illustrating the importance of maintaining good internal connectivity such that Gloucestershire residents can benefit from local growth and businesses can benefit from retaining the local skills base;
- Maintaining and enhancing external transport links to large regional economic centres such as Bristol, West Midlands, Swindon and the M4 corridor, London and South Gloucestershire will be key in helping strengthen Gloucestershire’s economic competitiveness in the South West through agglomeration and supporting travel to work movements;
- Key cross border journey to work movements from Gloucestershire include:
  - Links to the Herefordshire and Monmouthshire from the Forest of Dean;
  - Links to South West Gloucestershire, Wiltshire and Bristol from Cheltenham, Gloucester and South Cotswolds;
  - Links to Warwickshire/Worcestershire towns from north of the County (Tewkesbury and Cotswolds); and
  - Links between the Cotswolds Towns into Oxfordshire and Swindon.
9.3. Network Constraints

9.3.1. Journey Times

DfT validated average speed data for Gloucestershire’s A Roads reveals that average speeds on of 29.5mph are 21% higher than the national average (24.5mph). As such, average journey times on Gloucestershire’s managed ‘A roads’ (2.03 vehicle minutes per mile) is less than the national average (2.41 vehicle minutes per mile).

However, these averages mask more locally specific issues on the network, particularly on the main corridors into Cheltenham and Gloucester. Local data indicates the national average journey time of 2.41 vehicle minutes per mile is exceeded at locations along the following corridors:

- Cheltenham: A40, A4013, A4019, A435, A46, B4063 and Leckhampton Road; and
- Gloucester: A38, A40, A417, A4173, A430, A432, B4063, B4073, B4215, Barnwood Road and Hucclecote Road.

9.3.2. Network Reliability

Congestion mapping, as shown in Figure 9.2 for the AM peak period (07:00-09:30) in the Central Severn Vale (CSV) area of the County, helps identify a number of problem locations:

- A40, A417 and A48 corridors into Gloucester from the Forest of Dean market towns;
- Localised congestion at junctions in Cheltenham and Gloucester Urban areas;
- A417 East of Gloucester between Elmbridge, C&G and Walls Roundabouts;
- A40 and B4063 north east of Gloucester at Elmbridge Roundabout;
- A38/ Cole Avenue to the south of Gloucester;
- A40 from M5 Junction 11 into Cheltenham;
- Pockets of congestion on the route from M5 J10 into Cheltenham;
- A435 from Bishops Cleeve North of Cheltenham;
- A40 corridor into Cheltenham from Charlton Kings; and
- A417/A436 Air Balloon and Nettleton Bottom south of Cheltenham.

Further analysis of internal monitoring data shows that between 2008/09 and 2010/11 there has been a gradual worsening of congestion on the following corridors in Cheltenham and Gloucester:

- A40 between M5 J10 and Cheltenham;
- A4013 (Princess Elizabeth Way) linking the A40 and A4019 west of Cheltenham;
- A435 from Bishops Cleeve, North of Cheltenham;
- B4633 (Gloucester Road), West of Cheltenham;
- B4075 (Priors Road/Hales Road), East of Cheltenham;
- A40 west and north of Gloucester;
- A40 from M5 J10 into Gloucester;
- A4073 (Stroud Road) into Gloucester;
- B4063 Cheltenham Road to Elmbridge Roundabout;
- A430 Trier Way; and
- Barnwood Road from Brockworth into Gloucester.

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1 2012/13 LTP Annual Progress Report, April 2012 (data for 2011/12)
2 GCC Congestion Monitoring Report 2008/09-2010/11
A Transport Study undertaken for the CSV area produced forecasts for 2026 detailing the most congested junctions on the network in order to provide an indication of where future capacity enhancements will be most needed, as shown in Figure K.1. Using this data and congestion priorities identified through the LTB, LTP, LEP, local core strategies and other sources, the main congestions hotspots (existing and future) are identified below:

- A40 Corridor between M5 J11 and Cheltenham - Arle Court Roundabout, A40/Whittingham Road and A40/A4013 Benhall Roundabout;
- A38/A4019 Junction – route to M5;
- A38 Longford Roundabouts;
- A40 Over Roundabout and Highnam Lodge;
- St Whites Road and Valley Road Junction;
- Walls and C&G Roundabouts;
- M5 Junctions 9 – 13;
- A46 (Shurdington Road) to Cheltenham;
- A38 Corridor from M5 J12 to Gloucester;
- Abbeymead and Metz Way Corridor;
- A417 Air Balloon, Birdlip Junction and Nettleton Bottom (Missing Link);
- Lydney Town Centre congestion issues (Newerne Link, Forest Road Junction, Beam Road and Albert Street);
- Tourist related traffic congestion in Market Towns (Cirencester; Stow on the Wold, Stroud, Bourton on the Water, Newent, Coleford and Cinderford);
- St Barnabas Roundabout;
- Final stage of Gloucester South West Bypass (widening near Llanthony Priory);
- Staverton Bridge Junction;
- London Road, Cheltenham / East Cheltenham (Charlton Kings Approach); and

1 GCC Congestion Monitoring Report 2008/09-2010/11
- A438 Tewkesbury (M5 to Shannon Way).

Further details of each of these hotspots is provided in Table K.2.

The LEP Growth Strategy (2013) identified the following two corridors as important economic growth areas and as such good connectivity to and through these corridors is of high importance:

- The M5 Junctions 9, 10, 11 and 12 have all been identified for employment and mixed used developments; and
- The A417/A419 Cheltenham/Gloucester to Swindon corridor is of regional economic significance but long standing problems along the corridor have been noted.

