ATKINS

East Staffordshire Growth Options Study

Transport Strategy Report (Volume 1)

May 2009

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Executive Summary

In October 2006, the Government designated East Staffordshire as a “Growth Point” area, one of only two in Staffordshire. The purpose of Growth Point status is to accelerate delivery of the development commitment of 12,900 new houses and employment opportunities between 2006 and 2026.

Delivering a transport strategy to support the development of the Burton Growth Point proposals will be very challenging. The period to 2026 will see East Staffordshire become one of the fastest growing areas in Staffordshire. This is a challenge that the Borough Council and its partners are committed to addressing.

East Staffordshire has committed to the requirement of 12,900 net new houses (11,000 in Burton upon Trent) between 2006 and 2026 as their Growth Point. Of the 11,000 new homes planned for Burton:

- 6,500 will be provided on previously developed land within Burton; and
- 4,500 will be provided in the form of a Sustainable Urban Extension (SUE) to the west of Burton on greenfield land.

In addition, some 200 ha of land will be allocated for employment uses across East Staffordshire. Within Burton new employment opportunities will be created largely on existing curtilages with major extensions to existing employment areas within the existing urban area and south of the town alongside the A38(T) (South of Branston).

The growth in trip making that is forecast to occur within Burton between 2007 and 2026 is 32% in the AM Peak and 36% in the PM Peak. It is important to note that this figure represents the situation without the transport strategy in place to mitigate the impacts of the growth point developments.

To place this into context, the average growth of traffic within Great Britain over the same period is forecast to be 19%. This shows that the forecast level of growth within Burton is significantly higher than the average forecast for Great Britain and the surrounding area and reflects the significant expansion of Burton that is provided by the growth point proposals.

The aim of this transport strategy is to identify a comprehensive package of measures to mitigate the traffic impact of the Growth Point proposals. We have followed a four stage process to determine the most suitable transport strategy for Burton. The four stages of the strategy development process were:

- **Stage 1** – Identify measures to enhance the sustainability of the new development sites;
- **Stage 2** - Identify measures which can be used to encourage active modes and use of public transport, for example, walking, cycling and buses across the study area as a whole;
- **Stage 3** – Identify measures to make better use of the existing transport networks; and
- **Stage 4** – Identify measures to provide new infrastructure where there are still likely to be residual transport capacity issues following the application of stages 1 to 3.

Each stage of the strategy will add together cumulatively to provide a comprehensive overall package of measures.

Stage 1

The testing of sustainable transport measures, in particular travel plans for residential and commercial developments has shown that these measures can have a clear effect upon the traffic generated from the new development sites. Therefore we conclude that measures of this type should form a cornerstone of the transport strategy to support the Burton Growth Point.

Stage 2

It is clear from our testing that public transport measures of the type tested as part of the strategy development process have significant potential to deliver model change within Burton.

We conclude that Park & Ride has significant potential within Burton to assist both with the delivery of the Growth Point and AAP proposals. However, for Park & Ride to be truly effective, parking management policies need to be introduced within Burton Town Centre to minimise the additional number of car trips that may drive there.

Rail plays a small, but still significant, part in the overall amount of travel to and from Burton. The proposals that we have brought forward as part of this stage of the strategy development process provide new and enhanced linkages to the Railway Station from new development sites and Park & Ride facilities. We consider it highly likely that our proposed measures will support Rail travel and indeed provides convenient links to the railway station from the proposed sustainable urban extensions and new employment sites.

Stage 3

Measures to make the best use of the existing transport network, that have been tested as part of the strategy development process included:

- Signal Optimisation (for existing signalised junctions);
- Junction Signalisation;
- Minor junction capacity improvements (localised widening etc.); and
- Major junction capacity improvements (on the Trunk Road network).

It is clear from our testing that the measures that we have tested as part of Stage 3 have delivered or have the potential to deliver significant benefits within Burton. All of the measures that we have tested can be delivered within the highway boundary. However, it may be necessary, in certain locations for the county council to consider transport network improvements that will require the purchase of third party land to enable their implementation.

Stage 4

This stage tested the effectiveness of providing new link roads to provide alternative access routes to the SUE development sites. The testing of these link roads showed that they provided significant benefits. However, detailed examination reveals that the major beneficiaries of the new link roads are the rural road network which has become used as a ‘rat-run’ prior to their introduction. The rural roads through Anslow, Rough Hay and Tatenhill are not suitable for carrying increased traffic volumes and the link roads provide shorter and more convenient routes for users of the rural roads to reach their destinations.

Conclusions for the Sustainable Urban Extensions

We have determined that even with the application of a wide range of strategy measures, the impact of the development traffic from the SUE sites to the west of Burton is difficult to accommodate upon the highway network.

Atkins is of the opinion that there is a level of development that can be accommodated in SUEs to the west of Burton. Although, on the basis of our current testing we conclude that the current SUE proposals are too intensive and probably require scaling back. This will require a new study to establish the quantum of development that can be accommodated to the west of Burton and how this should be distributed between the candidate SUE sites.

A reduction in the scale of the proposed SUEs will lead to the requirement for additional development sites being considered as candidates to accommodate the shortfall in housing numbers to deliver the full Growth Point proposals.

Potential candidate sites include Lawns Farm and the former Drakelow Power Station site. Further studies will be required to establish the most appropriate location to accommodate the potential shortfall in the provision of Growth Point housing numbers in combination with the revised SUE development proposals.

Overall Conclusions

Overall the complete transport strategy as tested provides significant benefits for Burton when compared to the Do Minimum situation. However, it must be considered that all of the testing has been undertaken at 2026. This forecast year assumes that there is significant background traffic growth prior to the introduction of the new housing and employment developments. This means that in general, although the strategy provides overall benefits when compared to the 2026 do-minimum situation, there is still going to be significantly more traffic on the roads within Burton than there is at present.

Therefore we conclude that measures that are most likely to have an impact on improving the transport situation within Burton are those which are going to influence the demand for travel. However, for these measures to have a significant effect they must be targeted not only at the new development sites, but across existing residents and employees as well. This would suggest an extensive roll out of the measures proposed in Stage 1 and 2 of the strategy development process across the existing developments within Burton.

As part of the strategy development process we have tested one package of Smarter choice options and one package of bus/rail measures however there are several others that could be tested that are likely to have a greater impact. However, the cost of the schemes (in terms of capital and revenue expenditure) would increase accordingly.

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1. Introduction

1.1 Background

In October 2006, the Government designated East Staffordshire as a “Growth Point” area, one of only two in Staffordshire. The purpose of Growth Point status is to accelerate delivery of the development commitment of 12,900 new houses and employment opportunities between 2006 and 2026.

Key aims of the transport strategy that will be developed to serve the Burton Growth point include:

- Ensuring that transport infrastructure supports all the aspects of the Growth Point proposals;
- New development makes the best use of existing infrastructure;
- Maximising the opportunities to reduce the need to travel by car and improve accessibility by the development of sustainable and innovative modes of travel; and
- There will be improvements to the public transport infrastructure and the progressive provision of park and ride and facilities to promote walking and cycling.

The development of the transport strategy for the East Staffordshire Growth Options has built upon the findings of the Initial Options Assessment Report, produced by Atkins, which examined the effects of different land use development options.

The Initial Option Assessment Report identified the key performance indicators of each land use development option and ranked the options in order of their overall effects and impacts. The report also identified key operational issues with the transport network in East Staffordshire following the introduction of the growth option development traffic.

The Initial Options Assessment Report compared the transport effects of five different land use scenarios. These options were referred to as:

- Option 1;
- Option 1 + Additional Housing;
- Option 2;
- Option 2 + Additional Housing; and
- Option 3 (Option 2 + New Employment at Lawns Farm)

The content of each of these options in terms of numbers of new housing and jobs is shown in Table 1.1.

Table 1.1 – Comparison of the Land Use Option Scenarios

Development Test Scenario	Total Households	Net Total Jobs
Option 1	13139	24400
Option 1 + Additional Housing	18259	24400
Option 2	13253	16023
Option 2 + Additional Housing	18133	16023
Option 3	13253	24400

Following consideration of the findings of the Initial Option Assessment Report East Staffordshire Borough Council decided to proceed with Option 3 as the basis for developing a comprehensive transport strategy to cater for the Growth Point proposals. Option 3 therefore has become the basis for developing the transport strategy for the East Staffordshire New Growth Point.

The locations of the key developments which form part of the Burton Growth Point proposals are shown in Plan 1.1 in Volume 2 of this report.

Strategy Objectives

It is the intention of East Staffordshire Borough Council that the proposed greenfield housing sites will be delivered as part of a Sustainable Urban Extension (SUE) to the existing built form of Burton.

In terms of transport SUEs are meant to be[1]:

- Well connected, with good transport services and communication linking people to jobs, schools, health and other services
- Have good transport links that give users the choice of a range of travel modes that are safe, accessible and environmentally friendly?
- Provides walkers and cyclists priority, whilst providing facilities for cars where necessary?
- Incorporates and makes use of modern information communication technology?

These principles of SUEs will be incorporated into the development of the Transport Strategy for the Burton Growth Point.

The objectives for the strategy to support the development of the Growth Point in Burton upon Trent need to be compatible with those contained in the Staffordshire Local Transport Plan, as well as those set out within the Growth Point Programme of Development. In addition the strategy will need to address the key requirements for the Partnership for Growth and Governments support for East Staffordshire as a New Growth Point, as outlined in the DCLG Advice - Annex C: Conditions of Partnership for Growth, namely

- Exploit existing public transport networks in determining the most sustainable locations for growth;
- Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;
- Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport; and
- Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.

The relevant objectives of the Staffordshire Local Transport Plan are to:-

- Improve personal security, road safety, and access for everyone, particularly for those people with special needs;
- Improve the availability, accessibility, efficiency, and attractiveness of walking, cycling, and public transport;
- Promote land-use patterns which can be served by a range of transport modes;
- Reduce reliance on private cars;
- Make it easier for people to switch between different forms of transport;

[1] Based upon the Inspire East Excellence Framework produced by the East of England Development Agency

- Improve the quality of the local environment and attractiveness of town centres, local centres, residential and other sensitive areas;
- Manage car parking to improve enforcement and to discourage reliance on the private car for work and other journeys where there are effective alternatives;
- Reduce transport related pollution; and
- Reduce the impact of road freight.

In addition to the above we consider that it is essential that the objectives for the development of the transport strategy also take into account the governments' latest transport policies set out in Delivering a Sustainable Transport System (DaSTS)[2].

DaSTS provides a new overarching set of transport policies for England taking into account the recommendations of the Eddington Study[3] and Stern Review[4]. These policies are expressed as National Transport Goals and are to:

- Tackle Climate Change;
- Support Economic Growth;
- Promote Quality of Opportunity;
- Contribute to better safety, security and Health; and
- Improve quality of life.

These 'goals' replace the shared priority for transport around which LTP2 was based.

Therefore the Transport Strategy for the East Staffordshire Growth Options will take into account the objectives from the growth point, local transport plan and DaSTS into consideration during its development.

1.2 Challenges

Delivering a transport strategy to support the development of the Burton Growth Point proposals will be very challenging. The proposed growth in Burton is programmed for implementation over a long time period, up to 2026.

To provide a robust transport strategy we must develop it to cater for the maximum level of development in the town. This means that the transport strategy will be based upon the Burton Transport Model forecasts for 2026. The challenging element will be that the strategy will not only have to cater for the growth in population, movement and hence traffic, associated with the growth point proposals, but also the background growth in traffic that is also forecast to occur over the same timeframe.

To place these changes into context, the Burton 2007 base year transport model has:

- 56100 trips in the AM peak period; and
- 51500 trips in the PM peak period.

By 2026 there are forecast to be:

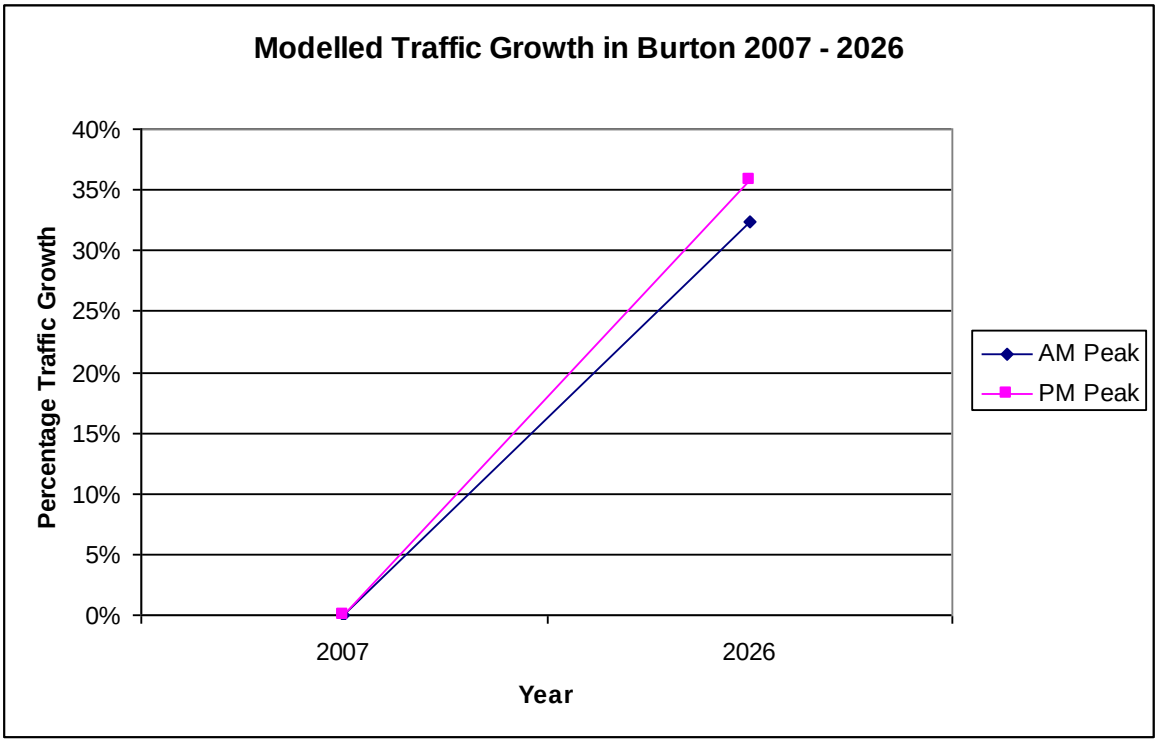
- 74300 trips in the AM peak period; and
- 70000 trips in the PM peak period.

[2] DfT, November 2008
[3] The Eddington Study examined the long-term links between transport and the UK's economic productivity.
[4] The Stern Review reported on the Economics of Climate Change.

The 2026 figures assume that Option 3 is the preferred development option and that there are no mitigation measures in place.

Figure 1.1 shows this change graphically. From this view it is clear to see the scale of the forecast increases in traffic within the Burton area.

Figure 1.1 – Graph showing the percentage growth in trips between 2007 and 2026



It can be seen that on average the growth in trip making between 2007 and 2026 is 32% in the AM Peak and 36% in the PM Peak. It is important to note that this figure represents the situation without the transport strategy in place to mitigate the impacts of the growth point developments.

To place this into context, Table 1.2 compares the forecast growth in Burton against that forecast for Great Britain, Staffordshire and East Staffordshire over the same period.

Table 1.2 – Comparison of TEMPRO Forecast Traffic Growth

Location	TEMPRO Background Growth 2007 - 2026
Great Britain	**19%**
Staffordshire	**10%**
East Staffordshire	**16%**

Table 1.2 shows that the forecast level of growth within Burton is significantly higher than the average forecast for Great Britain and the surrounding area and reflects the significant expansion of Burton that is provided by the growth point proposals.

2. Strategy Development

The period to 2026 will see East Staffordshire become one of the fastest growing areas in Staffordshire. This is a challenge that the Borough Council and its partners are committed to addressing.

East Staffordshire has committed to the requirement of 12,900 net new houses (11,000 in Burton upon Trent) between 2006 and 2026 as their Growth Point. Of the 11,000 new homes planned for Burton:

- 6,500 will be provided on previously developed land within Burton; and
- 4,500 will be provided in the form of a Sustainable Urban Extension (SUE) to the west of Burton on greenfield land.

In addition, some 200 ha of land will be allocated for employment uses across East Staffordshire. Within Burton new employment opportunities will be created largely on existing curtilages with major extensions to existing employment areas within the existing urban area and south of the town alongside the A38(T) (South of Branston).

The proposed SUEs to the west of Burton will need to deliver sustainable communities and not just additional housing. A definition of a sustainable community is shown below.

> *Sustainable communities are places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all.*[5]

From the transport perspective, some of the main items that will be required to deliver a SUE together with a sustainable community will include minimising the scale and scope of potential increases in traffic and related emissions associated with new housing and employment developments within the existing urban area and urban extensions.

One of the key ways to achieve this is to reduce traffic generation at source by either:

- **Reducing the need to travel:** - by facilitating home working and home shopping activities through the provision of excellent ICT infrastructure within the new developments to allow fast broadband internet access;
- **Reducing car travel:** - by introducing infrastructure and planning/transport policies to facilitate a step change in the use of active modes of transport such as walking and cycling. These modes are not only sustainable, but they also provide health benefits and provide more activity and interaction within the communities;
- **Increasing the use of public transport:** - New developments, whether within the existing urban area or proposed urban extensions need to be well served by public transport services, predominantly bus based within Burton, which provide residents with access to destinations that they want to travel to. The quality of these services should be such that they provide a viable alternative to the private car for a significant number of trips that will be generated within the new developments;

However, if after the application of measures of this type there are still residual problems you should consider the following type of interventions:

- **Making best use of the existing transport networks:** - In terms of sustainability it is always going to be better to make better use of your existing assets, rather than consider their

[5] Extract from the Inspire East Excellence Framework produced by the East of England Development Agency

replacement. In the transportation context this means that efforts should be made to improve the efficiency of the existing transport networks by tackling congestion hotspots and other locations which impede the progress of traffic, particularly for buses.

Providing new transport infrastructure: - Only after you have exhausted all other options should new infrastructure be considered. Sometimes it is a necessity to provide access to new development sites. New infrastructure should be carefully designed to prevent the overprovision of capacity within the transport network as this is likely to be counterproductive in areas where there are capacity constraints in the surrounding network leading to unwanted 'induced traffic' effects.

The aim of the strategy development process is to identify a comprehensive package of measures to mitigate the traffic impact of the Growth Point proposals based upon the hierarchy of interventions previously described.

We propose to follow a four stage process to determine the most suitable transport strategy for Burton. The four stages of the strategy development process are:

- **Stage 1** – Identify measures to enhance the sustainability of the new development sites;
- **Stage 2** - Identify measures which can be used to encourage active modes and use of public transport, for example, walking, cycling and buses across the study area as a whole;
- **Stage 3** – Identify measures to make better use of the existing transport networks; and
- **Stage 4** – Identify measures to provide new infrastructure where there are still likely to be residual transport capacity issues following the application of stages 1 to 3.

Each stage of the strategy will add together cumulatively to provide a comprehensive overall package and hence within each chapter this report:

- Sets out our proposals for measures under each of the four stages of strategy development
- Describes how the effects of the strategy measures will be modelled and assessed; and
- Present the results of the testing of each strategy element.

Towards the end of each chapter we will provide a summary table which shows how each stage in the strategy development process is contributing towards meeting the overall study objectives.

Following on from the results of the four stages we will (in Chapter 7) provide a clear set of recommendations regarding the overall transport strategy to support the development of the Growth Point proposals.

3. Stage 1 – Enhancing the Sustainability of Development Sites

3.1 Strategy Rationale

There is significant scope within Burton to pursue measures to reduce the use of private motor cars in conjunction with the development of new housing and employment, hence enhancing their sustainability.

Initiatives which can be used to reduce the use of cars and to reduce the need to travel are often described as 'soft' transport policy measures or 'smarter choices' in promoting walking, cycling and public transport. These measures seek to give better information and opportunities, aimed at helping people to choose to reduce their car use while enhancing the attractiveness of alternatives. These can include the following measures:

- Workplace and school travel plans;
- Personalised travel planning, /Individualised Travel Marketing/ Residential Travel Planning (PTP/ITM/ RTP);
- Travel awareness campaigns;
- Public transport information and marketing;
- Car clubs and car sharing schemes;
- Teleworking, teleconferencing and home shopping;
- Cycle and Pedestrian Schemes;
- Leisure Travel Plans;
- Railway Station Travel Plans;
- Car Clubs;
- Car Sharing; and
- Demand Management.

In addition there are some design features that could be built into the new build housing such as:

- Locating key facilities such as schools, shops and employment opportunities within the housing developments;
- Encouraging Home Working by incorporating a study in the house designs;
- Ensuring that high speed broadband internet connections are available to all new homes; and
- Provision of teleconferencing and video conferencing facilities at a central location within the housing developments that would be available to all who wanted to use them.

Based upon the current best practice we recommend that the following two 'forms of sustainable transport measures are pursued to meet the requirements of Stage 1 of the strategy development process. These are:

- Residential Travel Plans (RTPs); and
- Workplace Travel Plans (WTPs).

RTPs consist of a package of measures designed to reduce car use originating from new housing by supporting alternative forms of transport and reducing the need to travel in the first place[6].

Based upon current best practice we recommend that the RTPs for the new housing sites in the Burton area contain:

- Personal Travel Planning (PTP);
- Services and facilities such as
    - car clubs;
    - cycle hire;
    - parking management at workplaces; and
    - provision of high-speed internet access.
- Coordination and monitoring;
- Ensuring developments are pedestrian and cycle friendly;

Personal Travel Planning (PTP) will form a key part of the RTPs. Personal Travel Planning (PTP) is defined as:

> *"A targeted marketing technique providing travel advice based upon personal trip patterns that seek to induce voluntary travel behaviour changes in favour of more sustainable modes of transport."*[7]

Within PTP information is provided on a range of different travel options, and can typically include:

- Public transport timetable and fare information (for the local stops and services);
- Personalised journey planning services for residents of the new developments;
- Maps of local walking and cycling routes;
- A free limited period trial on public transport;
- A free consultation for further travel advice.

A Workplace Travel Plan (WTP) is defined as:

> *"A strategy for managing the travel generated by an organisation, with the aim of reducing its environmental impact. Travel plans typically combine measures to support walking, cycling, public transport and car sharing. These are reinforced with promotion and incentives and by the management of workplace parking. Travel plans also include action to reduce the need to travel, such as telecommuting. They can focus on both commuter and business travel."*[8]

There is significant scope with the proposed new housing and employment for an intensive programme of RTPs, PTP and WTPs. The funding of these should be secured via planning obligations/conditions with each of the prospective employment and housing site developers.

We propose that all of the greenfield housing growth option sites are required to implement a RTP which includes PTP as part of their planning obligations. This could be implemented by each developer, or implemented by the County Council using the equivalent funds provided by each developer. The latter approach will ensure that the measures are implemented consistently across the development sites, ensure the quality of the measures and also facilitate regular monitoring of their performance.

[6] Making Residential Travel Plans Work, DfT, June 2007
[7] Making Personal Travel Planning Work - Research Report, DfT, December 2007.
[8] The Essential Guide To Travel Planning, DfT, March 2008

There are also over 6000 new dwellings that are planned to be built upon brownfield sites within the existing urban area. RTPs in such numbers have been successfully implemented in many areas across the UK, Europe and Australia. These also need to be considered as candidates for requiring RTPs and PTP. Due to viability issues there is likely to be a cut off level for the introduction of intensive RTPs. This is could be for developments of a size less than 10 dwellings. However, it may be possible to consider RTPs for all new housing developments, regardless of size, provided that suitable planning policies are in place to allow for pooling of financial contributions received via planning obligations. For example, within the existing urban area it may be possible to provide an overarching RTP framework which smaller developments can 'buy in' to. However this is reliant upon the local authorities securing sufficient resources from planning obligations to enable this to be set up and managed.

To enable the travel planning initiatives to be provided across Burton on a consistent basis we suggest that there is an overarching Sustainable Transport Strategy for Burton that would include the initiatives focused on the new developments as well as initiatives focussed on existing communities and workplaces. This goes beyond the scope of the work of this current project and therefore we have not modelled this situation. However this could be developed as a separate project if required by the clients.

Planning obligations to fund these measures could be sought via S106 agreements or via a future Community Infrastructure Levy (CIL). There are still many issues to be resolved regarding the application of CIL which may mean that in the short to medium term S106 agreements are the main method of securing planning obligations.

ODPM Circular 05/2005 on planning obligations provides guidance on securing pooled contributions from multiple developments and the application of formulaic or standard charges. Provided that a suitable Supplementary Planning Document (SPD) is adopted by the borough council there is nothing to prevent the planning obligations described in this section from being wholly secured via S106 agreements.

Planning obligations need to be quantifiable so that a suitable sum can be secured to implement the measures. RTPs and WTPs are typically revenue intensive over the long term with capital outlays associated with the provision of specific infrastructure or start up expenses for services such as car clubs.

Therefore we suggest that a commuted sum is secured from the relevant developer which can be used to fund the revenue activities of the RTP or WTP for a number of years. The commuted sum can then be used by the highway authority to provide an annual revenue stream to fund the RTP/WTP activities.

Published research from DfT provides a cost per dwelling and employee for RTPs and WTPs so the total cost to be secured from developers can be readily calculated.

We can estimate the overall effectiveness of RTP/WTP within the Burton transport model by applying the likely effects of RTP/WTP obtained from existing research to new housing and employment development zones where we can assume that either RTPs/PTP or WTPs are in force.

Research/guidance published by the DfT suggests that:

PTP:

- Reduce car driver trips, on average, by 11%;
- Reduce car journey distance, on average, by 12%; and
- Cost between £20 and £38 per household per year to implement.[9]

WTPs:

- Reduce car commuting by up to 18%; and
- On average cost £47 per employee per year to implement.[10]

The measures described above are normally delivered as part of a package approach which includes walking, cycling and bus initiatives.

We do not consider that it is viable to build a strategy for the whole of the Burton area purely upon the provision of RTPs and WTPs related to the proposed new housing and employment developments as these will not address current and future transport issues elsewhere within the Burton area. Therefore we also propose a wider package of measures, which will require implementation alongside RTPs and WTPs. These are described in the following sections.

3.2 Modelling the effects of Stage 1

There is the potential to over-estimate or double-count the effects of sustainable travel measures such as RTPs and WTPs within the Burton Transport Model. This is because they form part of a package of complementary measures usually including measures to improve alternative transport modes to the car, such as buses, walking and cycling as well as improving information provision regarding public transport. All of these measures are due to be tested in their own right as part of the strategy development process.

Therefore we need to identify the reduction in car use which can directly be attributed to RTPs and WTPs.

3.2.1 Reduced Car Use

The assumed reduction in car use has been estimated by analysing the size of the change that could be attributed to measures which would be introduced to complement a RTP or WTP. We have estimated that 8% of the reduction in car use of RTPs and WTPs can be attributed to the complementary measures (this is described in 4.2). Therefore the net effect of RTPs will be:

- 11% - 8% = **3%**; and the net effect of WTPs will be
- 18% - 8% = **10%**.

Therefore we have modelled the impact of these measures by applying the following traffic reductions at the matrix level:

- Reduced car trips to/from the new housing sites by **3%** in the peak hours;
- Reduced car trips to/from the new employment sites by **10%** in the peak hours; and
- To further avoid double counting we have treated trips between new housing sites and new employment sites once. These trips will be reduced by **10%** to reflect the reduction anticipated at the workplace end.

[9] Making personal travel planning work - Practitioners guide, DfT, November 2008
[10] Making travel plans work - lessons from UK case studies, DfT, June 2005

3.2.2 Research on the effects of Sustainable Transport Measures

Extensive travel behaviour research, including research in the three Sustainable Travel Demonstration Towns of Darlington, Peterborough and Worcester, has shown that:

- Most of people's day to day trips are local;
- A quarter of all car trips are less than two miles;
- Most people are concerned about traffic growth and support policies favouring public transport, walking and cycling above car travel;
- Around half of all local car trips could be replaced by sustainable travel modes using existing facilities;
- Lack of information about the alternatives to the car, and motivation to try them out, are key barriers to change;
- Poor perceptions of relative travel time for the single greatest barriers to walking and cycling in place of the car for local trips and yet over short distance travelling by car saves little or no time;
- People perceive door-to-door journey times by car relative to public transport to be around twice as quick as they really are;
- Cycling provides a viable alternative for the greatest share of local car trips, followed by public transport and walking;
- The potential for reducing car use through soft measures is significant and often greater than could be achieved by infrastructure improvements alone; and
- Soft measures can achieve significant reductions in car use through relatively small changes in individual behaviour.

It has however been possible form the extensive research available on smarter choice measures, particularly the Sustrans Travel Behaviour Research[11], to outline the potential impact of the introduction of smarter choice measures in an area.

Section 3.2.3 of this report sets out a summary of the common features of the eco-towns and SUEs that relate to the promotion of sustainable modes and a range in the reduction of car trips that can be achieved by the introduction of sustainable initiatives.

3.2.3 Estimated Impact of Smarter Choices Measures

Walking Schemes

From research carried out it is considered a 10% percentage reduction of car trips could be applied. It would be possible to have a higher percentage reduction for trips less than 1km than those 2km trips.

This needs to be considered alongside other smarter choices initiatives and care taken to not double count.

Workplace Travel Plans (WTP) (including Higher/ Further Education Travel Plans)

Estimating the impact of WTP would involve identifying all major employers in the study area. The Smarter Choices- Changing the Way We Travel report indicates a 5% (low intensity) or 9% (high intensity impact) reduction in car trips due to WTP implementation.

[11] Travel Behaviour Research Baseline Survey 2004, Sustainable Travel Demonstration Towns, Sustrans and Socialdata, 2004

Area Wide Behavioural Change Marketing

Travel awareness campaigns aim to improve general understanding of the problems caused by traffic growth and to encourage people to think about their own travel behaviour. Tentative evidence from a York campaign suggested that between 3% - 12% of car drivers may have cut their car use as a result of the campaign. Work carried out in Taunton for the Taunton Transport Strategy Review looked at a 2.4% network reduction in car trips.

Corridor Specific Behavioural Change Marketing

The impact of area wide behavioural change marketing could be confined to areas where there is a suitable network of walking, cycling and/or public transport routes.

Personalised Travel Planning/ Individualised Travel Marketing/ Residential Travel Planning (PTP/ ITM/ RTP)

This technique involves providing information and incentives to individuals or households designed to enable them to choose a different pattern of travel behaviour. This will provide benefits for the recipient as well as reducing car use and/or increasing the use of more sustainable transport modes.

There have been a range of individualised marketing projects in the UK delivering net reductions in car driver trips of 6% (Frome), 6.6% (Darlington), 9% (Gloucester) and 15% (Peterborough). Using the evidence available it is considered realistic that car trips can be reduced between 6% and 9%.

Care will need to be taken to avoid double counting with other smarter choices interventions.

Cycling Schemes

Cycling provides a viable alternative for the greatest share of local car trips, particularly those less than 5 miles (8 kilometres). In the Sustainable Travel Demonstration Towns cycling provided a viable alternative for the greatest share of local car trips, ranging from 26% in Peterborough to more than a third (34%) in both Darlington and Worcester.

Public Transport Information and Marketing

Public transport information and marketing projects could include projects promoting an individual bus route serving the people most likely to use it.

The impact of public transport information and marketing has a strong overlap with public transport schemes and area wide and corridor specific marketing. Care would again be needed to avoid the effect of double

3.2.4 Modelling Rationale

The information contained in sections 3.2.2 and 3.2.3 indicates that sustainable transport measures can achieve significantly higher results than those assumed in this study. The 3% reduction in car trips to and from new household sites is a conservative estimate. However, in developing a transport strategy of this type we consider that it is important not to over-estimate the effects of sustainable transport measures, or to double-count them. Our conservative estimate of the effects of these types of measures provides a robust basis for developing a transport strategy. This is due to the large range of potential outcomes from introducing measures of this type.

This does not diminish the potential role of sustainable transport measures as there is significant potential to be able to deliver significant benefits in the long-term alongside other changes in behaviour and working patterns. However, at present, this potential cannot be quantified. Therefore to provide a robust assessment we have used the assumptions set out in this section of the report as the basis for testing their effectiveness within the Burton transport model.

These reductions have been applied to all of the new housing and employment development sites that are contained in Option 3. This includes the brownfield housing sites within the existing urban area and the housing within the greenfield urban extensions.

3.3 Appraising the results of Stage 1

Following the model adjustment, to reflect the reduction in trips due to the measures outlined above, the resultant 2026 matrices were assigned to the original 2026 Option 3 Do Minimum network. This test has been called Do Something 1 (DS1). Following this a series of statistics and key performance indicators were extracted from the transport model to enable the results to be compared with the Option 3 Do Minimum (DM).

Plan 3.1 (in Volume 2 of this report) shows a SATURN plot of the differences in traffic flow between DS1 and the Do Minimum in the AM peak period. As can be seen, DS1 leads to reductions in traffic flow over the majority of the Burton area.

The widespread nature of the traffic reductions means that the effect upon individual links is relatively modest. However the following links have all had traffic flow reductions of over 50 vehicles in the 2026 AM Peak Period:

- A511 Tutbury Road (North of Beamhill);
- Wyggeston Street;
- A38(T) Southbound (through Burton); and
- B5018 Hawkins Lane.

Table 3.1 shows the Volume / Capacity Ratios (V/C) for a selection of key junctions in the 2026 AM Peak Period for both the Do Minimum and DS1 scenarios.

Table 3.1 – Comparison of V/C Ratios 2026 AM Peak

Junction	2026 AM Do Minimum V/C Ratio (%)	2026 AM DS1 V/C Ratio (%)
A511/A5121 Derby Turn Junction	102%	102%
Shobnall Road / Wellington Road Junction	87%	84%
Shobnall Road / Shobnall Street Junction	91%	92%
St Peters Bridge / Stapenhill Road	96%	96%

Table 3.1 shows that the effects of the measures included in DS1 have not provided significant improvements at some of the most congested junctions in Burton. However minor improvements are noted at the Shobnall Street / Wellington Road junction. The reason for these results is that:

- All of these junctions currently suffer capacity related problems;
- At 2026 the current problems will be exacerbated by background traffic growth; and
- The measures proposed in DS1 only target the new housing and employment sites; this is a relatively small proportion of the total amount of travel within Burton hence the effects of these measures are readily diluted across the town.

Plan 3.2 (in Volume 2 of this report) shows a SATURN plot of the differences in traffic flow between DS1 and the Do Minimum in the PM peak period. As can be seen, DS1 leads to reductions in traffic flow over the majority of the Burton area, with the exception of Newton Road which experiences an increase in traffic.

The widespread nature of the traffic reductions means that the effect upon individual links is relatively modest. However the following links have all had traffic flow reductions of over 50 vehicles in the 2026 PM Peak Period:

- A5121 Derby Road (North of Hawkins Lane);
- A38(T) Southbound (North of Clay Mills); and
- B5018 Hawkins Lane.

Although to some extent these reductions are offset by an increase on Newton Road, indicating that strategic traffic reassignments may be occurring.

Table 3.2 shows the Volume / Capacity Ratios (V/C) for a selection of key junctions in the 2026 PM Peak Period for both the Do Minimum and DS1 scenarios.

Table 3.2 - Comparison of V/C Ratios 2026 PM Peak

Junction	2026 PM Do Minimum V/C Ratio (%)	2026 PM DS1 V/C Ratio (%)
A511/A5121 Derby Turn Junction	107%	104%
A5121 Derby Street / Victoria Road	89%	84%
A511 Horninglow Street / Guild Street	95%	86%
Guild Street / Station Street	90%	86%
Branston Road / St Peters Bridge	96%	95%
St Peters Bridge / Stapenhill Road	95%	95%
Shobnall Road / Shobnall Street Junction	97%	97%

Table 3.2 shows that the effects of the measures included in DS1 have led to significant improvements at some of the most congested junctions in Burton in the PM Peak period. These include:

- A511/A5121 Derby Turn Junction (3% decrease in V/C Ratio);
- A5121 Derby Street / Victoria Street (5% decrease in V/C Ratio);
- A511 Horninglow Street / Guild Street (9% decrease in V/C Ratio); and
- Guild Street / Station Street (4% decrease in V/C Ratio).

Changes in V/C ratios for individual links and junctions following the introduction of the measures in DS1 can be found in Volume 2 of this report.

The overall statistics for this test, shown in Table 3.3, indicate that the measures assumed in DS1 would have beneficial effects which lead to reductions in vehicle hours and vehicle kilometres together with a modest increase in average vehicle speeds, indicating that there has been some reduction in the levels of congestion when compared to the Do Minimum scenario in both of the AM and PM peak periods. This overall view confirms the findings of the comparison of link flows and V/C ratios.

The key point to note is the reduction in development demand of the order of 6.5%. It is this reduction in travel demand which is driving the positive outcomes in all of the other KPIs.

Table 3.3 – Performance of Option 3 DS1 compared to Option 3 Do Min

Sub Objectives	Option 3 DM		Option 3 DS1	
	AM	PM	AM	PM
Vehicle Hours	22936	21762	22350	21142
% Change Relative to DM			**-2.6%**	**-2.8%**
Vehicle Kilometres	1341495	1294867	1332074	1284447
% Change Relative to DM			**-0.7%**	**-0.8%**
Vehicle Speeds (km/hr)	58.5	59.5	59.6	60.8
% Change Relative to DM			**1.9%**	**2.1%**
Average Trip Length (km)	18.4	18.8	18.5	18.9
% Change Relative to DM			**0.3%**	**0.4%**
Total Demand Flow	72769	68703	72068	67884
% Change Relative to DM			**-1.0%**	**-1.2%**
Development Demand	12192	13837	11418	12933
% Change Relative to DM			**-6.4%**	**-6.5%**

A complete set of Key Performance Indicators (KPIs) for this and all other model tests completed as part of the detailed strategy appraisal is included in Volume 2 of this report.

3.4 Summary of Stage 1 Results

Table 3.4 – Comparison of Stage 1 Results against Strategy Objectives

DaSTS Goals	Local Objective	Source	Stage 1 - Enhancing Sustainability of New Developments	Overall Strategy
Tackle Climate Change	Reduce reliance on private cars;	Staffs LTP	✓✓✓	✓✓✓
	Reduce transport related pollution; and	Staffs LTP	✓✓	✓✓
	Reduce the impact of road freight.	Staffs LTP	0	0
	Manage car parking to improve enforcement and to discourage reliance on the private car for work and other journeys where there are effective alternatives;	Staffs LTP	0	0
Support Economic Growth	Exploit existing public transport networks in determining the most sustainable locations for growth;	DCLG	✓✓✓	✓✓✓
	Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.	DCLG	✓	✓
	Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;	DCLG	✓	✓
Promote Equal Opportunity	Improve accessibility for everyone particularly those with special needs	Staffs LTP	✓	✓
	Promote land-use patterns which can be served by a range of transport modes;	Staffs LTP	✓✓✓	✓✓✓
	Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport	DCLG	✓✓✓	✓✓✓

Improve Quality of Life				
	Improve the quality of the local environment and attractiveness of town centres, local centres, residential and other sensitive areas;	Staffs LTP	✓	✓
	Improve the availability, accessibility, efficiency, and attractiveness of walking, cycling, and public transport;	Staffs LTP	✓✓	✓✓
	Make it easier for people to switch between different forms of transport;	Staffs LTP	✓✓✓	✓✓✓
Better Safety, Security and Health	Improve personal security, road safety,	Staffs LTP	✓	✓

Key:

✓✓✓	Very positive effect
✓✓	Positive effect
✓	Slightly positive effect
0	Neutral
✕	Slightly negative effect
✕✕	negative effect
✕✕✕	Very negative effect

3.5 Conclusions

The testing of sustainable transport measures, in particular travel plans for residential and commercial developments has shown that these measures can have a clear effect upon the traffic generated from the new development sites.

The modelled assessment undertaken as part of this stage of strategy development has been conservative in nature. However, there is a significant body of evidence now available (as reported in section 3.2.2 and 3.2.3) which highlights that measures of the type under consideration, for the Burton Growth Point, can be much more successful than we have assumed within our initial assessments.

Therefore we conclude that measures of this type should form a cornerstone of the transport strategy to support the Burton Growth Point. However, it is apparent that these measures cannot address all of the transport issues within Burton by themselves. In particular the measures in the DS1 tests only address trips to and from the new development sites and do not address any of the issues caused by increases in background traffic growth

It is clear from our testing that these measures do not fully mitigate the effects of car traffic generated by the new development sites However, these measures have reduced the demand from the development sites has reduced by a significant amount. If measures of this type were rolled out across the town it is likely that there could be a significant reduction in the overall travel demand within Burton. The effects of this could be readily tested using the Burton model, but undertaking these additional model runs are outside the scope of the current study.

Therefore despite the introduction of the Stage 1 measures there are still significant residual problems upon the transport network which require addressing. This means that additional measures must be investigated for inclusion within the transport strategy to support the Burton Growth Point.

3.6 Recommendations

Following the completion of testing for Stage 1 of the Transport Strategy we make the following recommendations:

- **Residential and Workplace Travel Plans should form the cornerstone of the transport strategy to support the Burton Growth Point; and**
- **Additional strategy interventions will be needed over and above the measures tested at Stage 1 to fully address the transport impacts of the Burton Growth Point Proposals.**

4. Stage 2 - Measures to encourage active modes and use of public transport

4.1 Strategy Rationale

Stage 1 of the strategy development process analysed measures which can be used to enhance the sustainability of new development sites through the introduction of WTPs and RTPs. The results of this testing showed that these measures can be successful. However, there are still residual problems upon the network which require addressing.