More work is required to assess and prioritise the weaknesses identified here, in particular around linking network issues with economic opportunities, as none of the congestion hot spots identified here were considered in the LTB’s first round of schemes. If the case for these schemes is strong then they need to be reflected within the developing SEP and LTP.

### 9.3.3. Highway Condition and Maintenance

The value of the County’s 3,300 mile highway network is estimated to be £6.1billion, with carriageways accounting for approximately 79% of this. The remaining value consists of, et al, footways, lighting, street furniture and drainage. An overview of the County’s carriageway asset is presented in Table K.3.

GCC are responsible for the management of approximately 96% of the total network length in the County, with approximately 78% of the total network being of ‘C’ road or unclassified status. Collectively, these network attributes place significant funding pressures on the highway authority in terms of:

- Sourcing and allocating sufficient budgets to keep the network up to standard;
- Having effective systems in place to collate, review and respond to the information needed to prioritise maintenance investment such that it offers best value to the tax payer and results in optimal overall network performance; and
- Prioritising and addressing maintenance demands (winter maintenance).

The performance of the highway network is a potential threat to the County’s economy and well being. There are a number of indicators that measure the extent to which the highway network is performing in asset management terms. The service standards of the network are monitored against national and local targets. Given that almost half of the total highway network in Gloucestershire is unclassified, it is unsurprising that these routes perform worst in terms of the proportion of routes classified as defective (17%), as shown in Table 9.1 (a trend graph for the period 2007-2012 is shown in Figure K.2). Since 2007, the proportion of defective unclassified network has remained broadly static, but falls significantly behind the performance of A, B and C routes.

<table>
<thead>
<tr>
<th>Table 9.1</th>
<th>Proportion of Gloucestershire’s Highway Network rated as Defective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>March 2007</td>
</tr>
<tr>
<td>A Roads</td>
<td>10%</td>
</tr>
<tr>
<td>B &amp; C Roads</td>
<td>15%</td>
</tr>
<tr>
<td>Unclassified Roads</td>
<td>20%</td>
</tr>
</tbody>
</table>

Locally, GCC aims to maintain the proportion of road network requiring maintenance at ≤4% for the principal road network and ≤10% for the non-principal road network (B & C Roads), with Figure K.3 showing this to have been achieved in 2012. However, given the County’s

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1 Chartered Institute of Public Finance and Accountancy (2012)
maintenance budget is expected to fall, the risk of failing to meet these targets increases. This is especially concerning given the high proportion of highway routes classified as ‘amber’ – a score which represents the part of an assets’ life cycle where it is most difficult to predict the pace of deterioration.

When compared to the national average, it can be seen that GCC is marginally underperforming in terms of maintaining its unclassified carriageway asset, as shown in Table 9.2.

<table>
<thead>
<tr>
<th>Local Authority</th>
<th>% in Need of Maintenance</th>
<th>Estimated Road Length</th>
<th>% of Road Network that is Urban</th>
<th>% of Road Network that is Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucestershire</td>
<td>17</td>
<td>2898</td>
<td>27</td>
<td>73</td>
</tr>
<tr>
<td>National average</td>
<td>16</td>
<td>3530</td>
<td>29</td>
<td>71</td>
</tr>
</tbody>
</table>

The residual life of an average road in Gloucestershire diminishes at approximately 2-4% per annum, with the County required to spend an estimated £15.1million per annum (standstill cost) to keep up with the associated maintenance. A serious weakness for the County is the backlog of required maintenance costs, which stands at £91million, as detailed in Table K.4. The maintenance backlog is greatest in actual terms and on a per-head basis in Cotswold District, accounting for 40% of total backlog costs in the County. The Forest of Dean district ranks second most critical in the County, whilst the urban districts of Cheltenham and Gloucester have the lowest levels of backlog.

9.4. Summary of Key Issues

The key points regarding highway provision in Gloucestershire are detailed below.

Strengths

- In general terms, Gloucestershire benefits from a relatively well connected and efficient highway network – this represents an opportunity for local businesses to access a wider pool of labour, supply chains and business clusters; and
- Average speeds on Gloucestershire’s roads are faster than the national average.

Weaknesses

- There are a number of challenges relating to the highway network that the LTP needs to address:
  - Congestion is prevalent on the main corridors into Cheltenham and Gloucester and other routes – this is only expected to worsen in the future as new housing and employment comes online in these major local growth areas;
  - Anticipated urban extensions offer potential to encourage sustainable transport options relevant to walking, cycling and public transport use;
  - East-west movements in and out of the Forest of Dean district are constrained by a single crossing across the River Severn (A40) and the absence of a well defined ring road around Gloucester. The A40 is consequently heavily congested during peak periods – particularly when the Severn Bridge is closed. This places significant pressure on already congested corridors around Gloucester; and
  - Highway congestion adversely impacts on the attractiveness of public transport modes as well as private modes.
- More work is required to assess and prioritise the weaknesses of the highway network, in particular around linking network issues with economic opportunities to feed into scheme prioritisation (e.g. the extent to which the A417/A419 missing link between

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1 Gloucestershire Highways Information Pack (2013)
Gloucestershire and Swindon is a constraint to local businesses and residents needs to be better understood.

**Opportunities**

- Better network coverage and better use of the current network (reducing delay and improving journey time reliability, etc) allows for increased connectivity, quicker journey times and better access to new locations. This allows businesses to expand their labour pools, benefit from agglomeration impacts and access bigger markets. For commuters, better network connectivity further results in greater employment and key service choices; and
- Travel to Work self containment is high within the County, illustrating the importance of maintaining good internal connectivity such that Gloucestershire residents can benefit from local growth and businesses can benefit from retaining high local skills base.

**Threats**

- There is a culture of high car dependency and usage in the County – if unmitigated this attribute combined with significant planned growth in the County, will place increasing pressure on transport networks across the County – resulting poor journey times and network saturation will have a detrimental impact on local business activity in the County and undermine its capacity to secure growth;
- A fall in budget for road maintenance risks increasing the already high backlog of works to be undertaken, threatening network resilience and the economic competitiveness of the County should emergency maintenance need to be undertaken or roads closed. Due to the nature of the highway network in Gloucestershire, this risk is most greatly faced in the rural areas of the County, risking economic opportunities in these areas. Badly maintained roads (pot holes, etc) are also a risk to the safety of all road users; and
- New employment and housing developments will place growing pressures on the highway network if they are not delivered in a sustainable manner with public transport options well integrated.

**9.5. Constraints and Risks the Highway Network Poses to Achieving the LTP’s Strategic Objectives**

The previous section has identified the weaknesses of Gloucestershire’s highway network, such as the maintenance backlog and congestion on the network. Table 9.3 considers how these weaknesses may impact on the strategic objectives identified for the County’s LTP and evaluates the likely impacts of not alleviating the problems identified.
Table 9.3  **Constraints and Risks the Highway Network Poses to Achieving the LTP’s Strategic Objectives**

<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
</table>
| Secure conditions for economic growth | - There is a culture of high car dependency and usage in the County, placing increasing pressures on the highway network, as evident with the congestion hotspots identified previously. This is a serious concern for the main corridors in the County, particularly those leading into Cheltenham and Gloucester. Highway congestion adversely impacts on the attractiveness of public transport modes, leading to a vicious circle situation.  
- New employment and housing developments will place growing pressures on the highway network if they are not delivered in a sustainable manner with public transport options well integrated.  
- Historic under-investment has resulted in an estimated £91m backlog that will only be significantly reduced with long term additional funding. | - Congestion, delays, increasing average journey times (and unpredictability) and network saturation have a detrimental impact on local business activity and competitiveness. This deters investment and undermines capacity for growth.  
- Without alternatives to car based transport, new employment and housing developments will add further trips to the network, increasing congestion and harming economic growth potential.  
- If unaddressed, maintenance problems represent a risk to the economy through lost time due to major maintenance works, as well as the safety of road users. Poor maintenance adversely effects network resilience and reliability, both important factors for business. |
| Conserve and enhance Gloucestershire’s unique natural and built environment | - High levels of car usage. | - Damage to the natural environment through pollutants such as noise and carbon dioxide. |
| Ensure that communities are given equal opportunity to benefit from economic prosperity | - The Cotswolds and Forest of Dean have the largest backlogs of under investment in maintenance, meaning rural routes are suffering. | - This places rural businesses and communities at a disadvantage for achieving economic prosperity. |
| Create healthy, safe and engaged communities | - Anticipated urban extensions offer potential to encourage sustainable transport options relevant to walking, cycling and public transport use only if they are well designed and integrated. | - Failure to deliver effective alternatives to car based transport will lead to over reliance on the car, with associated impacts for health. This will add pressures to healthcare provision in the County. |
10. **Freight**

10.1. **Introduction**

The efficient distribution of goods and services is critical for all the basic essentials of everyday life such as food, drink, clothing and fuel. All that we consume, buy or use has at some point been part of this system of distribution. The challenge is to ensure this system operates to support economic growth and vibrancy, whilst transporting our goods in the most sustainable way. The council recognises this and takes seriously the need to achieve a more sustainable distribution of freight that balances the needs of the economy, the environment and society.

10.2. **Current situation**

Baseline data on freight within Gloucestershire is limited, with no recent data on modal split, demand or issues. The most recent data on HGV Highway flows in the County is presented in Table 10.1.

<table>
<thead>
<tr>
<th>Route</th>
<th>Area</th>
<th>2007</th>
<th>2010</th>
<th>Change 2007 – 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4231 Winding Wheel Bream</td>
<td>Forest of Dean</td>
<td>112</td>
<td>103</td>
<td>-8%</td>
</tr>
<tr>
<td>A4151 Popes Hill, Littledean</td>
<td>Forest of Dean</td>
<td>36</td>
<td>31</td>
<td>-32%</td>
</tr>
<tr>
<td>B4221 Gorsley</td>
<td>Forest of Dean</td>
<td>137</td>
<td>113</td>
<td>-17%</td>
</tr>
<tr>
<td>A48 Westbury on Sever</td>
<td>Forest of Dean</td>
<td>232</td>
<td>145</td>
<td>-38%</td>
</tr>
<tr>
<td>A4136 Longhope Road, Huntley</td>
<td>Forest of Dean</td>
<td>397</td>
<td>410</td>
<td>+3%</td>
</tr>
<tr>
<td>C262 Frocester Hill</td>
<td>Stroud</td>
<td>15</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>A46 Fiddlers Elbow, W Cranham</td>
<td>Stroud</td>
<td>8</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>A46 Bear Hill, Woodchester</td>
<td>Stroud</td>
<td>80</td>
<td>64</td>
<td>-20%</td>
</tr>
<tr>
<td>B4077, East of Teddington Hands</td>
<td>Tewkesbury</td>
<td>91</td>
<td>117</td>
<td>+29%</td>
</tr>
<tr>
<td>A433 Illsum Stid, East of Tetcbury</td>
<td>Cotswolds</td>
<td>64</td>
<td>52</td>
<td>-19%</td>
</tr>
<tr>
<td>B4632, South of Winchcombe</td>
<td>Cotswolds</td>
<td>14</td>
<td>15</td>
<td>+7%</td>
</tr>
<tr>
<td>A44 Trprs Lodge (Bourton on the Hill)</td>
<td>Cotswolds</td>
<td>230</td>
<td>230</td>
<td>-</td>
</tr>
<tr>
<td>A417 East of Whilfield Turn</td>
<td>Cotswolds</td>
<td>94</td>
<td>93</td>
<td>-1%</td>
</tr>
<tr>
<td>B4632 Willersley</td>
<td>Cotswolds</td>
<td>49</td>
<td>34</td>
<td>-31%</td>
</tr>
</tbody>
</table>