This stage of the strategy development process will examine the role that promoting the use of alternatives to the car can have in addressing the residual transport issues within Burton as a whole.

This stage will examine the potential that motorised and non-motorised alternatives to the car have. Non-motorised modes will include:

- Walking; and
- Cycling.

Whilst motorised modes will consider:

- Bus; and
- Train

4.1.1 Non-Motorised alternatives to the car

Non-motorised modes, namely walking and cycling, will be encouraged by the provision of housing and employment developments which provide suitable facilities and infrastructure to support walking and cycling.

ESBC have invited the Advisory Team for Large Scale Applications (ATLAS – part of the Homes and Communities Agency) to work with the Council and prospective developers to ensure that new homes in west Burton are delivered as 'sustainable urban extensions' (SUE). Development will be guided by the principles enshrined in the Inspire East Excellence Framework. With respect to transportation the desirable characteristics of the SUE are held to be;

- *Well connected and reducing car-dependency through a sustainable travel network both within the new extension and to nearby communities. This includes streets and public spaces designed to give priority given to pedestrians, cyclists and public transport; having key local facilities within safe walking distance; providing exemplar provision in terms of public transport; and widely available and effective telecommunications and internet access.*

For the housing developments this means laying out the development in a way to support walking and cycling following the guidance provided by the DfT's Manual for Streets. In addition provision needs to be made so that there are suitable routes for people to be able to walk from within the development sites to locations outside, particularly to the existing urban areas on the current outskirts of Burton. A priority must be to ensure that there are adequate pedestrian and cycle links provided which link the Beam Hill and Red House Farm developments to key destinations such as Queens Hospital.

The location of housing developments and their proximity to key destinations is a key factor, together with their proximity and access to existing cycle routes. The planning obligations which are secured for the housing sites should make provision for extending, or providing links to the existing cycle network to enable safer and more convenient cycling journeys.

For the employment sites it means securing suitable facilities through site design and planning obligations such as suitable pedestrian and cyclist routes, secure cycle storage and showering/changing facilities within the buildings for cyclists. In addition, extensions or new lengths of cycle network may have to be secured via planning obligations to enable safer and more convenient cycling journeys to the workplace.

New cycle routes need to be developed to link the proposed new housing developments at Beamhill and Harehedge Lane on the western side of Burton to the existing/proposed cycle route network. The locations and routes of proposed new cycling facilities are shown on Plan 4.1 and Plan 4.2 in Volume 2 of this report. Opportunities should be explored to provide segregated cycle routes where possible and enhance links to the town centre. In addition locations need to be identified where good, secure, convenient cycle parking facilities can be provided in the central area.

Provision needs to be made in the design and layout of the proposed new housing areas to ensure that suitable cycle routes are provided within the development sites and that provision is made to enable cycle links to be made between the new developments and the existing urban areas.

We also suggest that a trial of the cycle hire scheme from the station is undertaken as per the current London initiative, albeit on a much smaller scale.

These measures to support walking and cycling, in conjunction with the Sustainable Transport Measures set out in Stage 1 should support the use of non-motorised alternatives to the car.

4.1.2 Motorised alternatives to the car

Buses

In terms of buses we consider that the following measures should be considered to form part of the overall transport strategy:

- Better information provision;
- Improve bus reliability;
- Improve bus journey times; and
- New Bus Services and Facilities.

The AAP proposes that an enhanced bus interchange facility is provided in New Street. The facility could be enhanced still further if the nearby car forecourt was made available.

Each of these headings will now be considered in turn.

Better information provision

This would include improving the promotion and publicity which is provided for the bus services operating within the Burton area. Good examples of this are the materials which Trent Barton uses to promote their quality bus partnership routes within Derby and Nottingham.

This often works best if a particular area or suburb is targeted in a structured manner with leaflet drops and local advertising publicising the bus services that are available in their locality, the destinations served and the fares, including any special offers/concessions that may be available.

Another action would be to look at the standard of information provided at the individual bus stops themselves. The information should always be clear and up-to-date, particularly in the town centre where there are a lot of bus stops and different bus services in a relatively small area.

The Programme of Development states that there are plans to introduce Real Time Passenger Information (RTPI) within Burton along Route 3 as part of BUATMS, which could be extended to other routes should resources permit. We would fully support the introduction of a facility of this type as this will directly complement the other public transport and ‘soft’ measures which are

emerging from the strategy development process. RTPI systems such as the Star-Trak system in use in Leicestershire and Derby have the ability to provide real time information to display boards located at bus stops and also provide SMS/text alerts to mobile phone users regarding departure times from particular bus stops. The Star-Trak system in Leicestershire and Derby is also linked into the Urban Traffic Management and Control (UTMC) systems to enable buses to be given priority at traffic signal controlled junctions; this will be considered further in a later section.

There is also the potential to put real time information displays at large destinations along the bus routes such as shops, health centres and businesses.

Published research indicates that marketing and enhanced information provision can increase public transport demand by up to 20%[12]. However, the duration of this uplift may be limited. This indicates that providing better public transport information is an ongoing process and will need to be continued into the foreseeable future if it is to have any significant long-term benefits. This is likely to require a significant revenue commitment from the local authorities to maintain any increased public transport demand that is obtained after its initial roll out.

Improve bus reliability and journey times

Bus reliability is particularly affected at peak times by congestion upon the highway network. There are many locations within Burton where traffic congestion is having a significant impact upon the reliability of the bus network. Table 4.1 provides a list of the key junctions that require improvement in the forecast year. Unfortunately, within Burton there is limited scope for significant upgrades to junction capacities or to reallocate road space to provide bus priority measures within the existing highway boundaries.

Table 4.1 –Junctions which require improvements

Junction
A38(T) Clay Mills
A38(T) Branston
Main Street/Wellington Road
Wellington Road/Parkway
Wellington Road/Shobnall Road
Derby Street/Horninglow Street
Derby Road/Hawkins Lane
Main Street/St Peter's Street
Stapenhill Road/Newton Road/Ashby Road

Therefore we recommend that RTPI is used in conjunction with the towns UTMC system to provide bus priority at signalised junctions within Burton to improve the reliability of the bus network and to improve bus journey times. Furthermore we recommend that traffic signal control is implemented at several current priority controlled junctions. These junctions will be described in a later section, however, the aim of the signalisation will be to control the flow of traffic upon the network and to provide additional locations at which positive bus priority can be provided to support the existing bus network following the addition of traffic from new housing and employment developments.

[12] TRL Report 593 - The Demand for Public Transport: A Practical Guide. R. Balcombe et al 2004.

Research published in TRL report 593 suggests that measures to improve bus reliability and journey times can increase passenger demand by up to 9% on average.

New Bus Services

There is a new bus service planned by SCC to serve the Centrum 100 development and the Branston South development. This new service links together the Winshill and Stapenhill areas of the town with Branston and the Centrum 100 Business Park. The existing service is relatively poor and relatively infrequent and commuters will undoubtedly benefit from the proposed new service which will operate to a half hourly pattern between 07:00 and 19:00 on weekdays. This service will be included within this stage of the strategy testing.

In addition to this route we propose three further new bus services to link the proposed urban extensions to the north west of Burton to the existing and proposed new employment areas, the town centre and the railway station. Some of these routes would make use of new highway infrastructure required to support the planned urban extension to Burton. The routes are presented in Plan 4.3 (in Volume 2 of this report) and outlined below:

- **New Route A:-** Harehedge Lane – Beamhill Road – Beamhill Link Road – Lawns Farm Link Road – Branston Junction – Wellington Road – Parkway – Shobnall Road – Beamhill Link Road – Beamhill Road – Harehedge Lane. (If the Lawns Farm development does not come forward the route would be as follows: Harehedge Lane – Beamhill Road – Beamhill Link Road – Shobnall Road - Parkway – Wellington Road – Parkway – Shobnall Road – Beamhill Link Road – Beamhill Road – Harehedge Lane).
- **New Route B:**- Harehedge Lane – Beamhill – Beamhill Link Road – Shobnall Road –(Town Centre – Railway Station) – Shobnall Road – Beamhill Link Road – Beamhill Road – Harehedge Lane.
- **New Route C1:-** Harehedge Lane – Bitham Lane – Bridge Street – Hillfield Lane – James Brindley Way – Derby Road – Hawkins Lane – Town Centre – Railway Station – Derby Street – Horninglow Road – Rolleston Road – Harehedge Lane.
- **New Route C2:**- Harehedge lane – Rolleston Road – Horninglow Road – Derby Street – Railway Station – Town Centre – Hawkins Lane – Derby Road – James Brindley Way – Hillfield Lane – Bridge Street – Bitham Lane – Harehedge Lane.

It is proposed that there are two buses used on the ‘C’ routes, one bus runs the route in a clockwise direction (C1) with the other running the route in an anti-clockwise direction (C2). This provides passengers with a route choice depending upon which area of the town they want to reach. The C1 and C2 routes complement the existing 1, 3 and 5 services operated by Arriva. The primary purpose of this route is to link the proposed new housing areas to the north west of Burton, with the employment areas along to the north of the town centre and the A5121 corridor.

All of the above proposed bus services are meant to complement and support the existing bus network and are not a direct replacement for any existing bus services.

Of the above services (A, B, C1 & C2) none would be high frequency with each having a minimum of one bus per hour. However, cumulatively all of the services would be timed to provide a departure from the development north of Harehedge Lane every fifteen minutes. This will provide, overall, a high frequency service which will complement the existing bus network. The services all provide links to the town centre and the railway station and/or the major employment areas to the south, north and centre of the town. SCC has already identified a significant series of measures to address bus reliability within Burton Town Centre in BUATMS as well as in the POD and CIF2 Bid documents. The measures proposed within this strategy are complementary and in addition to those measures already identified by SCC.

Park & Ride:

Park & Ride can provide a significant contribution towards addressing the transport issues associated with the Burton Growth Point, as well as enabling the delivery of the Area Action Plan (AAP) for Burton Town Centre.

For Park & Ride to be truly effective it needs to be implemented as part of a package of measures within a coherent transport strategy. In terms of the transport strategy for the Burton Growth Point, Park & Ride is being considered as a key integral element of the overall transport strategy and not in isolation.

Park & Ride sites can be used to achieve one or more of the following:

- Enable a reduction in town centre parking spaces, which are then replaced at the Park & Ride site(s);
- Enables the conversion of town centre parking from long stay to short stay if it is mainly used by commuters;
- Increase the amount of overall parking for a town centre, without increasing the number of spaces within the town centre.

Within Burton we are aware that the AAP is proposing an increase in the amount of retail and employment uses within the town centre. Without any other interventions, this expansion would require a significant expansion of town centre parking provision. This would attract more people to drive into the town centre, exacerbating the current transport related problems and making it difficult to implement a consistent transport strategy to cater for the growth point proposals.

Therefore we propose that, within Burton, Park & Ride is used to achieve, to different extents, all of the outcomes described above, namely:

To discourage commuters from driving into Burton Town Centre there should be a policy of converting the majority of spaces from long stay to short stay. The effect of this is three fold:

a) People who use town centre parking spaces for commuting purposes are encouraged to use the Park & Ride facilities or other bus services to reach the town centre;

b) More efficient use is made of the existing town centre parking stock, with the potential for several users of a given parking space during a weekday that previously may have been occupied by a single vehicle (also potentially generating more revenue from parking charges);

c) Short stay parking typically assists in supporting the retail offer within an area. Increasing the availability of short stay parking (with no overall increase in the amount of town centre car parking spaces) should provide support for both the current and proposed town centre retail offer.

Additional parking envisaged as being required by the AAP should be provided outside of the town centre at Park & Ride sites. The effect of this intervention will be to:

a) Support the expansion of development within the town centre envisaged by the AAP, without bringing in additional traffic to the town centre; and

b) Provide an encouragement to use Park & Ride, or other bus services, to reach the town centre.

In addition to supporting the AAP developments within Burton Town Centre, Park & Ride can be an effective way of reducing car trips into Burton who have travelled from outside of the conurbation, particularly via the trunk road network.

The latest edition of the Programme of Development for the East Staffordshire Growth Point indicates that Park & Ride should be considered as part of the overall transport strategy for the Burton Area.

It is our current understanding that the developer of the Lawns Farm site has proposed to develop part of the site as a Park and Ride facility. A copy of the Lawns Farm draft Masterplan is shown as Plan 4.4 in Volume 2 of this report. Provided that the site is relatively close to the A38 Branston Junction this site could be relatively successful at providing a Park & Ride facility for people travelling into the centre of Burton from the south.

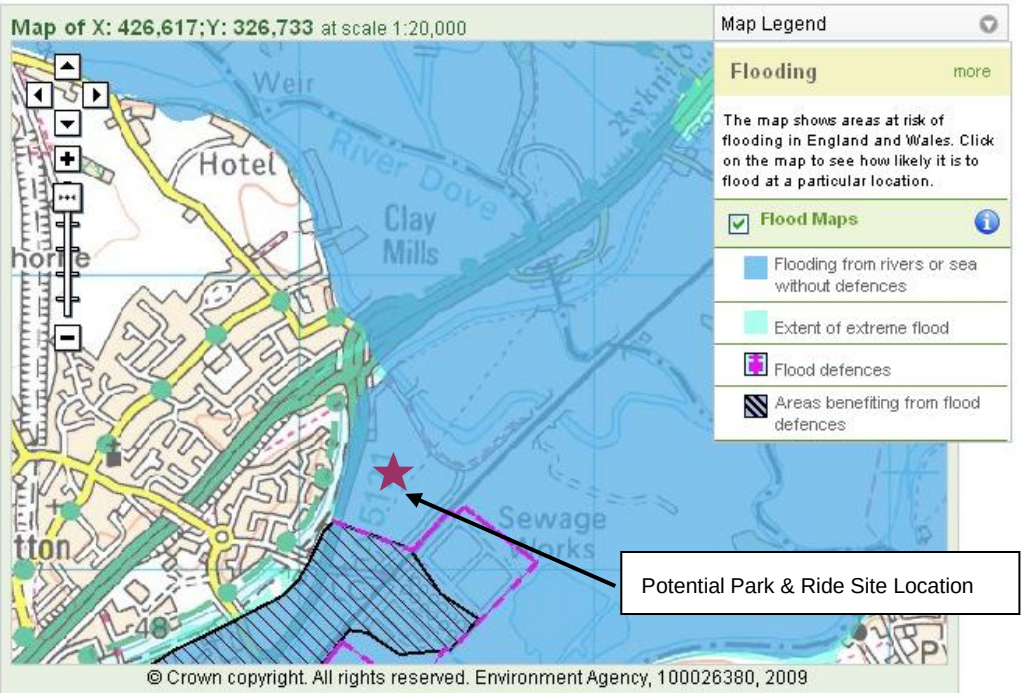
As well as serving the town centre, a Park & Ride service could serve Burton Railway Station which has limited parking and is located adjacent to the town centre. A nominal route for the Lawns Farm Park & Ride site would be:

- Lawns Farm – Branston Junction – Wellington Road – Shobnall Road – Town Centre – Railway Station – Wellington Street – Wellington Road – Branston Junction – Lawns Farm.

For Park & Ride to have a significant effect upon travel demand within a town a network of sites is usually required. Initial investigations suggested that an additional site located on the A5121 at Clay Mills to the South of the A38 would be an ideal location. Unfortunately, although there is land which could be available to construct a Park & Ride site upon there are several constraints which are likely to preclude the development of a Park & Ride Site at this location. These are:

- To the east of the A5121 there is a large area to the north of Meadow Lane which could be developed into a Park & Ride facility. Unfortunately, preliminary checks have shown that this area is within the floodplain and development here, particularly of a large hard surfaced Park & Ride facility, is likely to exacerbate any flooding problems which may arise and therefore likely to meet significant opposition from the Environment Agency. According to the EA website, (See Figure 4.1) this area has a significant chance of flooding. The chance of flooding each year is great than 1.3% (1 in 75). This takes into account the effect of any flood defences that may be in this area, whether or not these are currently illustrated on the Flood Map. However, we recommend that further work is undertaken, independently of this current study, to ascertain the possibility of developing a Park & Ride facility at this location.
- To the west of the A5121 there is the recreation ground between Hillfield Lane and James Brindley Way. Although a suitable size and location, constructing a Park & Ride site here would mean the loss of a valued community resource and is not likely therefore to be a viable proposition.

Figure 4.1 – Copy of information obtained from Environment Agency Website



A useful interim option would be to explore the possibility of using the extensive parking at Burton Albion's Pirelli Stadium. There is significant existing parking available and is directly located upon the A5121 corridor. There are going to be numerous issues regarding the usage of this site as a Park & Ride site, however these are not insurmountable and can be resolved. An example of where this has been achieved is the car park at Derby County's Pride Park Stadium is used as a Park & Ride site. Information provided by Derby City Council shows that the Pride Park & Ride service operates in conjunction with the football club as follows:

- The 111 service (which also serves the city centre, Pride Park and the Wyvern Business Park) runs every 10 to 15 minutes from 7.00am until 7.00pm, Monday to Saturday. On a Saturday, when there is a football match, the 111 does not serve the park and ride site and finishes at 1.00pm. When there is a weekday game then the service finishes at 6.00pm.

Our preliminary view is that it will be difficult and expensive to provide a suitable permanent Park & Ride facility to the north of the town centre unless it is built upon land currently allocated or in use for employment purposes. During the period under consideration (i.e. up to 2026) there is the possibility that one or more of these sites may become available for regeneration. If this occurs then ESBC should consider introducing planning policies in place to protect a suitable site for development as a park and ride site.

The location of the proposed Lawns Farm and Burton Albion Park & Ride sites is shown on Plan 4.5 contained within Volume 2 of this report.

Preliminary analysis of the Burton transport model suggests that there may be scope for a third park and ride site located on the A511 to the east of the town centre. It appears that there is potential for a greenfield site on Ashby Road. This site is within South Derbyshire and therefore not in the control of East Staffordshire Borough Council. However, this should not be considered as a significant impediment to the delivery of the new P&R site. The suggested location for this park and ride site is shown in Plan 4.6 within Volume 2 of this report.

The Burton transport model has been used to estimate how much traffic that Park & Ride sites could remove from the highway network. Based upon this estimate we can provide some understanding about how much Park & Ride could contribute towards an overall transport strategy for Burton.

Rail:

Rail only makes up about 1% of all travel to work within the borough. However, rail patronage to/from Burton is growing and that's with what is considered an unattractive station with poor facilities.

The rail services from Burton to key destinations such as Birmingham and Derby are very good. There are 4 trains an hour to Birmingham with a journey time between 29 to 38 minutes. There are 5 trains in the morning peak to Derby with a journey time between 13 and 15 minutes. This level of service could prove to be very attractive to people in the new housing developments provided that there are excellent links to the railway station.

The improvements that we have assumed within this study are those which were put forward within the Burton Sustainable Transport CIF proposal. The measures include:

- Widening the highway into the station forecourt to allow improved bus waiting facilities with space for passing traffic; and
- Improved access to the station by walking and cycling and new cycle parking.

To accommodate this, the current car parking arrangements will be removed and re-sited in the upgraded railway station car park opposite. The railway station operator will take on the maintenance of the station frontage area within their lease boundary.

Improvements to the railway station building are assumed to be provided by the rail industry, these include:

- Real Time Information / clear departure information;
- CCTV;
- Heated and refurbished waiting room;
- Appropriate seating on platform;
- Improved lighting; and
- Additional printed timetable information.

Our primary strategy has been to improve links to the rail station from within Burton. There is significant opportunity to do so from the 6000+ new dwellings planned to be built upon previously developed land within the existing urban area and hence the routing of the new bus services discussed above ensure that these new and existing housing have adequate links to the rail station.

4.2 Modelling the effects of Stage 2

Non-Motorised Modes

Section 4.1 sets out a series of improvements for pedestrians and cyclists to encourage the use of these non-motorised modes. These improvements would be complementary to the RTP/WTPs and will support their development. Therefore we are not considering any further traffic reductions from the introduction of walk and cycle measures over and above those considered within Stage 1 of the strategy development process. The approach to modelling the impact of bus and rail initiatives is described in the following sections:

Buses

We have proposed the following measures within the previous section to encourage the use of buses:

- Better information provision (RTPI);

- Improve bus reliability;
- Improve bus journey times; and
- New Bus Services.

Better Information and Reliability/Journey Time Improvements

As discussed above, research has suggested that better bus information provision could increase patronage by up to 20%. Research also suggests that improvements in bus reliability and journey times could increase bus patronage by up to 9%.