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1 GCC County Lorry Monitoring 2007-2010. Figures are 24 hour five day averages for lorry count sites in the County.
Table 10.1 illustrates that HGV flows in the more sensitive areas of the Forest of Dean and the Cotswolds are generally decreasing, though this is within the context of economic recession and continued monitoring is advocated.

DfT National Growth Forecasts indicate that the number of LGVs on that nation’s highway network is to increase by 43% between 2010 levels and 2035. Managing the quality of life and environmental impacts of freight traffic therefore needs to form a key component of the strategy moving forward.

10.3. **Key Constraints**

A detailed review of the issues affecting the movement of freight is necessary to support the future development strategy priorities for LTP. Without this, evidence based decision making cannot occur. However, anecdotal information highlights issues consistent with neighbouring local authorities such as Wiltshire, which may be a starting point for the LTP to consider, as detailed below.

**Strategy and Information**

- A switch of freight from road to rail needs to be encouraged, although it is recognised that there are no rail freight terminals in Gloucestershire, preventing direct rail routes to or from the County. Additionally, GCC’s options for encouraging modal shift to rail may be difficult when freight movements do not start in the County. A number of opportunities for intermodal freight facilities have been considered in isolation over recent years, none of which have been taken forward. Further consideration needs to be given to the strategic relevance of intermodal freight facilities in the County that, as a minimum, gives a firm position on the following muted proposals:
  - Ashchurch MOD Site: This site, located close to Tewkesbury, is pending closure and has been under recent consideration for housing or intermodal freight land use. A recent study concluded that implementing an intermodal facility here would rely on a number of technical constraints being overcome including its ability to accommodate 750m long trains and turning restrictions; and
  - Sharpness Docks: These docks are Gloucestershire’s only sea port and are linked to a dormant rail line. Reinstatement of this line would require significant investment and no work is currently being implemented to assess the overall feasibility of such a scheme.

- Building on the lessons learnt from the Cotswold HGV Management Zones, a coherent countywide strategy is required to ensure that Gloucestershire’s residents are protected from the adverse impacts of HGV traffic, particularly in rural population centres;

- The Oxfordshire Local Transport Plan makes reference to de-priming the A44 on its own network between Moreton in Marsh and Chipping Norton as a means by which to address LQMA mitigation. If implemented this could affect local communities in the North Cotswolds by pushing vehicles on to less suitable routes, something GCC should be prepared for;

- Attendance at Freight Quality Partnership events has been poor in recent years and consequently a coherent understanding of the current issues affecting the Gloucestershire freight sector and its key partners is limited. Effort is required to reinitiate such meetings in order that local issues can be fully understood and clear County investment priorities can be determined (although the logistics groups of the LEP may be a more appropriate body to take this forward); and

- In 2009 GCC produced an Advisory Route Map, showing the preferred routes for HGVs through Gloucestershire as well as freight facilities. The lack of a recent update is a weakness for the County, though it is envisaged that an update will be commissioned in 2013/14.

**Environmental and Social Impacts**

- Given the County’s rural nature, there is a tension between the conflicting demands of meeting the needs of business by allowing freight transport and the resulting environmental and social impacts;
• Reliance on road based freight movements has implications for inappropriate route choice. This can result in adverse impacts on rural roads, such as verge erosion, and can cause intimidation within residential areas; and
• GCC and its partners in the freight sector need to seek methods of local climate change targets on HGV use, through application of more efficient and innovative vehicle technologies, demand management and logistical techniques including urban Freight Consolidation Centres (FCC). FCCs are depots at which freight is unloaded, combined and distributed into smaller units prior to delivery on smaller, more efficient vehicles. There are no current proposals for FCCs in the County, nor has there been any detailed investigation into their overall commercial viability. The current LTP recognises that further work is necessary to confirm the value of such a facility to jointly serve Cheltenham and Gloucester.

Congestion
• Traffic congestion can be a problem, particularly during peak hours. This can have adverse implications for the movement of goods and freight by road.

Infrastructure
• Facilities for lorry drivers to take their breaks, in line with European Union driving hour directives, need to be addressed. Historical issues identified by the Gloucestershire Freight Quality Partnership include:
  • Unsuitable lay-by facilities for overnight parking, with a lack of appropriate amenities and sanitation;
  • Affordability of overnight parking service is an issue; and
  • Security is an ongoing issue, a particular concern for the industry as insurance companies make it a condition that HGVs transporting high value goods only use secure overnight parking facilities.