The strategy proposes a roll out of the RTPI system in the Burton Urban Area and the route to Swadlincote, as well as an expanded UTMC system. The RTPI and UTMC systems would be linked to provide active bus priority (where possible) thereby improving reliability and journey times.

It is important that the effects of these measures are captured and analysed on the overall network, and it is considered that the best way to examine the effect of these types of interventions at the strategic level is to apply the traffic reduction of the modelled bus use increase across the whole model matrix.

The TRL Research Report 568 suggests that:

- Better information provision (RTPI) could achieve a **2%** switch from car to Public Transport; and
- Improve bus reliability and / or journey times; could achieve a **4%** switch from car to Public Transport.

These changes were modelled by using PT-SATURN to identify how users respond to changes in the generalised cost of Public Transport. The perceived generalised costs of public transport were reduced to account for the enhanced provision of RTPI and improvements in bus reliability and journey times to achieve a 6% car reduction as identified above.

The resultant 2026 matrices have then be assigned to the 2026 Option 3 Do Minimum network and key performance statistics and indicators produced, to enable the results to be compared.

New Bus Services

For the new bus services we have identified four new potential routes. These are described in Section 4.1.2. The detail of each new bus route was coded into the Burton Transport Model.

The new bus services are designed to link new housing with new and existing employment areas, Burton Town Centre and the Railway Station. The new bus services are estimated to operate at an hourly frequency, therefore there will be only one bus on each new route within the peak hours.

The effect of the new bus services (including the new Centrum service) was modelled to identify how users from the new developments respond to the provision of new bus services which link the developments to employment areas, the rail station and town centre.

Park & Ride

We have identified the potential for three park and ride sites that will be assessed using the Burton model. These are:

- Lawns Farm;
- Burton Albion Football Club Car Park; and
- Land to the South of A511 Ashby Road (East of Brizlincote Lane).

The Park & Ride service is assumed to run between the site and the town centre, including the railway station. We have assumed a conservative interception rate of 8%[13] for this strategic assessment of the Park & Ride sites. This interception rate reflects the likely impact of the RTPI/UTMC based related bus priority measures which should provide an improvement in journey times into the town centre from the Park & Ride sites. This rate does not take into account the potential effects of town centre parking policies that were discussed in the previous section. The introduction of revised town centre parking policies and management strategies could have a significant effect upon the usage of Park & Ride services.

The effects of the Park & Ride sites have been assessed using the Burton Transport model using the following methodology:

- Select Link assignments undertaken on the links adjacent to the proposed Park & Ride sites to identify the total number of trips that would drive past the Park & Ride site to a destination in Burton Town Centre;
- Of the above trips an inception rate of 8% has been applied which we will assume will make use of the new Park & Ride sites; and
- Of the 8% of trips that were selected for each Park & Ride site, their destination within the trip matrix have been adjusted from being Burton Town Centre to the relevant Park & Ride site.

It is considered that a greater interception rate could be achieved if an appropriate management regime is adopted with respect to the cost and availability of long and short stay parking in the town centre (as discussed within the previous section).

It is recognised that this is a simplified methodology for estimating Park & Ride patronage as the methodology does not take into account any reassignment of traffic generation effects that could occur following the introduction of new Park & Ride facilities. An assessment of these effects is not currently possible within the current strategic modelling system. However, it is likely that these effects (if fully taken into account) would lead to a higher rate of Park & Ride usage than will be estimated using the current methodology.

Whilst the introduction of the Park and Ride will provide a valuable facility for the town centre it is recognised that the increase in buses running to a high frequency pattern may impact on the town centre as it is possible that the current New Street Interchange may be overstretched.

Rail

We are not explicitly modelling the effects of the rail proposals within this stage of the transport strategy development. This is because the key focus of the other strategy measures is providing new and / or enhanced linkages between the railway station and residential / employment areas. These improvements are captured within the other modelling assessments and hence, to avoid double counting, they were not considered separately.

4.3 Appraising the results of Stage 2

The results of the testing of the various components of this stage of transport strategy development are described in the following sections.

Better Information and Reliability/Journey Time Improvements/New Bus Services

The transport strategy proposed five new bus services (including the new Centrum service) to link the proposed urban extensions to the north west of Burton to the existing and proposed new employment areas, the town centre and the railway station. These new bus services have been

[13] This rate is based upon our previous experience of assessing Park & Ride facilities. The interception rate of P&R sites varies considerably. Successful P&R systems such as those in Cambridge and York can achieve interception rates of between 15% to 25% (Source: Darlington Park and Ride Study, Atkins, 2008)

added into the Burton Transport Model as part of the measures for this strategy test. As set out above it is being assumed that the new bus services serving the new housing developments to the west of Burton would attract 2% of potential car users from the new housing development sites. This applies to the SUE sites to the north west of Burton only. We are providing a conservative/robust assessment to ensure that we do not overestimate the effectiveness of these measures. This change has been reflected by reducing the car demand from the development sites accordingly within the trip matrix.

The initial test of this scenario, referred to as Do Something 2 (DS2), lead to significant reductions in vehicle hours (up to 12%) and vehicle kilometres (up to 6%). However, testing of measures for Stage 3 of the strategy (making better use) indicated that the scale of improvements which could be made at many key junctions (within the constraints of the highway boundary) is likely to be modest at best.

This directly impacts upon the scale of the improvements which can be provided to public transport in terms of journey time reliability and journey times. Therefore a new DS2 was created with revised assumptions to reflect the improvements which could be provided for public transport within Burton. The revised assumptions were:

- Better information provision (RTPI); **1% switch from car to PT;**
- Improve bus reliability and journey times; **0.5% switch from car to PT; and**
- New Bus Services. **2% switch from car to pt (for traffic from new housing developments only)**

These revised assumptions were incorporated into the DS2 model run. The statistics for this test, shown in Table 4.2, indicate that the measures assumed in DS2 are having beneficial effects at a level that is considered realistic taking into account the constraints within the Burton area. A complete set of KPIs for this and all other model tests completed as part of the detailed strategy appraisal is included within Volume 2 of this report.

Plan 4.7 (in Volume 2 of this report) shows the differences in traffic flow between DS2 and the Do Minimum in the AM peak period. As can be seen, DS2 leads to reductions in traffic flow over the majority of the Burton area in both time periods.

The widespread nature of the traffic reductions means that the effect upon individual links is relatively modest. However the following links have all had traffic flow reductions of over 50 vehicles in the 2026 AM Peak Period:

- B5017 Forest Road;
- B5017 Shobnall Road;
- A38(T) Southbound (Through Burton); and
- A511 Ashby Road (on approach to Stapenhill Road);

Table 4.2 Shows the Volume / Capacity Ratios (V/C) for a selection of key junctions in the 2026 AM Peak Period for both the Do Minimum and DS1 scenarios.

Table 4.2 – Comparison of V/C Ratios 2026 AM Peak

Junction	2026 AM Do Minimum V/C Ratio (%)	2026 AM DS1 V/C Ratio (%)	2026 AM DS2 V/C Ratio (%)
A511/A5121 Derby Turn Junction	102%	102%	102%
Shobnall Road / Wellington Road Junction	87%	84%	92%
Shobnall Road / Shobnall Street Junction	91%	92%	93%
St Peters Bridge / Stapenhill Road	96%	96%	97%

Table 4.2 shows that the effects of the measures included in Stage 2 have not led to significant improvements at some of the most congested junctions in Burton. The reasons for these results are that:

- All of these junctions currently suffer capacity related problems, even after the application of the Stage 1 measures;
- At 2026 the current problems will be exacerbated by background traffic growth; and
- The relative proportion of current public transport users, in relation to car users, is small. Therefore even a significant increase in overall public transport patronage levels will not have a significant overall impact on car travel without additional interventions.

However, it is also apparent that the road space freed up by people using public transport is being reused to provide alternative routes for existing trips. The reassignment effects following the introduction of Stage 2 measures have lead to increases in traffic flows of over 50 vehicles in the 2026 AM Peak Period on the A5121 Wellington Road.

Plan 4.8 (in Volume 2 of this report) shows the differences in traffic flow between Stage 2 and the Do Minimum in the PM peak period. As can be seen, Stage 2 leads to reductions in traffic flow over the majority of the Burton area in both time periods.

The widespread nature of the traffic reductions means that the effects upon individual links are relatively modest. However the following links have all had net traffic flow reductions of over 50 vehicles in the 2026 PM Peak Period:

- A38(T) Through Burton (Both Directions);
- B5017 Shobnall Road;
- A5121 Wellington Road;
- A5189 Evershed Way; and
- Stapenhill Road.

Table 4.2 Shows the Volume / Capacity Ratios (V/C) for a selection of key junctions in the 2026 PM Peak Period for both the Do Minimum and Stage 2 scenarios.

Table 4.3 – Comparison of V/C Ratios 2026 PM Peak

Junction	2026 PM Do Minimum V/C Ratio (%)	2026 PM DS1 V/C Ratio (%)	2026 PM DS2 V/C Ratio (%)
A511/A5121 Derby Turn Junction	107%	104%	103%
A5121 Derby Street / Victoria Road	89%	84%	80%
A511 Horninglow Street / Guild Street	95%	86%	85%
Guild Street / Station Street	90%	86%	86%
Branston Road / St Peters Bridge	96%	95%	94%
St Peters Bridge / Stapenhill Road	95%	95%	94%
Shobnall Road / Shobnall Street Junction	97%	97%	103%

Table 4.3 shows that the effects of the measures included in Stage2 have not led to significant improvements at some of the most congested junctions in Burton. However slight improvements are noted at:

- A511/A5121 Derby Turn Junction (-1% compared to DS1);
- A5121 Derby Street / Victoria Road (-4% compared to DS1);
- A511 Horninglow Street / Guild Street (-1% compared to DS1);
- Branston Road / St Peters Bridge (-1% compared to DS1); and
- St Peters Bridge / Stapenhill Road (-1% compared to DS1).

The reasons for these results are that the same as those highlighted previously for the 2026 DS2 AM Peak tests.

The overall statistics for this test, shown in Table 4.4, indicate that the measures assumed in Stage 2 would have beneficial effects which lead to further reductions in vehicle hours and vehicle kilometres together with a modest increase in average vehicle speeds, indicating that there has been an overall reduction in the levels of congestion when compared to the Do Minimum scenario in both of the AM and PM peak periods. There has also been a significant reduction in the demand generated from the new development sites, indicating that the measures contained in Stage 1 and Stage 2 of the strategy development process are having positive effects. This overall view confirms the findings of the comparison of link flows and V/C ratios.

Table 4.4 – Performance of Option 3 DS2 compared to Option 3 Do Min and DS1

Sub Objectives	Option 3 DM		Option 3 DS1		Option 3 DS2	
	AM	PM	AM	PM	AM	PM
Vehicle Hours	22936	21762	22350	21142	21865	20754
% Change Relative to DM			**-2.6%**	**-2.8%**	**-4.7%**	**-4.6%**
Vehicle Kilometres	1341495	1294867	1332074	1284447	1317440	1268761
% Change Relative to DM			**-0.7%**	**-0.8%**	**-1.8%**	**-2.0%**
Vehicle Speeds (km/hr)	58.5	59.5	59.6	60.8	60.3	61.1
% Change Relative to DM			**1.9%**	**2.1%**	**3.0%**	**2.7%**
Average Trip Length (km)	18.4	18.8	18.5	18.9	18.5	18.9
% Change Relative to DM			**0.3%**	**0.4%**	**0.3%**	**0.5%**
Total Demand Flow	72769	68703	72068	67884	71218	66961
% Change Relative to DM			**-1.0%**	**-1.2%**	**-2.1%**	**-2.5%**
Development Demand	12192	13837	11418	12933	11213	12703
% Change Relative to DM			**-6.4%**	**-6.5%**	**-8.0%**	**-8.2%**

It is noted that as the transport strategy is being built up in a cumulative manner that the KPIs for DS2 also include the effects of DS1 as well. Therefore DS 2 represents the cumulative situation following the application of the measures set out in Stage 1 and Stage 2 of the strategy development process.

Changes in V/C ratios for individual links and junctions following the introduction of the measures in Stage 2 can be found in Volume 2 of this report.

Park & Ride

The proposed transport strategy identified the potential for three park and ride sites. These are:

- Lawns Farm;
- Burton Albion Football Club Car Park; and
- Land to the South of A511 Ashby Road (East of Brizlincote Lane)

The location of the proposed Park & Ride sites is shown on Plan 4.1 and 4.2 (contained in Volume 2 of this report).

As noted above, an 8% interception rate has been used to assess the impact of these facilities, based upon our previous experience of assessing Park & Ride facilities. It is recognised, however that the interception rate of P&R sites varies considerably with successful P&R systems such as those in Cambridge and York achieving interception rates of 15% to 25%[14]

[14] (Source: Darlington Park and Ride Study, Atkins, 2008)

The 8% interception rate is based upon our previous experience of assessing Park & Ride facilities. The interception rate of P&R sites varies considerably. Successful P&R systems such as those in Cambridge and York can achieve interception rates of 15% to 25%.

The 8% rate was chosen as this represents (just over half) of the rate achieved in successful Park & Ride facilities. This reflects:

- We have assumed no town centre parking policies to support Park & Ride development; and
- We have assumed that only a moderate amount of bus priority measures are implemented to support Park & Ride services.

These changes were then applied to the DS2 matrix to make a new scenario Do Something 2A (DS2A).

Based on this process the estimated usage of each of the park & ride sites is shown in Table 4.5.

Table 4.5 – Total Two-Way Park & Ride Site Usage Estimated in DS2A

Park & Ride Site	Total Usage AM Peak Hour	Total Usage PM Peak Hour
Ashby Road	83	159
Burton Albion	46	58
Lawns Farm	33	43

The results reflect that a significant amount of traffic entering the Burton is travelling to the employment areas that are outside of the town centre area. However, for the reasons set out previously, the figures shown in Table 4.5 are likely to be an underestimate of the actual usage as we've not been able to take into account strategic reassignments to use the park and ride services. In addition there is likely to be significant inter-peak usage of the park & ride sites which we have not estimated at this stage.

Secondly we have not assumed that any further measures are implemented to encourage usage of the Park and Ride facilities. Typically these would be introduced as part of an overall parking and / or demand management strategy for Burton. In particular quantifying the amount, location and type of parking that is available within Burton Town Centre and considering the use of this in conjunction with the potential for Park and Ride facilities. Following on from this measures that could be considered include, reducing the overall level of parking supply, for example making current town centre parking sites available for re-development and considering the supply of long stay and short stay parking. All of which could make the use of strategic Park and Ride sites much more attractive.

Further to this, a wider demand management strategy could consider the parking standards that are applied to developments throughout the Burton area, in particular looking at the levels of workplace parking and overall parking availability within the town centre area with a view to using the planning system to manage the provision of new parking and other measures or agreements to manage the existing parking stock. The results of this strategy development process need to feed back into the AAP process to allow the development of a consistent strategy across the whole town.

In order to reflect the potential for reassignment of traffic and other measures to support the development of the P&R sites, the impacts of higher inception rates have been considered as demonstrated in Table 4.6.

Table 4.6 – Forecast levels of interception at Park & Ride sites

Figures with a 15% Interception Rate				Figures with a 25% Interception Rate		
Park & Ride Site	Total usage AM Peak	Total Usage PM Peak		Park & Ride Site	Total usage AM Peak	Total Usage PM Peak
Ashby Road	156	298		Ashby Road	259	497
Burton Albion	86	109		Burton Albion	144	181
Lawns Farm	62	81		Lawns Farm	103	134

The overall key performance indicator results of this test (assuming 8% abstraction) can be seen in Table 4.7.

Table 4.7 – Performance of Option 3 DS2A compared to Option 3 Do Min

- Sub Objectives	Option 3 DM		Option 3 DS2		Option 3 DS2A	
	AM	PM	AM	PM	AM	PM
Vehicle Hours	22936	21762	21865	20754	21789	20691
% Change Relative to DM			**-4.7%**	**-4.6%**	**-5.0%**	**-4.9%**
Vehicle Kilometres	1341495	1294867	1317440	1268761	1316525	1267763
% Change Relative to DM			**-1.8%**	**-2.0%**	**-1.9%**	**-2.1%**
Vehicle Speeds (km/hr)	58.5	59.5	60.3	61.1	60.4	61.3
% Change Relative to DM			**3.0%**	**2.7%**	**3.3%**	**3.0%**
Average Trip Length (km)	18.4	18.8	18.5	18.9	18.5	18.9
% Change Relative to DM			**0.3%**	**0.5%**	**0.2%**	**0.4%**
Total Demand Flow	72769	68703	71218	66961	71247	67029
% Change Relative to DM			**-2.1%**	**-2.5%**	**-2.1%**	**-2.4%**
Development Demand	12192	13837	11213	12703	11167	12626
% Change Relative to DM			**-8.0%**	**-8.2%**	**-8.4%**	**-8.7%**

The results in Table 4.7 show that there are overall incremental improvements from DS2 to DS2A with a further reduction in vehicle hours and vehicle kilometres.

This partly reflects the conservative assessment that has been undertaken, as we have not taken into account any strategic reassignments which may take place for people to use the park & ride facilities once that they are in place.

Plan 4.9 and 4.10 (in Volume 2 of this report) shows SATURN plots of the differences in traffic flow between DS2A and the Do Minimum in the AM and PM peak hours. As can be seen, DS2A

leads to further reductions in traffic flow over the majority of the Burton area when compared to DS2.

A detailed assessment of park and ride and indeed parking and demand management, falls outside of the remit of this current study. However it is clear that our conservative assessment has indicated that there is potential for the development of a park & ride network within the Burton area and that if developed it would have a beneficial effect upon the overall transport system and in particular the town centre and the AAP development aspirations.

4.4 Summary of Stage 2 Results

Table 4.8 - Comparison of Stage 2 Results against Strategy Objectives

DaSTS Goals	Local Objective	Source	Stage 1 - Enhancing Sustainability of New Developments	Stage2 - Promoting Active Modes / PT	Overall Strategy
Tackle Climate Change	Reduce reliance on private cars;	Staffs LTP	✓✓✓	✓✓✓	✓✓✓
	Reduce transport related pollution; and	Staffs LTP	✓✓	✓✓	✓✓
	Reduce the impact of road freight.	Staffs LTP	0	0	0
	Manage car parking to improve enforcement and to discourage reliance on the private car for work and other journeys where there are effective alternatives;	Staffs LTP	0	✓	✓
Support Economic Growth	Exploit existing public transport networks in determining the most sustainable locations for growth;	DCLG	✓✓✓	✓✓✓	✓✓✓
	Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.	DCLG	✓	✓✓	✓✓
	Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;	DCLG	✓	0	✓

Promote Equal Opportunity	Improve accessibility for everyone particularly those with special needs	Staffs LTP	✓	✓✓	✓✓
	Promote land-use patterns which can be served by a range of transport modes;	Staffs LTP	✓✓✓	✓✓✓	✓✓✓
	Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport	DCLG	✓✓✓	✓✓✓	✓✓✓
Improve Quality of Life	Improve the quality of the local environment and attractiveness of town centres, local centres, residential and other sensitive areas;	Staffs LTP	✓	✓✓	✓✓
	Improve the availability, accessibility, efficiency, and attractiveness of walking, cycling, and public transport;	Staffs LTP	✓✓	✓✓✓	✓✓✓
	Make it easier for people to switch between different forms of transport;	Staffs LTP	✓✓✓	✓✓✓	✓✓✓
Better Safety, Security and Health	Improve personal security, road safety,	Staffs LTP	✓	✓✓	✓✓

Key:

✓✓✓	Very positive effect	✕	Slightly negative effect
✓✓	Positive effect	✕✕	negative effect
✓	Slightly positive effect	✕✕✕	Very negative effect
0	Neutral		

4.5 Conclusions

Measures to increase the use of alternatives to the car, that have been tested as part of the strategy development process included:

- Better information provision (including RTPI);
- Improved bus reliability;
- Improved bus journey times; and
- New Bus Services and Facilities (including better links to the Railway Station and Park & Ride).

It can be concluded that all of the interventions have had positive effects, however the scale of the impacts that each measure is having is constrained by either:

- The physical constraints on the transport network; and
- The limitations of our modelling methodologies.

It is clear from our testing that public transport measures of the type tested as part of the strategy development process have significant potential to deliver modal change within Burton. However, the constraints that we are working with, in particular the requirement to deliver improvements within the existing highway boundary, does mean that we do not consider it possible to deliver all of the improvements that may be necessary upon the existing transport network to support faster and more reliable public transport services.

We conclude that Park & Ride has significant potential within Burton to assist both with the delivery of the Growth Point and AAP proposals. However, in order to maximise the success and impact of Park & Ride parking management policies would need to be introduced within Burton Town Centre to minimise the additional number of car trips that may drive to the town centre. These parking management measures could include reducing the number of long stay spaces, increasing the charges for central area long stay parking and the introduction of a Workplace Parking Levy. Making the park and ride free would also increase the effectiveness but would result in increased annual subsidy costs.

Rail plays a small, but still significant, part in the overall amount of travel to and from Burton. The proposals that we have brought forward as part of this stage of the strategy development process provide new and enhanced linkages to the Railway Station from new development sites and Park & Ride facilities. Although we are unable to make a direct assessment of the effects on Rail demand using the current model, we consider it highly likely that the proposed measures will support Rail travel and indeed provides convenient links to the railway station from the proposed sustainable urban extensions and new employment sites.

Therefore we conclude that measures of this type should form part of the transport strategy to support the Burton Growth Point. However, it is apparent that these measures, in addition to those described in Stage 1, cannot address all of the transport issues within Burton.

It is clear from our testing that these measures, whilst providing significant potential benefits, do not fully mitigate the effects of car traffic generated by the new development sites. Therefore despite the introduction of the Stage 2 measures there are still some residual problems upon the transport network which require addressing. This means that additional measures must be investigated for inclusion within the transport strategy to support the Burton Growth Point.

4.6 Recommendations

Following the completion testing for Stage 2 of the Transport Strategy we make the following recommendations:

- **Real Time Passenger Information services should be rolled out across the main public transport routes within Burton;**
- **Measures to improve bus journey time reliability and journey times should be implemented as these are key to achieving model shift within the town;**
- **New bus services will be required to adequately serve the SUE developments and provide suitable linkages to the town centre, employment sites and the railway station;**
- **Park & Ride needs to be considered as a key element of the transport strategy to support the development of the Burton Growth Point;**
- **Further detailed studies are required to:**
  - **Confirm the location of Park & Ride Sites; and**
  - **Provide detailed estimates of potential Park & Ride patronage.**
- **The County Council need to consider the possibility of introducing highway measures that extend outside of the current highway boundary in some locations. Testing has shown that the benefits of permitting this could exceed the costs of doing so; and**
- **Additional strategy interventions (such as parking management) will be needed over and above the measures tested at Stage 2 to fully address the transport impacts of the Burton Growth Point Proposals.**

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5. Stage 3 – Making Best Use

5.1 Strategy Rationale

At this stage of the strategy development process we have already considered:

- Measures to increase the sustainability of new developments; and
- Measures to increase the use of active modes and public transport.

Following the application of measures under both of these category headings we have determined from the transport modelling that there will still be residual problems of congestion and delays on the transport network that require addressing to enable the delivery of the Burton Growth Point.

We determined in Section 1.2 that in the Do Minimum situation there would be a 34% increase in overall modelled traffic levels (in 2026 compared to 2007) due to the Growth Point proposals. Testing has shown that the application of all of the measures described in Stage 1 & 2 of the strategy development process can reduce overall transport demand within the Burton Model by 2.4%, but can reduce development demand by 8.7% (see Table 4.7 for details).

Addressing these problems requires the strategy to consider measures to make the best use of the existing transport network and to suggest measures which could be used to provide increases in efficiency and or capacity to address the traffic problems associated with the Burton Growth Point proposals.

Measures that will be considered under this stage of strategy development include:

- Signal Optimisation (for existing signalised junctions);
- Junction Signalisation;
- Minor junction capacity improvements (localised widening etc.); and
- Major junction capacity improvements (on the Trunk Road network).

5.2 Current Issues and Opportunities

The highway network in Burton currently suffers from significant congestion problems during the peak hours. The County Council has proposed to implement a number of transport interventions and junction improvements by 2011 as BUATMS is progressively rolled out and these improvements have been incorporated in our 2026 Do-Minimum Scenario. However these proposed improvements will not provide sufficient new capacity to accommodate the growth point agenda, as demonstrated by our 2026 forecast year assessments using the Burton traffic model which predict that congestion problems will get significantly worse following the addition of new traffic from the proposed housing and employment developments.

The County Council have instructed Atkins to assume that any highway improvements that we consider within the existing urban area must be deliverable within the existing highway boundary which places a very real constraint on the nature and scale of improvements that can be provided. Several key locations in the network have been identified that will need to be improved, as shown in Table 5.1 and 5.2, and it is considered that when designing improvements that priority should be given to enabling better bus services. This is likely to mean limited scale improvements (due to the constraint of working within existing highway boundaries).

Table 5.1 – Key Locations which require general capacity improvements

Location of Capacity Improvement
A38(T) Clay Mills junction
A38(T) Branston junction
A5121/B5018 Wellington Road / Main Street junction
A5121 Wellington Road / Parkway junction
A5121/B5017 Wellington Road / Shobnall Road junction
A5121/A511 Derby Turn Junction
A5121/5018 Derby Road / Hawkins Lane junction
A5189/A444 St Peters Bridge Stapenhill Road junction
A511/A444 Ashby Road / Stapenhill Road junction

Table 5.2 – Key Locations which require Bus Priority Improvements

Location of Bus Priority Improvement
A511 Tutbury Road / Harehedge Lane junction
A511 Tutbury Road near Calais Road junction
A511 Horninglow Road near Rolleston Road junction

General Capacity Measures

In terms of the overall strategy for managing traffic through out the Burton conurbation we consider that that proposed signalised junctions along the A5189 corridor (Proposed in the A5189 Route Strategy) should all be linked into the towns UTMC system. Details of these changes are shown in Plan 5.1 in Volume 2 of this report. In this way UTMC strategies can be devised to manage traffic flows across the whole town centre, and more importantly across both Burton Bridge and St Peter's Bridge. The indicative area of UTMC coverage is shown on Plan 5.2 in Volume 2 of this report.

The county council investigated the possible signalisation of the A5121/A511 'Derby Turn' junction as part of feasibility work for the CIF2 Sustainable Package Bid. It concluded that the best solution was to introduce improved (signalised) crossing facilities on Horninglow Road (N) and A5121 Derby St (W) and to use them to gate traffic using UTC.

On site observations suggest that the roundabouts large area of circulatory carriageway is used inefficiently. Atkins consider that the option of reducing the area of the circulatory carriageway, but yet still retaining two well signed lanes, should enforce better lane usage and potentially more efficient usage of the junction.

This option could be used in conjunction with the gating scheme outlined in the CIF2 bid, as we still consider that reducing the size of the circulatory carriageway could be a useful measure to implement as it is likely to slow the speed of traffic on the circulatory and hence provide more opportunities for traffic on different entry arms to enter the roundabout.

Bus Priority Measures

To cater for the proposed urban extension we propose that three locations are improved to provide measures for bus priority and general network efficiency. These are:

- **Location 1:** Junction of Tutbury Road / Harehedge Lane / Beamhill Road (Capacity increase at existing signalised junction);
- **Location 2:** Tutbury Road near Calais Road (Provision of Bus Priority); and
- **Location 3:** Horninglow Road near Rolleston Road (Provision of Bus Priority).

These locations of the proposed junction improvements are shown on Plan 5.3 in Volume 2 of this report.

- **Location 1** will be placed under significant pressure by both of the proposed housing developments located north of Harehedge Lane and South of Beamhill Road. There appears to be land within the highway boundary to enable a modest capacity increase at this junction, particularly increasing the number of lanes at the stop line on Beamhill Road from one to two lanes. There also appears to be scope to increase the number of lanes at the stop line from Harehedge Lane from one to two as well. The isolated nature of this junction, together with the significant traffic increases forecast to travel through it means that this is an ideal candidate for MOVA traffic signal control. In addition to this provision should be made for the junction controller to be able to interface with the RTPI system to provide priority to the buses serving the Harehedge lane and Beamhill housing developments. Improvements to this junction should be considered as part of the planning obligations for both the Harehedge Lane and Beamhill sites. An improvement of this type has had to be assumed within the Do Minimum testing for all of the Burton land use scenarios. This is because without an improvement, the traffic generated by the housing developments at Harehedge Lane and Beamhill led to a near gridlock situation in this area.
- **Location 2** is placed under pressure by the proposed housing developments north of Harehedge Lane and South of Beamhill Road. However the main reason for improving this location would be to enable buses to negotiate this junction more efficiently with the new housing developments in place. This is a key junction for the Arriva '3' services which serve this area and the Hospital. The location would be improved by providing a signalised pedestrian crossing to the east of the junction. The crossing controller would be able to interface to the RTPI system to enable priority for buses travelling through this location.
- **Location 3** is also placed under pressure by the proposed housing developments north of Harehedge Lane and South of Beamhill Road. However the main reason for improving this location would also be to enable buses to negotiate this location more efficiently with the new housing developments in place. This is a key junction for the Arriva '1' services which serve this area. The location would be improved by providing a signalised pedestrian crossing to the east of the junction. The crossing controller would be able to interface to the RTPI system to enable priority for buses travelling through this location.

5.3 Improvements Required to the Strategic Highway Network

The 2026 Forecast Year traffic flows were provided to the Highways Agency for the Option 2B Land Use Scenario. The impact of these traffic flows on the existing strategic network junctions on the A38 at Branston and Clay Mills was assessed and outline improvement schemes were developed that demonstrate that these traffic flows can be accommodated. However these preliminary designs (Plan 5.4, 5.5 & 5.6, shown in Volume 2) and their respective construction costs may need to be revisited following the development and adoption of Option 3, which includes additional employment development at Lawns Farm. The HA are likely to seek a reasonable level of developer contributions towards the delivery of these or similar improvement schemes to these key junctions.

For the moment the details of these original junction improvement schemes provided by the HA have been incorporated into the modelling work to develop the overall transport strategy.

5.4 Modelling the effects of Stage 3

The initial option assessment report highlighted several junctions that were at or over capacity in the do minimum situation and these are highlighted in Table 5.1.

The majority of these junctions on the local highway network have been 'improved' in the recent past, however, based on the initial assessment of the future year models, these previous improvements appear not to operate effectively once the increased levels of traffic associated with Growth Point proposals are introduced. Therefore further improvements are likely to be required at these locations.

The final list of junctions and their proposed improvements will be based upon the assignment results of Stage 2 of the strategy. This assignment will already include traffic reductions from the sustainable transport measures and bus improvements introduced into the network. By using these assignment results to determine the junctions to be improved we will prevent ourselves from over specifying junction improvements in terms of capacity. As discussed in Chapter 2 all improvements must be deliverable within the existing highway boundary. The specified improvements will be modelled by changing the coding of individual junctions to simulate the effects of changing geometric characteristics, introducing a new form of junction or varying the way signals operate etc.

The junctions that we have coded capacity improvements for are as shown in Table 5.3, along with a description of the improvement that has been included.

Table 5.3 – Junctions which have been improved in Do Something 3 (DS3)

Junction	Improvement included within DS3
A38(T) Clay Mills	Scheme proposed by Highways Agency (see Volume 2)
A38(T) Branston	Scheme proposed by Highways Agency (see Volume 2)
Main Street/Wellington Road	Signal timings optimised for forecast traffic flows.
Wellington Road/Parkway	Increased the saturation flows of the approach arms to provide minor improvements and allow more realistic simulation of junction.
Wellington Road/Shobnall Road	Adjusted the saturation flows of the approach arms to provide minor improvements and allow more realistic simulation of junction.
A511/A5121 Derby Turn Junction	Recoded junction as a roundabout (as in Base Year model)
Derby Road/Hawkins Lane	Adjusted the saturation flows of the approach arms to provide minor improvements and allow more realistic simulation of junction.
Main Street/St Peter's Street	Junction improved to provide 3 lanes on the southern entry arm, one of which is a bus lane. Improvement should be possible within existing highway boundary.
Stapenhill Road/Newton Road/Ashby Road	Optimised signal timings for forecast traffic flows.

In addition to the above it should be noted that a significant improvement is assumed within the Do Minimum at the junction of Beam Hill Road and Tutbury Road, as without this improvement it would not be possible to accommodate the housing developments proposed at Beamhill and Harehedge Lane.

We have been supplied with details of the A38 junction improvements by the Highways Agency. These will also be added into the Burton Transport Model as part of this stage of the transport strategy development.

The package of proposed highway improvement schemes should be included in the 2006 Do Minimum network. An assignment of the trip matrix resulting from the Stage 1 Tests should then be made and the key performance statistics and indicators should be generated. A 2026 Stage 2 Network will result from this test

5.5 Appraising the results of Stage 3

To avoid the over provision of highway capacity we have examined the performance of the junctions which have still got indicated capacity related issues following the application of the measures proposed in Stage 1 and 2 of the strategy development process.

The introduction of these measures, in particular the proposed improvements at the A38(T) Clay Mills junction do have some noticeable effects within Burton. The Clay Mills improvement seems to be leading to some strategic route reassignments within Burton and the surrounding area. This suggests that the improvement does not perform as well as expected and should therefore be subject to further examination by the Highways Agency.

Plan 5.7 (in Volume 2 of this report) shows the SATURN plot of the differences in traffic flow between DS3 and the Do Minimum in the AM peak period. As can be seen, DS3 leads to significant reductions in traffic flow over some of the Burton area in the AM Peak period. However, this is offset by increases in traffic flow in other areas.

Plan 5.7 shows that there have been reductions in flow, greater than 200 vehicles on:

- A5121 Derby Road; and
- B5017 Shobnall Road.

However, there are also increases in traffic flow greater than 200 vehicles on:

- A511 Tutbury Road and Horninglow Road; and
- A5121 Wellington Road.

Improvements in V/C ratios are noted on several links around the town centre area including Station Street and Horninglow Street. The effect of the measures on key junctions in the 2026 AM Peak Period are shown in Table 5.3. The table also shows for comparison purposes the V/C ratios at the junctions from the Do Minimum, DS1 and DS2 model tests.

Table 5.4 - Comparison of V/C Ratios 2026 AM Peak

Junction	2026 AM Do Minimum V/C Ratio (%)	2026 AM DS1 V/C Ratio (%)	2026 AM DS2 V/C Ratio (%)	2026 AM DS3 V/C Ratio (%)
A511/A5121 Derby Turn Junction	102%	102%	102%	92%
Shobnall Road / Wellington Road Junction	87%	84%	92%	83%
Shobnall Road / Shobnall Street Junction	91%	92%	93%	93%
St Peters Bridge / Stapenhill Road	96%	96%	97%	93%

Table 5.4 shows that the measures included in Stage 3 have had significant effects in improving the operational capacity of some key junctions within Burton. However the constraints that we are working within (that all improvements must be delivered within the existing highway boundary) has restricted the scale of the capacity enhancements and hence improvements in V/C ratios that are achievable at some junctions.

Plan 5.8 (in Volume 2 of this report) show the SATURN plot of the differences in traffic flow between Stage 3 and the Do Minimum in the PM peak period. As can be seen, Stage 3 leads to reductions in traffic flow over some of the Burton area in the PM Peak period. However, this is offset by increases in traffic flow in other areas.

Plan 5.8 shows that there have been reductions in flow, greater than 200 vehicles on:

- A5121 Derby Road; and
- B5017 Forest Road.

However, there are also increases in traffic flow greater than 200 vehicles on:

- A511 Horninglow Road
- Newton Road; and
- St Peters Bridge.

Table 5.5 Shows the Volume / Capacity Ratios (V/C) for a selection of key junctions in the 2026 PM Peak Period for both the Do Minimum and Stage 2 scenarios.

Table 5.5 - Comparison of V/C Ratios 2026 PM Peak

Junction	2026 PM Do Minimum V/C Ratio (%)	2026 PM DS1 V/C Ratio (%)	2026 PM DS2 V/C Ratio (%)	2026 PM DS3 V/C Ratio (%)
A511/A5121 Derby Turn Junction	107%	104%	103%	86%
A5121 Derby Street / Victoria Road	89%	84%	80%	78%
A511 Horninglow Street / Guild Street	95%	86%	85%	87%
Guild Street / Station Street	90%	86%	86%	78%
Branston Road / St Peters Bridge	96%	95%	94%	95%
St Peters Bridge / Stapenhill Road	95%	95%	94%	91%
Shobnall Road / Shobnall Street Junction	97%	97%	103%	101%

Table 5.5 shows that the effects of the measures included in Stage 3 have led to significant improvements at some of the most congested junctions in Burton. A significant improvement is noted at the A511/A5121 Derby Turn Junction (-17%), improvements are also noted at:

- A5121 Derby Street / Victoria Road (-2%);
- Guild Street / Station Street (-8%); and

- St Peters Bridge / Stapenhill Road (-3%).

The overall statistics for this test, shown in Table 5.6, indicate that the measures assumed in DS3 are having beneficial effects leading to reductions in vehicle hours and vehicle kilometres together with a modest increase in average vehicle speeds, indicating that there has been a reduction in the overall levels of congestion when compared to the Do Minimum scenario in both of the AM and PM peak periods. A complete set of KPIs for this and all other model tests completed as part of the detailed strategy appraisal is included in Volume 2 of this report.

Table 5.6 – Performance of Option 3 DS3 compared to Option 3 Do Minimum

- Sub Objectives	Option 3 DM		Option 3 DS2		Option 3 DS3	
	AM	PM	AM	PM	AM	PM
Vehicle Hours	22936	21762	21865	20754	21588	20689
% Change Relative to DM			**-4.7%**	**-4.6%**	**-5.9%**	**-4.9%**
Vehicle Kilometres	1341495	1294867	1317440	1268761	1315135	1268091
% Change Relative to DM			**-1.8%**	**-2.0%**	**-2.0%**	**-2.1%**
Vehicle Speeds (km/hr)	58.5	59.5	60.3	61.1	60.9	61.3
% Change Relative to DM			**3.0%**	**2.7%**	**4.2%**	**3.0%**
Average Trip Length (km)	18.4	18.8	18.5	18.9	18.4	18.9
% Change Relative to DM			**0.3%**	**0.5%**	**0.1%**	**0.3%**
Total Demand Flow	72769	68703	71218	66961	71296	67048
% Change Relative to DM			**-2.1%**	**-2.5%**	**-2.0%**	**-2.4%**
Development Demand	12192	13837	11213	12703	11167	12626
% Change Relative to DM			**-8.0%**	**-8.2%**	**-8.4%**	**-8.7%**

The results presented in Table 5.6 are incremental, i.e. the results shown for DS3 also include the effects of the measures included at DS1 and DS2 as well.

Changes in V/C ratios for individual links and junctions following the introduction of the measures in DS3 can be found in Volume 2 of this report.

5.6 Summary of Stage 3 Results

Table 5.7 - Comparison of Stage 3 Results against Strategy Objectives

DaSTS Goals	Local Objective	Source	Stage 1 - Enhancing Sustainability of New Developments	Stage2 - Promoting Active Modes / PT	Stage 3 - Making Best Use	Overall Strategy
Tackle Climate Change	Reduce reliance on private cars;	Staffs LTP	✓✓✓	✓✓✓	×	✓✓
	Reduce transport related pollution; and	Staffs LTP	✓✓	✓✓	✓	✓✓
	Reduce the impact of road freight.	Staffs LTP	0	0	✓✓	✓✓
	Manage car parking to improve enforcement and to discourage reliance on the private car for work and other journeys where there are effective alternatives;	Staffs LTP	0	✓	0	✓
Support Economic Growth	Exploit existing public transport networks in determining the most sustainable locations for growth;	DCLG	✓✓✓	✓✓✓	✓	✓✓✓
	Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.	DCLG	✓	✓✓	✓✓	✓✓
	Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities;	DCLG	✓	0	0	✓

Promote Equal Opportunity	Improve accessibility for everyone particularly those with special needs	Staffs LTP	✓	✓✓	0	✓✓
	Promote land-use patterns which can be served by a range of transport modes;	Staffs LTP	✓✓✓	✓✓✓	✓	✓✓✓
	Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport	DCLG	✓✓✓	✓✓✓	0	✓✓✓
Improve Quality of Life	Improve the quality of the local environment and attractiveness of town centres, local centres, residential and other sensitive areas;	Staffs LTP	✓	✓✓	0	✓✓
	Improve the availability, accessibility, efficiency, and attractiveness of walking, cycling, and public transport;	Staffs LTP	✓✓	✓✓✓	✓	✓✓✓
	Make it easier for people to switch between different forms of transport;	Staffs LTP	✓✓✓	✓✓✓	0	✓✓✓
Better Safety, Security and Health	Improve personal security, road safety,	Staffs LTP	✓	✓✓	✓	✓✓

Key:

✓✓✓	Very positive effect	✕	Slightly negative effect
✓✓	Positive effect	✕✕	negative effect
✓	Slightly positive effect	✕✕✕	Very negative effect
0	Neutral		

5.7 Conclusions

Measures to make the best use of the existing transport network, that have been tested as part of the strategy development process included:

- Signal Optimisation (for existing signalised junctions);
- Junction Signalisation;
- Minor junction capacity improvements (localised widening etc.); and
- Major junction capacity improvements (on the Trunk Road network).