10.4. Summary of Key Issues
The key points regarding freight in Gloucestershire are detailed below.

Strengths
• Gloucestershire benefits from a relatively well connected and efficient highway network – this represents an opportunity for freight within the County; and
• Average speeds on Gloucestershire’s road are faster than the national average.

Weaknesses
• There are a number of challenges relating to the highway network that the LTP needs to address so to minimise adverse impacts on freight:
  • Congestion on main corridors into Cheltenham and Gloucester and at other pinch points on the network – this is only expected to worsen in major local growth areas; and
  • The A40 is heavily congested during peak periods – particularly when the Severn Bridge is closed. This places significant pressure on already congested corridors around Gloucester.
  • Work is required to assess and prioritise the weaknesses of the highway network, in particular around linking network issues with economic opportunities to feed into scheme prioritisation (e.g. the extent to which the A417/A419 missing link between Gloucestershire and Swindon is a constraint to freight movement needs to be better understood).

Opportunities
• Better network coverage and better use of the current network (reducing delay and improving journey time reliability, etc) allows for increased connectivity, quicker journey times and better access to new locations;
• To maximise opportunities to achieve sustainable distribution methods, particularly transferring from road to rail;
- Build on lessons learnt from the Cotswold HGV Management Zone; and
- Improve understanding of issues through improving attendance at the Freight Quality Partnership.

**Threats**
- Difficulty in transferring freight from road to rail as routes are predominantly through Gloucestershire rather than stopping;
- A fall in budget for road maintenance risks increasing the already high backlog of works to be undertaken, threatening network resilience and the economic competitiveness of the County should emergency maintenance need to be undertaken or roads closed; and
- Lack of update to the Freight Advisory Route Map in recent times – this should also be seen as an opportunity.

### 10.5. Constraints and Risks Freight Poses to Achieving the LTP’s Strategic Objectives

Table 10.2 considers how the weaknesses for freight may impact on the objectives identified for the County’s LTP and evaluates the likely impacts of not alleviating the problems identified.
Table 10.2 Constraints and Risks Freight Poses to Achieving the LTP’s Strategic Objectives

<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Constraints to Achieving Objective</th>
<th>Implications of Not Alleviating Identified Constraints</th>
</tr>
</thead>
</table>
| Secure conditions for economic growth           | • The congestion issues captured in Chapter 9 and journey time reliability are a concern for the movement of freight on the County’s highway network, particularly in urban areas.  
  • Lack of intermodal freight facility prevents modal shift. | • Congestion, delay and increased journey times lead to unproductive time for freight distributors, with economic ramifications.  
  • An over reliance on the highway network by Gloucestershire’s businesses for the movement of freight due to the lack of a rail alternative, could lead to economic disadvantage. |
| Conserve and enhance Gloucestershire’s unique natural and built environment | • There is a need to re-engage with hauliers and industry to reduce freight based carbon emissions.  
  • Inappropriate route choice by haulage operators can result in adverse impacts on rural roads, such as verge erosion.  
  • The Oxfordshire LTP makes reference to de-priming the A44 on its own network between Moreton in Marsh and Chipping Norton, as a means by which to address LQMA targets. If implemented, this could affect local communities in the North Cotswolds by pushing vehicles on to less suitable routes. | • A failure to meet carbon emission targets and improve environmental quality in the County.  
  • Damage to the County’s natural environment.  
  • Increasing freight use of rural routes in the Cotswolds will have environmental implications.  
  • Impact of noise on urban and rural routes. |
| Create healthy, safe and engaged communities     | • Inappropriate route choice for freight can cause intimidation within residential areas.            | • Intimidation and concerns over actual or perceived safety impacts on a community’s quality of life.                       |
11. **Conclusions**

11.1. **Introduction**

This chapter pulls together the key issues emerging from a comprehensive review of transport evidence to answer the following questions:

- What are the wider aspirations and social, economic and environmental outcomes that the LTP will need to help deliver over the plan period up to 2031?
- What outcomes does the LTP need to deliver in order to meet these aspirations?
- What are the specific transport network constraints that will affect Gloucestershire’s capacity to meet these wider policy aspirations?
- What is the likely impact of not alleviating the problems and constraints identified?

11.2. What are the wider aspirations and social, economic and environmental outcomes that the LTP will need to help deliver over the plan period up to 2031?

Current central government priorities are focussed on creating conditions for economic growth by focussing on the delivery of sustainable transport solutions, reducing congestion on roads and creating equal access and opportunity for all to engage in the benefits of growth. The Council Strategy, District Core Strategies, the existing LTP, as well as health and social policies, all support this agenda.

This comprehensive review of evidence has demonstrated that transport infrastructure has and will continue to play a key role in delivering wider social, economic and environmental outcomes in Gloucestershire. Reflecting both national government priorities to kick start sustainable economic growth and the growing influence of the LEP in the identification of local investment priorities, a major strategic challenge for the LTP will also be to facilitate local growth.