It can be concluded that most of the interventions have had positive effects, however the scale of the impacts that each measure is having is constrained by either:

- The physical constraints on the transport network; and
- The limitations of our modelling methodologies.

It is clear from our testing that the measures that we have tested as part of Stage 3 have delivered or have the potential to deliver significant benefits within Burton. All of the measures that we have tested can be delivered within the highway boundary. However, in certain locations the scale of improvement that could be delivered within the existing highway boundary is insufficient to address the full scale of the future congestion problems. Therefore, we conclude that it may be necessary in certain locations for the county council to consider transport network improvements that cannot be delivered without acquiring third party land. This adds an additional level of cost and uncertainty with regard to delivering improvements, but may be the only way in which some problems can be addressed. Particularly when you consider the significant growth that is forecast in traffic by 2026 which is associated with the growth point proposals.

Therefore we conclude that measures of this type should form part of the transport strategy to support the Burton Growth Point. However, it is apparent that these measures, in addition to those described in Stage 1 and 2, cannot address all of the transport issues within Burton.

It is clear from our testing that these measures do not fully mitigate the effects of car traffic generated by the new development sites. This can be evidenced by the small changes observed in the V/C ratios at the most congested junctions and the small changes in overall transport demand within the area.

Therefore despite the introduction of the Stage 3 measures there are still significant residual problems upon the transport network which require addressing. This means that additional measures must be investigated for inclusion within the transport strategy to support the Burton Growth Point.

5.8 Recommendations

Following the completion testing for Stage 3 of the Transport Strategy we make the following recommendations:

- **Measures to make best use of the existing transport network need to be introduced to tackle some of the current and forecast capacity bottlenecks;**
- **The County Council need to consider the possibility of introducing highway measures that extend outside of the current highway boundary in some locations. Testing has shown that the benefits of permitting this may exceed the costs of doing so; and**
- **Additional strategy interventions will be needed over and above the measures tested at Stage 3 to fully address the transport impacts of the Burton Growth Point Proposals.**

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6. Stage 4 – New Transport Infrastructure

6.1 Strategy Rationale

For a sustainable transport strategy, new transport infrastructure should only be considered once all other measures have been applied and evaluated. In this case we have already completed three stages of strategy development, including:

- **Stage 1** – Measures to increase the sustainability of new developments;
- **Stage 2** – Measures to increase the use of active modes and public transport; and
- **Stage 3** – Measures to make better use of the existing transport networks.

At the conclusion of Stage 3 there are still significant transport related problems in terms of congestion and capacity which need to be addressed to ensure that there is an efficient transport system within Burton. Therefore we need to consider as part of the strategy development process measures to provide new infrastructure where there are residual transport capacity issues following the application of stages 1 to 3.

Analysis of the traffic model output has indicated that there are significant problems in accommodating the traffic from the SUE sites to the west of Burton. This is evidenced by analysing the V/C ratios of the key links which these developments load their traffic onto.

Table 6.1 provides a snapshot of the V/C ratios for the links closely related to the SUE sites. It can be seen, that even with the introduction of the Stage 3 measures that the highway network in the vicinity of the development sites has to cater for traffic demands in excess of their operational capacities.

Table 6.1 – V/C ratios for links close to the SUE sites, 2026 AM Peak

Road Link Name	2026 AM Peak DS3 V/C Ratio (%)
Harehedge Lane	105%
A511 Tutbury Road (South of Harehedge Lane)	111%
Rolleston Road (South of Harehedge Lane)	104%
A511 Horninglow Road (South of Rolleston Road)	96%
Bitham Lane	106%
Shobnall Street	105%

In view of the findings shown in Table 6.1, we need to consider ways in which we can remove traffic from these roads and provide a more appropriate route for them to use to access their destination.

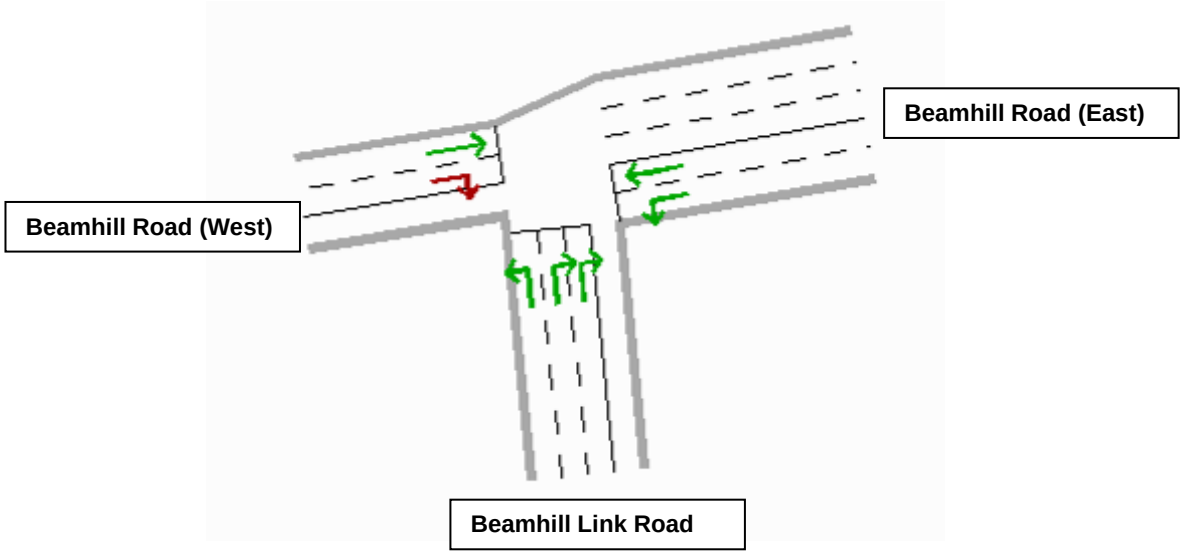
Therefore we propose to test the effect of a series of new link roads to provide access from the SUE sites to the main new employment areas within Burton and also to the trunk road network, without having to travel through the centre of Burton, or along roads which are already at or over capacity.

The links that we propose to test are:

- Beamhill Link Road – (Beamhill Road to Shobnall Road);
- Lawns Farm Link Road (Shobnall Road to A38 Branston Junction – proposed within the Lawns Farm Masterplan – (see Plan 4.4 Volume 2 of report); and
- Branston South Link Road plus New A38 Junction (proposed as part of Branston development).

It is worth considering the significant assumptions which were made in order to test the effectiveness of the link roads, in particular the connecting junctions with Beamhill Road and Shobnall Road. Figure 6.1 shows the assumed junction arrangement that would be required to provide sufficient capacity at the junction of the Beamhill Link Road and Beamhill Road.

Figure 6.1 – Assumed SATURN Junction Layout for Beamhill Road / Beamhill Link Road junction



Providing the necessary junction between the link road and Beamhill Road would require a significant localised widening of Beamhill Road. The constrained nature of this road means that acquisition of third party land, and potentially property demolitions, would be required to provide a junction with sufficient capacity in this location.

Whilst this is not impossible to deliver, it places a great many constraints and uncertainties regarding the delivery of this particular piece of infrastructure.

Similar issues are apparent with the remainder of the Beamhill Link Road, not least the lack of a current policy basis for taking the scheme forward, and the likely physical issues with delivering this link due o the topography of the area over which it passes.

6.2 Modelling the effects of Stage 4

New road links are proposed to enable some of the major housing and employment sites to come forward. These are:

- Branston South Link Road + New A38 Junction;
- Beamhill Link Road – (Shobnall Road to Beamhill Road); and
- Lawns Farm Link Road (Branston Junction to Shobnall Road).

The alignments for the routes of the link roads are purely indicative and have been drawn on the map to indicate potentially suitable routes. The link roads were tested within the SATURN model on the basis of providing straight line links from and between the housing developments on to the

existing highway network. The exception to this is Lawns Farm, where the route is based upon that shown on the indicative site Masterplan as shown on Plan 4.4 in Volume 2 of this report.

Further investigations are required to confirm the viability or otherwise of the proposed routes in terms of physical and policy constraints. This is beyond the scope of this current study, but will need addressing prior to taking these particular proposals forward.

We have assumed that these new links will have a maximum design speed of 64kph (40mph) and will generally be of single carriageway construction of a standard 7.3m width. Nominal junctions will be designed where the details are not known; this applies particularly to the Beamhill Link Road. The locations of these new link roads are shown on Plan 6.1 contained within Volume 2 of this report.

The 40mph design speed has been assumed for the following reasons:

- This design speed will make the new transport links more attractive for trips which may have an alternative shorter, but slower route to their destination on the existing highway network; and
- As these links are likely to form the main distributor roads through the development sites we have assumed that there would be no direct frontage access from them. This will enable them to perform their role of carrying traffic through and away from the development site without significant on street impediments.

The Lawns Farm Link Road will act as a through route in this scenario so that traffic from the Beamhill area can access the A38 without having to travel through town.

6.3 Appraising the results of Stage 4

The new link roads have been incorporated into a model test called Do Something 4 (DS4).

Plan 6.2 (in Volume 2 of this report) shows the SATURN plot of the differences in traffic flow between DS4 and the Do Minimum in the AM peak period. As can be seen, DS4 leads to significant reductions in traffic flow in the areas to the west of Burton.

In particular the roads which provide an alternative access from Beamhill such as Main Road and Hopley Road via Anslow experience a significant reduction in traffic following the introduction of the new link roads. This is illustrated in Table 6.2 which shows the changes between DS4, DS3 and Do Minimum to highlight the changes that are attributable to introducing the new link roads.

Table 6.2 – Changes in traffic flow (2026 AM Peak) following the introduction of new link roads

Road Name	Difference in traffic flow DS4 – DM	Difference in traffic flow DS4 – DS3
Main Road (Anslow)	-643	-225
Hopley Road (Anslow)	-728	-307
Postern Road (Rough Hey)	-372	-164
B5017 Henhurst Hill (Rough Hay)	-425	-233
B5017 Forest Road	-384	-180

Table 6.1 shows the effect that the introduction of the link roads has compared to Stage 3 (DS3) and the Do Minimum situation.

It is evident that the measures introduced in stages 1 to 3 have enabled development traffic to make more direct routes to their destinations rather than making long detours via the rural road

network, hence the continuing high demand for travel on routes such as the A511 Tutbury Road and Horninglow Road.

In the 2026 AM Peak Period the new link roads appear to provide more relief to the rural road network than the urban network, in particular the A511 through Horninglow. This is to be expected as the new link roads provide a shorter and faster route to the majority of destinations within Burton. The Lawns Farm Link Road also provides a new route to the A38 Trunk Road to the Beamhill area without having to travel through Burton, the transport model suggests that this link would be heavily utilised carrying up to 1600 vehicles in the AM Peak Period.

Table 6.3 Shows the Volume / Capacity Ratios (V/C) for a selection of key junctions in the 2026 AM Peak Period for both the Do Minimum and DS1, 2, 3 and 4 scenarios.

Table 6.3 – Comparison of V/C Ratios 2026 AM Peak

Junction	2026 AM Do Minimum V/C Ratio (%)	2026 AM DS1 V/C Ratio (%)	2026 AM DS2 V/C Ratio (%)	2026 AM DS3 V/C Ratio (%)	2026 AM DS4 V/C Ratio (%)
A511/A5121 Derby Turn Junction	102%	102%	102%	92%	91%
Shobnall Road / Wellington Road Junction	87%	84%	92%	83%	84%
Shobnall Road / Shobnall Street Junction	91%	92%	93%	93%	89%
St Peters Bridge / Stapenhill Road	96%	96%	97%	93%	94%

Table 6.3 shows that the effects of the new link roads included in Stage 4 have not led to significant improvements at some of the most congested junctions in Burton. A minor improvement is noted at the B5017 Shobnall Road / Shobnall Street junction. However, this junction is still forecast to be operating above capacity in the 2026 forecast year. The reasons for these results are that:

- The link roads are addressing issues to the west of Burton, mainly reducing the level of previously 'rat-running' traffic on the rural road network; and
- Some of the key junctions (St Peters Bridge for example) are remote from where the link roads are introduced and therefore are not likely to benefit from strategic reassignment effects.

Table 6.4 shows the changes in V/C ratios for key links following the introduction of the new link roads in stage 4 of the strategy development process.

Table 6.4 – V/C ratios for links close to the SUE sites, DS4, 2026 AM Peak

Road Link Name	2026 AM Peak DS3 V/C Ratio (%)	2026 AM Peak DS4 V/C Ratio (%)
Harehedge Lane	105%	105%
A511 Tutbury Road (South of Harehedge Lane)	111%	110%
Rolleston Road (South of Harehedge Lane)	104%	104%
A511 Horninglow Road (South of Rolleston Road)	96%	92%
Bitham Lane	106%	103%
Shobnall Street	105%	104%

The results shown in Table 6.4 show that the proposed new link roads are not providing congestion relief to the key links adjacent to the SUE development sites. Therefore in the AM Peak period it must be concluded that that link roads, whilst providing needed additional capacity to the system, do not fully address the primary problems of queues and delays on the existing highway network in the vicinity of the proposed SUE developments.

Plan 6.3 (in Volume 2 of this report) shows the SATURN plot of the differences in traffic flow between DS4 and the Do Minimum in the PM peak period. As can be seen, DS4 leads to significant reductions in traffic flow in the areas to the west of Burton.

In particular the roads which provide an alternative access from Beamhill such as Main Road and Hopley Road via Anslow experience a significant reduction in traffic following the introduction of the new link roads. This is illustrated in Table 6.5 which shows the changes between DS4, DS3 and Do Minimum to highlight the changes that are attributable to introducing the new link roads.

Table 6.5 – Changes in traffic flow (2026 PM Peak) following the introduction of new link roads

Road Name	Difference in traffic flow DS4 – DM	Difference in traffic flow DS4 – DS3
Main Road (Anslow)	-512	-151
Hopley Road (Anslow)	-613	-196
Postern Road (Rough Hey)	-314	-238
B5017 Henhurst Hill (Rough Hay)	-531	-155
B5017 Forest Road	-500	-97

Table 6.4 shows the effect that the introduction of the link roads has compared to Stage 3 (DS3) and the Do Minimum situation in the PM Peak period.

As observed in the AM Peak, it is evident that the measures introduced in stages 1 to 3 have enabled development traffic to make more direct routes to their destinations rather than making long detours via the rural road network, hence the continuing high demand for travel on routes such as the A511 Tutbury Road and Horninglow Road.

In the 2026 PM Peak Period, as in the AM Peak, the new link roads appear to provide more relief to the rural road network than the urban network, in particular the A511 through Horninglow. This is to be expected as the new link roads provide a shorter and faster route to the majority of

destinations within Burton. The Lawns Farm Link Road also provides a new route to the A38 Trunk Road to the Beamhill area without having to travel through Burton, the transport model suggests that this link would be heavily utilised carrying over 1600 vehicles in the PM Peak Period.

Table 6.6 Shows the Volume / Capacity Ratios (V/C) for a selection of key junctions in the 2026 PM Peak Period for both the Do Minimum and DS1, 2, 3 and 4 scenarios.

Table 6.6 – Comparison of V/C Ratios 2026 PM Peak

Junction	2026 PM Do Minimum V/C Ratio (%)	2026 PM DS1 V/C Ratio (%)	2026 PM DS2 V/C Ratio (%)	2026 PM DS3 V/C Ratio (%)	2026 PM DS4 V/C Ratio (%)
A511/A5121 Derby Turn Junction	107%	104%	103%	86%	84%
A5121 Derby Street / Victoria Road	89%	84%	80%	78%	74%
A511 Horninglow Street / Guild Street	95%	86%	85%	87%	86%
Guild Street / Station Street	90%	86%	86%	78%	78%
Branston Road / St Peters Bridge	96%	95%	94%	95%	95%
St Peters Bridge / Stapenhill Road	95%	95%	94%	91%	92%
Shobnall Road / Shobnall Street Junction	97%	97%	103%	101%	99%

The results presented in Table 6.6 are incremental, i.e. the results shown for DS4 also include the effects of the measures included at DS1, DS2 and DS3 as well.

Table 6.6 shows that the effects of the new link roads included in Stage 4 have not led to significant improvements at some of the most congested junctions in Burton. The reasons for these results are that:

- The link roads are addressing issues to the west of Burton, mainly reducing the level of previously ‘rat-running’ traffic on the rural road network; and
- Some of the key junctions (St Peters Bridge for example) are remote from where the link roads are introduced and therefore are not likely to benefit from strategic reassignment effects.

Table 6.7 shows the changes in V/C ratios (in the PM Peak Period) for key links following the introduction of the new link roads in stage 4 of the strategy development process.

Table 6.7 – V/C ratios for links close to the SUE sites, DS4, 2026 PM Peak

Road Link Name	2026 PM Peak DS3 V/C Ratio (%)	2026 PM Peak DS4 V/C Ratio (%)
Harehedge Lane	86%	89%
A511 Tutbury Road (South of Harehedge Lane)	91%	86%
Rolleston Road (South of Harehedge Lane)	48%	52%
A511 Horninglow Road (South of Rolleston Road)	102%	102%
Bitham Lane	100%	100%
Shobnall Street	91%	86%

The results shown in Table 6.7 show that the proposed new link roads are not providing congestion relief to the key links adjacent to the SUE development sites. Therefore in the PM Peak period , consistent with the AM Peak, it must be concluded that that link roads, whilst providing needed additional capacity to the system, do not address the primary problems of queues and delays on the existing highway network in the vicinity of the proposed SUE developments.

The statistics for this test, shown in Table 6.8, indicate that the measures assumed in DS4 are having beneficial effects at the overall strategic level, leading to reductions in vehicle hours and vehicle kilometres together with a modest increase in average vehicle speeds, indicating that there has been some reduction in the levels of congestion when compared to the Do Minimum scenario in the AM Peak Periods.

A complete set of KPIs for this and all other model tests completed as part of the detailed strategy appraisal is included in Volume 2 of this report.

Table 6.8 - Performance of Option 3 DS4 compared to Option 3 Do Min

Sub Objectives	Option 3 DM		Option 3 DS4	
	AM	PM	AM	PM
Vehicle Hours	22936	21762	21491	20624
% Change Relative to DM			**-6.3%**	**-5.2%**
Vehicle Kilometres	1341495	1294867	1313618	1268862
% Change Relative to DM			**-2.1%**	**-2.0%**
Vehicle Speeds (km/hr)	58	60	61.1	61.5
% Change Relative to DM			**4.5%**	**3.4%**
Average Trip Length (km)	18	19	18.4	18.9
% Change Relative to DM			**-0.1%**	**0.3%**
Total Demand Flow	72769	68703	71342	67093
% Change Relative to DM			**-2.0%**	**-2.3%**
Development Demand	12192	13837	11167	12626
% Change Relative to DM			**-8.4%**	**-8.7%**

6.3.1 Opportunities provided by the new link roads

The introduction of the Beamhill Link road provides the opportunity to provide a new access to Queens Hospital. Currently the main route to the Hospital from the south of the town is via Shobnall Road and Shobnall Street. This junction has been identified as part of this study as being particularly congested. However the very constrained nature of this junction means that there is very limited scope to reduce congestion at this junction. Therefore for an additional model test we have introduced a new link between the Beamhill Link road and Belvedere Road to provide a new access route into Queens Hospital; this is shown in Plan 6.4 (in Volume 2 of this report). In conjunction with this we have altered the Shobnall Road / Shobnall Street junction so that it can only be used 'left-in' 'left out'. This arrangement removes the problematic right turns from this junction freeing up capacity along Shobnall Road. This test is referred to as Do Something 4A (DS4A).

The results of this test have demonstrated, as expected, that the introduction of the new hospital link and the access restrictions on Shobnall Street lead to reductions in traffic volumes of over 200 vehicles in the AM Peak when compared to the Stage 4 (DS4) Scenario.

Table 6.9 shows the changes in V/C ratios (in the AM Peak Period) for key links following the introduction of the new link roads and access to the Hospital in as tested in DS4A of the strategy development process.

Table 6.9 – V/C ratios for links close to the SUE sites, DS4, 2026 PM Peak

Road Link Name	2026 AM Peak DS4 V/C Ratio (%)	2026 AM Peak DS4A V/C Ratio (%)
Harehedge Lane	105%	96%
A511 Tutbury Road (South of Harehedge Lane)	110%	81%
Rolleston Road (South of Harehedge Lane)	104%	97%
A511 Horninglow Road (South of Rolleston Road)	92%	80%
Bitham Lane	103%	106%
Shobnall Street	104%	98%

It can be seen that the provision of a new access route to the hospital has a significant effect upon trip assignment and routing within the local area as evidenced by the significant improvements in the V/C ratios shown in Table 6.9.

However, these improvements are obtained at the expense of increases in traffic flows on roads such as Wyggeston Street and Belvedere Road in the order of 130 to 160 vehicles in the AM Peak period respectively.

Therefore, whilst the new Hospital access and changes to Shobnall Street address some of the issues associated with the Growth Point proposals, they only do so by creating secondary problems. These problems, such as increased traffic levels in the residential areas surrounding the hospital are undesirable and would require significant effort to mitigate.

The key statistics for the DS4A test are shown in Table 6.10.

Table 6.10 – Performance of Option 3 DS4A compared to Option 3 Do Min

Sub Objectives	Option 3 DM		Option 3 DS4A	
	AM	PM	AM	PM
Vehicle Hours	22936	21762	21338	20542
% Change Relative to DM			**-7.0%**	**-5.6%**
Vehicle Kilometres	1341495	1294867	1313501	1267447
% Change Relative to DM			**-2.1%**	**-2.1%**
Vehicle Speeds (km/hr)	58	60	61.6	61.7
% Change Relative to DM			**5.2%**	**3.7%**
Average Trip Length (km)	18	19	18.4	18.9
% Change Relative to DM			**-0.2%**	**0.2%**
Total Demand Flow	72769	68703	71385	67083
% Change Relative to DM			**-1.9%**	**-2.4%**
Development Demand	12192	13837	11167	12626
% Change Relative to DM			**-8.4%**	**-8.7%**

The statistics for this test, shown in Table 6.10, indicate that the new link to Queens Hospital, as well as the Shobnall Street changes that are included in DS4A are having overall strategic beneficial effects leading to further reductions in vehicle hours and vehicle kilometres together with an increase in average vehicle speeds, indicating that this test has led to a reduction in the level of congestion when compared to both the DS4 and Do Minimum scenarios in both of the AM and PM peak periods.

However, the strategic benefits are masking some local issues in the vicinity of the hospital, particularly increased traffic flows, which are undesirable.

Plan 6.5 & 6.6 in Volume 2 of this report, show SATURN plots of the differences in traffic flow between DS4A and the Do Minimum in the AM and PM peak periods. A complete set of KPIs for this and all other model tests completed as part of the detailed strategy appraisal is included in Volume 2 of this report. Changes in the V/C ratios for individual links and junctions following the introduction of the measures in DS4A can also be found in Volume 2.

6.4 Summary Results for Stage 4

Table 6.11 - Comparison of Stage 1 Results against Strategy Objectives

DaSTS Goals	Local Objective	Source	Stage 1 - Enhancing Sustainability of New Developments	Stage2 - Promoting Active Modes / PT	Stage 3 - Making Best Use	Stage 4 - New Infrastructure	Overall Strategy
Tackle Climate Change	Reduce reliance on private cars;	Staffs LTP	✓✓✓	✓✓✓	×	×	✓✓
	Reduce transport related pollution; and	Staffs LTP	✓✓	✓✓	✓	✓	✓✓
	Reduce the impact of road freight.	Staffs LTP	0	0	✓✓	✓✓	✓✓
	Manage car parking to improve enforcement and to discourage reliance on the private car for work and other journeys where there are effective alternatives;	Staffs LTP	0	✓	0	0	✓
Support Economic Growth	Exploit existing public transport networks in determining the most sustainable locations for growth;	DCLG	✓✓✓	✓✓✓	✓	0	✓✓✓
	Note that the Highways Agency is required to protect the service levels on the strategic road network and may need to introduce restraints on access to that network.	DCLG	✓	✓✓	✓✓	✓	✓✓

	Minimise any increase in long-distance commuting by the appropriate alignment of housing and employment opportunities ;	DCLG	✓	0	0	0	✓
Promote Equal Opportunity	Improve accessibility for everyone particularly those with special needs	Staffs LTP	✓	✓✓	0	0	✓✓
	Promote land-use patterns which can be served by a range of transport modes;	Staffs LTP	✓✓✓	✓✓✓	✓	✓	✓✓✓
	Ensure that the design and location of new developments enables access to employment opportunities and key services by bicycle, walking and public transport	DCLG	✓✓✓	✓✓✓	0	0	✓✓✓
Improve Quality of Life	Improve the quality of the local environment and attractiveness of town centres, local centres, residential and other sensitive areas;	Staffs LTP	✓	✓✓	0	✓	✓✓
	Improve the availability, accessibility, efficiency, and attractiveness of walking, cycling, and public transport;	Staffs LTP	✓✓	✓✓✓	✓	0	✓✓✓

	Make it easier for people to switch between different forms of transport;	Staffs LTP	✓✓✓	✓✓✓	0	0	✓✓✓
Better Safety, Security and Health	Improve personal security, road safety,	Staffs LTP	✓	✓✓	✓	✓	✓✓

Key:

✓✓✓	Very positive effect
✓✓	Positive effect
✓	Slightly positive effect
0	Neutral
✕	Slightly negative effect
✕✕	negative effect
✕✕✕	Very negative effect

6.5 Conclusions

The rationale for Stage 4 of the strategy development process was that the measures proposed in Stages 1 to 3 combined had not fully addressed the transport problems associated with the Growth Point proposals, in particular the SUE developments to the west of Burton. Therefore this stage tested the effectiveness of providing new link roads to provide alternative access routes to the SUE development sites.

The testing of these link roads showed that from the strategic perspective they provided some significant benefits as evidenced from the improvements in some of the modelled KPIs. However, detailed examination reveals that the major beneficiaries of the new link roads are not the congested existing routes into Burton from the SUEs but the rural road network which has become used as a 'rat-run'. The rural roads through Anslow, Rough Hay and Tatenhill are not suitable for carrying increased traffic volumes and the link roads provide shorter and more convenient routes for users of the rural roads to reach their destinations.

Therefore, one must conclude, that the link roads, in particular the Beamhill Link Road, provides benefits to the rural highway network, which may be very important in terms of road safety and casualty prevention, they are not the necessarily the ultimate solution to address the outstanding transport issues in the Burton area associated with the Growth Point proposals.

The deliverability of the link roads has to be a prime consideration in relation to them becoming part of the transport strategy. The link roads proposed for the Branston South and Lawns Farm developments are already part of proposals which are already within the planning process (as is the case with Branston) or forms part of a proposed development Masterplan (Lawns Farm). The proposed Beamhill Link Road does not have any status at present.

In addition, providing the necessary junction between the link road and Beamhill Road would require a significant localised widening of Beamhill Road. The constrained nature of this road means that acquisition of third party land, and potentially property demolitions, would be required to provide a junction with sufficient capacity in this location.

Whilst this is not impossible to deliver, it places a great many constraints and uncertainties regarding the delivery of the Beamhill Link Road, not least the lack of a current policy basis for taking the scheme forward, and the likely physical issues with delivering this link due o the topography of the area over which it passes.

On the basis of the testing that we have completed to date we conclude that the current quantum of development that is proposed in the SUEs to the west of Burton cannot be delivered due to the constraints on the existing transport network.

It is apparent that some development can be accommodated to the west of Burton. However, further work will be required to determine the optimum number of housing numbers and their distribution amongst the proposed SUE sites.

It is worth noting that the link roads have only been tested in combination with each other, therefore a useful piece of additional work would be to test each link in isolation to determine their individual effects.

6.6 Recommendations

Following the completion testing for Stage 4 of the Transport Strategy we make the following recommendations:

- **We recommend that further detailed analysis is undertaken on the performance of each of the link roads on an individual basis;**
- **We also recommend that further work is undertaken on the Beamhill Link Road to ascertain if it is possible to deliver a new road in this location;**
- **Our analysis to date shows that the link roads could have significant benefits on the rural road network to the west of Burton. We recommend that detailed analysis is undertaken to estimate the potential safety benefits of the link roads by removing traffic from the existing rural road network; and**
- **The Beamhill Link Road does not appear to provide the traffic relief from development traffic to the A511 corridor that could be expected. Therefore we recommend that further analysis is undertaken to determine the quantum and location of development that can be accommodated in the SUEs to the west of Burton with and without the provision of a new link road.**

7. Strategy Recommendations

Following the completion of the strategy development process, this section provides a summary of all of the recommendation that we have made.

Stage 1

- Residential and Workplace Travel Plans should form the cornerstone of the transport strategy to support the Burton Growth Point.

Stage 2

- Real Time Passenger Information services should be rolled out across the main public transport routes within Burton;
- Measures to improve bus journey time reliability and journey times should be implemented as these are key to achieving model shift within the town;
- New bus services will be required to adequately serve the SUE developments and provide suitable linkages to the town centre, employment sites and the railway station;
- Park & Ride needs to be considered as a key element of the transport strategy to support the development of the Burton Growth Point;
- Further detailed studies are required to:
  - Confirm the location of Park & Ride Sites; and
  - Provide detailed estimates of potential Park & Ride patronage.
- The County Council need to consider the possibility of introducing highway measures that extend outside of the current highway boundary in some locations. Testing has shown that the benefits of permitting this could exceed the costs of doing so.

Stage 3

- Measures to make best use of the existing transport network need to be introduced to tackle some of the current and forecast capacity bottlenecks; and
- The County Council need to consider the possibility of introducing highway measures that extend outside of the current highway boundary in some locations. Testing has shown that the benefits of permitting this may exceed the costs of doing so.

Stage 4

- We recommend that further detailed analysis is undertaken on the performance of each of the link roads on an individual basis;
- We also recommend that further work is undertaken on the Beamhill Link Road to ascertain if it is possible to deliver a new road in this location;
- Our analysis to date shows that the link roads could have significant benefits on the rural road network to the west of Burton. We recommend that detailed analysis is undertaken to estimate the potential safety benefits of the link roads by removing traffic from the existing rural road network; and
- The Beamhill Link Road does not appear to provide the traffic relief from development traffic to the A511 corridor that could be expected. Therefore we recommend that further analysis is undertaken to determine the quantum and location of development that can be accommodated in the SUEs to the west of Burton with and without the provision of a new link road.

We also recommend that all the sustainable transport measures we have discussed in the report would be supported by publicity and marketing campaigns. This would apply to the bus improvements and to the P+R as well.

Of all of the recommendations, the key one is the last bullet point from Stage 4. This highlights that despite the application of a wide range of measures, as part of the options that we have tested to date, that the impact of the development traffic from the SUE sites to the west of Burton is difficult to accommodate upon the highway network.

There is a level of development that can be accommodated in SUEs to the west of Burton. On the basis of our current testing we conclude that the current proposals are too intensive and probably require scaling back. Therefore, we recommend that a new study is commissioned to establish the quantum of development that can be accommodated to the west of Burton and how this should be distributed between the candidate SUE sites.

IF the quantum of development within the SUEs is scaled back, further development sites will need to be considered as candidates to accommodate the shortfall in housing numbers to deliver the full Growth Point proposals. Potential candidate sites include Lawns Farm and the former Drakelow Power Station site. We recommend that a further study is undertaken to establish the most appropriate location to accommodate the potential shortfall in the provision of Growth Point housing numbers in combination with the revised SUE development proposals.

We consider that the Stage 1 and 2 measures could deliver potentially higher benefits in terms of demand reductions or increased modal shift to sustainable transport modes; in particular there is significant scope for Park & Ride to play a significant role in addressing the traffic issues within Burton associated with the Growth Point proposals.

However, it must be remembered that the growth point proposals will lead to traffic levels more than 30% higher than they were in 2007 by 2026. In that context we consider it a prudent recommendation that the councils consider both the quantum of development that is brought forward and also its location to meet the growth point requirements.

8. The Cost of Implementing the Strategy

The cost of implementing the transport strategy will be significant. The development of over 13,000 new dwellings and 24,000 new jobs is anticipated to take place over the period 2009 – 2026 in East Staffordshire Borough. Around 11,000 of these new homes are expected to be provided within Burton

The following section will present the costs estimates for each part of the transport strategy and describes how the cost of the overall strategy could be apportioned between the various developments if a roof tax/infrastructure levy was adopted by the Council.

8.1 The Cost of Stage1

We have estimated the cost of implementing this strategy over this extended period based upon the estimated build rates for housing and job creation. This has assumed the following:

Table 8.1 – Assumptions on New Dwellings and Jobs used To Calculate the Cost of the Transport Strategy

Time Period	Assumed annual build rate of dwellings	Assumed annual rate of new job creation
2006 – 2016	650	1105
2017 - 2026	675	1334

Typical costs for RTPs and WTPs were discussed in Chapter 3. These were:

- RTP - £29 per household per year; and
- WTP - £47 per employee per year.

We have assumed that we would secure 5 years funding for such measures from each development type.

On this basis the total cost for RTPs/WTPs is

- RTP - £1,548,000; and
- WTP - £4,747,000.

The total for Stage 1 being **£6,295,000.**

Please note that the above estimates do not include for the effects of inflation.

A detailed breakdown of the derivation of these costs is included in Appendix A.

8.2 The Cost of Stage 2

Within this element we have assumed the following:

- Pedestrian Improvements (Based upon the costs used in the CIF bid proposals) - £775,000;
- Cycling Improvements (Based upon the costs used in the CIF bid proposals) - £565,000;
- RTPI - Roll Out across town / entire bus fleet (including 150 RTPI signs) - £1,803,000;
- 4 New Buses to operate new bus routes (and initial subsidy) - £1,023,000; and
- New park & ride services including provision of sites and new buses - £2,767,000.

Total Cost of this Strategy Element - **£6,933,000.**

8.3 The Cost of Stage 3

Table 8.2 shows the junction improvement measures and costs that have been included within Stage 3 of the strategy development process.

Table 8.2 – Stage 3 Junction Improvements

Junction	Nature of Improvement	Cost of Improvement
Main Street/Wellington Road	Signal timings optimised for forecast traffic flows.	£5,000 (includes for monitoring and review of results and further adjustment of signals)
Wellington Road/Parkway	Increased the saturation flows of the approach arms to provide minor improvements and allow more realistic simulation of junction.	£2,000 (*)
Wellington Road/Shobnall Road	Adjusted the saturation flows of the approach arms to provide minor improvements and allow more realistic simulation of junction.	£19,000 (*)
Derby Street/Horninglow Street	Recoded junction as a roundabout (as in Base Year model)	£5,000 (To optimise lane markings on approach to and around roundabout)
Derby Road/Hawkins Lane	Adjusted the saturation flows of the approach arms to provide minor improvements and allow more realistic simulation of junction.	£5,000 (To optimise lane markings on approach to and around roundabout)
St Peter's Bridge / Stapenhill Road	Junction improved to provide 3 lanes on the southern entry arm, one of which is a bus lane. Improvement should be possible within existing highway boundary.	£21,000 (*)
Stapenhill Road/Newton Road/Ashby Road	Optimised signal timings for forecast traffic flows.	£5,000 (includes for monitoring and review of results and further adjustment of signals)
Tutbury Road / Harehedge Lane	Provide an additional lane on each approach to the junction and install MOVA control	£338,000
Tutbury Road / Calais Road	Signalised pedestrian crossing linked to the RTPI system to provide bus priority	£40,000
Tutbury Road / Rolleston Road	Signalised pedestrian crossing linked to the RTPI system to provide bus priority	£40,000

(*) Costs obtained from A5189 Route Management Strategy Report

With Optimism Bias included (at 44%) the total cost of this element of the transport strategy is **£480,000.**

8.4 The Cost of Stage 4

Faithful + Gould have provided provisional estimates for constructing the Beamhill and Lawns Farm Link Roads. We have not included the cost of the Branston South Link Road as this is expected to be provided entirely at the developers cost.

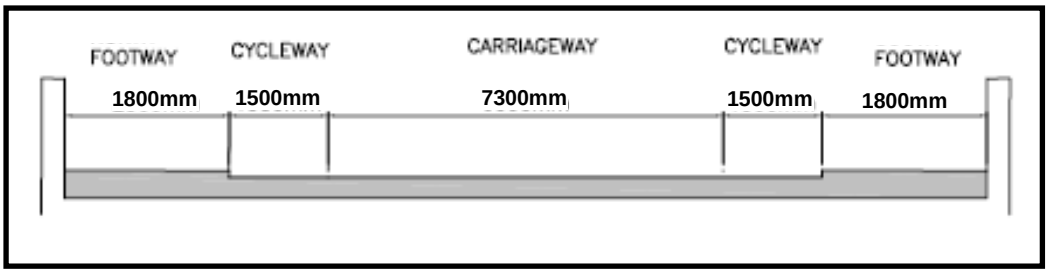
In terms of the overall funding package for the transport strategy it is considered that the costs of the link roads should be directly attributed to the developments that will make use and benefit from them rather than sharing the cost between all of the developments that will be coming forward within the Burton area. This provides more certainty with regard to the funding for delivering these key pieces of new infrastructure, which could prove problematic if a significant amount of 'other' development is required to come forward to generate the necessary funding to implement the scheme.

We have made some assumptions regarding the design standards that the new link roads would be designed to. These are:

- Carriageway Width – 7.3m;
- Design Speed – 40mph;
- Footways – 1.8m on either side of the carriageway; and
- Cycleways – 1.5m on either side of the carriageway.

A typical cross section of the new link roads is shown below in Figure 5.1.

Figure 8.1 - Typical Carriageway Cross Section for New Link Roads



The costs for the new link roads are preliminary and are based on the assumptions set out above. It is important to note that the costs for the new link roads do not include:

- Dealing with any Contaminated Land;
- Land Purchase; and
- Carriageway Lighting.

Each of the above elements could have significant costs associated with them which need to be considered when reviewing the costs for these elements.

The cost estimates for the total length of link roads are as follows:

- Beamhill Link Road - **£7,950,166**; and
- Lawns Farm Link Road - **£9,515,387.**

Both of the above estimates include an allowance for statutory undertaker's equipment diversions (particularly at the junctions with the existing network) and Optimism Bias at 44%.

It is assumed that the Lawns Farm development would have to fund the entire construction of the Lawns Farm link road. A significant length of this link road would be required to provide access

into the site as well as the necessary estate roads. It is also likely that two points of access will be required for the Lawns Farm development. This would be to address traffic management and safety concerns which could arise if a 55 hectare employment development with over 8000 employees was served from a single point of access.

A significant part of the Beamhill Link Road falls within the Beamhill and Red House Farm development sites. Therefore a significant length of the link road would be expected to be constructed as part of these developments as estate roads.

The total length of the Beamhill Link Road is 2.2km, of which 1.3km is contained within the Beamhill and Red House Farm development sites. The following lengths of the Beamhill Link Road would fall outside of the development sites:

- Between Beamhill and Red House Farm developments – 0.5km; and
- Between Red House Farm and Shobnall Road – 0.4km.

A breakdown of the cost of developing the Beamhill Link Road is shown in Table 5.2.

Table 8.3 – Cost Breakdown for the Beamhill Link Road

Link Road Section	Length of Section	Cost per Section
Beam Hill Development	0.8km	£2,877,878
Beam Hill to Red House Farm	0.5km	£1,708,674
Red House Farm Development	0.5km	£1,996,674
Red House Farm to Shobnall Road	0.4km	£1,366,939
TOTAL	**2.2km**	**£7,950,166**

Table 5.2 shows that the majority of the length of the Beamhill Link Road (1.3km) falls within the Beamhill and Red House Farm development sites.

It is proposed that the cost of providing the new link road is split proportionately between the two development sites in the following manner:

- The Beamhill development is estimated to provide 2400 new houses; and
- The Red House Farm development is estimated to provide 320 new houses
- This provides a total of 2720 new houses.
- The total cost of the link road is **£7,950,166.**
- This equates to £2923 per house, meaning that the developments contribution towards the construction of the link road would be:
    - Beamhill – **£7,014,852.35**
    - Red House Farm – **£935,313.65**

These costs would be met directly from the Beamhill and Red House Farm developments rather than as part of the overall roof tax/infrastructure levy.

8.5 Trunk Road Improvements

In addition to the improvements to the local highway network, improvements to the A38 junctions at Branston and Clay Mills have been included within the DS3/DS4/DS4A model tests. Details of these improvements were supplied by the Highways Agency.

The costs of these improvements are estimated to be:

Branston - **£6 Million**; and

Clay Mills - **£17 Million**.

The cost of these measures have not been included within the overall transport strategy as it is unclear what the delivery mechanism of these measures will be, particularly as we are aware that the HA are seeking to fund these schemes via the current round of Regional Funding Allocations (RFA).

However, a sensitivity test will be undertaken which includes these cost elements.

8.6 Cost Summary

A breakdown of the costs associated with the transport strategy is shown in Table 8.4. It is important to note that the costs include Optimism Bias at 44% (where appropriate) and that no account has been taken of inflation.