The focus on economic growth does not, however, negate the importance of transport infrastructure in delivering other policy outcomes. The LTP will also need to focus on delivering interventions that help:

- **Secure conditions for economic growth in Gloucestershire where:**
  - Local infrastructure (including transport) is not a constraint to unlocking the most sustainable development employment and housing sites;
  - Businesses are well connected to the skilled labour, business clusters and supply chains, and customers upon which they rely to grow; and
  - Both rural and urban economies are resilient to the adverse local impacts of extreme weather events.
- **Ensure the County’s unique natural and built environment (a primary contributor to attracting people to live, work and invest in Gloucestershire) is preserved and enhanced;**
- **Establish communities that are given equal opportunity to benefit from economic prosperity and are well connected to employment, education and training, healthcare and other key services; and**
- **Create healthy, safe and engaged communities.**

11.3. What are the pending strategic challenges for the LTP and what are the risks associated with not achieving?

Drawing upon the evidence presented in subsequent chapters, it is evident a large range of strategic and network specific challenges exist if the County is to successfully achieve its vision. The simplified logic maps that follow are intended to summarise the main challenges that exist for
transport and the implications of not achieving them. Furthermore, the links between these challenges and the outcomes and impacts the LTP needs to achieve are also captured.
Table 11.1 Logic Chain: Secure conditions for economic growth

<table>
<thead>
<tr>
<th>What are the key challenges to achieving the objective?</th>
<th>What are the implications of not overcoming the challenge?</th>
<th>What outcomes does the LTP need to deliver in order to meet these aspirations?</th>
<th>What impacts will these outcomes have?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The need to ensure the right transport connections and services are in place to facilitate economic growth and improve business competitiveness by allowing good connectivity between people, businesses and supply chains</td>
<td>Poor transport choice can prevent people from taking up employment and restrict their choice of jobs</td>
<td>A reliable and efficient transport network that connects communities, employment and services, with minimal congestion and competitive journey times</td>
<td>Good transport networks will enable economic growth by facilitating efficient movements, broadening the scope for travel to work and ensuring businesses are well connected to their customers and supply chains</td>
</tr>
<tr>
<td>Mitigating the effects of forecast economic growth on multi-modal network efficiency and reliability</td>
<td>Worsening network efficiency and reliability will deter growth and investment</td>
<td>A transport network that can accommodate increasing demands, particularly increase in public transport use</td>
<td>Population and employment growth in appropriate places that supports the wider economy</td>
</tr>
<tr>
<td>Ensuring transport is not a limitation on population and employment growth</td>
<td>An inadequate supply of employment and housing land</td>
<td>A reduction in the use of private vehicles, with a corresponding rise in sustainable modes of travel</td>
<td>More efficient road networks, with a fall in congestion, and economic advantage for the County.</td>
</tr>
<tr>
<td>Manage travel demand and encouraging modal shift from car to more sustainable modes</td>
<td>A high reliance on cars contributes to congestion and delay, undermining economic competitiveness</td>
<td>The right connections, at the right price, for all people seeking to better themselves through education or training</td>
<td>A stronger, smarter employment base which will support economic growth</td>
</tr>
<tr>
<td>Reducing car dependency</td>
<td>An increasing skills gap and shortage of talented labour can undermine economic competitiveness</td>
<td>An evidence backed understanding of the PROW network, with prioritised investment implemented</td>
<td>A well designed, connected and maintained PROW network which encourages modal shift, with increased footfall supporting local economies</td>
</tr>
<tr>
<td>Providing good access to education and skills training</td>
<td>A poor quality PROW network may deteriorate, discouraging use and having economic impacts</td>
<td>An efficient bus network which serves communities and allows for sustainable travel</td>
<td>A better connected workforce supports the economy whilst improved bus services can encourage modal shift</td>
</tr>
<tr>
<td>Poor PROW evidence limits understanding and prevents identification of priorities for improvement</td>
<td>Without an integrated public transport service, the use of the car will increase, placing pressures on the highway network</td>
<td>A well connected rail network with competitive links to London</td>
<td>A good rail network provides capacity for economic growth</td>
</tr>
<tr>
<td>Integrating and enhance core bus corridors within existing and new communities</td>
<td>Poor connectivity and capacity on the rail network will restrict passenger and freight growth</td>
<td>The provision of an intermodal freight facility in a strategically appropriate location</td>
<td>Modal shift for freight, with a fall in HGVs with corresponding improvements for congestion capacity for growth in the freight market in Gloucestershire</td>
</tr>
<tr>
<td>Improving rail connectivity and journey times, particularly with the London market</td>
<td>The lack of an inter-modal freight facility will be a deterrent to growth and investment should road base congestion and delay increase</td>
<td>A high quality road network</td>
<td>A more resilient road network that supports a growing economy</td>
</tr>
<tr>
<td>The lack of an intermodal freight facility on the County’s network</td>
<td>Poor quality roads represent a risk to the economy through lost time due to major maintenance works, impacting network resilience and reliability</td>
<td>A resilient transport network that can withstand extreme weather events and long term changes to the climate</td>
<td>An economic advantage for Gloucestershire and reduced ‘down time’ during poor weather</td>
</tr>
<tr>
<td>Improving the condition of highway assets</td>
<td>Poor network resilience directly impacts on economic productivity through weather related disruption or indirectly through loss of inward investment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 11.2 Logic Chain: Conserve and enhance Gloucestershire’s unique natural and built environment

<table>
<thead>
<tr>
<th>What are the key challenges to achieving the objective?</th>
<th>What are the implications of not overcoming the challenge?</th>
<th>What outcomes does the LTP need to deliver in order to meet these aspirations?</th>
<th>What impacts will these outcomes have?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing car use and dependency, particularly in rural areas</td>
<td>Car use causes damage to the natural environment through pollutants such as noise and air pollution</td>
<td>A reduction in the use of private vehicles, with a corresponding rise in sustainable modes of travel</td>
<td>A reduction in the adverse impacts of private vehicle use, including CO\textsubscript{2} emissions, noise and air pollution</td>
</tr>
<tr>
<td>Reducing transport’s contribution to CO\textsubscript{2} emissions</td>
<td>Without modal shift and reduced car/HGV use, targets for CO\textsubscript{2} emission reductions cannot be achieved</td>
<td>A shift towards the use of low carbon vehicles and regular use of sustainable modes of travel</td>
<td>A shift towards the use of low carbon vehicles and regular use of sustainable modes of travel</td>
</tr>
<tr>
<td>The lack of an intermodal freight facility prevents freight modal shift with environmental impacts</td>
<td>Poor quality PROWs and congestion in town centres will deter tourism</td>
<td>Implementation of appropriate intermodal freight facilities in a strategically appropriate location</td>
<td>Implementation of appropriate intermodal freight facilities in a strategically appropriate location</td>
</tr>
<tr>
<td>Poor PROW evidence base limits understanding and prevents identification of priorities for improvement</td>
<td>A poor public realm deters visitors and does nothing to enhance the County’s built environment</td>
<td>An evidence backed understanding of the PROW network, with prioritised investment implemented</td>
<td>An evidence backed understanding of the PROW network, with prioritised investment implemented</td>
</tr>
<tr>
<td>Improving poor quality bus interchanges</td>
<td>Degradation of rural routes</td>
<td>A high quality public realm throughout Gloucestershire</td>
<td>A high quality public realm throughout Gloucestershire</td>
</tr>
<tr>
<td>Poor quality of public realm around Gloucester station</td>
<td></td>
<td>The use of appropriate routes by freight operators</td>
<td>The use of appropriate routes by freight operators</td>
</tr>
<tr>
<td>Preventing inappropriate route choice by freight operators which results in adverse impacts on rural roads</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 11.3 Logic Chain: Ensure that communities are given equal opportunity to benefit from economic prosperity

<table>
<thead>
<tr>
<th>What are the key challenges to achieving the objective?</th>
<th>What are the implications of not overcoming the challenge?</th>
<th>What outcomes does the LTP need to deliver in order to meet these aspirations?</th>
<th>What impacts will these outcomes have?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieving the critical mass for public transport in areas of dispersed population</td>
<td>Continued reliance on the car, or social exclusion issues for those without a car if people cannot access work opportunities</td>
<td>Housing growth in the right areas to ensure the critical mass can be achieved</td>
<td>A reduction in the adverse impacts of private vehicle use, including congestion, delay and CO₂ emissions</td>
</tr>
<tr>
<td>Providing innovative and financially sustainable transport solutions for rural communities and those without access to a car</td>
<td>Poor travel provision outside core business hours has implications for access to employment and night time economies</td>
<td>Public transport access that caters to all needs and that operates an appropriate level of service throughout all hours of the day</td>
<td>A stronger economy with communities better able to access work, goods and services</td>
</tr>
<tr>
<td>Improving the provision of public transport outside of a 0900-1700 day to cater to a range of travel needs</td>
<td>Poor connectivity between public transport services places those reliant on these services at a disadvantage</td>
<td>A well connected public transport provision, with strong links between rail and bus modes.</td>
<td>Better connectivity and reduced social exclusion for the disabled</td>
</tr>
<tr>
<td>Improving links between bus and rail</td>
<td>Failing to ensure equal access to rail services has social inequality impacts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improving accessibility at rail stations with DDA compliance issues</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Achieving the critical mass for public transport in areas of dispersed population

Housing growth in the right areas to ensure the critical mass can be achieved

A reduction in the adverse impacts of private vehicle use, including congestion, delay and CO₂ emissions

A stronger economy with communities better able to access work, goods and services

Poor travel provision outside core business hours has implications for access to employment and night time economies

Public transport access that caters to all needs and that operates an appropriate level of service throughout all hours of the day

A well connected public transport provision, with strong links between rail and bus modes.

Better connectivity and reduced social exclusion for the disabled

Failing to ensure equal access to rail services has social inequality impacts

A reduction in the adverse impacts of private vehicle use, including congestion, delay and CO₂ emissions

A stronger economy with communities better able to access work, goods and services

Continued reliance on the car, or social exclusion issues for those without a car if people cannot access work opportunities

A reduction in the use of private vehicles, with a corresponding rise in sustainable modes of travel
Table 11.4  Logic Chain: Create healthy, safe and engaged communities

<table>
<thead>
<tr>
<th>What are the key challenges to achieving the objective?</th>
<th>What are the implications of not overcoming the challenge?</th>
<th>What outcomes does the LTP need to deliver in order to meet these aspirations?</th>
<th>What impacts will these outcomes have?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving the transport needs of an ageing population</td>
<td>Sections of the elderly population may face issues of social exclusion without transport provision</td>
<td>A public transport service that serves all, which is affordable in terms of delivery and inclusive in terms of use</td>
<td>A happier, better connected elderly population</td>
</tr>
<tr>
<td>Overcoming health challenges, particularly the high incidence of obesity in the County</td>
<td>Poor health can limit travel horizons, leading to exclusion from key services and life choices</td>
<td>Encourage active travel modes as part of a healthy lifestyle, whilst improving links to health services.</td>
<td>Improved health and a stronger workforce</td>
</tr>
<tr>
<td>Improving road safety around the most heavily trafficked corridors</td>
<td>Dangerous roads damage social wellbeing, whilst loss of life/serious injury having economic impacts</td>
<td>Improve safety on roads in Gloucestershire</td>
<td>Lives saved and economic damage prevented</td>
</tr>
<tr>
<td>Improving the design and provision of walking and cycling routes and cycle storage infrastructure</td>
<td>Discouragement of cycling and walking with resulting health impacts</td>
<td>A well connected network of cycle and walking routes with the right level of infrastructure in the right places</td>
<td>A healthier society and increased tourism</td>
</tr>
<tr>
<td>Detering inappropriate route choice for freight which causes intimidation within residential areas</td>
<td>Reduced social welfare</td>
<td>An agreed network of freight routes which minimise the use of residential areas</td>
<td>Safer communities</td>
</tr>
</tbody>
</table>
11.4. What are the specific network problems and constraints that will affect Gloucestershire’s capacity to meet these wider policy aspirations?