Table 8.4 – Cost Summary of Transport Strategy

Strategy Element	Item Description	Cost
Stage 1	Reducing the use of cars	£6,295,000
Stage 2	*Encouraging active modes & Public Transport*	
	Pedestrian Measures	£775,000
	Cycling Measures	£565,000
	RTPI - Roll Out across town / entire fleet	£1,803,000
	4 New Buses	£864,000
	Initial subsidy for new bus routes	£159,000
	Park & Ride	
	P&R Sites	£2,000,000
	P&R Buses (3)	£648,000
	P&R Subsidy	£119,000
Stage 3	Making best use (Local Roads)	£480,000
	Making best use (Trunk Roads)	£23,000,000
Stage 4	New infrastructure (Local Roads)	£17,466,000
	TOTAL STRATEGY COST	**£54,174,000**
	Cost of Strategy areas to be funded from Roof Tax	**£13,708,000**

The overall cost of the transport strategy can be divided into three areas:

- Integrated Transport Measures – £13.2 Million;
- Trunk Road Junction Improvements – £23 Million; and
- New Link Roads – £17.5 Million.

Of the above:

- The integrated transport improvements could be funded via a S106 roof tax / infrastructure levy on new developments proposed in the Burton area;
- The Trunk Road improvements will be funded by the Highways Agency and specific developer contributions; and
- The new Link Roads will be funded entirely by the developments that require them to provide access to their sites.

8.7 Financing the Transport Strategy

In principle the outstanding costs of delivering the integrated transport strategy could be funded by a S106 based 'roof tax' or infrastructure levy on all of the proposed development in the Burton area. However this would require ESBC to include proposals for a supplementary planning document on planning obligations in the Core Strategy.

The alternative would be to use the transport model to demonstrate functional linkage between individual developments and elements of the strategy.

Assuming the former;

The proposed development consists of an additional:

- 13,253 Houses; and
- 24,400 Jobs

The jobs will be provided via the development of significant areas of land for employment purposes.

To enable the costs of the strategy to be distributed equitably between all of the new developments it is necessary to consider them in terms of the same units of measurement.

Based upon our previous experience of this type of calculation we recommend expressing all of the developments in terms of housing units.

To calculate this we have examined the traffic generation of a particular land use type compared to the assumed residential traffic generation. Based upon this comparison we can calculate what the traffic generation of a particular type of employment land is in terms of the equivalent number of houses. Once this is known the cost of the transport strategy can be apportioned between all of the proposed developments in the Burton area.

Following discussions with the county and borough councils it has been decided to exclude the developments associated with the town centre area action plan from this calculation. This is because the AAP developments are expected to be delivered before the remainder of the Growth Point developments. If the AAP developments were tied into the same funding mechanism as the Growth Point developments there is a significant chance that insufficient developer funds would be available within the timescale necessary for the delivery of measures deemed necessary to support the AAP.

Similarly the Branston South development has been excluded from these calculations. This is because of the significant cost of infrastructure that is required to be paid for by the developer to deliver this site. There is a concern that if the developer is also required to contribute to the overall growth point fund as well it could impact upon the viability of the Branston South development..

Using the above methodology we have determined that there are **17,800** equivalent housing units proposed for the Burton area. The total cost of the part of the strategy to be funded via a roof tax / infrastructure levy is **£13.7 Million**. This gives a cost per housing unit of **£770.**

This value per dwelling is considered reasonable and comparable to what other authorities charge per dwelling. For example Derby City Council charges between **£960** and **£1,400** per dwelling as

a contribution towards delivering their transport strategy as set out in their Supplementary Planning Document on Planning Obligations adopted in December 2008.

Appendix A provides a detailed breakdown of how this amount will be distributed amongst all of the developments included in Option 3.

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9. Conclusions

The testing of the various elements of the transport strategy for Burton upon Trent has shown that it is possible to provide improvement to the operation of the transport network within the town following the implementation of the strategy when compared to the 2026 Do Minimum situation.

The Key Performance Indicators (full details of which are shown in Volume 2) show that the full strategy provides benefits to the transport network, in particular reducing levels of network stress.

The strategy testing has shown that sustainable travel measures (residential travel plans, workplace travel plans and personalised travel planning) lead to the biggest individual step change in travel demand and hence the overall efficiency of the transport network within Burton. Achieving these results will require a concentrated and sustained implementation of these measures. Over the life of the strategy implementing the sustainable transport measures at this level is estimated to cost in the region of £6.3 Million (See Appendix A for a breakdown of this cost estimate).

The coordination and management of the implementation of the sustainable transport measures is going to be key to achieving their estimated benefits. The responsibility for the coordination and management could be held by either Staffordshire County Council or East Staffordshire Borough Council. Alternatively a dedicated organisation or company could be created to undertake this role on behalf of the two councils.

The public transport interventions contained within DS2 have been shown to have significant benefits to the overall transport strategy and DS2A highlighted the potential for a Park & Ride network to reduce levels of congestion within the town.

A detailed assessment of park and ride and parking / demand management, falls outside of the remit of this current study. However it is clear that our conservative assessment of the potential for Park & Ride within Burton has indicated that there is potential for the development of a park & ride network and, that if developed it, would have a beneficial effect upon the overall transport system.

The historic nature of most of Burton's built form means that there is limited opportunities to provide significant transport capacity improvements within the existing highway boundary. We have highlighted the key locations where we have determined that improvements can be made to improve the efficiency of the transport network. It is clear that some location may benefit from the introduction of significant junction improvements. It is suggested that, in the absence of the A38 – A511 Regeneration Route, that consideration is given to bringing forward some significant junction improvements that may require land outside of the current highway boundary.

The provision of new infrastructure, in particular new link roads to the west of Burton to enable the efficient distribution of traffic from the proposed new housing sites, has been shown to be successful at improving the overall efficiency of the transport network in Burton. In particular the proposed Beamhill Link Road provide the opportunity to provide a new route to Queens Hospital enabling traffic management and other measures to be introduced in the Shobnall Street area to improve both the efficiency of the transport network in this area of Burton and also the environment for residents of this area by the removal of traffic travelling to the hospital. However, the Beamhill Link Road does not provide the expected relief to the A511 corridor through Horninglow, but it does provide significant benefits to the rural road network, bringing potentially significant safety benefits to this area.

However, even with the application of a wide range of measures, as part of the strategy options that we have tested to date, the impact of the development traffic from the SUE sites to the west of Burton is difficult to accommodate upon the highway network.

Atkins are of the opinion that there is a level of development that can be accommodated in SUEs to the west of Burton. Although, on the basis of our current testing we conclude that the current SUE proposals are too intensive and probably require scaling back. This will require a new study to establish the quantum of development that can be accommodated to the west of Burton and how this should be distributed between the candidate SUE sites.

A reduction in the scale of the proposed SUEs will lead to the requirement for additional development sites being considered as candidates to accommodate the shortfall in housing numbers to deliver the full Growth Point proposals.

Potential candidate sites include Lawns Farm and the former Drakelow Power Station site. Further studies will be required to establish the most appropriate location to accommodate the potential shortfall in the provision of Growth Point housing numbers in combination with the revised SUE development proposals.

Overall the complete transport strategy as tested provides significant benefits for Burton when compared to the Do Minimum situation. However, it must be considered that all of the testing has been undertaken at 2026. This forecast year assumes that there is significant background traffic growth prior to the introduction of the new housing and employment developments. This means that in general, although the strategy provides overall benefits when compared to the 2026 do-minimum situation, it is recognised that there will still be significantly more traffic on the roads within Burton than there is at present.

To place this into context, in the 2026 Do Minimum scenario traffic is forecast to have increased by over 30% compared to 2007 levels. The application of all of the strategy measures can reduce this level of demand by a maximum of 2.4% across the study area as a whole, however the level of the new growth point development trips have been reduced by around 8.5%.

Therefore it is considered that measures that are most likely to have an impact on improving the transport situation within Burton are those which are going to influence the demand for travel. However, for these measures to have a significant effect they must be targeted not only at the new development sites, but across existing residents and employees as well. This would suggest an extensive roll out of the measures proposed in Stage 1 and 2 of the strategy development process across the whole of Burton.

A higher impact strategy to encouraging use of sustainable modes and reducing car traffic generated could be developed and tested as the tools and knowledge are available to assess the impact of these measures on a significant scale. This could therefore form the basis of a future study.

Appendix A - Transport Strategy Costs to be sought from the Option 3 developments

A.1 Transport Strategy Costs – Sustainable Transport Measures

Table A.1 - Calculation of annual costs for sustainable transport measures

Year			RTP	WTP	
From	To	Dwellings P/A	Jobs P/A	£29	£47
2011	2012	650	1105	£18,850	£51,935
2012	2013	650	1105	£18,850	£51,935
2013	2014	650	1105	£18,850	£51,935
2014	2015	650	1105	£18,850	£51,935
2015	2016	650	1105	£18,850	£51,935
2016	2017	675	1334	£19,575	£62,698
2017	2018	675	1334	£19,575	£62,698
2018	2019	675	1334	£19,575	£62,698
2019	2020	675	1334	£19,575	£62,698
2020	2021	675	1334	£19,575	£62,698
2021	2022	675	1334	£19,575	£62,698
2022	2023	675	1334	£19,575	£62,698
2023	2024	675	1334	£19,575	£62,698
2024	2025	675	1334	£19,575	£62,698
2025	2026	675	1334	£19,575	£62,698
2026	2027	-	-	£19,575	£62,698
2027	2028	-	-	£19,575	£62,698
2028	2029	-	-	£19,575	£62,698
2029	2030	-	-	£19,575	£62,698
2030	2031	-	-	£19,575	£62,698

Table A.2 – RTP Annual Costs - Assuming that five years funding is secured for each development via S106 Agreement

RTP Annual Costs - Assuming that five years funding is secured for each development via S106 Agreement

Year			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
From	To																	
2011	2012	£18,850	£18,850															
2012	2013	£37,700	£18,850	£18,850														
2013	2014	£56,550	£18,850	£18,850	£18,850													
2014	2015	£75,400	£18,850	£18,850	£18,850	£18,850												
2015	2016	£94,250	£18,850	£18,850	£18,850	£18,850	£18,850											
2016	2017	£94,975		£18,850	£18,850	£18,850	£18,850	£19,575										
2017	2018	£95,700			£18,850	£18,850	£18,850	£19,575	£19,575									
2018	2019	£96,425				£18,850	£18,850	£19,575	£19,575	£19,575								
2019	2020	£97,150					£18,850	£19,575	£19,575	£19,575	£19,575							
2020	2021	£97,875						£19,575	£19,575	£19,575	£19,575	£19,575						
2021	2022	£97,875							£19,575	£19,575	£19,575	£19,575	£19,575					
2022	2023	£97,875								£19,575	£19,575	£19,575	£19,575	£19,575				
2023	2024	£97,875									£19,575	£19,575	£19,575	£19,575	£19,575			
2024	2025	£97,875										£19,575	£19,575	£19,575	£19,575	£19,575		
2025	2026	£97,875											£19,575	£19,575	£19,575	£19,575	£19,575	
2026	2027	£97,875												£19,575	£19,575	£19,575	£19,575	£19,575
2027	2028	£78,300													£19,575	£19,575	£19,575	£19,575
2028	2029	£58,725														£19,575	£19,575	£19,575
2029	2030	£39,150															£19,575	£19,575
2030	2031	£19,575																£19,575

Total Cost **£1,548,000**

Average Annual Cost **£77,394**

Table A.3 – WTP Annual Costs - Assuming that five years funding is secured for each development via S106 Agreement

WTP Annual Costs - Assuming that five years funding is secured for each development via S106 Agreement

Year																				
From	To		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
2011	2012	£51,935	£51,935															
2012	2013	£103,870	£51,935	£51,935														
2013	2014	£155,805	£51,935	£51,935	£51,935													
2014	2015	£207,740	£51,935	£51,935	£51,935	£51,935												
2015	2016	£259,675	£51,935	£51,935	£51,935	£51,935	£51,935											
2016	2017	£270,438		£51,935	£51,935	£51,935	£51,935	£62,698										
2017	2018	£281,201			£51,935	£51,935	£51,935	£62,698	£62,698									
2018	2019	£291,964				£51,935	£51,935	£62,698	£62,698	£62,698								
2019	2020	£302,727					£51,935	£62,698	£62,698	£62,698	£62,698							
2020	2021	£313,490						£62,698	£62,698	£62,698	£62,698	£62,698						
2021	2022	£313,490							£62,698	£62,698	£62,698	£62,698	£62,698					
2022	2023	£313,490								£62,698	£62,698	£62,698	£62,698	£62,698				
2023	2024	£313,490									£62,698	£62,698	£62,698	£62,698	£62,698			
2024	2025	£313,490										£62,698	£62,698	£62,698	£62,698	£62,698		
2025	2026	£313,490											£62,698	£62,698	£62,698	£62,698	£62,698	
2026	2027	£313,490												£62,698	£62,698	£62,698	£62,698	£62,698
2027	2028	£250,792													£62,698	£62,698	£62,698	£62,698
2028	2029	£188,094														£62,698	£62,698	£62,698
2029	2030	£125,396															£62,698	£62,698
2030	2031	£62,698																£62,698

Total Cost £4,747,000

Average Annual Cost £237,338

TOTAL COST for RTP/WTP £6,295,000

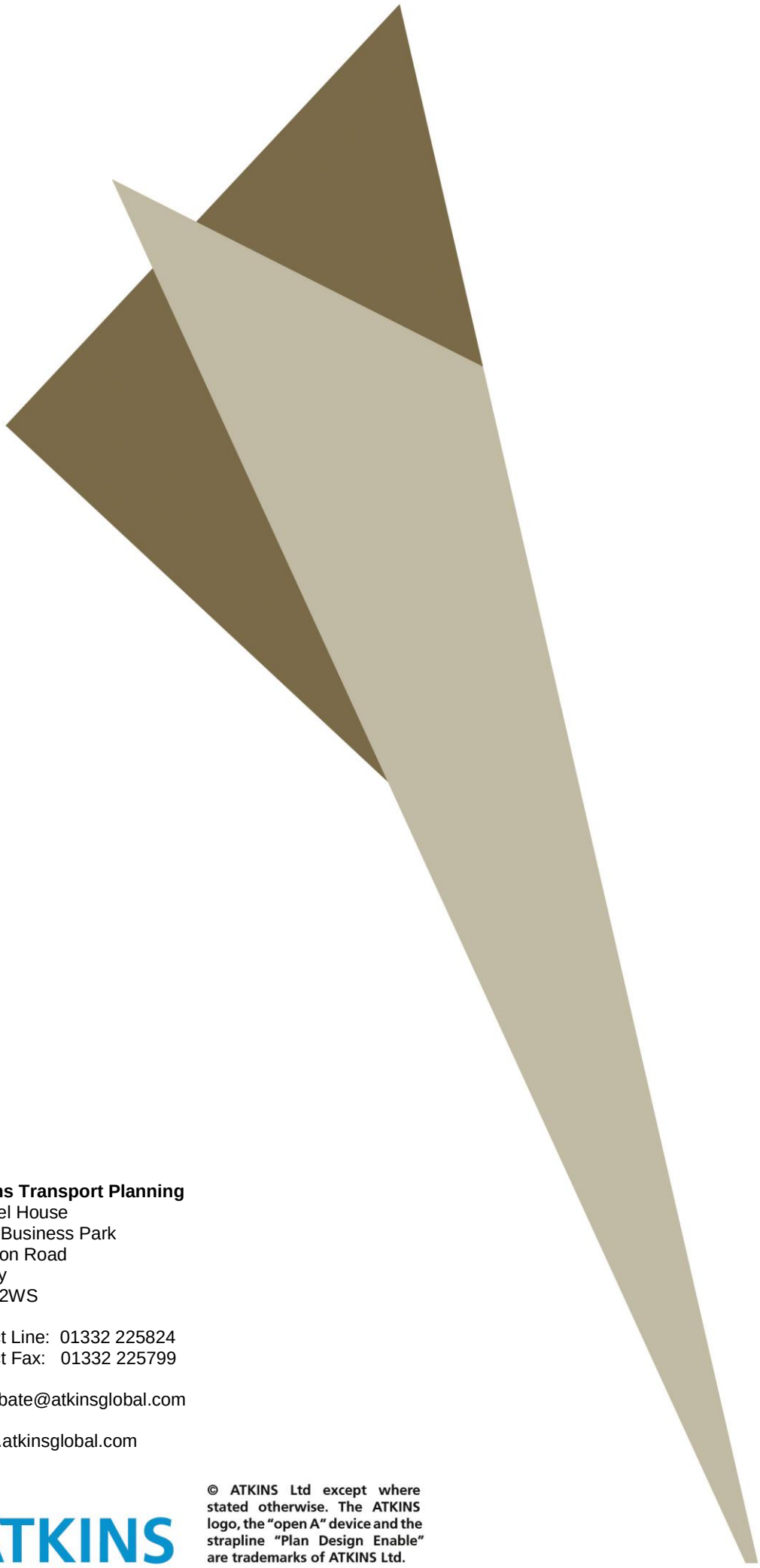
A.2 Transport Strategy Costs per Development

Table A.4 - Transport Strategy Costs to be sought from the Option 3 developments

Development Name	Development Type	Equivalent Number of Housing Units	Development Contribution to Transport Strategy
Forest Edge Way	Housing	33	£25,282
Rolleston Road	Housing	11	£8,633
Horninglow Road North	Housing	6	£4,933
Wetmore	Housing	128	£98,662
Wetmore Road	Housing	32	£24,357
Shobnall Road (Waste Site)	Housing	39	£29,907
Curzon Street	Housing	74	£57,039
Scalpcliffe Road	Housing	8	£6,166
Scalpcliffe Close	Housing	14	£10,791
Vancouver Drive	Housing	26	£20,349
Broadway Street	Housing	10	£7,400
Blackpool Street	Housing	10	£8,016
Stanton Road	Housing	10	£8,016
Model dairy Farm	Housing	152	£117,162
Lynwood Road	Housing	29	£22,507
Bridgeford Avenue	Housing	8	£6,166
Manor Farm	Housing	92	£70,914
Tatenhill Lane	Housing	98	£75,230
Rosliston Road	Housing	5	£4,008
Dallow Street/ Victoria Road	Housing	18	£14,183
All Saints Road	Housing	12	£9,558
Berryhedge Youth Centre	Housing	9	£6,783
Stretton Business Park Completed	Industry	50	£38,692
Pirelli - existing factory and offices	Industry	489	£376,742
Plasplugs, Wetmore Road	Housing	80	£61,664
Grief UK Ltd, Victoria Crescent	Housing	72	£55,498
Steel Fabs Industrial Estate, Victoria Cresent	Housing	40	£30,832
Dallow Bridge, APV, Dallow Street	Housing	48	£36,998

Stonell Direct, Victoria Crescent	Housing	36	£27,749
Renolds Chains	Housing	152	£117,162
Little Burton West	Housing	28	£21,582
Hartshorne Volvo, Derby Street	Housing	28	£21,582
Former railway sidings rear of bonded warehouse	Industry	133	£102,170
Vacant land rear Derby Turn office building	Industry	17	£13,327
Former garage/pet suppliers	Industry	23	£17,769
Northside Business Park	Industry	3	£2,496
Site adjacent to river, Wetmore Road	Industry	29	£22,211
James Properties, Wood Street	Housing	12	£9,250
Briggs, Derby Road	Housing	80	£61,664
Eddie Stobart, Derby Road	Housing	80	£61,664
Brabazon Court, Shobnall Road	Housing	88	£67,830
Active, CHF Tankers, Shobnall Road	Housing	40	£30,832
Pectel, Shobnall Road	Housing	16	£12,333
Centrum West	Industry	836	£644,117
Adjacent Kongsberg Auto	Industry	81	£62,191
Centrum 100	Industry	127	£97,728
Expansion Land for Healthcare at Home	Industry	17	£13,327
Expansion Land for Holland and Barrett	Industry	121	£93,286
Expansion Land for former LUK unit	Industry	80	£61,415
Wellington Road	Industry	132	£101,726
Anson Developments, Avro Business Park	Industry	506	£390,335
Mercia Business Park	Industry	396	£304,875
Centrum East	Industry	242	£186,572
Branston Depot	Housing	992	£764,634
Leavsley containers	Housing	104	£80,163
Anglesey House and Industrial Estate, Anglesey Road	Housing	216	£166,493
Webb Ivory, Queen Street	Housing	40	£30,832
Thurco, Watson Street	Housing	16	£12,333
Development Site (i76)	Industry	144	£111,055
Development Site (i79)	Industry	121	£93,286
Development Site (i81)	Industry	133	£102,170

Fauld Industrial Estate/ Castle Point Park	Industry	194	£149,361
Anslow Park	Industry	179	£137,708
Development Site (i89)	Industry	69	£53,306
Redhouse Farm	Housing	320	£246,656
Beamhill	Housing	2400	£1,849,921
North of Harehedge Lane	Housing	760	£585,808
Lawns Farm	Industry	3170	£2,443,201
Windfall housing (various locations)	Housing	4021	£3,099,389
Total Developments (in Equivalent Housing Units)		**17784**	**£13,708,000**



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