Transport is a clear enabler of wider outcomes and its importance should not be understated. A prosperous successful economy requires the efficient movement of goods, people and services and the right time and to the right places. Whilst some evidence gaps still remain (mainly around end user perspectives), this document has helped identify a number of more explicit problems and symptoms affiliated to the strategic challenges described above. These are summarised below by mode.

11.4.1. Walking and Cycling

- Convincing internal and external stakeholders of the potential ‘triple win’ benefits of walking and cycling interventions represents a key challenge for the County (economic, environmental and social benefits);
- There is a general need to better collate and rationalise barriers to cycling and walking as identified by end users – this will help GCC form a more coherent approach to removing physical, educational and psychological barriers to cycle use;
- Traffic congestion on urban corridors will be a deterrent to achieving greater cycling and walking modal share;
- Building attractive walking and cycling links into new developments is key to improving uptake in the future;
- Integrating cycling infrastructure with key transport hubs and trip generators represents an opportunity to improve modal share; and
- There has been a worsening in cycle and walking KSI accidents and KSI’s amongst the 65 years plus age group.

11.4.2. Bus

- Without adequate bus priority measures, bus services remain vulnerable to the reliability issues facing highways in the main urban centres;
- Bus improvements need to be focussed on addressing congestion issues on the worst affected corridors (particularly in the CSV urban areas);
- Daytime coverage of the core network to the nearest primary urban centre is relatively good, but greater challenges exist in securing improvements that provide existing and potential users with greater destination and time of day travels choice – this will require focussed effort on improving bus interchange and focussed bus priority measures to facilitate sustainable access to key services;
- Feedback from users (2011 GCC bus review) suggests that travel provision is not always sufficiently flexible to cater for the range travel demands outside of the 09:00-17:00 day – this has implications for night time economies, shift workers and evening hours hospital access;
- Depending on findings from the 2011 Travel to Work data, there may be a case for improving the quality of bus links to destinations outside of the County e.g. Warwickshire, Worcestershire, Monmouth, Oxfordshire and Bristol;
- Empirical evidence around barriers to bus use in the County is limited – this evidence gap needs to be filled;
- Public transport interchanges in the County require improvement as a means of facilitating seamless travel options and increasing overall travel choice; and
- New development offers both a challenge and opportunity to improvement of local bus networks.

11.4.3. Rail

- Demand for rail services is increasing steadily at an average of 10% per annum. Car parking and public transport access to rail stations may suppress demand in the future, placing added pressure on highway networks;
• Delivery of some improvements to Gloucestershire rail services and networks are outside the direct control of GCC – however GCC needs to achieve clarity around local service improvements that could be delivered if network constraints elsewhere are addressed (e.g. Cardiff, West Midlands and Severn Junction);
• Rail journey times from Gloucestershire to London are relatively unattractive when compared to those from Bristol, Birmingham and Leicester (settlements of similar distance from the capital);
• Anticipated growth of housing in Tewkesbury may assist in increasing the case for improved service levels from Ashchurch for Tewkesbury;
• Local rail station car parks are over capacity, suggesting latent demand for rail travel and potential issues with the quality of interchange with local bus services;
• Rail access to local international gateways (airports) is relatively in-attractive relative to car equivalent journey times;
• A recent station audit identified the poor quality of intermodal public transport information at local stations; and
• Scope for movement of freight on the rail network is limited.

11.4.4. Highway Issues

• Consistent with findings of the CSV Transport Study, peak hour congestion (poor journey time reliability) is problematic and indeed worsening on key urban corridors around Cheltenham, Gloucester and Tewkesbury, market towns and on the A417 missing link;
• Countywide employment and housing development aspirations will increase congestion pressures on urban links around Cheltenham, Gloucester and Tewkesbury;
• Congestion on urban networks can be a barrier in its own right to implementation of public transport, high occupancy vehicles lane and on road cycle routes due to limited road space;
• The resilience of Gloucestershire’s primary road network is particularly poor, reflecting the reliance on the A40 as route from the Forest of Dean towns, the lack of completed ring road and its location on a primary diversion route (Severn Crossing closures);
• Gloucestershire is performing on par with other similar authorities in terms of its maintenance responsibilities. However as funding constraints continue to bite, there is a risk (particularly in outlying rural areas) that road conditions may deteriorate, contributing to heightened safety risk and disruption to road networks;
• Cost estimates for solutions at the A417 missing link represents a current blockage in progressing with improvements to this route;
• The needs of freight need to be incorporated into the transport strategy (parking facilities, HGV restrictions, congestion hotspots etc); and
• Congestion has direct implications upon quality of life (visual intrusion, noise and vibration, air quality (AQMA’s), safety and well being).
Appendix A. List of Tables and Figures

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